

COMMISSIONERS:
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HOLLY WILLIAMS
STAN VANDERWERF
CAMI BREMER

PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT
 CRAIG DOSSEY, EXECUTIVE DIRECTOR

TO: El Paso County Planning Commission
Jim Egbert, Chair

FROM: Len Kendall, Planner I
Daniel Torres, PE Engineer II
Craig Dossey, Executive Director

RE: Project File #: VA-18-006
Project Name: USS Manitou Water CO46103-A (Vahsholtz)
Parcel No.: 83264-00-018

| OWNER: | REPRESENTATIVE: |
|--|---|
| George R. Vahsholtz 301 S Weber Street. Colorado Springs, CO 80903 | Virtual Site Walk, LLC 2215 SE 37 th Avenue Portland, OR 97214 |

Commissioner District: 3

| | |
|--|-----------|
| Planning Commission Hearing Date: | 5/7/2019 |
| Board of County Commissioners Hearing Date | 5/28/2019 |

EXECUTIVE SUMMARY

A request by Virtual Site Walk, LLC, representing the property owner George R. Vahsholtz, for approval of a variance of use for an existing 60-foot tall monopole Commercial Mobile Radio Service (CMRS) Facility. On November 20, 1997, the Board of County Commissioners approved the original request for a 53-foot monopole communication tower (VA-97-017). Two renewals of the original variance of use have been approved by the Board of County Commissioners (VA-02-028 and VA-08-001). In addition, two co-locations (TWR-04-005 and TWR-07-014) have been approved administratively for the monopole. Construction pursuant to PCD File No. TWR-04-005



resulted in an increase in the height of the structure by 6.5 feet, resulting in an overall height of 60 feet. There are two CMRS facilities on the property, one of which was approved as a special use pursuant to PCD File No. AL-09-008 and the other is the tower that is the subject of the current request. The variance of use associated with the subject tower (VA-08-001) included a condition of approval stating that the approval would expire in five (5) years. The date of expiration of the approval occurred on June 12, 2013.

A. REQUEST/WAIVERS/DEVIATIONS/AUTHORIZATION

Request: A request by Virtual Site Walk, LLC, representing the property owner George R. Vahsholtz, for approval of a variance of use for an existing 60-foot tall monopole Commercial Mobile Radio Service (CMRS) Facility.

Waiver(s)/Deviation(s): There are no waivers associated with this request.

Authorization to Sign: There are no documents associated with this application that require signing.

B. PLANNING COMMISSION SUMMARY

Request Heard:

Recommendation:

Waiver Recommendation:

Vote:

Vote Rationale:

Summary of Hearing:

Legal Notice:

C. APPROVAL CRITERIA

Pursuant to Section 5.3.4 of the Land Development Code, the Planning Commission and Board of County Commissioners may consider the following criteria in approving a variance of use:

- The strict application of any of the provisions of this Code would result in peculiar and exceptional practical difficulties or undue hardship.
- The proposed use is compatible with the surrounding area, harmonious with the character of the neighborhood, not detrimental to the surrounding area, not detrimental to the future development of the area, and not detrimental to the health, safety, or welfare of the inhabitants of the area and County;
- The proposed use will be able to meet air, water, odor or noise standards established by County, State or federal regulations during construction and upon completion of the project;

- The proposed use will comply with all applicable requirements of this Code and all applicable County, State and federal regulations except those portions varied by this action;
- The proposed use will not adversely affect wildlife or wetlands;
- The applicant has addressed all off-site impacts;
- The site plan for the proposed variance of use will provide for adequate parking, traffic circulation, open space, fencing, screening, and landscaping; and/or
- Sewer, water, storm water drainage, fire protection, police protection, and roads will be available and adequate to serve the needs of the proposed variance of use as designed and proposed.

D. LOCATION

| | | |
|--------|-------------------------------|--------------------|
| North: | R-T (Residential Topographic) | US Highway 24 West |
| South: | R-T (Residential Topographic) | Vacant/Forest |
| East: | R-T (Residential Topographic) | Vacant/Forest |
| West: | R-T (Residential Topographic) | Residential |

E. BACKGROUND

The property is zoned R-T (Residential Topographic) and is located on the southwest side of US Highway 24 West approximately one-half (1/2) mile northwest of the intersection of US Highway 24 West and Long Ranch Road. The property was originally zoned pursuant to the R-T (Residential Topographic) zoning district in 1966. In 1990, El Paso County adopted regulations restricting transmission towers to the commercial and industrial districts. In 2007, El Paso County adopted regulations modifying the regulations for freestanding transmission towers to a special use in commercial and industrial districts. Both the previous and current Land Development Code prohibit CMRS towers in residential zoning districts.

On November 20, 1997, the Board of County Commissioners approved the original request for a 53-foot monopole communication tower (VA-97-017). Two renewals of the original variance of use have been approved by the Board of County Commissioners (VA-02-028 and VA-08-001). In addition, two co-locations (TWR-04-005 and TWR-07-014) have been approved administratively for the monopole. Construction pursuant to PCD File No. TWR-04-005 resulted in an increased in the height of the structure by 6.5 feet, for an overall height of 60 feet.

There are two CMRS facilities on the property, one of which was approved as a special use pursuant to PCD File No. AL-09-008 and the other is the tower that is the subject of the current request. The variance of use associated with the subject tower (VA-08-001)

included a condition of approval stating that the approval would expire in five (5) years. The date of expiration of the approval occurred on June 12, 2013. The variance of use has expired, therefore, a new variance of use is required in order to legalize the use.

F. ANALYSIS

1. Land Development Code Analysis

Section 5.2.18.B.7.c, Maximum Height for Freestanding CMRS Facilities, of the Land Development Code (2019) states that a freestanding monopole structure cannot exceed the height limitation of the zoning district unless specifically requested as part of a special use or variance of use approval. The setbacks for the tower are the height of the tower plus ten (10) feet, which would be 70 feet for the subject tower, from any property boundary. Staff recommends that the subject tower meets the setback requirement since it is located 140 feet away from the closest property boundary. The tower is co-locatable and has been previously co-located on by other service providers.

2. Zoning Compliance

The tower is not currently an allowed use in the R-T (Residential Topographic) zoning district, which triggers the requirement for this variance of use application.

3. Policy Plan Analysis

The El Paso County Policy Plan (1998) has a dual purpose; it serves as a guiding document concerning broader land use planning issues, and provides a framework to tie together the more detailed sub-area elements of the County Master Plan. Relevant policies are as follows:

Goal 7.1 – Reasonably accommodate unique and special uses which provide value to the greater community and which can be made consistent with the surrounding uses.

Policy 7.1.2 – Consider the future combined impact of potential additional land use requests when considering individual applications for special or unique land uses.

Goal 7.5 – Allow for towers, transmission lines, and related facilities that provide a benefit to County residents in a manner which balances considerations of economics, equity, and environmental sensitivity and provides equitable compensation to private land owners for impacts caused by these facilities.

This tower will allow multiple communication service providers to utilize the structure to provide services to County residents and visitors. As depicted in the applicant's coverage maps, the tower should provide an improvement in service access to residents in the Ute Pass area of the County.

4. Small Area Plan Analysis

The property is located within the Ute Pass Comprehensive Plan (1981). The Plan places a major emphasis on minimization of visual impacts and a strict limitation on the location of commercial areas to designated areas, which does not include the area where the subject property is located. Staff believes the site is very well screened from a visual standpoint and notes the tower is not out of scale compared with other uses in the Ute Pass area of the County, including but not limited to buildings, other CMRS facilities, and existing power lines poles. The Plan identifies the site as suitable for cluster residential land uses and as having moderate potential visual impacts. The applicant included photos from the US Highway 24 West right-of-way. The photos are from the eastbound and westbound lanes of the Highway and they depict the tower as being minimally if at all visible.

5. Other Master Plan Elements

The El Paso County Wildlife Habitat Descriptors (1996) identifies the parcels as having a high wildlife impact potential.

The Master Plan for Mineral Extraction (1996) identifies granite in the area of the subject parcels. A mineral rights certification was prepared by the applicant indicating that, upon researching the records of El Paso County, no severed mineral rights exist.

G. PHYSICAL SITE CHARACTERISTICS

1. Hazards

A significant portion of the parcel contains slopes in excess of 30 percent. The property slopes down towards US Highway 24 West to a point where it drops off significantly. The slope of the property makes the tower harder to see from the Highway 24 right-of-way.

2. Wildlife

The El Paso County Wildlife Habitat Descriptors (1996) identifies the parcels as having a high wildlife impact potential.

3. Floodplain

The FEMA Flood Insurance Rate Map (FIRM) panel number 08041C0489G shows that the property lies within the zone X area, which is determined to be outside the 500-year floodplain.

4. Drainage And Erosion

The property is located within the Manitou Reservoir (FOFO7400) drainage basin. There are no fees associated with this drainage basin. No public drainage improvements will be required as there are no anticipated drainage or erosion impacts identified with this request.

5. Transportation

The property is accessed via an existing indirect access road off of Highway 24. A traffic impact study was not required and the County road impact fee does not apply to this request as the proposed variance of use is not expected to generate 100 daily vehicle trips more than the property would be expected to generate currently. No public roadway improvements will be required.

H. SERVICES

1. Water

Water is provided by a private well. Water service is not needed to support operation of the CMRS facility.

2. Sanitation

Wastewater is provided by an onsite wastewater treatment system (OWTS). Wastewater service is not needed to support operation of the CMRS facility.

3. Emergency Services

The property is within the Cascade Fire Protection District.

4. Utilities

Colorado Springs Utilities provides electrical service to the site.

5. Metropolitan Districts

The property is not located within a metropolitan district.

6. Parks/Trails

Land dedication and fees in lieu of park land dedication are not required for a variance of use application.

7. Schools

Land dedication and fees in lieu of school land dedication are not required for a variance of use application.

I. APPLICABLE RESOLUTIONS

Approval Page 51

Disapproval Page 52

J. STATUS OF MAJOR ISSUES

There are no major issues with this project.

K. RECOMMENDED CONDITIONS AND NOTATIONS

Should the Planning Commission and Board of County Commissioners find that the request meets the criteria for approval outlined in Section 5.3.4 of the El Paso

County Land Development Code (2019), staff recommends the following conditions and notations:

CONDITIONS

1. Approval is limited to the one (1) existing commercial tower of sixty (60) feet in height, designed as a monopole communications tower, and existing antennas and equipment buildings as discussed and depicted in the applicant’s letter of intent and site plan drawings.
2. Prior to the authorization of a building permit a site development plan must be applied for and approved by the El Paso County Planning and Community Development Department.
3. The tower shall be painted a suitable color to fit the natural surroundings, as determined by the El Paso County Planning and Community Development Department.

NOTATIONS

1. Variance of use approval includes conditions of approval and the accompanying site plan and elevation drawings. No substantial expansion, enlargement, intensification or modification shall be allowed except upon reevaluation and public hearing as specified in the El Paso County Land Development Code.
2. The Board of County Commissioners may consider revocation and/or suspension if zoning regulations and/or variance of use conditions/standards are being violated, preceded by notice and public hearing.
3. If the use is discontinued or abandoned for two (2) years or longer, the variance of use shall be deemed abandoned and of no further force and effect.

L. PUBLIC COMMENT AND NOTICE

The Planning and Community Development Department notified four (4) adjoining property owners on April 18, 2019, for the Planning Commission hearing. Responses will be provided at the hearing.

M. ATTACHMENTS

- Vicinity Map
- Letter of Intent
- Site Plan
- Photos from US Highway 24 West right-of-way

El Paso County Parcel Information

File Name:

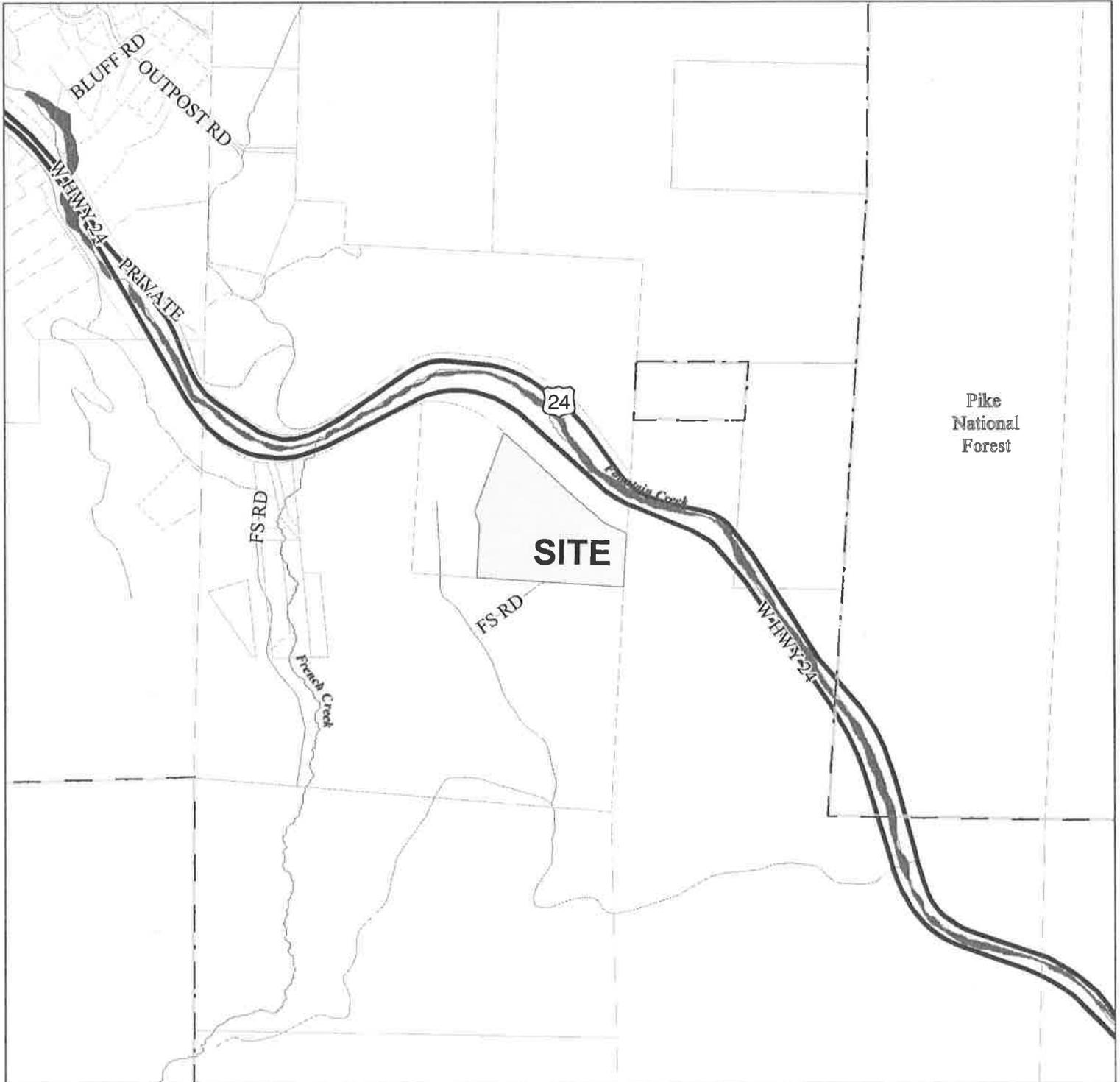
Zone Map No.

| PARCEL | NAME |
|------------|----------------------|
| 8326400018 | VAHSHOLTZ, GEORGE R. |

| ADDRESS | CITY | STATE |
|----------------|------------------|-------|
| 301 S WEBER ST | COLORADO SPRINGS | CO |

| ZIP | ZIPLUS |
|-------|--------|
| 80903 | 2156 |

Date:



Please report any parcel discrepancies to:
 El Paso County Assessor
 1675 W. Garden of the Gods Rd.
 Colorado Springs, CO 80907
 (719) 520-6600



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January 14, 2019

El Paso County
Planning Department
2880 International Circle, Suite 110
Colorado Springs, CO 80910

RE: Variance of Use Permit Renewal (VA-08-001)
Site Name/Number: USWW Manitou Water/CO46103
Site Address: 7225 West Highway 24, Manitou Springs, CO 80829
Owner Info: George Vahsholtz, 301 S. Weber, Colorado Springs, CO 80903

Dear Planning Department,

Please find attached Sprint's application and request for a Variance of Use Renewal for the existing telecommunications facility located at 7225 West Highway 24, Manitou Springs, CO 80829. Parcel ID/Schedule Number 8326400018 (replaced 8326400014). The legal description of the property is:

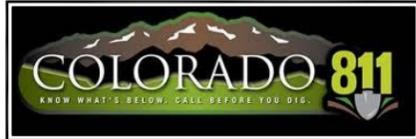
"A TR OF LAND IN SEC 26-13-68 DESC AS FOLS: BEG AT PT ON S LN OF NE4SE4 SEC 26, A DIST OF 437.0 FT E OF SW4, TH N 88<31' W 50.0 FT, N 00<26' E 314.46 FT, N 22<00' W 81.50 FT. THN 18<02' E 498.67 FT TO SLY R/W OF HWY 24. TH S 50<04' E 233.20FT. S 02<00' W 722.18 FT. TH N 88<31' W 230.0 FT. TO POB. TOG WITH TR IN NE4SE4 SCE 26-13-68 AS FOLS: BEG AT A PT ON S LN OF SD NE4SE4 387.0 FT E OF SW COR THEREOF. N 00<26'E 314.46FT, N 22<00' W 81.5 FT. N 18<02' E 498.67 FT TO SLY R/W LN OF HWY 24, SELY ON SD R/W LN TO INTSEC ELY LN OF SD NE4SE4, S ON E LN TO SE COR OF SD NE4SE4, TH W ON S LN OF SD NE4SE4 882.0 FT TO POB".

The property is approximately 16 acres in the R-T (Residential Topographic) zoning district. The existing site is NOT visible from any public right-of-way. The site is up on a hill and is tucked back off the main road (Highway 24) about 700ft. The telecommunications site has adhered to all applicable laws and regulations and Sprint would like to continue to provide wireless telecommunications service from this site.

There has been no change in technology since the first renewal of the Variance approval in 2002 to make this site obsolete. It is an important site in Sprint's coverage plan. The tower site has not changed since 2002 and remains in compliance with all El Paso County requirements.

Thank you.

Nicole Comach (Representative/Applicant)
Virtual Site Walk LLC
1533 SE 33rd Ave
Portland, OR 97214
nicole@virtualsitewalk.com
Phone: 541-228-4823



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

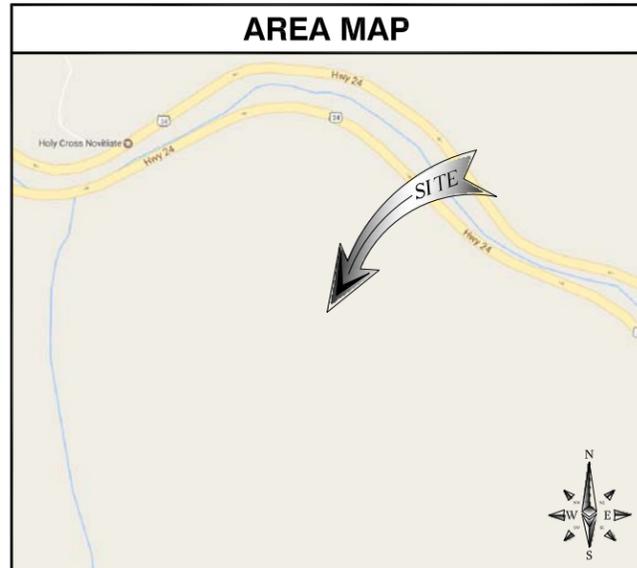
SITE TYPE: MONOPOLE



1387 CALLE AVANZADO
SAN CLEMENTE CA 92673 (949) 391-6824

DRAWN BY: MB
CHECKED BY: MM

| SITE INFORMATION | |
|------------------------|---|
| PROPERTY OWNER: | GEORGE VAHSOLTZ 7225 WEST HIGHWAY 24 MANITOU SPRINGS, CO 80829 GEORGE VAHSOLTZ |
| 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) |
| CURRENT USE: | UNMANNED TELECOMMUNICATIONS FACILITY |
| ASSESSOR'S PARCEL NO.: | 83264-00-018 |
| PROPOSED USE: | UNMANNED TELECOMMUNICATIONS FACILITY |
| TYPE OF CONSTRUCTION: | V-B |
| OCCUPANCY GROUP: | U-2 |



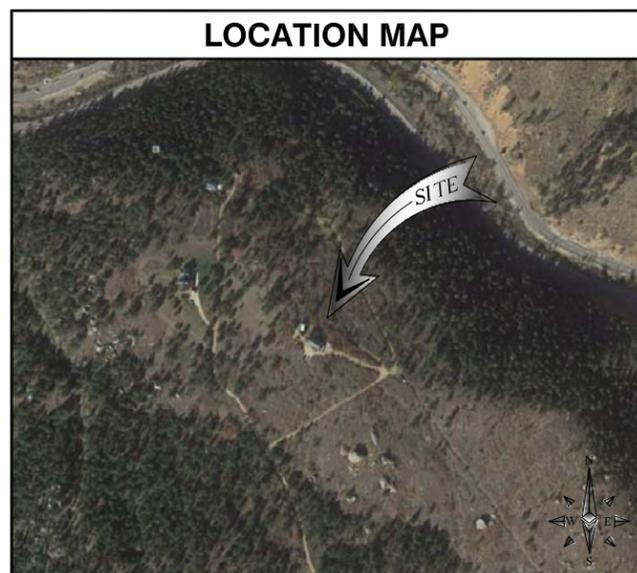
| PROJECT DESCRIPTION | |
|---|--|
| SPRINT PROPOSES TO MODIFY AN EXISTING WIRELESS INSTALLATION. THE SCOPE WILL CONSIST OF THE FOLLOWING: | |
| • REMOVE | (2) EXISTING SPRINT PANEL ANTENNAS |
| • RELOCATE | (2) EXISTING SPRINT 1900 RRU'S TO ANTENNA LEVEL |
| • INSTALL | (1) NEW SPRINT MONOPOLE MOUNT |
| • INSTALL | (2) NEW SPRINT PANEL ANTENNAS |
| • INSTALL | (4) NEW SPRINT RRU @ ANTENNA LEVEL |
| • INSTALL | (2) NEW SPRINT HYBRID CABLE |
| • INSTALL | (2) NEW SPRINT POWER JUNCTION CYLINDERS |
| • INSTALL | (2) NEW SPRINT FIBER JUNCTION CYLINDERS |
| • INSTALL | (4) NEW SPRINT BATTERIES IN EXISTING BBU CABINET |
| • INSTALL | (1) NEW SPRINT 2.5GHZ BASEBAND UNIT IN EXISTING MMBS CABINET |
| • INSTALL | (2) NEW SPRINT QUADPLEXERS |

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

| DRAWING INDEX | |
|---------------|------------------------------------|
| SHEET NO: | SHEET TITLE |
| 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 |
| E-3 | PANEL SCHEDULE |
| E-4 | ANTENNA GROUNDING PLAN AND DIAGRAM |
| E-5 | GROUNDING DETAILS |
| RF-1 | RADIO FREQUENCY DATA SHEET |

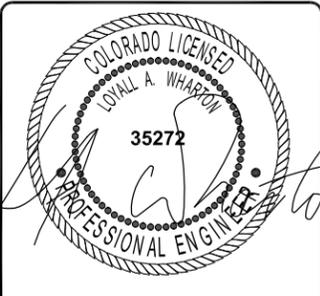
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|-----|------------|------------------------|
| △ | 01/10/2019 | 100% CD - JX COMMENTS |
| 0 | 12/11/2017 | 100% CD - BP SUBMITTAL |
| B | 11/30/2017 | 90% CD'S - REVISED |
| A | 11/2/2017 | 90% CD'S FOR REVIEW |

| PROJECT TEAM | |
|---|--|
| REAL ESTATE MANAGER: 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.com | ENGINEER: M SQUARED WIRELESS 1387 CALLE AVANZADO SAN CLEMENTE, CA 92673 CONTACT: MICHAEL MONTELLO EMAIL: michael@msquaredwireless.com |
| SITE ACQUISITION M SQUARED WIRELESS CONTACT: MATTHEW BABB 1387 CALLE AVANZADO SAN CLEMENTE, CA 92673 PH: (619) 992-5561 EMAIL: matthewbabb61@gmail.com | RF ENGINEER: CONTACT: NEERAJ BERI PH: (440) 222-8729 EMAIL: neeraj.beri@sprint.com |
| | CONSTRUCTION MANAGER: CONTACT: BRANDON WHINERY PH: (303) 505-5750 EMAIL: brandon.whinery@sprint.com |



| APPLICABLE CODES |
|---|
| 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 TO THESE CODES: |
| <ul style="list-style-type: none"> 2015 INTERNATIONAL BUILDING CODE 2014 NATIONAL ELECTRICAL CODE LOCAL BUILDING CODES CITY/COUNTY ORDINANCES |

| 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 LOCAL BUILDING DEPARTMENT & MAY IMPOSE CHANGES OR MODIFICATIONS. | |
| SPRINT RF ENGINEER: _____ | DATE: _____ |
| SPRINT OPERATIONS: _____ | DATE: _____ |
| SITE ACQUISITION: _____ | DATE: _____ |
| CONSTRUCTION MANAGER: _____ | DATE: _____ |
| PROPERTY OWNER: _____ | DATE: _____ |
| ZONING: _____ | DATE: _____ |
| PROJECT MANAGER: _____ | DATE: _____ |



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.

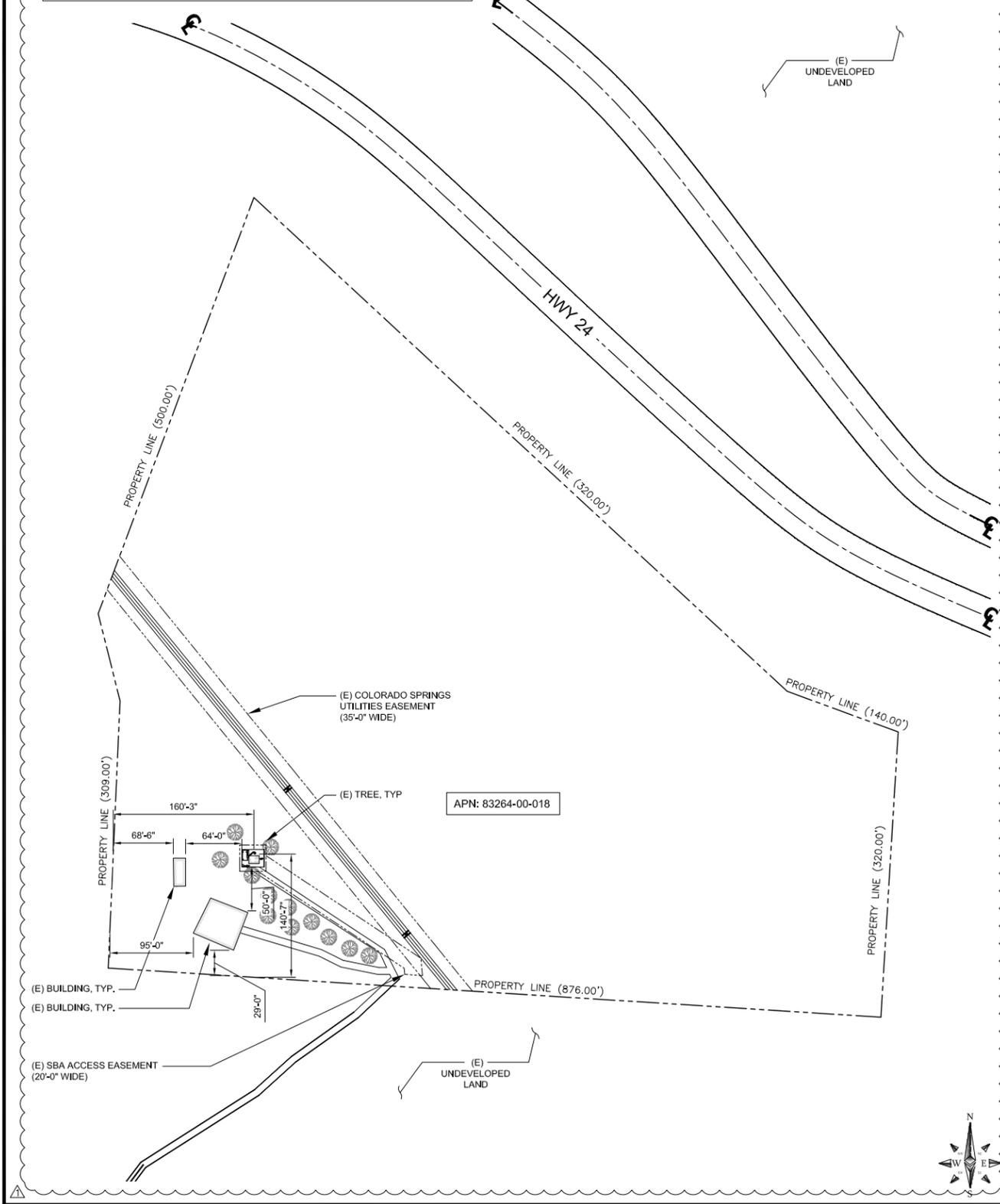
USWW MANITOU WATER
DN14XC247
7353 W. HWY 24
CASCADE, CO 80809
MONOPOLE

| GENERAL NOTES |
|--|
| THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED 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. |

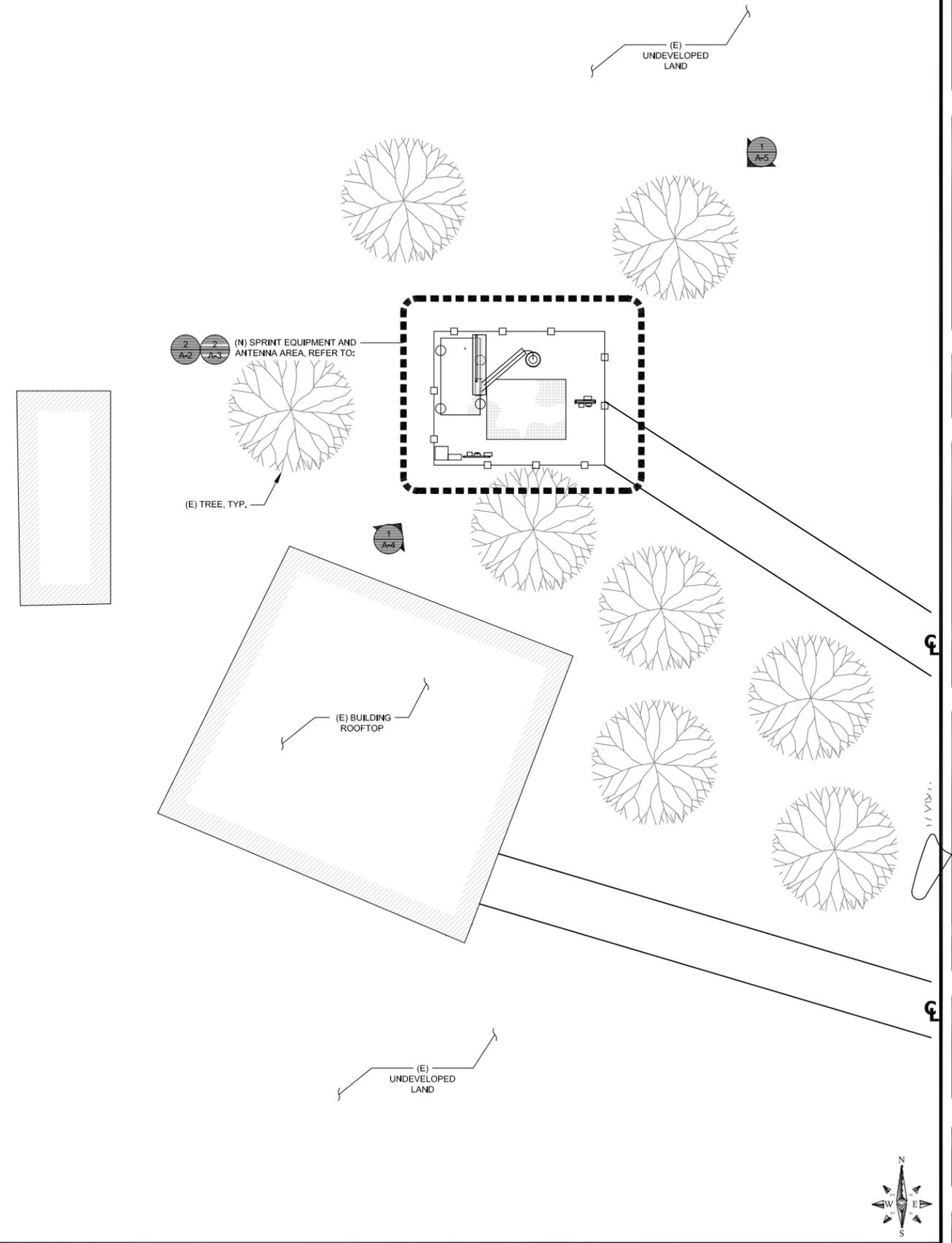
| DO NOT SCALE DRAWINGS |
|--|
| SUBCONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS & FIELD CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME. |

| |
|-----------------------------------|
| SHEET TITLE TITLE SHEET |
| SHEET NUMBER T-1 |

- NOTES:**
1. THE WIRELESS COMMUNICATION FACILITY COMPLIES WITH FEDERAL STANDARDS FOR RADIO FREQUENCY IN ACCORDANCE WITH THE TELECOMMUNICATION ACT OF 1996 AND SUBSEQUENT AMENDMENTS AND ANY OTHER REQUIREMENTS IMPOSED BY STATE OR FEDERAL REGULATORY AGENCIES.
 2. NO EXISTING PARKING STALLS ARE BEING ADDED OR REMOVED AS PART OF THE NEW INSTALLATION.
 3. THESE DRAWINGS WERE PRODUCED WITHOUT THE BENEFIT OF A CURRENT LAND SURVEY. ALL PROPERTY LINES, EASEMENTS, SETBACKS, AND EXISTING CONDITIONS ARE APPROXIMATE AND SHALL BE VERIFIED PRIOR TO START OF CONSTRUCTION.
 4. NO GRADING WORK IS INCLUDED IN THIS SCOPE OF WORK ON THIS PAGE



SITE PLAN 24"x36" SCALE: 1" = 80'-0" 11"x17" SCALE: 1" = 160'-0" **1**

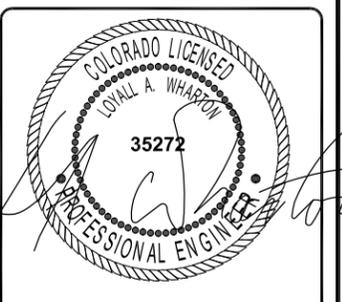


ENLARGED SITE PLAN 24"x36" SCALE: 1" = 10'-0" 11"x17" SCALE: 1" = 20'-0" **2**



DRAWN BY: MB
 CHECKED BY: MM

| REV | DATE | DESCRIPTION |
|-----|------------|------------------------|
| △ | 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 |



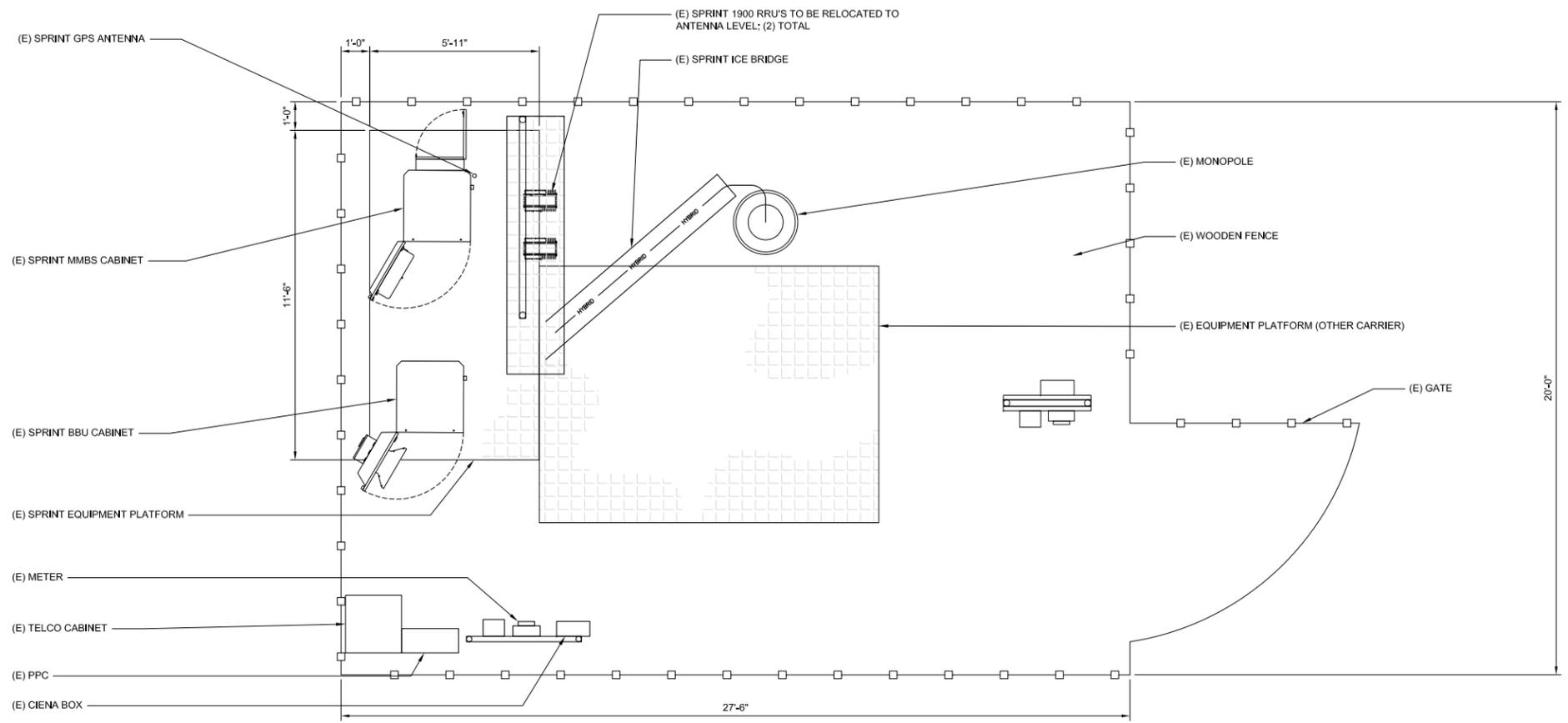
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

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

SHEET TITLE
SITE PLAN

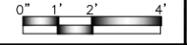
SHEET NUMBER
A-1

NOTE:
ANTENNAS NOT SHOWN FOR CLARITY.



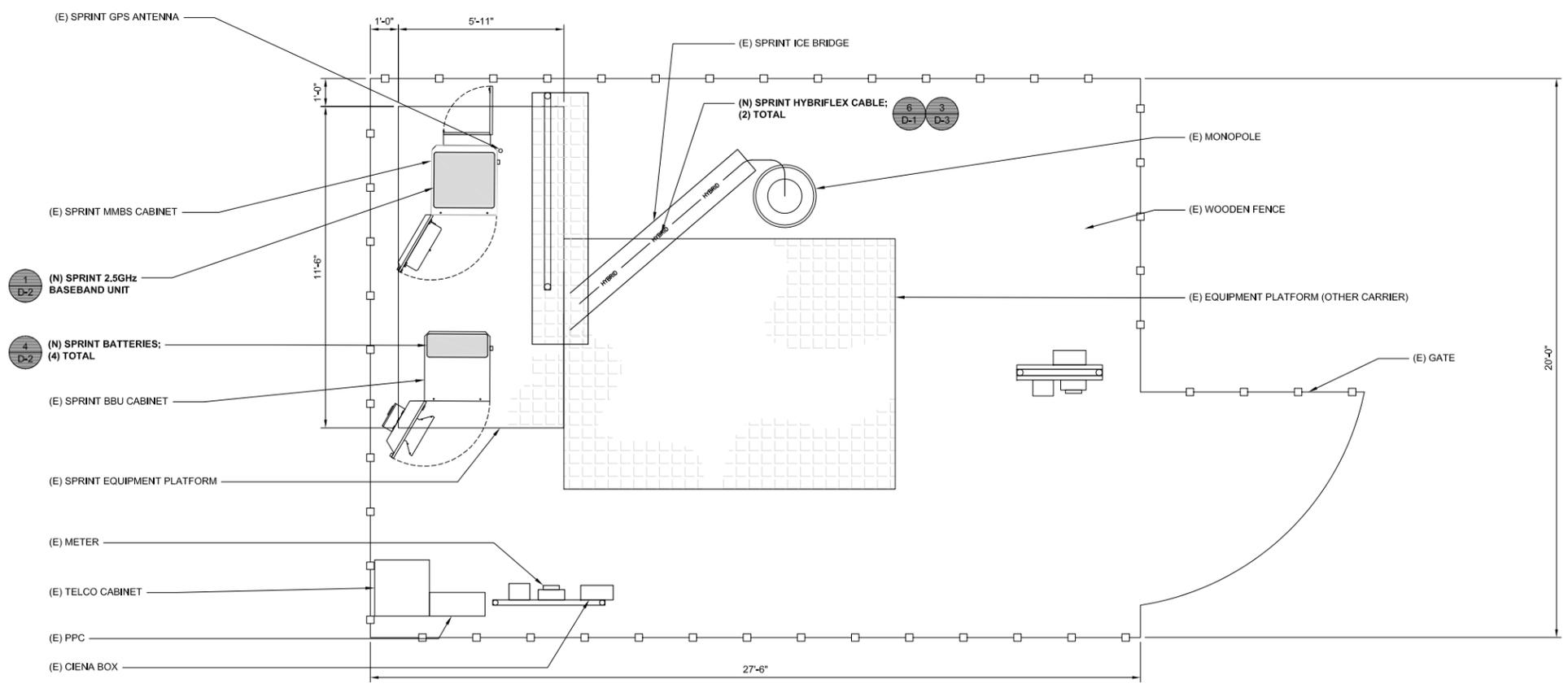
EXISTING EQUIPMENT LAYOUT

24"x36" SCALE: 3/8" = 1'-0"
11"x17" SCALE: 3/4" = 1'-0"



1

NOTE:
ANTENNAS NOT SHOWN FOR CLARITY.



PROPOSED EQUIPMENT LAYOUT

24"x36" SCALE: 3/8" = 1'-0"
11"x17" SCALE: 3/4" = 1'-0"



2



M SQUARE
WIRELESS

1387 CALLE AVANZADO
SAN CLEMENTE CA 92673 (949) 391-6824

DRAWN BY: MB
CHECKED BY: MM

| REV | DATE | DESCRIPTION |
|-----|------------|------------------------|
| △ | 01/10/2019 | 100% CD - JX COMMENTS |
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| B | 11/30/2017 | 90% CD'S - REVISED |
| A | 11/2/2017 | 90% CD'S FOR REVIEW |



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
EQUIPMENT LAYOUT

SHEET NUMBER
A-2

NOTE:

- M. SQUARED 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/OR STRUCTURAL LETTER FOR THE APPROVAL OF ALL MODIFICATIONS TO AND ADDING EQUIPMENT OF NEW TOWER APPURTENANCES.
- 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.

| ANTENNA POSITION | REMOTE RADIO UNITS | | DC CABLES | |
|------------------|---------------------|------------|-----------|-----|
| | RRUS MAKE AND MODEL | RRUS COUNT | LENGTH | AWG |
| 1 | (N) 2500MHz RRU | 1 | ±75' | -- |
| 2 | (N) 800MHz RRU | 1 | ±75' | -- |
| 3 | (E) 1900MHz RRU | 1 | ±75' | -- |
| 4 | -- | -- | -- | -- |
| 1 | (N) 2500MHz RRU | 1 | ±75' | -- |
| 2 | (N) 800MHz RRU | 1 | ±75' | -- |
| 3 | (E) 1900MHz RRU | 1 | ±75' | -- |
| 4 | -- | -- | -- | -- |

| ANTENNA POSITION | NEW OPTIMAL ANTENNA REQUIREMENTS (VERIFY WITH CURRENT RFDS) | | ANTENNA MAKE AND MODEL | | RAD CENTER | | AZIMUTH | | TRANSMISSION LINE | | |
|------------------|---|---------------------|------------------------|------------------------|---------------|--------|----------|------|-------------------|------------|-------------|
| | TECHNOLOGY | ANTENNA COUNT | EXISTING | NEW | EXISTING | NEW | EXISTING | NEW | CABLE LENGTH | CABLE QTY. | FEEDER TYPE |
| | 1 | 800/1900MHz 2500MHz | 1 | GENERIC SPRINT ANTENNA | HPA65R-KE4A-K | 58'-0" | 58'-0" | 320' | 325' | ±10' | 10 |
| 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 1 | 800/1900MHz 2500MHz | 1 | GENERIC SPRINT ANTENNA | HPA65R-KE4A-K | 58'-0" | 58'-0" | 120' | 125' | ±10' | 10 | JUMPERS |
| 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

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 VISUAL INSPECTION DURING SITE-WALK. CONTRACTOR TO VERIFY ACTUAL LENGTH DURING PRE-CONSTRUCTION WALK
- CONTRACTOR TO VERIFY PORTS HAVE SUFFICIENT ROOM

NOTE:

- (E) ANTENNA AZIMUTHS ARE ESTIMATED AND ARE TO BE VERIFIED BY RF.
- ALL NEW FIBER/CABLE RUNS TO UTILIZE (E) CONDUIT PATHS PREVIOUSLY ESTABLISHED WITHIN A PRE-APPROVED ACCESS/UTILITY ROUTE.



M SQUARED WIRELESS
 1387 CALLE AVANZADO
 SAN CLEMENTE CA 92673 (949) 391-6824

DRAWN BY: MB
 CHECKED BY: MM

| REV | DATE | DESCRIPTION |
|-----|------------|------------------------|
| 0 | 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 |



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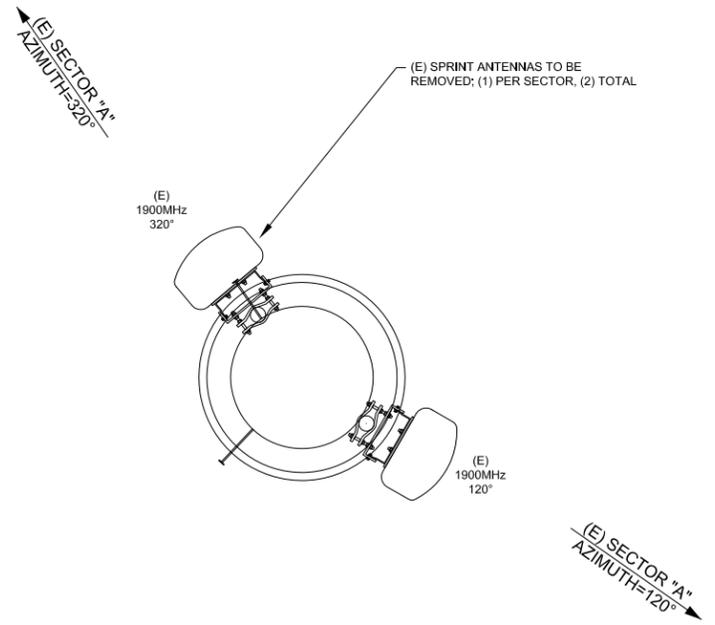
USWW MANITOU WATER
 DN14XC247
 7353 W. HWY 24
 CASCADE, CO 80809
 MONOPOLE

SHEET TITLE
ANTENNA LAYOUT

SHEET NUMBER
A-3

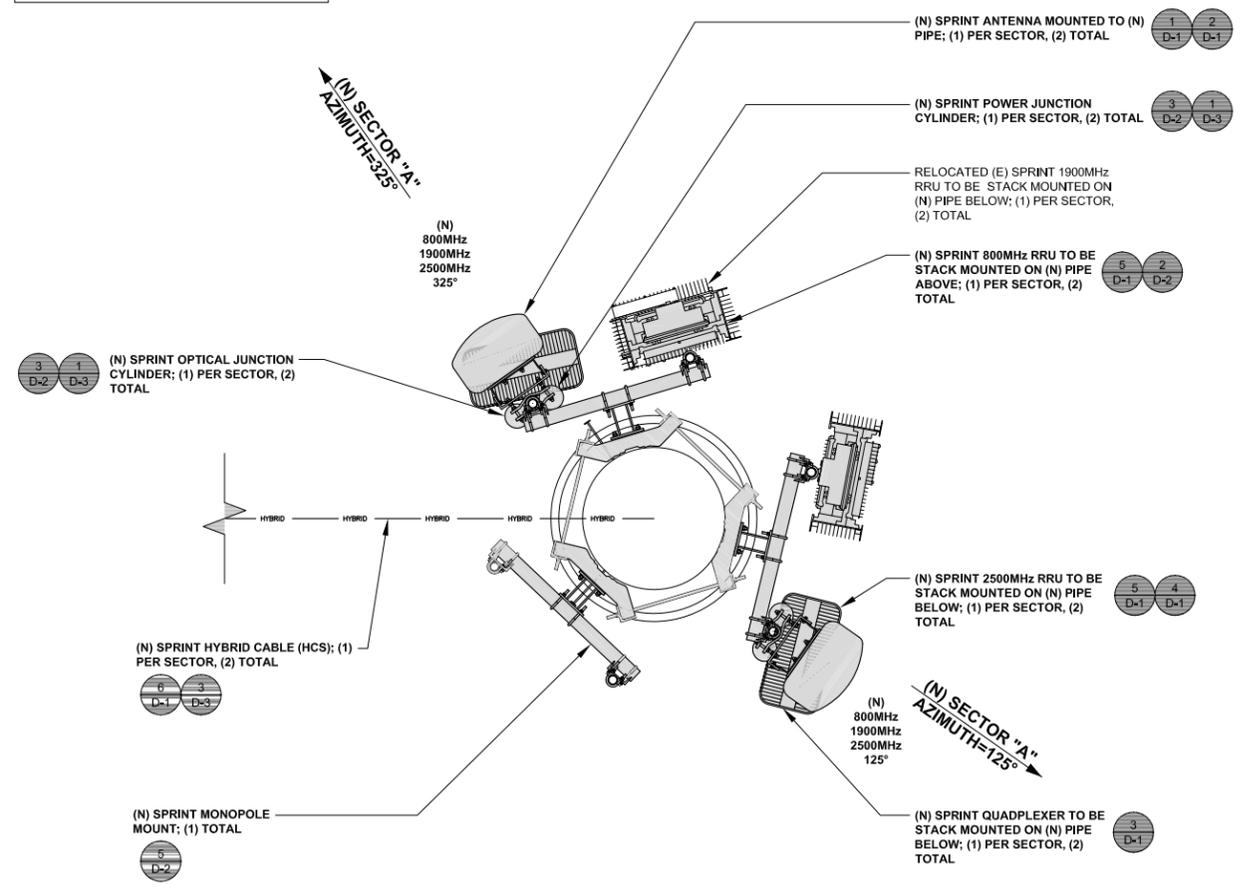
NOTES

NOTE:
 GROUND EQUIPMENT NOT SHOWN FOR CLARITY.



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

NOTE:
 GROUND EQUIPMENT NOT SHOWN FOR CLARITY.



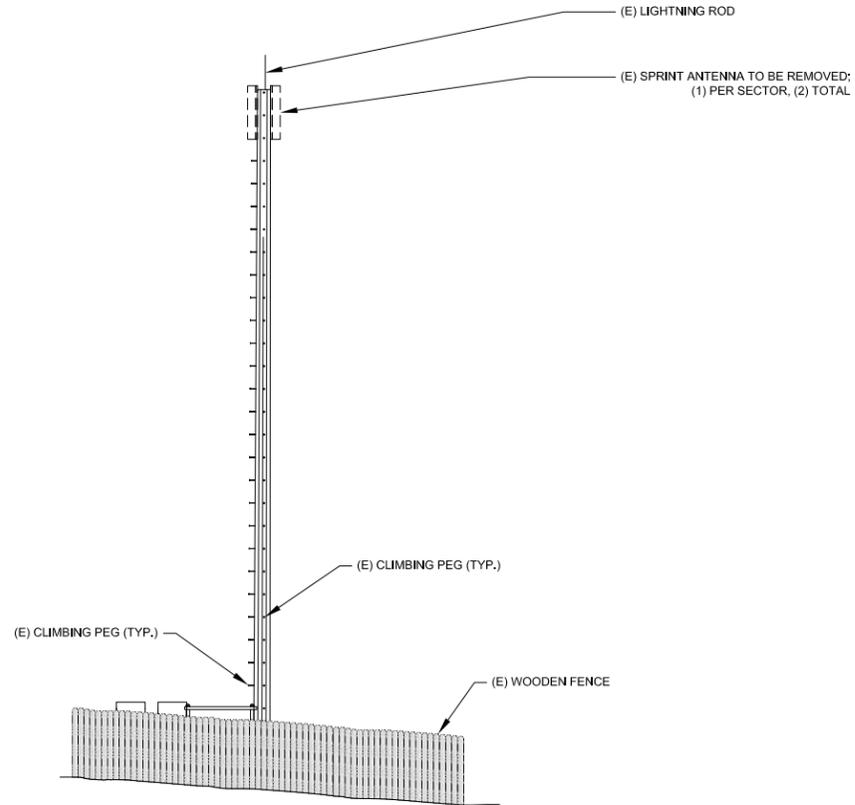
24"x36" SCALE: 1/4" = 1'-0"
 11"x17" SCALE: 1/2" = 1'-0"
 2

EXISTING ANTENNA LAYOUT

PROPOSED ANTENNA LAYOUT

TOP OF (E) SPRINT PANEL ANTENNAS
 ELEV. 60'-4" AGL
 TOP OF (E) MONOPOLE
 ELEV. 60'-0" AGL
 RAD CENTER OF (E) SPRINT PANEL ANTENNAS
 ELEV. 58'-0" AGL

(E) EQUIPMENT PLATFORM LEVEL
 ELEV. ±1'-6" AGL
 GROUND LEVEL
 ELEV. 0'-0" AGL



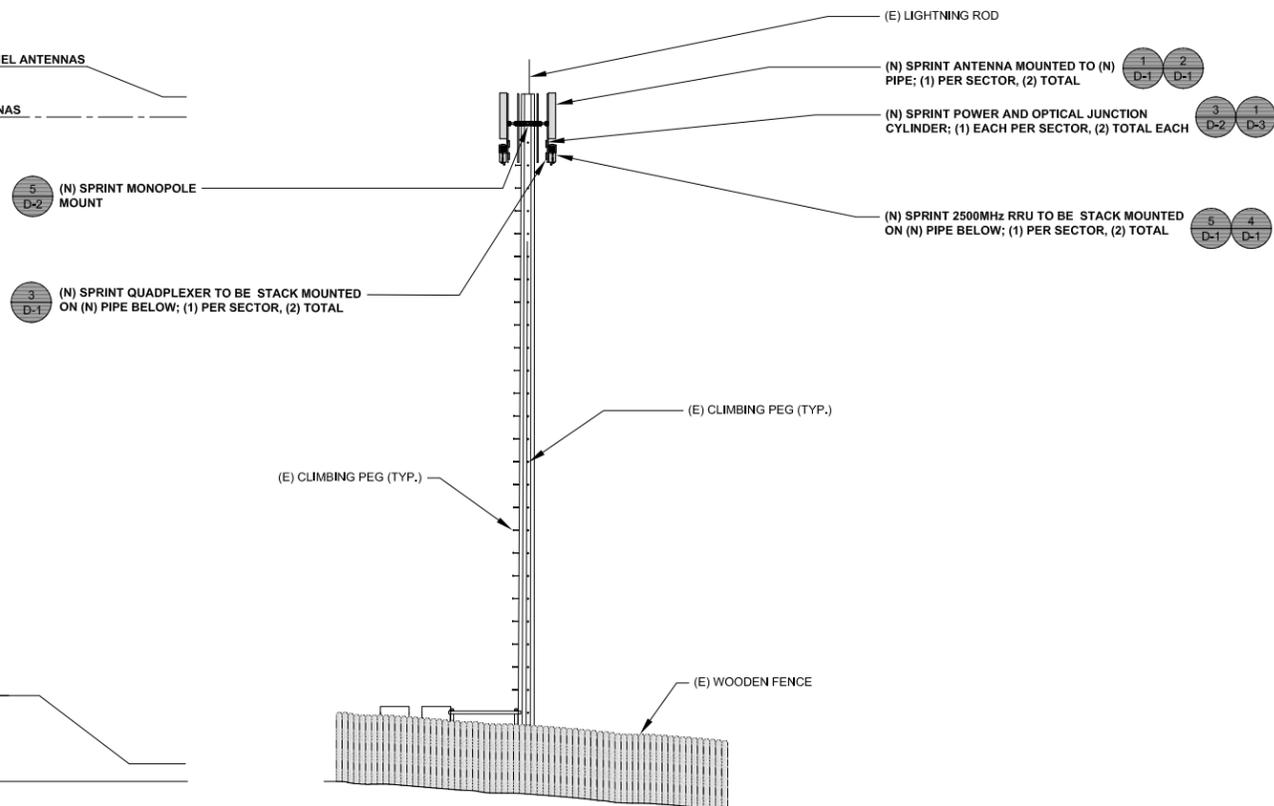
EXISTING SOUTHWEST ELEVATION

24"x36" SCALE: 1/8" = 1'-0"
 11"x17" SCALE: 1/4" = 1'-0"

1

TOP OF (E) MONOPOLE AND (N) SPRINT PANEL ANTENNAS
 ELEV. 60'-0" AGL
 RAD CENTER OF (N) SPRINT PANEL ANTENNAS
 ELEV. 58'-0" AGL

(E) EQUIPMENT PLATFORM LEVEL
 ELEV. ±1'-6" AGL
 GROUND LEVEL
 ELEV. 0'-0" AGL



PROPOSED SOUTHWEST ELEVATION

24"x36" SCALE: 1/8" = 1'-0"
 11"x17" SCALE: 1/4" = 1'-0"

2



1387 CALLE AVANZADO
 SAN CLEMENTE CA 92673 (949) 391-6824

DRAWN BY: MB
 CHECKED BY: MM

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

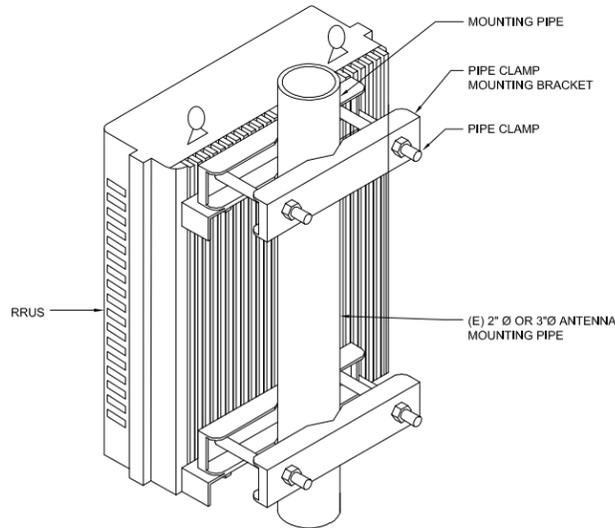


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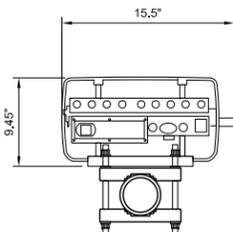
USWW MANITOU WATER
 DN14XC247
 7353 W. HWY 24
 CASCADE, CO 80809
 MONOPOLE

SHEET TITLE
ELEVATIONS

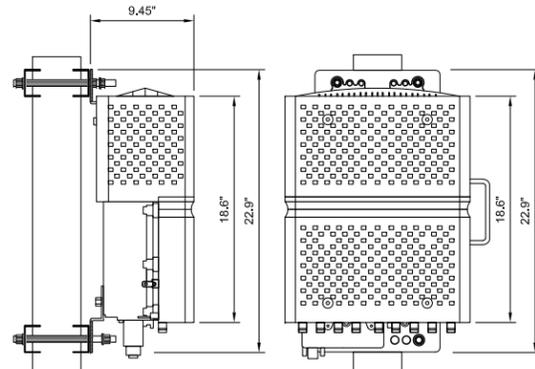
SHEET NUMBER
A-4



SAMSUNG 2.5 GHz RRH
 MANUFACTURER: SAMSUNG
 DIMENSIONS, HxWxD: 18.6"x15.5"x9.45"
 WEIGHT: 59.5lbs.
 WEIGHT W/ BRACKET: 71.8 LBS.

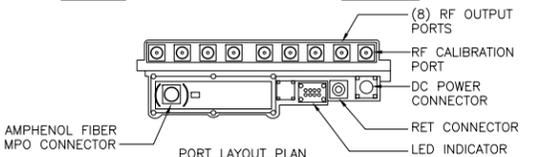


BOTTOM VIEW



SIDE VIEW

FRONT VIEW



PORT LAYOUT PLAN

NOTES:
 COMPLY WITH MANUFACTURER'S INSTRUCTIONS TO ENSURE THAT ALL RRH'S RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING. DO NOT OPEN RRH PACKAGES IN THE RAIN.

(N) AND (E) RRUS MOUNTING DETAIL

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

5

(N) 2500 MHZ RRU

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

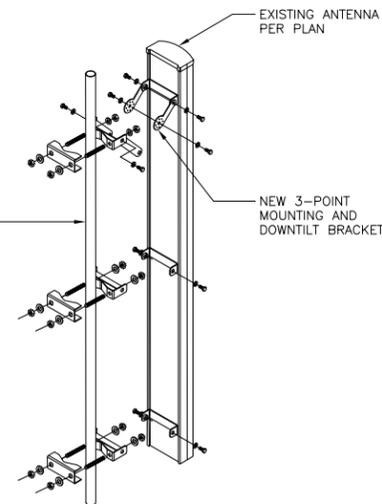
4

(N) ANTENNA MOUNTING

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

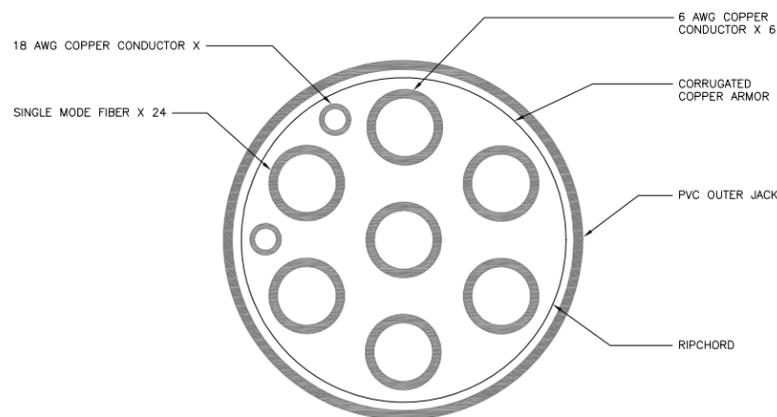
1

3"-4 1/2" ANTENNA PIPE MAST PER PLAN
 EXISTING ANTENNA PER PLAN
 NEW 3-POINT MOUNTING AND DOWNTILT BRACKET



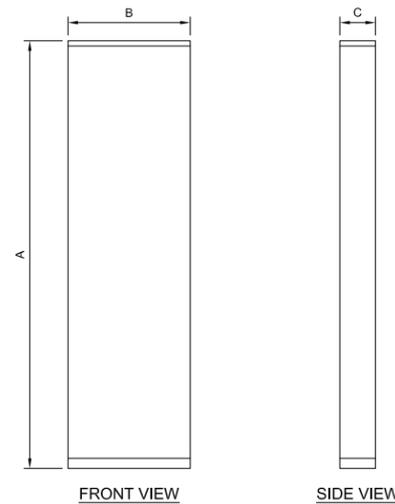
NOTE:
 TOP BRACKET MAY BE VALMONT MODEL DB380
 ALSO IF NO DOWNTILT OF ANTENNA IS REQUIRED.

| 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 (HIGH) | | +80° C |
| FIBER TYPE | | LOW WATER PEAK SINGLE MODE LOOSE TUBE |
| FIBER STRAND COMPLIANCE | | ITU-T REC. G.652.D, G657.A2 |
| | | IEC 60793-2-50 TYPE B.1.3 & TYPE B.6 A&B |
| FIBER COATING DIAMETER (UM) | | .242 +/- 0.007MM 0.9 +/- 0.005MM |
| 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

| MANUFACTURER: | | CCI | |
|---------------|-------|------------------------|----------------|
| MODEL NO.: | | HPA65R-KE4A-K | |
| DIMENSIONS: | | CONNECTOR TYPE: | TOTAL WEIGHT : |
| A | 48" | (6) 7/16" DIN (FEMALE) | 28.7 LBS |
| B | 11.7" | CONNECTOR LOCATION: | |
| C | 7.6" | BOTTOM | |



TOP VIEW

FRONT VIEW

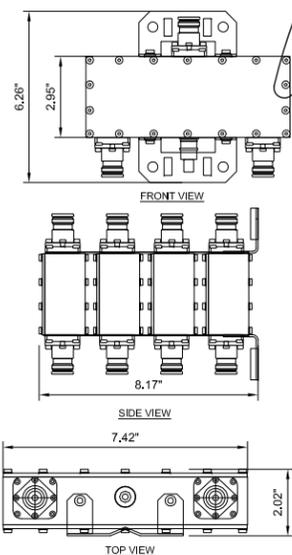
SIDE VIEW

(N) PANEL ANTENNA

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

2

| MECHANICAL | | | |
|-------------------------|--|----------------|-----------------------|
| MODULARITY | QUAD | | |
| WEIGHT W/ BRACKETS | 14.4 LBS (6.6KG) | | |
| | 6.26X7.42X8.17 in. (159X188.5X207.4mm) | | |
| ELECTRICAL | | | |
| RF PARAMETERS | PORTS | FREQUENCY(MHz) | SPECIFICATION |
| RETURN LOSS | COMMON | 1695 - 2180 | 18 dB min, 20 dB typ |
| | PCS/AWS | 1695 - 2180 | 18 dB min, 20 dB typ |
| | BRS | 2496 - 2690 | 18 dB min, 20 dB typ |
| INSERTION LOSS | COMMON TO PCS/AWS | 1695 - 2180 | 0.2 dB typ, 0.25dBmax |
| | COMMON TO BRS | 2496 - 2690 | 0.2 dB typ, 0.25dBmax |
| REJECTION | COMMON TO PCS/AWS | 2496 - 2690 | 50 dB mini |
| | COMMON TO BRS | 1695 - 2180 | 50 dB mini |
| ISOLATION | PCS/AWS TO BRS | 1695 - 2180 | 50 dB mini |
| | BRS TO PCS/AWS | 2496 - 2690 | 50 dB mini |
| GENERAL CHARACTERISTICS | | | |
| General Impedance | 50 ohms | | |
| Cont. Average PWR | 250 W max (input ports), 500 W maximum (Common port) | | |
| Peak Envelope PWR | 1 kW max (input ports), 3 kW maximum (Common port) | | |
| Intermodulation | <-117 dBm (-160 dBc) at 2 x +43 dBm tones all bands | | |



FRONT VIEW

SIDE VIEW

TOP VIEW

(N) HYBRID CABLE SPECIFICATIONS

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

6

(N) QUADPLEXER DPO-7126Y-0X1

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

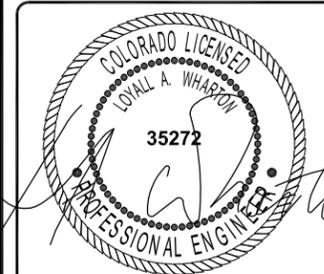
3



1387 CALLE AVANZADO
 SAN CLEMENTE CA 92673 (949) 391-6624

DRAWN BY: MB
 CHECKED BY: MM

| REV | DATE | DESCRIPTION |
|-----|------------|------------------------|
| 0 | 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 |



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

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
D-1

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

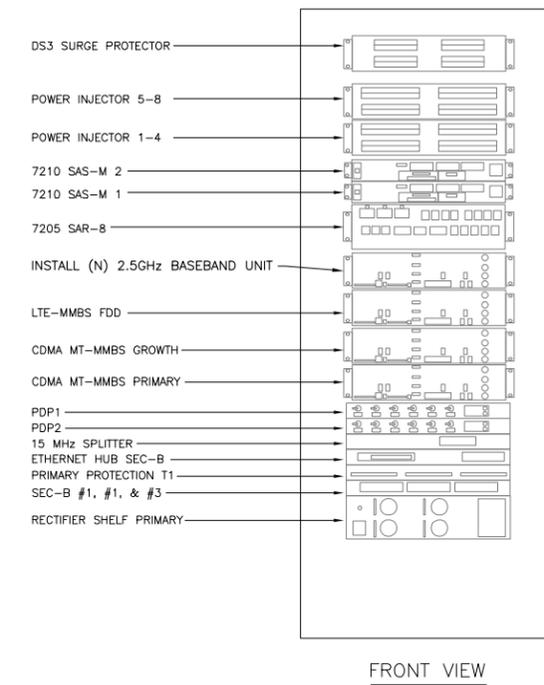
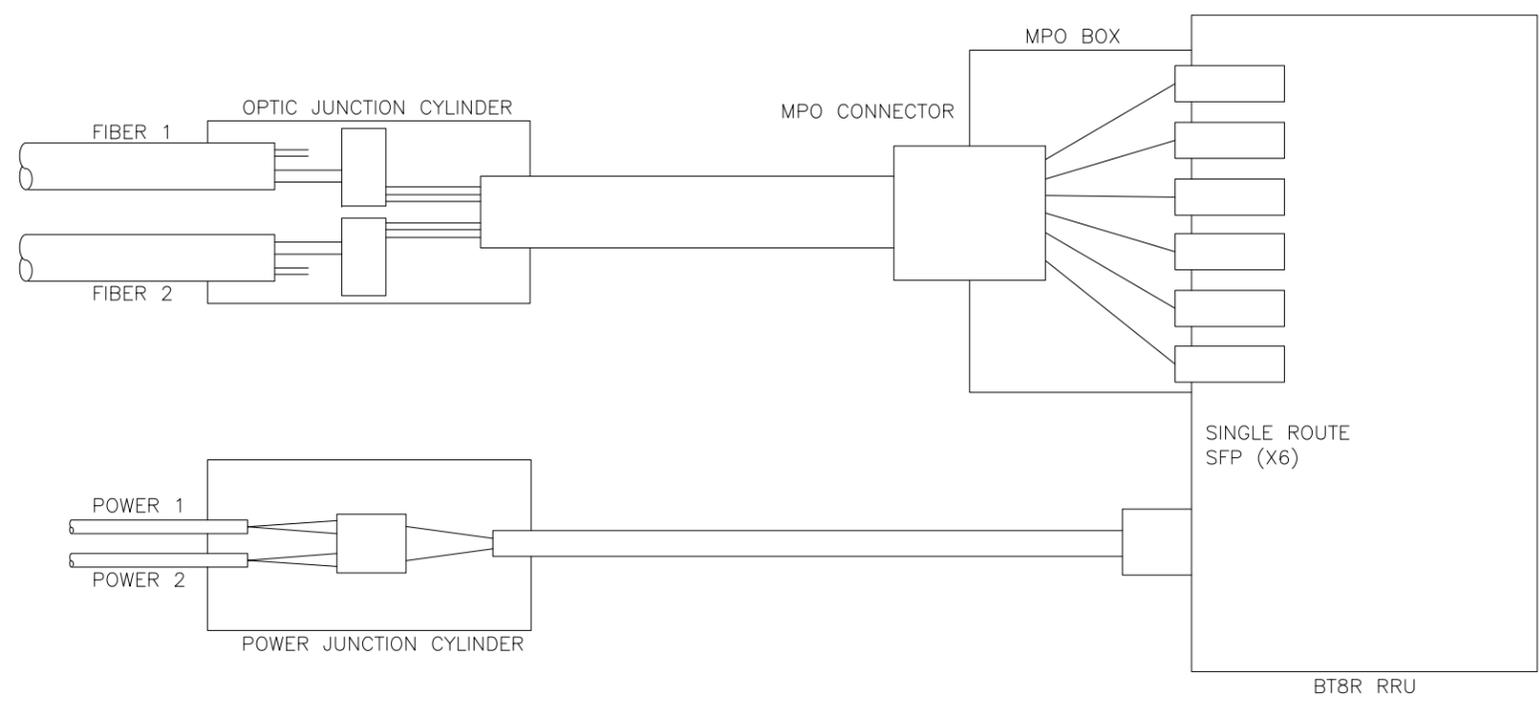


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USWW MANITOU WATER
DN14XC247
7353 W. HWY 24
CASCADE, CO 80809
MONOPOLE

SHEET TITLE
DETAILS

SHEET NUMBER
D-2



(N) POWER & OPTIC CYLINDER SCHEMATIC DETAIL

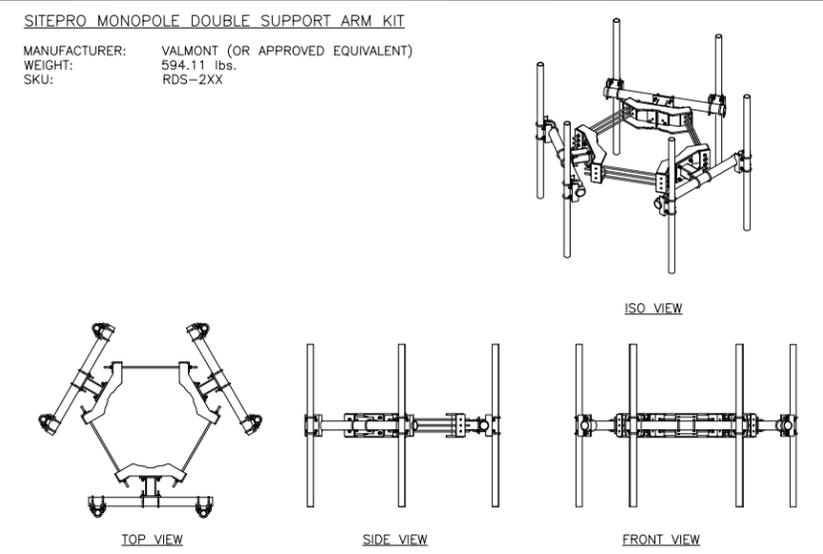
24"x36" SCALE: NTS
11"x17" SCALE: NTS

3

(E) MMBS CABINET

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

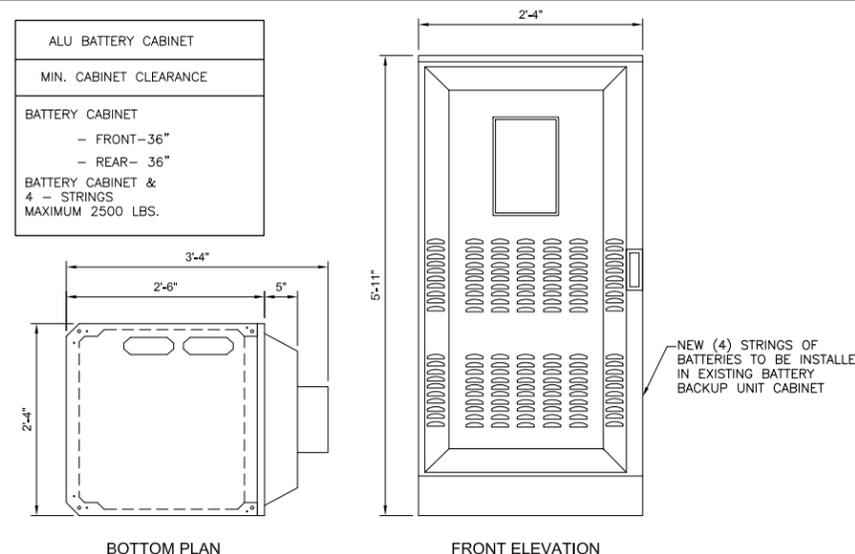
1



(N) MONOPOLE MOUNT

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

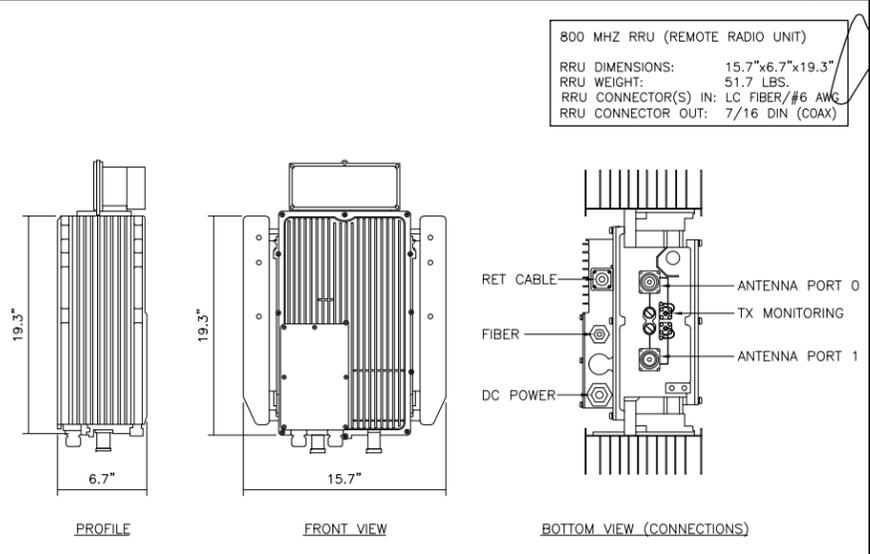
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(E) BATTERY BACKUP UNIT CABINET

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

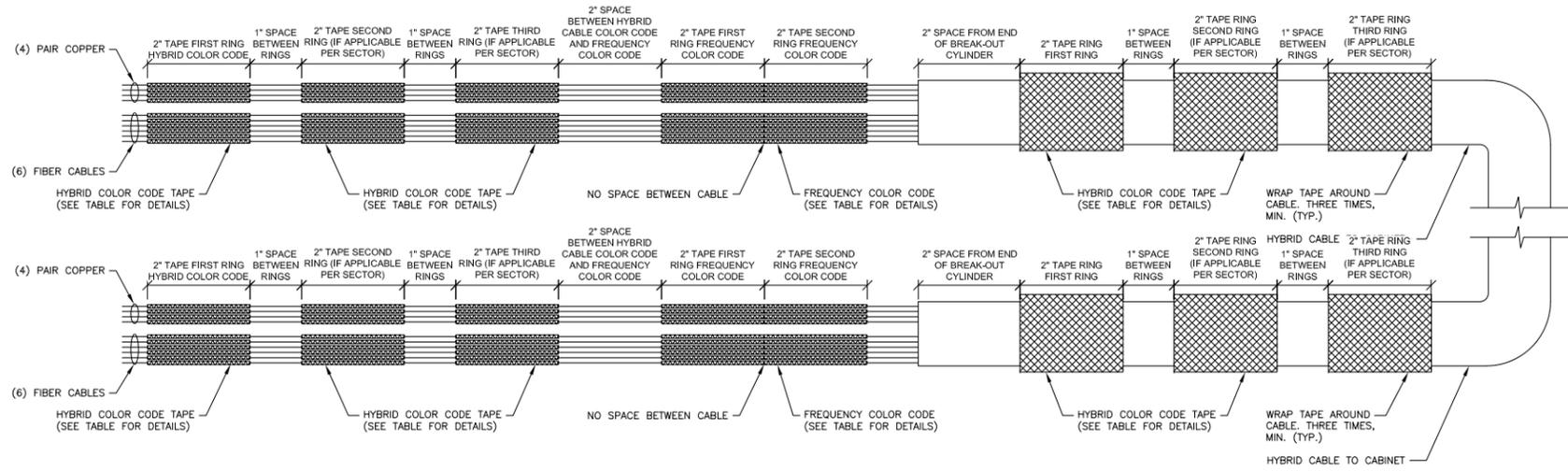
4



(N) 800MHz RRU

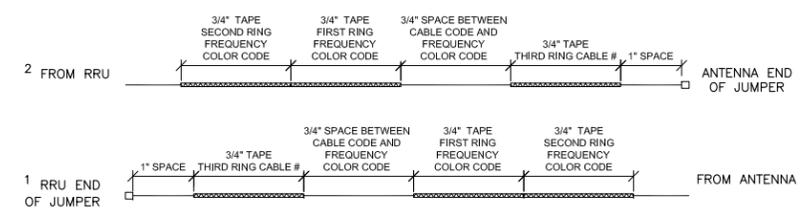
24"x36" SCALE: NTS
11"x17" SCALE: NTS

2

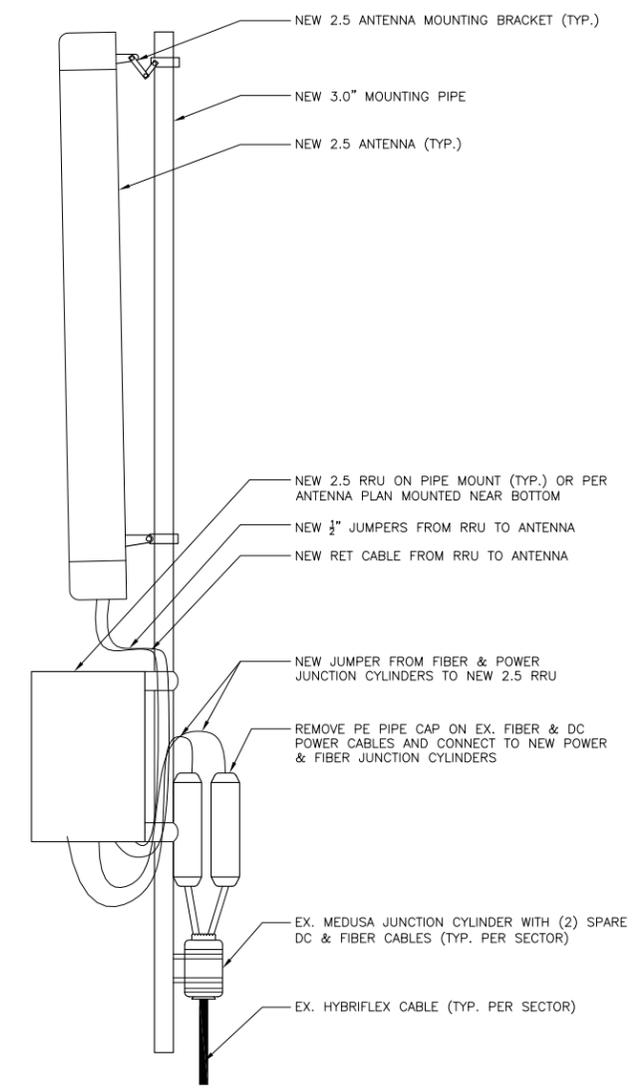


HYBRID CABLE CONNECTION AT CABINET

- NOTES:**
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 EACH RING.
 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 POSSIBLE.
 8. COLOR BAND ON JUMPERS SHALL BE 2" WIDE WITH A 2" SPACE.



JUMPER CABLE CONNECTION AT RRU AND ANTENNA



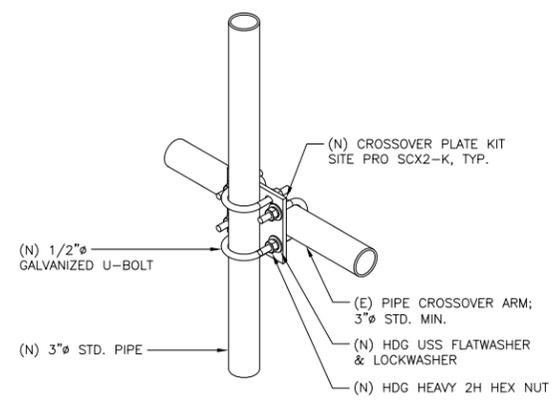
(N) HYBRID CABLE COLOR SCHEME DETAIL

| | TYPE 1 | TYPE 2 | TYPE 3 | TYPE 4 | TYPE 5 | TYPE 6 | TYPE 7 |
|--|--|---|---|---|---|---|---|
| TOTAL LENGTH | ~35 M (114.8') | ~55 M (180.4') | ~65 M (213.3') | ~80 M (262.5') | ~100 M (328.1') | ~120 M (393.7') | ~160 M (524.9') |
| HYBRID POWER CABLE CONFIGURATION | AWG 10 1 PAIR, AWG 12 3 PAIR | AWG 8 1 PAIR, AWG 10 3 PAIR | AWG 6 1 PAIR, AWG 8 1 PAIR, AWG 10 2 PAIR | AWG 6 PAIR, AWG 8 3 PAIR | AWG 4 1 PAIR, AWG 6 1 PAIR, AWG 8 2 PAIR | AWG 6 1 PAIR, AWG 8 3 PAIR | AWG 2 1 PAIR, AWG 4 3 PAIR |
| CABLE Ø | 25MM (0.98") | 27MM (1.06") | 30MM (1.18") | 30/32MM (1.18"/1.25") | 39.2MM (1.25") | 39.2MM (1.56") | 43.5MM (1.69") |
| BEND RADIUS | 11.81" | 12.99" | 15.35" | 17.71" | 17.71" | 18.00"/30.00" | 21.00"/35.00" |
| OPTIC CABLE | LC/PC-TO-LC/PC, SINGLE MODE | | | | | | |
| DU CABINET (POWER CABLE TERMINAL MAX SIZE AWG 4) | 2 PAIR POWER AND OPTIC CABLE WITH PE PIPE | | | | | | |
| RRU POWER CABLE SPEC | AWG 8, 14.7~15.4MM (0.57"-0.60") / AWG 10, 11.5~12.4MM (0.45"-0.48") | | | | | 8 AWG CABLES 4 PAIRS | |
| NON-USE POWER AND OPTIC CABLE PROTECTION | 2 PAIR POWER AND OPTIC CABLE WITH PE PIPE | 2 PAIR POWER AND OPTIC CABLE WITH PE PIPE | 2 PAIR POWER AND OPTIC CABLE WITH PE PIPE | 2 PAIR POWER AND OPTIC CABLE WITH PE PIPE | 2 PAIR POWER AND OPTIC CABLE WITH PE PIPE | 2 PAIR POWER AND OPTIC CABLE WITH PE PIPE | 2 PAIR POWER AND OPTIC CABLE WITH PE PIPE |
| SAMSUNG FIBER | 0.5LBS/LF | 0.6LBS/LF | 0.8LBS/LF | 0.9LBS/LF | 1.1LBS/LF | N/A | N/A |
| ASIA TAI | 0.7LBS/LF | 0.7LBS/LF | 0.7LBS/LF | 0.7LBS/LF | 0.7LBS/LF | N/A | N/A |
| TESCO | N/A | N/A | N/A | N/A | N/A | 1.6LBS/LF | 2.2LBS/LF |

(N) HYBRID CABLE TYPE

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

CROSSOVER MOUNTING KIT



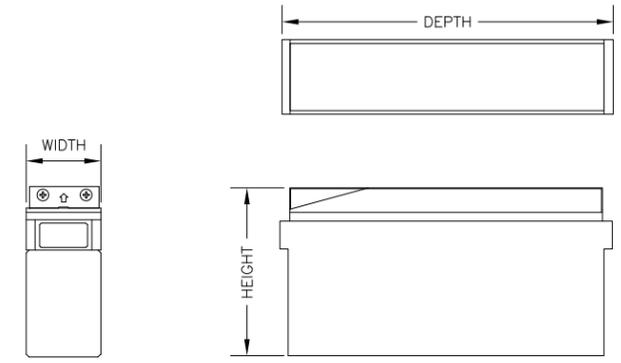
MOUNTING - ISOMETRIC

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

2.5 ANTENNA/RRU CONNECTIONS, TYP.

MANUFACTURER: ACME
MODEL NO: 12NDT190
HEIGHT: 12.45"
WIDTH: 4.93"
DEPTH: 21.99"
WEIGHT: 42.2LBS
VOLTAGE: 9.6V
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



BATTERY DETAIL

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



DRAWN BY: MB
CHECKED BY: MM

| REV | DATE | DESCRIPTION |
|-----|------------|------------------------|
| Δ | 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 |



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

SHEET TITLE
DETAILS

SHEET NUMBER
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 MALFUNCTIONS, FAULTY, EQUIPMENT, 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 DATE 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.
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' LONG. GROUNDING HARDWARE SHALL BE ERICO, STORM COPPER COMPONENTS, FUSHI COPPERWELD OR APPROVED EQUAL.
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 ENGRAVED PHENOLIC NAMEPLATES, BLACK WITH WHITE LETTERING, AND ATTACHED WITH RIVETS.

ABBREVIATIONS

| | | | | | |
|------|----------------------------------|------|------------------------------------|------|-------------------------------|
| AAV | ALTERNATE ACCESS VENDOR | GR | GROWTH (CABINET) | UADU | UNIVERSAL TYPE A DIGITAL UNIT |
| ACCA | ANTENNA CABLE ASSEMBLY | GRC | GALVANIZED RIGID (STEEL) CONDUIT | U/G | UNDERGROUND |
| AFF | ABOVE FINISHED FLOOR | IGB | INTERNAL GROUND BAR | WP | WEATHERPROOF |
| AFG | ABOVE FINISHED GRADE | IGR | INTERIOR GROUND RING | WW | WIREWAY |
| AWS | ADVANCED WIRELESS SERVICES | IMC | INTERMEDIATE METALLIC CONDUIT | XFMR | TRANSFORMER |
| 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 | | |
| AWG | AMERICAN WIRE GAUGE | MGB | MAIN (OR MASTER) GROUND BAR | | |
| BBU | BASEBAND UNIT | MMBS | MULTI-MODE BASE STATION | | |
| BCW | BARE COPPER WIRE | MTS | MANUAL TRANSFER SWITCH | | |
| BSCW | BARE STRANDED COPPER WIRE | NEC | NATIONAL ELECTRIC CODE | | |
| BTCW | BARE TINNED COPPER WIRE | NID | NETWORK INTERFACE DEVICE | | |
| C | CONDUIT | NV | NETWORK VISION | | |
| CAB | CABINET | O/H | OVERHEAD | | |
| CE | CONCRETE ENCASED | PCS | PERSONAL COMMUNICATION SERVIICES | | |
| CGB | COLLECTOR GROUND BAR | PPC | POWER PROTECTION CABINET | | |
| CKT | CIRCUIT | PRC | PRIMARY RADIO CABINET | | |
| COVP | CAPACITOR OVERVOLTAGE PROTECTION | PVC | POLYVINYL CHLORIDE | | |
| DB | DIRECT BURIED | PWR | POWER | | |
| DEI | DIGITAL EXPANSION INTERFACE | RGS | RIGID GALVANIZED STEEL | | |
| DISC | DISCONNECT | RRH | REMOTE RADIO HEAD | | |
| EMT | ELECTRICAL METALLIC TUBING | RRU | REMOTE RADIO UNIT | | |
| GFCI | GROUND FAULT CURRENT INTERRUPTER | SPD | SURGE PROTECTIVE DEVICE | | |
| G | GROUND | S/S | STAINLESS STEEL | | |
| GND | GROUND | TVSS | TRANSIENT VOLTAGE SURGE SUPPRESSOR | | |
| GPS | GLOBAL POSITIONING SYSTEM | TYP | TYPICAL | | |

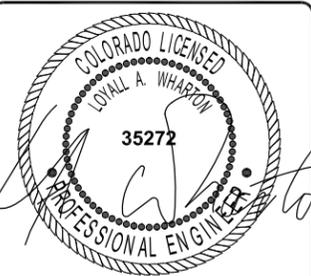
ELECTRICAL LEGEND

| | | | |
|---------------------------|--------------------------|---|---|
| — UGP — UGP — UGP — | EXISTING U/G ELECTRICAL | — X — X — X — | EXISTING CHAINLINK FENCE |
| — OE — OE — OE — | EXISTING O/H ELECTRICAL | — X — X — X — | NEW CHAINLINK FENCE |
| — AGP — AGP — AGP — | EXISTING A/G ELECTRICAL | — □ — □ — □ — | EXISTING WOOD FENCE |
| — UGT — UGT — UGT — | EXISTING U/G TELEPHONE | — □ — □ — □ — | NEW WOOD FENCE |
| — FO — FO — FO — | EXISTING FIBER OPTIC | | |
| — HFLEX — HFLEX — HFLEX — | EXISTING HYBRIFLEX CABLE | | |
| — UGP — UGP — UGP — | NEW U/G ELECTRIC |  | ELEVATION/SECTION REFERENCE. TOP NUMBER IS THE DETAIL; BOTTOM NUMBER IS THE SHEET NO. |
| — OE — OE — OE — | NEW O/H ELECTRIC | | |
| — AGP — AGP — AGP — | NEW A/G ELECTRIC | | |
| — UGT — UGT — UGT — | NEW U/G TELEPHONE | | |
| — FO — FO — FO — | NEW FIBER OPTIC | | |
| — HFLEX — HFLEX — HFLEX — | NEW HYBRIFLEX CABLE | | |



DRAWN BY: MB
CHECKED BY: MM

| REV | DATE | DESCRIPTION |
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USWW MANITOU WATER
DN14XC247
7353 W. HWY 24
CASCADE, CO 80809
MONOPOLE

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

SHEET NUMBER
E-1



MAIN PANEL

| | | | | | | | |
|---------------|-----------|-----------------|----------|-------------------|----------|----------------|--------|
| SITE NUMBER: | DN14XC247 | ENCLOSURE TYPE: | NEMA 3R | BUSS RATING: | 200 AMPS | INTERNAL TVSS: | YES |
| VOLTAGE: | 240V/120 | PANEL STATUS: | EXISTING | NEUTRAL RATING: | YES | WIRE: | 3 |
| MAIN BREAKER: | 200 AMP | MODEL NUMBER: | TBD | NEUTRAL BUS: | YES | AIC: | 22,000 |
| MOUNT: | SURFACE | PHASE: | 1 | N to GROUND BOND: | YES | GROUND BAR: | YES |

| CKT NO | CKT BKR | | | SERV LD VA | USE FAC | DESCRIPTION | PHASE A VA | PHASE B VA | DESCRIPTION | USE FAC | SERV LD VA | CKT BKR | | | CKT NO |
|--------|---------|------|------|------------|---------|----------------|------------|------------|-------------|------------|------------|---------|------|------|--------|
| | AMPS | P | STAT | | | | | | | | | STAT | P | AMPS | |
| 1 | 200 | 2 | ---- | 0 | 0.00 | GENERATOR MAIN | 0 | | TVSS | 1.00 | 0 | ---- | ---- | ---- | 2 |
| 3 | ---- | ---- | ---- | 0 | 0.00 | — | | 0 | | 1.00 | 0 | ---- | ---- | ---- | 4 |
| 5 | ---- | ---- | ---- | 0 | 0.00 | SPACE | 500 | | SPACE | 0.00 | 0 | ---- | ---- | ---- | 6 |
| 7 | ---- | ---- | ---- | 0 | 0.00 | 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 |
| | | | | | | | | | | TOTAL KVA: | | 23.76 | | | |
| | | | | | | | | | | AMPS | | 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 NUMBER: | DN14XC247 | ENCLOSURE TYPE: | NEMA 3R | BUSS RATING: | 125 AMPS | INTERNAL TVSS: | YES |
| VOLTAGE: | 240V/120 | PANEL STATUS: | EXISTING | NEUTRAL RATING: | YES | WIRE: | 3 |
| MAIN BREAKER: | 100 AMP | MODEL NUMBER: | TBD | NEUTRAL BUS: | YES | AIC: | 22,000 |
| MOUNT: | SURFACE | PHASE: | 1 | N to GROUND BOND: | YES | GROUND BAR: | YES |

| CKT NO | CKT BKR | | | SERV LD VA | USE FAC | DESCRIPTION | PHASE A VA | PHASE B VA | DESCRIPTION | USE FAC | SERV LD VA | CKT BKR | | | CKT NO |
|--------|---------|------|------|------------|---------|-------------|------------|------------|----------------------|------------|------------|---------|------|------|--------|
| | AMPS | P | STAT | | | | | | | | | STAT | P | AMPS | |
| 1 | ---- | ---- | ---- | | | SPACE | 8750 | | SAMSUNG MMBS CABINET | 1.00 | 0 | ON | 2 | 100 | 2 |
| 3 | ---- | ---- | ---- | | | SPACE | | 8750 | | 1.00 | 0 | ---- | ---- | ---- | 4 |
| 5 | ---- | ---- | ---- | | | SPACE | 400 | | SAMSUNG BATTERY | 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 |
| | | | | | | | | | | 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

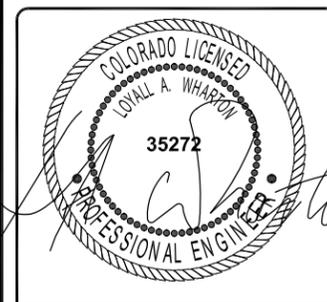
SEE SINGLE LINE DIAGRAM FOR WIRING DIAGRAM
*THIS IS A TYPICAL PANEL SCHEDULE SUBJECT TO CHANGE AND TO BE FIELD VERIFIED.



1387 CALLE AVANZADO
SAN CLEMENTE CA 92673 (949) 391-6824

DRAWN BY: MB
CHECKED BY: MM

| REV | DATE | DESCRIPTION |
|-----|------------|------------------------|
| Δ | 01/10/2019 | 100% CD - JX COMMENTS |
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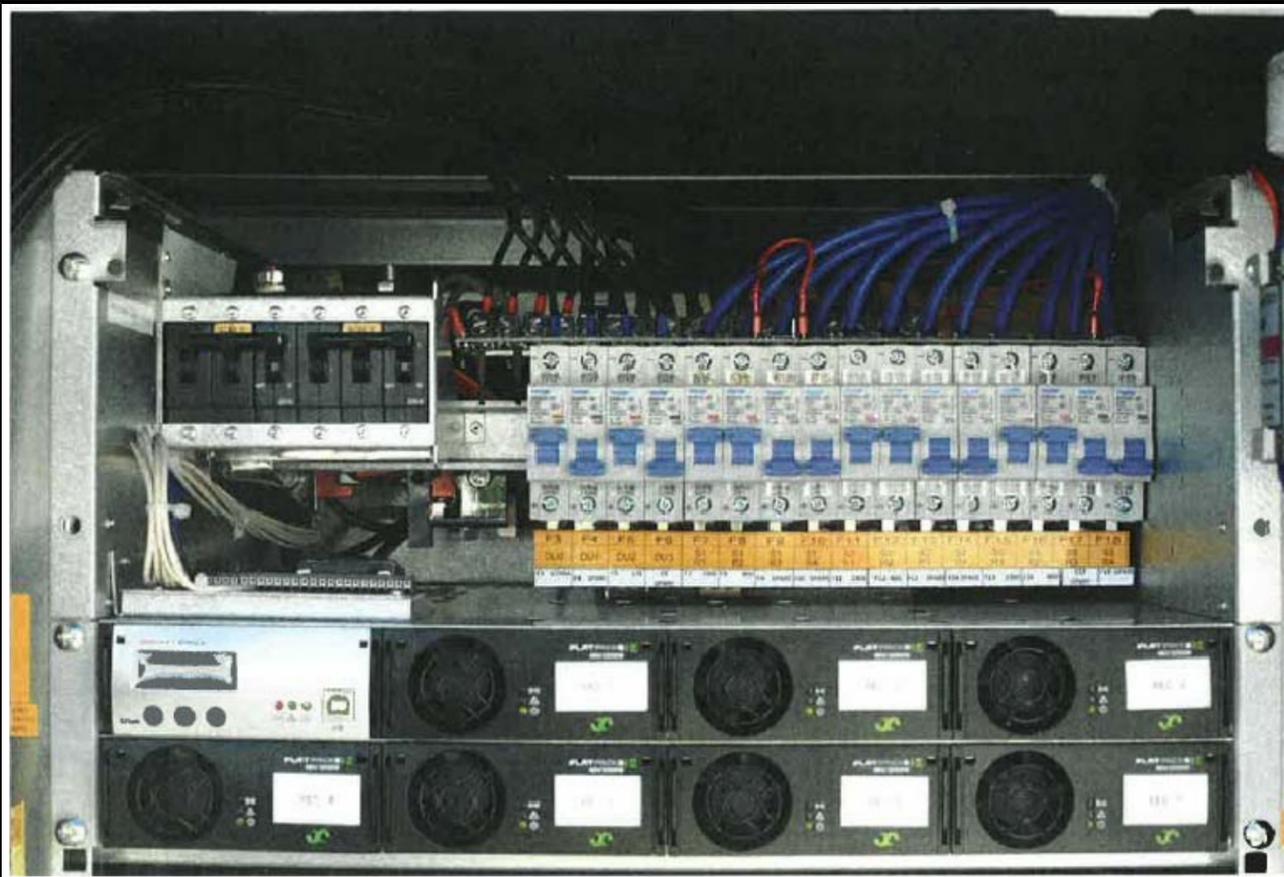


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USWW MANITOU WATER
DN14XC247
7353 W. HWY 24
CASCADE, CO 80809
MONOPOLE

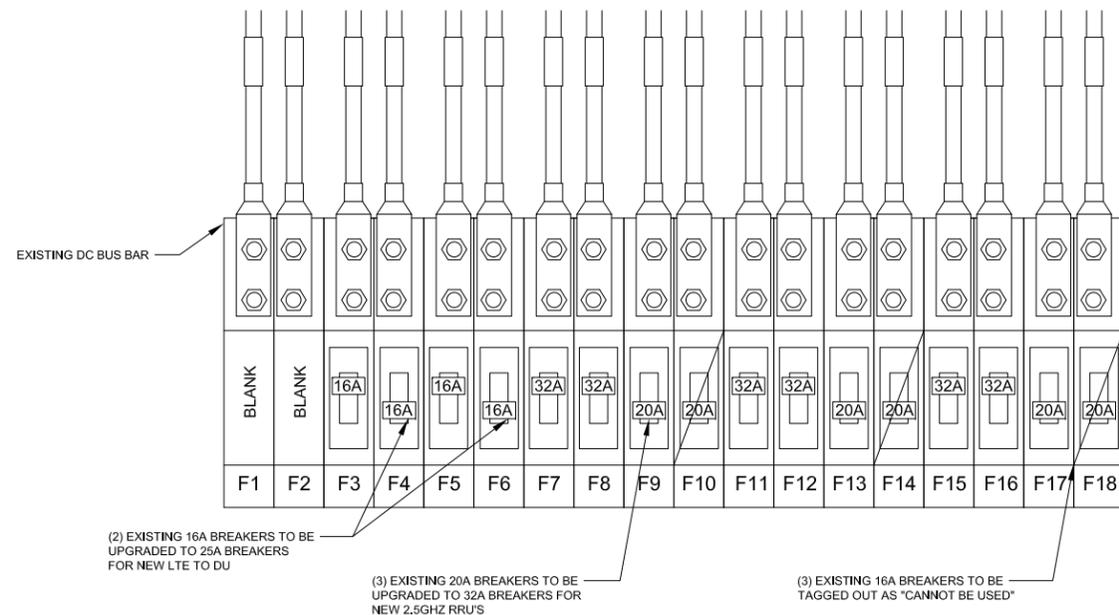
SHEET TITLE
PANEL SCHEDULE

SHEET NUMBER
E-3

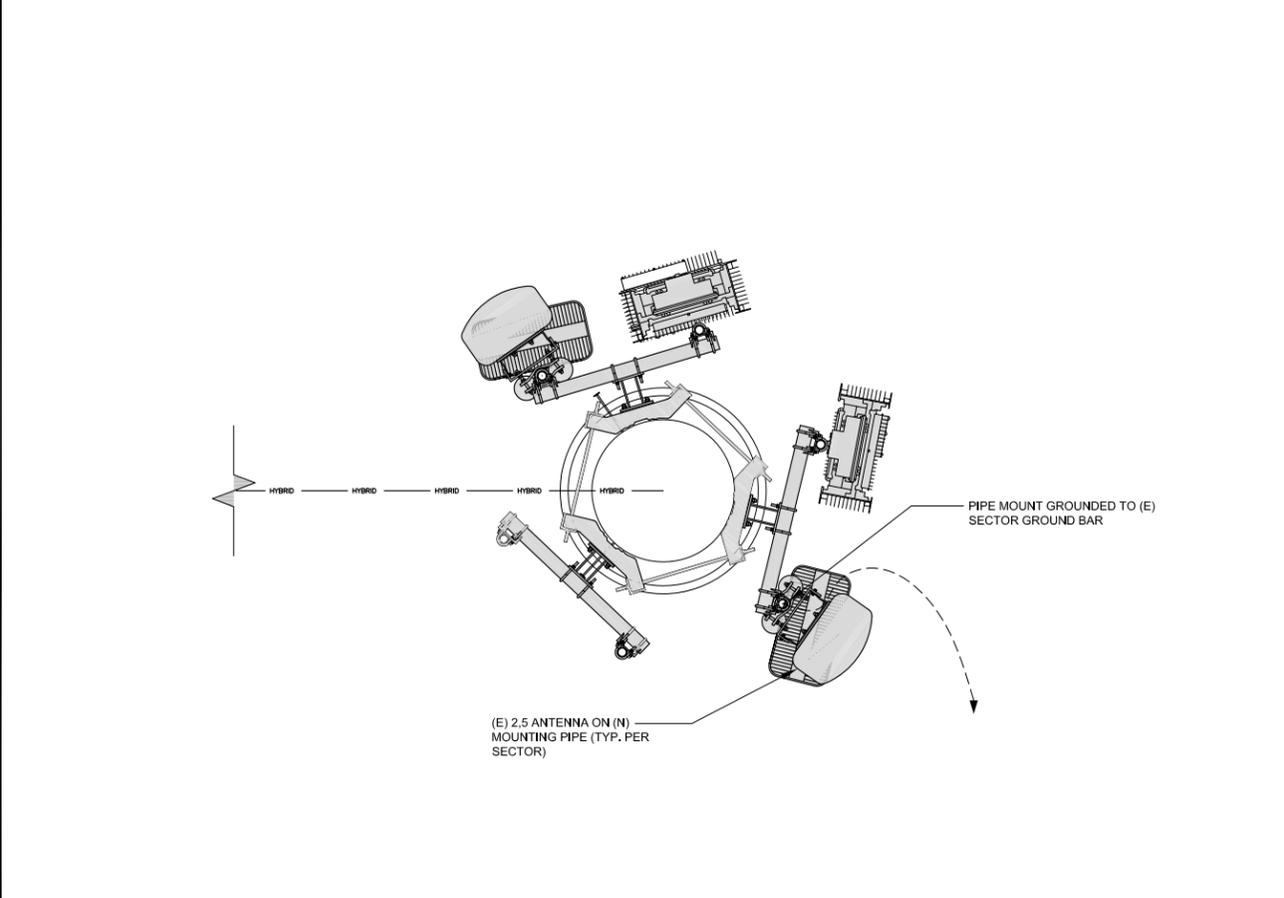


EXISTING DC POWER DISTRIBUTION

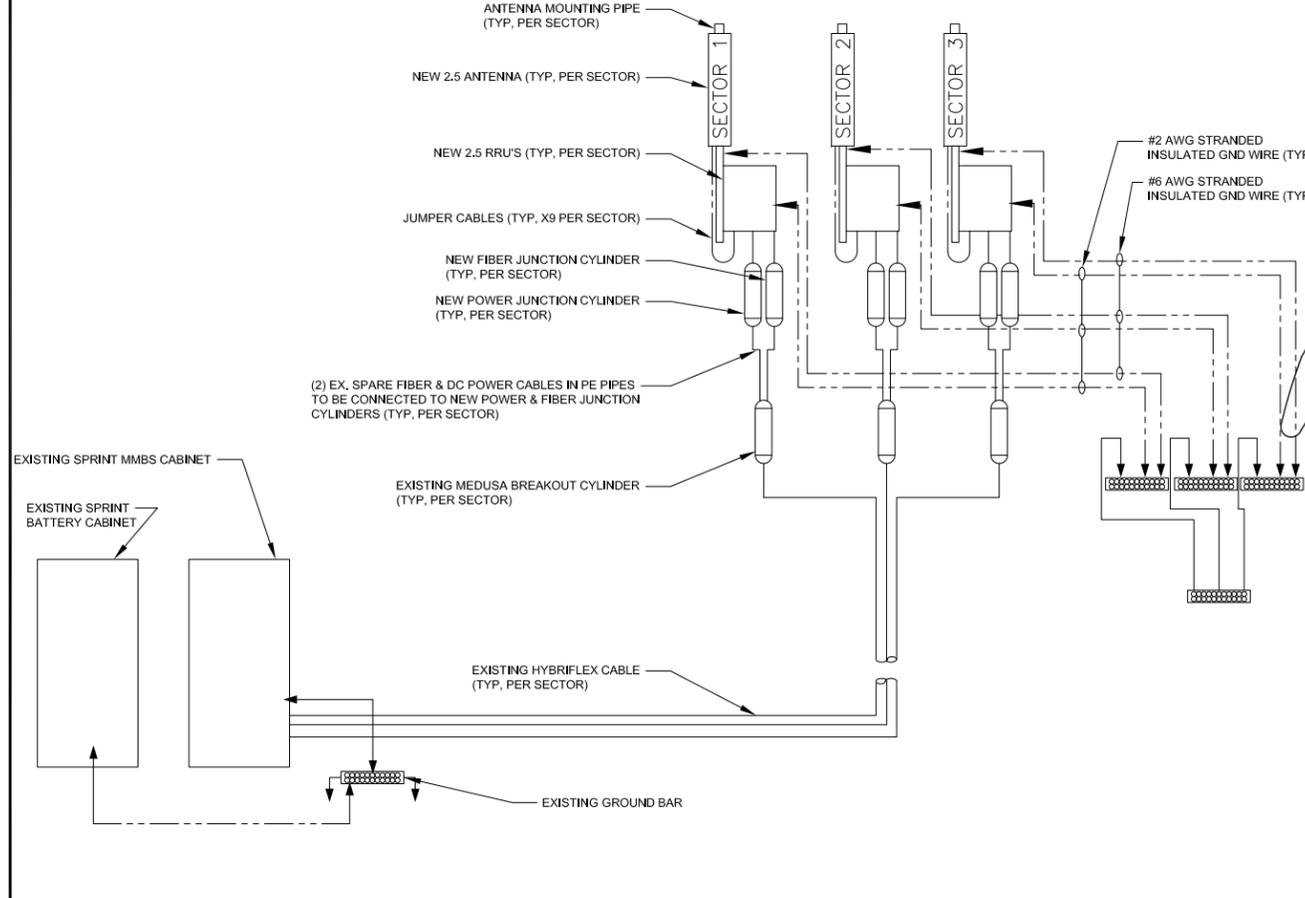
- NOTES:
 1. (2) DU BREAKERS TO BE UPGRADED FROM 16A TO 25A.
 2. (3) RRU BREAKERS TO BE UPGRADED FROM 20A TO 32A.
 3. REMAINING/UNUSED RRH BREAKERS TO BE TAGGED OUT AS "CANNOT BE USED"



TYPICAL DC POWER DISTRIBUTION



TYPICAL ANTENNA GROUNDING PLAN



TYPICAL GROUNDING RISER DIAGRAM



DRAWN BY: MB
 CHECKED BY: MM

| REV | DATE | DESCRIPTION |
|-----|------------|------------------------|
| A | 11/2/2017 | 90% CD'S FOR REVIEW |
| B | 11/30/2017 | 90% CD'S - REVISED |
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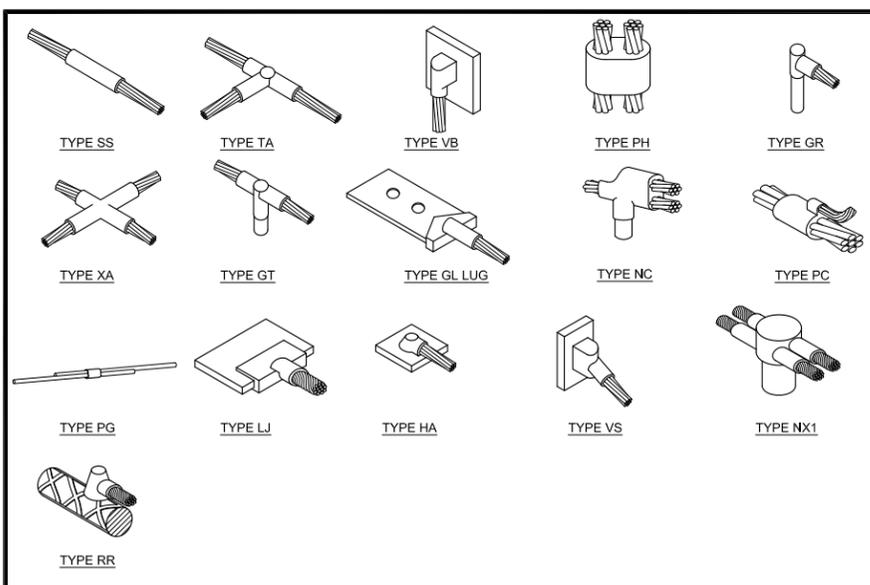


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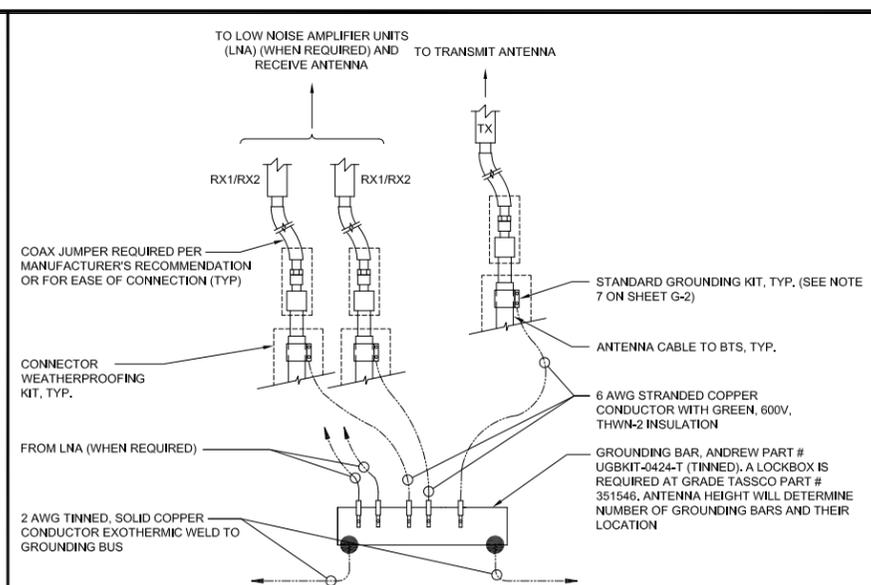
USWW MANITOU WATER
 DN14XC247
 7353 W. HWY 24
 CASCADE, CO 80809
 MONOPOLE

SHEET TITLE
DC DISTRIBUTION AND ANTENNA GROUNDING PLAN AND DIAGRAM

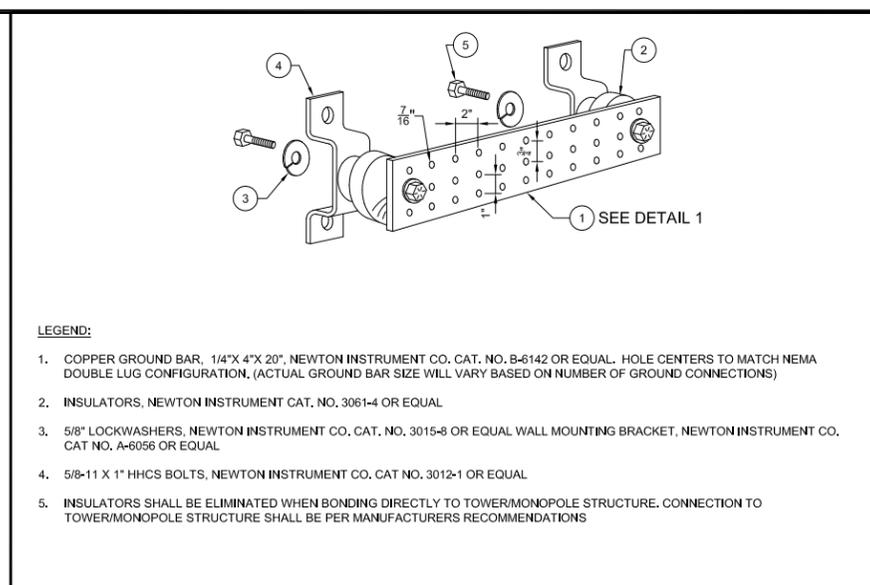
SHEET NUMBER
E-4



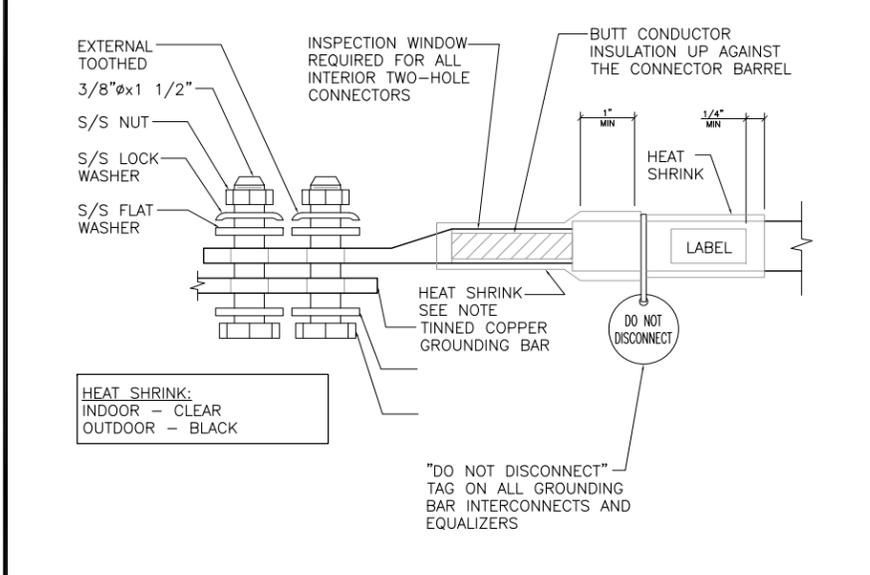
TYPICAL CADWELD TYPES 24"x36" SCALE: NTS 11"x17" SCALE: NTS **7**



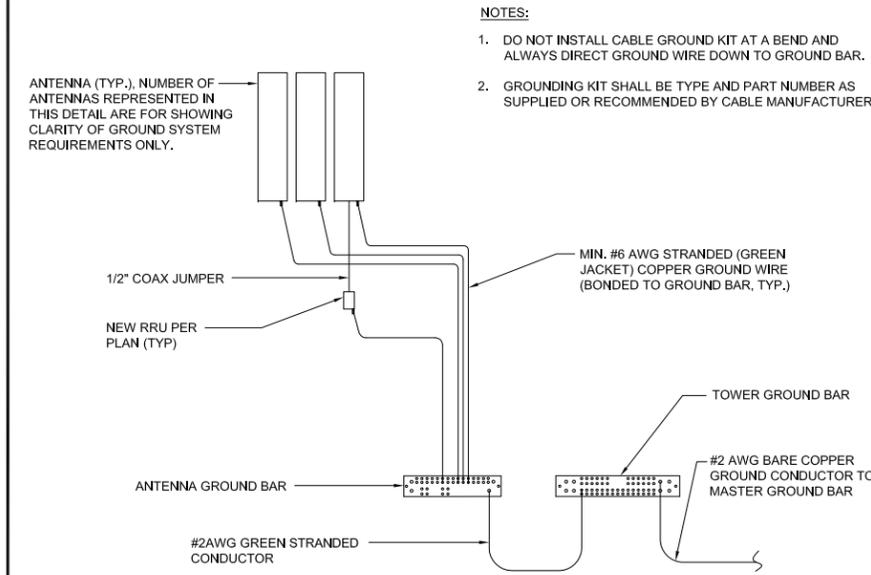
GROUNDING BAR CONNECTION 24"x36" SCALE: NTS 11"x17" SCALE: NTS **4**



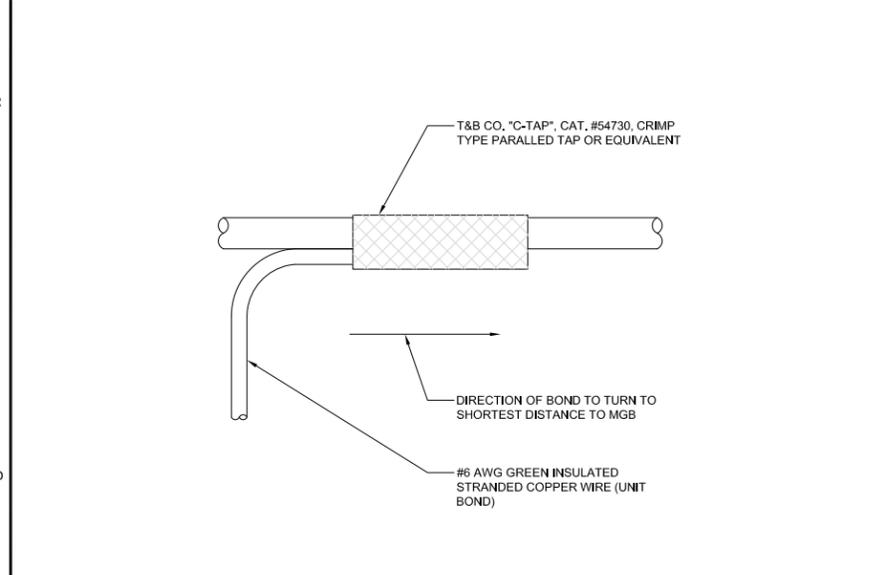
GROUNDING BAR DETAIL 24"x36" SCALE: NTS 11"x17" SCALE: NTS **1**



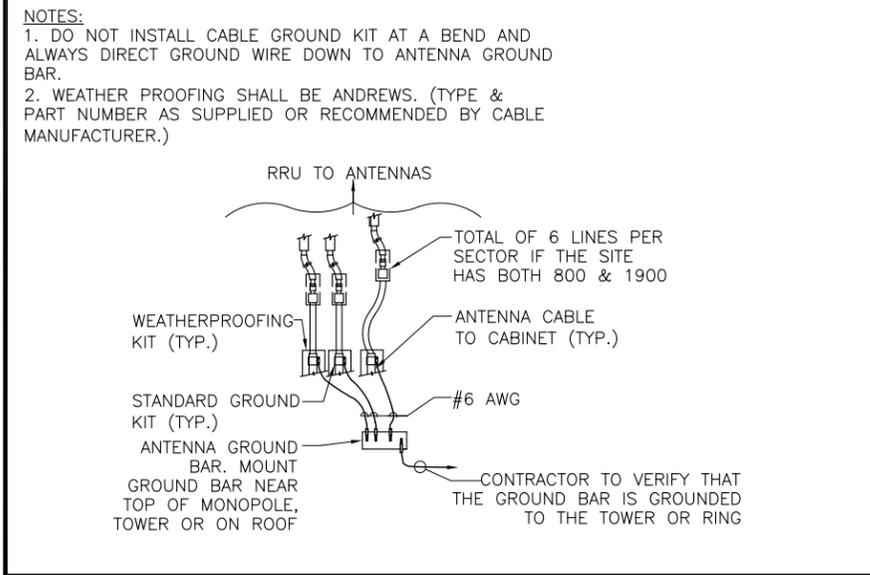
GROUND LUG TO BUS BAR 24"x36" SCALE: NTS 11"x17" SCALE: NTS **8**



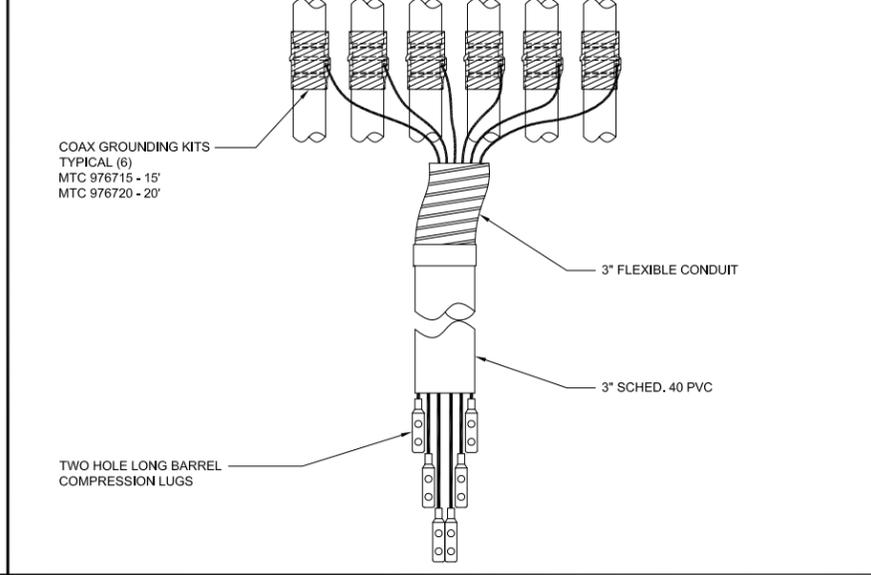
ANTENNA GROUNDING PLAN 24"x36" SCALE: NTS 11"x17" SCALE: NTS **5**



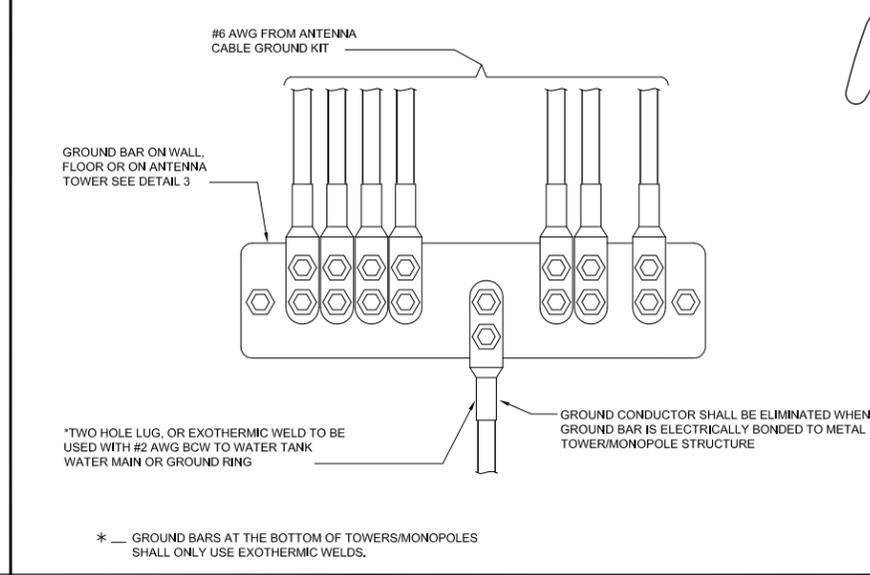
GROUNDING WIRE CONNECTION 24"x36" SCALE: NTS 11"x17" SCALE: NTS **2**



TYPICAL COAX GROUNDING 24"x36" SCALE: NTS 11"x17" SCALE: NTS **9**



COAX GROUND KIT 24"x36" SCALE: NTS 11"x17" SCALE: NTS **6**

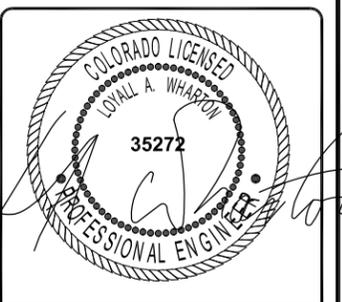


WIRE TO GROUND BAR CONNECTION 24"x36" SCALE: NTS 11"x17" SCALE: NTS **3**



| | |
|-------------|----|
| DRAWN BY: | MB |
| CHECKED BY: | MM |

| REV | DATE | DESCRIPTION |
|-----|------------|------------------------|
| 0 | 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 |



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

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
E-5

SprintVision **RF Design Sheet**

| Site Identification | | Contact Information | | Location Details | |
|--------------------------|--|---------------------------|---------------------------|------------------|-----------------|
| Cascade | DN14XC247 | Engineer Email | gprina.2.1@msw@sprint.com | Latitude | 38.80664 |
| SMS Schedule ID | 124494 | Sprint Badged RF Engineer | Geneta Team | Longitude | -104.86842 |
| SMS Schedule Name | CO Micro Upgrade | RF Engineer Email | gprina.2.1@msw@sprint.com | Market | Colorado |
| RFID | | RF Engineer Phone | 224-346-9619 | Region | West |
| RRU OEM | Samung | RF Manager | Dejananda.Rou@sprint.com | City | Manitou Springs |
| Switch OEM | 39A | RF Manager Email | Dejananda.Rou@sprint.com | State | CO |
| RFDS Issue Date | 2017-04-12 00:00:00 | RF Manager Phone | 949-214-5811 | Zip Code | CO80809 |
| RFDS Revision | 3 | | | County | El Paso |
| Filter Analysis Complete | | Carrier Count | | Sector Count | |
| RFDS - Issue Date | 2017-04-12 00:00:00 | 2500 LTE | 3 | 2500MHz | 2 |
| Design Status | Complete | 1900 LTE | | 1900EVDO | |
| Border Analysis Complete | YES | 1900 Voice | | 1900MHz | |
| Project Description | 488 800 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 lower top. | 800 LTE | 1 | 800MHz | 2 |
| | | 800 Voice | 1 | | |

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 lower 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 | Alpha | Beta | Gamma | Delta | Epsilon | Zeta |
|-----------------|-----------------|-----------------|-------|-------|---------|------|
| 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 | Alpha | Beta | Gamma | Delta | Epsilon | Zeta |
|-------------------------------|-----------------------|-----------------------|-------|-------|---------|------|
| Model Number | EP96-04223A | EP96-04223A | N/A | N/A | N/A | N/A |
| Weight (lbs) | 4.58 | 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 Qty needed | Alpha | Beta | Gamma | Delta | Epsilon | Zeta |
|--------------------------------------|-----------------------|-----------------------|-------|-------|---------|------|
| 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 Qty needed | | | | | | |

| Band: 2500 | Alpha | Beta | Gamma | Delta | Epsilon | Zeta |
|--|--------------------------------------|--------------------------------------|------------|-------|---------|------|
| Antenna1 | | | | | | |
| Model Number | Antenna assigned on a different band | Antenna assigned on a different band | | | | |
| Weight (lbs) | 0 | 0 | N/A | N/A | N/A | N/A |
| Dimensions | 0 x 0 x 0 | 0 x 0 x 0 | N/A | N/A | N/A | N/A |
| Manufacturer | - | - | N/A | N/A | N/A | N/A |
| Ant 1 Top Jumper Make/Mode/Cty | 2.5 Jumper | 4 | 2.5 Jumper | 4 | 0 | 0 |
| Ant 1 RF requested Diameter | 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 | N/A |
| Antenna 1 Azimuth | 325 | 125 | N/A | N/A | N/A | N/A |
| Antenna 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 |

| 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 |
| Dimensions | 48 x 11.7 x 7.6 | 48 x 11.7 x 7.6 | N/A | N/A | N/A | N/A |
| Manufacturer | CCI | CCI | N/A | N/A | N/A | N/A |
| Ant 1 Top Jumper Make/Mode/Cty | 800/1900 Jumper | 1 | 800/1900 Jumper | 2 | 0 | 0 |
| Ant 1 RF requested Diameter | 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 | N/A |
| Antenna 1 Azimuth | 325 | 125 | N/A | N/A | N/A | N/A |
| Antenna 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 | 3 | 3 | N/A | N/A | N/A | N/A |



DRAWN BY: MB
CHECKED BY: MM

| REV | DATE | DESCRIPTION |
|-----|------------|------------------------|
| △ | 01/10/2019 | 100% CD - JX COMMENTS |
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USWW MANITOU WATER
DN14XC247
7353 W. HWY 24
CASCADE, CO 80809
MONOPOLE

SHEET TITLE
RADIO FREQUENCY DATA SHEET

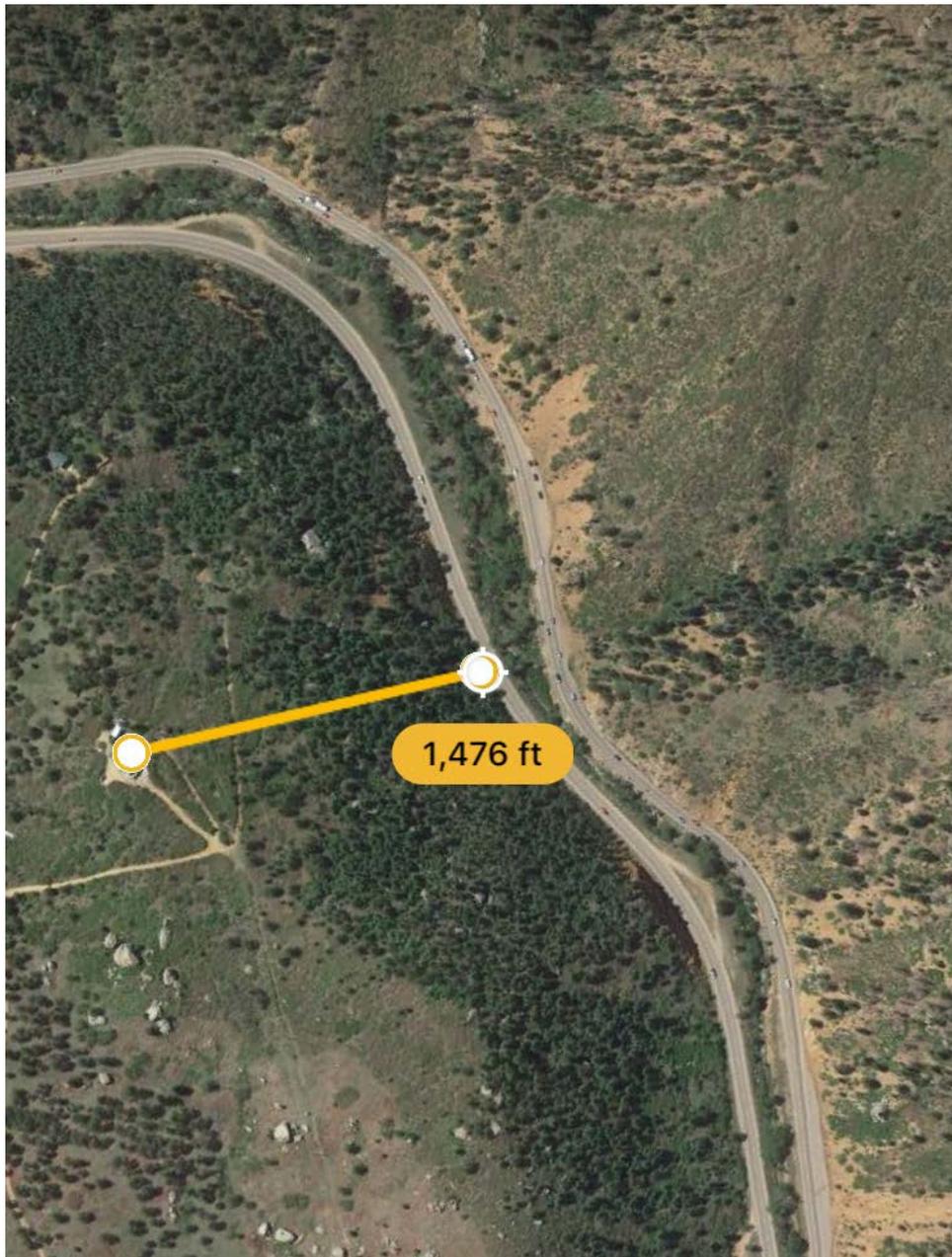
SHEET NUMBER
RF-1

Wireless Telecommunications Facility

Photo Key #2- 7225 Highway 24, Manitou Springs, CO- 2018

Note: these photographs of the tower are from the property lines adjacent to other properties. The site is not in a public right-of-way

PHOTOS FROM THE SAME SIDE OF THE ROAD OF THE SITE











PHOTOS OF THE SITE FROM ACROSS THE HIGHWAY











