





PROJECT: DO MACRO UPGRADE

SITE NAME: **USWW MANITOU WATER**

SITE CASCADE: **DN14XC247**

ADDRESS: 7353 W. HWY 24

> **CASCADE, CO 80809 EL PASO COUNTY**

LATITUDE: 38.88689° N / 38° 53' 12.8" N LONGITUDE: 104.95846° W / 104° 57' 30.5" W

SITE TYPE: MONOPOLE

SITE INFORMATION

PROPERTY OWNER:

GEORGE VAHSHOLTZ 7225 WEST HIGHWAY 24 MANITOU SPRINGS, CO 80829 GEORGE VAHSHOLTZ

APPLICANT: SPRINT GROUND ELEVATION: ±7460'

LAT/LONG TYPE: NAD-83

LATITUDE: 38.88689° N / 38° 53' 12.8" N LONGITUDE: 104.95846° W / 104° 57' 30.5" W

ZONING JURISDICTION: EL PASO COUNTY

ZONING CLASSIFICATION: RESIDENTIAL - TOPOGRAPHIC (R-T) UNMANNED TELECOMMUNICATIONS FACILITY

CURRENT USE:

ASSESSOR'S PARCEL NO.: 83264-00-018 UNMANNED TELECOMMUNICATIONS FACILITY PROPOSED USE:

TYPE OF CONSTRUCTION: V-B OCCUPANCY GROUP:

AREA MAP

PROJECT DESCRIPTION SPRINT PROPOSES TO MODIFY AN EXISTING WIRELESS INSTALLATION, THE SCOPE WILL CONSIST O EXISTING SPRINT PANEL ANTENNAS EXISTING SPRINT 1900 RRU'S TO ANTENNA LEVEL RELOCATE INSTALL NEW SPRINT MONOPOLE MOUNT NEW SPRINT PANEL ANTENNAS NEW SPRINT FAILE AND ALEVEL NEW SPRINT HYBRID CABLE NEW SPRINT HYBRID CABLE NEW SPRINT POWER JUNCTION CYLINDERS NEW SPRINT FIBER JUNCTION CYLINDERS NEW SPRINT BATTERIES IN EXISTING BBU CABINET INSTAL INSTALL NEW SPRINT 2.5GHz BASEBAND UNIT IN EXISTING MMBS CABINET NEW SPRINT QUADPLEXERS

NO NEW AC ELECTRICAL WORK IS INCLUDED IN THE SCOPE OF THIS PROJECT

DRAWING INDEX SHEET TITLE SHEET NO: T-1 TITLE SHEET GN-1 GENERAL NOTES GN-2 GENERAL NOTES A-1 SITE PLAN A-2 EQUIPMENT LAYOUT A-3 ANTENNA LAYOUT A-4 ELEVATIONS A-5 COLOR CODING D-1 EQUIPMENT DETAILS D-2 EQUIPMENT DETAILS D-3 EQUIPMENT DETAILS E-1 GENERAL ELECTRICAL NOTES E-2 ONE-LINE DIAGRAM F-3 PANEL SCHEDULE E-4 ANTENNA GROUNDING PLAN AND DIAGRAM E-5 GROUNDING DETAILS RF-1 RADIO FREQUENCY DATA SHEET

PROJECT TEAM

REAL ESTATE MANAGER: CONTACT: CHRISTINE POULIGNOT CONTACT: CHRISTINE POULIGNOT
REAL ESTATE MANAGER - COLORADO
SPRINT NEXTEL CORPORATION
C/O CHRISTINE POULIGNOT
MAILSTOP: COENGJ0201 333 INVERNESS DRIVE SOUTH ENGLEWOOD, CA 80112 PH: (720) 329-7993 EMAIL:christine.poulignot@sprint.con

SITE ACQUISITION
M SQUARED WIRELESS
CONTACT: MATTHEW BABB

1387 CALLE AVANZADO SAN CLEMENTE, CA 92673

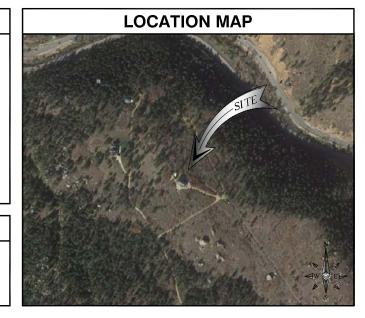
ENGINEER: M SQUARED WIRELESS M SQUARED WIRELESS
1387 CALLE AVANZADO
SAN CLEMENTE, CA 92673
CONTACT: MICHAEL MONTELLO
EMAIL: michael@msquaredwireless.com

RF ENGINEER:
CONTACT: NEERAJ BERI
PH: (440) 222-8729
EMAIL: neeraj.beri@sprint.com

CONSTRUCTION MANAGER: CONTACT: BRANDON WHINERY

GENERAL NOTES

ACCESS REQUIREMENTS ARE NOT REQUIRED IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE, A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS NEW.



ALL WORK AND MATERIALS SHALL BE PERFORMED AND 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

- 2015 INTERNATIONAL BUILDING CODE
- 2014 NATIONAL ELECTRICAL CODE LOCAL BUILDING CODES CITY/COUNTY ORDINANCES

APPLICABLE CODES

	LOCAL BUILDING DEPARTM	IENT & MAY IMPOSE CHANGES OR MODIFICATIONS.		
	SPRINT RF ENGINEER:		DATE:	
	SPRINT OPERATIONS: _		DATE:	
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APPROVALS

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS & AUTHORIZE THE SUBCONTRACTOR

TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE

SITE ACQUISITION: CONSTRUCTION MANAGER: PROPERTY OWNER

PROJECT MANAGER:

DO NOT SCALE DRAWINGS

SUBCONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS & FIELD CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.





DRAWN BY:	МВ
CHECKED BY:	ММ

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	A	01/10/2019	100% CD - JX COMMENTS
	0	12/11/2017	100% CD - BP SUBMITTAL
	В	11/30/2017	90% CD'S - REVISED
	Α	11/2/2017	90% CD'S FOR REVIEW
	REV	DATE	DESCRIPTION



IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THE PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT

> **USWW MANITOU WATER** DN14XC247 7353 W HWY 24 CASCADE, CO 80809 MONOPOLE

> > SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

SECTION 01 100 - SCOPE OF WORK:

THE WORK: SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF.

PRECEDENCE:
SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE.

SITE FAMILIARITY:
CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION.

ON-SITE SUPERVISION:
TECHNICURE SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNICURES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE:
THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.

- A. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. PROVIDE ALL MATERIALS AND LABOR AS REQUIRED TO PROVIDE A COMPLETE AND FUNCTIONING SYSTEM. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
- B. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK, DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE, MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
- C. MARK THE FIELD SET OF DRAWINGS IN RED, DOCUMENTING ANY CHANGES FROM THE CONSTRUCTION DOCUMENTS.

METHODS OF PROCEDURE (MOPS) FOR CONSTRUCTION:
CONTRACTOR SHALL PERFORM WORK AS DESCRIBED IN THE FOLLOWING INSTALLATION AND COMMISSIONING MOPS.

- A. TOP HAT B. HOW TO INSTALL A NEW CABINET C. BASE BAND UNIT IN EXISTING UNIT D. INSTALLATION OF BATTERIES
- E. INSTALLATION OF HYBRID CABLE
- . INSTALLATION OF RRU'S
- 1 INSTALLATION OF TAXOS G. CABLING H. TS-0200 REV 4 ANTENNA LINE ACCEPTANCE STANDARDS
- I. SPRINT CELL SITE ENGINEERING NOTICE EN 2012-001, REV 1.
- J. COMMISSIONING MOPS
- K. GROUNDING NE-312-201
- L. SPRINT INTEGRATED CONSTRUCTION STANDARDS VERSION 4.0

SECTION 01 200 - COMPANY FURNISHED MATERIAL AND EQUIPMENT

COMPANY FURNISHED MATERIAL AND EQUIPMENT IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DRAWINGS,

CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND FOLIPMENT TO ENSURE IT IS PROTECTED AND HANDLED PROPERLY THROUGHOUT THE CONSTRUCTION DURATION.

CONTRACTOR IS RESPONSIBLE FOR RECEIPT OF SPRINT FURNISHED EQUIPMENT AT CELL SITE OR CONTRACTORS LOCATION. CONTRACTOR TO COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE.

SECTION 01 300 - CELL SITE CONSTRUCTION

NOTICE TO PROCEED: NO WORK SHALL COMPLETE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF WORK ORDER.

SITE CLEANLINESS:
CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

SECTION 01 400 - SUBMITTALS & TESTS

ALTERNATES:
AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINTS CONSTRUCTION MANAGER FOR APPROVAL, SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING, NO VERBAL APPROVALS WILL BE CONSIDERED.

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTION AND PROJECT DOCUMENTATION.

B, CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. COAX SWEEPS AND FIBER TESTS PER TS-0200 REV 4 ANTENNA LINE ACCEPTANCE STANDARDS.

2. AGL. AZIMUTH AND DOWNTILT PROVIDE AN AUTOMATED REPORT UPLOADED TO SITERRA USING A COMMERCIAL MADE-FOR THE PURPOSE ELECTRONIC ANTENNA ALIGNMENT TOOL (AAT). INSTALLED AZIMUTH, CENTERLINE AND DOWNTILT MUST CONFORM WITH RF CONFIGURATION DATA.

3 CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.

4. ALL TESTING REQUIRED BY APPLICABLE INSTALLATION MOPS

C. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

1. AZIMUTH, DOWNTILT, AGL FROM SUNSIGHT INSTRUMENTS - ANTENNA ALIGNMENT TOOL (ATT)

3. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT

4. ALL AVAILABLE JURISDICTIONAL INFORMATION

5. PDF SCAN REDLINES PRODUCED IN FIELD

6. A PDF SCAN OF RELINE MARK-UPS SUITABLE FOR USE IN ELECTRONIC AS-BUILT DRAWING PRODUCTION

7. LIEN WAIVERS

8. FINAL PAYMENT APPLICATION

10. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS

11, ALL POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED IN SITERRA (SPRINTS DOCUMENT REPOSITORY

12. CLOSEOUT PHOTOGRAPHS:

a. PROVIDE PHOTOGRAPHS OF FINAL PROJECT PER THE FOLLOWING LIST. ADDITIONAL PHOTOGRAPHS MAY BE REQUIRED TO SUPPORT ACCEPTANCE PROCESSES

- (I) MAIN HYBRID CABLE ROLLTE (MINIMUM TWO PHOTOS).

- (I) MAIN HTBRILD ABLE ROULE (MINIMOM I YOF PHOTOS)

 (I) PHOTOS OF EACH ANTENNA AND RRU

 (III) MANUFACTURERS NAME TAG FOR ALL SERIALIZED EQUIPMENT

 (IV) PULL AND DISTRIBUTION BOXES INTERMEDIATE BETWEEN RRUS AND MMBS (DOOR OPEN)

 (V) MMBS CABINET WITH DOOR OPEN SHOWING MODIFICATIONS

- (VI) POWER CABINET, DOORS OPEN, BATTERIES INSTALLED (VII) BREAK OUT CYLINDERS
- (VIII) ASR SIGNAGE FOR SPRINT OWNED TOWERS
- (IX) RADIATION EXPOSURE WARNING SIGNS
- PHOTOGRAPH FROM EACH SECTOR FROM APPROXIMATELY RAD CENTER OF ANY NEW ANTENNA AT HORIZON.

b. LOAD PHOTOS TO SITERRA PROJECT LIBRARY IS. IN IS CREATE NEW CATEGORY; 2.5 DEPLOYMENT AND SECTION; PERMANENT CONSTRUCTION, LABEL PHOTOS WITH SITE CASCADE AND VIEW BEING DEPICTED. CAMERAS USED TO TAKE PHOTOGRAPHS SHALL GPS ENABLED SUCH THAT THE GPS COORDINATED ARE INCLUDED IN THE PHOTO MEDIA-FILE INFORMATION.

COMMISSIONING: PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPS

INTEGRATION:
PERFORM ALL INTEGRATION ACTIVITIES AS REQUIRED BY APPLICABLE MOPS

SECTION 07 500 - ROOF CUTTING, PATCHING AND REPAIR

SUMMARY:
THIS SECTION SPECIFIES CUTTING AND PATCHING EXISTING ROOFING SYSTEMS WHERE CONDUIT OR CABLES EXIT THE
BUILDING-MOUNTED ANTENNAS, AND AS REQUIRED FOR WATERTIGHT PERFORMANCE, ROOFTOP ENTRY OPENINGS IN MEMBRANE
ROOFTOPS SHALL BE CONSTRUCTED TO COMPLY WITH LANDLORD, ANY EXISTING WARRANTY, AND LOCAL JURISDICTIONAL STANDARDS.

1.4 SUBMITTALS:

A, PRE-CONSTRUCTION ROOF PHOTOS; COMPLETE A ROOF INSPECTION PRIOR TO THE INSTALLATION OF SPRINT EQUIPMENT ON ANY ROOFTOP BUILD. AT A MINIMUM INSPECT AND PHOTOGRAPH (MINIMUM 3 EA.) ALL AREAS IMPACTED BY THE ADDITION

B. PROVIDE SIMILAR PHOTOGRAPHS SHOWING ROOF CONDITIONS AFTER CONSTRUCTION (MINIMUM 3 EA.)

C. ROOF INSPECTION PHOTOGRAPHS SHOULD BE UPLOADED WITH CLOSEOUT PHOTOGRAPHS.

QUALITY ASSURANCE:

A. COMPLY WITH COVERING CODES AND REGULATIONS, PROVIDE PRODUCTS OF ACCEPTABLE MANUFACTURERS WHICH HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR THREE YEARS. USE EXPERIENCED INSTALLERS. DELIVER, HANDLE, AND STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS

B. COMPLY WITH ALL ENVIRONMENTAL REGULATIONS FOR VOLATILE ORGANIC COMPOUNDS.

MATERIALS:

A. MANUFACTURERS; BENJAMIN MOORE, ICI DEVOE COATINGS, PPG, SHERWIN WILLIAMS OR APPROVED EQUAL, PROVIDE PREMIUM GRADE, PROFESSIONAL - QUALITY PRODUCTS FOR COATING SYSTEMS.

A. EXTERIOR ANTENNAS AND ANTENNA MOUNTING HARDWARE: ONE COAT OF PRIMER AND TWO FINISH COATS, PAINT FOR ANTENNAS SHALL BE NON-METALLIC BASED AND CONTAIN NO METALLIC PARTICLES, PROVIDE COLORS AND PATTERNS AS REQUIRED TO MASK APPEARANCE OF ANTENNAS. ON ADJACENT BUILDING SURFACES AND AS ACCEPTABLE TO THE OWNER. REFER TO ANTENNA MANUFACTURER'S INSTRUCTIONS WHENEVER POSSIBLE.

B. ROOF TOP CONSTRUCTION: TOUCH UP - PREPARE SURFACES TO BE REPAIRED. FOLLOW INDUSTRY STANDARDS AND REQUIREMENTS OF OWNER TO MATCH EXISTING COATING AND FINISH.

PAINTING APPLICATION

1. INSPECT SURFACES, REPORT UNSATISFACTORY CONDITIONS IN WRITING; BEGINNING WORK MEANS ACCEPTANCE OF SUBSTRATE.

2, COMPLY WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR PREPARATION, PRIMING AND COATING WORK, COORDINATE WITH WORK OF OTHER SECTIONS.

 $3.\,MATCH$ APPROVED MOCK-UPS FOR COLOR, TEXTURE, AND PATTERN. RE-COAT OR REMOVE AND REPLACE WORK WHICH DOES NOT MATCH OR SHOWS LOSS OF ADHESION.

4. CLEAN UP, TOUGH UP AND PROTECT WORK.

TOUCHUP PAINTING

I. GALVANIZING DAMAGE AND ALL BOLTS AND NUTS SHALL BE TOUCHED UP AFTER TOWER ERECTION WITH "GALVANOX", "DRY

2. FIELD TOUCHUP PAINT SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.

3. ALL METAL COMPONENTS SHALL BE HANDLED WITH CARE TO PREVENT DAMAGE TO THE COMPONENTS. THEIR PRESERVATIVE TREATMENT, OR THEIR PROTECTIVE COATINGS.

SECTION 11 700 - ANTENNA ASSEMBLY, REMOTE RADIO UNITS AND CABLE INSTALLATION

<u>SUMMARY:</u> THIS SECTION SPECIFIES INSTALLATION OF ANTENNAS, RRU'S, AND CABLE EQUIPMENT, INSTALLATION, AND TESTING OF COAXIAL FIBER CABLE

ANTENNAS AND RRUS: THE NUMBER AND TYPE OF ANTENNAS AND RRU'S TO BE INSTALLED IS DETAILED ON THE CONSTRUCTION DRAWINGS.

THE WAS CABLE WILL BE DO/FIBER AND FURNISHED FOR INSTALLATION AT EACH SITE, CABLE SHALL BE INSTALLED PER THE CONSTRUCTION DRAWINGS AND THE APPLICABLE MANUFACTURER'S REQUIREMENTS.

JUMPERS AND CONNECTORS:
FURNISH AND INSTALL 1/2" COAX JUMPER CABLES BETWEEN THE RRU'S AND ANTENNAS. JUMPERS SHALL BE TYPE LDF 4, FLC 12-50,
CR 540, OR FXL 540, SUPER-FLEX CABLES ARE NOT ACCEPTABLE. JUMPERS BETWEEN THE RRU'S AND ANTENNAS OR TOWER TOP
AMPLIFIERS SHALL CONSIST OF 1/2 INCH FOAM DIELECTRIC, OUTDOOR RATED COAXIAL CABLE. DO NOT USE SUPER-FLEX OUTDOORS, MAXIMUM OF 4 FEET EXCESS PER JUMPER AND HAVE CONNECTORS AT EACH END. MANUFACTURED BY SUPPLIER, IF JUMPERS ARE FIELD FABRICATED, FOLLOW MANUFACTURER'S REQUIREMENTS FOR INSTALLATION OF CONNECTORS.

REMOTE ELECTRICAL TILT (RET) CABLES:

MISCELLANEOUS: INSTALL SPLITTERS, COMBINERS, FILTERS PER RF DATA SHEET, FURNISHED BY SPRINT.

ANTENNA INSTALLATION:
THE CONTRACTOR SHALL ASSEMBLE ALL ANTENNAS ONSITE IN ACCORDANCE WITH THE INSTRUCTIONS SUPPLIED BY THE MANUFACTURER, ANTENNA HEIGHT, AZIMUTH, AND FEED ORIENTATION INFORMATION SHALL BE A DESIGNATED ON THE

A. THE CONTRACTOR SHALL POSITION THE ANTENNA ON TOWER PIPE MOUNTS SO THAT THE BOTTOM STRUT IS LEVEL. THE PIPE MOUNTS SHALL BE PLUMB TO WITHIN 1 DEGREE.

B. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE DRAWINGS.

A. THE CONTRACTOR SHALL ROUTE, TEST, AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAN THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADII

C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.

FASTENING MAIN HYBRID CABLES: ALL CABLES SHALL BE PERMANENTLY FASTENED TO THE COAX LADDER AT 4'-0" OC USING NON-MAGNETIC STAINLESS STEEL CLIPS.

2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA), WITHIN THE MMBS CABINET AND

a. FIBER: SUPPORT FIBER BUNDLES USING 1/2" VELCRO STRAPS OF THE REQUIRED LENGTH O 18" OC. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR

b, DC; SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH, ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL

3. FASTENING JUMPERS: SECURE JUMPERS TO THE SIDE ARMS OR HEAD FRAMES USING STAINLESS STEEL TIE WRAPS OR STAINLESS STEEL BUTTERFLY CLIPS.

4. CABLE INSTALLATION:

a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE. NOTIFY THE CONSTRUCTION MANAGER.

b. CABLE ROUTING: CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOP AS INDICATED ON THE DRAWINGS.

c. HOIST CABLE USING PROPER HOISTING GRIPS, DO NOT EXCEED MANUFACTURERS RECOMMENDED MAXIMUM BEND

5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS

6, HYBRID CABLE COLOR CODING; ALL COLOR CODING SHALL BE AS REQUIRED IN TS 0200 REV 4

7. HYBRID CABLE LABELING; INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001 REV 4.

WATERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS

A. ALL FIBER & COAX CONNECTORS AND GROUND KITS SHALL BE WATERPROOFED.

B. WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.

1 COLD SHRINK: ENCOMPASS CONNECTOR IN COLD SHRINK TUBING AND PROVIDE A DOUBLE WRAP OF 2" ELECTRICAL

2. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF-AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF-AMALGAMATING TAPE.

3. 3M SLIM LOCK CLOSURE 716; SUBSTITUTIONS WILL NOT BE ALLOWED.

4. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).

SECTION 11 800 - INSTALLATION OF MULTIMODAL BASE STATIONS (MMBS) AND RELATED EQUIPMENT

SUMMARY: A. THIS SECTION SPECIFIES MMBS CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE AND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE

B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANFOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY TH APPLICABLE INSTALLATION MOPS

C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS.

DC CIRCUIT BREAKER LABELING A. LABEL CIRCUIT BREAKERS ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1.

SECTION 11 800 - INSTALLATION OF MULTIMODAL BASE STATIONS (MMBS) AND RELATED EQUIPMENT

A. THIS SECTION SPECIFIES MMBS CABINETS. POWER CABINETS. AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT F FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).

B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS.

C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS.

A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE

PRODUCTS BY THE FOLLOWING:

1. ALLIED TUBE AND CONDUIT 2. B-LINE SYSTEM

3. SUNISTRUT DIVERSIFIED PRODUCTS

4. THOMAS & BETTS

B. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS FOLLOWS:

1. EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE.

2. POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DESIGNED SPECIFICALLY FOR THE INTENDED SERVICE.

3. FASTEN BY MEANS OF WOOD SCREWS ON WOOD

4. TOGGLE BOLTS ON HOLLOW MASONRY UNITS.

5. CONCRETE INSERTS OF EXPANSION BOLTS ON CONCRETE OR SOLID MASONRY 6. MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS ON STEEL.

7. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE SHALL NOT BE PERMITTED.

8. DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER THAN THREADED STUDS TO STEEL STRUCTURES. 9. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET METAL SCREWS.

SUPPORTING DEVICES

A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY IN ACCORDANCE WITH NEC.
B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER TRADES.

- C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE STRUCTURE IN ACCORDANCE WITH THE FOLLOWING:

 D. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.

 E. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS.





CKED BY:	М
01/10/2019	100% CD - JX COMMENTS
12/11/2017	100% CD - BP SUBMITTAL
11/30/2017	90% CD'S - REVISED
11/2/2017	90% CD'S FOR REVIEW
DATE	DESCRIPTION
	12/11/2017 11/30/2017 11/2/2017



PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT

35272

RADO LICENS

USWW MANITOU WATER DN14XC247 7353 W HWY 24 CASCADE, CO 80809 MONOPOLE

> SHEET TITLE SITE PLAN

SHEET NUMBER

GN-1

ELECTRICAL IDENTIFICATION:

A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN THE MOUNTING BRACKET, INSIDE DOORS OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM.

BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM.

B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUIPMENT SHALL BE CLEARLY IDENTIFIED AS SUCH AT THE

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

CONDUIT:

A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFURNISHED INTERIOR LOCATIONS AND FOR ENCASED RUNS IN CONCRETE, RIGID CONDUIT AND FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZING PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS C80.1, FEDERAL SPECIFICATION WW-C-SSI AND SHALL BE LISTED WITH THE UNDERWINTERS' LABORATORIES. FITTING WILL NOT BE ACCEPTABLE. RGS CONDUITS SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.

B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE FOR DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL.

C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.

D, EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED FINISHED SPACES CONCEALED IN WALLS AND CEILINGS, EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION C80.3, FEDERAL SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTING SHALL BE METALLIC COMPRESSION. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE.

E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FINAL CONNECTION TO EQUIPMENT. FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE, MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6-FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRE BY NEC. MANUFACTURERS OF FLEXIBLE CONDUITS SHALL BE CAROL, ANACONDA METAL. HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL.

F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21 MM).

HUBS AND BOXES:

A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED. HUB SHALL INCLUDE LOCKNUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION.

B. CABLE TERMINATION FITTINGS FOR CONDUIT

- 1. CABLE TERMINATORS FOR RGS CONDUIT SHALL BE TYPE CRC BY O-Z/GEDNEY OR EQUAL
- 2. CABLE TERMINATORS FOR LFMC SHALL BE ETCO CL2075; OR MADE FOR THE PURPOSE PRODUCTS BY ROXTEC.

C. EXTERIOR PULL BOXES AND PULL BOXES IN INTERIOR INDUSTRIAL AREAS SHALL BE PLATED CAST ALLOY, HEAVY DUTY, WEATHERPROOF, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS WAB SERIES OR EQUAL.

D. CONDUIT OUTLET BODIES SHALL BE PLATED CAST ALLOY WITH SIMILAR GASKET COVERS. OUTLET BODIES SHALL BE OF THE CONFIGURATION AND SIZE SUITABLE FOR THE APPLICATION. PROVIDE CROUSE-HINDS FORM 8 OR EQUAL.

E. MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE-HIND, COOPER, ADALET, APPLETON, O-Z GEDNEY, RACO. OR APPROVED EQUAL.

SUPPLEMENTAL GROUNDING SYSTEM

A, FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM AS INDICATED ON THE DRAWINGS, SUPPORT SYSTEM WITH NON-MAGNETIC STAINLESS STEEL CLIPS WITH RUBBER GROMMETS, GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS, PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS AS INDICATED.

B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH CAD WELDS, EXCEPT AT EQUIPMENT USE LUGS OR OTHER AVAILABLE GROUNDING MEANS AS REQUIRED BY MANUFACTURER; AT GROUND BARS USE TWO HOLE SPADES WITH NO OX.

C. STOLEN GROUND-BARS: IN THE EVENT OF STOLEN GROUND BARS, CONTACT SPRINT CM FOR REPLACEMENT INSTRUCTION USING THREADED ROD KITS.

EXISTING STRUCTURE:

A. EXISTING EXPOSED WIRING AND ALL EXPOSED OUTLETS, RECEPTACLES, SWITCHES, DEVICES, BOXES, AND OTHER EQUIPMENT THAT ARE NOT TO BE UTILIZED IN THE COMPLETED PROJECT SHALL BE REMOVED OR DE-ENERGIZED AND CAPPED IN THE WALL, CEILING, OR FLOOR SO THAT THEY ARE CONCEALED AND SAFE, WALL, CEILING, OR FLOOR SHALL BE PATCHED TO MATCH THE ADJACENT CONSTRUCTION.

CONDUIT AND CONDUCTOR INSTALLATION:

A. 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 OUTLETS DOILS CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CELLING LINES, ALL CONDUIT SHALL BE FINISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUIT SHALL BE TEMPORARILY CAPPED TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.

B. CONDUCTORS SHALL BE PULLED IN ACCORDANCE WITH ACCEPTED GOOD PRACTICE.

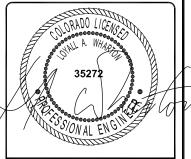




SAN CLEMENTE CA 92673 (949) 391-6824

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A	01/10/2019	100% CD - JX COMMENTS
0	12/11/2017	100% CD - BP SUBMITTAL
В	11/30/2017	90% CD'S - REVISED
Α	11/2/2017	90% CD'S FOR REVIEW
REV	DATE	DESCRIPTION
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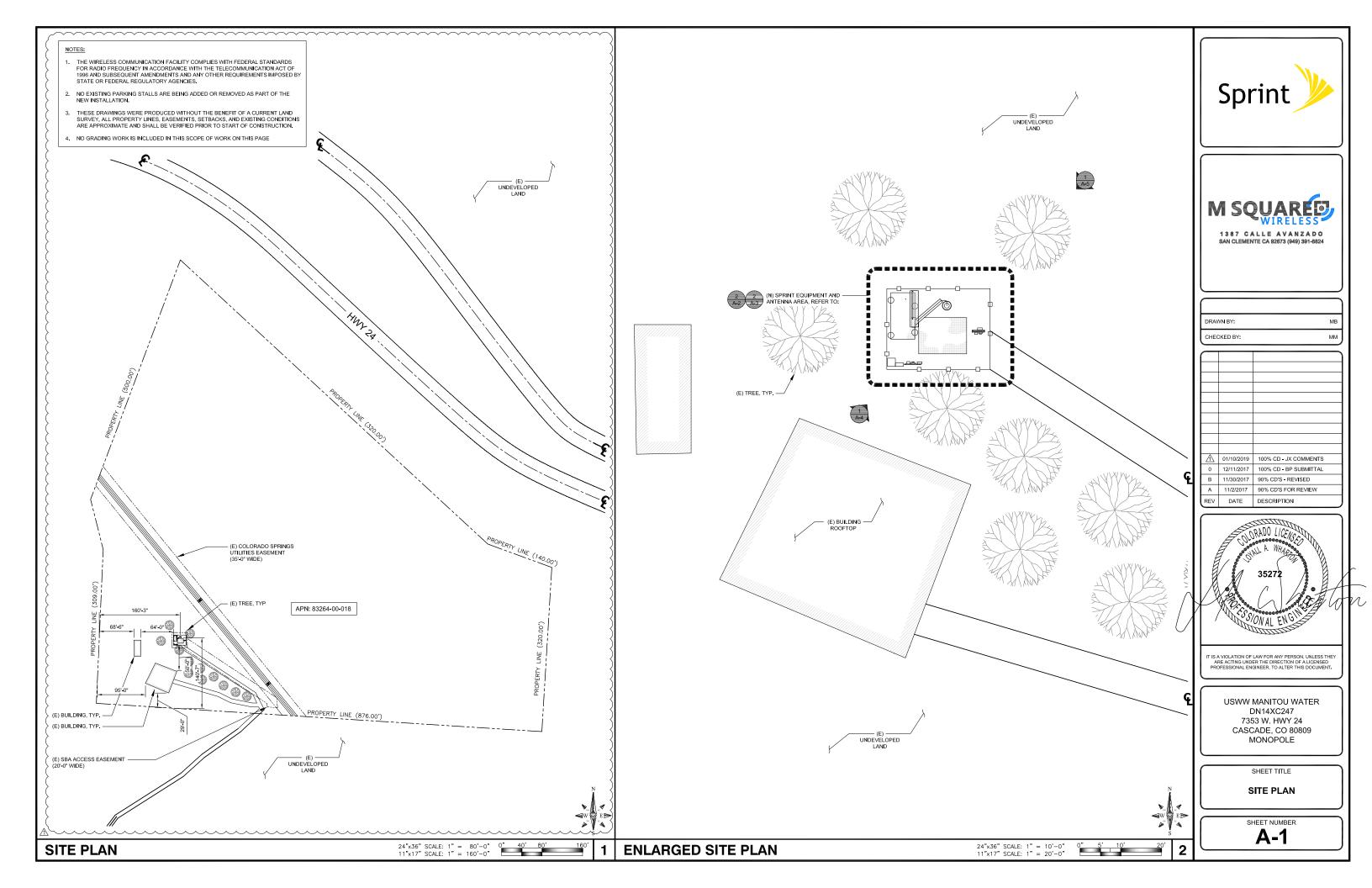
USWW MANITOU WATER
DN14XC247
7353 W. HWY 24
CASCADE, CO 80809
MONOPOLE

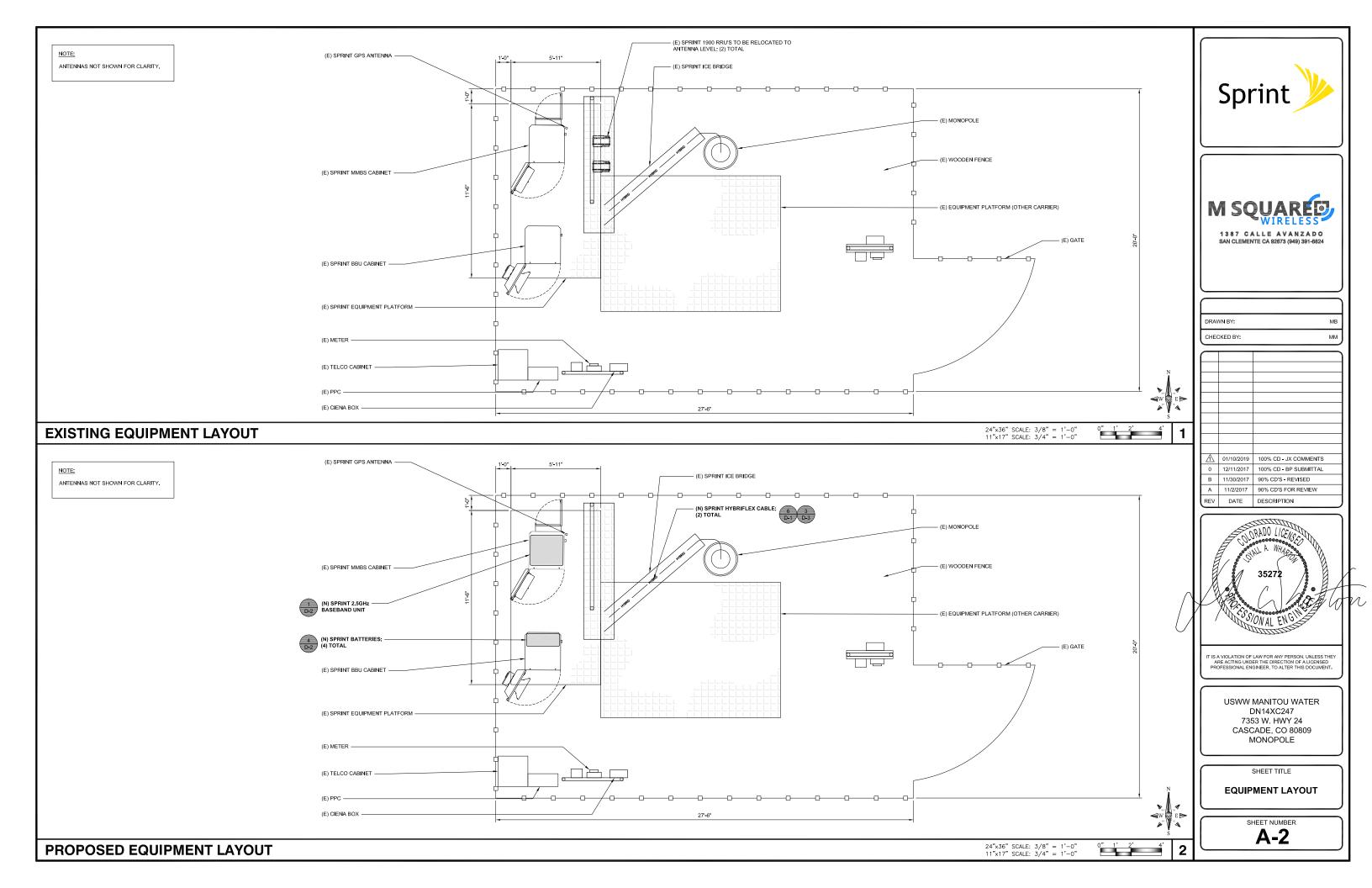
SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-2





- M. SOUARED ENGINEERS ACCEPTS NO LIABILITY FOR THE STRUCTURAL CAPACITY OF THE TOWER STRUCTURE. MOUNTS, ANTENNAS, CABLES OR ANY OTHER APPURTENANCE ON THE TOWER. THE CONTRACTOR AND SUBCONTRACTOR SHALL COORDINATE WITH AND COMPLY WITH THE PROVISIONS OF THE STRUCTURAL ANALYSIS PREPARED FOR THIS SITE AND PROJECT PRIOR TO THE INSTALLATION OF ANTENNAS AND CABLE ON THE TOWER. IMMEDIATELY REPORT ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DRAWINGS AND THE STRUCTURAL ANALYSIS TO SPRINT. REFER TO THE STRUCTURAL ANALYSIS AND/ORS TRUCTURAL LETTER FOR THE APPROVAL OF ALL MODIFICATIONS TO AND ADDING EQUIPMENT OF NEW TOWER APPLIRTENANCES.
- APPURTENANCES.
- APPURIENANCES.

 REFER TO ADDITIONAL DRAWINGS SPECIFIC TO TOWER REINFORCEMENT FOR THIS SITE SHOULD THERE BE A REQUIREMENT FOR ANY TOWER REINFORCEMENT.

 REFER TO STRUCTURAL ANALYSIS FOR COAXIAL AND OTHER CABLE SUPPORT AND CONFIGURATION DETAIL.
- REFER TO STRUCTURAL ANALYSIS FOR ALL CARRIERS APPURTENANCES AS THEY MAY NOT BE SHOWN IN ELEVATION DETAIL.

NOTES TO CONTRACTOR:

- CONTRACTOR IS TO REFER TO SPRINT'S MOST CURRENT RADIO FREQUENCY DATA SHEET (RFDS) PRIOR TO CONSTRUCTION CABLE LENGTHS WERE DETERMINED BASED ON
- CABLE LENGTHS WERE DETERMINED BASEL VISUAL INSPECTION DURING SITE-WALK. CONTRACTOR TO VERIFY ACTUAL LENGTH DURING PRE-CONSTRUCTION WALK CONTRACTOR TO VERIFY PORTS HAVE SUFFICIENT ROOM

	\times	REMOTE RADIO UNITS	DC CABLES					
	ANTENNA POSITION	RRUS MAKE AND MODEL	RRUS COUNT	LENGTH	AWG			
A	1	(N) 2500MHz RRU	1	±75'	LENGTH AWG			
SECTOR	2	(N) 800MHz RRU	1	±75'	-			
녒	3	(E)1900MHz RRU	1	±75'	-			
S	4	1	-		-			
В	1	(N) 2500MHz RRU	1	±75'	-			
8	2	(N) 800MHz RRU	1	±75'	-			
SECTOR	3	(E)1900MHz RRU	1	±75'	_			
S	4	- 1	-	-	_			

NEW OPTIMAL ANTENNA REQUIREMENTS (VERIFY WITH CURRENT RFDS)				ANTEI	NNA MAKE AND MODEL	RAD CI	ENTER	AZIM	IUTH	TH TRANSMISSION LINE		
ANTENNA POSITION TE		TECHNOLOGY	ANTENNA COUNT	EXISTING	NEW	EXISTING	NEW	EXISTING	NEW	CABLE LENGTH		FEEDER TYPE
Α	1	800/1900MHZ 2500MHZ	1	GENERIC SPRINT ANTENNA	HPA65R-KE4A-K	58'-0"	58'-0"	320°	325°	±10'	10	JUMPERS
SECTOR A	2	-	-	-		-	-	-	-	-	-	-
ECT.	3	-	-	-	_	-	-	-	-	-	-	-
S	4	-	-	_	_	-	-	-	-	-	-	-
В	1	800/1900MHZ 2500MHZ	1	GENERIC SPRINT ANTENNA	HPA65R-KE4A-K	58'-0"	58'-0"	120°	125*	±10'	10	JUMPERS
OR	2											
SECTOR B	3				·				,			
ซี	4				·							





DRAWN BY: CHECKED BY:

12/11/2017 100% CD - BP SUBMITTAL A 11/2/2017 90% CD'S FOR REVIEW REV DATE DESCRIPTION



PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT

USWW MANITOU WATER DN14XC247 7353 W. HWY 24 CASCADE, CO 80809 MONOPOLE

SHEET TITLE

ANTENNA LAYOUT

SHEET NUMBER

A-3

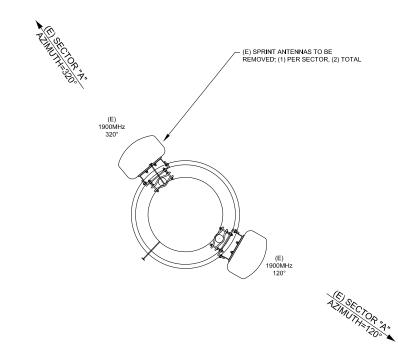
- (E) ANTENNA AZIMUTHS ARE ESTIMATED AND ARE TO BE VERIFIED BY RF.

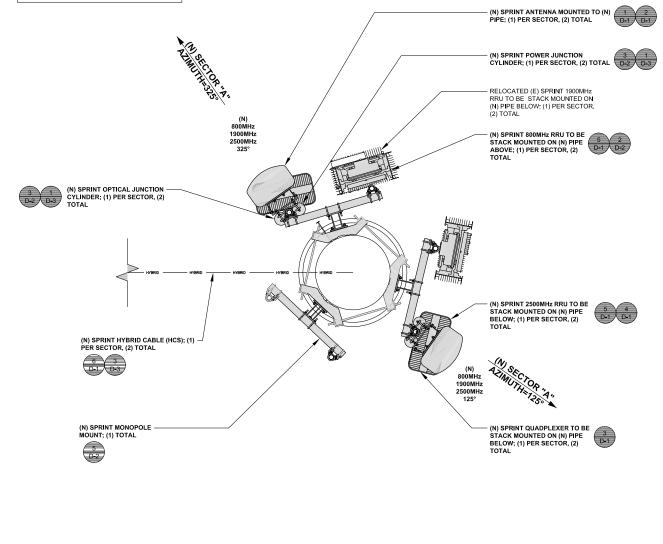
ALL NEW FIBEROCABLE RONS TO OTILIZE (E)	
CONDUIT PATHS PREVIOUSLY ESTABLISHED WITHIN	
A PRE-APPROVED ACCESS/UTILITY ROUTE.	

NOTE:

NOTES

GROUND EQUIPMENT NOT SHOWN FOR CLARITY







NOTE:

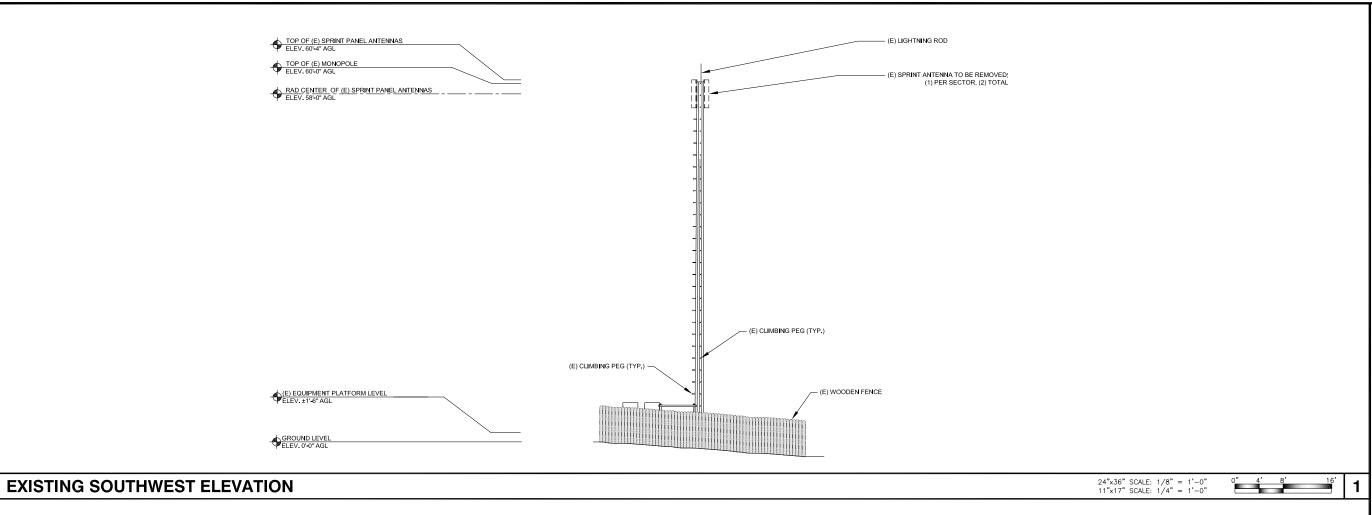
GROUND EQUIPMENT NOT SHOWN FOR CLARITY.

24"x36" SCALE: 1" = 1'-0" 11"x17" SCALE: 2" = 1'-0"

PROPOSED ANTENNA LAYOUT

EXISTING ANTENNA LAYOUT

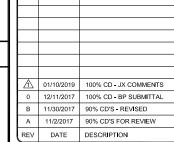
24"x36" SCALE: 1/4" = 1'-0" 11"x17" SCALE: 1/2" = 1'-0"







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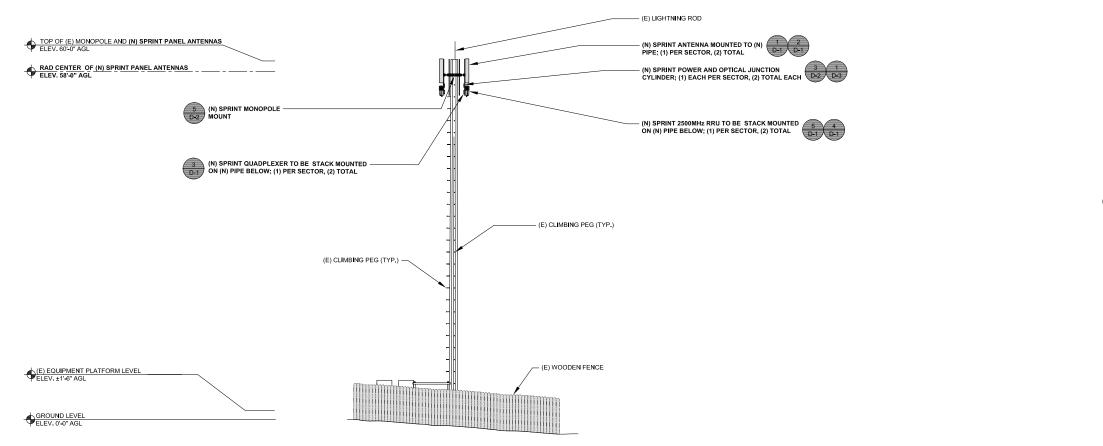
> USWW MANITOU WATER DN14XC247 7353 W. HWY 24 CASCADE, CO 80809 MONOPOLE

> > SHEET TITLE

ELEVATIONS

SHEET NUMBER

A-4



Frequency/Radio	Indicator	D		
800 #1	Yellow	Green		
1900 #1	Yellow	Red		
1900 #2	Yellow	Brown		
1900 #3	Yellow	Blue		
1900 #4	Yellow	Grey		
800 #2	Yellow	Orange		
2500 #1	Yellow	White		
2500 #2	Yellow	Purple		

TECHNOLOGY COLOR CODING

24"x36" SCALE: NTS 11"x17" SCALE: NTS

2500MHz #1 Cal Cable - Sector	Cable	First Ring	Second Ring	Third Ring	Forth Ring	Fifth Ring	Sixth Ring
1 Alpha	1	Yellow		Yellow	White		
2 Beta	2	Yellow	Yellow		Yellow	White	
3 Gamma	3	Yellow	Yellow	Yellow		Yellow	White
2500MHz #2 Cal Cable - Sector	Cable	First Ring	Second Ring	Third Ring	Forth Ring	Fifth Ring	Sixth Ring
1 Alpha	1	Yellow		Yellow	Purple		
2 Beta	2	Yellow	Yellow		Yellow	Purple	
3 Gamma	3	Yellow	Yellow	Yellow		Yellow	Purple

Sector	Cable	First Ring	Second Ring	Third Ring
1 Alpha	1	Green	No Tape	No Tape
1	2	Blue	No Tape	No Tape
1	3.	Brown	eqsT oh	No Tape
1	4	White	No Tape	No Tape
1	5	Red	No_Tape	No Tape
1	6	Grey	No Tape	No Tape
1	7	Purple	No Tape	No Tape
1	B	Orange	No Tape	No Tape
2 Beta	1	Green	Green	eqaf oil
2	2	里山田		eqsT oi4
2	3	Brown	Brown	No Tape
2	4	White	White	No Tape
2	5	Red	Red	No Tape
2	6	Grey	Grey	No Tape
2	7	Purple	Purple	No Tape
2	B	Orange	Orange	No Tape
3 Gamma	1	Green	Green	Green
3	2	FUE		
3	3	Brown	Brown	Brown
3	4	White	White	White
3	5	Red	Red	Red
3	6	Grey	Grey	Grey
3	7	Purple	Purple	Purple
3	8	Orange	Orange	Orange





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↑ 01/10/2019 100% CD - JX COMMENTS 0 12/11/2017 100% CD - BP SUBMITTAL B 11/30/2017 90% CD'S - REVISED A 11/2/2017 90% CD'S FOR REVIEW REV DATE DESCRIPTION			
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B 11/30/2017 90% CD'S - REVISED A 11/2/2017 90% CD'S FOR REVIEW	A	01/10/2019	100% CD - JX COMMENTS
A 11/2/2017 90% CD'S FOR REVIEW	0	12/11/2017	100% CD - BP SUBMITTAL
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REV DATE DESCRIPTION	Α	11/2/2017	90% CD'S FOR REVIEW
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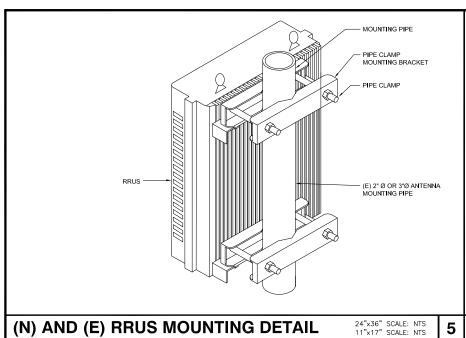


USWW MANITOU WATER DN14XC247 7353 W. HWY 24 CASCADE, CO 80809 MONOPOLE

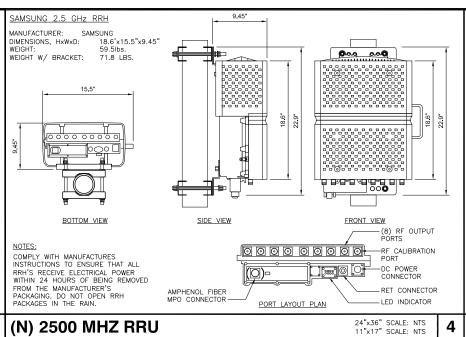
SHEET TITLE

COLOR CODING

SHEET NUMBER **A-5**

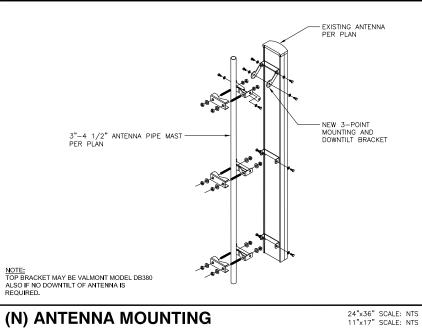


(N) AND (E) RRUS MOUNTING DETAIL



(N) 2500 MHZ RRU

5

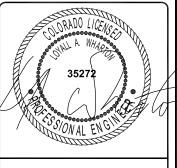






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	В	11/30/2017	90% CD'S - REVISED
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	REV	DATE	DESCRIPTION



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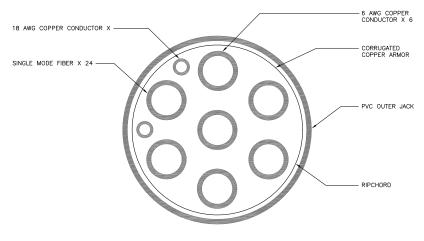
USWW MANITOU WATER DN14XC247 7353 W. HWY 24 CASCADE, CO 80809 MONOPOLE

SHEET TITLE

EQUIPMENT DETAILS

SHEET NUMBER

CABLE TYPE	NUMBER, SIZE (AWG)	6/C #6 + 2/C #18
	VOLTAGE	600
	OUTER JACKET	PVC
	SHIELDING	CORRUGATED COPPER
	MAX SHIELDING RESISTANCE (OHM/FT @ 20 C)	0.0035
	DRAIN	N/A
	RIPCHORD	KEVLAR
	DC CONDUCTOR MATERIAL	COPPER
	DC CONDUCTOR SIZE (AWG)	6
	MAX DC RESISTANCE (OHM/1000FT)	0.411 @ 20° C
	COLOR CODE	BLACK/RED
	ALARM CONDUCTOR MATERIAL	COPPER
	ALARM CONDUCTOR SIZE (AWG)	18
	MAX DC RESISTANCE (OHM/1000FT)	6.7
	COLOR CODE	TBD
	FIBER CABLES	SM
	OUTER DIAMETER (IN) - NOMINAL	1.24
	WEIGHT (LB/FT)	1.05
	MINIMUM BEND RADIUS (IN)	15
	BEND MOMENT (LB/IN)	TBD
	TENSIL STRENGTH (LB)	325
	CRUST RESISTANCE, FOTP-41 (N/MM)	22
	STRENGTH MEMBER	NO
	OPERATING TEMPERATURE RANGE (LOW)	-40° C
	OPERATING TEMPERATURE RANGE (LOW)	+80° C
TIBER TYPE		LOW WATER PEAK SINGLE MODE LOOSE TUBE
		ITU-T REC. G.652.D, G657.A2
TIBER STRAND COMPLIANCE		IEC 60793-2-50 TYPE B.1.3 & TYPE B.6 A&B
TIBER COATING DIAMETER (UM)		.242 +/- 0.007MM 0.9+/- 0.005MM
FIBER COUNT		24
NUMBER OF FIBER SUBUNITS		.1
FIBER COUNT EACH UNITS		24
FIBER COUNT JACKETS		FR JACKET
MAX ATTENUATION, 1310 NM (DB/KM)		LESS THAN EQUA 0.5
MAX ATTENUATION, 1550 NM (DB/KM)		LESS THAN EQUA 0.5



NOTE: CABLE CROSS-SECTION NOT DRAWN TO SCALE

(N) PAI	IEL AN	ITEN	ANA					6" SCALE: NTS 7" SCALE: NTS	2	
	N	MECHA	ANICAL		1 1					\d
MODU	LARITY		QUAD		1	1	9 9 -	0 0	• /• /	4 1
WEIGHT W/	BRACKETS	6.26X	LBS (6.6KG) 7.42X8.17 in. 88.5X207.4mm)		6.26"	2.95"	9 9 9 <u>0</u>	0 0 0		
			RICAL		1.					П
RF PARAMETERS	PORTS		FREQUENCY(MHz)	SPECIFICATION	1 -		E	RONT VIEW		Ц
RETURN LOSS	COMMON	1	1695 - 2180	18 dB min, 20 dB typ	1				li	L
	PCS/AWS	S	1695 - 2180	18 dB min, 20 dB typ	1	<u>dad</u>	dad.		٣	П
	BRS		2496 - 2690	18 dB min, 20 dB typ	1	1	ין ווי	9 19	ľ	П
INSERTION LOSS	COMMON TO P		1695 - 2180	0.2 dB typ, 0.25dBmax	1	9) q p	9 99	P	Ш
	COMMON TO		2496 - 2690	0.2 dB typ, 0.25dBmax	1	q	od þ	al þal	þ	Ш
REJECTION	COMMON TO P		2496 - 2690	50 dB mini	1		100	ما ما	<u> </u>	Ш
	COMMON TO		1695 - 2180	50 dB mini	1	1844	 	 	TA .	Ш
ISOLATION	PCS/AWS TO		1695 - 2180	50 dB mini	l					ш
	BRS TO PCS	S/AWS	2496 - 2690	50 dB mini	ł		8.	17"		1
	GENERA	L CHA	RACTERISTI	CS			SIDE 7,42"	VIEW		lí
General Impedance	50 ohms				1 -			-	1	П
Cont. Average PWR	250 W max	(input p	orts), 500 W max	imum (Common port)	1💂	-			+ +	П
Peak Envelope PWR	1 kW max (ir	nput port	s), 3 kW maximu	m (Common port)	11 🌠	M a	\ (in)		5	I۱
Intermodulation	<-117 dBm (-160 dB	c) at 2 × +43 c	IBm tones all bands	1 🖉				2.02"	1
]=			 	<u> </u>	H

FRONT VIEW

(N) HYBRID CABLE SPECIFICATIONS

MODEL NO.:

DIMENSIONS:

11.7" 7.6"

CONNECTOR TYPE: TOTAL
(6) 7/16" DIN (FEMALE) WEIGHT

TOP VIEW

CONNECTOR LOCATION: 28.7 LBS

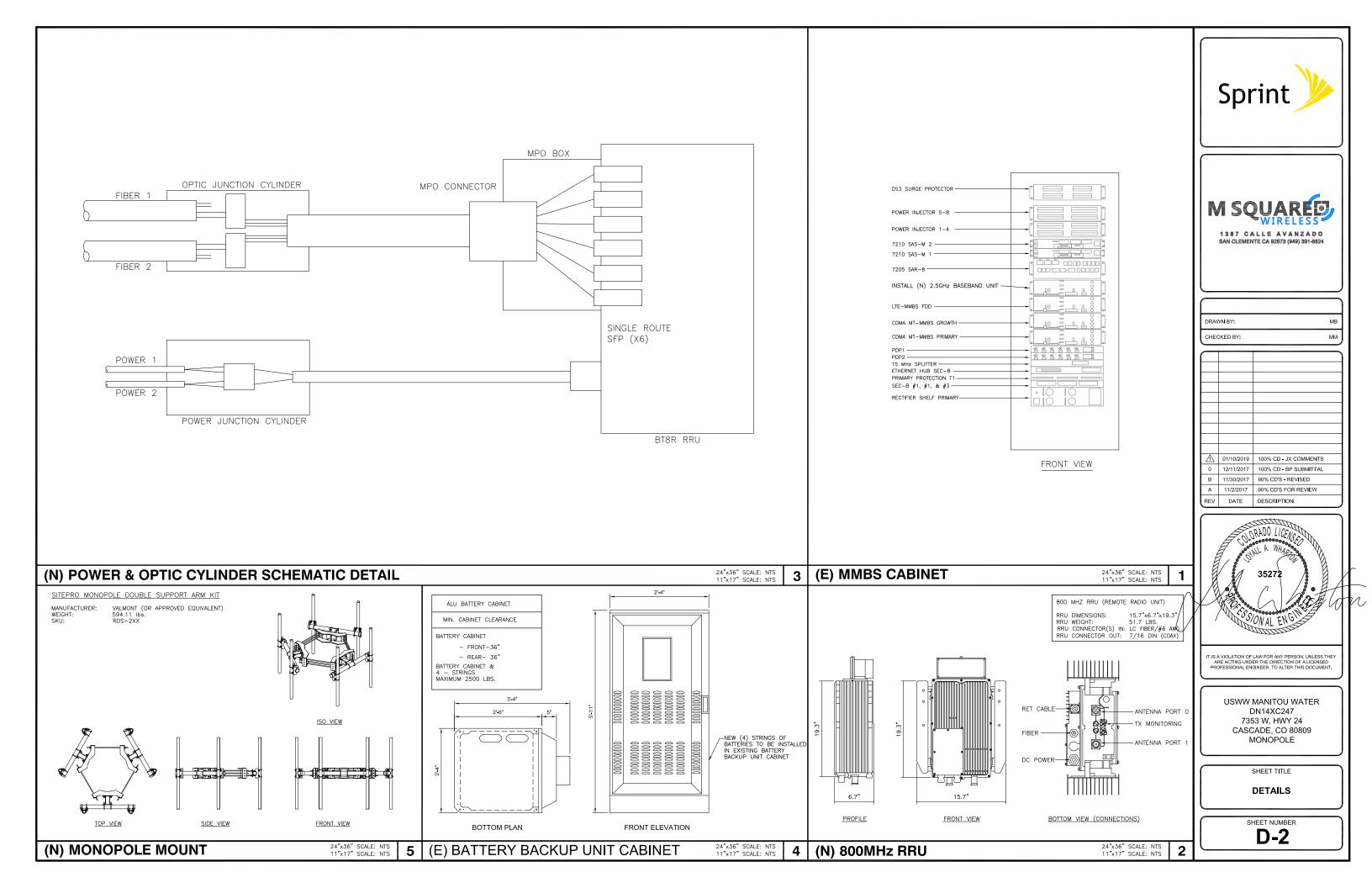
6 (N) QUADPLEXER DPO-7126Y-0X1

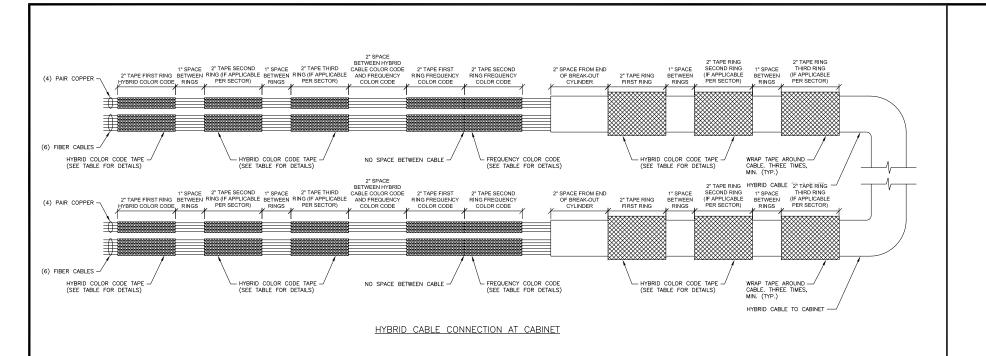
24"x36" SCALE: NTS 11"x17" SCALE: NTS

TOP VIEW

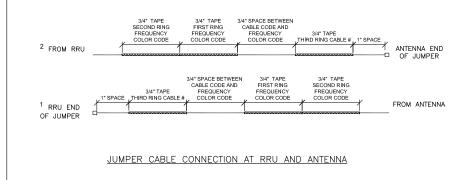
SIDE VIEW

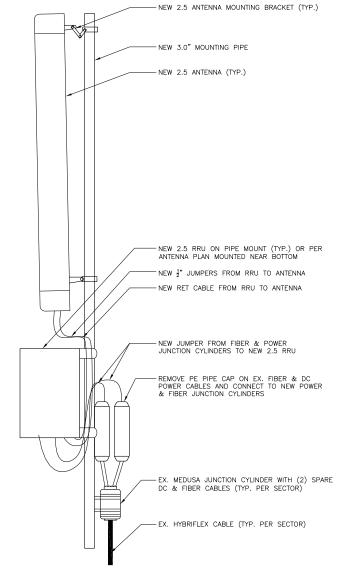
D-1





- 1. ALL CABLES SHALL BE MARKED AT THE TOP AND BOTTOM WITH 2" COLORED TAPE OR STENCIL TAG. COLOR TAPE SHALL BE OBTAINED FROM GRAYBAR ELECTRIC.
- 2. THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE AND SPACED APPROXIMATELY 2" FROM AN END CONNECTOR, WEATHERPROOFING, OR BREAK-OUT CYLINDER, WITH 1" SPACE BETWEEN
- 3. THE HYBRID CABLE COLOR SHALL BE APPLIED IN ACCORDANCE WITH THE "TYPICAL HYBRID CABLE COLOR CODE" TABLE BELOW FOR THE RESPECTIVE SECTOR.
- 4. INDIVIDUAL POWER PAIRS AND FIBER CABLES SHALL BE LABELED WITH BOTH THE HYBRID CABLE COLOR FOR THE RESPECTIVE SECTOR AND A FREQUENCY COLOR CODE IN ACCORDANCE WITH THE "FREQUENCY COLOR CODE FOR PAIRS AND FIBER CABLES OF HYBRID CABLE" TABLE.
- 5. A 2" GAP SHALL SEPARATE THE HYBRID CABLE COLOR CODE FROM THE FREQUENCY COLOR CODE
- 6. THE 2" COLOR RINGS FOR THE FREQUENCY CODE SHALL BE PLACED NEXT TO EACH OTHER WITH NO SPACES.
- 7. THE 2" COLORED TAPE(S) SHALL EACH BE WRAPPED A MINIMUM OF 3 TIMES AROUND THE HYBRID CABLE OR INDIVIDUAL CABLES, AND THE TAPE SHALL BE KEPT IN THE SAME LOCATION AS MUCH AS
- 8. COLOR BAND ON JUMPERS SHALL BE 2" WIDE WITH A 2" SPACE.





Sprint



ММ

Λ	01/10/2019	100% CD - JX COMMENTS
0	12/11/2017	100% CD - BP SUBMITTAL
В	11/30/2017	90% CD'S - REVISED
Α	11/2/2017	90% CD'S FOR REVIEW
REV	DATE	DESCRIPTION



PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT

USWW MANITOU WATER DN14XC247 7353 W. HWY 24 CASCADE, CO 80809 MONOPOLE

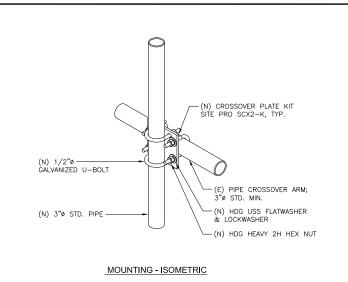
SHEET TITLE

DETAILS

SHEET NUMBER

(N) HYBRID CABLE COLOR SCHEME DETAIL

	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TYPE 6	TYPE 7
TOTAL LENGTH	~35 M	~55 M	~65 M	~80 M	~100 M	~120 M	~160 M
	(114.8')	(114.8')	(213.3')	(262.5')	(328.1')	(420.0')	(550.0')
HYBRID POWER			AWG 6 1 PAIR,	AWG 6 PAIR,	AWWG 4 1	AWG 6 1 PAIR,	
CABLE			AWG 8 1 PAIR,	AWG 8 3 PAIR	PAIR, AWG 6 1	AWG 8 3 PAIR	AWG 4 3 PAIR
CONFIGURATION			AWG 10 2 PAIR		PAIR, AWG 8 2 PAIR		
CABLE Ø	25MM (0.98")	27MM (1.06")	30MM (1.18")	30/32MM	39.2MM (1.25")	39.2MM (1.56")	43.5MM (1.69")
				(1.18"/1.25")			
BEND RADIUS	11.81"	12.99"	15.35"	17.71"	17.71"	18.00"/30.00"	21.00"/35.00"
OPTIC CABLE			LC/PC-T	O-LC/PC, SIGN	LE MODE		
DU CABINET			2 PAIR POWER	AND ODTIC CADI	E WITH DE DIDE		
(POWER CABLE			Z FAIR FOWER /	AND OF HE CABL	L WIITI FE FIFE		
TERMINAL MAX							
SIZE AWG 4)							
RRU POWER	AWG 8, 14.7~	15.4MM (0.57"-	0.60") / AWG 1	0. 11.5~12.4MM	(0.45"-0.48")	8 AWG CABI	ES 4 PAIRS
CABLE SPEC		(0.01	, ,		(01.00 01.00)		
NON-USE	2 PAIR POWER	2 PAIR POWER	2 PAIR POWER	2 PAIR POWER		2 PAIR POWER	2 PAIR POWER
POWER AND	AND OPTIC	AND OPTIC	AND OPTIC	AND OPTIC		AND OPTIC	AND OPTIC
ODTIO OADLE	CABLE WITH PE		CABLE WITH PE			CABLE WITH PE	
OPTIC CABLE				PIPE			
PROTECTION	PIPE	PIPE	PIPE			PIPE	PIPE
PROTECTION SAMSUNG	PIPE 0.5LBS/LF	PIPE 0.6LBS/LF	0.8LBS.LF	0.9LBS/LF	1.1LBS/LF	N/A	N/A
PROTECTION SAMSUNG FIBER	0.5LBS/LF	0.6LBS/LF	0.8LBS.LF	0.9LBS/LF	, i	N/A	N/A
PROTECTION SAMSUNG					1.1LBS/LF 0.7LBS/LF N/A		



MANUFACTURER: MODEL NO: WEIGHT: 42.2LBS VOLTAGE: 9.6V HEIGHT: 12.45" 4.93" WIDTH: DEPTH: 21.99" 10 HR TO 1.8 VPC @ 25° C ELECTROLYTE CONTENT: 2.58 GAL PER BATTERY CELL EXISTING ELECTROLYTE CONTENT: 30.96 GAL NEW ELECTROLYTE CONTENT: 10.32 GAL TOTAL ELECTROLYTE CONTENT PER PLAN: 41.28 GAL WIDTH

2.5 ANTENNA/RRU CONNECTIONS, TYP.

(N) HYBRID CABLE TYPE

5

CROSSOVER MOUNTING KIT

24"x36" SCALE: NTS

4

BATTERY DETAIL

24"x36" SCALE: NTS 11"x17" SCALE: NTS

D-3

GENERAL ELECTRICAL NOTES

- 1. SUBMITTAL OF BIO INDICATES CONTRACTOR IS COGNIZANT OF ALL JOB SITE CONDITIONS AND WORK TO BE PREFORMED UNDER THIS CONTRACT.
- 2. CONTRACTOR SHALL PERFORM ALL FIELD VERIFICATION AND EXAMINATION WORK PRIOR TO THE ORDERING OF THE ELECTRICAL EQUIPMENT AND THE ACTUAL CONSTRUCTION. CONTRACTOR SHALL ISSUE A WRITTEN NOTICE OF ALL FINDINGS TO THE ENGINEER AND OWNER LISTING ALL MAI FUNCTIONS. FAULTY FOURMENT, AND DISCREPANCIES.
- 3. THESE PLANS ARE SCHEMATIC ONLY; CONTRACTOR SHALL FOLLOW AS CLOSELY AS POSSIBLE.
- 4. ANTENNA MOUNTING HEIGHTS AND AZIMUTHS SHALL BE VERIFIED WITH OWNER PRIOR TO INSTALLATION.
- 5. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION TOOLS, TRANSPORTATION, ETC., FOR A COMPLETE AND PROPERLY OPERATIVE SYSTEM ENERGIZED THROUGHOUT AND AS INDICATED ON DRAWINGS, AS SPECIFIED HEREIN AND/OR AS OTHERWISE INDICATED. NOTE THAT CONTRACTOR SHALL SECURE ALL NECESSARY ELECTRICAL PERMITS, AND PAY ALL REQUIRED FEES.
- 6. IF REQUIRED, CONTRACTOR SHALL COORDINATE WITH LOCAL UTILITY COMPANY FOR CONNECTION OF TEMPORARY AND PERMANENT POWER TO THE SITE. THE TEMPORARY POWER AND ALL HOOK-UP COSTS SHALL BE PAID BY THE CONTRACTOR.
- 7. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN PERFECT CONDITION WHEN INSTALLED AND SHALL BE OF THE BEST GRADE AND OF THE SAME MANUFACTURER THROUGHOUT FOR EACH CLASS OR GROUP OF EQUIPMENT. EXCEPTIONS TO THIS MAY BE PERMITTED IF NEW REPLACEMENT BREAKERS OR SWITCHES ARE NOT AVAILABLE FOR ORIGINAL ELECTRICAL DISTRIBUTION EQUIPMENT ON THAT CASE. RECONDITIONED EQUIPMENT MAY BE PERMISSIBLE IF IT CARRIES ONE (1) YEAR WARRANTY. MATERIALS SHALL BE LISTED AND APPROVED BY UNDERWRITER'S LABORATORY AND SHALL BEAR THE INSPECTION LABEL "J" WHERE SUBJECT TO SUCK APPROVAL. Materials SHALL MEET WITH APPROVAL OF THE DIVISION OF INDUSTRIAL SAFETY AND ALL GOVERNING BODIES HAVING JURISDICTION. MATERIALS SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA, AND NBFU.
- 8. IF CONTRACTOR IS PROPOSING ALTERNATE MATERIALS OR CONSTRUCTION METHODS FROM WHAT IS SPECIFIED IN THE PLANS, CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND/OR CATALOG CUT-SHEETS TO OWNER FOR APPROVAL PRIOR TO COMMENCEMENT OF THE WORK.
- 9. ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH CURRENT NATIONAL CODES AND ALL LOCAL AND STATE CODES, LAWS, AND ORDINANCES. PROVIDE ALL COMPONENTS AND WIRING SIZES AS REQUIRED TO MEET NEC.
- 10. EACH CONDUCTOR OF EVERY SYSTEM SHALL BE PERMANENTLY TAGGED IN EACH PANELBOARD, PULLBOX, J-BOX, SWITCH BOX, ETC., IN COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (O.S.H.A.) REQUIREMENTS.
- 11. COMPLETE JOB SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR AFTER THE DATE OF JOB ACCEPTANCE BY OWNER, ANY WORK, MATERIAL OR EQUIPMENT FOUND TO BE FAULTY DURING THAT PERIOD SHALL BE CORRECTED AT ONCE, UPON WRITTEN NOTIFICATION, AT THE EXPENSE OF THE CONTRACTOR
- 12. CLEAN WORK SITE DAILY, AND REMOVE ALL DEBRIS RESULTING FROM CONSTRUCTION. LEAVE JOB SITE IN A TIDY AND UNDAMAGED CONDITION.
- 13. UPON COMPLETION OF WORK, PERFORM CONTINUITY, SHORT CIRCUIT, AND GROUNDING TEST. GROUNDING SYSTEM SHALL BE TESTED BY INDEPENDENT TESTING AGENCY, WITH WRITTEN REPORT SUBMITTED TO THE OWNER FOR REVIEW AND APPROVAL. AFTER APPROVAL, FURNISH ONE COPY OF REPORT TO ENGINEER.
- 14. PROVIDE OWNER WITH ONE SET OF COMPLETE ELECTRICAL "AS BUILT" DRAWINGS AT THE COMPLETION OF THE JOB, SHOWING ACTUAL EQUIPMENT LOCATIONS, CONDUIT/CABLE ROUTING, PANEL SCHEDULE, AND OTHER DETAILS WITHIN 10 DAYS OF PROJECT COMPLETION. DATE OF JOB COMPLETION SHALL BE THE SATE ON THE CONTRACTOR'S "NOTICE OF COMPLETION" SUBMITTED TO THE OWNER, AFTER SITE INSPECTION AND SIGNOFF BY OWNER.
- 15. ALL BROCHURES, OPERATING MANUAL, CATALOGS, SHOP DRAWINGS, ETC. SHALL BE TURNED OVER TO OWNER AT JOB COMPLETION.

ABBREVIATIONS

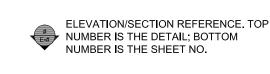
- 16. ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THAN THE MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED, AND A MINIMUM OF 10,000 A.I.C.
- 17. PATCH, REPAIR AND PAINT ANY AREA THAT HAS BEEN DAMAGED IN THE COURSE OF THE ELECTRICAL WORK.

- 18. IN DRILLING HOLES INTO CONCRETE WHETHER FOR FASTENING OR ANCHORING PURPOSED THORUGH THE FLOOR OR WALLS FOR CONDUIT RUNS, PIPE RUNS, ETC., IT MUST CLEARLY UNDERSTOOD THAT TENDONS AND/OR REINFORCING STEEL WILL NOT BE DRILLED INTO, CUT, OR DAMAGED UNDER ANY CIRCUMSTANCES.
- 19. EXACT LOCATION OF TENDONS AND/OR REINFORCING STEEL ARE NOT KNOWN AND THEREFORE MUST BE SEARCHED FOR BY APPROPRIATE METHODS, SUCH AS X-RAY EQUIPMENT OR OTHER DEVICES THAT CAN ACCURATELY LOCATE THE REINFORCING AND/OR STEEL TENDONS.
- 20. ALL EXTERIOR WALL PENETRATIONS SHALL BE SEALED WITH SUITABLE WEATHERPROOF SEALANT. PENETRATIONS IN FIRE RATED WALLS SHALL BE FIRE STOPPED IN ACCORDANCE WITH CURRENT LOCAL BUILDING CODES USING U.L. RATED MATERIALS.
- 21. ALL CONDUCTORS SHALL BE COPPER, #12 AWG MINIMUM. UNLESS NOTED OTHERWISE, INSULATION SHALL BE 90°C RATED, AND DUAL RATED THHN/THWN-2. NO BX OR ROMEX CABLE IS PERMITTED UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.
- 22. ALL CONDUIT ONLY (C.O.) RUNS SHALL HAVE A PULL WIRE OR ROPE, AND TRUE TAPE.
- 23. GROUND THE ENTIRE ELECTRICAL SYSTEM IN ACCORDANCE WITH THE NEC AND DRAWINGS. BELOW GRADE GROUND CONDUCTORS SHALL BE #2 AWG SOLID BARE TINTED COPPER, ABOVE GRADE, ALL CONDUCTORS SHALL BE STRANDED GREEN INSULATED COOPER, SEIZED #2 AWG OR AS SHOWN IN THE DRAWINGS. GROUND CONDUCTOR SHALL HAVE A MINIMUM 24" BENDING RADIUS. GROUND RODS SHALL BE COPPER CLAD STEEL, 5/8" ROUND AND 8'L ONG, GROUNDING HARDWARE SHALL BE FRICO. STORM COPPER COMPONENTS, EUSHI COPPERWEL DOR APPROVED FOLIA!
- 24. GROUND ALL ANTENNA BASES, ENCLOSURES, FRAMES, CABLE RUNS, AND OTHER METALLIC COMPONENTS USING GROUND WIRES AND CONNECT TO THE BUS BARS. FOLLOW EQUIPMENT MANUFACTURER'S RECOMMENDATIONS FOR GROUNDING. GROUND COAX SHIELD AT BOTH ENDS USING CABLE MANUFACTURER'S RECOMMENDATIONS.
- 25. THE NUMBER OF GROUNDING BARS MAY VARY DEPENDING UPON THE SITE LAYOUT, ANTENNA LOCATION, AND OTHER FACTORS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING SUFFICIENT GROUNDING BARS AS REQUIRED. PROVIDING 50% SPARE CONNECTION POINTS.
- 26. EXOTHERMIC WELDS SHALL INCLUDE ALL CABLE TO CABLE, SPLICES, CABLE TO GROUND RODS, GROUND ROD SPLICES AND OTHER SYSTEMS AS INDICATED. ALL MATERIALS USED (MOLDS, WELDING, METAL, ETC.) SHALL BE INSTALLED PER MANUFACTURERS' RECOMMENDATIONS AND PROCEDURES. ALL EXOTHERMIC WELD CONNECTIONS ON GALVANIZED SURFACES SHALL BE CLEANED THOROUGHLY AND COLORED TO MATCH SURFACE WITH (2) TWO COATS OF GALVITE (WHITE) PAINT OR SILVERBRITE (ALUMINUM).
- 27. ALL STRANDED COPPER WITH GREEN INSULATION TO BE ATTACHED WITH CRIMPED DOUBLE LUG, ATTACHED WITH NUTS, BOLTS AND STAR WASHERS TYPICAL. ALL MECHANICAL CONNECTIONS SHALL HAVE ANTI-OXIDANT GREASE (E.G. NO-OX) APPLIED BETWEEN LUG AND BUS BAR.
- 28. ALL EXPOSED TINNED COPPER GROUNDS SHALL BE PROTECTED BY 1/2" PVC CONDUIT AND SECURED. WHERE SUBJECT TO MECHANICAL DAMAGE, OTHER GROUND LEADS SHALL ALSO BE ENCLOSED IN 1/2" OR 3/4" LTFC.
- 29. COMPRESSION FITNESS TO BE USED ON ALL CONDUITS (NO SETSCREWS).
- 30. PVC CONDUIT INSTALLED IN OUTDOOR LOCATIONS SUBJECT TO SUNLIGHT EXPOSURE SHALL BE UV RESISTANT. SURFACE-MOUNTED CONDUIT INSTALLED IN LOCATIONS SUBJECT TO FOOT TRAFFIC OR OTHER WEAR AND TEAR, SHALL BE PVC SCHEDULE 80, IMC, OR GRC. CONDUIT RUNS ALONG WALLS OR FLOORS SHALL BE SURFACE MOUNTED UNLESS SPECIFICALLY NOTED OTHERWISE ON THE PLANS. OTHER CONDUIT REQUIREMENTS: 30.a. INTERMEDIATE METALLIC CONDUIT (IMC) SHALL HAVE U.L. LABEL, FITTINGS SHALL BE WATERTIGHT COMPRESSION TYPE. IMC SHALL BE USED FOR OUTDOOR RUNS, IMC IN CONTACT WITH EARTH SHALL BE 1/2 LAPPED WRAPPED WITH HUNTS WRAP PROCESS NO. 3
- 30.b. ELECTRICAL METALLIC TUBING (EMT) SHALL HAVE U.L. LABEL. FITTINGS SHALL BE GLAND RING COMPRESSION TYPE. EMT SHALL BE USED ONLY FOR INTERIOR RUNS.
- 30.c. FLEXIBLE METALLIC CONDUIT SHALL HAVE U.L. LISTED LABEL AND MAY BE USED WHERE PERMITTED BY CODE. FITTINGS SHALL BE "JAKE" OR "SQUEEZE" TYPE, LENGTH SHALL HAVE FULL SIZE GROUND WIRE.
- 30.d. ALL UNDERGROUND CONDUIT SHALL BE PVC SCHEDULE 40 (UNLESS NOTED OTHERWISE) AT A MINIMUM DEPTH OF 24" BELOW GRADE.
- 31. ALL NEW ELECTRICAL ENCLOSURES (EXCEPT FOR JUNCTION OR SPLICE BOXES) SUCH AS PANELBOARDS AND DISCONNECT SWITCHES SHALL BE LABELED WITH PERMANENT ENGRRAVED PHENOLIC NAMEPLATES, BLACK WITH WHITE LETTERING, AND ATTACHED WITH RIVETS.

ELECTRICAL LEGEND

ALTERNATE ACCESS VENDOR GROWTH (CABINET) UNIVERSAL TYPE A DIGITAL UNIT LIADU ANTENNA CABLE ASSEMBLY GRC GALVANIZED RIGID (STEEL) CONDUIT ACCA U/G UNDERGROUND AFF ABOVE FINISHED FLOOR INTERNAL GROUND BAR WP WEATHERPROOF IGB AFG ABOVE FINISHED GRADE INTERIOR GROUND RING ww WIREWAY AWS ADVANCED WIRELESS SERVICES INTERMEDIATE METALLIC CONDUIT TRANSFORMER XFMR A/G ABOVE GROUND ISCW INSULATED STRANDED COPPER WIRE AGB ANTENNA GROUND BAR LTE LONG TERM EVOLUTION ATS AUTOMATIC TRANSFER SWITCH LTFC LIQUID TIGHT FLEXIBLE CONDUIT AMERICAN WIRE GAUGE AWG MGB MAIN (OR MASTER) GROUND BAR BBU BASEBAND UNIT MMBS MULTI-MODE BASE STATION **BCW** BARE COPPER WIRE MTS MANUAL TRANSFER SWITCH BARE STRANDED COPPER WIRE BSCW NEC NATIONAL ELECTRIC CODE BARE TINNED COPPER WIRE NID NETWORK INTERFACE DEVICE BTCW CONDUIT NV NETWORK VISION CAB CARINET O/F OVERHEAD PERSONAL COMMUNICATION SERVICES CE CONCRETE ENCASED PCS CGB POWER PROTECTION CABINET COLLECTOR GROUND BAR PPC CKT PRIMARY RADIO CABINET CIRCUIT PRC COVE CAPACITOR OVERVOLTAGE PROTECTION PVC POLYVINYL CHLORIDE DIRECT BURIED DEI DIGITAL EXPANSION INTERFACE RGS RIGID GALVANIZED STEEL DISC DISCONNECT RRH REMOTE RADIO HEAD FMT ELECTRICAL METALLIC TURING RRH REMOTE RADIO LINIT GROUND FAULT CURRENT INTERRUPTER GFCI SPD SURGE PROTECTIVE DEVICE GROUND STAINLESS STEEL S/S GND GROUND TVSS TRANSIENT VOLTAGE SURGE SUPPRESSOR GLOBAL POSITIONING SYSTEM TYP

- UGP - UGP - UGP - EXISTING U/G ELECTRICAL
— OE —— OE —— EXISTING O/H ELECTRICAL
- AGP AGP AGP EXISTING A/G ELECTRICAL
- ugt ugt EXISTING U/G TELEPHONE
—— FO —— FO —— EXISTING FIBER OPTIC
- HFLEX — HFLEX — HFLEX – EXISTING HYBRIFLEX CABLE
- UGP - UGP - NEW U/G ELECTRIC
— OE —— OE —— NEW O/H ELECTRIC
– AGP —— AGP —— AGP — NEW A/G ELECTRIC
- UGT UGT NEW U/G TELEPHONE
FO NEW FIBER OPTIC
- HFLEX — HFLEX — HFLEX - NEW HYBRIFLEX CABLE



- x ----- x ----- x -EXISTING CHAINLINK FENCE

—————— EXISTING WOOD FENCE

- x - x - x - NEW CHAINLINK FENCE





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	В	11/30/2017	90% CD'S - REVISED

11/2/2017 90% CD'S FOR REVIEW



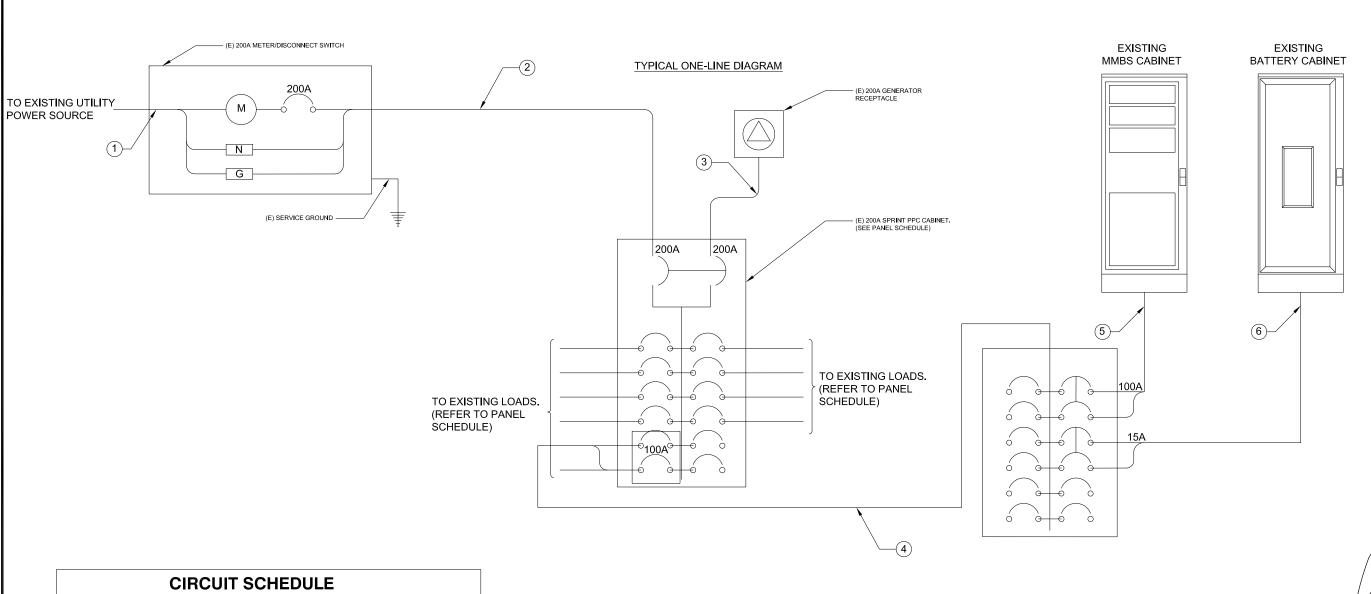
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SHEET TITLE
GENERAL ELECTRICAL
NOTES, ABBREVIATIONS,
AND ELEC. LEGEND

SHEET NUMBER

E-1







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CHECKED BY: MM

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> > SHEET TITLE

ONE-LINE DIAGRAM

E-2

NOTES:

1. MECHANICALLY INTERLOCKED TO PREVENT SIMULTANEOUS FEED FROM UTILITY AND GENERATOR, "BREAK-BEFORE-MAKE."

NO

1

2

3

4

(5)

6

FROM

UTILITY SOURCE

METER/ DISCONNECT

TRANSFER &

LOAD CENTER

TRANSFER &

LOAD CENTER

SUB PANEL

SUB PANEL

TO

METER/ DISCONNECT

TRANSFER &

LOAD CENTER

GENERATOR

RECEPTICLE

SUB PANEL

EXISTING

MMBS CABINET

EXISTING

MMBS CABINET

CONFIGURATION

EXISTING

EXISTING

EXISTING

EXISTING

EXISTING

EXISTING

MAIN PANEL

VOLTA	BREAKE					ENCLOSURE TYPE: PANEL STATUS: MODEL NUMBER: PHASE:	NEMA 3R EXISTING TBD 1	BUSS RATI NEUTRAL F NEUTRAL E N to GROU	RATING: YES BUS: YES	W	ITERNAL 'IRE: IC: ROUND			YES 3 22, YES	,000
CKT NO	C	KT BK	R STAT	SERV LD VA	USE FAC	DESCRIPTION	PHASE A VA	PHASE B VA	DESCRIPTION	USE FAC	SERV LD VA	STAT	CKT P	BKR AMPS	CKT NO
1	200	2		0		GENERATOR MAIN	0		TVSS	1.00					2
3				0	0.00	_		0		1.00	0				4
5				0	0.00	SPACE	500		SPACE	0.00	0				6
7				0		SPACE		0	LIGHT	1.00	500	ON	1	20	8
9	100	2	ON	9150	1.25	SUB PANEL	11618		FAN	1.00	200	ON	1	10	10
11				9150	1.25			11637.5	TELCO GFI	1.00	180	ON	1	20	12
							12118	11638		TOTAI	_ KVA:		23.76		
						_	·			AMPS	6		98.98		

NOTE: CL = LONG CONTINUOUS LOAD LML = LARGEST MOTOR LOAD

UM = UTILITY MAIN CIRCUIT BREAKER GM = GENERATOR MAIN CIRCUIT BREAKER SEE SINGLE LINE DIAGRAM FOR WIRING DIAGRAM

*THIS IS A TYPICAL PANEL SCHEDULE SUBJECT TO CHANGE AND TO BE FIELD VERIFIED.

SUB-PANEL

SITE N VOLTAG MAIN E MOUNT	GE: BREAKE				,		ENCLOSURE TYPE: PANEL STATUS: MODEL NUMBER: PHASE:	NEMA 3R EXISTING TBD 1	TING NEUTRAL RATING: YES		S S	INTERNAL TVSS: WIRE: AIC: GROUND BAR:			YES 3 22, YES	.000	
CKT NO	C AMPS	KT BK	R STAT	SERV LD VA	USE FAC		DESCRIPTION	PHASE A VA	PHASE B VA	DESCRIPT	ΓΙΟΝ	USE FAC	SERV LD VA	STAT	CKT	BKR AMPS	CKT NO
1	AIVIP 3			LD VA	1 40	SPACE		8750	VA	SAMSUNG MMBS	CABINET	1.00	0	ON	2	100	2
3						SPACE			8750			1.00	0				4
5						SPACE		400		SAMSUNG BATTE	ERY	0.00	0	ON	2	15	6
7						SPACE			400			1.00	500				8
9						SPACE		0		SPACE		1.00	200				10
11						SPACE			0	SPACE		1.00	180				12
								9150	9150			TOTAL	KVA:		18.30		
												AMPS			76.25		

NOTE: CL = LONG CONTINUOUS LOAD

LML = LARGEST MOTOR LOAD

UM = UTILITY MAIN CIRCUIT BREAKER GM = GENERATOR MAIN CIRCUIT BREAKER SEE SINGLE LINE DIAGRAM FOR WIRING DIAGRAM

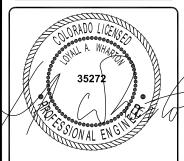
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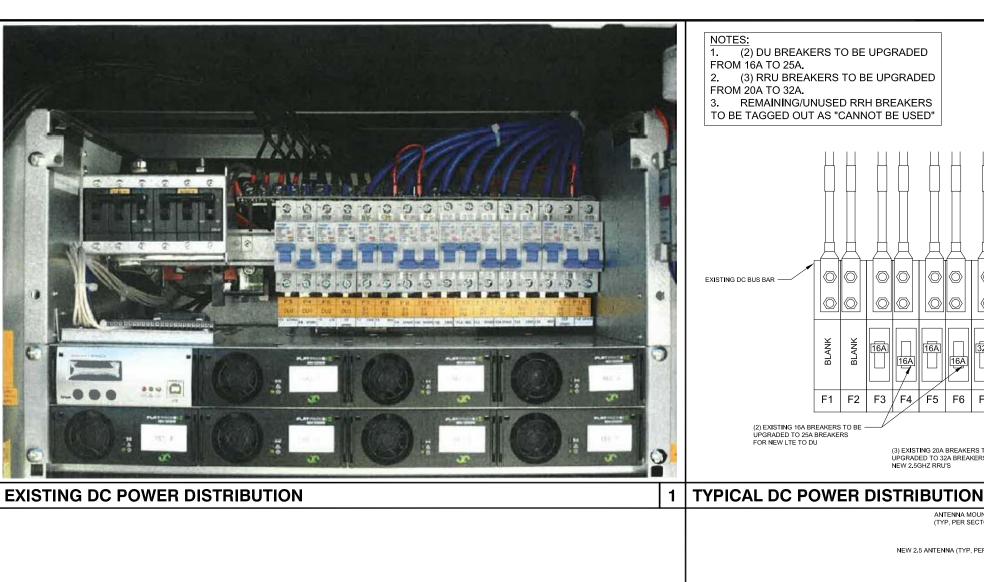
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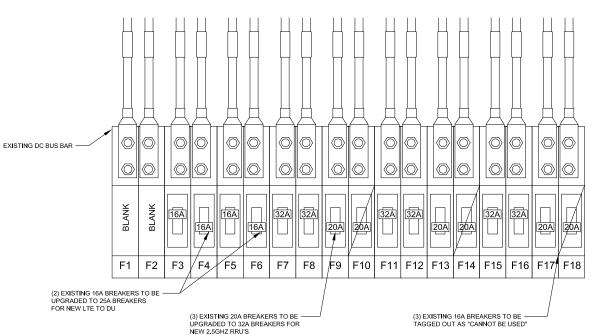
SHEET TITLE

PANEL SCHEDULE

SHEET NUMBER **E-3**



- 1. (2) DU BREAKERS TO BE UPGRADED FROM 16A TO 25A.
- (3) RRU BREAKERS TO BE UPGRADED FROM 20A TO 32A.
- 3. REMAINING/UNUSED RRH BREAKERS TO BE TAGGED OUT AS "CANNOT BE USED"







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	CHECKED BY:	ММ

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		A	01/10/2019	100% CD - JX COMMENTS
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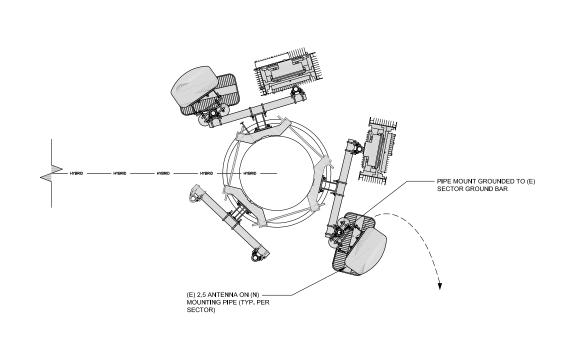


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SHEET TITLE DC DISTRIBUTION AND **ANTENNA GROUNDING** PLAN AND DIAGRAM

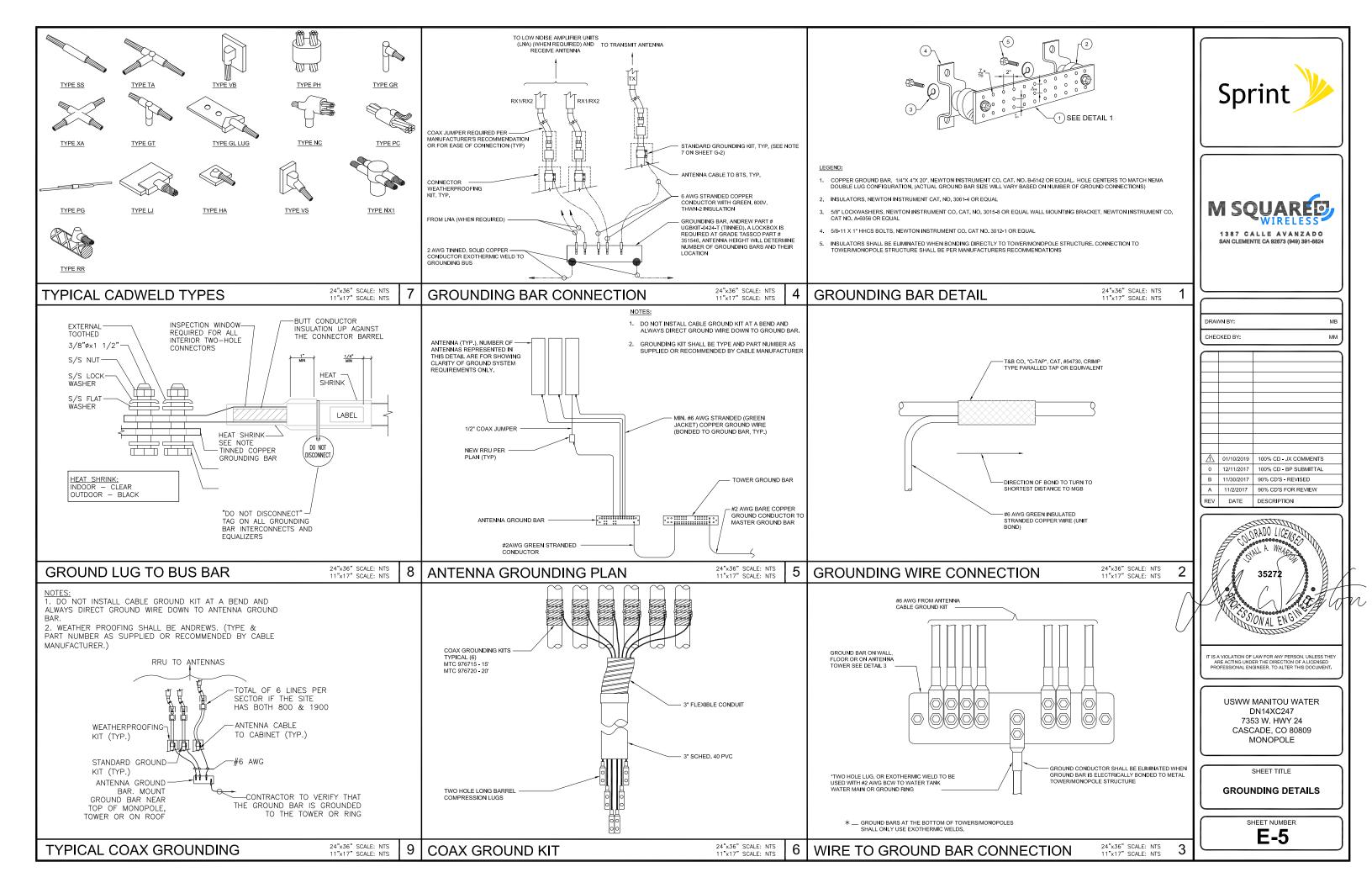
> SHEET NUMBER E-4



ANTENNA MOUNTING PIPE -(TYP, PER SECTOR) NEW 2.5 ANTENNA (TYP, PER SECTOR) – #2 AWG STRANDED INSULATED GND WIRE (TYI NEW 2.5 RRU'S (TYP, PER SECTOR) #6 AWG STRANDED INSULATED GND WIRE (TY JUMPER CABLES (TYP, X9 PER SECTOR) NEW POWER JUNCTION CYLINDER (TYP, PER SECTOR) (2) EX, SPARE FIBER & DC POWER CABLES IN PE PIPES -TO BE CONNECTED TO NEW POWER & FIBER JUNCTION CYLINDERS (TYP, PER SECTOR) EXISTING SPRINT MMBS CABINET EXISTING MEDUSA BREAKOUT CYLINDER (TYP, PER SECTOR) EXISTING SPRINT -BATTERY CABINET EXISTING HYBRIFLEX CABLE (TYP, PER SECTOR) - EXISTING GROUND BAR

3 TYPICAL GROUNDING RISER DIAGRAM

TYPICAL ANTENNA GROUNDING PLAN



SprintVision

RF Design Sheet

		Contact Information	
	DN14XC247	Engineer Email	gorima.2.tewoni@sprint.com
	12344044	Sprint Badged RF Engineer	Ganna Tawani
	DO Macro Upgrade	RF Engineer Email	garima.2 tewani@sprint.com
		RF Engineer Phone	224-345-9619
	Samuring	RF Manager	Deyananda Rau
	STA	RF Manager Email	Dayananda Rau@sprint.com
		RF Manager Phone	949-214-5481
	2017-04-12 00:00:00:0	Carrier Count	1.0000000000000000000000000000000000000
_	3	2500 LTE	3
	Time.	1900 LTE	
	YES	1900 EVDO	
		1900 Voice	la l
	Complete	800 LTE	1
	YES	800 Voice	1

Location Details		
Latitude	36.68604	
Longitude	-104.96842	
Market	Colorado	
Region	West	
City	Manitou Springs	
State	co	
Zip Code	CO/80829	
County	El Paso	
Sector Count		
2500MHz	2	
1900MHz	= 1°	
800MHz	2	

Additional RF Notes

Add 800 3G/4G and 2500 4G. On each sector, replace existing antenna with (1) 4' 6-port triband antenna. Diplex 1900 & 2500 bands. Relocate 1900 RRUs to tower top.

Band: 2500	Alpha	Beta	Gamma	Delta	Epsilon	Zeta			
Radio Model									
Model Number	RRH-B8	RRH-B8	N/A	N/A	N/A	N/A			
Weight (lbs)	59.75	59.75	N/A	N/A	N/A	N/A			
Dimensions	21.26 x 15.03 x 8.03	21.26 x 15.03 x 8.03	N/A	N/A	N/A	N/A			
Manufacturer	STA	STA	N/A	N/A	N/A	N/A			
Number of RRUs needed	1	1	0	0	0	0			

Band: 800	Alpha	Beta	Gamma	Delta	Epsilon	Zeta			
Radio Model									
Model Number	RRH-C2A	RRH-C2A	N/A	N/A	N/A	N/A			
Weight (lbs)	55.16	55.16	N/A	N/A	N/A	N/A			
Dimensions	23.7 x 15.75 x 6.73	23.7 x 15.75 x 6.73	N/A	N/A	N/A	N/A			
Manufacturer	STA	STA	N/A	N/A	N/A	N/A			
Number of RRUs needed	1	1	0	0	0	0			

Trunk Cable 1										
Model Number	1900 Hybrid_STA	1900 Hybrid_STA	N/A	N/A	N/A	N/A				
Weight (Lbs.)	2.2	2.2	N/A	N/A	N/A	N/A				
Dimensions (In.)	1.76	1.76	N/A	N/A	N/A	N/A				
Manufacturer	STA	STA	N/A	N/A	N/A	N/A				

Power Junction Cylinder Model								
Model Number	EP96-04223A	EP96-04223A	N/A	N/A	N/A	N/A		
Weight (Lbs.)		4.58	N/A	N/A	N/A	N/A		
Dimensions (In.)	15.35 High x 3.15 dia	15.35 High x 3.15 dia	N/A	N/A	N/A	N/A		
Manufacturer	STA	STA	N/A	N/A	N/A	N/A		
Power Junction Cylinder Qty	1	1	0	0	0	0		
Optical Junction Cylinder City needed								
Model Number	EP96-04225A	EP96-04225A	N/A	N/A	N/A	N/A		
Weight (Lbs.)	4.04	4.04	N/A	N/A	N/A	N/A		
Dimensions (in.)	11.22 High x 3.15 dia	11.22 High x 3.15 dia	N/A	N/A	N/A	N/A		
Manufacturer	STA	STA	N/A	N/A	N/A	N/A		
Optical Junction Cylinder Oty needed								

Band: 2500 Alpha		Beta		Gamma		Delta		Epsilon		Zeta			
Antenna1													
Model Number	Antenna assigned on a differen	t band	Antenna assigned on a different band										
Weight (lbs)	0		0		N/A		N/A		N/A	N/A			
Dimensions	ons 0 x 0 x 0		0 x 0 x 0		N/A		N/A		N/A	N/A		N/A	
Manufacturer -				N/A		N/A		N/A	N/A		N/A		
Ant1 Top Jumper Make/Mode/Qtyl	2.5 Jumper	4	2.5 Jumper	4	N/A	0	N/A	0	N/A	0	N/A	0	
Ant 1 RF requested Diameter	N/A		N/A		N/A		N/A		N/A	N/A		N/A	
Ant 1 RF requested Top Jumper Length(ft)	N/A		1		N/A		N/A		N/A		N/A		
Antenna 1 Azimuth	325	325		125		N/A		N/A		N/A		N/A	
Antenna 1 Mechanical DT	nna 1 Mechanical DT 0		0		N/A		N/A		N/A		N/A		
Antenna 1 Center Line (ft)	58		58		N/A		N/A		N/A		N/A		
Antenna 1 Electrical DT	2		N/A		N/A		N/A		N/A	N/A			
Antenna 1 Electrical DT 2	N/A		2		N/A		N/A		N/A		N/A		

		_		_				$\overline{}$		_		
Band: 800	Alpha		Beta	_	Gamma		Delta		Epsilon		Zeta	
Antenna1												
Model Number	HPA65R-KE4AA-K		HPA65R-KE4AA-K									
Weight (lbs)	28.7		28.7	N/A	N/A		N/A		N/A		N/A	
Dimensions	48 x 11.7 x 7.6		48 x 11.7 x 7.6	N/A	N/A		N/A		N/A		N/A	
Manufacturer	CCI		CCI	N/A	N/A		N/A		N/A		N/A	
Ant1 Top Jumper Make/Mode/Qtyl	800/1900 Jumper	1	800/1900 Jumper 2	N/A	0		N/A 0	N	/A 0	N/A	0	
	N/A		N/A	N/A		N/A		N/A		N/A		
Ant 1 RF requested Top Jumper Length(ft)	N/A		N/A	N/A				N/A		N/A		
Antenna 1 Azimuth	325		125	N/A				N/A		N/A		
Antenna 1 Mechanical DT	0		0	N/A	N/A		N/A		N/A		N/A	
Antenna 1 Center Line (ft)	58		58	N/A			N/A		N/A			
Antenna 1 Electrical DT	3		3	N/A		N/A		N/A		N/A		





	DRAWN BY:	МВ
Ц	CHECKED BY:	ММ
L		

A	01/10/2019	100% CD - JX COMMENTS
0	12/11/2017	100% CD - BP SUBMITTAL
В	11/30/2017	90% CD'S - REVISED
Α	11/2/2017	90% CD'S FOR REVIEW
REV	DATE	DESCRIPTION



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.

> USWW MANITOU WATER DN14XC247 7353 W. HWY 24 CASCADE, CO 80809 MONOPOLE

> > SHEET TITLE

RADIO FREQUENCY DATA SHEET

SHEET NUMBER

RF-1