

T-Mobile

T-MOBILE SITE NUMBER: DN06163A
T-MOBILE SITE NAME: SPRINT RETAIN SITE DN14XC247
T-MOBILE PROJECT: SPRINT RETAIN

SBA SITE ID: CO46103-A
SITE ADDRESS: 7353 WEST HIGHWAY 24
JURISDICTION: MANITOU SPRINGS, CO 80829
EL PASO COUNTY

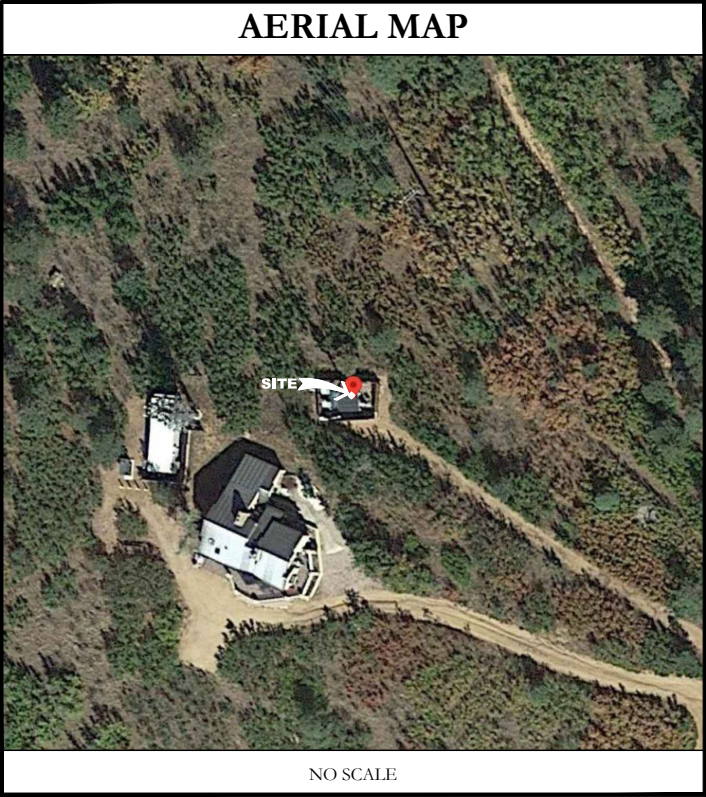
T-Mobile

12920 SE 38TH STREET
BELLEVUE, WA 98006



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

SITE INFORMATION	
SBA SITE NAME	USS MANITOU WATER
SITE ADDRESS:	7353 WEST HIGHWAY 24 MANITOU SPRINGS, CO 80829
COUNTY:	EL PASO
AREA OF CONSTRUCTION:	EXISTING
LATTITUDE:	38.886841° N
LONGITUDE:	104.958417° 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



NO SCALE



NO SCALE

DRAWING INDEX	
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G-1	GROUNDING DIAGRAM
G-2	GROUNDING DETAILS

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

GROUND SCOPE OF WORK	
1.	INSTALL NEW 600A SSC CABINET
2.	INSTALL NEW BATTERY CABINET
3.	INSTALL NEW ICE BRIDGE
4.	INSTALL NEW PPC
5.	INSTALL NEW DISCONNECT
6.	INSTALL (1) FSMF
7.	INSTALL (2) ASIK
8.	INSTALL (2) ASIB
9.	INSTALL (3) ABIA
10.	INSTALL (4) ABIL
11.	INSTALL (3) ABIC
12.	INSTALL (2) AMIA
13.	INSTALL (1) CSR IXRe V1
14.	INSTALL (2) JUNCTION BOXES

TOWER SCOPE OF WORK	
1.	REMOVE (2) ANTENNAS
2.	REMOVE (2) POWER CYLINDERS
3.	REMOVE (2) OPTICAL JUNCTION BOXES
4.	REMOVE (2) DIPLEXERS
5.	REMOVE (6) RRHs
6.	INSTALL (6) CROSSOVER CHANNEL BRACKETS
7.	INSTALL (6) CROSSOVER PLATES
8.	INSTALL (3) SUPPORT RAIL PIPES
9.	INSTALL (2) SUPPORT RAIL END CONNECTION KITS
10.	INSTALL (4) ANTENNAS
11.	INSTALL (6) RRHs
12.	INSTALL (2) BREAKOUT PENDANTS
13.	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	2017 PPRBC (2015 IBC)
MECHANICAL	2015 IMC
ELECTRICAL	2014 NEC
REFERENCE DOCUMENTS:	
STRUCTURAL ANALYSIS:	TOWER ENGINEERING SOLUTIONS (PROJECT #: 104224)
DATED:	04/27/2021
MOUNT ANALYSIS:	TOWER ENGINEERING SOLUTIONS (PROJECT #: 103105)
DATED:	03/11/2021
RFDS REVISION:	1
DATED:	11/09/2020

Kimley»Horn

421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601

REV: DATE: DESCRIPTION: BY:

1	08/26/21	REVISED PER CLIENT	DPL
0	05/12/21	ISSUED FOR CONSTRUCTION	DLF
A	05/07/21	ISSUED FOR REVIEW	AMG

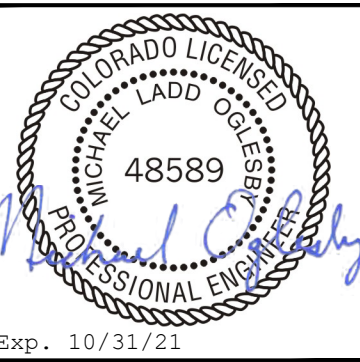
DRAWN BY: CHECKED BY:

AMG	DLF
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KHA PROJECT NUMBER:

KHCL- 11797

ENGINEER SEAL:



PROJECT INFORMATION:

DN06163A SPRINT RETAIN SITE DN14XC247 SBA #: CO46103-A 7353 WEST HIGHWAY 24 MANITOU SPRINGS, CO 80829
--

SHEET TITLE:

TITLE SHEET

SHEET NUMBER:

T-1



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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).

T-Mobile

12920 SE 38TH STREET
BELLEVUE, WA 98006



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

PLANS PREPARED BY:

KimleyHorn

421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601

REV: DATE: DESCRIPTION: BY:

1	08/26/21	REVISED PER CLIENT	DPL
0	05/12/21	ISSUED FOR CONSTRUCTION	DLF
A	05/07/21	ISSUED FOR REVIEW	AMG

DRAWN BY: CHECKED BY:

AMG DLF

KHA PROJECT NUMBER:

KHCL- 11797

ENGINEER SEAL:



Exp. 10/31/21

PROJECT INFORMATION:

DN06163A
SPRINT RETAIN SITE
DN14XC247
SBA #: CO46103-A
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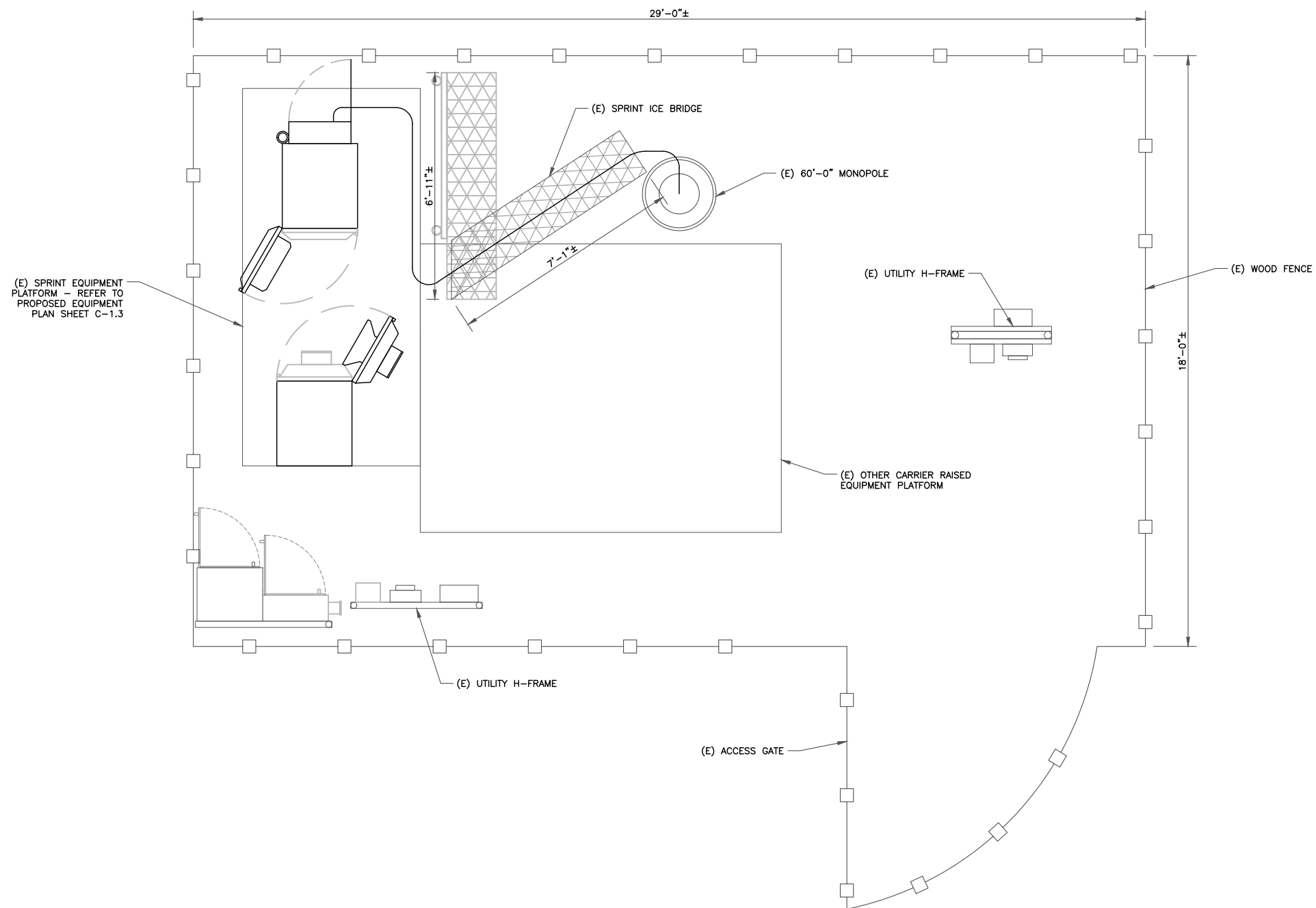
SHEET TITLE:

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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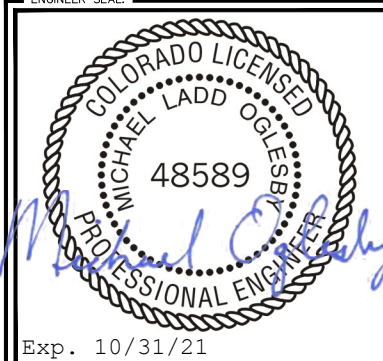
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KHA PROJECT NUMBER:

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ENGINEER SEAL:



PROJECT INFORMATION:

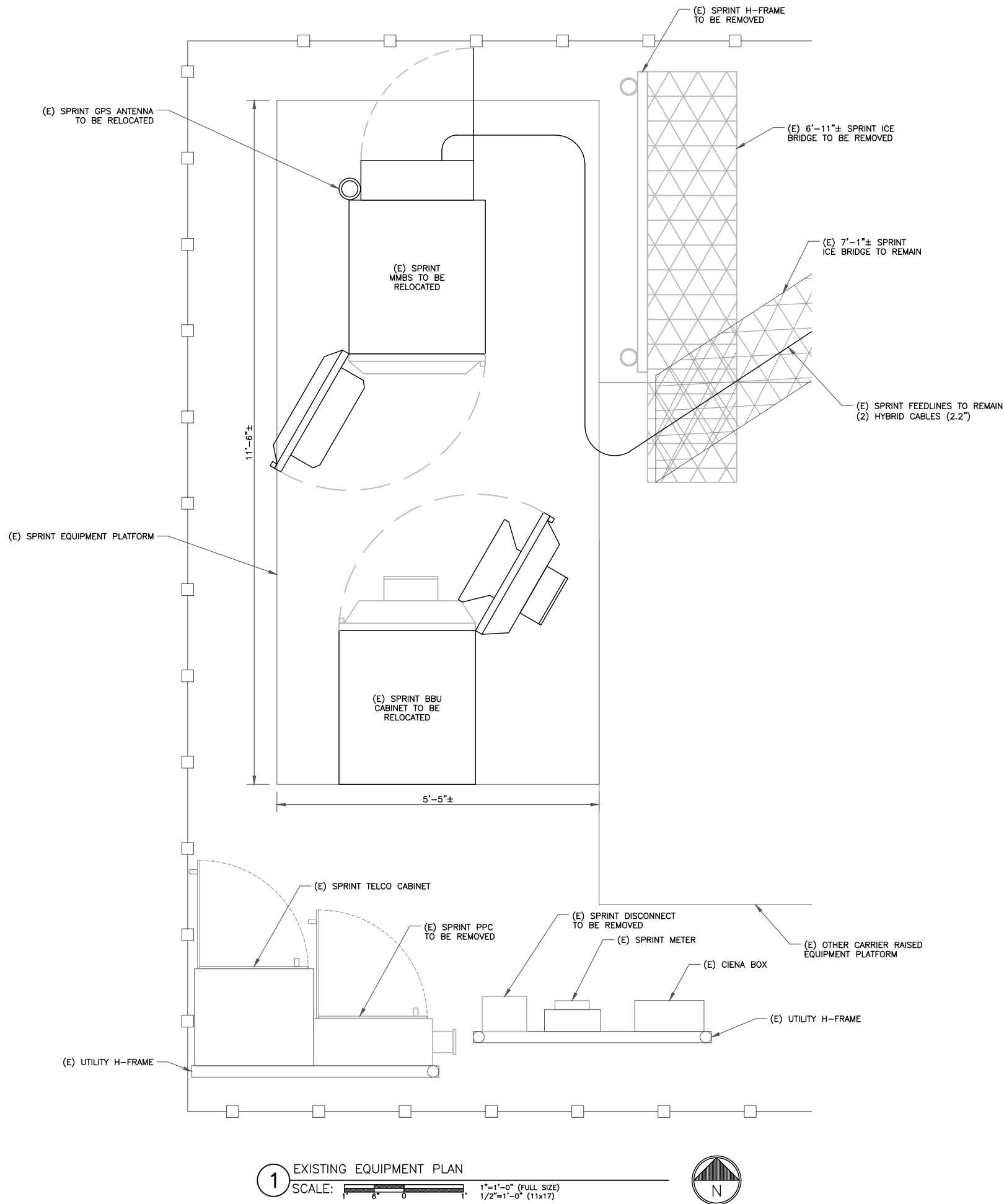
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SHEET TITLE:

OVERALL SITE PLAN

SHEET NUMBER:

C-1.1



INSTALLER NOTE:
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.

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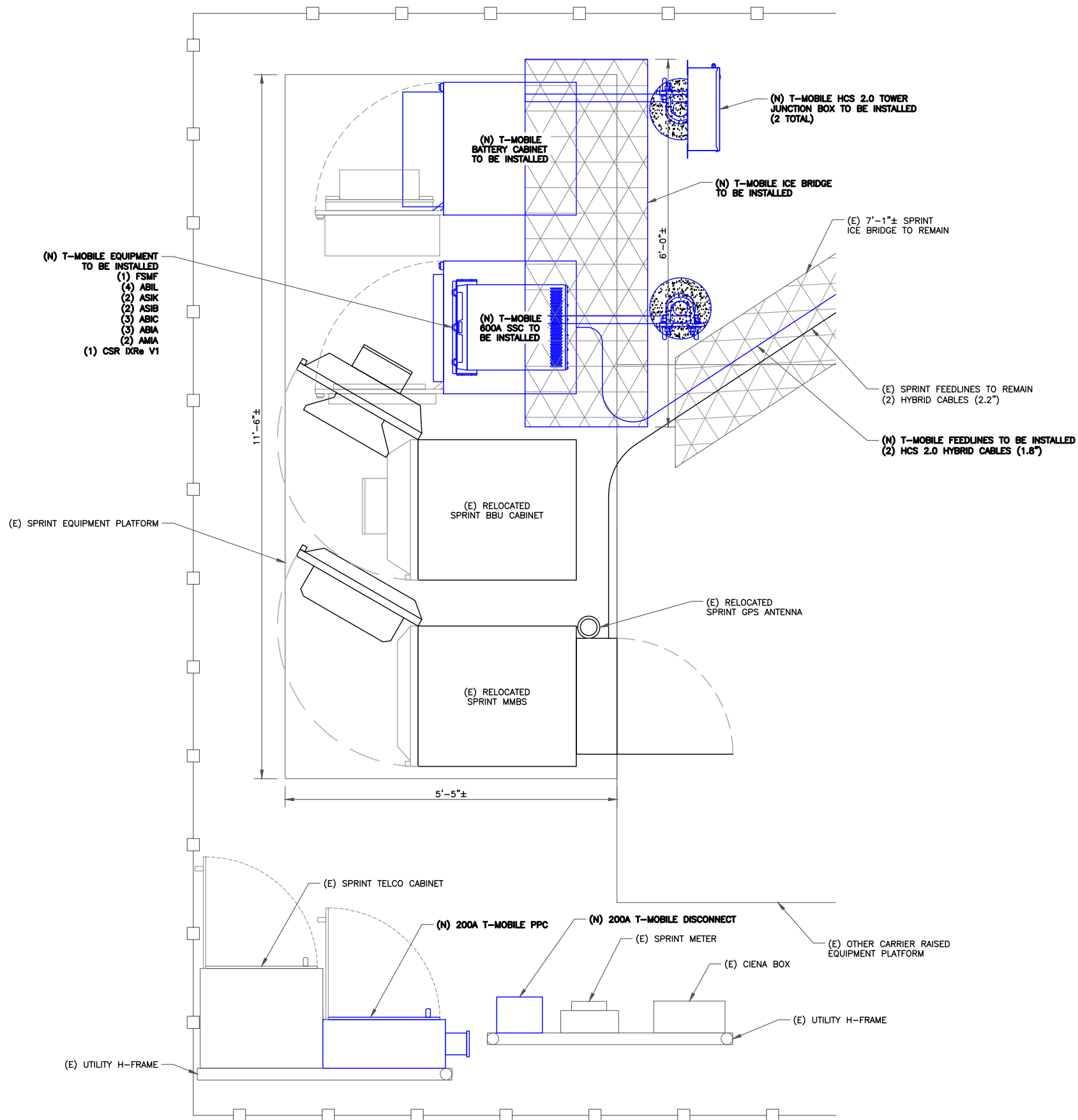
ENGINEER SEAL:

Exp. 10/31/21

PROJECT INFORMATION:
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SBA #: CO46103-A
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SHEET TITLE:
EXISTING EQUIPMENT PLAN

SHEET NUMBER:
C-1.2



INSTALLER NOTE:

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.

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KHA PROJECT NUMBER:

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ENGINEER SEAL:



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SHEET TITLE:

FINAL
EQUIPMENT PLAN

SHEET NUMBER:

C-1.3

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



(N) COPPER CLAD LIGHTNING ROD TO BE
INSTALLED PER TES STRUCTURAL ANALYSIS
(PROJECT #: 104224, DATED 04/27/21)

(N) MONOPOLE EXTENSION TO BE
INSTALLED PER TES STRUCTURAL ANALYSIS
(PROJECT #: 104224, DATED 04/27/21)

(E) SPRINT EQUIPMENT
(3) DOUBLE SUPPORT ARMS

(N) T-MOBILE EQUIPMENT
TO BE INSTALLED
(4) ANTENNAS
(4) RRHs
(2) BREAKOUT PENDANT
(8) METROSITE CROSSOVER
CHANNEL BRACKETS
(6) CROSSOVER PLATES
(3) SUPPORT RAIL PIPES
(2) METROSITE SUPPORT RAIL
END CONNECTION KITS

(N) FLANGE PLATE TO BE INSTALLED
PER TES STRUCTURAL ANALYSIS
(PROJECT #: 104224, DATED 04/27/21)

(N) FLAT BAR REINFORCEMENTS TO BE
INSTALLED PER TES STRUCTURAL ANALYSIS
(PROJECT #: 104224, DATED 04/27/21)

(N) ANCHOR ROD REINFORCEMENTS TO BE
INSTALLED PER TES STRUCTURAL ANALYSIS
(PROJECT #: 104224, DATED 04/27/21)

NEW LIGHTNING ROD TIP
ELEV. = 84'-0"

TOP OF NEW MONOPOLE EXTENSION
ELEV. = 80'-0"

TOP OF EXISTING TOWER
ELEV. = 60'-0"

EXISTING & PROPOSED TMO ACL
ELEV. = 58'-0"

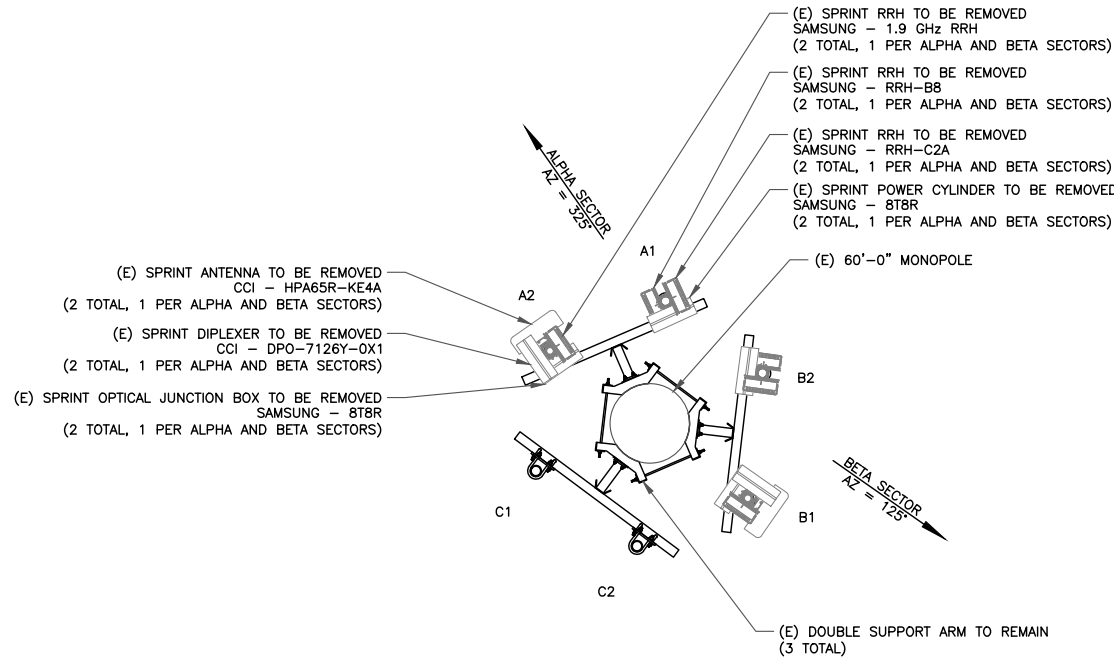
(E) 60'-0" MONOPOLE

(E) SPRINT FEEDLINES TO REMAIN
(2) HYBRID CABLES (2.2")

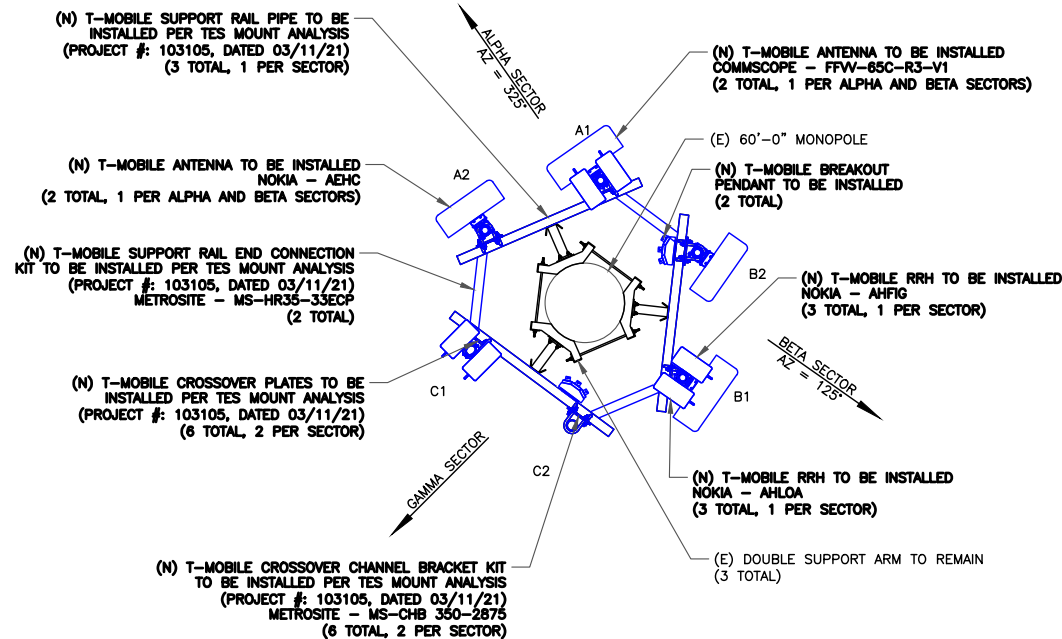
(N) T-MOBILE FEEDLINES TO BE INSTALLED
(2) HCS 2.0 HYBRID CABLES (1.8")

GROUND LEVEL
ELEV. = 0'-0"

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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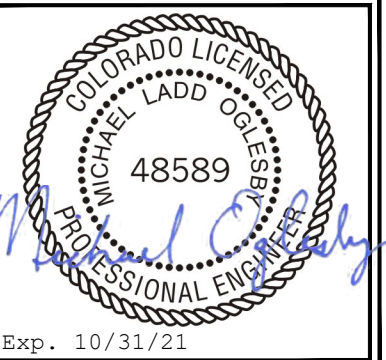
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SHEET TITLE:

TOWER ELEVATION
& ANTENNA PLAN


SHEET NUMBER:

C-2

NEW AND EXISTING ANTENNA AND CABLE SCHEDULE																		
SECTOR	POS.	AZIMUTH	RAD CENTER	M. TILT	TECHNOLOGY	ANTENNA	STATUS	RRU TYPE	DIPLEXER/ TMA	COVP	CABLE STATUS	COAX CABLE LENGTH	HCS FACTORY LENGTH	JUMPER LENGTH				
ALPHA	A2	325°	58’-0”	0°	L2500, N2500	NOKIA – AEHC	NEW	–	–	(2) NEW BREAKOUT PENDANTS	(2) EXISTING 2.2” HYBRID CABLES, (2) NEW 1.8” HYBRID CABLES	EXISTING	EXISTING	<15’-0”				
	A1	325°	58’-0”	0°	L600, N600, L700, L1900, G1900, L2100	COMMScope – FFVW-65C-R3-V1	NEW	(1) NEW AHLOA, (1) NEW AHFIG	–					<15’-0”				
BETA	B2	125°	58’-0”	0°	L2500, N2500	NOKIA – AEHC	NEW	–	–					<15’-0”				
	B1	125°	58’-0”	0°	L600, N600, L700, L1900, G1900, L2100	COMMScope – FFVW-65C-R3-V1	NEW	(1) NEW AHLOA, (1) NEW AHFIG	–					<15’-0”				
GAMMA	C2	–	–	–	–	–	–	–	–					–				
	C1	–	58’-0”	–	–	–	–	(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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KHA PROJECT NUMBER:

KHCLE- 11797

ENGINEER SEAL:

COLORADO LICENSED

MICHAEL LADD OGLESBY

48589

PROFESSIONAL ENGINEER

Exp. 10/31/21

PROJECT INFORMATION:

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SHEET TITLE:

ANTENNA SCHEDULE

SHEET NUMBER:

C-3

* For 5G and LTE Airscale BB dimensioning refer to Fiber Port matrices.
(Alpha, Beta & Gamma)



1 RFDS
SCALE: N/A

C-4

FFVV-65C-R3-V1



8-port sector antenna, 4x 617-894 and 4x 1695-2690 MHz, 65° HPBW, 3x RET

General Specifications

Antenna Type	Sector
Band	Multiband
Color	Light gray
Effective Projective Area (EPA), frontal	0.99 m² 10.656 ft²
Effective Projective Area (EPA), lateral	0.33 m² 3.552 ft²
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, General

RET Interface	8-pin DIN Female 8-pin DIN Male
RET Interface, quantity	1 female 1 male

Dimensions

Width	640 mm 25.197 in
Length	2437 mm 95.945 in

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	70.3 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	25.5dBi
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 / <0.6m2
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)

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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

NOKIA

2 ANTENNA SPECIFICATIONS
SCALE: NOT TO SCALE

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SHEET TITLE:

EQUIPMENT
SPECIFICATIONS

SHEET NUMBER:

C-5

AirScale Dual RRH 4T4R B12/71 240W AHLOA



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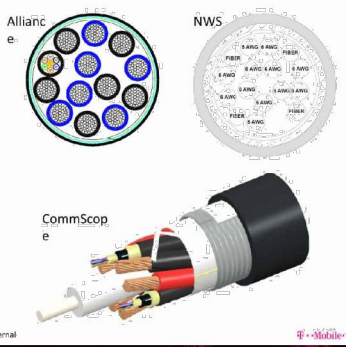
Product Code: 474331A	3GPP Band 12/71
Supported Frequency bands	
Frequencies	Band 12: adjusted: UL 698 ~ 716 MHz, DL 728 ~ 746 MHz Band 71: UL 663 MHz ~ 698 MHz, DL 617 MHz ~ 652 MHz
Number of TX/RX paths/pipes	4 pipes; 2T2R, 2T4R, 4T4R for both bands
Instantaneous Bandwidth IBW	17 MHz for B12 and 35MHz 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

NOKIA

1 NOKIA – AHLOA
SCALE: NOT TO SCALE

Trunk Cable General Specifications

Characteristic	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
A 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

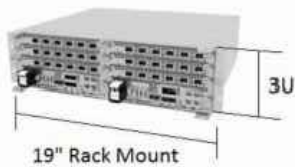
AirScale System Module Installation Guidelines - AMIA

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

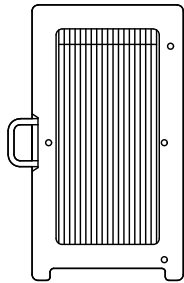
*Bottom support is available



19" Rack Mount

T-Mobile

3 AMIA SPECIFICATIONS
SCALE: NOT TO SCALE



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

4 NOKIA – AHFIG
SCALE: NOT TO SCALE

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SHEET TITLE:

EQUIPMENT
SPECIFICATIONS

SHEET NUMBER:

C-6



Outdoor Power & Battery Enclosures for AAV Equipment

The following products are described in this section. Please refer to Shelf power section for rectifiers, controllers and circuit breakers.

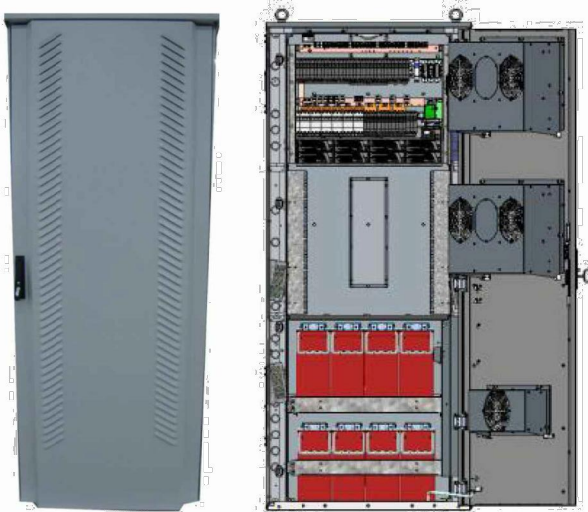
Products: Small SSC, LP Small SSC, Medium SSC, Large SSC, HP Large SSC, Battery Enclosure Advantage 1kW, Advantage 2kW & Advantage 6U



Basic Overview					
Pad Mount Power Cabinets					
Parameter	LP Small SSC	Small SSC	Medium SSC	Large SSC	HP Large SSC
Max Output (@-54V)	150	200	200	200	400
Height	37"	37"	54"	72"	72"
Width	26"	26"	30"	30"	30"
Depth	27"	27"	35"	35"	35"
Weight (w/ Rectifiers)	196	198	320	419	470
Open Rack Space	7RU	6RU	10RU	10RU	12RU
Max Eqmt Depth	15"	15"	20"	20"	20"
No. Battery Strings	1 x 100Ah	1 x 100Ah	1 x 100Ah 1 x 185Ah	3 x 185Ah	2 x 185Ah
Load Circuit Positions	17	17	17	17	52



HP Large Site Support Cabinet



HP Large SSC

- Corrosion Resistant Aluminum Construction
- Direct Air Cooling with optional Gore filter upgrade
- Compact design for power, battery, and equipment
- 72"H x 30"W x 36"D
- 400A/48V Power System
- Supports 2 Battery strings of 185 Ahr each
- 12RU/19" or 23" rack for Equipment

T-Mobile SAP Number	Delta Part Number	Product Description
33112	ESOA400-CCU01	HP Large SS Cabinet w/ (3) 2900W rectifiers
33113	3799442800-S	Optional Mounting Plinth, 6"
30068	ESR-48/40C F-A	DPR2000 Rectifier Module, -48V, 2000W, 96% efficiency
31910	ESR-48/56C F-A	DPR2900 Rectifier Module, -48V, 2900W, 96% efficiency
See Page 27	See Page 27	Load Circuit Breakers, DIN rail type
14502	0999142300	-48V String (4 batteries) of PYL12V185FT with intercell connectors
32186	3799252800-S	Gore filter upgrade kit w/ fan
	CU-19C A13	CSU502 Controller (FRU)

HP Large SS SAP number includes: enclosure with thermal management (fans & heaters), AC load center with surge protection, 23" 10.5RU power system with CSU502 controller, power system equipped with (1) 200A 4-pole breaker for battery string, (1) 150A 3-pole breaker for load, (3) 10A 1-pole breakers for load, (2) thermal probes for battery strings. In addition, HP Large SS ships with (3) 50A rectifiers.

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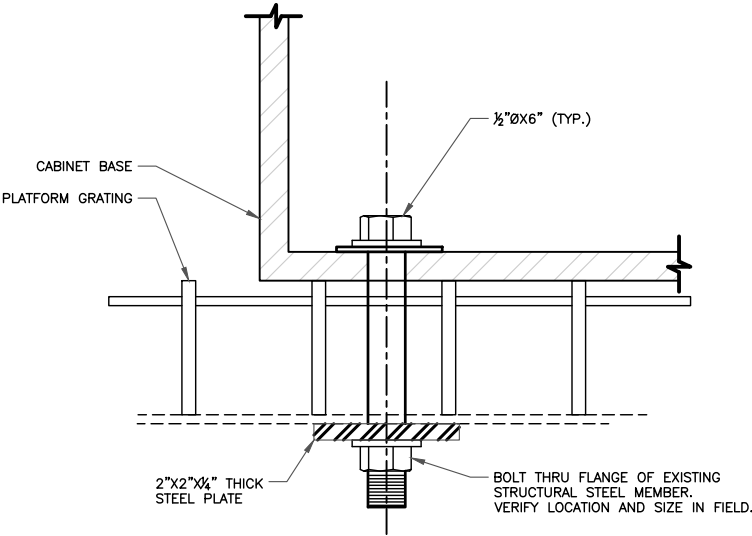
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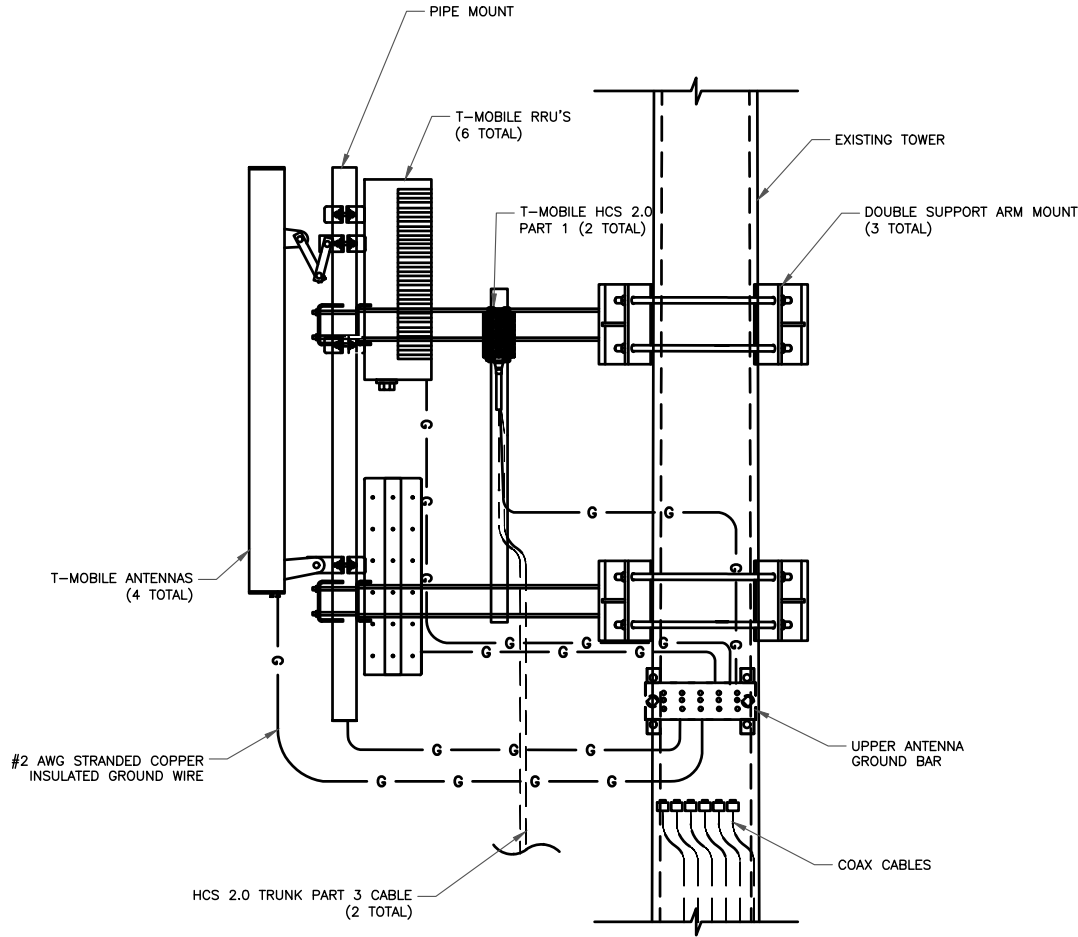
EQUIPMENT
SPECIFICATIONS

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C-7



1 CABINET BOLT DOWN DETAIL
SCALE: NOT TO SCALE



2 ANTENNA/RRU MOUNT DIAGRAM
SCALE: NOT TO SCALE

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AMG DLF

KHA PROJECT NUMBER:

KHCLE- 11797

ENGINEER SEAL:



PROJECT INFORMATION:

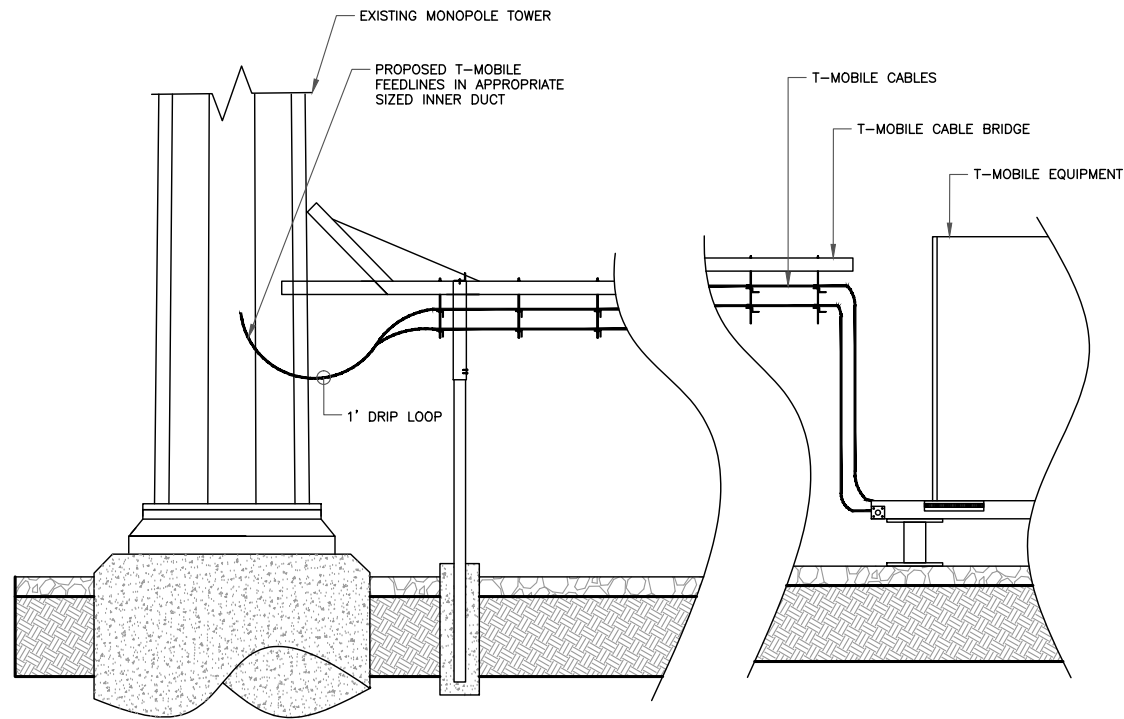
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DN14XC247
SBA #: CO46103-A
7353 WEST HIGHWAY 24
MANITOU SPRINGS, CO 80829

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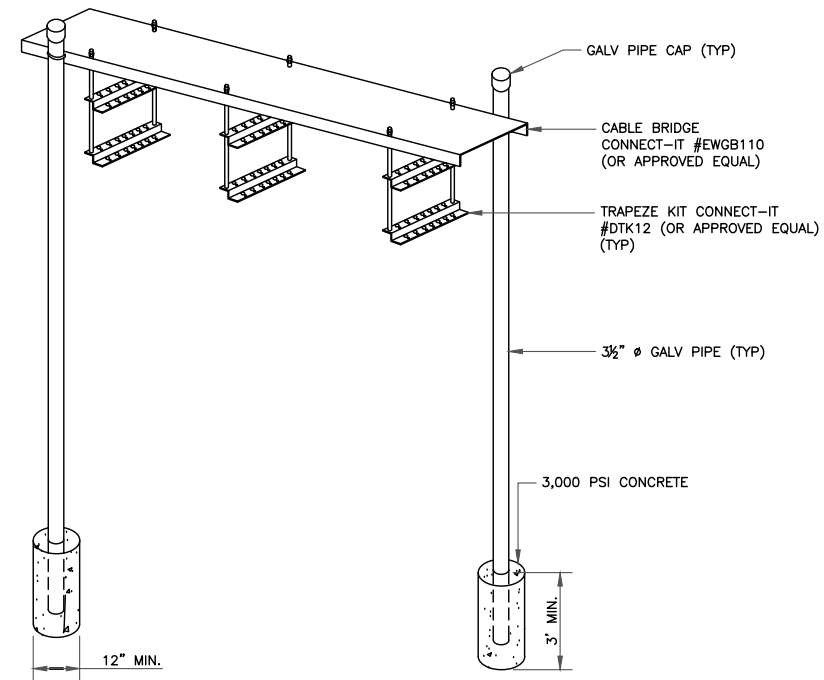
MOUNTING DETAIL

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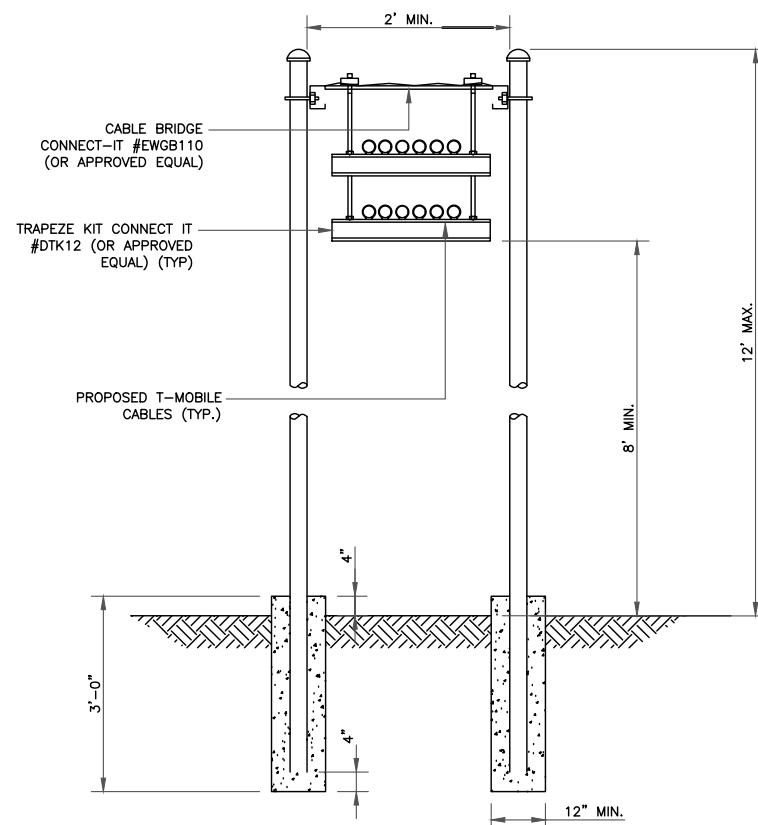
C-8



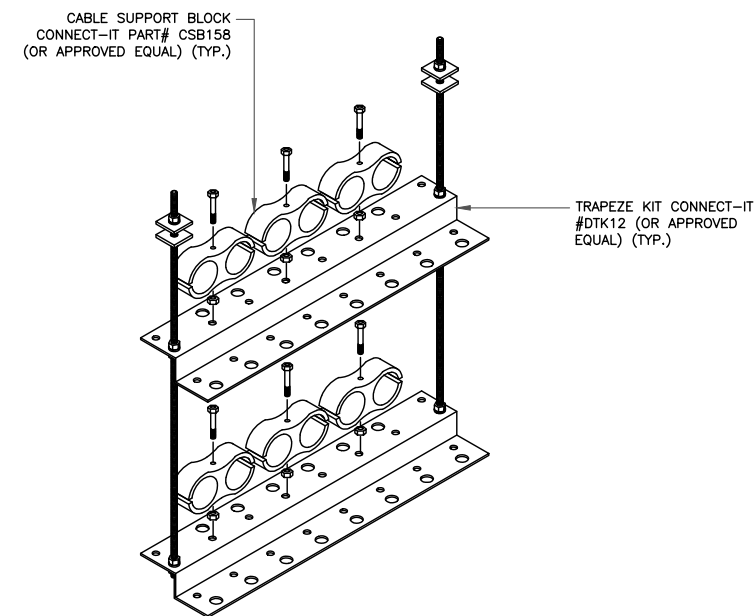
1 CABLE BRIDGE ELEVATION (TYP)
SCALE: NOT TO SCALE



2 CABLE BRIDGE ANONOMETRIC (TYP)
SCALE: NOT TO SCALE



3 CABLE BRIDGE CROSS SECTION
SCALE: NOT TO SCALE



4 TRAPEZE KIT ISOMETRIC
SCALE: NOT TO SCALE

T-Mobile

12920 SE 38TH STREET
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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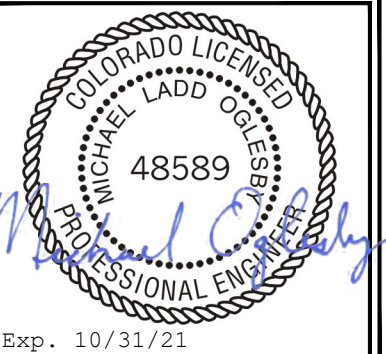
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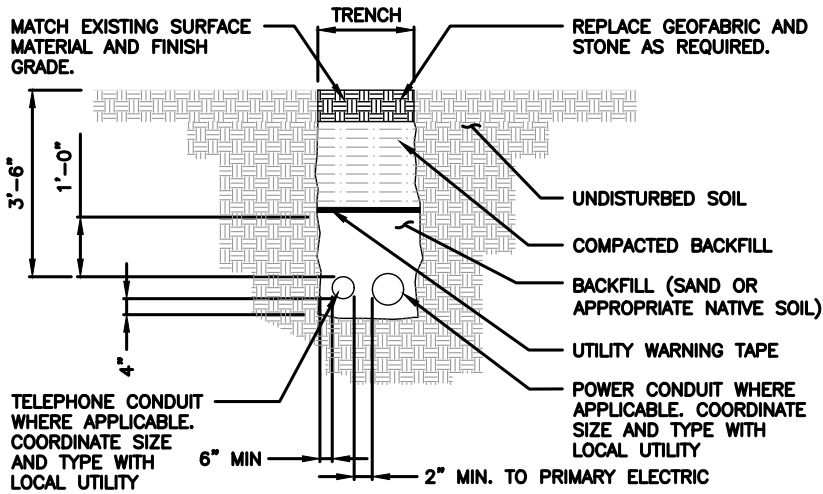
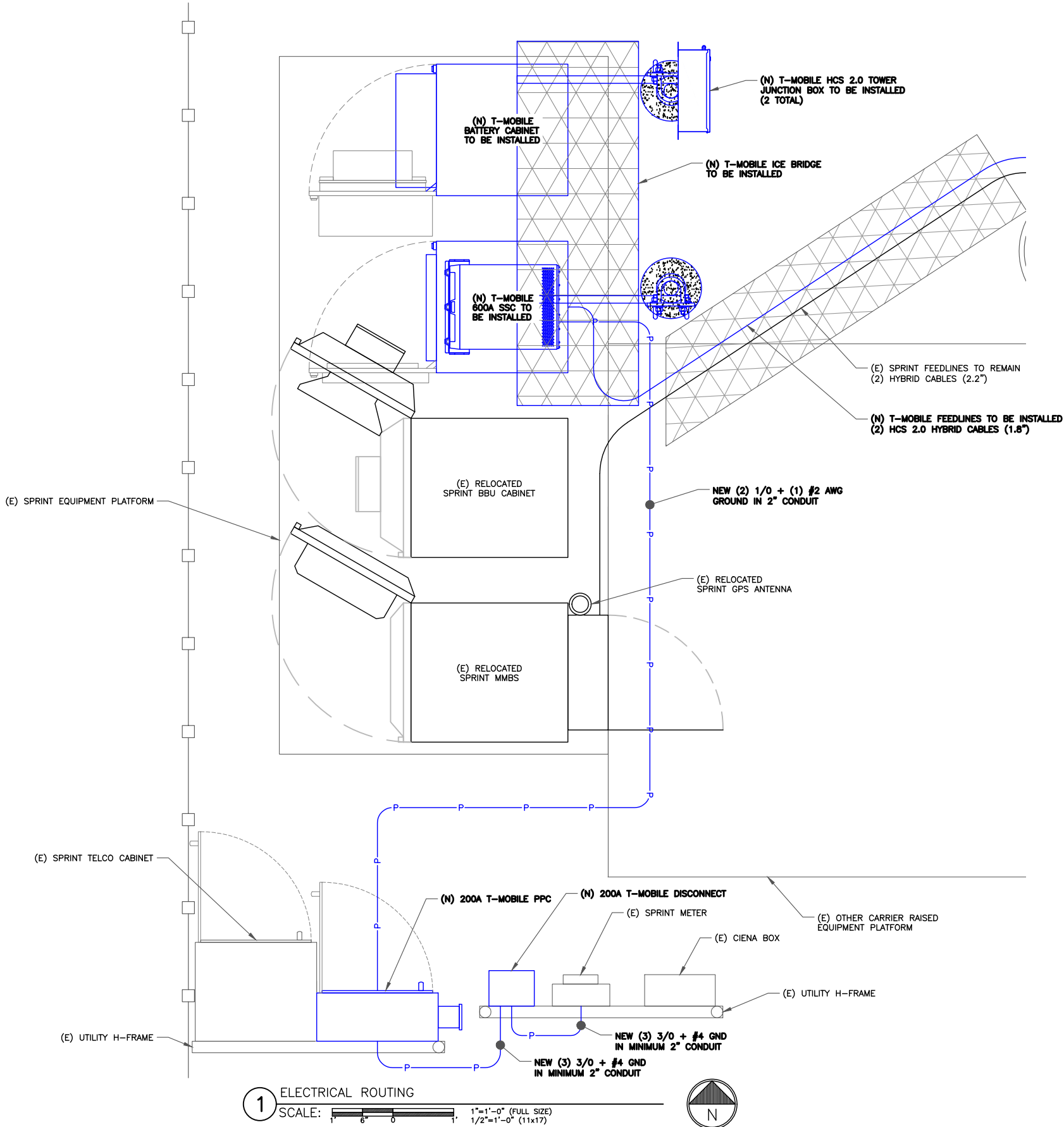
ICE BRIDGE
DETAILS

SHEET NUMBER:

C-9

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.



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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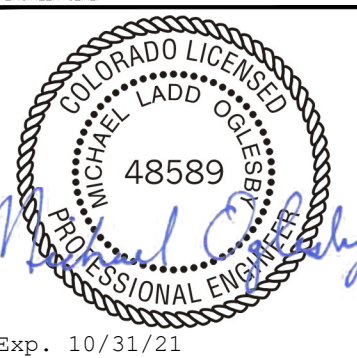
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SHEET TITLE:

ELECTRICAL
ROUTING

SHEET NUMBER:

E-1

VOLTAGE	120/240V	AIC RATING	10,000 AMPS
MAIN BREAKER	200 AMP	BUSS RATING	200 AMPS
MOUNT	SURFACE	NEUTRAL BAR	YES
ENCLOSURE TYPE	NEMA 3R	GROUND BAR	YES
PANEL STATUS	NEW	N TO GROUND BOND	YES
PHASE, WIRES	SINGLE, 3	INTERNAL TVSS	TBD

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	UNKNOWN	60	2	OFF	0	1.25	0		1.25	0	ON	2	60	AC SURGE PROTECTOR	2
3		60	2	OFF	0	1.25		0	1.25	0	ON	2	60		4
5	EXISTING MMBS	100	2	ON	6,000	1.25	9300		1.25	1,440	ON	2	15	EXISTING BBU	6
7		100	2	ON	6,000	1.25		9300	1.25	1,440	ON	2	15		8
9	GENERATOR CHARGER	20	1	OFF	0	1.25	180		1.00	180	ON	1	20	TELCO GFI	10
11	FAN	10	1	ON	360	1.25		12450	1.25	9,600	ON	2	150*	NEW SSC CABINET	12
13	SPACE	-	1	N/A	0	1.25	12000		1.25	9,600	ON	2	150*		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	SPACE	-	1	N/A	0	1.25	0		1.25	0	N/A	1	-	SPACE	22
23	SPACE	-	1	N/A	0	1.25		0	1.25	0	N/A	1	-	SPACE	24

OVERALL LOAD SUMMARY	
TOTAL SERVICE LOAD KVA	43.23
AMPS	180.13

= Loading provided by T-Mobile. = Assumed Maximum Loading Per Breaker Size
* = New 150A Breaker

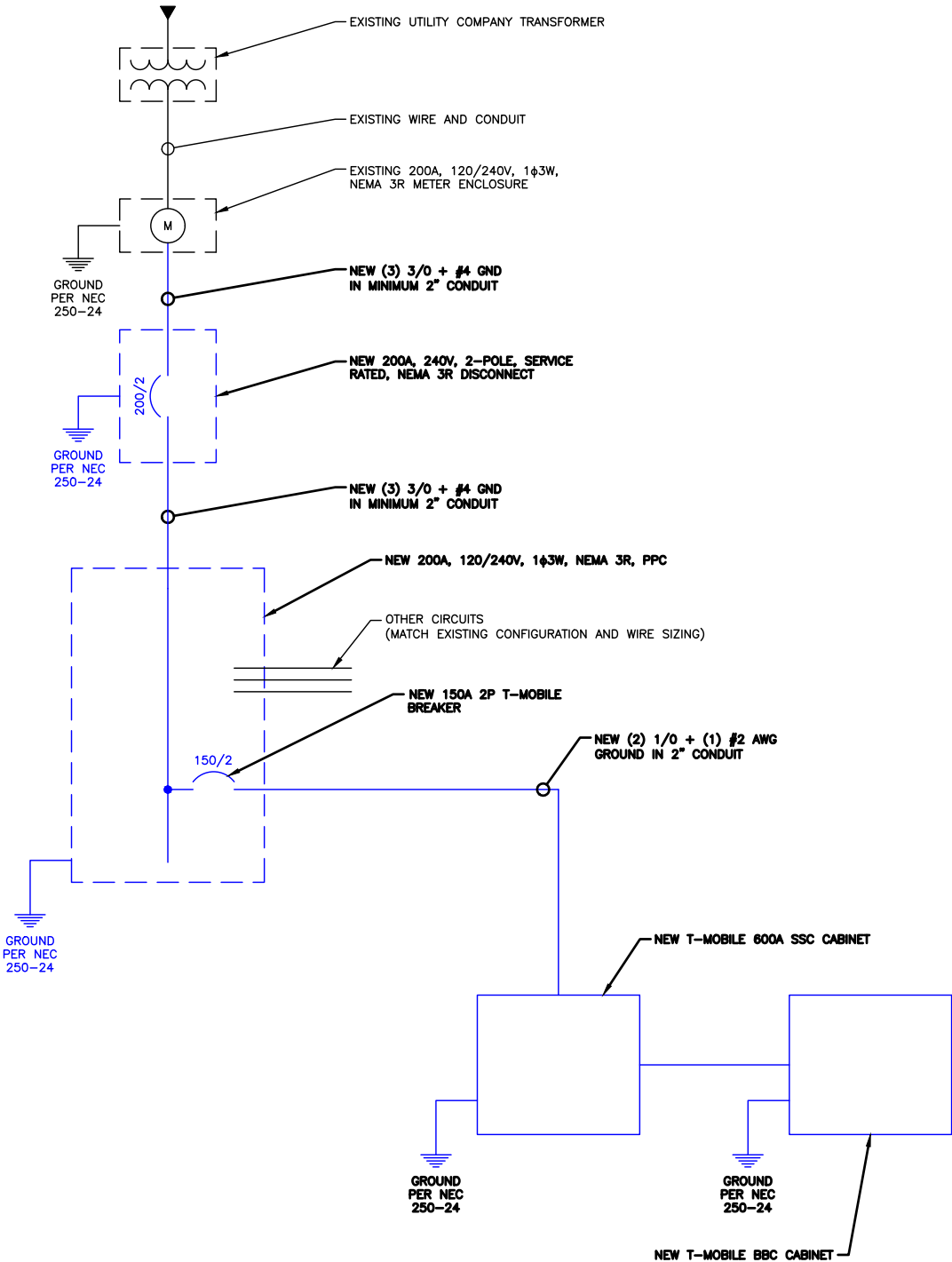
1 ELECTRICAL PANEL SCHEDULE

- CONTRACTOR SHALL INSPECT THE EXISTING CONDITIONS PRIOR TO SUBMITTING BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS OT 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 12" 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 DEGREES 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 TYPEWRITTEN 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 CNNECTED 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



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Exp. 10/31/21

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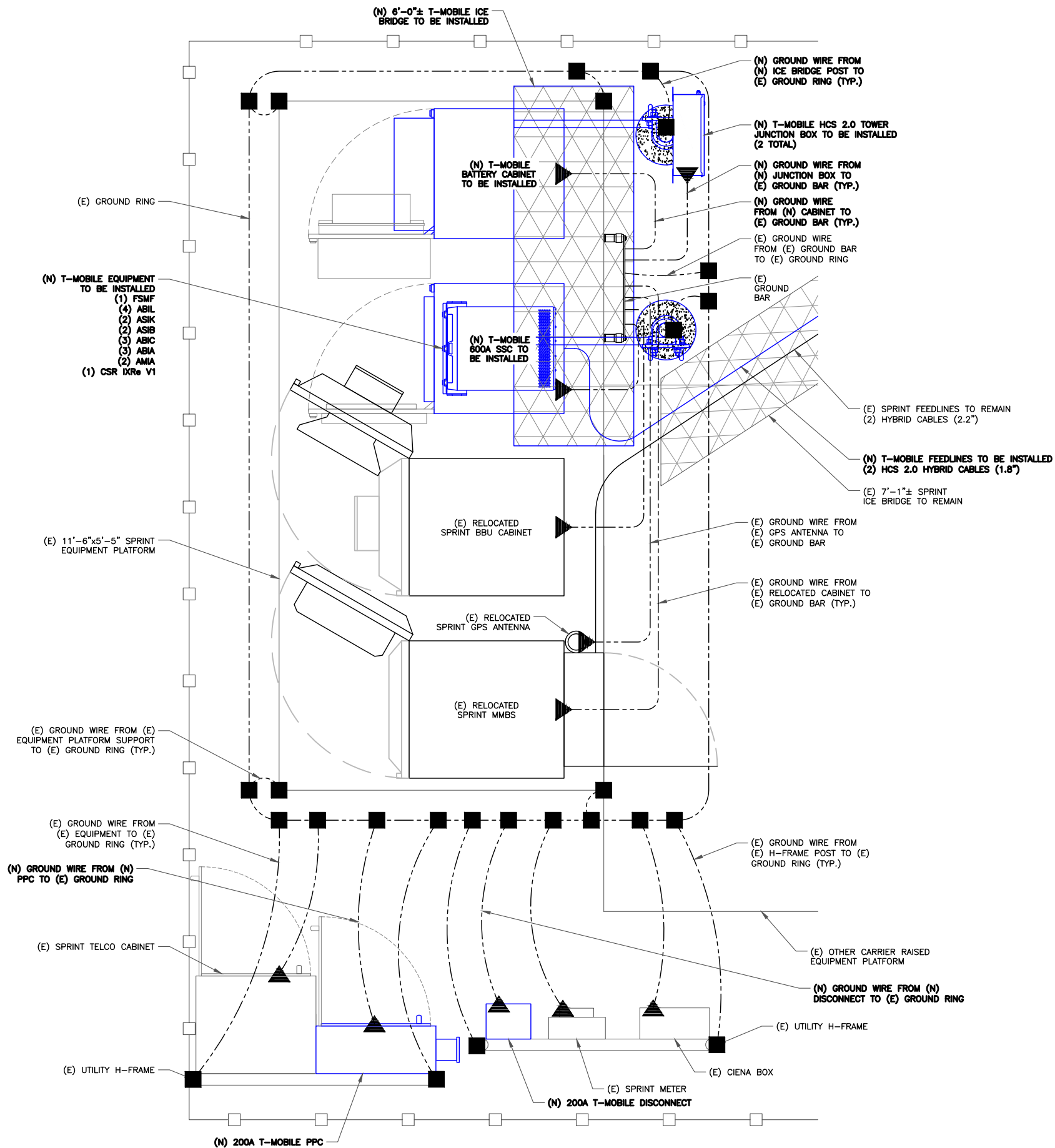
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SHEET TITLE:

PANEL SCHEDULE
& ONE-LINE DIAGRAM

SHEET NUMBER:

E-2



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

1 EQUIPMENT GROUNDING PLAN
SCALE: 1"=1'-0" (FULL SIZE)
1/2"=1'-0" (11x17)

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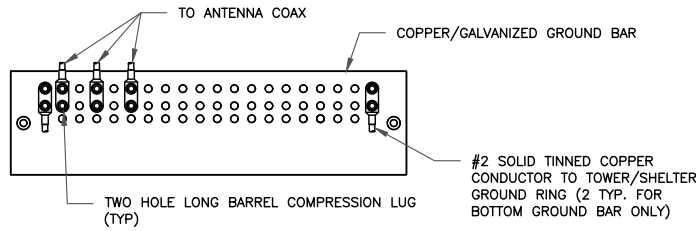
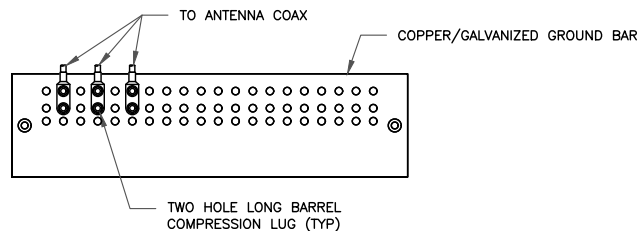
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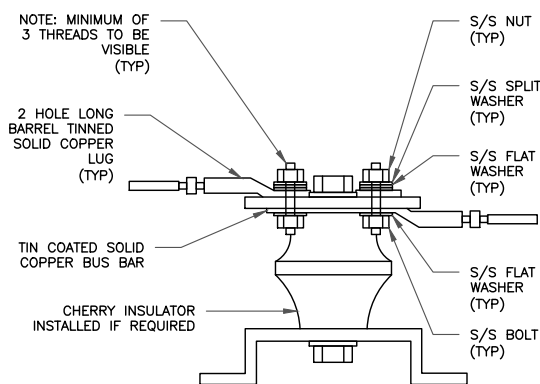
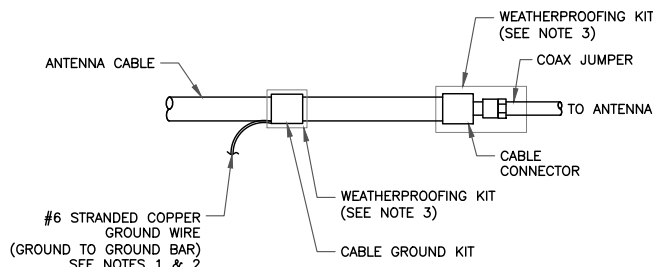
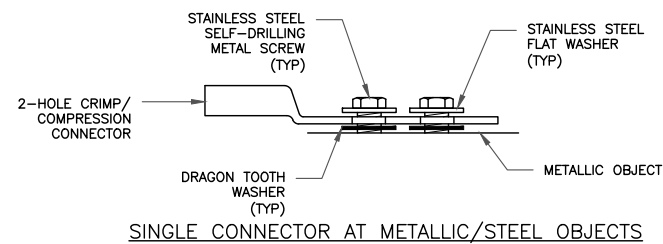
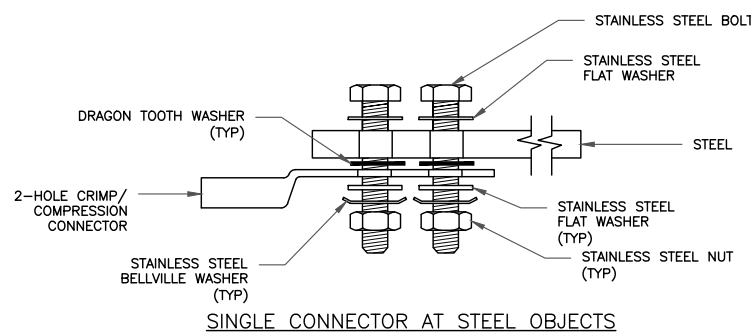
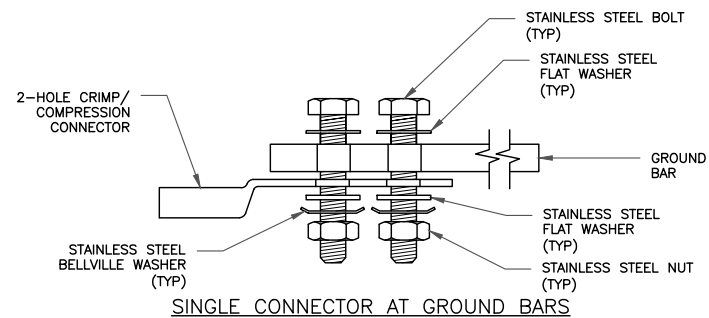
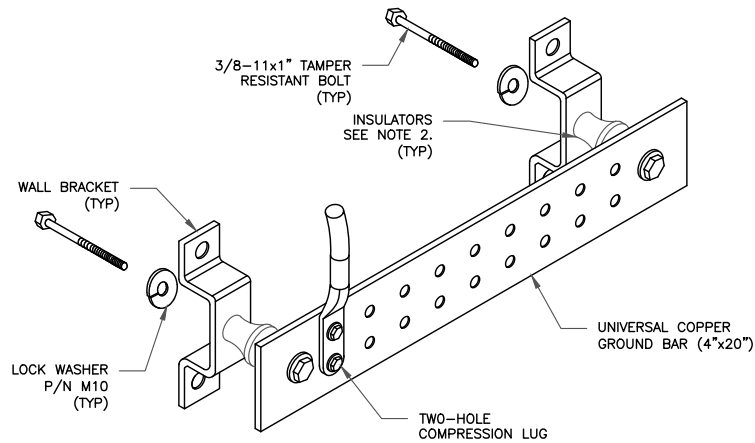
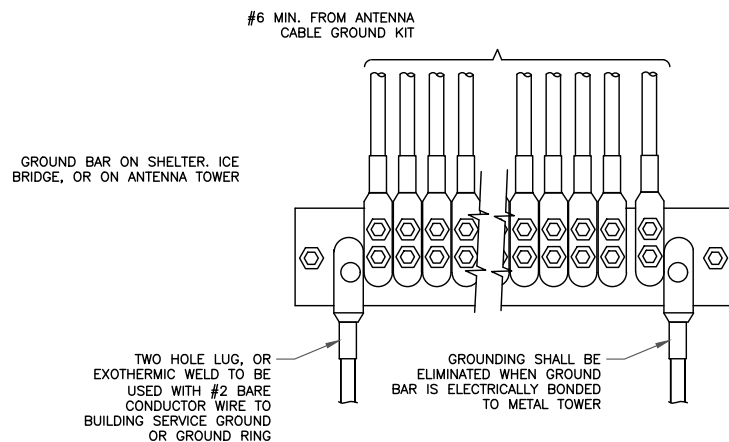
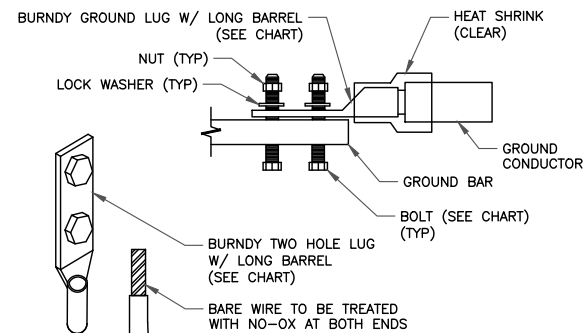
GROUNDING
DIAGRAM

SHEET NUMBER:

G-1



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



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SHEET TITLE:

GROUNDING
DETAILS

SHEET NUMBER:

G-2