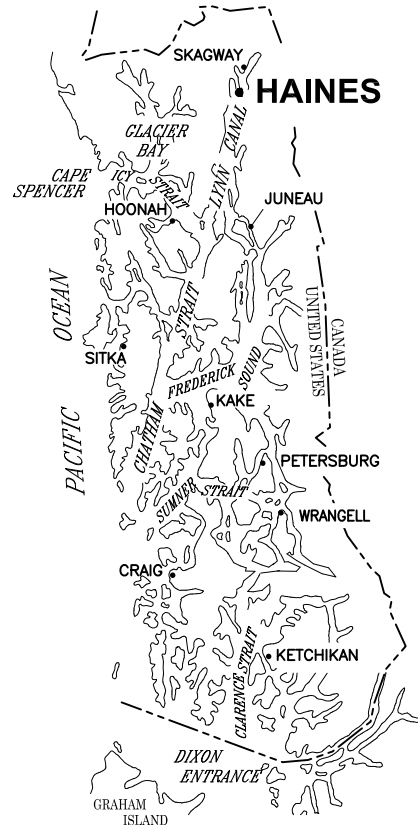


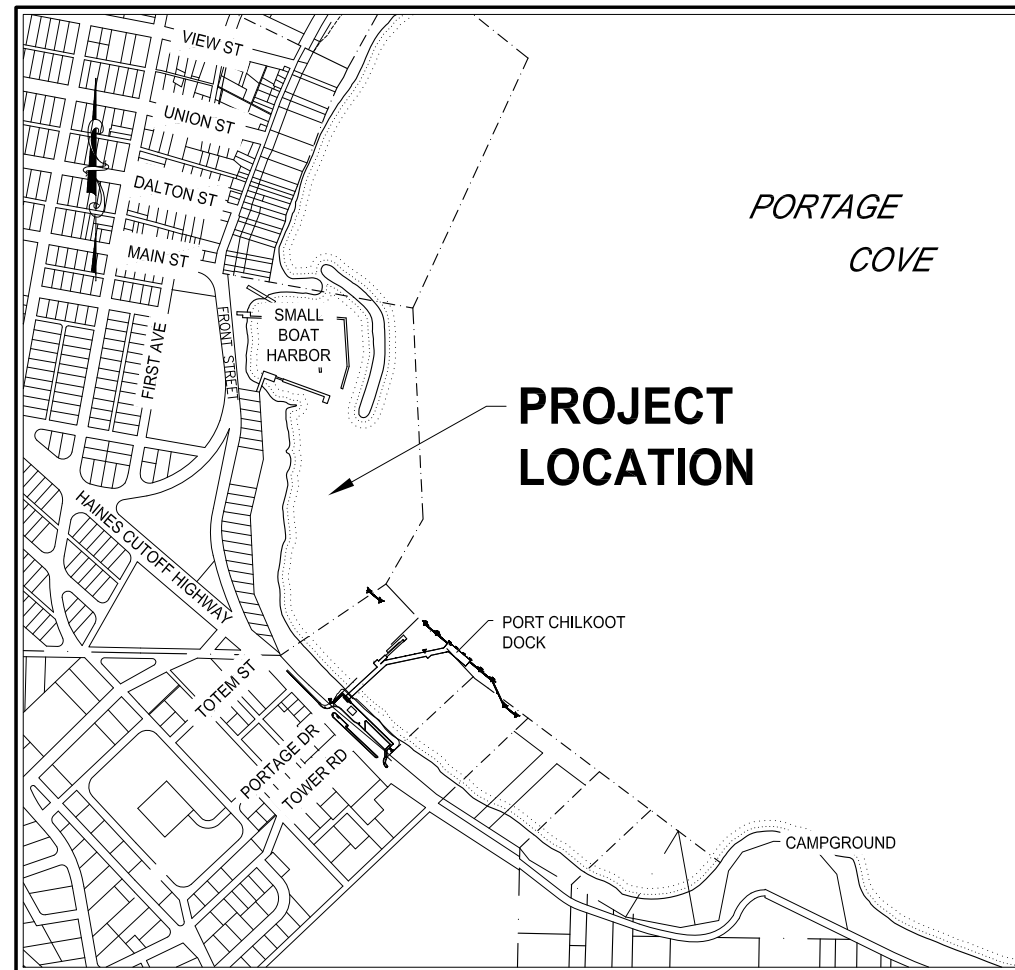
# HAINES BOROUGH PORTAGE COVE HARBOR EXPANSION



LOCATION MAP



SOUTHEAST ALASKA



VICINITY MAP

MAP ADAPTED FROM: HAINES BOROUGH GIS



### TIDAL DATA

HIGHEST OBSERVED WATER LEVEL (APPROX.) = 26.5 FEET
MEAN HIGHER HIGH WATER = 16.7 FEET
MEAN HIGH WATER = 15.7 FEET
MEAN LOWER WATER = 1.6 FEET
MEAN LOWER LOW WATER = 0 FEET
LOWEST OBSERVED WATER LEVEL (APPROX.) = -6.5 FEET

FROM: NOAA NOS/CO-OPS STATION ID:9452400 SKAGWAY, ALASKA

DRAWING INDEX			TITLE
SHEET NO.	DWG. NO.	DWG. NO.	TITLE
<b>GENERAL</b>			
1	OF 31	1.01	COVER SHEET, VICINITY MAPS AND DRAWING INDEX
2	OF 31	1.02	GENERAL NOTES, LEGEND AND ABBREVIATIONS
3	OF 31	1.03	EXISTING CONDITIONS, SURVEY CONTROL & BH LOCATIONS
4	OF 31	1.04	EXISTING CONDITIONS AND SITE PHOTOGRAPHS
5	OF 31	1.05	GENERAL SITE PLAN
6	OF 31	1.06	DEMOLITION, SALVAGE & DISPOSAL PLAN
7	OF 31	1.07	TRANSIENT FLOAT PLAN - PILE LAYOUT AND DETAILS
<b>WASTEWATER OUTFALL</b>			
8	OF 31	2.01	WASTEWATER OUTFALL PLAN & PROFILE
9	OF 31	2.02	WASTEWATER OUTFALL DETAILS
10	OF 31	2.03	WASTEWATER OUTFALL DIFFUSER DETAILS
<b>DREDGING</b>			
11	OF 31	3.01	DREDGING PLAN
12	OF 31	3.02	DREDGING SECTIONS
13	OF 31	3.03	DREDGING OFFSHORE DISPOSAL PLAN
<b>UPLANDS</b>			
14	OF 31	4.01	UPLAND GRADING AND DRAINAGE PLAN
15	OF 31	4.02	UPLAND SECTIONS AND LAYOUT TABLES
16	OF 31	4.03	STORM DRAIN DETAILS
<b>WAVE BARRIER</b>			
17	OF 31	5.01	WAVE BARRIER SITE PLAN
18	OF 31	5.02	WAVE BARRIER NORTH PARTIAL PLAN
19	OF 31	5.03	WAVE BARRIER SOUTH PARTIAL PLAN
20	OF 31	5.04	PARTIAL ELEVATION
21	OF 31	5.05	TYPICAL SECTIONS
22	OF 31	5.06	ROCK BREAKWATER SECTION
23	OF 31	5.07	PILE SCHEDULE
24	OF 31	5.08	PILE SCHEDULE
25	OF 31	5.09	BEARING PILES AND WALERS
26	OF 31	5.10	BEARING PILE DETAILS
27	OF 31	5.11	BOX CAP DETAILS
28	OF 31	5.12	FENDER AND MARINE SIGNAL LIGHT
29	OF 31	5.13	LADDER
30	OF 31	5.14	PILE ANODES ADDITIVE ALTERNATE 'B'
31	OF 31	5.15	NAVIGATION STRUCTURE DETAILS

### PROJECT SCHEDULE

DESCRIPTION	SCHEDULE
1. SUBSTANTIAL COMPLETION	MAY 31, 2018
2. FINAL COMPLETION OF ALL WORK UNDER THIS CONTRACT.	JUNE 30, 2018

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FINAL DESIGN REVIEW SUBMITTAL



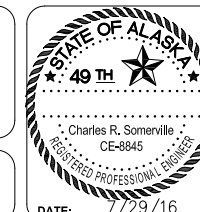
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SCALE: AS SHOWN



HAINES BOROUGH  
PORTAGE COVE  
HARBOR EXPANSION

SHEET TITLE:  
**COVER SHEET, VICINITY MAPS  
AND DRAWING INDEX**

1.01

SHEET  
1 OF 31

PND PROJECT NO.: 102029

# GENERAL NOTES

## 1. EROSION AND POLLUTION CONTROL PLANS

THE CONTRACTOR SHALL DEVELOP AND SUBMIT FOR ENGINEER AND AGENCY REVIEW AND APPROVAL A STORM WATER POLLUTION PREVENTION PLAN (SWPPP). THIS PLAN SHALL INCLUDE AN EROSION AND SEDIMENT CONTROL PLAN BASED UPON THE CONTRACTOR'S SCHEDULING, EQUIPMENT AND WORK. TO THE GREATEST EXTENT POSSIBLE FOLLOW THE ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES (ADOT/PF) ALASKA STORM WATER POLLUTION PREVENTION PLAN GUIDE (ASWPPPG). THE PLAN SHALL CONSIDER FIRST PREVENTING EROSION, THEN MINIMIZING AND TRAPPING SEDIMENT PRIOR TO ITS ENTERING THE WATERWAYS. THE PLAN MUST ADDRESS THE SITE-SPECIFIC CONTROLS AND MANAGEMENT FOR THE CONSTRUCTION SITE AS WELL AS ALL MATERIAL SITES, WASTE DISPOSAL SITES AND AFFECTED AREAS. THE PLAN MUST INCORPORATE ALL THE REQUIREMENTS OF THE PROJECT PERMITS. BEST MANAGEMENT PRACTICES AS LISTED IN THE ASWPPPG SHALL BE USED.

THE CONTRACTOR SHALL PREPARE A HAZARDOUS MATERIAL CONTROL PLAN (HMCP) FOR THE HANDLING, STORAGE, CLEAN-UP AND DISPOSAL OF PETROLEUM AND OTHER HAZARDOUS SUBSTANCES. THE CONTRACTOR SHALL LIST AND GIVE LOCATIONS OF ALL HAZARDOUS MATERIALS, INCLUDING FIELD OFFICE MATERIALS, TO BE USED AND STORED ON-SITE AND THEIR ESTIMATED QUANTITIES. THE PLAN SHALL PROVIDE DETAILS FOR STORING THESE MATERIALS AS WELL AS DISPOSING WASTE PETROLEUM PRODUCTS AND OTHER HAZARDOUS MATERIALS GENERATED BY THE PROJECT.

IDENTIFY THE LOCATIONS WHERE HAZARDOUS MATERIAL STORAGE, FUELING AND MAINTENANCE ACTIVITIES WILL TAKE PLACE. IF ON-SITE, DESCRIBE THE MAINTENANCE ACTIVITIES AND LIST ALL CONTROLS TO PREVENT THE ACCIDENTAL SPILLAGE OF OIL, PETROLEUM PRODUCTS AND OTHER HAZARDOUS MATERIALS. DETAIL PROCEDURES FOR CONTAINMENT AND CLEANUP OF HAZARDOUS SUBSTANCES INCLUDING A LIST OF THE TYPES AND QUANTITIES OF EQUIPMENT AND MATERIALS AVAILABLE ON-SITE TO BE USED.

THE PLAN SHALL PROVIDE DETAILS FOR PREVENTION, CONTAINMENT, CLEAN-UP AND DISPOSAL OF SOIL AND WATER CONTAMINATED BY ACCIDENTAL SPILLS AND FOR UNEXPECTED CONTAMINATED SOIL AND WATER ENCOUNTERED DURING CONSTRUCTION.

## 2. MATCH EXISTING GRADES AT PROJECT LIMITS AND WHERE REQUIRED TO MATCH ELEVATIONS AT EXISTING ROADS.

## 3. THE LOCATIONS OF EXISTING UTILITIES SHOWN ON THE DRAWINGS WERE TAKEN FROM HAINES BOROUGH AS-BUILTS AND ARE APPROXIMATE. ADDITIONAL UTILITIES MAY BE PRESENT HOWEVER ARE NOT SHOWN. THE CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS IN THE FIELD AS NECESSARY, PRIOR TO BEGINNING WORK. THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL UTILITIES ENCOUNTERED IN THE FIELD SHALL BE RECORDED ON THE CONTRACTOR'S RECORD DRAWINGS. CONTACT LOCAL UTILITY COMPANIES PRIOR TO ANY/ ALL EXCAVATIONS AT THE FOLLOWING TELEPHONE NUMBERS:

WATER AND WASTE MATERIAL (907) 766-2237 OR 766-2200  
 POWER AND LIGHT (AP&T) (907) 766-2331  
 CATV (907) 766-2137  
 TELEPHONE (GTE) (907) 766-2311

## 4. ADJACENT PROPERTY DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ITS PRE-CONSTRUCTION CONDITION OR BETTER AT NO ADDITIONAL COST.

## 5. GRADING AND ALIGNMENT OF PIPE, STRUCTURES & FINAL SURFACING ARE SUBJECT TO MINOR REVISIONS BY THE ENGINEER TO BEST FIT SITE CONDITIONS. GRADE ALL IMPROVEMENTS WITH POSITIVE DRAINAGE AWAY FROM STRUCTURES.

## 6. PROPERTY LINE LOCATIONS USED IN THESE PLANS ARE DERIVED FROM RECORD PLATS AND DO NOT REPRESENT A BOUNDARY SURVEY.

### LEGEND

EXISTING	THIS PROJECT
—OHE <sub>x</sub> —	OVERHEAD ELECTRICAL
—FU <sub>x</sub> —	BURIED FUEL LINE
—EU <sub>x</sub> —	ELECTRICAL (UNDERGROUND)
—W <sub>x</sub> —	WATER
—SS <sub>x</sub> —	SANITARY SEWER
—SS <sub>A</sub> —	SANITARY SEWER (ABANDONED)
—ROW—	RIGHT-OF-WAY
—CU <sub>x</sub> —	COMMUNICATION (CABLE/TEL)
—SD—	STORM DRAIN
—FM <sub>x</sub> —	FORCE MAIN
— ? — ? —	INFERRED SOIL STRATUM CHANGE
— - - -	PROPERTY LINE
— . . .	GRADE BREAK
— x — x —	GEOTEXTILE FABRIC

# LEGEND

EXISTING	THIS PROJECT
	ARTWORK/ DISPLAYS
	GUY WIRE ANCHOR
	SURVEY CONTROL
	NAVIGATION AID
	UTILITY POLE
	BOLLARD
	CURB & GUTTER
	ELECTRICAL TRANSFORMER
	ELECTRICAL VAULT
	ELECTRICAL HANDHOLE
	FIRE HYDRANT
	LIGHT POLE
	TRAFFIC SIGNAL
	SANITARY SEWER MANHOLE
	STORM DRAIN STRUCTURE
	STORM DRAIN INLET
	SIGN
	TREE/VEGETATION
	LAYOUT POINT
	LAYOUT RADIUS
	GUARDRAIL
	WATER VALVE
	SECTION OR DETAIL CALLOUT
	LOCATION OF DETAIL OR REFERENCE DRAWING

# ABBREVIATIONS

<b>A</b>	AT	<b>H</b>	HUB & TACK	<b>Q</b>	QUANTITY
@	ASBESTOS CEMENT PIPE	H&T	HEAVY DUTY	QTY	QUANTITY
AC	ASPHALT CONCRETE PAVEMENT	HD	HOT-DIPPED GALVANIZED	<b>R</b>	RADIUS
ACP	AMERICANS WITH DISABILITIES ACT	HDG	HIGH DENSITY POLYETHYLENE	R/RAD	RADIUS
ADA	ADJUSTABLE	HDPE	HORIZONTAL	RE	RIM ELEVATION
ADJ	ASSOCIATED PILE AND FITTING CORP.	HORIZ	HOUSE	REF	REFERENCE
APF	APPROXIMATE	HSE	HEIGHT	REINF	REINFORCEMENT
APPROX. or APPX.	ALASKA TIDELANDS SURVEY	HT	HIGHWAY	REQD	REQUIRED
ATS	AIR RELEASE VALVE	HWY.	IN ACCORDANCE WITH	RET	RETAINING
AV	BEGINNING OF CURB CUT	I	INCH	RO	ROUGH OPENING
<b>B</b>	BUTTERFLY VALVE	IAW	INSIDE DIAMETER	ROW	RIGHT OF WAY
BCC	BOREHOLE	ID	INVERT ELEVATION	<b>S</b>	SOUTH
BFV	BUILDING	IE	INCH	S	SOUTH
BH	BEGINNING OF PROJECT	IN	IRON PIPE	SCHED/SCH	SCHEDULE
BLDG	BOTTOM	IP	INCLUDE (D) (ING)	SD	STORM DRAIN
BLDG BOP/BP	BTM, BOT	INCL	INSULATE (D) (ION)	SDI	STORM DRAIN INLET STRUCTURE
<b>C</b>	CURB & GUTTER	INSUL	INVERT	SDO	STORM DRAIN OUTLET STRUCTURE
C&G	CATCH BASIN	INV	JUNCTION BOX	SDR	STANDARD DIMENSION RATIO
CB	CAST IRON	JB	L	SF	SQUARE FOOT
CI	CAST-IN-PLACE	<b>L</b>	LBS	SHLDR	SHOULDER
CIP	CONTROL JOINT	LF	POUNDS	SI	STREET INTERSECTION
CJ	CENTER LINE	LL	LINEAR FEET	SPEC	SPECIFICATION (S)
CL	CLEAR	LL	LIVE LOAD	SQ	SQUARE
CLR	CORRUGATED METAL PIPE	LOC	LOCATION	SRB	SHOT ROCK BORROW
CMP	CLEANOUT	LS	LUMP SUM	SSC	SANITARY SEWER CONNECTION
CO	CORPS OF ENGINEERS	<b>M</b>	MAX	SS	STAINLESS STEEL, SANITARY SEWER
C.O.E.	COMMUNICATION	MAX	MAXIMUM	SDMH	STORM DRAIN MANHOLE
COMM	CONCRETE	M.E.	MATCH EXISTING	SSMH	SANITARY SEWER MANHOLE
CONC.	COMPLETE PENETRATION	MECH	MECHANICAL	STA	STATION
CP	CORRUGATED POLYETHYLENE PIPE	MFR	MANUFACTURE (R)	STD	STANDARD
CPEP/CPP	CORNER	MH	MANHOLE	STL	STEEL
COR	COUNTERSINK	MJ	MECHANICAL JOINT	STRG	STRONG
CSC	CENTER	MI	MALLEABLE IRON	SW	SIDEWALK
CTR	CUBIC YARD	MIN	MINIMUM	SWR	SEWER
CY	DISSIMILAR PIPE COUPLING	MLLW	MEAN LOWER LOW WATER	SY	SQUARE YARD
<b>D</b>	DIAMETER	MSF	1000 SQUARE FEET	SYM	SYMMETRICAL
DCP	DOUBLE	MSE	MECHANICALLY STABILIZED EARTH MATERIAL (S)	<b>T</b>	THICK
D/DIA	DEMOLITION	MTL	N	t	TOP AND BOTTOM
DBL	DEAD LOAD	N	NORTH	T&B	TONGUE AND GROOVE
DEMO	DUCTILE IRON PIPE	NFS	NON FROST SUSCEPTIBLE	T&G	TONGUE AND GROOVE
DL	DIMENSION	NIC	NOT IN CONTRACT	TBC	TOP BACK OF CURB
DIP	DOWN	NO	NUMBER	TBD	TO BE DETERMINED
DIM	DETAIL	NTS	NOT TO SCALE	TBM	TEMPORARY BENCH MARK
DN	EAST	<b>O</b>	OVERBURDEN	TD	TRENCH DRAIN
DTL	EACH	OBD	ON CENTER	TEL	TELEPHONE
<b>E</b>	EDGE OF CONCRETE	OC	OUTSIDE DIAMETER	TEMP	TEMPERATURE, TEMPORARY
E	END OF CURB CUT	OD	ORIGINAL GOUND	TH	TEST HOLE
EA.	EXISTING GRADE	OG	OVERHEAD ELECTRICAL	THK	THICK
EC	EXPANSION JOINT	OHE	OIL-WATER SEPARATOR	TRANS	TRANSVERSE
ECC	ELEVATION	OWS	OPPSITE	TV	TELEVISION
EG	ELECTRICAL	OPP	P	TYP	TYPICAL
EJ	END OF PAVEMENT	<b>P</b>	PIPE	<b>U</b>	UNIFORM BUILDING CODE
EL/ELEV	END PROJECT	P	POINT OF CURVATURE, PIECE	UE	UNDERGROUND ELECTRIC
ELEL	EQUAL	PC	PRECAST CONCRATE	UMC	UNIFORM MECHANICAL CODE
EP	EQUIPMENT	PCC	POINT OF COMPOUND CURVATURE	UHMW	ULTRA HIGH MOLECULAR WEIGHT
EP	ESTIMATE	PE	POLYETHYLENE	UON/UNO	UNLESS OTHERWISE NOTED
EQ	EACH WAY	PED	PEDESTAL	UPC	UNIFORM PLUMBING CODE
EQUIP	EXCAVATE	PER	PERIMETER	<b>V</b>	VALVE BOX
EST	EXISTING	PERF	PERFORATE (D)	VB	VERTICAL
EW	FACE OF CURB	PI	POINT OF INTERSECTION	VG	VALLEY GUTTER
EXC	FLOOR DRAIN	PLWD	PLYWOOD	<b>W</b>	WEST
EXIST	FINISHED FLOOR	PL	PROPERTY LINE, PLATE	W/	WITH
<b>F</b>	FINISHED GRADE	POC	POINT OF CURVE	WD	WOOD
FC	FIRE HYDRANT, FLAT HEAD	PP	POLYPROPYLENE	WELDMT	WELDMENT
FD	FINISH (ED)	PRC	POINT OF REVERSE CURVATURE	WL	WATERLINE
FF	FORCE MAIN SEWER	PROJ	PROJECT	WQU	WATER QUALITY UNIT
FG	FOUNDATION	PRKG	PARKING	WV	WATER VALVE
FH	FACE OF CURB	PRV	PRESSURE REDUCING VALVE	WW	WATER WATER
FIN	FOOT	PSI	POUND PER SQUARE INCH	WWTP	WASTE WATER TREATMENT PLANT
FM	FOOTING	PT	POINT, PRESSURE TREATED,	W/O	WITHOUT
FND	FLOWLINE OR FLANGE	PVC	POINT OF TANGENCY	<b>X</b>	TRANSFORMER
FOC	GALLON	PVI	POINT OF VERTICAL CURVATURE,	XFMR	ANGLE POINT
FT	GALVANIZED		POLY-VINYL CHLORIDE	<PT	
FTG	GRADE BREAK				
FL	GALLONS PER MINUTE				
<b>G</b>	GROUND				
GAL	GATE VALVE				
GALV					
GB					
GPM					
GRD					
GV					

FINAL DESIGN REVIEW SUBMITTAL



REVISIONS					
REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

**P | N | D**  
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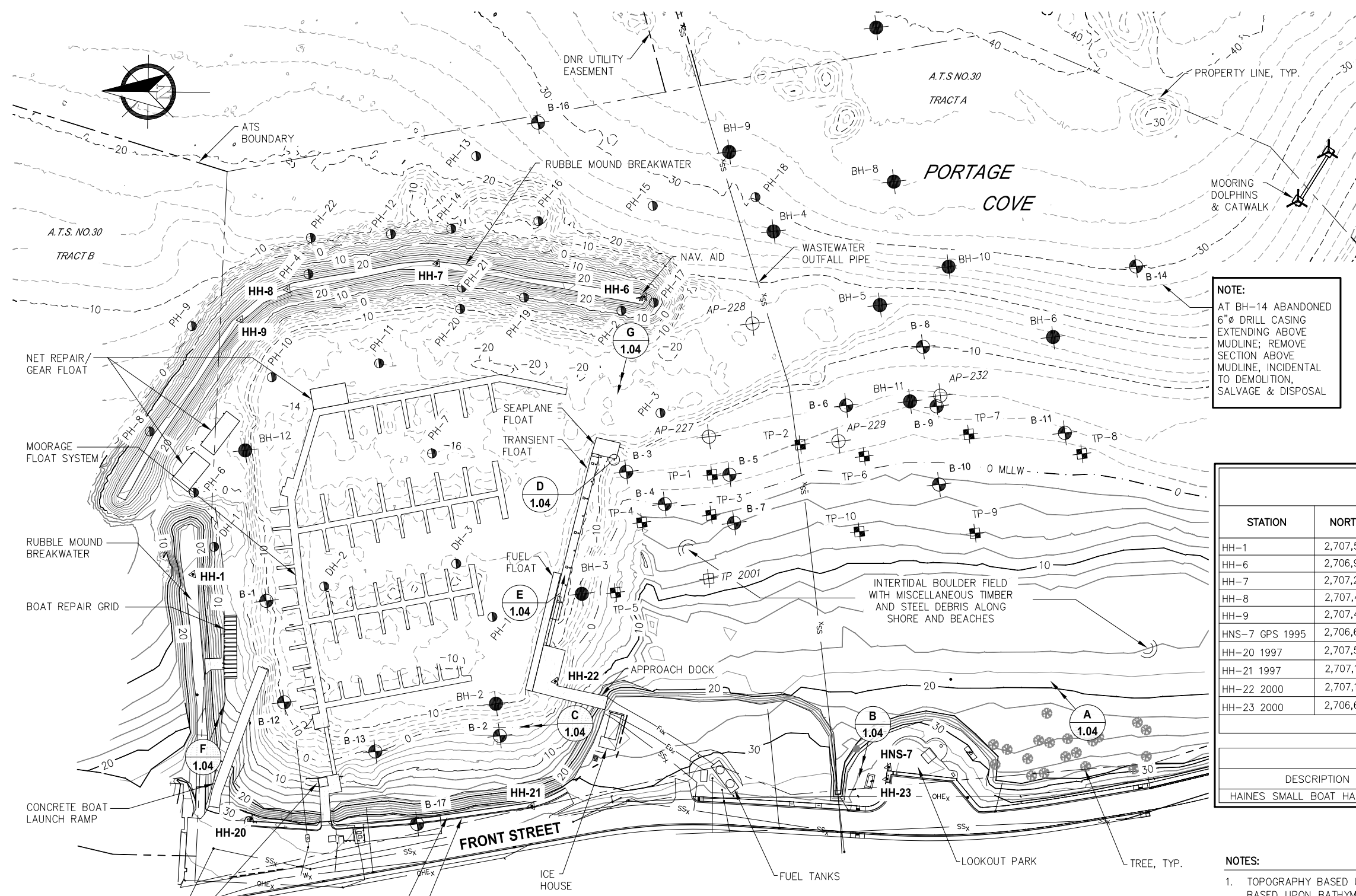


**HAINES BOROUGH  
 PORTAGE COVE  
 HARBOR EXPANSION**

SHEET TITLE:  
**GENERAL NOTES, LEGEND AND  
 ABBREVIATIONS**

1.02  
 SHEET  
 2 OF 31

PND PROJECT NO.: 102029



**LEGEND**

- B-1 PND ENGINEERS, INC.: BOREHOLE, (2014)
- BH-2 PND ENGINEERS, INC.: BOREHOLE, (2012)
- TP-8 PND ENGINEERS, INC.: TEST PIT, (2010)
- DH-1 PH-1 U.S. ARMY CORPS OF ENGINEERS: PROBE AND DRILLHOLES, (1957, 1973, 1975) LOCATION APPROXIMATE
- AP-232 U.S. ARMY CORPS OF ENGINEERS: BOREHOLE, (2004) LOCATION APPROXIMATE
- TP 2001 U.S. ARMY CORPS OF ENGINEERS: TEST PIT, (2000) LOCATION APPROXIMATE

**NOTE:**  
 AT BH-14 ABANDONED 6" Ø DRILL CASING EXTENDING ABOVE MUDLINE; REMOVE SECTION ABOVE MUDLINE, INCIDENTAL TO DEMOLITION, SALVAGE & DISPOSAL

**A**  
 1.04 SITE PHOTO ORIENTATION

**SURVEY CONTROL DATA**

STATION	NORTHING	EASTING	ELEV (MLLW)	ELEV (NAVD88)	DESCRIPTION
HH-1	2,707,596.79	2,353,756.26	25.64	21.80	USACE SURVEY MARK SBC
HH-6	2,706,922.52	2,354,071.75	25.74	21.90	USACE SURVEY MARK SBC
HH-7	2,707,206.44	2,354,151.36	26.12	22.28	USACE SURVEY MARK SBC
HH-8	2,707,421.75	2,354,139.73	24.73	20.89	USACE SURVEY MARK SBC
HH-9	2,707,492.29	2,354,105.04	25.52	21.68	USACE SURVEY MARK SBC
HNS-7 GPS 1995	2,706,656.27	2,353,376.15	35.62	31.78	AKDOT 3.25" DOMED BRASS CAP
HH-20 1997	2,707,554.58	2,353,405.42	32.22	28.38	USACE 3.25" DOMED BRASS CAP
HH-21 1997	2,707,160.36	2,353,378.82	33.55	29.71	USACE 3.25" DOMED BRASS CAP
HH-22 2000	2,707,107.68	2,353,549.09	26.66	22.82	USACE 3.25" DOMED BRASS CAP
HH-23 2000	2,706,660.66	2,353,360.01	35.54	31.70	USACE 3.25" DOMED BRASS CAP

SEE NOTE 2 FOR CONTROL DATA DETAILS.

★ NAVIGATION AIDS ★

DESCRIPTION	USCG No.	NORTHING	EASTING
HAINES SMALL BOAT HARBOR LIGHT 2	23910	2,706,927.5	2,354,070.8

- NOTES:**
- TOPOGRAPHY BASED UPON FIELD SURVEY BY PND CONDUCTED IN MAY 2013. BATHYMETRY BASED UPON BATHYMETRIC SURVEYS CONDUCTED WITH PND, CONCURRENT (MAY 2013) BY RICK BRAUN (LS 5485) AND DAVID EVANS ASSOCIATES.
  - HORIZONTAL AND VERTICAL CONTROL PROVIDED BY THE USACE "HAINES HARBOR CONDITION SURVEY" CONDUCTED IN JULY 2011. SEE ADDITIONAL NOTES FROM THIS SURVEY.
  - ALL EXISTING UTILITIES ARE SHOWN APPROXIMATE FROM SURVEYED INFORMATION AND ALSO AS-BUILT RECORDS PROVIDED BY THE HAINES BOROUGH.
  - BOREHOLE LOGS & ADDITIONAL GEOTECHNICAL INFORMATION AVAILABLE IN HAINES BOROUGH SOUTH PORTAGE COVE HARBOR EXPANSION GEOTECHNICAL ENGINEERING REPORT, MARCH 2015, PND ENGINEERS, INC.

**FINAL DESIGN REVIEW SUBMITTAL**



**REVISIONS**

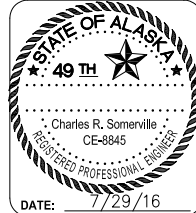
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SCALE: SCALE IN FEET  
 0 80 160 FT.



**HAINES BOROUGH PORTAGE COVE HARBOR EXPANSION**

SHEET TITLE:  
**EXISTING CONDITIONS, SURVEY CONTROL & BH LOCATIONS**

**1.03**

PND PROJECT NO.: 102029

SHEET 3 OF 31



**A** INTERTIDAL BOULDERS W/ TIMBER, CONCRETE, STEEL DEBRIS AND ORGANICS



**B** ARTWORK/ DISPLAY TO BE RELOCATED BY OWNER



**C** INNER HARBOR DREDGE AREA LOOKING NORTH



**D** SEAPLANE FLOAT PILE HOOPS TO BE REMOVED, SALVAGED AND REINSTALLED



**E** TRANSIENT FLOAT PILES TO BE REPLACED EXISTING LIGHT FIXTURES TO BE SALVAGED AND REINSTALLED BY CONTRACTOR. POWER CABLE TO BE SALVAGED BY CONTRACTOR, POWER CABLE TO BE INSTALLED BY OWNER



**F** DREDGE AREA INNER HARBOR LOOKING EAST



**G** DREDGE AREA LOOKING WEST AT TRANSIENT FLOAT

NOTE:  
SEE DREDGING PLAN FOR REFERENCED DREDGE AREAS.



REVISIONS					
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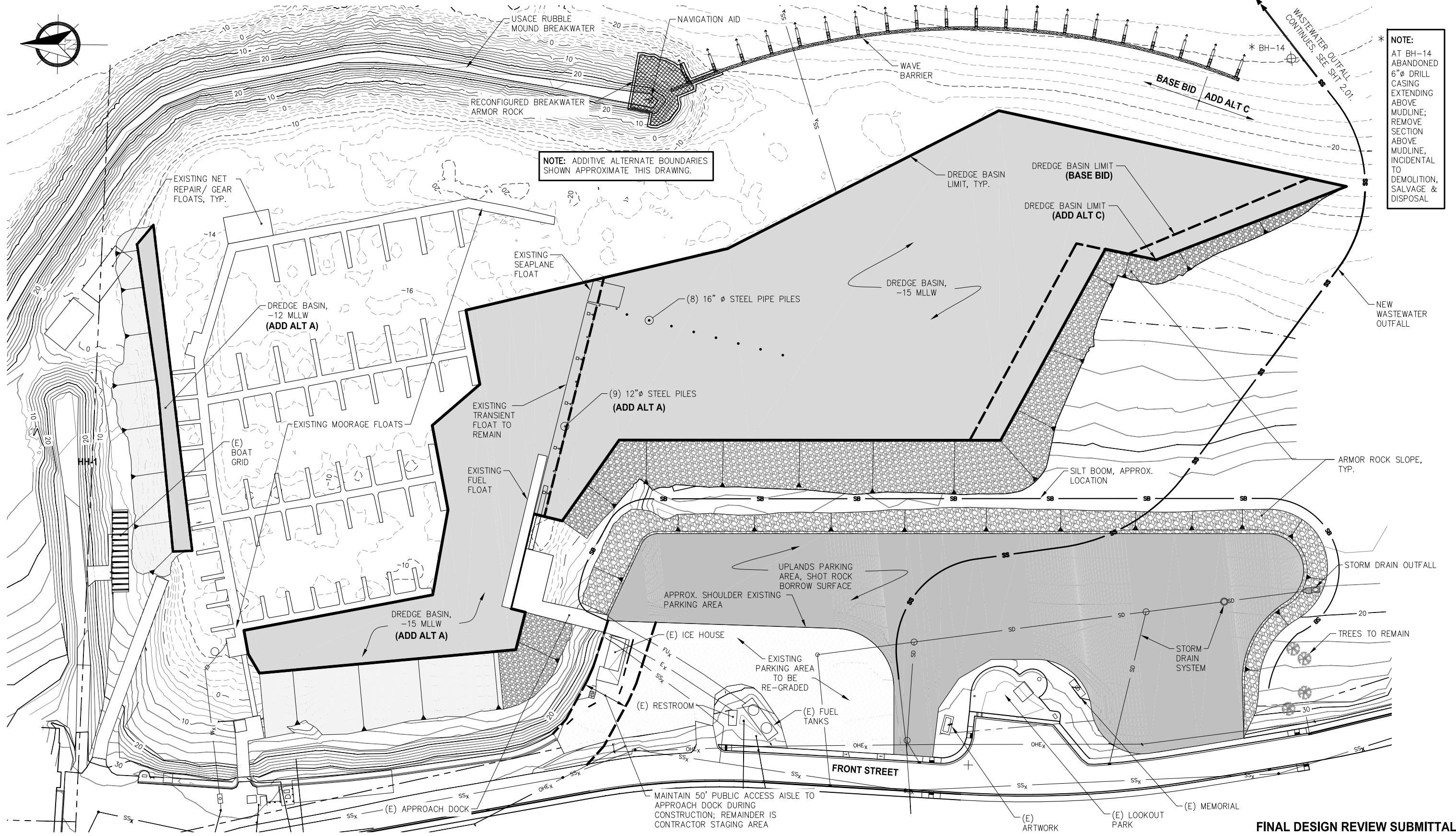
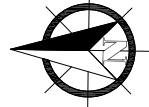
FINAL DESIGN REVIEW SUBMITTAL

**HAINES BOROUGH  
PORTAGE COVE  
HARBOR EXPANSION**

SHEET TITLE:  
**EXISTING CONDITIONS AND  
SITE PHOTOGRAPHS**

PND PROJECT NO.: 102029

**1.04**  
SHEET  
4 OF 31



**NOTE:**  
 AT BH-14  
 ABANDONED  
 6" Ø DRILL  
 CASING  
 EXTENDING  
 ABOVE  
 MUDLINE; REMOVE  
 SECTION  
 ABOVE  
 MUDLINE, INCIDENTAL  
 TO DEMOLITION,  
 SALVAGE &  
 DISPOSAL

**NOTE:** ADDITIVE ALTERNATE BOUNDARIES  
 SHOWN APPROXIMATE THIS DRAWING.

**FINAL DESIGN REVIEW SUBMITTAL**

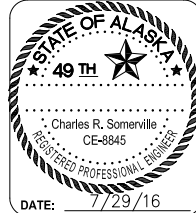


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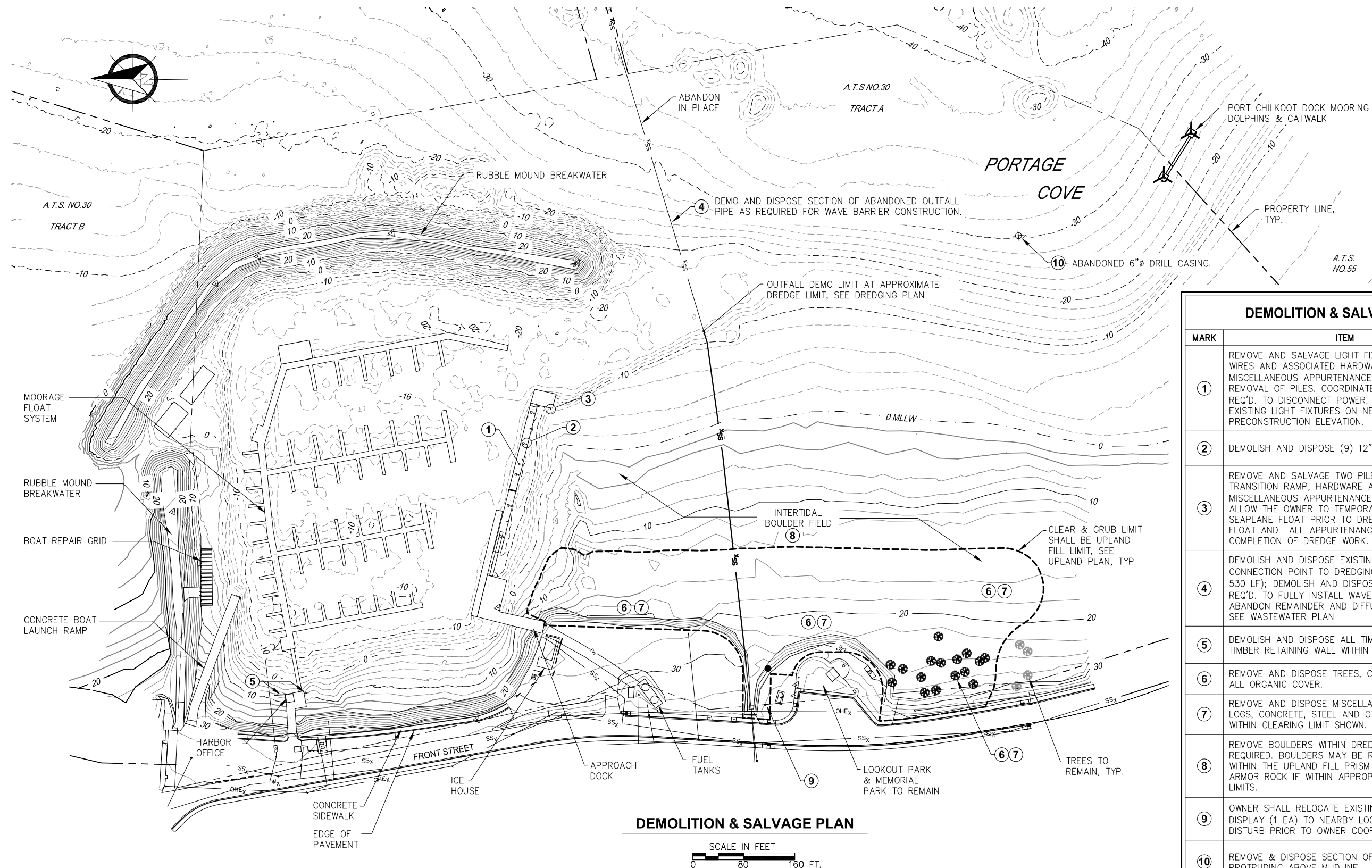


**HAINES BOROUGH  
 PORTAGE COVE  
 HARBOR EXPANSION**

SHEET TITLE:  
**GENERAL SITE PLAN**

PND PROJECT NO.: 102029

**1.05**  
 SHEET  
 5 OF 31



DEMOLITION & SALVAGE SUMMARY TABLE		
MARK	ITEM	BASE BID/ ADD ALT
①	REMOVE AND SALVAGE LIGHT FIXTURES, OVERHEAD WIRES AND ASSOCIATED HARDWARE AND MISCELLANEOUS APPURTENANCES AS REQ'D. FOR REMOVAL OF PILES. COORDINATE WITH UTILITY AS REQ'D. TO DISCONNECT POWER. REINSTALL EXISTING LIGHT FIXTURES ON NEW PILES TO PRECONSTRUCTION ELEVATION.	ADDITIVE ALTERNATE A
②	DEMOLISH AND DISPOSE (9) 12"Ø STEEL PILES.	ADDITIVE ALTERNATE A
③	REMOVE AND SALVAGE TWO PILE HOOPS, TRANSITION RAMP, HARDWARE AND OTHER MISCELLANEOUS APPURTENANCES AS REQ'D. TO ALLOW THE OWNER TO TEMPORARILY RELOCATE SEAPLANE FLOAT PRIOR TO DREDGING. REINSTALL FLOAT AND ALL APPURTENANCES UPON COMPLETION OF DREDGE WORK.	BASE BID
④	DEMOLISH AND DISPOSE EXISTING OUTFALL PIPE; CONNECTION POINT TO DREDGING LIMITS, (APPROX. 530 LF); DEMOLISH AND DISPOSE SECTION AS REQ'D. TO FULLY INSTALL WAVE BARRIER; ABANDON REMAINDER AND DIFFUSER IN PLACE, SEE WASTEWATER PLAN	BASE BID
⑤	DEMOLISH AND DISPOSE ALL TIMBER PILES & TIMBER RETAINING WALL WITHIN DREDGE LIMIT.	ADDITIVE ALTERNATE A
⑥	REMOVE AND DISPOSE TREES, CLEAR AND GRUB ALL ORGANIC COVER.	BASE BID
⑦	REMOVE AND DISPOSE MISCELLANEOUS TIMBER, LOGS, CONCRETE, STEEL AND OTHER DEBRIS WITHIN CLEARING LIMIT SHOWN.	BASE BID
⑧	REMOVE BOULDERS WITHIN DREDGE AREAS AS REQUIRED. BOULDERS MAY BE RELOCATED TO WITHIN THE UPLAND FILL PRISM OR UTILIZED AS ARMOR ROCK IF WITHIN APPROPRIATE GRADATION LIMITS.	BASE BID
⑨	OWNER SHALL RELOCATE EXISTING ARTWORK/ DISPLAY (1 EA) TO NEARBY LOCATION; DO NOT DISTURB PRIOR TO OWNER COORDINATION.	BASE BID
⑩	REMOVE & DISPOSE SECTION OF 6"Ø DRILL CASING PROTRUDING ABOVE MUDLINE	BASE BID

**DEMOLITION & SALVAGE PLAN**  
SCALE IN FEET  
0 80 160 FT.

**FINAL DESIGN REVIEW SUBMITTAL**

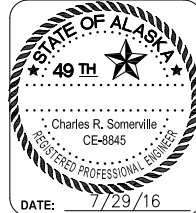


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REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

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DRAWN: PJD    APPROVED: CRS



**HAINES BOROUGH  
PORTAGE COVE  
HARBOR EXPANSION**

SHEET TITLE:  
**DEMOLITION, SALVAGE &  
DISPOSAL PLAN**

PND PROJECT NO.: 102029

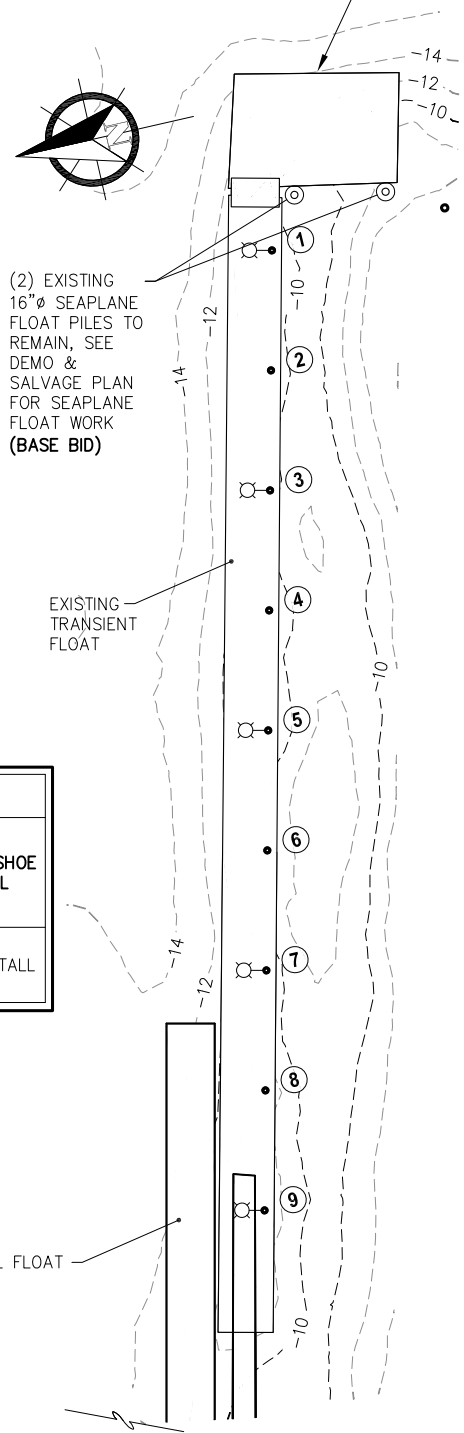
**1.06**  
SHEET  
6 OF 31

PILE SCHEDULE (ADD ALT A)						
PILE #	PILE LENGTH (FT)	PILE SIZE	OWNER PROVIDED LENGTHS (FT)	ANTICIPATED CUTOFF (70')	NO. OF FIELD SPLICES REQ'D.	CUTTING SHOE INSTALL
①	70	12¾"φ x 0.500"t	58	13' ±	1	FIELD INSTALL
②	70	12¾"φ x 0.500"t	58	1' ±	1	FIELD INSTALL
③	70	12¾"φ x 0.500"t	55	19' ±	1	FIELD INSTALL
④	70	12¾"φ x 0.500"t	55	4' ±	1	FIELD INSTALL
⑤	70	12¾"φ x 0.500"t	55	40' ±	1	FIELD INSTALL
⑥	70	12¾"φ x 0.500"t	55	25' ±	1	FIELD INSTALL
⑦	70	12¾"φ x 0.500"t	55	10' ±	1	FIELD INSTALL
⑧	70	12¾"φ x 0.500"t	CONTRACTOR FURNISH FULL LENGTH w/ CUTTING SHOE		0	SHOP INSTALL
⑨	70	12¾"φ x 0.500"t	CONTRACTOR FURNISH FULL LENGTH w/ CUTTING SHOE		0	SHOP INSTALL

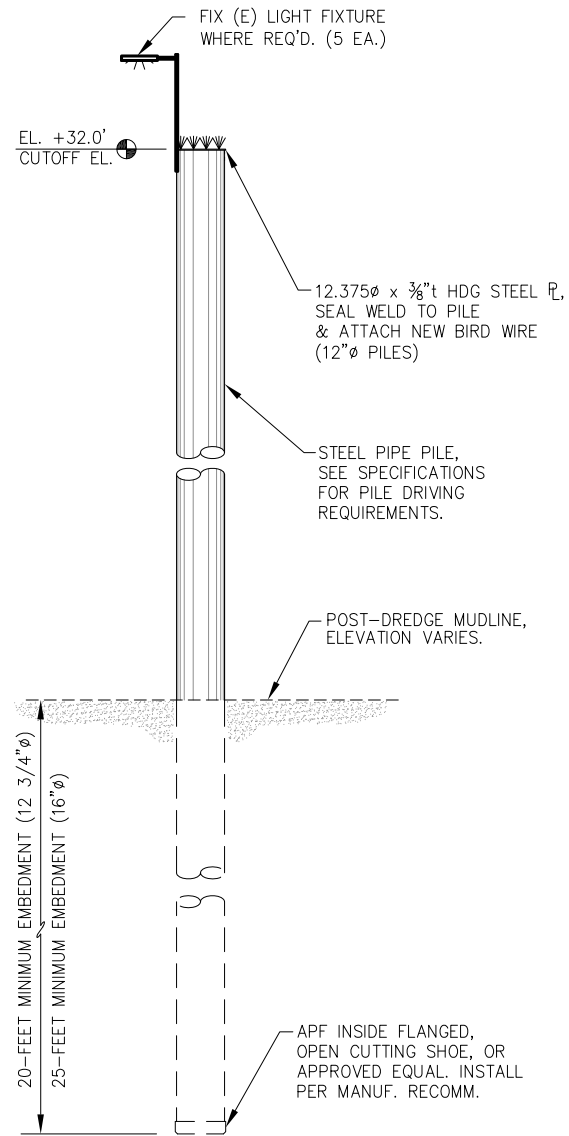
PILE SCHEDULE (BASE BID)						
PILE #	PILE LENGTH (FT)	PILE SIZE	CONTRACTOR PROVIDED LENGTHS (FT)	ANTICIPATED CUTOFF (70')	NO. OF FIELD SPLICES REQ'D.	CUTTING SHOE INSTALL
⑩⑪⑫⑬⑭⑮⑯⑰	75	16"φ x 0.500"t	FURNISH FULL LENGTH w/ CUTTING SHOE		0	SHOP INSTALL

- NOTES:**
- PILE NOS. 1-9 INSTALLED UNDER **ADD ALT A**; PILE NOS. 10-17 **BASE BID**
  - ANTICIPATED LENGTHS & CUTOFF LENGTHS ESTIMATED FOR REFERENCE ONLY, PILES SHALL MEET MIN. EMBEDMENT REQUIREMENTS.

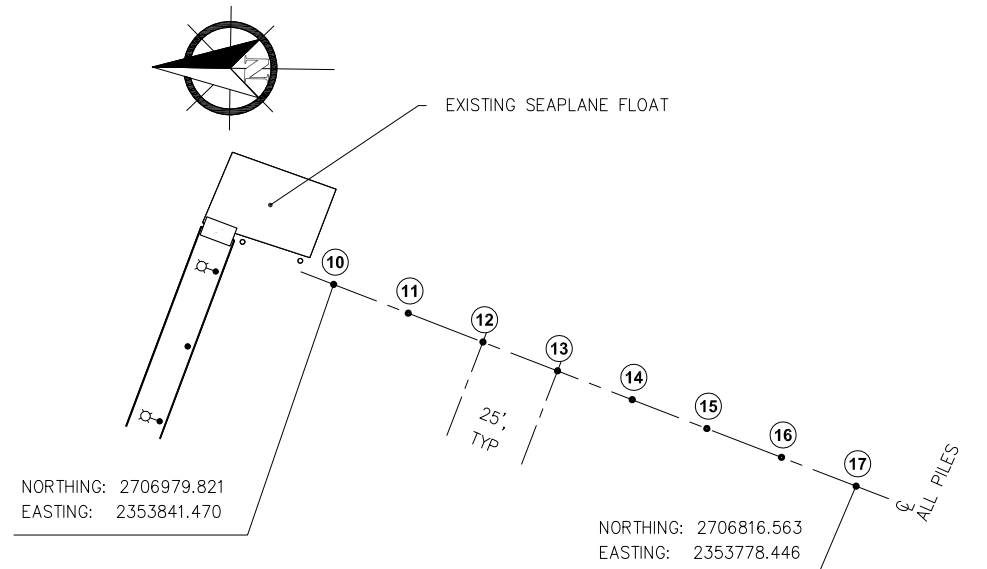
EXISTING SEAPLANE FLOAT, TO BE TEMPORARILY RELOCATED BY OWNER TO ALLOW DREDGING; CONTRACTOR SHALL REINSTALL FLOAT UPON COMPLETION OF DREDGING (**BASE BID**)



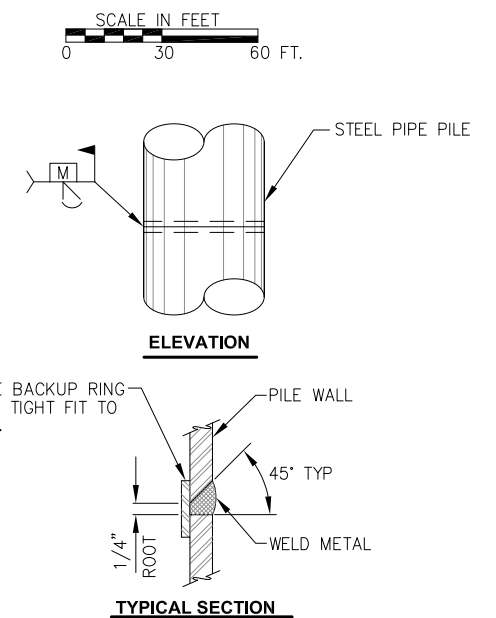
**TRANSIENT FLOAT PILE LAYOUT (ADD ALT A)**



**TYPICAL STEEL FLOAT MOORING PILE**



**16"φ PILE LAYOUT**



**TYPICAL PILE SPLICE WELD**  
(TYPICAL FOR ALL PIPE PILE SPLICES)

**NOTES:**

- 12¾"φ PILES AND ASSOCIATED WORK AT THE TRANSIENT FLOAT SHALL BE PERFORMED UNDER **ADDITIVE ALTERNATE A** AND SHALL BE COMPLETED PRIOR TO **ADDITIVE ALTERNATE A** DREDGING.  
**CONTRACTOR OPTION (INCIDENTAL):** TEMPORARILY RELOCATE TRANSIENT FLOAT PRIOR TO ADD ALT A DREDGING AND INSTALL FLOAT AND PILES UPON COMPLETION OF DREDGING; CONTRACTOR SHALL DISCONNECT ELECTRICAL UTILITIES AND COORDINATE TEMPORARY STOWAGE OF GANGWAY.
- INSTALLATION OF 16"φ PILES SHALL BE PERFORMED UNDER THE **BASE BID**.
- OWNER SHALL SUPPLY PIECES OF 12¾"φ HDG STEEL PIPE FOR PILES IN LENGTHS ADEQUATE TO CONSTRUCT (7) 70' STEEL PILES, CONTRACTOR SHALL FIELD SPLICE PILES & INSTALL CUTTING SHOES AS REQ'D, (**ADDITIVE ALTERNATE A**). OWNER-SUPPLIED PILE MATERIALS ARE LOCATED AT ?

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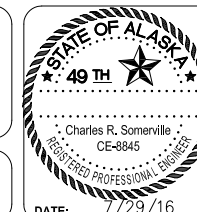
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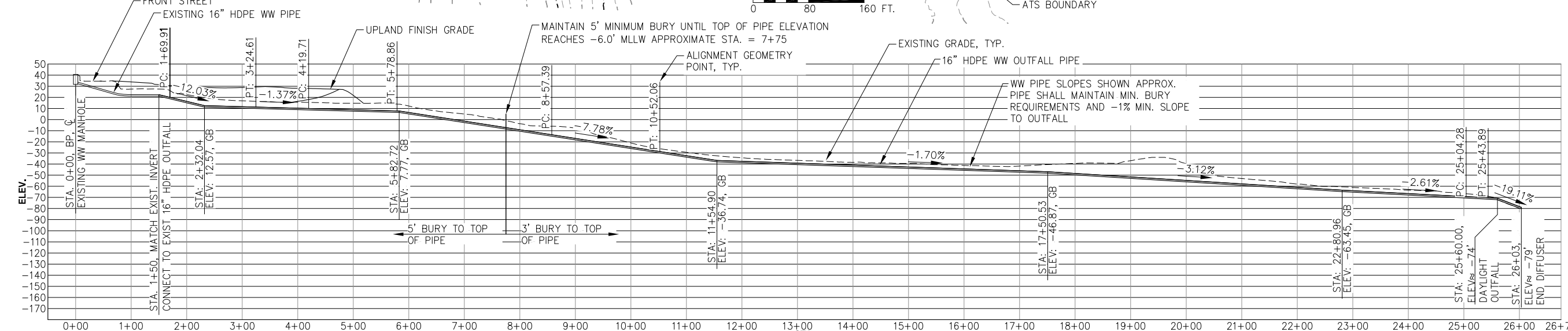
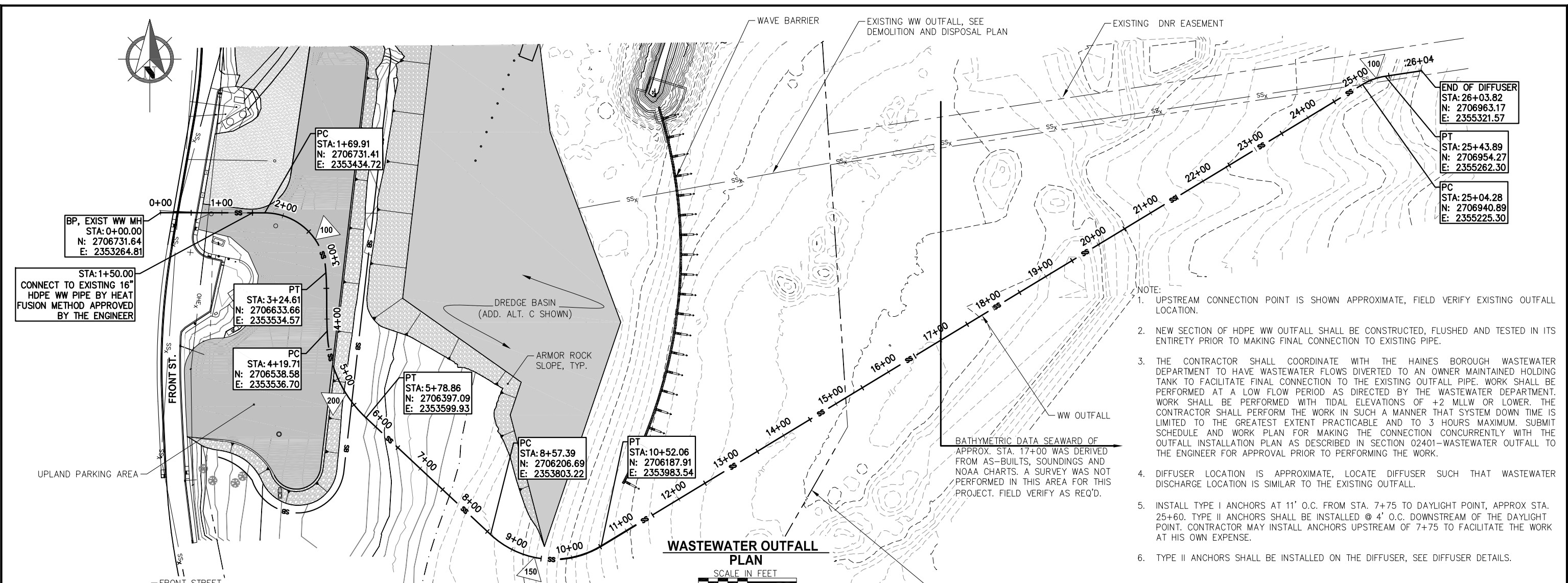


**HAINES BOROUGH  
PORTAGE COVE  
HARBOR EXPANSION**

SHEET TITLE: **TRANSIENT FLOAT PLAN,  
PILE LAYOUT AND DETAILS**

PND PROJECT NO.: 102029

**1.07**  
SHEET  
OF 31



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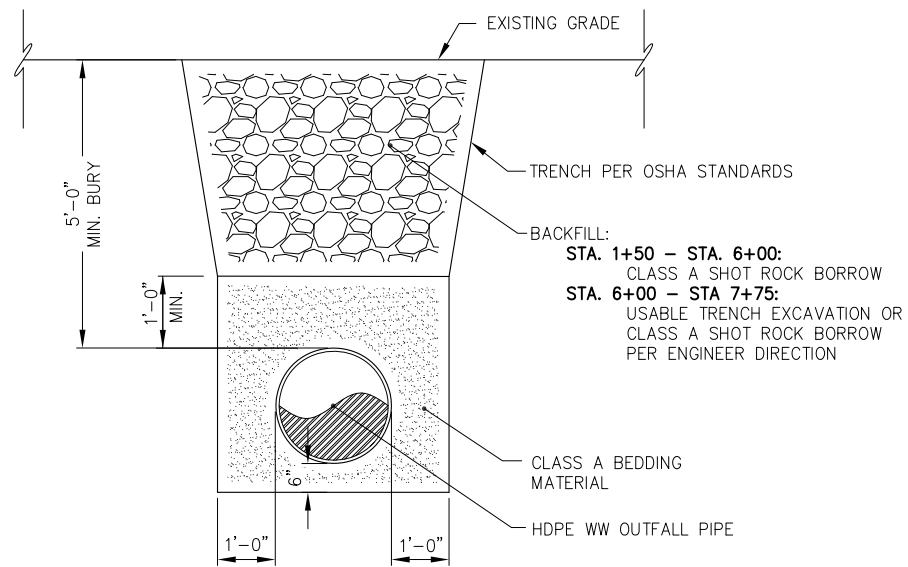
**HAINES BOROUGH PORTAGE COVE HARBOR EXPANSION**

SHEET TITLE: **WASTEWATER OUTFALL PLAN & PROFILE**

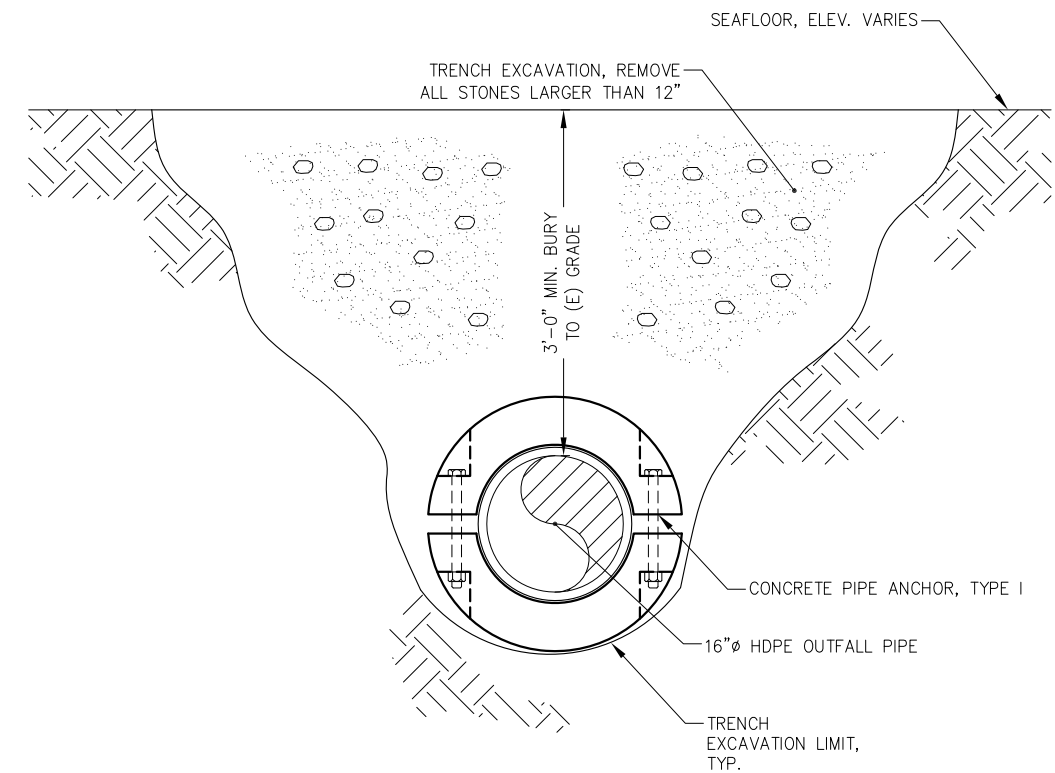
PND PROJECT NO.: 102029

**2.01**  
SHEET 8 OF 31

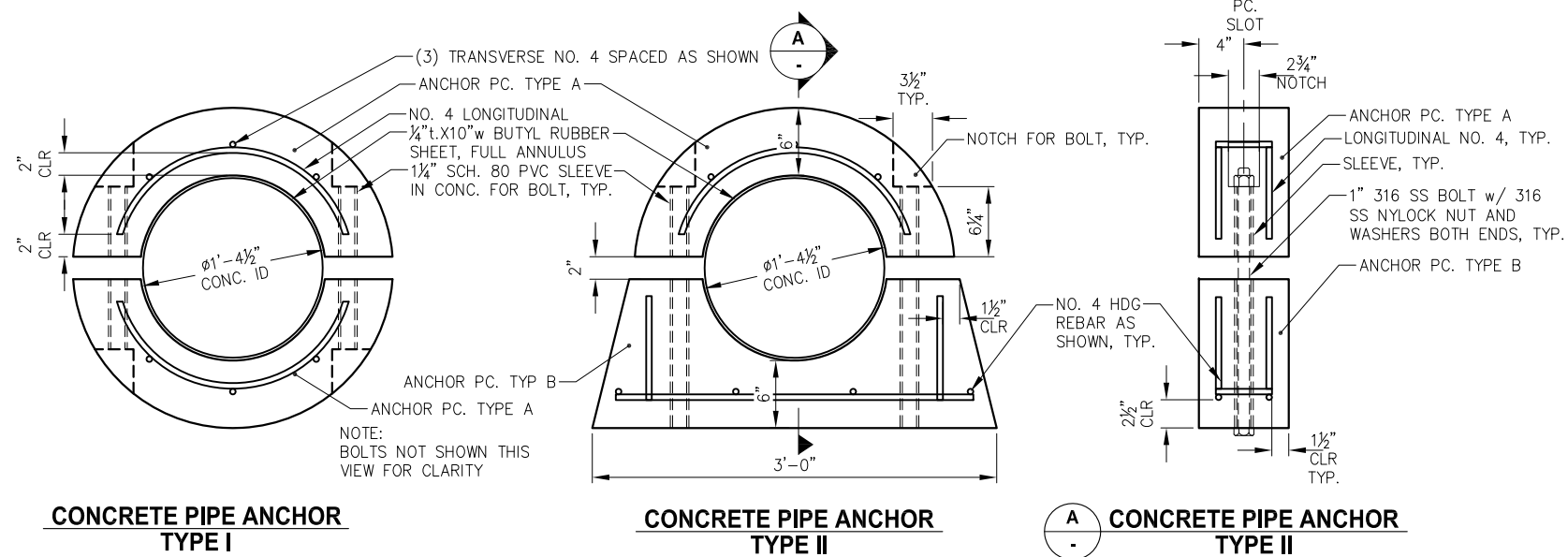




**OUTFALL PIPE TRENCH STA. 1+50 TO STA. 7+75  
SECTION**



**OUTFALL PIPE TRENCH STA. 7+75 TO DAYLIGHT  
SECTION**



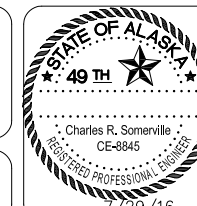
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**HAINES BOROUGH  
 PORTAGE COVE  
 HARBOR EXPANSION**

SHEET TITLE: **WASTEWATER  
 OUTFALL DETAILS**

**2.02**

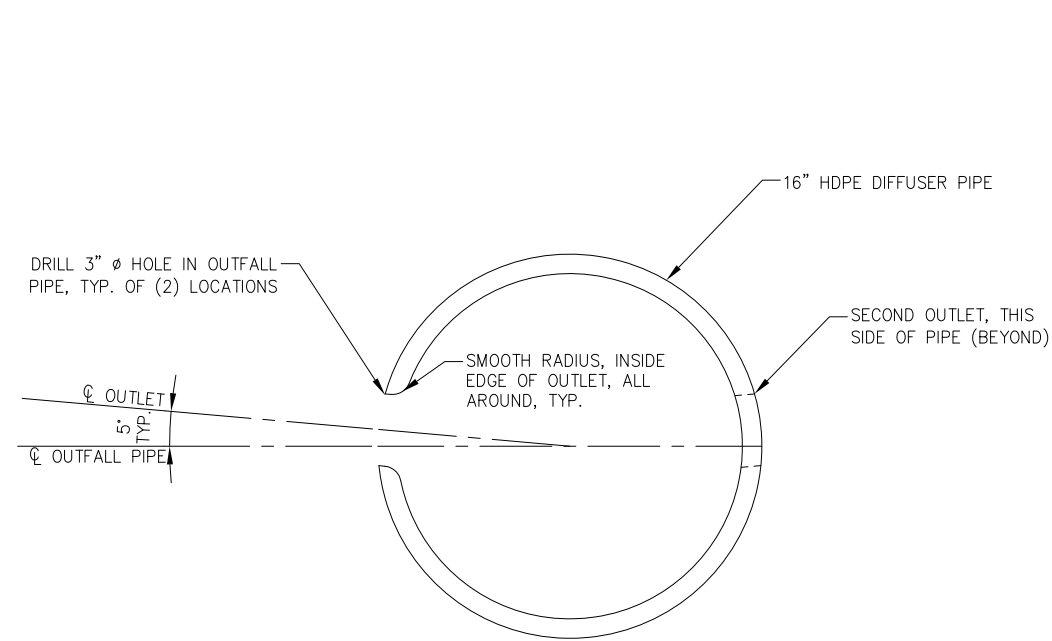
SHEET  
 9 OF 31

PND PROJECT NO.: 102029

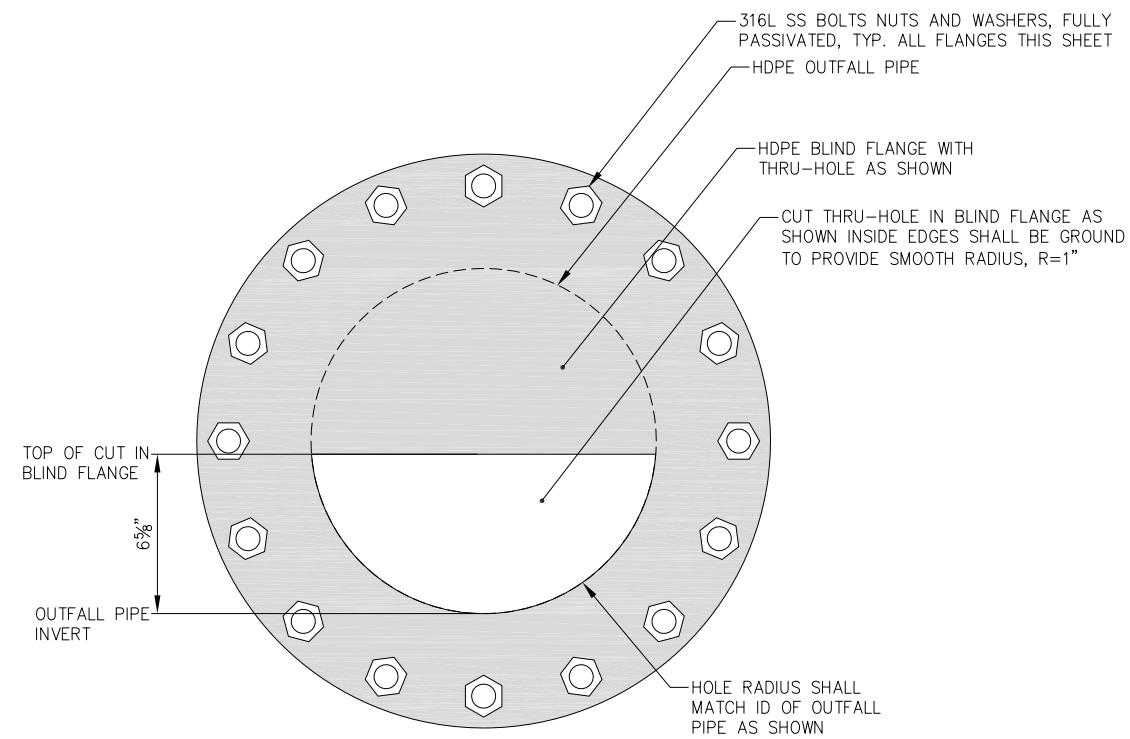
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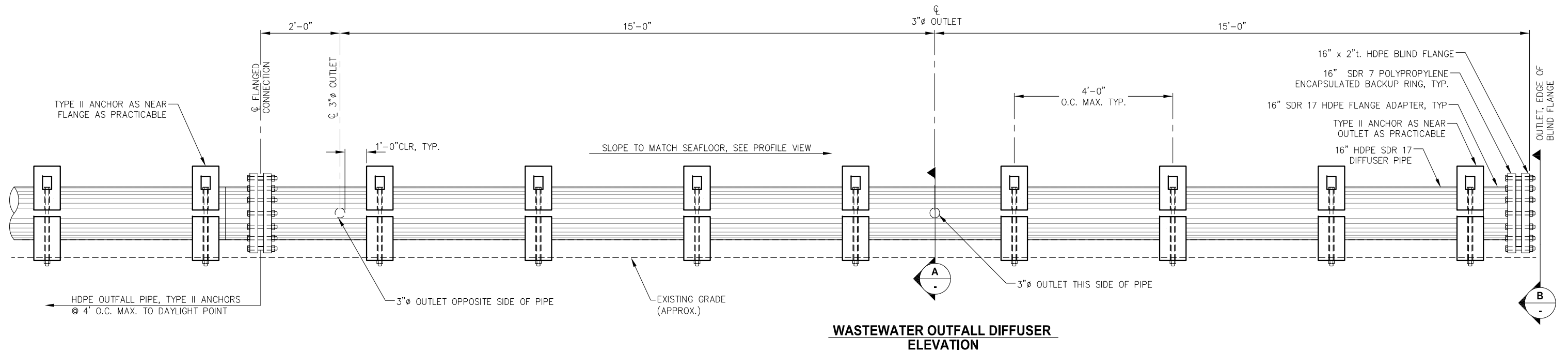
DATE: 7/29/16



**A** DIFFUSER OUTLET  
TYPICAL SECTION



**B** DIFFUSER END  
ELEVATION



**WASTEWATER OUTFALL DIFFUSER  
ELEVATION**

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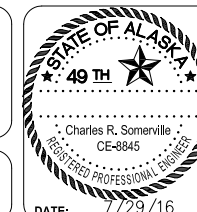


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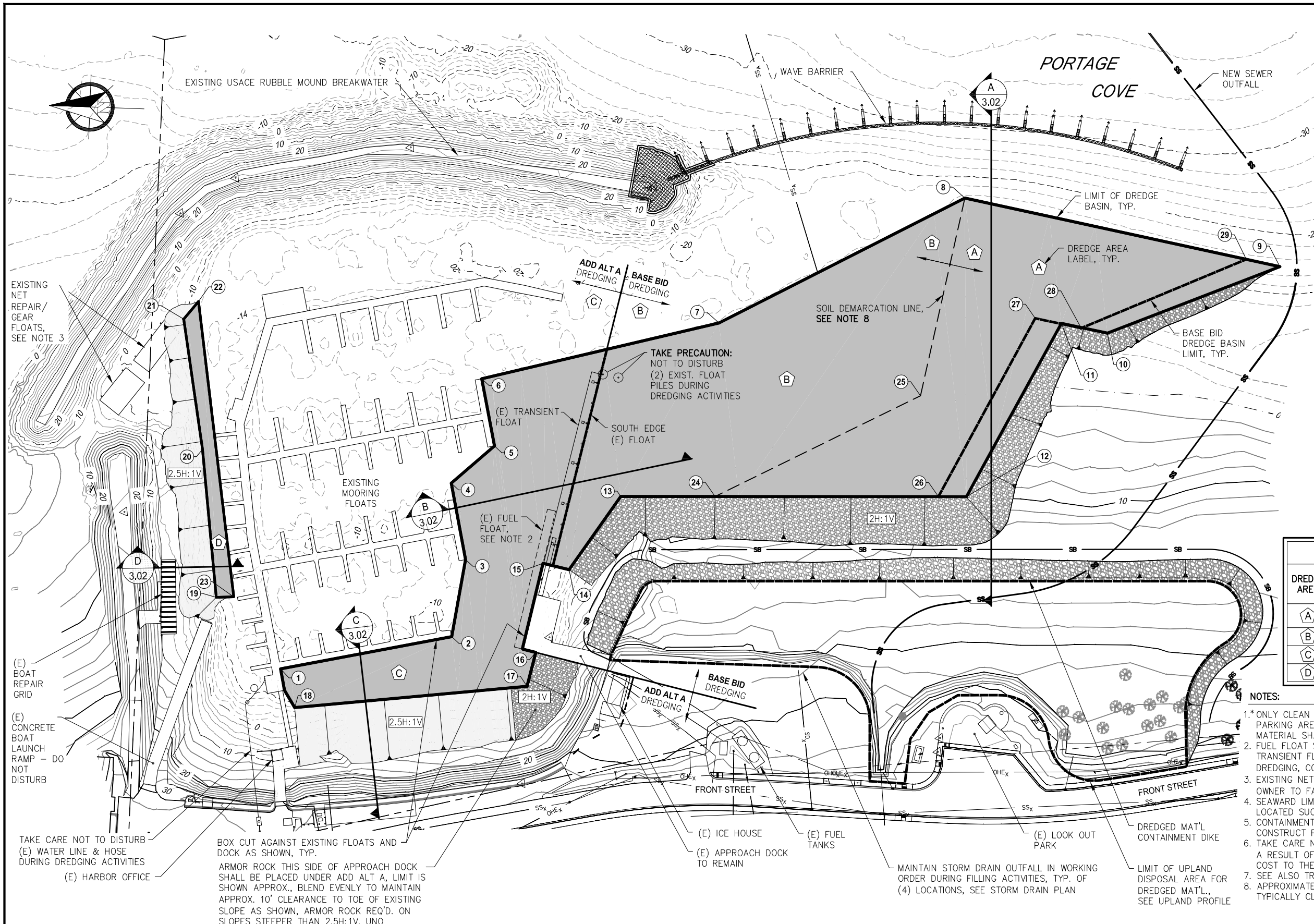
**HAINES BOROUGH  
PORTAGE COVE  
HARBOR EXPANSION**

SHEET TITLE: **WASTEWATER OUTFALL  
DIFFUSER DETAILS**

DATE: 7/29/16

PND PROJECT NO.: 102029

**2.03**  
SHEET  
10 OF 31



DREDGE LAYOUT TABLE		
POINT #	NORTHING	EASTING
1	2707432.156	2353548.002
2	2707224.058	2353562.987
3	2707197.021	2353652.937
4	2707203.643	2353745.856
5	2707147.145	2353784.293
6	2707153.113	2353866.043
7	706863.008	2353900.156
8	2706553.166	2354015.445
9	2706187.367	2353890.878
10	2706401.781	2353835.141
11	2706455.285	2353853.066
12	2706591.963	2353659.685
13	2707003.661	2353706.936
14	2707075.108	2353626.825
15	2707105.298	2353637.955
16	2707126.058	2353532.786
17	2707141.088	2353493.607
18	2707420.698	2353499.944
19	2707499.074	2353641.858
20	2707495.270	2353820.003
21	2707499.943	2353977.621
22	2707479.901	2353996.644
23	2707478.376	2353640.186
24	2706891.336	2353694.044
25	2706633.001	2353786.029
26	2706625.308	2353663.512
27	2706485.838	2353862.664
28	2706432.299	2353844.728
29	2706226.432	2353904.181

DREDGE SUMMARY TABLE				
DREDGE AREA	DEPTH ELEV. (FT MLLW)	BACKSLOPE	DISPOSAL	BASE BID/ADD ALT
A	-15	ARMORED	* UPLAND/OFFSHORE	BASE BID
B	-15	ARMORED	OFFSHORE	BASE BID
C	-15	AS SHOWN	OFFSHORE	ADD ALT A
D	-12	ARMORED	OFFSHORE	ADD ALT A

- NOTES:
- \* ONLY CLEAN GRANULAR DREDGE MATERIAL SHALL BE USED TO FILL UPLAND PARKING AREA PER TYPICAL SECTION TO EXTENT REQUIRED, REMAINING MATERIAL SHALL BE DISPOSED OFFSHORE.
  - FUEL FLOAT SHALL BE TEMPORARILY MOVED LONGITUDINALLY ALONG THE TRANSIENT FLOAT BY OWNER TO FACILITATE ADDITIVE ALTERNATE A DREDGING, COORDINATE WITH OWNER AS REQ'D.
  - EXISTING NET REPAIR/ GEAR FLOATS WILL BE TEMPORARILY RELOCATED BY OWNER TO FACILITATE DREDGING, COORDINATE WITH OWNER AS REQ'D.
  - SEAWARD LIMIT OF DREDGE BASIN SHOWN APPROXIMATE, LIMIT SHALL BE LOCATED SUCH THAT EXISTING GRADE MATCHES BASIN DEPTH LIMIT.
  - CONTAINMENT DIKE DETAILS & LAYOUT SHALL BE PER UPLANDS DETAILS, CONSTRUCT PRIOR TO DREDGING ACTIVITIES.
  - TAKE CARE NOT TO UNDERMINE EXISTING FACILITIES, DAMAGE INCURRED AS A RESULT OF THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED AT NO COST TO THE OWNER.
  - SEE ALSO TRANSIENT FLOAT PLAN CONDITIONS.
  - APPROXIMATE SOIL DEMARCATION BOUNDARY; SOILS TO SOUTH SIDE ARE TYPICALLY CLEANER & SUITABLE FOR UPLAND CONTAINED DISPOSAL

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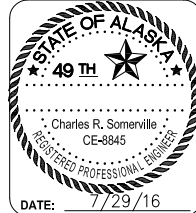
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SCALE: SCALE IN FEET  
 0    60    120 FT.

DATE: 7/29/16

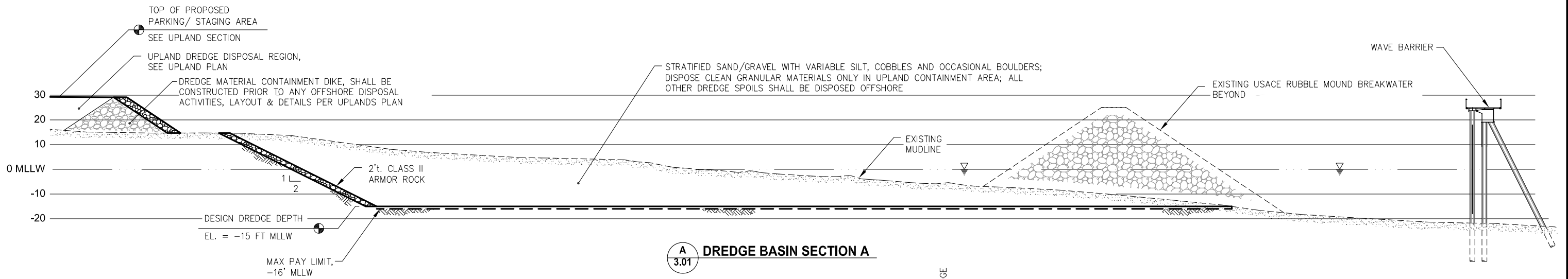


**HAINES BOROUGH PORTAGE COVE HARBOR EXPANSION**

SHEET TITLE: **DREDGING PLAN**

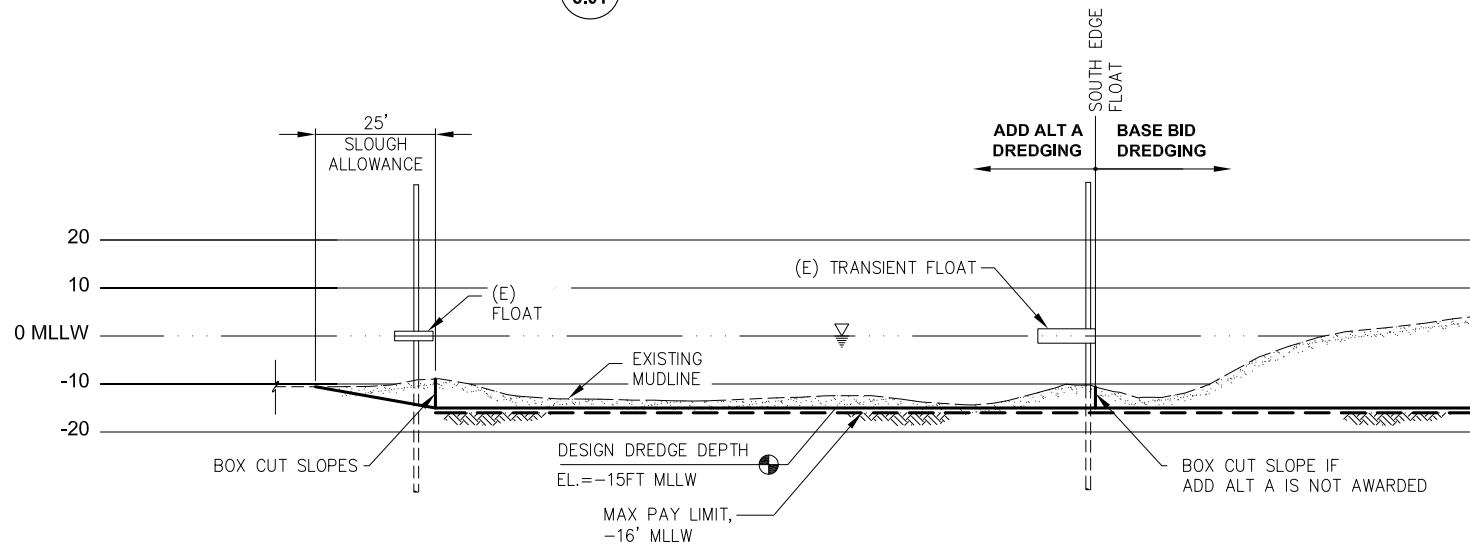
PND PROJECT NO.: 102029

**3.01**  
SHEET 11 OF 31



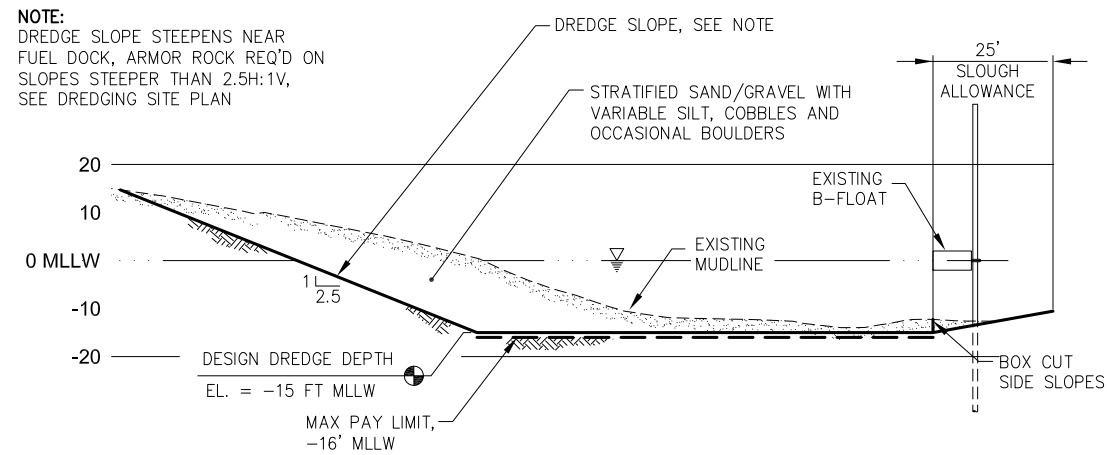
**A**  
3.01  
**DREDGE BASIN SECTION A**

**NOTE:**  
SEE GEOTECHNICAL REPORT: (HAINES BOROUGH SOUTH PORTAGE COVE HARBOR EXPANSION GEOTECHNICAL ENGINEERING REPORT MARCH, 2015) FOR DETAILED SOIL DESCRIPTIONS WITHIN DREDGE AREAS

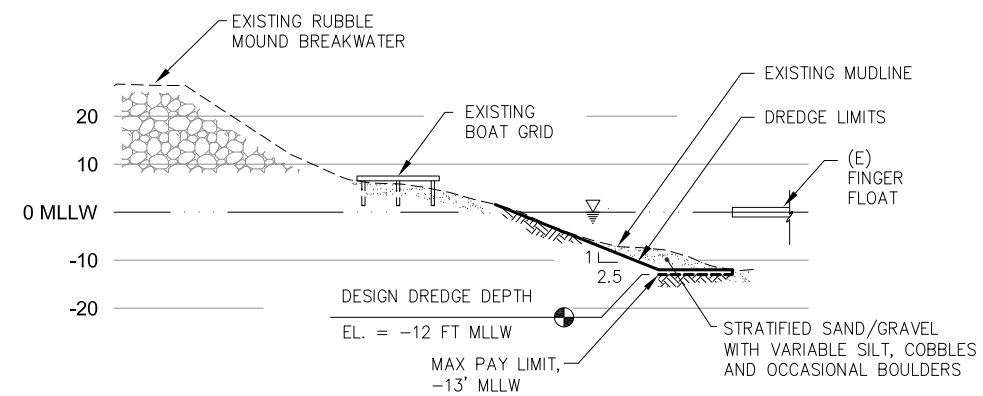


**B**  
3.01  
**DREDGE BASIN SECTION B**

- NOTES:**
1. BID SCHEDULE VOLUMES ARE APPROXIMATE, FINAL PAY QUANTITIES SHALL BE DETERMINED BY THE PRE AND POST DREDGE SURVEYS.
  2. PRE & POST DREDGE SURVEYS SHALL EXTEND 25' MIN. BEYOND DREDGE LIMITS TO DETERMINE SLOUGH.
  3. SLOUGH ALLOWANCE IS TYPICAL ALL BOX CUTS.



**C**  
3.01  
**DREDGE BASIN SECTION C**



**D**  
3.01  
**DREDGE BASIN SECTION D**

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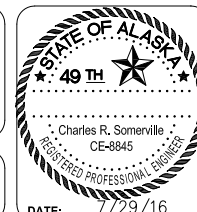
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SCALE: SCALE IN FEET  
0    20    40 FT.



**HAINES BOROUGH PORTAGE COVE HARBOR EXPANSION**

SHEET TITLE: **DREDGING SECTIONS**

PND PROJECT NO.: 102029

**3.02**  
SHEET 12 OF 31

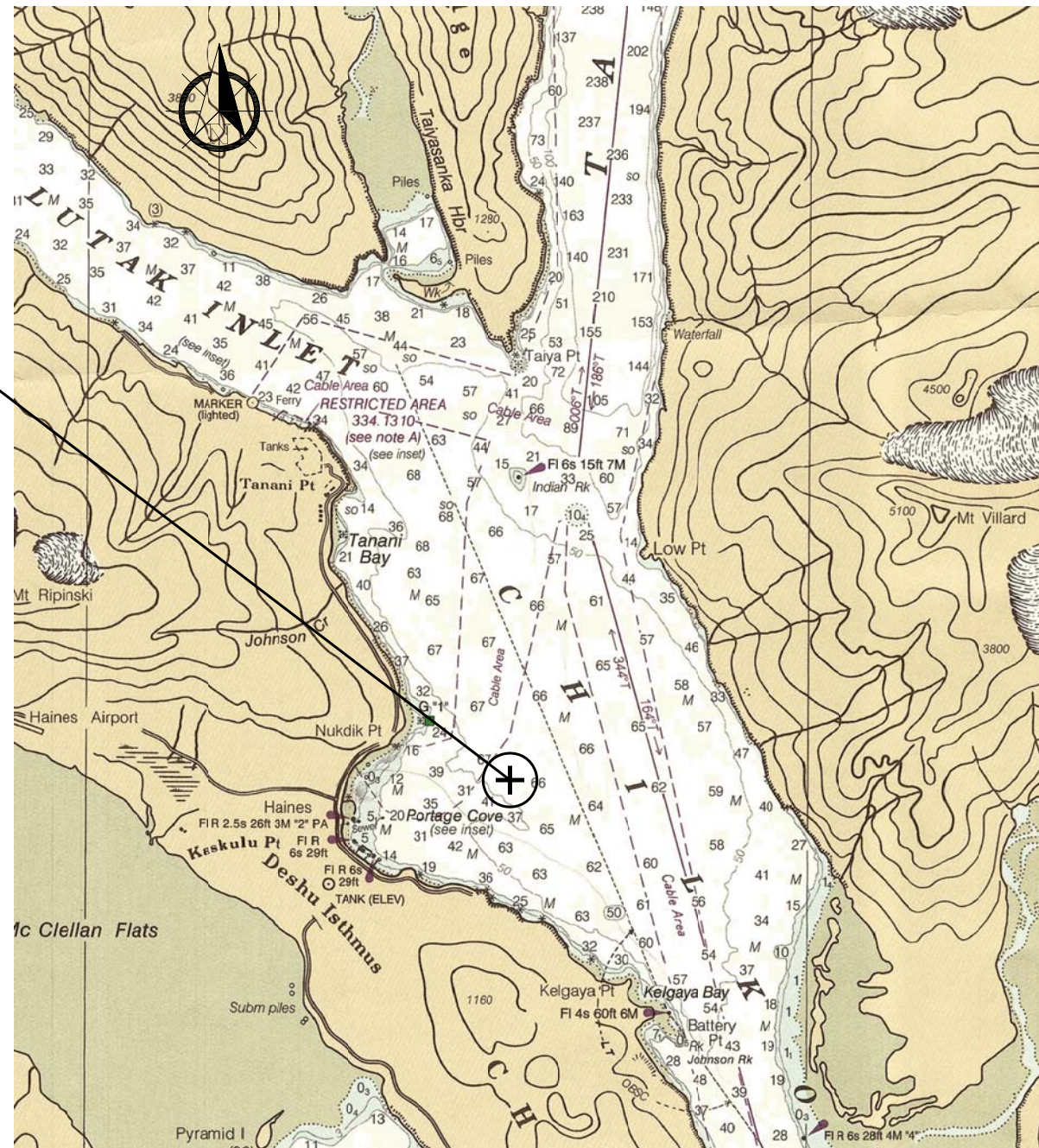
OFFSHORE DISPOSAL SITE  
(± 50 ACRES)

OFFSHORE DISPOSAL SITE CENTER:

LAT: N 59°14'18"

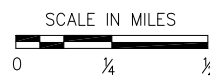
LONG: W 135°24'12"

NOTE:  
CENTER LOCATION APPROXIMATE



BATHYMETRY FROM: NOAA 17317  
LYNN CANAL - SHERMAN POINT TO SKAGWAY

OFFSHORE DISPOSAL PLAN



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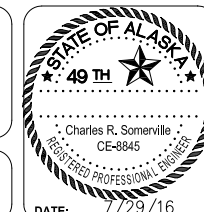


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HAINES BOROUGH  
PORTAGE COVE  
HARBOR EXPANSION

SHEET TITLE:  
**DREDGING OFFSHORE  
DISPOSAL PLAN**

3.03

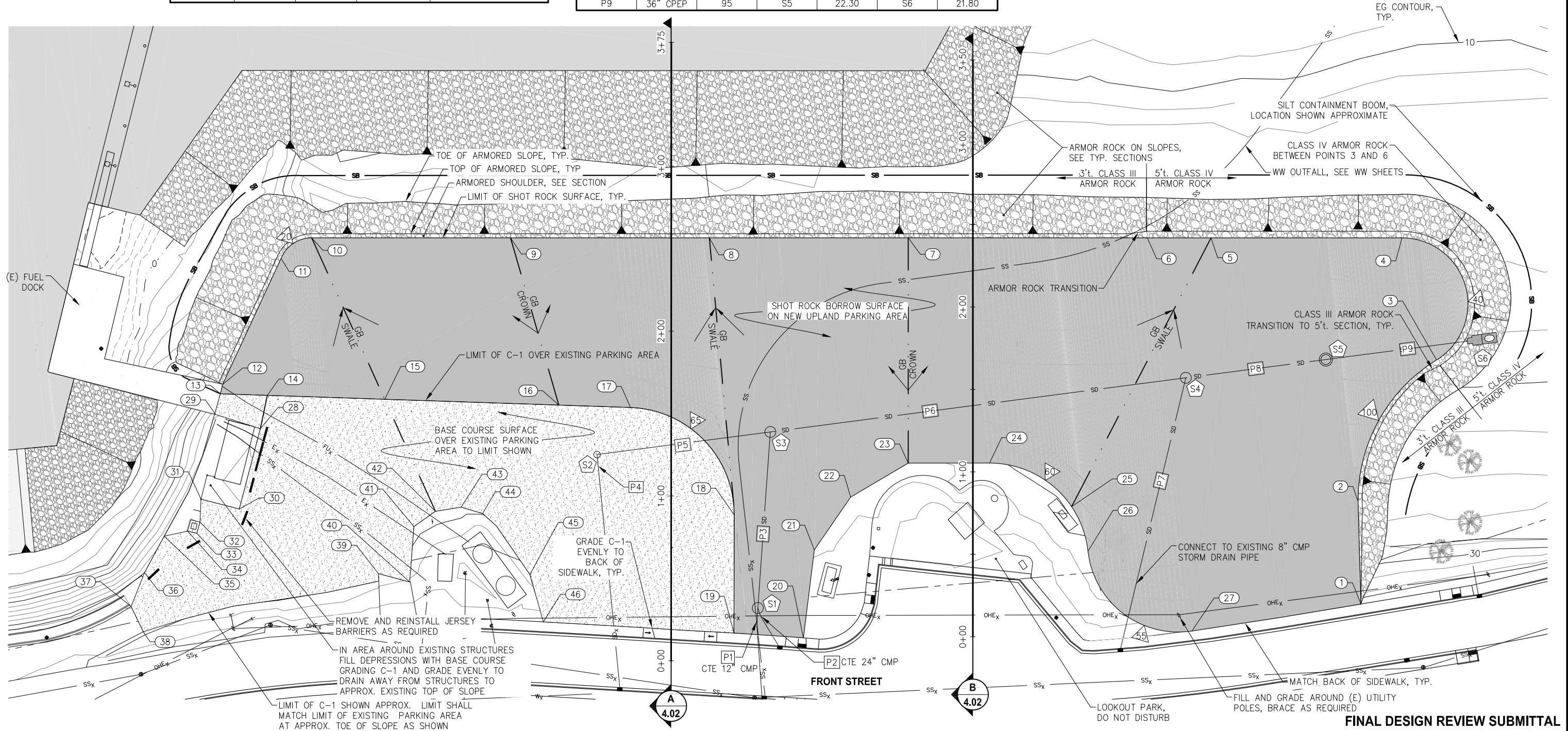
SHEET  
13 OF 31

PND PROJECT NO.: 102029

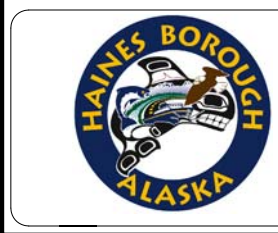
STORM DRAIN STRUCTURES				
STRUCTURE DESIGNATION	NORTHING	EASTING	RIM ELEVATION	TYPE
S1	2706729.88	2353347.47	34.48	TYPE I MANHOLE
S2	2706816.19	2353451.02	31.08	TYPE II MANHOLE
S3	2706710.21	2353452.69	30.47	TYPE I MANHOLE
S4	2706456.14	2353456.70	28.61	TYPE I MANHOLE
S5	2706370.49	2353458.06	30.76	OIL WATER SEPARATOR
S6	2706267.51	2353459.68	21.80	STORM DRAIN OUTFALL**

STORM DRAIN PIPE						
PIPE DESIGNATION	NOMINAL DIA.	LENGTH	FROM	IE	TO	IE
P1	24" CPEP	10	CTE	27.50	S1	27.00
P2	12" CPEP	10	CTE	29.30	S1	28.70
P3	36" CPEP	113	S1	26.80	S3	26.00
P4	24" CPEP	10	CTE	25.90	S2	25.85
P5	24" CPEP	103	S2	25.75	S3	25.10
P6	36" CPEP	263	S3	25.00	S4	23.00
P7	12" CPEP	154	CTE	25.00	S4	23.00
P8	36" CPEP	91	S4	22.90	S5	22.40
P9	36" CPEP	95	S5	22.30	S6	21.80

- NOTE:
1. INVERT ELEVATIONS PROVIDED AT CONNECTIONS TO EXISTING ARE APPROXIMATE, FIELD LOCATE.
  2. DISSIMILAR PIPES SHALL BE COUPLED AS SHOWN IN THE CONCRETE ENCASEMENT DETAIL. ENCASEMENTS SHALL BE 4 FEET LONG.
  3. WATER OR WASTEWATER PIPES, INCLUDING THE 16" WASTEWATER OUTFALL SHALL BE INSULATED WITH BOARD INSULATION PER SPECIFICATIONS AT ALL LOCATIONS WHERE THE DISTANCE BETWEEN THE WW PIPE AND A STORM DRAIN PIPE OR STRUCTURE IS LESS THAN 5' PER ENGINEER DIRECTION.
  4. STORM DRAIN OUTFALL ELEVATION REFERENCES INVERT OF DISCHARGE PIPE AT OUTLET.



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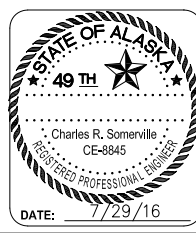


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**PND ENGINEERS, INC.**  
 9360 Glacier Highway, Ste. 100  
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DESIGN: TCB    CHECKED: CRS  
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SCALE: SCALE IN FEET  
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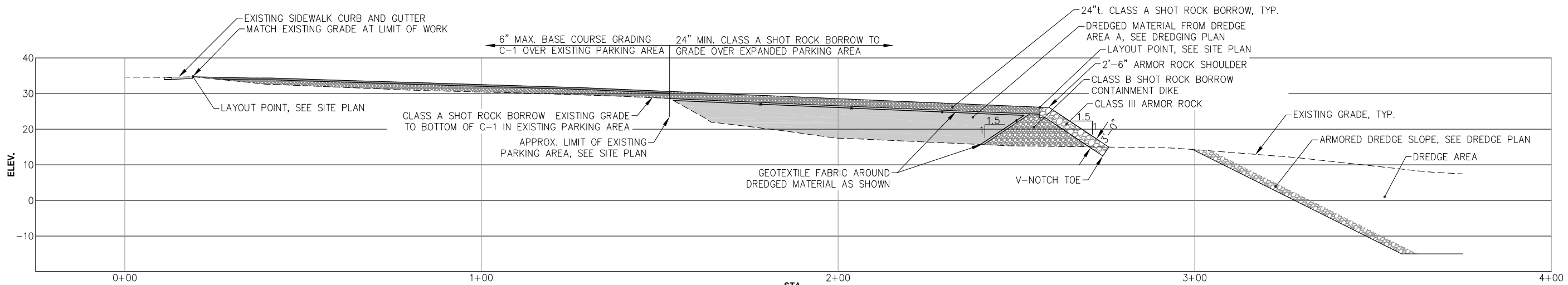
**HAINES BOROUGH PORTAGE COVE HARBOR EXPANSION**

SHEET TITLE: **UPLAND GRADING AND DRAINAGE PLAN**

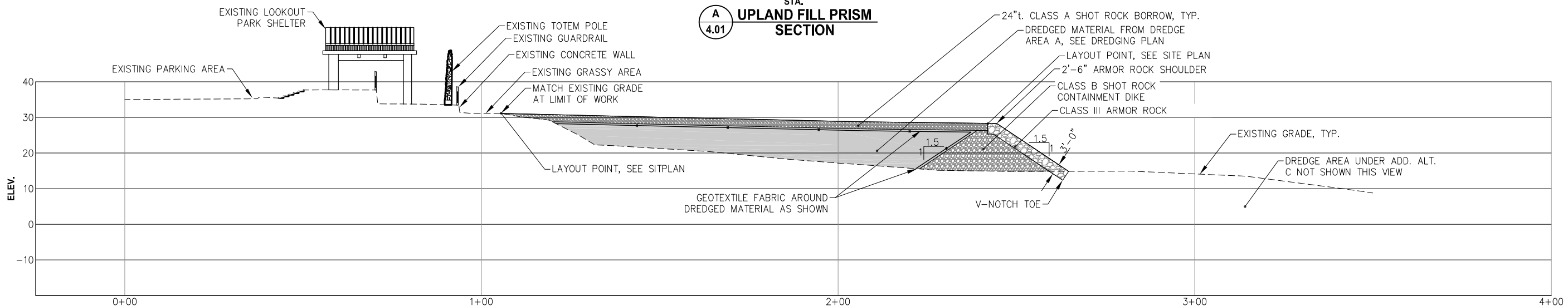
PND PROJECT NO.: 102029

DATE: 7/29/16

**4.01**  
SHEET 14 OF 31



**A**  
4.01  
STA. UPLAND FILL PRISM SECTION



**B**  
4.01  
STA. UPLAND FILL PRISM SECTION

LAYOUT TABLE				
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	2706366.24	2353308.30	35.30	ESRB, ME
2	2706360.88	2353370.33	34.03	ESRB, PC
3	2706303.85	2353450.18	32.01	ESRB, PCC, BEGIN CLASS IV ARMOR
4	2706316.26	2353526.15	29.94	ESRB, PT
5	2706431.30	2353539.31	26.09	ESRB, GB
6	2706469.70	2353543.70	27.05	ESRB, END CL IV ARMOR
7	2706613.74	2353560.16	29.03	ESRB, GB
8	2706733.56	2353573.86	25.71	ESRB, GB
9	2706853.37	2353587.56	28.13	ESRB, GB
10	2706973.19	2353601.26	24.81	ESRB, GB, PC
11	2706993.06	2353590.95	25.18	ESRB, PT
12	2707036.90	2353519.20	27.28	ESRB, ME@DOCK

LAYOUT TABLE				
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
13	2707038.93	2353513.56	27.11	ESRB, ME@DOCK
14	2707010.78	2353509.39	27.36	ESRB, GB
15	2706940.29	2353498.93	26.50	ESRB, GB
16	2706835.81	2353483.44	31.25	ESRB, GB
17	2706792.72	2353477.05	31.01	ESRB, PC
18	2706737.69	2353405.25	32.67	ESRB, PT, GB
19	2706745.97	2353334.01	34.95	ESRB, ME
20	2706704.46	2353326.36	34.39	ESRB, ME
21	2706691.84	2353378.59	33.38	ESRB, ME
22	2706666.30	2353407.93	32.84	ESRB, ME
23	2706629.26	2353424.39	32.71	ESRB, GB, ME
24	2706580.27	2353418.84	30.58	ESRB, PC

LAYOUT TABLE				
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
25	2706533.80	2353386.91	29.58	ESRB, POC, GB, ME
26	2706527.03	2353358.92	30.45	ESRB, PRC, ME
27	2706469.91	2353303.69	35.41	ESRB, PT, ME
28	2707017.25	2353489.81	27.48	EC1, ME
29	2707043.30	2353501.43	26.73	EC1, ME@DOCK
30	2707035.47	2353442.81	27.75	EC1, ME
31	2707057.85	2353451.35	27.55	EC1, ME
32	2707060.07	2353437.62	27.98	EC1, ME
33	2707062.69	2353431.14	27.96	EC1, ME
34	2707068.16	2353433.09	28.03	EC1, ME
35	2707082.62	2353431.61	27.02	EC1, ME
36	2707096.94	2353411.00	29.70	EC1, ME

LAYOUT TABLE				
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
37	2707107.39	2353391.54	31.94	EC1, ME
38	2707101.78	2353375.47	32.84	EC1, ME
39	2706956.07	2353394.29	30.72	EC1, ME
40	2706937.86	2353387.15	32.26	EC1, ME
41	2706931.50	2353420.27	28.84	EC1, ME
42	2706917.49	2353428.00	28.50	EC1, GB, ME
43	2706901.73	2353428.67	28.78	EC1, ME
44	2706889.17	2353423.39	29.87	EC1, ME
45	2706864.89	2353383.38	31.20	EC1, ME
46	2706860.08	2353353.87	35.31	EC1, ME

ABBREVIATIONS:  
 ESRB: EDGE OF CLASS A SRB  
 EC1: EDGE OF C-1  
 GB: GRADE BREAK  
 ME: MATCH EXISTING  
 PC: POINT OF CURVATURE  
 PCC: POINT OF COMPOUND CURVATURE  
 POC: POINT ON CURVE  
 PRC: POINT OF REVERSE CURVATURE

FINAL DESIGN REVIEW SUBMITTAL

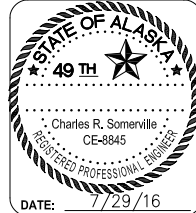


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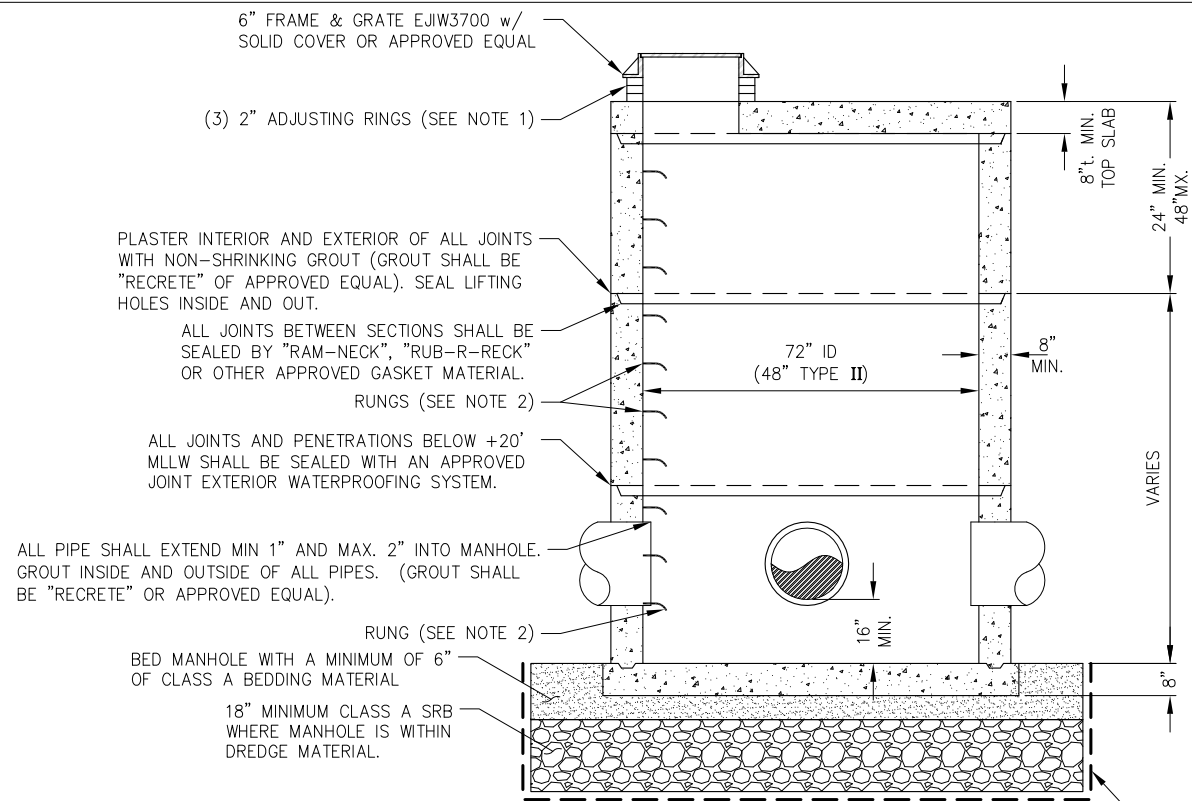
**HAINES BOROUGH PORTAGE COVE HARBOR EXPANSION**

SHEET TITLE: **UPLAND SECTIONS AND LAYOUT TABLES**

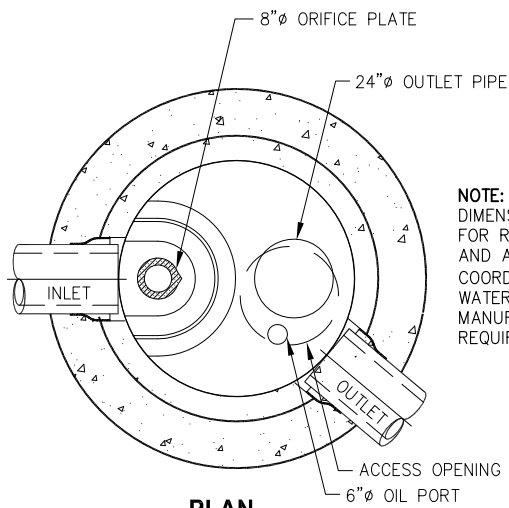
PND PROJECT NO.: 102029

DATE: 7/29/16

**4.02**  
SHEET 15 OF 31

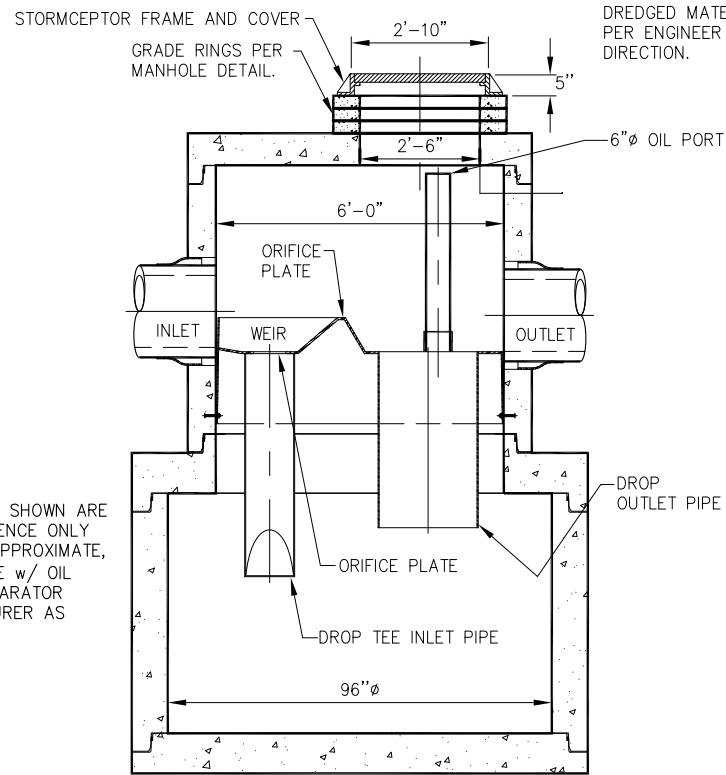


- NOTES:**
1. TOP RING SHALL BE EJIW INFRA RISER OR APPROVED EQUAL.
  2. RUNGS TO BE PLACED 12" O.C. ON OBSTRUCTED SIDE OF MANHOLE. LAST RUNG SHALL BE 18" MAXIMUM FROM BOTTOM OF MANHOLE, AND TOP RUNG SHALL BE 6" MAXIMUM FROM TOP OF CONE. IF UNOBSTRUCTED SIDE NOT AVAILABLE, LAST RUNG SHALL BE PLACED 6" OVER SMALLEST PIPE. REFER TO ASTM C-478.
  3. BLOCKOUTS MUST BE FORMED.
  4. COVER SHALL BE STENCILED "DRAIN".
  5. TYPE II MANHOLES SHALL HAVE INTEGRAL BASE.



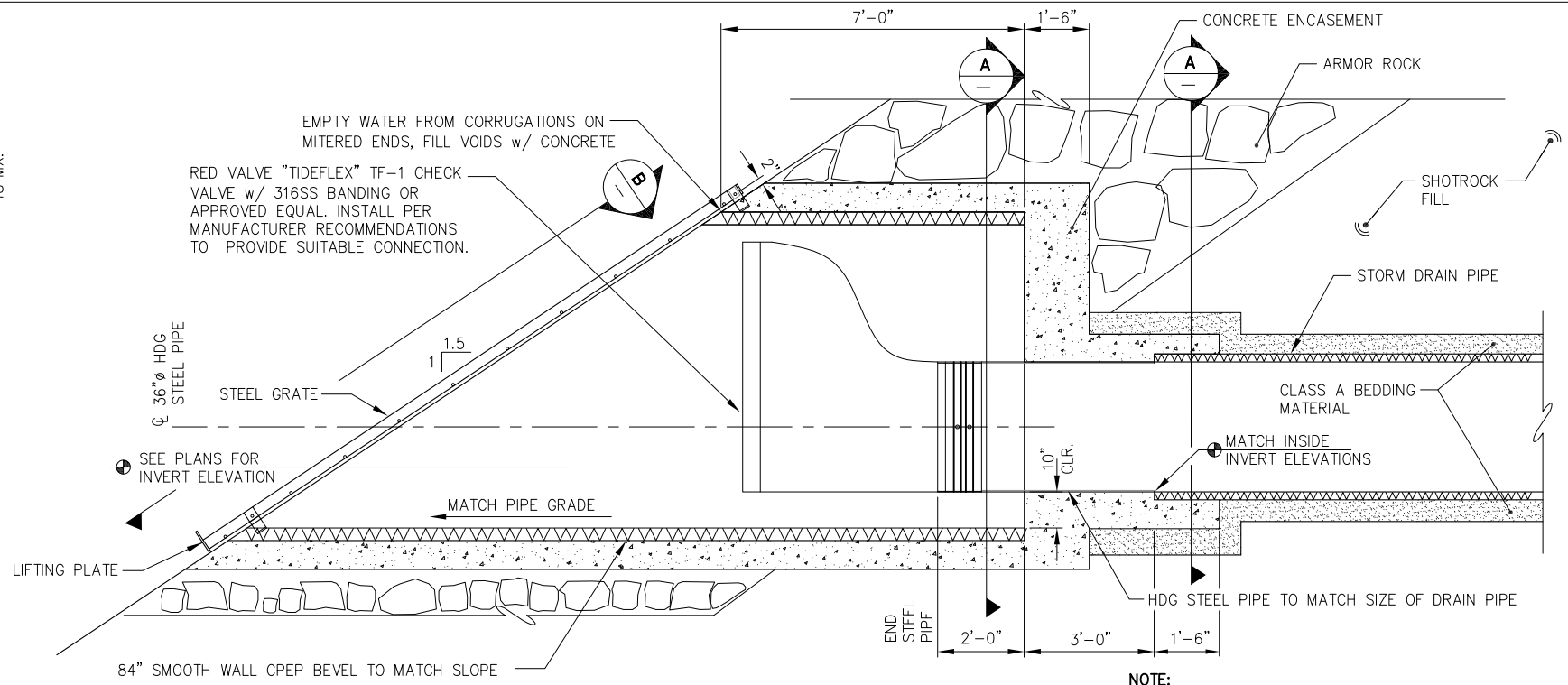
**OIL WATER SEPARATOR**

**STORM DRAIN MANHOLE - TYPE I (AS SHOWN)**



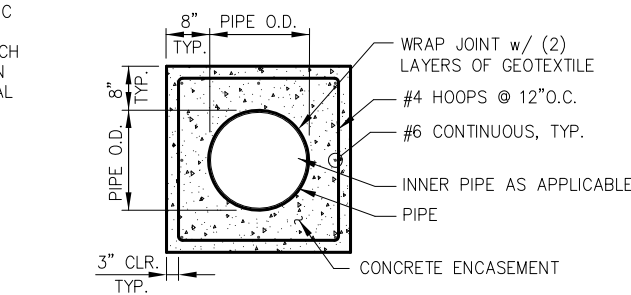
**SECTION THROUGH CHAMBER**

**NOTE:** SUBGRADE PREPARATION SIMILAR TO S.D. MANHOLE

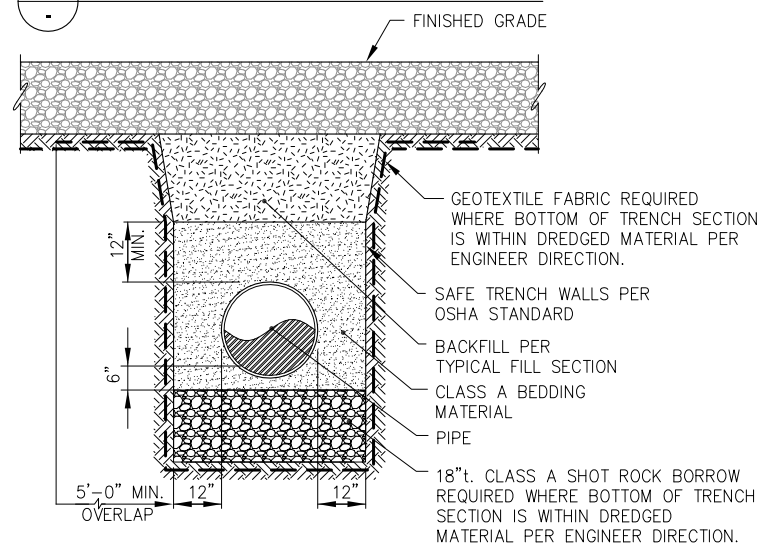


**STORM DRAIN OUTFALL STRUCTURE**

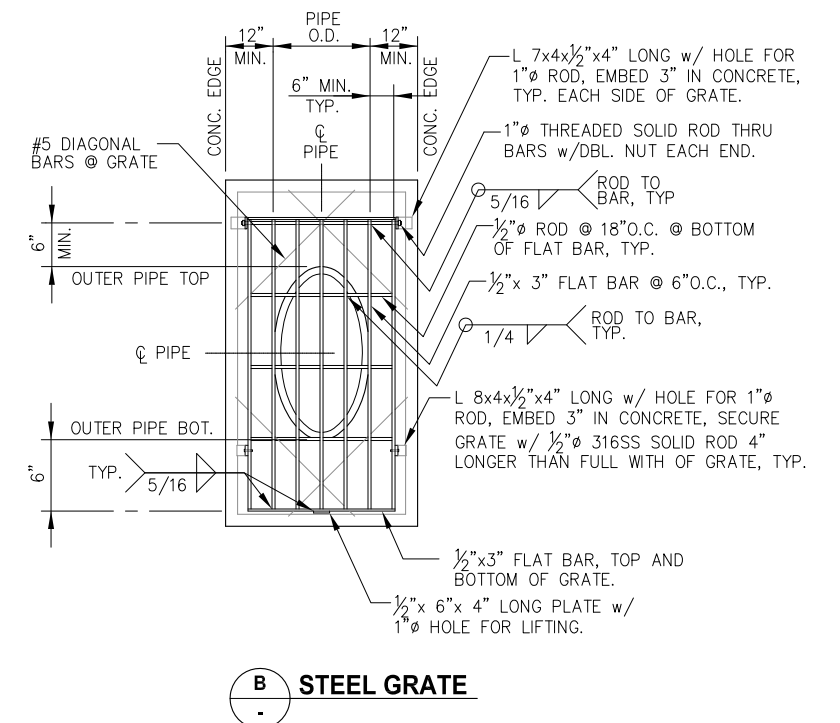
**NOTE:** PROVIDE GEOTEXTILE FABRIC WRAP AROUND DISSIMILAR PIPE COUPLINGS PER CONCRETE ENCASEMENT DETAIL THIS SHEET.



**CONCRETE ENCASEMENT SECTION**



**TYPICAL STORM DRAIN PIPE BEDDING SECTION**



**STEEL GRATE**



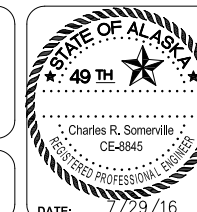
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SCALE: NTS



SHEET TITLE:  
**STORM DRAIN DETAILS**

**4.03**

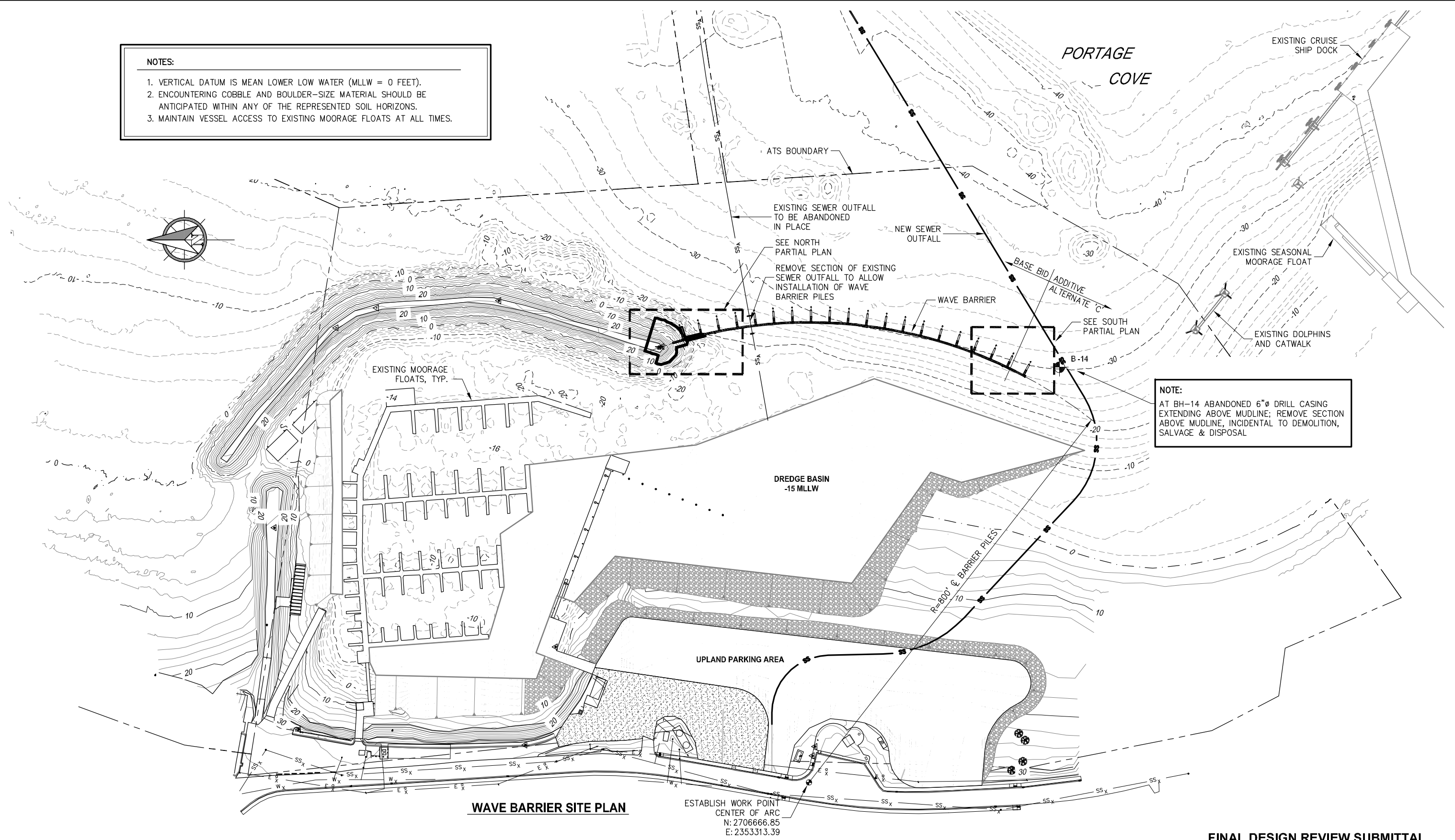
SHEET  
16 OF 31

PND PROJECT NO.: 102029



NOTES:

- 1. VERTICAL DATUM IS MEAN LOWER LOW WATER (MLLW = 0 FEET).
- 2. ENCOUNTERING COBBLE AND BOULDER-SIZE MATERIAL SHOULD BE ANTICIPATED WITHIN ANY OF THE REPRESENTED SOIL HORIZONS.
- 3. MAINTAIN VESSEL ACCESS TO EXISTING MOORAGE FLOATS AT ALL TIMES.



NOTE:  
 AT BH-14 ABANDONED 6"Ø DRILL CASING  
 EXTENDING ABOVE MUDLINE; REMOVE SECTION  
 ABOVE MUDLINE, INCIDENTAL TO DEMOLITION,  
 SALVAGE & DISPOSAL

WAVE BARRIER SITE PLAN

FINAL DESIGN REVIEW SUBMITTAL



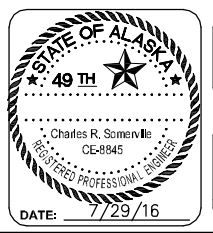
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REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

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DESIGN: JDO CHECKED: CRS  
 DRAWN: GRD APPROVED: CRS

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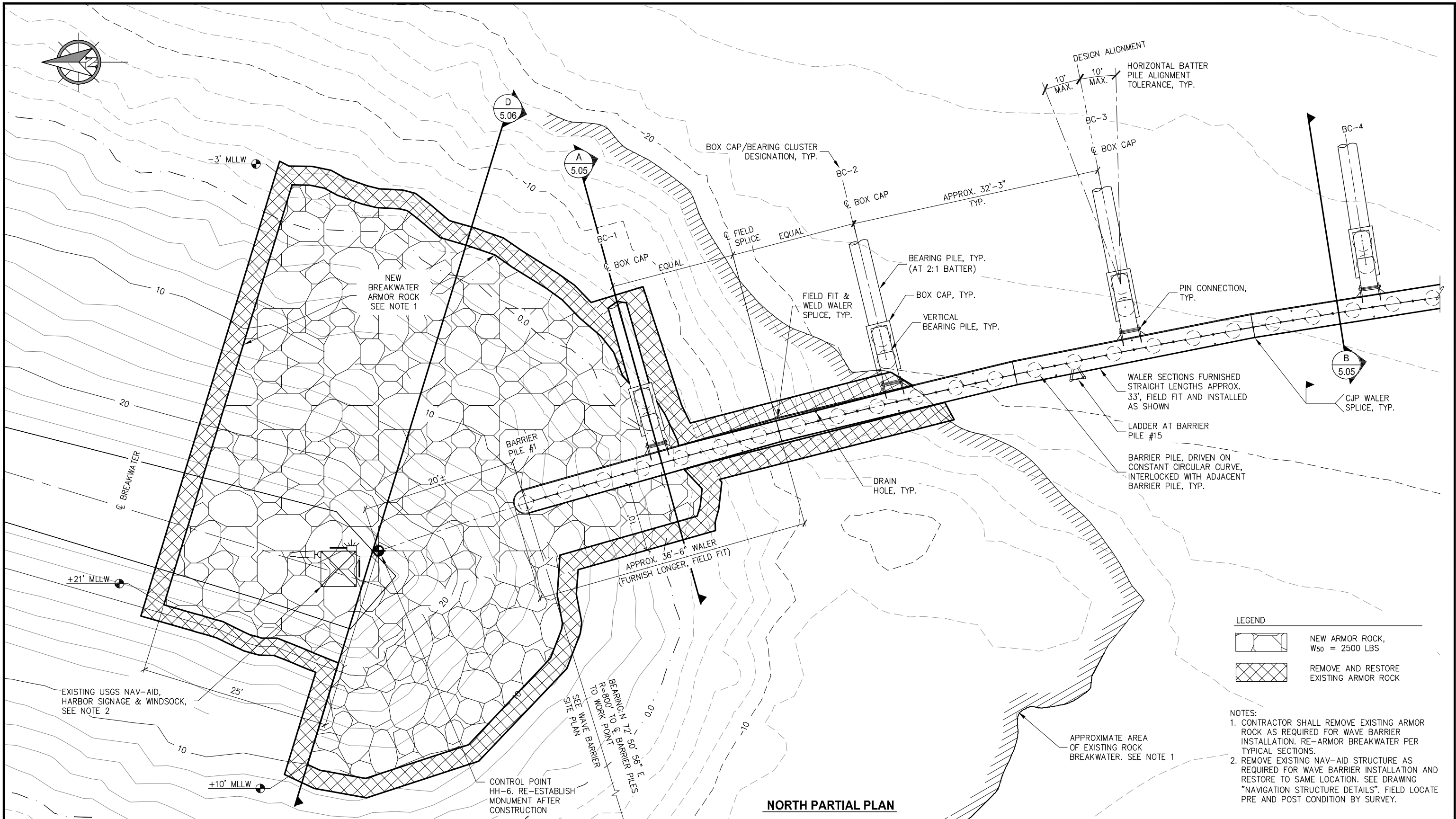
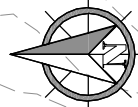
**HAINES BOROUGH  
 PORTAGE COVE  
 HARBOR EXPANSION**

SHEET TITLE:  
**WAVE BARRIER SITE PLAN**

PN&D PROJECT NO.: 102029.10

DATE: 7/29/16

**5.01**  
 SHEET  
 17 OF 31



**LEGEND**

	NEW ARMOR ROCK, W <sub>50</sub> = 2500 LBS
	REMOVE AND RESTORE EXISTING ARMOR ROCK

- NOTES:**
- CONTRACTOR SHALL REMOVE EXISTING ARMOR ROCK AS REQUIRED FOR WAVE BARRIER INSTALLATION. RE-ARMOR BREAKWATER PER TYPICAL SECTIONS.
  - REMOVE EXISTING NAV-AID STRUCTURE AS REQUIRED FOR WAVE BARRIER INSTALLATION AND RESTORE TO SAME LOCATION. SEE DRAWING "NAVIGATION STRUCTURE DETAILS". FIELD LOCATE PRE AND POST CONDITION BY SURVEY.

**NORTH PARTIAL PLAN**

**FINAL DESIGN REVIEW SUBMITTAL**



**REVISIONS**

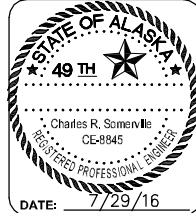
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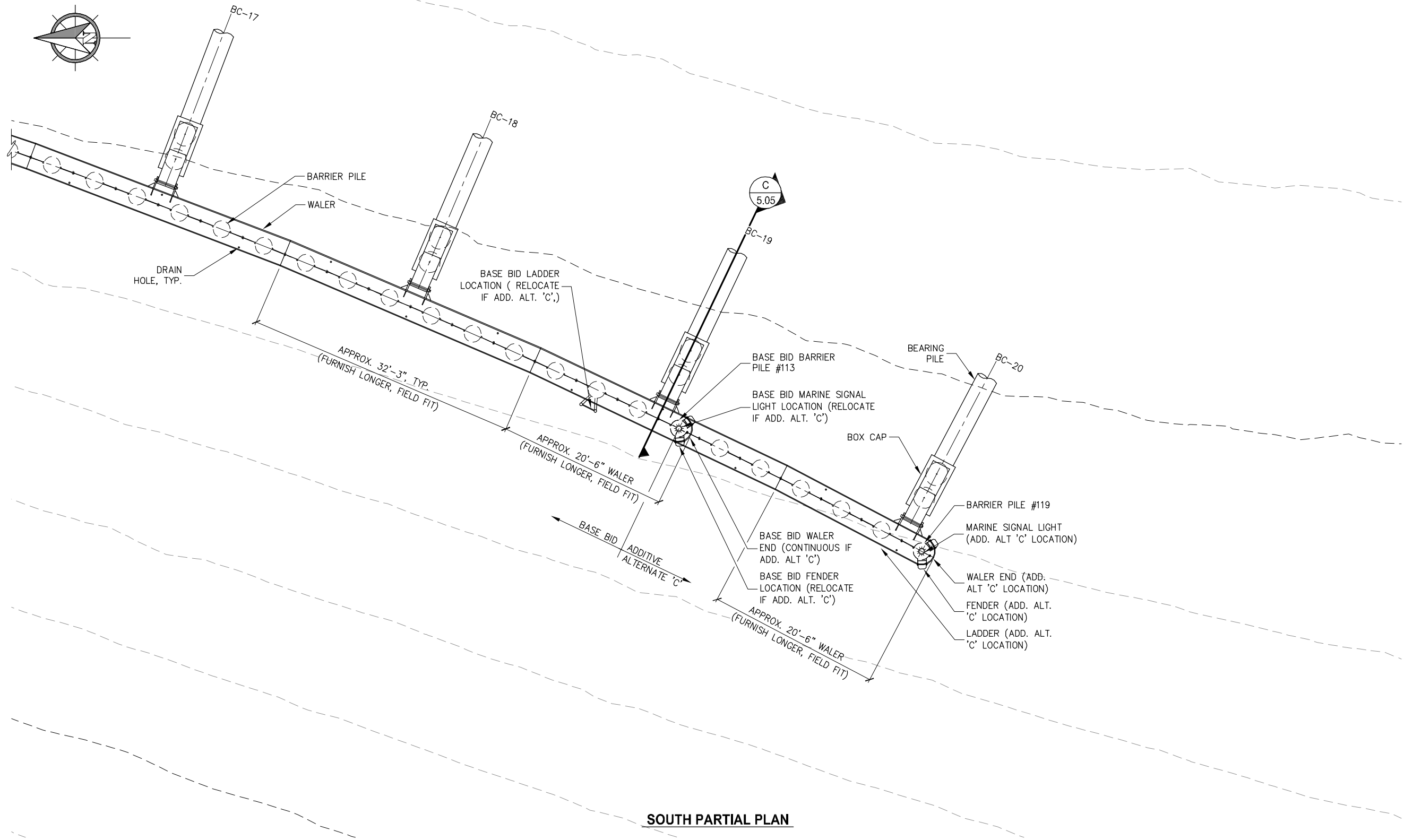
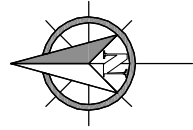
**HAINES BOROUGH PORTAGE COVE HARBOR EXPANSION**

SHEET TITLE: **WAVE BARRIER NORTH PARTIAL PLAN**

DATE: 7/29/16

PN&D PROJECT NO.: 102029.10

**5.02**  
SHEET 18 OF 31



**SOUTH PARTIAL PLAN**

**FINAL DESIGN REVIEW SUBMITTAL**



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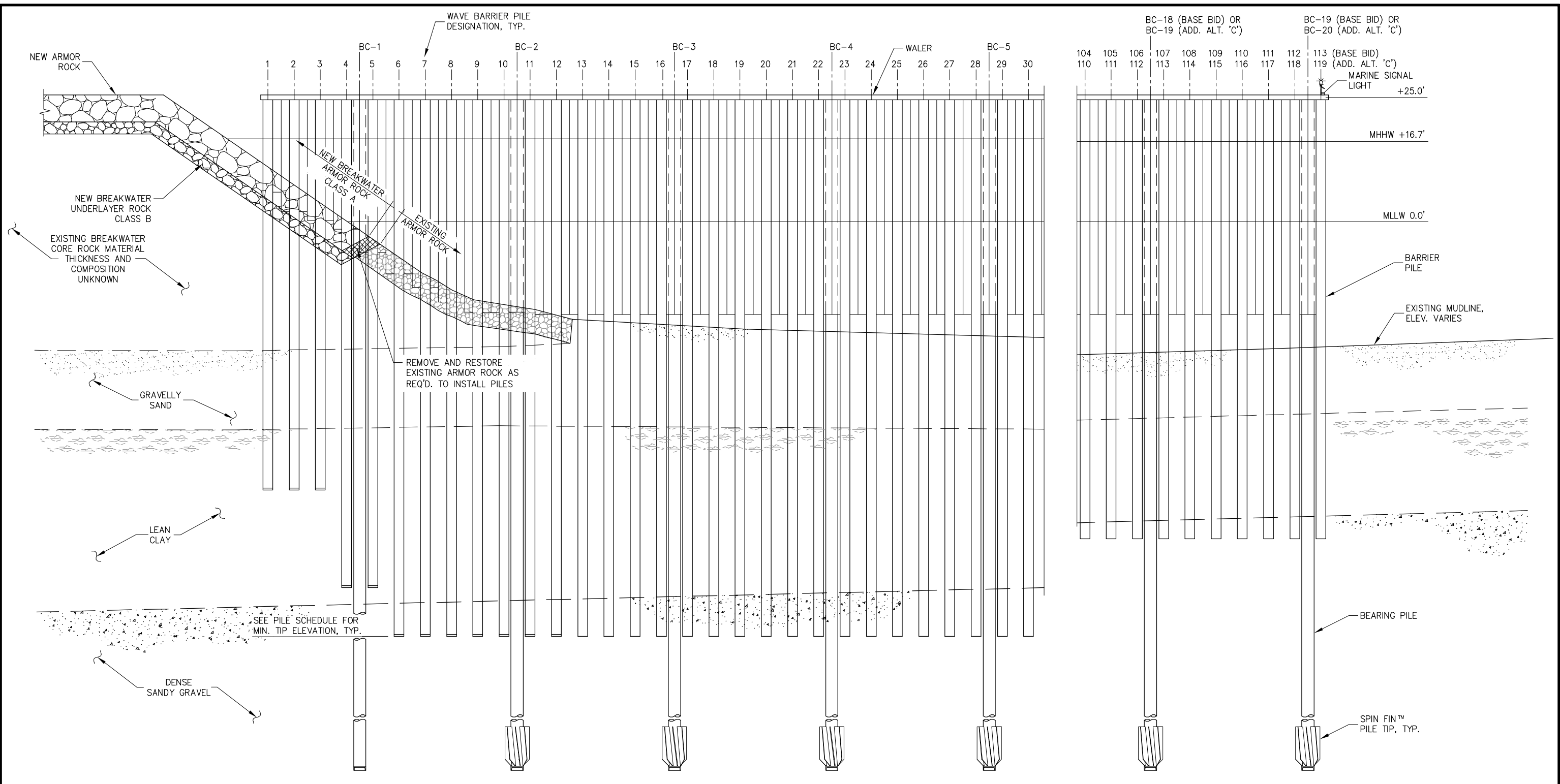
**HAINES BOROUGH  
PORTAGE COVE  
HARBOR EXPANSION**

SHEET TITLE:  
**WAVE BARRIER SOUTH  
PARTIAL PLAN**

DATE: 7/29/16

PN&D PROJECT NO.: 102029.10

**5.03**  
SHEET  
19 OF 31



**NOTE:**  
 1. SOIL INFORMATION SHOWN IS APPROXIMATE AND FOR GENERAL ILLUSTRATION PURPOSES ONLY. SEE GEOTECHNICAL REPORT FOR SPECIFIC SOILS INFORMATION.  
 2. SEE PILE SCHEDULE FOR DETAILS NOT SHOWN AND INSTALLATION CRITERIA.

**PARTIAL ELEVATION**  
 NOTE: LADDERS NOT SHOWN FOR CLARITY

**FINAL DESIGN REVIEW SUBMITTAL**



SPIN FIN™ PILE IS A REGISTERED TRADEMARK OF PND ENGINEERS, INC.

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**HAINES BOROUGH PORTAGE COVE HARBOR EXPANSION**

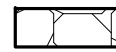
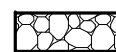

SHEET TITLE:  
**PARTIAL ELEVATION**

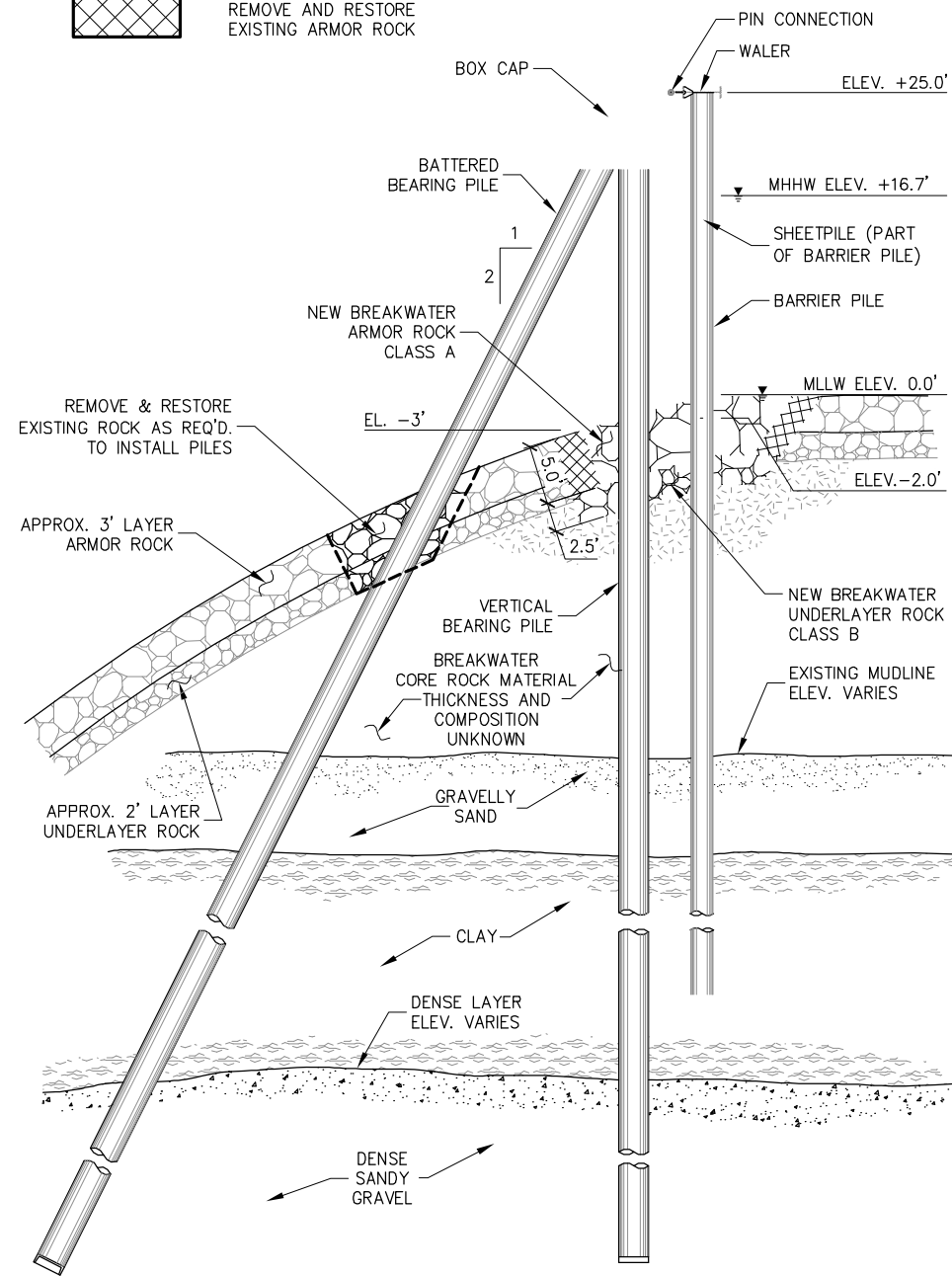
PN&D PROJECT NO.: 102029.10

DATE: 7/29/16

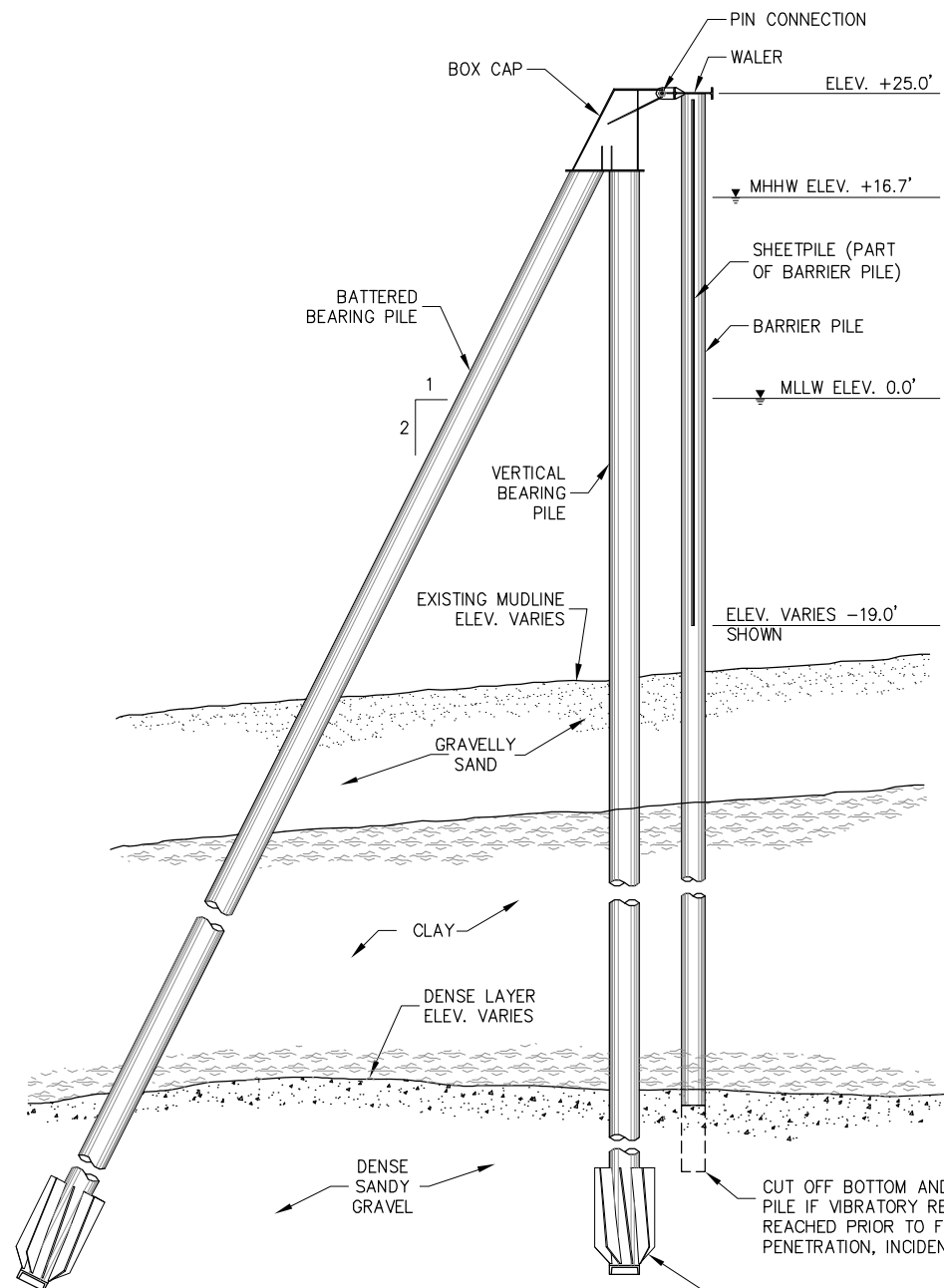
**5.04**  
 SHEET 20 OF 31

**NEW ARMOR ROCK SIZE:**

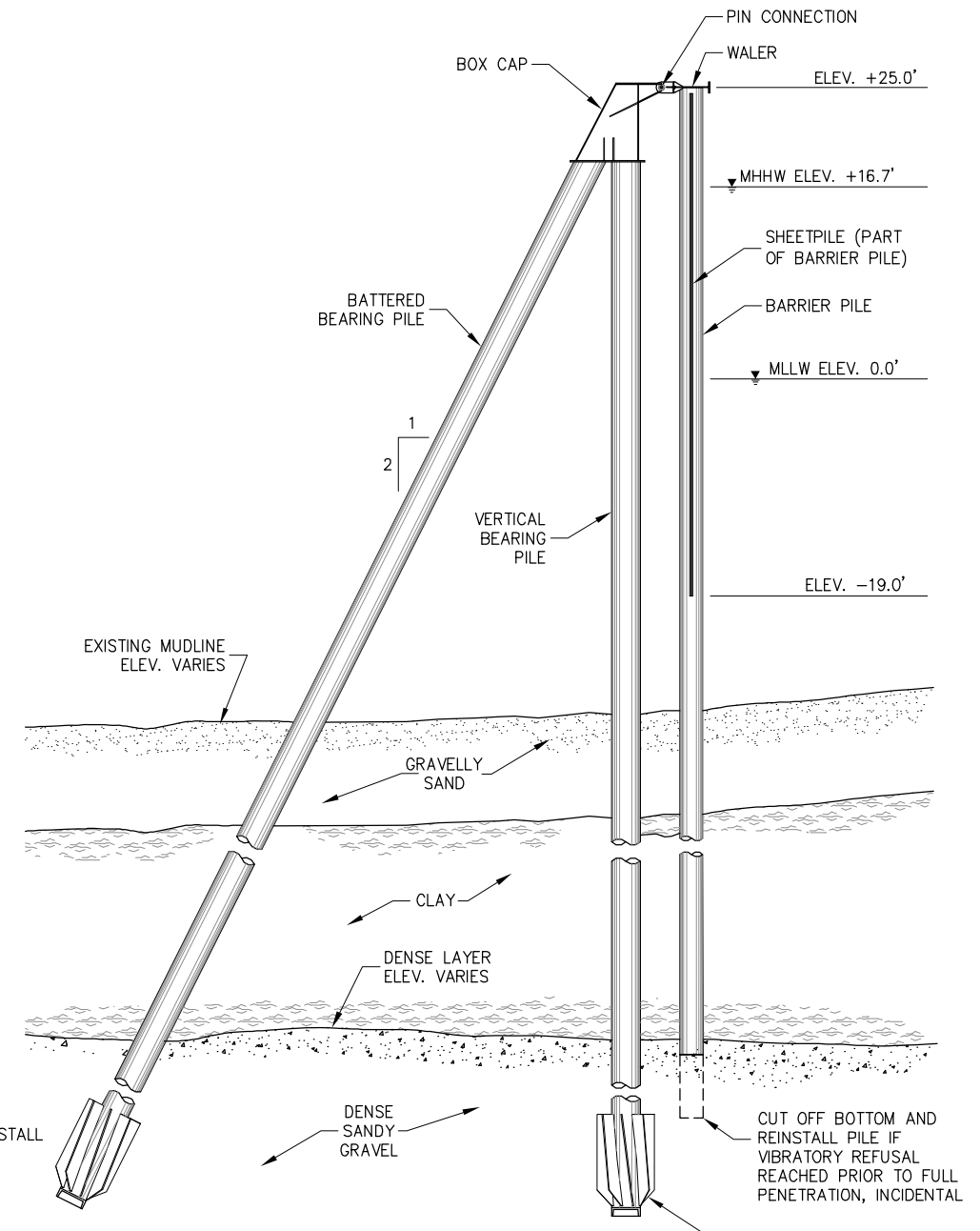
-  NEW ARMOR ROCK  
W<sub>50</sub> = 2500 LBS
-  NEW UNDERLAYER ROCK  
W<sub>50</sub> = 250 LBS
-  REMOVE AND RESTORE EXISTING ARMOR ROCK



**A** TYPICAL SECTION  
5.02



**B** TYPICAL SECTION  
5.02



**C** TYPICAL SECTION  
5.03

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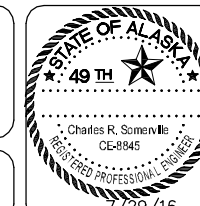
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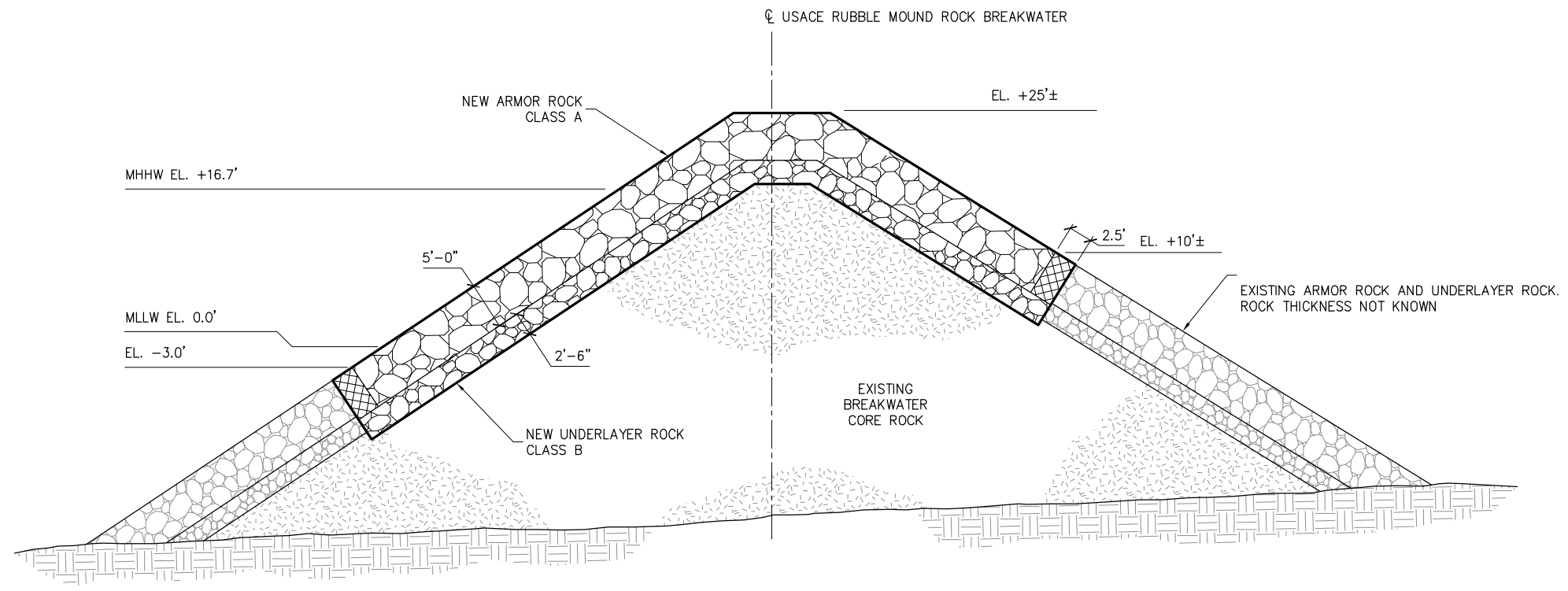
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SHEET TITLE:  
**TYPICAL SECTIONS**  
PN&D PROJECT NO.: 102029.10

**5.05**  
SHEET  
21 OF 31



**D** TYPICAL SECTION  
5.02

**NEW ARMOR ROCK SIZE:**

-  NEW ARMOR ROCK  
W<sub>50</sub> = 2500 LBS
-  NEW UNDERLAYER ROCK  
W<sub>50</sub> = 250 LBS
-  REMOVE AND RESTORE  
EXISTING ARMOR ROCK

**FINAL DESIGN REVIEW SUBMITTAL**

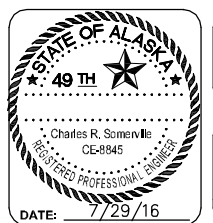


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**HAINES BOROUGH  
PORTAGE COVE  
HARBOR EXPANSION**

SHEET TITLE:  
**ROCK BREAKWATER SECTION**

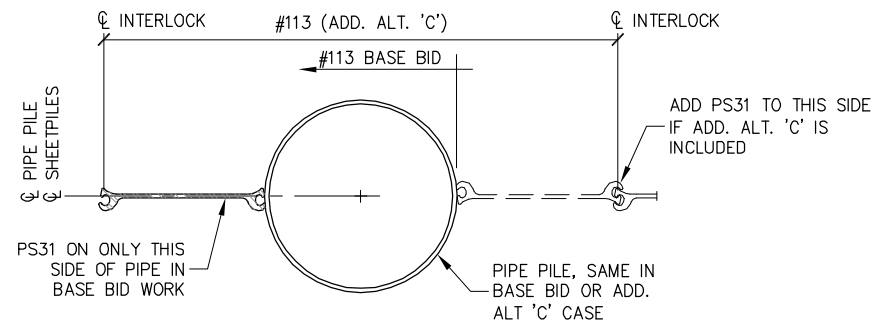
PN&D PROJECT NO.: 102029.10

**5.06**  
SHEET  
22 OF 31



WAVE BARRIER PILE SCHEDULE (Cont.)								
Pile Location	Pile Size Diameter x Wall	Supply Length (ft)	Max. Length of Bare Pile (ft)	Length of Sheetpile (ft)	Tip Type	Pile Tip Elevation (ft)	Design Compression Capacity	Comments
							(Allowable/Ultimate) (kips)	
101	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 both sides
102	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 both sides
103	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 both sides
104	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 both sides
105	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 both sides
106	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 both sides
107	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 both sides
108	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 both sides
109	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 both sides
110	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 both sides
111	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 both sides
112	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 both sides
113	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 one side of pile only (see detail below)
ADDITIVE ALTERNATE 'C'								
113	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 both sides of pile (see detail below)
114	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 both sides
115	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 both sides
116	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 both sides
117	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 both sides
118	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 both sides
119	24"dia x 0.500"t	90	40	44	None	-65	--	PS31 one side of pile only*

\* PAY PARTICULAR ATTENTION TO INTERLOCK ORIENTATION



**BARRIER PILE #113**  
(USE APPROPRIATE PILE FOR BASE BID OR ADD. ALT. 'C')

BEARING PILE SCHEDULE								
Pile Location	Pile Batter	Pile Size Diameter x Wall	Supply Length (ft)	Length of Bare Pile (ft)	Tip Type	Capacity (Allowable/Ultimate) (kips)		Minimum Tip Elevation
						Compression	Tension	
BC-1	Vertical	30"dia x 0.75"t	160	80	Cutting Shoe Only	300/680	290/650	-135'
	2:1	30"dia x 0.750"t	200	100	Cutting Shoe Only	335/750	325/730	-155'
BC-2	Vertical	30"dia x 0.750"t	160	80	SPIN FIN	550/1240	525/1180	-135'
	2:1	30"dia x 0.750"t	200	100	SPIN FIN	600/1350	575/1300	-155'
BC-3	Vertical**	30"dia x 0.750"t	160	80	SPIN FIN	550/1240	525/1180	-135'
	2:1**	30"dia x 0.750"t	200	100	SPIN FIN	600/1350	575/1300	-155'
BC-4	Vertical	30"dia x 0.750"t	160	80	SPIN FIN	550/1240	525/1180	-135'
	2:1	30"dia x 0.750"t	200	100	SPIN FIN	600/1350	575/1300	-155'
BC-5	Vertical	30"dia x 0.750"t	160	80	SPIN FIN	550/1240	525/1180	-135'
	2:1	30"dia x 0.750"t	200	100	SPIN FIN	600/1350	575/1300	-155'
BC-6	Vertical	30"dia x 0.750"t	160	80	SPIN FIN	550/1240	525/1180	-135'
	2:1	30"dia x 0.750"t	200	100	SPIN FIN	600/1350	575/1300	-155'
BC-7	Vertical	30"dia x 0.750"t	160	80	SPIN FIN	550/1240	525/1180	-135'
	2:1	30"dia x 0.750"t	200	100	SPIN FIN	600/1350	575/1300	-155'
BC-8	Vertical	30"dia x 0.750"t	160	80	SPIN FIN	550/1240	525/1180	-135'
	2:1	30"dia x 0.750"t	200	100	SPIN FIN	600/1350	575/1300	-155'
BC-9	Vertical	30"dia x 0.750"t	160	80	SPIN FIN	550/1240	525/1180	-135'
	2:1	30"dia x 0.750"t	200	100	SPIN FIN	600/1350	575/1300	-155'
BC-10	Vertical	30"dia x 0.750"t	160	80	SPIN FIN	550/1240	525/1180	-135'
	2:1	30"dia x 0.750"t	200	100	SPIN FIN	600/1350	575/1300	-155'
BC-11	Vertical**	30"dia x 0.750"t	160	80	SPIN FIN	550/1240	525/1180	-135'
	2:1**	30"dia x 0.750"t	200	100	SPIN FIN	600/1350	575/1300	-155'
BC-12	Vertical	30"dia x 0.750"t	160	80	SPIN FIN	550/1240	525/1180	-135'
	2:1	30"dia x 0.750"t	200	100	SPIN FIN	600/1350	575/1300	-155'
BC-13	Vertical	30"dia x 0.750"t	160	80	SPIN FIN	550/1240	525/1180	-135'
	2:1	30"dia x 0.750"t	200	100	SPIN FIN	600/1350	575/1300	-155'
BC-14	Vertical	30"dia x 0.750"t	160	80	SPIN FIN	550/1240	525/1180	-135'
	2:1	30"dia x 0.750"t	200	100	SPIN FIN	600/1350	575/1300	-155'
BC-15	Vertical	30"dia x 0.750"t	160	80	SPIN FIN	550/1240	525/1180	-135'
	2:1	30"dia x 0.750"t	200	100	SPIN FIN	600/1350	575/1300	-155'
BC-16	Vertical	30"dia x 0.750"t	160	80	SPIN FIN	550/1240	525/1180	-135'
	2:1	30"dia x 0.750"t	200	100	SPIN FIN	600/1350	575/1300	-155'
BC-17	Vertical	30"dia x 0.750"t	160	80	SPIN FIN	550/1240	525/1180	-135'
	2:1	30"dia x 0.750"t	200	100	SPIN FIN	600/1350	575/1300	-155'
BC-18	Vertical	30"dia x 0.750"t	160	80	SPIN FIN	550/1240	525/1180	-135'
	2:1	30"dia x 0.750"t	200	100	SPIN FIN	600/1350	575/1300	-155'
BC-19	Vertical**	30"dia x 0.750"t	160	80	SPIN FIN	550/1240	525/1180	-135'
	2:1**	30"dia x 0.750"t	200	100	SPIN FIN	600/1350	575/1300	-155'
ADDITIVE ALTERNATE 'C'								
BC-20	Vertical	30"dia x 0.75"t	160	80	SPIN FIN	550/1240	525/1180	-135'
	2:1	30"dia x 0.75"t	200	100	SPIN FIN	600/1350	575/1300	-155'

\*\* INDICATES PDA REQUIRED (SEE SPECIFICATION 02896)



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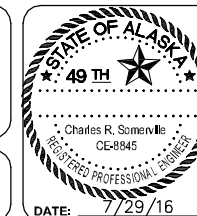
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SCALE:



FINAL DESIGN REVIEW SUBMITTAL

HAINES BOROUGH  
PORTAGE COVE  
HARBOR EXPANSION

SHEET TITLE:

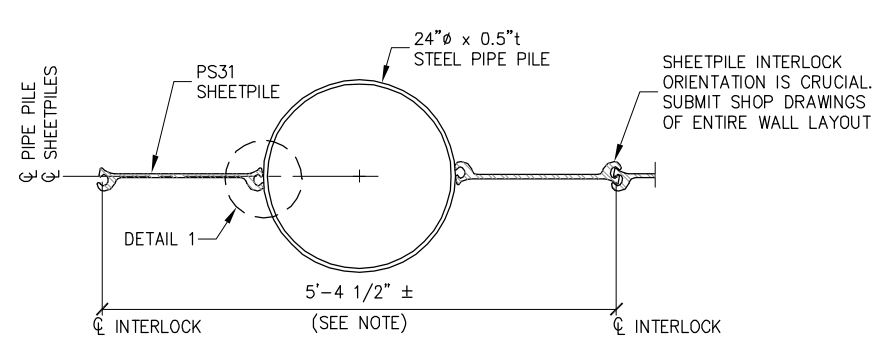
PILE SCHEDULE

5.08

SHEET  
24 OF 31

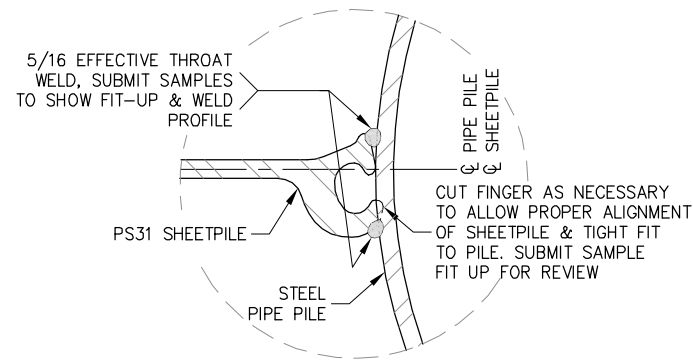
PN&D PROJECT NO.: 102029.10



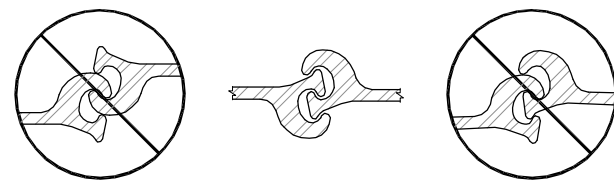


**TYPICAL BARRIER PILE**

NOTE:  
IF DIMENSION VARIES SUBSTANTIALLY FROM THIS ESTIMATE DUE TO FIT-UP OF PROPOSED SHEETPILE, ADDITIONAL BARRIER PILES AND SHEETPILE MAY BE REQUIRED TO OBTAIN OVERALL DESIRED LENGTH OF WAVE BARRIER SHOWN.



**DETAIL 1**



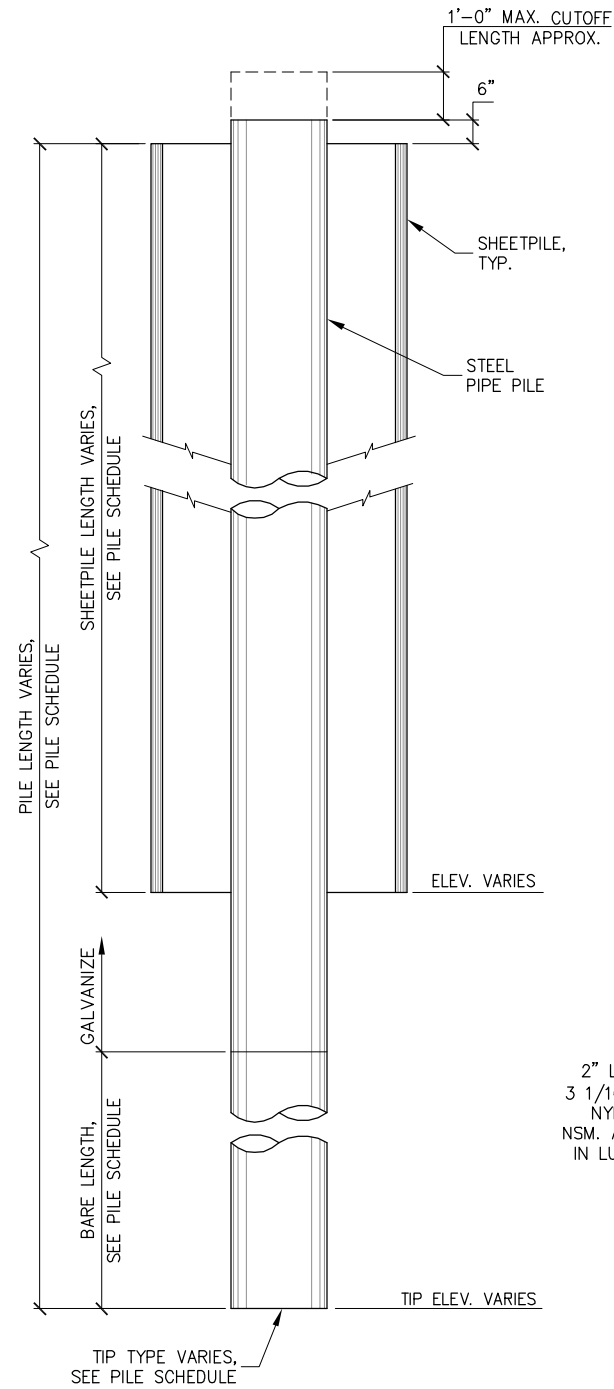
INCORRECT

CORRECT

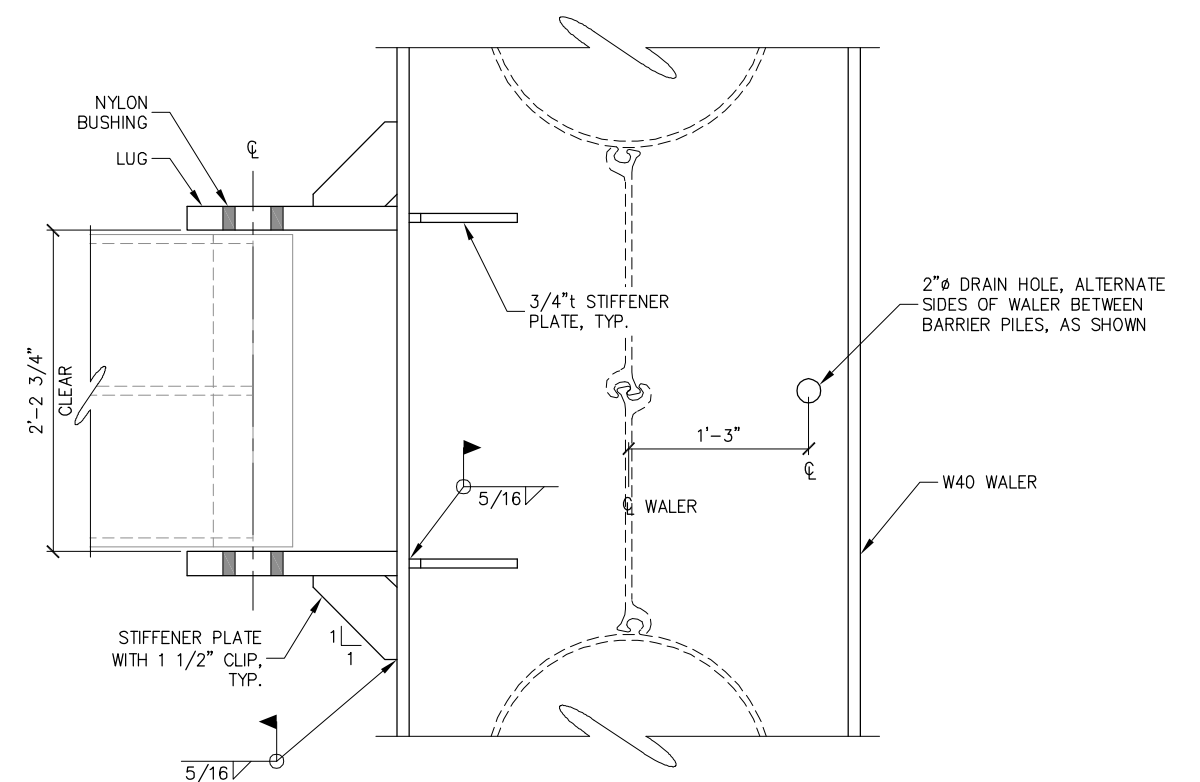
INCORRECT

**SHEETPILE INTERLOCK DETAILS**

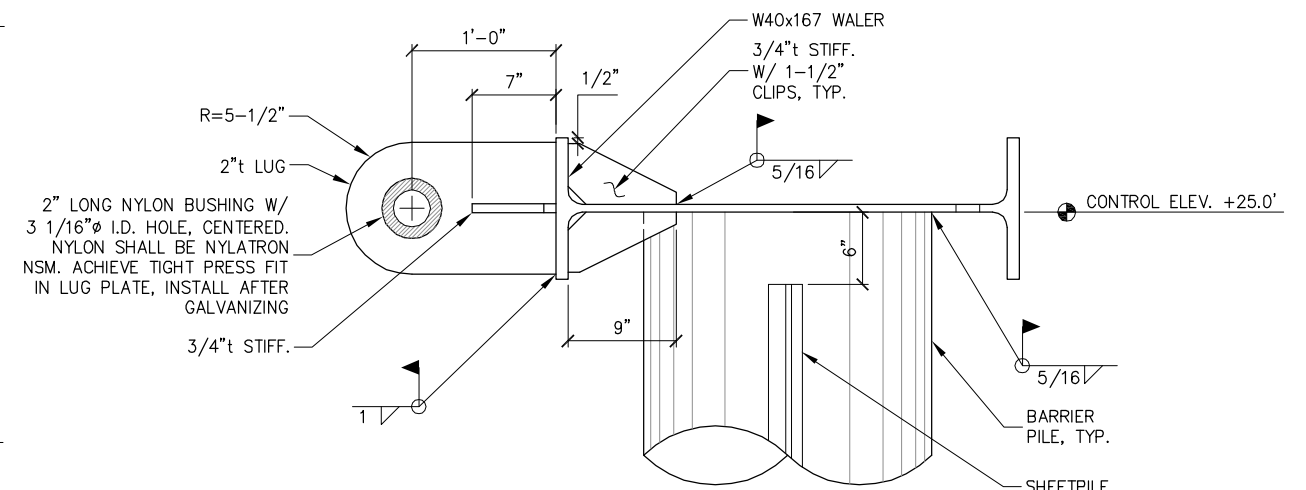
NOTE: ORIENTATION OF INTERLOCKS IS CRITICAL, VIEW SHOWN FROM TOP.



**TYPICAL WAVE BARRIER PILE**



**PLAN**



**ELEVATION**

**WALER DETAILS**



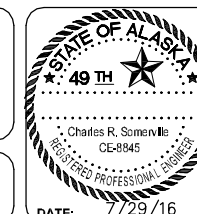
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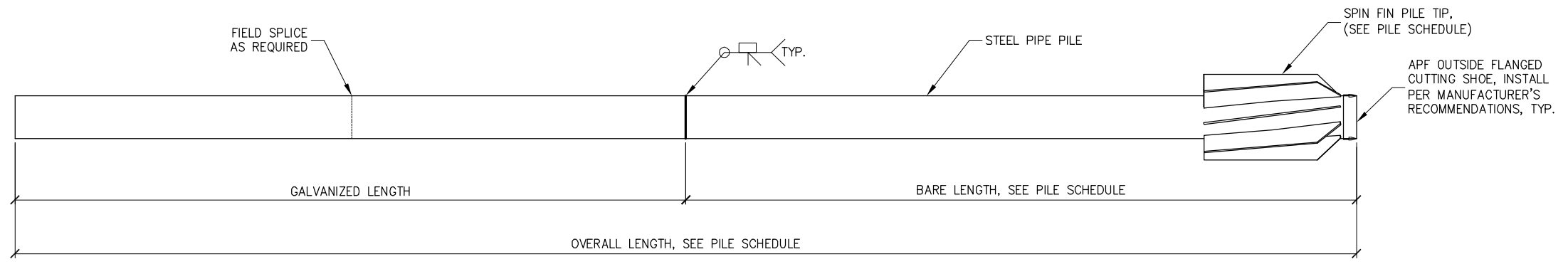
**HAINES BOROUGH  
PORTAGE COVE  
HARBOR EXPANSION**

SHEET TITLE:  
**BARRIER PILES AND WALERS**

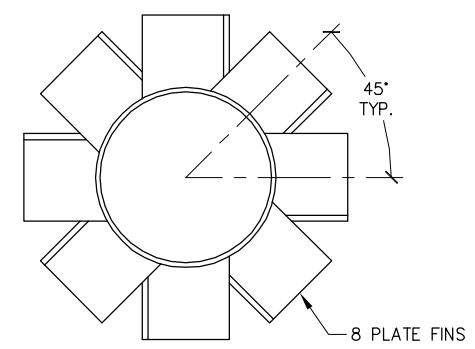
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SHEET  
**25 OF 31**

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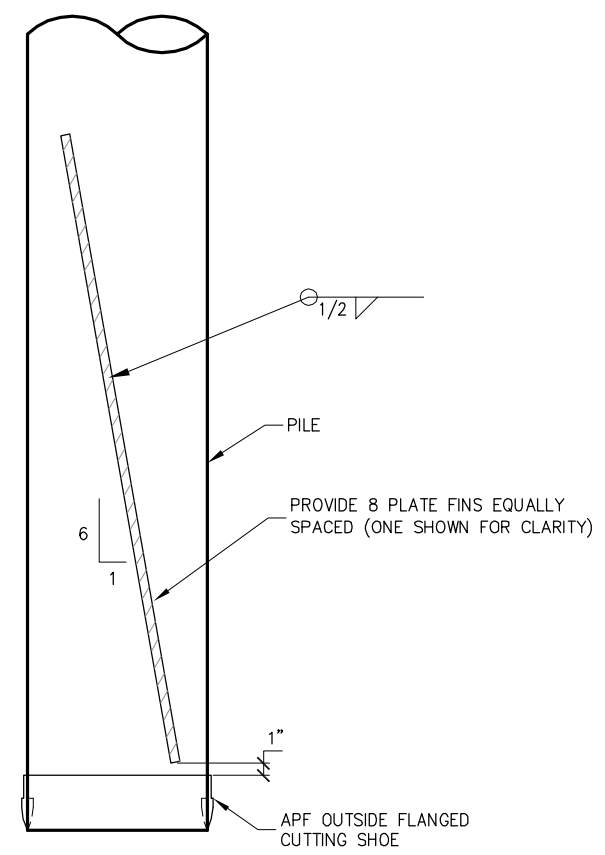


**BEARING PILE**  
NTS

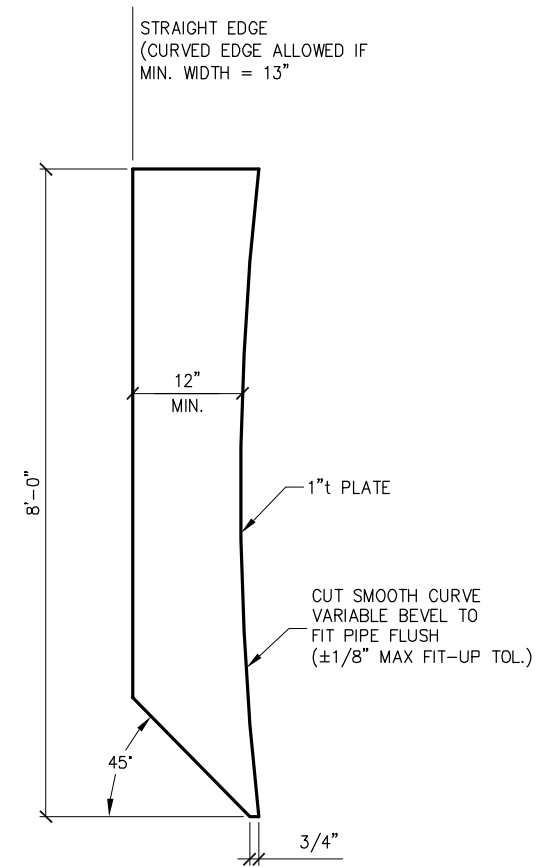


**PLAN**

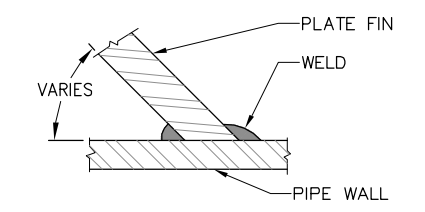
**SPIN FIN PILE TIP**  
NTS



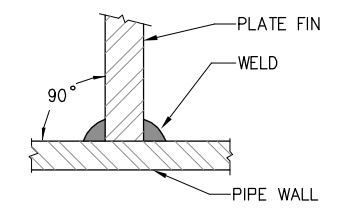
**ELEVATION**



**PLATE FIN**  
NTS



**PILE/FIN SECTION**  
NTS



**PILE/FIN SECTION AT CENTERLINE OF PLATE**  
NTS



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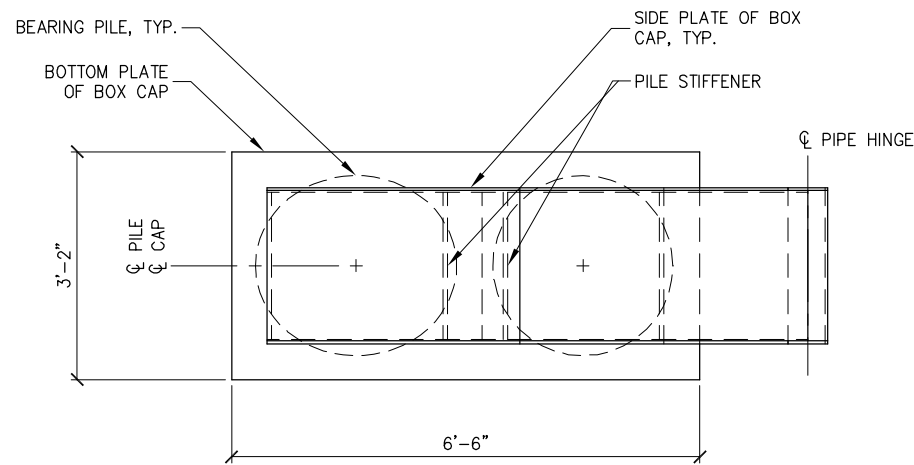
**FINAL DESIGN REVIEW SUBMITTAL**

**HAINES BOROUGH PORTAGE COVE HARBOR EXPANSION**

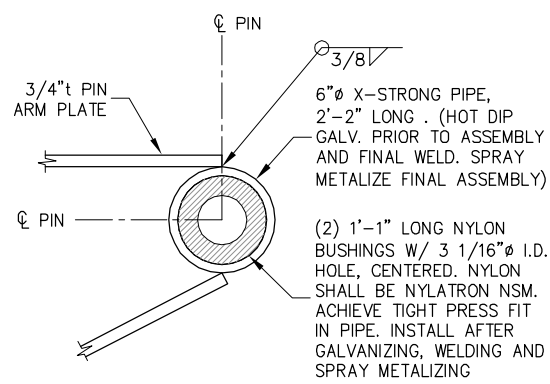
SHEET TITLE:  
**BEARING PILE DETAILS**

PN&D PROJECT NO.: 102029.10

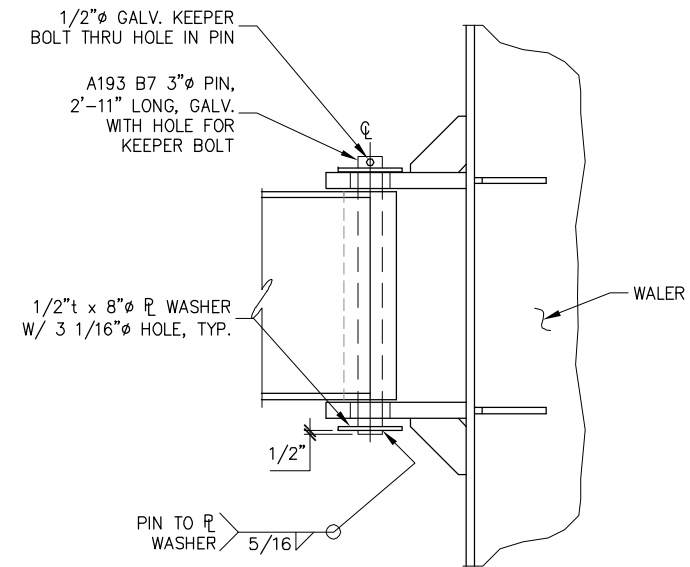
**5.10**  
SHEET 26 OF 31



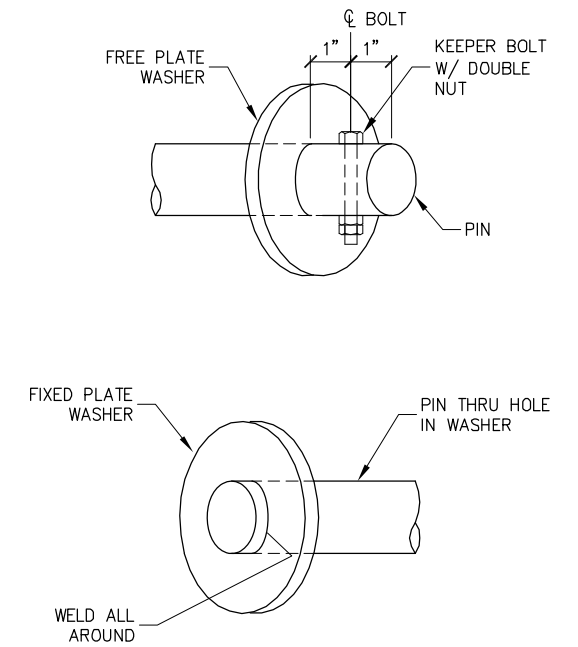
**PLAN**



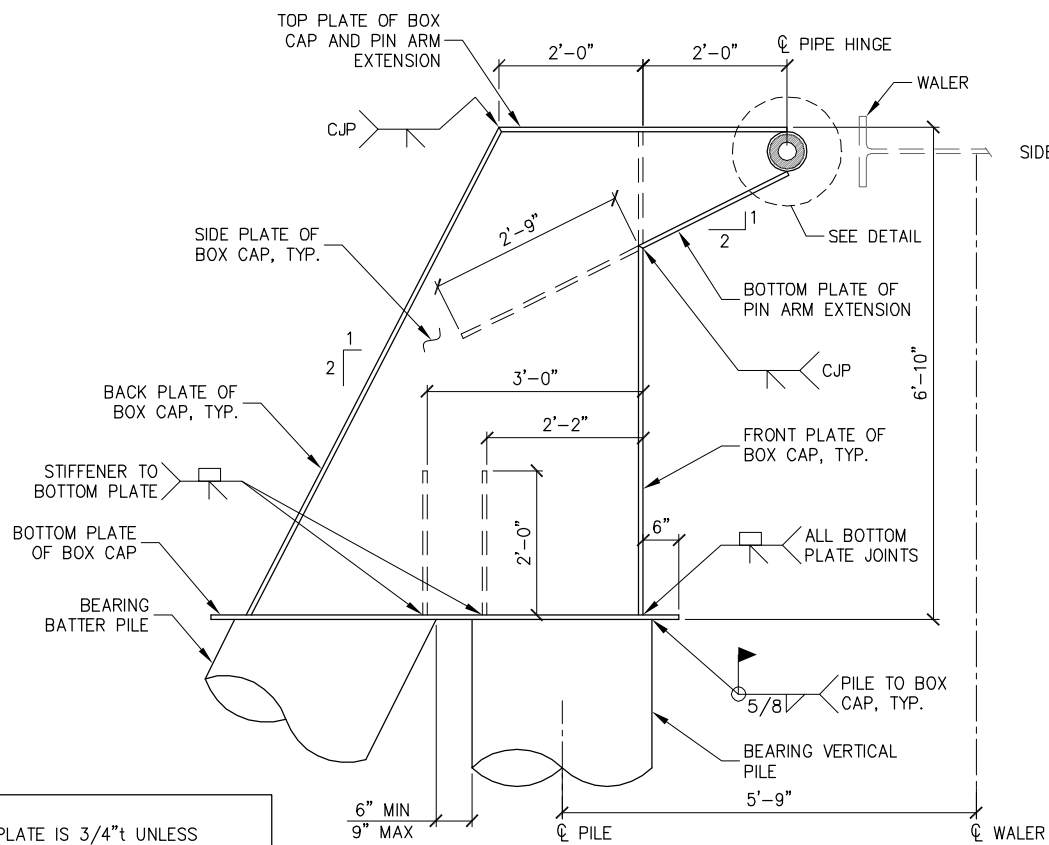
**DETAIL**



**PIN CONNECTION PLAN**

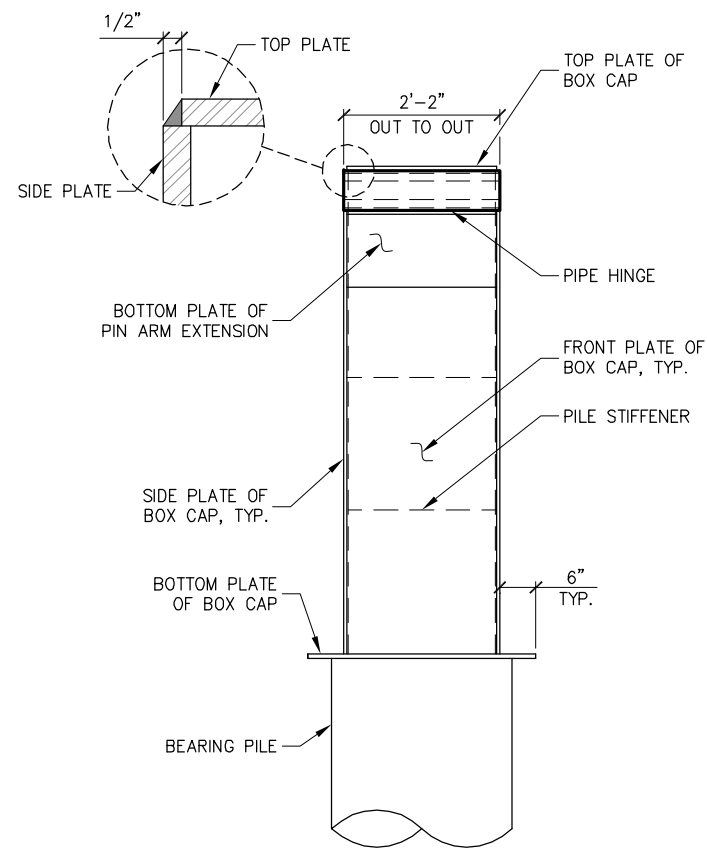


**PIN CONNECTION DETAILS**

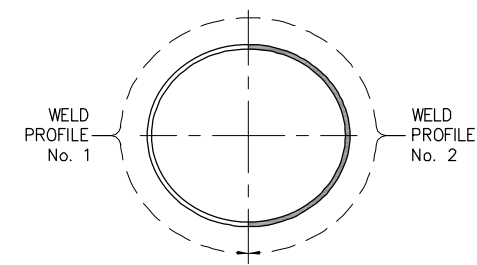


**SIDE ELEVATION**

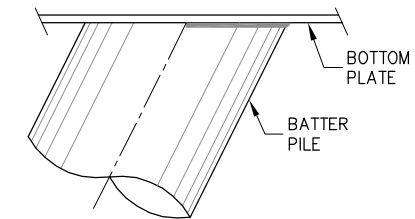
**BOX CAP**



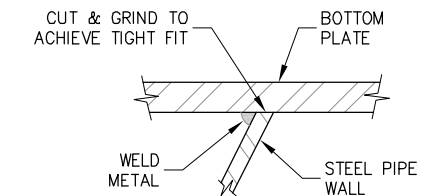
**FRONT ELEVATION**



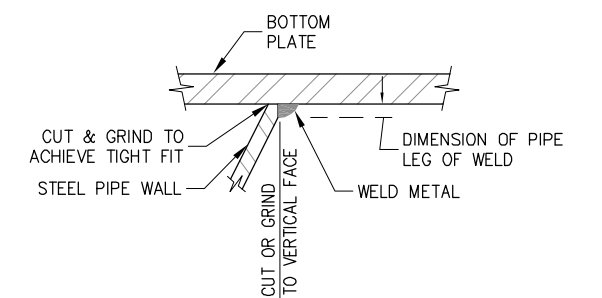
**PLAN**



**SIDE VIEW**



**No 1 WELD PROFILE**



**No 2 WELD PROFILE**

**BATTER PILE WELD**  
(ALL BATTER PILES)

**FINAL DESIGN REVIEW SUBMITTAL**

- NOTES:**
1. ALL PLATE IS 3/4"t UNLESS OTHERWISE NOTED.
  2. ALL OTHER WELDS ON BOX CAP NOT SHOWN SHALL BE 1/2" FILLET OR EQUIVALENT BEVEL, ALL AROUND.
  3. SPRAY METALIZE BOX CAP AFTER FINAL SHOP ASSEMBLY OF STEEL COMPONENTS



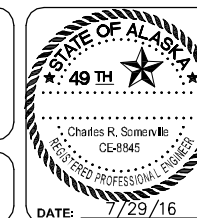
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SCALE:



DATE: 7/29/16

**HAINES BOROUGH  
PORTAGE COVE  
HARBOR EXPANSION**

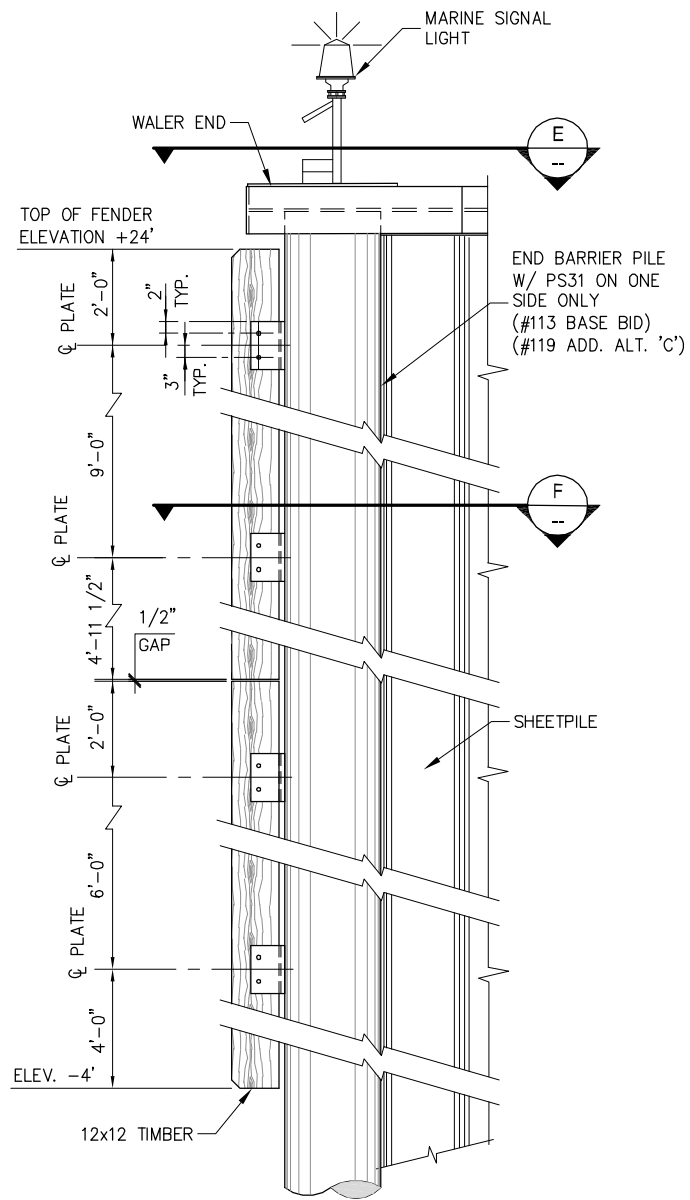
SHEET TITLE:

**BOX CAP DETAILS**

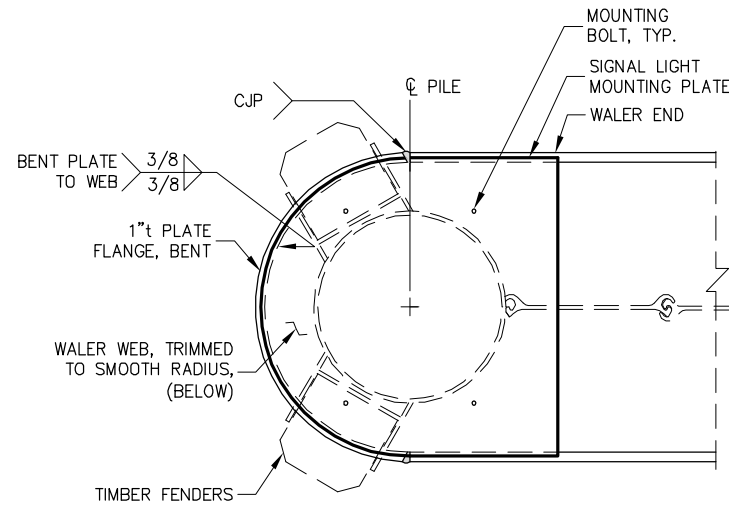
PN&D PROJECT NO.: 102029.10

**5.11**

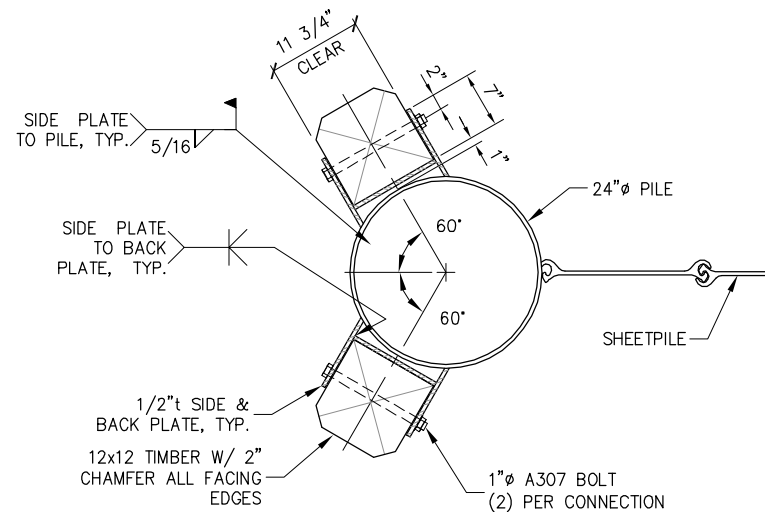
SHEET  
27 OF 31



**PARTIAL ELEVATION**

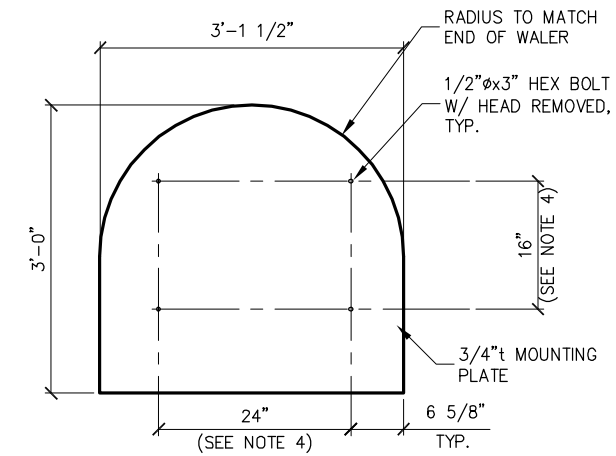


**E VIEW**

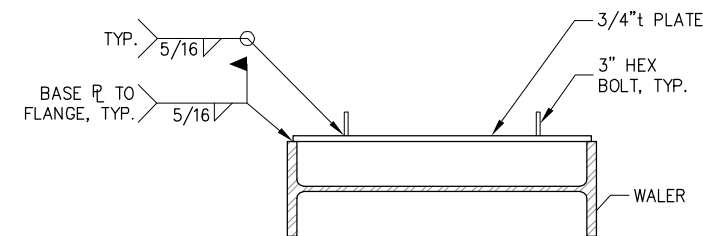


**F VIEW**

**FENDER**



**PLAN**



**SECTION**

**SIGNAL LIGHT MOUNTING PLATE**



**MARINE SIGNAL LIGHT**

**SIGNAL LIGHT NOTES:**

- 1) ALL METALS AND HARDWARE SHALL BE HOT DIP GALVANIZED PER ASTM A123 OR A153 AS APPROPRIATE.
- 2) BOLTS SHALL BE ASTM A325. STEEL PLATE SHALL BE A MINIMUM ASTM A36.
- 3) TIDELAND SIGNAL CORP. SOLA-CHAN MARINE SIGNAL LIGHT. ML-155 ON 4" PEDESTAL WITH 10W SOLAR MODULE OR APPROVED EQUAL, INCLUDING ON 12V SECONDARY ENERGY CELL AND MAXIFALO-60 LED FLASHER SET AT 0.4 SEC. "ON" AND 3.6 SEC. "OFF" (15 FLASHES/MINUTE) VISIBLE FOR MIN. 2 NM. COLOR AND FLASH PATTERN PER US COAST GUARD PERMIT REQUIREMENTS.
- 4) CENTER MARINE SIGNAL LIGHT ON BASE PLATE. CONTRACTOR TO VERIFY BOLT PATTERN AND SPACING ON LIGHT BASE.
- 5) ORIENT SOLAR PANEL FACING SOUTH.

**FINAL DESIGN REVIEW SUBMITTAL**



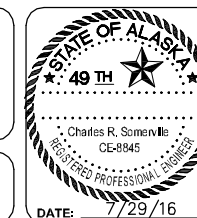
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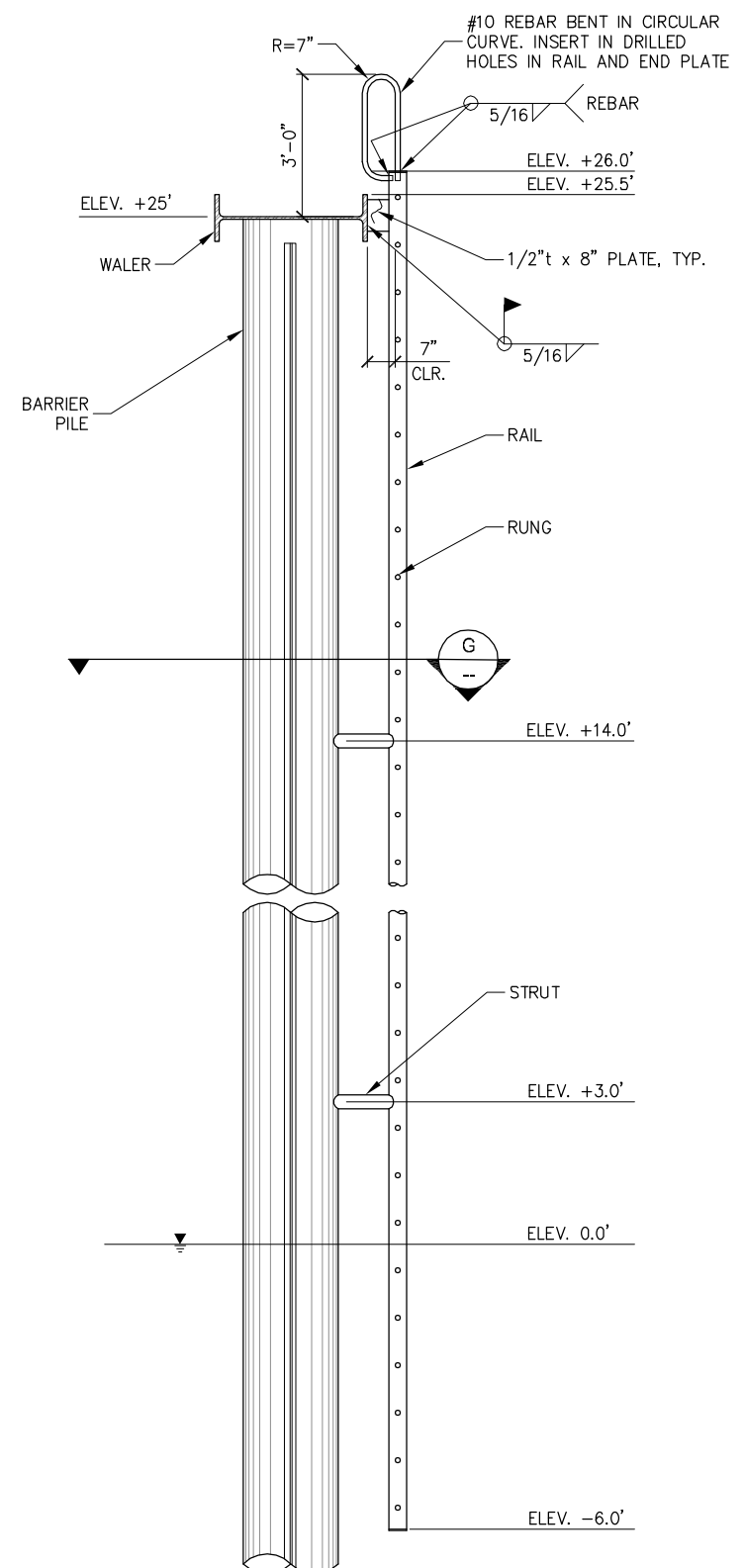
**HAINES BOROUGH  
PORTAGE COVE  
HARBOR EXPANSION**

SHEET TITLE: **FENDER AND MARINE  
SIGNAL LIGHT**

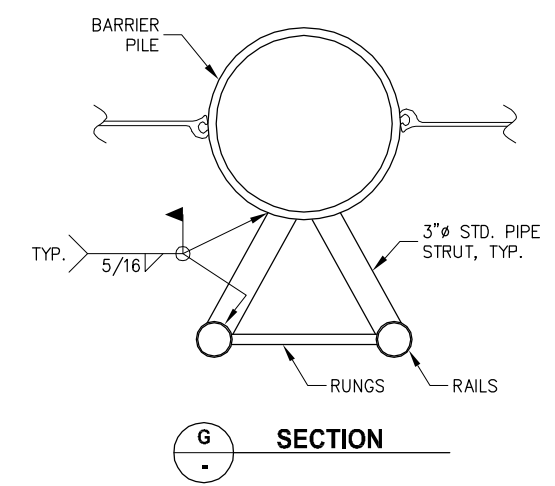
**5.12**

SHEET  
**28 OF 31**

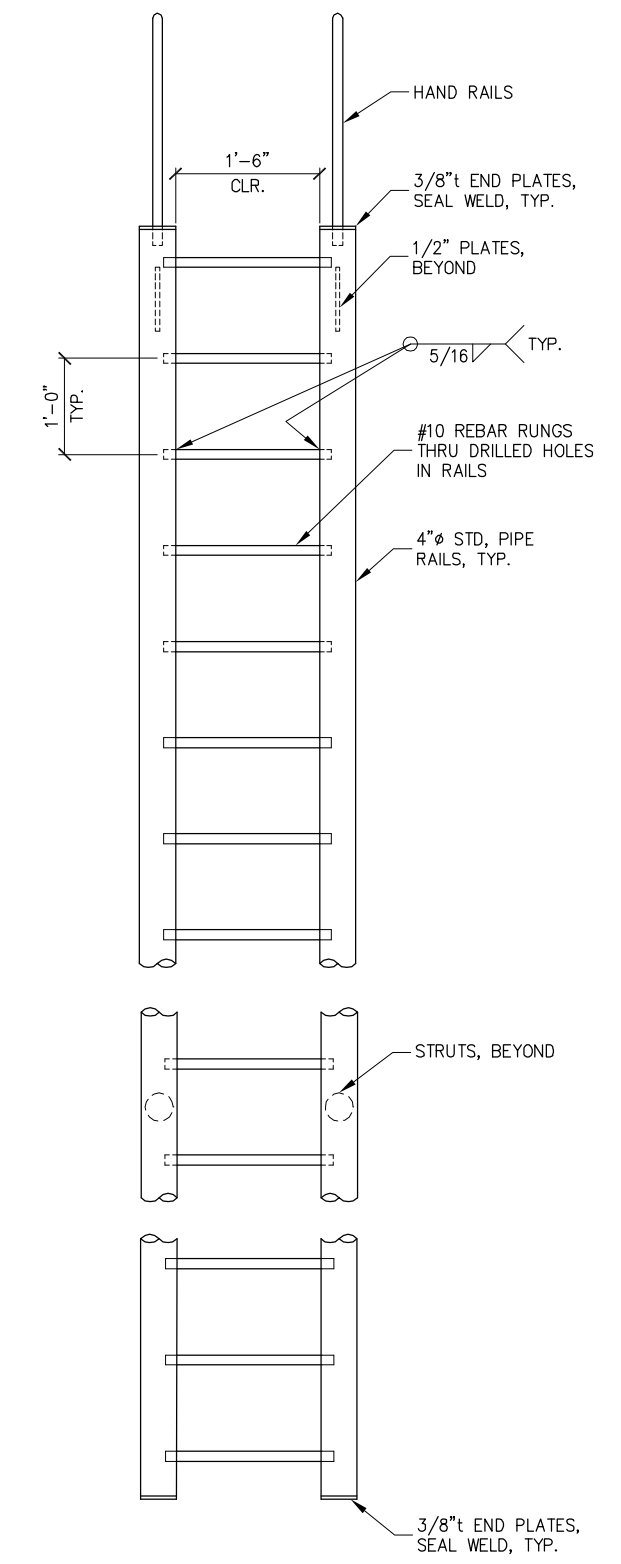
PN&D PROJECT NO.: 102029.10



**PROFILE**



**SECTION G**



**ELEVATION**

**FINAL DESIGN REVIEW SUBMITTAL**

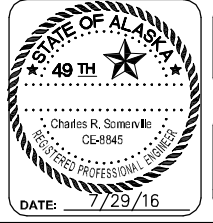


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DESIGN: JDO CHECKED: CRS SCALE:  
DRAWN: GRD APPROVED: CRS

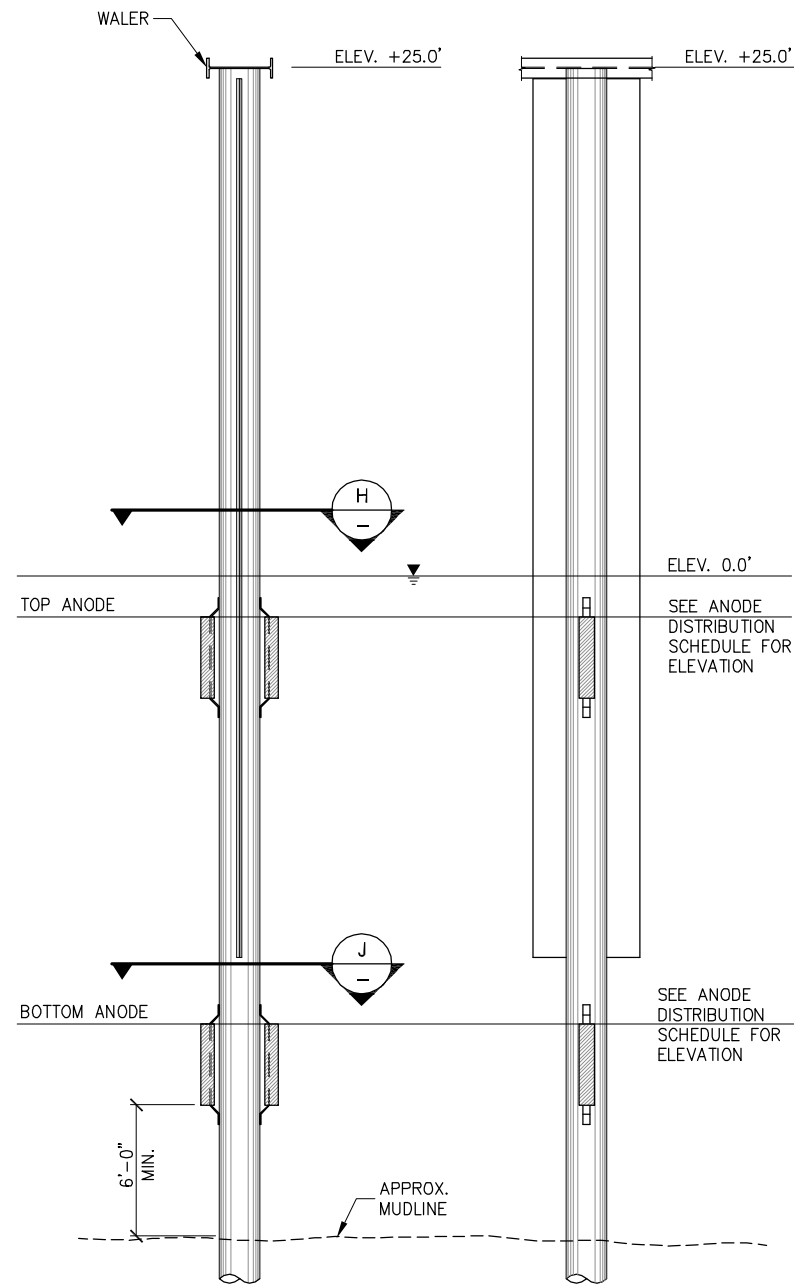


**HAINES BOROUGH  
PORTAGE COVE  
HARBOR EXPANSION**

SHEET TITLE:  
**LADDER**

PN&D PROJECT NO.: 102029.10

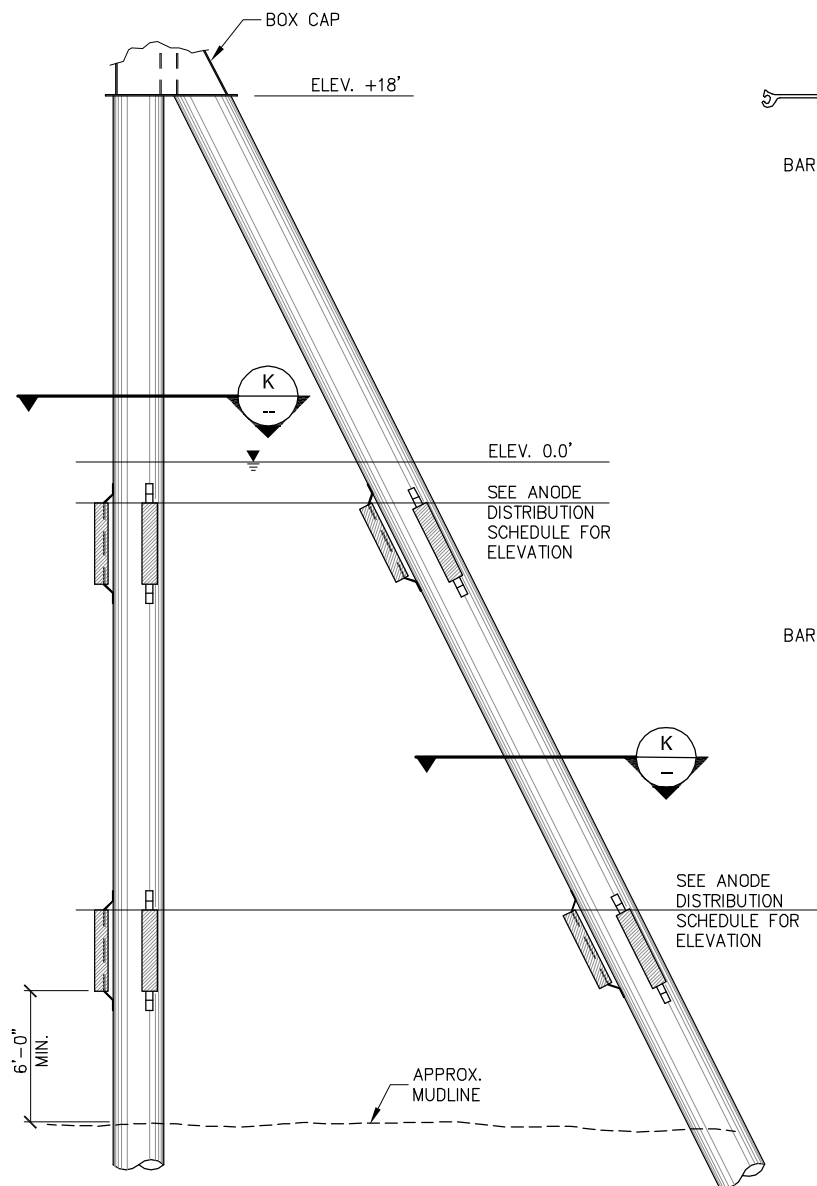
**5.13**  
SHEET  
29 OF 31



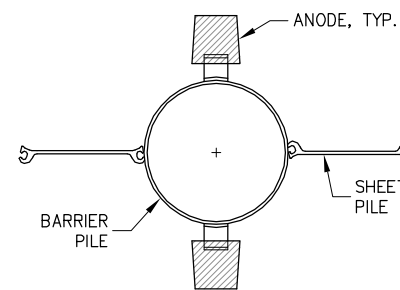
**PROFILE**

**ELEVATION**

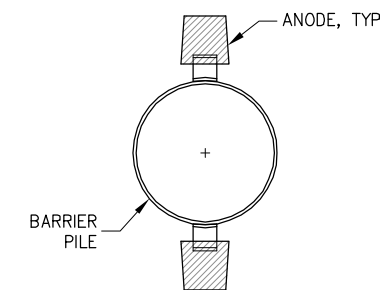
**BARRIER PILE ANODES**



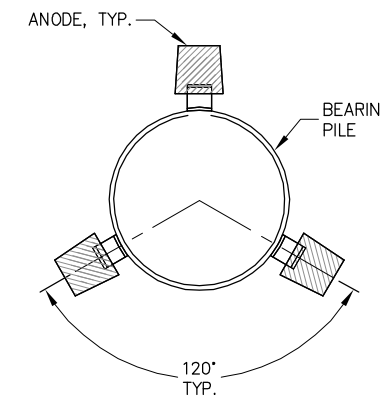
**BEARING PILE CLUSTER ANODES**



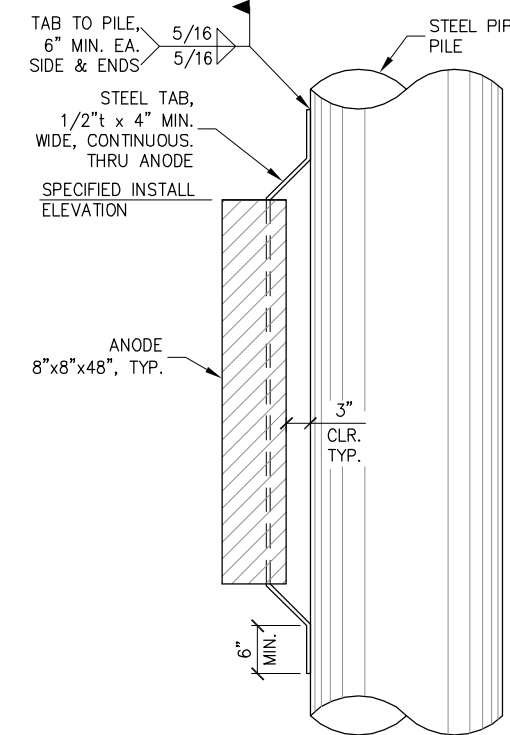
**H SECTION**



**J SECTION**



**K SECTION**



**ANODE DETAIL**

PILE DESIGNATION	TOP ANODES	BOTTOM ANODES
	ELEV.	ELEV.
BARRIER PILES 1 TO 5	NA	NA
BARRIER PILES 6 TO 32 (EVEN ONLY)	-2.0'	NA
BARRIER PILES 34 TO 40 (EVEN ONLY)	-2.0'	-15.0'
BARRIER PILES 42 TO 46 (EVEN ONLY)	-2.0'	-16.0'
* BARRIER PILES 48 TO 112 (EVEN ONLY)	-2.0'	-17.0'
* BARRIER PILES 114 TO 118 (EVEN ONLY)	-2.0'	-16.0'
BEARING PILE CLUSTER BC-1	NA	NA
BEARING PILE CLUSTERS BC-2 TO BC-5	-2.0'	NA
BEARING PILE CLUSTERS BC-6 TO BC-7	-2.0'	-15.0'
BEARING PILE CLUSTERS BC-8 TO BC-19	-2.0'	-17.0'
* BEARING PILE CLUSTER BC-20	-2.0'	-17.0'

\* ADDITIVE ALTERNATE 'C' ONLY.

**NOTE:**  
ANODES SHOWN ON TYPICAL SECTION VIEWS OF BARRIER PILE AND BEARING PILES FOR GENERAL ILLUSTRATION. QUANTITIES AND PLACEMENT ELEVATIONS VARY ALONG WALL. REFER TO ANODE DISTRIBUTION SCHEDULE FOR SPECIFICS.

**REVISIONS**

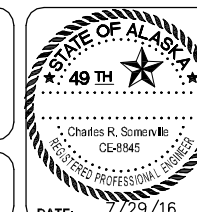
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**HAINES BOROUGH  
PORTAGE COVE  
HARBOR EXPANSION**

SHEET TITLE: **PILE ANODES  
ADDITIVE ALTERNATE 'B'**

PN&D PROJECT NO.: 102029.10

**5.14**  
SHEET  
30 OF 31

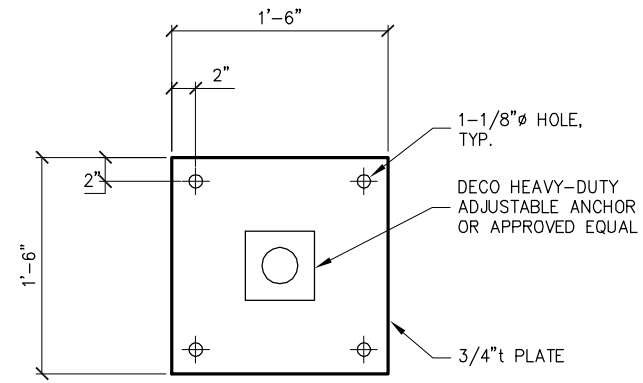




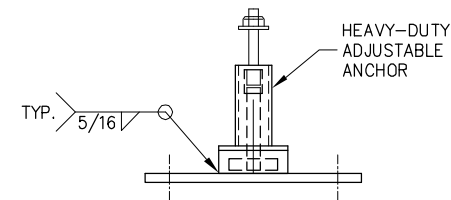
**EXISTING NAV-AID STRUCTURE**



**EXISTING NAV-AID FOUNDATION**



**PLAN**

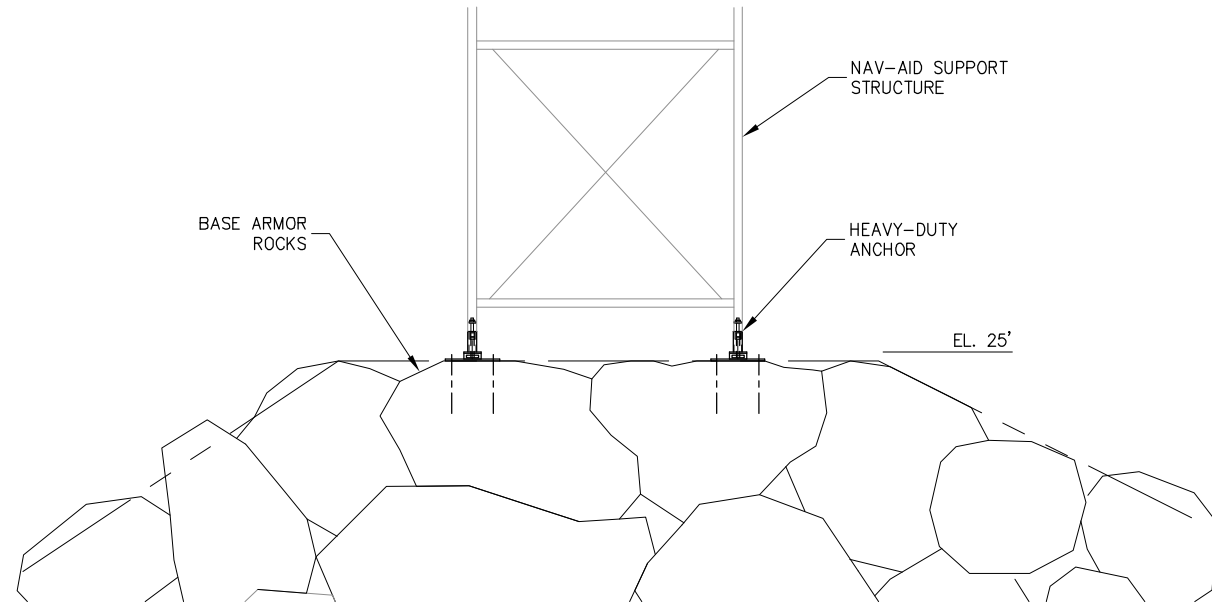


**SECTION**

**BASE PLATE**

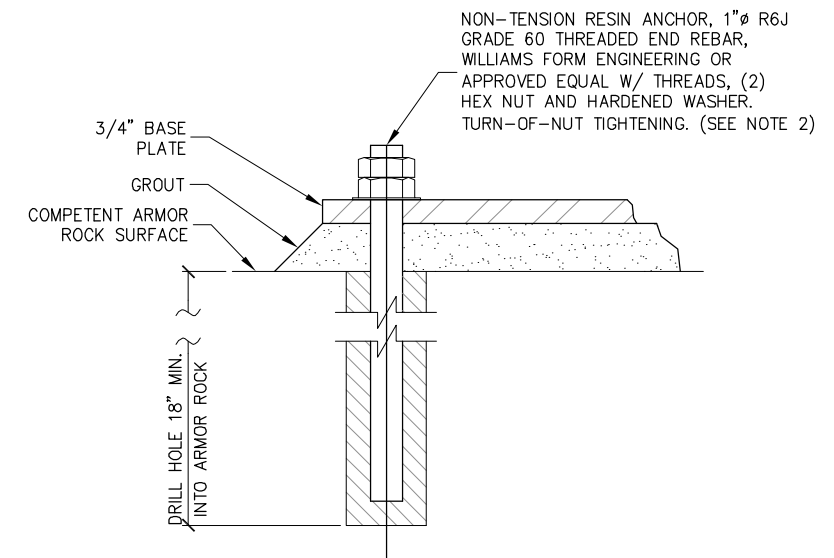
**NAVIGATION STRUCTURE NOTES:**

- 1) NAVIGATION AID BASE PLATES (4 EACH) SHALL BE PLACED ON ONE ARMOR ROCKS WHICH ARE SPECIALLY PLACED WITH A FLAT SIDE UP ORIENTATION. ARMOR ROCKS ON ALL SIDES SHALL BE PLACED TO PROVIDE MAXIMUM INTERLOCK AND STABILITY BETWEEN THE BASE AND THE ARMOR ROCK. NAVIGATION AID BASE PLATE SHALL BE HORIZONTAL, LEVEL AND SHALL BE ROCK BOLTED AND GROUTED INTO FLAT SIDE UP ARMOR ROCK.
- 2) RESIN ANCHORS SHALL BE EPOXY TYPE RESIN CARTRIDGES PER MANUFACTURER'S RECOMMENDATIONS. USE RESIN THE FULL LENGTH OF THE DRILL HOLE, CLEAN HOLE CAREFULLY BEFORE INSERTING RESIN. INSTALL IN STRICT COMPLIANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- 3) BASE ARMOR ROCK SHALL BE THE LARGEST ROCK THAT CAN BE QUARRIED AND PLACED, WITH MINIMUM NOMINAL DIMENSIONS 4'x4'x3'.
- 4) ALL METALS AND HARDWARE SHALL BE HOT DIP GALVANIZED PER ASTM A123 OR A153 AS APPROPRIATE.
- 5) BOLTS SHALL BE ASTM A325. STEEL PLATE SHALL BE A MINIMUM ASTM A36.
- 6) GROUT SHALL BE PLACED PER MANUFACTURER'S RECOMMENDATIONS. GROUT SHALL BE NON-CORROSIVE, NON-METALLIC, CEMENT BASED GROUT MEETING ASTM C-1107, GRADE C, MEET THE REQUIREMENTS OF ASTM 520, AND DEVELOP A 28 DAY COMPRESSIVE STRENGTH OF 9,000 PSI.
- 7) SIZE OF HEAVY DUTY ADJUSTABLE ANCHOR SHALL MATCH BOLT SIZE AND THREAD OF EXISTING ANCHOR.
- 8) REMOVE EXISTING NAV-AID STRUCTURE, CLEAN, REPLACE EXISTING THREADED ROD WITH NEW AND RESTORE ON NEW FOUNDATION AT SAME LOCATION AND ORIENTATION, SOLAR PANEL FACING SOUTH.
- 9) APPLY ANTI-SEIZE COMPOUND TO THREADED ROD.



**NAVIGATION AID ATTACHMENT**

NOT TO SCALE



**ROCK BOLT ANCHOR**

NOT TO SCALE

**FINAL DESIGN REVIEW SUBMITTAL**



REVISIONS					
REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

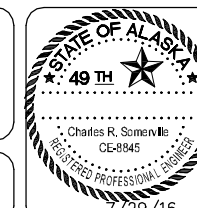


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DESIGN: JDO CHECKED: CRS  
DRAWN: GRD APPROVED: CRS

SCALE:



DATE: 7/29/16

**HAINES BOROUGH  
PORTAGE COVE  
HARBOR EXPANSION**

SHEET TITLE:  
**NAVIGATION STRUCTURE  
DETAILS**

**5.15**

SHEET  
**31 OF 31**

PN&D PROJECT NO.: 102029.10