

## T-MOBILE SITE NUMBER:

DN02415A

# **T-MOBILE SITE NAME:**

KEEBLER

# CCI SITE#:

877103

## **SITE ADDRESS:**

231 MAIN STREET COLORADO SPRINGS, CO 80911

# APPROVAL SIGNATURE BLOCK

THE FOLLOWING PARTIES HAVE REVIEWED THESE DOCUMENTS:

SITE ACQUISITION SPECIALIST:	APPROVED:	DATE:
	REJECTED:	
RF ENGINEER:	APPROVED:	DATE:
	REJECTED:	
CONSTRUCTION MANAGER:	APPROVED:	DATE:
	REJECTED:	
OPERATIONS:	APPROVED:	DATE:
	REJECTED:	
PROJECT MANAGER:	APPROVED:	DATE:
	REJECTED:	

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

# T--Mobile---

T-MOBILE SITE NUMBER: DN02415A T-MOBILE SITE NAME:

SITE TYPE:

**TOWER HEIGHT:** 

**KEEBLER MONOPOLE** 

TITLE SHEET

GENERAL NOTES

FINAL SITE PLAN

EQUIPMENT SITE PLAN

EQUIPMENT ELEVATION

EQUIPMENT DETAILS

EQUIPMENT DETAILS

EQUIPMENT DETAILS

ELECTRICAL PLAN

MOUNT SPECIFICATION

GROUNDING DETAILS

GROUNDING DETAILS

ELECTRICAL SPECIFICATIONS

EQUIPMENT AND ANTENNA GROUNDING PLAN

60.0 FT

SHEET #

CROWN CASTLE BU #: 877103

231 MAIN STREET **SITE ADDRESS: COLORADO SPRINGS, CO 80911** 

**COUNTY: EL PASO** 

COUNTY OF EL PASO, **JURISDICTION:** 

CO / PPRBD T-MOBILE 2018 NSD LAT: 38° 45′ 6.34″, LONG: -104° 44′ 31.64″

KEEBLER/COLORADO SPGS/CSP209 SITE NAME:

SITE INFORMATION

231 MAIN STREET SITE ADDRESS COLORADO SPRINGS, CO 80911

COUNTY: 65141-03-028 MAP/PARCEL# AREA OF CONSTRUCTION: EXISTING 38° 45' 6.34" -104° 44' 31.64' LONGITUDE NAD83 LAT/LONG TYPE: 5,724 FT GROUND ELEVATION: CURRENT ZONING:

JURISDICTION: COUNTY OF EL PASO, CO / PPRBD

OCCUPANCY CLASSIFICATION: U

TYPE OF CONSTRUCTION:

A.D.A. COMPLIANCE: FACILITY IS UNMANNED AND NOT FOR HUMAN

HABITATION

PROPERTY OWNER: GLOBAL SIGNAL ACQUISITIONS IV LLC PO BOX 277455

ATLANTA, GA 303384-7455

TOWER OPERATOR: CROWN CASTLE, USA

2000 CORPORATE DRIVE CANONSBURG, PA 15317

CARRIER/APPLICANT: T-MOBILE.

18400 E. 22ND AVENUE

AURORA, CO 80011 CROWN CASTLE

**PROJECT TEAM** 

DALWORTHINGTON GARDENS, TX 76016

CONTACT: JACOB GORALSKI, PLLC

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BROADUS SERVICES

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1106 COLBLST

(719) 466-9629

T-MOBILE CONTACTS: MACKENZIE KEYS -

PH: (817) 456-2621

APPLICATION ID:

DESIGNER FIRM:

ENGINEER FIRM:

CROWN CASTLE

CONTACTS

ELECTRIC PROVIDER: COLORADO SPRINGS UTILITIES

TELCO PROVIDER: CENTURYLINK

# PROJECT DESCRIPTION

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR FULL SIZE. CONTRACTOR SH SRIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND S IMMEDIATELY NOTHY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE

**DRAWING INDEX** 

EQUIPMENT PLAN & DIMENSION PLAN

TOWER ELEVATION & ANTENNA PLAN

PLUMBING & CABLE SPECIFICATIONS

SHEET DESCRIPTION

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

### OWER SCOPE OF WORK:

- INSTALL (6) PANEL ANTENNAS
- INSTALL (6) RRUs
- INSTALL (2) COVP • INSTALL (2) HYBRID CABLE LINES
- INSTALL NEW PLATFORM MOUNT

#### ROUND SCOPE OF WORK:

DATE: 4/19/2018 1:23:16 PM

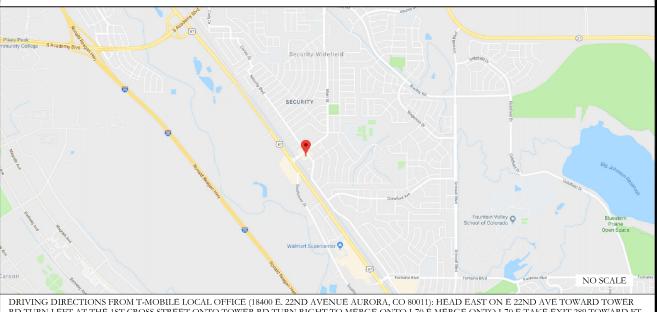
• INSTALLATION OF NEW 8'-0"x8'-0" MODULAR EQUIPMENT PLATFORM WITHIN A NEW 10'-0"x15'-0" LEASE AREA WITHIN THE EXISTING FENCED COMPOUND

DESIGN PACKAGE BASED ON THE APPLICATION

DESIGN PACKAGE BASED ON THE RFDS

REVISION: 2

## LOCATION MAP



RD TURN LEFT AT THE 1ST CROSS STREET ONTO TOWER RD TURN RIGHT TO MERGE ONTO 1-70 É MERGE ONTO 1-70 É TAKE EXIT 289 TOWARD FI COLLINS/COLO SPRINGS USE THE RIGHT 2 LANES TO TURN RIGHT (SIGNS FOR COLO SPRINGS) USE THE RIGHT 3 LANES TO TAKE THE RAMP ONTO E-470 S USE THE RIGHT 2 LANES TO TAKE EXIT 1A FOR INTERSTATE 25 S TOWARD COLÓ SPRINGS MERGE ONTO I-25 S TAKE EXIT 135 FOR CO-83/ACADEMY BLVD USE THE LEFT 2 LANES TO KEEP LEFT AT THE FORK AND CONTINUE TOWARD S ACADEMY BLVD USE THE LEFT 2 LANES TO TURN LEFT ONTO S ACADEMY BLVD TAKE THE US-85 EXIT TOWARD FOUNTAIN TURN RIGHT ONTO US-85 S/US-87 S (SIGNS FOR FOUNTAIN) TURN LEFT ONTO MAIN ST TURN RIGHT DESTINATION WILL BE ON THE RIGHT

# 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 NO CONFORMING TO THESE CODES:

CODE TYPE MECHANICAI 2015 IMC ELECTRICAL

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS: BY OTHERS

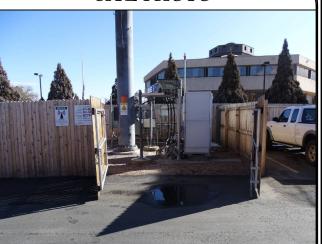
MOUNT ANALYSIS: BY OTHERS



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



## **SITE PHOTO**



18400 E. 22ND AVENUE



T-MOBILE SITE NUMBER: DN02415A

BU #: 877103 KEEBLER/COLORADO SPGS/CSP209

231 MAIN STREET COLORADO SPRINGS, CO 80911

EXISTING 60.0 FT MONOPOLE

ISSUED FOR:					
REV	DATE	DRWN	DESCRIPTION	DES./QA	
Α	07-10-2018	JAS	PRELIMINARY	ELG	
В	08-17-2018	JAS	PRELIMINARY	ELG	
0	08-29-2018	JAS	FINAL	ELG	
1	11-20-2018	JAS	FINAL	ELG	



JACOB GORALSKI, PLLC

CONSULTING ENGINEER JACOB GORALSKI, PLLC CO PE# 0049661 1106 COLBI ST. KENNEDALE 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,

SHEET NUMBER

#### SITE WORK GENERAL NOTES:

- 1. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF
- 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 INSTEAD OF THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE INCLUDED. TO ALL SHALL BROTECTOR IS ACCOUNTED. LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING
- 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.
- ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS.
- 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
- 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.
- 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.
- 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.
- 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:

- ALL STEEL WORK SHALL BE PAINTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND IN ACCORDANCE WITH ASTM A36 UNLESS OTHERWISE NOTED.
- BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE (3/4"

  Ø) 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:**

- 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.
- 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 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 FARTH. CONCRETE EXPOSED TO EARTH OR WEATHER #6 AND LARGER... .....2 IN #5 AND SMALLER & WWF CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE

BEAMS AND COLUMNS ....

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:

- 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 PSL
- 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.
- WALL SHALL RECEIVE TEMPORARY BRACING. TEMPORARY BRACING SHALL NOT BE REMOVED UNTIL GROUT IS FULLY CURED.

#### **GENERAL NOTES:**

FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY: CONTRACTOR-

SUBCONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION) T-MOBILE
CROWN CASTLE
ORIGINAL EQUIPMENT MANUFACTURER

OWER OWNER-

- 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.
- . 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, REQULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY RECARDING 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 ADDITIONAL PROPERTY AND ACTION.
- 4. DRAWINGS PROVIDED HERE ARE NOT TO SCALE AND ARE INTENDED TO SHOW OUTLINE
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED
- "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
- 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.
- 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, CURRS, I ANDSCAPING 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:**

ABOVE GRADE LEVEL BASE TRANSCEIVER STATION AGL BTS FXISTING EXISTING
MINIMUM
REFERENCE
RADIO FREQUENCY
TO BE DETERMINED
TO BE RESOLVED REQ REQUIRED FOLIPMENT GROUND RING AMERICAN WIRE GAUGE MASTER GROUND BAR EQUIPMENT GROUND BARE COPPER WIRE BARE TINNED COPPER WIRE SMART INTEGRATED ACCESS DEVICE SIAD GEN GENERATOR INTERIOR GROUND RING (HALO) RADIO BASE STATION

#### SYMBOLS:

-S/G- SOLID GROUND BUS BAR -S/Ne- SOLID NEUTRAL BUS BAR SUPPLEMENTAL GROUND CONDUCTOR 2-POLE THERMAL-MAGNETIC CIRCUIT BREAKER SINGLE-POLE THERMAL-MAGNETIC CIRCUIT BREAKER

CHEMICAL GROUND ROD

 $\otimes$ TEST WELL

┙ DISCONNECT SWITCH Ø

> EXOTHERMIC WELD (CADWELD) (UNLESS OTHERWISE NOTED)

MECHANICAL CONNECTION

GROUNDING WIRE

#### **ELECTRICAL INSTALLATION NOTES:**

- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
- CONDUIT ROUTINGS ARE SCHEMATIC. 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.
- 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.
- 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 AMPACTY 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 FOREN, CONTROL AND EXPIRENT GROUND WINING IN TOBING OR CONDUCTOR (#14 AWG OR LARGER), 600 V, OIL RESISTANT THINN OR TINNN-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
- 11. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (#6 AWG OR LARGER), 600V, OIL RESISTANT THIN 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
- 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
- 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
- 4. 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
- 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
- 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 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 FILUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE INON BUSHIN ON INSIDE AND GALVANIZED MALLEABLE INFONCED BUSHING BUSHIN ON INSIDE AND GALVANIZED MALLEABLE BUSHING BUSHIN ON INSIDE AND GALVANIZED MALLEABLE BUSHING 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:**

- ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
- THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTAL 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.
- 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.
- 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.
- 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, SHBE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS
- 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.
- 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.
- 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.
- 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 CONDUTTS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS, WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT ON 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 DROUBLISTER BY LOCAL CONDET THE GROUND CONDUCTOR SHALL BE 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 GRAD 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 ASE/CODE LETTER DESCRIPTION WIRE COLOR BLACK LEG 1 240/120 10 LEG 2 RED AC NEUTRAL N WHITE GROUND (EGC) GREEN RED-POLARITY MAR AT TERMINATION \*BLACK-POLARITY VDC NEG TERMINATION PHASE A BLACK RED(ORG. IF HI LEG) 240V OR 208V, 30 PHASE B PHASE C BLUE PHASE A BROWN 480V. 3Ø PHASE B ORANGE OR PURPL PHASE C YELLOW

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





T-MOBILE SITE NUMBER: DN02415A

BU #: **877103** KEEBLER/COLORADO SPGS/CSP209

231 MAIN STREET COLORADO SPRINGS, CO 80911

EXISTING 60.0 FT MONOPOLE

_				-		
	ISSUED FOR:					
REV	DATE	DRWN	DESCRIPTION	DES./QA		
Α	07-10-2018	JAS	PRELIMINARY	ELG		
В	08-17-2018	JAS	PRELIMINARY	ELG		
0	08-29-2018	JAS	FINAL	ELG		
1	11-20-2018	JAS	FINAL	ELG		
<b>V</b>						

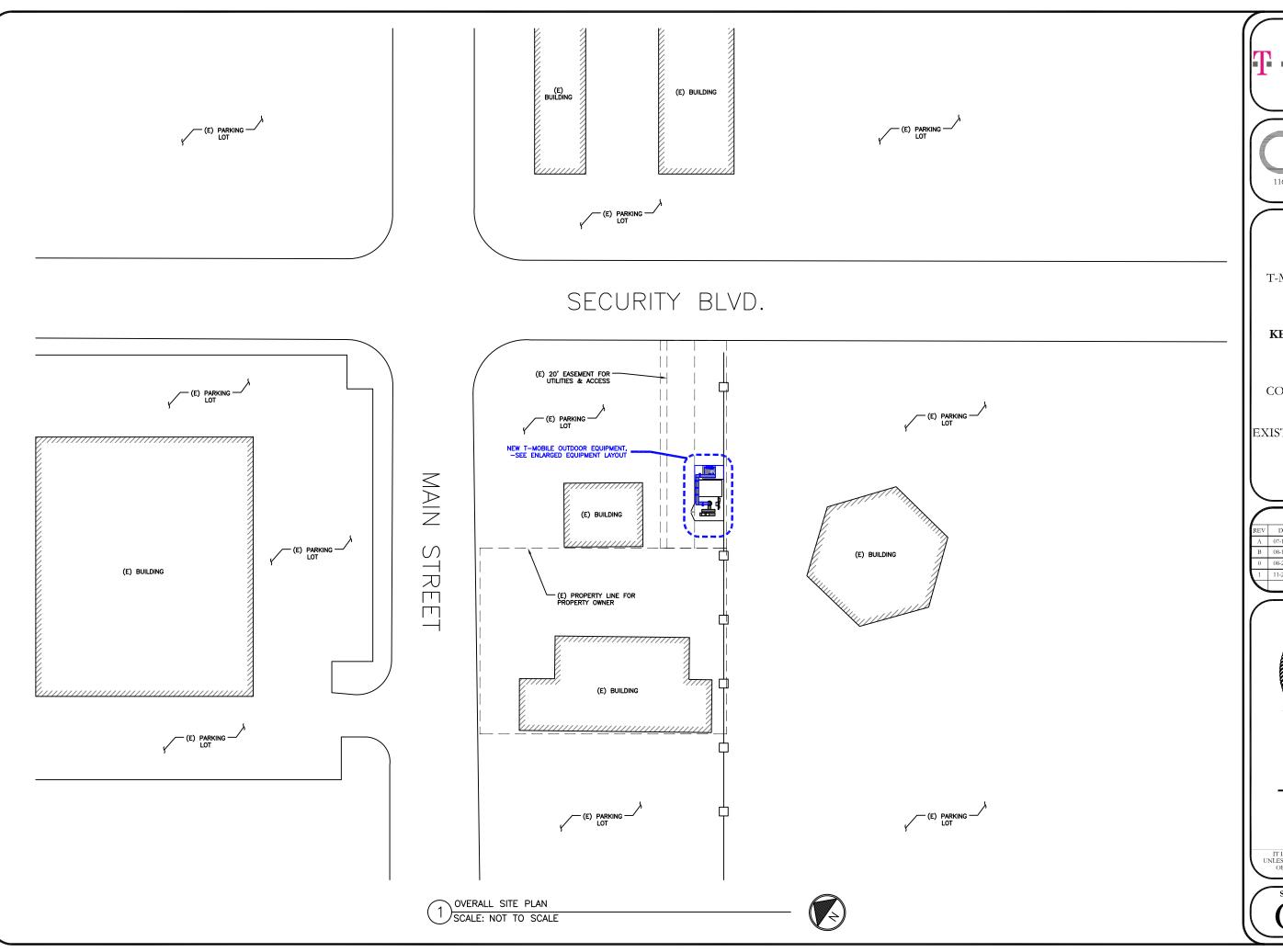


JACOB GORALSKI, PLLC CONSULTING ENGINEER JACOB GORALSKI, PLLC

CO PE# 0049661 1106 COLBI ST. KENNEDALE 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:



18400 E. 22ND AVENUE AURORA, CO 80011



T-MOBILE SITE NUMBER: DN02415A

BU #: **877103** KEEBLER/COLORADO SPGS/CSP209

231 MAIN STREET COLORADO SPRINGS, CO 80911

EXISTING 60.0 FT MONOPOLE

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11/29/2018

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CO PE# 0049661

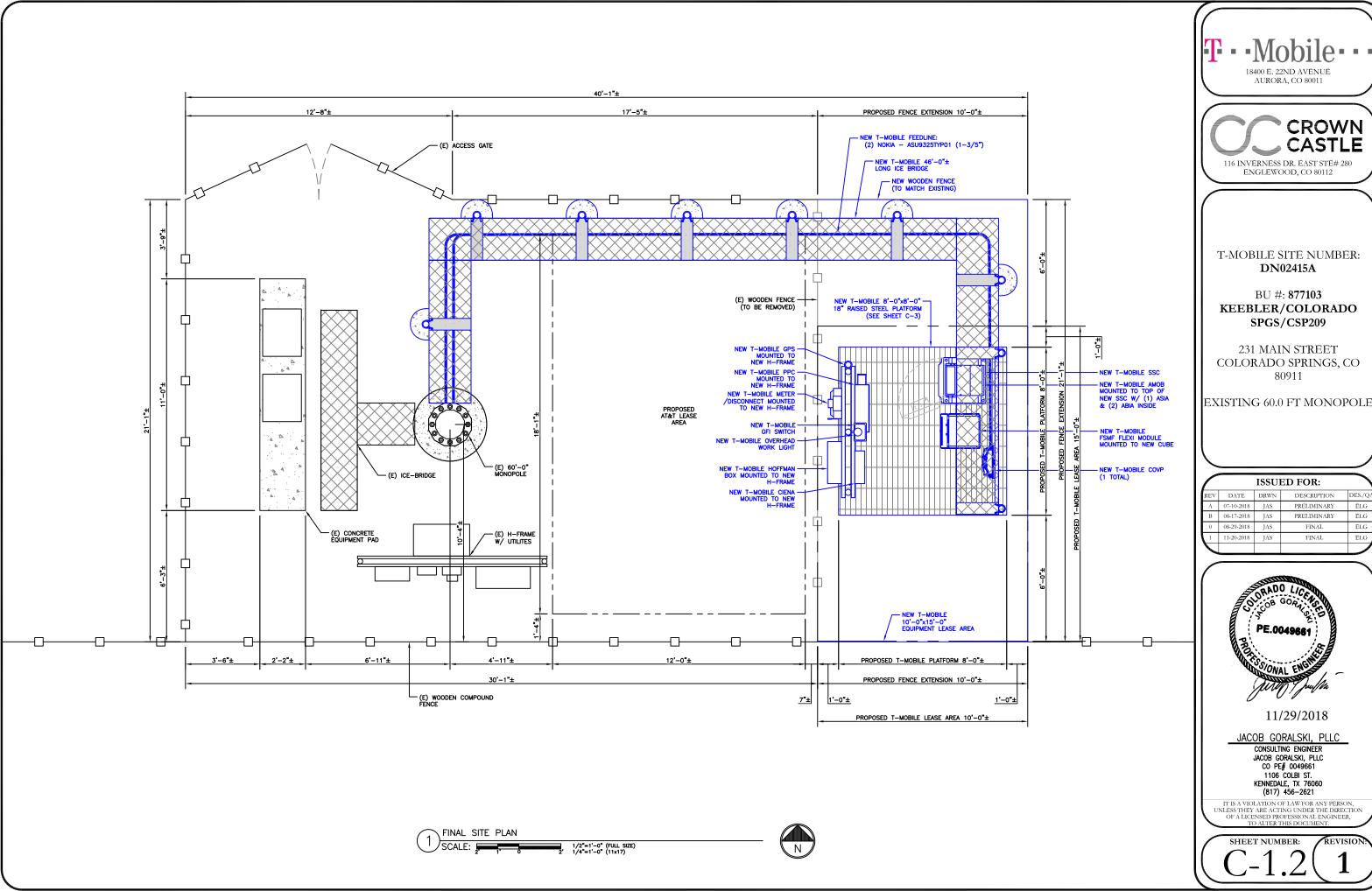
1106 COLBI ST.

KENNEDALE, TX 76060

(817) 456−2621

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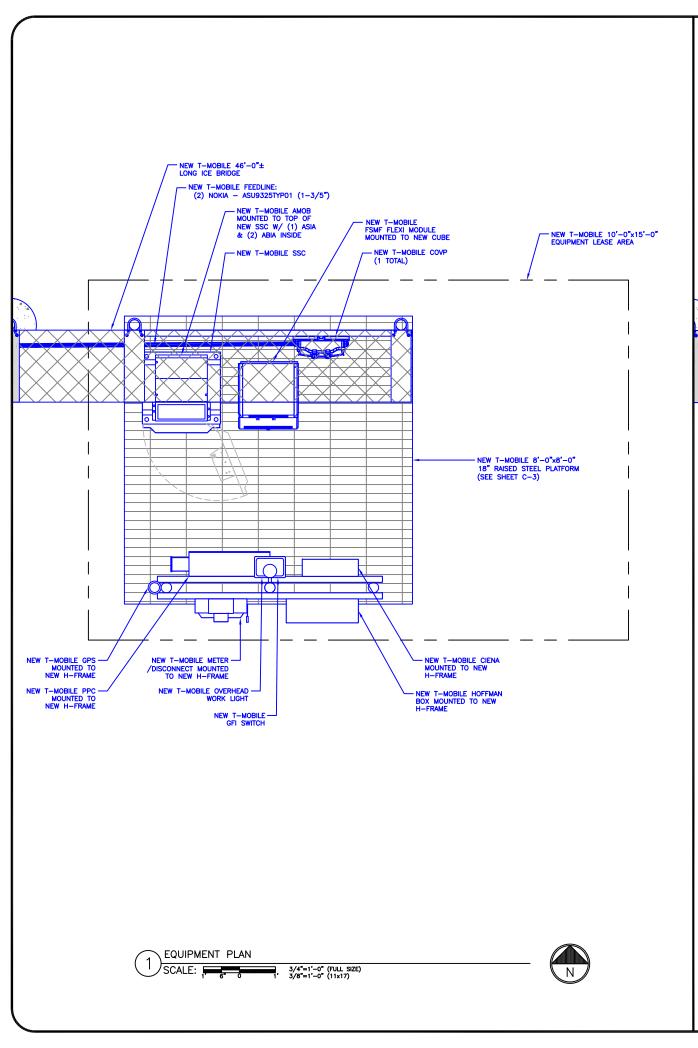


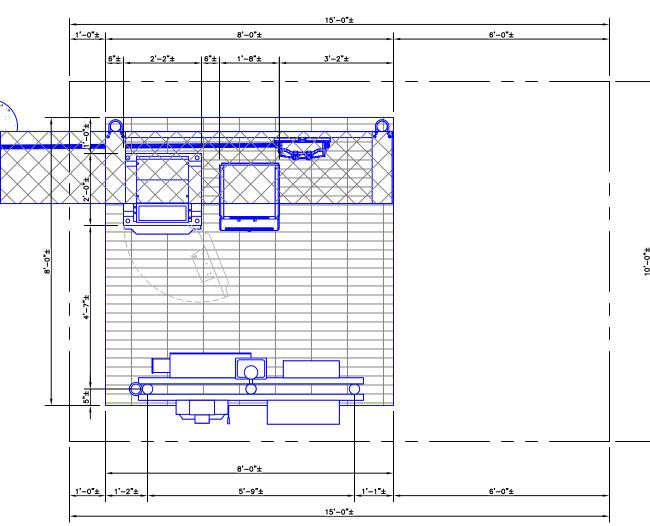
KEEBLER/COLORADO

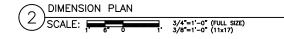
COLORADO SPRINGS, CO

ISSUED FOR:					
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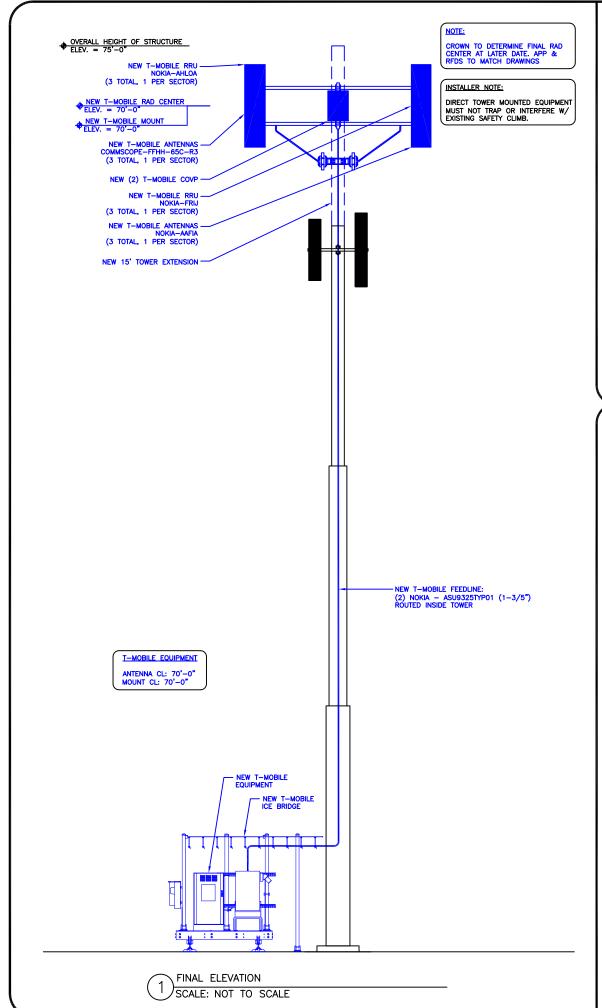
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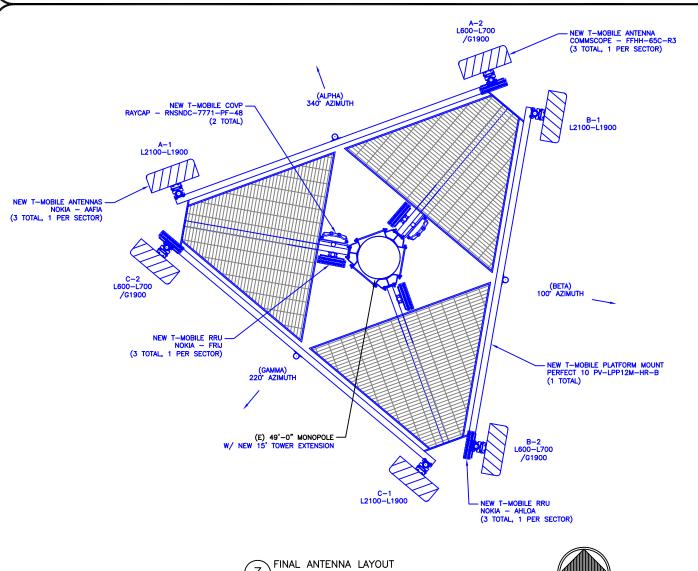
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SHEET NUMBER: REVISION 1



	ANTENNA SCHEDULE						
SECTOR	ALF	РНА	BE	BETA		GAMMA	
ANTENNA POSITION	A-1	A-2	B-1	B-2	C-1	C-2	
ANTENNA TYPES	L2100-L1900	L700-L600 /U2100	L2100-L1900	L700-L600 /U2100	L2100-L1900	L700-L600 /U2100	
AZIMUTH	340°	340*	100°	100°	220°	220	
RAD CENTER (AGL)	70'-0"	70'-0"	70'-0"	70'-0"	70'-0"	70'-0"	
MODEL	NOKIA - AAFIA	COMMSCOPE - FFHH-65C-R3	NOKIA - AAFIA	COMMSCOPE - FFHH-65C-R3	NOKIA - AAFIA	COMMSCOPE - FFHH-65C-R3	
FEEDER LENGTH	±125'-0"	±125'-0"	±125'-0"	±125'-0"	±125'-0"	±125'-0"	
FEEDER TYPE	HYBRID CABLE	HYBRID CABLE	HYBRID CABLE	HYBRID CABLE	HYBRID CABLE	HYBRID CABLE	

2 ANTENNA SCHEDULE SCALE: NOT TO SCALE



SCALE: NOT TO SCALE

T - Mobile - - -



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231 MAIN STREET COLORADO SPRINGS, CO 80911

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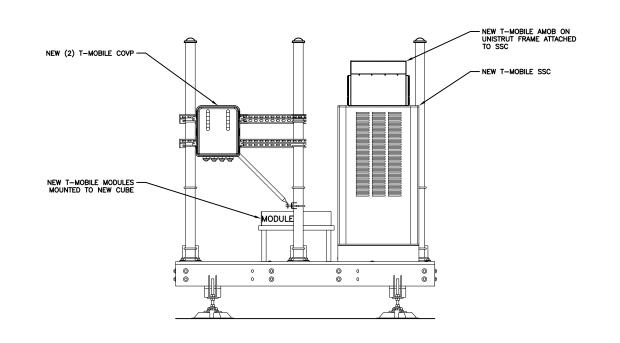
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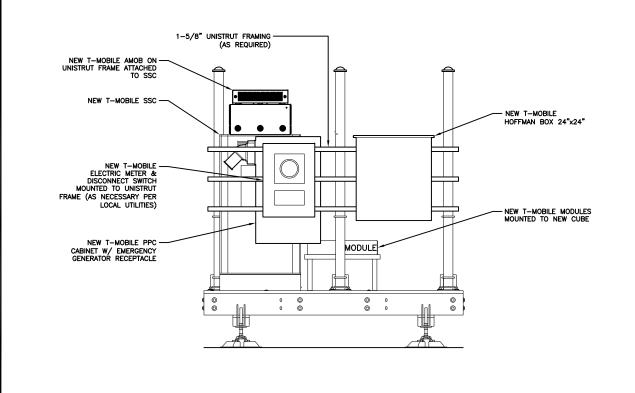
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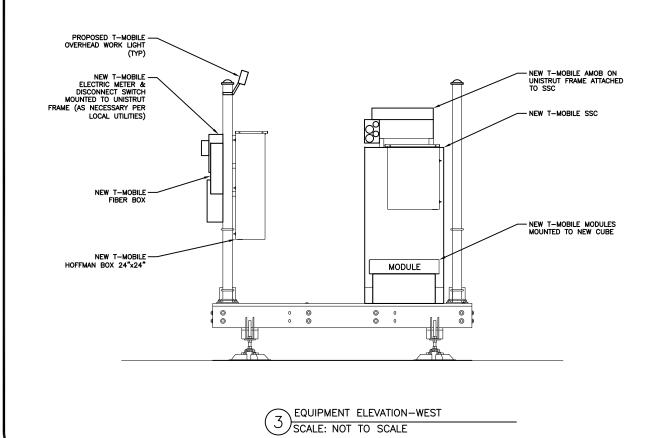


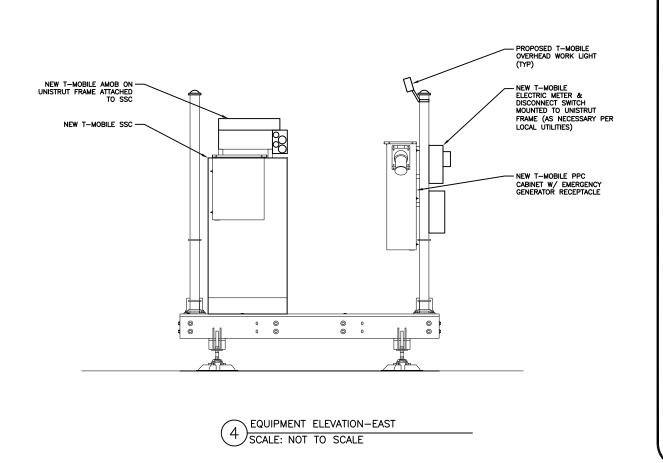
EQUIPMENT ELEVATION-NORTH

SCALE: NOT TO SCALE



EQUIPMENT ELEVATION-SOUTH 2 SCALE: NOT TO SCALE





18400 E. 22ND AVENUE AURORA, CO 80011



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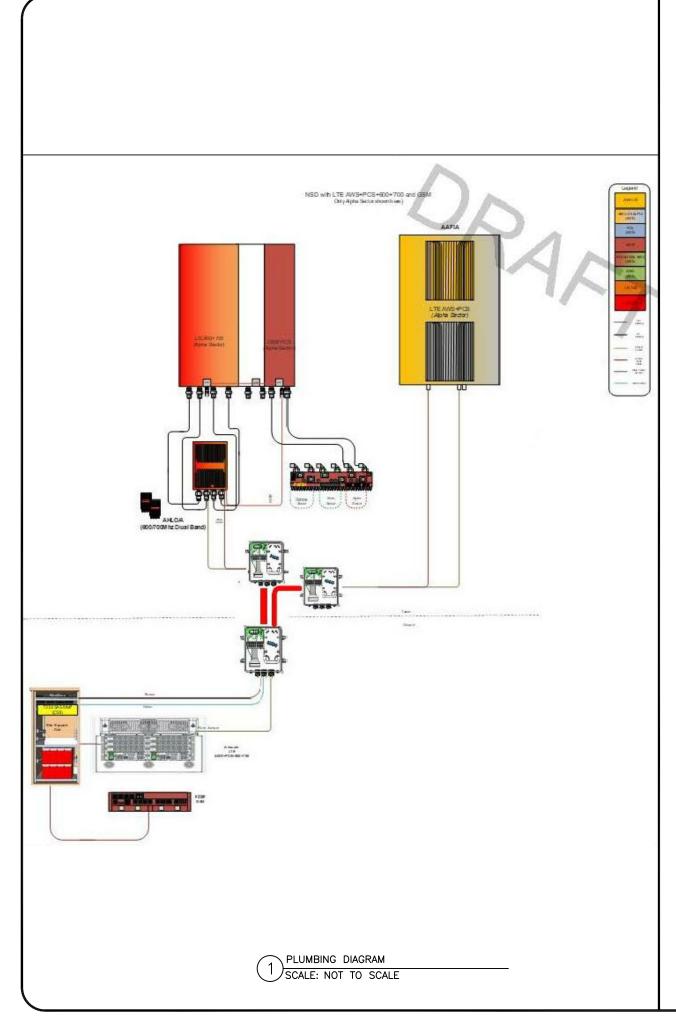
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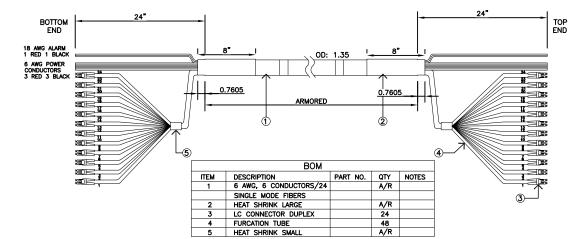


CABLE TYPE	NUMBER, SIZE (AWG) VOLTAGE OUTER JACKET SHIELDING MAX SHIELD RESISTANCE (ohm/ft ② 20 c) DRAIN RIPCORD DC CONDUCTOR MATERIAL DC CONDUCTOR SIZE (AWG) MAX DC RESISTANCE (ohm/1000 ft) COLOR CODE ALARM CONDUCTOR MATERIAL ALARM CONDUCTOR SIZE (AWG) MAX DC RESISTANCE (ohm/1000 ft) COLOR CODE FIBER CABLES OUTER DIAMETER (in) — NOMINAL WEIGHT (Ib/ft) MINIMUM BEND RADIUS (in) BEND MOMENT (Ib/ft) TENSILE STRENGTH (Ib) 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		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 mm (dB/Km)		LESS THAN EQUA 0.5
MAX ATTENUATION, 1550 MM (dB/Km)		LESS THAN EQUA 0.5

—6 AWG COPPER CONDUCTOR x6
SINGLE MODE FIBER x24
-18 AWG COPPER
CONDUCTOR x2
CORRUGATED COPPER ARMOR
PVC OUTER
JACKET

NOTE: CABLE CROSS SECTION NOT DRAWN TO SCALE

CABLE TYP	E: 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:

1. DIMENSIONS ARE IN INCHES.
2. 12 DUPLEX LC CONNECTORS PER END, 4 DUPLEX LC CONNECTORS PER GROUP, TOTAL OF 3 GROUPS.
3. TOTAL OF 12 PAIRS OF SINGLE MODE FIBERS.
4. TOTAL OF 6 AC CABLES 3 RED & 3 BLACK.
5. TOP END AND BOTTOM END ARE IDENTICAL.
6. EACH AND EVERY FIBERS MUST BE LABELED FROM #1 TO #24 AT BOTH ENDS.
7. LABEL BOTH ENDS WITH: SERIAL NUMBER, PART NUMBER AND CUSTOMER NAME.
8. INSERTION LOSS AND RETURN LOSS SHALL BE MEASURED 100%%% SAMPLING FOR ALL PRODUCTION.
9. TEST AND MEASUREMENT REPORT SHALL BE FURNISHED WITH CABLE ASSEMBLY.
10. ALL CONNECTORS SHALL BE SHIPPED WITH FURRULES PROTECTED WITH REMOVABLE CAPS.
11. ALL FIBER BREAKOUT WILL BE PROTECTED FROM WATER PENETRATION.

CABLE SPECIFICATIONS 2 SCALE: NOT TO SCALE





T-MOBILE SITE NUMBER: DN02415A

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231 MAIN STREET COLORADO SPRINGS, CO 80911

EXISTING 60.0 FT MONOPOLE

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11/29/2018

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SHEET NUMBER:

8-port sector antenna, 4x 617-806 and 4x 1695-2360 MHz, 65° HPBW, 3x RET, 600 MHz-Ready Antenna Technology



Electrical Specifications

XX XX XX XX (Bee

XX XX XX XX (B25) 8x2x2bands

16x6.25W4 (100W)

2·12 degrees 3Q18 (L18SP)

71 "x26"x8"

242lbn / 1.846 in<sup>2</sup>

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 PIM, 3rd Order, 2 x 20 W, dBc	1.5   14.0	1.5   14.0 -153	1.5   14.0 -153	1.5   14.0	1.5   14.0	1.5   14.0 -1.53
Input Power per Port at 50°C, maximum, watts	250	250	2.50	250	250	200
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Frequency Band, MHz	617-698	698-806	1695-1880	1850-1990	1920-2200	2300-236
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
	2 °   14.8	2 °   15.0	2 °   17.2	2 °   17.6	2 °   18.1	2 °   18.8
Gain by Beam Tilt, average, dBi	8 °   15.1	8 °   15.3	7 °   17.5	7°   18.0	7 °   18.6	7°   19.4
	13 °   15.0	13 0   15.1	12 º   17.4	12 °   17.8	12 0   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	9	8

ANTENNA NOT SHOWN FOR CLARITY

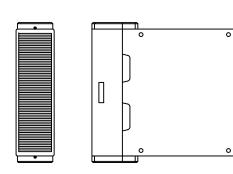
RRU MOUNTING PLATE

PIPE MOUNT BRACKET

COMMSCOPE - FFHH-65C-R3

2) SCALE: NOT TO SCALE





NOKIA — FXFB WEIGHT: 55.1 LBS SIZE (LxWxH): 5.2x19.3x22.0 IN.

NOKIA - FXFB SCALE: NOT TO SCALE AirScale Dual RRH 4T4R B12/71 240W AHLOA



NOKIA - AHLOA (4) SCALE: NOT TO SCALE

EXISTING 60.0 FT MONOPOLE

ISSUED FOR:

RADO LICA

PE.0049661

11/29/2018

JACOB GORALSKI, PLLC

CONSULTING ENGINEER JACOB GORALSKI, PLLC

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KENNEDALE, TX 76060

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A 07-10-2018 JAS PRELIMINARY

DESCRIPTION

PRELIMINARY

FINAL

FINAL

ELG

ELG

ELG

DATE DRWN

B 08-17-2018 JAS

0 08-29-2018 IAS

18400 E. 22ND AVENUE AURORA, CO 80011

116 INVERNESS DR. EAST STE# 280

ENGLEWOOD, CO 80112

T-MOBILE SITE NUMBER:

DN02415A

BU #: **877103** KEEBLER/COLORADO

SPGS/CSP209

231 MAIN STREET COLORADO SPRINGS, CO 80911

CROWN CASTLE



- Features

  Employs the Strikscorb\* 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 two DC operating voltages (46V).

  The Strikscorb 30-V1-HV is able a Class I SPD, certified by VDE per the IEC 61043-1 standard as suitable for installation in areas where direct lightning exposure is expected. Strikscorb 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).

- Configurable cable ports are designed to accommodate NSN high-capacity/ low-capacity hybrid trunk cables (combined power and fiber optic), Goax Reuse, and NSN hybrid jumper cables. Lightweight serodynamic design provides maximum flexibility for tower top installation.





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

# INSTALLER NOTES:

AAFIA Prototype

NOKIA

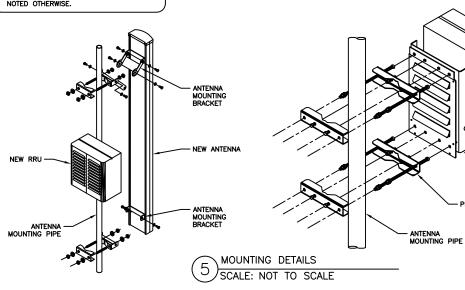
NOKIA – AAFIA

SCALE: NOT TO SCALE

COMPLY WITH MANUFACTURERS
INSTRUCTIONS TO ENSURE THAT ALL RRUS
RECEVE 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.

Size (HaWxD) in

Weight / Wind Sail



DC Surge Protection for RRH/RFM (High-Capacity Junction Box) ASU9338TYP01 (RNSNDC-7771-PF-48)



and induced surge currents of up ower (820).

Provides very low let through / ol ower, (820).

Provides very low let through / olamping 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 chips 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.

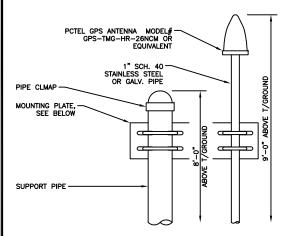
Offers unique maintenance-free protection against direct lightning currents.

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.



SHEET NUMBER:



00

0

MOUNTING PLATE

0 0

MINIMUM OF 75% OR 270° IN ANY DIRECTION OBSTRUCTIONS MUST BE BELOW 15\*

#### 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.

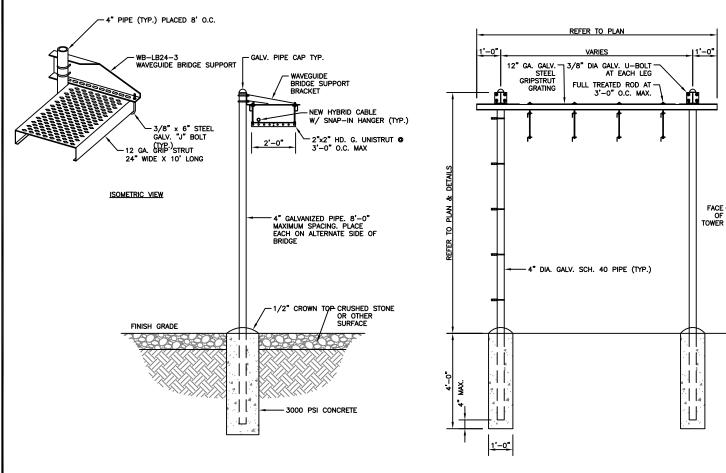
- ANTENNA MOUNT.
  IT IS CRITICAL THAT THE GPS ANTENNA IS MOUNTED SUCH THAT IT IS
  WITHIN 2 DEGREES OF VERTICAL AND THE BASE OF THE ANTENNA IS
  WITHIN 2 DEGREES OF LEVEL.
  DO NOT SWEEP TEST GPS ANTENNA.

GPS ANTENNA DETAIL SCALE: NOT TO SCALE

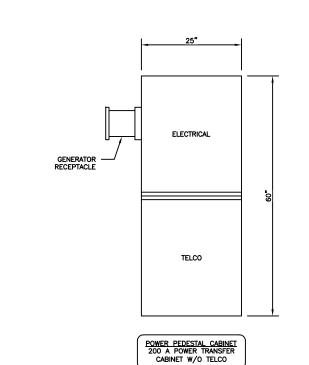
7/16" SLOTTED HOLE

(TYP. OF 8)

- 1/4" HOT DIP GALV. STEEL



ICE BRIDGE DETAIL SCALE: NOT TO SCALE



GENERAL CONSTRUCTION: SINGLE LAYER AL. ENCLOSURE, TYPE 3R 20 x 40 x 10 INCH APPROX. 75 LBS (WITHOUT PACKAGING) POLYESTER POWDER PAINT 3-POINT LATCHING, PAD LOCKABLE DIMENSIONS (WxHxD): WEIGHT: FINISH: DOOR LATCH: UL50 (CABINET)

ENVIRONMENT
OPERATING TEMPERATURE: -40°C TO +46°C (-40°F TO 115°F) HUMIDITY (RELATIVE): PROTECTION CLASS: AC SECTION 95%, NON-CONDENSING (MAX.)
TYPE 3R

240/120V SINGLE PHASE (3 WIRE + GROUND) 200A UTILITY 65,000 AMPS, PANLOC 10,000 AMPS GENERATOR INTERFACE: PANLOC™ (LEFT MOUNT) SERVICE DISCONNECT: SQUARE D 200 AMP MANUAL TRANSFER SWITCH VOLTAGE: CURRENT: AIC RATING:

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:

WEIGHT OF CABINET IS 150 LBS. NORTHERN TECHNOLOGIES, INC. PPC#CS7S2-W836-R OR APPROVAL EQUAL. SEE PPC CABINET DIAGRAM (1/E-2) FOR BREAKER REQUIREMENTS.

## NOTE:

WEIGHT OF CABINET IS 150 LBS.
NORTHERN TECHNOLOGIES, INC.
PPC#CS7S2-W836-R OR APPROVAL
EQUAL. SEE AC PANEL FOR BREAKER
REQUIREMENTS.

PPC UNIT SCALE: NOT TO SCALE





T-MOBILE SITE NUMBER: DN02415A

BU #: **877103** KEEBLER/COLORADO SPGS/CSP209

231 MAIN STREET COLORADO SPRINGS, CO 80911

EXISTING 60.0 FT MONOPOLE

#### ISSUED FOR: DATE DRWN DESCRIPTION A 07-10-2018 JAS PRELIMINARY ELG B 08-17-2018 JAS PRELIMINARY ELG 0 08-29-2018 IAS FINAL ELG FINAL



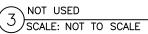
11/29/2018

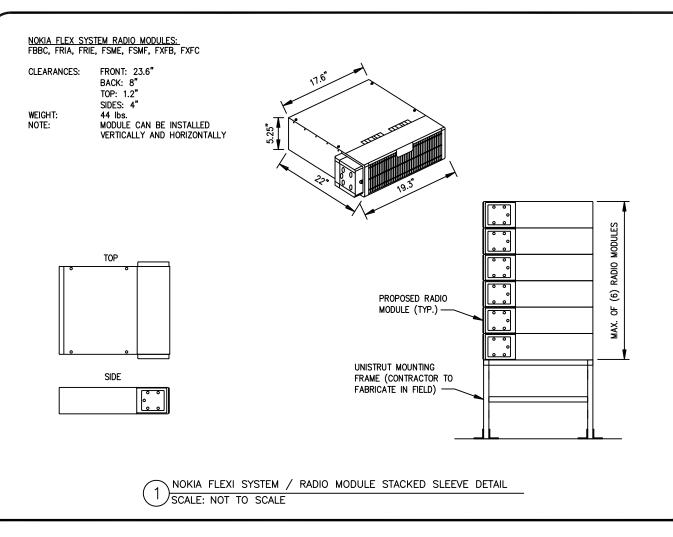
JACOB GORALSKI, PLLC

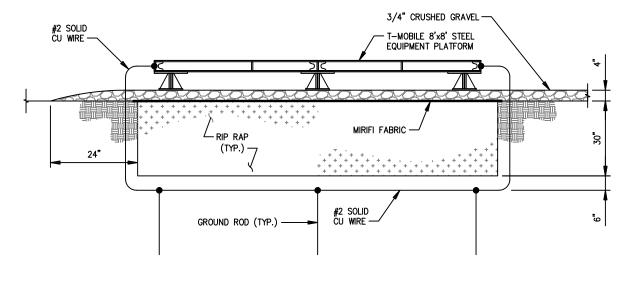
CONSULTING ENGINEER JACOB GORALSKI, PLLC CO PE# 0049661 1106 COLBI ST. KENNEDALE TX 76060 (817) 456-2621

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SHEET NUMBER:







STEEL EQUIPMENT PLATFORM GROUND DETAIL SCALE: NOT TO SCALE

NOTE: ROAD BASE BACKFILL COMPACTED ±95%

# 18400 E. 22ND AVENUE AURORA, CO 80011



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11/29/2018

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COD GURALSNI, PL CONSULTING ENGINEER JACOB GORALSKI, PLLC CO PE# 0049661 1106 COLBI ST. KENNEDALE, TX 76060 (817) 456-2621

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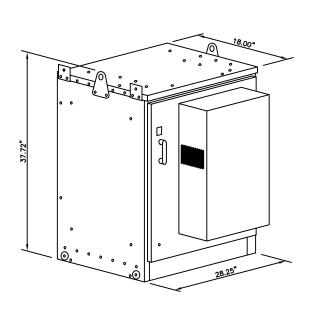
SHEET NUMBER:

# AirScale Subrack Outdoor AMOB datasheet

Environmental protection	IP55		
		Height	8U (354 mm)
eature description:		Width (front cover)	487mm
Outdoor Subrack for AirScale System	m Module Indoor plug-in units	Width (cabinet)	448mm (fits into 19 inch rack)
High performance Heat Exchanger	"HEX"		487mm (without conduit plugs or fittings)
Compatible with Flexi BTS mechan	ics stack/plinth/wall/pole/rack installation	Depth	Total 605mm (472mm from rack mounting surface)
	racks and cabinets if it follows clearances	Weights	23 kg AMOB enclosure 3 kg ASIA (Core Module)
	acks and cabinets in it follows clearances		2 kg ABIA (Expansion Module)
and airflow requirements			32 kg ½ Capacity (1 Core + 3 Expansion)
Possible to install AMOB inside FCC	DA cabinet		41 kg Full Capacity (2 Core + 6 Expansion)
Service doors on front and rear sig	les	Ingress Protection	IP55
service doors on front and real sid		Operating Temperature	-40°C up to +55°C (without solar radiation)
	448	Installation Temperature	-20°C - +55°C
HEX Assembly(~4U)		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)
PDU and Heater(~1U) ASIA+ABIA(3U)		Clearances for cooling	40 mm Minimum on the back and front side
ASIATABIA(3U)	80	Cold start	~2h from -40°C to -5°C  On from -40°C to -5°C  To Storional 2nd heater can be added to meet NAM requirement, cold start from -40°C  to -5°C in 1 hour instead of 2 hours
	472	Nominal supply voltage	-40.557 V DC
4.	8> 605	Input voltage range	Extended Service Voltage Range supported -36Vdc60Vdc Floating
		Volume	104.5L
		Mass capacity	Support Max 18Kg inside
© Nokia 2016	Confidential	Power consumption	Typical max ~265W (all fans at highest speed) Cold start ~6COW (heater On 55W + fans at low speed)
G NORIG ZOTO		Conduit cabe entry	2x1.5" + 3x 1" on each left and right side

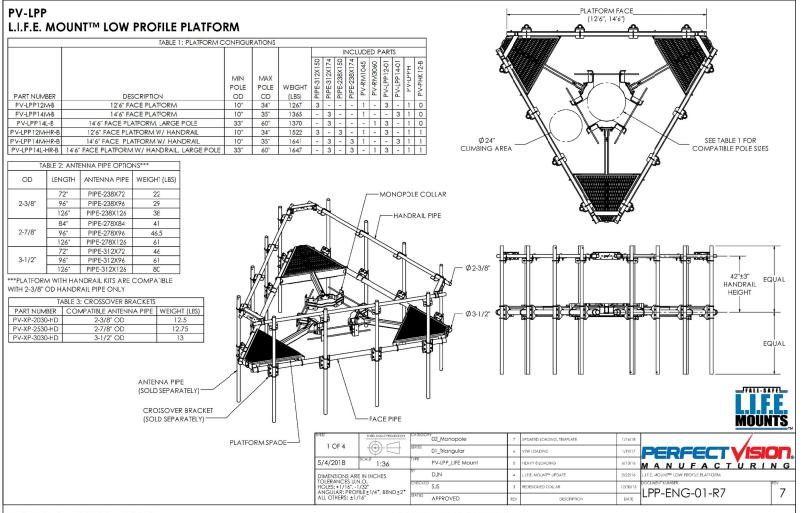
AMOB SPECIFICATIONS

SCALE: NOT TO SCALE



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

200AMP SITE SUPPORT CABINET SCALE: NOT TO SCALE



## 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)							
			REQUIR	ED EXTREME WIND I	OAD (LBS)		
		700	750	1150	1550	1800	
SS)	0	M750R (0)-4[6]	M750R(0)-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]	
REME NAD (LI	800	M750R (800)-4[6]	M750R(800)-4[6]	M1150R(800)-4[6]	M1550R(800)-4[6]	M1800R(800)-4[6]	
REQUIRED EXTREME IC LOAD (LBS	1100	M750R(1100)-4[6]	M750R (1100)-4[6]	M1150R (1100)-4[6]	M1550R(1100)-4[6]	M1800R(1100)-4[6]	
- G -	1250	M750R(1250)-4[6]	M750R (1250)-4[6]	M1150R (1250)-4[6]	M1550R(1250)-4[6]	M1800R(1250)-4[6]	

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 (ICKER BRACE TO AVOID POLE CRIMPING FAILURES. KICKER

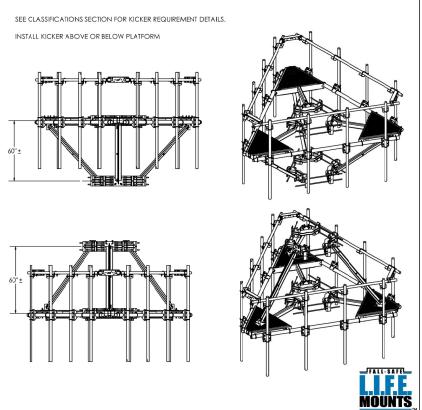
POLE THICKN	POLE THICKNESS LIMITATIONS						
MOUNT CLASSIFICATION	MINIMUM POLE THICKNESS						
M750R-4[6]	1/4"						
M800R-4[6]	1/4"						
M900R-4[6]	1/4"						
M950R-4[6]	1/4"						
M1000R-4[6]	5/16"						
M1400R-4[6]	5/16"						
M1000R(i)-4[6]	5/16"						
M1150R(i)-4[6]	5/16"						

#### PLATFORM EPA:

PL	ATFORM EPA	
PLATFORM TYPE	NO ICE (FT <sup>2</sup> )	1/2" RADIAL ICE (FT <sup>2</sup> )
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:



# 18400 E. 22ND AVENUE AURORA, CO 80011



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231 MAIN STREET COLORADO SPRINGS, CO 80911

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11/29/2018

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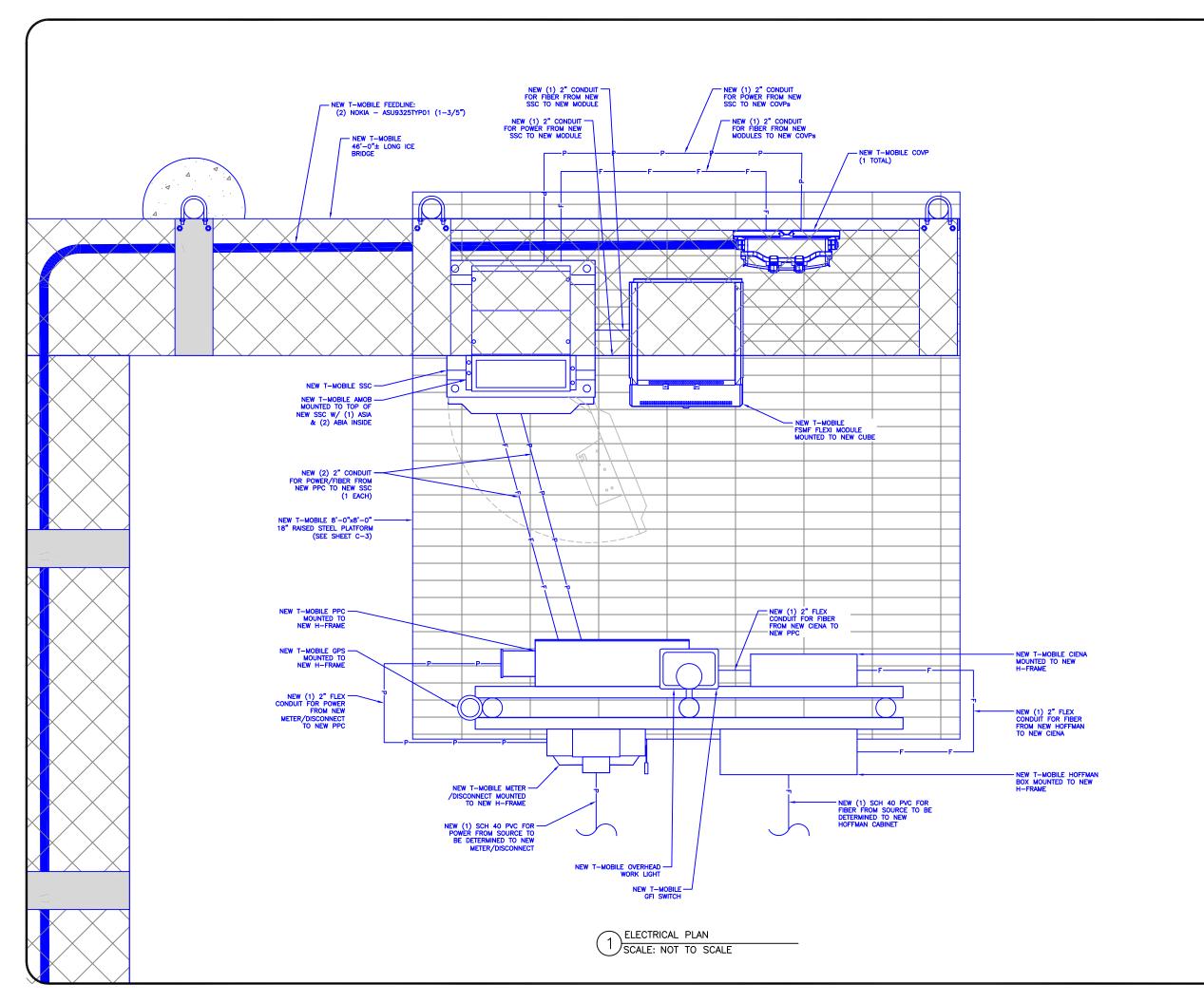
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SHEET NUMBER:

REVISION

PERFECT 10 PV-LPP12M-HR-B SCALE: NOT TO SCALE

02 Monopole PERFECT VISIOF 5/4/2018 PV-LPP\_LIFE Moun 1:48 MANUFACTURING DJN ULAR: PROFILE ± 1/4\*, BEND ±2\* LPP-ENG-01-R7







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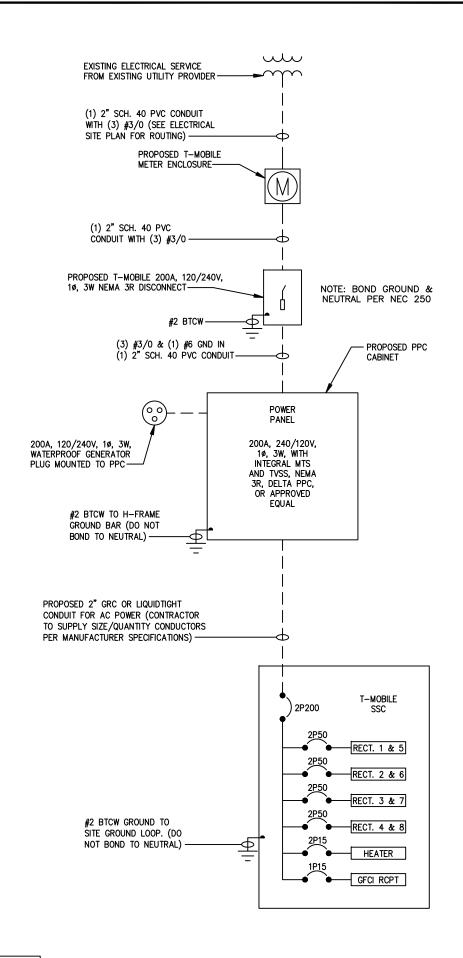
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SHEET NUMBER:

revision

1



ELECTRICAL ONE LINE DIAGRAM

SCALE: NOT TO SCALE

CONTRACTOR TO COORDINATE

WITH LOCAL UTILITY PROVIDER PRIOR TO CONSTRUCTION

PANEL: PPC

SPACE

120/240 VOLTS, 1 PHASE, 3 WIRE, S/N, 2004 AMP MCB NEMA 3R ENCL MINIMUM AIC RATING - 22,000A

23

**DESCRIPTION** BKR POLE CKT V۸ | φ | V۸ CKT POLE BKR **DESCRIPTION** SURGE PROTECTOR 30 2 --50 2 10 FAN 1 В SPACE 2P BRANCH --3 --4 RECEPTACLE/LIGHTS 5 230 SPACE 15 1 20 1000 20 HEATER В 2 SPACE 1000 10 2P BRANCH В 15,000 (N) DELTA SUPPORT CABINET SPACE 11 12 2 200 SPACE 13 15,000 \_\_ 14 SPACE 15 В 2P BRANCH --16 --\_\_ SPACE 17 18 \_\_ \_\_ SPACE 19 В 20 \_\_\_ \_\_ \_\_ \_\_\_ SPACE 21 Α --22 --\_\_

В

--

24

--

#### LOAD CALCULATIONS: PANEL

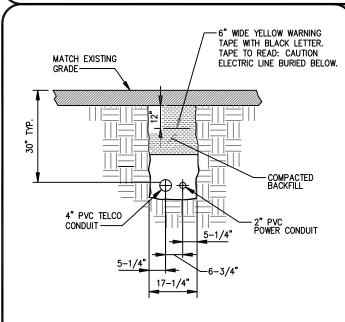
LIGHTS: 50 VOLTAMPS  $\times$  1.25 = 180 VOLTAMPS x 1.00 = MISC. EQUIPMENT:  $32050 \text{ VOLTAMPS} \times 1.00 = 32,050 \text{ VA}$  TOTAL CALCULATED CONNECTED LOAD: 32,280 VA TOTAL CALCULATED DEMAND LOAD: 32,293 VA

\_\_

TOTAL CALCULATED DEMAND LOAD. 135A 120/240V 1PH 3W

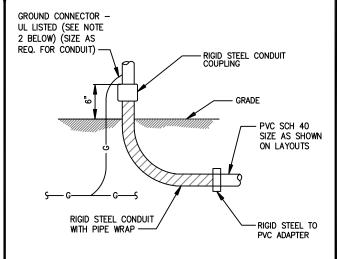
\_\_

BREAKER PANEL SCHEDULE (2) SCALE: NOT TO SCALE



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

> CONDUIT TRENCH DETAIL SCALE: NOT TO SCALE



 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 G90 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.

> UNDERGROUND CONDUIT STUB-UP SCALE: NOT TO SCALE





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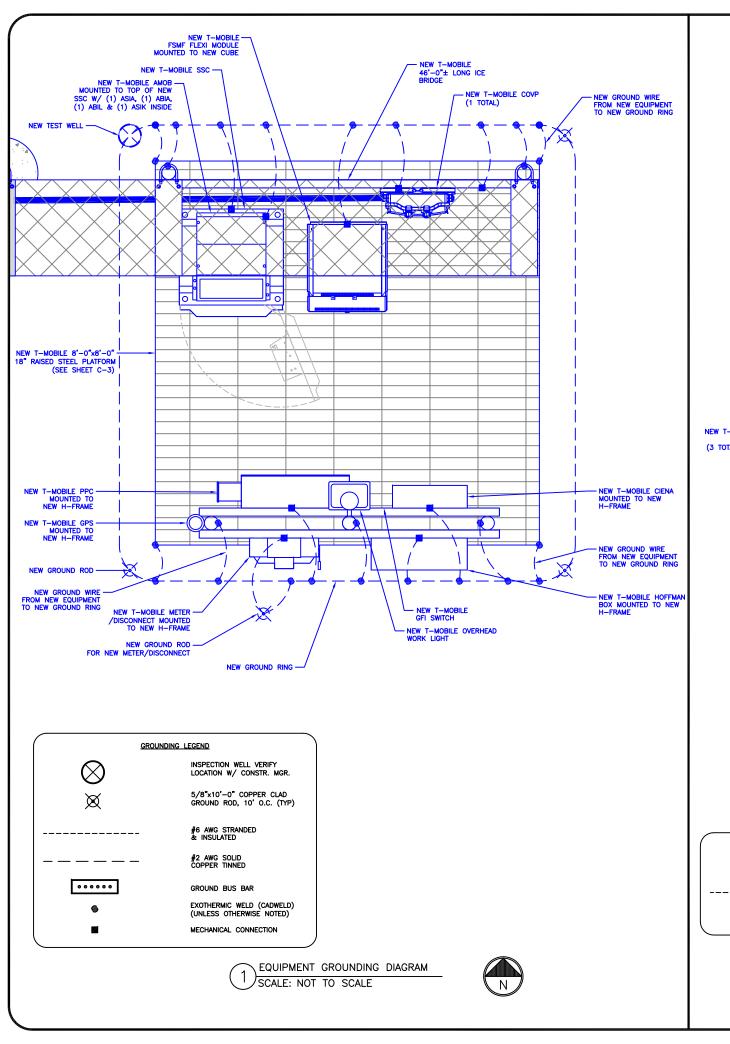
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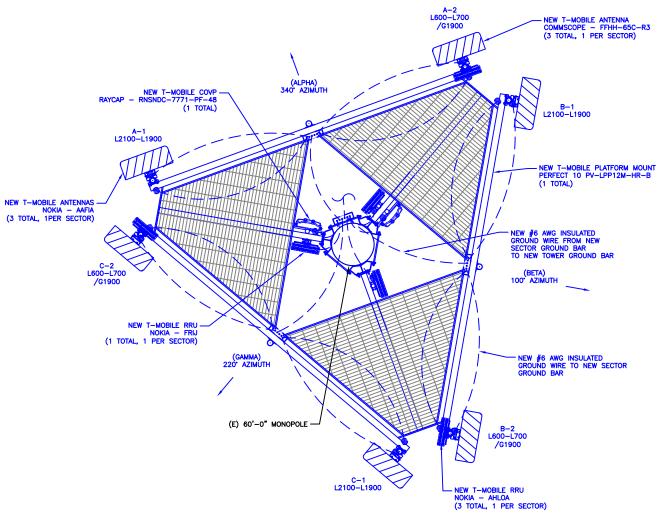
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SHEET NUMBER:





GROUNDING LEGEND

MECHANICAL CONNECTION

#6 AWG STRANDED & INSULATED

GROUND BUS BAR

ANTENNA GROUNDING PLAN SCALE: NOT TO SCALE



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



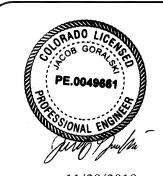
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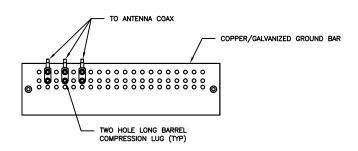
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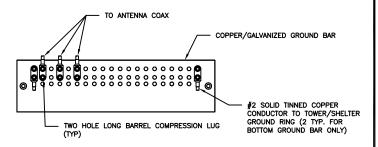
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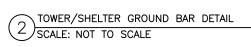


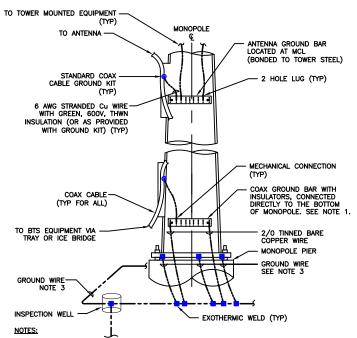
- 1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
- 2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
- 3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL.
- ANTENNA GROUND BAR DETAIL SCALE: NOT TO SCALE



#### NOTES:

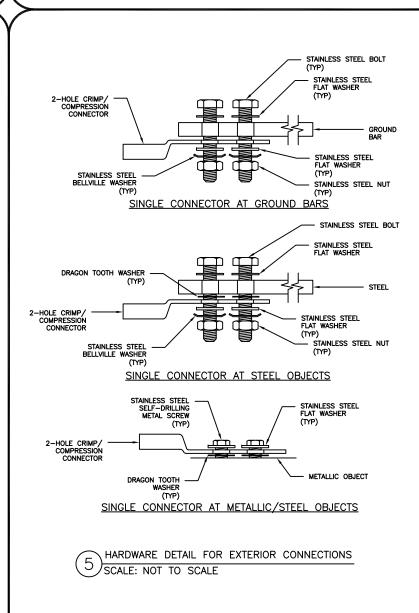
- 1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
- 2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
- 3. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

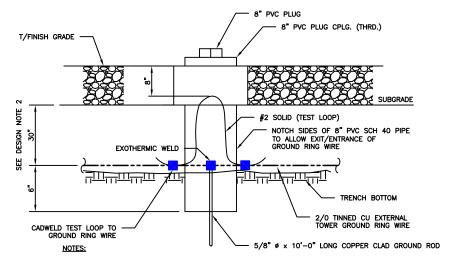




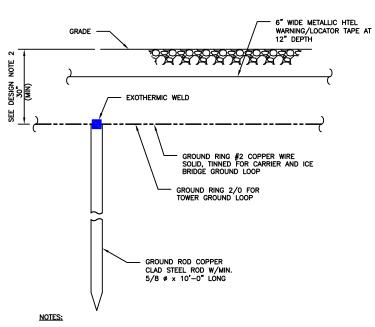
- NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATIONS AND CONNECTION ORIENTATION. COAXIAL CABLES EXCEEDING 200 FEET ON THE TOWER SHALL HAVE GROUND KITS AT THE MIDPOINT. PROVIDE AS REQUIRED.
- ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO CROWN CASTLE TOWERS. ALL MECHANICAL CONNECTIONS SHALL BE TREATED WITH AN ANTI-OXIDANT COATING.
- 3. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF THE RECOGNIZED EDITION OF ANSI/TIA 222 AND NFPA 780.

TYPICAL ANTENNA CABLE GROUNDING (4) SCALE: NOT TO SCALE





- GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
- GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE.
   (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)
- INSPECTION WELL DETAIL SCALE: NOT TO SCALE



- GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
   GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

GROUND ROD DETAIL (6) SCALE: NOT TO SCALE

# 18400 E. 22ND AVENUE AURORA, CO 80011



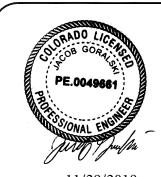
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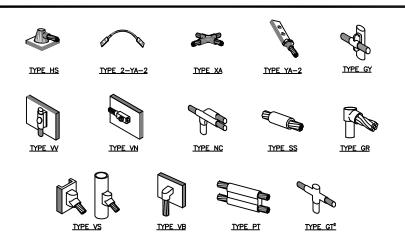
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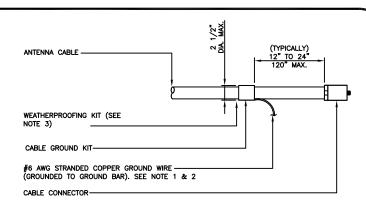
SHEET NUMBER



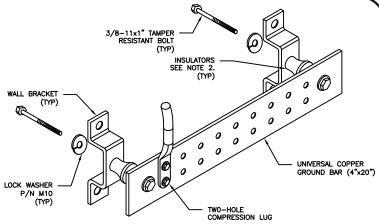
#### NOTE:

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

CADWELD GROUNDING CONNECTIONS SCALE: NOT TO SCALE



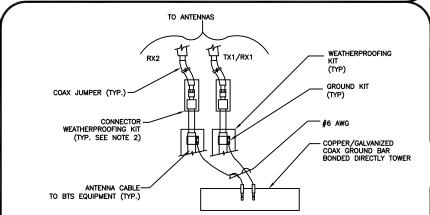
- Do not install cable ground kit at a bend and always direct ground wire down to ground bar.
- GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
- WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT
- CABLE GROUND KIT CO SCALE: NOT TO SCALE CABLE GROUND KIT CONNECTION



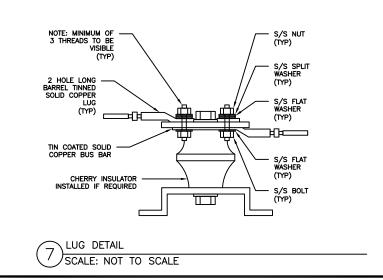
1. DOWN LEAD (HOME RUN) CONDUCTORS ARE <u>NOT</u> TO BE INSTALLED ON CROWN CASTLE TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS—STD—10091. NO MODIFICATION OR POILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD—WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.

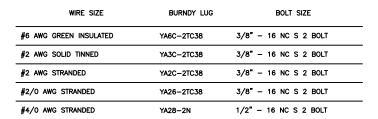
2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

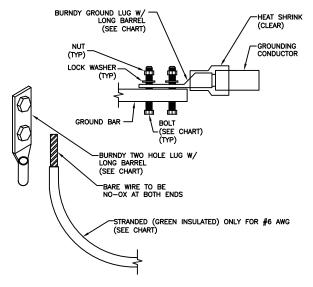
GROUND BAR DETAIL (6) SCALE: NOT TO SCALE



- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
- WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.
- GROUND CABLE CONNECTION (4) SCALE: NOT TO SCALE



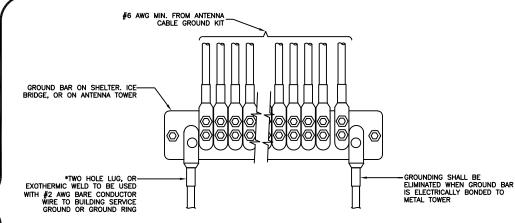




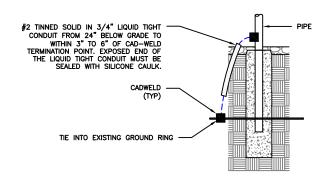
#### NOTES:

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.

MECHANICAL LUG CONNECTION SCALE: NOT TO SCALE



GROUNDWIRE INSTALLATION SCALE: NOT TO SCALE



TRANSITIONING GROUND DETAIL (8) SCALE: NOT TO SCALE

18400 E. 22ND AVENUE AURORA, CO 80011



T-MOBILE SITE NUMBER: DN02415A

BU #: **877103** KEEBLER/COLORADO SPGS/CSP209

231 MAIN STREET COLORADO SPRINGS, CO 80911

EXISTING 60.0 FT MONOPOLE

ISSUED FOR:						
REV	DATE	DRWN	DESCRIPTION	DES./QA		
Α	07-10-2018	JAS	PRELIMINARY	ELG		
В	08-17-2018	JAS	PRELIMINARY	ELG		
0	08-29-2018	JAS	FINAL	ELG		
1	11-20-2018	JAS	FINAL	ELG		
1				4		



11/29/2018

JACOB GORALSKI, PLLC

CONSULTING ENGINEER JACOB GORALSKI, PLLC CO PE# 0049661 1106 COLBI ST. KENNEDALE, 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