



T-MOBILE SITE NUMBER:

DN02315A

T-MOBILE SITE NAME:

HENDERSON

CCI SITE#:

877109

SITE ADDRESS:

9915 E. 104TH AVENUE
HENDERSON, CO 80640

APPROVAL SIGNATURE BLOCK

THE FOLLOWING PARTIES HAVE REVIEWED THESE DOCUMENTS:

SITE ACQUISITION SPECIALIST:	APPROVED: <input type="checkbox"/> REJECTED: <input type="checkbox"/>	DATE:
RF ENGINEER:	APPROVED: <input type="checkbox"/> REJECTED: <input type="checkbox"/>	DATE:
CONSTRUCTION MANAGER:	APPROVED: <input type="checkbox"/> REJECTED: <input type="checkbox"/>	DATE:
OPERATIONS:	APPROVED: <input type="checkbox"/> REJECTED: <input type="checkbox"/>	DATE:
PROJECT MANAGER:	APPROVED: <input type="checkbox"/> REJECTED: <input type="checkbox"/>	DATE:

DRAWINGS ARE NO LONGER TO BE "APPROVED WITH COMMENTS" - IF YOU HAVE ANY REDLINES TO THESE DRAWINGS THEN YOU MUST SELECT REJECTED.



T-MOBILE SITE NUMBER: DN02315A

T-MOBILE SITE NAME: HENDERSON

SITE TYPE: MONOPOLE

TOWER HEIGHT: 92.0 FT

CROWN CASTLE BU #: 877109

SITE ADDRESS: 9975 E. 104TH AVENUE
HENDERSON, CO 80640

COUNTY: ADAMS

JURISDICTION: CITY OF COMMERCE, CO

T-MOBILE 2018 NSD LAT: 39° 53' 11.64", LONG: -104° 52' 20.94"

SITE INFORMATION

SITE NAME:

FILL-IN/DENVER/DEN145

SITE ADDRESS:

9975 E. 104TH AVENUE
HENDERSON, CO 80640

COUNTY:

ADAMS

MAP/PARCEL #:

0172110401006

AREA OF CONSTRUCTION:

EXISTING

LATITUDE:

39° 53' 11.64"

LONGITUDE:

-104° 52' 20.94"

LAT/LONG TYPE:

NAD83

GROUND ELEVATION:

5,082 FT

CURRENT ZONING:

I-3

JURISDICTION:

CITY OF COMMERCE, CO

OCCUPANCY CLASSIFICATION:

U

TYPE OF CONSTRUCTION:

VB

A.D.A. COMPLIANCE:

FACILITY IS UNMANNED AND NOT FOR HUMAN
HABITATION

PROPERTY OWNER:

TOWER OPERATOR:

CROWN CASTLE, USA
2000 CORPORATE DRIVE
CANONSBURG, PA 15317

CARRIER/APPLICANT:

T-MOBILE
18400 E. 22ND AVENUE
AURORA, CO 80011

CROWN CASTLE
APPLICATION ID:

441211

ELECTRIC PROVIDER:

UNITED POWER
(800) 468-8809

TELCO PROVIDER:

CENTURYLINK
(800) 244-1111

DRAWING INDEX

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

PROJECT DESCRIPTION

THE PURPOSE OF THIS PROJECT IS TO PROPOSE AN ANTENNA MODIFICATION ON AN EXISTING WIRELESS SITE.

TOWER SCOPE OF WORK:

- INSTALL (6) PANEL ANTENNAS
- INSTALL (4) RRUs
- INSTALL (1) COVP
- INSTALL (1) HYBRID CABLE LINES
- INSTALL NEW PLATFORM MOUNT

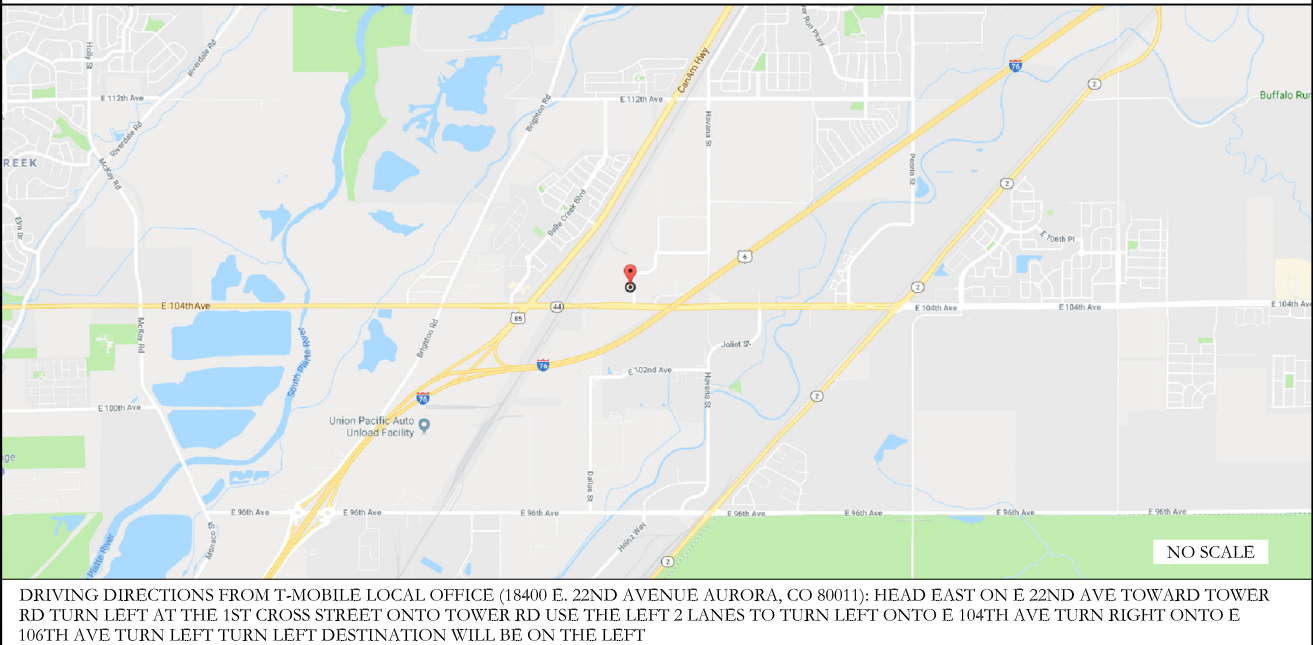
GROUND SCOPE OF WORK:

- INSTALLATION OF NEW 10'-0"x12'-0" MODULAR EQUIPMENT PLATFORM WITHIN A NEW 10'-0"x15'-0" LEASE AREA WITHIN THE EXISTING FENCED COMPOUND

DESIGN PACKAGE BASED ON THE RFDS
REVISION: R0.1
DATE: 4/18/2018 2:10:30 PM

DESIGN PACKAGE BASED ON THE APPLICATION
ID: 441211
REVISION: 1

LOCATION MAP



APPLICABLE CODES/REFERENCE DOCUMENTS

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

CODE TYPE	CODE
BUILDING	2012 IBC
MECHANICAL	2012 IMC
ELECTRICAL	2014 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS: BY AW SOLUTIONS
PROJECT# 877109
DATED: JUNE 08, 2018

MOUNT ANALYSIS: BY OTHERS



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



SITE PHOTO



18400 E. 22ND AVENUE
AURORA, CO 80011



T-MOBILE SITE NUMBER:
DN02315A

BU #: 877109
FILL-IN/DENVER
/DEN145

9975 E. 104TH AVENUE
HENDERSON, CO 80640

EXISTING 92.0 FT MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	07-09-2018	JAS	PRELIMINARY	ELG
B	08-17-2018	JAS	PRELIMINARY	ELG
0	08-27-2018	JAS	FINAL	ELG
1	10-29-2018	JAS	FINAL	ELG
2	01-16-2019	JAS	FINAL	ELG
3	01-23-2019	JAS	FINAL	ELG
4	02-06-2019	JAS	FINAL	ELG
5	03-28-2019	JAS	FINAL	ELG
6	04-23-2019	JAS	FINAL	ELG
7	05-1-2019	JAS	FINAL	ELG

JACOB GORALSKI, PLLC

CONSULTING ENGINEER
JACOB GORALSKI, PLLC
UT PE# 9226401-2202
1106 COLBI ST.
KENNEDEALE, TX 76060
(817) 456-2621

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

SHEET NUMBER:

T-1

REVISION:

7

SITE WORK GENERAL NOTES:

1. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION.
3. ALL SITE WORK TO COMPLY WITH QAS–STD–10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE TOWER SITE" AND LATEST VERSION OF TIA 1019 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
4. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS.
5. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
6. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.
7. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
8. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
9. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
10. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
11. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE PROJECT SPECIFICATIONS.
12. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
13. NOTICE TO PROCEED– NO WORK TO COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF A PURCHASE ORDER.
14. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/TIA 1019 (LATEST EDITION), OSHA, AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA–1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE PAINTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND IN ACCORDANCE WITH ASTM A36 UNLESS OTHERWISE NOTED.
2. BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE (3/4") CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
3. NON–STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" ASTM A307 BOLTS UNLESS NOTED OTHERWISE.
4. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS.

CONCRETE AND REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST–IN–PLACE CONCRETE.
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. SLAB FOUNDATION DESIGN ASSUMING ALLOWABLE SOIL BEARING PRESSURE OF 2000 PSF.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

CONCRETE CAST AGAINST EARTH.....3 IN.
CONCRETE EXPOSED TO EARTH OR WEATHER:
#6 AND LARGER.....2 IN.
#5 AND SMALLER & WWF.....1 1/2 IN.
CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
SLAB AND WALLS.....3/4 IN.
BEAMS AND COLUMNS.....1 1/2 IN.
5. A CHAMFER 3/4" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE. IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

MASONRY NOTES:

1. HOLLOW CONCRETE MASONRY UNITS SHALL MEET A.S.T.M. SPECIFICATION C90, GRADE N. TYPE 1. THE SPECIFIED DESIGN COMPRESSIVE STRENGTH OF CONCRETE MASONRY (F'm) SHALL BE 1500 PSI.
2. MORTAR SHALL MEET THE PROPERTY SPECIFICATION OF A.S.T.M. C270 TYP. "S" MORTAR AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI.
3. GROUT SHALL MEET A.S.T.M. SPECIFICATION C475 AND HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 2000 PSI.
4. CONCRETE MASONRY SHALL BE LAID IN RUNNING (COMMON) BOND.
5. WALL SHALL RECEIVE TEMPORARY BRACING. TEMPORARY BRACING SHALL NOT BE REMOVED UNTIL GROUT IS FULLY CURED.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:













CONTRACTOR–
SUBCONTRACTOR–
CARRIER–
TOWER OWNER–
OEM–
GENERAL CONTRACTOR (CONSTRUCTION)
T–MOBILE
CROWN CASTLE
ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR AND CROWN CASTLE.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO SCALE AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CONTRACTOR AND CROWN CASTLE PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWINGS.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

ABBREVIATIONS AND SYMBOLS:

ABBREVIATIONS:

AGL ABOVE GRADE LEVEL
BTS BASE TRANSCIEVER STATION
(E) EXISTING
MIN. MINIMUM
REF REFERENCE
RF RADIO FREQUENCY
T.B.D. TO BE DETERMINED
T.B.R. TO BE RESOLVED
TYP TYPICAL
REQ REQUIRED
EGR EQUIPMENT GROUND RING
AWG AMERICAN WIRE GAUGE
MGB MASTER GROUND BAR
EG EQUIPMENT GROUND
BCW BARE COPPER WIRE
BTCW BARE TINNED COPPER WIRE
SIAD SMART INTEGRATED ACCESS DEVICE
GEN GENERATOR
IGR INTERIOR GROUND RING (HALO)
RBS RADIO BASE STATION

SYMBOLS:

 SOLID GROUND BUS BAR
 SOLID NEUTRAL BUS BAR
 SUPPLEMENTAL GROUND CONDUCTOR
 2–POLE THERMAL–MAGNETIC CIRCUIT BREAKER
 SINGLE–POLE THERMAL–MAGNETIC CIRCUIT BREAKER
 CHEMICAL GROUND ROD
 TEST WELL
 DISCONNECT SWITCH
 METER
 EXOTHERMIC WELD (CADWELD) (UNLESS OTHERWISE NOTED)
 MECHANICAL CONNECTION
 GROUNDING WIRE

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC. HILTI EPOXY ANCHORS ARE REQUIRED BY CROWN CASTLE.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
5. CABLES SHALL NOT BE ROUTED THROUGH LADDER–STYLE CABLE TRAY RUNGS.
6. EACH END OF EVERY POWER, POWER PHASE CONDUCTOR (I.E., HOTS), GROUNDING AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
7. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH PLASTIC TAPE PER COLOR SCHEDULE. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (I.E. PANEL BOARD AND CIRCUIT ID'S).
8. PANEL BOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
9. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
10. POWER, CONTROL AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (#14 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN–2, CLASS B STRANDED COPPER CABLE RATED FOR 90° C (WET & DRY) OPERATION LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED UNLESS OTHERWISE SPECIFIED.
11. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (#6 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN–2 GREEN INSULATION CLASS B STRANDED COPPER CABLE RATED FOR 90° C (WET AND DRY) OPERATION LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI–CONDUCTOR, TYPE TC CABLE (#14 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN–2, CLASS B STRANDED COPPER CABLE RATED FOR 90° C (WET AND DRY) OPERATION WITH OUTER JACKET LISTED OR LABELED FOR THE LOCATION USED UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP–STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E. RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT) OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID–TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION–TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
21. WIREWAYS SHALL BE EPOXY–COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER).
22. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON–PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHIN ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
23. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY–COATED SHEET STEEL; SHALL MEET OR EXCEED UL 50 AND RATED NEMA 1 (OR BETTER) INDOORS OR NEMA 3R (OR BETTER) OUTDOORS.
24. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY–COATED OR NON–CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
25. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
26. THE SUBCONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
27. THE SUBCONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
28. INSTALL PLASTIC LABEL ON THE METER CENTER TO SHOW "T–MOBILE".
29. ALL CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.
30. INSTALL PULL BOXES TO THE MAIN SERVICE FEEDER CONDUIT RUN, AS NEEDED TO COMPLY WITH NEC AND UTILITY COMPANY REQUIREMENTS

GREENFIELD GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL–OF–POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
3. THE SUBCONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.
4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 AWG SOLID TINNED COPPER FOR OUTDOOR BTS.
7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 AWG SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
15. APPROVED ANTIOXIDANT COATINGS (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
17. MISCELLANEOUS ELECTRICAL AND NON–ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
18. BOND ALL METALLIC OBJECTS WITHIN 6 FT. OF MAIN GROUND WIRES WITH 1–#2 AWG TIN–PLATED COPPER GROUND CONDUCTOR.
19. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS, WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON–METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 TINNED SOLID IN 3/4" LIQUID TIGHT CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD–WELD TERMINATION POINT. THE EXPOSED END OF THE LIQUID TIGHT CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).

NEC INSULATOR COLOR CODE		
DESCRIPTION	PHASE/CODE LETTER	WIRE COLOR
240/120 1Ø	LEG 1	BLACK
	LEG 2	RED
AC NEUTRAL	N	WHITE
GROUND (EGC)	G	GREEN
VDC POS	+	*RED–POLARITY MARK AT TERMINATION
VDC NEG	–	*BLACK–POLARITY MARK AT TERMINATION
240V OR 208V, 3Ø	PHASE A	BLACK
	PHASE B	RED(ORG. IF HI LEG)
	PHASE C	BLUE
480V, 3Ø	PHASE A	BROWN
	PHASE B	ORANGE OR PURPLE
	PHASE C	YELLOW

* SEE NEC 210.5(C)(1) AND (2)

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DN02315A

BU #: **877109**
FILL-IN/DENVER
/DEN145

9975 E. 104TH AVENUE
HENDERSON, CO 80640

EXISTING 92.0 FT MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
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3	01-23-2019	JAS	FINAL	ELG
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7	05-1-2019	JAS	FINAL	ELG

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CONSULTING ENGINEER
JACOB GORALSKI, PLLC
UT PE# 9226401–2202
1106 COLBI ST.
KENNEDALE, TX 76060
(817) 456–2621

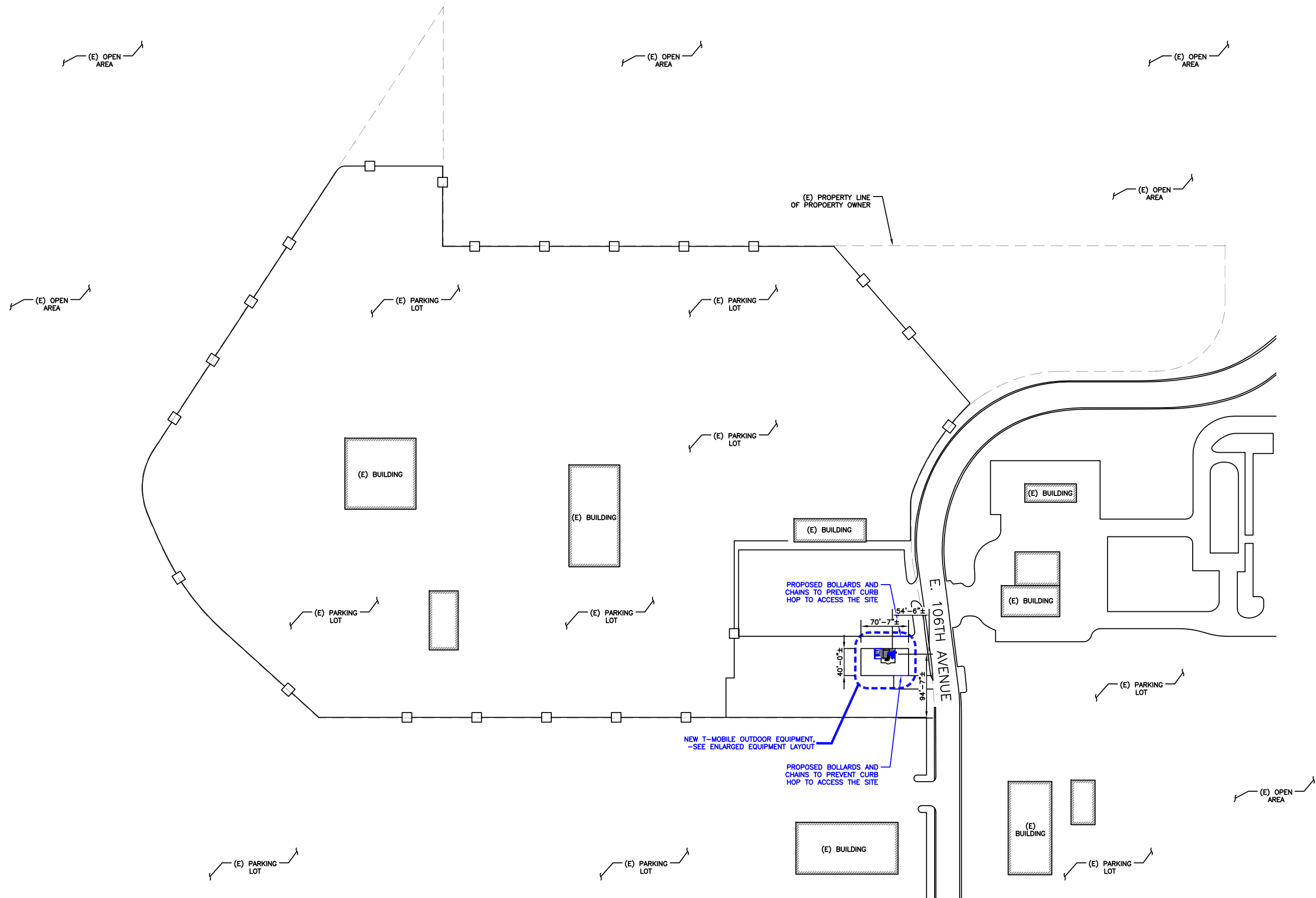
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1 OVERALL SITE PLAN
SCALE: NOT TO SCALE



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EXISTING 92.0 FT MONOPOLE

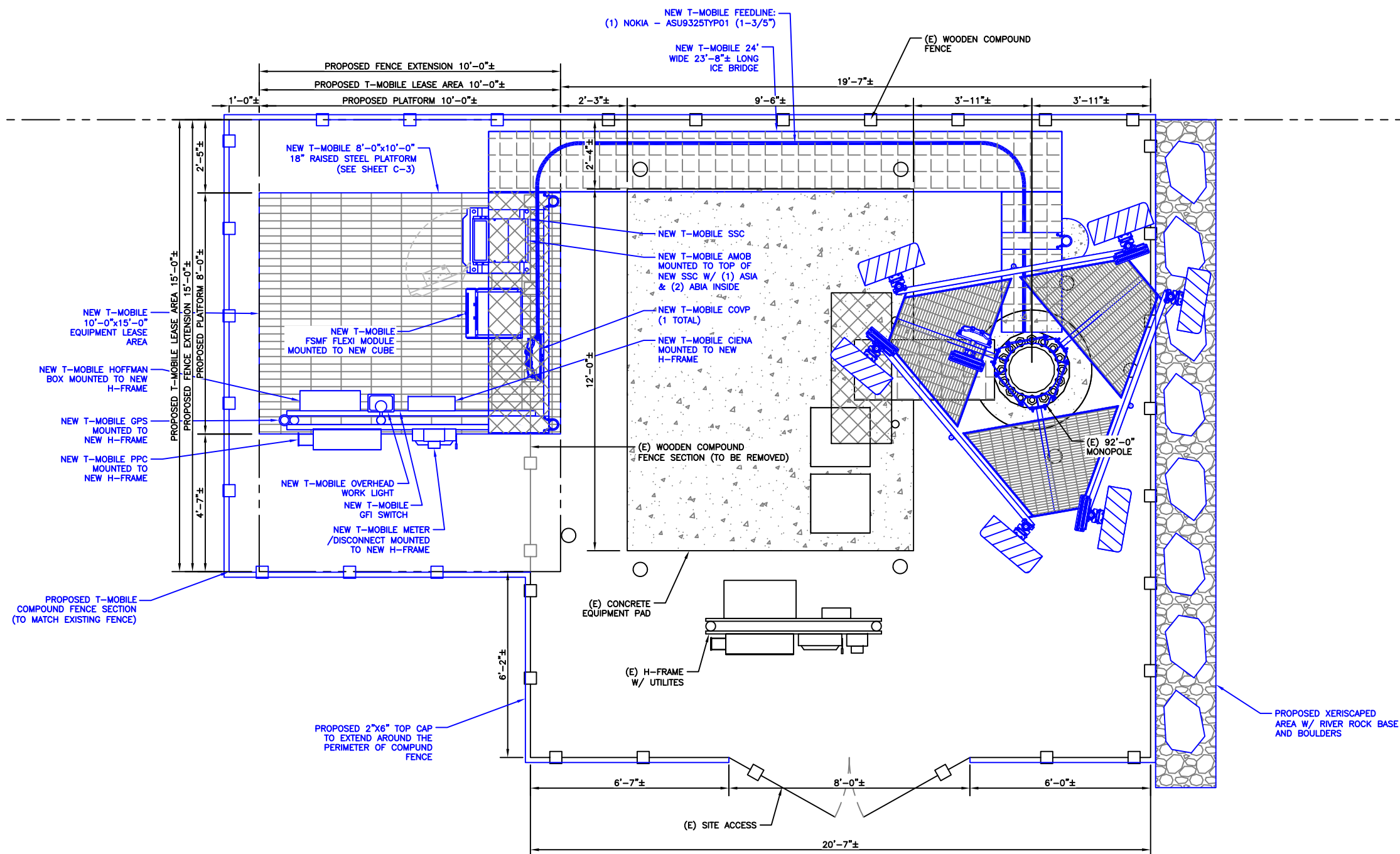
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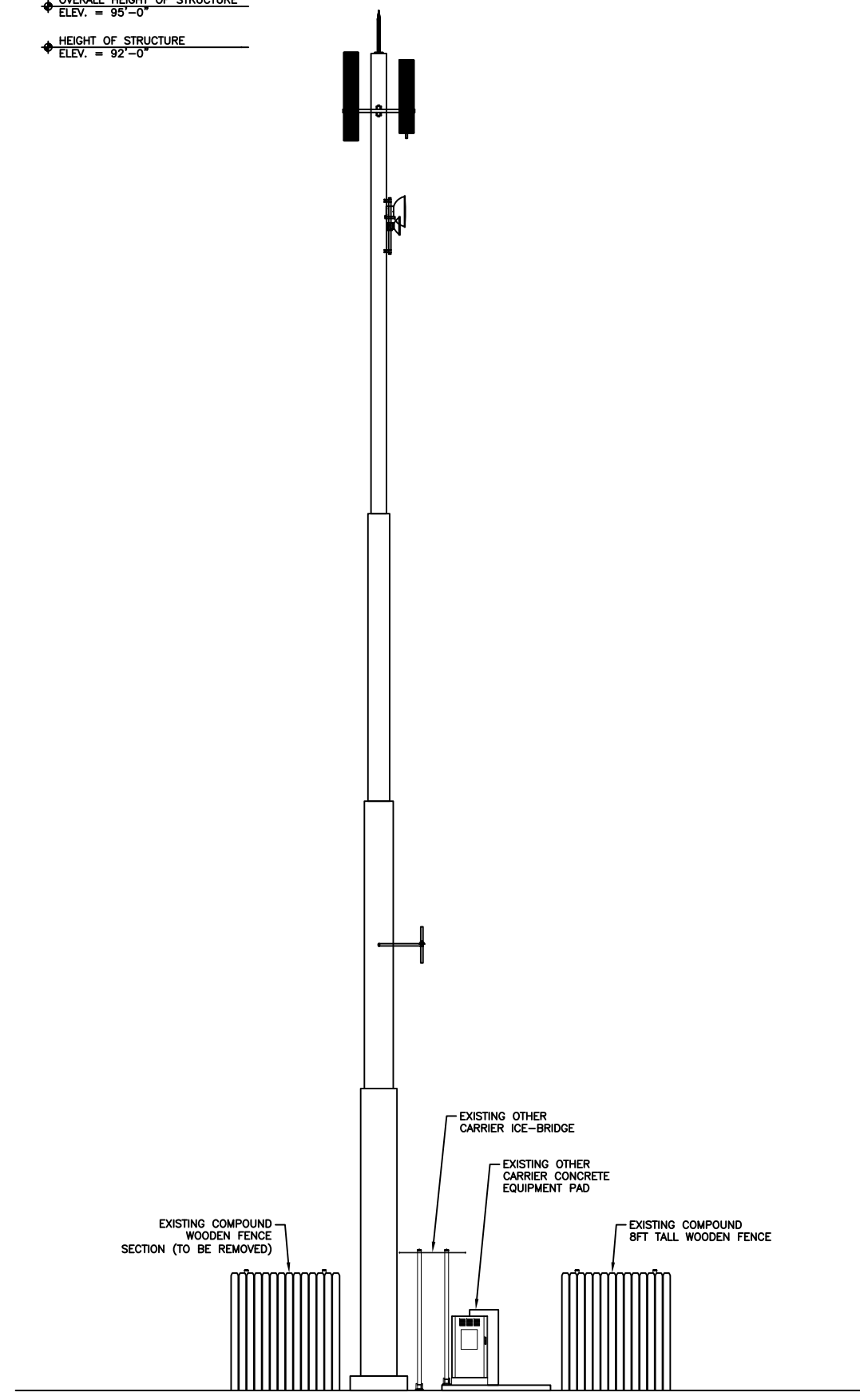
1 FINAL SITE PLAN
SCALE: $\frac{1}{2}'' = 1'-0''$ (FULL SIZE)
 $\frac{1}{4}'' = 1'-0''$ (11x17)



**CC CROWN
CASTLE**
116 INVERNESS DR. EAST STE# 280
ENGLEWOOD, CO 80112

OVERALL HEIGHT OF STRUCTURE
ELEV. = 95'-0"

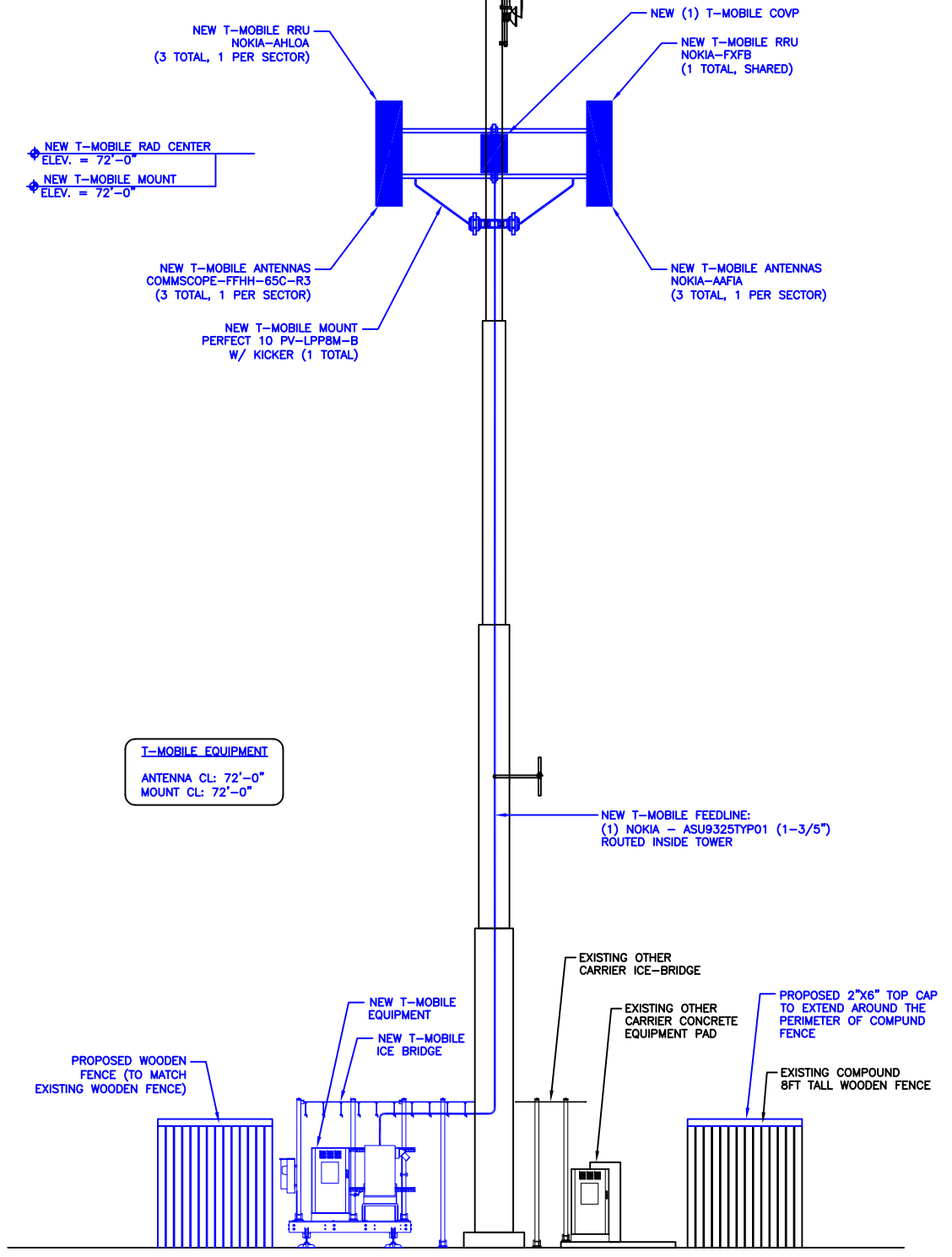
HEIGHT OF STRUCTURE
ELEV. = 92'-0"



1 EXISTING ELEVATION
SCALE: NOT TO SCALE

OVERALL HEIGHT OF STRUCTURE
ELEV. = 95'-0"

HEIGHT OF STRUCTURE
ELEV. = 92'-0"



1 FINAL ELEVATION
SCALE: NOT TO SCALE

INSTALLER NOTE:
DIRECT TOWER MOUNTED EQUIPMENT
MUST NOT TRAP OR INTERFERE W/
EXISTING SAFETY CLIMB.

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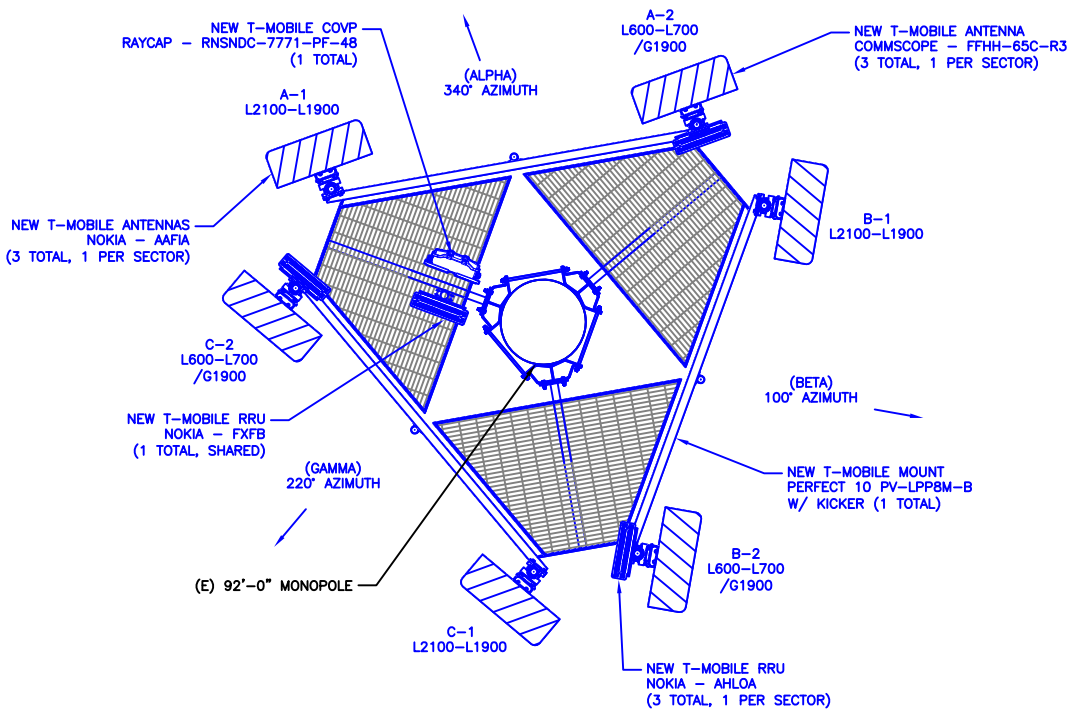
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ANTENNA SCHEDULE						
SECTOR	ALPHA		BETA		GAMMA	
ANTENNA POSITION	A-1	A-2	B-1	B-2	C-1	C-2
ANTENNA TYPES	L2100-L1900	L700-L600 /G1900	L2100-L1900	L700-L600 /G1900	L2100-L1900	L700-L600 /G1900
AZIMUTH	340°	340°	100°	100°	220°	220°
RAD CENTER (AGL)	72'-0"	72'-0"	72'-0"	72'-0"	72'-0"	72'-0"
MODEL	NOKIA - AAFIA	COMMSCOPE - FFHH-65C-R3	NOKIA - AAFIA	COMMSCOPE - FFHH-65C-R3	NOKIA - AAFIA	COMMSCOPE - FFHH-65C-R3
FEEDER LENGTH	±100'-0"	±100'-0"	±100'-0"	±100'-0"	±100'-0"	±100'-0"
FEEDER TYPE	HYBRID CABLE	HYBRID CABLE	HYBRID CABLE	HYBRID CABLE	HYBRID CABLE	HYBRID CABLE

1 ANTENNA SCHEDULE
SCALE: NOT TO SCALE



2 FINAL ANTENNA LAYOUT
SCALE: NOT TO SCALE

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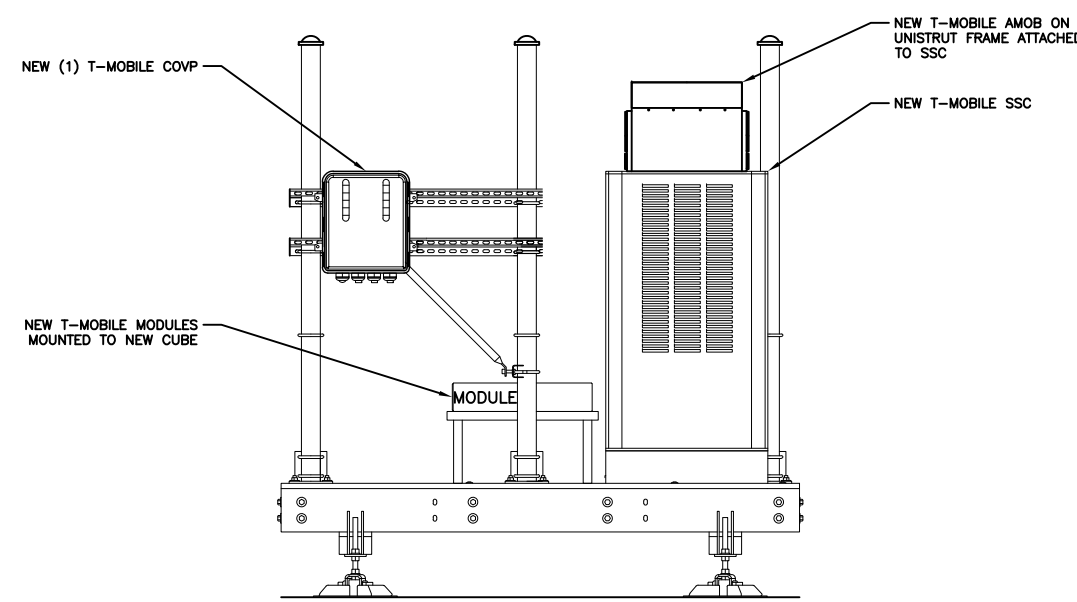
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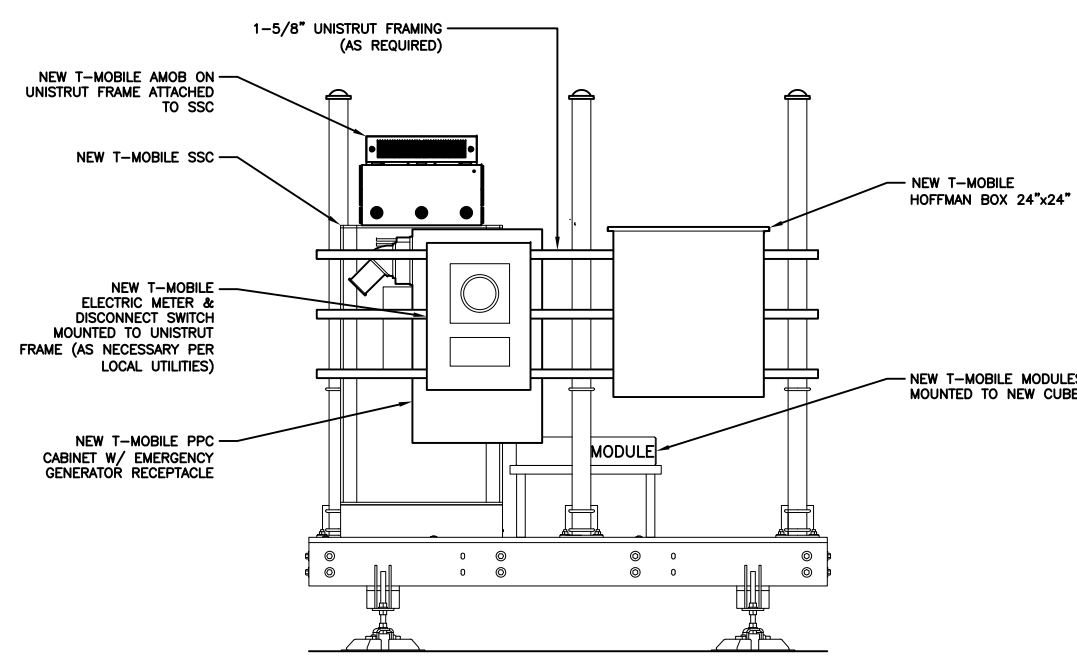
C-3

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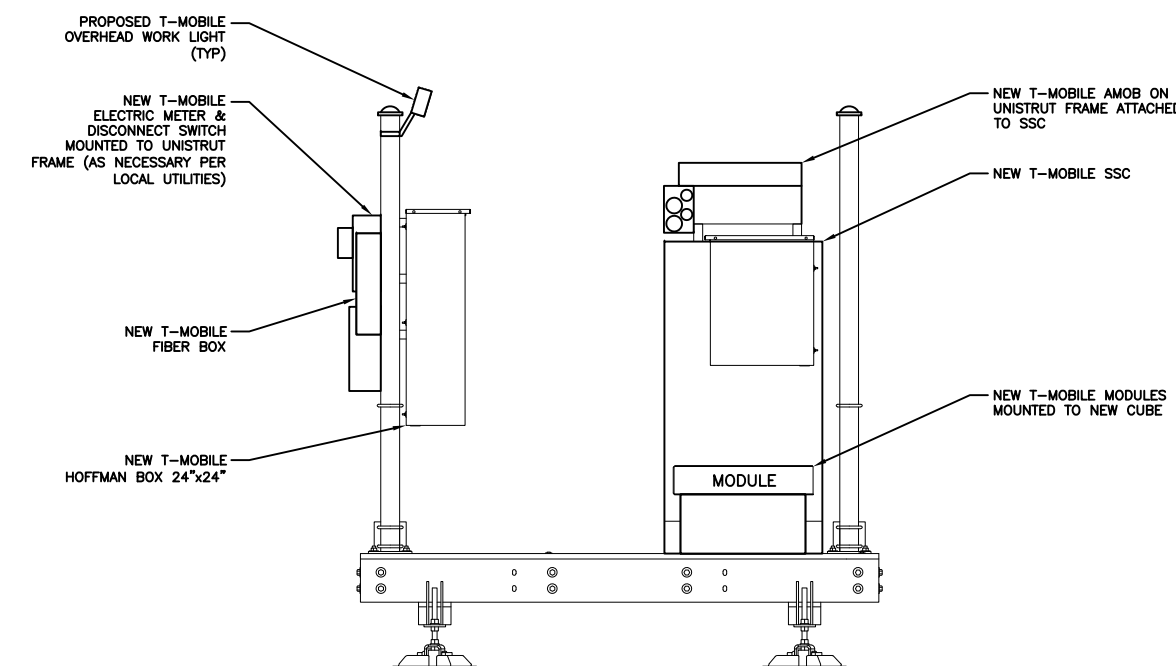
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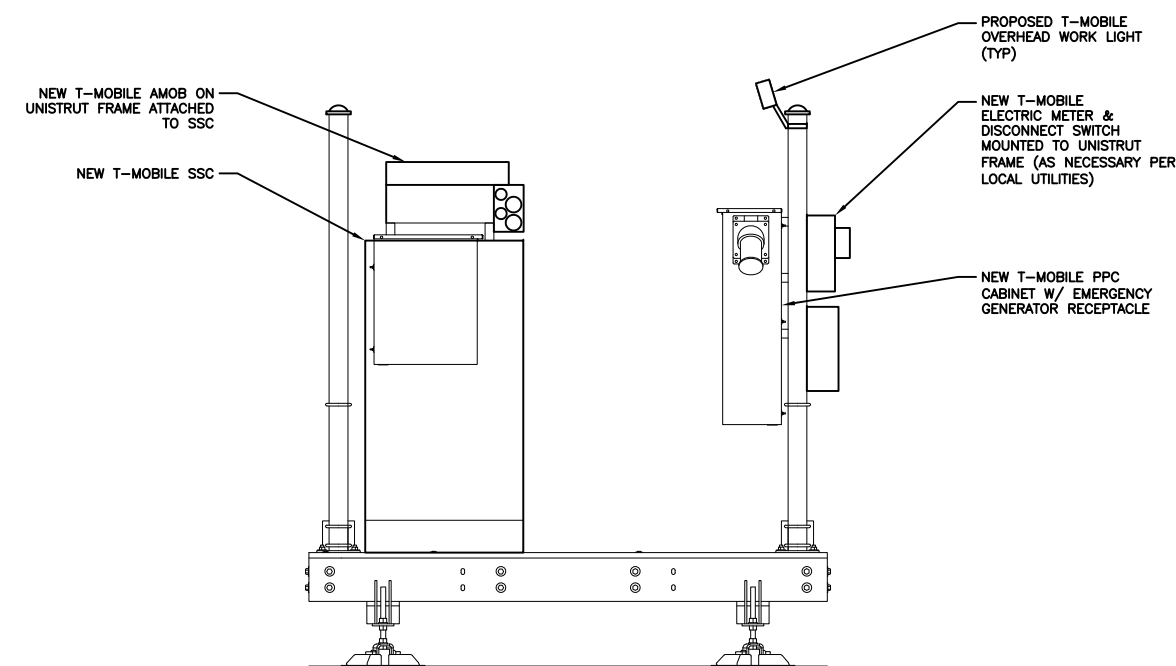
1 EQUIPMENT ELEVATION-NORTH
SCALE: NOT TO SCALE



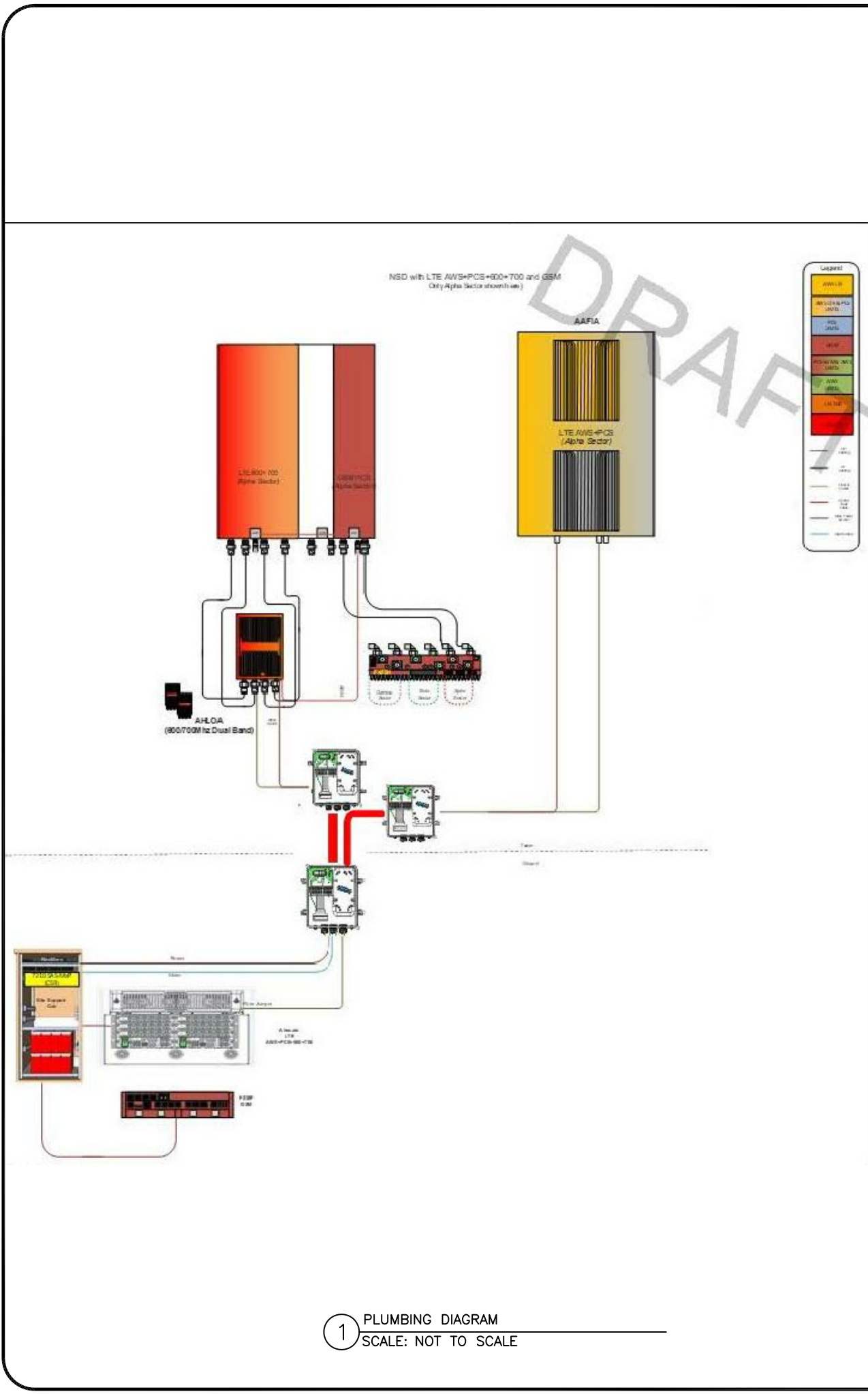
2 EQUIPMENT ELEVATION-SOUTH
SCALE: NOT TO SCALE



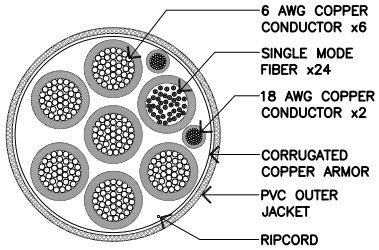
3 EQUIPMENT ELEVATION-WEST
SCALE: NOT TO SCALE



4 EQUIPMENT ELEVATION-EAST
SCALE: NOT TO SCALE

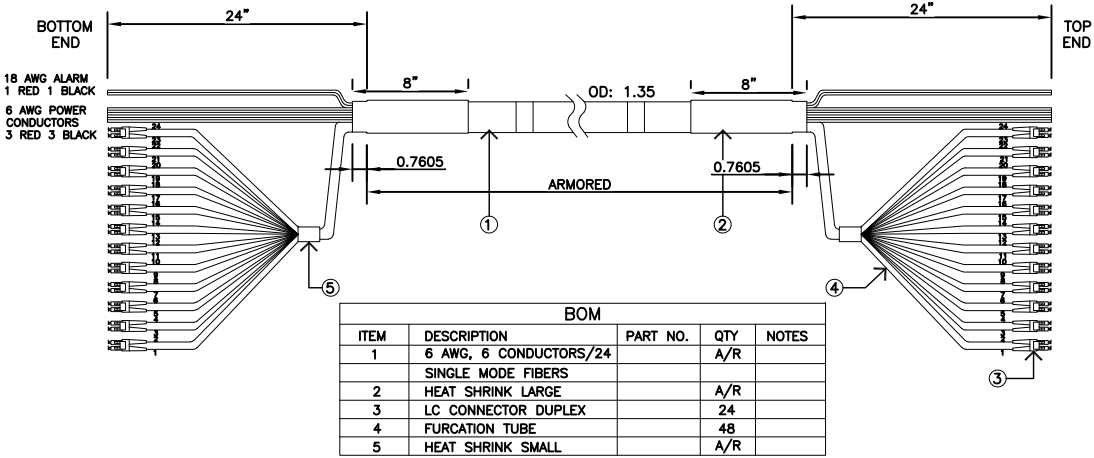


CABLE TYPE	NUMBER, SIZE (AWG) VOLTAGE OUTER JACKET SHIELDING MAX SHIELD RESISTANCE (ohm/ft @ 20 c) DRAIN RIPCORDER DC CONDUCTOR MATERIAL DC CONDUCTOR SIZE (AWG) MAX DC RESISTANCE (ohm/1000 ft) COLOR CODE ALARM CONDUCTOR MATERIAL ALARM CONDUCTOR SIZE (AWG) MAX DC RESISTANCE (ohm/1000 ft) COLOR CODE FIBER CABLES OUTER DIAMETER (in) - NOMINAL WEIGHT (lb/ft) MINIMUM BEND RADIUS (in) BEND MOMENT (lb/ft) TENSILE STRENGTH (lb) CRUSH RESISTANCE, FOTP-41 (N/mm) STRENGTH MEMBER OPERATING TEMPERATURE RANGE (LOW) OPERATING TEMPERATURE RANGE (HIGH) +80°C	6/C #6 + 2/C #18 600 PVC CORRUGATED COPPER 0.0035 N/A KEVLAR COPPER 6 0.411 @ 20°C BLACK/RED COPPER 18 6.7 TBD SM 1.24 1.05 15 TBD 325 22 NO -40°C
FIBER TYPE		LOW WATER PEAK, SINGLE MODE, LOOSE TUBE
FIBER STANDARD COMPLIANCE		ITU-T REC. G.652.D, G657.A2 IEC 60793-2-50 TYPE B.1.3 & TYPE B.6 A&B
FIBER COATING DIAMETER (um)		.242 +/- 0.007mm 0.9 +/- 0.0005mm
FIBER COUNT		24
NUMBER OF FIBER SUBUNITS		1
FIBER COUNT EACH UNITS		24
FIBER OUTER JACKETS		FR JACKET
MAX ATTENUATION, 1310 nm (dB/Km)		LESS THAN EQUA 0.5
MAX ATTENUATION, 1550 MM (dB/Km)		LESS THAN EQUA 0.5



NOTE: CABLE CROSS SECTION NOT DRAWN TO SCALE

CABLE TYPE: 6/#6, 2/#18, 24 FIBER		
CABLE ASSY LENGTH (L)	TOLERANCE (FT)	PACKAGING METHOD
50	+0.50 / -0.50	COIL
100	+1.00 / -1.00	REEL
125	+1.25 / -1.25	REEL
150	+1.50 / -1.50	REEL
175	+1.75 / -1.75	REEL



- NOTES:
- DIMENSIONS ARE IN INCHES.
 - 12 DUPLEX LC CONNECTORS PER END, 4 DUPLEX LC CONNECTORS PER GROUP, TOTAL OF 3 GROUPS.
 - TOTAL OF 12 PAIRS OF SINGLE MODE FIBERS.
 - TOTAL OF 6 AC CABLES 3 RED & 3 BLACK.
 - TOP END AND BOTTOM END ARE IDENTICAL.
 - EACH AND EVERY FIBERS MUST BE LABELED FROM #1 TO #24 AT BOTH ENDS.
 - LABEL BOTH ENDS WITH: SERIAL NUMBER, PART NUMBER AND CUSTOMER NAME.
 - INSERTION LOSS AND RETURN LOSS SHALL BE MEASURED 100%% SAMPLING FOR ALL PRODUCTION.
 - TEST AND MEASUREMENT REPORT SHALL BE FURNISHED WITH CABLE ASSEMBLY.
 - ALL CONNECTORS SHALL BE SHIPPED WITH FURRULES PROTECTED WITH REMOVABLE CAPS.
 - ALL FIBER BREAKOUT WILL BE PROTECTED FROM WATER PENETRATION.

FIBER	COLOR	FIBER	COLOR
1	BLUE	13	RED
2	BLUE	14	RED
3	ORANGE	15	BLACK
4	ORANGE	16	BLACK
5	GREEN	17	YELLOW
6	GREEN	18	YELLOW
7	BROWN	19	PURPLE
8	BROWN	20	PURPLE
9	GREY	21	TAN
10	GREY	22	TAN
11	WHITE	23	PINK
12	WHITE	24	PINK

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AAFIA Prototype - Specifications




AAFIA is a dual band Massive MIMO with 16 TRX per band

Link to Massive MIMO 3D File Desc.

Dimension	Nokia 16TRX Dual
Band	806 ~ 825 (B2)
Antenna Config (col x row x pol)	XX XX XX XX (B6) XX XX XX XX (B5) 90°/180°
Power	16x 125W* (100W)
Instantaneous Bandwidth	90MHz DL / 70MHz UL (B6)
Realistic Use Case	25MHz per band
Downlink Range (all beams affected)	≥12 degrees
HW/SW Availability	3Q2B (L185P)
Size (HxWxD) in	71" x 26" x 8"
Weight / Wind Sail	342lbs / 1,846 in ²

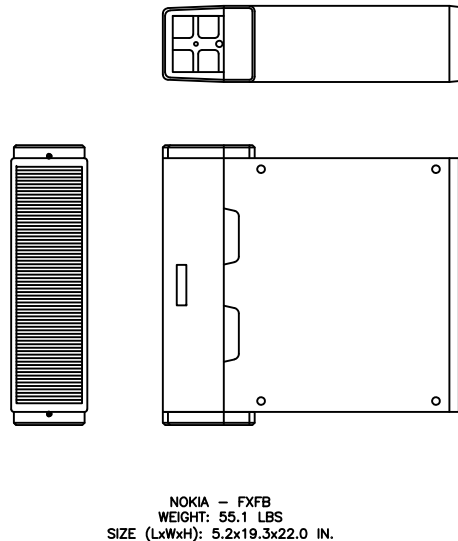
* To be confirmed by Nokia - 1x80W value was 100W

1 NOKIA – AAFIA
SCALE: NOT TO SCALE

FFHH-65C-R3 8-port sector antenna, 4x 617-806 and 4x 1695-2360 MHz, 65° HPBW, 3x RET, 600 MHz-Ready Antenna Technology						
						
Electrical Specifications						
Frequency Band, MHz	617-698	698-806	1695-1880	1850-1990	1920-2200	2300-2360
Gain, dBi	15.3	15.5	17.8	18.2	18.9	19.6
Beamwidth, Horizontal, degrees	67	63	65	66	64	55
Beamwidth, Vertical, degrees	10.2	9.1	5.7	5.3	4.9	4.4
Beam Tilt, degrees	2-13	2-13	2-12	2-12	2-12	2-12
USLS (First Lobe), dB	19	17	20	19	19	21
Front-to-Back Ratio at 180°, dB	32	29	35	40	40	41
Isolation, dB	28	28	28	28	28	28
Isolation, Intersystem, dB	28	28	28	28	28	28
VSWR Return Loss, dB	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port at 50°C, maximum, watts	250	250	250	250	250	200
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*						
Frequency Band, MHz	617-698	698-806	1695-1880	1850-1990	1920-2200	2300-2360
Gain by all Beam Tilts, average, dBi	15.0	15.2	17.4	17.9	18.5	19.3
Gain by all Beam Tilts Tolerance, dB	±0.6	±0.5	±0.4	±0.5	±0.6	±0.5
Gain by Beam Tilt, average, dBi	2 ° 14.8	2 ° 15.0	2 ° 17.2	2 ° 17.6	2 ° 18.1	2 ° 18.8
	8 ° 15.1	8 ° 15.3	7 ° 17.5	7 ° 18.0	7 ° 18.6	7 ° 19.4
	13 ° 15.0	13 ° 15.1	12 ° 17.4	12 ° 17.8	12 ° 18.4	12 ° 19.2
Beamwidth, Horizontal Tolerance, degrees	±2.7	±4.8	±5.5	±5.2	±4.9	±6.4
Beamwidth, Vertical Tolerance, degrees	±0.6	±0.7	±0.4	±0.3	±0.4	±0.1
USLS, beampeak to 20° above beampeak, dB	17	12	15	16	16	18
Front-to-Back Total Power at 180° ± 30°, dB	23	21	29	31	31	31
CPR at Boresight, dB	24	23	21	20	21	22
CPR at Sector, dB	6	10		9	9	8

2 COMMSCOPE – FFHH-65C-R3
SCALE: NOT TO SCALE



3 NOKIA – FXFB
SCALE: NOT TO SCALE

AirScale Dual RRH 4T4R B12/71 240W AHLOA



32.6lb
38kg

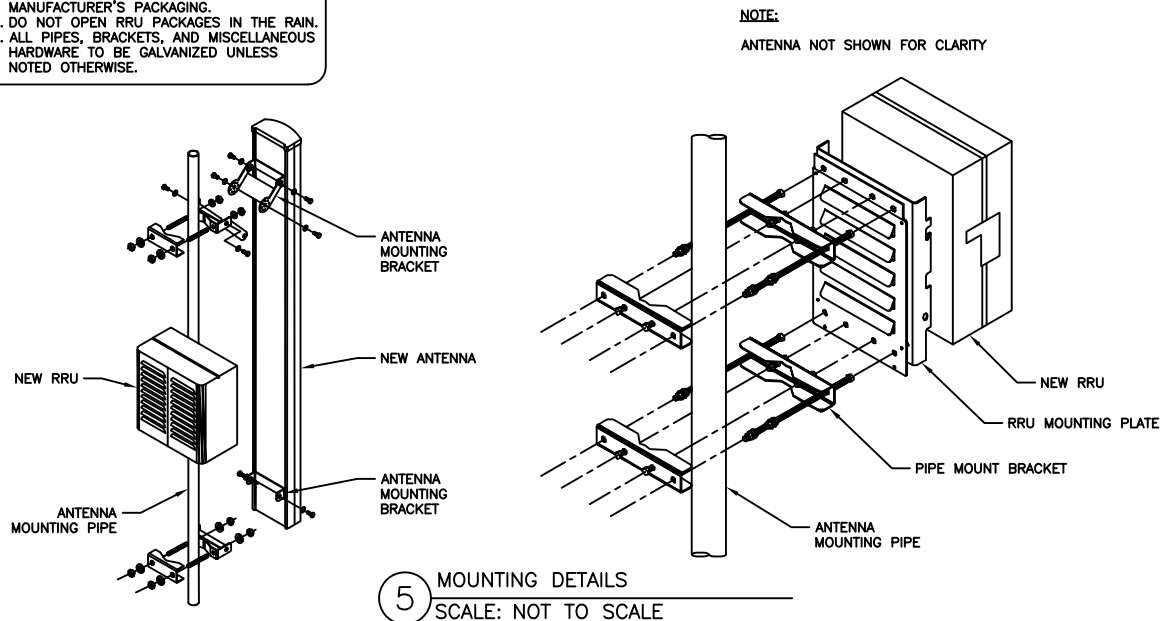
Product Code: 6163516

Supported Frequency bands	5G NR Band 12/71
Frequencies	Band 12: adjusted UL 698 ~ 719 MHz, DL 728 ~ 748 MHz Band 71: UL 698 MHz ~ 699 MHz, DL 617 MHz ~ 618 MHz
Number of TX/RX paths/pipes	4 pipes: 2T4R, 2T4R, 4T4R for both bands
Instantaneous Bandwidth (BW)	17 MHz for B12 and 30 MHz for B71 17 MHz below B12, 18 MHz for future use
Occupied Bandwidth (OBW)	0.15 MHz contiguous 0.1, B12 1.7 MHz ~ 1.9 MHz NB IoT future use, B71 30 MHz
Output Power	30W per TX shared between bands
Supply Voltage / Range	DC -48V to -72V, -58V to -60V
Typical Power Consumption	450W (ETTS) Baseband Load at 4Tx@30W 450W (ETTS) Baseband Load at 4Tx@30W
Antenna Ports	4 ports, 4 x 10+
Optical Ports	2 x CPR 9.8 Gbps
ALB Control Interface	25G SFP+ and 10G SFP+ on AMP1 & AMP2
Other Interfaces	External Alarm NDR-25 (4 inputs, 1 Output) DC Circular Power Connector
Physical	260mm x 326mm x 189mm Approximately 38kg with no covers or brackets
Operating Temperature Range	-40°C to 55°C (with no solar load)
Surge Protection	Class II SA
Installation Options	Pole Mount, Rack Mount

1. © Nokia 2017
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4 NOKIA – AHLOA
SCALE: NOT TO SCALE

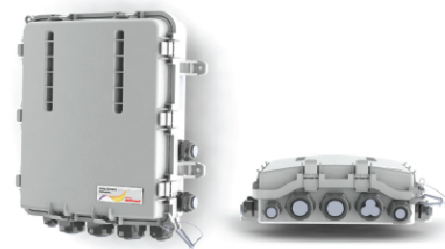
- INSTALLER NOTES:**
1. COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRUs RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING.
 2. DO NOT OPEN RRU PACKAGES IN THE RAIN.
 3. ALL PIPES, BRACKETS, AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED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



5 MOUNTING DETAILS
SCALE: NOT TO SCALE

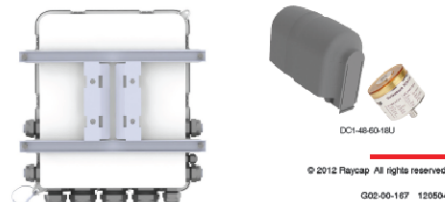
DATA SHEET DC Surge Protection for RRH/RFM (High-Capacity Junction Box)
ASU9338TYP01 (RNSNDC-7771-PF-48)
Overvoltage Protection & Fiber Management Junction Box

The deployment of Remote Radio Head (RRH) and Remote Flexi Modules (RFM) architecture poses unique challenges to the mobile telecom industry. Raycap's innovative RRFH protection solutions mitigate the risk of damage due to lightning and provide high levels of availability and reliability to radio equipment.



- Features**
- Employs the Strikesorb® 30-V1-HV Surge Protective Device (SPD) specifically designed for the Remote Radio Head (RRH) and Remote Flexi Modules (RFM) installation environment and certified for use in DC applications and at low DC operating voltages (48V).
 - The Strikesorb 30-V1-HV is a Class I SPD, certified by VDE per the IEC 61643-1 standard as suitable for installation in areas where direct lightning exposure is expected. Strikesorb 30-V1-HV is able to withstand direct lightning currents of up to 5kA (10/350) and induced surge currents of up to 60kA (8/20).
 - Provides very low let through / clamping voltage - unique for a Class I product - as it does not employ spark gaps or other switching elements. Strikesorb offers unique protection levels to the RRH equipment as well as the Base Band Units.
 - Stock unit ships with all glands necessary for use with hybrid cable. This includes the top and base of towers, and the central unit on roof top applications.
 - Fully recognized to the UL 1449 3rd Edition Safety Standard.
 - Patent pending design

- Benefits**
- Offers unique maintenance-free protection against direct lightning currents.
 - Protects up to 9 RRHs/RFMs and connects up to 18 fiber pairs.
 - Utilizes an IP 67 rated enclosure, allowing for indoor or outdoor installation on a roof or tower top.
 - Configurable cable ports are designed to accommodate NSN high-capacity/ low-capacity hybrid trunk cables (combined power and fiber optic), Coax Reuse, and NSN hybrid jumper cables.
 - Lightweight aerodynamic design provides maximum flexibility for tower top installation.



6 RAYCAP – RNSDC-7771-PF-48
SCALE: NOT TO SCALE

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18400 E. 22ND AVENUE
AURORA, CO 80011

CROWN CASTLE
116 INVERNESS DR. EAST STE# 280
ENGLEWOOD, CO 80112

T-MOBILE SITE NUMBER:
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FILL-IN/DENVER /DEN145

9975 E. 104TH AVENUE
HENDERSON, CO 80640

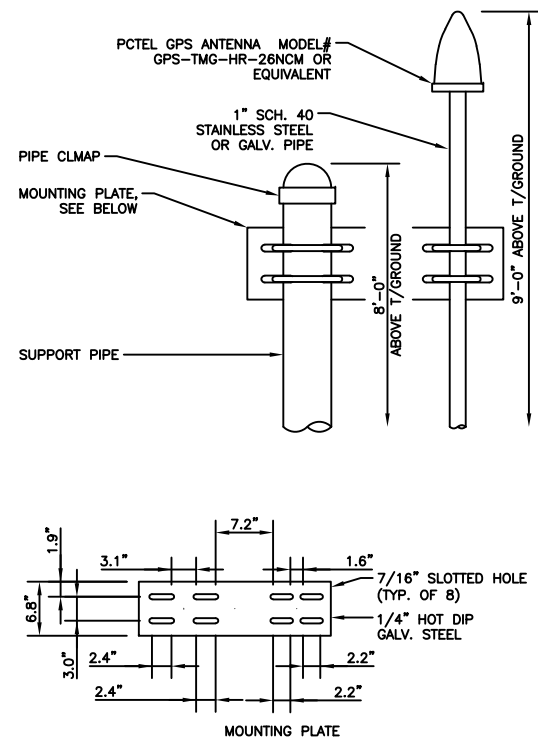
EXISTING 92.0 FT MONOPOLE

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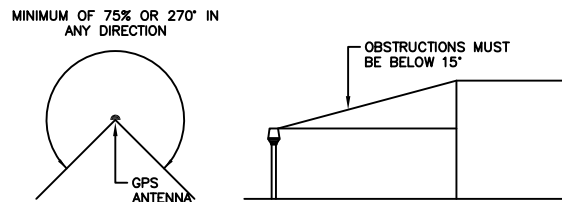
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JACOB GORALSKI, PLLC
UT PE# 9226401-2202
1106 COLBI ST.
KENNEDEALE, TX 76060
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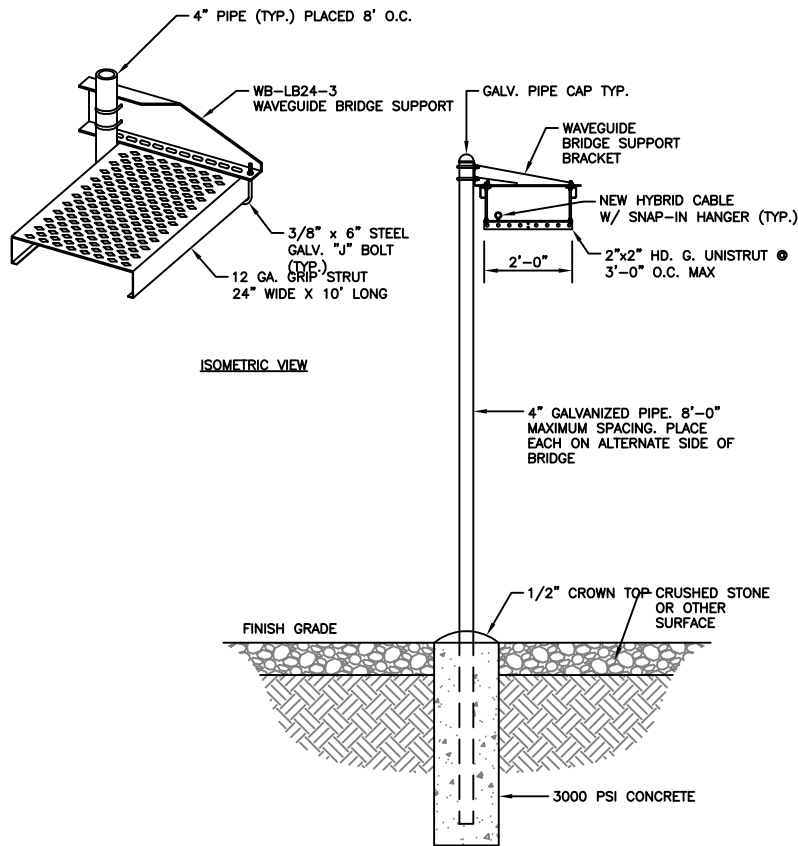
SHEET NUMBER: **C-5** REVISION: **7**



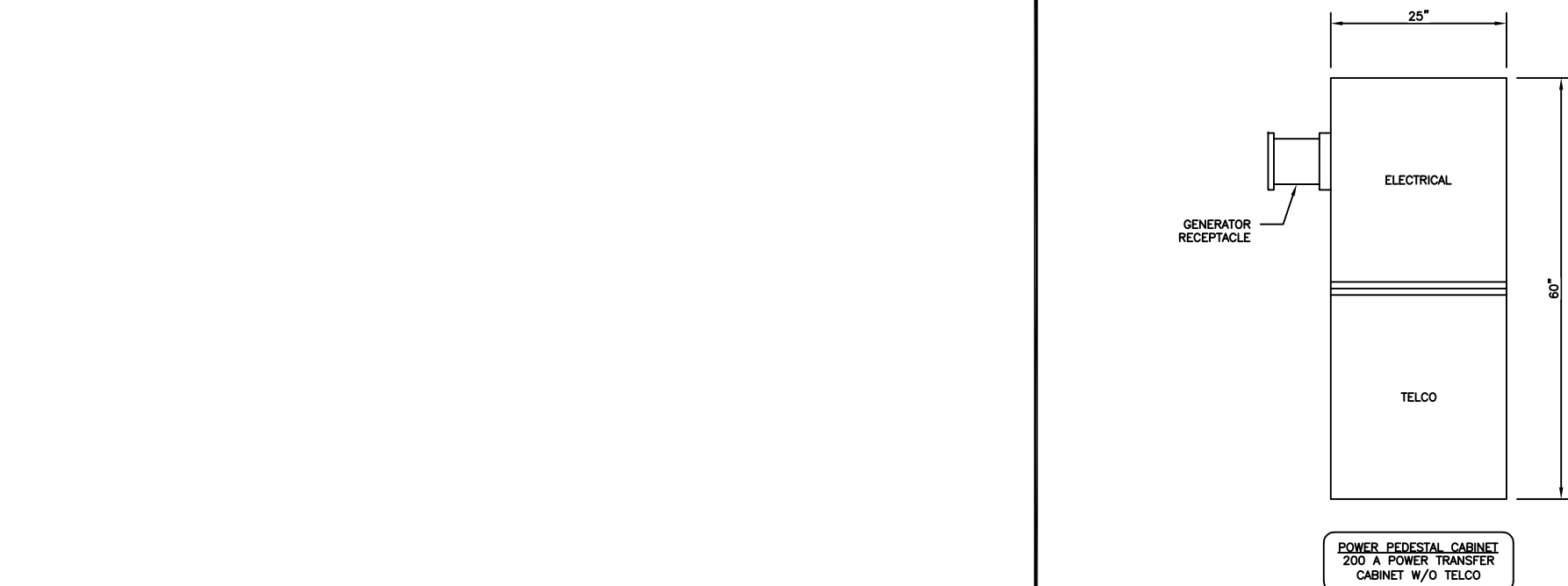
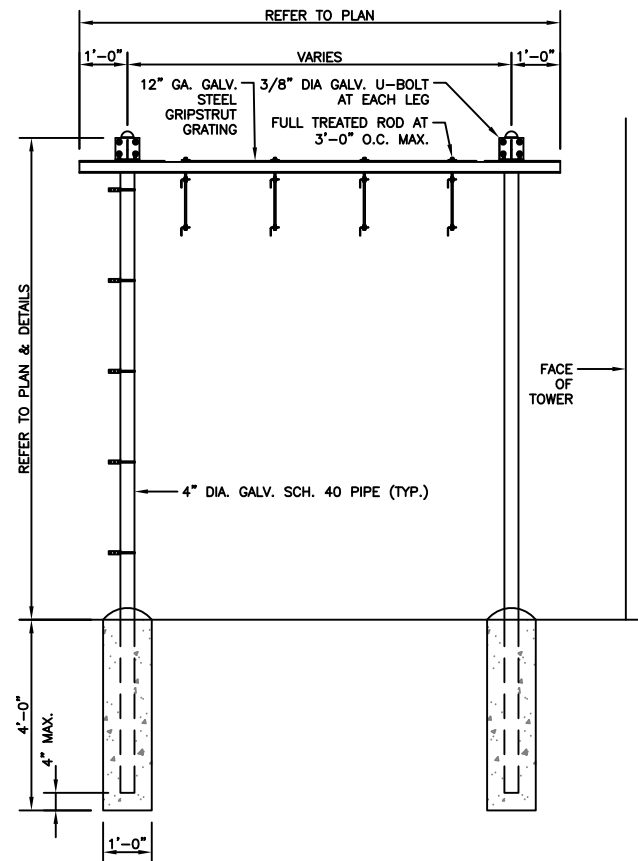
1 GPS ANTENNA DETAIL
SCALE: NOT TO SCALE



- GPS MINIMUM SKY VIEW REQUIREMENTS
- NOTES:**
1. THE ELEVATION AND LOCATION OF THE GPS ANTENNA SHALL BE IN ACCORDANCE WITH THE FINAL RF REPORT.
 2. THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARD 1-1/4" O.D. SCHEDULE 40, GALVANIZED STEEL OR STAINLESS STEEL PIPE. THE PIPE MUST NOT BE THREADED AT THE ANTENNA MOUNT END. THE PIPE SHALL BE CUT TO THE REQUIRED LENGTH (MINIMUM OF 18 INCHES) USING A HAND OR ROTARY PIPE CUTTER TO ASSURE A SMOOTH AND PERPENDICULAR CUT. A HACK SAW SHALL NOT BE USED. THE CUT PIPE END SHALL BE DEBARRED AND SMOOTH IN ORDER TO SEAL AGAINST THE NEOPRENE GASKET ATTACHED TO THE ANTENNA MOUNT.
 3. IT IS CRITICAL THAT THE GPS ANTENNA IS MOUNTED SUCH THAT IT IS WITHIN 2 DEGREES OF VERTICAL AND THE BASE OF THE ANTENNA IS WITHIN 2 DEGREES OF LEVEL.
 4. DO NOT SWEEP TEST GPS ANTENNA.



2 ICE BRIDGE DETAIL
SCALE: NOT TO SCALE



4 PPC UNIT
SCALE: NOT TO SCALE

GENERAL	
CONSTRUCTION:	SINGLE LAYER AL. ENCLOSURE, TYPE 3R
DIMENSIONS (WxHxD):	20 x 40 x 10 INCH
WEIGHT:	APPROX. 75 LBS (WITHOUT PACKAGING)
FINISH:	POLYESTER POWDER PAINT
DOOR LATCH:	3-POINT LATCHING, PAD LOCKABLE
SAFETY:	UL50 (CABINET)
ENVIRONMENT	
OPERATING TEMPERATURE:	-40°C TO +46°C (-40°F TO 115°F)
HUMIDITY (RELATIVE):	95%, NON-CONDENSING (MAX.)
PROTECTION CLASS:	TYPE 3R
AC SECTION	
VOLTAGE:	240/120V SINGLE PHASE (3 WIRE + GROUND)
CURRENT:	200A
AIC RATING:	UTILITY 65,000 AMPS, PANLOC 10,000 AMPS
	GENERATOR INTERFACE: PANLOC™ (LEFT MOUNT)
	SERVICE DISCONNECT: SQUARE D 200 AMP
	MANUAL TRANSFER SWITCH
OTHER FEATURES	
	LOAD CENTER: SQUARE D 200 AMP, QO SERIES, 24 POSITION
	SURGE PROTECTION DEVICE (SPD) - 1 EA. AC DATA 2080
	SQUARE D 30 AMP, 2 POLE BREAKER FOR SPD
	GROUND BAR
	SILKSCREENED DEAD-FRONT
	CAPTIVE DEAD-FRONT FASTENERS

- NOTE:**
1. WEIGHT OF CABINET IS 150 LBS.
 2. NORTHERN TECHNOLOGIES, INC. PPC#CS7S2-WB36-R OR APPROVAL EQUAL SEE PPC CABINET DIAGRAM (1/E-2) FOR BREAKER REQUIREMENTS.

- NOTE:**
1. WEIGHT OF CABINET IS 150 LBS.
 2. NORTHERN TECHNOLOGIES, INC. PPC#CS7S2-WB36-R OR APPROVAL EQUAL SEE AC PANEL FOR BREAKER REQUIREMENTS.

3 NOT USED
SCALE: NOT TO SCALE

T-Mobile
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AURORA, CO 80011

CROWN CASTLE
116 INVERNESS DR. EAST STE# 280
ENGLEWOOD, CO 80112

T-MOBILE SITE NUMBER:
DN02315A

BU #: **877109**
FILL-IN/DENVER
/DEN145

9975 E. 104TH AVENUE
HENDERSON, CO 80640

EXISTING 92.0 FT MONOPOLE

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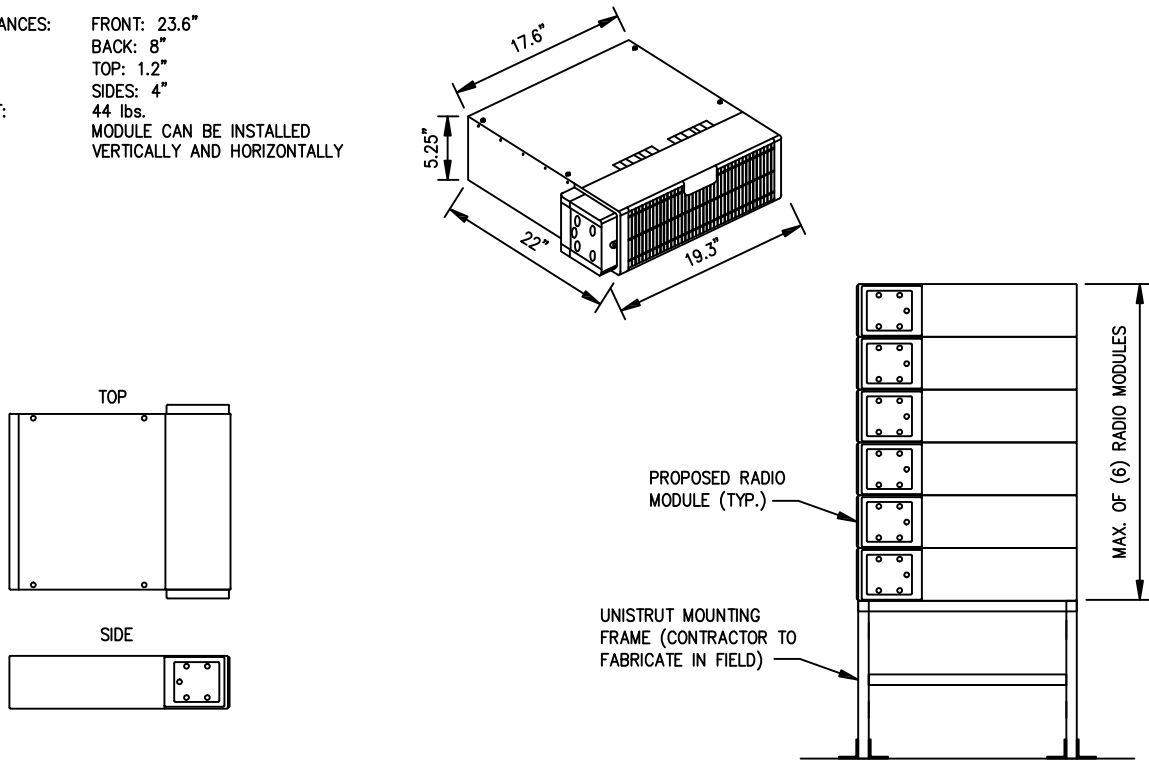
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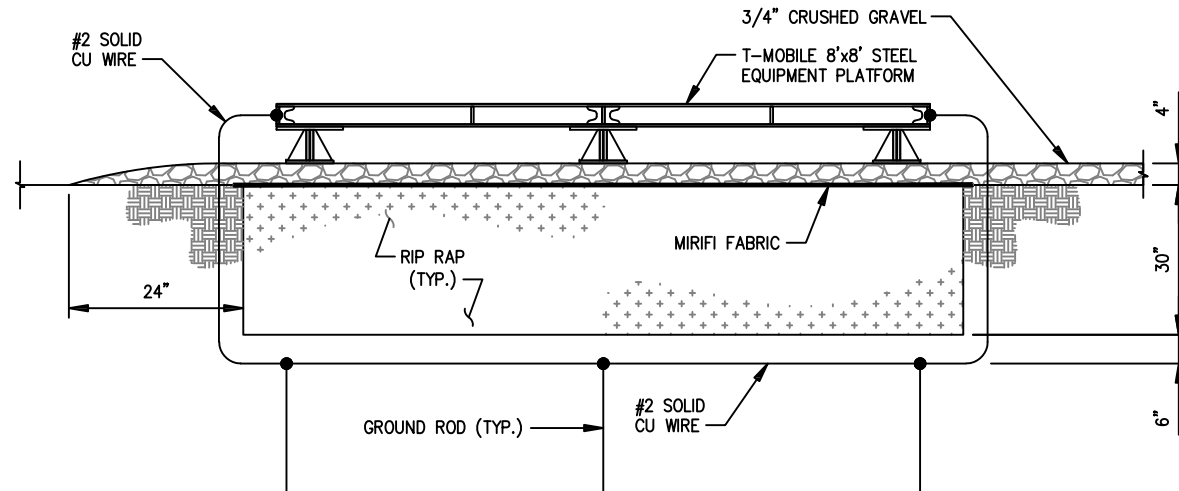
SHEET NUMBER: **C-6** REVISION: **7**

NOKIA FLEX SYSTEM RADIO MODULES:
FBBC, FRIA, FRIE, FSME, FSMF, FXFB, FXFC

CLEARANCES: FRONT: 23.6"
BACK: 8"
TOP: 1.2"
SIDES: 4"
WEIGHT: 44 lbs.
NOTE: MODULE CAN BE INSTALLED
VERTICALLY AND HORIZONTALLY



1 NOKIA FLEXI SYSTEM / RADIO MODULE STACKED SLEEVE DETAIL
SCALE: NOT TO SCALE



NOTE:
ROAD BASE BACKFILL
COMPACTED ±95%

2 STEEL EQUIPMENT PLATFORM GROUND DETAIL
SCALE: NOT TO SCALE

AirScale Subrack Outdoor AMOB datasheet

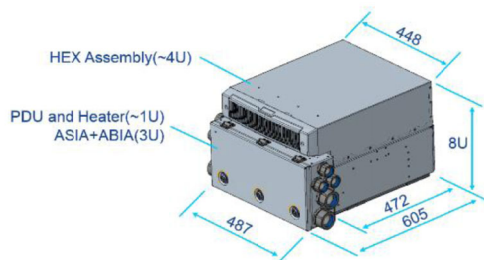
Datasheet

Environmental protection

IP55

Feature description:

- Outdoor Subrack for AirScale System Module Indoor plug-in units
- High performance Heat Exchanger "HEX"
- Compatible with Flexi BTS mechanics stack/plinth/wall/pole/rack installation
- Compatible with the 3rd part 19" racks and cabinets if it follows clearances and airflow requirements
- Possible to install AMOB inside FCOA cabinet
- Service doors on front and rear sides

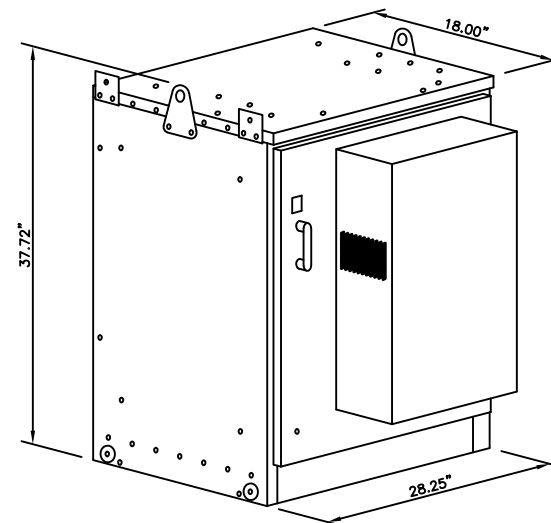


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Height	8U (354 mm)
Width (front cover)	487mm
Width (cabinet)	448mm (fits into 19 inch rack) 487mm (without conduit plugs or fittings)
Depth	Total 605mm (472mm from rack mounting surface)
Weights	23 kg AMOB enclosure 3 kg ASIA (Core Module) 2 kg ABIA (Expansion Module) 32 kg 1/2 Capacity (1 Core + 3 Expansion) 41 kg Full Capacity (2 Core + 6 Expansion)
Ingress Protection	IP55
Operating Temperature	-40°C up to +35°C (without solar radiation)
Installation Temperature	-20°C - +55°C
Airflow Direction	Back to front airflow direction supported for Horizontal(FCOA, 19" rack, Flexi stack) Front to back airflow direction supported for Vertical(wall and pole mounting case)
Clearances for cooling	40 mm Minimum on the back and front side
Cold start	~2h from -40°C to -5°C *Optional 2nd heater can be added to meet NAM requirement, cold start from -40°C to -5°C in 1 hour instead of 2 hours
Nominal supply voltage	-40.5 ... -57 V DC
Input voltage range	Extended Service Voltage Range supported -36Vdc ... -60Vdc Floating
Volume	104.5L
Mass capacity	Support Max 18Kg inside
Power consumption	Typical max ~265W (all fans at highest speed) Cold start ~600W (heater On 55W + fans at low speed)
Conduit cable entry	2x1.5" + 3x 1" on each left and right side

3 AMOB SPECIFICATIONS
SCALE: NOT TO SCALE



NOTES:

- WEIGHT OF CABINET (WITHOUT BATTERIES) IS 232 LBS.
- BASE FRAME NOT SHOWN.

4 PROPOSED 200AMP SITE SUPPORT CABINET
SCALE: NOT TO SCALE

T-Mobile
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AURORA, CO 80011

CROWN CASTLE
116 INVERNESS DR. EAST STE# 280
ENGLEWOOD, CO 80112

T-MOBILE SITE NUMBER:
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BU #: 877109
**FILL-IN/DENVER
/DEN145**

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KENNEDEALE, TX 76060
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SHEET NUMBER:

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REVISION:

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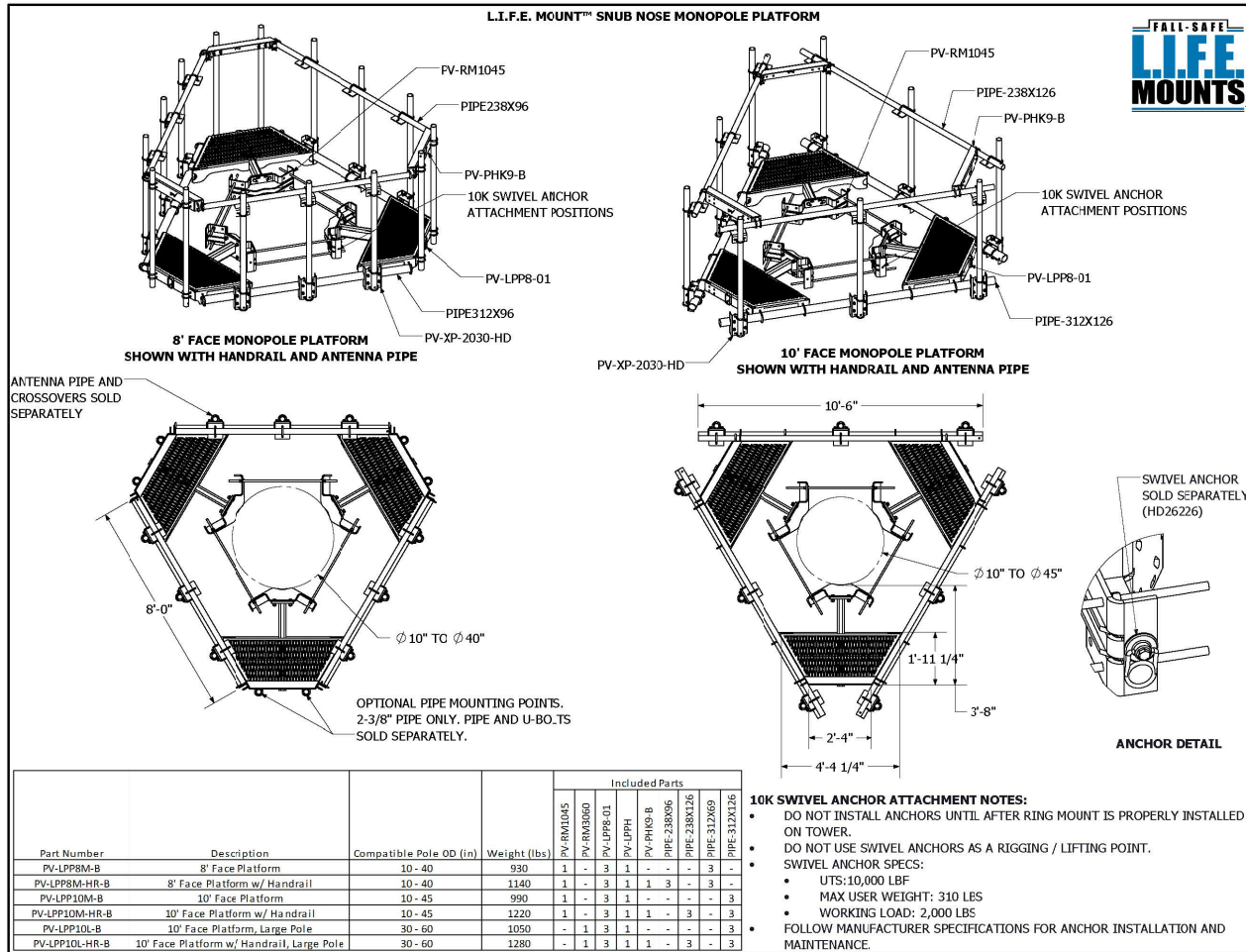
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MOUNT CLASSIFICATIONS:

REFERENCE STRUCTURAL LETTER (LPP-STL-01-R1) FOR ADDITIONAL LOADING REQUIREMENTS

MOUNT CLASSIFICATION INFORMATION:

- MAX STRUCTURE HEIGHT: 400ft
- STRUCTURE CLASS: I OR II
- EXPOSURE CATEGORY: B OR C
- TOPOGRAPHIC CATEGORY: 1
- DESIGN WIND PRESSURE (NO ICE): 135psf
- DESIGN WIND PRESSURE (ICED): 15psf
- DESIGN ICE THICKNESS: 2.75in Radial

APPROVED MOUNT CLASSIFICATIONS*

APPROVED MOUNT CLASSIFICATIONS (4 PIPE)						
REQUIRED EXTREME WIND LOAD (LBS)						
REQUIRED EXTREME ICE LOAD (LBS)	0	700	750	1150	1550	1800
	M750R(0)-4(6)	M750R(700)-4(6)	M750R(750)-4(6)	M1150R(0)-4(6)	M1550R(0)-4(6)	M1800R(0)-4(6)
	600	M750R(600)-4(6)	M750R(600)-4(6)	M1150R(600)-4(6)	M1550R(600)-4(6)	M1800R(600)-4(6)
	800	M750R(800)-4(6)	M750R(800)-4(6)	M1150R(800)-4(6)	M1550R(800)-4(6)	M1800R(800)-4(6)
	1100	M750R(1100)-4(6)	M750R(1100)-4(6)	M1150R(1100)-4(6)	M1550R(1100)-4(6)	M1800R(1100)-4(6)
1250	M750R(1250)-4(6)	M750R(1250)-4(6)	M1150R(1250)-4(6)	M1550R(1250)-4(6)	M1800R(1250)-4(6)	

- HEAVY-5

APPLIES TO ALL PV-LPP12M, PV-LPP14M, AND PV-LPP14L SERIES PLATFORMS WITH ANTENNAS AND APPURTENANCES SYMMETRICALLY MOUNTED ABOUT THE PLATFORM CENTERLINE.

POLE THICKNESS LIMITATIONS:

ON POLES WITH WALL THICKNESS EQUAL TO OR GREATER THAN THE VALUES LISTED BELOW, THE PERFECT VISION PV-LPP MOUNT SERIES IS STRUCTURALLY CAPABLE OF SUPPORTING THE ABOVE LOADING SCENARIOS WITHOUT THE NEED FOR AN ADDITIONAL KICKER BRACE.

FOR THIN WALL POLES, USE PV-PKBK PLATFORM KICKER BRACE TO AVOID POLE CRIMPING FAILURES. KICKER BRACE CAN BE INSTALLED ABOVE OR BELOW PLATFORM.

POLE THICKNESS LIMITATIONS	
MOUNT CLASSIFICATION	MINIMUM POLE THICKNESS
M750R-4(6)	1/4"
M800R-4(6)	1/4"
M900R-4(6)	1/4"
M950R-4(6)	1/4"
M1000R-4(6)	5/16"
M1400R-4(6)	5/16"
M1000R(i)-4(6)	5/16"
M1150R(i)-4(6)	5/16"

PLATFORM EPA:

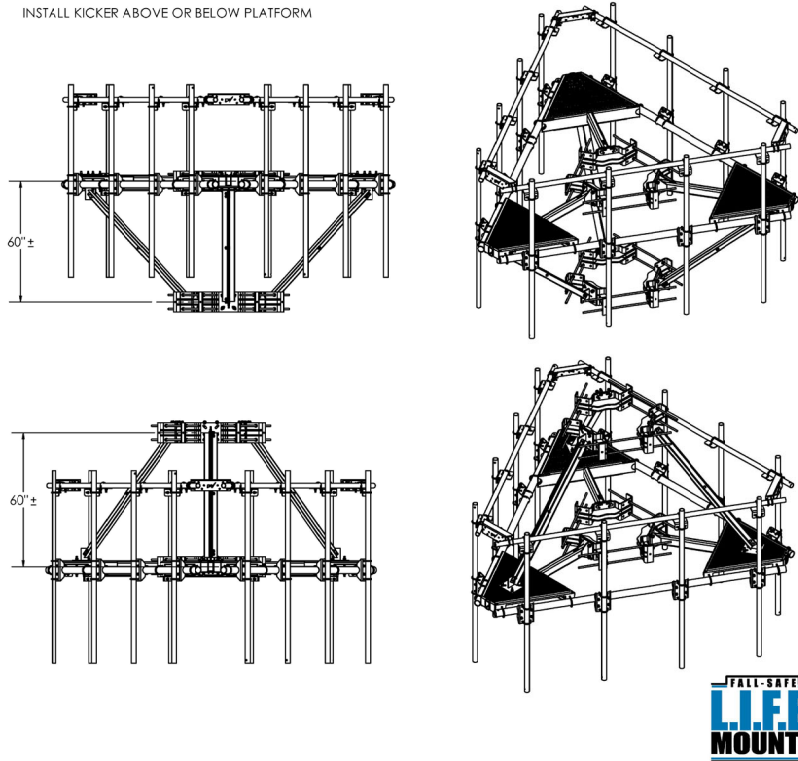
PLATFORM EPA		
PLATFORM TYPE	NO ICE (FT ²)	1/2" RADIAL ICE (FT ²)
12'6" FACE	20.3*	25.8*
12'6" FACE WITH HANDRAIL	34.4**	43.0**
14'6" FACE	22.1*	28.1*
14'6" FACE WITH HANDRAIL	36.8**	46.2**

*DOES NOT INCLUDE
CROSSOVER PLATES OR
ANTENNA PIPES
**DOES NOT INCLUDE
ANTENNA PIPES

KICKER ATTACHMENT:

SEE CLASSIFICATIONS SECTION FOR KICKER REQUIREMENT DETAILS.

INSTALL KICKER ABOVE OR BELOW PLATFORM



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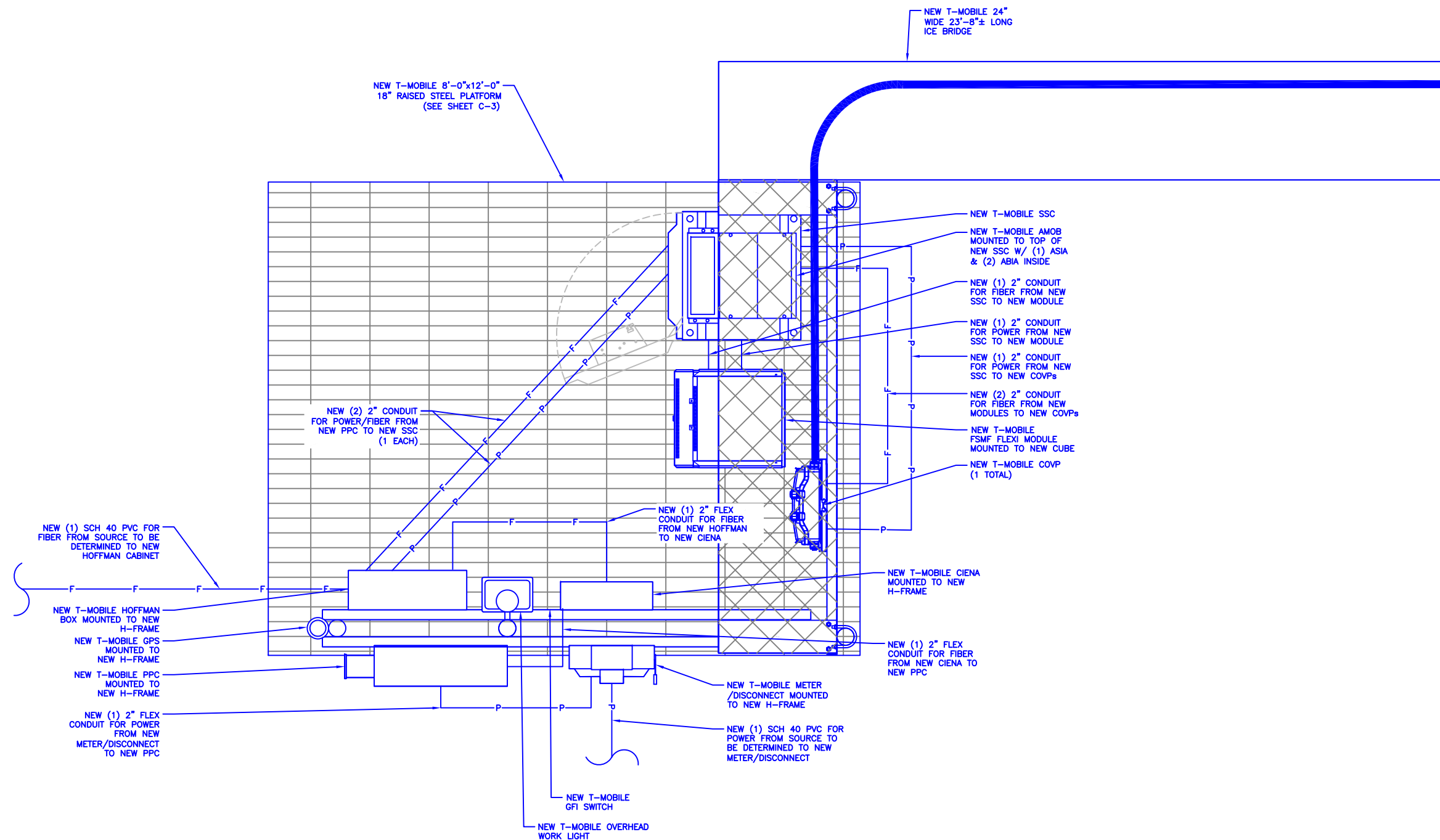
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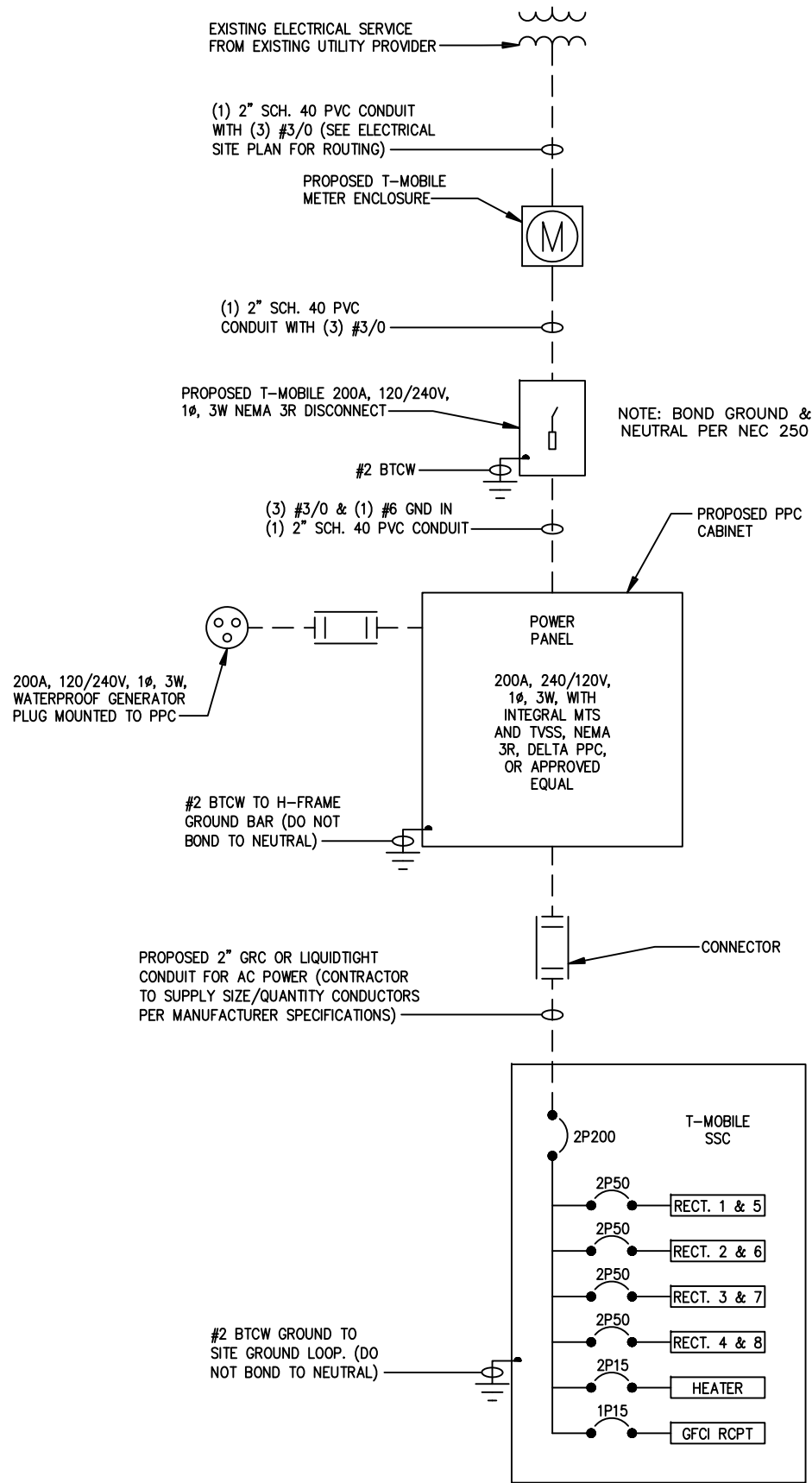
SHEET NUMBER:

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7





NOTE:
CONTRACTOR TO COORDINATE
WITH LOCAL UTILITY PROVIDER
PRIOR TO CONSTRUCTION

1 ELECTRICAL ONE LINE DIAGRAM
SCALE: NOT TO SCALE

PANEL: PPC

120/240 VOLTS, 1 PHASE, 3 WIRE, S/N, 200A AMP MCB NEMA 3R ENCL
MINIMUM AIC RATING - 22,000A

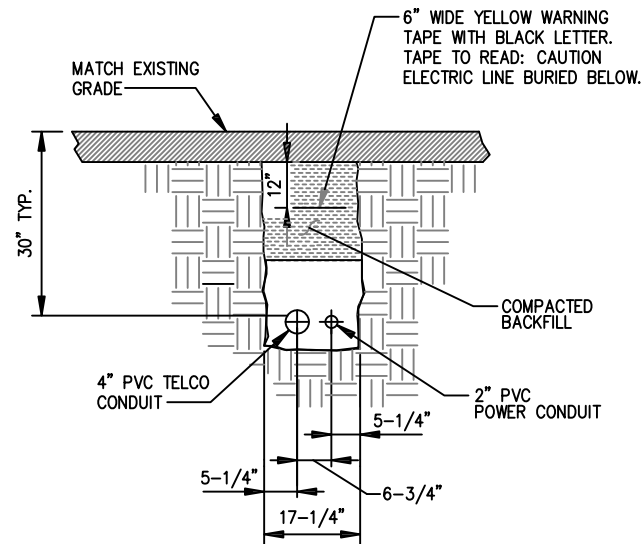
DESCRIPTION	BKR	POLE	CKT	VA	φ	VA	CKT	POLE	BKR	DESCRIPTION
SURGE PROTECTOR	30	2	1	--	A	50	2	1	10	FAN
2P BRANCH	--	--	3	--	B		4			SPACE
RECEPTACLE/LIGHTS	15	1	5	230	A		6			SPACE
SPACE	20	1	7		B	1000	8	2	20	HEATER
SPACE			9		A	1000	10	--	--	2P BRANCH
SPACE			11		B	15,000	12	2	200	(N) DELTA SUPPORT CABINET
SPACE			13		A	15,000	14	--	--	--
SPACE			15		B	--	16	--	--	2P BRANCH
SPACE			17		A	--	18	--	--	--
SPACE			19		B	--	20	--	--	--
SPACE			21		A	--	22	--	--	--
SPACE			23		B	--	24	--	--	--

PANEL LOAD CALCULATIONS:

LIGHTS: 50 VOLTAMPS x 1.25 = 63 VA
RECEPTACLE: 180 VOLTAMPS x 1.00 = 180 VA
MISC. EQUIPMENT: 32050 VOLTAMPS x 1.00 = 32,050 VA

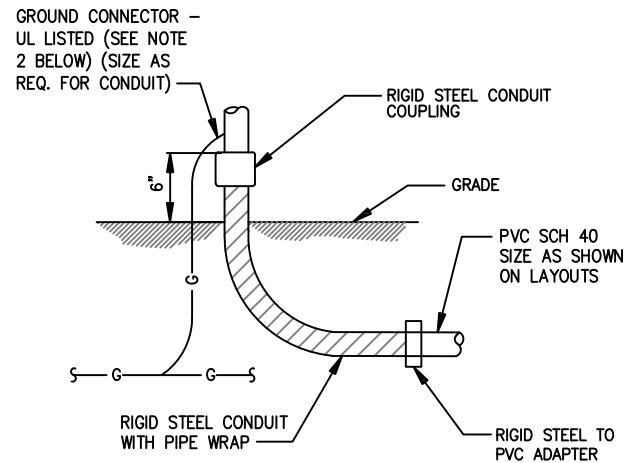
TOTAL CALCULATED CONNECTED LOAD: 32,280 VA
TOTAL CALCULATED DEMAND LOAD: 32,293 VA
TOTAL CALCULATED DEMAND LOAD: 135A 120/240V 1PH 3W

2 BREAKER PANEL SCHEDULE
SCALE: NOT TO SCALE



NOTE:
NUMBER AND SIZE OF CONDUITS MAY VARY. SEE DWG E-1 FOR CONDUIT SIZE AND LOCATION. CONFIRM DIMENSIONS SHOWN WITH UTILITY COMPANY

3 CONDUIT TRENCH DETAIL
SCALE: NOT TO SCALE



NOTES:
1. ALL CONDUIT ABOVE GRADE MUST BE RIGID STEEL OR LIQUIDTIGHT.
2. ALL NEW STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A123 C90 AFTER FABRICATION.
3. FIELD ABRASIONS SHALL BE TOUCH UP PAINTED WITH ZINC RICH GALVANIZING REPAIR PAINT IN ACCORDANCE WITH ASTM A780.
4. ALL EXPOSED ENDS OF CONDUITS SHALL HAVE WEATHER PROOF CAPS. DO NOT USE DUCT TAPE.
5. PROVIDE 200LB. TEST PULL WIRES IN EACH TELEPHONE AND POWER CONDUIT. STUB CONDUITS INTO ENCLOSURE AND LABEL.

4 UNDERGROUND CONDUIT STUB-UP
SCALE: NOT TO SCALE

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T-MOBILE SITE NUMBER:
DN02315A

BU #: 877109
FILL-IN/DENVER
/DEN145

9975 E. 104TH AVENUE
HENDERSON, CO 80640

EXISTING 92.0 FT MONOPOLE

ISSUED FOR:

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CONSULTING ENGINEER
JACOB GORALSKI, PLLC
UT PE# 9226401-2202
1106 COLBI ST.
KENNEDEALE, TX 76060
(817) 456-2621

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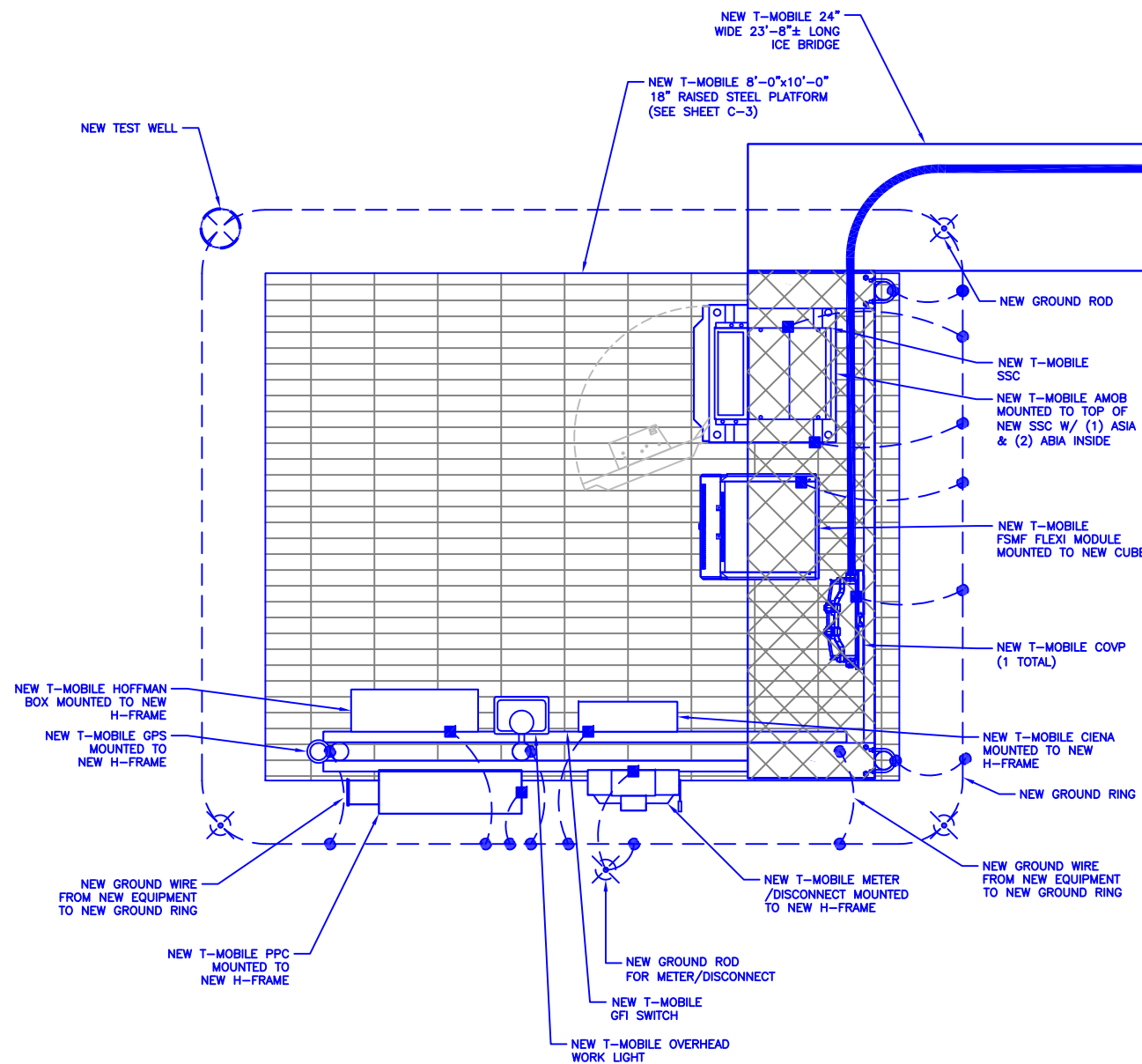
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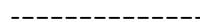
GROUNDING LEGEND



INSPECTION WELL. VERIFY
LOCATION W/ CONSTR. MGR.



5/8"x10'-0" COPPER CLAD
GROUND ROD, 10' O.C. (TYP)



#6 AWG STRANDED
& INSULATED



#2 AWG SOLID
COPPER TINNED



GROUND BUS BAR

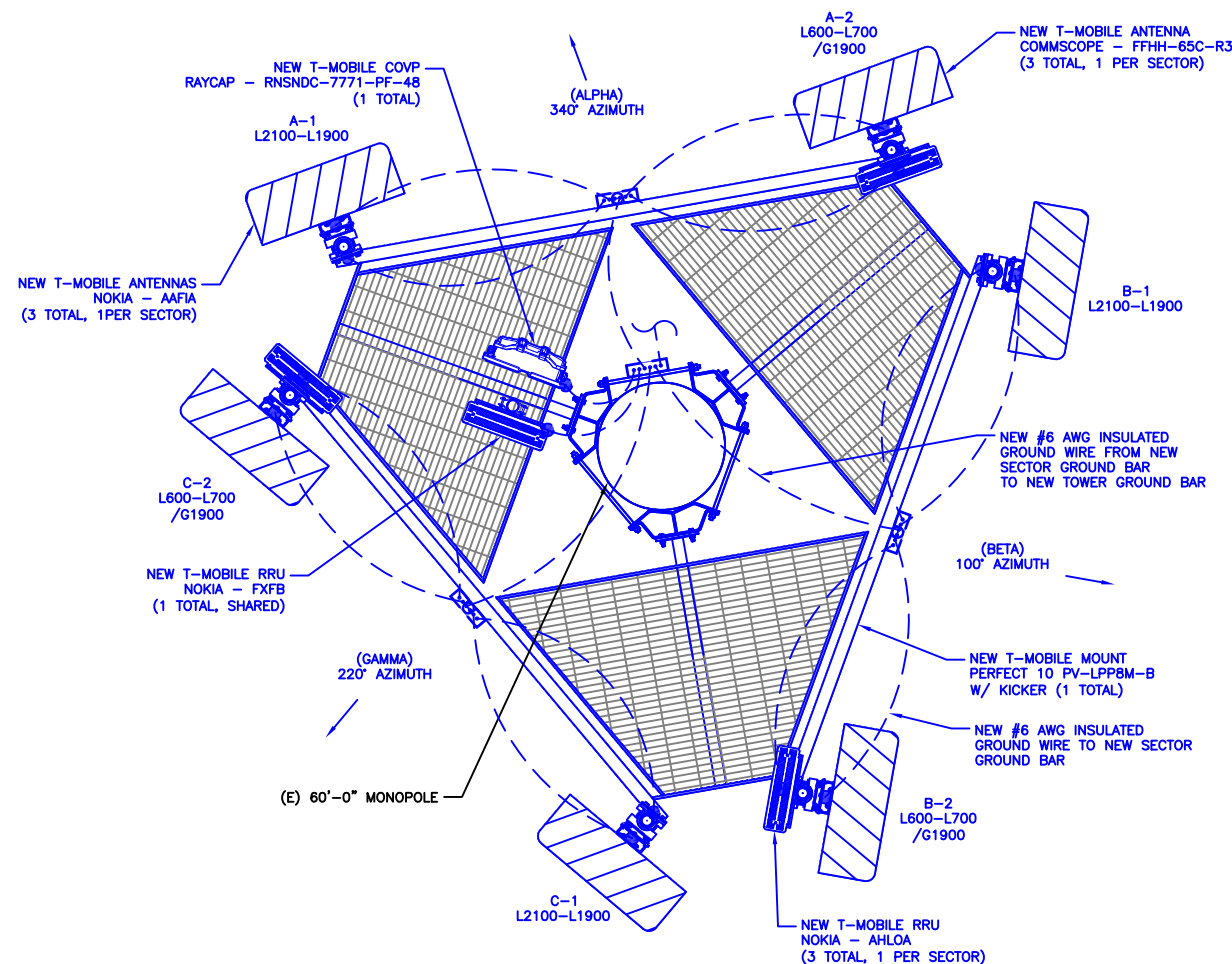


EXOTHERMIC WELD (CADWELD)
(UNLESS OTHERWISE NOTED)



MECHANICAL CONNECTION

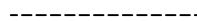
1 EQUIPMENT GROUNDING DIAGRAM
SCALE: NOT TO SCALE



GROUNDING LEGEND



MECHANICAL CONNECTION



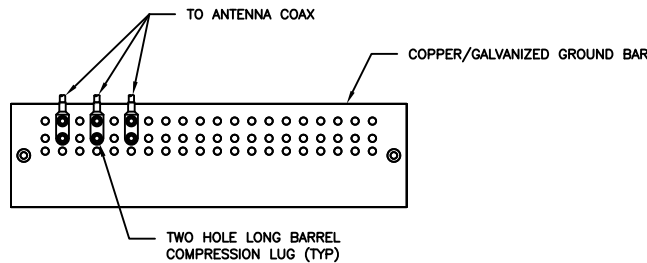
#6 AWG STRANDED & INSULATED



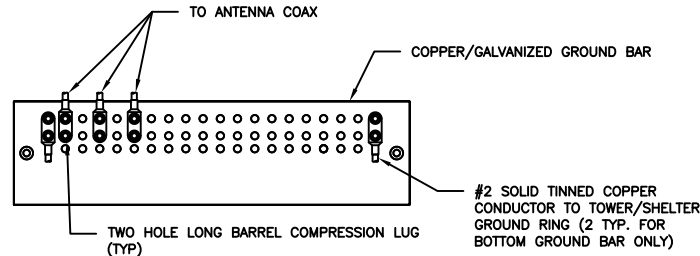
GROUND BUS BAR

2 ANTENNA GROUNDING PLAN
SCALE: NOT TO SCALE

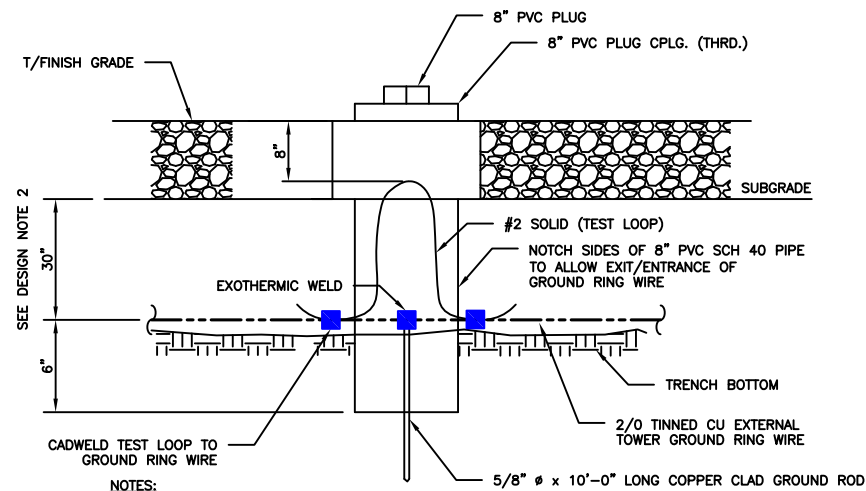




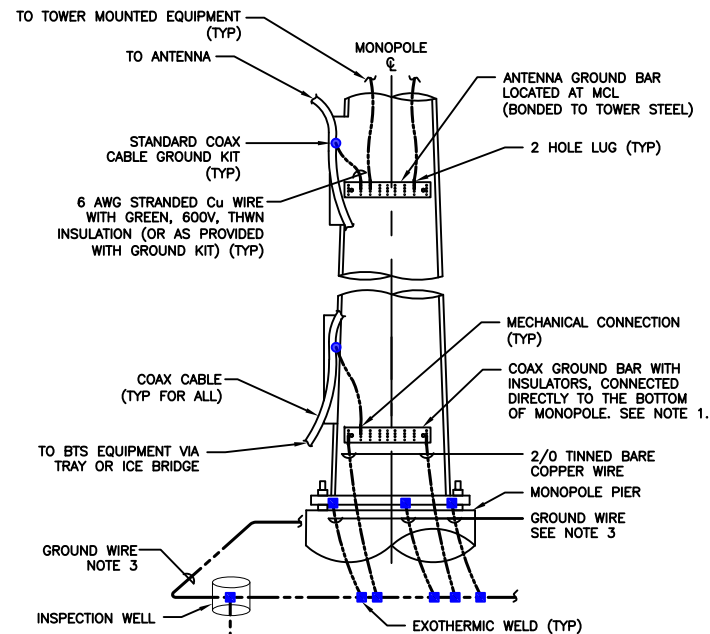
1 ANTENNA GROUND BAR DETAIL
SCALE: NOT TO SCALE



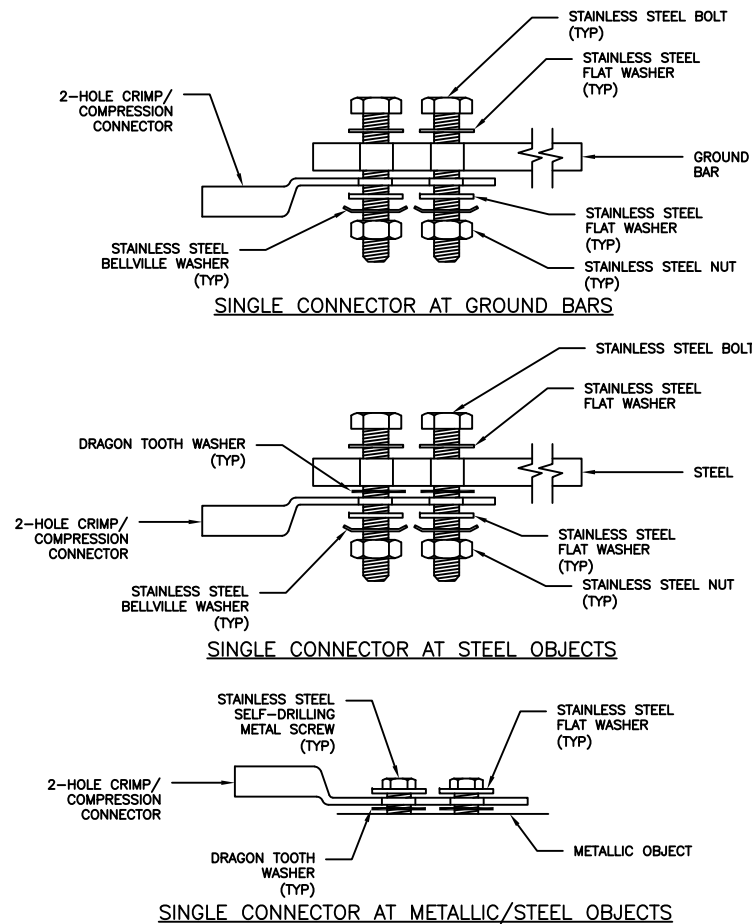
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



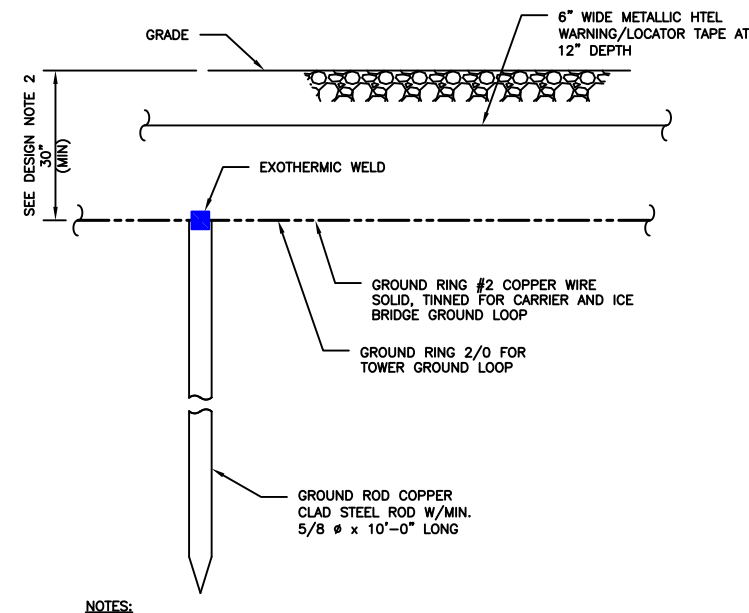
3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE



4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

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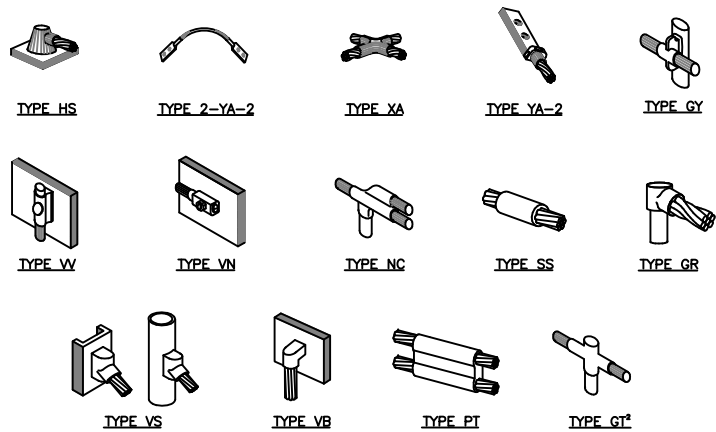
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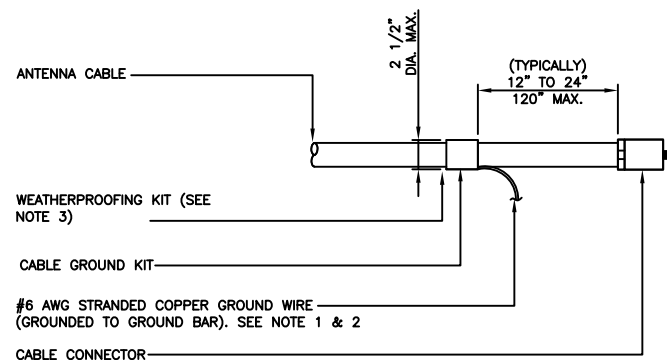
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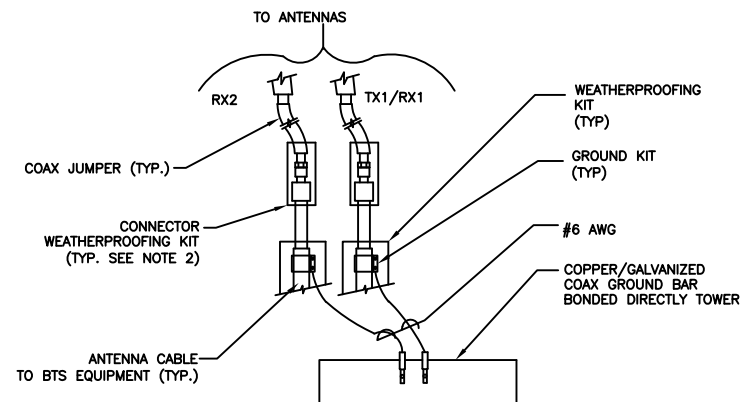
- NOTE:
1. ERICO EXOTHERMIC "MOLD TYPES" SHOWN HERE ARE EXAMPLES. CONSULT WITH CONSTRUCTION MANAGER FOR SPECIFIC MOLDS TO BE USED FOR THIS PROJECT.
 2. MOLD TYPE ONLY TO BE USED BELOW GRADE WHEN CONNECTING GROUND RING TO GROUND ROD.

1 CADWELD GROUNDING CONNECTIONS SCALE: NOT TO SCALE



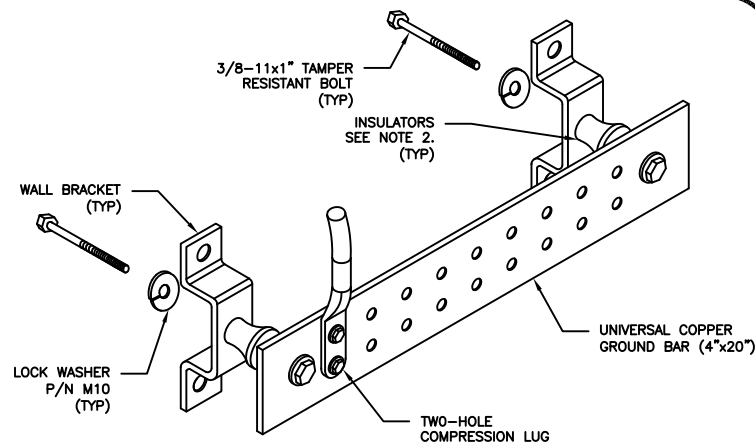
- NOTES:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
 2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
 3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

3 CABLE GROUND KIT CONNECTION SCALE: NOT TO SCALE



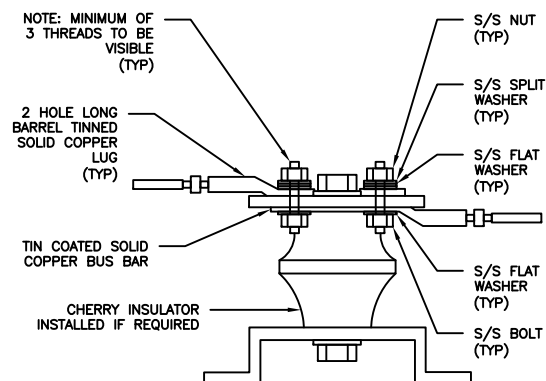
- NOTES:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
 2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

4 GROUND CABLE CONNECTION SCALE: NOT TO SCALE



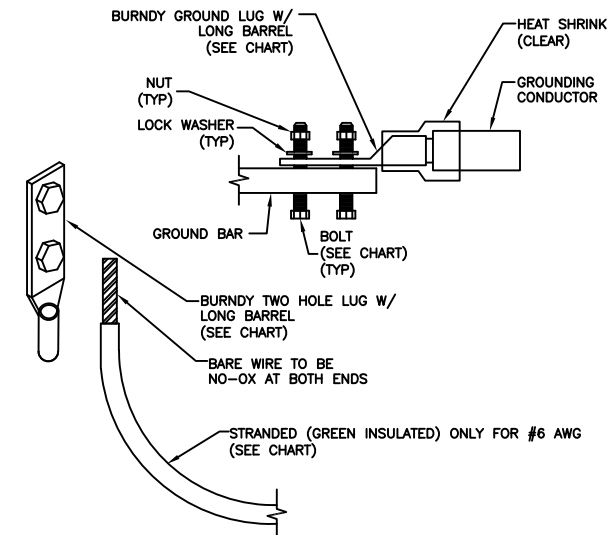
- NOTES:
1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STG-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
 2. OMIT INSULATOR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

6 GROUND BAR DETAIL SCALE: NOT TO SCALE



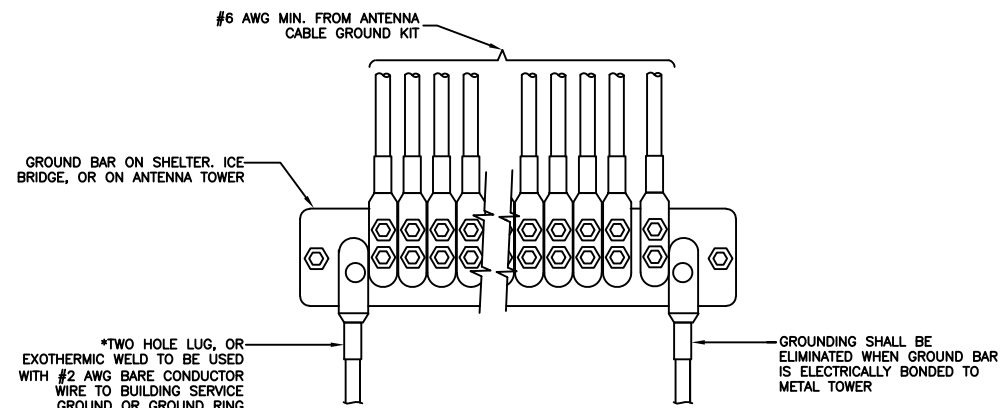
7 LUG DETAIL SCALE: NOT TO SCALE

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

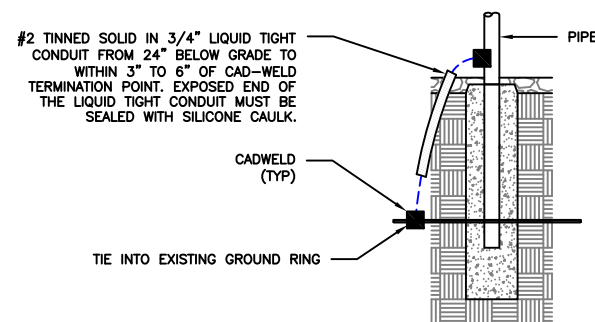


- NOTES:
1. ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE BOLTS, NUTS, LOCK WASHERS SHALL BE STAINLESS STEEL. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER, GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.

2 MECHANICAL LUG CONNECTION SCALE: NOT TO SCALE



5 GROUNDWIRE INSTALLATION SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL SCALE: NOT TO SCALE

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