

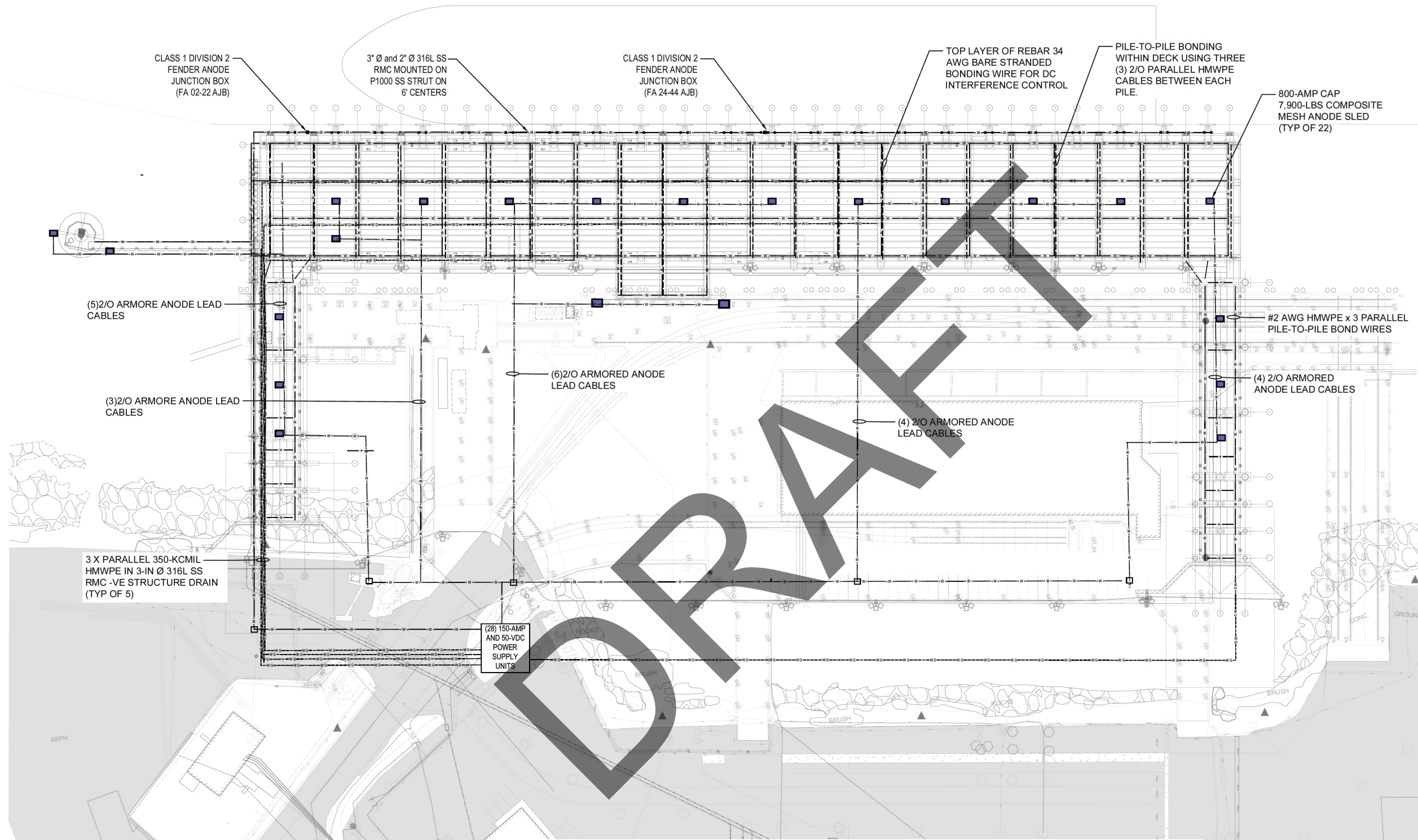


NOTES:

1. INSTALL UPLAND CONDUIT AND PULL BOXES IN CONJUNCTION WITH UPLAND IMPROVEMENT
2. INSTALL 6" Ø FLEXIBLE PVC/ STEEL BRAID PIPE CONDUIT FROM UPLAND PULL BOXES DOWN THE SHORE UNDER THE AMOUR ROCK
3. PROVIDE MULE TAPE IN ALL CONDUIT AND SEAL ENDS TO PREVENT CONTAMINATION
4. WHEN WIRES ARE INSTALLED IN CONDUIT, SEAL END WITH DUCT SEAL
5. INSTALL PILE-TO-PILE BOND WIRES PROGRESSIVELY AS THE WORK PROCEEDS FROM TRESTLE 1-A WEST AND NORTH
6. INSTALL AND ENERGIZE ANODE PROGRESSIVELY AS THE WORK PROCEEDS FROM TRESTLE 1-A NORTH
7. INSTALL ANODE SLEDS BY LOWERING THEM WITH A CRANE FROM THE DECK AS IT IS PROGRESSIVELY ERECTED
8. DO NOT ENERGIZE ANODE SLEDS ADJACENT TO UN-BONDED PILES TO PREVENT POSSIBLE CP INTERFERENCE

LEGEND

- 800-AMP CAPACITY AND 7,900-LBS COMPOSITE MESH MMO ANODE SLED
- 2/O ARMORED ANODE LEAD WIRES INSIDE ANCHORED TO SEAFLOO WITH CONCRETE BALLAST
- THREE (3) 2/O BARE STRANDED CU PILE-TO-PILE BOND /CP DRAIN WIRES IN CIP CONCRETE AND EXOTHERMICALLY WELDED TO INSIDE SURFACE OF PIPE PILES
- THREE (3) PARALLEL 350-KCMIL HMWPE IN 3-IN Ø 316L SS RMC -VE STRUCTURE DRAIN
- #4 AWG REBAR TO REBAR BONDING WIRE EXOTHERMICALLY WELDED TO ALL SURFACE REBAR PARALLEL TO SHORE FOR DC TRACTION STRAY CURRENT MITIGATION
- CLASS 1 DIV 2 CAST ALUMINUM FENDER ANODE JUNCTION BOXES TO BALANCE CP CURRENT
- 36-IN X 36-IN X 36-IN AIRCRAFT RATED CONCRETE POLYMER PULL BOX WITH GALVANIZED LID.



WHARF, TRESTLE AND DOLPHIN PILES IMPRESSED CURRENT CATHODIC PROTECTION ANODE LAYOUT

1 SCALE: 1/4" = 1'-0"



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REV	DATE	DESCRIPTION	BY	APVD

GHD-WSP JV
1400 W. BENSON BLVD, SUITE 400
ANCHORAGE, ALASKA 99503
AK ENGINEERING LICENSE # 197742(GHD) - AECC236(WSP)
AK BUSINESS LICENSE # 2164152(GHD) - 1113511(WSP)

WSP
CONSULTANT

DSGN	DR	CHK	APVD
RCS	RCS	JK	JK

SEAL

PORT OF ALASKA

PORT OF ALASKA
MODERNIZATION PROGRAM

CATHODIC PROTECTION
WHARF, FENDERS, TRESTLE AND DOLPHIN
CATHODIC PROTECTION PLAN

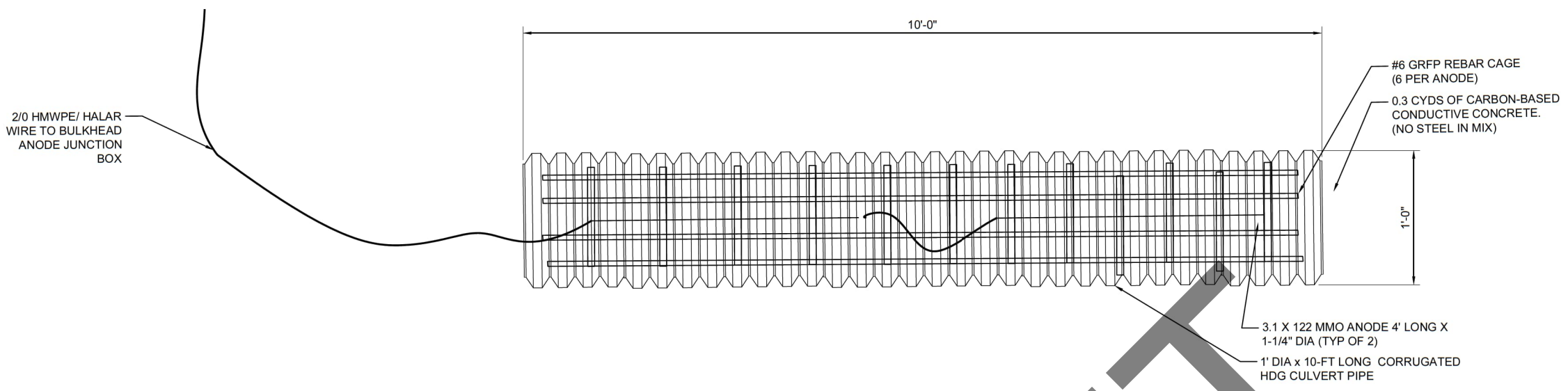
PORT OF ALASKA

PORT OF ALASKA MODERNIZATION PROGRAM
CARGO TERMINAL 1 DESIGN
ANCHORAGE, ALASKA

HORIZ SCALE: AS SHOWN	DATE: 10/27/2023	T1-W-201
VERT SCALE: AS SHOWN	SHEET: 1 OF 349	

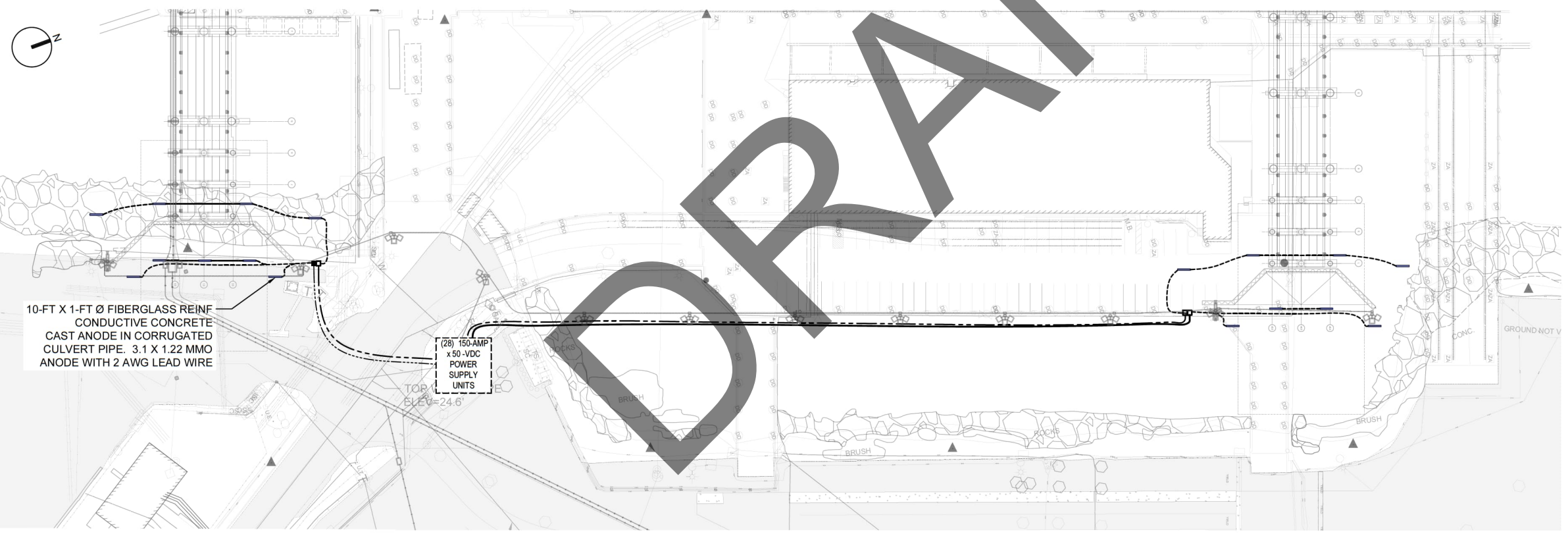
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2 BULKHEAD ICCP ANODE DETAIL
MMO-CONDUCTIVE CONCRETE ANODE DETAIL
 SCALE: 1" = 1'-0"

- NOTES**
- BURY ANODES TO ELEVATION OF -5-FT. MAY BE INSTALLED HORIZONTALLY OR VERTICALLY.
 - USE CONDUIT TO PROTECT WIRE WHERE NEEDED (IE. WHERE WIRE MAY BE IN RIP RAP)
 - CAST ANODE ON SITE 28-DAYS BEFORE INSTALLATION.
 - CAST SIX (6) 6-IN CORES OF THE CONDUCTIVE CONCRETE FOR COMPRESSIVE TESTING
 - INSTALL UPLAND CONDUIT AND AIRCRAFT RATED 36" x 36" x 36" PULL BOXES IN CONJUNCTION WITH UPLAND IMPROVEMENT
 - INSTALL DISTRIBUTED ANODE BED ONLY ONCE THEY WILL NOT BE SUBJECT TO DAMAGE FROM DEMO OR CONSTRUCTION OPERATIONS
 - INSTALL CAST ANODE HORIZONTALLY AT AN ELEVATION OF -5'.
 - PROVIDE SCHEDULE 80 CONDUIT TO PROTECT ANODE LEADS FROM DAMAGE BY ARMOR ROCK.



1 T1-A AND TA-B BULKHEAD DISTRIBUTED ICCP PLAN VIEW
 SCALE: 1/4" = 1'-0"

- LEGEND**
- 3.1 X 1.22 MMO ANODE CAST IN FG REINFORCED CONDUCTIVE CONCRETE CYLINDER 10-FT X 1-FT Ø (TYP OF 17)
 - #1 AWG ANODE HEADER TO T1-B BULKHEAD JCT BOX
 - #4 AWG ANODE HEADER TO T1-B BULKHEAD JCT BOX
 - 1/0 ANODE HEADER TO T1-B BULKHEAD JCT BOX
 - #2 AWG HMWPE/ HALAR ANODE LEAD WIRES (1 PER ANODE)
 - 4-CIRC ANODE JUNCTION BOX IN NEMA 4X 316L SS ENCLOSURE
 - 5-CIRC ANODE JUNCTION BOX IN NEMA 4X 316L SS ENCLOSURE

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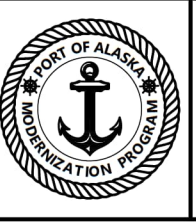
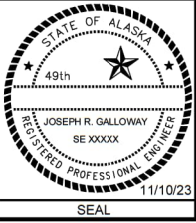
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REVISIONS				

GHD **wsp**

GHD-WSP JV
 1400 W. BENSON BLVD, SUITE 400
 ANCHORAGE, ALASKA 99503
 AK ENGINEERING LICENSE # 197742(GHD) - AECC236(WSP) AK BUSINESS LICENSE # 2164152(GHD) - 113511(WSP)

DSGN: RCS DR: RCS CHK: JK APVD: JK

CONSULTANT



CATHODIC PROTECTION

T1-A AND T1-B BULKHEADS DISTRIBUTED ICCP PLAN

PORT OF ALASKA

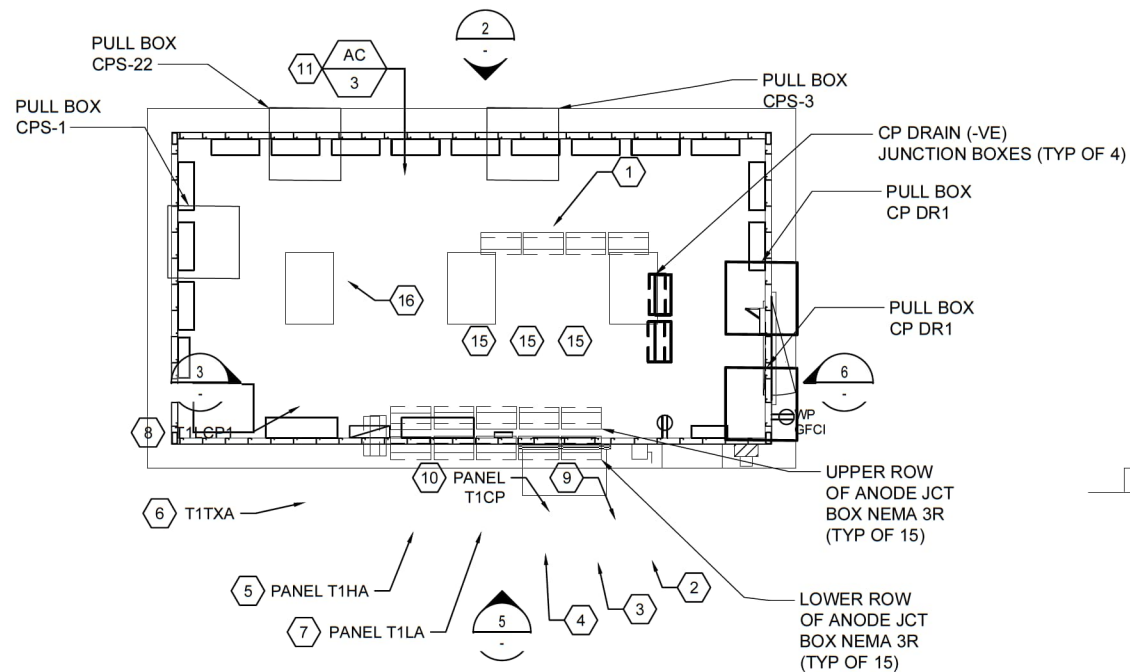
PORT OF ALASKA MODERNIZATION PROGRAM
 CARGO TERMINAL 1 DESIGN
 ANCHORAGE, ALASKA

HORIZ SCALE: AS SHOWN DATE: 11/16/2023
 VERT SCALE: AS SHOWN SHEET: 1 OF 349

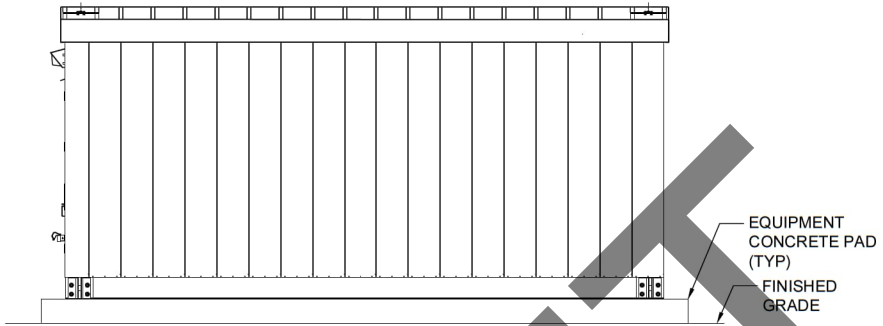
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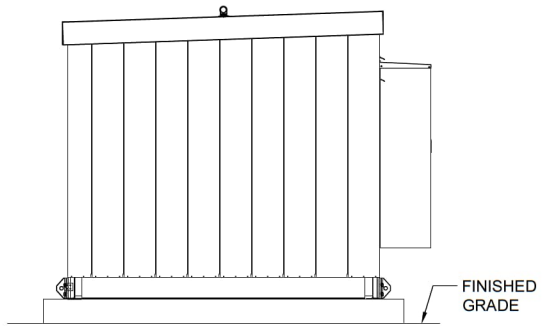
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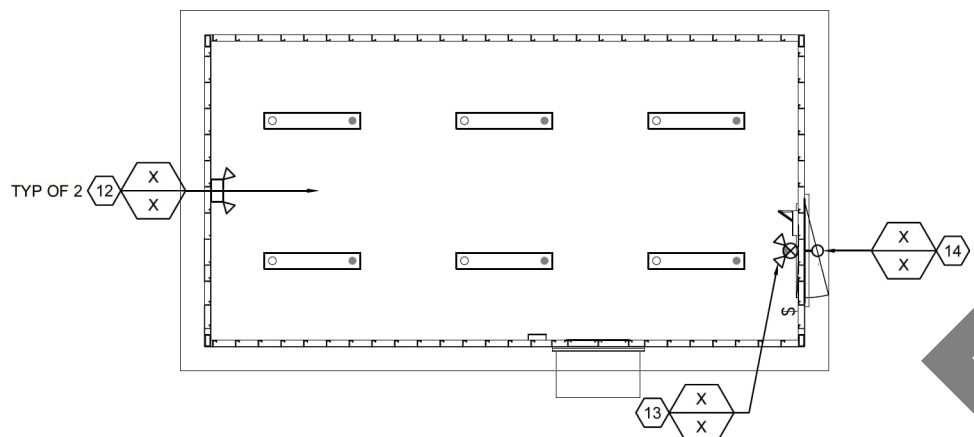
1 POWER PLAN
SCALE: 1/4" = 1'-0"



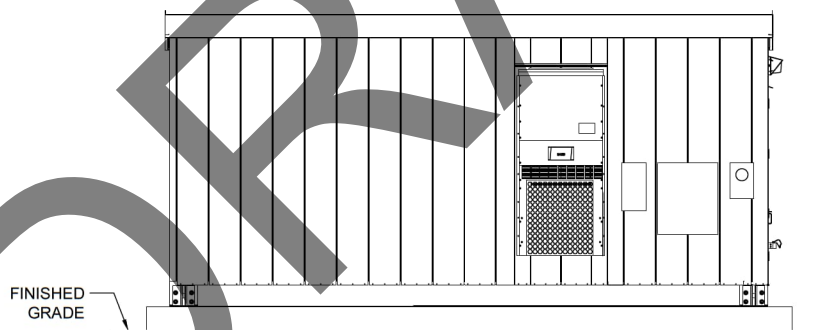
2 ELEVATION - SOUTH
SCALE: 1/4" = 1'-0"



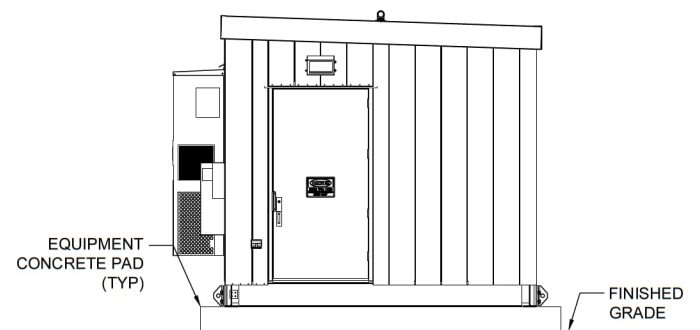
3 ELEVATION - WEST
SCALE: 1/4" = 1'-0"



4 LIGHTING PLAN
SCALE: 1/4" = 1'-0"



5 ELEVATION - NORTH
SCALE: 1/4" = 1'-0"



6 ELEVATION - EAST
SCALE: 1/4" = 1'-0"

GENERAL SHEET NOTES

1. PRE-ENGINEERED METAL TERMINAL T1 SHED.
2. PROVIDE COMPLETE PLANS, INCLUDING SEISMIC CALCULATIONS, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED BY THE STATE OF ALASKA.
3. REFER TO CIVIL AND STRUCTURAL PLANS FOR SEISMIC LOADING.
4. SEE LOW VOLTAGE ONE-LINE DIAGRAM ON SHEET T1-E-007 FOR EQUIPMENT RATINGS AND SIZES

SHEET KEYNOTES

1. PROVIDE PRE-ENGINEERED TERMINAL T1 SHED.
2. PROVIDE NEMA 4X UTILITY METER.
3. PROVIDE NEMA 4X CT CABINET ENCLOSURE.
4. PROVIDE NEMA 4X UTILITY DISCONNECT SWITCH.
5. PROVIDE NEMA 12 480 VOLT PANELBOARD.
6. PROVIDE NEMA 1 TRANSFORMER.
7. PROVIDE NEMA 12 PANELBOARD.
8. PROVIDE NEMA 4X LIGHTING CONTROL PANEL.
9. PROVIDE DATA INTERFACE PANEL.
10. PROVIDE NEMA 12 480 VOLT PANELBOARD FOR CATHODIC PROTECTION RACK.
11. PROVIDE AC UNIT.
12. PROVIDE LED INDUSTRIAL LIGHT FIXTURE.
13. PROVIDE LED COMBINATION EMERGENCY AND EXIT SIGN LIGHT FIXTURE.
14. PROVIDE LED WALL PACK LIGHT FIXTURE.
15. PROVIDE RACK FOR 30 CATHODIC PROTECTION POWER SUPPLY.
16. PROVIDE 48"L x 48"W x 24"D STEEL PULL BOX
17. PROVIDE FIVE (5) 36"L x 36"W x 36"D POLYMER CONCRETE PULL BOXES
18. PROVIDE 20"W x 24"L x 8"D NEMA 3R JUNCTION BOXES
19. PROVIDE GALV STRUT SUITABLE FOR MOUNTING 32 JCT BOXES FROM EXTERNAL PULL BOX TO AJB AND OVER TO CORRESPONDING SMPSU AND ASSOCIATED CONDUIT.



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REV	DATE	DESCRIPTION	BY	APVD
REVISIONS				

GHD **wsp**

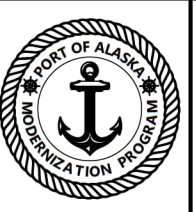
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1400 W. BENSON BLVD, SUITE 400
ANCHORAGE, ALASKA 99503

AK ENGINEERING LICENSE # 197742(GHD) - AECC236(WSP) AK BUSINESS LICENSE # 2164152(GHD) - 113511(WSP)

DSGN: RCS DR: RCS CHK: JK APVD: JK

CONSULTANT

PORT OF ALASKA



CATHODIC PROTECTION
TERMINAL T1 SHED POWER CATHODIC PROTECTION AND LIGHTING PLANS, AND ELEVATIONS

PORT OF ALASKA
PORT OF ALASKA MODERNIZATION PROGRAM
CARGO TERMINAL 1 DESIGN
ANCHORAGE, ALASKA

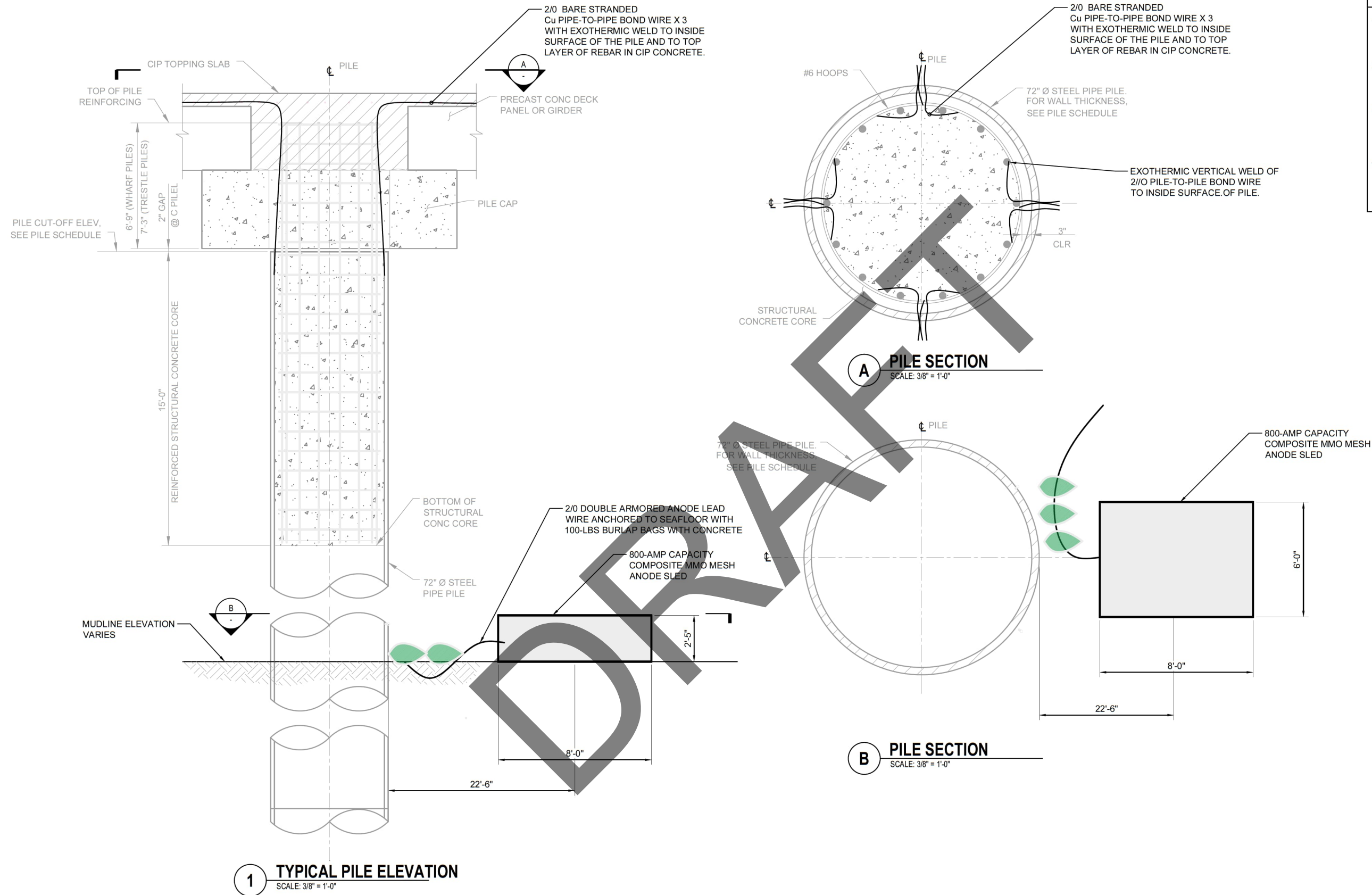
HORIZ SCALE: AS SHOWN DATE: 11/16/23
VERT SCALE: AS SHOWN SHEET: X OF

T1-W-410

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NOTES:

1. INSTALL 2/0 BONDING WIRES PROGRESSIVELY AS STRUCTURE IS ERECTED AND REBORE EACH PILE CAP CLOSURE CIP POUR.
2. TEST PILE-TO-PILE BONDS WITH A DIGITAL LOW RESISTANCE AMMETER (DLRO) TO CONFIRM SOUNDNESS OF BOND.
3. RECORD POSITION OF EACH ANODE SLED USING HIGH ACCURACY DGPS. USE OFFSET SURVEY MARK ON DECK TO SHOW RELATIVE POSITION.
4. ANODE SLEDS MAY BE ENERGIZED PROGRESSIVELY SO LONG AS ALL ADJACENT STRUCTURES ARE ELECTRICALLY BONDED.



1 TYPICAL PILE ELEVATION
SCALE: 3/8" = 1'-0"

A PILE SECTION
SCALE: 3/8" = 1'-0"

B PILE SECTION
SCALE: 3/8" = 1'-0"

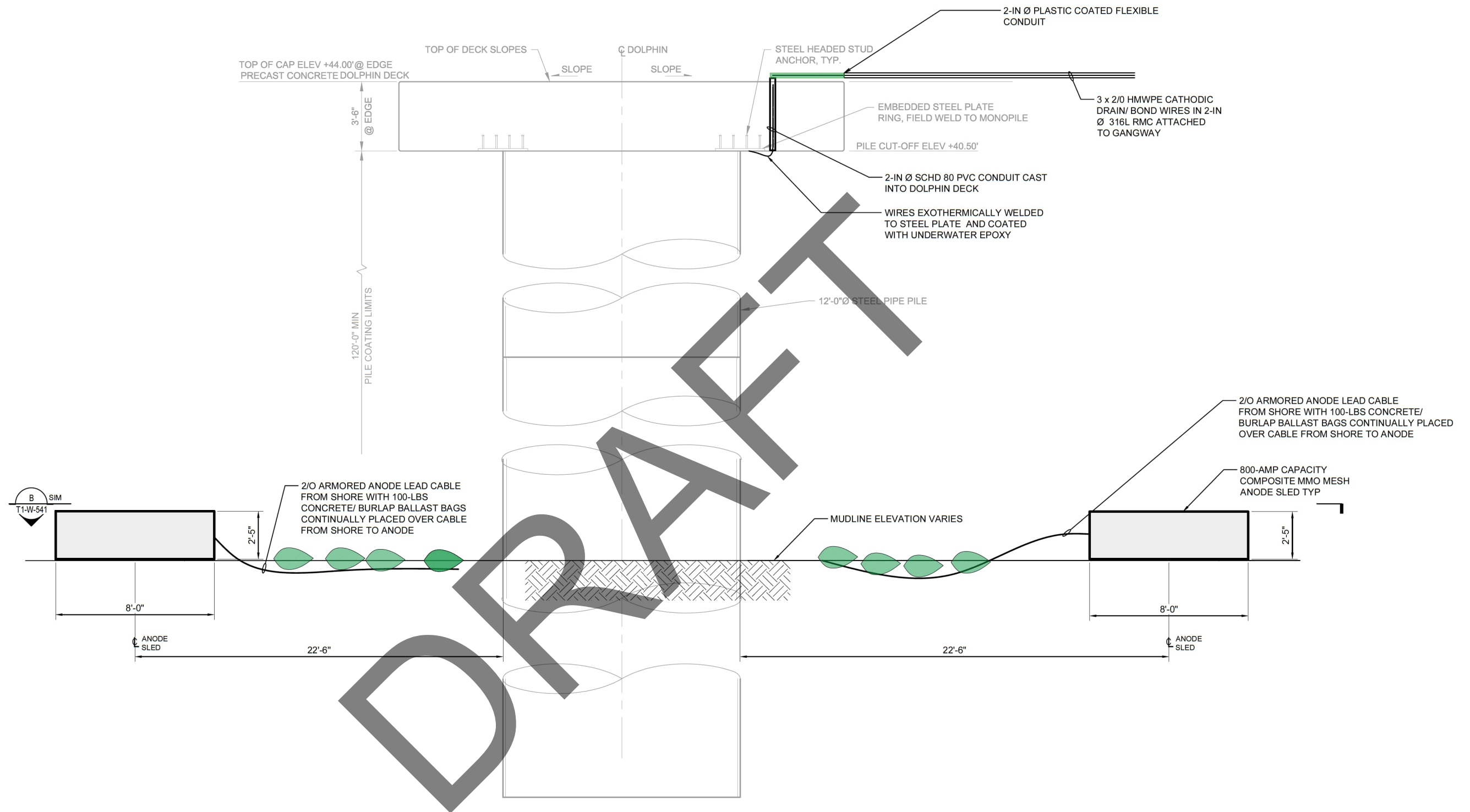
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<p>VERIFY SCALES</p> <p>BAR IS ONE INCH ON ORIGINAL DRAWING</p> <p>0 1"</p> <p>IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.</p>	<table border="1"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> <th>APVD</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REV	DATE	DESCRIPTION	BY	APVD						<p>GHD-WSP JV 1400 W. BENSON BLVD, SUITE 400 ANCHORAGE, ALASKA 99503 AK ENGINEERING LICENSE # 197742(GHD) - AECC236(WSP) AK BUSINESS LICENSE # 2164152(GHD) - 1113511(WSP)</p> <table border="1"> <tr> <td>DSGN</td> <td>DR</td> <td>CHK</td> <td>APVD</td> </tr> <tr> <td>RCS</td> <td>RCS</td> <td>JK</td> <td>JK</td> </tr> </table> <p>CONSULTANT</p>	DSGN	DR	CHK	APVD	RCS	RCS	JK	JK		<p>CATHODIC PROTECTION</p> <p>ELEVATION & SECTIONS PILE CP AND BOND WIRE INSTALLATION</p>	<p>PORT OF ALASKA</p> <p>PORT OF ALASKA MODERNIZATION PROGRAM</p> <p>CARGO TERMINAL 1 DESIGN</p> <p>ANCHORAGE, ALASKA</p>	
	REV	DATE	DESCRIPTION	BY	APVD																			
DSGN	DR	CHK	APVD																					
RCS	RCS	JK	JK																					
<p>REVISIONS</p>	<table border="1"> <tr> <td>HORIZ SCALE: AS SHOWN</td> <td>DATE: 11/16/23</td> <td rowspan="2">T1-W-541</td> </tr> <tr> <td>VERT SCALE: AS SHOWN</td> <td>SHEET: 93 OF 349</td> </tr> </table>	HORIZ SCALE: AS SHOWN	DATE: 11/16/23	T1-W-541	VERT SCALE: AS SHOWN	SHEET: 93 OF 349																		
HORIZ SCALE: AS SHOWN	DATE: 11/16/23	T1-W-541																						
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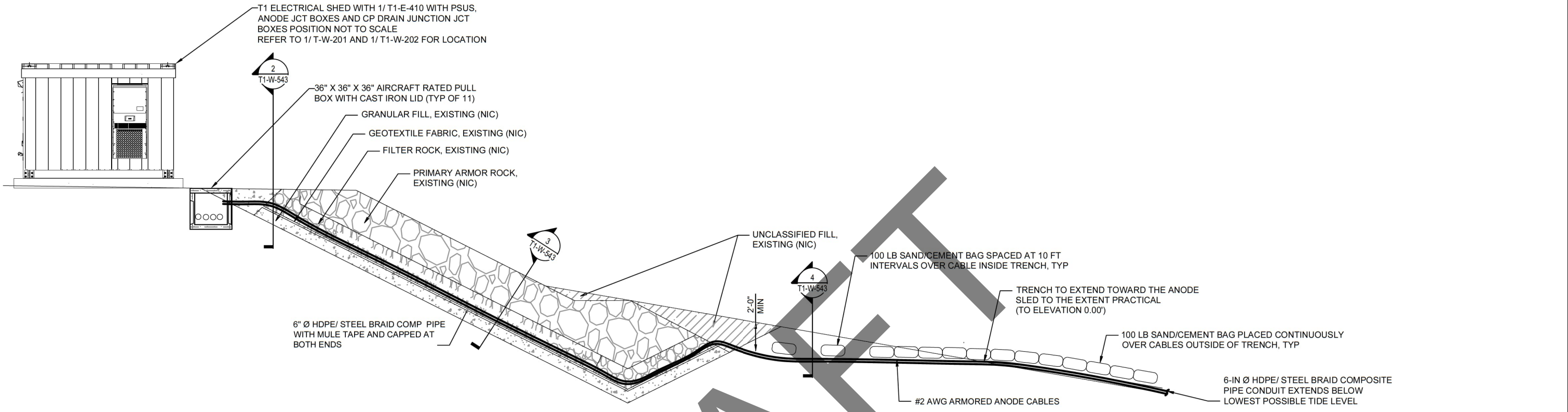
1 DOLPHIN PILE ANODE LAYOUT AND BONDING/ DRAIN WIRE CONNECTIONS
SCALE: NTS

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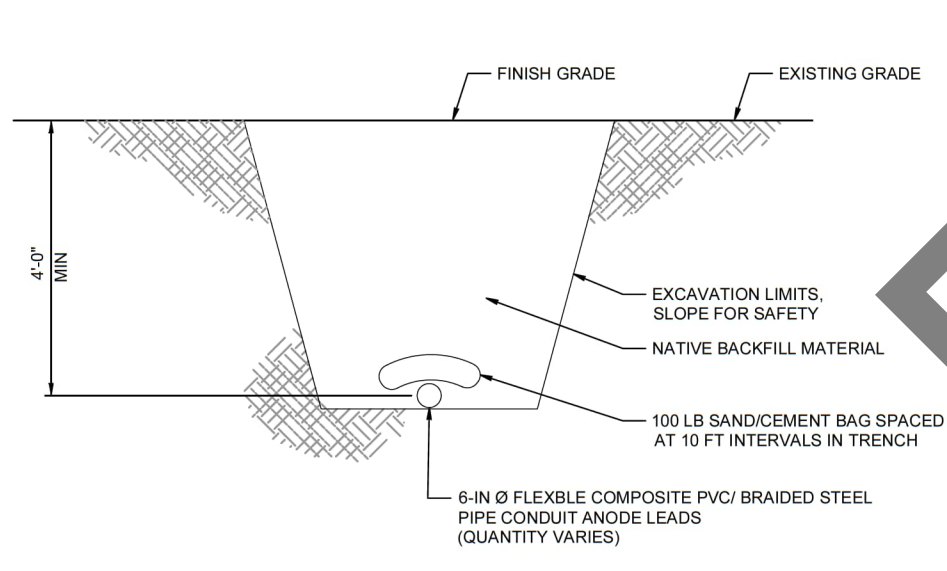
<p>VERIFY SCALES</p> <p>BAR IS ONE INCH ON ORIGINAL DRAWING</p> <p>0 1"</p> <p>IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.</p>	<table border="1"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> <th>APVD</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REV	DATE	DESCRIPTION	BY	APVD											<p>GHD-WSP JV 1400 W. BENSON BLVD, SUITE 400 ANCHORAGE, ALASKA 99503 AK ENGINEERING LICENSE # 197742(GHD) - AECC236(WSP) AK BUSINESS LICENSE # 2164152(GHD) - 113311(WSP)</p> <p>DSGN RCS DR RCS CHK JK APVD JK</p> <p>CONSULTANT</p>		<p>CATHODIC PROTECTDION</p> <p>DOLPHIN PILE ANODE, BONDING AND CP DRAIN</p>	<p>PORT OF ALASKA</p> <p>PORT OF ALASKA MODERNIZATION PROGRAM</p> <p>CARGO TERMINAL 1 DESIGN</p> <p>ANCHORAGE, ALASKA</p>
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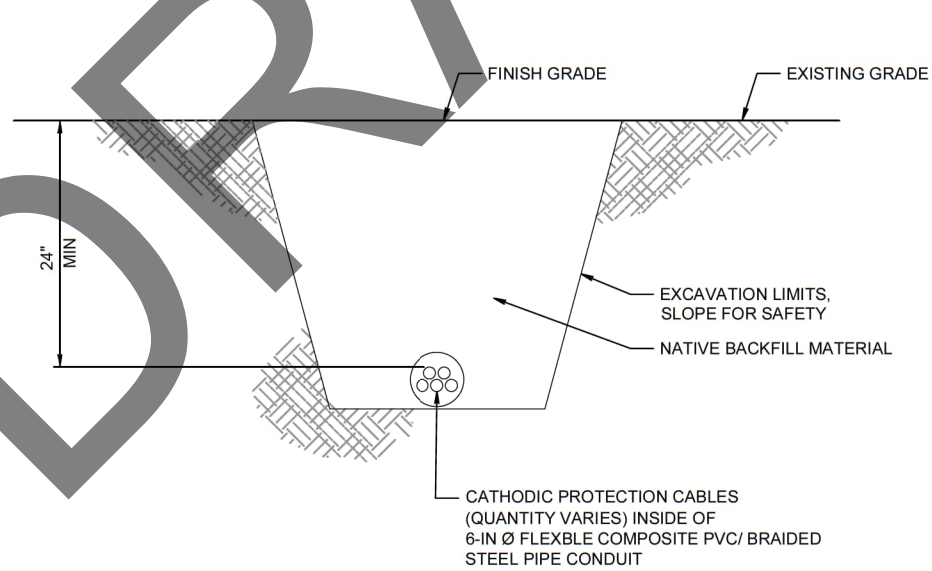
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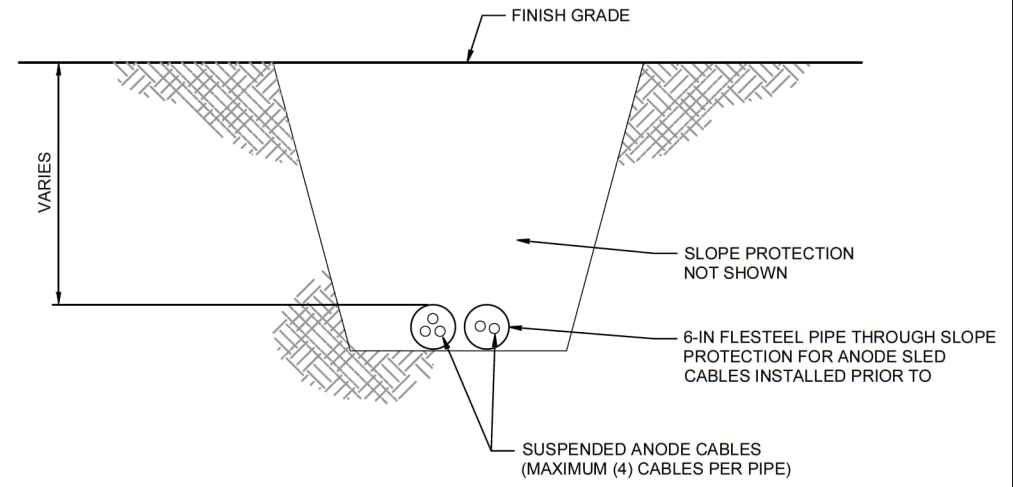
1 TRENCH ELEVATION
NTS REF



4 OFFSHORE TRENCH SECTION
NTS



3 ONSHORE TRENCH SECTION
NTS



2 6-IN DIA FLEXSTEEL PIPE BELOW SBS SLOPE PROTECTION SECTION
NTS

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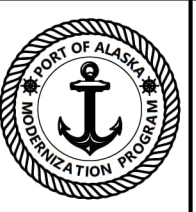
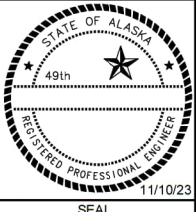
GHD **wsp**

GHD-WSP JV
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ANCHORAGE, ALASKA 99503

AK ENGINEERING LICENSE # 197742(GHD) - AECC236(WSP) AK BUSINESS LICENSE # 2164152(GHD) - 113511(WSP)

DSGN	DR	CHK	APVD
RCS	RCS	JK	JK

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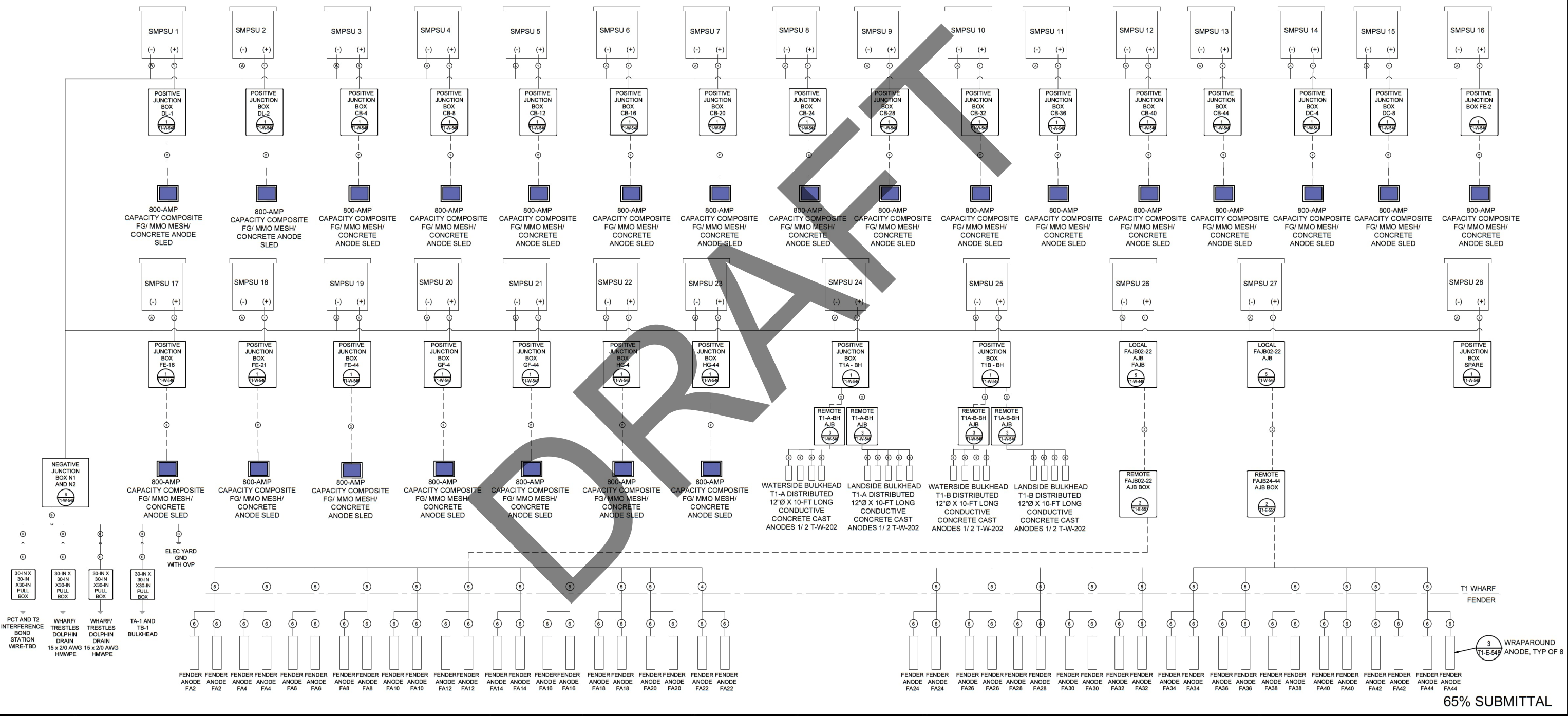
CATHODIC PROTECTION
ANODE LEAD WIRE SHORE-SIDE ROUTING FOR T1-A TRESTLE, T1-B TRESTLE, WHARF AND DOLPHIN

PORT OF ALASKA		
PORT OF ALASKA MODERNIZATION PROGRAM CARGO TERMINAL 1 DESIGN ANCHORAGE, ALASKA		
HORIZ SCALE: AS NOTED	DATE: 11/16/23	T1-W-543
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LEGEND		SHEET KEYNOTES	
— DIRECT BURY CABLES		POSITIVE CABLES ① 1" CONDUIT WITH (2) 4/0 AWG XHHW (RED HEAT SHRINK) CABLES ② (2) 2/0 ANRMORED CABLE ③ 2" CONDUIT WITH (2) 2/0 AWG HMWPE (RED HEAT SHRINK) CABLES ④ HMWPE ANODE LEADWIRE DIAMETER PER SCHEDULE TO BALANCE CURRENT CABLES. ⑤ HMWPE ANODE LEADWIRE DIAMETER PER SCHEDULE TO BALANCE CURRENT (RED HEAT SHRINK) CABLES IN 6-IN Ø 316L RMC	
		⑥ 2/0 AWG HMWPE (RED) PILING WRAPAROUND ANODE CABLES (ARMORED FIRST 20-FT)	NEGATIVE CABLES (A) 3-IN CONDUIT WITH (2) 4/0 AWG XHHW (BLACK) CABLES (B) 2/0 AWG HMWPE (BLACK) CABLES (C) (2) 2/0 AWG HMWPE (BLACK) CABLES (D) 2/0 AWG HMWPE (BLACK) CABLES (E) 2/0 AWG HMWPE (BLACK) CABLES (F) (2) 2/0 AWG BARE STRND CABLES IN 8" CIP TOPPING SLAB



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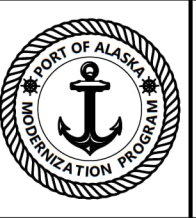
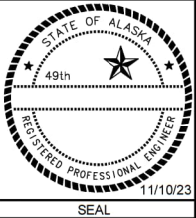
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DSGN DR CHK APVD
 RCS RCS JK JK

CONSULTANT



ELECTRICAL

PIER, TRESTLE, WHARF, DOLPHIN AND ABUTMENTS ICCP CIRCUIT DIAGRAM

PORT OF ALASKA

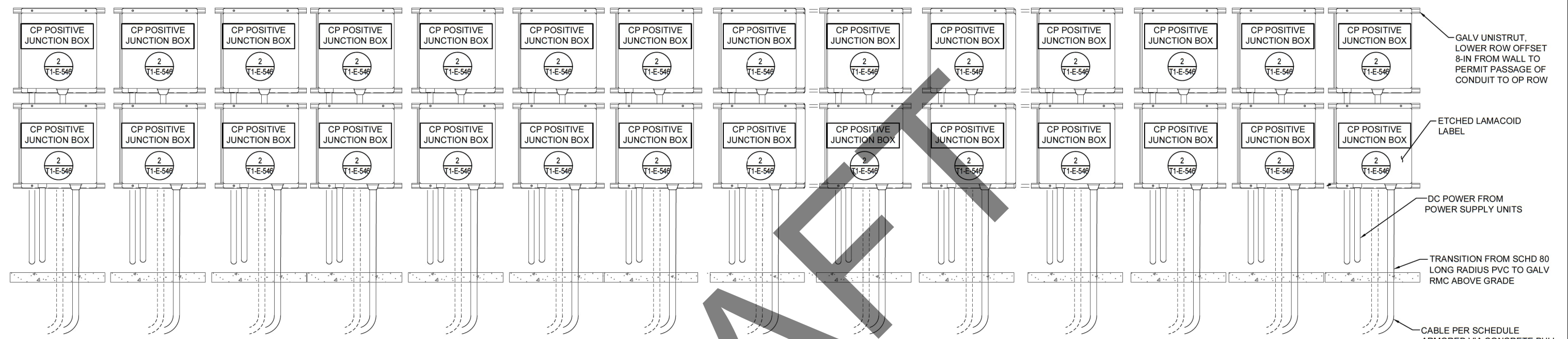
PORT OF ALASKA MODERNIZATION PROGRAM
CARGO TERMINAL 1 DESIGN
 ANCHORAGE, ALASKA

HORIZ SCALE: AS NOTED DATE: 11/16/23
 VERT SCALE: SHEET: X OF

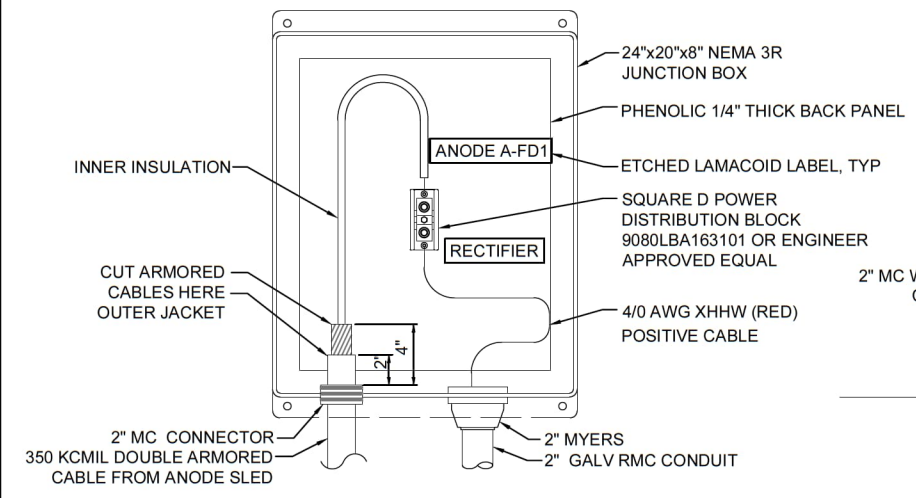
T1-W-545

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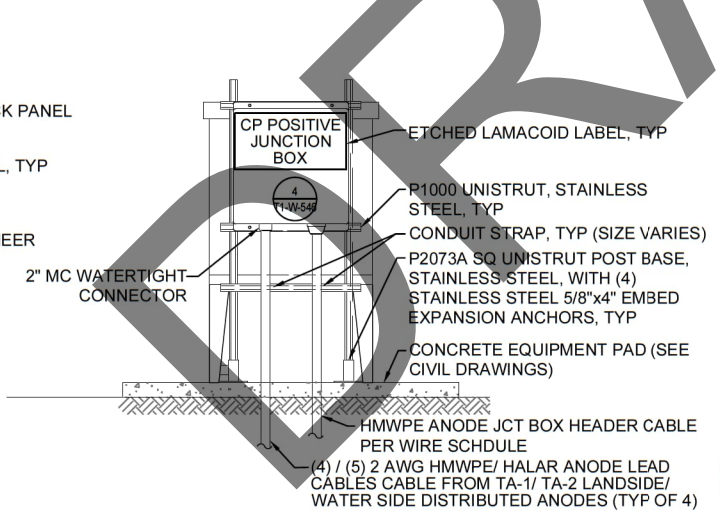
- NOTES**
- ALL METALLIC ELECTRICAL ENCLOSURES, METALLIC CONDUIT, METALLIC FRAMING SHALL BE BONDED EXTERNALLY USING #6 AWG THHN MINIMUM
 - JUNCTION BOXES OTHER THAN THE REMOTE ANODE JUNCTION BOXES FOR THE T1-A, T1-B, FA 2-22 AND FA 24-44 ARE TO BE MOUNTED INSIDE THE T1 POWER SHED.



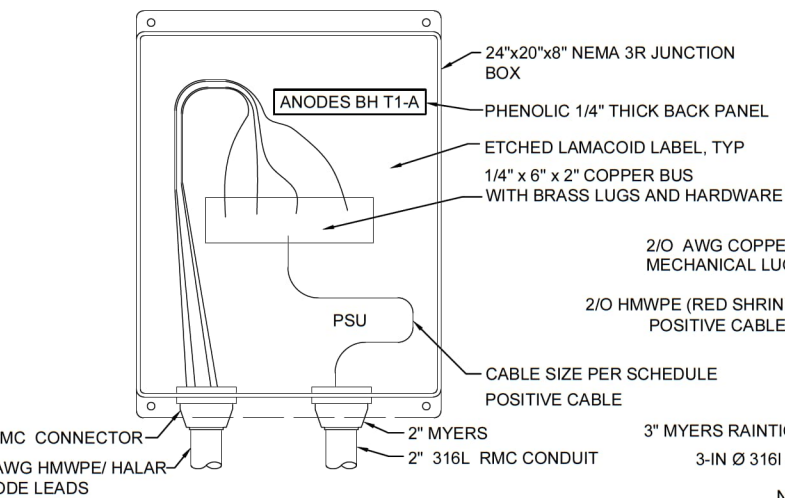
1 ANODE AND REMOTE POSITIVE JUNCTION BOXES DETAIL
SCALE: NTS



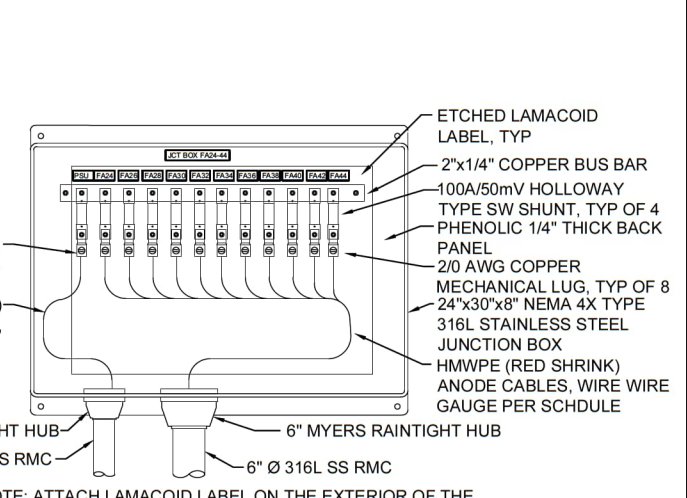
2 POSITIVE JUNCTION BOX DETAIL SLEDS AND REMOTE ANODE JCT BOXES
SCALE: NTS



3 T1-A AND T1-B BULKHEAD JUNCTION BOX MOUNTING ELEVATION
SCALE: NTS



4 POSITIVE JUNCTION BOX DETAIL FOR T1-A AND T1-B BULHEADS (TYP OF 4)
SCALE: NTS



5 ANODE JUNCTION BOX FA24-44 AND FA2-22 DETAIL TYP OF 2
SCALE: NTS

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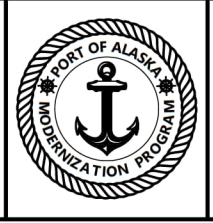
REV	DATE	DESCRIPTION	BY	APVD

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GHD **wsp**

GHD-WSP JV
1400 W. BENSON BLVD, SUITE 400
ANCHORAGE, ALASKA 99503
AK ENGINEERING LICENSE # 197742(GHD) - AEC236(WSP) AK BUSINESS LICENSE # 2164152(GHD) - 113511(WSP)

DSGN: RCS DR: RCS CHK: JK APVD: JK
CONSULTANT



CATHODIC PROTECTION
ANODE JUNCTION BOX DETAILS

PORT OF ALASKA
PORT OF ALASKA MODERNIZATION PROGRAM
CARGO TERMINAL 1 DESIGN
ANCHORAGE, ALASKA

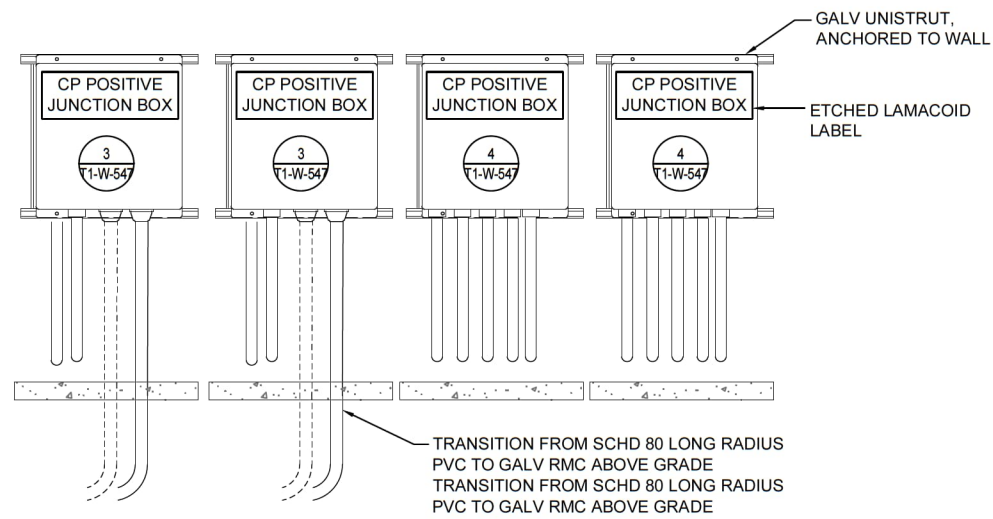
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T1-W-546

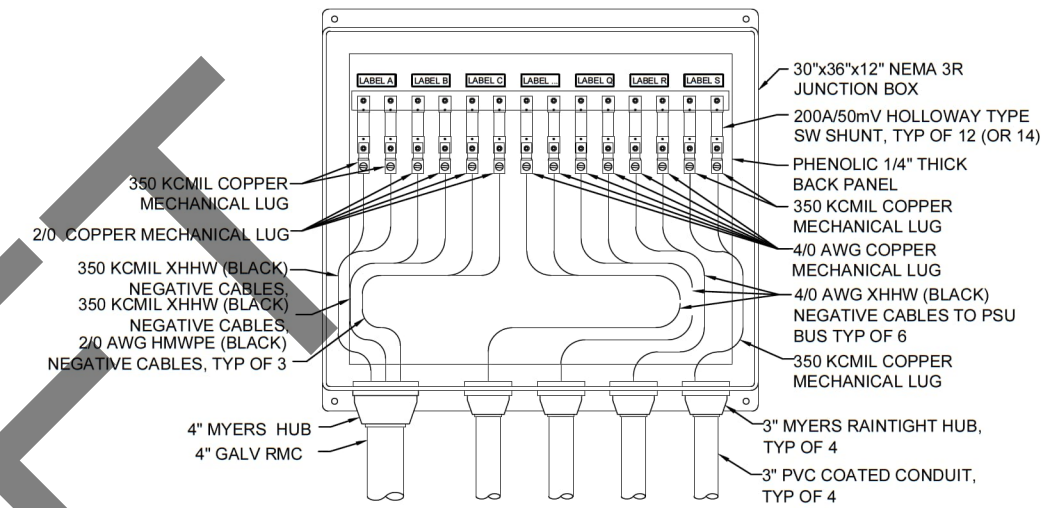
PRELIMINARY. NOT FOR USE IN DEVELOPING CONSTRUCTION BIDS

NOTES

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2. JUNCTION BOXES OTHER THAN THE REMOTE ANODE JUNCTION BOXES FOR THE T1-A, T1-B, FA 2-22 AND FA 24-44 ARE TO BE MOUNTED INSIDE THE CATHODIC PROTECTION SHED.

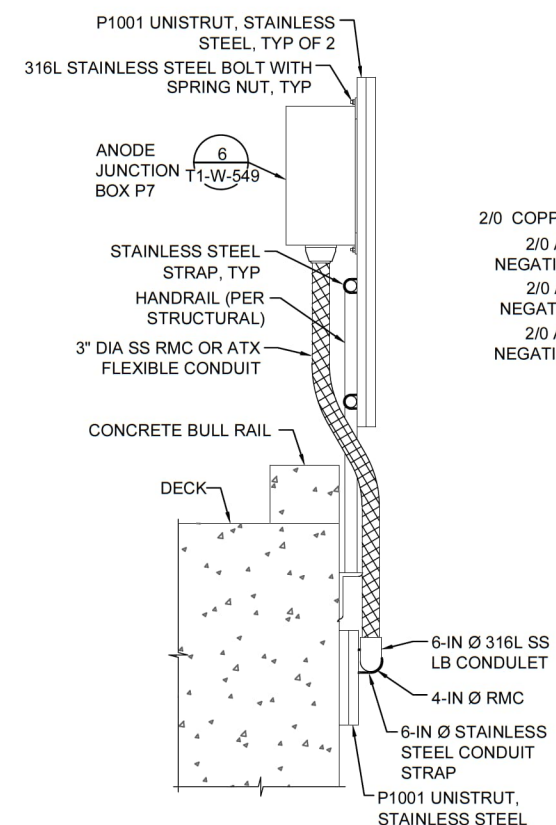


1 N1, N2, PSU BUS 1 AND PSU BUS 2 NEGATIVE JUNCTION BOXES DETAIL
SCALE: NTS

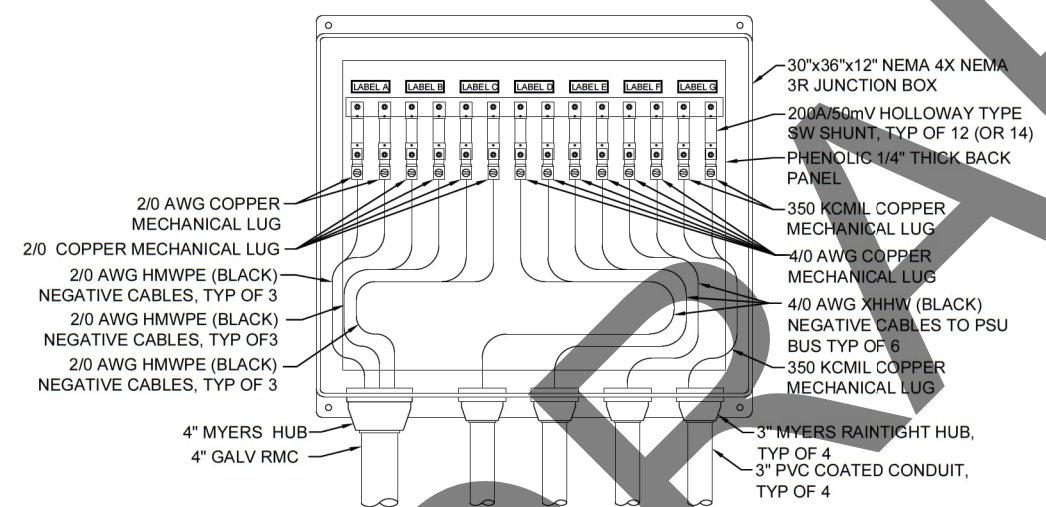


PSU BUS JCT BOX 1		PSU BUS JCT BOX 1		PSU BUS JCT BOX 1	
LABEL	DESCRIPTION	LABEL	DESCRIPTION	LABEL	DESCRIPTION
A	N1 NEG JCT BOX	H	PSU 6	O	PSU 13
B	N2 NEG JCT BOX	I	PSU 7	P	PSU 14
C	PSU 1	J	PSU 8	Q	PSU 15
D	PSU 2	K	PSU 9	R	PSU BUS JCT BOX 2
E	PSU 3	L	PSU 10	S	PSU BUS JCT BOX 2
F	PSU 4	M	PSU 11	T	
G	PSU 5	N	PSU 12	U	

PSU BUS JCT BOX 2		PSU BUS JCT BOX 2		PSU BUS JCT BOX 2	
LABEL	DESCRIPTION	LABEL	DESCRIPTION	LABEL	DESCRIPTION
A	N1 NEG JCT BOX	H	PSU 21	O	PSU 28
B	N2 NEG JCT BOX	I	PSU 22	P	PSU BUS JCT BOX 1
C	PSU 16	J	PSU 23	Q	PSU BUS JCT BOX 1
D	PSU 17	K	PSU 24	R	
E	PSU 18	L	PSU 25	S	
F	PSU 19	M	PSU 26	T	
G	PSU 20	N	PSU 27	U	



2 TYPICAL MOUNTING DETAIL
SCALE: NTS



NEGATIVE JUNCTION BOX N1		NEGATIVE JUNCTION BOX N2	
LABEL	DESCRIPTION	LABEL	DESCRIPTION
A	T1-A TRESTLE	A	T1-B BULKHEAD
B	T1-B TRESTLE	B	LOADING PLATFORM
C	WHARF ROW B	C	PCT/ T2 INTERFERENCE
D	WHARF ROW C	D	PSU BUS JCT
E	WHARF ROW D		
F	WHARF ROW E		
G	PSU BUS JCT 1		

4 N1 AND N2 NEGATIVE JUNCTION BOX DETAIL
SCALE: NTS

4 PSU BUS NEGATIVE JCT BOX DETAIL (TYP OF 2)
SCALE: NTS

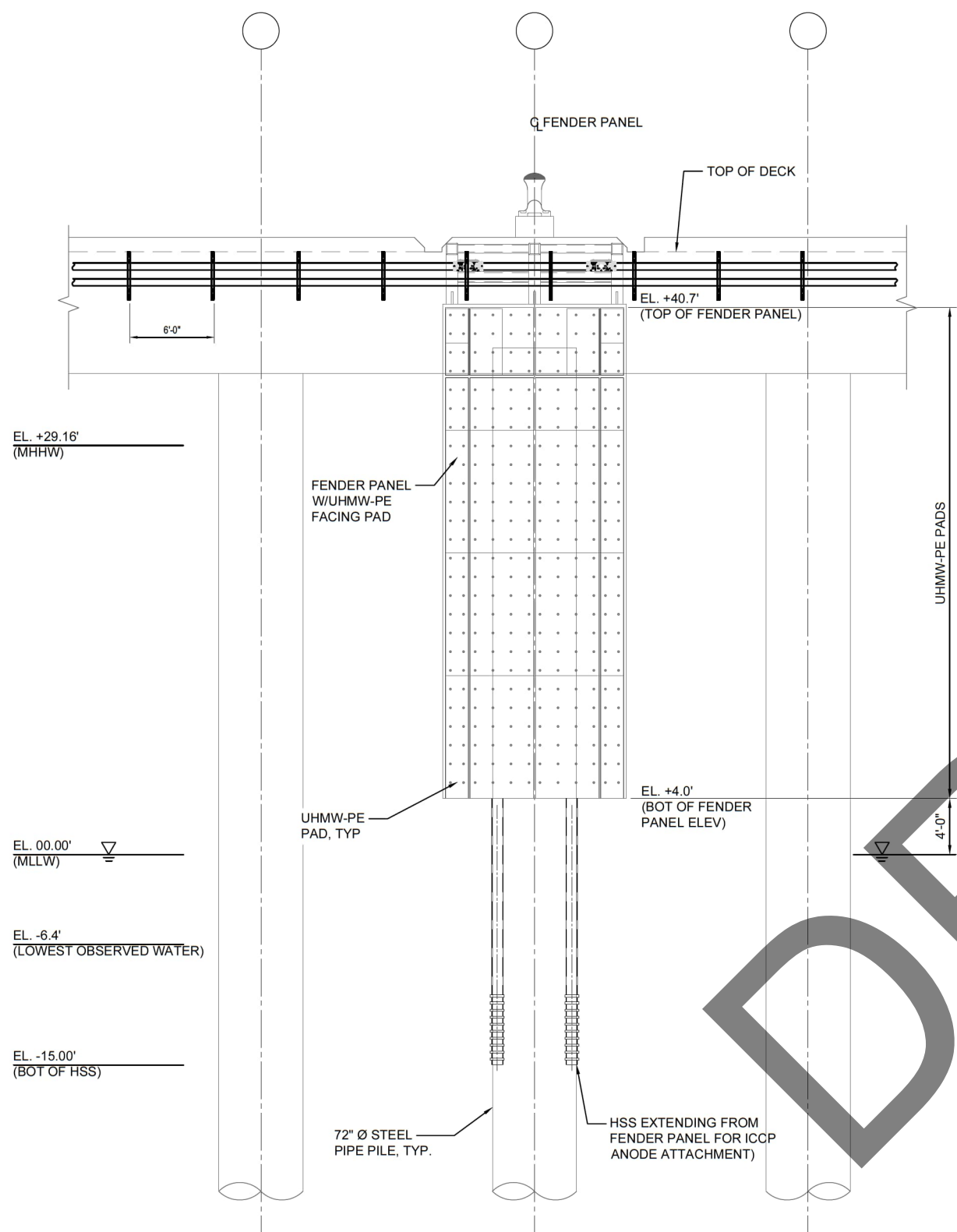
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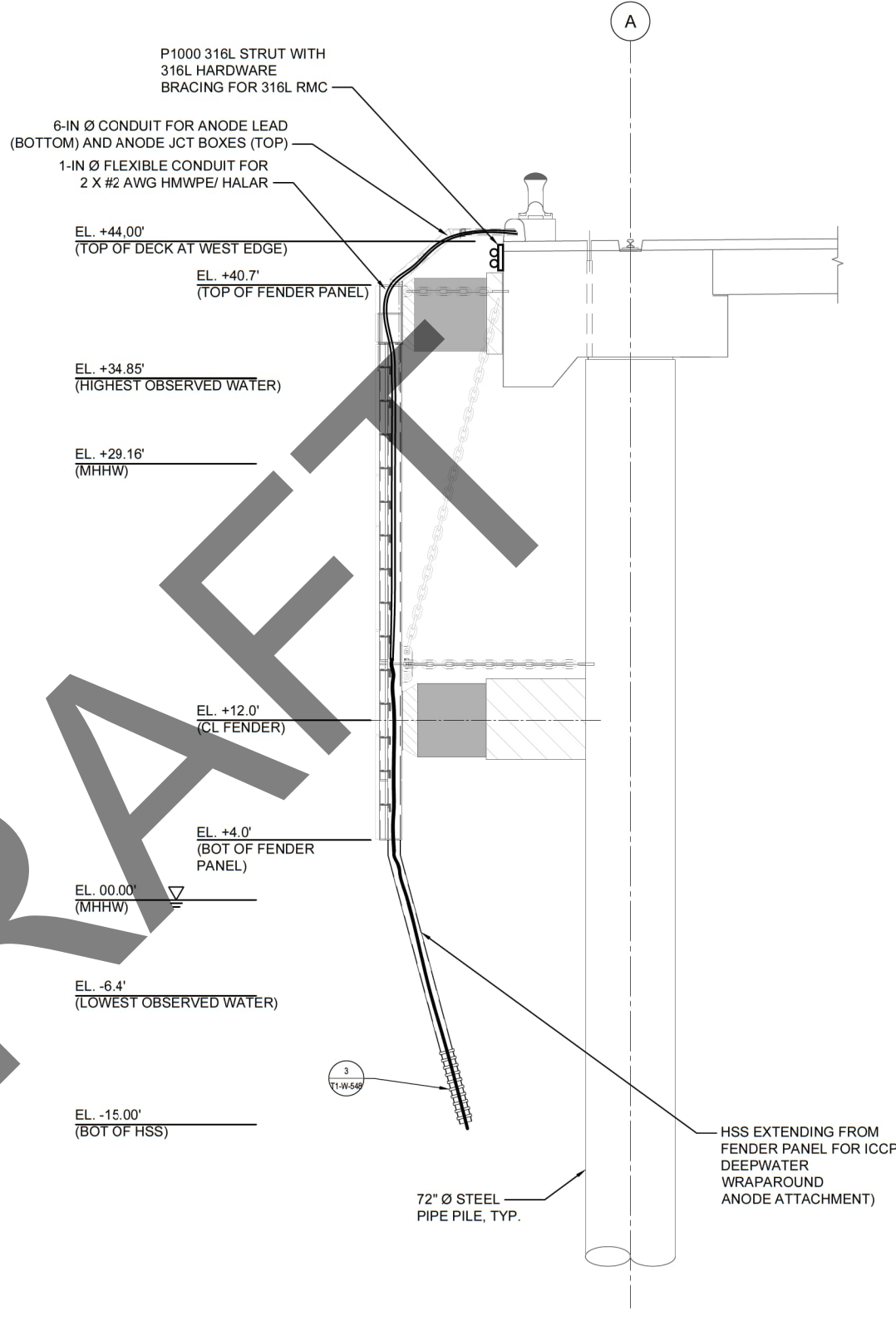
<p>VERIFY SCALES</p> <p>BAR IS ONE INCH ON ORIGINAL DRAWING</p> <p>IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.</p>	<table border="1"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> <th>APVD</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REV	DATE	DESCRIPTION	BY	APVD						<p>GHD-WSP JV 1400 W. BENSON BLVD, SUITE 400 ANCHORAGE, ALASKA 99503 AK ENGINEERING LICENSE # 197742(GHD) - AECC236(WSP) 2164152(GHD) - 113511(WSP)</p>				<p>CATHODIC PROTECTION</p> <p>FENDER ANODE AND CP NEGATIVE DRAIN JUNCTION BOX DETAILS</p>	<p>PORT OF ALASKA</p> <p>PORT OF ALASKA MODERNIZATION PROGRAM</p> <p>CARGO TERMINAL 1 DESIGN</p> <p>ANCHORAGE, ALASKA</p>
	REV	DATE	DESCRIPTION	BY	APVD												
<p>REVISIONS</p>	<p>RCS</p> <p>RCS</p> <p>CHK</p> <p>APVD</p> <p>JK</p> <p>JK</p>	<p>CONSULTANT</p>	<p>SEAL</p>	<p>DATE: 11/16/23</p> <p>SHEET: X OF</p>	<p>T1-W-547</p>												

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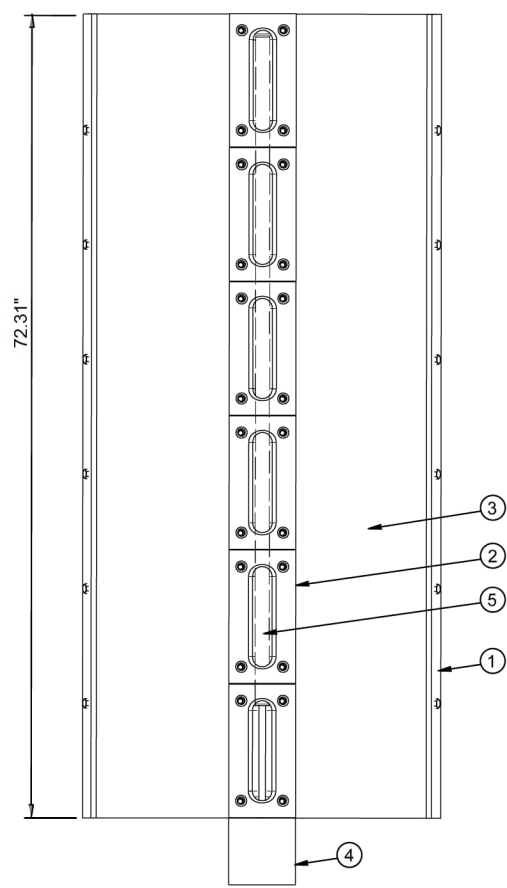
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1 FENDER ANODE DETAIL - FRONT VIEW
3/16" = 1'



2 FENDER ANODE DETAIL - SIDE VIEW
3/16" = 1'



- ① RAPAROUND FRAME
- ② ANODE PROTECTOR
- ③ DI-ELECTRIC SHIELD
- ④ CABLE TERMINATION
- ⑤ MIXED METAL OXIDE ANODE TUBE
- ⑥ 2/0 AWG CABLE

3 DEEPWATER WRAPAROUND ANODE DETAIL
3/16" = 1'

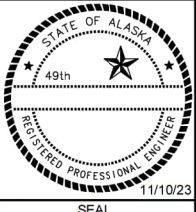
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REV	DATE	DESCRIPTION	BY	APVD

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AK ENGINEERING LICENSE # 197742(GHD) - AECC236(WSP) 2164152(GHD) - 1113511(WSP)

DR DSGN DR R.C. STUART CHK J. KNAUER APVD

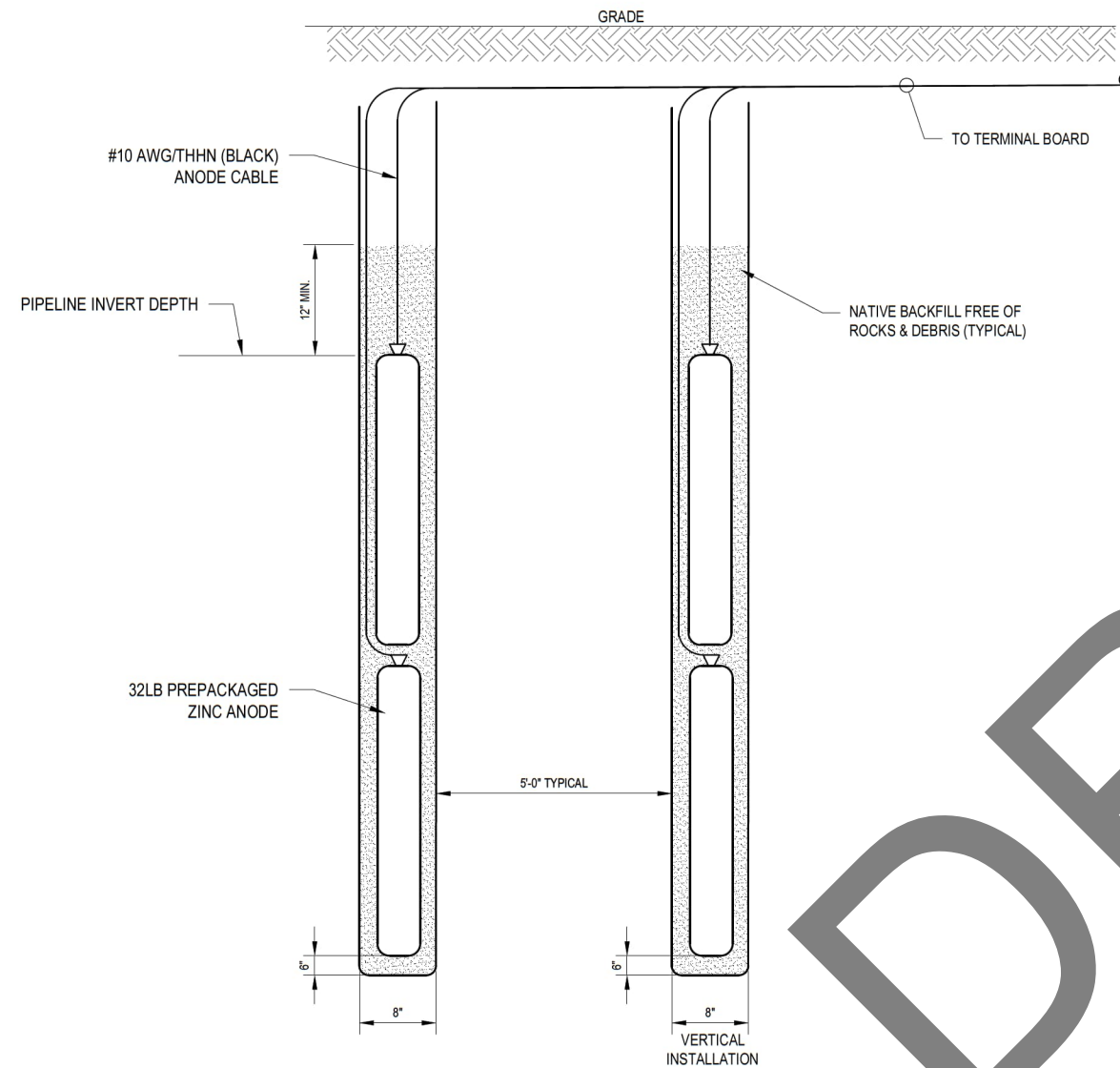


CATHODIC PROTECTION
FENDER ANODE LAYOUT

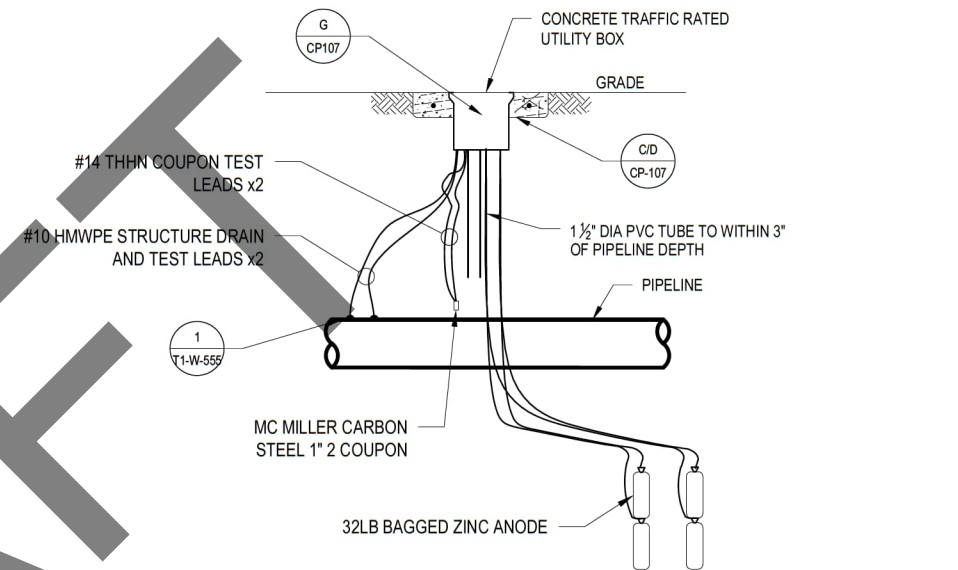
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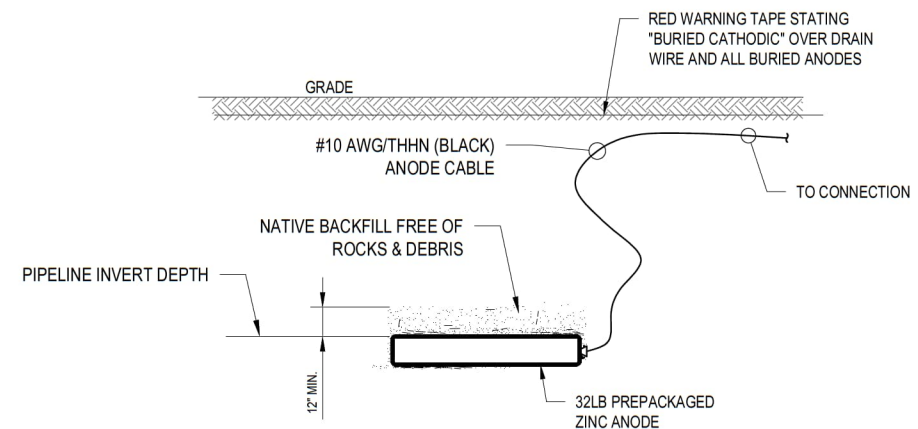
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1 VERTICAL ZINC ANODE INSTALLATION WITH ANODE ORIENTATION
SCALE: NTS T1-W-556



2 ANODE WIRING FROM FLUSH TO GRADE TEST STATION
SCALE: NTS T1-W-556



3 HORIZONTAL ZINC ANODE INSTALLATION
SCALE: NTS T1-W-556

DRAFT

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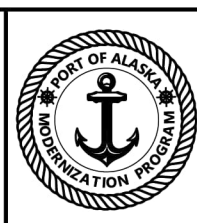
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AK ENGINEERING LICENSE # 197742(GHD) - AECC236(WSP)
AK BUSINESS LICENSE # 2164152(GHD) - 113511(WSP)

WSP
CONSULTANT

DRG	DR	CHK	APVD
RCS	RCS	JK	JK

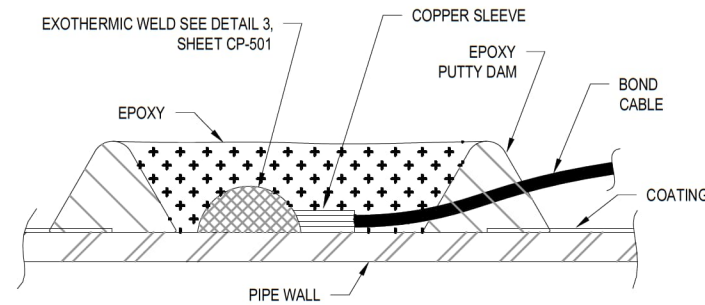


CATHODIC PROTECTION

LANDSIDE DETRAIL FOR APPLICATION OF GALVANIC CP TO BURIED PIPES/ UTILITIES.

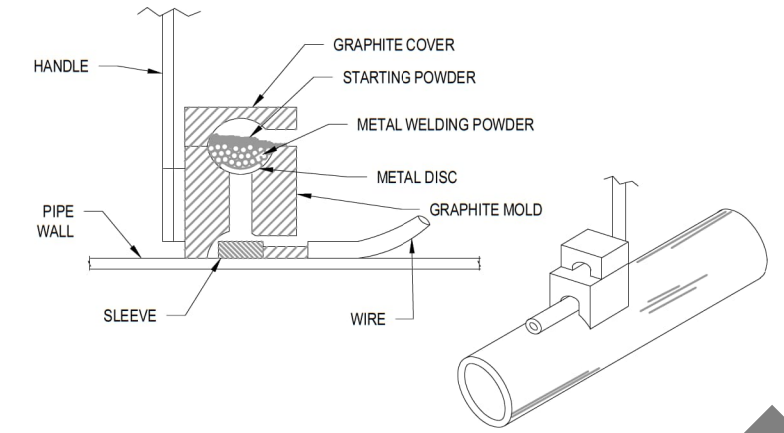
PORT OF ALASKA	
PORT OF ALASKA MODERNIZATION PROGRAM CARGO TERMINAL 1 DESIGN ANCHORAGE, ALASKA	
HORIZ SCALE: AS SHOWN	DATE: 11/16/2023
VERT SCALE: AS SHOWN	SHEET: 93 OF 349
T1-W-556	

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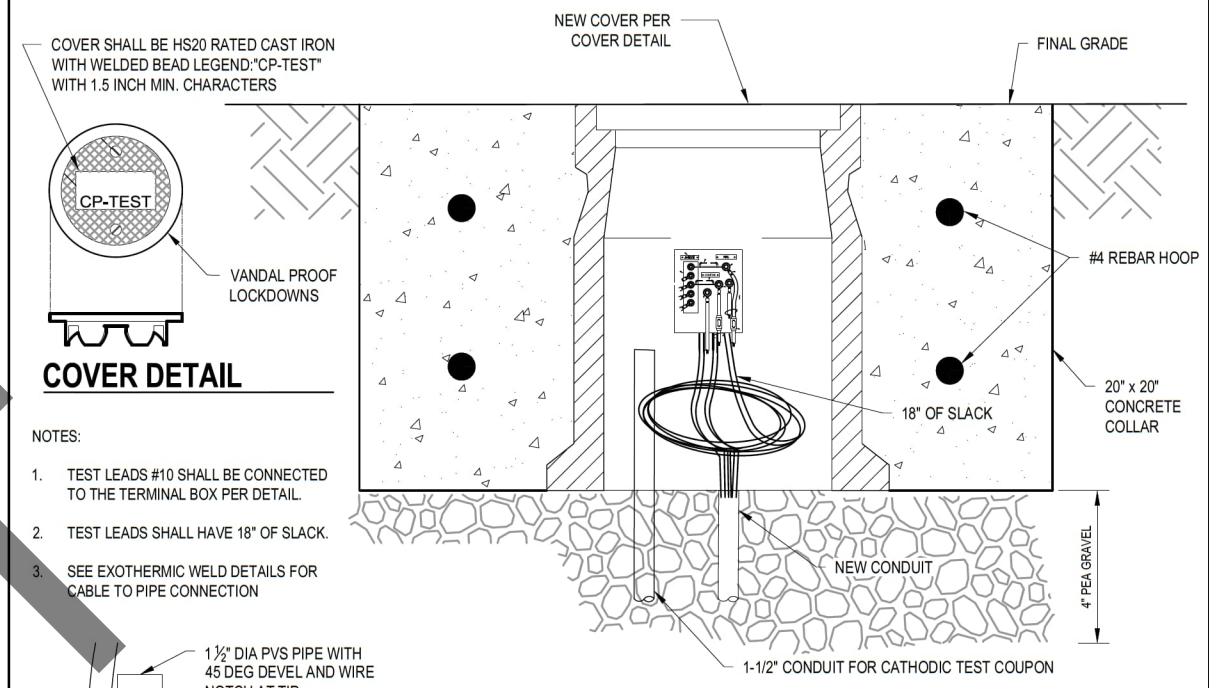
- NOTES:**
- WHERE (2) CABLE TO PIPE CONNECTIONS ARE IN THE SAME VICINITY, MAINTAIN A 3-INCH DISTANCE BETWEEN THE CABLE TO PIPE CONNECTIONS.
 - OVERLAP THE EXISTING COATING BY A MINIMUM OF 1/2-INCH.

1 CABLE TO PIPE DETAIL
SCALE: NTS T1-W-557



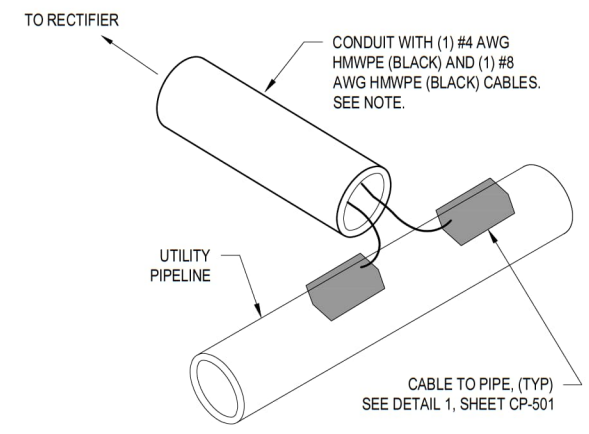
- FILE STRUCTURE CONNECTION AREA (3 INCHES X 3 INCHES MINIMUM).
 - STRIP INSULATION FROM WIRE. ATTACH SLEEVE (REQUIRED ON #4 AWG WIRE AND SMALLER).
 - HOLD MOLD FIRMLY WITH OPENING AWAY FROM OPERATOR AND IGNITE WITH FLINT GUN.
 - REMOVE SLAG FROM CONNECTION AND PEEN WELD FOR SOUNDNESS.
 - COVER CONNECTION AND EXPOSED STRUCTURE SURFACE WITH AN EPOXY COATING.
- NOTES:**
- ALL CABLES WELDS SHALL BE MINIMUM 3 INCHES APART.

2 EXOTHERMIC WELD DETAIL
SCALE: NTS T1-W-557



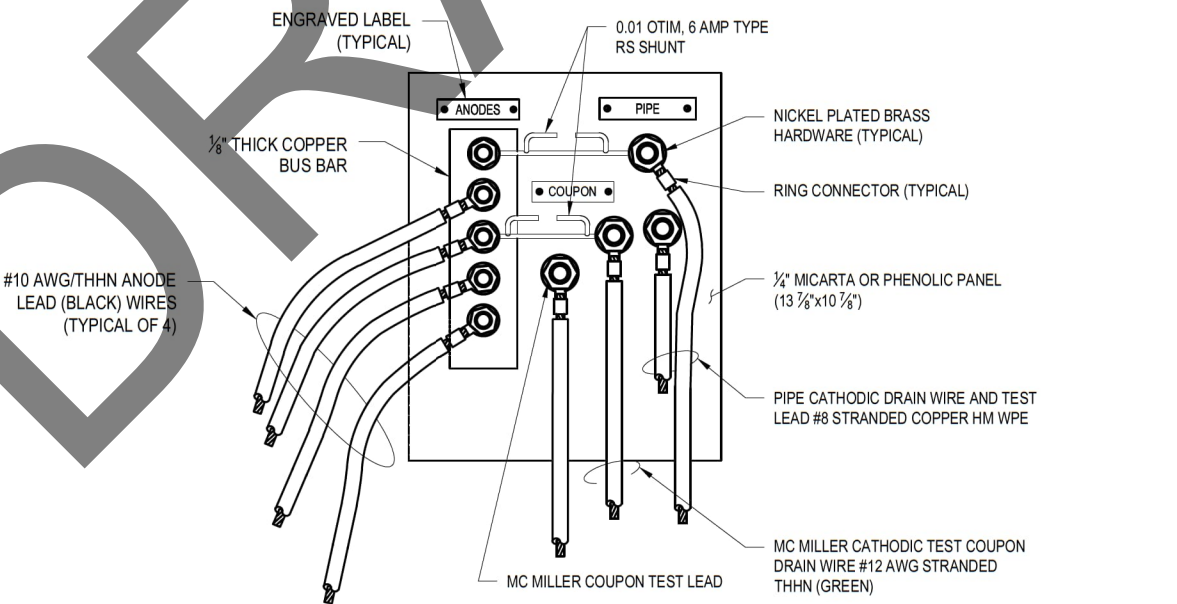
- COVER DETAIL**
- COVER SHALL BE HS20 RATED CAST IRON WITH WELDED BEAD LEGEND: "CP-TEST" WITH 1.5 INCH MIN. CHARACTERS
- NOTES:**
- TEST LEADS #10 SHALL BE CONNECTED TO THE TERMINAL BOX PER DETAIL.
 - TEST LEADS SHALL HAVE 18" OF SLACK.
 - SEE EXOTHERMIC WELD DETAILS FOR CABLE TO PIPE CONNECTION
- 1 1/2" DIA PVS PIPE WITH 45 DEG DEVEL AND WIRE NOTCH AT TIP
- MC MILLER 1" 2 COUPON ISECURED IN NOTCH AT TIP OF PVC

4 FLUSH MOUNTED CP MONITORING TEST STATION DETAIL
SCALE: NTS T1-W-557

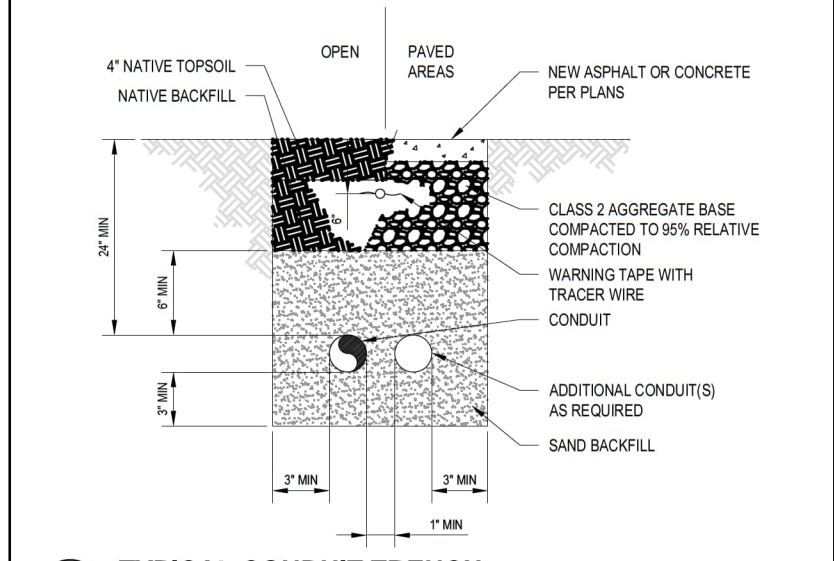


- NOTES:**
- USE GRS CONDUIT FOR ABOVE-GRADE AND PVC-COATED GRS CONDUIT FOR BELOW-GRADE.

3 BONDING DETAIL
SCALE: NTS T1-W-557



5 TYPICAL COUPON/ ANODE TEST STATION WIRING
SCALE: NTS T1-W-557



6 TYPICAL CONDUIT TRENCH
SCALE: NTS T1-W-557

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REV	DATE	DESCRIPTION	BY	APVD

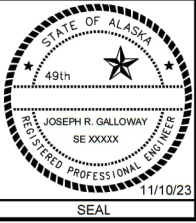
REVISIONS

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ANCHORAGE, ALASKA 99503
AK ENGINEERING LICENSE # 197742(GHD) - AECC236(WSP) AK BUSINESS LICENSE # 2164152(GHD) - 1113311(WSP)

DSGN RCS DR RCS CHK JK APVD JK

CONSULTANT



CATHODIC PROTECTION

TYPICAL SHORESIDE GALVANIC CP CONNECTION AND TEST STATION DETAIL

PORT OF ALASKA

PORT OF ALASKA MODERNIZATION PROGRAM

CARGO TERMINAL 1 DESIGN

ANCHORAGE, ALASKA

HORIZ SCALE: AS SHOWN DATE: 11/16/2023
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T1-W-557

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Cathodic Drain Wire Schedule				
Drain	Conductor	Number of Conductor	Length FT	
ROW B	2/0 HMWPE	3	1376	
ROW C	2/0 HMWPE	3	1150	
ROW D	2/0 HMWPE	3	870	
T1-A TRESTLE	2/0 HMWPE	3	200	
T1-B TRESTLE	2/0 HMWPE	3	890	
Cathodic Bonding				
Drain	Wire Length (FT)	Number of Conductor	Length FT	Extended
Wharf Row A	2/0 HMWPE	3	850	2550.0
Wharf Row B	2/0 HMWPE	3	850	2550.0
Wharf Row C	2/0 HMWPE	3	850	2550.0
Wharf Row D	2/0 HMWPE	3	850	2550.0
Wharf Row E	2/0 HMWPE	3	117	351.0
Trestle Bent F	2/0 HMWPE	3	56	168.0
Trestle Bent G	2/0 HMWPE	3	56	168.0
Trestle Bent H	2/0 HMWPE	3	56	168.0
Trestle Bent J	2/0 HMWPE	3	56	168.0
Trestle Bent K	2/0 HMWPE	3	56	168.0
Trestle Bent L	2/0 HMWPE	3	28	84.0
Wharf Bent 1 through 45	2/0 HMWPE	12	860	10320.0
E5 Platform	2/0 HMWPE	9	35	315.0
Trestle 1A Row 1 and 2	2/0 HMWPE	6	210	1260.0
Trestle 1B Row 43 and 45	2/0 HMWPE	6	267	1602.0
Rebar Bond on Wharf (Bent 1-Bent 45)	4 AWG Bare Strnd	45	100	4500.0
Total	2/0 HMWPE	12	860	24972.0
Total	4 AWG Bare Strnd			4500.0



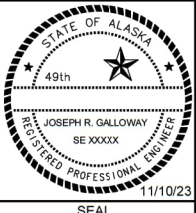


Cathodic Bonding				
Drain	Wire Length (FT)	Number of Conductor	Length FT	Extended
Wharf Row A	2/0 HMWPE	3	850	2550.0
Wharf Row B	2/0 HMWPE	3	850	2550.0
Wharf Row C	2/0 HMWPE	3	850	2550.0
Wharf Row D	2/0 HMWPE	3	850	2550.0
Wharf Row E	2/0 HMWPE	3	117	351.0
Trestle Bent F	2/0 HMWPE	3	56	168.0
Trestle Bent G	2/0 HMWPE	3	56	168.0
Trestle Bent H	2/0 HMWPE	3	56	168.0
Trestle Bent J	2/0 HMWPE	3	56	168.0
Trestle Bent K	2/0 HMWPE	3	56	168.0
Trestle Bent L	2/0 HMWPE	3	28	84.0
Wharf Bent 1 through 45	2/0 HMWPE	12	860	10320.0
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Trestle 1A Row 1 and 2	2/0 HMWPE	6	210	1260.0
Trestle 1B Row 43 and 45	2/0 HMWPE	6	267	1602.0
Rebar Bond on Wharf (Bent 1-Bent 45)	4 AWG Bare Strnd	45	100	4500.0
Total	2/0 HMWPE	12	860	24972.0
Total	4 AWG Bare Strnd			4500.0

Anode Sled Wire Schedule				
Anode Name	Wire Length (FT)		Conductor	Anode
DL-1	757		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
DL-2	707		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
DC-4	468		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
CB-4	500		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
CB-8	420		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
CB-12	500		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
CB-16	575		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
EF-16	380		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
CB-20	650		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
EF-22	460		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
CB-24	725		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
CB-28	780		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
CB-32	865		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
CB-36	940		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
CB-40	1015		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
CB-44	1120		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
HG-1	320		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
GF-1	365		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
FE-1	410		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
HG-44	800		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
GF-44	850		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh
FE-44	940		2/0 ARMORED	800-AMP CAP Sled with MMO Mesh

Fender Pile Anodes				
Anode Name	Anode Lead Wire Length	Wire Length to Junction Box	Conductor	Anode
FA2	40		6 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA4	60		6 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA6	100		4 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA8	140		4 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA10	180		4 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA12	220		3 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA14	260		3 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA16	300		2 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA18	340		1 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA20	380		1 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA22	420		1/0 ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
Fender Anode JB 3-23		750	2/0 HMWPE	
FA24	40		6 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA26	60		6 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA28	100		4 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA30	140		4 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA32	180		4 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA34	220		3 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA36	260		3 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA38	300		2 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA40	340		1 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA42	380		1 AWG ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
FA44	420		1/0 ARMORED	(2) Wraparound 8-FT x 1.25-IN MMO
Fender Anode JB 25-43		1150	2/0 HMWPE	

Bulkhead Anode and Wire Schedule				
Structure	Length (FT)	Wire length to Junction Box	Wire Gauge	Anode
T1-A Waterside	50	200	4 AWG	(4) 1-FT x 10-FT Conductive Concrete
T1-A Landside	50	200	1/0	(5) 1-FT x 10-FT Conductive Concrete
T1-B Waterside	50	900	4 AWG	(4) 1-FT x 10-FT Conductive Concrete
T1-B Landside	50	900	1 AWG	(4) 1-FT x 10-FT Conductive Concrete

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<p>VERIFY SCALES</p> <p>BAR IS ONE INCH ON ORIGINAL DRAWING</p> <p>IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.</p>	<table border="1"> <tr><th>REV</th><th>DATE</th><th>DESCRIPTION</th><th>BY</th><th>APVD</th></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	REV	DATE	DESCRIPTION	BY	APVD																					 				<p>CATHODIC PROTECTIDION</p> <p>ANODE, ANODE WIRE CP DRAIN AND BONDING WIRE SCHEDULE</p>	<p>PORT OF ALASKA</p> <p>PORT OF ALASKA MODERNIZATION PROGRAM</p> <p>CARGO TERMINAL 1 DESIGN</p> <p>ANCHORAGE, ALASKA</p>
	REV	DATE	DESCRIPTION	BY	APVD																											
<p>REVISIONS</p>	<p>ANCHORAGE, ALASKA 99503</p> <p>AK ENGINEERING LICENSE # 197742(GHD) - AECC236(WSP) AK BUSINESS LICENSE # 2164152(GHD) - 113511(WSP)</p> <p>DSGN RCS DR RCS CHK JK APVD JK</p> <p>CONSULTANT</p>	<p>SEAL</p> <p>11/10/23</p>	<p>DATE: 11/16/23</p> <p>SHEET: 93 OF 349</p>	<p>T1-W-601</p>																												

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Last Saved by: Dsong on: Nov 14, 2023 3:49 PM File: C:\Users\dsong\OneDrive\GHD\Projects\Port of Alaska\Terminal Replacement\Project Files\01_WIP\Drawings\T1-W-602.dwg

Conduit and Pull Box Schedule										
Anode Lead	Length	Conduit Diameter	Conduit Name	Number of Conductors	Conductor Type	x-Sect Area One Conductor	x-Sect Area All Conductors	Conduit Fill (%)	Origin/ Destination	Pull Box/ JCT Box Name
DL-1	203	5-IN DIAMETER SCHED 80 PVC	DL-T1-A	5	2/0 Double Armored (1.16-IN OD)	1.06	5.28	26.91%	From:	CPS1
DL-2									To:	SHR - DL-T1-A
HG-1									From:	CPS1
GF-1									To:	SHR - 4/8
FE-1									From:	CPS2
DC-4	308	4-IN DIAMETER SCHED 80 PVC	R-4/8	3	2/0 Double Armored (1.16-IN OD)	1.06	3.17	25.23%	From:	CPS1
CB-4									To:	SHR - 4/8
CB-8									From:	CPS2
CB-12	212	5-IN DIAMETER SCHED 80 PVC	R-12/24	6	2/0 Double Armored (1.16-IN OD)	1.06	6.34	32.29%	From:	CPS2
CB-16									To:	SHR - R12/24
EF-16									From:	CPS2
CB-20									To:	SHR R28/40
EF-22									From:	CPS3
CB-24									To:	SHR T1-B-R44
CB-28	608	5-IN DIAMETER SCHED 80 PVC	R-28-40	4	2/0 Double Armored (1.16-IN OD)	1.06	6.34	32.29%	From:	CPS2
CB-32									To:	SHR R28/40
CB-36									From:	CPS3
CB-40									To:	SHR T1-B-R44
CB-44									From:	CPS3
HG-44	820	5-IN DIAMETER SCHED 80 PVC	T1-B-R44	4	2/0 Double Armored (1.16-IN OD)	1.06	6.34	32.29%	From:	CPS3
GF-44									To:	SHR T1-B-R44
FE-44									From:	CPS3
T1-A BH Water	200	2-IN DIAMETER SCHED 80 PVC	T1--A-BH	2	#4 AWG HMWPE (0.452-IN OD)	0.16	0.47	14.81%	From:	CPS3
T1-A BH Land	200				1/0 HMWPE (0.623-IN OD)				To:	GRB T-A-BH
T1-B-BH Water	820	4-IN DIAMETER SCHED 80 PVC	T1--B-BH	2	#4 AWG HMWPE (0.452-IN OD)	0.16	0.43	13.58%	From:	CPS3
T1-B-BH Land	820				#1 AWG HMWPE (0.582-IN OD)				To:	GRB T1B-BH

CP Drain Conduit and Pull Box Schedule										
CP Drain Leads	Length	Conduit Diameter	Conduit Name	Number of Conductors	Conductor Type	x-Sect Area One Conductor	x-Sect Area All Conductors	Conduit Fill (%)	Origin/ Destination	Pullbox Names
ROW B	100	4-IN DIAMETER SCHED 80 PVC	CP-DR1	12	2/0 HMWPE (0.693-IN OD)	0.38	4.53	36.01%	From:	CPS-CP-DR1
ROW C	100								To:	SHR-CP-DR1
ROW D	100								From:	CPS-CP-DR2
ROW E	100								To:	SHR-CP-DR2
T1-A TRESTLE	100	3-IN DIAMETER SCHED 80 PVC	CP-DR2	6	2/0 HMWPE (0.693-IN OD)	0.38	2.26	32.01%	From:	CPS-CP-DR2
T1-A BULK HEAD	100								To:	SHR-CP-DR2
T1-B Trestle	820	3-IN DIAMETER SCHED 80 PVC	CP-DR3	6	2/0 HMWPE (0.693-IN OD)	0.38	2.26	32.01%	From:	CPS-CP-DR2
T1-B BULKHEAD	820								To:	SHR-CP-DR3

Fender Pile Anodes Conduit / Junction Box Schedule										
Anode Name	Anode Lead Wire Length	Conduit Type/ Diameter	Conduit Name	Number of Conductors	Conductor	x-Sect Area One Conductor	x-Sect Area All Conductors	Conduit Fill (%)	Origin/ Destination	Pullbox/ JCT Box Names
FA2	40	3-IN 316L SS RMC	FA2-22 HDR Conduit	11	6 AWG HALAR	0.13	2.17	30.75%	From:	SHR - 4/8
FA4	60				6 AWG HALAR					
FA6	100				4 AWG HALAR					
FA8	140				4 AWG HALAR					
FA10	180				4 AWG HALAR					
FA12	220				3 AWG HALAR					
FA14	260				3 AWG HALAR					
FA16	300				2 AWG HALAR					
FA18	340				1 AWG HALAR					
FA20	380				1 AWG HALAR					
FA22	420				1/0 HALAR					
Fender Anode JB 2-22	780	3-IN 316L SS RMC	2/0 HMWPE	2	2/0 HMWPE	1.06	2.12	29.99%	From:	SHR - 4/8
FA24	40	3-IN 316L SS RMC	FA22-44 HDR Conduit	11	6 AWG HALAR	0.13	2.17	30.75%	From:	FA 22-44 AJB
FA26	60				6 AWG HALAR					
FA28	100				4 AWG HALAR					
FA30	140				4 AWG HALAR					
FA32	180				4 AWG HALAR					
FA34	220				3 AWG HALAR					
FA36	260				3 AWG HALAR					
FA38	300				2 AWG HALAR					
FA40	340				1 AWG HALAR					
FA42	380				1 AWG HALAR					
FA44	420				1/0 HALAR					
Fender Anode JB 24-44	400	2-IN 316L SS RMC	2/0 HMWPE	1	2/0 HMWPE	1.06	1.06	33.76%	From:	FA 2-22 AJB
									To:	FA 22-44 AJB

Bulkhead Anode Conduit/ Pull Box Schedule										
Anode Name	Anode Lead Wire Length	Conduit Type/ Diameter	Conduit Name	Number of Conductors	Conductor	x-Sect Area One Conductor	x-Sect Area All Conductors	Conduit Fill (%)	Origin/ Destination	Pullbox/ JCT Box Names
T1-A BH WATER	100	4-IN DIAMETER SCHED 80 PVC	T1-A-BH	2	4 AWG	0.16	0.46	6.51%	From:	CPS3
T1-A BH LAND	100				1/0				To:	SHR-CP-T1A
T1-B-BH WATER	820	4-IN DIAMETER SCHED 80 PVC	T1-B-BH	2	4 AWG	0.16	0.43	6.08%	From:	CPS3
T1-B-BH LAND	820				1 AWG				To:	SHR-CP-T1B

- NOTES:**
- ALL PULL BOXES ARE TRAFFIC RATED 36" x 36" x 36" POLYMER CONCRETE.
 - ALL CONDUITS SHALL BE INSTALLED WITH A SUFFICIENT NUMBER OF RUNS FOR MULE TAPE NEEDED TO INSTALL WIRE. CONDUITS SHALL BE CAPPED BEFORE AFTER INSTALLATION.
 - AFTER CABLES ARE INSTALLED, DUCT SEAL SHALL BE USED TO FILL THE ANNULAR SPACE BETWEEN THE CABLES AND THE ID OF THE CONDUIT TO EXCLUDE WATER.

65% SUBMITTAL

REV	DATE	DESCRIPTION	BY	APVD

REVISIONS

GHD-WSP JV
1400 W. BENSON BLVD, SUITE 400
ANCHORAGE, ALASKA 99503
AK ENGINEERING LICENSE # 197742(GHD) - AECC236(WSP) AK BUSINESS LICENSE # 2164152(GHD) - 113511(WSP)

DSGN DR CHK APVD
RCS RCS JK JK

CONSULTANT



CATHODIC PROTECTDION
CONDUIT AND PULL BOX SCHEDULE

PORT OF ALASKA
PORT OF ALASKA MODERNIZATION PROGRAM
CARGO TERMINAL 1 DESIGN
ANCHORAGE, ALASKA

HORIZ SCALE: AS SHOWN DATE: 11/16/23
VERT SCALE: AS SHOWN SHEET: 93 OF 349

T1-W-602

PRELIMINARY. NOT FOR USE IN DEVELOPING CONSTRUCTION BIDS