

CITY OF VALDEZ RADIO INFRASTRUCTURE UPGRADE FIRE STATION 1 SITE

407 W PIONEER ST - VALDEZ, AK
61° 07' 55.57" N, 146° 21' 44.12" W



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FOR REFERENCE ONLY

IFC

REV	DESCRIPTION	DATE
0	ISSUE FOR CONSTRUCTION	230320
1	UPDATED PACKAGE	230620

**CITY OF VALDEZ
RADIO
INFRASTRUCTURE
UPGRADE
FIRE STATION 1 SITE**

DWN: JAA	DSN: DRB	APP: DRB	REV 1
JOB #: 22-0132-90-03			DATE: 230320

COVER
SHEET

T1.0

PROJECT DESCRIPTION

SITE FENCING
100 FT SELF-SUPPORTING TOWER, 3 LEG WITH ANTENNAS
12'x22' COMMUNICATION SHELTER
POWER AND COMMUNICATION LINES
SITE GROUNDING

PROJECT INFORMATION

NHTI PROJECT NUMBER: 22-00132-90-03
LEGAL DESCRIPTION: LOT 1, BLOCK 6 (BLOCK 20 MINERAL CREEK SUBDIVISION FIRE STATION REPLAT PLAT NO 2019-4) AND BLOCK 5, (BLOCK 20 ADD NO 2 PLAT NO 79-7), TOWNSHIP 8 SOUTH, RANGE 6 WEST, COPPER RIVER MERIDIAN, AK

PROPERTY OWNER: CITY OF VALDEZ
OWNER SITE NAME: FIRE STATION 1

CONTACT INFORMATION

ENGINEER:
NEW HORIZONS TELECOM, INC
901 COPE INDUSTRIAL WAY
PALMER, AK 99645
(907) 761-6000
LICENSE # AECC610

CIVIL/STRUCTURAL
DALE R. BROWNING, PE, SE
(907) 761-6069
DBROWNING@NHTIUSA.COM

ELECTRICAL
PATRICK T. GOODYEAR, PE
(907) 761-6070
PGOODYEAR@NHTIUSA.COM

VICINITY MAP



DRIVING DIRECTIONS

FROM VALDEZ AIRPORT, HEAD WEST ON AIRPORT RD (0.9 MI)
TURN RIGHT ONTO RICHARDSON HWY (3.2 MI)
TURN RIGHT ONTO PIONEER DR (0.6 MI)
TURN RIGHT INTO THE FIRE STATION PARKING LOT (0.1 MI)

CODE INFORMATION

2021 IBC (AS ADOPTED BY 13 AAC 50.020)
2020 NEC (AS ADOPTED BY SOA)

DRAWING INDEX

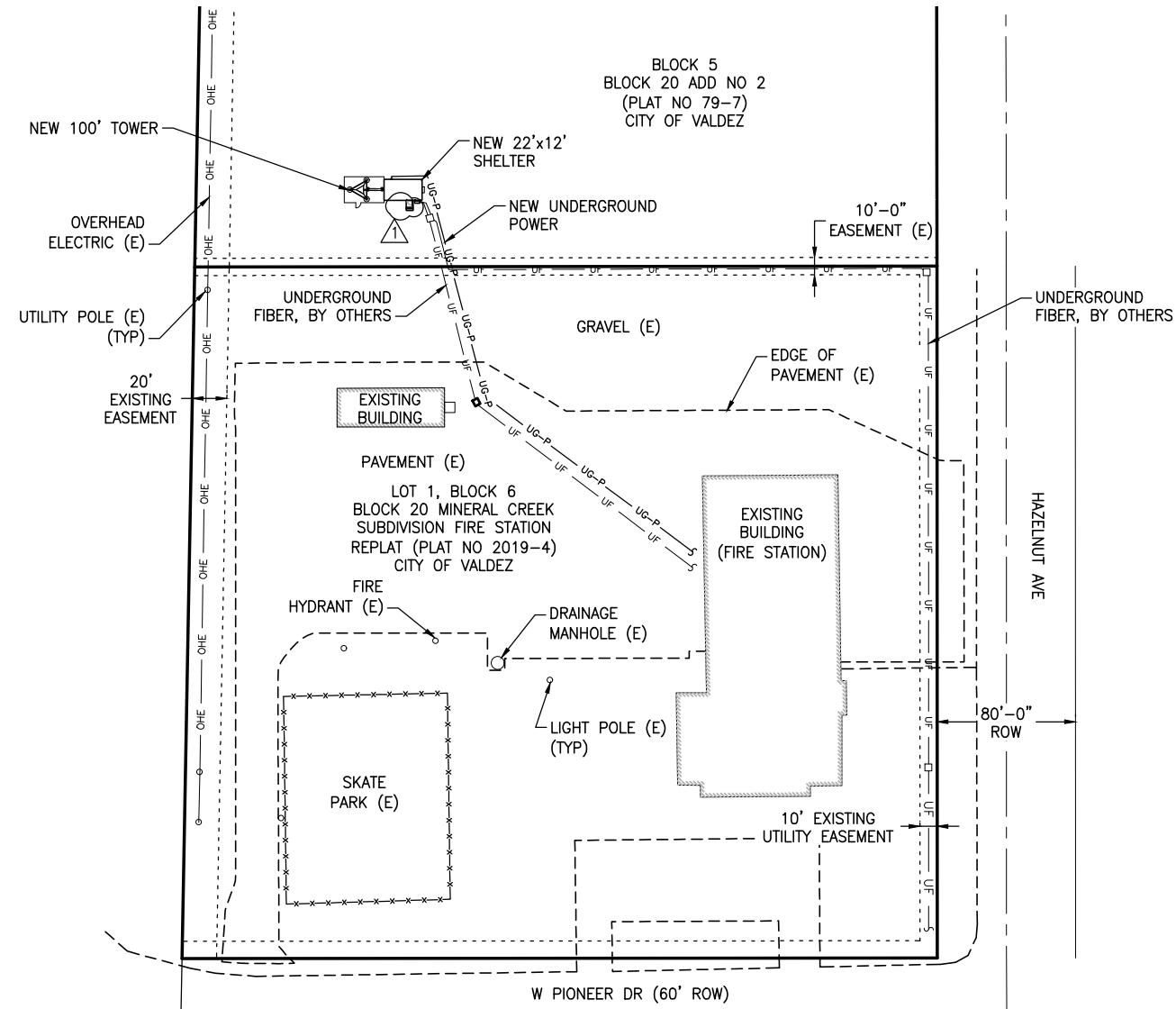
SHEET #	TITLE	REV #
T1.0	COVER SHEET	1
C1.0	SITE PLAN	1
C1.1	ENLARGED SITE PLAN	1
C2.0	TOWER ELEVATION	0
S1.0	STRUCTURAL NOTES	0
S2.0	TOWER FOUNDATION PLAN	0
S2.1	TOWER FOUNDATION SECTION	0
S3.0	ICE BRIDGE DETAILS	0
S4.0	SHELTER GRADE BEAMS	0
S4.1	SHELTER SKID	0
S5.0	SHELTER FLOOR PLAN	0
S5.1	SHELTER FLOOR JOIST LAYOUT	0
S5.2	SHELTER FRAMING PLAN AND BUILDING SECTION	0
S5.3	SHELTER FRAMING ELEVATIONS	0
S5.4	EQUIPMENT MOUNTING DETAILS	0
S5.5	SHELTER ATTACHMENT DETAILS	0
S5.6	STAIR AND LANDING DETAILS	1
E1.0	ELECTRICAL NOTES	0
E1.1	ELECTRICAL EQUIPMENT PLAN	0
E1.2	AC POWER AND LIGHTING PLAN	0
E1.3	ELECTRICAL ONE LINE DIAGRAM	0
E1.4	ELECTRICAL ONE LINE PANEL SCHEDULE	0
E1.5	AIC CALCULATIONS	0
E1.6	SIGNAL PLAN	0
E2.0	GROUNDING NOTES	0
E2.1	PANI SYSTEM GROUNDING	0
E2.2	CABLE LADDER AND GROUNDING PLAN	0
E2.3	OUTSIDE GROUNDING PLAN	1
E2.4	GROUNDING DETAILS	0
E2.5	TOWER GROUNDING DETAILS	0

FILE: \\NHTI-FS02\OLD\SHARES\ENGINEERING\22 JOB\22-0132-90-CITY OF VALDEZ - RADIO NETWORK IMPROVEMENTS PERMITTING & DESIGN\05-ENGR\CAD\03 FIRE STATION INT.1.0 COVER SHEET.DWG | PLOT DATE: 230620

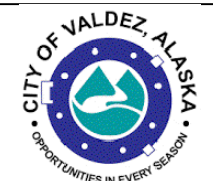
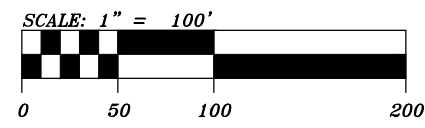


NOTE:

1. SITE PLAN DEVELOPED FROM SITE SURVEY OF VALDEZ FIRE STATION, PREPARED BY MCCLINTOCK LAND ASSOCIATES, INC, DATED 7/26/22.



1
C1.0 **SITE PLAN**
SCALE: 1" = 100'



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1	UPDATED STAIRS AND LANDING	230620

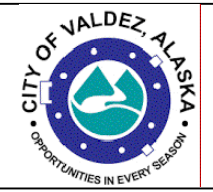
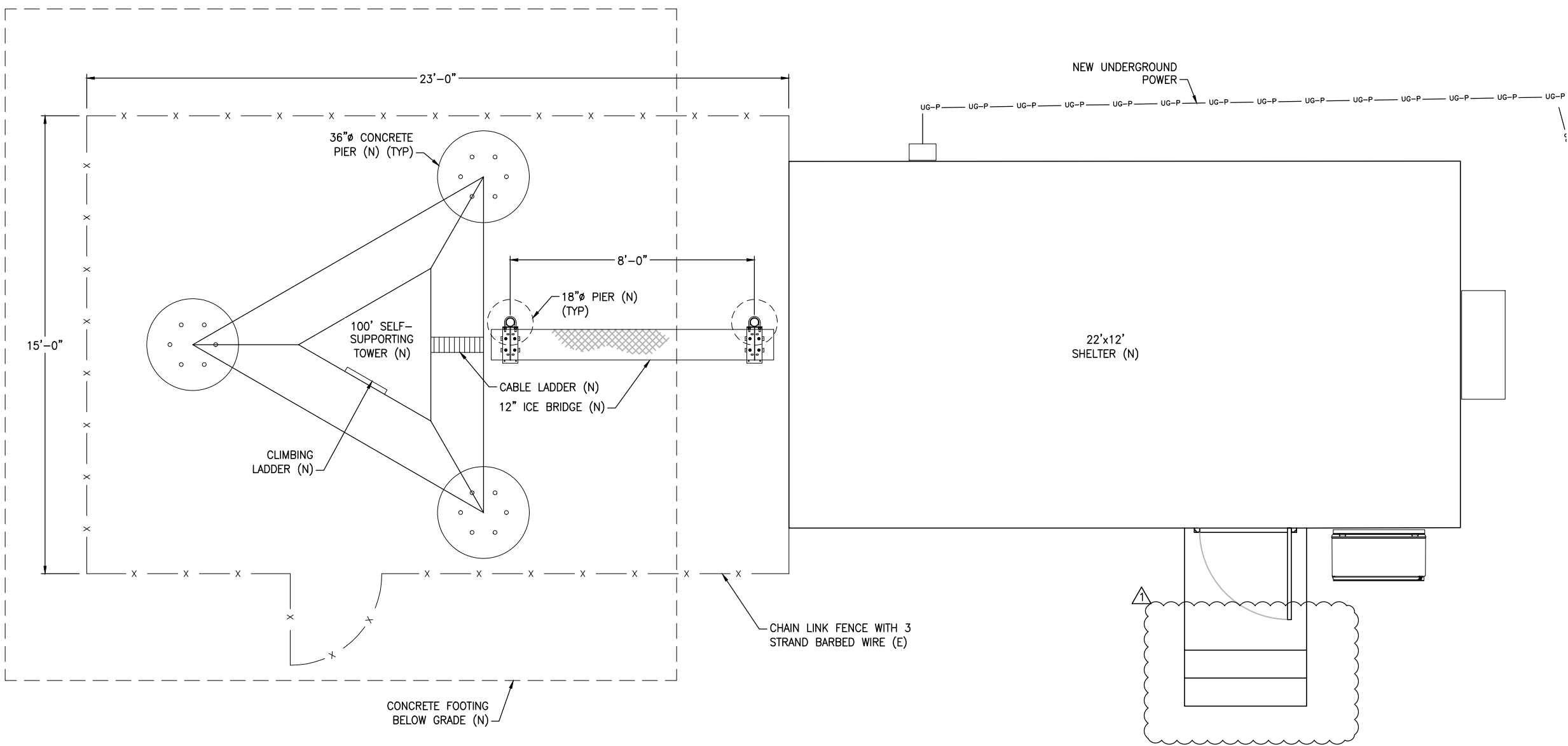
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JOB #: 22-0132-90-03			DATE: 230320

**SITE
PLAN**

C1.0

FILE: \\NHIT-FS02\OLDSHARES\ENGINEERING\22 JOBS\22-0132-90 CITY OF VALDEZ - RADIO NETWORK IMPROVEMENTS\PERMITTING & DESIGN\05-ENGR\CAD\03 FIRE STATION 1\0 SITE PLAN.DWG | PLOT DATE: 230620



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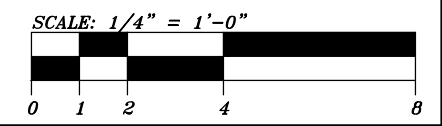
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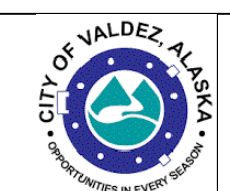
**ENLARGED
 SITE PLAN**

C1.1

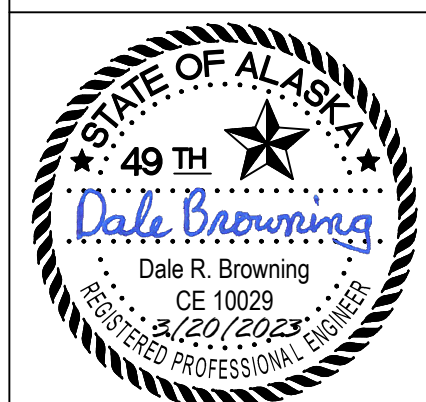
1
C1.1 ENLARGED SITE PLAN
 SCALE: 1/4" = 1'-0"



FILE: \\NHIT-FS02\OLDSHARES\ENGINEERING\22 JOBS\22-0132-90\CITY OF VALDEZ - RADIO NETWORK IMPROVEMENTS PERMITTING & DESIGN\05-ENGR\CAD03 FIRE STATION 1 ENLARGED SITE PLAN.DWG | PLOT DATE:



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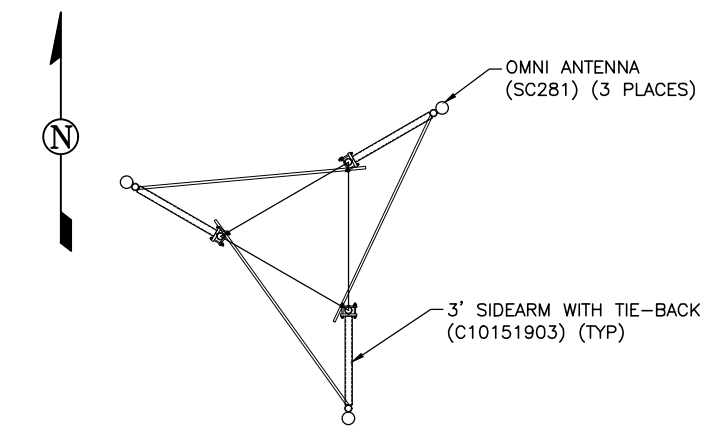
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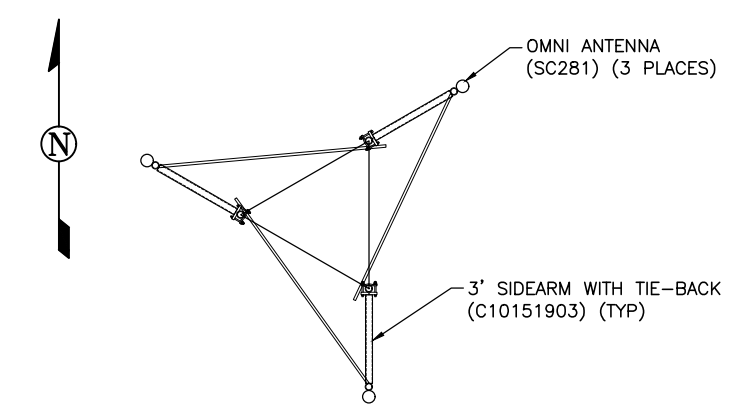
**TOWER
 ELEVATION**

C2.0

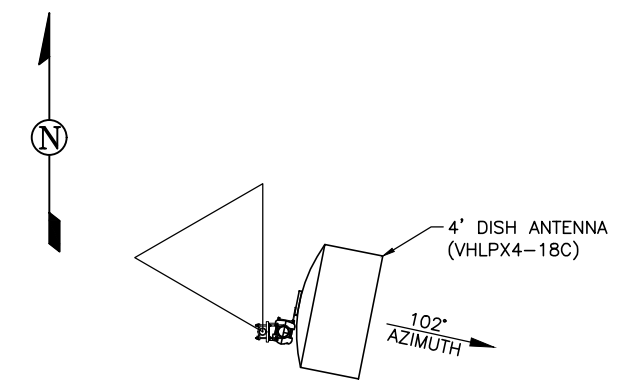
NOTES:
 1. ELEVATION VIEWS DO NOT ACCURATELY DEPICT EQUIPMENT ORIENTATION AND MAY NOT SHOW ALL EQUIPMENT.



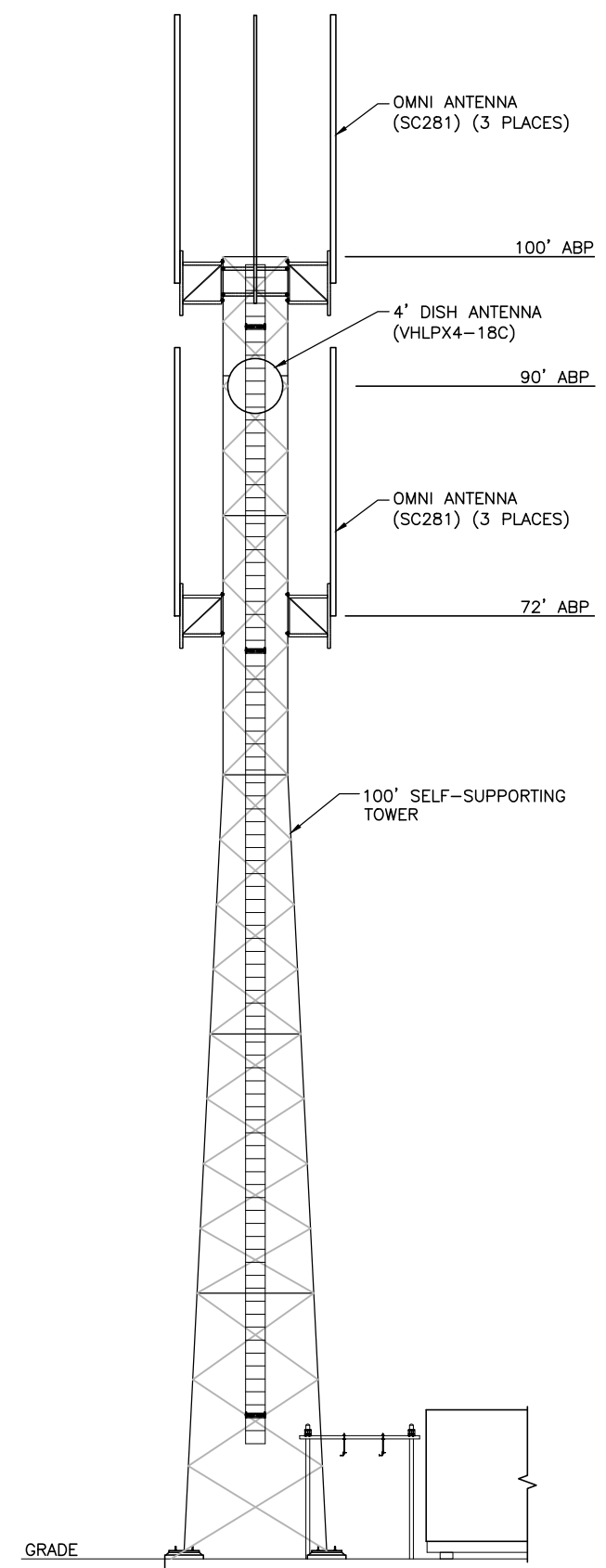
1
C2.0
ANTENNA LAYOUT - 100' ABP
 SCALE: NTS



2
C2.0
ANTENNA LAYOUT - 72' ABP
 SCALE: NTS



3
C2.0
ANTENNA LAYOUT - 90' ABP
 SCALE: NTS



A
C2.0
TOWER ELEVATION
 SCALE: NTS

FILE: \\NHIT-FS02\OLDSHARESENGINEERING\22 JOBS\22-0132-90 CITY OF VALDEZ - RADIO NETWORK IMPROVEMENTS PERMITTING & DESIGN\05-ENGR\CAD\03 FIRE STATION 1\02 TOWER ELEVATION.DWG | PLOT DATE: 2/23/2023

CONCRETE:

1. CONCRETE SHALL OBTAIN A 28-DAY COMPRESSIVE STRENGTH OF 4,500 PSI (F_c = 4,500 PSI). THE MIX SHALL CONTAIN A MINIMUM OF 6 SACKS CEMENT PER CUBIC YARD OF CONCRETE.
2. CEMENT SHALL CONFORM TO ASTM C150 TYPE I OR II.
3. AGGREGATE SHALL CONFORM TO ASTM C33. MAXIMUM AGGREGATE SIZE SHALL BE 3/4 INCH.
4. SLUMP SHALL BE BETWEEN 3 - 5 INCHES.
5. ADMIXTURE SHALL BE PROVIDED AS REQUIRED TO PROVIDE 4.5% - 7.5% AIR ENTRAINMENT WITH A MAXIMUM WATER/CEMENT RATIO OF 0.45.
6. CONCRETE SHALL BE KEPT FROM FREEZING FOR THE FIRST SEVEN DAYS AFTER PLACING. SURFACES TO RECEIVE CONCRETE SHALL BE NOT LESS THAN 40° F. THE TEMPERATURE OF THE CONCRETE WHEN PLACED SHALL NOT BE LESS THAN 50° F OR GREATER THAN 80° F.

REINFORCING STEEL:

1. ALL REINFORCING BARS SHALL BE DEFORMED AND CONFORM TO ASTM A615, GRADE 60.
2. ALL BOTTOM MAT REINFORCING BARS SHALL BE ACCURATELY PLACED AND SUPPORTED BY GALVANIZED METAL CHAIRS OR CONCRETE BLOCKS (WOODEN STAKES SHALL NOT BE USED).
3. MINIMUM CONCRETE COVER FOR REBAR WHERE CONCRETE IS PLACED IN DIRECT CONTACT WITH SOIL IS 3 INCHES CLEAR, FOR ALL OTHER FORMED SURFACES IS 1.5 INCHES.
4. ALL REBAR SPLICES SHALL BE LAPPED 48 BAR DIAMETERS.
5. PIER TIES (HOOPS) SHALL OVERLAP AT ENDS BY AT LEAST 6 INCHES AND SHALL TERMINATE WITH A STANDARD HOOK THAT ENGAGES A LONGITUDINAL BAR. OVERLAPS AT ENDS OF ADJACENT CIRCULAR TIES SHALL BE STAGGERED AROUND THE PERIMETER ENCLOSING THE LONGITUDINAL BAR.

STRUCTURAL STEEL:

1. ALL 3/4"Ø BOLTED CONNECTIONS TO HAVE A MINIMUM OF 1-1/2" EDGE DISTANCE TO CENTER OF HOLE, UNO. ALL 1/2"Ø BOLTED CONNECTIONS TO HAVE A MINIMUM OF 1-1/4" EDGE DISTANCE TO CENTER OF HOLE, UNO.
2. ALL BOLTED CONNECTIONS TO HAVE A MINIMUM OF 3" CENTER TO CENTER SPACING, UNO.
3. W12 BEAMS TO BE BOLTED WITH (3) 3/4" Ø BOLTS.
4. KNIFE PLATES TO BE 3/8" THICK AND WELDED TO MAIN BEAMS WITH 3/16" FILLET WELDS.
5. ALL BOLTS TO BE ASTM A325 WITH A563DH HEX NUTS AND F844 WASHERS, UNO. ALL FASTENERS TO BE GALVANIZED.
6. STRUCTURAL STEEL W BEAMS TO BE ASTM A992. PLATES TO BE ASTM A572 GR 50. ANGLES TO BE ASTM A36. ALL STRUCTURAL STEEL TO BE HOT DIPPED GALVANIZED OR COATED WITH TWO HEAVY COATS OF ZRC GALVILITE (OR EQUAL) COLD GALVANIZING PAINT AFTER FABRICATION AND TOUCH UP AFTER INSTALLATION AS REQUIRED.
7. ALL WELDS TO BE PERFORMED USING WELDERS AND PROCEDURES CERTIFIED BY AWS. USE E70XX FILLER MATERIAL.
8. GRATING TO BE HOT DIPPED GALVANIZED. ALL FIELD CUT EDGES TO BE COATED WITH ZRC GALVILITE, OR EQUAL.

TOWER FOUNDATION EARTHWORK:

1. EXCAVATE TO REMOVE SILTY, FROST SUSCEPTIBLE, LOOSE MATERIALS TO A DEPTH OF 10-12FT. THE EXCAVATION SHOULD EXTEND Laterally AWAY FROM THE BOTTOM EDGE OF THE FOUNDATION A DISTANCE EQUAL TO THE THICKNESS OF THE SOIL REMOVE.
2. BOTTOM OF EXCAVATION SHOULD BE OBSERVED BY AN EXPERIENCED ENGINEER TO DETERMINE IF ADDITIONAL EXCAVATION IS REQUIRED TO REMOVE UNSUITABLE SOILS OR ORGANICS.
3. BACKFILL EXCAVATION WITH TYPE IIA CLASSIFIED FILL (COVSS) AND COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D-1557 IN 10" TO 12" LIFTS. COMPACTED CLASSIFIED FILL SHALL EXTEND TO TOP OF SLAB FOOTING.
4. FILL ABOVE SLAB FOOTING CAN BE NATIVE SOILS WITHOUT ORGANIC MATERIALS. FILL TO BE COMPACTED TO 95% OF MAXIMUM DENSITY PER ASTM D-1557.

LUMBER:

1. DIMENSIONAL LUMBER TO BE DFL #2 OR BETTER.
2. INTERIOR FLOOR SHALL BE 1-1/8" T&G PLYWOOD GLUED AND SCREWED WITH 9 GA, 3" LG WOODSCREWS AT 6" O.C. ALL EDGES AND PANEL JOINTS BLOCKED AND 12" O.C. IN FIELD.
3. EXTERIOR WALL SHEATHING SHALL BE 1/2" OR 15/32" RATED STRUCTURAL 1, PS1 OR PS2 WITH SPAN RATING OF 32/16. SHEATHING SHALL BE FASTENED WITH 16GA X 1.5" STAPLES AT 6" O.C. AT BOUNDARY AND SHEATHING EDGES, ALL EDGES BLOCKED AND 12" O.C. IN FIELD.
4. INTERIOR WALL SHEATHING SHALL BE 5/8" OR 19/32" A-C, STRUCTURAL 1, PS1 OR PS2 WITH SPAN RATING OF 32/16. SHEATHING SHALL BE FASTENED WITH 16GA X 1.75" STAPLES AT 6" O.C. AT ALL BOUNDARY AND SHEATHING EDGES, ALL EDGES BLOCKED AND 12" O.C. IN FIELD.
5. INTERIOR CEILING SHEATHING, SHALL BE 5/8" OR 19/32" A-C, RATED STRUCTURAL 1, PS1 OR PS2 WITH SPAN RATING OF 32/16. FASTENED WITH 16GA X 1.75" STAPLES AT 6" O.C. AT BOUNDARY AND SHEATHING EDGES, ALL EDGES BLOCKED AND 12" O.C. IN FIELD.
6. EXTERIOR ROOF SHEATHING SHALL BE 3/4" OR 23/32" RATED STRUCTURAL 1, PS1 OR PS2 WITH SPAN RATING OF 48/24. FASTEN WITH 16GA X 1.75" NAILS AT 6" O.C. AT ALL BOUNDARY AND SHEATHING EDGES, ALL EDGES BLOCKED AND 12" O.C. IN FIELD.

TOWER FOUNDATION DESIGN CRITERIA:

STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES, ANTENNAS AND SMALL WIND TURBINE SUPPORT STRUCTURES (ANSI/TIA-222-H)
 EXPOSURE: D
 TOPO CATEGORY: 1
 RISK CATEGORY: III
 IMPORTANCE FACTOR: 1.15
 S_s: 1.5
 S₁: 0.77
 SOIL SITE CLASS: D
 SEISMIC DESIGN CATEGORY: E
 WIND SPEED: 141 MPH (ULTIMATE)
 RADIAL ICE: 1/2 IN

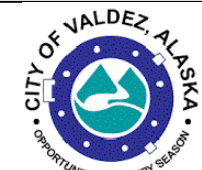
REACTIONS AT BASE OF TOWER

AXIAL LOAD: 18 KIPS
 TOTAL SHEAR: 32 KIPS
 O.T. MOMENT: 2,200 KIP-FT
 UPLIFT PER LEG: 220 KIP
 COMP PER LEG: 238 KIP
 SHEAR PER LEG: 20 KIP

ALLOWABLE SOIL BEARING PRESSURE: 5,000 PSF

GEOTECHNICAL ENGINEERING REPORT BY SHANNON & WILSON, INC, CITY OF VALDEZ-RADIO NETWORK IMPROVEMENTS - FIRE STATION 1, DATED 8-11-22

TOWER: SABRE INDUSTRIES 100' S3TL FIRE STATION 1, AK JOB: 513940, DATED 10/11/22



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DWN:JAA	DSN: DRB	APP: DRB	REV 0
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**STRUCTURAL
 NOTES**

S1.0

FILE: \\NHIT-FS02\OLD\SHARES\ENGINEERING\22 JOB\22-0132-90 CITY OF VALDEZ - RADIO NETWORK IMPROVEMENTS PERMITTING & DESIGN\05-ENGR\CAD\03 FIRE STATION 1\S1.0 STRUCTURAL NOTES.DWG | PLOT DATE: 2



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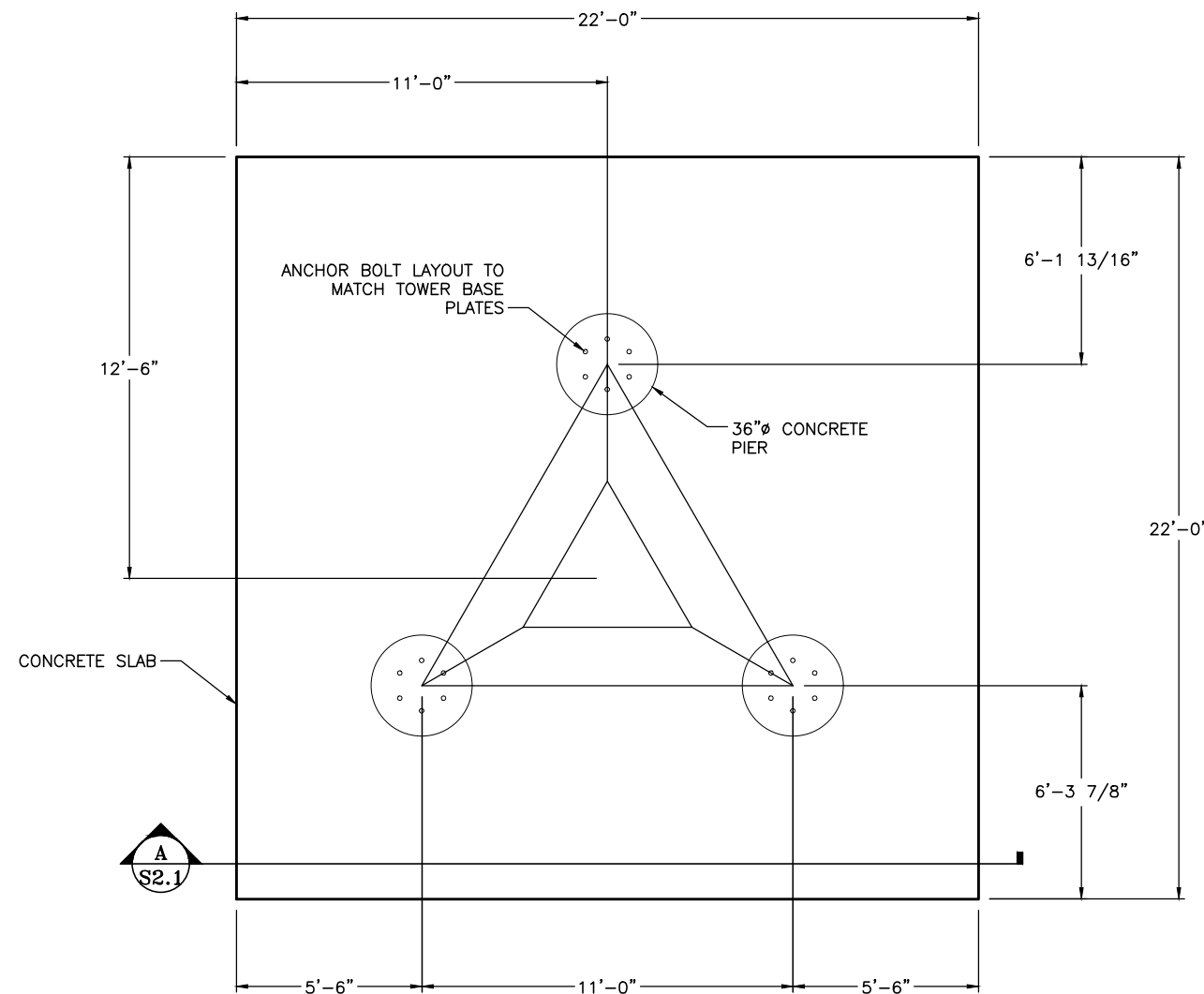
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**TOWER
 FOUNDATION
 PLAN**

S2.0



1
S2.0 **TOWER FOUNDATION PLAN**
 SCALE: 3/16" = 1'-0"

SCALE: 3/16" = 1'-0"



FILE: \\NHIT1-FS02\OLDSHARES\ENGINEERING\22 JOBS\22-0132-90 CITY OF VALDEZ - RADIO NETWORK IMPROVEMENTS PERMITTING & DESIGN\05-ENGR\CAD\03 FIRE STATION 1S2.0 TOWER FOUNDATION.DWG | PLOT DATE:



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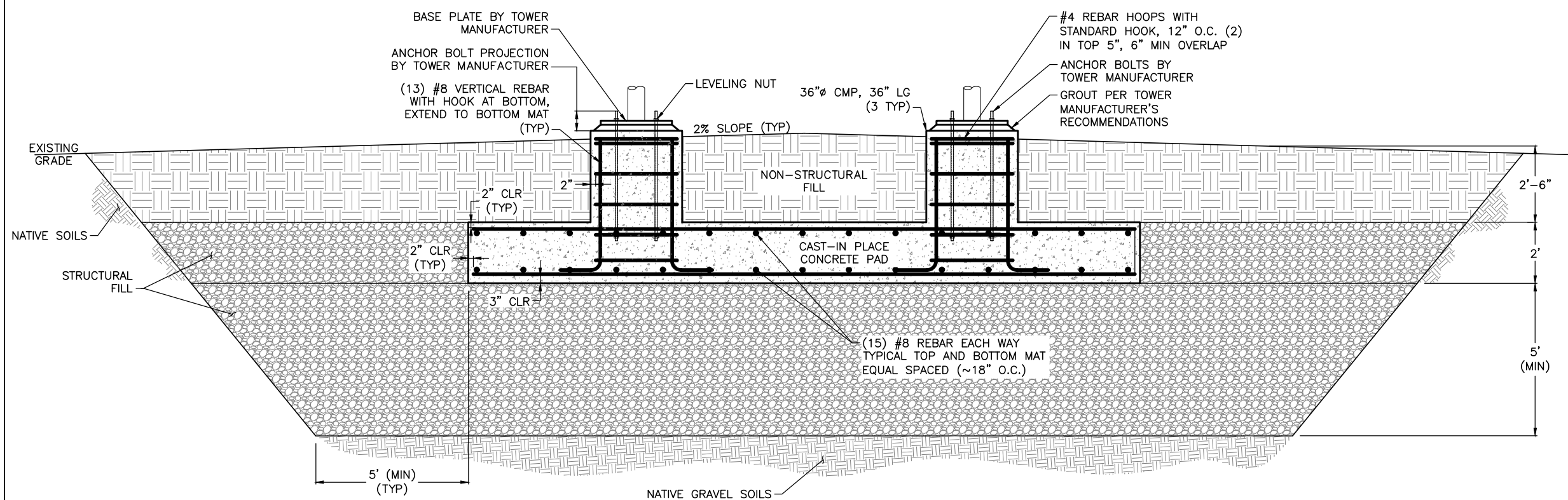
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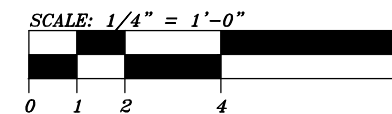
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TOWER
 FOUNDATION
 SECTION

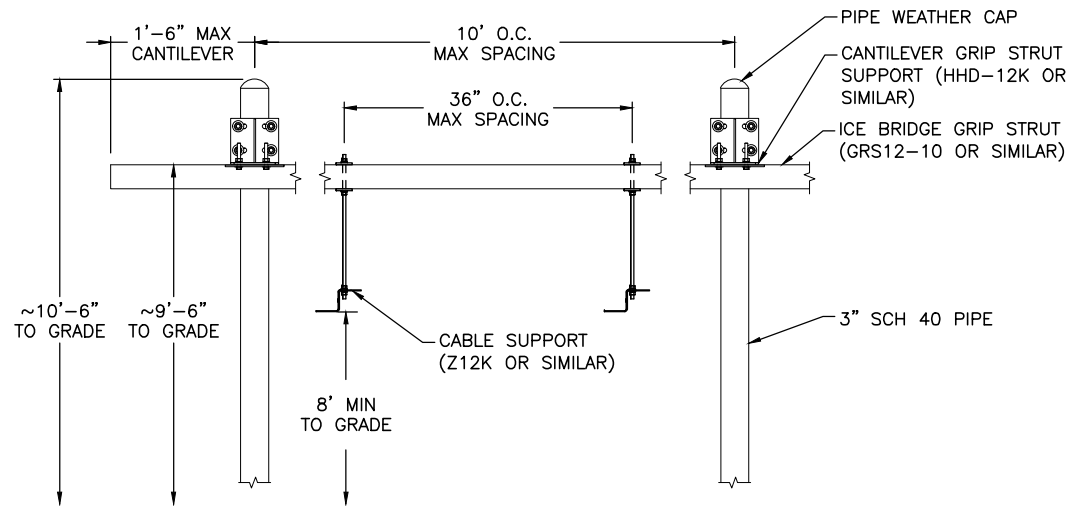
S2.1



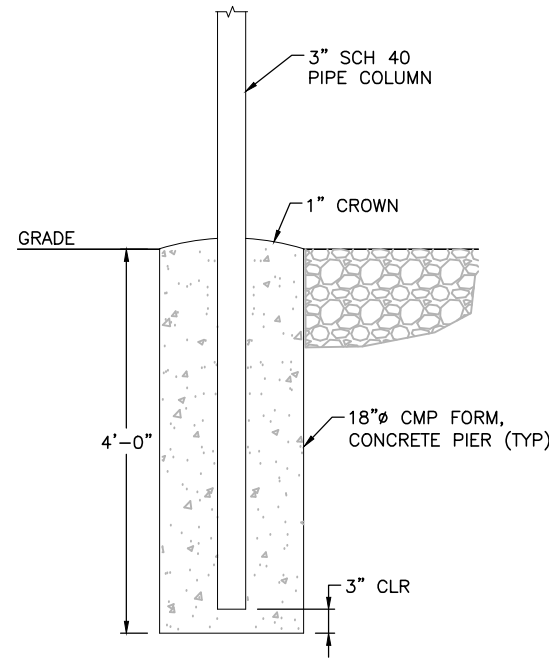
A
S2.1 TOWER FOUNDATION SECTION
 SCALE: 1/4" = 1'-0"



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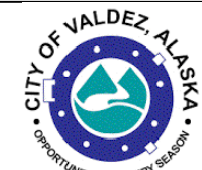
1 ICE BRIDGE DETAIL - SINGLE POST
S3.0 SCALE: NONE



2 ICE BRIDGE FOUNDATION DETAIL
S3.0 SCALE: NONE

NOTES:

1. PART NUMBERS REFERENCED IN PARENTHESIS ARE FROM VALMONT SITE PRO 1.
2. ALL STEEL COMPONENTS TO BE HOT DIPPED GALVANIZED.
3. FOUNDATION DESIGNED FOR 10' MAXIMUM SPACING BETWEEN ICE BRIDGE SUPPORTS.
4. IF TOP OF EXISTING TOWER CONCRETE FOUNDATION IS LESS THAN 42" BELOW GRADE, ICE BRIDGE FOUNDATION CAN BE SHORTENED WITH BOTTOM OF ICE BRIDGE FOUNDATION PLACED ON TOP OF TOWER FOUNDATION AND THE ICE BRIDGE FOUNDATION SECURED TO THE EXISTING TOWER FOUNDATION WITH (4) #4 REBAR 24" LONG EMBEDDED 4 INCHES INTO TOWER FOUNDATION AND SECURED WITH HILTI HIT HY200 OR EQUAL.



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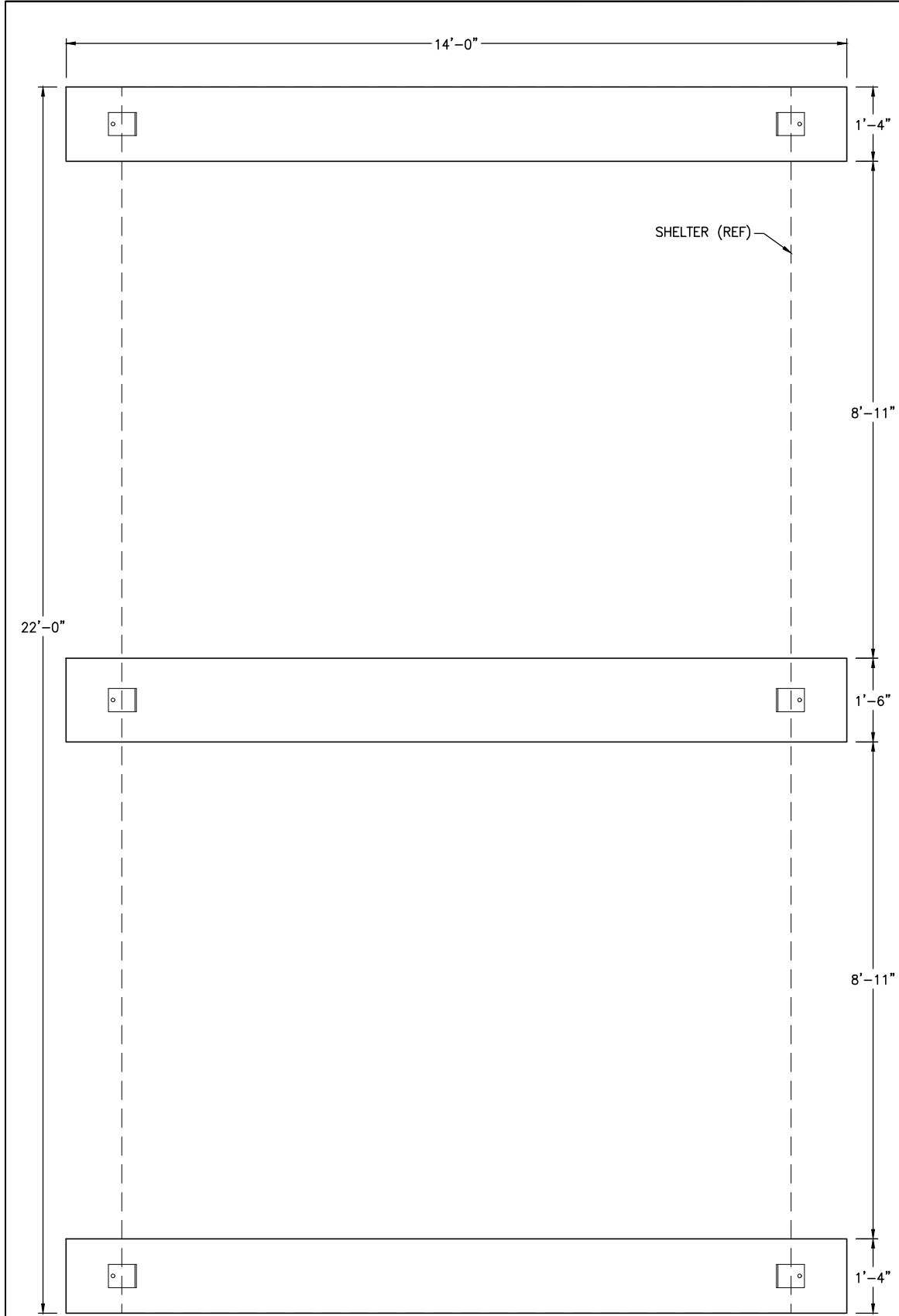
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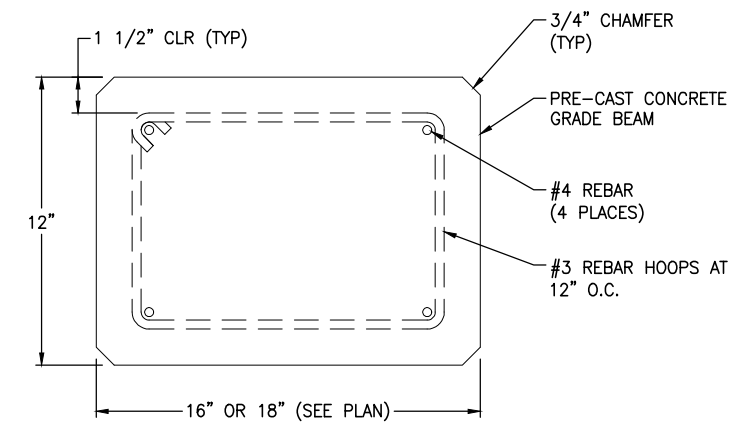
**ICE BRIDGE
DETAILS**

S3.0

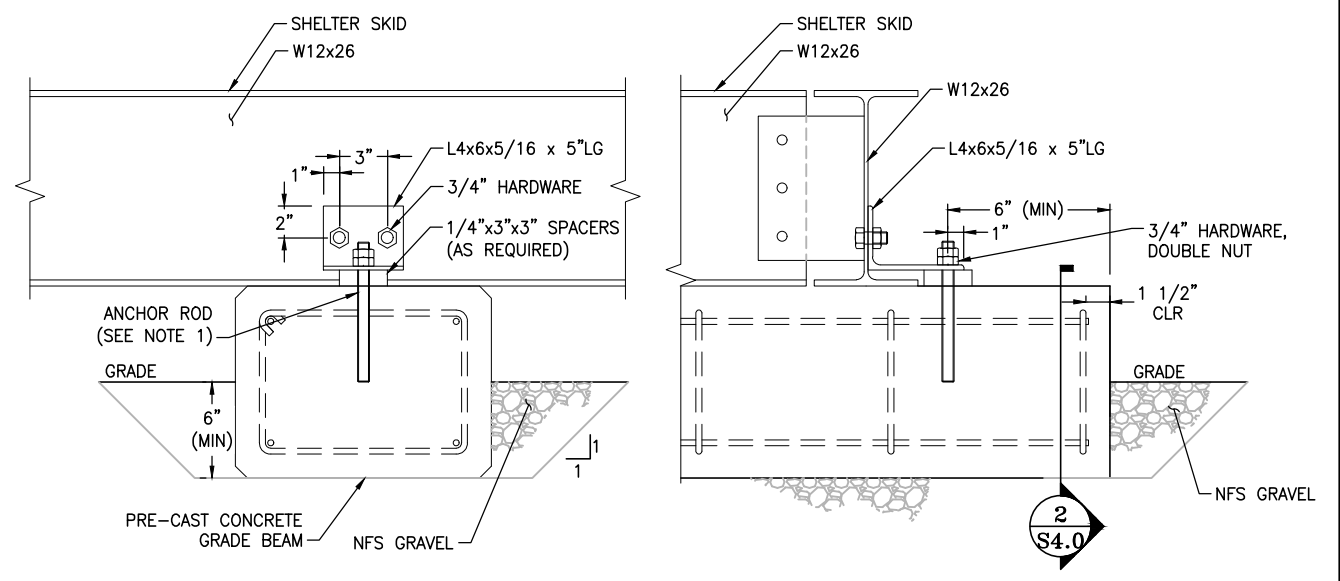


1
S4.0 GRADE BEAM LAYOUT
SCALE: 3/8" = 1'-0"

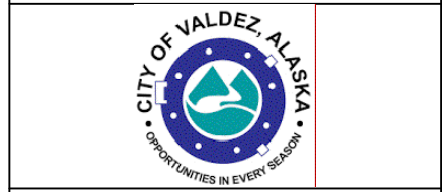
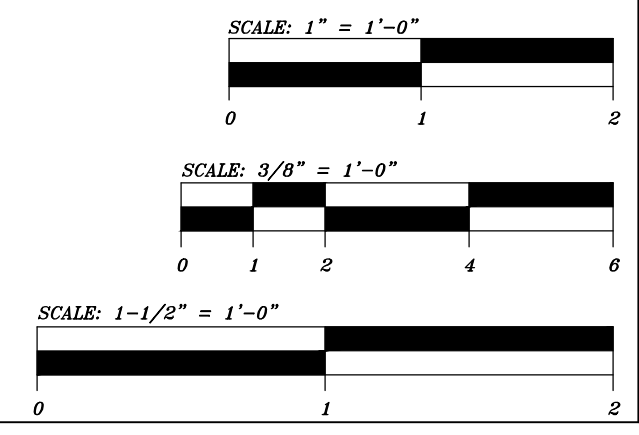
NOTE:
1. 3/4"x9" ASTM F1554 GR 36 HDG, THREADED ROD EMBEDDED 6", HIT-HY 200 V3.



2
S4.0 GRADE BEAM DETAIL
SCALE: 1-1/2" = 1'-0"



3
S4.0 SKID TO GRADE BEAM ATTACHMENT DETAIL
SCALE: 1" = 1'-0"



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IFC

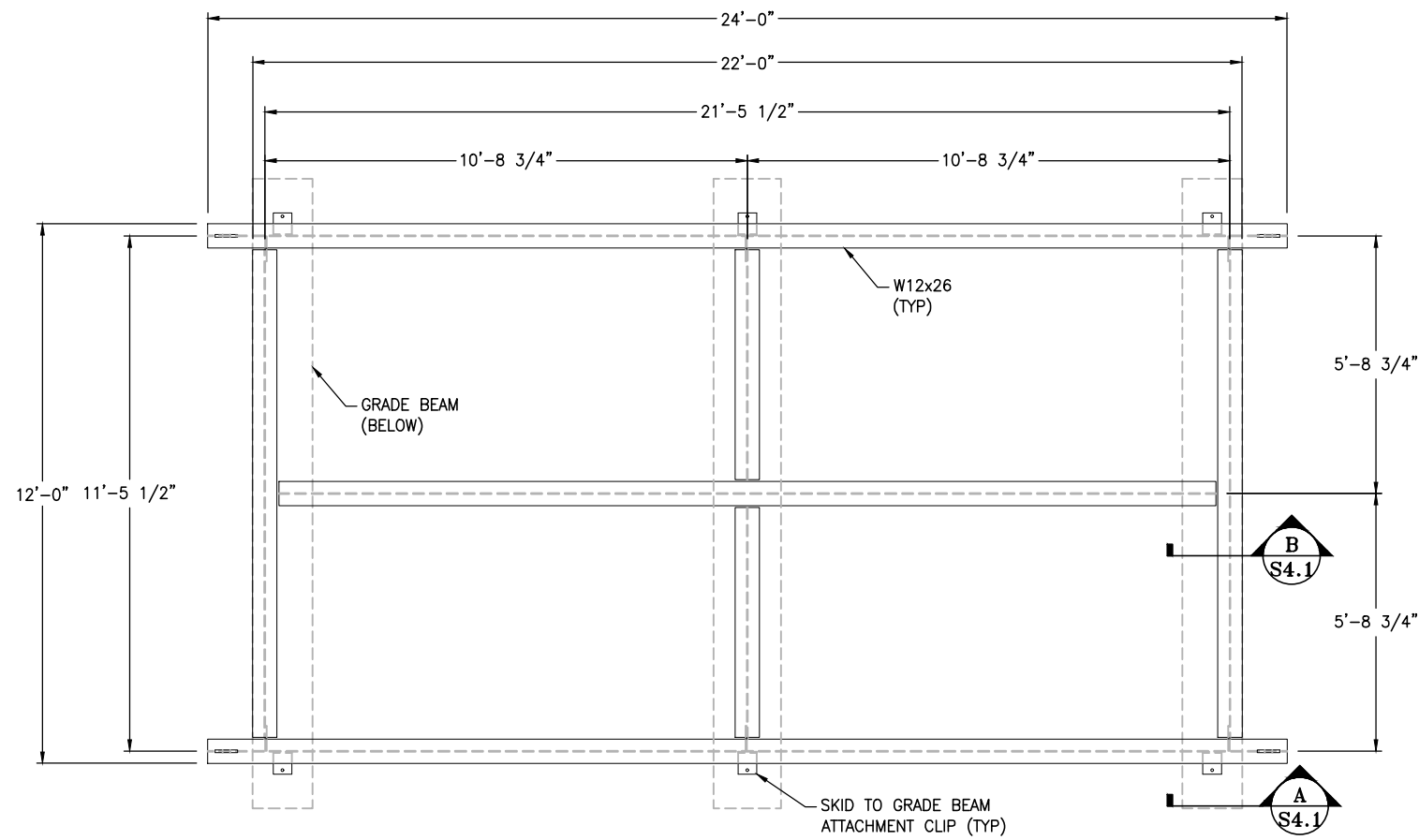
REV	DESCRIPTION	DATE
0	ISSUE FOR CONSTRUCTION	230320

CITY OF VALDEZ
RADIO
INFRASTRUCTURE
UPGRADE
FIRE STATION 1 SITE

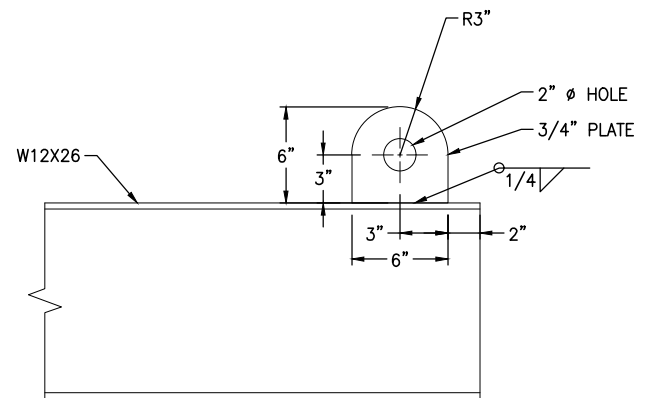
DWN: JAA	DSN: DRB	APP: DRB	REV: 0
JOB #: 22-0132-90-03			DATE: 230320

SHELTER GRADE BEAMS
S4.0

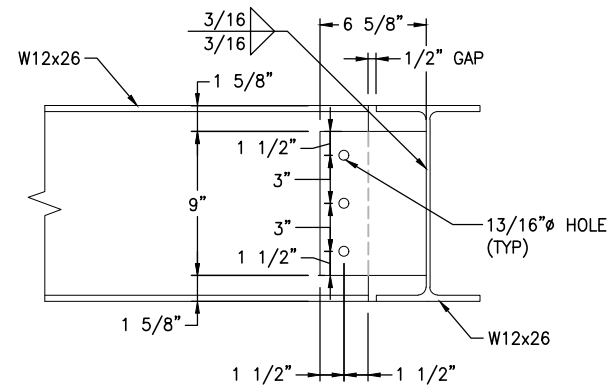
FILE: \\NHIT-FS02\OLDSHARES\ENGINEERING\22 JOBS\22-0132-90 CITY OF VALDEZ - RADIO NETWORK IMPROVEMENTS\PERMITTING & DESIGN\05-ENGR\CAD\03 FIRE STATION 1\S4.0 SHELTER GRADE BEAMS.DWG | PLOT DATA



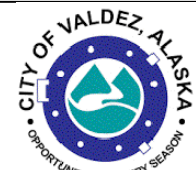
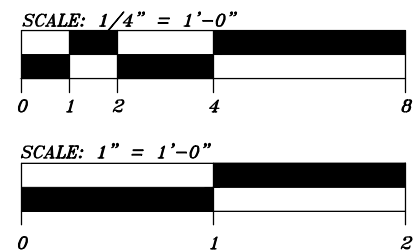
1
S4.1 SHELTER SKID
SCALE: 1/4" = 1'-0"



A
S4.1 LIFTING EYE DETAIL
SCALE: 1" = 1'-0" (TYPICAL)



B
S4.1 W12x26 BEAM CONNECTION
SCALE: 1" = 1'-0" (TYPICAL)



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**CITY OF VALDEZ
RADIO
INFRASTRUCTURE
UPGRADE
FIRE STATION 1 SITE**

DWN: JAA	DSN: DRB	APP: DRB	REV 0
JOB #: 22-0132-90-03			DATE: 230320

**SHELTER
SKID**

S4.1

FILE: \\NHIT-FS02\OLDSHARES\ENGINEERING\22 JOBS\22-0132-90 CITY OF VALDEZ - RADIO NETWORK IMPROVEMENTS\PERMITTING & DESIGN\05-ENGR\CAD\03 FIRE STATION 1\S4.1 SHELTER SKID.DWG | PLOT DATE: 230320

NOTES:

1. ADJACENT RACKS ARE TO BE CONNECTED TOGETHER AT THEIR TOPS OR ALONG THEIR SIDES.
2. DOOR: 36"x84" INSULATED METAL DOOR WITH PAINTED STEEL THERMAL BREAK FRAME AND LOCKABLE HARDWARE. SUBMIT VENDOR DATA TO OWNER FOR APPROVAL PRIOR TO PURCHASE.



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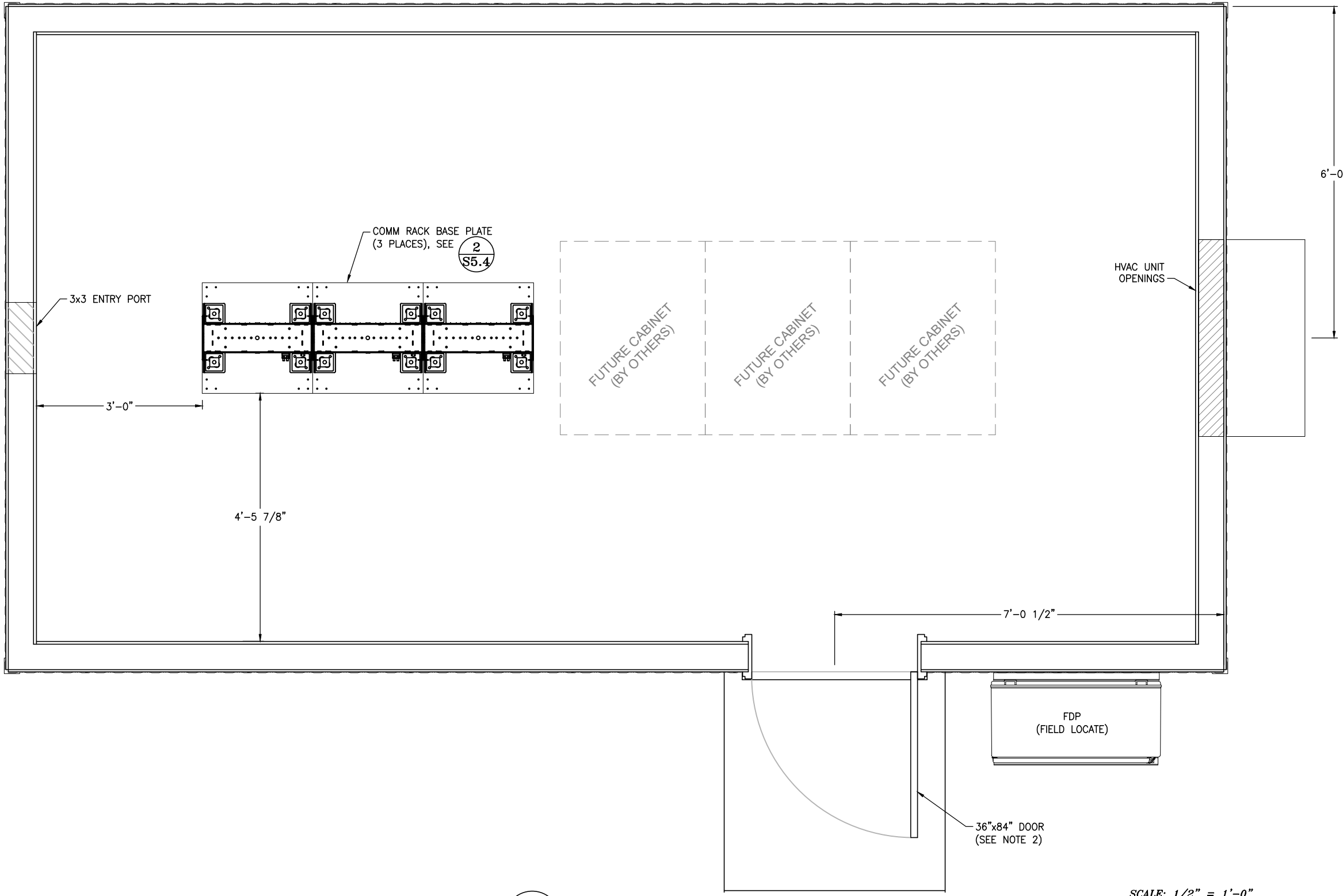
REV	DESCRIPTION	DATE
0	ISSUE FOR CONSTRUCTION	230320

**CITY OF VALDEZ
 RADIO
 INFRASTRUCTURE
 UPGRADE
 FIRE STATION 1 SITE**

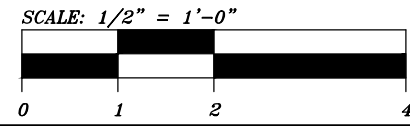
DWN: JAA	DSN: DRB	APP: DRB	REV 0
JOB #: 22-0132-90-03			DATE: 230320

**SHELTER FLOOR
 PLAN**

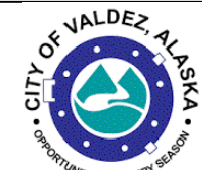
S5.0



1
SHELTER FLOOR PLAN
 SCALE: 1/2" = 1'-0"



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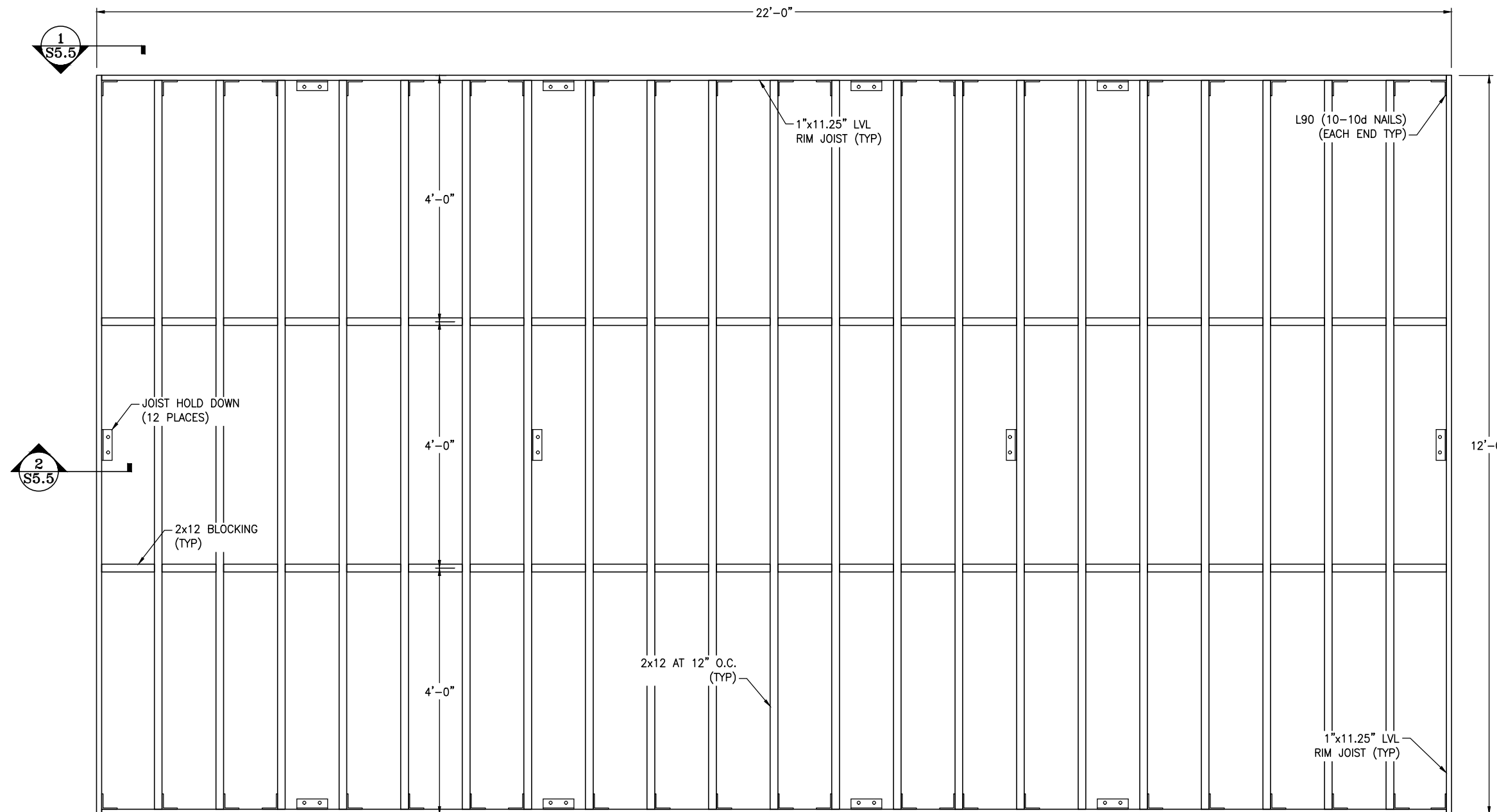
REV	DESCRIPTION	DATE
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**CITY OF VALDEZ
 RADIO
 INFRASTRUCTURE
 UPGRADE
 FIRE STATION 1 SITE**

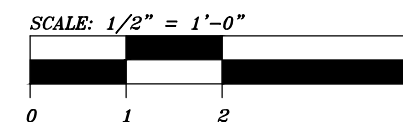
DWN: JAA	DSN: DRB	APP: DRB	REV 0
JOB #: 22-0132-90-03			DATE: 230320

**SHELTER FLOOR
 JOIST LAYOUT**

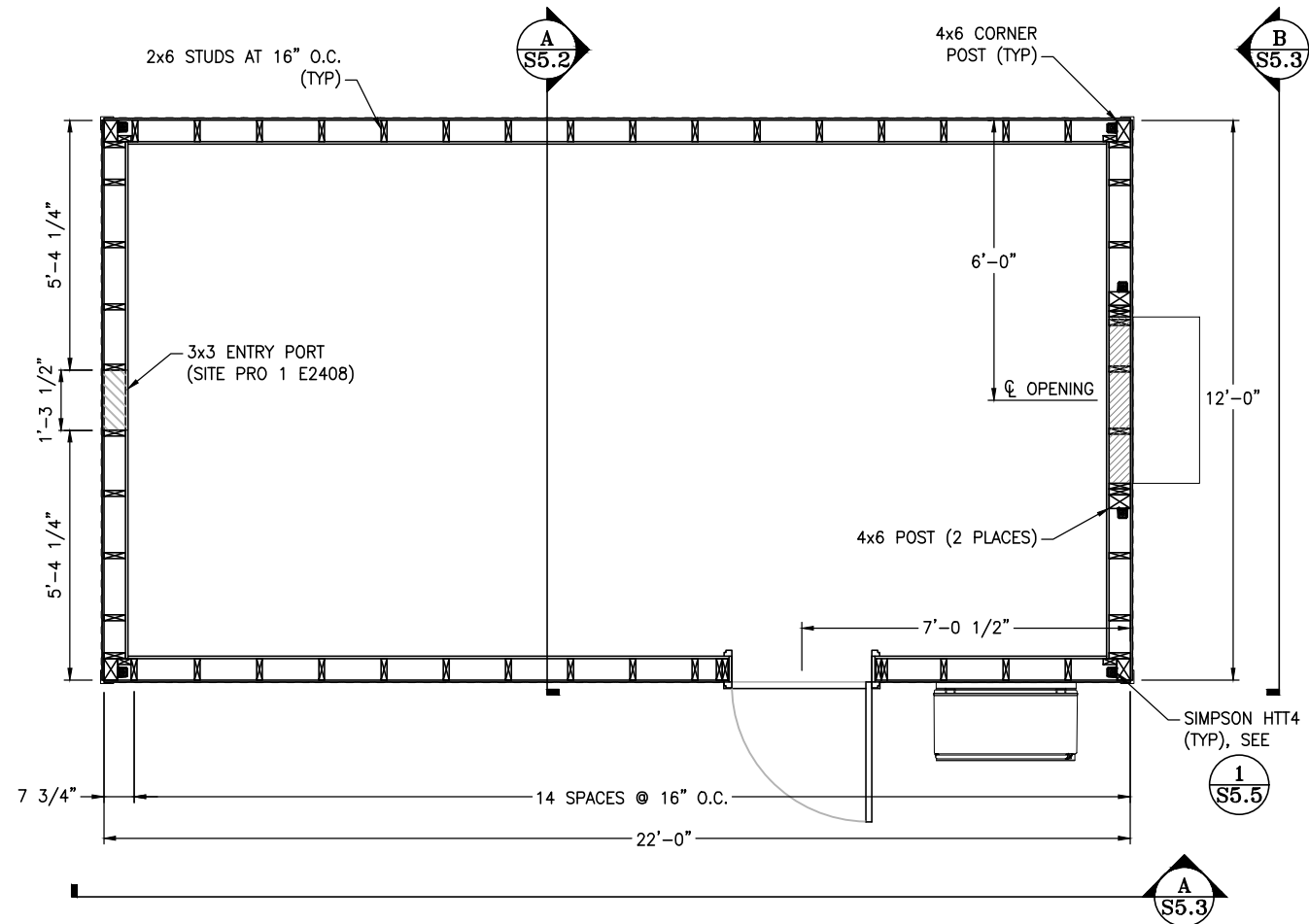
S5.1



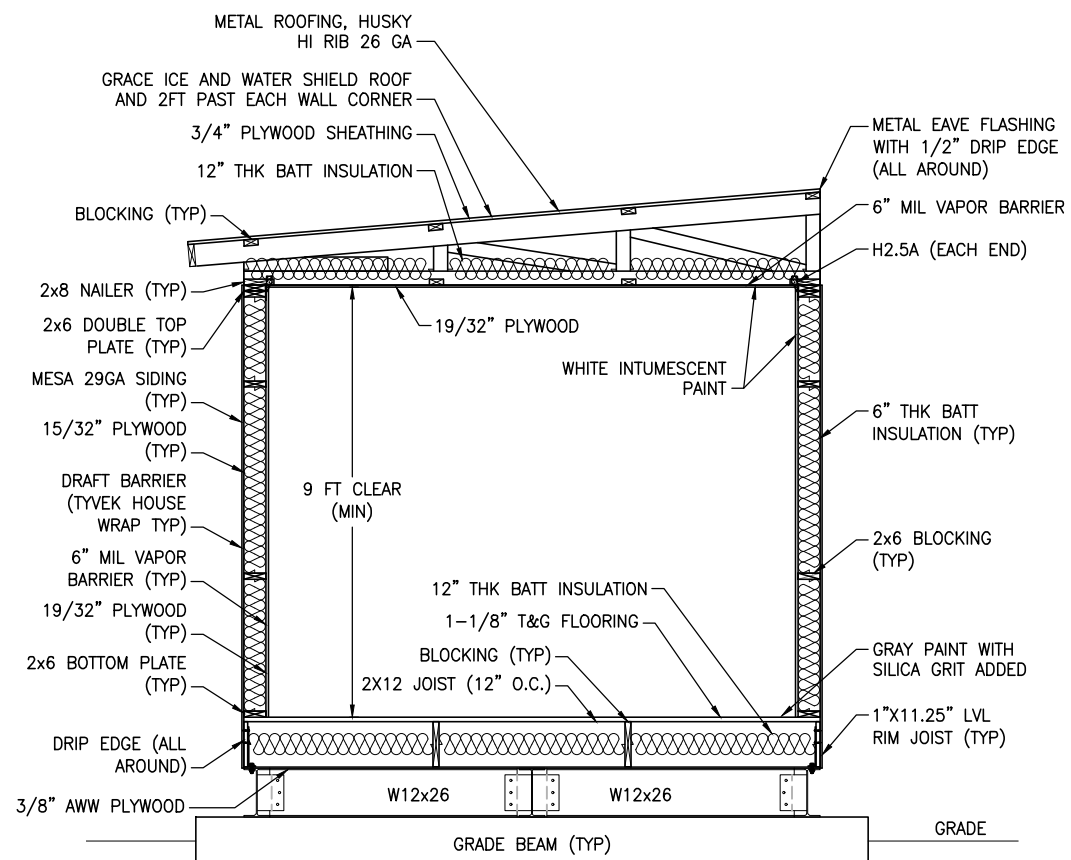
1 FLOOR JOIST LAYOUT
 S5.1 SCALE: 1/2" = 1'-0"



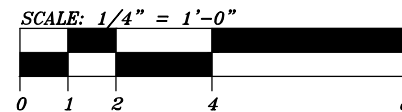
FILE: \\NHIT-FS02\OLD\SHARES\ENGINEERING\22 JOBS\22-0132-90\CITY OF VALDEZ - RADIO NETWORK IMPROVEMENTS\PERMITTING & DESIGN\05-ENGR\CAD\03 FIRE STATION 1\SS.1 SHELTER FLOOR JOIST LAYOUT.DWG IPL



1
S5.2 **FRAMING PLAN**
SCALE: 1/4" = 1'-0"
(DIMENSIONS TO FACE OF STUD)

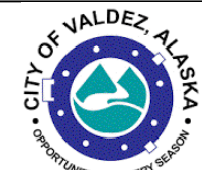


A
S5.2 **SECTION**
SCALE: 1/4" = 1'-0"



NOTES:

1. SLOPE ROOF 1:12 FROM FRONT TO BACK. WITH 12 INCH OVERHANG AT BACK.
2. TRUSS DESIGN: TOP CHORD DL = 10 PSF. BOTTOM CHORD DL = 15 PSF, TOP CHORD ROOF SNOW LOAD 160 PSF. SPACE TRUSSES AT 16" O.C. PROVIDE 12" ENERGY HEEL.
3. EXTERIOR PLYWOOD EXTENDS FROM BOTTOM OF FLOOR JOIST TO TOP OF ROOF TRUSS.
4. SECURE TRIM, FLASHING, ROOF AND WALL PANELS WITH #12 SCREWS AT 6" O.C. ALL BUILDING EDGES, 12" O.C. ALL PANEL EDGES AND 18" O.C. IN FIELD.



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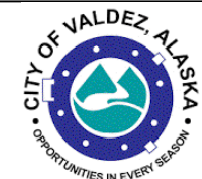
REV	DESCRIPTION	DATE
0	ISSUE FOR CONSTRUCTION	230320

**CITY OF VALDEZ
RADIO
INFRASTRUCTURE
UPGRADE
FIRE STATION 1 SITE**

DWN:JAA	DSN: DRB	APP: DRB	REV
JOB #: 22-0132-90-03			DATE: 230320
			0

**SHELTER FRAMING
PLAN AND BUILDING
SECTION**

S5.2



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**CITY OF VALDEZ
 RADIO
 INFRASTRUCTURE
 UPGRADE
 FIRE STATION 1 SITE**

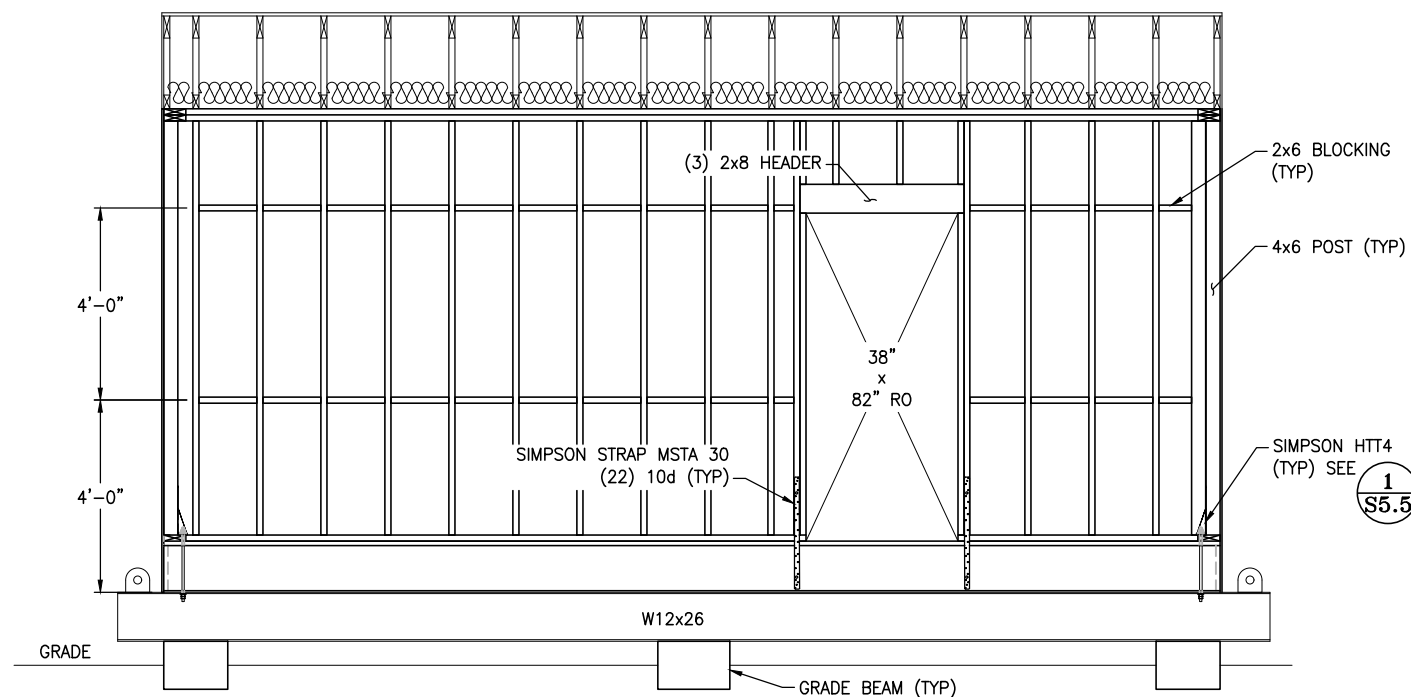
DWN: JAA	DSN: DRB	APP: DRB	REV
JOB #: 22-0132-90-03	DATE: 230320		0

**SHELTER
 FRAMING
 ELEVATIONS**

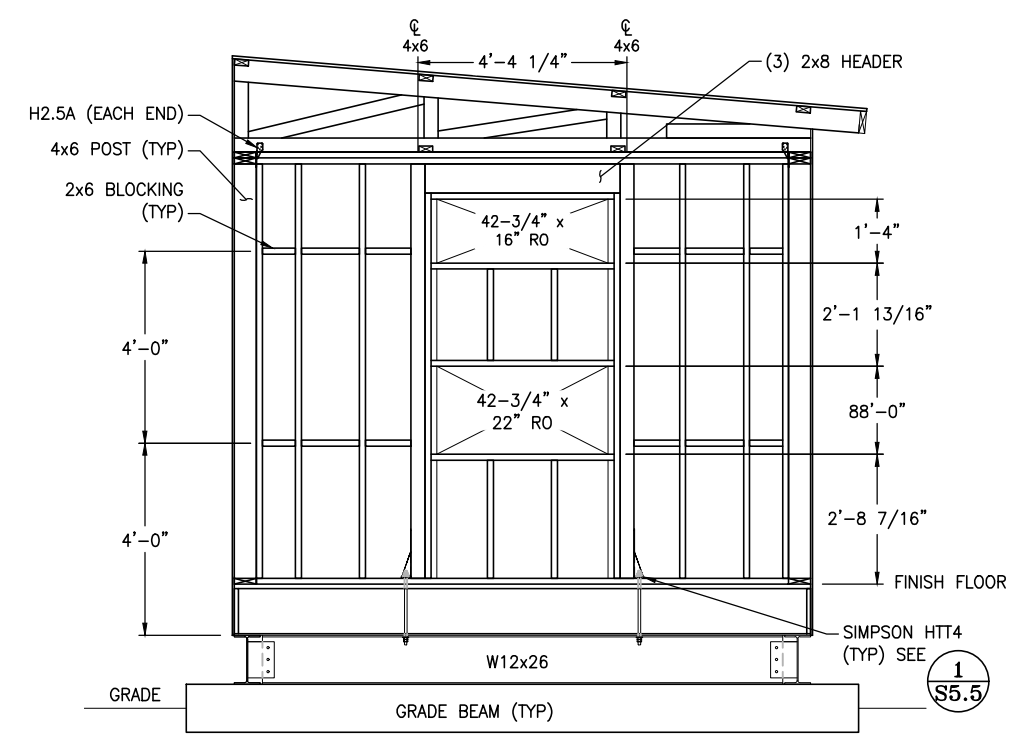
S5.3

NOTES:

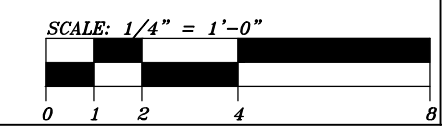
1. SLOPE ROOF 1:12 FROM FRONT TO BACK. WITH 12 INCH OVERHANG AT BACK.
2. TRUSS DESIGN: TOP CHORD DL = 10 PSF. BOTTOM CHORD DL = 15 PSF, TOP CHORD ROOF SNOW LOAD 160 PSF. SPACE TRUSSES AT 16" O.C. PROVIDE 12" ENERGY HEEL.
3. EXTERIOR PLYWOOD EXTENDS FROM BOTTOM OF FLOOR JOIST TO TOP OF ROOF TRUSS.



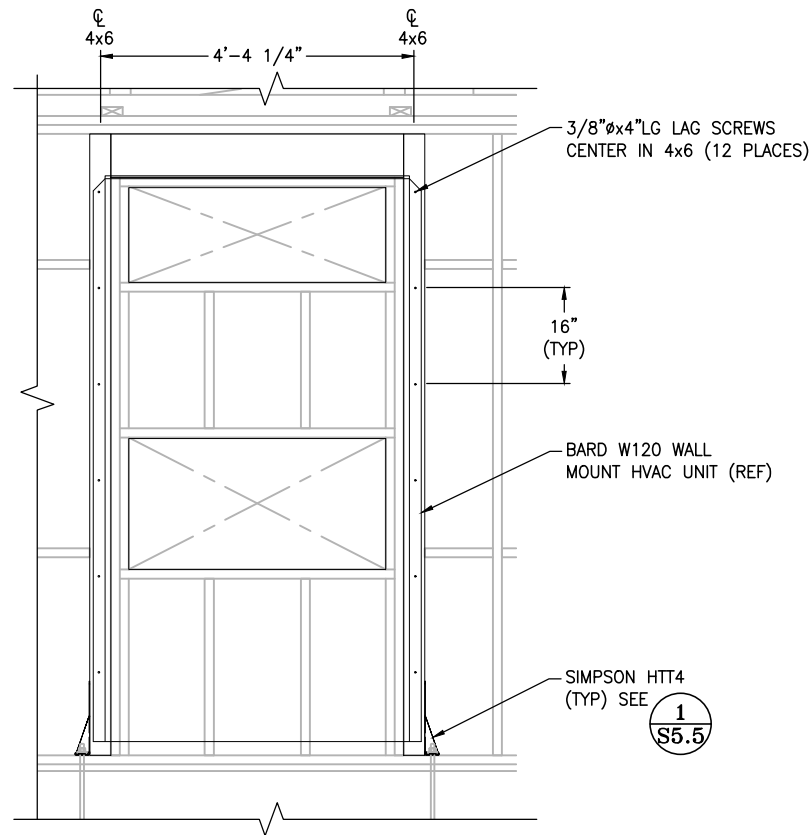
A FRONT ELEVATION
 S5.3 SCALE: 1/4" = 1'-0"



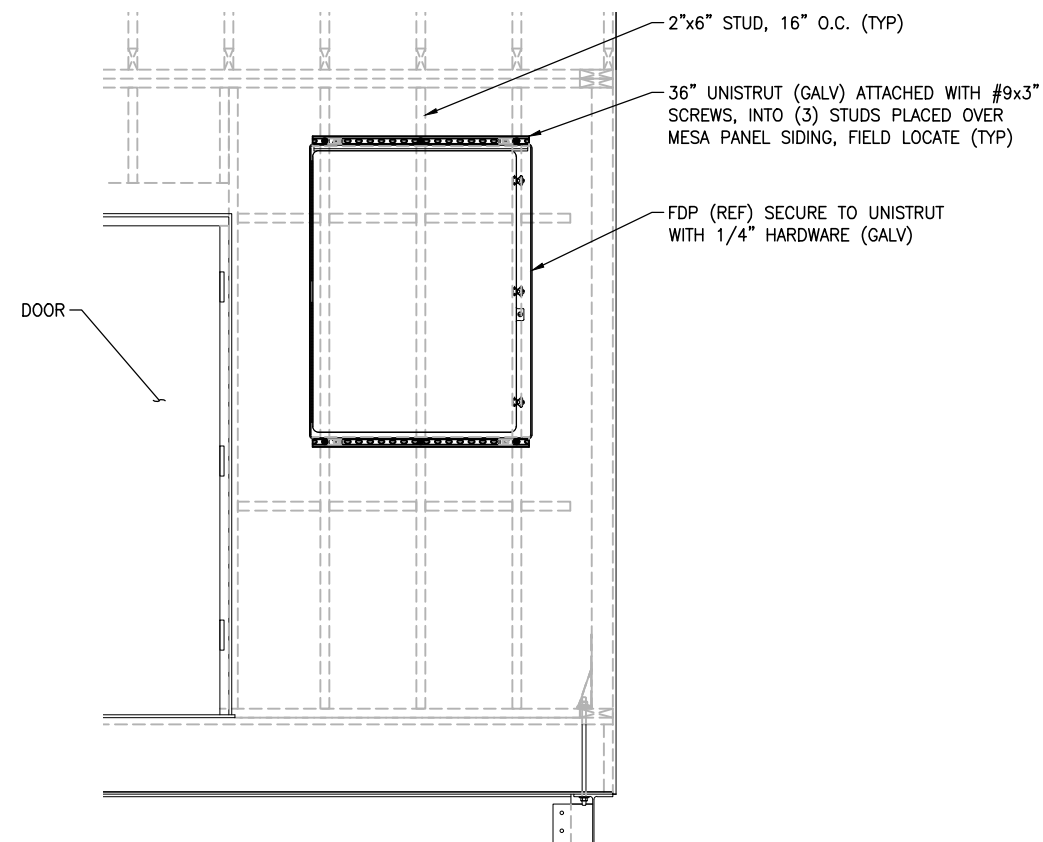
B RIGHT ELEVATION
 S5.3 SCALE: 1/4" = 1'-0"



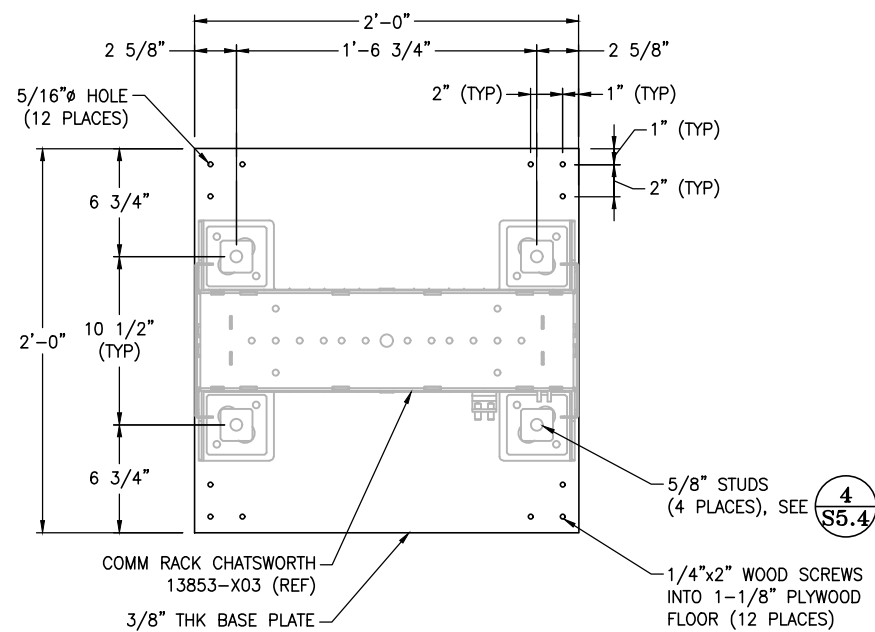
FILE: \\NHIT-FS02\OLD\SHARES\ENGINEERING\22 JOBS\22-0132-90\CITY OF VALDEZ - RADIO NETWORK IMPROVEMENTS PERMITTING & DESIGN\05-ENGR\CAD03 FIRE STATION ASS.3 SHELTER FRAMING ELEVATIONS.DWG | 1P



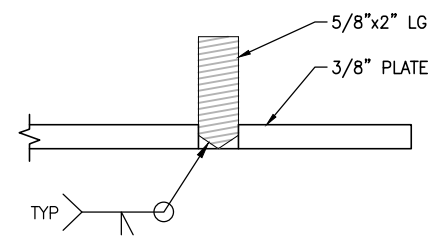
1 BARD UNIT MOUNTING
S5.4 SCALE: NTS



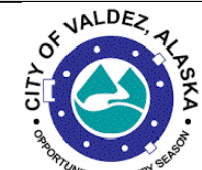
3 FDP UNIT MOUNTING
S5.4 SCALE: NTS



2 COMM RACK BASE PLATE
S5.4 SCALE: NTS



4 BASE PLATE ANCHOR DETAIL
S5.4 SCALE: NTS



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0	ISSUE FOR CONSTRUCTION	230320

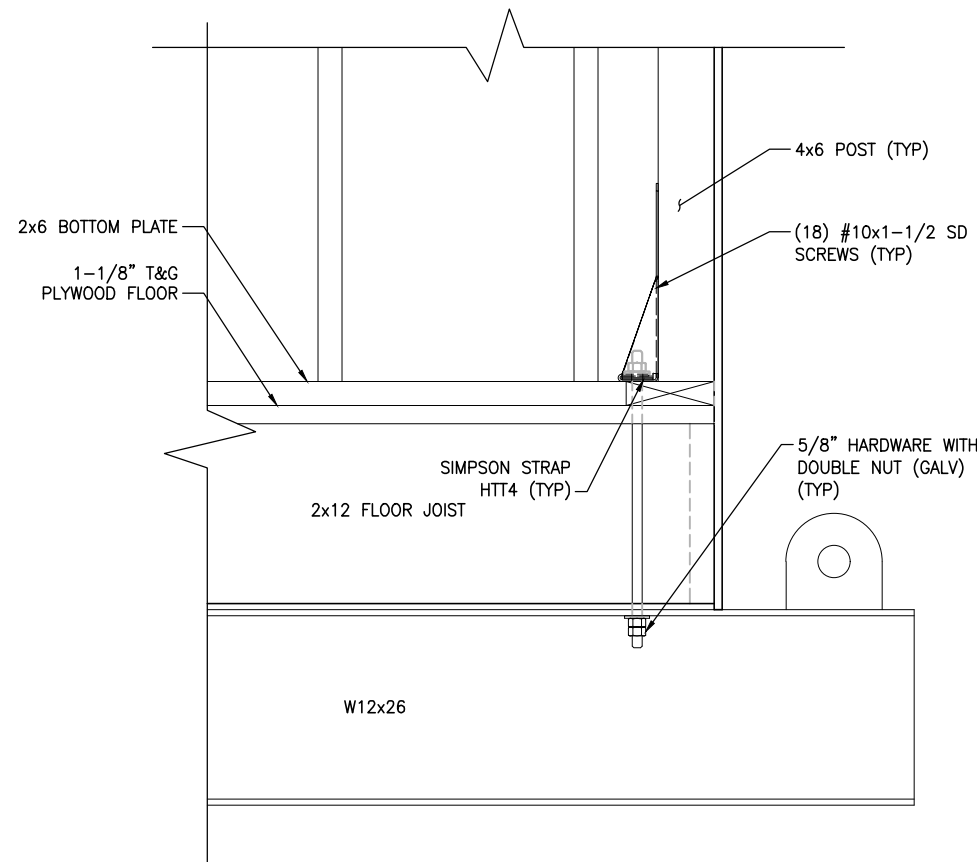
**CITY OF VALDEZ
RADIO
INFRASTRUCTURE
UPGRADE
FIRE STATION 1 SITE**

DWN: JAA	DSN: DRB	APP: DRB	REV 0
JOB #: 22-0132-90-03			DATE: 230320

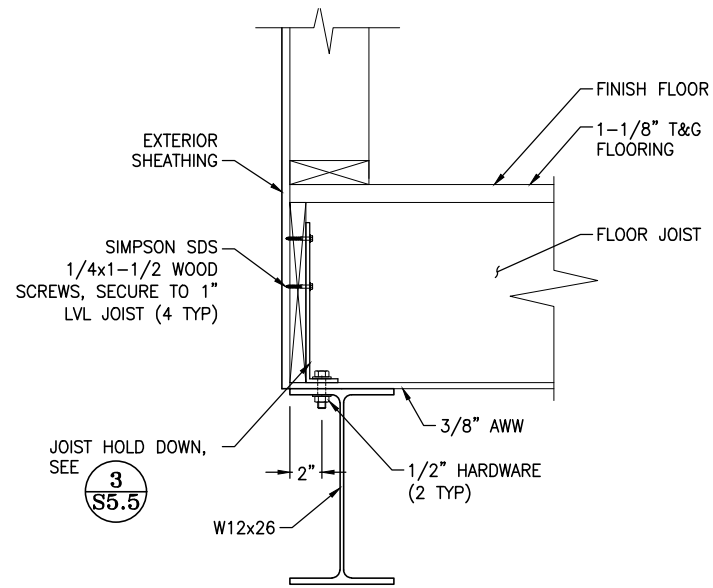
**EQUIPMENT
MOUNTING
DETAILS**

S5.4

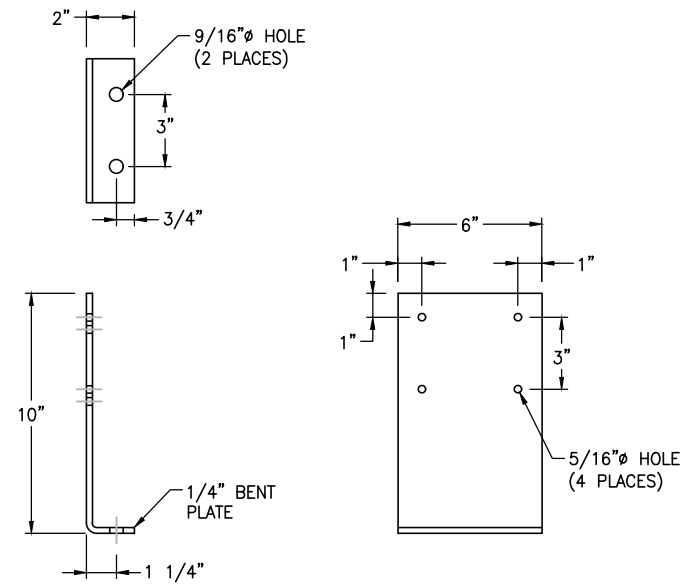
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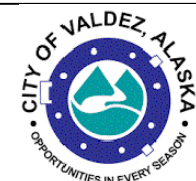
1 **HTT4 HOLD DOWN BRACKET**
S5.5 SCALE: NTS



2 **JOIST ATTACHMENT DETAIL**
S5.5 SCALE: NTS



3 **JOIST HOLD DOWN**
S5.5 SCALE: NTS



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**CITY OF VALDEZ
RADIO
INFRASTRUCTURE
UPGRADE
FIRE STATION 1 SITE**

DWN: JAA	DSN: DRB	APP: DRB	REV 0
JOB #: 22-0132-90-03			DATE: 230320

**SHELTER
ATTACHMENT
DETAILS**

S5.5

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REV	DESCRIPTION	DATE
0	ISSUE FOR CONSTRUCTION	230320
1	UPDATED STAIRS AND LANDING	230620

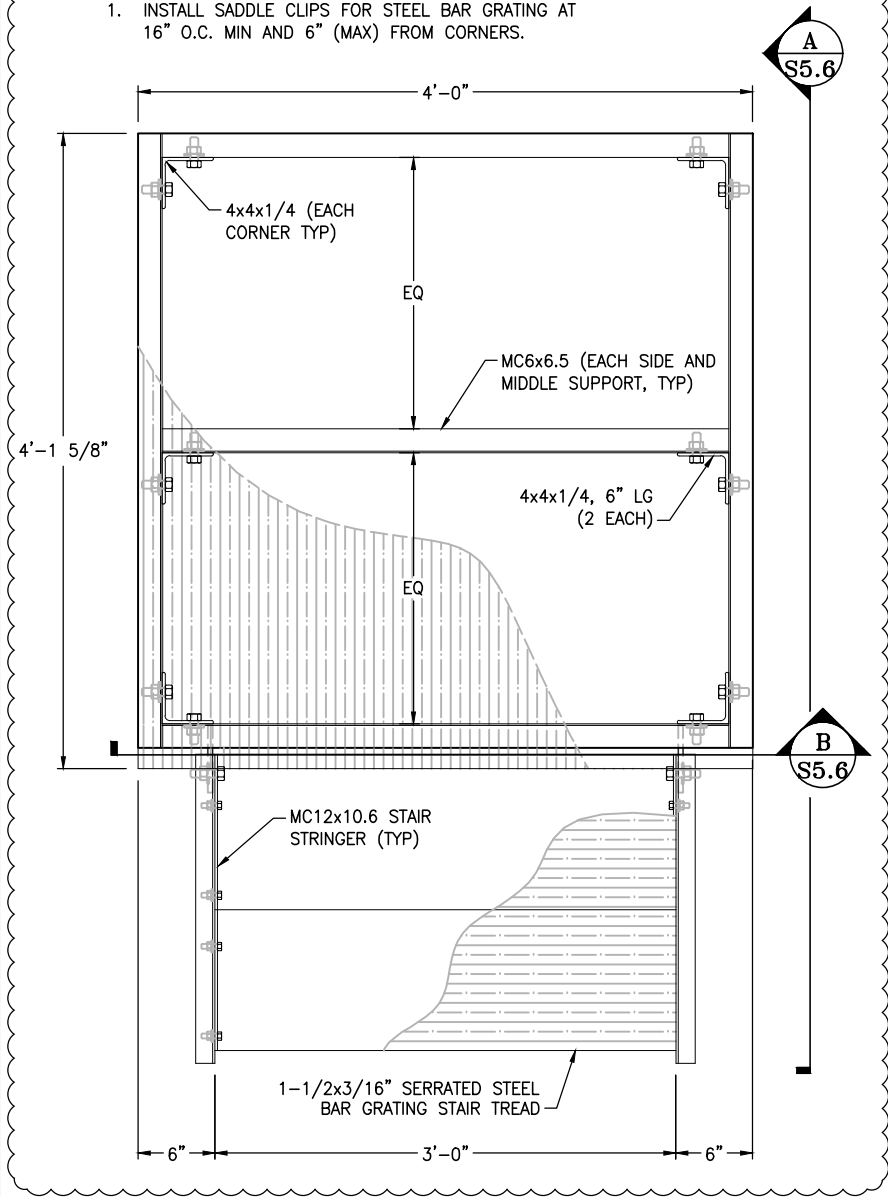
**CITY OF VALDEZ
 RADIO
 INFRASTRUCTURE
 UPGRADE
 FIRE STATION 1 SITE**

DWN:JAA	DSN: DRB	APP: DRB	REV 1
JOB #: 22-0132-90-03			DATE: 230320

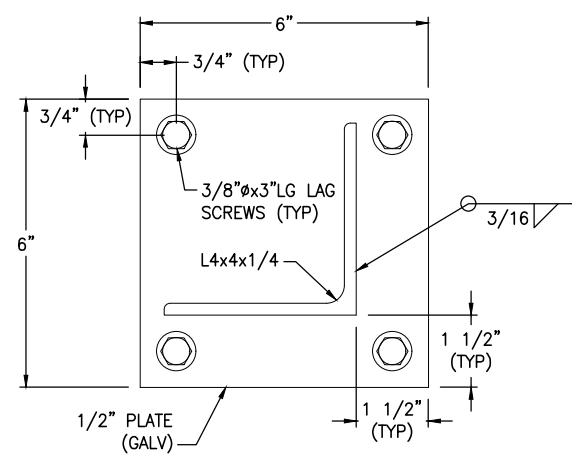
**STAIR AND
 LANDING DETAILS**

NOTE:

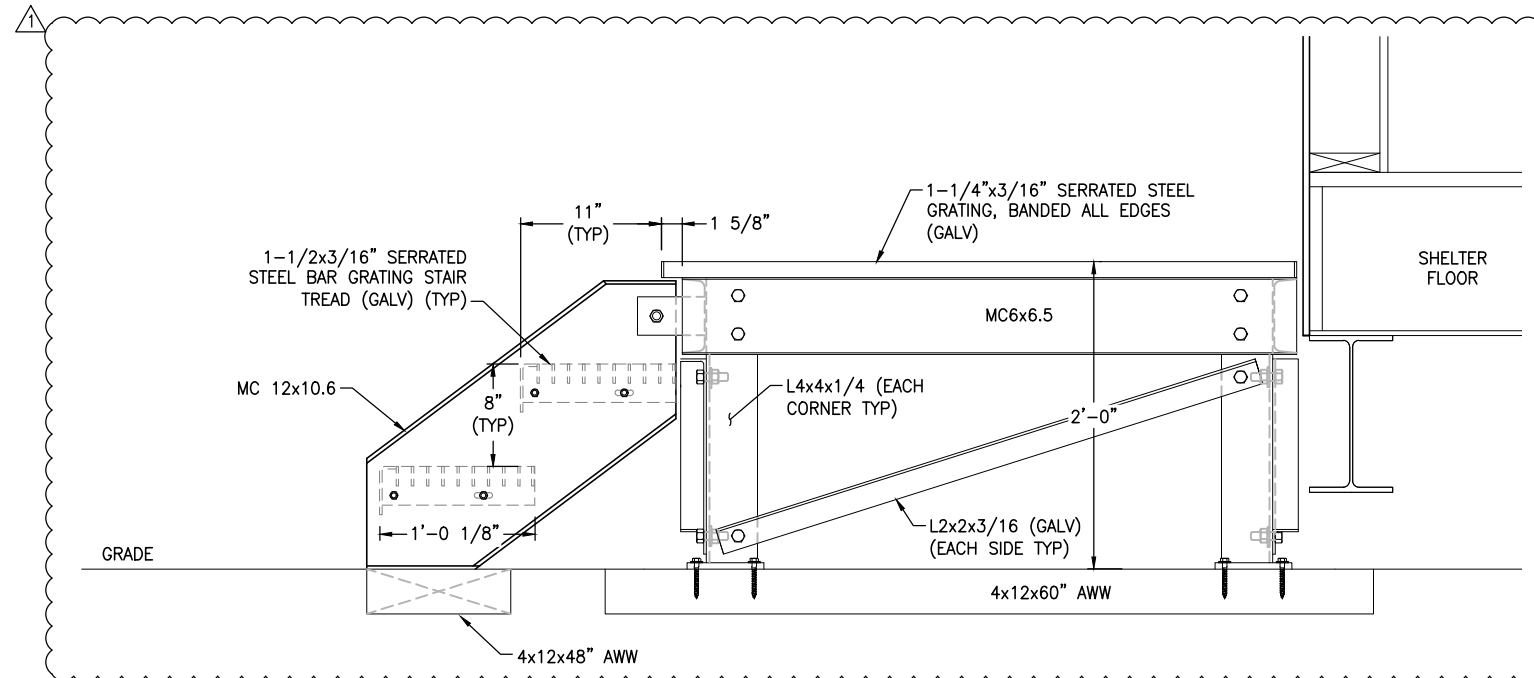
1. INSTALL SADDLE CLIPS FOR STEEL BAR GRATING AT 16" O.C. MIN AND 6" (MAX) FROM CORNERS.



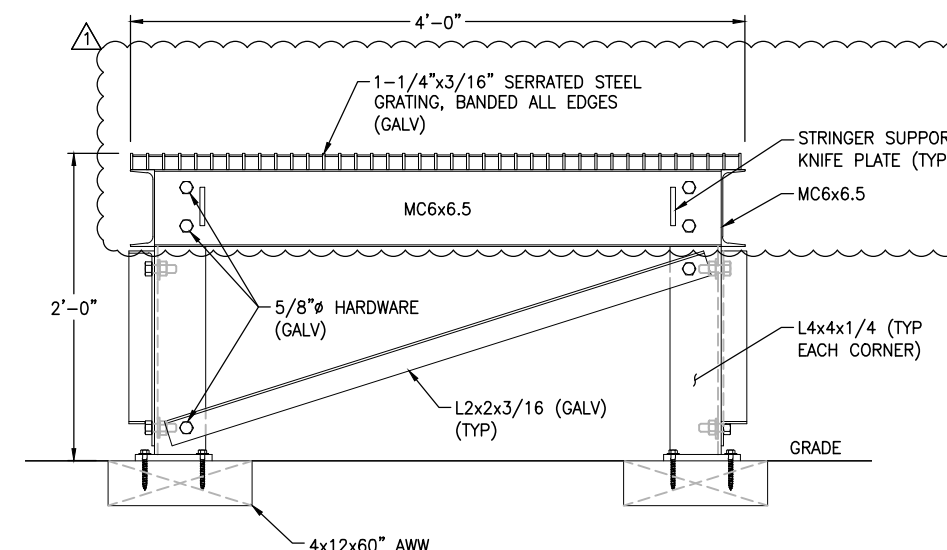
1 LANDING PLAN VIEW
 S5.6 SCALE: NTS



2 LANDING BASEPLATE
 S5.6 SCALE: NTS



A STAIR AND LANDING ELEVATION
 S5.6 SCALE: NTS



B LANDING ELEVATION
 S5.6 SCALE: NTS

ANTENNA MOUNTING:

- DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO CURRENT ANSI/TIA-222 OR APPLICABLE LOCAL CODES.
- ALL ANTENNA MOUNTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS NOTED OTHERWISE.
- ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT DIP) ON IRON AND STEEL HARDWARE", UNLESS NOTED OTHERWISE.
- DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.

TORQUE REQUIREMENTS:

- ALL RF CONNECTIONS SHALL BE TIGHTENED TO THE MANUFACTURER RECOMMENDED TORQUE.

COAXIAL CABLE NOTES:

- TYPES AND SIZES OF THE ANTENNA CABLES ARE BASED ON ESTIMATED LENGTHS. PRIOR TO ORDERING CABLE, CONTRACTOR SHALL VERIFY ACTUAL LENGTH BASED ON CONSTRUCTION LAYOUT AND NOTIFY THE PROJECT MANAGER IF ACTUAL LENGTHS EXCEED ESTIMATED LENGTHS.
- CONTRACTOR SHALL CONFIRM COAX COLOR CODING PRIOR TO CONSTRUCTION.
- ALL COAXIAL CABLES SHALL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE, IN AN APPROVED MANNER, AT DISTANCES NOT TO EXCEED 4'-0" ON-CENTER.
- CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS REGARDING BOTH THE INSTALLATION AND GROUNDING OF ALL COAXIAL CABLES, AND CONNECTORS.
- CONTRACTOR SHALL PROVIDE STRAIN-RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES, COAX CABLES AND RET CONTROL CABLES. CABLE STRAIN-RELIEFS AND CABLE SUPPORTS SHALL BE APPROVED FOR THE INTENDED PURPOSE. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
- ALL COAXIAL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUND KITS. FOLLOW THE CABLE MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS FOR THE APPLICABLE GROUND KIT. COAXIAL CABLE SHALL BE GROUNDED AT:
 - GROUNDED AT THE ANTENNA LEVEL.
 - GROUNDED AT MID LEVEL, TOWERS WHICH ARE OVER 200'-0", ADDITIONAL CABLE GROUNDING REQUIRED.
 - GROUNDED AT BASE OF TOWER PRIOR TO TURNING HORIZONTAL.
 - GROUNDED OUTSIDE THE EQUIPMENT SHELTER AT ENTRY PORT.
 - GROUNDED INSIDE THE EQUIPMENT SHELTER AT THE ENTRY PORT.

GENERAL CABLE AND EQUIPMENT NOTES:

- CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ANTENNA AND COAX CONFIGURATION, MAKE AND MODELS PRIOR TO INSTALLATION.
- EACH END OF EVERY COAXIAL, HYBRID, AND CONTROL CABLES SHALL BE LABELED AND COLOR-CODED BY INSULATION OR WITH ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL).
- CONTRACTOR TO INSTALL COAXIAL CABLES AND GROUND WIRES WITH CUSHION HANGERS PER CABLE MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
- ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC SHALL BE INSTALLED PER TOWER MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
- CONTRACTOR SHALL REFERENCE THE TOWER STRUCTURAL ANALYSIS/DESIGN DRAWINGS FOR DIRECTIONS ON CABLE DISTRIBUTION/ROUTING.
- ALL EXISTING OUTDOOR RF CONNECTORS/CONNECTIONS SHALL BE WEATHERPROOFED USING BUTYL TAPE AFTER INSTALLATION AND FINAL CONNECTIONS ARE MADE. BUTYL TAPE SHALL HAVE A MINIMUM OF ONE-HALF TAPE WIDTH OVERLAP ON EACH TURN AND EACH LAYER SHALL BE WRAPPED THREE TIMES. WEATHERPROOFING SHALL BE SMOOTH WITHOUT BUCKLING. BUTYL BLEEDING IS NOT ALLOWED.
- IF REQUIRED TO PAINT ANTENNAS AND/OR COAX:
 - TEMPERATURE SHALL BE ABOVE 50°F.
 - PAINT COLOR MUST BE APPROVED BY BUILDING OWNER/LANDLORD.
 - FOR REGULATED TOWERS, FAA/FCC APPROVED PAINT IS REQUIRED.
 - DO NOT PAINT OVER COLOR CODING OR ON EQUIPMENT MODEL NUMBERS.

WORK INCLUDED:

THIS SPECIFICATION AND ACCOMPANYING DRAWINGS CONTEMPLATE THE PROVISION AND INSTALLATION, BY THE ELECTRICAL CONTRACTOR OF ALL LABOR, MATERIALS AND EQUIPMENT REQUIRED TO COMPLETELY INSTALL THE ELECTRICAL WORK AND SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:

- THE MODIFICATION OF AN ELECTRICAL SERVICE AND ALL ASSOCIATED CONDUCTOR AND CONDUIT AS REQUIRED AND/OR INDICATED ON PLANS.
- ALL CONDUITS SHALL BE LEFT WITH 200# TEST PULL WIRE (UNO). STUB AND PLUG BOTH ENDS OF ALL SPARE CONDUITS UP AT 12" ABOVE GRADE.

CODES, PERMITS AND FEES:

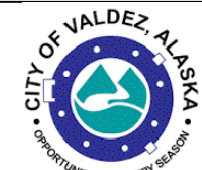
- ALL REQUIRED PERMITS, LICENSES, INSPECTIONS AND APPROVALS SHALL BE SECURED AND ALL FEES FOR SAME PAID BY CONTRACTOR.
- THE INSTALLATION SHALL COMPLY WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL, CODES AND ORDINANCES, AND THE DESIGN, PERFORMANCE CHARACTERISTICS AND METHODS OF CONSTRUCTION OF ALL ITEMS AND EQUIPMENT, SHALL BE IN ACCORDANCE WITH THE LATEST ISSUE OF THE VARIOUS APPLICABLE STANDARD SPECIFICATIONS OF THE FOLLOWING RECOGNIZED AUTHORITIES:
 - ANSI - AMERICAN NATIONAL STANDARDS INSTITUTE
 - IEEE - INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS
 - NEC - NATIONAL ELECTRIC CODE
 - NEMA - NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
 - NFPA - NATIONAL FIRE PROTECTION ASSOCIATION
 - UL - UNDERWRITERS LABORATORIES, INC.
- THE CONTRACTOR SHALL BE LICENSED TO PERFORM WORK IN THE STATE, CITY OR COUNTY OF THE PROJECT SITE AS REQUIRED.

UTILITY COORDINATION:

- CONTRACTOR TO COORDINATE UTILITY LOCATES AND IDENTIFY POTENTIAL CONFLICTS PRIOR TO CONSTRUCTION.
- ELECTRICAL CONTRACTOR SHALL COMPLETE ALL WORK IN ACCORDANCE WITH THE RULES OF THE LOCAL UTILITY COMPANY. BEFORE SUBMITTING A BID, THE CONTRACTOR SHALL CHECK WITH THE UTILITY COMPANIES SUPPLYING SERVICE TO THIS PROJECT AND SHALL DETERMINE FROM THE UTILITY ALL EQUIPMENT AND CHARGES WHICH THEY WILL REQUIRE AND SHALL INCLUDE THE COST IN THE BID WHENEVER POSSIBLE.
- THE CONTRACTOR SHALL COORDINATE WITH UTILITY TO PROVIDE THE ELECTRICAL SERVICE ENTRANCE CONDUCTORS AND CONDUIT AND MAKE THE CONNECTION TO THE SERVICE EQUIPMENT.
- CONTRACTOR SHALL NOTIFY ELECTRIC AND TELEPHONE SERVICES CONTACT AT START OF CONSTRUCTION (2 WEEKS MIN):

POWER CO: COPPER VALLEY ELECTRIC ASSOCIATION (CVEA)
 CONTACT: TBD
 PHONE #: 866-835-2832

TELEPHONE CO: COPPER VALLEY TELECOM
 CONTACT: TBD
 PHONE #: 800-235-5414



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IFC

REV	DESCRIPTION	DATE
0	ISSUE FOR CONSTRUCTION	230320

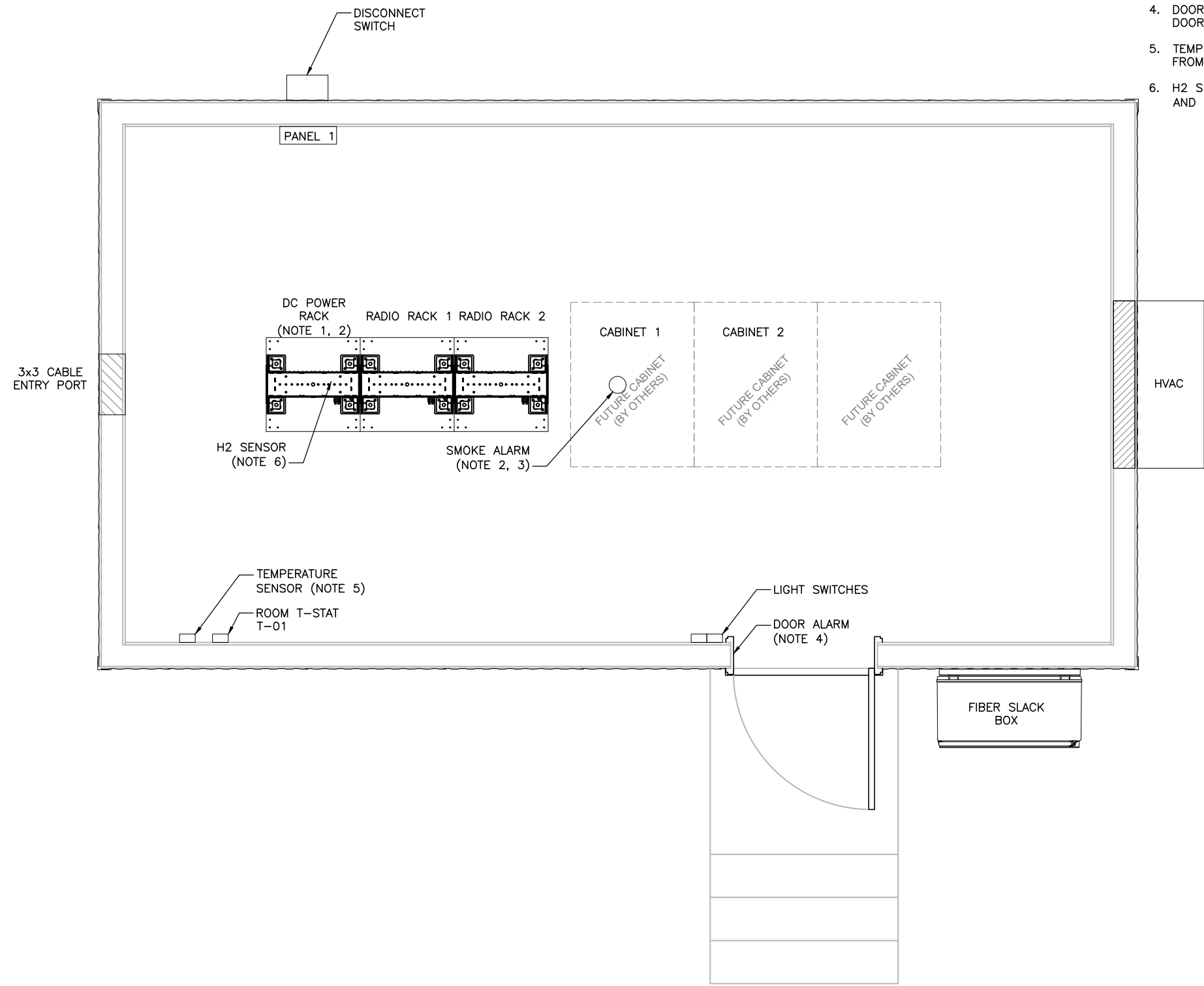
CITY OF VALDEZ
 RADIO
 INFRASTRUCTURE
 UPGRADE
 FIRE STATION 1 SITE

DWN: JAA	DSN: PTG	APP: PTG	REV
JOB #: 22-0132-90-03	DATE: 230320		0

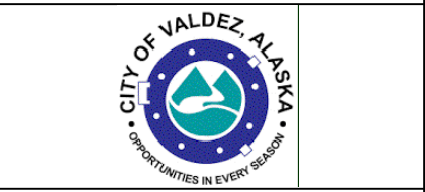
ELECTRICAL NOTES

E1.0





- NOTES:**
1. DC POWER SYSTEM: 13.8 VDC
 2. SMOKE ALARM TO BE FIELD LOCATED NEAR CENTER OF BUILDING ON CEILING.
 3. FEED SMOKE DETECTOR FROM AC PANEL CKT 12.
 4. DOOR ALARM TO BE FIELD LOCATED AT TOP EDGE OF DOOR.
 5. TEMPERATURE SENSOR TO BE FIELD LOCATED AWAY FROM EQUIPMENT AT A HEIGHT OF 6 FT.
 6. H2 SENSOR TO BE PLACED ON THE CEILING ABOVE AND CENTERED ON THE (2) BATTERY PLANTS.



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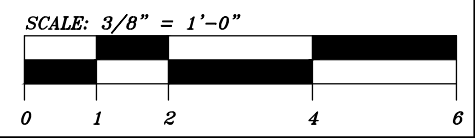
**CITY OF VALDEZ
 RADIO
 INFRASTRUCTURE
 UPGRADE
 FIRE STATION 1 SITE**

DWN: JAA	DSN: PTG	APP: PTG	REV
JOB #: 22-0132-90-03			0
DATE: 230320			

**ELECTRICAL
 EQUIPMENT PLAN**

E1.1

1
E1.1 ELECTRICAL EQUIPMENT PLAN
 SCALE: 3/8" = 1'-0"



FILE: \\NHIT-FS02\OLD\SHARE\ENGINEERING\22 JOBS\22-0132-90 CITY OF VALDEZ - RADIO NETWORK IMPROVEMENTS PERMITTING & DESIGN\05-ENGR\CAD\03 FIRE STATION 1\E1.1 ELECTRICAL EQUIPMENT PLAN.DWG 1/PL



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**CITY OF VALDEZ
 RADIO
 INFRASTRUCTURE
 UPGRADE
 FIRE STATION 1 SITE**

DWN: JAA	DSN: PTG	APP: PTG	REV 0
JOB #: 22-0132-90-03			DATE: 230320

**AC POWER AND
 LIGHTING PLAN**

E1.2

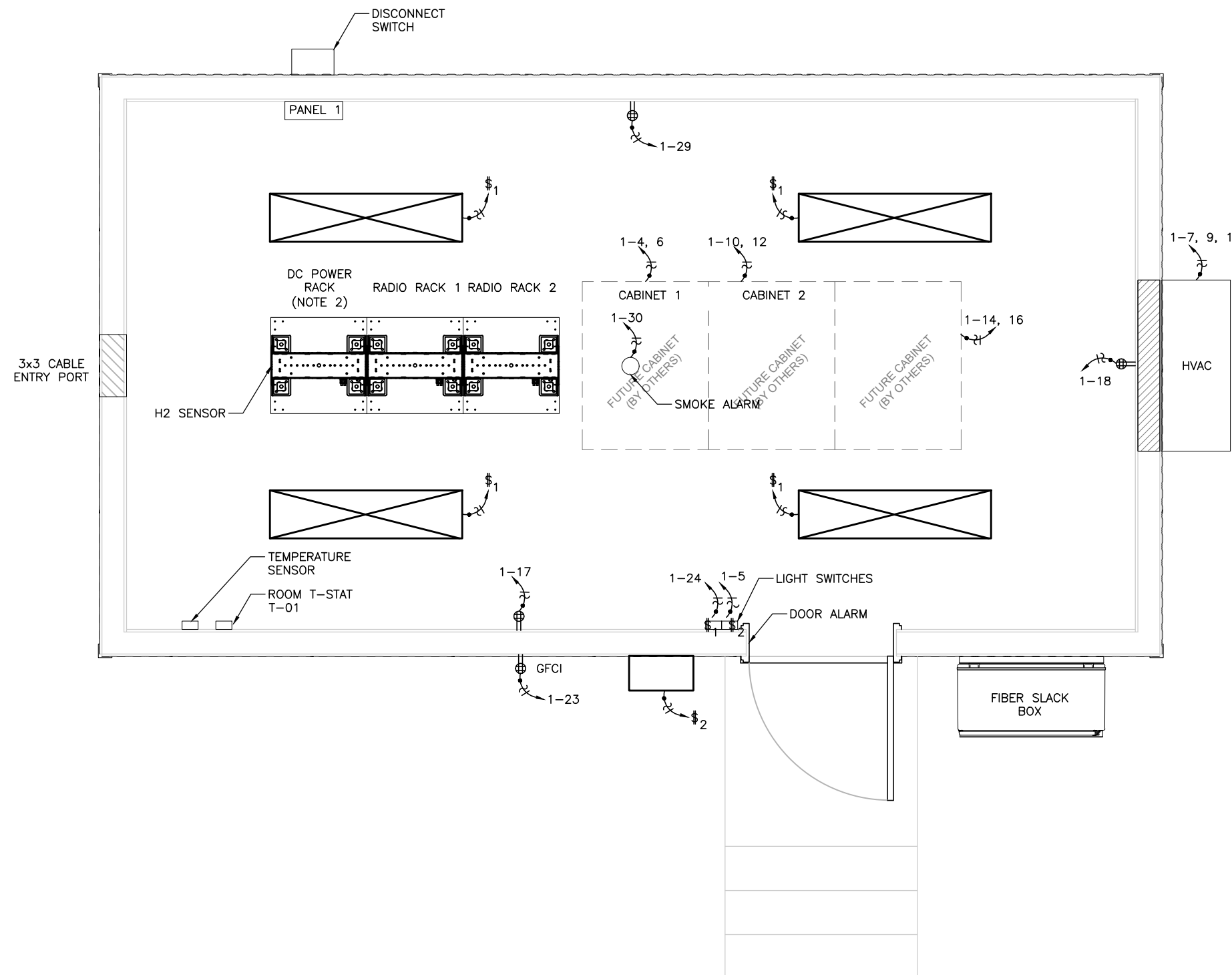
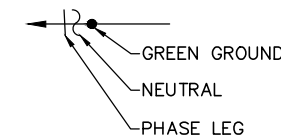
NOTES:

1. ALL WORK TO COMPLY WITH THE CURRENTLY ADOPTED VERSIONS OF THE NATIONAL ELECTRICAL CODE (NEC) AND NATIONAL ELECTRICAL SAFETY CODE (NESC).
2. 12VDC CHARGER INSTALLED IN DC POWER RACK. FEED FROM PANEL 1 CKT #1 TO RACK MOUNTED RECEPTACLE. CHARGER AND RECEPTACLE PLACEMENT IS TBD.
3. RADIO RACKS WILL BE FED FROM 12VDC SYSTEM.
4. LIGHT SWITCHES TO BE 8-HOUR TIMER TYPE.

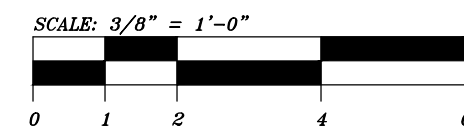
LEGEND:

- ⊕ QUAD RECEPTACLE
- ⌘ LIGHT SWITCH (NOTE 6)

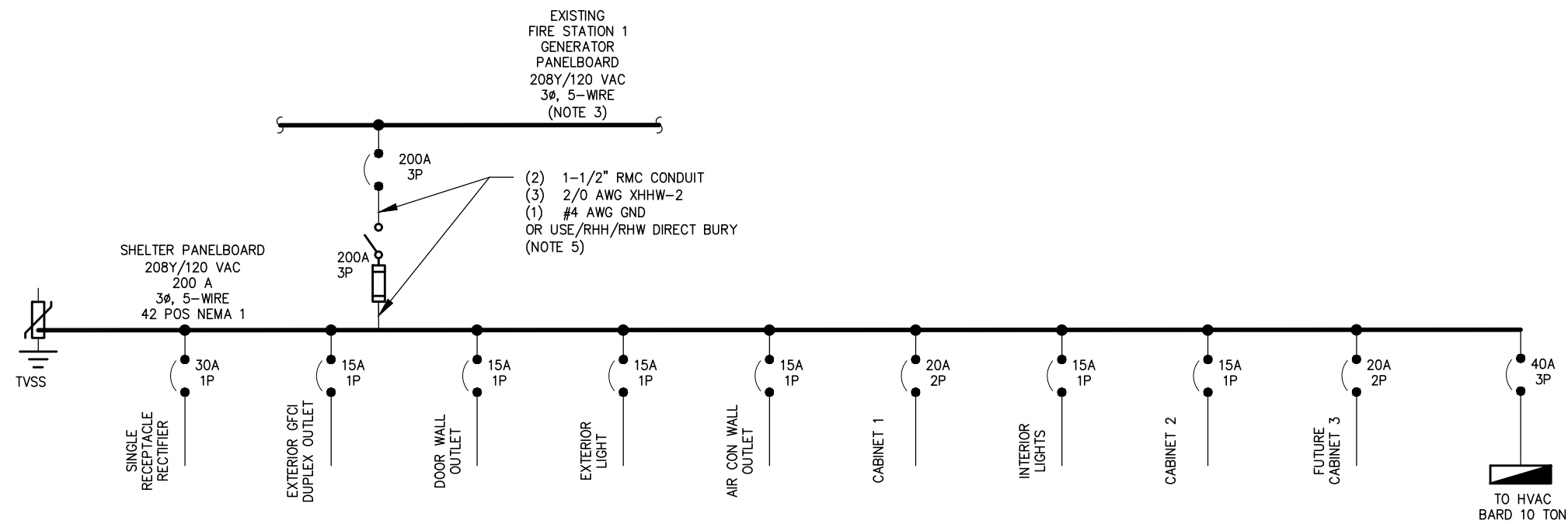
CONDUCTOR NOTATION:
 NUMBER OF SYMBOLS INDICATES THE NUMBER OF CONDUCTORS



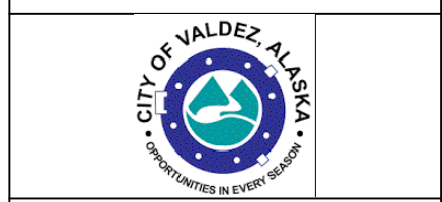
1
E1.2 AC POWER AND LIGHTING PLAN
 SCALE: 3/8" = 1'-0"



FILE: \\NH11-ES02\OLD\SHARES\ENGINEERING\22\JOBS\22-0132-90\CITY OF VALDEZ - RADIO NETWORK IMPROVEMENTS PERMITTING & DESIGN\05-ENGR\CAD\03 FIRE STATION 1.E1.2 AC POWER AND LIGHTING PLAN.DWG | P1



- NOTES:**
1. ALL ELECTRICAL WORK TO COMPLY WITH THE LATEST ADOPTED VERSIONS OF THE NATIONAL ELECTRICAL CODE (NEC) AND NATIONAL ELECTRICAL SAFETY CODE (NESC).
 2. ALL CONDUCTORS TO BE COPPER UNLESS NOTED OTHERWISE.
 3. NEW COMM SHELTER TO BE FED FROM THE EXISTING PANELBOARD CONNECTED TO 200A 3-POLE BREAKER IN FIRE STATION 1 PANEL "MDP".
 4. SAFETY DISCONNECT SWITCH SHALL BE MARKED WITH AVAILABLE FAULT CURRENT PER NEC 110.24 (A). MARKING ON METER/MAIN SHALL BE A DURABLE PLACARD STATING: "MAXIMUM AVAILABLE FAULT CURRENT IS 1.5KA, CALCULATED ON 8/26/2020."
 5. LARGER GAUGE CONDUCTOR REQUIRED TO KEEP VOLTAGE DROP LESS THAN 3%.



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**CITY OF VALDEZ
RADIO
INFRASTRUCTURE
UPGRADE
FIRE STATION 1 SITE**

DWN:JAA	DSN: PTG	APP: PTG	REV 0
JOB #: 22-0132-90-03			DATE: 230320

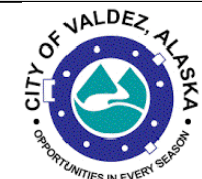
**ELECTRICAL
ONE-LINE
DIAGRAM
E1.3**

1
E1.3 ELECTRICAL ONE-LINE DIAGRAM
SCALE: NTS

FILE: \\NHIT-FS02\OLDSHARES\ENGINEERING\22 JOBS\22-0132-90-CITY OF VALDEZ - RADIO NETWORK IMPROVEMENTS PERMITTING & DESIGN\05-ENGR\CAD\03 FIRE STATION 1E1.3 ELECTRICAL ONE-LINE DIAGRAM.DWG [1]

NOTES:

- DISCONNECT SWITCH SHALL BE MARKED WITH AVAILABLE FAULT CURRENT PER NEC 110.24 (A). MARKING ON METER/MAIN SHALL BE A DURABLE PLACARD STATING: "MAXIMUM AVAILABLE FAULT CURRENT IS 0.2KA, CALCULATED ON 3/10/2023".
- CALCULATED AVAILABLE FAULT CURRENT AT DISCONNECT SWITCH IS 0.2KA.
- CALCULATED AVAILABLE FAULT CURRENT AT MAIN DISTRIBUTION PANEL IS 0.2KA.



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**CITY OF VALDEZ
 RADIO
 INFRASTRUCTURE
 UPGRADE
 FIRE STATION 1 SITE**

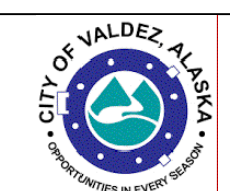
DWN: JAA	DSN: PTG	APP: PTG	REV 0
JOB #: 22-0132-90-03			DATE: 230320

**AIC
 CALCULATIONS**

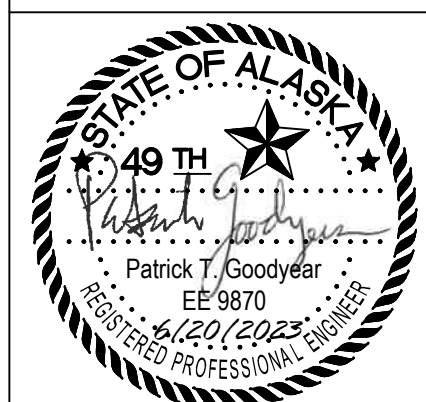
E1.5

Available Fault Current at Shelter Disconnect Switch (3-Phase)			
Line to Line Voltage (L-L)	E_{LL}	=	208V
Available Fault Current At Transformer (3-Phase)	$I_{F.C.(3ph)}$	=	0.2kA
Conductors Constant	C	=	11424
Number of Conductors Per Phase	n	=	2
Length of Conductors	L	=	300ft
"f" Factor (3-Phase)	f_{3ph}	=	0.022
Short Circuit Multiplier (3-Phase)	M_{3ph}	=	0.979
Available Fault Current at Disconnect Switch (3-Phase)	I_{3ph}	=	0.2kA
$I_{3ph} \text{ At Fire Station 1 Panel "MDP"}$ 2/0 CU Inside Nonmetallic Conduit OR Direct Bury 2 Runs Approximate $f_{3ph} = 1.732 \times L \times I_{F.C.(3ph)} \div C \div n \div E_{LL}$ $M_{3ph} = 1 \div (1 + f_{3ph})$ $I_{3ph} = M_{3ph} \times I_{F.C.(3ph)}$			
Available Fault Current At PANEL 1 (3-Phase)			
Line to Line Voltage (L-L)	E_{LL}	=	208V
Available Fault Current At MDP (3-Phase)	$I_{F.C.(3ph)}$	=	0.2kA
Conductors Constant	C	=	11424
Number of Conductors Per Phase	n	=	2
Length of Conductors	L	=	15ft
"f" Factor (3-Phase)	f_{3ph}	=	0.001
Short Circuit Multiplier (3-Phase)	M_{3ph}	=	0.999
Available Fault Current At MDP (3-Phase)	I_{3ph}	=	0.2kA
$I_{3ph} \text{ At Comm Shelter PANEL 1}$ 2/0 CU Inside Nonmetallic Conduit OR Direct Bury 2 Runs Approximate $f_{3ph} = 1.732 \times L \times I_{F.C.(3ph)} \div C \div n \div E_{LL}$ $M_{3ph} = 1 \div (1 + f_{3ph})$ $I_{3ph} = M_{3ph} \times I_{F.C.(3ph)}$			

FILE: \\NHTI-FS02\OLD\SHARE\ENGINEERING\2. JOBS\22-0132-90 CITY OF VALDEZ - RADIO NETWORK IMPROVEMENTS PERMITTING & DESIGN\05-ENGR\CAD\03 FIRE STATION 1\DWG | PLOT DATE: 230620



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**CITY OF VALDEZ
 RADIO
 INFRASTRUCTURE
 UPGRADE
 FIRE STATION 1 SITE**

DWN: JAA	DSN: PTG	APP: PTG	REV: 0
JOB #: 22-0132-90-03			DATE: 230320

**SIGNAL
 PLAN**

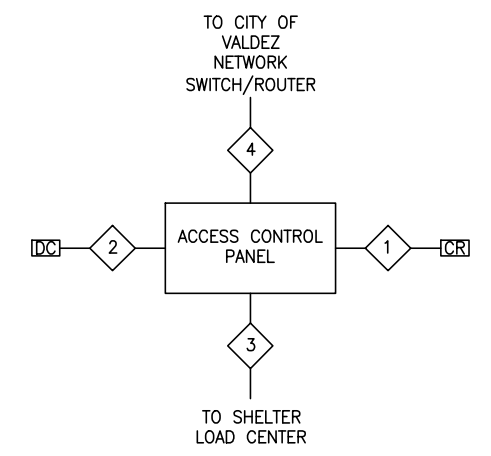
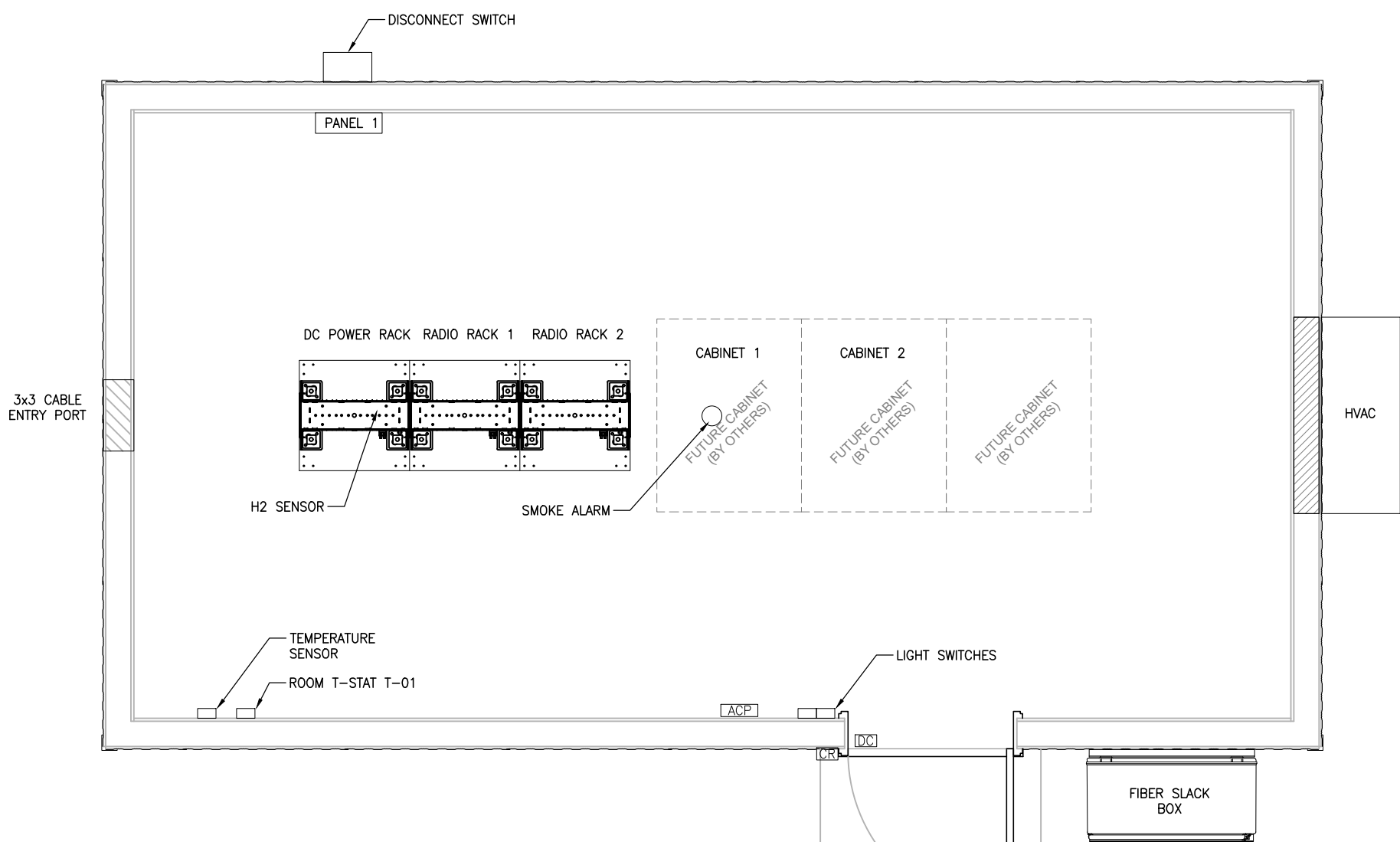
E1.6

NOTES:

- ALL WORK TO COMPLY WITH THE CURRENTLY ADOPTED VERSIONS OF THE NATIONAL ELECTRICAL CODE (NEC) AND NATIONAL ELECTRICAL SAFETY CODE (NESC).
- ACCESS CONTROL PANEL, NETWORK SWITCH/ROUTER, CARD READER, AND DOOR CONTRACT PROVIDED BY CITY OF VALDEZ.

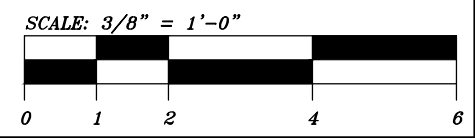
LEGEND:

- CARD READER
- DOOR CONTACT
- ACCESS CONTROL PANEL



ACCESS CONTROL SYSTEM CABLE SCHEDULE		
CABLE NUMBER	DESCRIPTION	CABLE TYPE
1	CARD READER CABLE	8-CONDUCTOR, #18 AWG, STRANDED, SHIELDED
2	DOOR CONTACT CABLE	2-CONDUCTOR, #14 AWG, SOLID, UNSHIELDED
3	ACP POWER CABLE 120 VAC)	3 CONDUCTOR, #12 AWG, SOLID, UNSHIELDED
4	COMMUNICATIONS CABLE	CAT5E OR CAT6

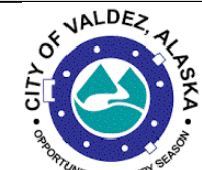
1
E1.6 **SIGNAL PLAN**
 SCALE: 3/8" = 1'-0"



1. ALL ELECTRICAL WORK TO COMPLY WITH THE CURRENTLY ADOPTED VERSION OF THE NATIONAL ELECTRICAL CODE (NEC) AND ALL APPLICABLE LOCAL, STATE AND FEDERAL CODES.
2. ALL GROUNDING CONDUCTORS TO BE #2 AWG SOLID BARE TINNED COPPER (SBTC) UNLESS NOTED OTHERWISE.
3. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
4. #2/0 (BTC) BARE TINNED SHALL BE 17-19 STRAND SOFT ANNEALED COPPER WITH EACH STRAND TINNED. #2/0 (BTC) BARE TINNED SHALL BE 17-19 STRAND SOFT ANNEALED COPPER WITH EACH STRAND TINNED.
5. ALL BELOW GRADE BONDS TO BE EXOTHERMIC WELDS. ABOVE GRADE BONDS TO BE COMPRESSION LUG CONNECTION OR EXOTHERMIC WELDS.
6. ALL BELOW GRADE GROUND SYSTEM CONDUCTORS AND GROUND RODS SHALL BE A MINIMUM DEPTH OF 30" BELOW GRADE.
7. REPAIR ALL GALVANIZED SURFACES THAT HAVE BEEN DAMAGED BY EXOTHERMIC WELDING. USE SPRAY GALVANIZED SUCH AS HOLUB LECTROSOL #15-501 OR EQUIVALENT.
8. ALL EXPOSED GROUNDING CONDUCTORS BETWEEN GRADE AND 6FT ABOVE GRADE TO BE PROTECTED FROM DAMAGE WITH LIQUIDTIGHT NON-METALLIC CONDUIT.
9. ALL EXTERIOR GROUND CONDUCTORS INCLUDING GROUND RING SHALL BE #2 AWG SOLID BARE TINNED COPPER. MAKE ALL GROUND CONNECTIONS AS SHORT AND DIRECT AS POSSIBLE. AVOID SHARP BENDS. THE RADIUS OF ANY BEND SHALL NOT BE LESS THAN 8" AND THE INCLUSIVE ANGLE OF ANY BEND SHALL NOT EXCEED 90°. GROUNDING CONDUCTORS SHALL BE ROUTED DOWNWARD TOWARD THE BURIED GROUND RING.
10. ALL GROUND CONDUCTOR CONNECTIONS TO BUILDING STEEL SHALL BE EXOTHERMIC WELD TYPE. COORDINATE USE OF LOW SMOKE EXOTHERMIC WELDS AS REQUIRED FOR SITE CONDITIONS.
11. ALL GROUND LEADS SHALL BE IDENTIFIED WITH BRASS TAGS.
12. ALL GROUNDING INSTALLATIONS SHALL BE INSPECTED AND APPROVED BY ANY JURISDICTION HAVING INSPECTION & APPROVAL AUTHORITY (IF REQUIRED) AND CUSTOMER OR CUSTOMERS REPRESENTATIVE BEFORE PLACING ANY BACKFILL.
13. ALL MATERIALS SHALL BE FURNISHED BY THE ELECTRICAL CONTRACTOR.
14. ALL MOUNTING HARDWARE SHALL BE STAINLESS STEEL.
15. CONNECT METER BASE NEUTRAL TO SITE EARTH ELECTRODE SYSTEM.
16. CONNECT THE TOWER GROUND CONDUCTORS TO TOWER USING EXOTHERMIC WELD.
17. CONNECTIONS BETWEEN DISSIMILAR METALS SHALL NOT BE MADE UNLESS THE CONDUCTORS ARE SEPARATED BY A SUITABLE MATERIAL THAT IS A PART OF THE ATTACHMENT DEVICE LISTED AND APPROVED FOR USE WITH THE SPECIFIC DISSIMILAR METALS MAY BE USED FOR THE PURPOSE.
18. AS APPLICABLE CONTRACTOR TO COORDINATE WITH TOWER CONTRACTOR TO PROVIDE, RUN AND TERMINATE POWER & CONTROL WIRES WITHIN CONDUITS FROM LIGHTING CONTROLLER TO ELECTRICAL AND CONTROL PANELS.
19. CONTRACTOR TO REPAIR ANY DAMAGED GROUND WIRE DUE TO CONSTRUCTION ACTIVITY.

20. DOWN CONDUCTORS FOR SUPPLEMENTAL TOWER GROUND BARS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUND BAR DOWN CONDUCTORS A MINIMUM DISTANCE OF 4'-0" BELOW GROUND BAR. TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.
21. GROUND ALL EXPOSED METALLIC OBJECTS USING A TWO-HOLE NEMA DRILLED CONNECTOR SUCH AS THOMAS & BETTS #32207 OR APPROVED EQUAL.
22. GROUND LEADS SHALL NOT BE SPLICED.
23. GROUND RODS SHALL NOT BE INSTALLED CLOSER THAN 6 FT. FROM OTHER GROUND RODS AND GROUNDING ELECTRODES (NFPA 70-2005, ARTICLE 250.56).
24. UNLESS NOTED OTHERWISE GROUND RODS SHALL NOT BE INSTALLED CLOSER TO ONE ANOTHER THAN THE SUM OF THEIR RESPECTIVE LENGTHS, WHEN POSSIBLE. THIS IS ESPECIALLY IMPORTANT FOR THE GROUND RODS ASSOCIATED WITH TOWER GROUND RINGS.
25. GROUND RODS NEAREST TO SERVICE EQUIPMENT SHALL BE SPACED 6' APART AND LEFT UNCOVERED FOR INSPECTION BY ELECTRIC UTILITY.
26. GROUND RODS WILL BE COPPER CLAD STEEL 5/8 INCH DIAMETER X 8 FEET IN LENGTH (MINIMUM).
27. INTERMEDIATE COAX GROUNDING TO BE INSTALLED ON VERTICAL RUNS THAT EXCEED 200 FEET IN LENGTH. CONTRACTOR SHALL COORDINATE WITH VERTICAL CONSTRUCTION MANAGER ON LOCATION OF INTERMEDIATE GROUNDING LOCATION.
28. LABEL ALL GROUND CONDUCTORS WITH BLACK LETTERS ON WHITE BACKGROUND AND APPLY LABELS TO EACH END OF EACH CONDUCTOR FOR IDENTIFICATION. ALL LABELS SHALL BE UNIQUE. POSITION LABELS SO THAT THEY ARE EASILY READABLE. ACCEPTED LABELERS SHALL BE BROTHER P-TOUCH UNITS. APPLY CLEAR HEAT SHRINK OVER THE ENTIRE LENGTH OF THE LABEL FOR PROTECTION.
29. LUGS SHALL BE 2-HOLE, LONG BARREL, TINNED SOLID COPPER UNLESS OTHERWISE SPECIFIED IN THIS DOCUMENT. LUGS SHALL BE BURNDY ELECTRICAL SERIES YA##-2TC38 OR YA##-2N OR EQUIVALENT.
30. MAINTAIN 2'-0" (TOWER) AND 3'-0" (SHELTER) BETWEEN GROUND RINGS AND FOUNDATIONS.
31. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER CONDUCTOR UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
32. METAL CONDUITS OR METAL CLAMPS COMPLETELY ENCIRCLING GROUND LEADS SHALL BE PROHIBITED.
33. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR.
34. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE SYSTEM REFERENCE GROUND, IN ACCORDANCE WITH THE NEC.
35. MONOPOLE/TOWER GROUND CONDUCTORS WILL BE #3/0 AWG STRANDED BARE TINNED COPPER.
36. PAINT, ENAMEL, LACQUER AND OTHER ELECTRICALLY NON-CONDUCTIVE COATINGS SHALL BE REMOVED FROM THREADS AND SURFACE AREAS WHERE CONNECTIONS ARE MADE TO ENSURE GOOD ELECTRICAL CONTINUITY.

37. THE CONTRACTOR SHALL COORDINATE AS REQUIRED TO HAVE UTILITY COMPANY REPRESENTATIVE AT THE SITE TO DISCONNECT THE UTILITY NEUTRAL FROM GROUNDING SYSTEM DURING FINAL INSPECTION SO THAT REQUIRED TESTING ON THE GROUND SYSTEM CAN BE PERFORMED. THE CONTRACTOR SHALL PROVIDE NOTICE TO THE CUSTOMER REPRESENTATIVE (TWO) DAYS PRIOR TO FINAL TESTING. IF THE CONTRACTOR FAILS TO MAKE UTILITY COMPANY REPRESENTATIVE AVAILABLE DURING THE FINAL TESTING, THE CONTRACTOR SHALL PAY THE COST FOR AN INDEPENDENT GROUNDING CONSULTANT TO PERFORM THE GROUND RESISTANCE TEST. GROUNDING CONSULTANT SHALL BE SELECTED BY THE VERTICAL BRIDGE REPRESENTATIVE. IF THE UTILITY COMPANY REPRESENTATIVE FAILS TO APPEAR DUE TO NO FAULT OF THE CONTRACTOR, NO PENALTY WILL APPLY.
38. THE CONTRACTOR SHALL NOTIFY THE CUSTOMER REPRESENTATIVE WHEN THE GROUND RING IS INSTALLED SO THAT THE REPRESENTATIVE CAN INSPECT GROUND RING BEFORE IT IS CONCEALED.
39. THE GROUND CONDUCTORS SHALL BE RUN STRAIGHT FOR MINIMUM INDUCTANCE AND VOLTAGE DROP. SINCE CABLE BENDS INCREASE INDUCTANCE. ALL METAL WORK WITHIN 10 FEET OF THE GROUND RING SHALL BE DIRECTLY BONDED TO THE GROUND SYSTEM, WITHOUT USING SERIES OR DAISY CHAIN CONNECTION ARRANGEMENTS.
40. UNLESS NOTED OTHERWISE ABOVE GROUND CONNECTIONS SHALL BE LISTED LUGS, LISTED PRESSURE CONNECTORS, LISTED CLAMPS OR OTHER LISTED MEANS REQUIRED BY THE SPECIFIC COMPONENT MANUFACTURER.
41. UPON COMPLETION OF THE GROUNDING SYSTEM, THE ELECTRICAL CONTRACTOR SHALL TEST THE GROUNDING SYSTEM. PERFORM TESTS, BY FALL-OF-POTENTIAL METHOD ACCORDING TO IEEE 81 (GUIDE FOR MEASUREMENT OF IMPEDANCE AND SAFETY CHARACTERISTICS OF LARGE, EXTENDED OR INTERCONNECTED GROUNDING SYSTEMS). THE MAXIMUM RESISTANCE LEVEL IS 5 OHMS. A COMPLETE WRITTEN REPORT SHALL BE SUBMITTED STATING ACTUAL RESISTANCE READING, LOCATION, DATE, TIME AND WEATHER CONDITIONS AND SOIL MOISTURE CONTENT. THE TEST EQUIPMENT USED SHALL BE IDENTIFIED BY MANUFACTURE, MODEL AND SERIAL NUMBERS. IF 5 OHMS IS EXCEEDED WITH CURRENT CONFIGURATION, ELECTRICAL CONTRACTOR SHALL SUBMIT A QUOTE TO LOWER RESISTANCE TO 5 OHMS OR LESS.
42. WHERE MECHANICAL CONNECTORS (TWO-HOLE OR CLAMP) ARE USED, APPLY A LIBERAL PROTECTIVE COATING OF A CONDUCTIVE ANTI-OXIDE COMPOUND ON ALL CONNECTORS. PROVIDE LOCK WASHERS ON ALL MECHANICAL CONNECTORS. USE STAINLESS STEEL HARDWARE THROUGHOUT. THOROUGHLY REMOVE ALL PAINT AND CLEAN ALL DIRT FROM SURFACES REQUIRING GROUND CONNECTORS, REPAINT TO MATCH EXISTING AFTER CONNECTION IS MADE TO MAINTAIN CORROSION RESISTANCE. ALL GROUND CONNECTIONS SHALL BE APPROVED FOR THE TYPES OF METALS BEING ATTACHED TO.



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IFC

REV	DESCRIPTION	DATE
0	ISSUE FOR CONSTRUCTION	230320

CITY OF VALDEZ
 RADIO
 INFRASTRUCTURE
 UPGRADE
 FIRE STATION 1 SITE

DWN:JAA	DSN: PTG	APP: PTG	REV 0
JOB #: 22-0132-90-03			DATE: 230320

GROUNDING
 NOTES

E2.0

(907) 278-3121



Know what's below.
 Call before you dig.

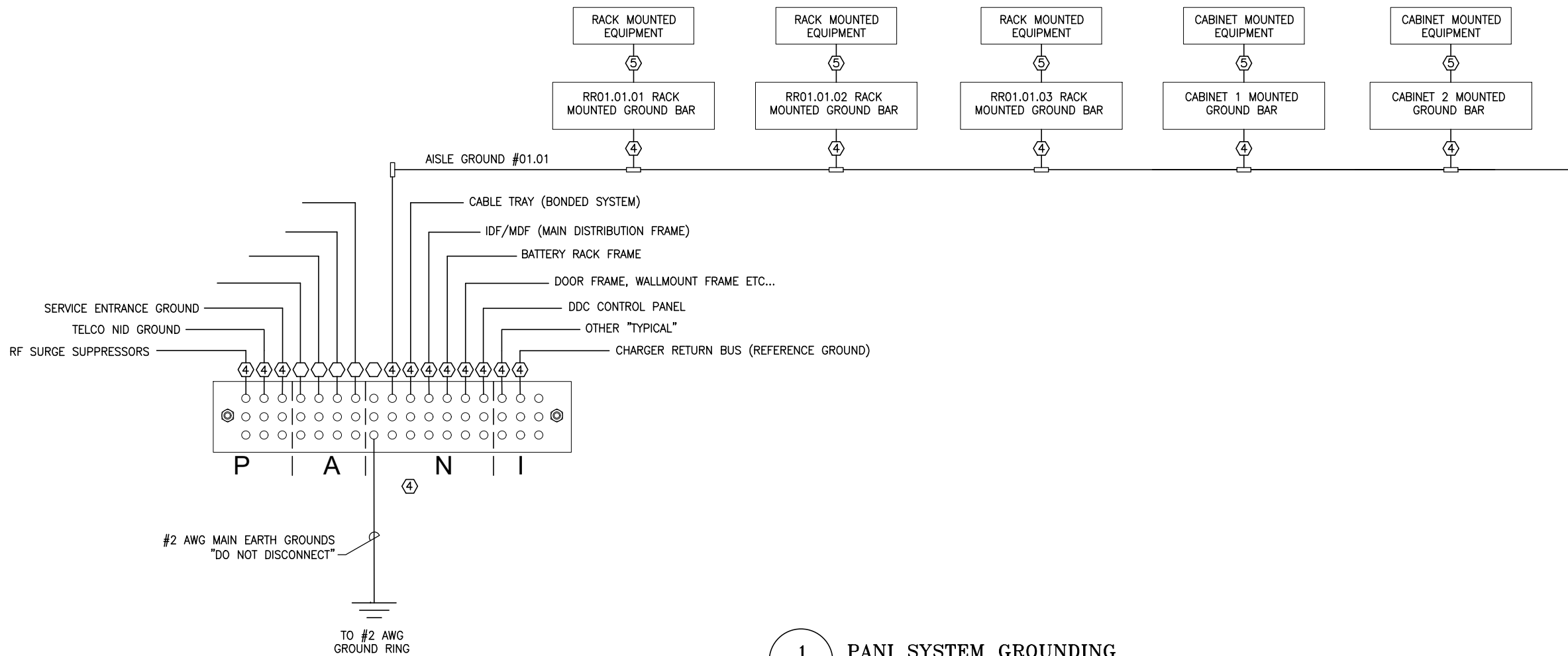
GROUNDING METHOD

P	A	N	I
SURGE PRODUCERS	SURGE ABSORBERS	NON IGZ	ISOLATED GROUND ZONES (IGZ)
<ul style="list-style-type: none"> RF SPD AC EQUIP TELCO SPD CABLE SHIELD ESD 	<ul style="list-style-type: none"> BUILDING STEEL AC NG BOND WATER LINE METALLIC PIPES CONCRETE ENCASED ELECTRODE GROUND RINGS 	<ul style="list-style-type: none"> -48VDC GND +24VDC GND +12VDC GND CABLE TRAY SYS EQUIP FRAME BATTERY RACKS ANCILLARY EQUIP 	<ul style="list-style-type: none"> LOGIC GROUND IG ZONES

NOTE:

1. ADDITIONAL GROUND LEADS MAY BE REQUIRED. ALL SYSTEM COMPONENTS NOT SHOWN. PHYSICAL LAYOUT MAY DIFFER FROM ILLUSTRATION OF BLOCK DIAGRAM. PANI METHOD WILL BE FOLLOWED. AC POWER SYSTEM GROUND WILL HAVE SEPARATE CONNECTION PROVISIONED TO THE SITE GROUND RING.

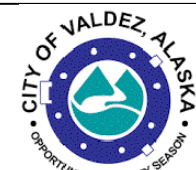
- ① — DUAL 2/0 STRANDED BARE COPPER WIRE (PROVIDED AT FIND SITE DESTINATION)
- ② — 4/0 WIRE (GRAY)
- ③ — 2/0 WIRE (GREEN)
- ④ — #2 AWG WIRE (GREEN)
- ⑤ — #6 AWG WIRE (GREEN)
- ⑥ — #6 - #14 AWG WIRE (GREEN)



#2 AWG MAIN EARTH GROUNDS
"DO NOT DISCONNECT"

TO #2 AWG GROUND RING

1
E2.1 PANI SYSTEM GROUNDING
SCALE: NTS



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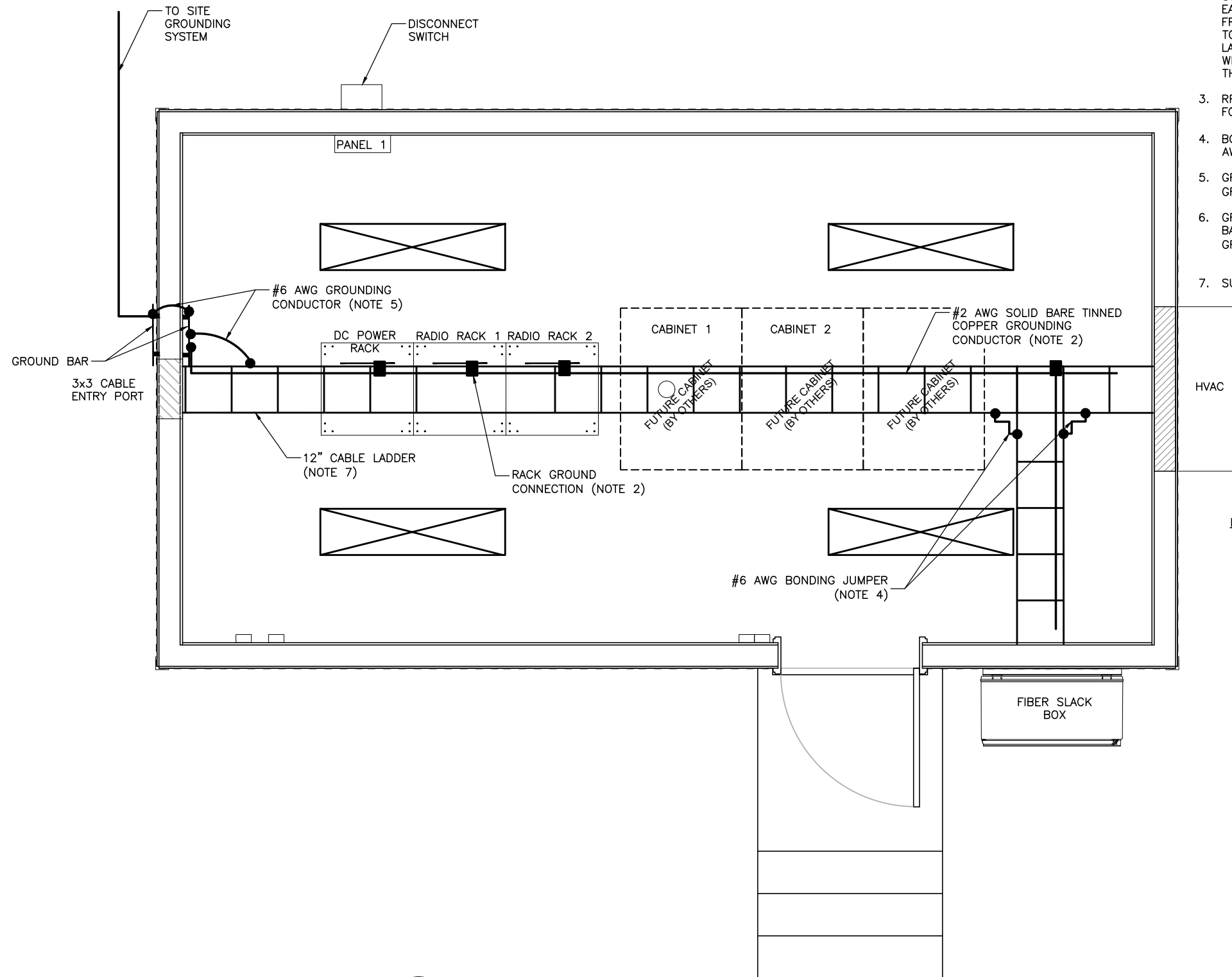
**CITY OF VALDEZ
RADIO
INFRASTRUCTURE
UPGRADE
FIRE STATION 1 SITE**

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**PANI SYSTEM
GROUNDING**

E2.1

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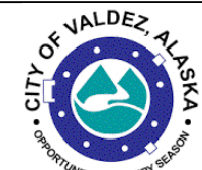
NOTES:

1. ALL ELECTRICAL WORK WILL COMPLY WITH THE CURRENTLY ADOPTED VERSION OF THE NATIONAL ELECTRICAL CODE (NEC).
2. RACK GROUNDING SYSTEM WILL BE A #2 AWG BARE COPPER CONDUCTOR ON THE CABLE LADDER. THE CONDUCTOR WILL RUN THE LENGTH OF THE LADDER. EACH RACK WILL HAVE A CONDUCTOR INSTALLED FROM A GROUND BAR IN THE TOP OF EACH RACK TO THE GROUND CONDUCTOR ON THE CABLE LADDER. A CONNECTOR THAT IS MADE FOR PURPOSE WILL CONNECT THE RACK GROUND CONDUCTOR TO THE CABLE LADDER CONDUCTOR.
3. RF PENETRATIONS GROUND BAR TO BE USED ONLY FOR RF COAX WAVEGUIDE ENTERING THE SHELTER.
4. BOND CABLE LADDER SECTIONS TOGETHER WITH #6 AWG JUMPERS.
5. GROUND CABLE LADDER ASSEMBLY TO EQUIPMENT GROUND BAR WITH #6 AWG GREEN CONDUCTOR.
6. GROUND THE +13.8 VDC NEGATIVE BUS OF THE BATTERY CHARGING UNIT TO THE EQUIPMENT GROUND BAR WITH #2/0 AWG GREEN CONDUCTOR.
7. SUPPORT CABLE LADDER EVERY 4 FEET.

LEGEND:

- COMPRESSION LUG
- EQUIPMENT GROUND BAR

1
E2.2 CABLE LADDER AND GROUNDING PLAN
SCALE: 3/8" = 1'-0"



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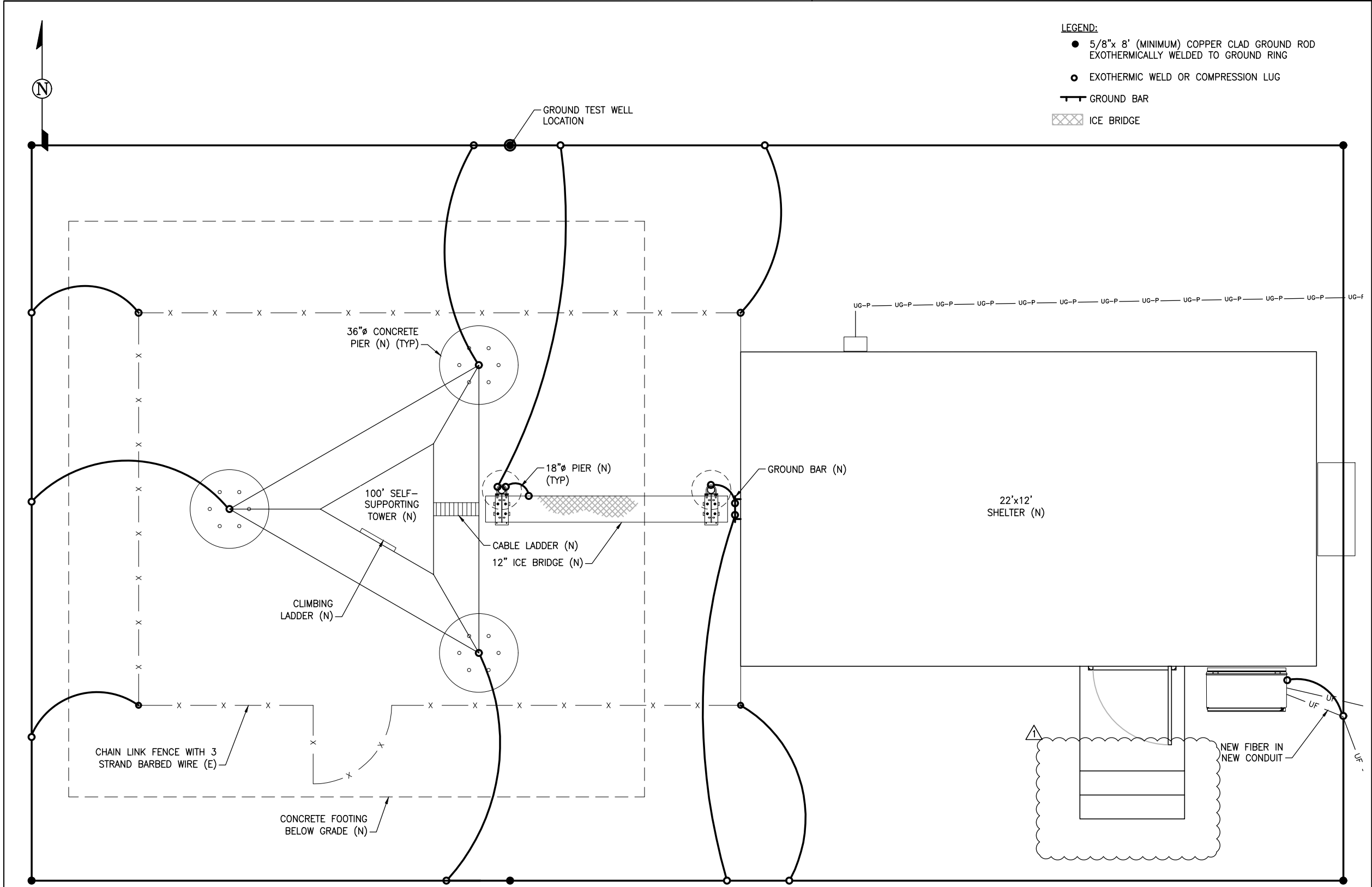
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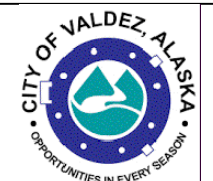
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**CABLE LADDER
AND GROUNDING
PLAN**

E2.2



- LEGEND:**
- 5/8" x 8' (MINIMUM) COPPER CLAD GROUND ROD EXOTHERMICALLY WELDED TO GROUND RING
 - EXOTHERMIC WELD OR COMPRESSION LUG
 - GROUND BAR
 - ▨ ICE BRIDGE



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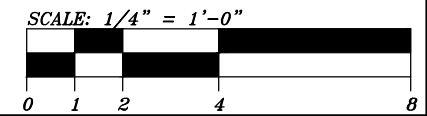
**CITY OF VALDEZ
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**OUTSIDE
 GROUNDING PLAN**

E2.3

1
E2.3 **OUTSIDE GROUNDING PLAN**
 SCALE: 1/4" = 1'-0"



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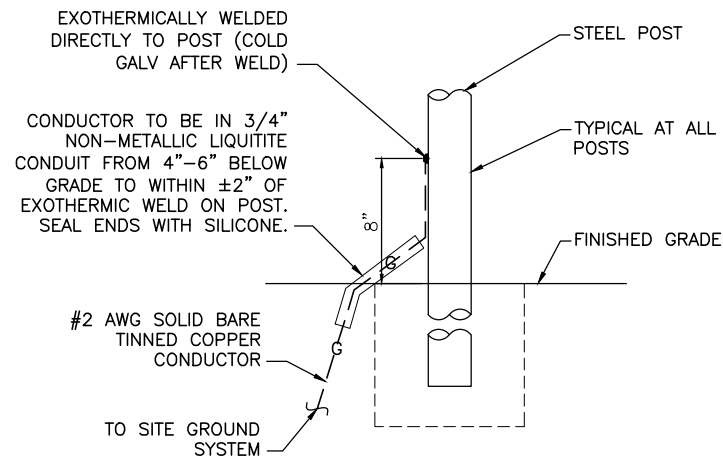
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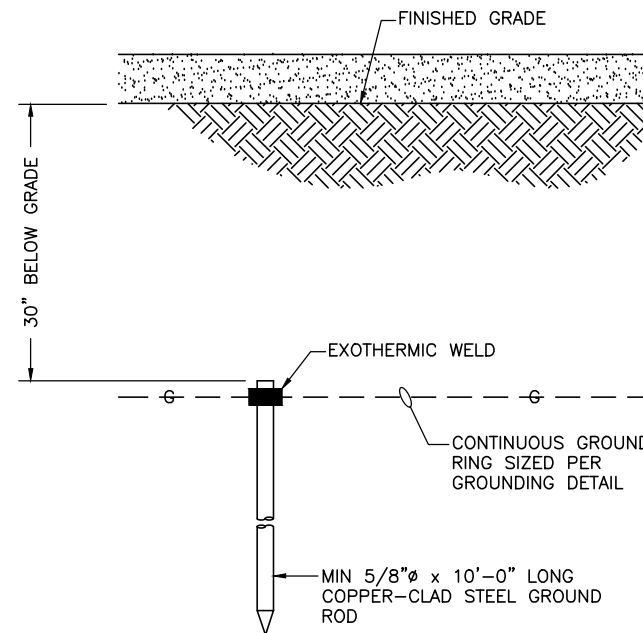
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GROUNDING
 DETAILS

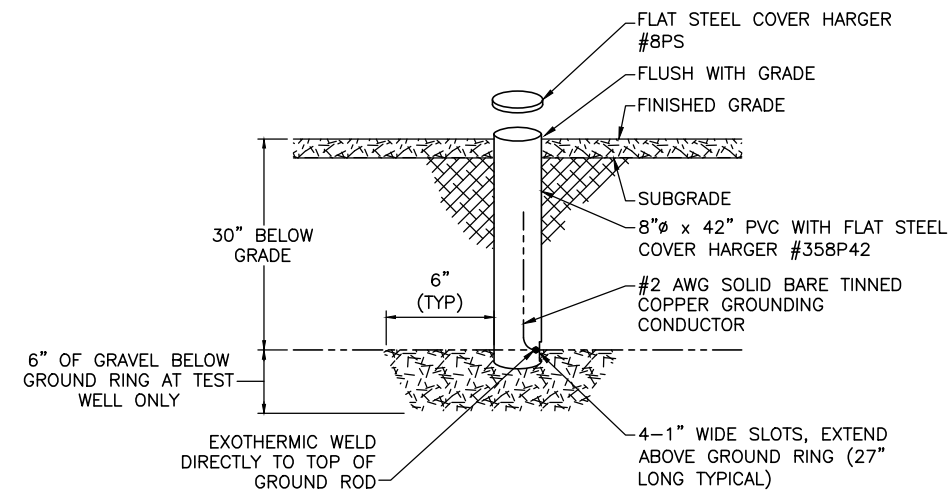
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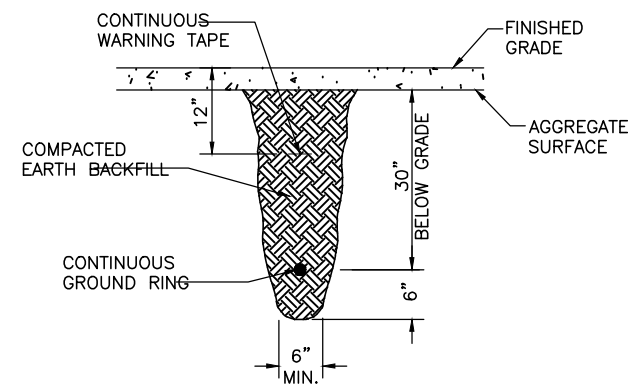
1 POST GROUNDING DETAIL
 E2.4 SCALE: NONE



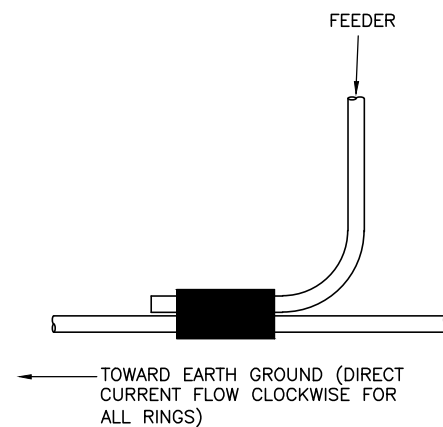
2 GROUND ROD DETAIL
 E2.4 SCALE: NONE



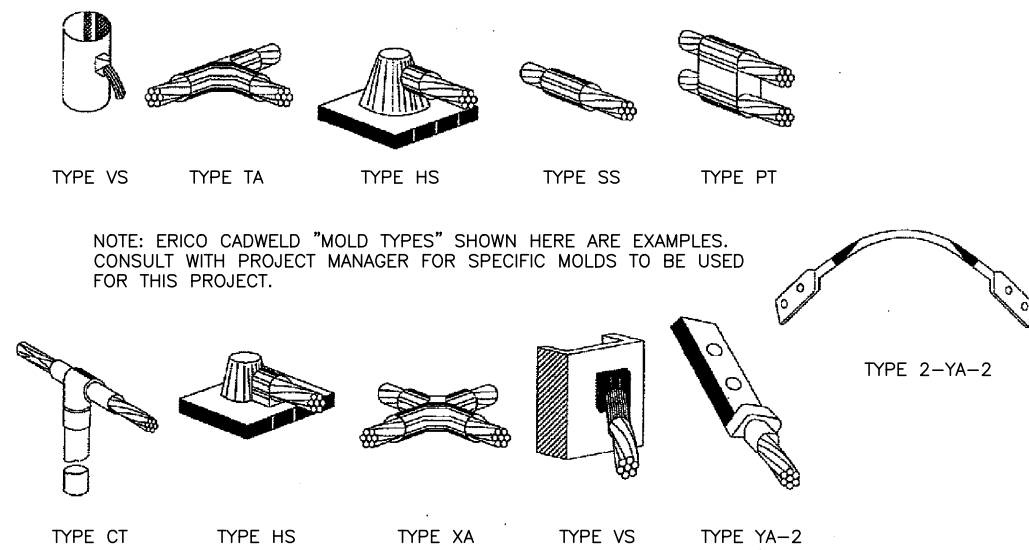
3 GROUND TEST WELL DETAIL
 E2.4 SCALE: NONE



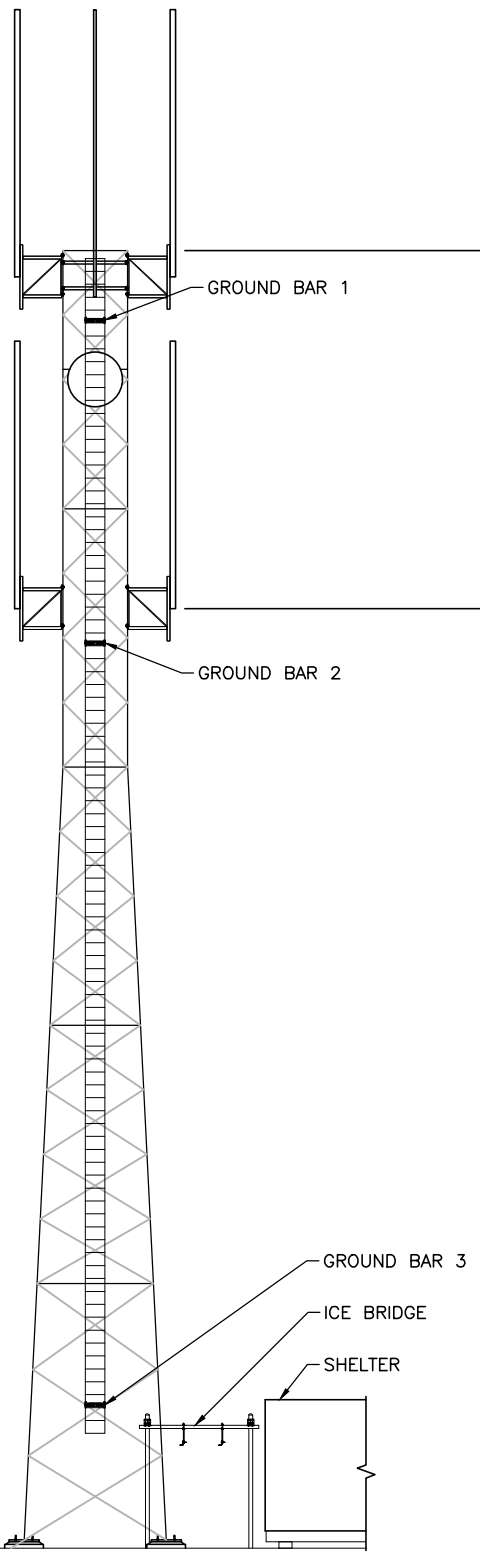
4 TRENCH DETAIL FOR GROUND RING
 E2.4 SCALE: NONE



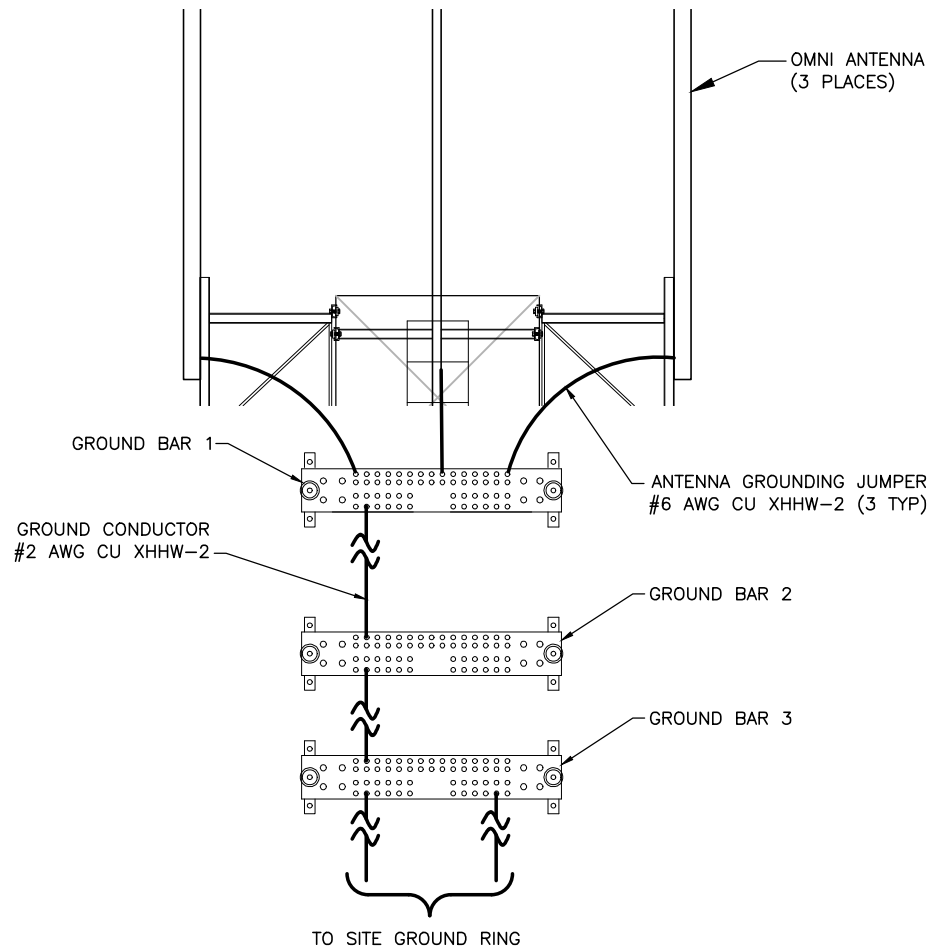
5 GROUND CONDUCTOR CONNECTION
 E2.4 SCALE: NONE



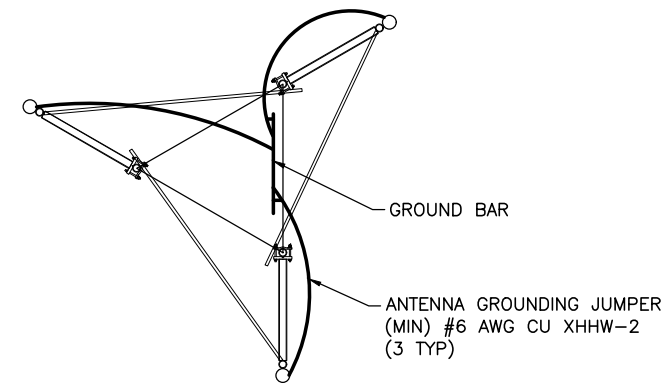
6 EXOTHERMIC WELD DETAILS
 E2.4 SCALE: NONE



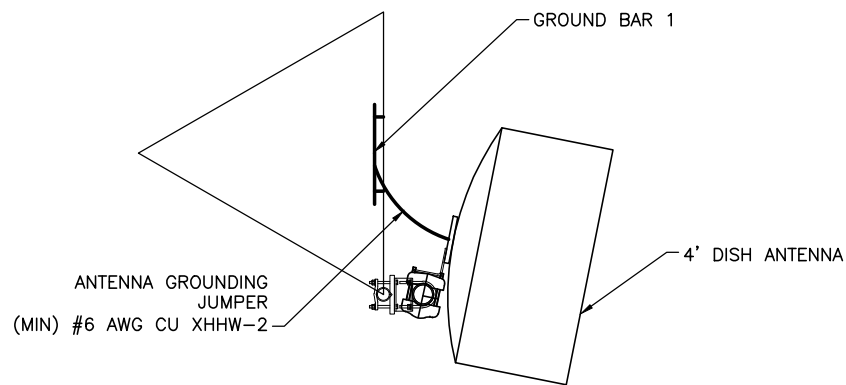
A
E2.5 TOWER ELEVATION
SCALE: NTS



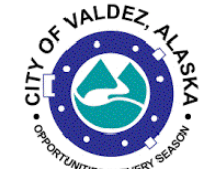
1
E2.5 TYPICAL ANTENNA SECTOR FRAME GROUNDING
SCALE: NTS



2
E2.5 TYPICAL ANTENNA GROUNDING
SCALE: NTS



3
E2.5 MW DISH GROUNDING
SCALE: NTS



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**CITY OF VALDEZ
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**TOWER
GROUNDING
DETAILS**

E2.5

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