



CITY OF
**West
Linn**

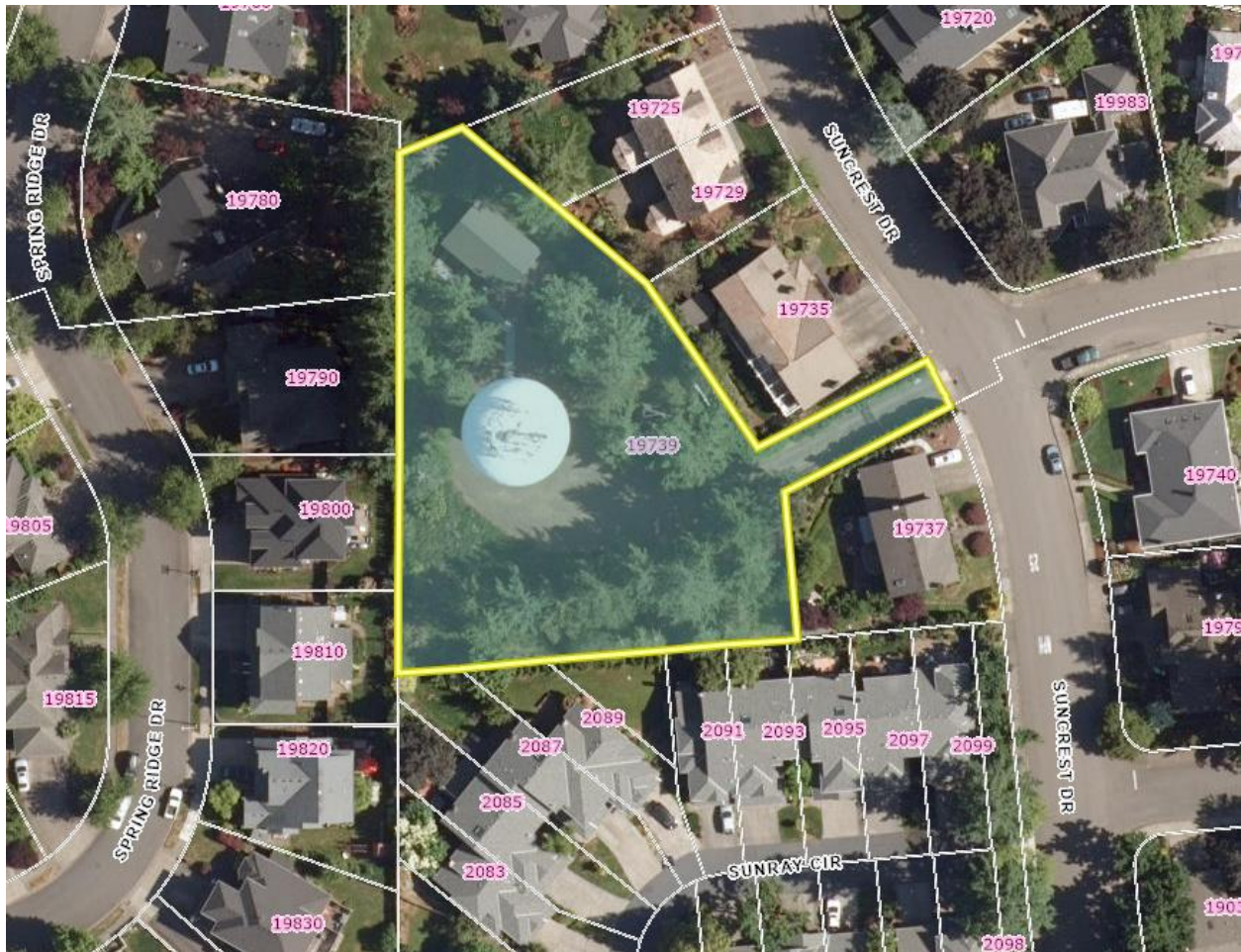
PRE-APPLICATION CONFERENCE

Thursday, June 6, 2024

**Willamette Room
City Hall
22500 Salamo Rd
West Linn**

9:00 am: Proposed DISH Wireless site
Applicant: Marina Monihan, applicant
Property Address: 19739 Suncrest Drive
Neighborhood Assn: Hidden Springs Neighborhood Association
Planner: Aaron Gudelj

Project #: PA-24-11





Pre-Application Conference Request

For Staff to Complete:

PA 24-11

Conference Date: 6/6/24

Time: 9:00am PT

Staff Contact: Aaron Gudelj

Fee: \$420

Pre-application conferences are held on the first and third Thursdays of the month between 9:00 am and 1:00 pm. Appointments must be made by 5:00 pm, 15 days before the meeting date. The applicant has a choice of an in-person or virtual meeting. To schedule a conference, submit this form, a site plan, and accompanying materials through the [Submit a Land Use Application](#) web page. The City will contact you to collect payment. Pre-application notes are valid for 18 months.

Property Owner Information

Name: City of West Linn/ Landlord Contact Matthew Kaatz
Email: mkaatz@westlinnoregon.gov
Phone #: 503-742-6083
Address: 22500 Salamo Road, West Linn, OR 97068

Applicant Information

Name: Marina Monihan, Technology Associates EC, Inc. on behalf of DISH Wireless, L.L.C.
Email: marina.monihan@taec.net
Phone #: (925)408-3387
Address: 525 3rd Street, Suite 200 Lake Oswego, OR 97034

Address of Subject Property (or tax lot): 19739 Suncrest Drive West Linn, OR 97068
Parcel: 00366302

REQUIRED ATTACHMENTS:

- ✓ A project narrative with a detailed description of the proposed project. Briefly describe the physical context of the site.
- ✓ A list of questions or issues the applicant would like the City to address.
- ✓ A dimensional site plan that shows:
 - North arrow and scale
 - Location of existing trees (a tree survey is highly recommended)
 - Streets Abutting the property and width of right of way
 - Location of creeks and/or wetlands (a wetland delineation is highly recommended)
 - Property Dimensions, existing buildings, and building setbacks
 - Slope map (if slope is 25% or more)
 - Location of existing utilities (water, sewer, etc.)
 - Conceptual layout, design, proposed buildings, building elevations, and setbacks
 - Location of all easements (access, utility, etc.)
 - Vehicle and bicycle parking layout (including calculation of required number of spaces, based on use and square footage of building), if applicable
 - Location of existing and proposed access and driveways. Include the proposed circulation system for vehicles, pedestrians, and bicycles, if applicable.
 - Proposed stormwater detention system with topographic contours

I certify that I am the owner or authorized agent of the owner:

APPLICANT:

DATE: 05/13/2024

The undersigned property owner authorizes the requested conference and grants city staff the **right of entry** onto the property to review the application.

PROPERTY OWNER: Please see attached redacted lease draft with the City of West Linn

DATE: 05/13/2024

May 13th, 2024

Planning & Development
City of West Linn
22500 Salamo Rd. #1000
West Linn, OR 97068
(503)742-6060

**Subject: DISH Wireless PRPDX00519A;
Pre-Application Conference Request**

To City of West Linn Planning & Development:

Please review the attached request for a Pre-Application Conference for the proposed DISH Wireless site PRPDX00519A, located at 19739 Suncrest Drive, West Linn, OR 97068. The proposed design will require a Class I Design Review. With this request I have included a preliminary site plan and a redacted version of our lease draft with the City.

DISH Wireless is proposing to collocate on the existing wireless facility located on the water tower owned by the City of West Linn. The current height of the tallest antenna is at 134' AGL, and DISH is proposing antennas that will have a tip height of 116' AGL. The proposed ground equipment will be located within the base of the water tank.

DISH Wireless L.L.C. proposed Scope of Work includes the following:

- Install (3) antennas, (6) antenna mounts, (6) radios, (3) OVP devices, and (6) discrete cables at 113' RAD on the existing water tank hand railing.
- Install (1) steel platform, (2) equipment cabinets, and associated wireless equipment within the base of the water tower.

I appreciate your time and consideration and look forward to scheduling the Pre-Application Conference. Please let me know if additional materials or information are needed.

Thank you,

Marina Monihan, Site Acquisition Specialist
Marina.monihan@taec.net
(925)408-3387



DISH Wireless L.L.C. SITE ID:
PRPDX00519A

DISH Wireless L.L.C. SITE ADDRESS:
19739 SUNCREST AVE.
WEST LINN, OR 97068

SCOPE OF WORK	
THIS IS NOT AN ALL INCLUSIVE LIST. CONTRACTOR SHALL UTILIZE SPECIFIED EQUIPMENT PART OR ENGINEER APPROVED EQUIVALENT. CONTRACTOR SHALL VERIFY ALL NEEDED EQUIPMENT TO PROVIDE A FUNCTIONAL SITE. THE PROJECT GENERALLY CONSISTS OF THE FOLLOWING:	
TOWER SCOPE OF WORK:	
<ul style="list-style-type: none"> - INSTALL (3) PANEL ANTENNAS (1 PER SECTOR) - INSTALL (6) ANTENNA MOUNT CROSSOVER PLATES (2 PER ANTENNA) - INSTALL PROPOSED JUMPERS - INSTALL (6) RRRs (2 PER SECTOR) - INSTALL (3) OVER VOLTAGE PROTECTION DEVICE (OVP) - INSTALL (6) DISCRETE CABLES 	
GROUND SCOPE OF WORK:	
<ul style="list-style-type: none"> - INSTALL (1) STEEL PLATFORM - INSTALL (1) PPC CABINET - INSTALL (1) EQUIPMENT CABINET - INSTALL (1) U/G HYBRID CABLE - INSTALL (1) POWER CONDUIT - INSTALL (1) TELCO CONDUIT - INSTALL (1) TELCO-FIBER BOX - INSTALL (1) GPS UNIT - INSTALL (1) SAFETY SWITCH (IF REQUIRED) - INSTALL (1) FIBER NID (IF REQUIRED) - INSTALL (1) METER SOCKET - INSTALL (1) DOUBLE CHAIN LINK GATE 	

SITE INFORMATION		PROJECT DIRECTORY	
PROPERTY OWNER:	CITY OF WEST LINN	APPLICANT:	DISH Wireless L.L.C.
ADDRESS:	22500 SALAMO RD., WEST LINN, OR 97068		5701 S. SANTA FE DR. LITTLETON, CO 80120
TOWER TYPE:	WATER TANK	TOWER OWNER:	PORTLAND GENERAL ELECTRIC
TOWER CO SITE ID:	ROSEMONT RESERVOIR		121 SW SALMON STREET PORTLAND, OR 97204 503-323-6700
TOWER APP NUMBER:	N/A	SITE DESIGNER:	PETER LUNDQUIST, PE
COUNTY:	CLACKAMAS COUNTY		3 MONROE PARKWAY, STE. P #313 LAKE OSWEGO, OR 97035 "SITE DESIGNER PHONE #"
LATITUDE (NAD 83):	45° 22' 46.5" N	SITE ACQUISITION:	BRIAN FLORES / JESSICA BAUER
LONGITUDE (NAD 83):	122° 39' 20.5" W		-
ZONING JURISDICTION:	CITY OF WEST LINN	CONSTRUCTION MGR:	TONY FILLIPPELLO
			-
ZONING DISTRICT:	R15: SINGLE FAMILY RESIDENTIAL DETACHED	RF ENGINEER:	VENUKUMAR YARDAV HOSUR
PARCEL NUMBER:	00366302		-
OCCUPANCY GROUP:	U, S-2		
CONSTRUCTION TYPE:	II-B		
POWER COMPANY:	PORTLAND GENERAL ELECTRIC		
TELEPHONE COMPANY:	CENTURYLINK		



5701 SOUTH SANTA FE DRIVE
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3 MONROE PARKWAY, SUITE P #313
LAKE OSWEGO, OR 97035

OREGON CODE OF COMPLIANCE	
ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.	
CODE TYPE	CODE
BUILDING	2019 OSSC/2018 IBC
MECHANICAL	2019 OMSC/2018 IMC
ELECTRICAL	2017 OESC/2020 NEC



UNDERGROUND SERVICE ALERT - OREGON 811
 UTILITY NOTIFICATION CENTER OF OREGON
 (800) 332-2344
 WWW.DIGSAFELYOREGON.COM

CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

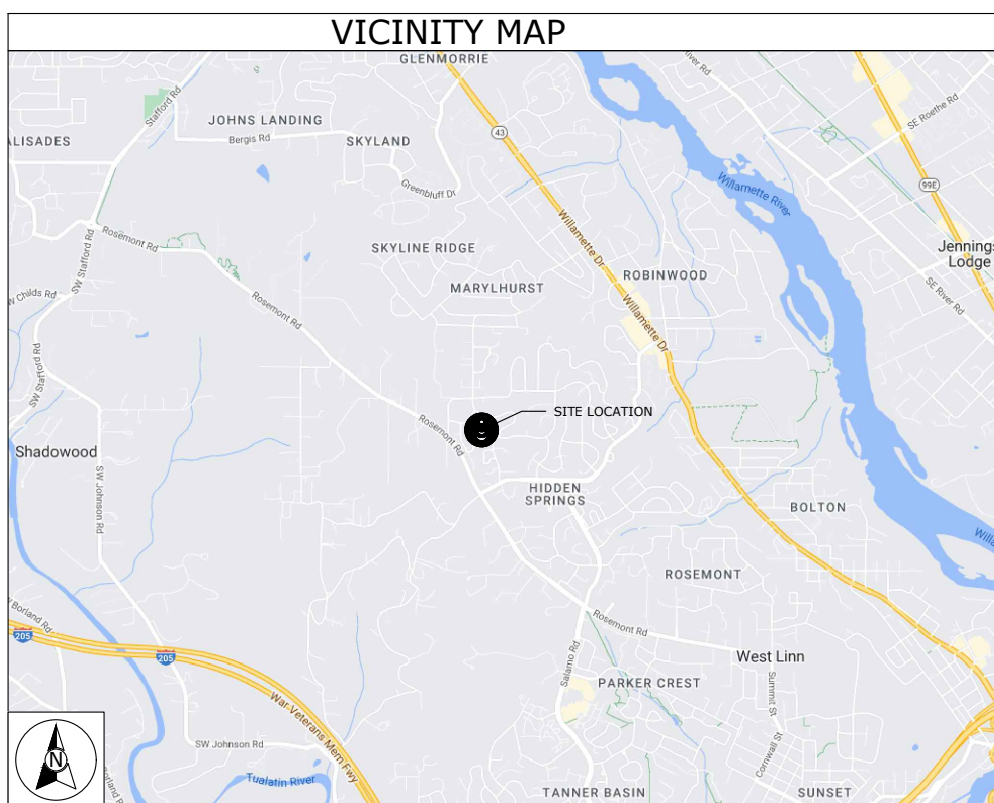
GENERAL NOTES

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OF EFFECT ON DRAINAGE. NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED

**11"x17" PLOT WILL BE HALF SCALE
UNLESS OTHERWISE NOTED**

CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE, AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

DIRECTIONS	
DIRECTIONS FROM PORTLAND INTERNATIONAL AIRPORT:	
<ol style="list-style-type: none"> 1. HEAD SOUTHEAST ON NE AIRPORT WAY 2. MERGE ONTO I-205 S TOWARD PORTLAND 3. TAKE EXIT 8 FOR STATE ROUTE 43 TOWARD W LINN/LAKE OSWEGO 4. TURN RIGHT ONTO WILLAMETTE DR 5. TURN LEFT ONTO PIMLICO DR 6. TURN RIGHT ONTO SANTA ANITA DR 7. TURN LEFT ONOT HIDDEN SPRINGS RD 8. TURN RIGHT ONTO SUNCREST DR DESTINATION WILL BE ON THE LEFT	



SHEET INDEX	
SHEET NO.	SHEET TITLE
T-1	TITLE SHEET
A-1	OVERALL AND ENLARGED SITE PLAN
A-2	ELEVATION, ANTENNA LAYOUT AND SCHEDULE
A-3	EQUIPMENT LAYOUT AND H-FRAME DETAILS
A-4	EQUIPMENT PLATFORM DETAILS
A-5	ANTENNA EQUIPMENT DETAILS
A-6	ANTENNA MOUNTING DETAILS
A-7	GROUND EQUIPMENT DETAILS
E-1	ELECTRICAL/FIBER ROUTE PLAN AND NOTES
E-2	ELECTRICAL DETAILS
E-3	ELECTRICAL ONE-LINE, FAULT CALCS AND PANEL SCHEDULE
E-4	NEUTRAL-TO-GROUND PPC SCHEMATIC
G-1	GROUNDING PLANS AND NOTES
G-2	GROUNDING DETAILS
G-2.1	GROUNDING DETAILS
RF-1	RF CABLE COLOR CODE
RF-2	DECLINATION MAP
GN-1	LEGEND AND ABBREVIATIONS
GN-2	RF SIGNAGE
GN-3	GENERAL NOTES
GN-3.1	GENERAL NOTES

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EL	AL	APPROVED BY

RFDS REV#: 0

CONSTRUCTION DOCUMENT

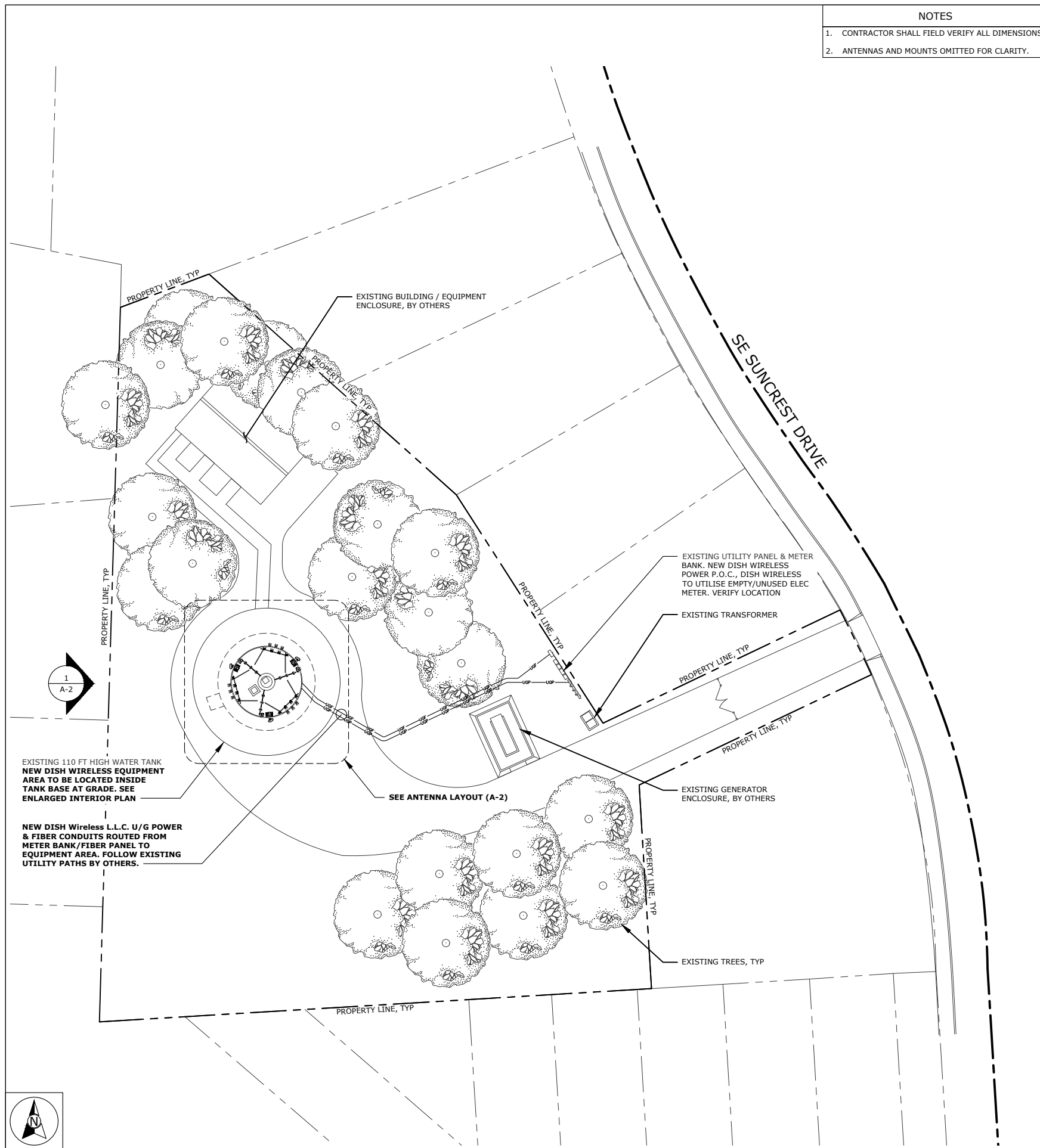
SUBMITTALS		
REV	DATE	DESCRIPTION
A	01/16/2024	PRELIMINARY PCD
0	02/22/2024	90% PCD REVIEW

A&E PROJECT NUMBER
004699

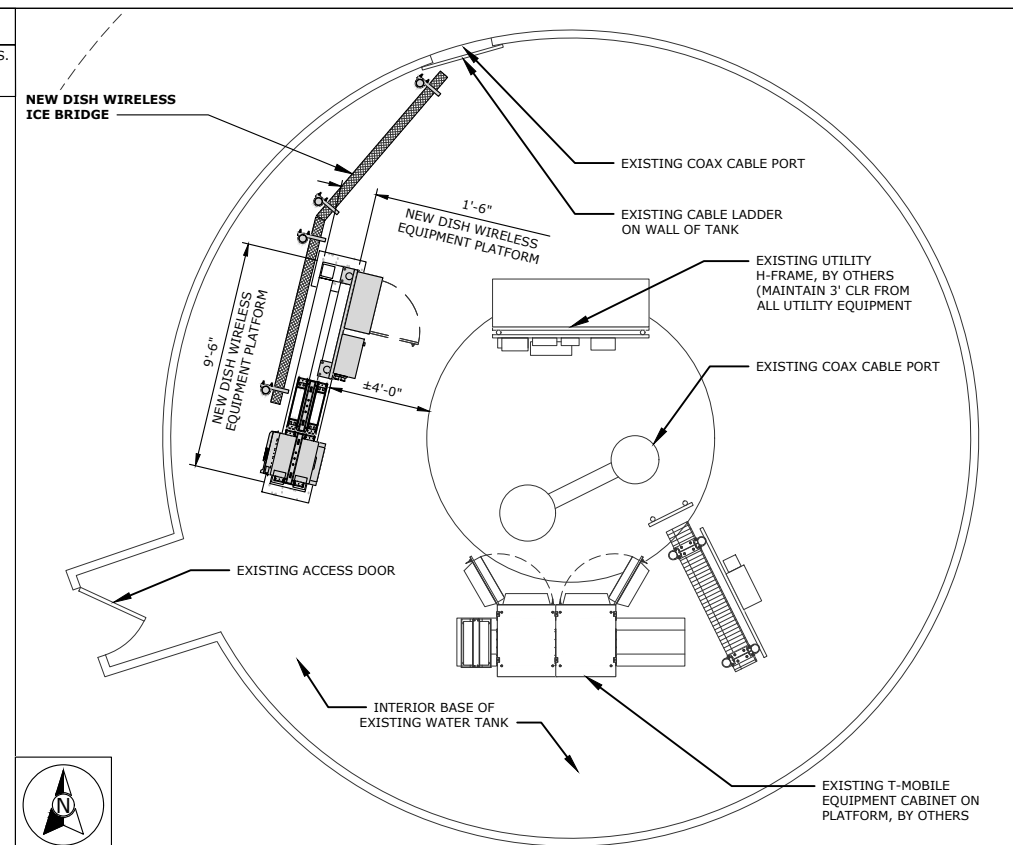
DISH Wireless L.L.C.
PROJECT INFORMATION
PRPDX00519A
19739 SUNCREST AVE.
WEST LINN, OR 97068

SHEET TITLE
TITLE SHEET

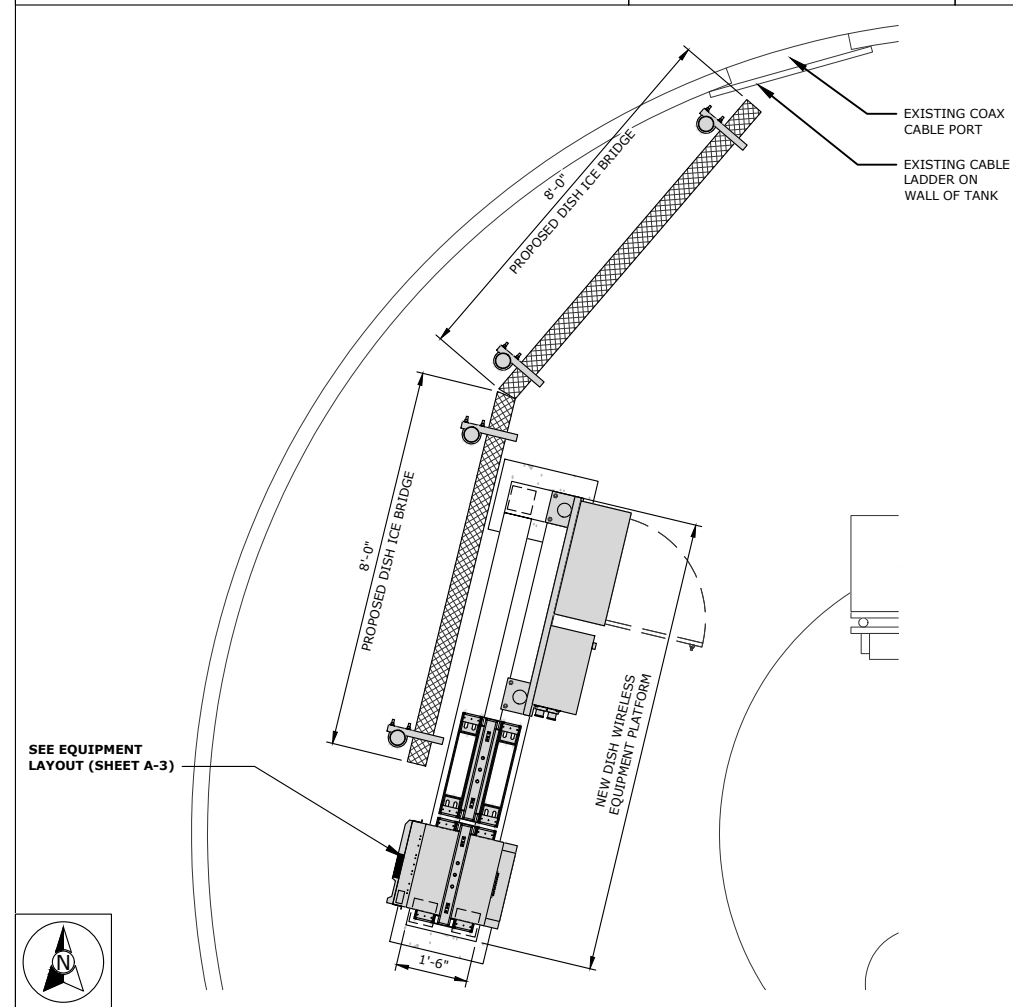
SHEET NUMBER
T-1



OVERALL SITE PLAN



ENLARGED INTERIOR PLAN



ENLARGED EQUIPMENT PLAN



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



3 MONROE PARKWAY, SUITE P #313
LAKE OSWEGO, OR 97035

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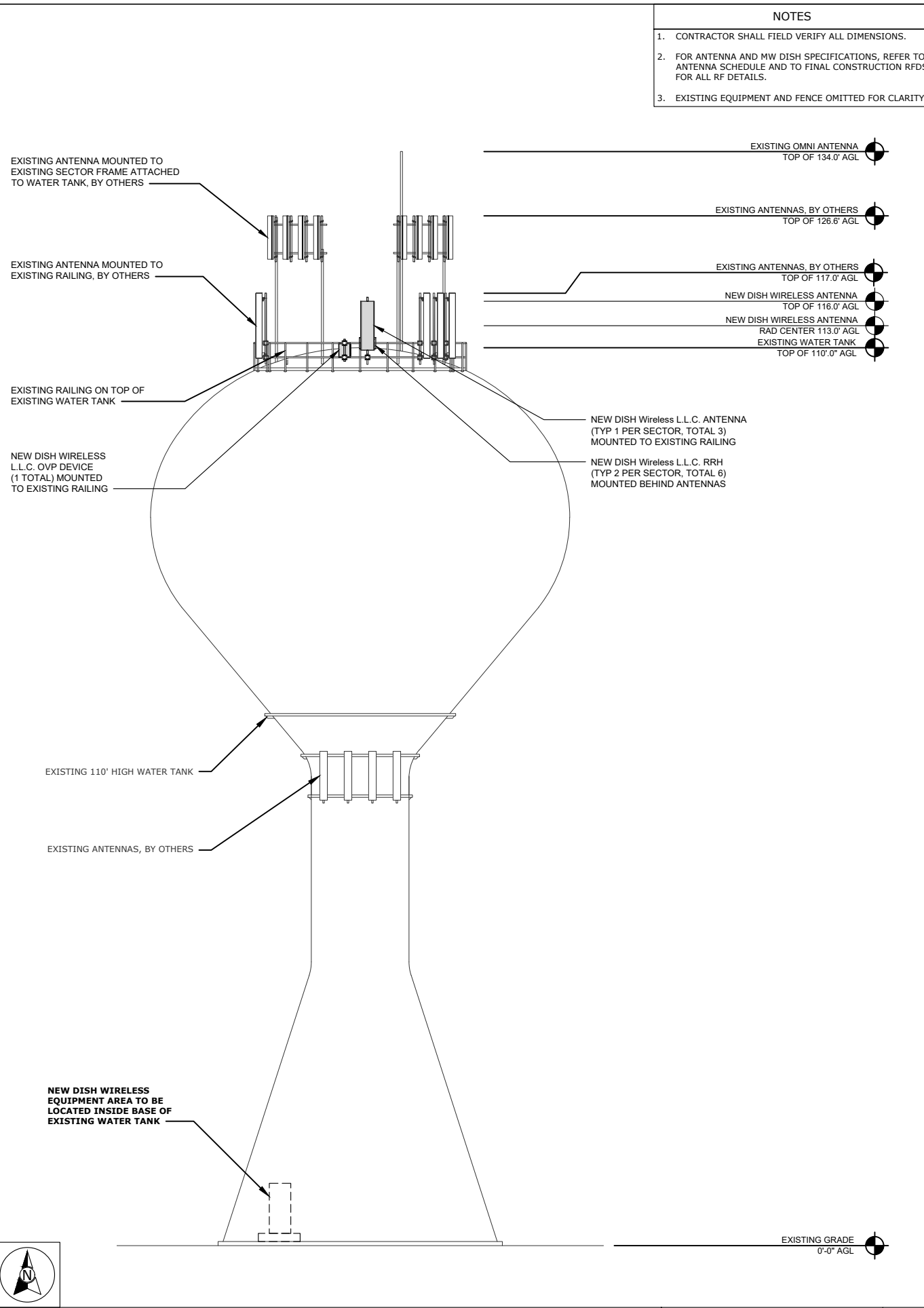
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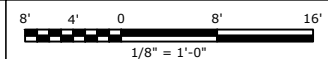
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OVERALL AND
ENLARGED SITE PLAN

SHEET NUMBER

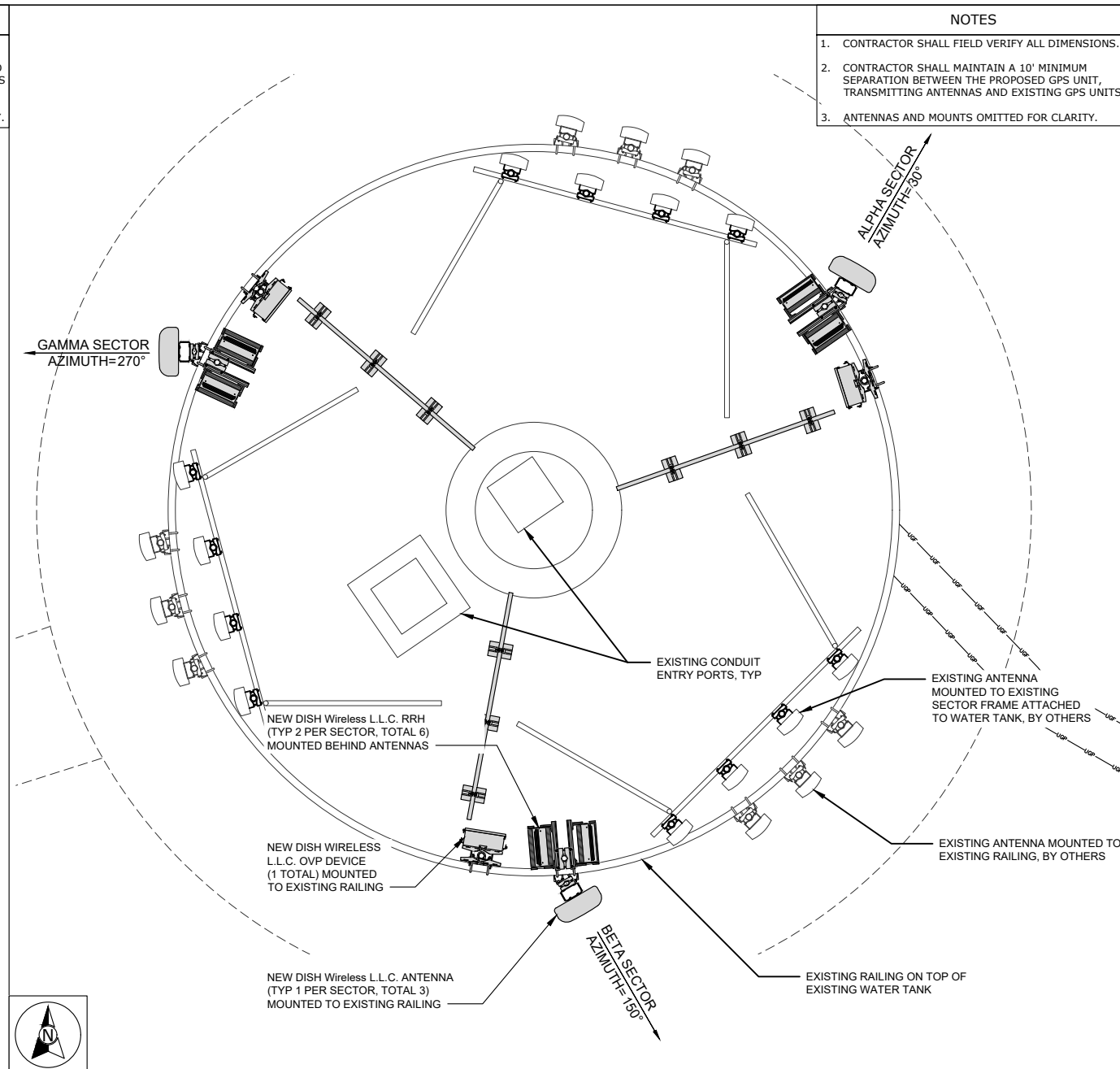
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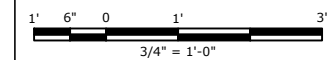
WATER TANK ELEVATION



1



ANTENNA LAYOUT



2

SECTOR POS.	EXISTING OR PROPOSED	ANTENNA				TRANSMISSION CABLE FEED LINE TYPE & LENGTH	RRH			OVP MANUFACTURER MODEL #
		MANUFACTURER - MODEL #	TECH	AZIMUTH	RAD CENTER		MANUFACTURER - MODEL #	TECH	POS.	
A1	NEW	JMA - MX08FRO665-21	5G	30°	113'-0"	(1) HIGH-CAPACITY HYBRID CABLE (120' LONG)	FUJITSU TA08025-B605	5G	A1	RAYCAP - RDIDC-9181-PF-48
A2	---	---	---	---	---		FUJITSU TA08025-B604	5G	A1	
A3	---	---	---	---	---		---	---	---	
A4	---	---	---	---	---		---	---	---	
B1	NEW	JMA - MX08FRO665-21	5G	150°	113'-0"	SHARED WITH ALPHA	FUJITSU TA08025-B605	5G	B1	RAYCAP - RDIDC-9181-PF-48
B2	---	---	---	---	---		FUJITSU TA08025-B604	5G	B1	
B3	---	---	---	---	---		---	---	---	
B4	---	---	---	---	---		---	---	---	
C1	NEW	JMA - MX08FRO665-21	5G	270°	113'-0"	SHARED WITH ALPHA	FUJITSU TA08025-B605	5G	C1	RAYCAP - RDIDC-9181-PF-48
C2	---	---	---	---	---		FUJITSU TA08025-B604	5G	C1	
C3	---	---	---	---	---		---	---	---	
C4	---	---	---	---	---		---	---	---	

- CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS.
- ANTENNA & RRH MODELS MAY CHANGE DUE TO EQUIPMENT AVAILABILITY. ALL EQUIPMENT CHANGES MUST BE APPROVED & REMAIN IN COMPLIANCE WITH THE PROPOSED DESIGN & STRUCTURAL ANALYSES.

ANTENNA SCHEDULE

NO SCALE

3

- NOTES
- CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
 - FOR ANTENNA AND MW DISH SPECIFICATIONS, REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS.
 - EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.

- NOTES
- CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
 - CONTRACTOR SHALL MAINTAIN A 10' MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
 - ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



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CONSTRUCTION DOCUMENT

SUBMITTALS

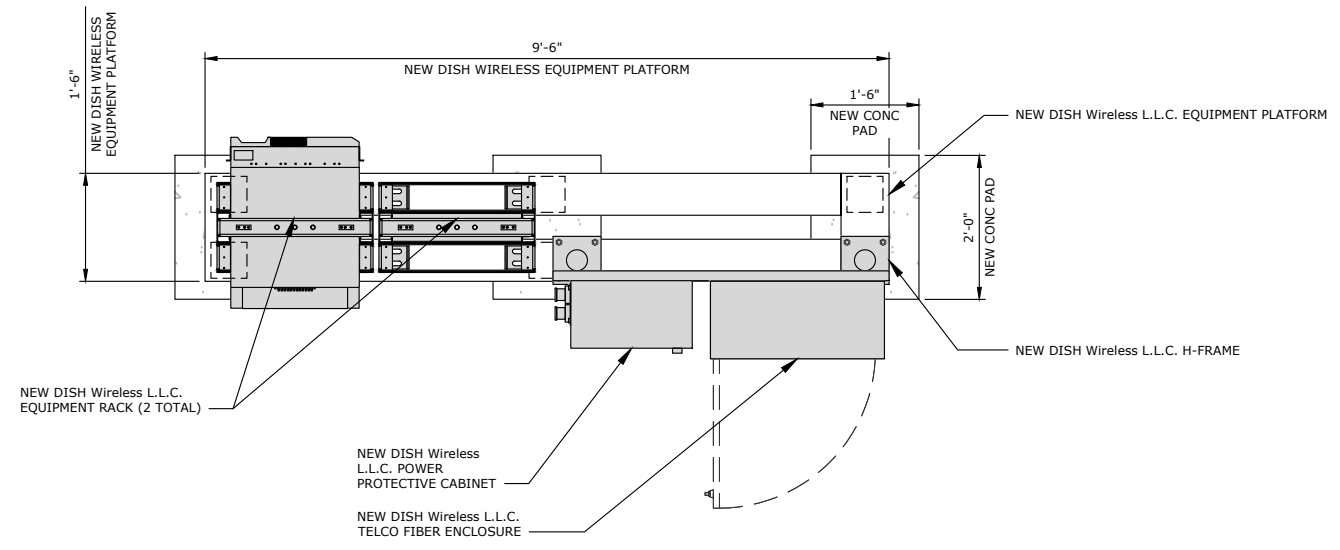
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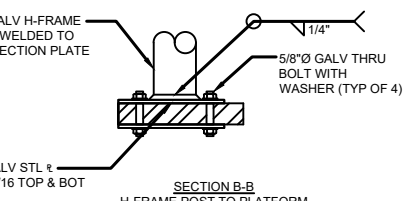
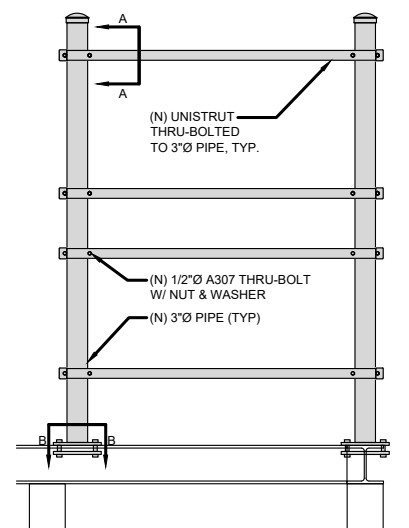
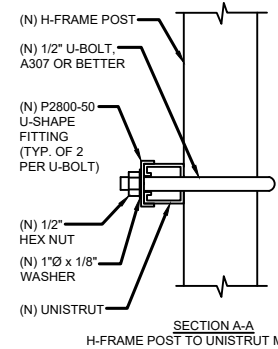
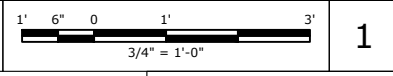
DISH Wireless L.L.C.
PROJECT INFORMATION
PRPDX00519A
19739 SUNCREST AVE.
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SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

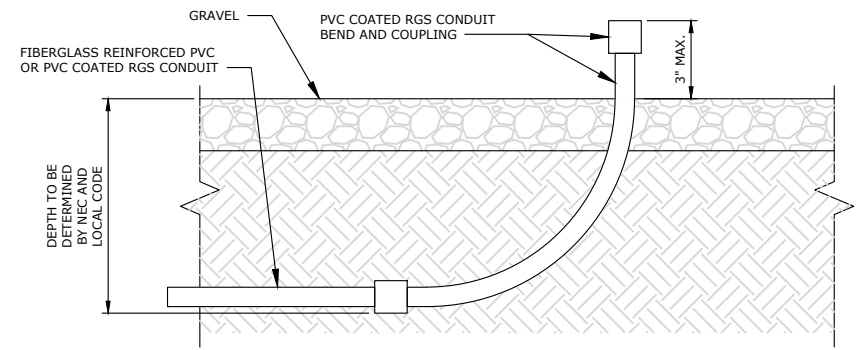
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A-2



PLATFORM EQUIPMENT PLAN



NOTES
PVC COATED CONDUIT BENDS AND FITTINGS SHALL BE USED WHERE CONCEALED CONDUIT RUNS ARE STUBBED UP FROM THE SLAB. RISERS ON POLES SHALL BE PVC COATED RGS INCLUDING WEATHERHEADS.



H-FRAME DETAIL

NO SCALE

2

STUB UP DETAIL

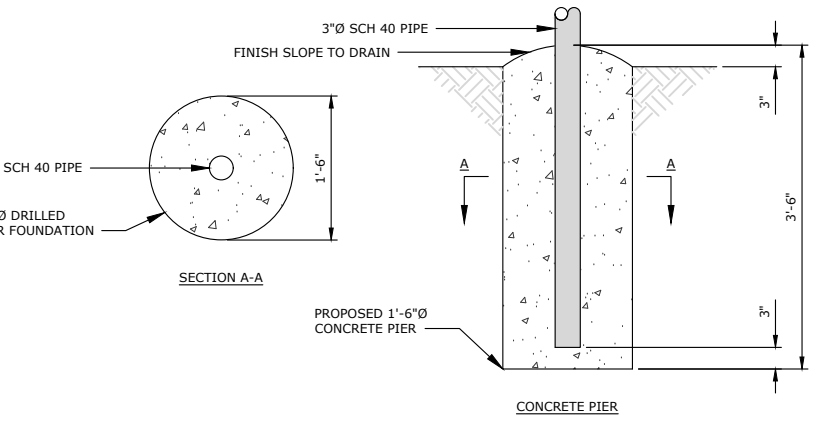
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3

PLATFORM ELEVATION

NO SCALE

4

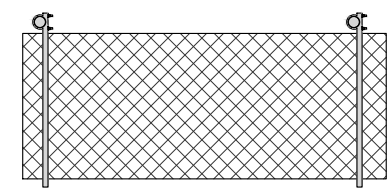


TYPICAL ICE BRIDGE CONCRETE PIER DETAIL

NO SCALE

5

COMMSCOPE WB-K21048-B14	
DIMENSIONS (HxL)	168"x120"x48"
WEIGHT	356 lbs

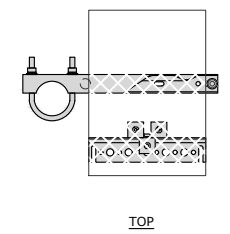


ICE BRIDGE DETAIL

NO SCALE

6

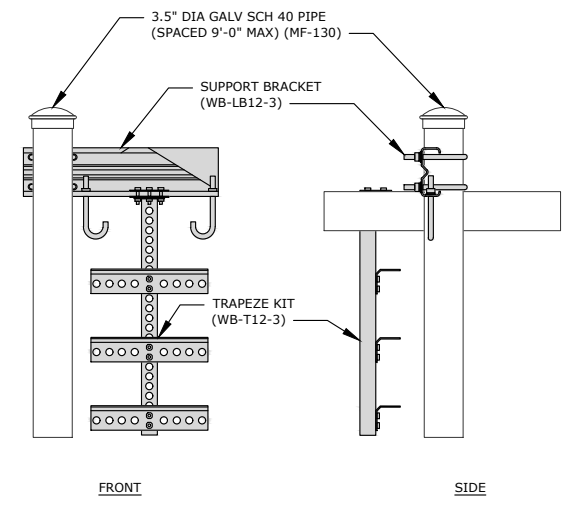
COMMSCOPE WB-K110-B	
DIMENSIONS (HxL)	160"x10'
WEIGHT	325 lbs
CABLE RUN (QTY)	12



ICE BRIDGE DETAIL

NO SCALE

7



5701 SOUTH SANTA FE DRIVE
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CONSTRUCTION DOCUMENT

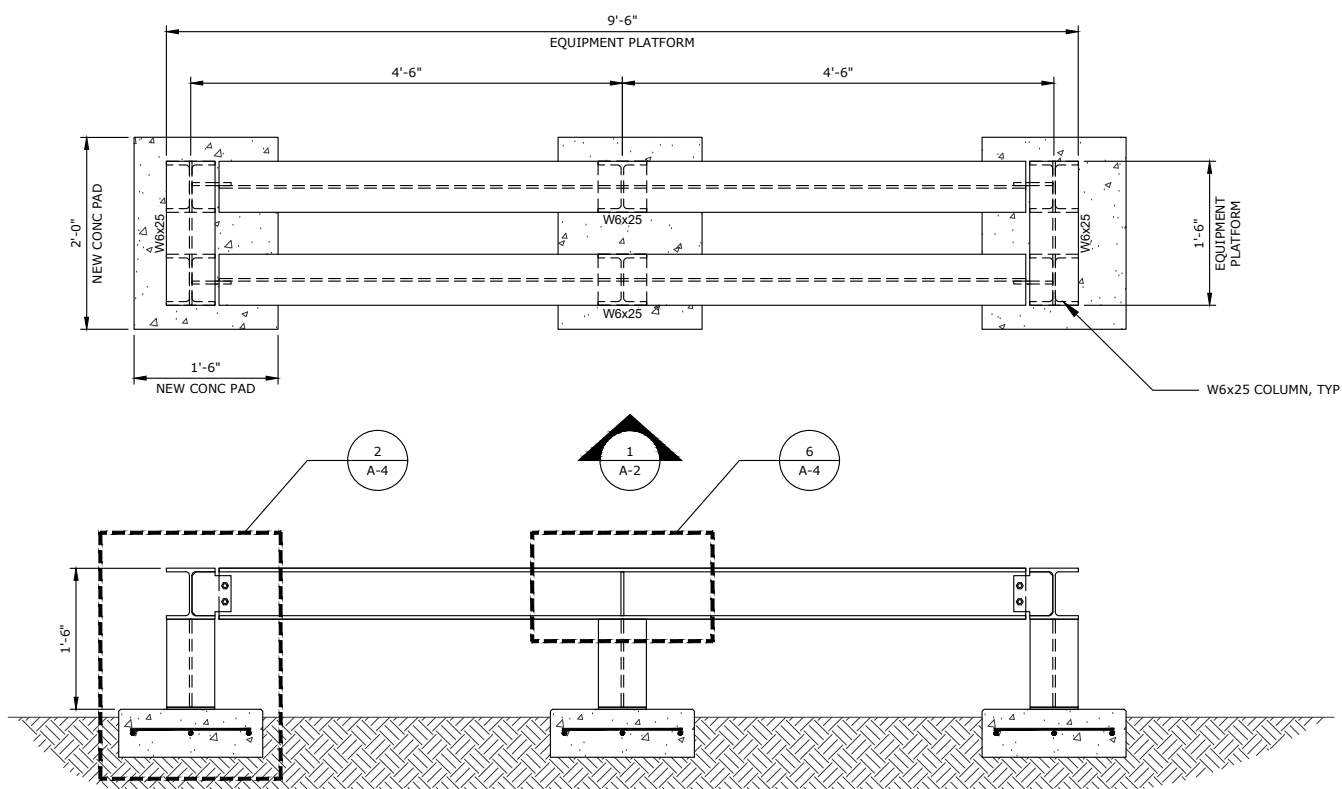
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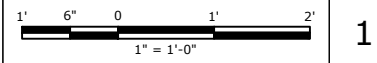
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SHEET TITLE
EQUIPMENT LAYOUT AND H-FRAME DETAILS

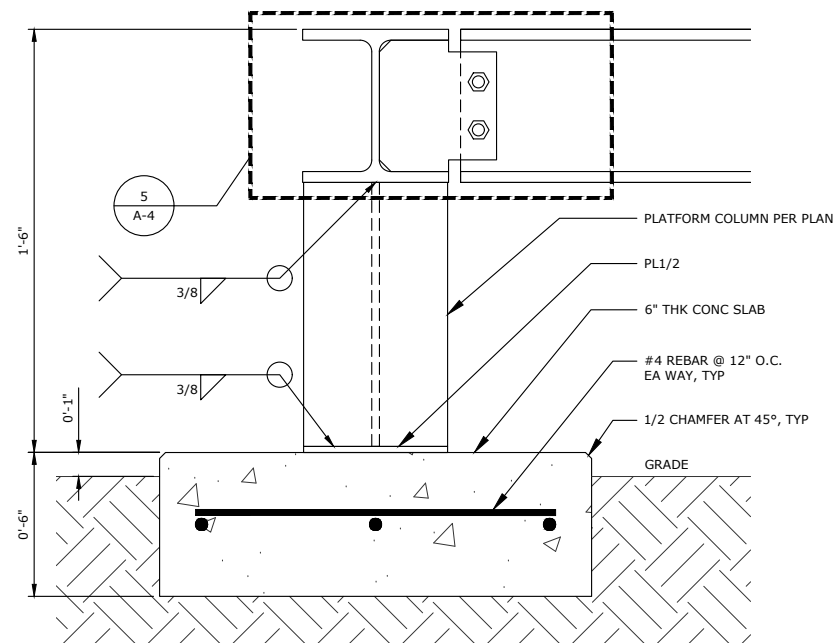
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A-3



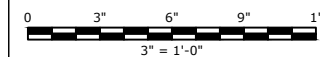
EQUIPMENT PLATFORM PLAN & SECTION



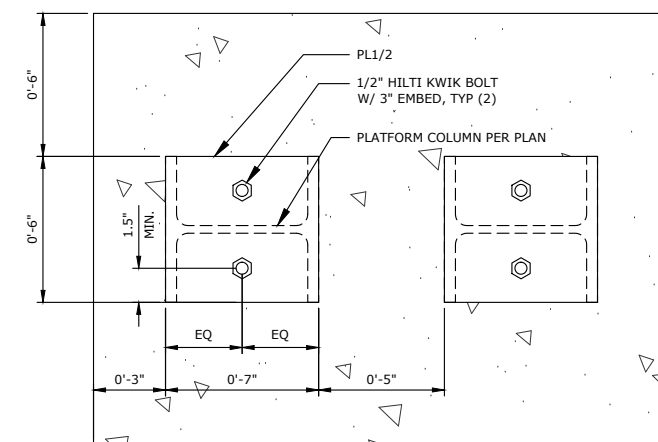
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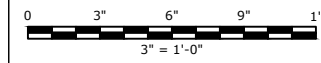
COLUMN - ELEVATION



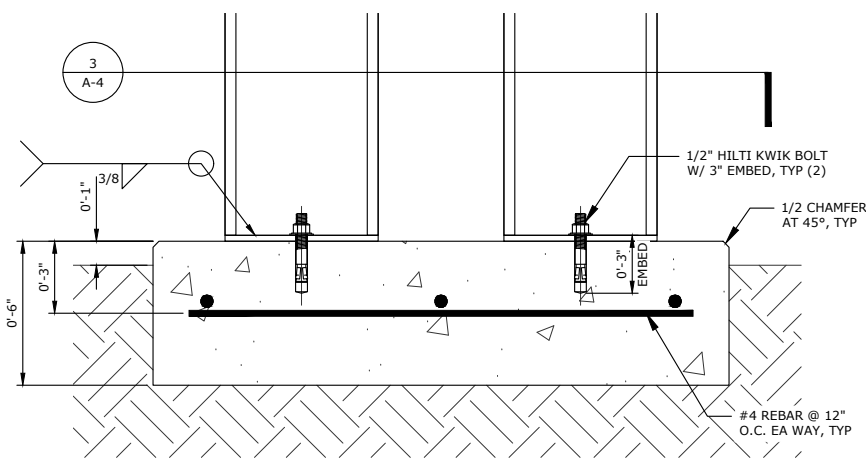
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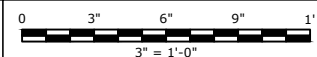
COLUMN CONNECTION PLAN



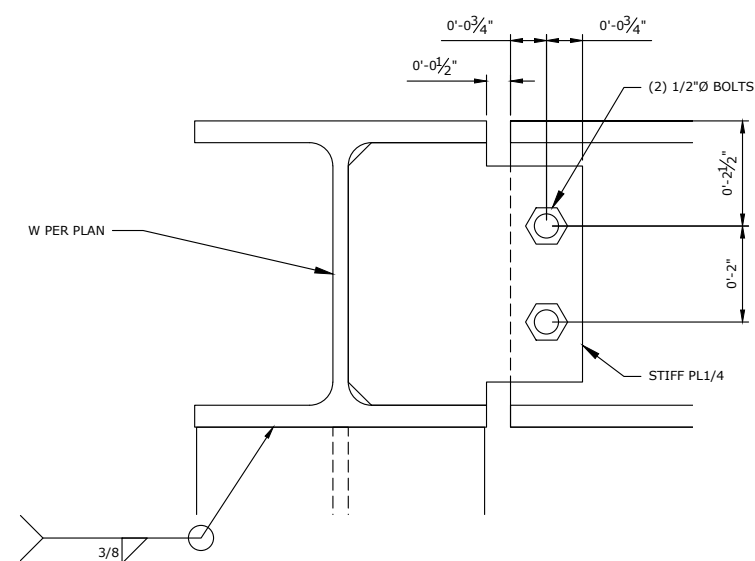
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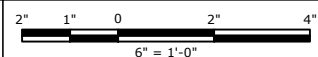
COLUMN CONNECTION DETAIL



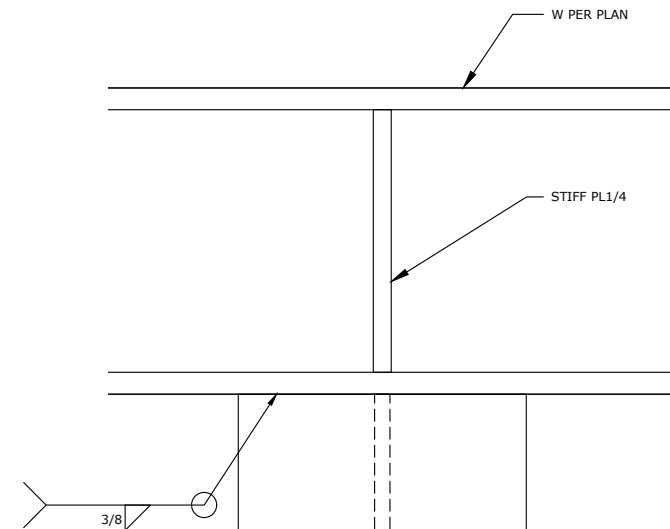
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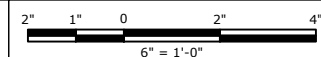
TYP PLATFORM SHEAR TAB



5



TYP PLATFORM STIFF PL



6

dish
wireless.

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LITTLETON, CO 80120

Technology Associates

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0	02/22/2024	90% PCD REVIEW

A&E PROJECT NUMBER
004699

DISH Wireless L.L.C.
PROJECT INFORMATION
PRPD00519A
19739 SUNCREST AVE.
WEST LINN, OR 97068

SHEET TITLE
EQUIPMENT PLATFORM DETAILS

SHEET NUMBER
A-4

JMA MX08FRO665-21	
DIMENSIONS (HxWxD)	72"x20"x8"
ANTENNA WEIGHT	64.5 lbs
WEIGHT WITH BRACKETS	82.5 lbs

SIDE FRONT TOP

JMA #91900318 BRACKET	
TOTAL WEIGHT	18 lbs
POLE DIAMETER RANGE	2.5" - 4.5"

NOTE:
KIT #91900318: TOP & BOTTOM BRACKETS FOR 4, 6 & 8-FOOT ANTENNAS.
ANTENNA BRACKET NOT PART OF KIT.

MOUNTING PIPE
TOP MOUNTING BRACKET
ANTENNA BRACKET
CENTER MOUNTING BRACKET

NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

COMMSCOPE RR-FA2 SMALL STABILIZER	
DIMENSIONS (HxWxD)	15"x15"x8.9"
WEIGHT	61.3 lbs

NOTES	
MOUNT WILL FIT LEGS UP TO	
-	5.6" ROUND
-	6.0" 60° ANGLE
-	4.5" 90° ANGLE

TOP SIDE

NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

ANTENNA DETAIL 1

ANTENNA BRACKET DETAIL 2

RRH MOUNT DETAIL 3

FUJITSU TA08025-B604	
DIMENSIONS (HxWxD)	14.9"x15.7"x7.8"
WEIGHT	63.9 lbs
RRH TYPE	DUAL-BAND

TOP
BACK SIDE FRONT

FUJITSU TA08025-B605	
DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
RRH TYPE	TRI-BAND

TOP
BACK SIDE FRONT

RAYCAP RDIDC-9181-PF-48	
DIMENSIONS (HxWxD)	18.98" x 14.39" x 8.15"
WEIGHT	21.82 lbs

TOP
BACK SIDE FRONT

RRH DETAIL NO SCALE 4

RRH DETAIL 5

OVP - SURGE SUPPRESSION DETAIL 6

NO SCALE 7

NO SCALE 8

9

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

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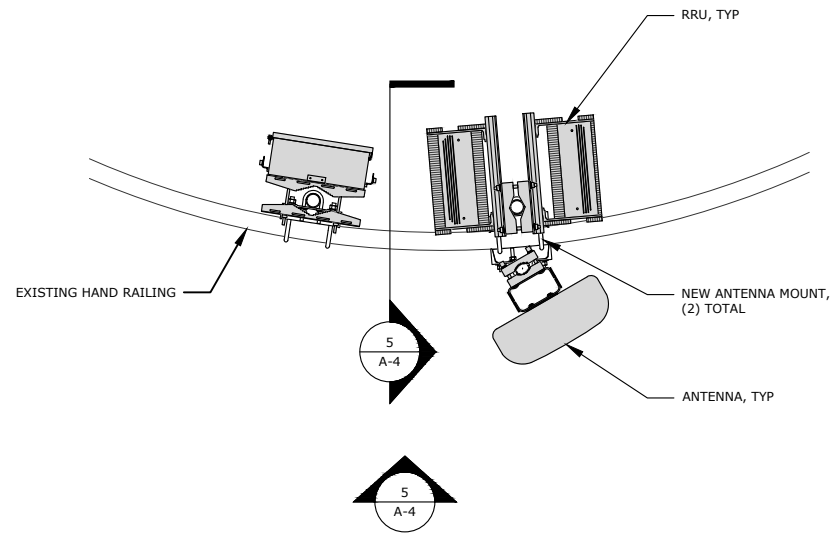
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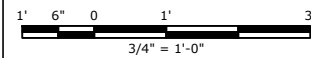
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PROJECT INFORMATION
PRPDX00519A
19739 SUNCREST AVE.
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SHEET TITLE
TOWER EQUIPMENT DETAILS

SHEET NUMBER
A-5

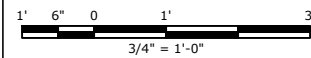
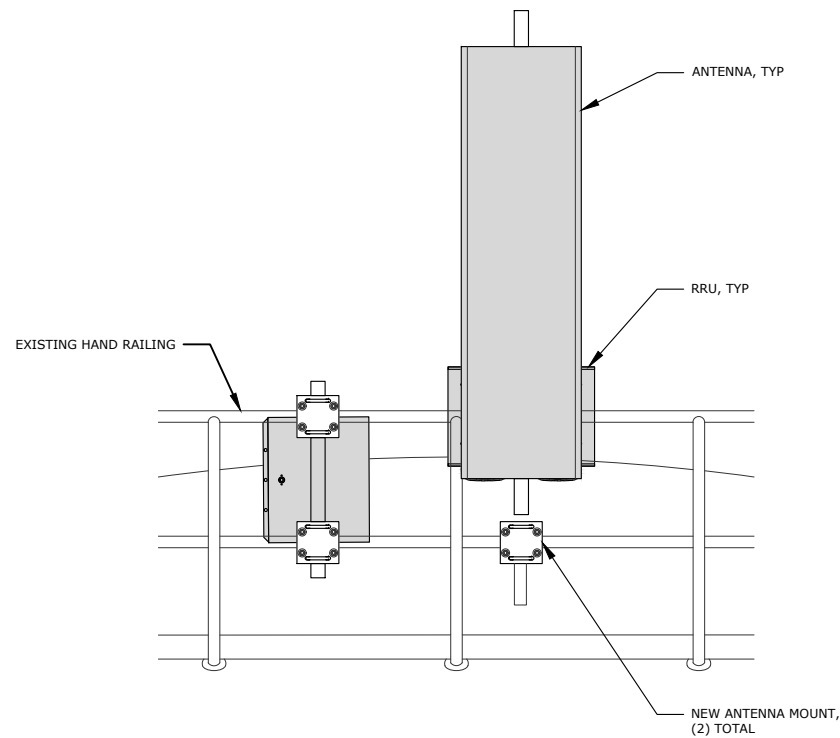


TYP ANTENNA MOUNTING PLAN



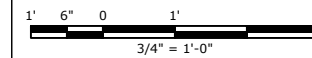
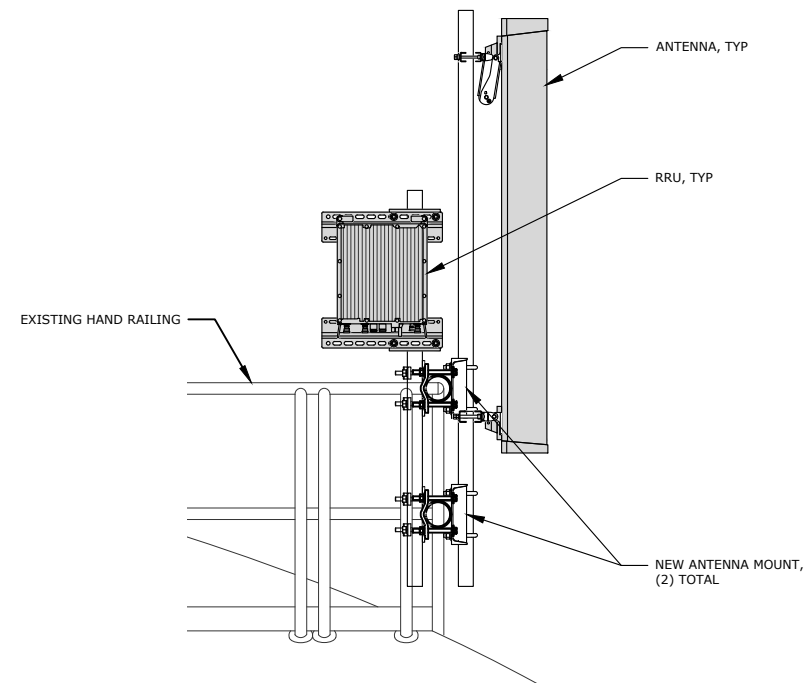
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TYP ANTENNA MOUNTING ELEVATION



2

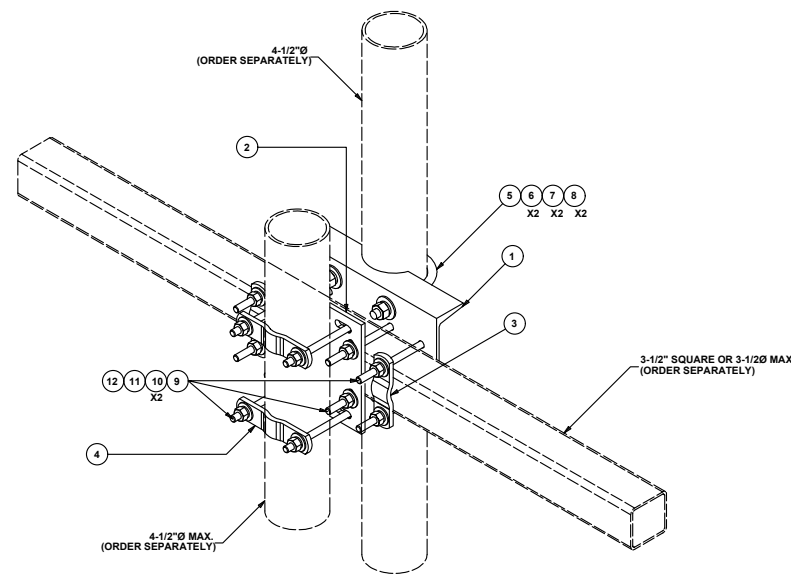
TYP ANTENNA MOUNTING SECTION



3

SITEPRO 1	
SP216-CK PIPE SUPPORT CROSS PLATE	
WEIGHT	61.3 lbs

PARTS LIST					
ITEM QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	1	X-SP216	LARGE SUPPORT CROSS PLATE		22.08
2	1	SCX3	CROSSOVER PLATE	9 1/4 in	7.19
3	2	X-100064	CLAMP (4" V-CLAMP) GALVANIZED		0.92
4	2	X-115765	5" V-CLAMP	7 1/16 in	1.03
5	2	X-UB5458	5/8" X 4-5/8" X 7" X 3" U-BOLT (HDG.)		1.54
6	4	G58FW	5/8" HDG USS FLATWASHER	1/8 in	0.07
7	4	G58LW	5/8" HDG LOCKWASHER		0.03
8	4	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13
9	12	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	5 1/2 in	0.41
10	24	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03
11	12	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01
12	12	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07
TOTAL WT. #					43.89



ANTENNA MOUNT

NO SCALE

5

dish
wireless

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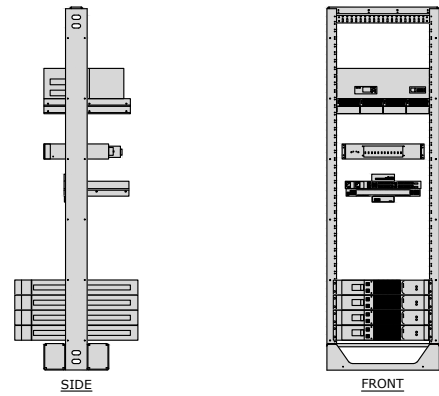
SHEET TITLE
ANTENNA MOUNTING
DETAILS

SHEET NUMBER

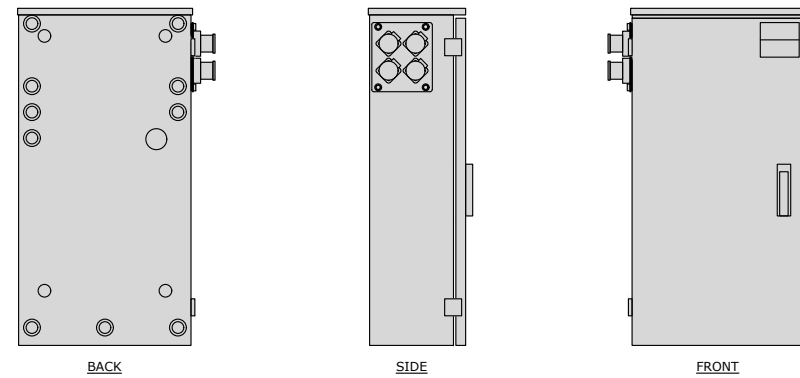
A-6

6

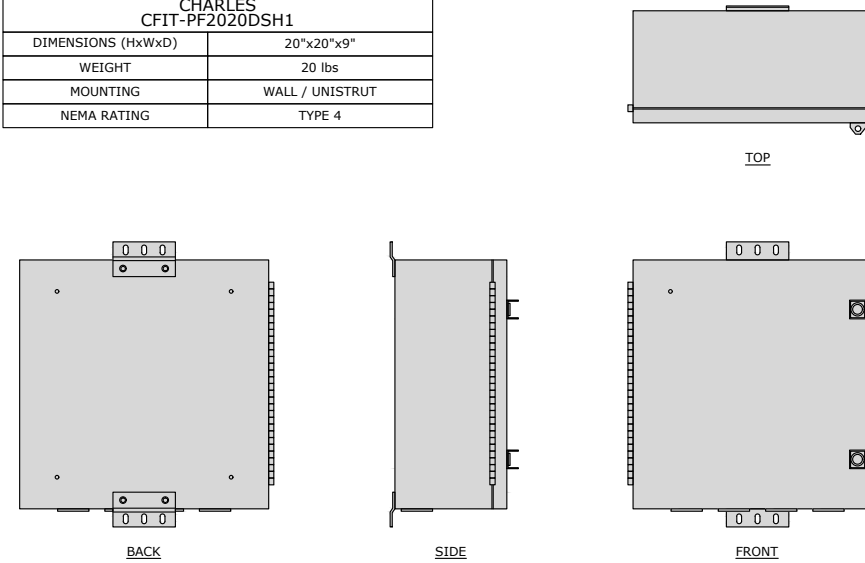
LINEAGE POWER LOADED FIF RACK	
DIMENSIONS (HxWxD)	84"x26"x28.5"
WEIGHT	±800 lbs



RAYCAP RDIAC-2465-P-240-MTS	
DIMENSIONS (HxWxD)	39"x22.9"x12.6"
OPERATING AC VOLTAGE	240/120 1 PHASE 3W+G
WEIGHT	80 lbs



CHARLES CFIT-PF2020DSH1	
DIMENSIONS (HxWxD)	20"x20"x9"
WEIGHT	20 lbs
MOUNTING	WALL / UNISTRUT
NEMA RATING	TYPE 4



CABINET DETAIL

NO SCALE

1

PPC CABINET DETAIL

NO SCALE

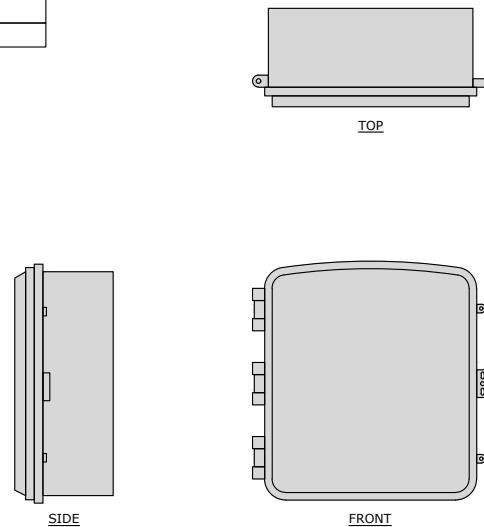
2

FIBER DEMARCATION BOX DETAIL

NO SCALE

3

CIENA 3931	
DIMENSIONS (HxWxD)	17"x16.8"x7"
WEIGHT	±28.6 lbs



FIBER NID ENCLOSURE DETAIL

NO SCALE

4

NO SCALE

NO SCALE

5

NO SCALE

NO SCALE

6

NO SCALE

NO SCALE

7

NO SCALE

NO SCALE

8

NO SCALE

NO SCALE

9



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SHEET TITLE
GROUND EQUIPMENT
DETAILS

SHEET NUMBER

A-7



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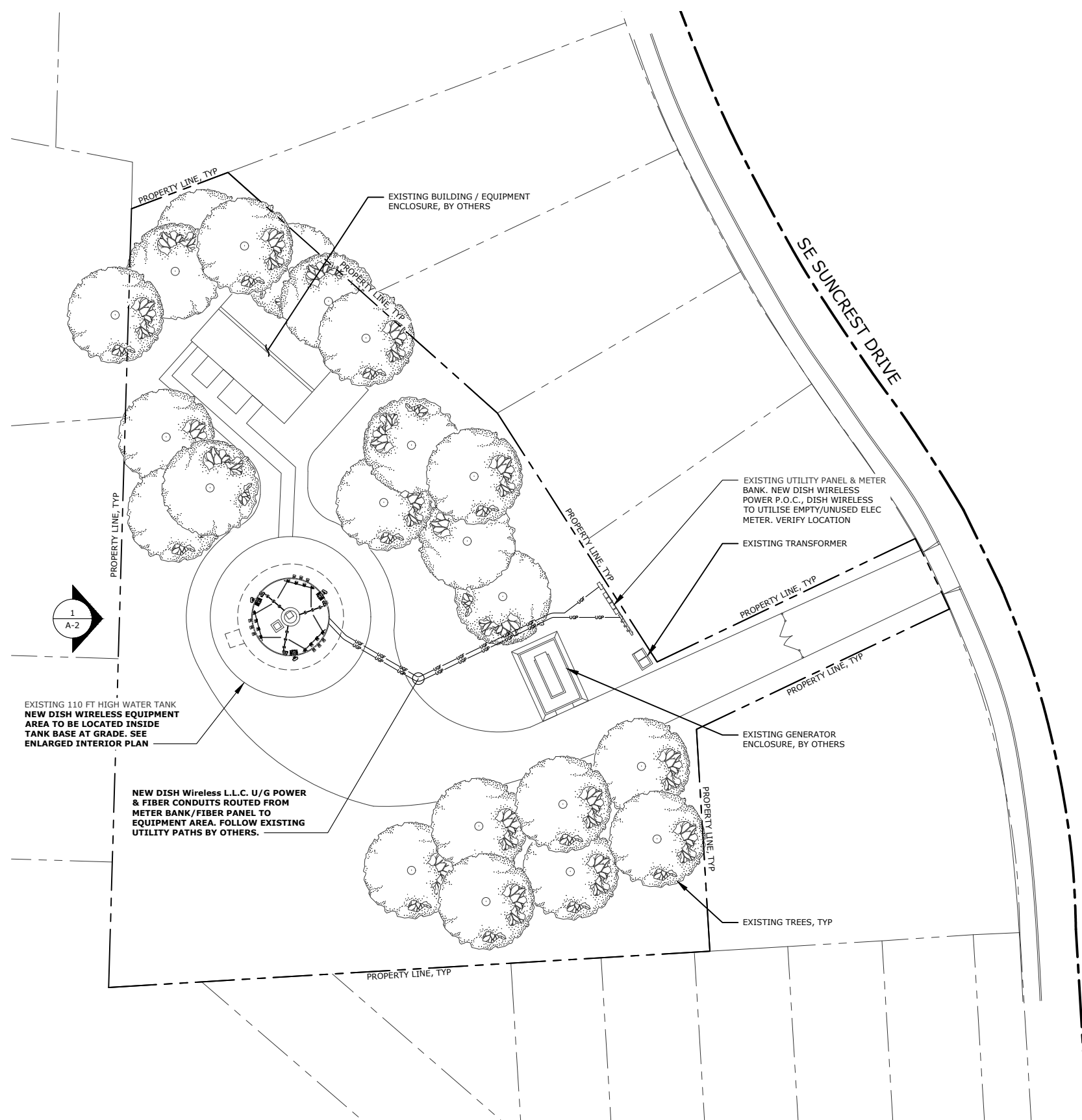
SHEET TITLE
ELECTRICAL/FIBER
ROUTE PLAN AND NOTES

SHEET NUMBER

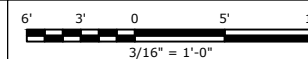
E-1

DC POWER WIRING SHALL BE COLOR CODED AT EACH END FOR IDENTIFYING +24V AND -48V CONDUCTORS. RED MARKINGS SHALL IDENTIFY +24V AND BLUE MARKINGS SHALL IDENTIFY -48V.

- CONTRACTOR SHALL INSPECT THE EXISTING CONDITIONS PRIOR TO SUBMITTING A BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS TO THE CONTRACTOR'S FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION, NOT AFTER THE CONTRACT HAS BEEN AWARDED.
- ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH CURRENT NATIONAL ELECTRICAL CODES AND ALL STATE AND LOCAL CODES, LAWS, AND ORDINANCES. PROVIDE ALL COMPONENTS AND WIRING SIZES AS REQUIRED TO MEET NEC STANDARDS.
- LOCATION OF EQUIPMENT, CONDUIT AND DEVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SHALL BE COORDINATED WITH FIELD CONDITIONS PRIOR TO CONSTRUCTION.
- CONDUIT ROUGH-IN SHALL BE COORDINATED WITH THE MECHANICAL EQUIPMENT TO AVOID LOCATION CONFLICTS. VERIFY WITH THE MECHANICAL EQUIPMENT CONTRACTOR AND COMPLY AS REQUIRED.
- CONTRACTOR SHALL PROVIDE ALL BREAKERS, CONDUITS AND CIRCUITS AS REQUIRED FOR COMPLETE SYSTEM.
- CONTRACTOR SHALL PROVIDE PULL BOXES AND JUNCTION BOXES AS REQUIRED BY THE NEC ARTICLE 314.
- CONTRACTOR SHALL PROVIDE ALL STRAIN RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
- ALL DISCONNECTS AND CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED PHENOLIC NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS INSTALLED ON, AND PANEL FIELD LOCATIONS FED FROM.
- INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS PER THE SPECIFICATIONS AND NEC 250. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED AT ALL JUNCTION BOXES, PULL BOXES, AND ALL DISCONNECT SWITCHES AND EQUIPMENT CABINETS.
- ALL NEW MATERIAL SHALL HAVE A U.L. LABEL.
- PANEL SCHEDULE LOADING AND CIRCUIT ARRANGEMENTS REFLECT POST-CONSTRUCTION EQUIPMENT.
- CONTRACTOR SHALL BE RESPONSIBLE FOR AS-BUILT PANEL SCHEDULE AND SITE DRAWINGS.
- ALL TRENCHES IN COMPOUND TO BE HAND DUG.



UTILITY ROUTE PLAN



1

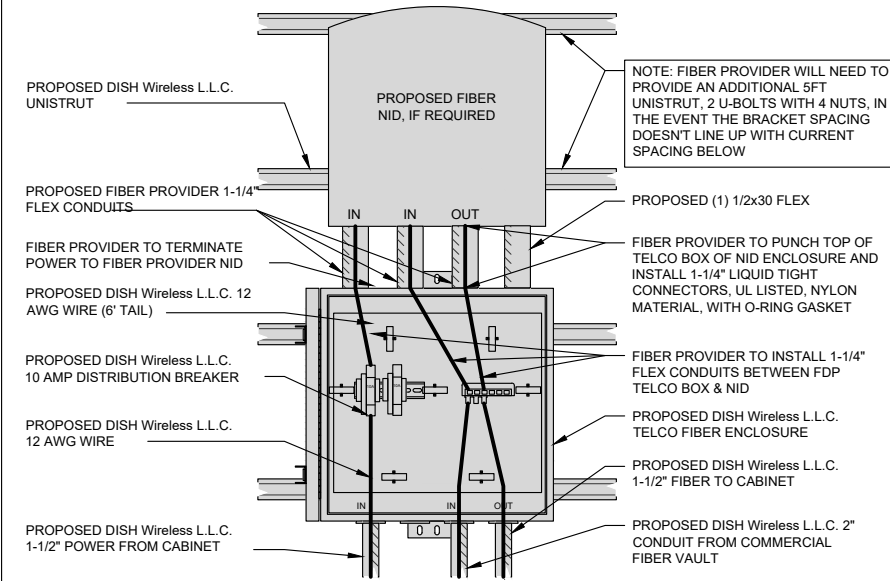
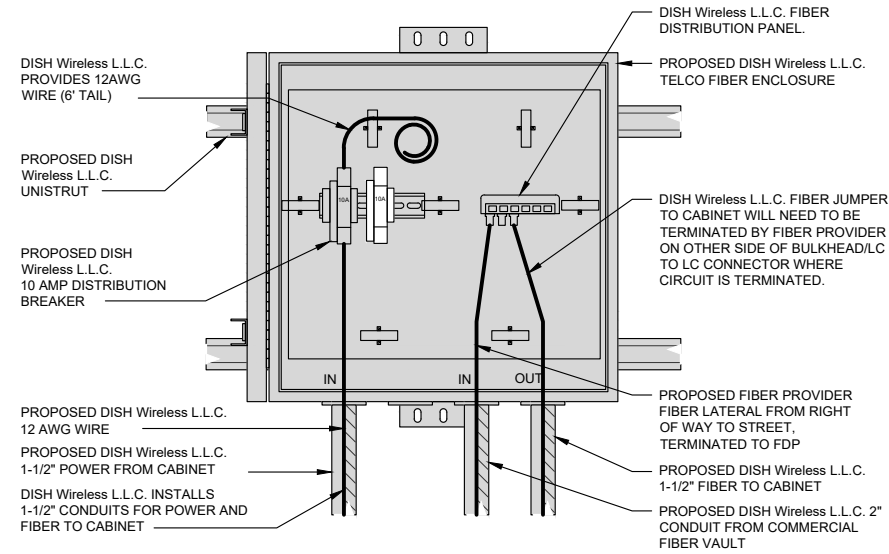
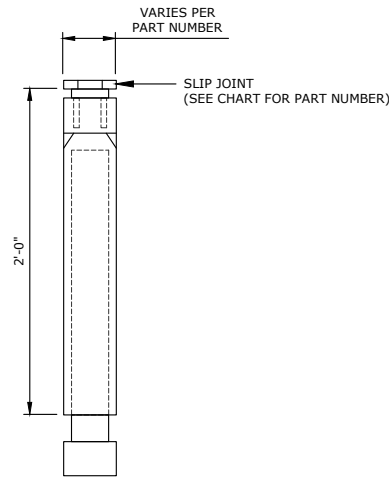
ELECTRICAL
NOTES

NO SCALE

2

CARLON EXPANSION FITTINGS				
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1-1/4"	5	4"
E945H	E945HX	1-1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2-1/2"	10	8"
E945L	E945LX	3"	10	8"
E945M	E945MX	3-1/2"	5	8"
E945N	E945NX	4"	5	8"
E945P	E945PX	5"	1	8"
E945R	E945RX	6"	1	8"

NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.



EXPANSION JOINT DETAIL

NO SCALE

1

DARK TELCO BOX - INTERIOR WIRING LAYOUT

NO SCALE

2

LIT TELCO BOX - INTERIOR WIRING LAYOUT (OPTIONAL)

NO SCALE

3

NOT USED

NO SCALE

4

NOT USED

NO SCALE

5

NOT USED

NO SCALE

6

NOT USED

NO SCALE

7

NOT USED

NO SCALE

8

NOT USED

NO SCALE

9

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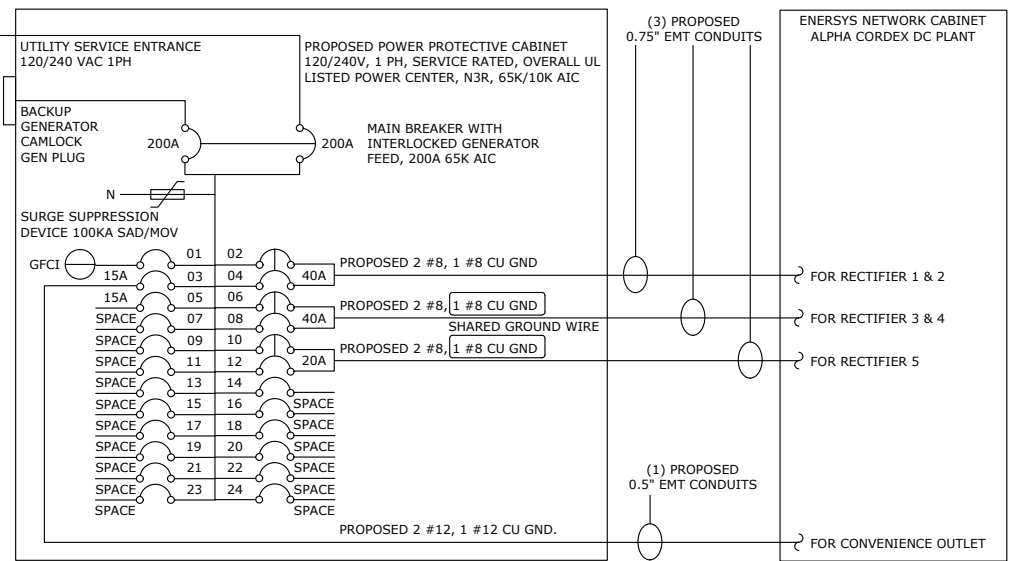
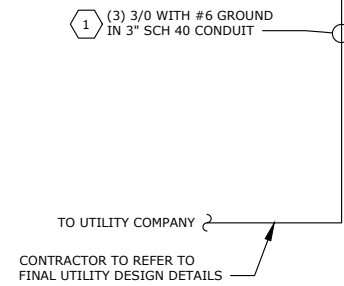
DISH Wireless L.L.C.
PROJECT INFORMATION

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WEST LINN, OR 97068

SHEET TITLE
ELECTRICAL
DETAILS

SHEET NUMBER

E-2



SERVICE/FEEDER CONDUCTOR LENGTH TABLE
(BASED ON INDUSTRY STANDARD 3% VOLTAGE DROP AND 5% NEC ALLOWABLE LIMIT)

DESIGN LOADS	CONDUCTOR SIZES					
	250 kcmil AL	300 kcmil AL	3/0 CU	4/0 CU	250 kcmil CU	300 kcmil CU
DISH Wireless L.L.C. MAXIMUM CONTINUOUS LOAD (160A) (NEC ARTICLE 220 AND 230 3% VOLTAGE DROP)	130'	155'	145'	180'	215'	255'
DISH Wireless L.L.C. MAXIMUM CONTINUOUS LOAD (160A) (NEC ARTICLE 220 AND 230 5% VOLTAGE DROP)	220'	260'	240'	300'	360'	425'

- NOTES:
- 250 MCM/KCMIL AL + #2 AL GRD MAY BE USED AS REPLACEMENT FOR 3/0 CU + #6 CU GRD SERVICE CONDUCTOR FROM THE DISH Wireless L.L.C. FIRST MEANS OF DISCONNECT/UTILITY COMPANY MEET-ME POINT. REFER TO VALUES ABOVE TO LIMIT VOLTAGE DROP TO 3%.
 - ALUMINUM/COPPER CONDUCTORS MUST BE RATED 75°C.
 - ALUMINUM TO COPPER BUSS CONNECTIONS MUST MEET AND CONFORM TO ANSI AND BE UL LISTED. USE ANTI CORROSION CONDUCTIVE LUBRICANT ON CONNECTIONS.
 - PPC MAIN DISCONNECT CIRCUIT BREAKERS ACCEPT #4 - 300KCMIL AL OR CU CONDUCTORS.
 - VOLTAGE DROP FOR SINGLE METER ENCLOSURE FED FROM TRANSFORMER WITH MULTIPLE CUSTOMERS IS CALCULATED FROM THE TRANSFORMER TO PPC. (SERVICE AND FEEDER CONDUCTOR LENGTH)
 - VOLTAGE DROP FOR MULTI-METER ENCLOSURE IS CALCULATED FROM THE METER TO PPC. (FEEDER CONDUCTOR LENGTH)
 - VOLTAGE DROP CALCULATIONS ARE BASED ON A POWER FACTOR OF 1, A LINE TO GROUND VOLTAGE PER CONDUCTOR OF 120V, NO CORRECTION FACTOR FOR AMBIENT TEMPERATURE OR ADJUSTMENT FACTOR FOR MORE THAN THREE CURRENT-CARRYING CONDUCTORS IN A SINGLE CONDUIT OR RACEWAY. A POWER FACTOR LESS THAN 1 FOR VOLTAGE LESS THAN 120 WILL RESULT IN SHORTER DISTANCES THAN SHOWN IN TABLE.

NOTE:

BRANCH CIRCUIT WIRING SUPPLYING RECTIFIERS ARE TO BE RATED UL1015, 105°C, 600V, AND PVC INSULATED, IN THE SIZES SHOWN IN THE ONE-LINE DIAGRAM. CONTRACTOR MAY SUBSTITUTE UL1015 WIRE FOR THWN-2 FOR CONVENIENCE OUTLET BRANCH CIRCUIT.

BREAKERS REQUIRED:

(2) 40A, 2P BREAKER - SQUARE D P/N: Q0240
 (1) 20A, 2P BREAKER - SQUARE D P/N: Q0220
 (2) 15A, 1P BREAKER - SQUARE D P/N: Q0115

NOTES

THE ENGINEER OF RECORD HAS PERFORMED ALL REQUIRED SHORT CIRCUIT CALCULATIONS AND THE AIC RATINGS FOR EACH DEVICE IS ADEQUATE TO PROTECT THE EQUIPMENT AND THE ELECTRICAL SYSTEM.

THE ENGINEER OF RECORD HAS PERFORMED ALL REQUIRED VOLTAGE DROP CALCULATIONS AND ALL BRANCH CIRCUIT AND FEEDERS COMPLY WITH THE NEC (LISTED ON T-1) ARTICLE 210.19(A)(1) FPN NO.4

CONDUIT SIZING: AT 40% FILL PER NEC CHAPTER 9, TABLE 4, ARTICLE 358.

0.5" CONDUIT - 0.122 SQ. IN AREA
 0.75" CONDUIT - 0.213 SQ. IN AREA
 2.0" CONDUIT - 1.316 SQ. IN AREA
 3.0" CONDUIT - 2.907 SQ. IN AREA

CABINET CONVENIENCE OUTLET CONDUCTORS (1 CONDUIT): USING THWN-2 CU.

#12 - 0.0050 SQ. IN X 2 = 0.0100 SQ. IN
 #12 - 0.0050 SQ. IN X 1 = 0.0050 SQ. IN <GROUND
 TOTAL = 0.0150 SQ. IN

0.5" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (3) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

RECTIFIER CONDUCTORS (3 CONDUITS): USING UL1015, CU.

#8 - 0.0552 SQ. IN X 2 = 0.1103 SQ. IN
 #8 - 0.0131 SQ. IN X 1 = 0.0131 SQ. IN <BARE GROUND
 TOTAL = 0.1234 SQ. IN

0.75" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (3) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

PPC FEED CONDUCTORS (1 CONDUIT): USING THWN, CU.

3/0 - 0.2679 SQ. IN X 3 = 0.8037 SQ. IN
 #6 - 0.0507 SQ. IN X 1 = 0.0507 SQ. IN <GROUND
 TOTAL = 0.8544 SQ. IN

3.0" SCH 40 PVC CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (4) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

(1) PPC FEED CONDUCTORS (1 CONDUIT): USING THWN, AL.

250kcmil AL - 0.3970 SQ. IN X 3 = 1.1910 SQ. IN
 #4 AL - 0.0824 SQ. IN X 1 = 0.0824 SQ. IN <GROUND
 TOTAL = 1.2734 SQ. IN

3.0" SCH 40 PVC CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (4) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

PPC ONE-LINE DIAGRAM

NO SCALE

1

PROPOSED ENERSYS PANEL SCHEDULE

LOAD SERVED	VOLT AMPS (WATTS)		TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPS (WATTS)		LOAD SERVED
	L1	L2						L1	L2	
PPC GFCI OUTLET	180	180	15A	1	A	2	40A	3840	3840	ENERSYS ALPHA CORDEX RECTIFIERS 1 AND 2
ENERSYS GFCI OUTLET		180	15A	3	B	4	40A	3840	3840	ENERSYS ALPHA CORDEX RECTIFIERS 3 AND 4
-SPACE-				5	A	6	40A	3840	3840	ENERSYS ALPHA CORDEX RECTIFIERS 3 AND 4
-SPACE-				7	B	8	40A	3840	3840	ENERSYS ALPHA CORDEX RECTIFIERS 3 AND 4
-SPACE-				9	A	10	20A	1920	1920	ENERSYS ALPHA CORDEX RECTIFIERS 5
-SPACE-				11	B	12	20A	1920	1920	ENERSYS ALPHA CORDEX RECTIFIERS 5
-SPACE-				13	A	14				-SPACE-
-SPACE-				15	B	16				-SPACE-
-SPACE-				17	A	18				-SPACE-
-SPACE-				19	B	20				-SPACE-
-SPACE-				21	A	22				-SPACE-
-SPACE-				23	B	24				-SPACE-
VOLTAGE AMPS								9500	9500	
200A MCB, 1Φ, 24 SPACE, 120/240V				L1	L2			9680	9680	
MB RATING: 65,000 AIC				81	81					
				81						
				102						

PANEL SCHEDULE

NO SCALE

2

NOT USED

NO SCALE

3



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A&E PROJECT NUMBER
004699

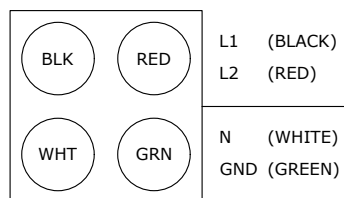
DISH Wireless L.L.C.
PROJECT INFORMATION
PRPDX00519A
19739 SUNCREST AVE.
WEST LINN, OR 97068

SHEET TITLE
ELEC. ONE-LINE, FAULT
CALCS AND PANEL SCH.

SHEET NUMBER
E-3

NOTES:

- HAZARD OF ELECTRICAL SHOCK OR BURN. TURN OFF POWER SUPPLYING THIS EQUIPMENT BEFORE WORKING INSIDE.
- 100 OR 200 AMP, 240 VOLTS, SINGLE PHASE ALTERNATING CURRENT CIRCUIT ONLY.
- GENERATOR SHORT CIRCUIT RATING: 10,000 / 20,000 AMPS RMS SYMMETRICAL, AMPERES AT 240 VOLTS.
- UTILITY SHORT CIRCUIT RATING: 65,000 AMPS RMS SYMMETRICAL, AMPERES AT 240 VOLTS.
- SUITABLE FOR USE AS SERVICE EQUIPMENT.
- SUITABLE FOR USE IN ACCORDANCE WITH ARTICLE 702 OF THE NATIONAL ELECTRIC CODE ANSI/NFPA 70.
- BONDED NEUTRAL WHEN INSTALLED AS SHOWN IN WIRING DIAGRAM.
- RAIN PROOF TYPE 3R.
- USE CU-AL WIRE 60-75 C°.
- EQUIPPED WITH SLIDE BAR MECHANICAL INTERLOCK.
- INTERLOCK PROHIBITS BOTH POWER SOURCES FROM BEING IN THE ON POSITION SIMULTANEOUSLY.
- EQUIPPED WITH SQUARE-D BREAKERS OR ALTERNATIVE MANUFACTURER EQUIVALENT.
- WHEN REPLACING LOAD CENTER BREAKERS, USE ONLY SQUARE-D (QO TYPE) OF THE SAME RATING OR EQUIVALENT.
- WHEN RESETTING BREAKERS TURN TO OFF POSITION, THE TO ON POSITION.
- WARNING: MAKE CONTINUITY CHECK WITH OHM METER TO VERIFY CORRECT PHASING AND GROUNDING CONNECTIONS BEFORE POWER UP.
- VERIFY PIN OUT CONFIGURATION OF GENERATOR PRIOR TO USE.
- RISK OF ELECTRIC SHOCK, BOTH ENDS OF DISCONNECTING MEANS MAY BE ENERGIZED. TEST BEFORE SERVICING.
- THIS SWITCH BOARD MAY CONTAIN A TAP ON THE SERVICE SIDE OF THE MAIN POWER DISCONNECT FOR REMOTE MONITORING OF UTILITY/STAND-BY POWER.
- THE NORMAL AC POWER MONITORING CIRCUIT MUST UTILIZE A DISCONNECTING MEANS WITH A SHORT CIRCUIT RATING GREATER THAN THE AVAILABLE INTERRUPTING CURRENT.
- A RED PUSH-TO-TRIP BUTTON PROVIDES A MEANS TO MECHANICALLY TRIP THE CIRCUIT BREAKER. THIS ACTION EXERCISES THE TRIPPING PORTION OF THE MECHANISM AND ALLOWS MAINTENANCE CHECK ON THE BREAKER.

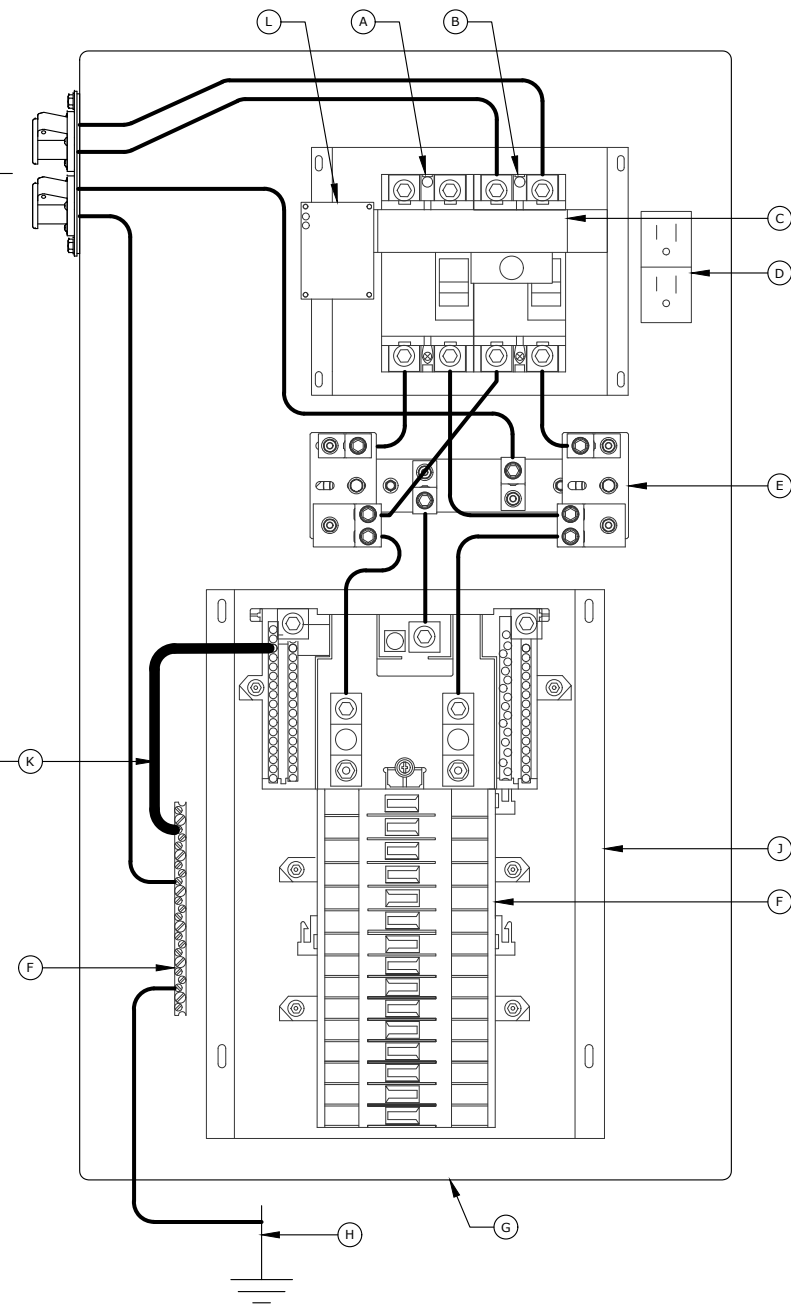


CAM-LOCK GENERATOR RECEPTACLE
 (AS VIEWED FROM OUTSIDE OF ENCLOSURE)
 USE LINE UP PIN AS REFERENCE

REFER TO RECEPTACLE FOR MODEL NUMBER

DANGER:
 HAZARD OF ELECTRICAL SHOCK OR BURN.
 TURN OFF POWER SUPPLYING THIS
 EQUIPMENT BEFORE WORKING INSIDE.

RAYCAP CUSTOMER SERVICE
 (800) 890-2569



- LEGEND:**
- A. UTILITY DISCONNECT (SERVICE RATED).
 - B. GENERATOR DISCONNECT.
 - C. MAIN DISCONNECT CIRCUIT BREAKERS W/MECHANICAL INTERLOCK.
 - D. GFCI RECEPTACLE 15A.
 - E. SPD STRIKESORB KELVIN CONNECTION (TYP OF 2).
 - F. BREAKER PANEL - 24 POSITION (CONTRACTOR TO ADD APPROPRIATE BREAKER PER ONE-LINE DIAGRAM PANEL SCHEDULE).
 - G. POWER PROTECTION CABINET (PPC) (FULLY ASSEMBLED FROM MANUFACTURER).
 - H. CONTRACTOR TO ATTACH TO UNDERGROUND GROUNDING HALO OR INSTALL GROUND ROD WHEN REQUIRED BY CODE.
 - I. GROUND BAR.
 - J. SQUARE-D Q SERIES LOAD CENTER.
 - K. NEUTRAL-TO-GROUND (N-G) BONDING JUMPER (CONTRACTOR INSTALLED IF REQUIRED).
 - L. OPTIONAL SPD STATUS INDICATORS.

NEUTRAL-TO-GROUND NOTES:

- WHEN THE PPC IS USED AS THE SERVICE ENTRANCE DEVICE, THE NEUTRAL TO GROUND BOND NEEDS TO BE ESTABLISHED IN THE PPC
- WHEN THE SERVICE ENTRY DEVICE IS A MULTI-METER CENTER OR A PRE-PPC DISCONNECT IS USED AND HAS "NEUTRAL-TO-GROUND" ACCOMMODATIONS, THE NEUTRAL TO GROUND WIRE IN THE PPC IS NOT REQUIRED.
- THE GREEN #6 WIRE IS PROVIDED WITH THE PPC CABINET AS A SEPARATE UNINSTALLED PART TO BE INSTALLED BY CONTRACTOR IF NEEDED.

NEUTRAL-TO-GROUND BONDING JUMPER:

INSTALLATION INSTRUCTIONS:

- IF REQUIRED, THE N-G BONDING KIT SHOULD BE INSTALLED BY QUALIFIED PERSONNEL.
- ENSURE THE MAIN BREAKERS ARE OFF.
- USE THE GREEN #6 WIRE PROVIDED WITH THE PPC.
- INSTALL THE JUMPER AS SHOWN IN THE WIRING DIAGRAM.
- TIGHTEN TERMINALS TO TORQUE VALUE SHOWN IN TORQUE TABLE.
- PLACE THE PROVIDED "SERVICE" LABEL IN THE SPACE BELOW THE WORDS "AC POWER" LOCATED ABOVE THE MAIN CIRCUIT.

SUITABLE FOR USE AS SERVICE EQUIPMENT

ELECTRICAL RATING 120/240 VOLTS SINGLE PHASE 60 Hz	
NORMAL AC POWER	GENERATOR POWER
100A □	100A □
200A □	200A □

CAUTION:

- THE OPERATING HANDLE ASSUMES A CENTER POSITION WHEN THE CIRCUIT BREAKER IS TRIPPED.
- THE BREAKER CAN BE RESET BY OPERATING THE HANDLE TO THE EXTREME OFF POSITION AND THEN TO ON.
- SLIDE BAR MECHANICAL INTERLOCK TRANSFERS NORMAL AC POWER TO GENERATOR POWER. THE SLIDE BAR MECHANICAL INTERLOCK PROHIBITS BOTH POWER SOURCES FROM BEING IN THE ON POSITION SIMULTANEOUSLY.
- TO TRANSFER FROM ON POWER SOURCE TO THE OTHER POWER SOURCE, SWITCH ON BREAKER TO THE OFF POSITION, MOVE THE SLIDE BAR TO THE OTHER SIDE AND THE SWITCH THE OTHER BREAKER TO THE ON POSITION.

200A UTILITY FEED

THIS SWITCHBOARD UTILITY MAIN BREAKER IS SUITABLE FOR USE ON CIRCUIT CAPABLE OF DELIVERING NOT MORE THAN 65,000 RMS SYMMETRICAL AMPS, 240 VOLTS MAXIMUM.	LOAD SIZE CIRCUIT BREAKERS				LINE SIDE MAIN CIRCUIT BREAKER					
	MFR.	TYPE	POLES	AMP RATING	MFR.	TYPE	AMP RATING	SYMMET. AMP RMS	VOLTS AC	PHASES
	SQ-D	QO	1/2	15-100A	SQ-D	QGL	200A	65,000A	240V	2

200A GENERATOR FEED

THIS SWITCHBOARD GENERATOR POWER CIRCUIT IS SUITABLE FOR USE ON A CIRCUIT CAPABLE OF DELIVERING NOT MORE THAN 10,000 RMS SYMMETRICAL AMPS, 240 VOLTS MAXIMUM.	LOAD SIZE CIRCUIT BREAKERS				LINE SIDE MAIN CIRCUIT BREAKER					
	MFR.	TYPE	POLES	AMP RATING	MFR.	TYPE	AMP RATING	SYMMET. AMP RMS	VOLTS AC	PHASES
	SQ-D	QO	1/2	15-100A	SQ-D	QGL	200A	65,000A	240V	2

MAXIMUM CONTINUOUS LOADS NOT TO EXCEED 80% OF THE OVER-CURRENT PROTECTIVE DEVICE (CIRCUIT BREAKER AND FUSES) RATINGS EMPLOYED IN OTHER THAN MOTOR CIRCUITS, EXCEPT FOR THOSE CIRCUITS EMPLOYING CIRCUIT BREAKERS MARKED AS SUITABLE FOR CONTINUOUS OPERATION AT 100% OF THEIR RATINGS. CONDUCTORS ARE NOT TO ENTER OR LEAVE THE ENCLOSURE DIRECTLY OPPOSITE THE WIRING TERMINAL



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CONSTRUCTION DOCUMENT

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DISH Wireless L.L.C.
 PROJECT INFORMATION
PRPDX00519A
19739 SUNCREST AVE.
WEST LINN, OR 97068

SHEET TITLE
**NEUTRAL-TO-GROUND
 PPC SCHEMATIC**

SHEET NUMBER
E-4

RAYCAP POWER PROTECTION CABINET - RDIAC-2465-P-240-MTS (NEUTRAL-TO-GROUND)

NO SCALE

1



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DISH Wireless L.L.C.
PROJECT INFORMATION

PRPDX00519A
19739 SUNCREST AVE.
WEST LINN, OR 97068

SHEET TITLE
GROUNDING PLANS
AND NOTES

SHEET NUMBER

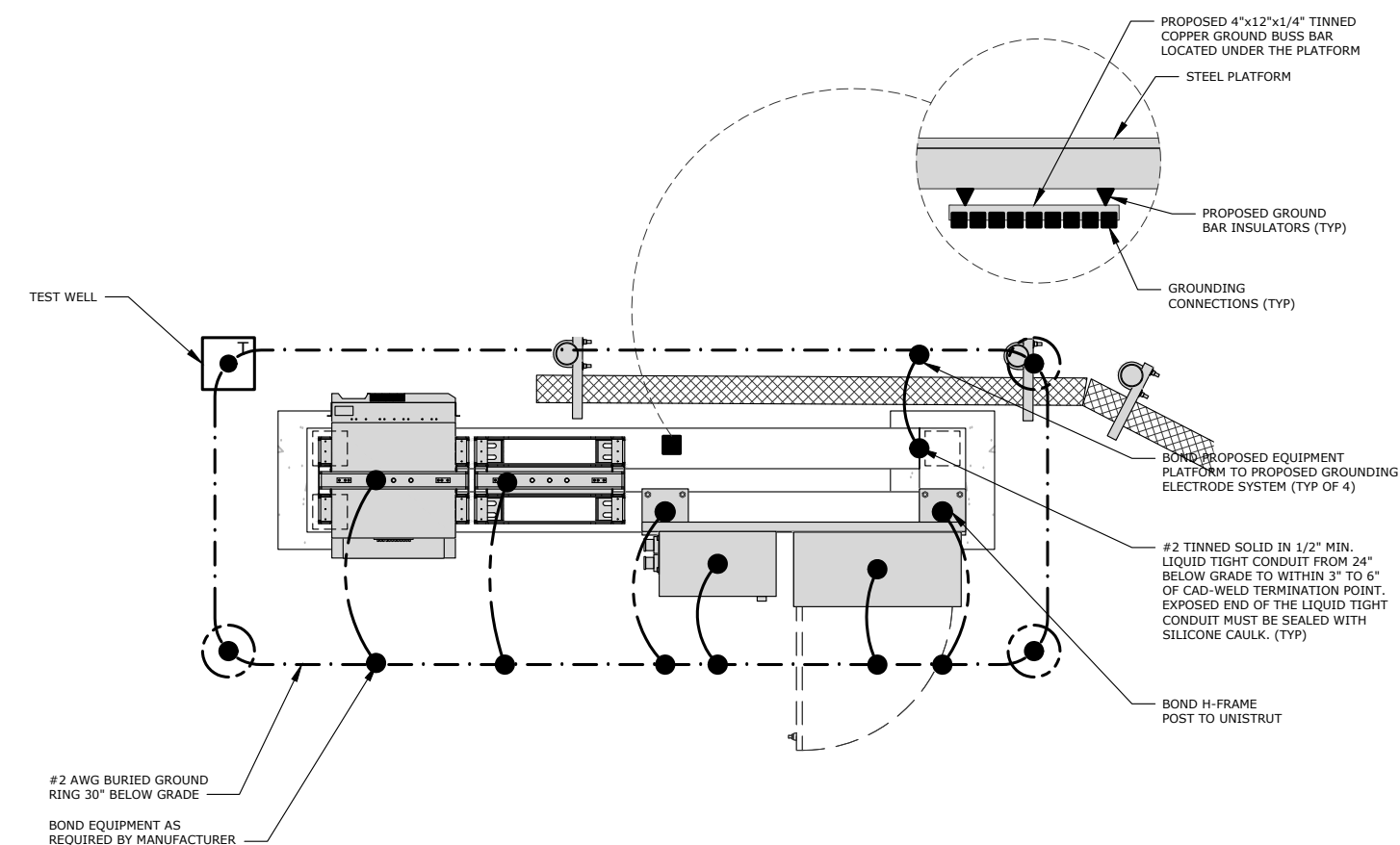
G-1

●	EXOTHERMIC CONNECTION
■	MECHANICAL CONNECTION
⊙	GROUND ROD
⊠	TEST GROUND ROD WITH INSPECTION SLEEVE
▲	BUSS BAR INSULATOR

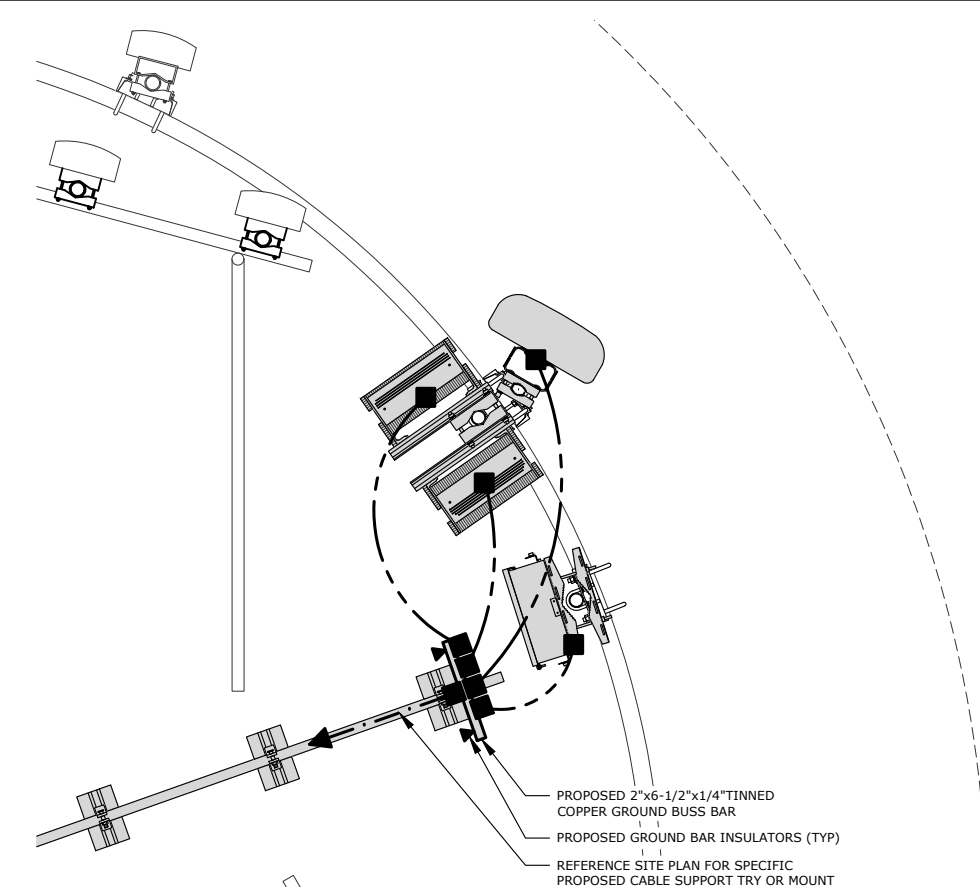
	GROUND BUSS BAR
	#6 AWG STRANDED AND INSULATED
	#2 AWG SOLID COPPER TINNED
	#2 AWG STRANDED AND INSULATED

GROUNDING LEGEND

1. GROUNDING IS SHOWN DIAGRAMMATICALLY ONLY.
 2. CONTRACTOR SHALL GROUND ALL EQUIPMENT AS A COMPLETE SYSTEM. GROUNDING SHALL BE IN COMPLIANCE WITH NEC SECTION 250 AND DISH Wireless L.L.C. GROUNDING AND BONDING REQUIREMENTS AND MANUFACTURER'S SPECIFICATIONS.
 3. ALL GROUND CONDUCTORS SHALL BE COPPER; NO ALUMINUM CONDUCTORS SHALL BE USED.
- A. **EXTERIOR GROUND RING:** #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 6 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING.
 - B. **TOWER GROUND RING:** THE GROUND RING SYSTEM SHALL BE INSTALLED AROUND AN ANTENNA TOWER'S LEGS, AND/OR GUY ANCHORS. WHERE SEPARATE SYSTEMS HAVE BEEN PROVIDED FOR THE TOWER AND THE BUILDING, AT LEAST TWO BONDS SHALL BE MADE BETWEEN THE TOWER RING GROUND SYSTEM AND THE BUILDING RING GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.
 - C. **INTERIOR GROUND RING:** #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR EXTENDED AROUND THE PERIMETER OF THE EQUIPMENT AREA. ALL NON-TELECOMMUNICATIONS RELATED METALLIC OBJECTS FOUND WITHIN A SITE SHALL BE GROUNDED TO THE INTERIOR GROUND RING WITH #6 AWG STRANDED GREEN INSULATED CONDUCTOR.
 - D. **BOND TO INTERIOR GROUND RING:** #2 AWG SOLID TINNED COPPER WIRE PRIMARY BONDS SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUND RING, LOCATED AT THE CORNERS OF THE BUILDING.
 - E. **GROUND ROD:** U.L. LISTED COPPER CLAD STEEL. MINIMUM 1/2" DIAMETER BY EIGHT FEET LONG. GROUND RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES. GROUND RODS SHALL BE DRIVEN TO THE DEPTH OF GROUND RING CONDUCTOR.
 - F. **CELL REFERENCE GROUND BAR:** POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BONDS ARE MADE WITH #2 AWG UNLESS NOTED OTHERWISE STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID TINNED COPPER CONDUCTORS.
 - G. **HATCH PLATE GROUND BAR:** BOND TO THE INTERIOR GROUND RING WITH (2) #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS. WHEN A HATCH-PLATE AND A CELL REFERENCE GROUND BAR ARE BOTH PRESENT, THE CRGB MUST BE CONNECTED TO THE HATCH-PLATE AND TO THE INTERIOR GROUND RING USING (2) #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS EACH.
 - H. **EXTERIOR CABLE ENTRY PORT GROUND BARS:** LOCATED AT THE ENTRANCE TO THE CELL SITE BUILDING. BOND TO GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTORS WITH AN EXOTHERMIC WELD AND INSPECTION SLEEVE.
 - I. **TELCO GROUND BAR:** BOND TO BOTH CELL REFERENCE GROUND BAR OR EXTERIOR GROUND RING.
 - J. **FRAME BONDING:** THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUSS BAR THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK.
 - K. **INTERIOR UNIT BONDS:** METAL FRAMES, CABINETS AND INDIVIDUAL METALLIC UNITS LOCATED WITH THE AREA OF THE INTERIOR GROUND RING REQUIRE A #6 AWG STRANDED GREEN INSULATED COPPER BOND TO THE INTERIOR GROUND RING.
 - L. **FENCE AND GATE GROUNDING:** METAL FENCES WITHIN 7 FEET OF THE EXTERIOR GROUND RING OR OBJECTS BONDED TO THE EXTERIOR GROUND RING SHALL BE BONDED TO THE GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTOR AT AN INTERVAL NOT EXCEEDING 25 FEET. BONDS SHALL BE MADE AT EACH GATE POST AND ACROSS GATE OPENINGS.
 - M. **EXTERIOR UNIT BONDS:** METALLIC OBJECTS, EXTERNAL TO OR MOUNTED TO THE BUILDING, SHALL BE BONDED TO THE EXTERIOR GROUND RING. USING #2 TINNED SOLID COPPER WIRE.
 - N. **ICE BRIDGE SUPPORTS:** EACH ICE BRIDGE LEG SHALL BE BONDED TO THE GROUND RING WITH #2 AWG BARE TINNED COPPER CONDUCTOR. PROVIDE EXOTHERMIC WELDS AT BOTH THE ICE BRIDGE AND BURIED GROUND RING.
 - O. DURING ALL DC POWER SYSTEM CHANGES INCLUDING DC SYSTEM CHANGE OUTS, RECTIFIER REPLACEMENTS OR ADDITIONS, BREAKER DISTRIBUTION CHANGES, BATTERY ADDITIONS, BATTERY REPLACEMENTS AND INSTALLATIONS OR CHANGES TO DC CONVERTER SYSTEMS IT SHALL BE REQUIRED THAT SERVICE CONTRACTORS VERIFY ALL DC POWER SYSTEMS ARE EQUIPPED WITH A MASTER DC SYSTEM RETURN GROUND CONDUCTOR FROM THE DC POWER SYSTEM COMMON RETURN BUS DIRECTLY CONNECTED TO THE CELL SITE REFERENCE GROUND BAR.
 - P. TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO PROPOSED ANTENNA MOUNT COLLAR. REFER TO DISH Wireless L.L.C. GROUNDING NOTES.



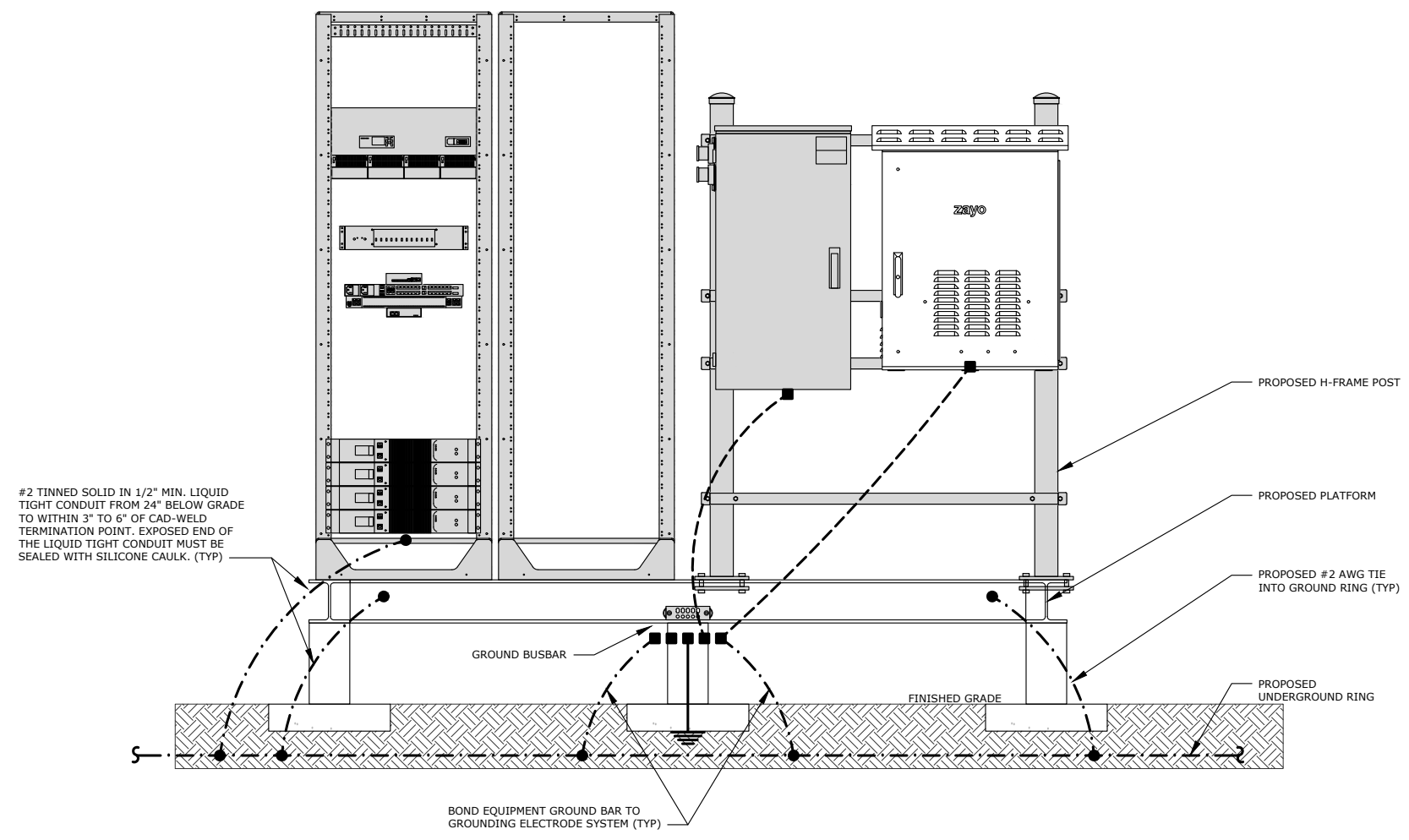
NO SCALE 1



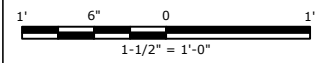
TYPICAL ANTENNA GROUNDING PLAN NO SCALE 2

GROUNDING KEY NOTES NO SCALE 3

NOTES
 1. EQUIPMENT CABINET AND PPC OMITTED FOR CLARITY PURPOSES

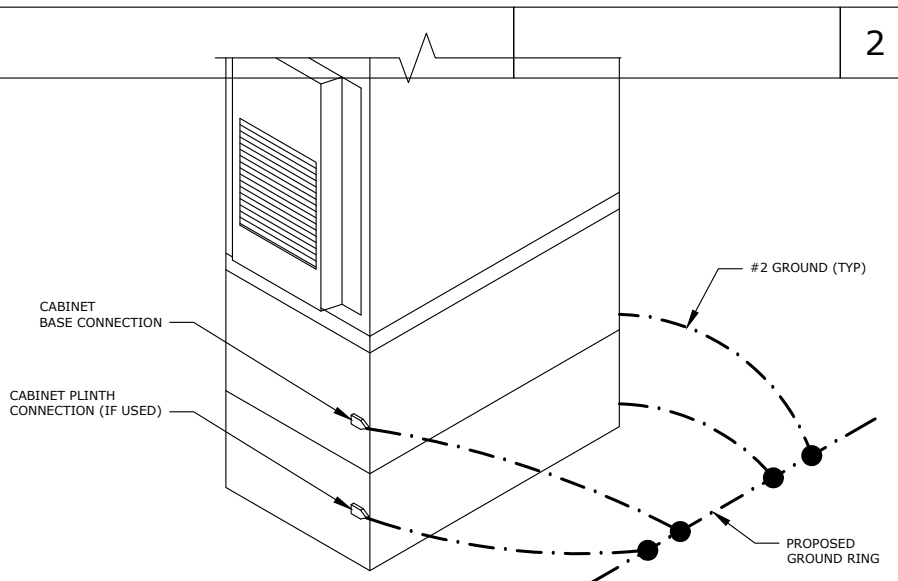


H-FRAME GROUNDING DETAIL



1

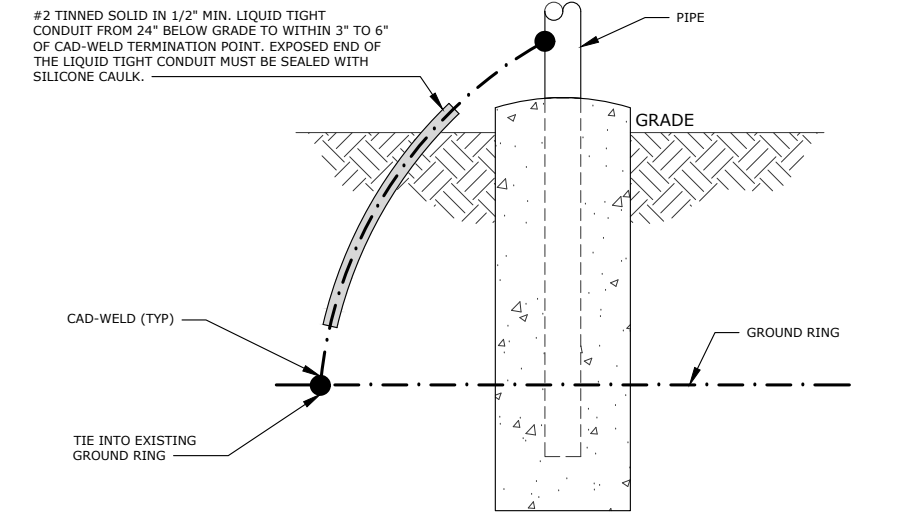
NOT USED NO SCALE



OUTDOOR CABINET GROUNDING

NO SCALE

3



TRANSITIONING GROUND DETAIL

NO SCALE

6

NOT USED

NO SCALE

4

NOT USED

NO SCALE

5



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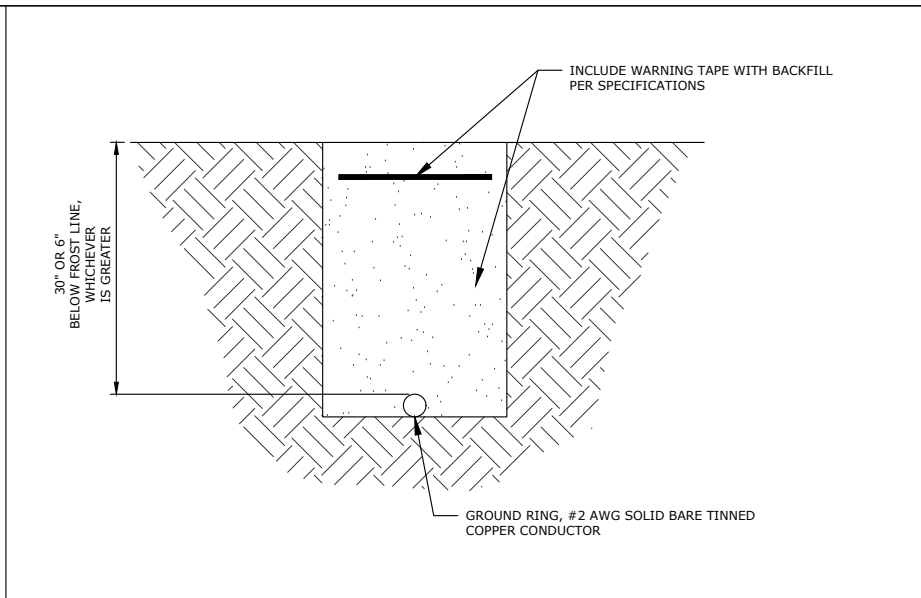
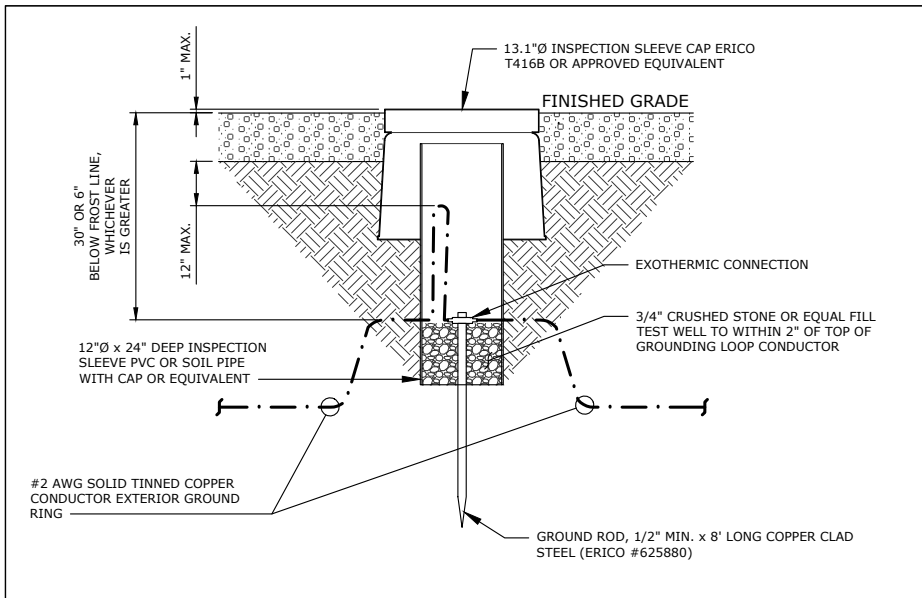
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 19739 SUNCREST AVE.
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SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-2

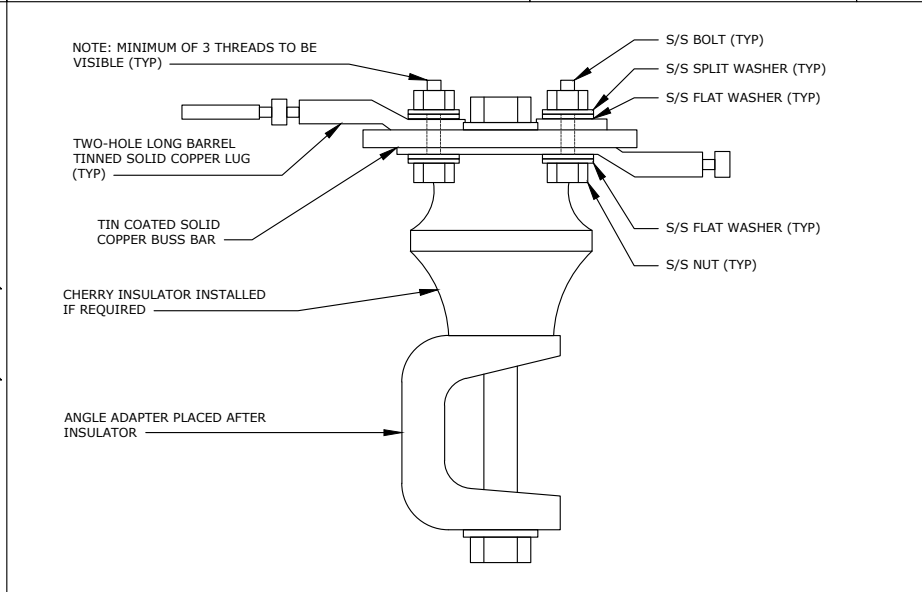
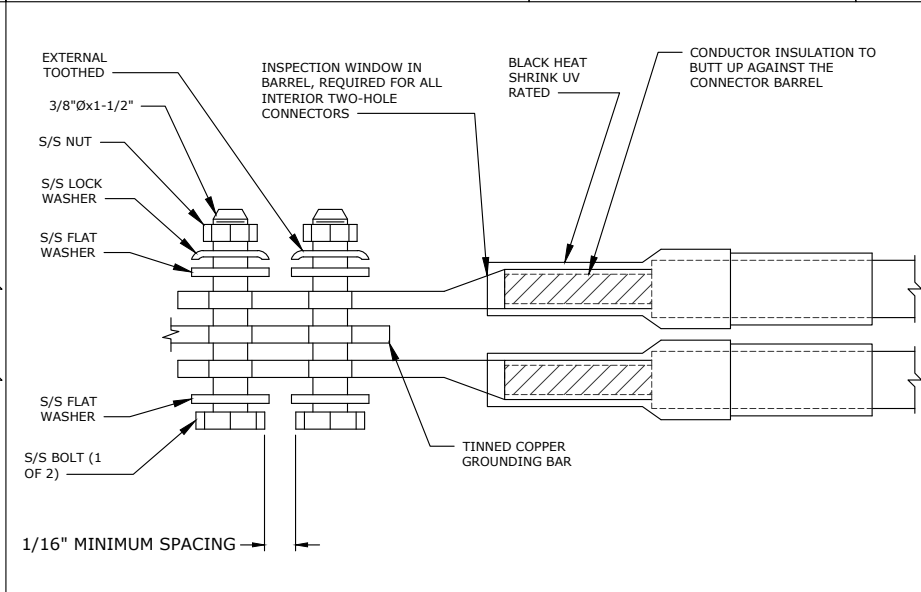
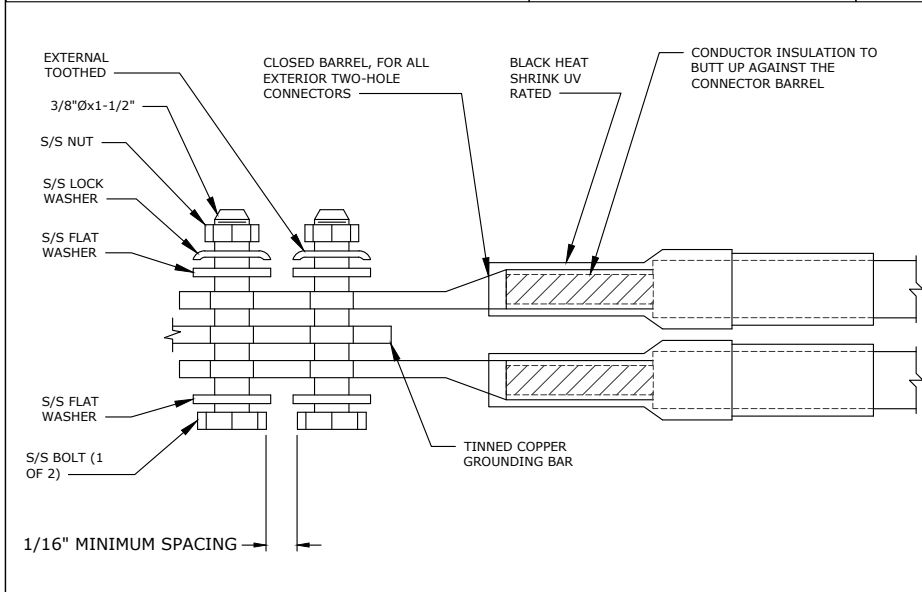


- EXOTHERMIC WELD (2) TWO, #2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUND BAR. ROUTE CONDUCTORS TO BURIED GROUND RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
- ALL EXTERIOR GROUNDING HARDWARE SHALL BE STAINLESS STEEL 3/8" DIAMETER OR LARGER. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
- FOR GROUND BOND TO STEEL ONLY: COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
- DO NOT INSTALL CABLE GROUNDING KIT AT A BEND ALWAYS DIRECT GROUND CONDUCTOR DOWN TO GROUNDING BUSS BAR.
- NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUND BAR & BOLTED ON THE BACK SIDE.
- ALL GROUNDING PARTS & EQUIPMENT TO BE SUPPLIED & INSTALLED BY CONTRACTOR.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL GROUND BAR AS REQUIRED.
- ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINER).

TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE NO SCALE 1

TYPICAL GROUND RING TRENCH NO SCALE 2

TYPICAL GROUNDING NOTES NO SCALE 3



TYPICAL EXTERIOR TWO HOLE LUG NO SCALE 4

TYPICAL INTERIOR TWO HOLE LUG NO SCALE 5

LUG DETAIL NO SCALE 6

NOT USED NO SCALE 7

NOT USED NO SCALE 8

NOT USED NO SCALE 9



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WEST LINN, OR 97068

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-2.1

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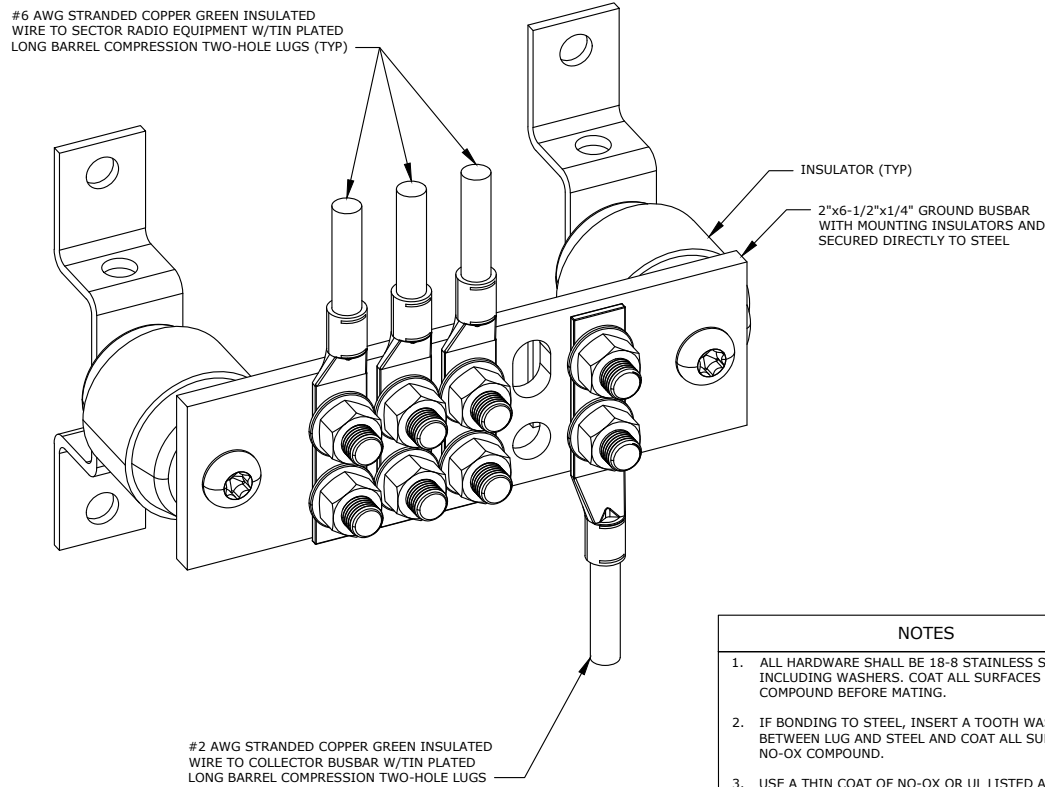
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SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

G-2.2

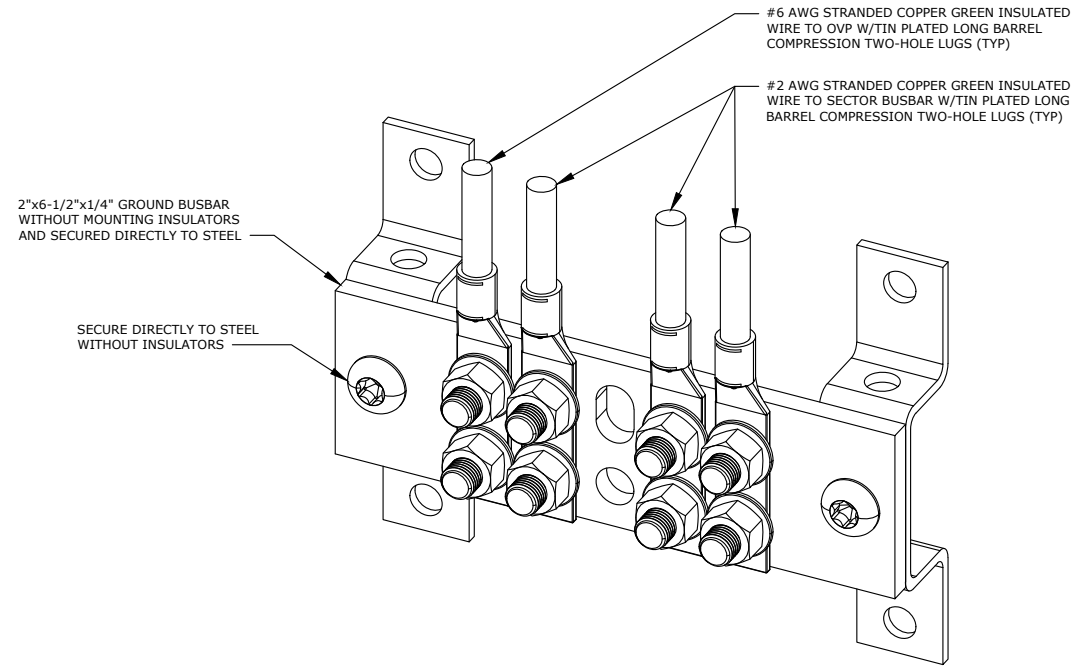


- NOTES**
1. ALL HARDWARE SHALL BE 18-8 STAINLESS STEEL INCLUDING WASHERS. COAT ALL SURFACES WITH NO-OX COMPOUND BEFORE MATING.
 2. IF BONDING TO STEEL, INSERT A TOOTH WASHER BETWEEN LUG AND STEEL AND COAT ALL SURFACE WITH NO-OX COMPOUND.
 3. USE A THIN COAT OF NO-OX OR UL LISTED ANTIOXIDANT COMPOUND BETWEEN GROUNDING CONNECTIONS.

SECTOR GROUND BUSBAR DETAIL

NO SCALE

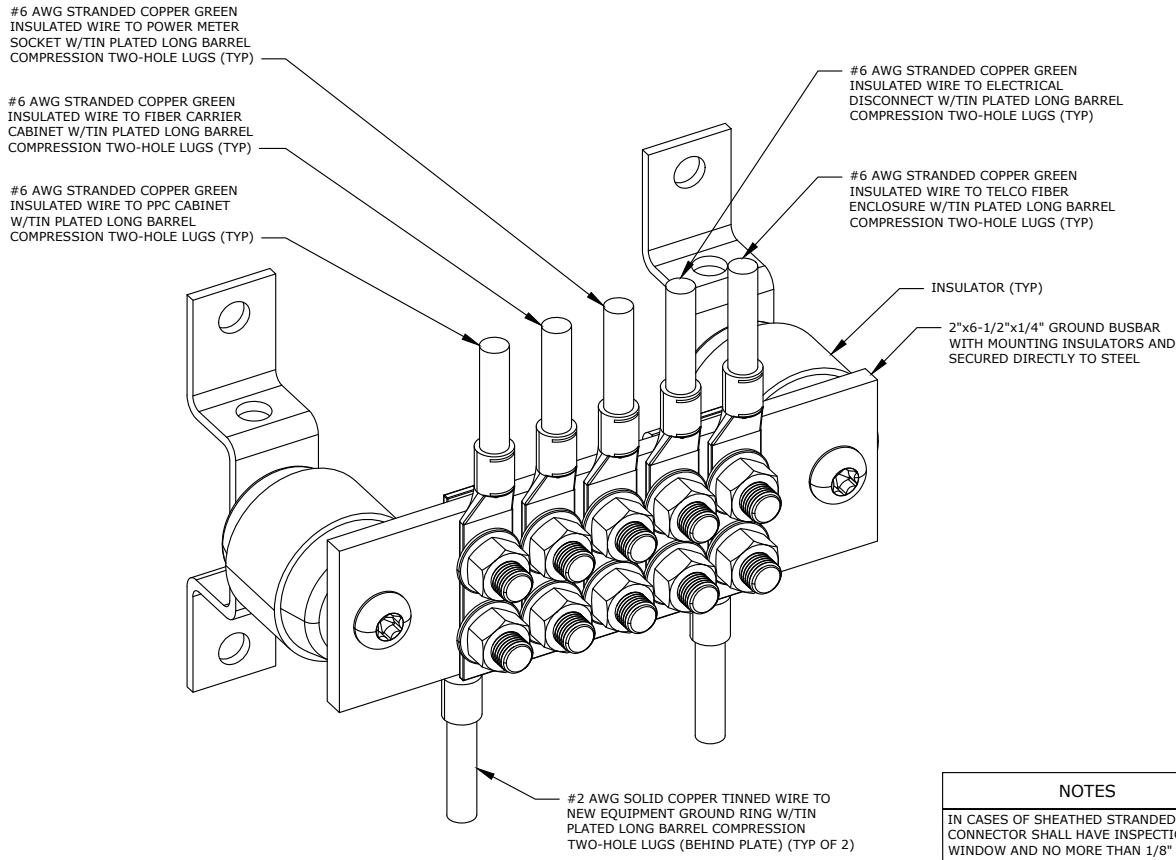
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UPPER TOWER COLLECTOR GROUND BUSBAR DETAIL

NO SCALE

2

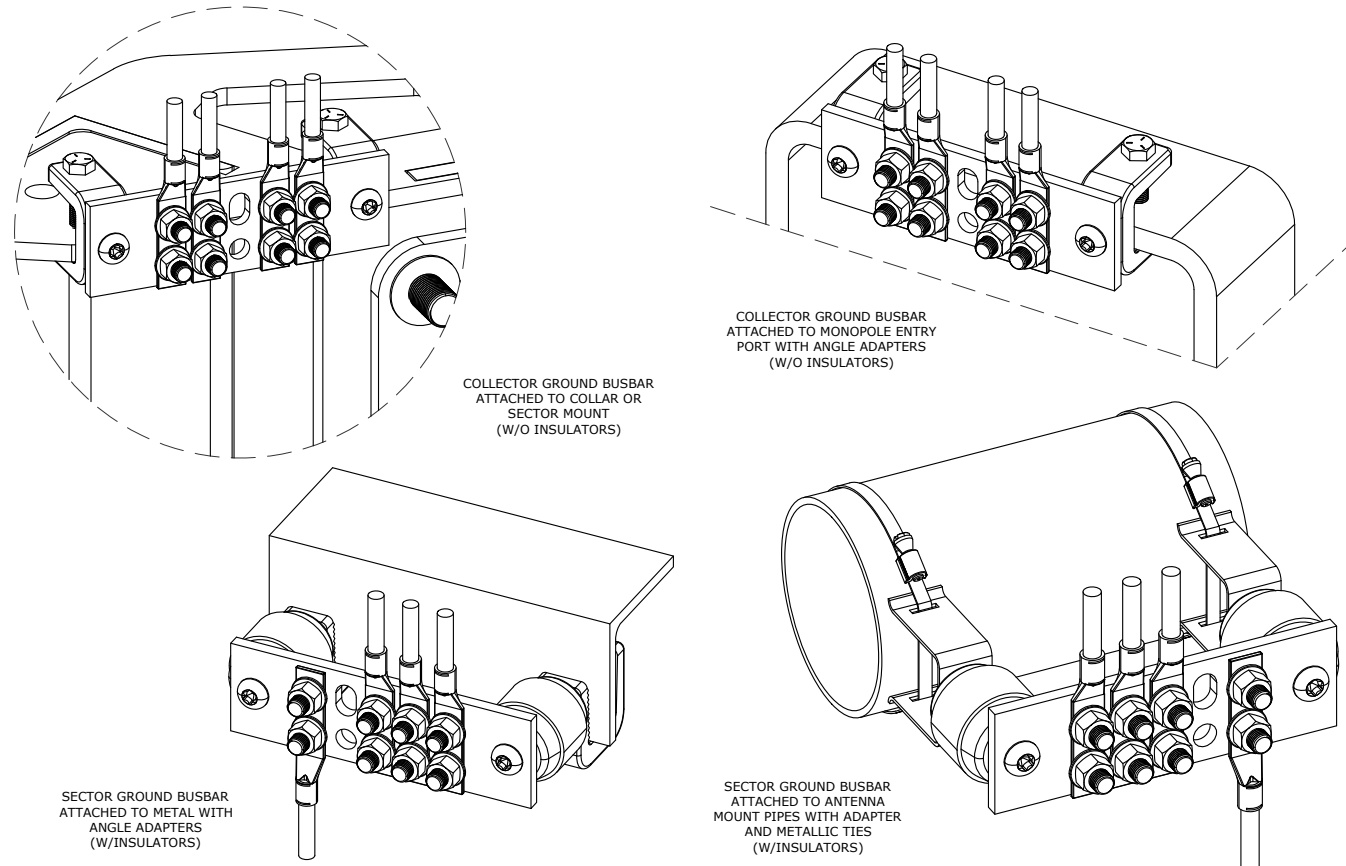


- NOTES**
- IN CASES OF SHEATHED STRANDED WIRES, CONNECTOR SHALL HAVE INSPECTION WINDOW AND NO MORE THAN 1/8" GAP BETWEEN CONNECTOR BODY AND SHEATH.

EQUIPMENT GROUND BUSBAR DETAIL

NO SCALE

3



GROUND BUSBAR ATTACHMENT OPTIONS

NO SCALE

4

		3/4" TAPE WIDTHS WITH 3/4" SPACING											
LOW-BAND RRH (600 MHz N71 BASEBAND) + (850 MHz N26 BAND) + (700 MHz N29 BAND) - OPTIONAL PER MARKET ADD FREQUENCY COLOR TO SECTOR BAND (LOW-BAND USES ORANGE BAND)	ALPHA RRH				BETA RRH				GAMMA RRH				
	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	
	RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN	
	ORANGE	ORANGE	RED	RED	ORANGE	ORANGE	BLUE	BLUE	ORANGE	ORANGE	GREEN	GREEN	
		WHITE	ORANGE	ORANGE		WHITE	ORANGE	ORANGE		WHITE	ORANGE	ORANGE	
				WHITE				WHITE				WHITE	
MID-BAND RRH (AWS BANDS N66+N70) ADD FREQUENCY COLOR TO SECTOR BAND (MID-BAND USES PURPLE BANDS)	RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN	
	PURPLE	PURPLE	RED	RED	PURPLE	PURPLE	BLUE	BLUE	PURPLE	PURPLE	GREEN	GREEN	
		WHITE	PURPLE	PURPLE		WHITE	PURPLE	PURPLE		WHITE	PURPLE	PURPLE	
				WHITE				WHITE				WHITE	
4th, 5th AND 6th SECTORS (LOW-BAND RRH) (600 MHz N71 BASEBAND) + (850 MHz N26 BAND) + (700 MHz N29 BAND) ADD FREQUENCY COLOR TO SECTOR BAND (LOW-BAND USES ORANGE BANDS)	DELTA RRH				EPSILON RRH				ZETA RRH				
	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	
	RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN	
	RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN	
	RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN	
	ORANGE	ORANGE	RED	RED	ORANGE	ORANGE	BLUE	BLUE	ORANGE	ORANGE	GREEN	GREEN	
		WHITE	ORANGE	ORANGE		WHITE	ORANGE	ORANGE		WHITE	ORANGE	ORANGE	
				WHITE				WHITE				WHITE	
UMFUS AUs (28GHz - PTP AND PTMP LINKS) (FIBER CONNECTIONS) 4th PTP RADIOS WILL CLAIM "2nd RADIO" FOR APPROPRIATE SECTOR ADD FREQUENCY COLOR TO SECTOR BAND (28GHz BAND USES BROWN BANDS)	ALPHA RRH				BETA RRH				GAMMA RRH				
	RADIO 1 FIBER #1	RADIO 2 FIBER #1	RADIO 3 FIBER #1	RADIO 4 FIBER #1	RADIO 1 FIBER #1	RADIO 2 FIBER #1	RADIO 3 FIBER #1	RADIO 4 FIBER #1	RADIO 1 FIBER #1	RADIO 2 FIBER #1	RADIO 3 FIBER #1	RADIO 4 FIBER #1	
	RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN	
	BROWN	RED	RED	RED	BROWN	BLUE	BLUE	BLUE	BROWN	GREEN	GREEN	GREEN	
		RED	RED	RED		BLUE	BLUE	BLUE		GREEN	GREEN	GREEN	
		BROWN	RED	RED		BROWN	BLUE	BLUE		BROWN	GREEN	GREEN	
			BROWN	RED			BLUE	BLUE			BROWN	GREEN	
			RED	BROWN			BLUE	BLUE			BROWN	BROWN	
			BROWN	BROWN			BROWN	BROWN			BROWN	BROWN	
FIBER JUMPERS TO RRHS RRH FIBER CABLES HAVE SECTOR + FREQUENCY STRIPE	LOW BAND RRH	MID BAND RRH	28GHz RRH (1)	28GHz RRH (2)	LOW BAND RRH	MID BAND RRH	28GHz RRH (1)	28GHz RRH (2)	LOW BAND RRH	MID BAND RRH	28GHz RRH(1)	28GHz RRH (2)	
	RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN	
	ORANGE	PURPLE	BROWN	RED	ORANGE	PURPLE	BROWN	BLUE	ORANGE	PURPLE	BROWN	GREEN	
				BROWN				BROWN				BROWN	
POWER CABLES TO RRHS RRH POWER CABLES HAVE SECTOR + FREQUENCY STRIPE SPACED	LOW BAND RRH	MID BAND RRH	28GHz RRH (1)	28GHz RRH (2)	LOW BAND RRH	MID BAND RRH	28GHz RRH (1)	28GHz RRH (2)	LOW BAND RRH	MID BAND RRH	28GHz RRH(1)	28GHz RRH (2)	
	RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN	
	ORANGE	PURPLE	BROWN	BROWN	ORANGE	PURPLE	BROWN	BROWN	ORANGE	PURPLE	BROWN	BROWN	

RET MOTORS AT ANTENNAS

EXAMPLE HERE SHOWS PARALLEL RET CABLE SPER SECTOR CONFIGURATION. SECOND ANTENNA ON EACH SECTOR WOULD DISPLAY TWO SECTOR COLOR STRIPE

3/4" TAPE WIDTHS WITH 3/4" SPACING					
ANT 1 LOW BAND RRH	ANT 1 MID BAND RRH	ANT 1 LOW BAND RRH	ANT 1 MID BAND RRH	ANT 1 LOW BAND RRH	ANT 1 MID BAND RRH
IN	IN	IN	IN	IN	IN
RED	RED	BLUE	BLUE	GREEN	GREEN
ORANGE	PURPLE	ORANGE	PURPLE	ORANGE	PURPLE

PTP MICROWAVE RADIO LINKS

(6GHz, 11GHz, 18GHz, 23GHz+BACKHAUL LINKS) LINKS WILL HAVE A 1.5-2 INCH WHITE WRAP WITH THE AZIMUTH COLOR OVERLAPPING IN THE MIDDLE. ADD ADDITIONAL SECTOR COLOR BANDS FOR EACH ADDITIONAL MW RADIO/TX CABLE.

MICROWAVE CABLES REQUIRE P-TOUCH LABELS INSIDE THE CABINET TO IDENTIFY THE LOCAL AND REMOTE SITE ID'S.

FORWARD AZIMUTH OF 0-120 DEGREES		FORWARD AZIMUTH OF 120-240 DEGREES		FORWARD AZIMUTH OF 240-359 DEGREES	
PRIMARY	SECONDARY	PRIMARY	SECONDARY	PRIMARY	SECONDARY
WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
RED	RED	BLUE	BLUE	GREEN	GREEN
WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
	WHITE		WHITE		WHITE
	WHITE		WHITE		WHITE

HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED ALONG WITH FREQUENCY BANDS.

EXAMPLE 1 - HYBRID, OR DISCREET, SUPPORTS ALL SECTORS, BOTH LOW-BANDS & MID-BANDS.

EXAMPLE 2 - HYBRID, OR DISCREET, SUPPORTS CBRS ONLY, ALL SECTORS.

EXAMPLE 3 - MAIN COAX WITH GROUND MOUNTED RRHS.

EXAMPLE 4 - HYBRID OR DISCREET POWER/FIBER, SINGLE ALPHA SECTOR WITH BOT LOW-BAND AND MID-BAND RRHS

EXAMPLE 1	EXAMPLE 2	EXAMPLE 3	EXAMPLE 4
RED	RED	BLUE	RED
BLUE	BLUE	BLUE	ORANGE
GREEN	GREEN	BLUE	PURPLE
ORANGE	BROWN	BROWN	
PURPLE			

LOW BANDS (N71+N26) OPTIONAL - (N29)	AWS (N66+N70+H-BLOCK)	UMFUS (28GHz)
ORANGE	PURPLE	BROWN
CBRS TECH (3 GHz)	NEGATIVE SLANT PORT ON ANT/RRH	
YELLOW	WHITE	
1 AND 2 STRIPES ALPHA SECTOR	1 AND 2 STRIPES BETA SECTOR	1 AND 2 STRIPES GAMMA SECTOR
RED	BLUE	GREEN
3 AND 4 STRIPES DELTA SECTOR	3 AND 4 STRIPES EPSILON SECTOR	3 AND 4 STRIPES ZETA SECTOR
RED	BLUE	GREEN

dish wireless

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

Technology Associates

3 MONROE PARKWAY, SUITE P #313
LAKE OSWEGO, OR 97035

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CONSTRUCTION DOCUMENT

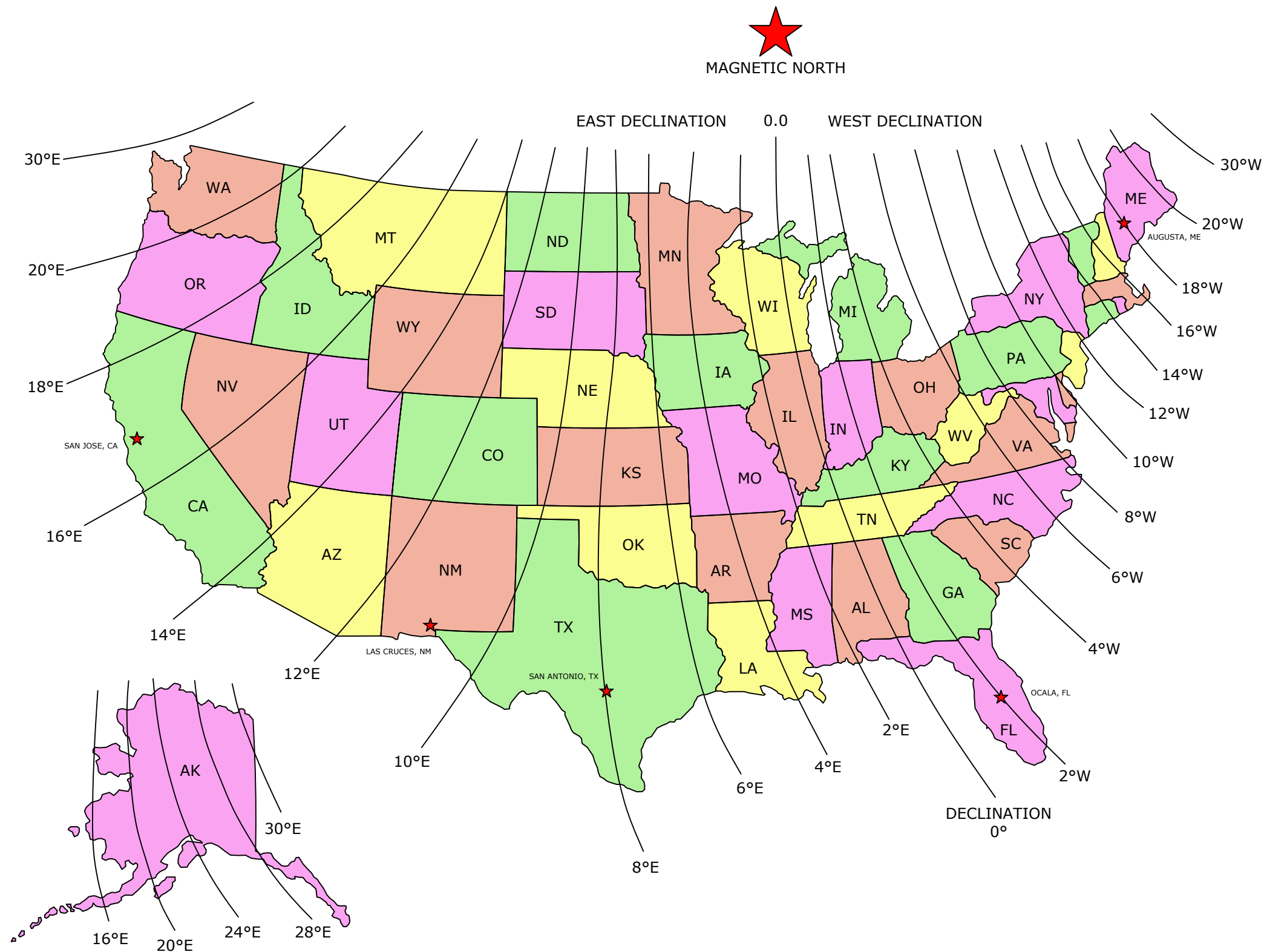
SUBMITTALS		
REV	DATE	DESCRIPTION
A	01/16/2024	PRELIMINARY PCD
0	02/22/2024	90% PCD REVIEW

A&E PROJECT NUMBER
004699

DISH Wireless L.L.C.
PROJECT INFORMATION
PRPD00519A
19739 SUNCREST AVE.
WEST LINN, OR 97068

SHEET TITLE
CABLE COLOR CODE

SHEET NUMBER
RF-1



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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PROJECT INFORMATION

PRPDX00519A
19739 SUNCREST AVE.
WEST LINN, OR 97068

SHEET TITLE

DECLINATION MAP

SHEET NUMBER

RF-2

EXOTHERMIC CONNECTION	●
MECHANICAL CONNECTION	■
BUSS BAR INSULATOR	▲
CHEMICAL ELECTROLYTIC GROUNDING SYSTEM	⊗
TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM	⊗T
EXOTHERMIC WITH INSPECTION SLEEVE	■
GROUNDING BAR	— —
GROUND ROD	⊙
TEST GROUND ROD WITH INSPECTION SLEEVE	⊙T
SINGLE POLE SWITCH	⌘
DUPLEX RECEPTACLE	⊕
DUPLEX GFCI RECEPTACLE	⊕GFCI
FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48-T8	F
SMOKE DETECTION (DC)	⊙SD
EMERGENCY LIGHTING (DC)	⊕
SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW LED-1-25A400/51K-SR4-120-PE-DBBTXD	⊕
CHAIN LINK FENCE	—X—X—X—X—X—X—X—X—
WOOD/WROUGHT IRON FENCE	—□—□—□—□—□—□—
WALL STRUCTURE	▨
LEASE AREA	—
PROPERTY LINE (PL)	—
SETBACKS	—
ICE BRIDGE	▨
CABLE TRAY	▨
WATER LINE	—W—W—W—W—W—W—W—
UNDERGROUND POWER	—UGP—UGP—UGP—UGP—UGP—
UNDERGROUND FIBER	—UGF—UGF—UGF—UGF—UGF—
OVERHEAD POWER	—OHP—OHP—OHP—OHP—OHP—
OVERHEAD FIBER	—OHF—OHF—OHF—OHF—OHF—
UNDERGROUND FIBER/POWER	—UGF/P—UGF/P—UGF/P—UGF/P—
ABOVE GROUND POWER	—AGP—AGP—AGP—AGP—AGP—
ABOVE GROUND FIBER	—AGF—AGF—AGF—AGF—AGF—
ABOVE GROUND FIBER/POWER	—AGF/P—AGF/P—AGF/P—AGF/P—
WORKPOINT	W.P.
SECTION REFERENCE	⊙ XX X-X
DETAIL REFERENCE	⊙ XX X-X
ELEVATION CALLOUT	⊙ XX X-X

LEGEND

NO SCALE

1

AB	ANCHOR BOLT
ABV	ABOVE
AC	ALTERNATING CURRENT
ADDL	ADDITIONAL
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AGL	ABOVE GROUND LEVEL
AIC	AMPERAGE INTERRUPTION CAPACITY
ALUM	ALUMINUM
ALT	ALTERNATE
ANT	ANTENNA
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BM	BEAM
BTC	BARE TINNED COPPER CONDUCTOR
BOF	BOTTOM OF FOOTING
CAB	CABINET
CANT	CANTILEVERED
CHG	CHARGING
CLG	CEILING
CLR	CLEAR
COL	COLUMN
COMM	COMMON
CONC	CONCRETE
CONSTR	CONSTRUCTION
DBL	DOUBLE
DC	DIRECT CURRENT
DEPT	DEPARTMENT
DF	DOUGLAS FIR
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DWG	DRAWING
DWL	DOWEL
EA	EACH
EC	ELECTRICAL CONDUCTOR
EL	ELEVATION
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ENG	ENGINEER
EQ	EQUAL
EXP	EXPANSION
EXT	EXTERIOR
EW	EACH WAY
FAB	FABRICATION
FF	FINISH FLOOR
FG	FINISH GRADE
FIF	FACILITY INTERFACE FRAME
FIN	FINISH(ED)
FLR	FLOOR
FDN	FOUNDATION
FOC	FACE OF CONCRETE
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FOW	FACE OF WALL
FS	FINISH SURFACE
FT	FOOT
FTG	FOOTING
GA	GAUGE
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GLB	GLUE LAMINATED BEAM
GLV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
GSM	GLOBAL SYSTEM FOR MOBILE
HDG	HOT DIPPED GALVANIZED
HDR	HEADER
HGR	HANGER
HVAC	HEAT/VENTILATION/AIR CONDITIONING
HT	HEIGHT
IGR	INTERIOR GROUND RING

ABBREVIATIONS

NO SCALE

2

IN	INCHES
INT	INTERIOR
LB(S)	POUND(S)
LF	LINEAR FEET
LTE	LONG TERM EVOLUTION
MAS	MASONRY
MAX	MAXIMUM
MB	MACHINE BOLT
MECH	MECHANICAL
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MISC	MISCELLANEOUS
MTL	METAL
MTS	MANUAL TRANSFER SWITCH
MW	MICROWAVE
NEC	NATIONAL ELECTRIC CODE
NM	NEWTON METERS
NO	NUMBERS
#	NUMBERS
NTS	NOT TO SCALE
OC	ON-CENTER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OPNG	OPENING
P/C	PRECAST CONCRETE
PCS	PERSONAL COMMUNICATION SERVICES
PCU	PRIMARY CONTROL UNIT
PRC	PRIMARY RADIO CABINET
PP	POLARIZING PRESERVING
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATED
PWR	POWER
QTY	QUANTITY
RAD	RADIUS
RECT	RECTIFIER
REF	REFERENCE
REINF	REINFORCEMENT
REQ'D	REQUIRD
RET	REMOTE ELECTRIC TILT
RF	RADIO FREQUENCY
RMC	RIGID METALLIC CONDUIT
RRH	REMOTE RADIO HEAD
RRU	REMOTE RADIO UNIT
RWY	RACEWAY
SCH	SCHEDULE
SHT	SHEET
SIAD	SMART INTEGRATED ACCESS DEVICE
SIM	SIMILAR
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
STD	STANDARD
STL	STEEL
TEMP	TEMPORARY
THK	THICKNESS
TMA	TOWER MOUNTED AMPLIFIER
TN	TOE NAIL
TOA	TOP OF ANTENNA
TOC	TOP OF CURB
TOF	TOP OF FOUNDATION
TOP	TOP OF PLATE (PARAPET)
TOS	TOP OF STEEL
TOW	TOP OF WALL
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE
UMTS	UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
UPS	UNINTERRUPTIBLE POWER SYSTEM (DC POWER PLANT)
VIF	VERIFIED IN FIELD
W	WIDE
W/	WITH
WD	WOOD
WP	WEATHERPROOF
WT	WEIGHT



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SUBMITTALS		
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A	01/16/2024	PRELIMINARY PCD
0	02/22/2024	90% PCD REVIEW

A&E PROJECT NUMBER
004699

DISH Wireless L.L.C.
PROJECT INFORMATION
PRPDX00519A
19739 SUNCREST AVE.
WEST LINN, OR 97068

SHEET TITLE
LEGEND AND ABBREVIATIONS

SHEET NUMBER
GN-1

SIGN TYPES		
SIGN TYPES	SIGN TYPES	COLOR CODE PURPOSE
INFORMATION	GREEN	*INFORMATIONAL SIGN* TO NOTIFY OTHERS OF SITE OWNERSHIP & CONTACT NUMBER & POTENTIAL RF EXPOSURE.
NOTICE	BLUE	*NOTICE BEYOND THIS POINT* RF FIELDS BEYOND THIS POINT MAY EXCEED THE FCC GENERAL PUBLIC EXPOSURE LIMIT. OBEY ALL POSTED SIGNS & SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307 (b)
CAUTION	YELLOW	*CAUTION BEYOND THIS POINT* RF FIELDS BEYOND THIS POINT MAY EXCEED THE FCC GENERAL PUBLIC EXPOSURE LIMIT. OBEY ALL POSTED SIGNS & SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(b)
WARNING	ORANGE/RED	*WARNING BEYOND THIS POINT* RF FIELDS AT THIS SITE EXCEED FCC RULES FOR HUMAN EXPOSURE. FAILURE TO OBEY ALL POSTED SIGNS & SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS COULD RESULT IN SERIOUS INJURY. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(b)

SIGN PLACEMENT:

- RF SIGNAGE PLACEMENT SHALL FOLLOW THE RECOMMENDATIONS OF AN EXISTING EME REPORT, CREATED BY A THIRD PARTY PREVIOUSLY AUTHORIZED BY DISH Wireless L.L.C.
- INFORMATION SIGN (GREEN) SHALL BE LOCATED ON EXISTING DISH Wireless L.L.C EQUIPMENT.
(A) IF THE INFORMATION SIGN IS A STICKER, IT SHALL BE PLACED ON EXISTING DISH Wireless L.L.C EQUIPMENT CABINET.
(B) IF THE INFORMATION SIGN IS A METAL SIGN IT SHALL BE PLACED ON EXISTING DISH Wireless L.L.C H-FRAME WITH A SECURE ATTACH METHOD.
- IF EME REPORT IS NOT AVAILABLE AT THE TIME OF CREATION OF CONSTRUCTION DOCUMENTS; PLEASE CONTACT DISH Wireless L.L.C. CONSTRUCTION MANAGER FOR FURTHER INSTRUCTION ON HOW TO PROCEED.

NOTES:

1. FOR DISH Wireless L.L.C. LOGO, SEE DISH Wireless L.L.C. DESIGN SPECIFICATIONS (PROVIDED BY DISH Wireless L.L.C.)
2. SITE ID SHALL BE APPLIED TO SIGNS USING "LASER ENGRAVING" OR ANY OTHER WEATHER RESISTANT METHOD (DISH Wireless L.L.C. APPROVAL REQUIRED)
3. TEXT FOR SIGNAGE SHALL INDICATE CORRECT SITE NAME AND NUMBER AS PER DISH Wireless L.L.C. CONSTRUCTION MANAGER RECOMMENDATIONS.
4. CABINET/SHELTER MOUNTING APPLICATION REQUIRES ANOTHER PLATE APPLIED TO THE FACE OF THE CABINET WITH WATER PROOF POLYURETHANE ADHESIVE
5. ALL SIGNS WILL BE SECURED WITH EITHER STAINLESS STEEL ZIP TIES OR STAINLESS STEEL TECH SCREWS
6. ALL SIGNS TO BE 8.5"x11" AND MADE WITH 0.04" OF ALUMINUM MATERIAL

INFORMATION

This is an access point to an area with transmitting antennas.

Obey all signs and barriers beyond this point.
Call the DISH Wireless L.L.C. NOC at 1-866-624-6874

Site ID: _____



THIS SIGN IS FOR REFERENCE PURPOSES ONLY

NOTICE

Transmitting Antenna(s)

Radio frequency fields beyond this point MAY EXCEED the FCC Occupational exposure limit.

Obey all posted signs and site guidelines for working in radio frequency environments.

Call the DISH Wireless L.L.C. NOC at 1-866-624-6874 prior to working beyond this point.

Site ID: _____

dish

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CAUTION

Transmitting Antenna(s)

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dish

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A&E PROJECT NUMBER

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DISH Wireless L.L.C.
PROJECT INFORMATION

PRPDX00519A
19739 SUNCREST AVE.
WEST LINN, OR 97068

SHEET TITLE

RF SIGNAGE

SHEET NUMBER

GN-2

SITE ACTIVITY REQUIREMENTS:

- NOTICE TO PROCEED - NO WORK SHALL COMMENCE PRIOR TO CONTRACTOR RECEIVING A WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE DISH Wireless L.L.C. AND TOWER OWNER NOC AND THE DISH Wireless L.L.C. AND TOWER OWNER CONSTRUCTION MANAGER.
- "LOOK UP" - DISH Wireless L.L.C. AND TOWER OWNER SAFETY CLIMB REQUIREMENT:
THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR DISH Wireless L.L.C. AND DISH Wireless L.L.C. AND TOWER OWNER POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
- PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
- ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND DISH Wireless L.L.C. AND TOWER OWNER STANDARDS, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA-322 (LATEST EDITION).
- ALL SITE WORK TO COMPLY WITH DISH Wireless L.L.C. AND TOWER OWNER INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON DISH Wireless L.L.C. AND TOWER OWNER TOWER SITE AND LATEST VERSION OF ANSI/TIA-1019-A-2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
- IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY DISH Wireless L.L.C. AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES INCLUDING PRIVATE LOCATES SERVICES PRIOR TO THE START OF CONSTRUCTION.
- ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.
- ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND DISH PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
- CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
- ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF DISH Wireless L.L.C. AND TOWER OWNER, AND/OR LOCAL UTILITIES.
- THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
- THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.
- CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
- THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
- CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS AND RADIOS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
- CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
- NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GENERAL NOTES:

- FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION
CARRIER:DISH Wireless L.L.C.
TOWER OWNER:TOWER OWNER
- THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
- THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.
- NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.
- SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.
- PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CARRIER POC AND TOWER OWNER.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
- CONTRACTOR IS TO PERFORM A SITE INVESTIGATION, BEFORE SUBMITTING BIDS, TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.
- THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF DISH Wireless L.L.C. AND TOWER OWNER
- CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
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RFDS REV#: 0

CONSTRUCTION DOCUMENT

SUBMITTALS		
REV	DATE	DESCRIPTION
A	01/16/2024	PRELIMINARY PCD
0	02/22/2024	90% PCD REVIEW

A&E PROJECT NUMBER
004699

DISH Wireless L.L.C.
PROJECT INFORMATION
PRPDX00519A
19739 SUNCREST AVE.
WEST LINN, OR 97068

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-3

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

- ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
- UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (F_c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°F AT TIME OF PLACEMENT.
- CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER-TO-CEMENT RATIO (W/C) OF 0.45.
- ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (F_y) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:
 #4 BARS AND SMALLER 40 ksi
 #5 BARS AND LARGER 60 ksi
- THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
 - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3"
 - CONCRETE EXPOSED TO EARTH OR WEATHER:
 - #6 BARS AND LARGER 2"
 - #5 BARS AND SMALLER 1-1/2"
 - CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
 - SLAB AND WALLS 3/4"
 - BEAMS AND COLUMNS 1-1/2"
- A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

- ALL ELECTRICAL WORK SHALL BE PERFORMED AND INSTALLED BY A LICENSED ELECTRICIAN, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
- CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
- WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
- ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
 - ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
 - ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
- EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
- ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
- PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
- TIE WRAPS ARE NOT ALLOWED.
- ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
- SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
- POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
- POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
- ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
- RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
- ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
- ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
- SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
- LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
- CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
- CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
- WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
- SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).

- CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER-ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
- EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3 (OR BETTER) FOR EXTERIOR LOCATIONS.
- METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
- NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
- THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR DISH Wireless L.L.C. AND TOWER OWNER BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
- THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
- INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "DISH Wireless L.L.C.".
- ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

GROUNDING NOTES:

- ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
- THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
- THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.
- METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
- METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
- EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.
- CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
- ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
- ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
- USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
- EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
- ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
- COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
- ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
- APPROVED ANTIOXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
- ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
- MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
- BOND ALL METALLIC OBJECTS WITHIN 6 ft OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.
- GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
- ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON-METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).
- BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM. THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY). DO NOT ATTACH GROUNDING TO FIRE SPRINKLER SYSTEM PIPES.



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0	02/22/2024	90% PCD REVIEW

A&E PROJECT NUMBER

004699

DISH Wireless L.L.C.
PROJECT INFORMATION

PRPDX00519A
19739 SUNCREST AVE.
WEST LINN, OR 97068

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-3.1