

T-Mobile

T-MOBILE SITE NUMBER: DN06267A
T-MOBILE SITE NAME: CO46086-A
T-MOBILE PROJECT: SPRINT RETAIN

SBA SITE ID: CO46086-A
SITE ADDRESS: 6753 SHOUP ROAD
 COLORADO SPRINGS, CO 80908
JURISDICTION: EL PASO COUNTY

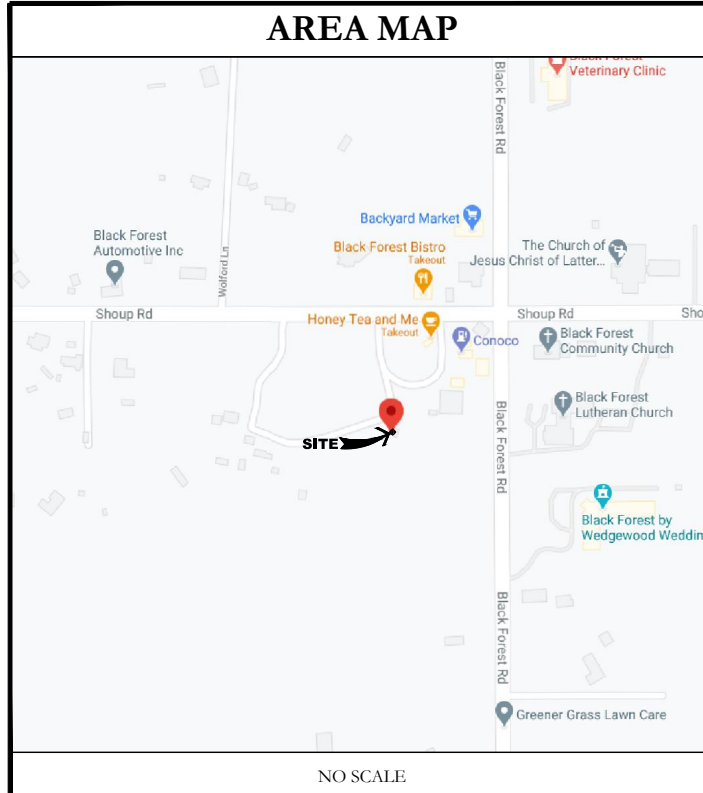
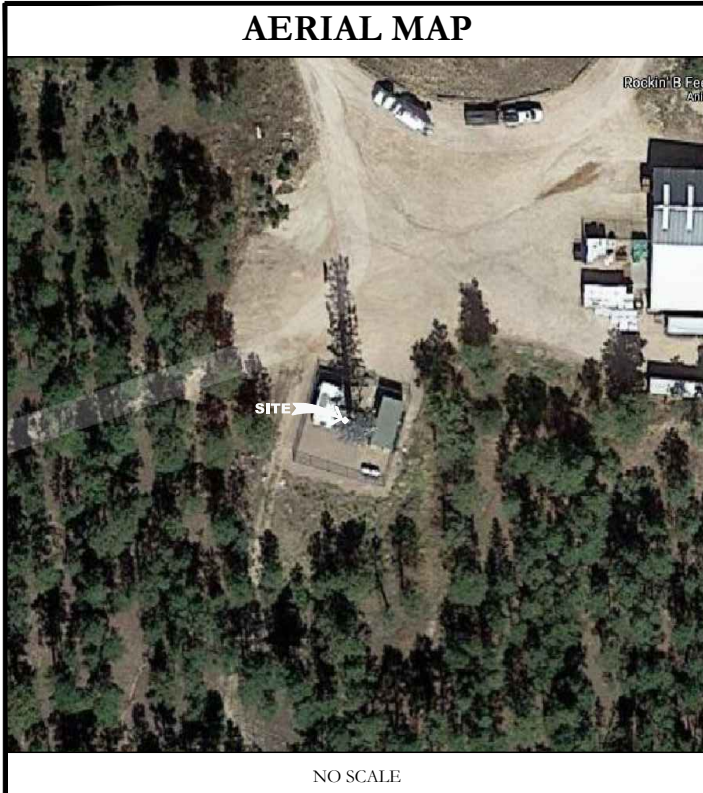
T-Mobile

12920 SE 38TH STREET
 BELLEVUE, WA 98006



470 DAVIDSON ROAD
 PITTSBURGH, PA 15239
 TEL: (740) 260-9710

SITE INFORMATION	
SBA SITE NAME	BLACK FOREST SOUTH
SITE ADDRESS:	6753 SHOUP ROAD COLORADO SPRINGS, CO 80908
COUNTY:	EL PASO
AREA OF CONSTRUCTION:	EXISTING
LATTITUDE:	39.011778° N
LONGITUDE:	104.701750° W
LAT/LONG TYPE:	NAD83
JURISDICTION:	EL PASO COUNTY
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
TOWER OWNER:	SBA COMMUNICATIONS 470 DAVIDSON ROAD PITTSBURGH, PA 15239
CARRIER/APPLICANT:	T-MOBILE 12920 SE 38TH STREET BELLEVUE, WA 98006



DRAWING INDEX	
SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1.1	OVERALL SITE PLAN
C-1.2	EXISTING EQUIPMENT PLAN
C-1.3	FINAL EQUIPMENT PLAN
C-2	TOWER ELEVATION & ANTENNA PLANS
C-3	ANTENNA SCHEDULE
C-4	PLUMBING DIAGRAM
C-5	EQUIPMENT SPECIFICATIONS
C-6	EQUIPMENT SPECIFICATIONS
C-7	EQUIPMENT SPECIFICATIONS
C-8	MOUNTING DETAIL
E-1	ELECTRICAL ROUTING
E-2	PANEL SCHEDULE & ONE-LINE DIAGRAM
G-1	GROUNDING DIAGRAM
G-2	GROUNDING DETAILS

PLANS PREPARED BY:

421 FAYETTEVILLE ST, SUITE 600
 RALEIGH, NC 27601

REV.	DATE	DESCRIPTION	BY
4	12/15/21	REVISED PER CLIENT	DLF
3	10/28/21	REVISED PER CLIENT	DLF
2	09/15/21	REVISED PER CLIENT	DLF
1	04/28/21	REVISED PER CLIENT	DLF
0	04/22/21	ISSUED FOR CONSTRUCTION	DLF
A	03/16/21	ISSUED FOR REVIEW	JIK

DRAWN BY:	JIK	CHECKED BY:	DLF
KHA PROJECT NUMBER:	KHCL-7604		

ENGINEER SEAL:

Exp. 10/31/23

- GROUND SCOPE OF WORK**
1. INSTALL NEW DELTA 600A ELITE POWER RACK
 2. INSTALL NEW 19" EQUIPMENT RACK
 3. INSTALL (1) FSMF
 4. INSTALL (2) ASIB
 5. INSTALL (2) ASIK
 6. INSTALL (3) ABIA
 7. INSTALL (6) ABIL
 8. INSTALL (3) ABIC
 9. INSTALL (2) AMIA
 10. INSTALL (1) CSR 1XRe V2
 11. INSTALL (2) JUNCTION BOXES
- THE POWER DESIGN FOR ANY AC ELECTRICAL POWER CHANGES IS TO BE PERFORMED BY OTHERS AND IS SHOWN HERE FOR REFERENCE PURPOSES ONLY. T-MOBILE IS SOLELY RESPONSIBLE FOR THE ELECTRICAL POWER DESIGN.

- TOWER SCOPE OF WORK**
1. REMOVE EXISTING T-ARM MOUNTS
 2. REMOVE (6) ANTENNAS
 3. REMOVE (9) RRHS
 4. REMOVE (3) POWER JUNCTION CYLINDERS
 5. REMOVE (3) FIBER JUNCTION CYLINDERS
 6. INSTALL NEW SABRE T-ARM MOUNTS MOUNT
 7. INSTALL (6) ANTENNAS
 8. INSTALL (6) RRHS
 9. INSTALL (2) BREAKOUT PENDANTS
 10. INSTALL (2) HYBRID CABLES

APPLICABLE CODES/REFERENCE DOCS

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	2015 IBC
MECHANICAL	2015 IMC
ELECTRICAL	2014 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS: TOWER ENGINEERING SOLUTIONS (PROJECT #: 102534)
 DATED: 02/19/21

MOUNT ANALYSIS: BY OTHERS
 DATED:

RFDS REVISION: 1
 DATED: 04/28/21

PROJECT TEAM

A&E FIRM: KIMLEY-HORN & ASSOCIATES, INC.
 3875 EMBASSY PKWY, SUITE 280
 AKRON, OH 44333
 KEVIN.CLEMENTS@KIMLEY-HORN.COM

SBA CONTACT: 470 DAVIDSON ROAD
 PITTSBURGH, PA 15239

WILL SPICE - PROJECT MANAGER
 WSPICE@SBASITE.COM

CALL COLORADO ONE CALL (800) 922-1987
 CALL 3 WORKING DAYS BEFORE YOU DIG!

PCD File #: TWR-21-006

DN06267A
 CO46086-A
 SBA #: CO46086-A
 6753 SHOUP ROAD
 COLORADO SPRINGS, CO 80908

SHEET TITLE:
TITLE SHEET

SHEET NUMBER:
T-1

GENERAL NOTES:

1. OWNER FURNISHED MATERIALS, T-MOBILE "THE COMPANY" WILL PROVIDE AND THE CONTRACTOR WILL INSTALL:

- A. BTS EQUIPMENT FRAME (PLATFORM) AND ICEBRIDGE SHELTER (GROUND BUILD/CO-LOCATE ONLY)
- B. AC/TELCO INTERFACE BOX(PPC)
- C. ICE BRIDGE (CABLE TRAY WITH COVER) (GROUND BUILD/CO-LOCATE ONLY, GC TO FURNISH AND INSTALL FOR ROOFTOP INSTALLATION)
- D. TOWERS, MONOPOLE
- E. TOWER LIGHTING
- F. GENERATORS & LIQUID PROPANE TANK
- G. ANTENNA STANDARD BRACKETS, FRAMES, AND PIPES FOR MOUNTING.
- H. ANTENNAS (INSTALLED BY OTHERS)
- I. TRANSMISSION LINE
- J. TRANSMISSION LINE JUMPERS
- K. TRANSMISSION LINE CONNECTORS WITH WEATHERPROOFING KITS
- L. TRANSMISSION LINE GROUND KITS
- M. HANGERS
- N. HOISTING GRIPS
- O. BTS EQUIPMENT

2. CONTRACTOR TO FURNISH AND INSTALL THE FOLLOWING:

THE CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL OTHER MATERIALS FOR THE COMPLETE INSTALLATION OF THE SITE INCLUDING, BUT NOT LIMITED TO, SUCH MATERIALS AS FENCING, STRUCTURAL STEEL SUPPORTING SUB-FRAME FOR PLATFORM, ROOFING LABOR AND MATERIALS, GROUNDING RINGS, GROUNDING WIRES, COPPER-CLAD OR XIT CHEMICAL GROUND ROD(S), BUSS BARS, TRANSFORMERS AND DISCONNECT SWITCHES WHERE APPLICABLE, TEMPORARY ELECTRICAL POWER, CONDUIT, LANDSCAPING COMPOUND STONE, CRANES, CORE DRILLING, SLEEPERS AND RUBBER MATTING, REBAR, CONCRETE CAISSONS, PADS AND/OR AUGER MOUNTS, MISCELLANEOUS FASTENERS, CABLE TRAYS, NON-STANDARD ANTENNA FRAMES AND ALL OTHER MATERIAL AND LABOR REQUIRED TO COMPLETE THE JOB ACCORDING TO THE DRAWINGS AND SPECIFICATIONS. IT IS THE POSITION OF T-MOBILE TO APPLY FOR PERMITTING AND CONTRACTOR RESPONSIBLE FOR PICKUP AND PAYMENT OF REQUIRED PERMITS.

3. T-MOBILE FURNISHED EQUIPMENT SHALL BE PICKED-UP AT THE T-MOBILE WAREHOUSE, NO LATER THAN 48HR AFTER BEING NOTIFIED INSURED, STORED, UNCRATED, PROTECTED AND INSTALLED BY THE

CONTRACTOR WITH ALL APPURTENANCES REQUIRED TO PLACE THE EQUIPMENT IN OPERATION, READY FOR USE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE EQUIPMENT AFTER PICKING UP.

4. ALL EQUIPMENT FURNISHED AND WORK PERFORMED UNDER THE CONTRACT DOCUMENTS SHALL BE GUARANTEED AGAINST DEFECTS IN MATERIALS OR WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE, UNLESS NOTED OTHERWISE. ANY FAILURE OF EQUIPMENT OR WORK DUE TO DEFECTS IN MATERIALS OR WORKMANSHIP SHALL BE CORRECTED BY THE CONTRACTOR AT NO COST TO THE OWNER.

5. ALL WORK, MATERIAL, AND EQUIPMENT SHALL COMPLY WITH ALL REQUIREMENTS OF THE LATEST EDITIONS AND INTERIM AMENDMENTS OF THE NATIONAL ELECTRICAL CODE (NEC), NATIONAL ELECTRICAL SAFETY CODE, OSHA, AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND ORDINANCES. ALL ELECTRICAL EQUIPMENT PROVIDED UNDER THIS CONTRACT SHALL BE NEW (EXCEPT WHERE OTHERWISE NOTED) AND SHALL COMPLY WITH THE REQUIREMENTS OF THE UNDERWRITERS' LABORATORIES (U.L.) AND BEAR THE U.L. LABEL.

6. T-MOBILE OR HIS ARCHITECT/ENGINEER RESERVES THE RIGHT TO REJECT ANY EQUIPMENT OR MATERIALS WHICH, IN HIS OPINION ARE NOT IN COMPLIANCE WITH THE CONTRACT DOCUMENTS, EITHER BEFORE OR AFTER INSTALLATION AND THE EQUIPMENT SHALL BE REPLACED WITH EQUIPMENT CONFORMING TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS BY THE CONTRACTOR AT NO COST TO THE OWNER OR HIS ARCHITECT/ENGINEER.

7. THE CONTRACTOR SHALL SUPPORT, BRACE AND SECURE EXISTING STRUCTURE AS REQUIRED. CONTRACTOR IS SOLELY RESPONSIBLE FOR THE PROTECTION OF ANY EXISTING STRUCTURES DURING CONSTRUCTION. FIELD VERIFY ALL EXISTING DIMENSIONS WHICH AFFECT THE NEW CONSTRUCTION.

8. THE CONTRACTOR SHALL NOT ALLOW OR CAUSE ANY OF THE WORK TO BE COVERED UP OR ENCLOSED UNTIL IT HAS BEEN INSPECTED BY THE GOVERNING AUTHORITIES. ANY WORK THAT IS ENCLOSED OR COVERED UP BEFORE SUCH INSPECTION AND TEST SHALL BE UNCOVERED AT THE CONTRACTOR'S EXPENSE; AFTER IT HAS BEEN INSPECTED, THE CONTRACTOR SHALL RESTORE THE WORK TO ITS ORIGINAL CONDITION AT HIS OWN EXPENSE.

9. ALL EXISTING UTILITIES, FACILITIES, CONDITIONS, AND THEIR DIMENSIONS SHOWN ON PLANS HAVE BEEN PLOTTED FROM AVAILABLE RECORDS. THE ARCHITECT/ENGINEER AND OWNER (T-MOBILE) ASSUME NO RESPONSIBILITY WHATEVER AS TO THE PROFICIENCY OR ACCURACY OF THE INFORMATION SHOWN ON THE PLANS OR THE MANNER OF THEIR REMOVAL OR ADJUSTMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL SAID UTILITIES AND FACILITIES PRIOR TO START OF CONSTRUCTION. CONTRACTOR SHALL ALSO OBTAIN FROM EACH UTILITY COMPANY DETAILED INFORMATION RELATIVE TO WORKING SCHEDULES AND METHODS OF REMOVING OR ADJUSTING AFFECTED UTILITIES.

GENERAL NOTES (CONTD):

10. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITIES BOTH HORIZONTALLY AND VERTICALLY PRIOR TO START OF CONSTRUCTION. ANY DISCREPANCIES OR DOUBTS AS TO THE INTERPRETATION OF PLANS SHOULD BE IMMEDIATELY REPORTED TO THE PROJECT MANAGER FOR RESOLUTION AND INSTRUCTION, AND NO FURTHER WORK SHALL BE PERFORMED UNTIL DISCREPANCY IS CHECKED AND CORRECTED BY THE ARCHITECT/ENGINEER. FAILURE TO SECURE SUCH INSTRUCTION MEANS CONTRACTOR WILL HAVE WORKED AT HIS OWN RISK AND EXPENSE.

11. CONTRACTORS SHALL CLEAN ENTIRE SITE AFTER CONSTRUCTION SUCH THAT NO PAPERS, TRASH, DEBRIS, WEEDS, BRUSH, OR ANY OTHER DEPOSITS REMAIN. ALL MATERIALS COLLECTED DURING CLEANING OPERATIONS SHALL BE PROPERLY DISPOSED OF OFF-SITE BY THE CONTRACTOR.

12. ALL SITE WORK SHALL BE CAREFULLY COORDINATED BY THE CONTRACTOR WITH LOCAL GAS, ELECTRIC, TELEPHONE, AND ANY OTHER UTILITY COMPANIES HAVING JURISDICTION OVER THIS LOCATION.

13. DURING CONSTRUCTION, THE CONTRACTOR SHALL AT ALL TIMES MAINTAIN THE UTILITIES OF THE BUILDING/SITE WITHOUT INTERRUPTION. SHOULD IT BE NECESSARY TO INTERRUPT ANY SERVICE OR UTILITY, THE CONTRACTOR SHALL SECURE PERMISSION IN WRITING FROM THE BUILDING/PROPERTY OWNER FOR SUCH INTERRUPTION, AT LEAST 72 HOURS IN ADVANCE. ANY INTERRUPTION SHALL BE MADE WITH A MINIMUM AMOUNT OF INCONVENIENCE TO THE BUILDING/PROPERTY OWNER AND ANY SUCH SHUTDOWN TIME SHALL BE COORDINATED WITH THE BUILDING/PROPERTY OWNER.

14. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION.

15. CONTRACTOR SHALL SUBMIT AT THE END OF THE PROJECT A COMPLETE SET OF AS BUILT DRAWINGS TO T-MOBILE'S PROJECT ENGINEER.

16. GC WILL NOT START THE CONSTRUCTION UNTIL AFTER THEY RECEIVE THE PRE CON PACKAGE AND HAVE A PRE CON WALK WITH THE PROJECT MANAGER.

DIVISION 2 - SITE WORK:

1. THE CONTRACTOR SHALL CALL UTILITIES 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 THE PROJECT MANAGER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT LIMITED TO:

- A. FALL PROTECTION
- B. CONFINED SPACE
- C. ELECTRICAL SAFETY
- D. TRENCHING AND EXCAVATION

2. REMOVE FROM SITE/OWNER'S PROPERTY ALL WASTE MATERIALS, UNUSED EXCAVATED MATERIAL INCLUDING MATERIAL CLASSIFIED UNSATISFACTORY, CONTAMINATED OR DANGEROUS TRASH AND DEBRIS, AND DISPOSE OF IN A LEGAL MANNER.

3. 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 ENGINEERING.

4. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE BUILDING OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, FERTILIZED, SEEDED, AND COVERED WITH MULCH

5. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, AS REQUIRED DURING CONSTRUCTION.

CONTRACTOR IS RESPONSIBLE FOR LAYOUT AND CONSTRUCTION STAKING. CONTRACTOR SHALL ESTABLISH GRADE AND LINE STAKES PRIOR TO CONSTRUCTION.

KIMLEY-HORN DOES NOT GUARANTEE OR WARRANT THAT THE AFOREMENTIONED EASEMENTS ARE SUFFICIENT FOR CONSTRUCTION TRAFFIC. GC SHALL CONSULT WITH A T-MOBILE REPRESENTATIVE AND LANDLORD WITH EXACT LOGISTICS TO FACILITATE CONTRACTIBILITY OF THE SITE AND DELIVERY OF CRITICAL MATERIALS SUCH AS THE TOWER, STEEL, CONCRETE AND CRANES TO THE PROPOSED LEASE AREA. GC SHALL RESTORE SITE TO ORIGINAL CONDITIONS AND REPLACE ANY AND ALL DISTURBED TREES OR LANDSCAPING.

KIMLEY-HORN IS NOT RESPONSIBLE FOR THE MAINTENANCE AND/OR OPERATIONAL FEASIBILITY.

SCOPE OF WORK FOR THESE PLANS DOES NOT INVOLVE VALUE ENGINEERING AS WELL AS MAINTAINABILITY OPERATIONS OF THE SITE, ACCESS OR UTILITIES.

DIVISION 3 - CONCRETE:

1. MINIMUM ALLOWABLE CONCRETE COMPRESSIVE STRENGTH SHALL BE 4000 PSI AT 28 DAYS WHEN TESTED IN ACCORDANCE WITH THE AMERICAN SOCIETY FOR TESTING AND MATERIALS METHODS STANDARDS ASTM C172, ASTM C31 AND ASTM C39 UNLESS OTHERWISE NOTED.

2. CONCRETE FOR ALL FOUNDATIONS: 540 LBS PER CUBIC YARD OF CONCRETE MINIMUM CEMENT CONTENT FOR 1-INCH MAXIMUM SIZE AGGREGATE, SLUMP RANGE 3 INCHES TO 5 INCHES, TOTAL AIR CONTENT 4 PERCENT TO 7 PERCENT BY VOLUME. AIR ENTRAINING ADMIXTURE REQUIRED TO CONTROL TOTAL AIR CONTENT, WATER REDUCING ADMIXTURE PERMITTED TO OBTAIN SLUMP OVER 3-INCHES.

3. ALL CONCRETE CONSTRUCTION SHALL MEET THE REQUIREMENTS OF THE LATEST EDITION OF THE AMERICAN CONCRETE INSTITUTE (ACI 318) BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE AND (ACI 301) STANDARD SPECIFICATION FOR STRUCTURAL CONCRETE.

4. REBARS SHALL BE ASTM A-615 DEFORMED TYPE WITH MINIMUM YIELD STRENGTH OF 60,000 PSI (40,000 PSI GRADE MAY BE USED FOR TIES & STIRRUPS).

WELDED WIRE FABRIC SHALL CONFORM TO ASTM A-185.

5. DETAILING SHALL BE IN ACCORDANCE WITH MANUAL OF STANDARD PRACTICE OF DETAILING REINFORCED CONCRETE STRUCTURES (ACI STD-315 LATEST EDITION).

6. CHAMFER ALL EXPOSED EDGES OF CONCRETE 3/4". UNLESS OTHERWISE NOTED.

7. REINFORCING STEEL SHALL BE ACCURATELY PLACED AND ADEQUATELY SECURED IN POSITION. LOCATION OF REINFORCEMENT SHALL BE INDICATED ON THE DRAWINGS. THE FOLLOWING MINIMUM COVER (INCHES) FOR REINFORCEMENT SHALL BE PROVIDED, EXCEPT AS NOTED ON DRAWINGS.

MINIMUM COVER (INCHES)
 CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH ... 3"
 EXPOSED TO EARTH OR WEATHER:
 #6 THROUGH #18 ... 2"
 #5 BAR AND SMALLER ... 1-1/2"

8. TESTS
 CONCRETE MATERIALS AND OPERATIONS SHALL BE TESTED AND INSPECTED BY THE ENGINEER AS THE WORK PROGRESSES. FAILURE TO DETECT ANY DEFECTIVE WORK OR MATERIAL SHALL NOT IN ANY WAY PREVENT LATER REJECTION WHEN SUCH DEFECT IS DISCOVERED NOR SHALL IT OBLIGATE THE ENGINEER FOR FINAL ACCEPTANCE.

A. FIVE CONCRETE TEST CYLINDERS SHALL BE TAKEN OF THE TOWER PIER FOUNDATION. TWO SHALL BE TESTED @ THREE DAYS, TWO @ TWENTY-EIGHT DAYS. THE FIFTH CYLINDER SHALL BE KEPT SEPARATELY, IF REQUIRED TO BE USED IN THE FUTURE.

B. ONE ADDITIONAL TEST CYLINDER SHALL BE TAKEN DURING COLD WEATHER AND CURED ON SITE UNDER SAME CONDITIONS AS CONCRETE IT REPRESENTS.

C. ONE SLUMP TEST SHALL BE TAKEN FOR EACH SET OF TEST CYLINDERS TAKEN.

9. PLACING CONCRETE
 A. THE ENGINEER SHALL BE NOTIFIED NOT LESS THAT 24 HOURS IN ADVANCE OF CONCRETE PLACEMENT, UNLESS INSPECTION IS WAIVED IN EACH CASE, PLACING OF CONCRETE SHALL BE PERFORMED ONLY IN THE PRESENCE OF THE ENGINEER. CONCRETE SHALL NOT BE PLACED UNTIL ALL FORMWORK, EMBEDDED PARTS, STEEL REINFORCEMENT, FOUNDATION SURFACES AND JOINTS INVOLVED IN THE PLACING HAVE BEEN APPROVED, AND UNTIL FACILITIES ACCEPTABLE TO THE T-MOBILE REPRESENTATIVE HAVE BEEN PROVIDED AND MADE READY FOR ACCOMPLISHMENT OF THE WORK AS SPECIFIED. CONCRETE MAY NOT BE ORDERED FOR PLACEMENT UNTIL ALL ITEMS HAVE BEEN APPROVED AND T-MOBILE HAS PERFORMED A FINAL INSPECTION AND GIVEN APPROVAL TO START PLACEMENT IN WRITING.
 B. PLACEMENT OF CONCRETE SHALL BE IN ACCORDANCE WITH ACI 301.

10. PROTECTION
 A. IMMEDIATELY AFTER PLACEMENT, THE CONTRACTOR SHALL PROTECT THE CONCRETE FROM PREMATURE DRYING, EXCESSIVELY HOT OR COLD TEMPERATURES, AND MECHANICAL INJURY. FINISHED WORK SHALL BE PROTECTED.
 B. CONCRETE SHALL BE MAINTAINED WITH MINIMAL MOISTURE LOSS AT RELATIVELY CONSTANT TEMPERATURE FOR A PERIOD NECESSARY FOR HYDRATION OF CEMENT AND HARDENING OF CONCRETE.
 C. ALL CONCRETE SHALL BE WATER CURED BY CONTINUOUS (NOT PERIODIC) FINE MIST SPRAYING OR SPRINKLING ALL EXPOSED SURFACES. WATER SHALL BE CLEAN AND FREE FROM ACID, ALKALI, SALTS, OIL SEDIMENT, AND ORGANIC MATTER. SUCCESSFUL CURING SHALL BE OBTAINED BY USE OF AN AMPLE WATER SUPPLY UNDER PRESSURE IN PIPES, WITH ALL NECESSARY APPLIANCES OF SPRINKLERS, AND SPRAYING DEVICES.

ELECTRICAL NOTES:

1. ELECTRICAL DESIGN SHALL BE PERFORMED BY ELECTRICAL CONTRACTOR. STRUCTURAL DESIGN SHALL BE PERFORMED BY GENERAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL ENSURE THAT ALL WORK COMPLIES WITH ALL APPLICABLE LOCAL AND STATE CODES AND NATIONAL ELECTRICAL CODE.

2. ALL SUGGESTED ELECTRICAL ELEMENTS (SUCH AS BREAKER SIZES, WIRE SIZES, CONDUITS SIZES ARE FOR ZONING PURPOSES ONLY. IT IS THE RESPONSIBILITY TO OF THE ELECTRICAL CONTRACTOR TO CONFIRM COMPLIANCE WITH LOCAL ELECTRICAL CODES AND PASS ALL APPLICABLE AND NECESSARY INSPECTIONS. IN SOME EVENTS, IT MAY BE NECESSARY TO PERFORM AN ELECTRICAL LOAD STUDY TO VERIFY THE CAPACITY OF THE EXISTING SERVICE. THIS IS NOT THE RESPONSIBILITY OF KIMLEY-HORN. IT IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.

3. CONTRACTOR SHALL FIELD LOCATE ALL BELOW GRADE GROUND LINES AND UTILITY LINES PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR RELOCATION OF ALL UTILITIES AND GROUND LINES THAT MAY BECOME DISTURBED OR CONFLICTING IN THE COURSE OF CONSTRUCTION.

DIVISION 5 - STRUCTURAL STEEL:

1. DETAIL, FABRICATE AND ERECT STRUCTURAL STEEL IN ACCORDANCE WITH THE LATEST AISC MANUAL OF STEEL CONSTRUCTION (ASD), AWS D1.1, AND THE BASIC BUILDING CODE. STRUCTURAL STEEL SHALL BE AS FOLLOWS:

A. ASTM A36, GRADE 36; ROLLED STEEL, RODS, PLATES, U-BOLTS AND ANCHOR BOLTS.

B. ASTM A325 BOLTS, BEARING TYPE
 C. ALL STEEL SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123.

2. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING AND/OR BRACING WHERE REQUIRED DURING CONSTRUCTION UNTIL ALL CONNECTIONS ARE COMPLETE.

3. ANY FIELD CHANGES OR SUBSTITUTIONS SHALL HAVE PRIOR APPROVAL FROM THE ENGINEER, AND T- MOBILE PROJECT MANAGER IN WRITING

4. TIGHTEN HIGH STRENGTH BOLTS TO A SNUG TIGHT CONDITION WHERE ALL PLIES IN A JOINT ARE IN FIRM CONTACT BY EITHER

- A. A FEW IMPACTS OF A IMPACT WRENCH
- B. THE FULL EFFORT OF A PERSON USING A SPUD WRENCH.

5. WELDING
 A. ALL WELDING SHALL BE DONE BY CERTIFIED WELDERS. CERTIFICATION DOCUMENTS SHALL BE MADE AVAILABLE FOR ENGINEER'S AND/OR OWNER'S REVIEW IF REQUESTED.

B. WELDING ELECTRODES FOR MANUAL SHIELDED METAL ARC WELDING SHALL CONFORM TO ASTM A-233, E70 SERIES. BARE ELECTRODES AND GRANULAR FLUX USED IN THE SUBMERGED ARC PROCESS SHALL CONFORM TO AISC SPECIFICATIONS.

C. FIELD WELDING SHALL BE DONE AS PER AWS D1.1 REQUIREMENTS VISUAL INSPECTION IS ACCEPTABLE.

6. PROTECTION
 A. UPON COMPLETION OF ERECTION INSPECT ALL GALVANIZED STEEL AND PAINT ANY FIELD CUTS, WELDS, OR GALVANIZED BREAKS WITH ZINC BASED PAINT. COLOR TO MATCH THE GALVANIZING PROCESS.

DIVISION 13 - SPECIAL CONSTRUCTION ANTENNA INSTALLATION

1. WORK INCLUDED:

A. ANTENNAS AND COAXIAL CABLES ARE FURNISHED BY T-MOBILE UNDER A SEPARATE CONTRACT. THE CONTRACTOR SHALL ASSIST ANTENNA INSTALLATION CONTRACTOR IN TERMS OF COORDINATION AND SITE ACCESS. ERECTION SUB-CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF PERSONNEL AND

B. INSTALL ANTENNAS AS INDICATED ON DRAWINGS AND T-MOBILE SPECIFICATIONS.

C. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS.

D. INSTALL FURNISHED GALVANIZED STEEL OR ALUMINUM WAVEGUIDE AND PROVIDE PRINTOUT OF THAT TEST.

E. CONTRACTOR SHALL PROVIDE FOUR (4) SETS OF SWEEP TESTS USING ANRITZU- PACKARD 8713B RF SCALAR NETWORK ANALYZER. SUBMIT FREQUENCY DOMAIN REFLECTOMETER(FDR) TESTS RESULTS TO THE PROJECT MANAGER. SWEEP TESTS SHALL BE AS PER ATTACHED RFS "MINIMUM FIELD TESTING RECOMMENDED FOR ANTENNA AND HELIAX COAXIAL CABLE SYSTEMS" DATED 10/5/93. TESTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING SERVICE AND BE BOUND AND SUBMITTED WITHIN ONE WEEK OF WORK COMPLETION.

F. INSTALL COAXIAL CABLES AND TERMINATING BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTORS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS. TERMINATE ALL COAXIAL CABLE THREE (3) FEET IN EXCESS OF ENTRY PORT LOCATION UNLESS OTHERWISE STATED.

G. ANTENNA AND COAXIAL CABLE GROUNDING:
 1. ALL EXTERIOR #6 GREEN GROUND WIRE "DAISY CHAIN" CONNECTIONS ARE TO BE WEATHER SEALED WITH RFS CONNECTOR/SPlice WEATHERPROOFING KIT #221213 OR EQUAL.
 2. ALL COAXIAL CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF COAXIAL CABLE (NOT WITHIN BENDS).



12920 SE 38TH STREET
 BELLEVUE, WA 98006



470 DAVIDSON ROAD
 PITTSBURGH, PA 15239
 TEL: (740) 260-9710

PLANS PREPARED BY:



421 FAYETTEVILLE ST, SUITE 600
 RALEIGH, NC 27601

REV: DATE: DESCRIPTION: BY:

REV	DATE	DESCRIPTION	BY
4	12/15/21	REVISED PER CLIENT	DLF
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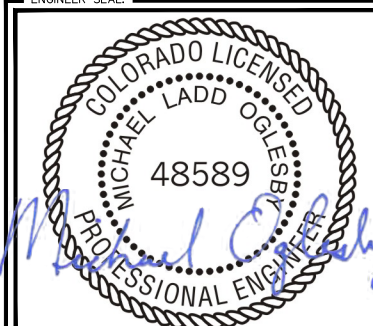
DRAWN BY: CHECKED BY:

JIK DLF

KHA PROJECT NUMBER:

KHCLE-7604

ENGINEER SEAL:



Exp. 10/31/23

PROJECT INFORMATION:

DN06267A
 CO46086-A
 SBA #: CO46086-A
 6753 SHOUP ROAD
 COLORADO SPRINGS, CO 80908

SHEET TITLE:

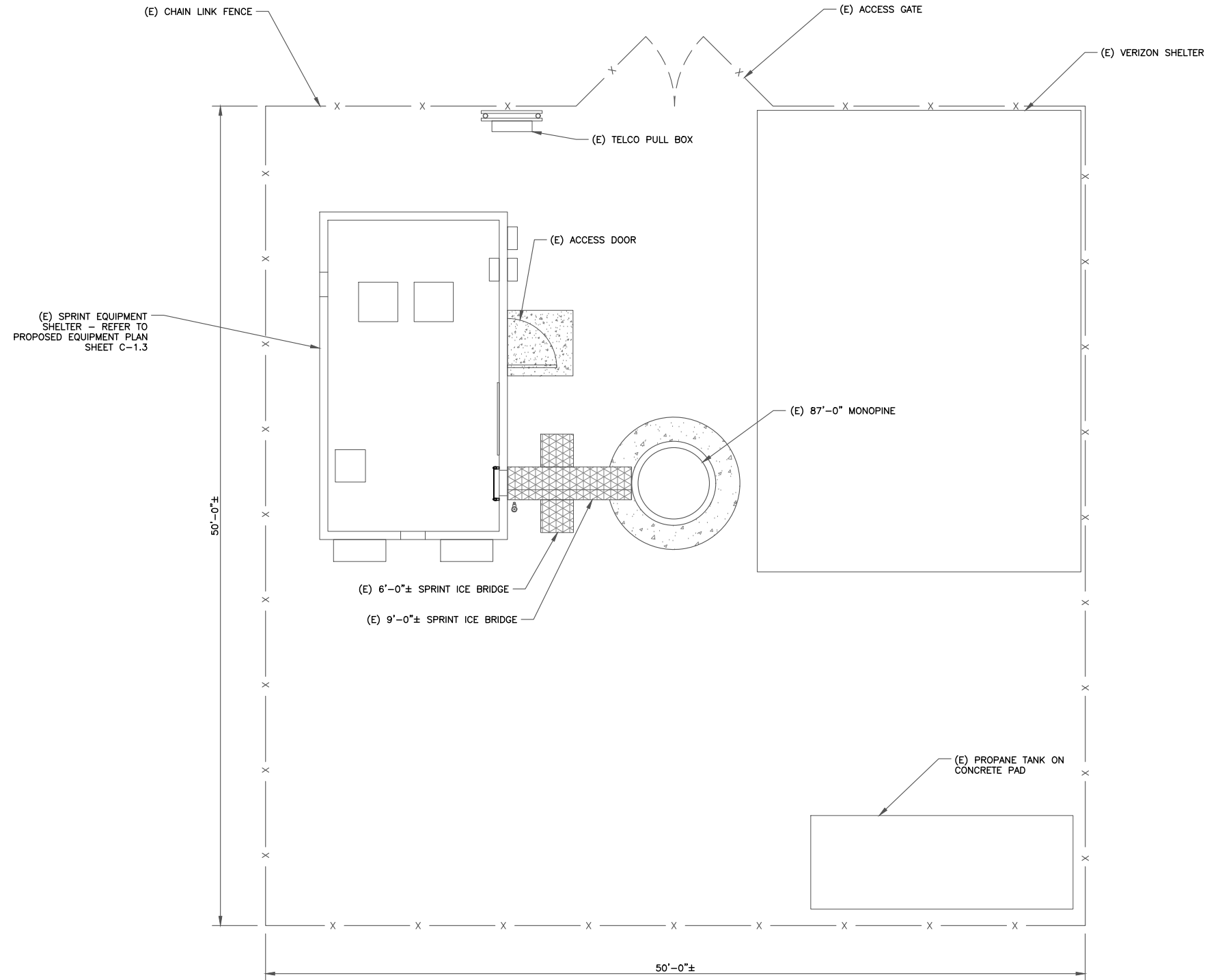
GENERAL NOTES

SHEET NUMBER:

T-2

SITE PLAN DISCLAIMER:

PROPERTY LINES AND STRUCTURES HAVE BEEN DIGITIZED FROM PREVIOUS PLAN SETS. KIMLEY-HORN HAS NOT COMPLETED A SITE SURVEY AND THEREFORE MAKES NO CLAIMS AS TO THE ACCURACY OF INFORMATION DEPICTED ON THIS SHEET.



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PITTSBURGH, PA 15239
TEL: (740) 260-9710

PLANS PREPARED BY:



421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601

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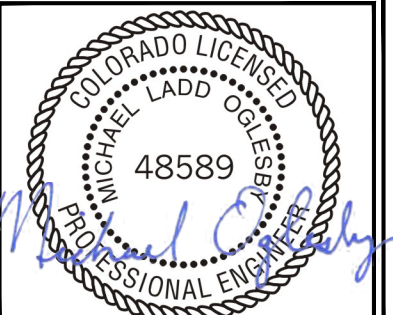
DRAWN BY: CHECKED BY:

JIK DLF

KHA PROJECT NUMBER:

KHCL-7604

ENGINEER SEAL:



Exp. 10/31/23

PROJECT INFORMATION:

DN06267A
CO46086-A
SBA #: CO46086-A
6753 SHOUP ROAD
COLORADO SPRINGS, CO 80908

SHEET TITLE:

OVERALL SITE PLAN

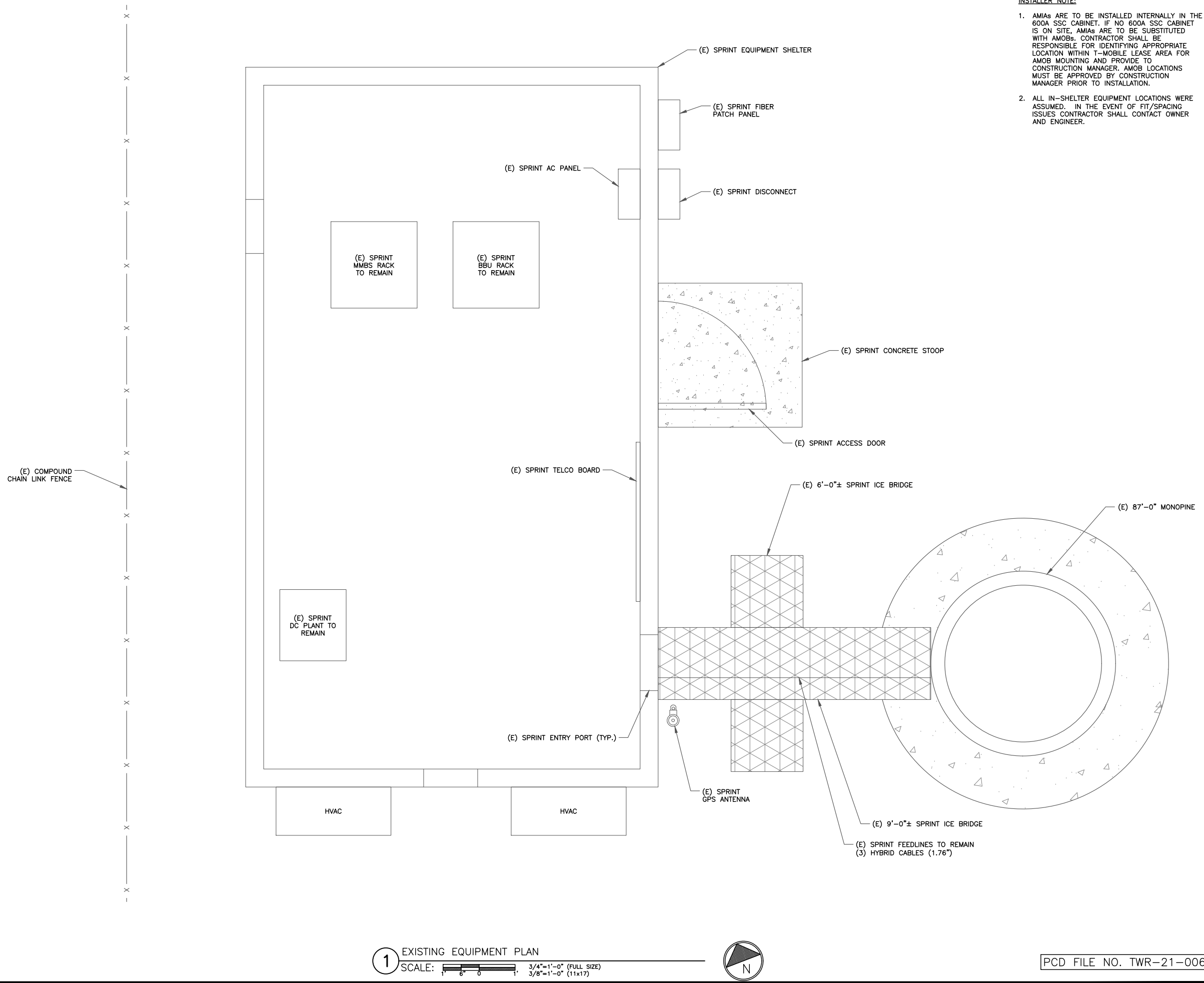
SHEET NUMBER:

C-1.1

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



PCD FILE NO. TWR-21-006



INSTALLER NOTE:

1. AMIAs ARE TO BE INSTALLED INTERNALLY IN THE 600A SSC CABINET. IF NO 600A SSC CABINET IS ON SITE, AMIAs ARE TO BE SUBSTITUTED WITH AMOBs. CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING APPROPRIATE LOCATION WITHIN T-MOBILE LEASE AREA FOR AMOB MOUNTING AND PROVIDE TO CONSTRUCTION MANAGER. AMOB LOCATIONS MUST BE APPROVED BY CONSTRUCTION MANAGER PRIOR TO INSTALLATION.
2. ALL IN-SHELTER EQUIPMENT LOCATIONS WERE ASSUMED. IN THE EVENT OF FIT/SPACING ISSUES CONTRACTOR SHALL CONTACT OWNER AND ENGINEER.

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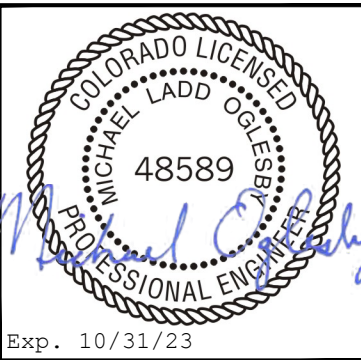
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KHA PROJECT NUMBER:

KHCL-7604

ENGINEER SEAL:



PROJECT INFORMATION:

DN06267A
CO46086-A
SBA #: CO46086-A
6753 SHOUP ROAD
COLORADO SPRINGS, CO 80908

SHEET TITLE:

EXISTING EQUIPMENT PLAN

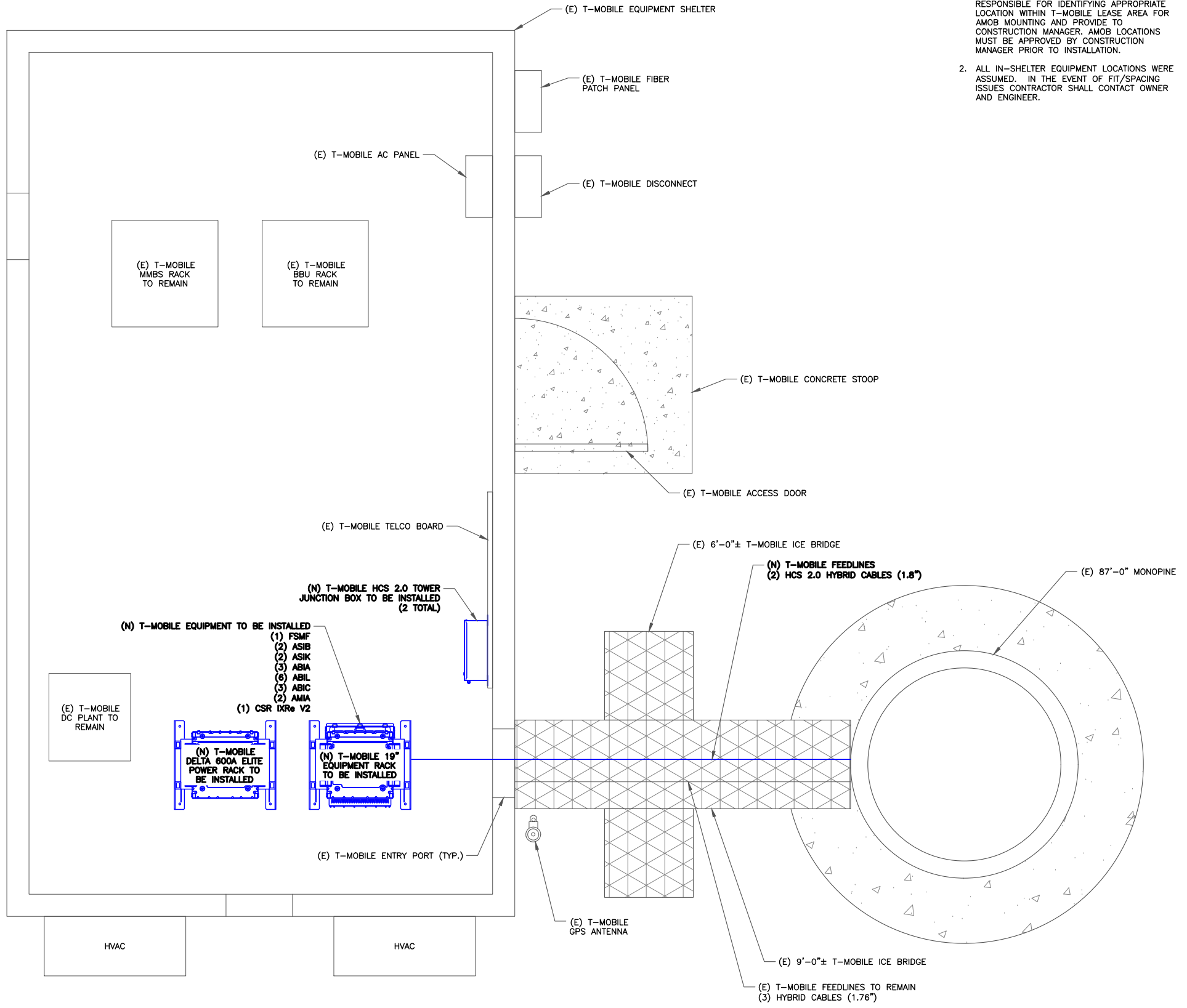
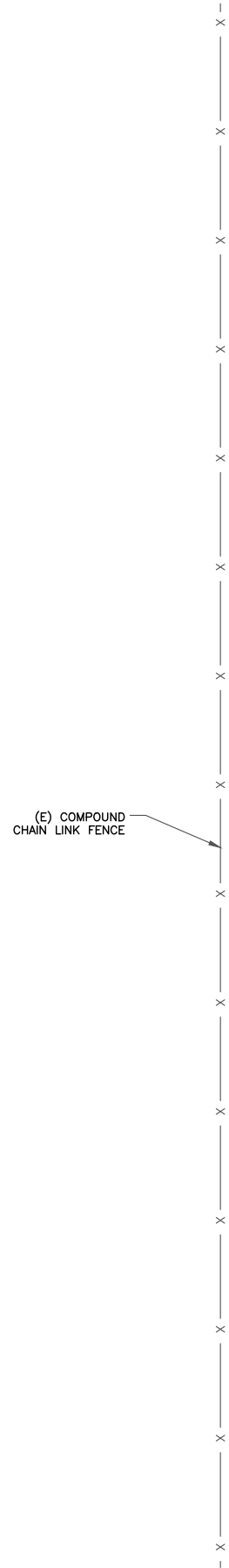
SHEET NUMBER:

C-1.2

1 EXISTING EQUIPMENT PLAN
SCALE: 3/4"=1'-0" (FULL SIZE)
3/8"=1'-0" (11x17)



PCD FILE NO. TWR-21-006



INSTALLER NOTE:

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DRAWN BY: JIK CHECKED BY: DLF

KHA PROJECT NUMBER: KHCL-7604

ENGINEER SEAL:

Exp. 10/31/23

PROJECT INFORMATION:

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 CO46086-A
 SBA #: CO46086-A
 6753 SHOUP ROAD
 COLORADO SPRINGS, CO 80908

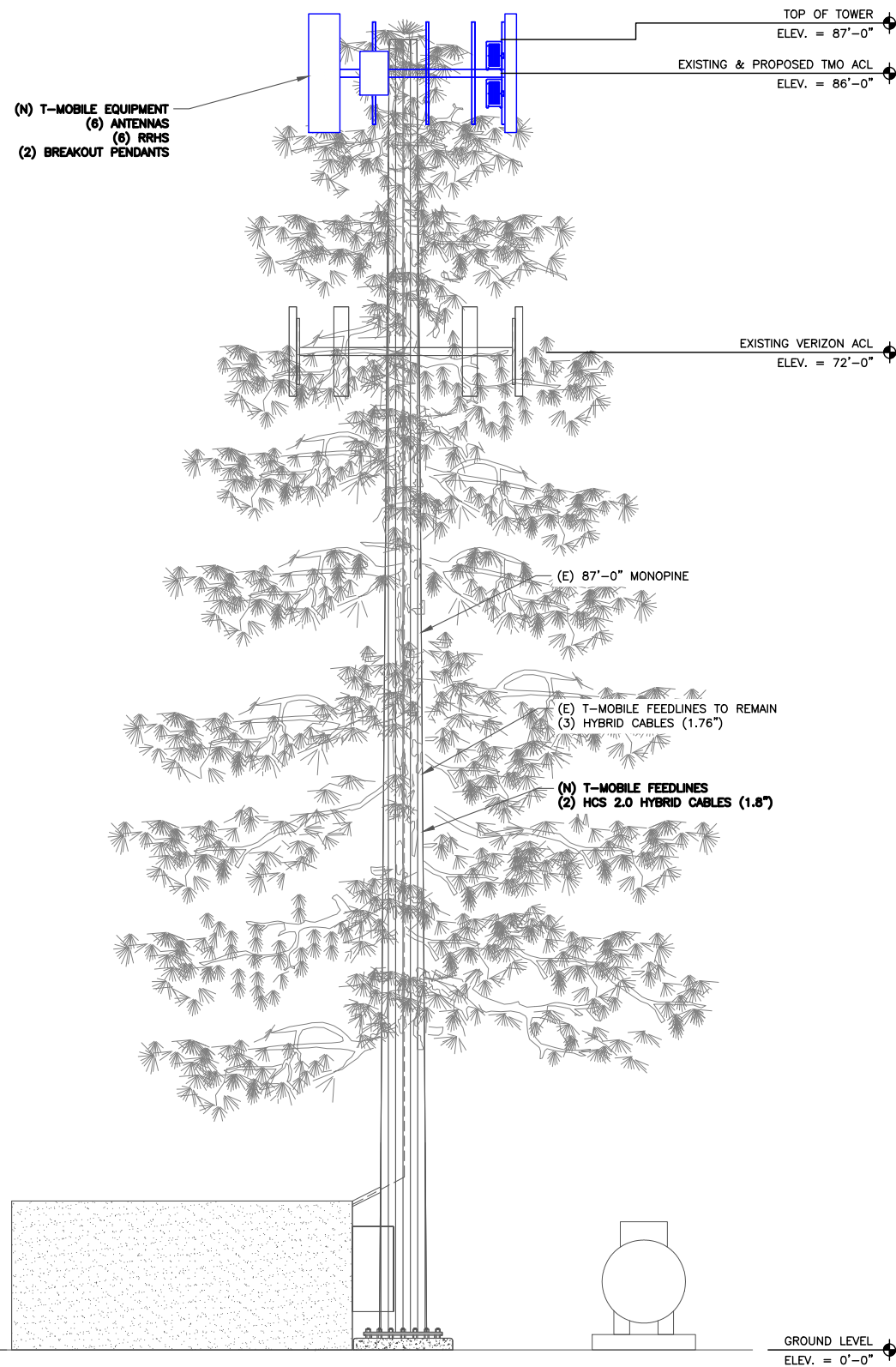
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SHEET NUMBER: **C-1.3**

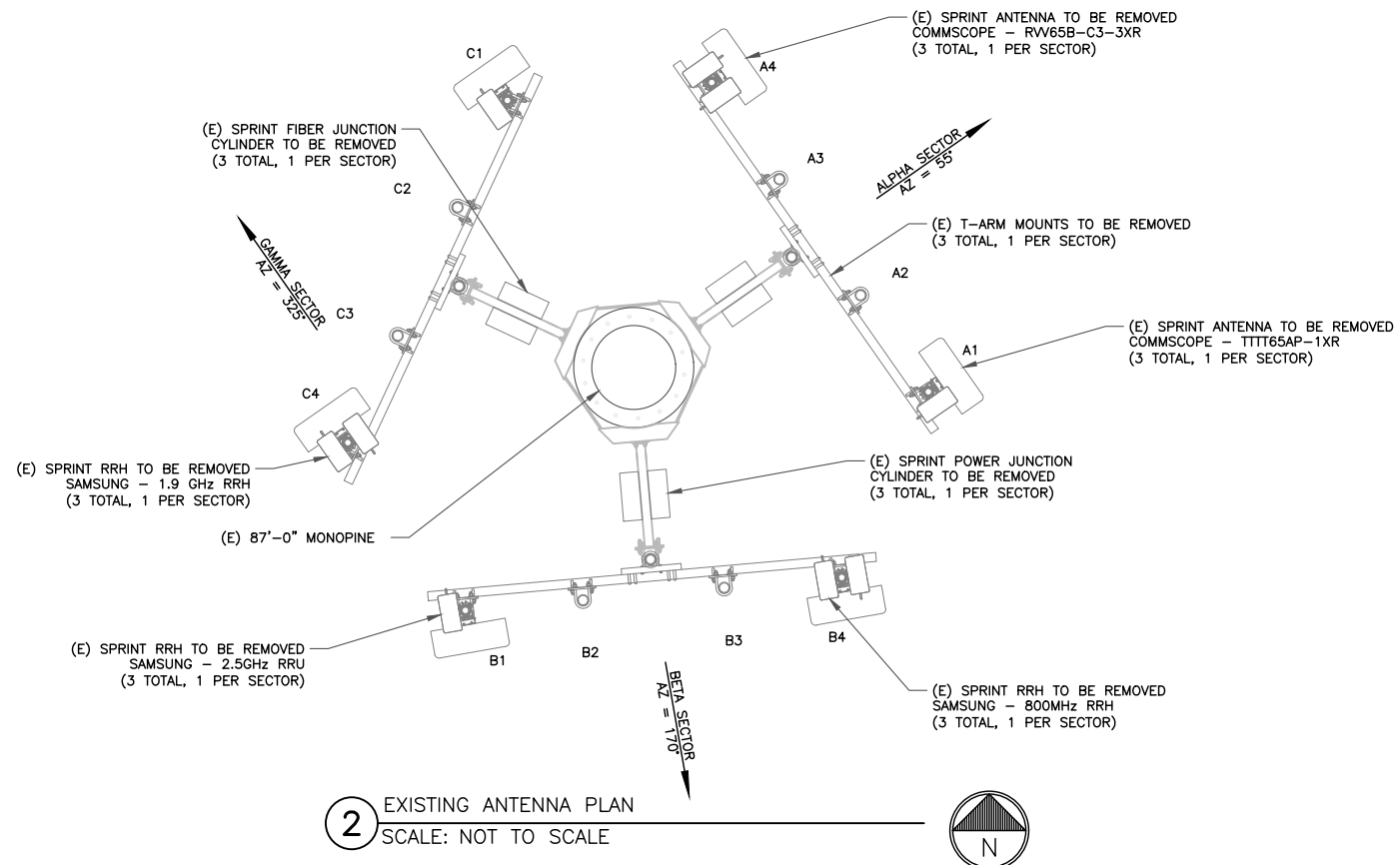
1 FINAL EQUIPMENT PLAN
 SCALE: 3/4"=1'-0" (FULL SIZE)
 3/8"=1'-0" (11x17)



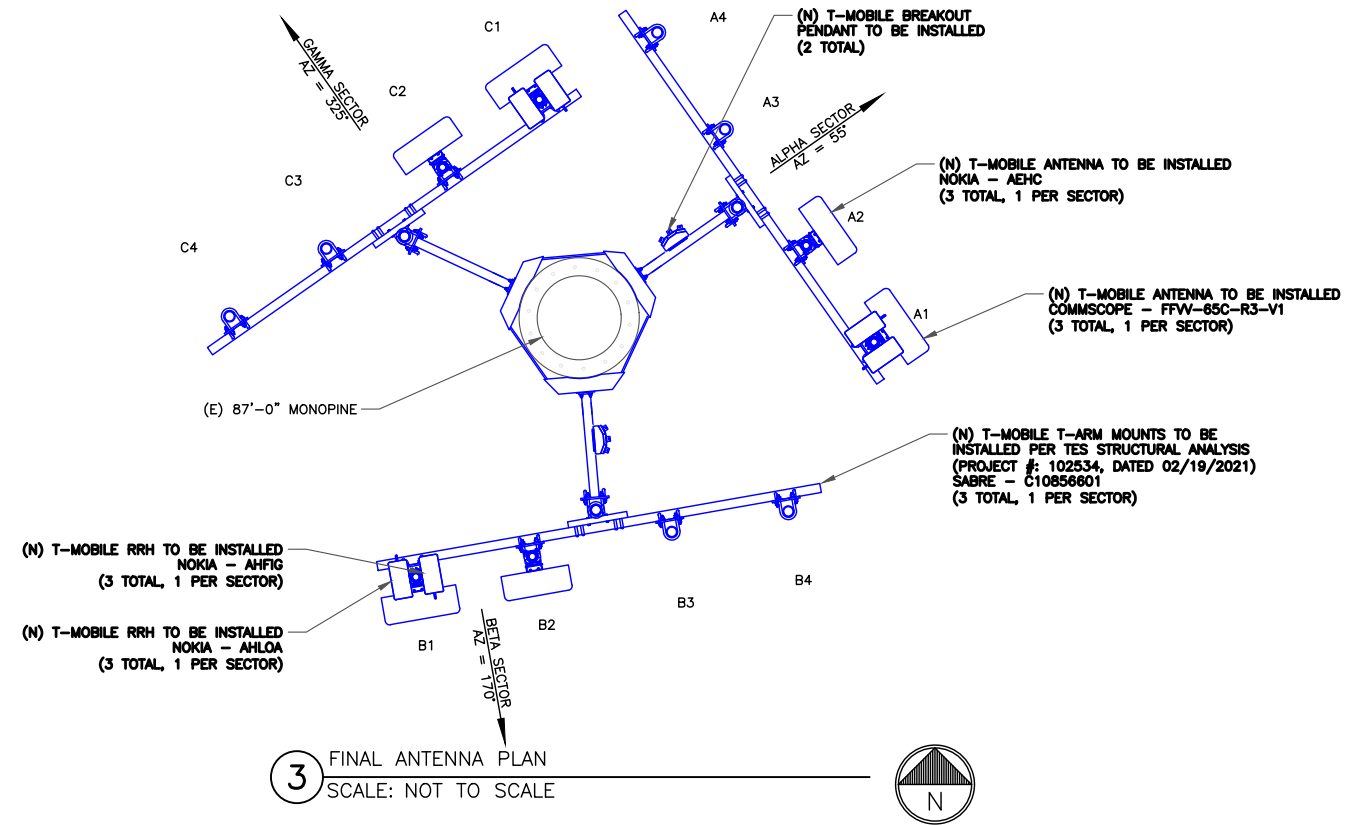
PCD FILE NO. TWR-21-006



1 FINAL ELEVATION
SCALE: NOT TO SCALE



2 EXISTING ANTENNA PLAN
SCALE: NOT TO SCALE



3 FINAL ANTENNA PLAN
SCALE: NOT TO SCALE

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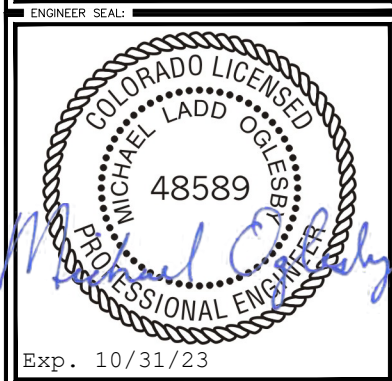
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KHA PROJECT NUMBER: KHCL-7604



PROJECT INFORMATION:
DN06267A
CO46086-A
SBA #: CO46086-A
6753 SHOUP ROAD
COLORADO SPRINGS, CO 80908

SHEET TITLE:
TOWER ELEVATION & ANTENNA PLAN

SHEET NUMBER:
C-2

NEW AND EXISTING ANTENNA AND CABLE SCHEDULE

SECTOR	POS.	AZIMUTH	RAD CENTER	TECHNOLOGY	ANTENNA	STATUS	RRU TYPE	DIPLEXER/TMA	COVP	CABLE STATUS	COAX CABLE LENGTH	HCS FACTORY LENGTH	JUMPER LENGTH				
ALPHA	A4	-	-	-	-	-	-	-	(2) NEW BREAKOUT PENDANTS	(3) EXISTING 1.76" HYBRID CABLES, (2) NEW 1.8" HCS 2.0 HYBRID CABLES	EXISTING	EXISTING	-				
	A3	-	-	-	-	-	-	-					-				
	A2	55°	86'-0"	L2500, N2500	NOKIA - AEHC	NEW	-	-					<15'-0"				
	A1	55°	86'-0"	L700, L600, N600, L2100, G1900, L1900	COMMSCOPE - FFV-65C-R3-V1	NEW	(1) NEW AHLOA, (1) NEW AHFIG	-					<15'-0"				
BETA	B4	-	-	-	-	-	-	-					-	-	-	-	-
	B3	-	-	-	-	-	-	-					-	-	-	-	-
	B2	170°	86'-0"	L2500, N2500	NOKIA - AEHC	NEW	-	-					<15'-0"				
	B1	170°	86'-0"	L700, L600, N600, L2100, G1900, L1900	COMMSCOPE - FFV-65C-R3-V1	NEW	(1) NEW AHLOA, (1) NEW AHFIG	-					<15'-0"				
GAMMA	C4	-	-	-	-	-	-	-					-	-	-	-	-
	C3	-	-	-	-	-	-	-					-	-	-	-	-
	C2	325°	86'-0"	L2500, N2500	NOKIA - AEHC	NEW	-	-					<15'-0"				
	C1	325°	86'-0"	L700, L600, N600, L2100, G1900, L1900	COMMSCOPE - FFV-65C-R3-V1	NEW	(1) NEW AHLOA, (1) NEW AHFIG	-					<15'-0"				

(*) SHARED WITH ALL SECTORS

IMPORTANT NOTE: PLEASE REFER TO LATEST RFDS SHEET FOR NSN CONFIGURATION. GC TO CAP ALL UNUSED PORTS



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JIK DLF

KHA PROJECT NUMBER:

KHCL-7604

ENGINEER SEAL:



PROJECT INFORMATION:

DN06267A
CO46086-A
SBA #: CO46086-A
6753 SHOUP ROAD
COLORADO SPRINGS, CO 80908

SHEET TITLE:

ANTENNA SCHEDULE

SHEET NUMBER:

C-3

Configuration 56790EZ_SR_T

* For 5G and LTE Airscale BB dimensioning refer to Fiber Port matrices.

(Alpha, Beta & Gamma) FDD - Lowband

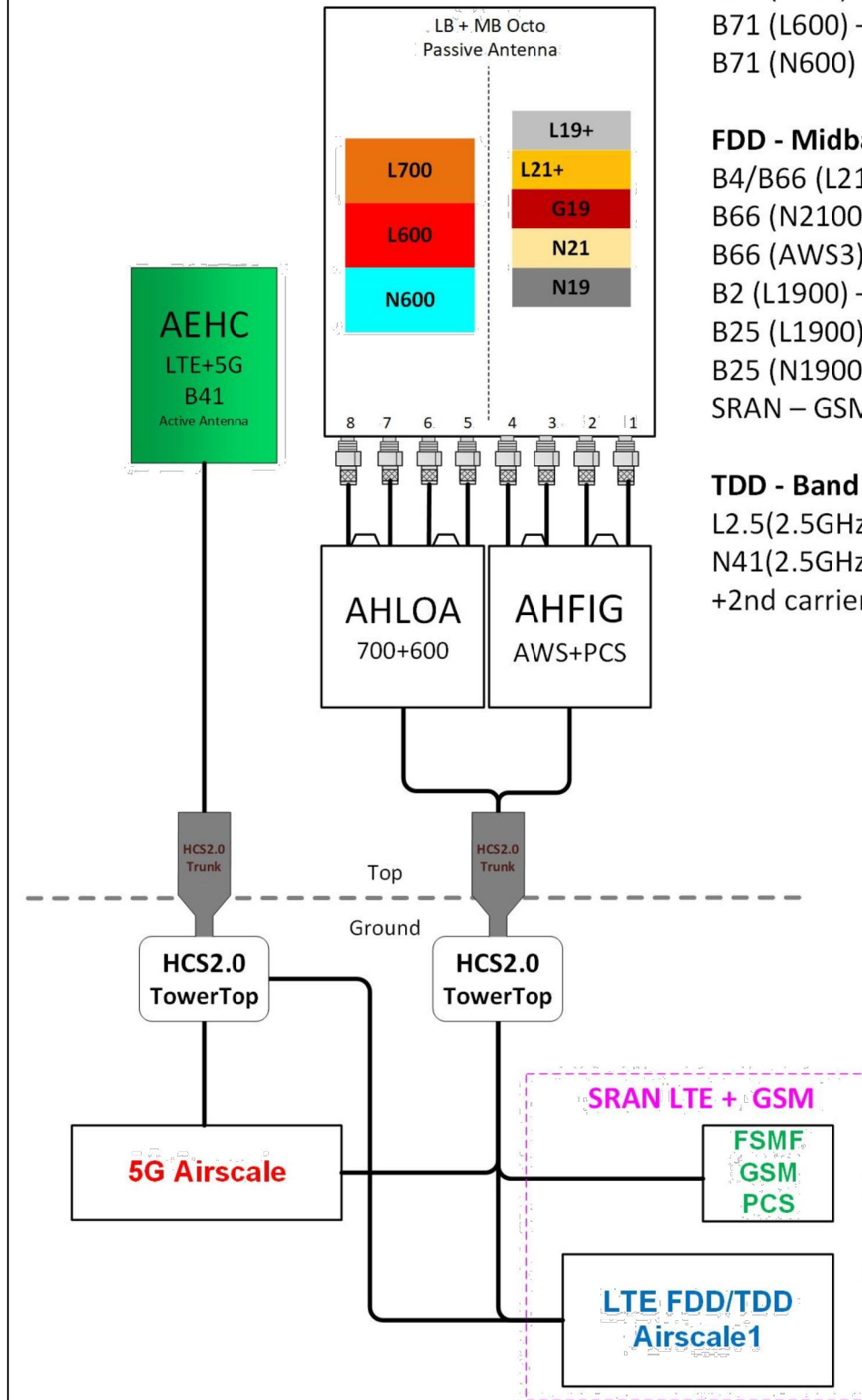
- B12 (L700) – 5 MHz
- B71 (L600) – 10 MHz
- B71 (N600) – 15 MHz

FDD - Midband

- B4/B66 (L2100) – 20 MHz
- B66 (N2100) – 20MHz
- B66 (AWS3) – 5MHz
- B2 (L1900) – 20 MHz
- B25 (L1900) – 20 MHz
- B25 (N1900) – 20MHz
- SRAN – GSM PCS

TDD - Band 41

- L2.5(2.5GHz)– 60 MHz
- N41(2.5GHz) – 100MHz
- +2nd carrier (<=80MHz)



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PROJECT INFORMATION:
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CO46086-A
SBA #: CO46086-A
6753 SHOUP ROAD
COLORADO SPRINGS, CO 80908

SHEET TITLE:
PLUMBING DIAGRAM

SHEET NUMBER:
C-4

FFVV-65C-R3-V1



General Specifications

Antenna Type	Sector
Band	Multiband
Color	Light gray
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Performance Note	Outdoor usage
Radome Material	Fiberglass, UV resistant
Radiator Material	Low loss circuit board
Reflector Material	Aluminum
RF Connector Interface	4.3-10 Female
RF Connector Location	Bottom
RF Connector Quantity, high band	4
RF Connector Quantity, low band	4
RF Connector Quantity, total	8

Remote Electrical Tilt (RET) Information

RET Interface	8-pin DIN Female 8-pin DIN Male
RET Interface, quantity	1 female 1 male
Input Voltage	10-30 Vdc
Internal RET	High band (2) Low band (1)
Power Consumption, idle state, maximum	1 W
Power Consumption, normal conditions, maximum	10 W
Protocol	3GPP/AISG 2.0 (Single RET)

Dimensions

Width	640 mm 25.197 in
Depth	335 mm 13.189 in
Length	2437 mm 96.343 in
Net Weight, without mounting kit	56.5 kg 124.561 lb

1 ANTENNA SPECIFICATIONS
SCALE: NOT TO SCALE

AEHC AirScale MAA 64T64R 192AE n41 240W

Preliminary Technical datasheet

Specification	3GPP/FCC compliant, TDD
Frequency range	2496 - 2690 MHz
Max. supported modulation	256 QAM
Number of TX/RX paths	64T / 64R
MIMO streams	16
Instantaneous bandwidth IBW	194 MHz
Occupied bandwidth OBW	194 MHz
Total average EIRP	79.3 dBm
Max. output power per TRX	3.75 W / TRX (240 W total)
Antenna configuration	12 rows, 8 columns, 2 (±45° X-polarized)
Max. Antenna gain	25.5 dBi
Horizontal beamwidth	15° (boresight)
Vertical beamwidth	6° (boresight)
Horizontal coverage angle	±45° (3 dB), ±60° (5 dB)
Vertical steering angle	±6°
Dimensions	TBD: 900 mm (H) x 580 mm (W) x 210 mm (D)
Volume / Windward area	TBD: <110 L / ~0.6m ²
Weight	~45kg (without mounting brackets)
Supply voltage / Connector type	DC -40.5 V... -57 V / 2 pole connector
Power consumption	900 W typical (75% DL duty cycle, 30% RF load) 1300 W max (75% DL duty cycle, 100% RF load)



Optical ports	4 x SFP28, 10/25GE eCPRI (with R2CT)
Other interfaces / Connector type	Control AISG RF monitor port / SMA Female External Alarms / MDR26 status LED
Operational temperature range	-40 °C ... +55 °C
Cooling	Natural convection cooling
Ingress protection class	IP65
Installation options	Pole / Wall, ± 5° vertical adjustment
Surge protection	Class II 20 kA

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2 ANTENNA SPECIFICATIONS
SCALE: NOT TO SCALE

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COLORADO SPRINGS, CO 80908

SHEET TITLE:

EQUIPMENT
SPECIFICATIONS

SHEET NUMBER:

C-5

AirScale Dual RRH 4T4R B12/71 240W AHLOA



Product Code: 474331A	3GPP Band 12/71
Supported Frequency Bands	3GPP Band 12/71
Frequencies	Band 12 adjusted: UL 698 - 716 MHz, DL 728 - 746 MHz Band 71: UL 663 MHz - 698 MHz, DL 617 MHz - 652 MHz
Number of TX/RX paths/pipes	4 pipes; 2T2R, 2T4R, 4T4R for both bands
Instantaneous Bandwidth IBW	17 MHz for B12 and 35MHz for B71 1 MHz below B12 NB IoT future use
Occupied Bandwidth OBW	UL 53MHz contiguous DL B12 17MHz + 1 MHz NB IoT future use, B71 35MHz
Output Power	60W per TX shared between bands
Supply Voltage / Range	DC-48 V / -36 V to -60 V
Typical Power Consumption	640W [ETSI Busy Hour Load at 4TX@60W] 450W [ETSI Busy Hour Load at 4TX@20W]
Antenna Ports	4 ports, 4.3-10+
Optical Ports	2 x CPRI 9.8 Gbps
ALD Control Interfaces	AISG3.0 and RET (DC on ANT1 & ANT3)
Other Interfaces	External Alarm MDR-26 (4 inputs, 1 Output) DC Circular Power Connector
Physical	560 mm x 308 mm x 189 mm Approximately 38kg with no covers or brackets
Operating Temperature Range	-40°C to 55°C (with no solar load)
Surge Protection	Class II 5A
Installation Options	Pole, Wall, Book Mount

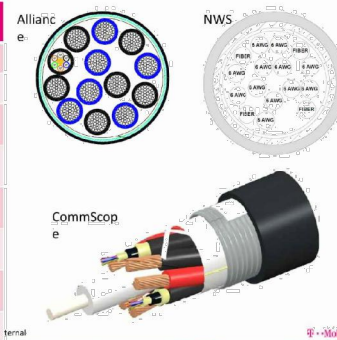
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NOKIA

1 NOKIA - AHLOA
SCALE: NOT TO SCALE

Trunk Cable General Specifications

Characteristics	Alliance	CommScope	NWS
Outer Diam.	1.46"	1.55"	1.48"
Weight	1.61 lb/ft	1.71 lb/ft	1.61 lb/ft
Min. Bend Rad	14.6"	18.6"	21.5"
DC Conductors	12 x 6AWG	12 x 6AWG	12 x 6AWG
Armor	Corrugated Cu	Corrugated Al	Cu tape, PVC
Conductor Termination	None	None	None
Single-Mode Fibers	48	48	48
Fiber Termination	LC pair	LC pair	LC pair



Breakout Feature General Specifications

Characteristics	Alliance	CommScope	NWS
Dimensions, in.	9.3x14.9x5.8	6.7x16.9x4.7	10.2x16.0x3.2
Weight	1.61 lb/ft	0.970 lb/ft	1.61 lb/ft
Port Interface	Senko U	Senko U	Senko U
Hybrid Ports	12	12	12
Conductor Termination	None	None	None
Single Mode Fibers	48	48	48
Fiber Termination	LC pair	LC pair	LC pair
Max RRU	12	12	12



Note: Permanently attached to trunk cable, not field removable/replaceable.
Note: No internal OVP.

2 HYBRID CABLE & BREAKOUT
SCALE: NOT TO SCALE

AirScale System Module Installation Guidelines - AMIA

AMIA is primary for indoor sites (environmentally controlled) or site support cabinets

- For a 19" rack installation 3U of space is needed (adapters/support required for 23" rack)
- For Medium/Large HP/ Large Delta SSC - Fan/filter kit required (SKU# 32168) to support medium config
- For Medium Purcell SSC - Nothing required to support minimal config (single LTE layer)
- For Medium Purcell SSC - Door upgrade kit required (SKU# 33401) to support full config

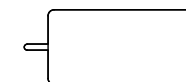
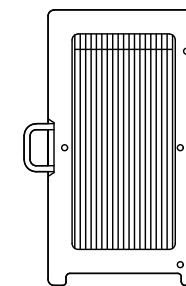
AMIA Mounting Options	3U space*	4U Space
Item Description		
19 to 23 inch adaptor bracket, 3U w/slot	x	
19 to 23 inch adaptor bracket, 4U w/slot		x
ASSY, SHELF		x

*Bottom support is available



T-Mobile

3 AMIA SPECIFICATIONS
SCALE: NOT TO SCALE



NOKIA - AHFG
WEIGHT (FULLY EQUIPPED): 79.4 LBS
SIZE (HxWxD): 27.6x13.4x5.6 IN.
CONNECTOR TYPE: 4.3-1 FEMALE

4 NOKIA - AHFG
SCALE: NOT TO SCALE

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ENGINEER SEAL:

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PROJECT INFORMATION:

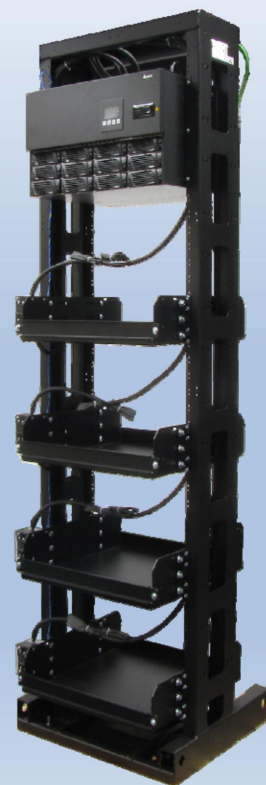
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6753 SHOUP ROAD
COLORADO SPRINGS, CO 80908

SHEET TITLE:

EQUIPMENT
SPECIFICATIONS

SHEET NUMBER:

C-6



Elite Power -48V 600A Indoor Rack Mounted Power system

Product Features

- 48V/600A Rack (23") Mounted Power System
- Slimline High Power / Efficiency DPR2900 Rectifiers (2900W / up to 96.3%), 12x max
- 7' High 2-post relay rack – zone 2 rated, zone 4 rated with top bracing
- 4 battery (190Ahr) trays
- Prewired battery cabling with 200A battery circuit breaker for each tray
- Battery Landings
 - 6 x 1/4" holes – 5/8" center to center
 - 6 x 3/8" holes – 1" center to center
- Front Access Load Distribution
 - (26) Load Breaker Positions (Bullet) / Up to 100A per position
 - GMT Fuse Adapter block (10-position) optional
- Battery LVD included

www.deltaww.com



Specifications

Model	Elite Power Rack -48V 600A	
1. Input		
AC Voltage	Single phase; 2W+PE (L1, L2/N, FG) 110 - 240VAC	
AC Current	Single phase, 32A each (6x) / 190A total (max)	
AC frequency	50 - 60HZ	
2. Output		
Output Voltage	42 – 58VDC; 54VDC (default)	
Output Current	600A @ -54V	
Power Limitation	32.4kW @ -54V	
Voltage Regulation	±1% over line, load, and temperature	
Current Sharing	±5% of the full capacity of the rectifier	
3. General		
Rectifier	DPR 2900C-48, up to 96.3% efficiency, 12x	
Controller	Orion Touch	
Battery	4 Trays, 190Ahr	
Dimensions (W x H x D)	24.7" x 84" x 22.6"	
Weight	250 Lbs	
4. Standards		
Safety	IEC / EN 60950, UL1801, UL1950	
EMC	NEBS (GR-1089)	
Operating Temperature	-40°C to +75 °C (-40°F to +167 °F)	
Humidity (relative)	95%, non-condensing (Max.)	
Environment	NEBS Level 3 (earthquake zone 4)	
5. Equipment		
Load Cable Entry	Front access	
Circuit Breakers and Landings	26x -48V, 100A max. per position, 1/4"-20, 3/8" center to center	
Fuse Module (optional)	10 position GMT 15A max/position 110A max. total	
Battery landings	(6) 1/4" holes - 5/8" center to center, (4) 3/8" holes - 1" center to center	
Low Voltage Disconnect	Battery LVD included	
6. Ordering information		
System	ESAA600AHCU03	Elite Power Rack, 7', -48V 600A, (4) Battery Trays including (10) Rectifiers
Rectifier	ESR-48/56C F-A	48V / 56A 2900W, 96.4%, CAN communication
GMT Module (optional)	3799260600-S	10 pos. plug-in module (takes 2 positions)
Load Breaker	0830xxxxxx	Breaker, Bullet, Mid-Trip, 5A - 250A
Load Breaker Adapter	3799235700-S	2 Pole Lug Adapter Kit (125A -200A)
	3799236400-S	3 Pole Lug Adapter Kit (250A)

*All specifications are subject to change without prior notice.

Delta Group Website:
www.deltaww.com

Product Website:
www.deltapowersolutions.com

United States of America & Canada:
Delta Electronics (USA) Inc.
2925 E. Plano Parkway
Plano, TX (Texas) 75074

Sales and Orders:
DEUSTPS.Sales@deltaww.com
DEUSTPS.Orders@deltaww.com

Field Support:
1-877-DELTA-08 option 3
(877-335-8208 option 3)
DEUSTPS.Support@deltaww.com

Installation Services:
DEUSTPS.Services@deltaww.com

RMA:
RMA.US@deltaww.com

T-Mobile

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BELLEVUE, WA 98006



470 DAVIDSON ROAD
PITTSBURGH, PA 15239
TEL: (740) 260-9710

PLANS PREPARED BY:

Kimley»Horn

421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601

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0	04/22/21	ISSUED FOR CONSTRUCTION	DLF
A	03/16/21	ISSUED FOR REVIEW	JIK

DRAWN BY: CHECKED BY:

JIK DLF

KHA PROJECT NUMBER:

KHCL-7604

ENGINEER SEAL:

FOR
REFERENCE
PURPOSES
ONLY

PROJECT INFORMATION:

DN06267A
CO46086-A
SBA #: CO46086-A
6753 SHOUP ROAD
COLORADO SPRINGS, CO 80908

SHEET TITLE:

EQUIPMENT
SPECIFICATIONS

SHEET NUMBER:

C-7

1 CABINET SPECIFICATIONS
SCALE: NOT TO SCALE

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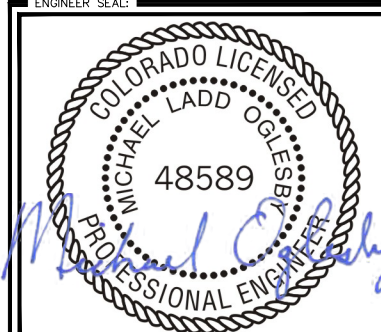
DRAWN BY: CHECKED BY:

JK DLF

KHA PROJECT NUMBER:

KHCL-7604

ENGINEER SEAL:



Exp. 10/31/23

PROJECT INFORMATION:

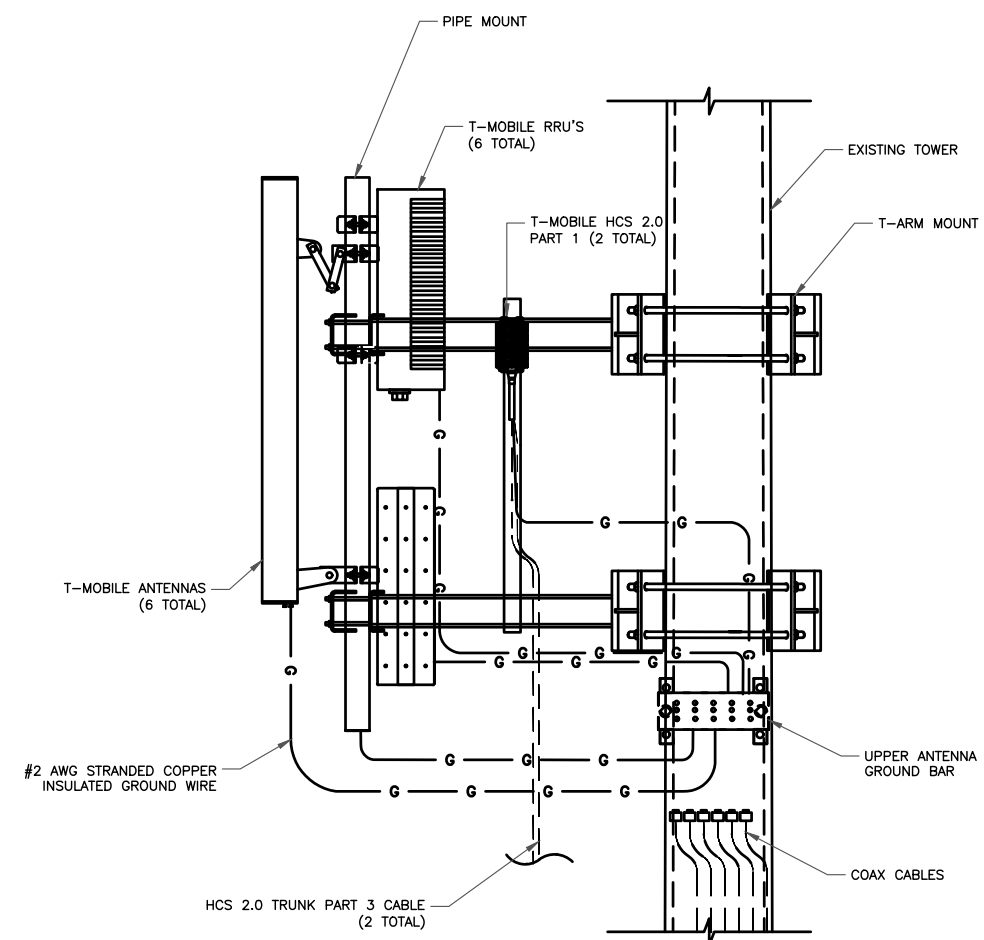
DN06267A
CO46086-A
SBA #: CO46086-A
6753 SHOUP ROAD
COLORADO SPRINGS, CO 80908

SHEET TITLE:

MOUNTING DETAIL

SHEET NUMBER:

C-8

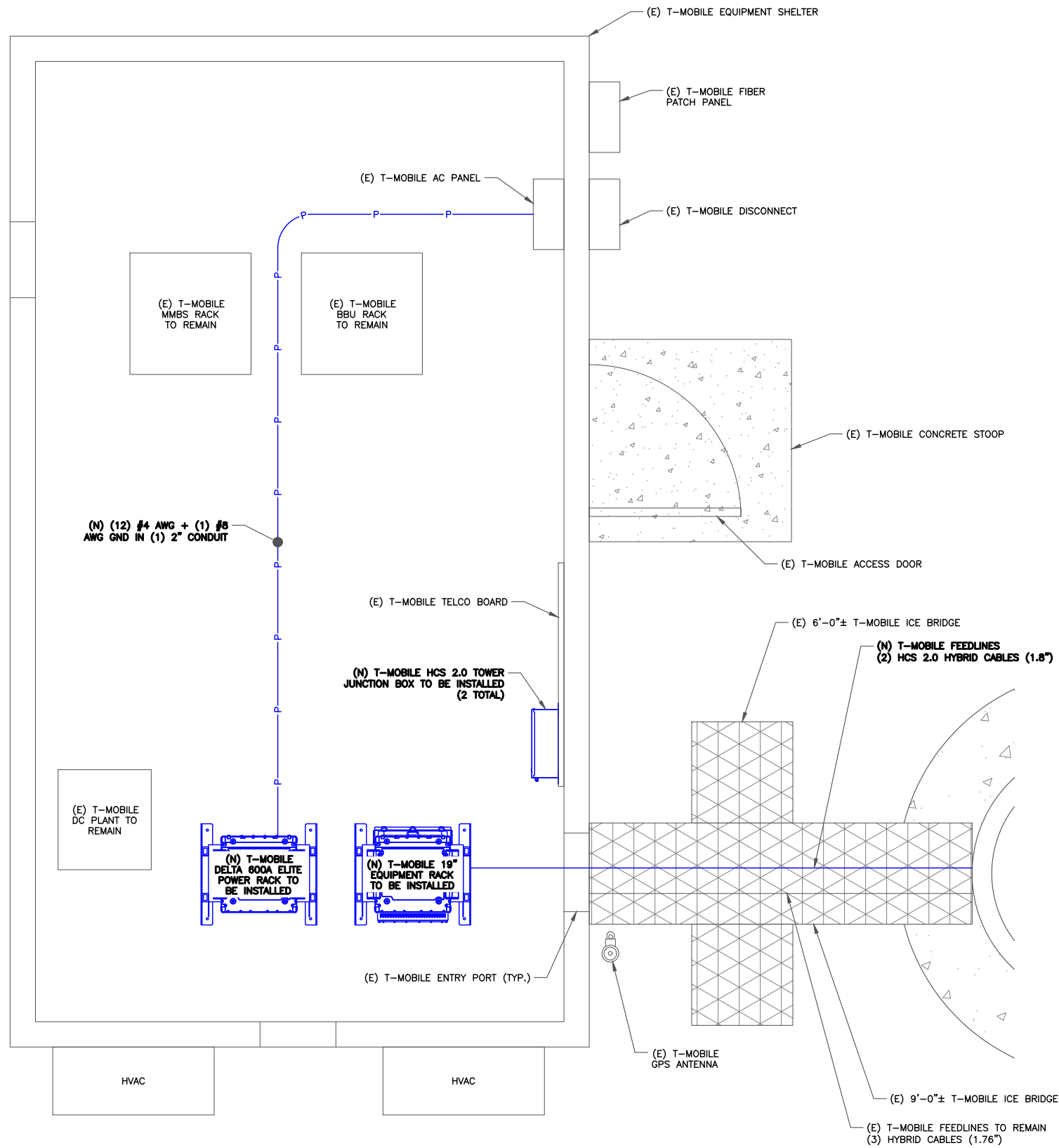


1 NOT USED
SCALE: NOT TO SCALE

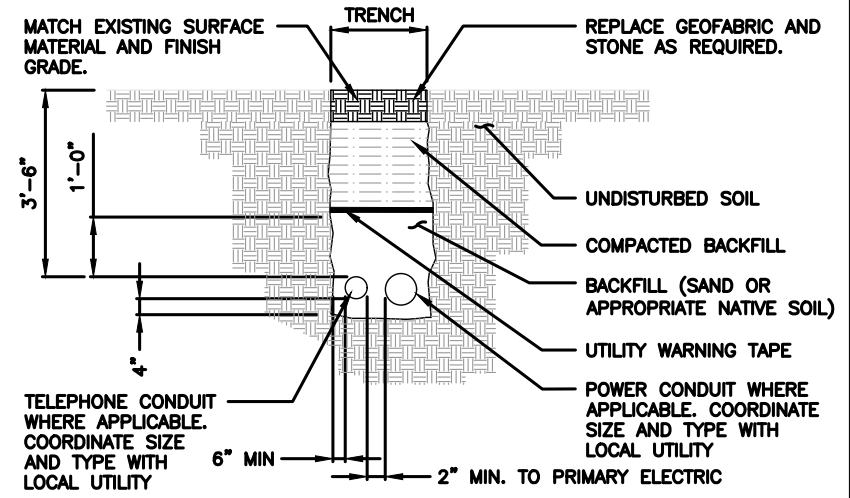
2 ANTENNA/RRU MOUNT DIAGRAM
SCALE: NOT TO SCALE

NOTES:

1. ALL NEW CONDUCTORS TO BE INSTALLED SHALL BE COPPER. ALL CONDUCTORS SHALL BE XHHW-2.
2. CONTRACTOR IS TO FIELD VERIFY ALL EXISTING ITEMS SHOWN ON THE ELECTRICAL ONE-LINE DIAGRAM AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
3. ALL GROUNDING AND BONDING PER THE NEC.



1 ELECTRICAL ROUTING
 SCALE: $\frac{3}{4}''=1'-0''$ (FULL SIZE)
 $\frac{3}{8}''=1'-0''$ (11x17)



- NOTES:**
1. CONTRACTOR TO HAND DIG ALL NEW TRENCHES INSIDE COMPOUND.
 2. SEPARATION DIMENSION TO BE VERIFIED WITH LOCAL UTILITY COMPANY REQUIREMENTS.

2 TRENCH DETAIL
 SCALE: NOT TO SCALE

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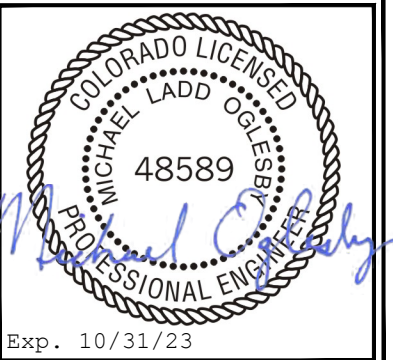
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 RALEIGH, NC 27601

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DRAWN BY: JIK CHECKED BY: DLF

KHA PROJECT NUMBER: KHCL-7604



Exp. 10/31/23

PROJECT INFORMATION:
 DN06267A
 CO46086-A
 SBA #: CO46086-A
 6753 SHOUP ROAD
 COLORADO SPRINGS, CO 80908

SHEET TITLE:
ELECTRICAL ROUTING

SHEET NUMBER:
E-1

CKT	LOAD DESCRIPTION	BREAKER AMPS	BREAKER POLES	BREAKER STATUS	SERVICE LOAD VA	USAGE FACTOR	PHASE A VA	PHASE B VA	USAGE FACTOR	SERVICE LOAD VA	BREAKER STATUS	BREAKER POLES	BREAKER AMPS	LOAD DESCRIPTION	CKT
1	NEW POWER RACK	40*	2	ON	1,800	1.25	4500		1.25	1,800	ON	2	40*	NEW POWER RACK	2
3		40*	2	ON	1,800	1.25		4500	1.25	1,800	ON	2	40*		4
5	NEW POWER RACK	40*	2	ON	1,800	1.25	4500		1.25	1,800	ON	2	40*	NEW POWER RACK	6
7		40*	2	ON	1,800	1.25		4500	1.25	1,800	ON	2	40*		8
9	NEW POWER RACK	40*	2	ON	1,800	1.25	4500		1.25	1,800	ON	2	40*	NEW POWER RACK	10
11		40*	2	ON	1,800	1.25		4500	1.25	1,800	ON	2	40*		12
13	SPACE**	-	1	N/A	0	1.25	0		1.25	0	N/A	1	-	SPACE**	14
15	SPACE**	-	1	N/A	0	1.25	0		1.25	0	N/A	1	-	SPACE**	16
17	SPACE**	-	1	N/A	0	1.25	0		1.25	0	N/A	1	-	SPACE**	18
19	SPACE**	-	1	N/A	0	1.25	0		1.25	0	N/A	1	-	SPACE**	20
21	HVAC #1	50	2	ON	4,800	1.25	6000		1.25	0	ON	2	50	HVAC #2	22
23		50	2	ON	4,800	1.25		6000	1.25	0	ON	2	50		24
25	EXIST MMBS	100	2	ON	1,340	1.25	1675		1.25	0	OFF	2	60	UNKNOWN	26
27		100	2	ON	1,340	1.25		1675	1.25	0	OFF	2	60		28
29	CONV. OUTLET	20	1	ON	240	1.25	600		1.25	240	ON	1	20	LIGHTS	30
31	CONV. OUTLET	20	1	ON	240	1.25		925	1.25	500	ON	1	20	SMOKE DETECTOR	32
33	CONV. OUTLET	20	1	ON	240	1.25	300		1.25	0	OFF	2	35	UNKNOWN	34
35	CONV. OUTLET	20	1	ON	240	1.25	300		1.25	0	OFF	2	35		36
37	SURGE SUPPRESSOR	60	2	ON	0	1.25	300		1.25	240	ON	1	20	CONV. OUTLET	38
39		60	2	ON	0	1.25		180	1.00	180	ON	1	20	GFCI RECEPTACLE	40
							22375	22580							

OVERALL LOAD SUMMARY	
TOTAL SERVICE LOAD kVA	44.96
AMPS	187.31

= Loading provided by T-Mobile.
 = Assumed maximum loading per breaker size.

* = New 40A Breaker ** = Remove existing rectifier breaker and cover space with insert

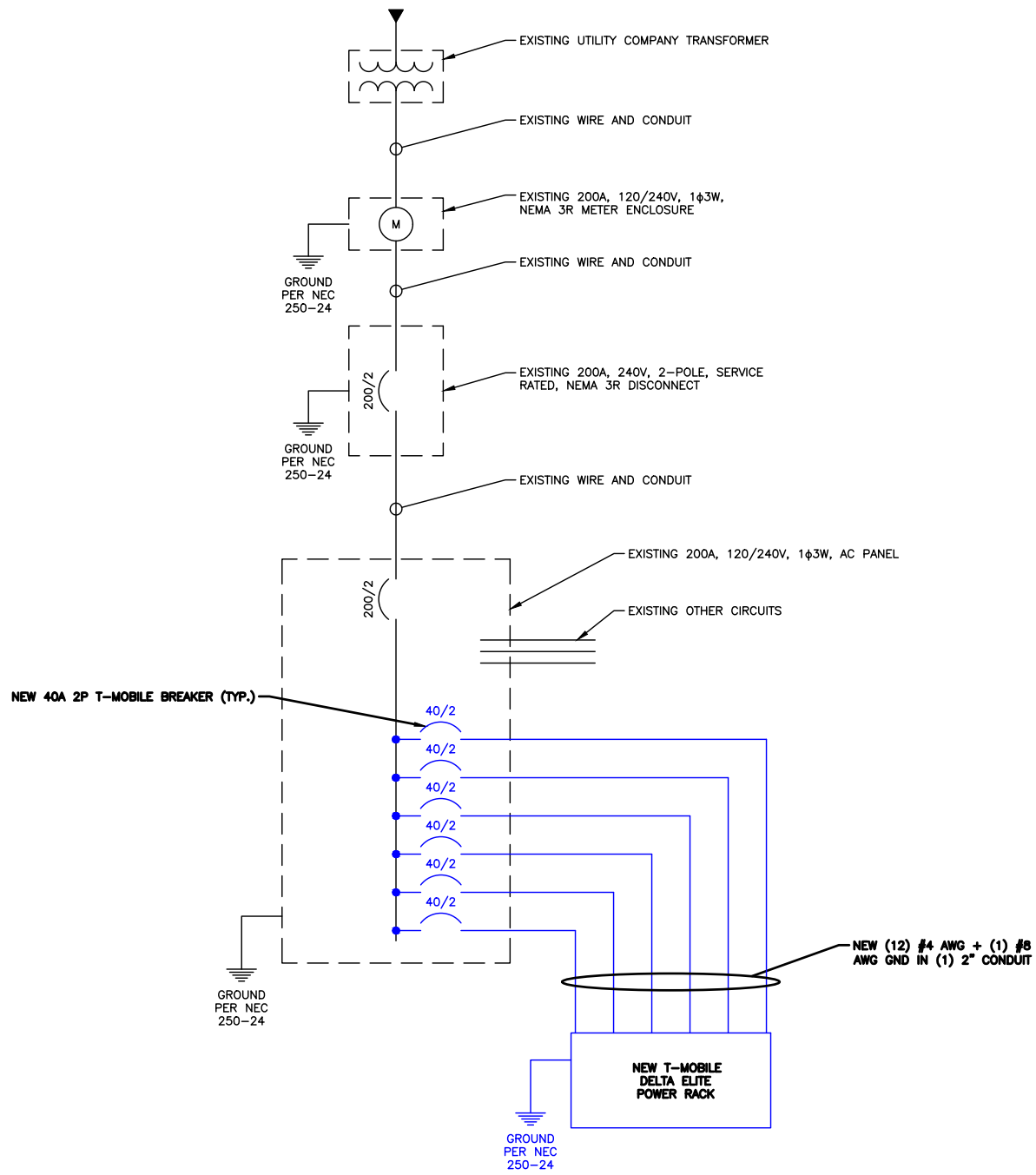
1 ELECTRICAL PANEL SCHEDULE

- CONTRACTOR SHALL INSPECT THE EXISTING CONDITIONS PRIOR TO SUBMITTING BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS OF THE CONTRACTORS FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION, NOT AFTER THE CONTRACT HAS BEEN AWARDED.
- LOCATION OF EQUIPMENT, CONDUIT AND DEVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SHALL BE COORDINATED WITH FIELD CONDITIONS PRIOR TO ROUGH-IN.
- THE CONDUIT RUNS AS SHOWN ON THE PLANS ARE APPROXIMATE. EXACT LOCATION AND ROUTING SHALL BE PER EXISTING FIELD CONDITIONS.
- PROVIDE PULL BOXES AND JUNCTION BOXES WHERE SHOWN OR REQUIRED BY NEC.
- ALL CONDUITS SHALL BE MET WITH BENDS MADE IN ACCORDANCE WITH NEC TABLE 346-10. NO RIGHT ANGLE DEVICE OTHER THAN STANDARD CONDUIT ELBOWS WITH 1/2" MINIMUM INSIDE SWEEPS FOR ALL CONDUITS 2" OR LARGER.
- ALL CONDUIT TERMINATION'S SHALL BE PROVIDED WITH PLASTIC THROAT INSULATING GROUNDING BUSHINGS.
- ALL WIRE SHALL BE TYPE THHN/THWN, SOLID ANNEALED COPPER UP TO SIZE #10 (#8 AND LARGER SHALL BE CONCENTRIC STRANDED) 75 DEGREE C (164 DEGREE F), 98% CONDUCTIVITY, MINIMUM #12.
- ALL WIRES SHALL BE TAGGED AT ALL PULL BOXES, J-BOXES, EQUIPMENT BOXES AND CABINETS WITH APPROVED PLASTIC TAGS, ACTION CRAFT, BRADY, OR APPROVED EQUAL.
- ALL NEW MATERIAL SHALL HAVE A U.L. LABEL.
- CONDUIT ROUGH-IN SHALL BE COORDINATED WITH THE MECHANICAL EQUIPMENT TO AVOID LOCATION TO CONFLICTS. VERIFY WITH MECHANICAL CONTRACTOR AND COMPLY AS REQUIRED.
- ALL PANEL DIRECTORIES SHALL BE TYPED NOT HAND WRITTEN.
- INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS PER THE SPECIFICATIONS AND NEC. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED AT ALL JUNCTION BOXES, PULL BOXES, AND ALL DISCONNECT SWITCHES, STARTERS, AND EQUIPMENT CABINETS.
- THE CONTRACTOR SHALL PREPARE AS-BUILT DRAWINGS, DOCUMENT ANY AND ALL WIRING AND EQUIPMENT CONDITIONS AND CHANGES WHILE COMPLETING THIS CONTRACT. SUBMIT AT SUBSTANTIAL COMPLETION.
- ALL DISCONNECT SWITCHES AND OTHER CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED LAMICOID NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS INSTALLED ON, AND PANEL FIELD LOCATIONS FED FROM (NO EXCEPTIONS).
- ALL ELECTRICAL DEVICES AND INSTALLATIONS OF THE DEVICES SHALL COMPLY WITH (ADA) AMERICANS WITH DISABILITIES ACT AS ADOPTED BY THE APPLICABLE STATE.
- PROVIDE CORE DRILLING AS NECESSARY FOR PENETRATIONS OR RISERS THROUGH BUILDING. DO NOT PENETRATE STRUCTURAL MEMBERS WITHOUT CONSTRUCTIONS MANAGERS APPROVAL. SLEEVES AND/OR PENETRATIONS IN FIRE RATED CONSTRUCTION SHALL BE PACKED WITH FIRE RATED MATERIAL WHICH SHALL MAINTAIN THE FIRE RATING OF THE WALL OR STRUCTURE. FILL FOR FLOOR PENETRATIONS SHALL PREVENT PASSAGE OF WATER, SMOKE, FIRE AND FUMES. ALL MATERIAL SHALL BE UL APPROVED FOR THIS PURPOSE.
- ELECTRICAL CHARACTERISTICS OF ALL EQUIPMENT (NEW AND EXISTING) SHALL BE FIELD VERIFIED WITH THE OWNER'S REPRESENTATIVE AND EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN OF CONDUIT AND WIRE. ALL EQUIPMENT SHALL BE PROPERLY CONNECTED ACCORDING TO THE NAMEPLATE DATA FURNISHED ON THE EQUIPMENT (THE DESIGN OF THESE PLANS ARE BASED UPON BEST AVAILABLE INFORMATION AT THE TIME OF DESIGN AND SOME EQUIPMENT CHARACTERISTICS MAY VARY FROM DESIGN AS SHOWN ON THESE DRAWINGS. LOCATION OF ALL OUTLET, BOXES, ETC., AND THE TYPE OF CONNECTION (PLUG OR DIRECT) SHALL BE CONFIRMED WITH THE OWNER'S REPRESENTATIVE PRIOR TO ROUGH-IN.
- FOR FLEXIBLE LIQUID TIGHT CONDUIT PROVIDE GLAND TYPE COMPRESSION FITTINGS. SET SCREW OR QUICK-CONNECT FITTINGS SHALL NOT BE ACCEPTABLE.
- FLEXIBLE CONDUITS SHALL BE USED FOR CONNECTION OF EQUIPMENT SUBJECT TO VIBRATION, NOISE TRANSMISSION OR MOVEMENT AND ALL MOTORS, RECESSED AND SEMI-RECESSED LIGHT FIXTURES. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6- FEET, SUBJECT TO NEC LIMITATIONS. FLEXIBLE CONDUITS SHALL NOT BE USED WHERE SUBJECT TO MECHANICAL DAMAGE.
- CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
- RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFINISHED INTERIOR LOCATIONS. RIGID CONDUIT SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZED PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS C80.1, FEDERAL SPECIFICATION WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LABORATORIES. EXTERIOR UNDERGROUND CONDUIT AND CONDUIT IN CONCRETE SHALL BE POLYVINYL CHLORIDE (PVC) SCHEDULE 40. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. UNDERGROUND ELBOW SWEEPS, AND TRANSITIONS TO ABOVE GROUND SHALL BE SCHEDULE 80 PVC OR SCHEDULE 40 GALVANIZED.

2 ELECTRICAL NOTES

NOTES:

- ALL NEW CONDUCTORS TO BE INSTALLED SHALL BE COPPER. ALL CONDUCTORS SHALL BE THHW, THWN, THWN-2, XHHW, OR XHHW-2 UNLESS NOTED OTHERWISE.
- CONTRACTOR IS TO FIELD VERIFY ALL EXISTING ITEMS SHOWN ON THE ELECTRICAL ONE-LINE DIAGRAM AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
- ALL GROUNDING AND BONDING PER THE NEC.



3 ONE-LINE DIAGRAM

SCALE: NOT TO SCALE

12920 SE 38TH STREET
 BELLEVUE, WA 98006

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 RALEIGH, NC 27601

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DRAWN BY: JIK CHECKED BY: DLF

KHA PROJECT NUMBER: KHCL-7604

ENGINEER SEAL:

Exp. 10/31/23

PROJECT INFORMATION:

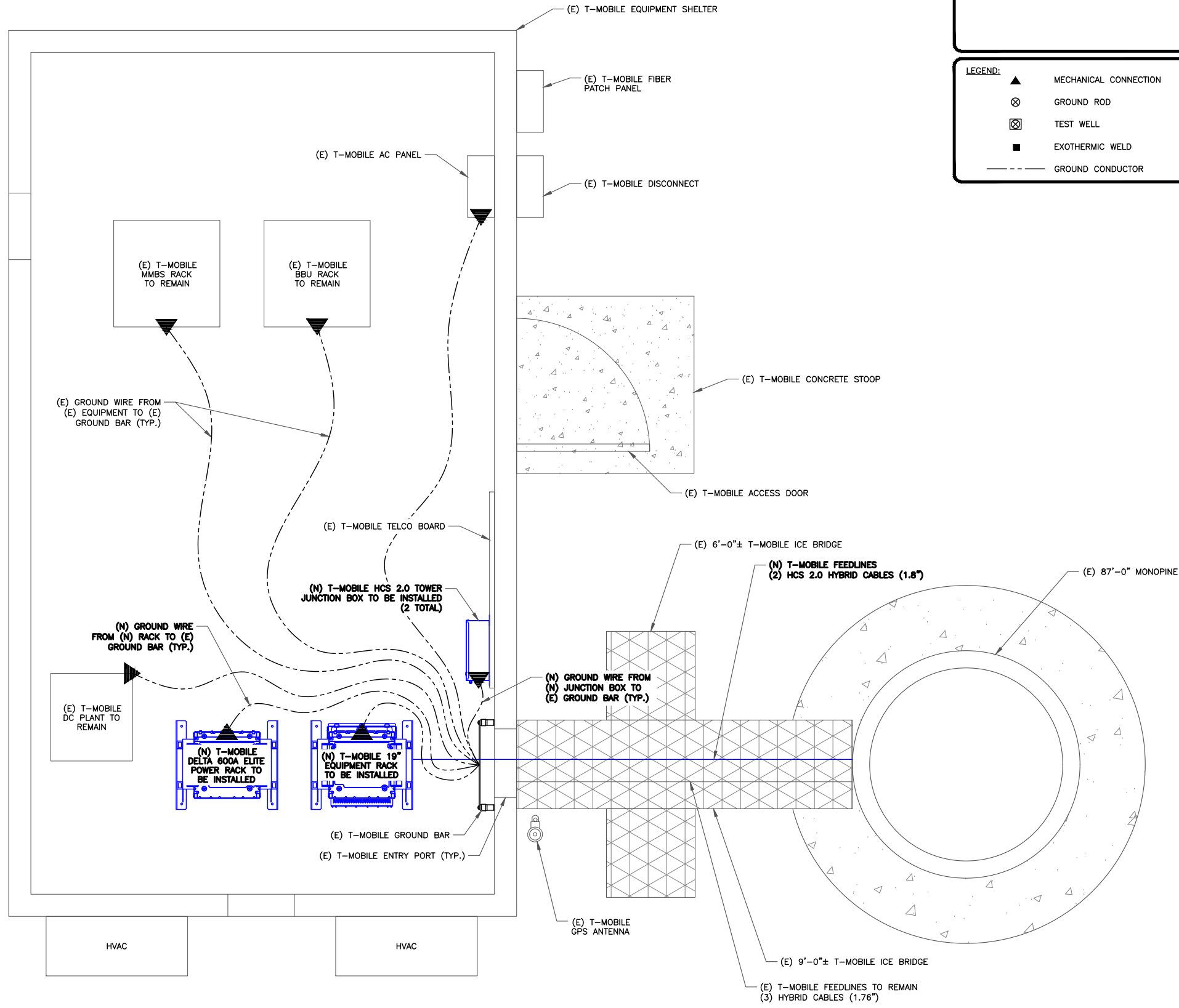
DN06267A
 CO46086-A
 SBA #: CO46086-A
 6753 SHOUP ROAD
 COLORADO SPRINGS, CO 80908

SHEET TITLE:
**PANEL SCHEDULE
 & ONE-LINE DIAGRAM**

SHEET NUMBER:

E-2

(E) COMPOUND CHAIN LINK FENCE



INSTALLER NOTE:
ALL TRENCHING REQUIRED WITHIN COMPOUND SHALL BE PERFORMED BY HAND-DIGGING ONLY.

LEGEND:

- ▲ MECHANICAL CONNECTION
- ⊗ GROUND ROD
- ⊠ TEST WELL
- EXOTHERMIC WELD
- GROUND CONDUCTOR

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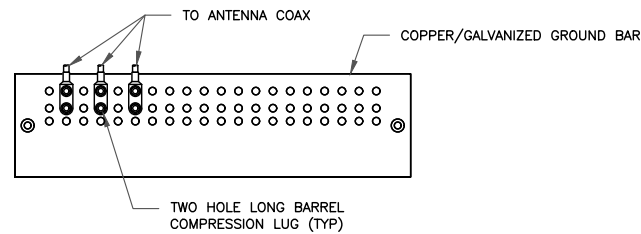
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 DN06267A
 CO46086-A
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 6753 SHOUP ROAD
 COLORADO SPRINGS, CO 80908

SHEET TITLE:
GROUNDING DIAGRAM

SHEET NUMBER:
G-1

1 EQUIPMENT GROUNDING PLAN
 SCALE: 3/4"=1'-0" (FULL SIZE)
 3/8"=1'-0" (11x17)

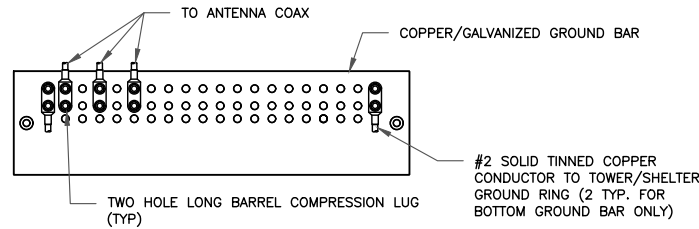




NOTES:

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

1 ANTENNA GROUND BAR DETAIL
SCALE: NOT TO SCALE

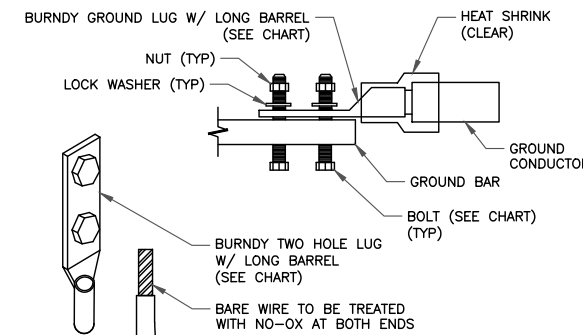


NOTES:

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

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

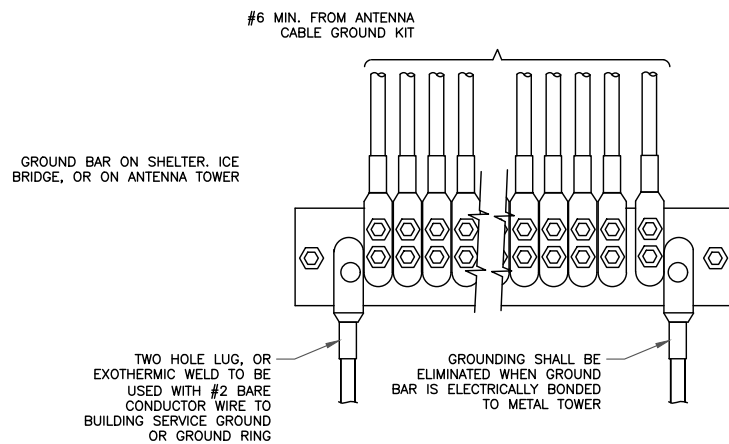
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC SS 2 BOLT
#2 SOLID TINNED	YA3C-2TC38	3/8" - 16 NC SS 2 BOLT
#2 STRANDED	YA2C-2TC38	3/8" - 16 NC SS 2 BOLT
#2/0 STRANDED	YA26-2TC38	3/8" - 16 NC SS 2 BOLT
#4/0 STRANDED	YA28-2N	1/2" - 16 NC SS 2 BOLT



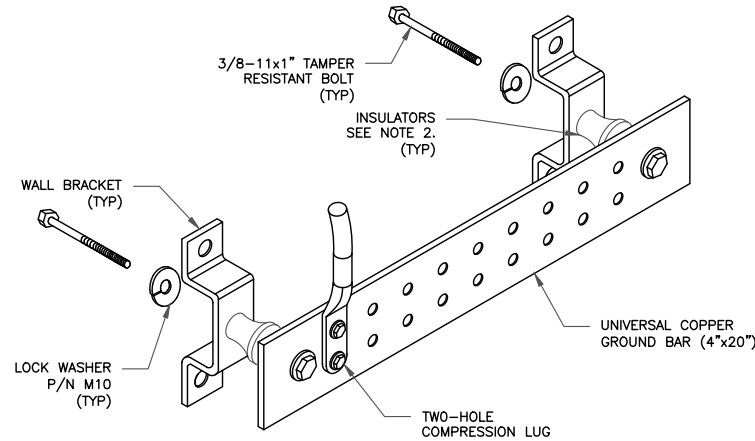
NOTE:

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



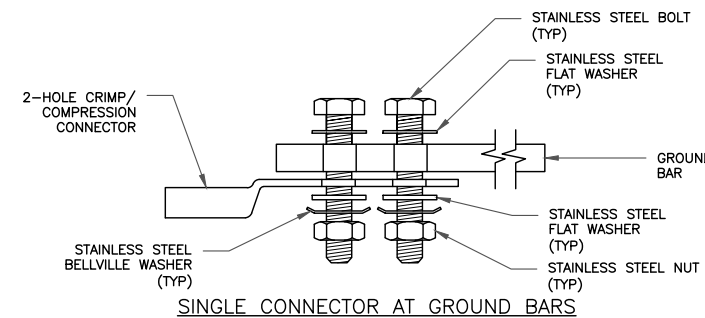
4 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



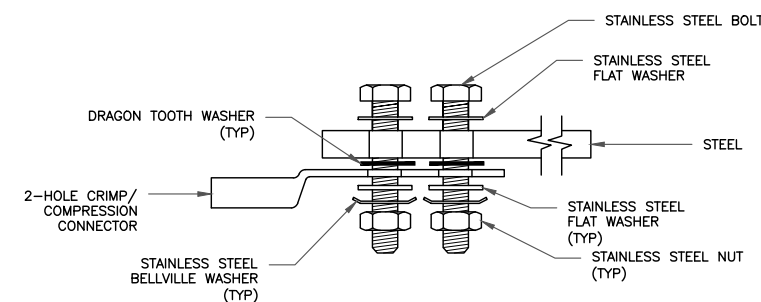
NOTES:

1. 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.
2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL. USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

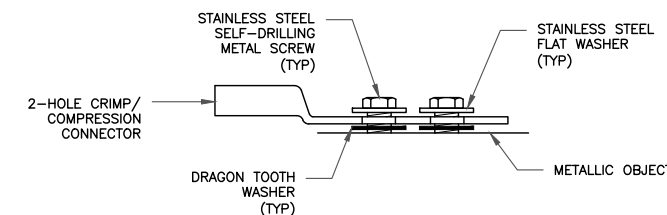
5 GROUND BAR DETAIL
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS

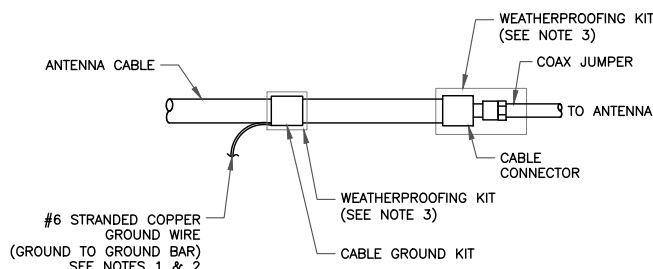


SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

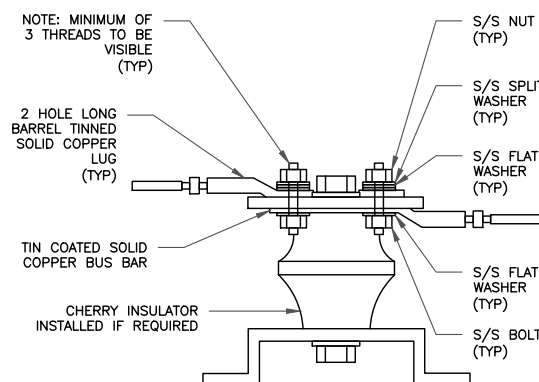
8 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. 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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0	04/22/21	ISSUED FOR CONSTRUCTION	DLF
A	03/16/21	ISSUED FOR REVIEW	JK

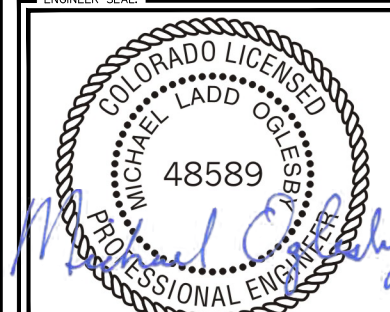
DRAWN BY: CHECKED BY:

JK DLF

KHA PROJECT NUMBER:

KHCL-7604

ENGINEER SEAL:



Exp. 10/31/23

PROJECT INFORMATION:

DN06267A
CO46086-A
SBA #: CO46086-A
6753 SHOUP ROAD
COLORADO SPRINGS, CO 80908

SHEET TITLE:

GROUNDING
DETAILS

SHEET NUMBER:

G-2