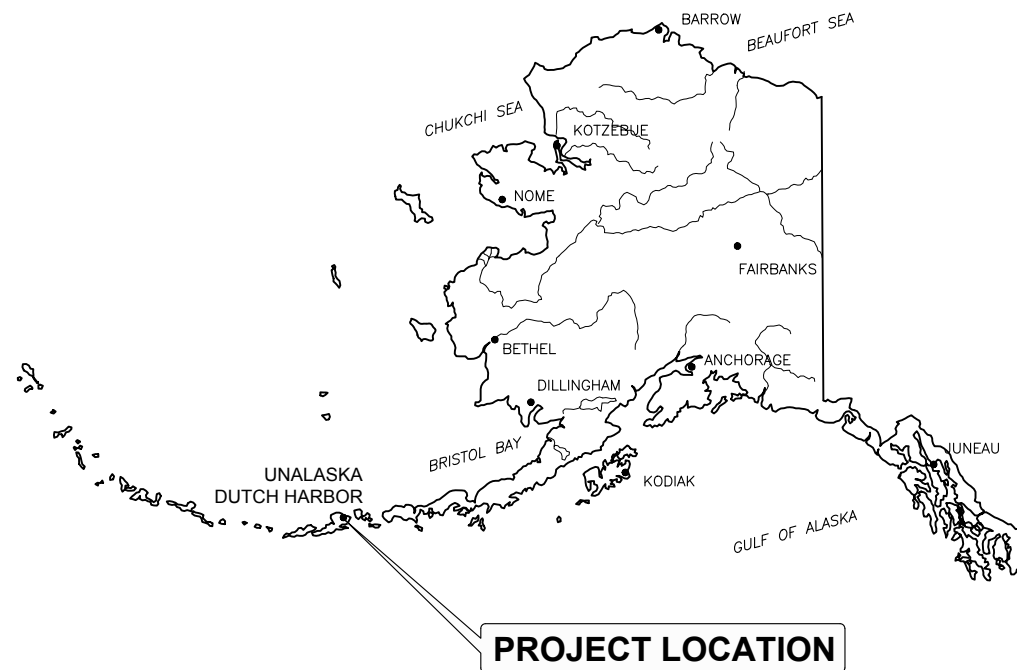


CITY OF UNALASKA LIGHT CARGO DOCK EXPANSION

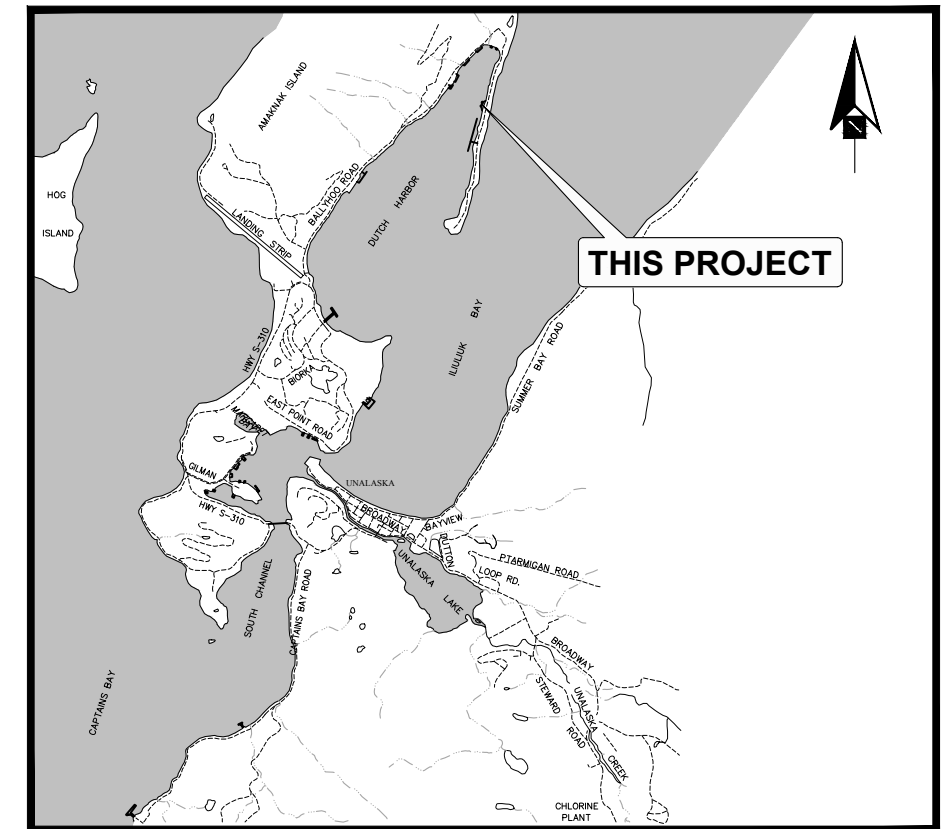
DPW PROJECT #15601
MAY 2016

DRAWING INDEX

| | |
|-------|--|
| 1 | COVER SHEET |
| 2 | EXISTING CONDITIONS, DEMOLITION PLAN, & SURVEY CONTROL |
| 3 | SITE PLAN |
| 4 | GRADING PLAN |
| 5 | SHEET PILE LAYOUT PLAN, DETAILS, & ELEVATIONS |
| 6 | SLAB PLAN |
| 7-8 | DOCK SECTIONS |
| 9-10 | DOCK DETAILS |
| 11 | UTILITY PLAN |
| 12-13 | UTILITY DETAILS |
| 14 | VIBRACOMPACTON DETAILS |
| 15-19 | GENERAL NOTES |
| E1 | DEMOLITION SITE PLAN |
| E2 | NEW LIGHTING ORIENTATION - SITE PLAN |
| E3 | HANDHOLD DETAILS |



STATE OF ALASKA



VICINITY MAP



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PROJECT: CITY OF UNALASKA
LIGHT CARGO DOCK EXPANSION

TITLE: COVER SHEET

DESIGNED BY: CJR DATE: MAY 2016
CHECKED BY: DST PROJECT NO: 151125

SHEET NO: 1 OF 19

LEGEND

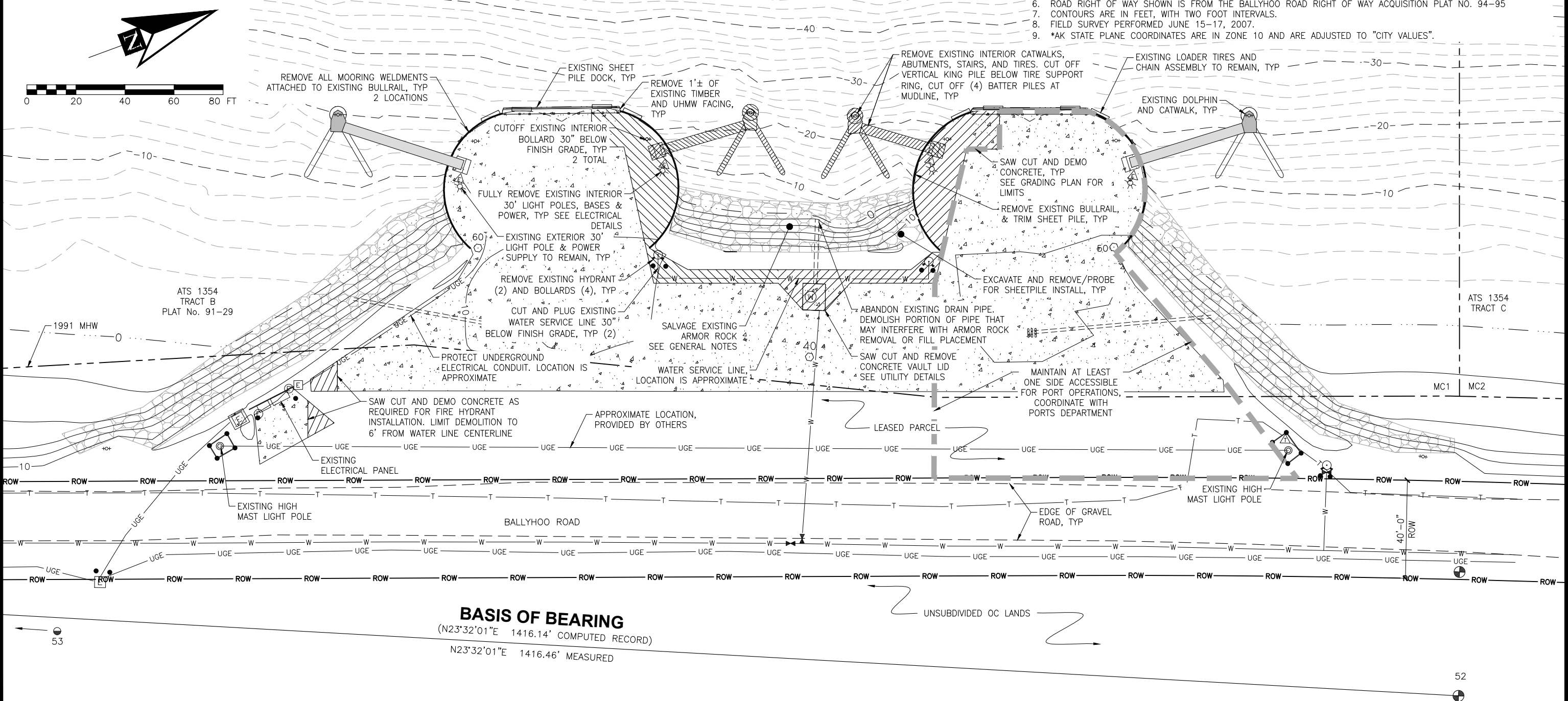
- FOUND MONUMENT
- FOUND REBAR W/ YPC
- SET MAG NAIL W/ PND FLASHER
- () RECORD INFORMATION (SEE NOTE 3)
- ⊠ ELECTRIC TRANSFORMER
- ⊙ ELECTRIC METER
- ⚡ ELECTRIC SERVICE
- EDGE OF GRAVEL ROAD
- ⊗ LIGHT POLE
- ⊙ HIGH MAST
- ⊕ WATER MANHOLE
- ⊕ WATER VALVE
- ⊕ FIRE HYDRANT
- PROTECTIVE BOLLARD
- ⊕ MOORING BOLLARD

PROJECT CONTROL COORDINATE TABLE

| PT# | LOCAL COORDINATES | | AK STATE PLANE COORDINATES* | | ELEVATION | DESCRIPTOR |
|-----|-------------------|----------|-----------------------------|-------------|-----------|---------------------|
| | NORTHING | EASTING | NORTHING | EASTING | | |
| 40 | 9049.905 | 6397.164 | NA | NA | 10.59 | SET NAIL W/ FLASHER |
| 50 | 9181.875 | 6398.303 | 1196332.684 | 5321285.72 | 9.97 | SET NAIL W/ FLASHER |
| 52 | 9249.976 | 6618.793 | NA | NA | 11.23 | FOUND AL MON |
| 53 | 7951.328 | 6053.217 | NA | NA | 13.94 | FOUND REBAR W/YPC |
| 60 | 8938.616 | 6308.515 | 1196079.676 | 5321228.979 | 10.03 | SET NAIL W/ FLASHER |

SURVEY NOTES:

1. VERTICAL DATUM IS MEAN LOWER LOW WATER (MLLW = 0.00')
2. FOR INFORMATION: BASIS OF VERTICAL DATUM FOR THIS SURVEY IS FROM THE N.O.A.A. BENCH MARK "No. 20 1974" ELEVATION 15.50' MLLW (SEE NOTE 1). THE BENCH MARK IS SET VERTICALLY IN THE EASTERN CORNER OF THE ALESKA BUNK HOUSE. FOR ADDITIONAL INFORMATION REFER TO THE PUBLISHED BENCH MARK SHEET FOR 9462620 UNALASKA.
3. BASIS OF BEARING FOR THIS SURVEY IS N 23° 32' 01"E AND IS BASED ON THE FOUND PRIMARY MONUMENT WCMC 2 C2 TR C OF ATS 1354 AND A FOUND R.O.W. CORNER AS SHOWN ON THE BALLYHOO ROAD RIGHT OF WAY ACQUISITION PLAT RECORDED IN THE ALEUTIAN ISLAND RECORDING DISTRICT AS PLAT NO. 94-45.
4. INFORMATION REGARDING THE LOCATION OF THE UNDERGROUND UTILITIES WAS PROVIDED BY ONSITE UTILITY COMPANY LOCATORS & INFORMATION SUPPLIED TO PND SURVEYORS BY THE CITY OF UNALASKA PUBLIC WORKS. REMAINING UTILITIES WERE LOCATED BASED ON VISUAL ABOVE GROUND UTILITY STRUCTURES.
5. BATHYMETRIC INFORMATION WAS OBTAINED UTILIZING AN INNERSPACE 448 SOUNDER AND A TRIMBLE PRO-XR GPS FOR POSITIONING.
6. ROAD RIGHT OF WAY SHOWN IS FROM THE BALLYHOO ROAD RIGHT OF WAY ACQUISITION PLAT NO. 94-95
7. CONTOURS ARE IN FEET, WITH TWO FOOT INTERVALS.
8. FIELD SURVEY PERFORMED JUNE 15-17, 2007.
9. *AK STATE PLANE COORDINATES ARE IN ZONE 10 AND ARE ADJUSTED TO "CITY VALUES".



BASIS OF BEARING
 (N23°32'01"E 1416.14' COMPUTED RECORD)
 N23°32'01"E 1416.46' MEASURED



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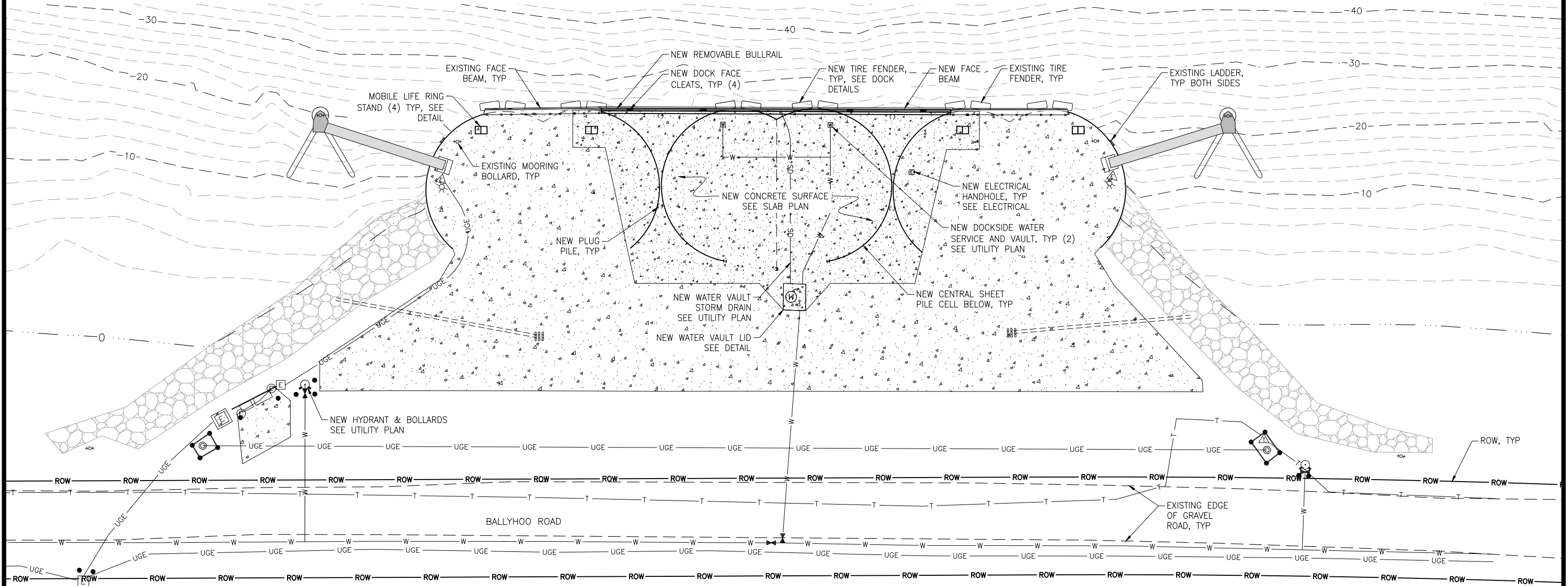
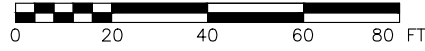


CITY OF UNALASKA
LIGHT CARGO DOCK EXPANSION

TITLE: **EXISTING CONDITIONS, DEMOLITION PLAN, & SURVEY CONTROL**

DESIGNED BY: CJR DATE: MAY 2016
 CHECKED BY: DST PROJECT NO: 151125

SHEET NO: **2** OF 19



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PROJECT: CITY OF UNALASKA LIGHT CARGO DOCK EXPANSION

TITLE: SITE PLAN

DESIGNED BY: CJR DATE: MAY 2016

CHECKED BY: DST PROJECT NO: 151125

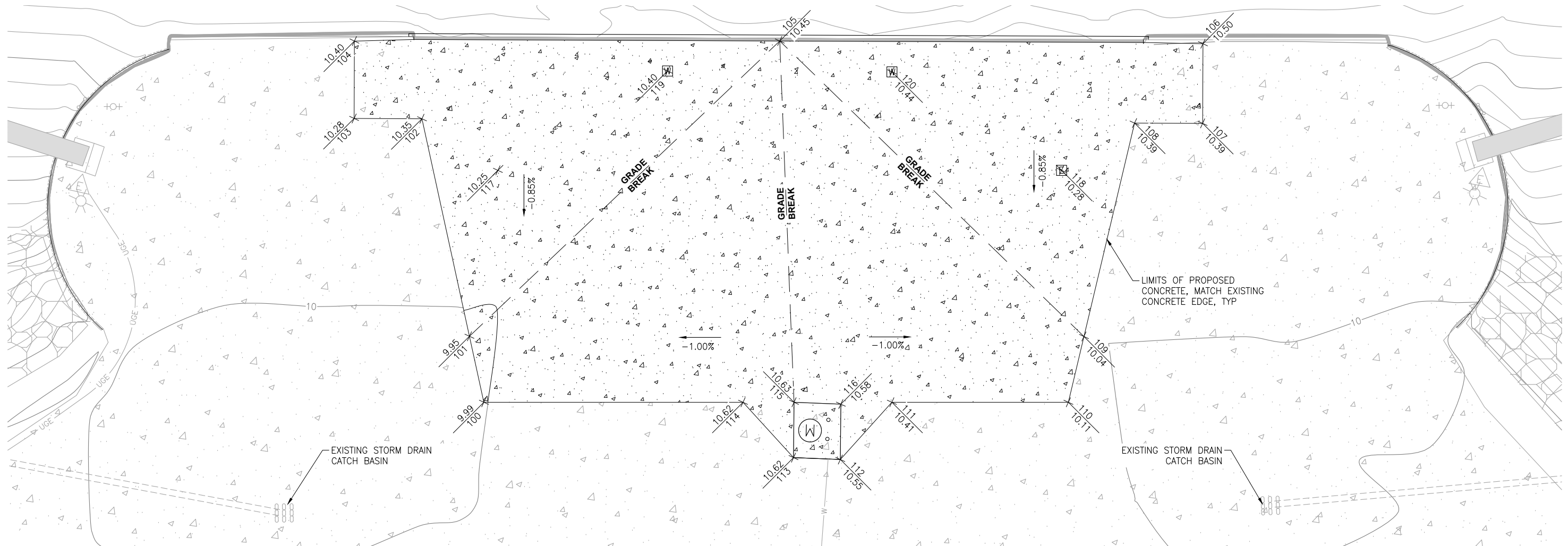
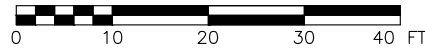
SHEET NO: **3** OF 19

| COORDINATE LAYOUT TABLE | | | |
|-------------------------|----------|----------|----------------------------|
| POINT NO | NORTHING | EASTING | NOTES |
| 100 | 9,000.81 | 6,346.91 | MATCH EXISTING |
| 101 | 9,002.66 | 6,333.79 | MATCH EXISTING, SEE NOTE 1 |
| 102 | 9,008.75 | 6,290.55 | MATCH EXISTING |
| 103 | 8,996.29 | 6,285.88 | MATCH EXISTING |
| 104 | 9,001.63 | 6,271.67 | MATCH EXISTING |
| 105 | 9,079.84 | 6,300.64 | DOCK FACE, GRADE BREAK |
| 106 | 9,157.47 | 6,329.98 | MATCH EXISTING |
| 107 | 9,151.98 | 6,344.60 | MATCH EXISTING |
| 108 | 9,139.48 | 6,339.91 | MATCH EXISTING |
| 109 | 9,115.64 | 6,375.71 | MATCH EXISTING, SEE NOTE 1 |
| 110 | 9,108.29 | 6,386.74 | MATCH EXISTING |

| COORDINATE LAYOUT TABLE | | | |
|-------------------------|----------|----------|---------------------------|
| POINT NO | NORTHING | EASTING | NOTES |
| 111 | 9,075.83 | 6,374.71 | MATCH EXISTING |
| 112 | 9,062.46 | 6,381.72 | VAULT LID, MATCH EXISTING |
| 113 | 9,053.97 | 6,378.19 | VAULT LID, MATCH EXISTING |
| 114 | 9,048.46 | 6,364.57 | MATCH EXISTING |
| 115 | 9,057.84 | 6,368.04 | VAULT LID, SEE NOTE 2 |
| 116 | 9,066.33 | 6,371.58 | VAULT LID, SEE NOTE 2 |
| 117 | 9,019.20 | 6,305.22 | VAULT LID, SEE NOTE 2 |
| 118 | 9,122.85 | 6,343.63 | VAULT LID, SEE NOTE 2 |
| 119 | 9,057.17 | 6,298.51 | VAULT LID, SEE NOTE 2 |
| 120 | 9,098.36 | 6,313.97 | VAULT LID, SEE NOTE 2 |

NOTE:

1. GRADE BREAK SHALL MATCH EXISTING LOW POINT. NORTHINGS AND EASTINGS ARE APPROXIMATE.
2. VAULT LID ELEVATIONS ARE APPROXIMATE. ELEVATION SHALL MATCH CONCRETE SURFACE LAYOUT.



PLAN



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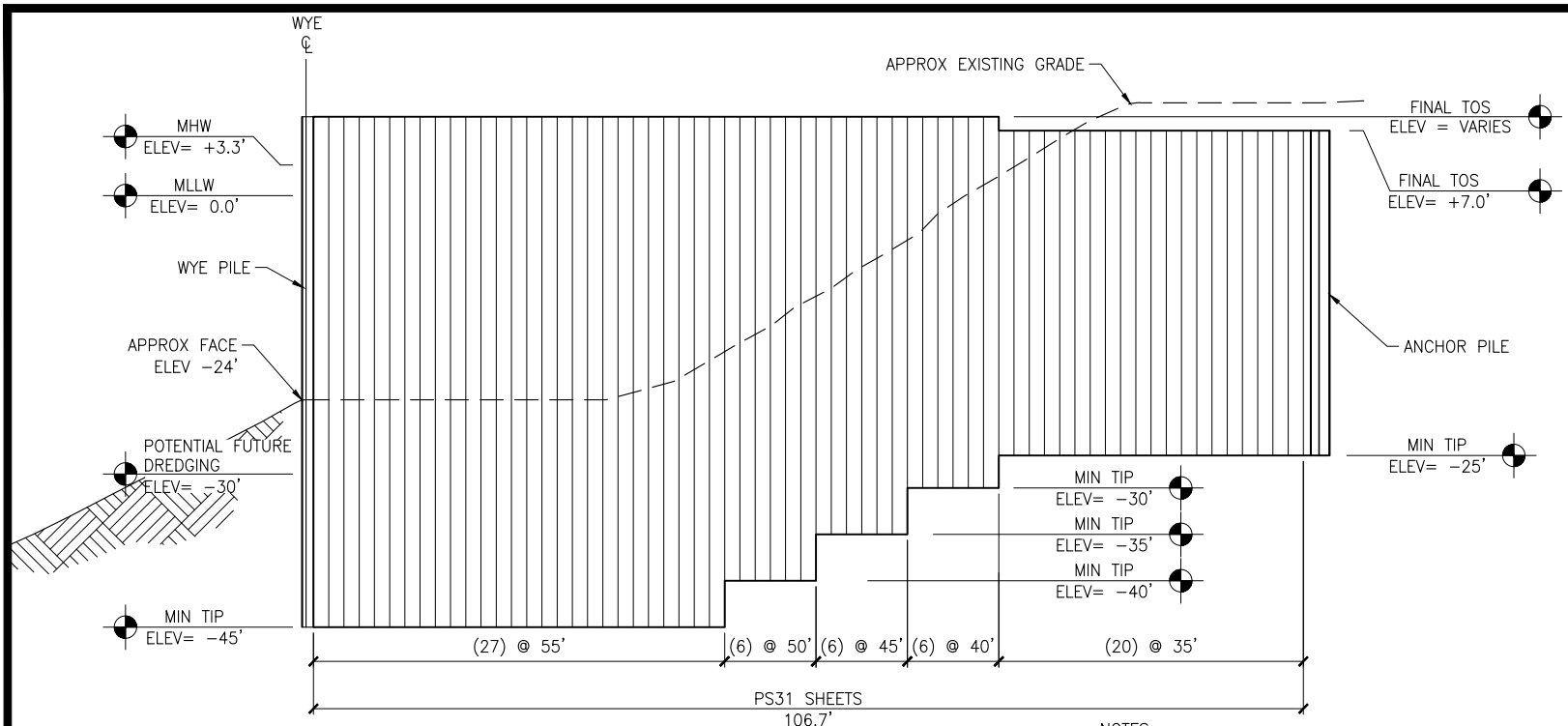


PROJECT: **CITY OF UNALASKA LIGHT CARGO DOCK EXPANSION**

TITLE: **GRADING PLAN**

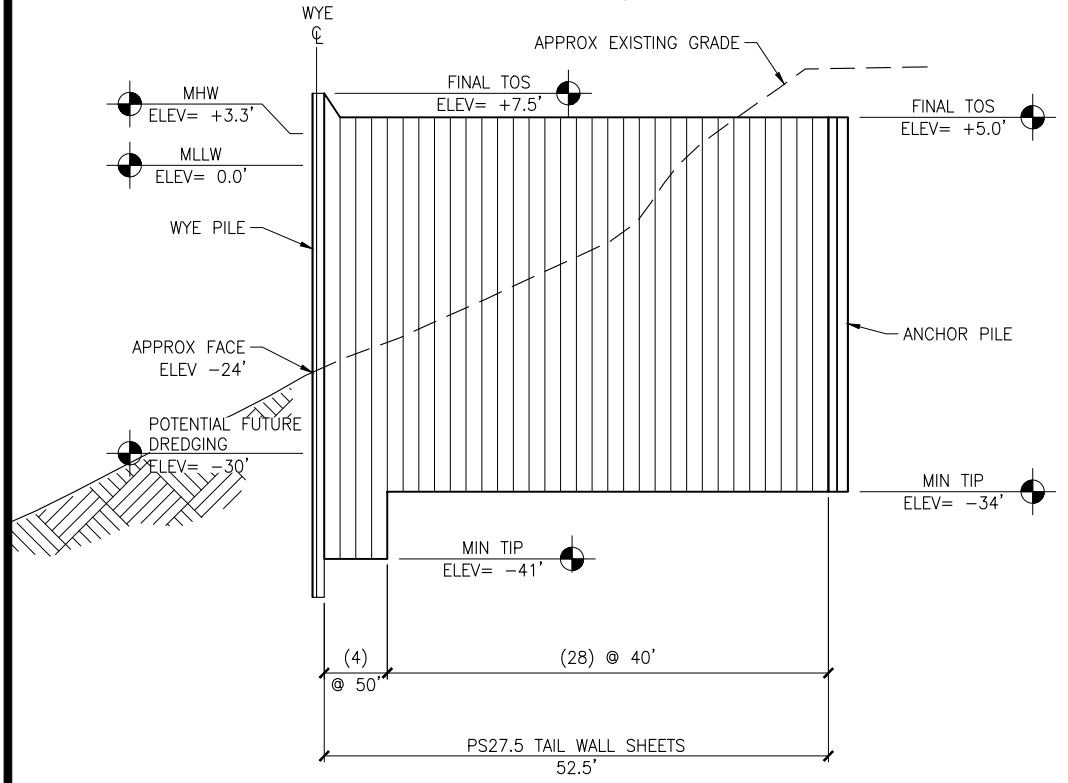
DESIGNED BY: CJR DATE: MAY 2016
CHECKED BY: DST PROJECT NO: 151125

SHEET NO: **4** OF 19



SHEET PILE FACE ELEVATION

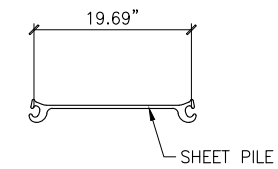
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SHEET PILE TAIL WALL ELEVATION

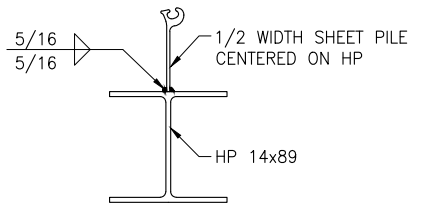
NTS

- NOTES:**
1. CURVED SHEET PILE FACE SHOWN FLAT FOR CLARITY
 2. EXISTING GRADE SHOWN ALONG SHEET PILE FACE
 3. FACE BEAM AND NOTCHES FOR W24 INFILL BEAMS NOT SHOWN
 4. SHEET PILE LENGTHS INDICATED ARE SUPPLY LENGTHS
 5. DEBRIS IS SUSPECTED TO EXIST IN THE PROJECT AREA. CONTRACTOR SHALL PROBE FOR AND/OR REMOVE OBSTRUCTING ROCK FROM ALL FACE CELL AND TAILWALL SHEET PILE ALIGNMENTS PRIOR TO SHEET PILE INSTALLATION. SUBMIT DEBRIS REMOVAL PLAN FOR APPROVAL.



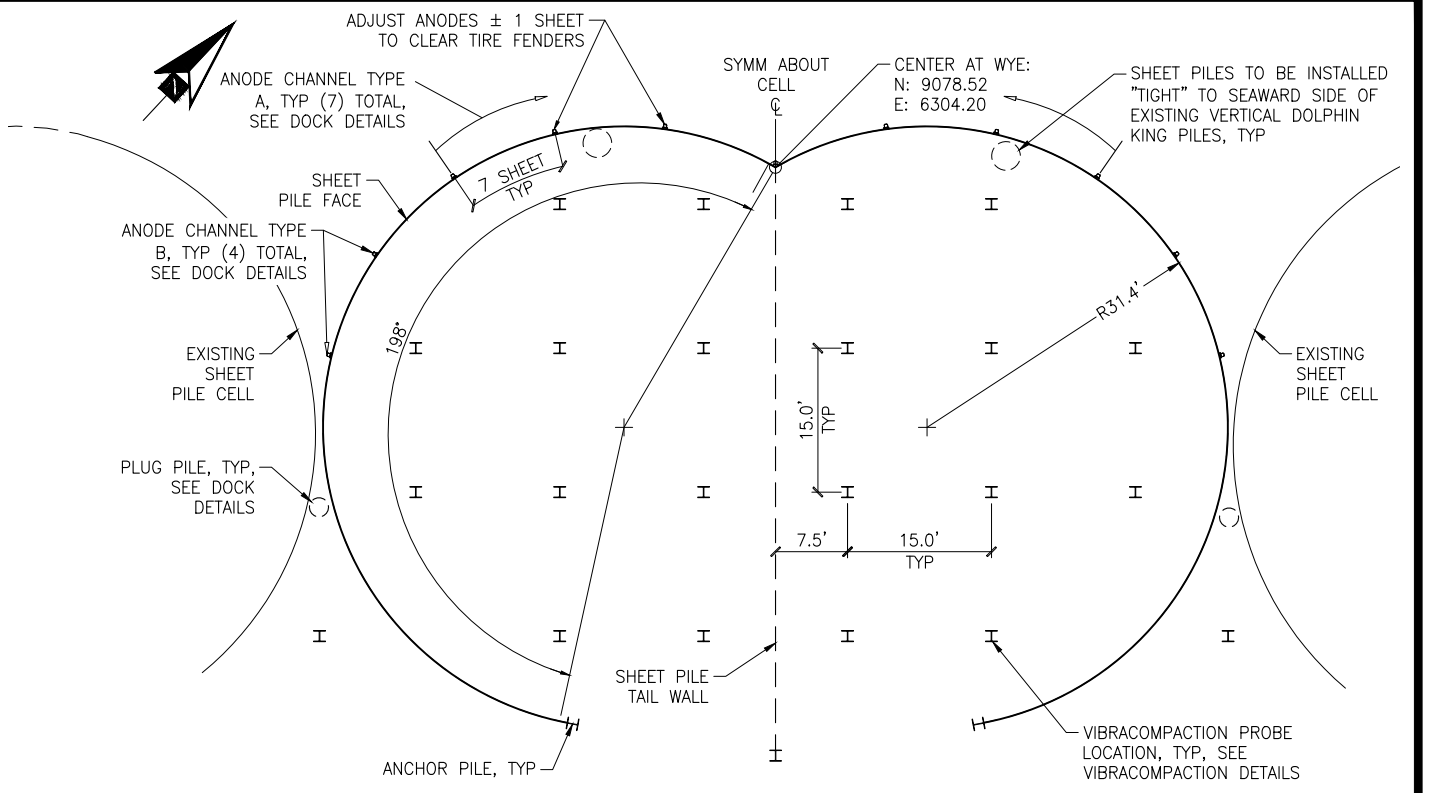
PS27.5/PS31

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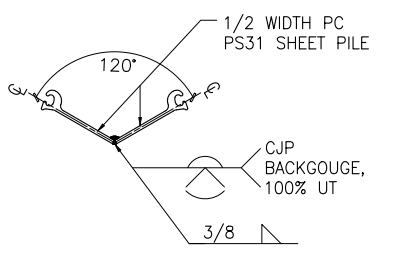
ANCHOR PILE SECTION

NTS

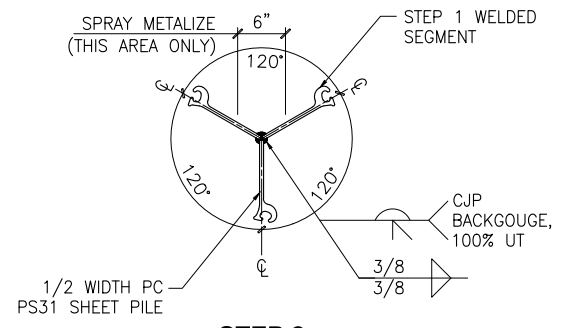


SHEET PILE CELL LAYOUT

NTS



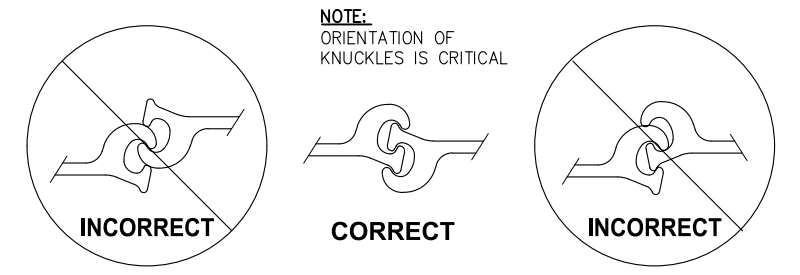
STEP 1



STEP 2

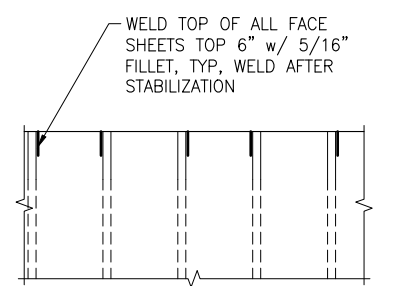
WELDED WYE FABRICATION

NTS



SHEET PILE INTERLOCK TYPICAL DETAIL

NTS



SHEET TOP WELD

NTS



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CITY OF UNALASKA
LIGHT CARGO DOCK EXPANSION

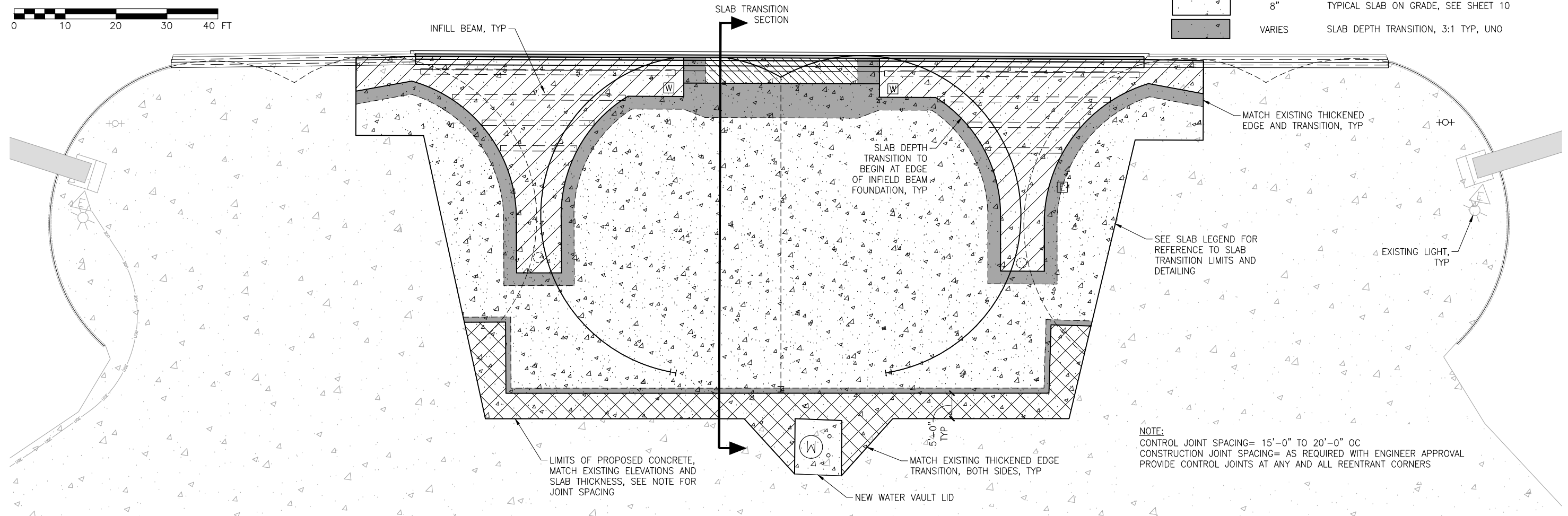
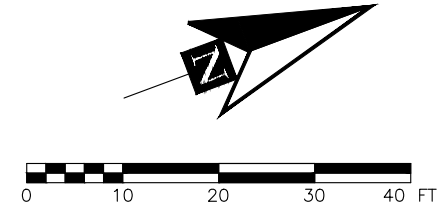
TITLE: **SHEET PILE LAYOUT PLAN, DETAILS, & ELEVATIONS**

DESIGNED BY: CJR DATE: MAY 2016
 CHECKED BY: DST PROJECT NO: 151125

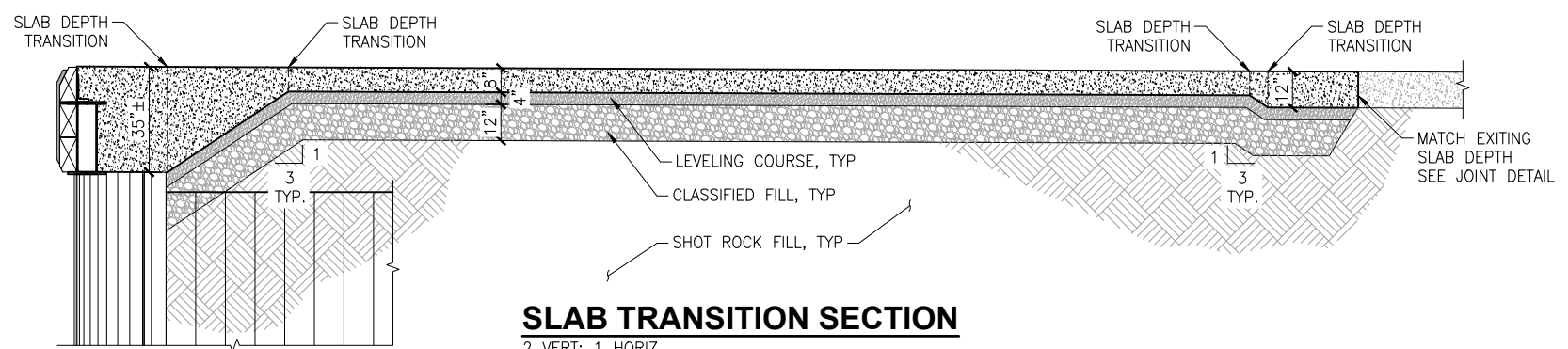
SHEET NO: **5** OF 19

SLAB LEGEND

| HATCH | SLAB THICKNESS | DESCRIPTION/REFERENCES |
|-------|----------------|-------------------------------------|
| | 35" | THICKENED SLAB, SEE DOCK SECTIONS |
| | 18" | ELEVATED SLAB, SEE DOCK SECTIONS |
| | 12" | THICKENED EDGE, SEE SHEET 10 |
| | 8" | TYPICAL SLAB ON GRADE, SEE SHEET 10 |
| | VARIES | SLAB DEPTH TRANSITION, 3:1 TYP, UNO |



SLAB PLAN



SLAB TRANSITION SECTION
2 VERT: 1 HORIZ



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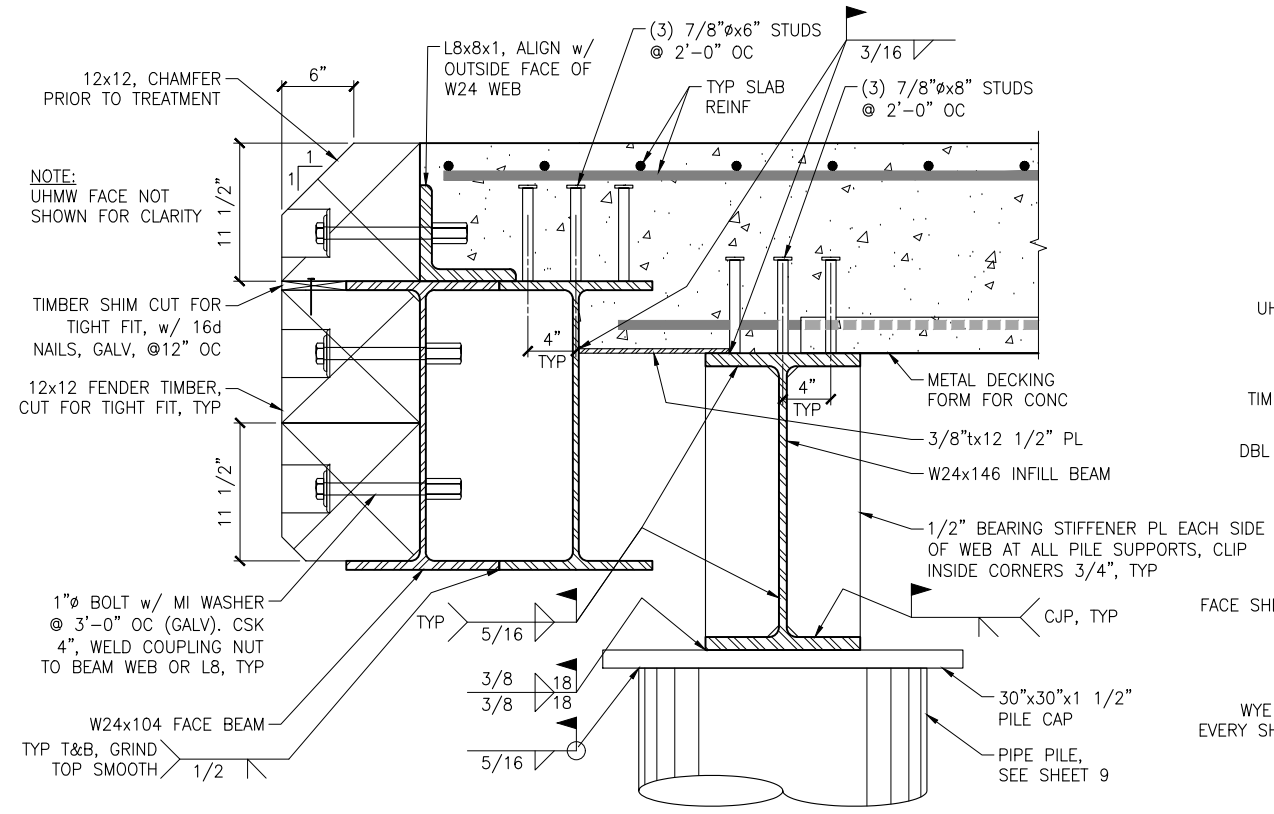
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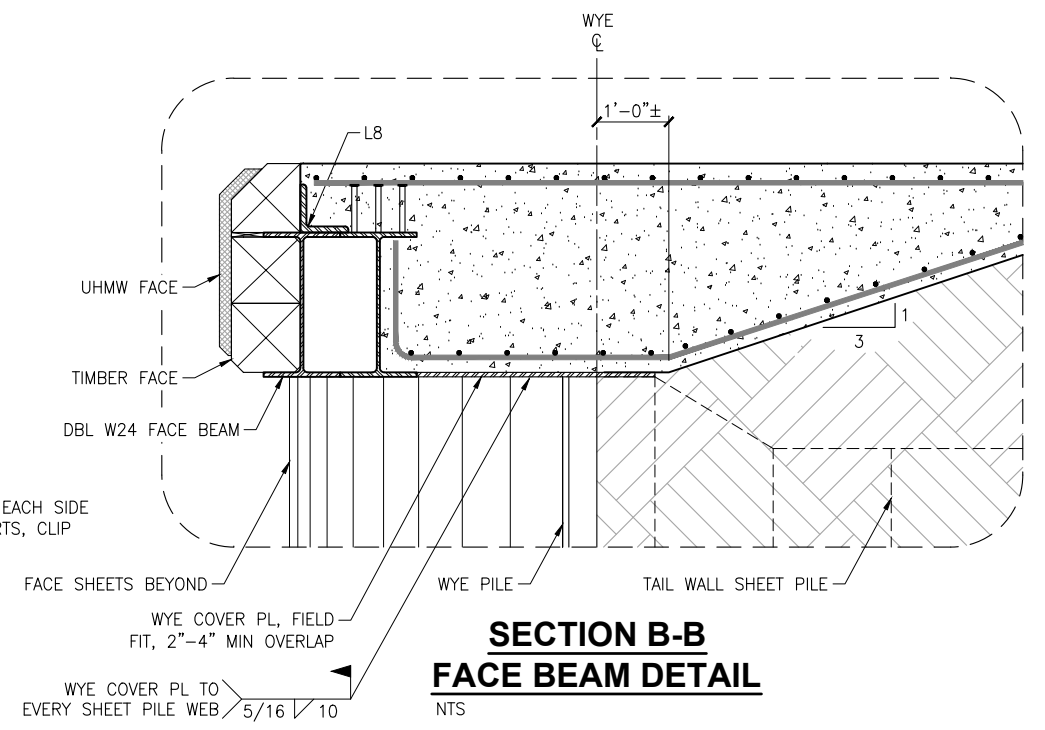
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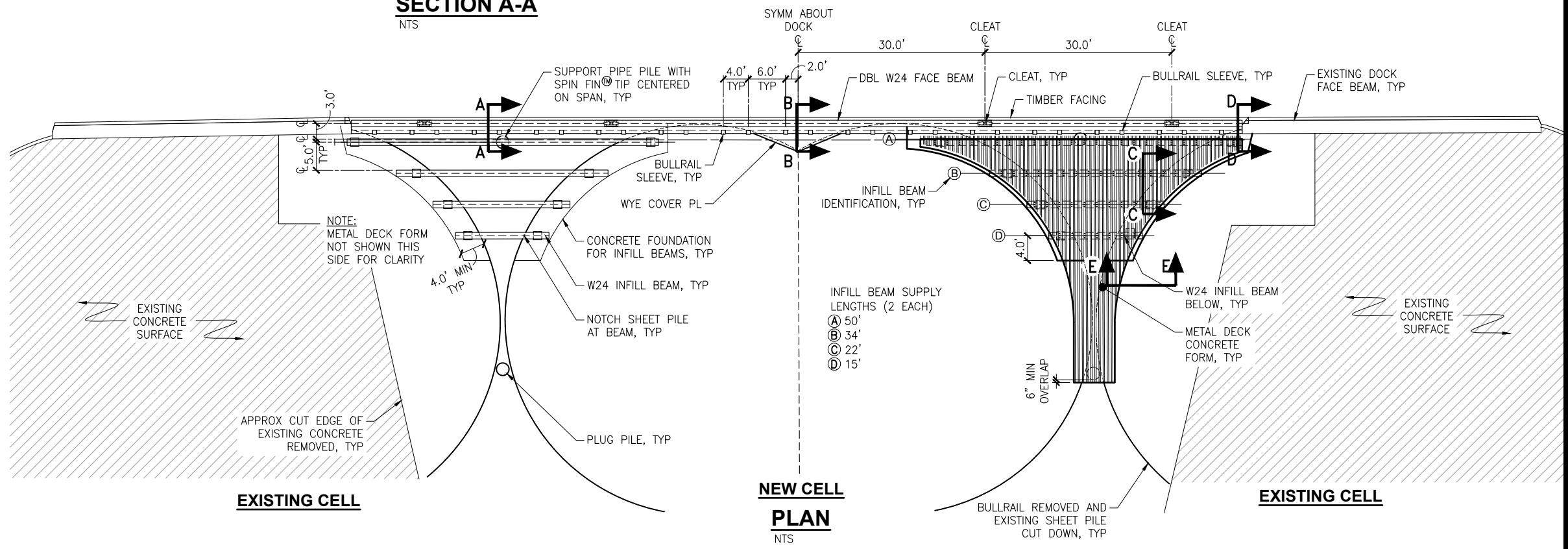
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| PROJECT: CITY OF UNALASKA LIGHT CARGO DOCK EXPANSION | |
| TITLE: SLAB PLAN | |
| DESIGNED BY: CJR | DATE: MAY 2016 |
| CHECKED BY: DST | PROJECT NO: 151125 |
| SHEET NO: 6 OF 19 | |



SECTION A-A
NTS



SECTION B-B
FACE BEAM DETAIL
NTS



NEW CELL
PLAN
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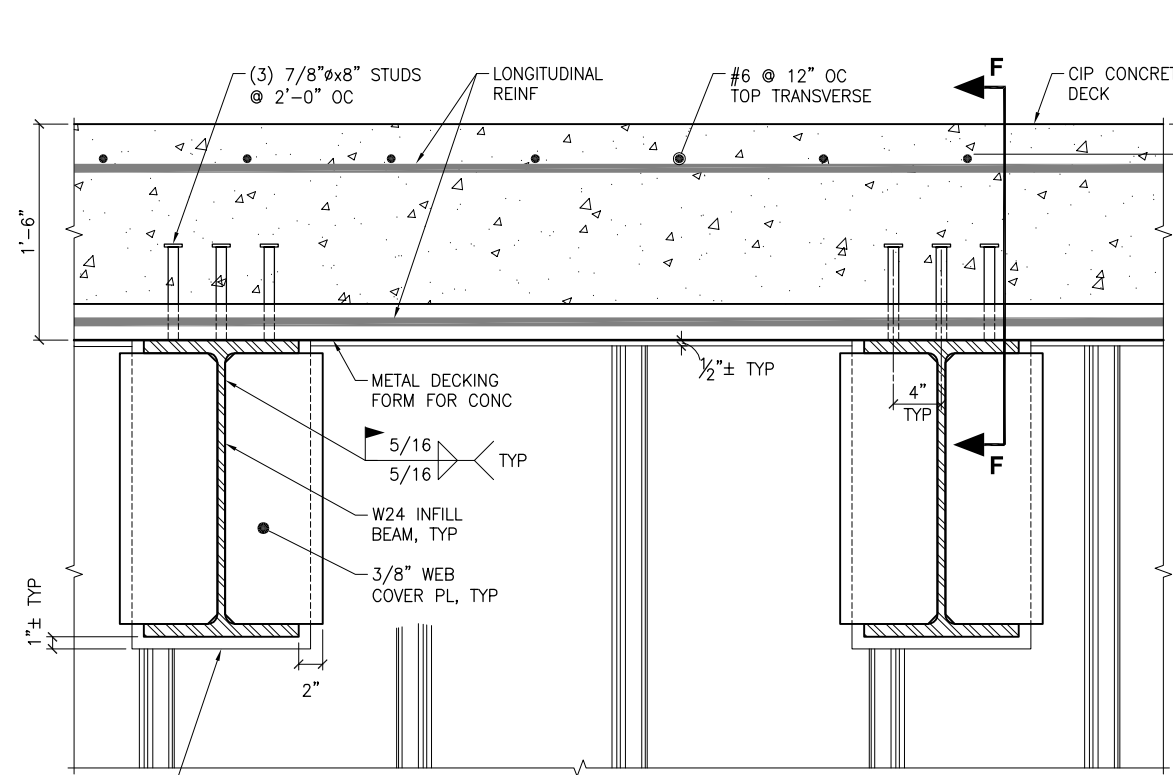


PROJECT: **CITY OF UNALASKA**
LIGHT CARGO DOCK EXPANSION

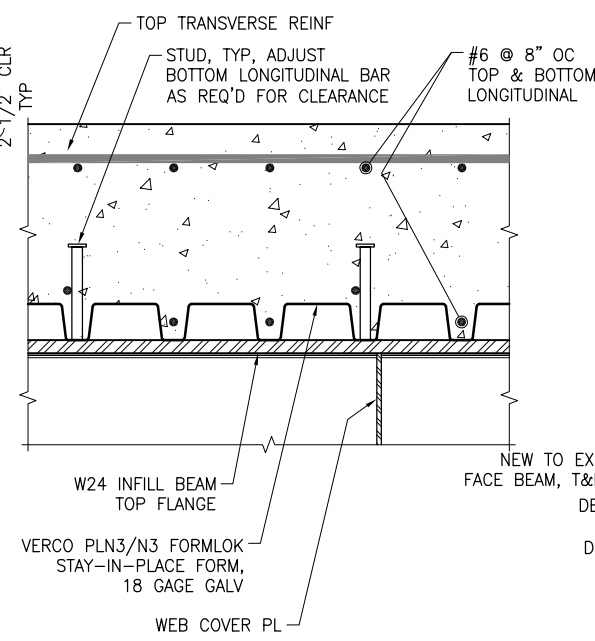
TITLE: **DOCK SECTIONS**
(1 OF 2)

DESIGNED BY: CJR DATE: MAY 2016
CHECKED BY: DST PROJECT NO: 151125

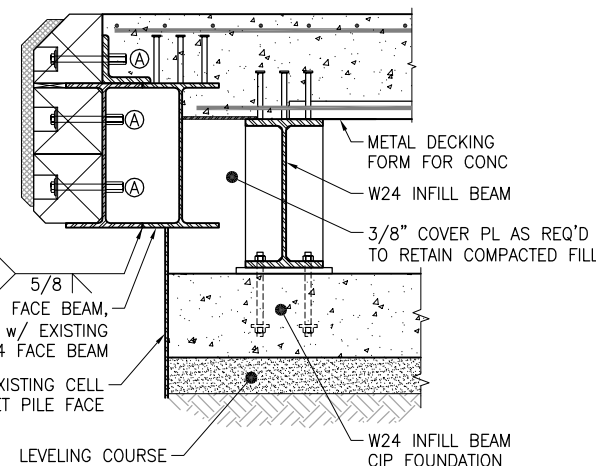
SHEET NO: **7** OF 19



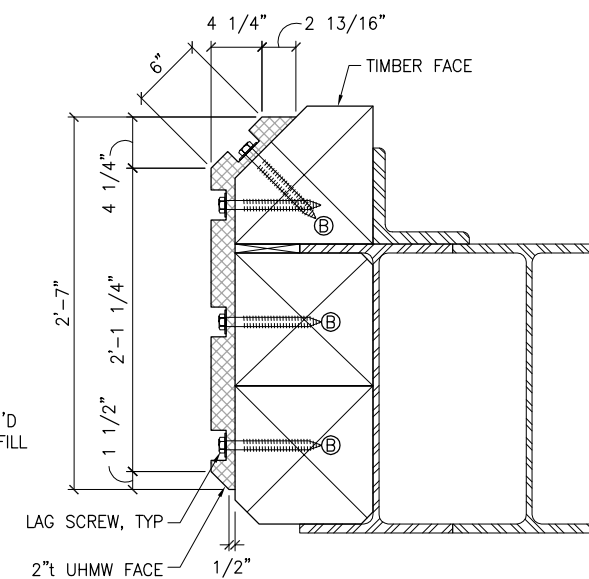
SECTION C-C
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SECTION F-F
NTS



SECTION D-D
NTS

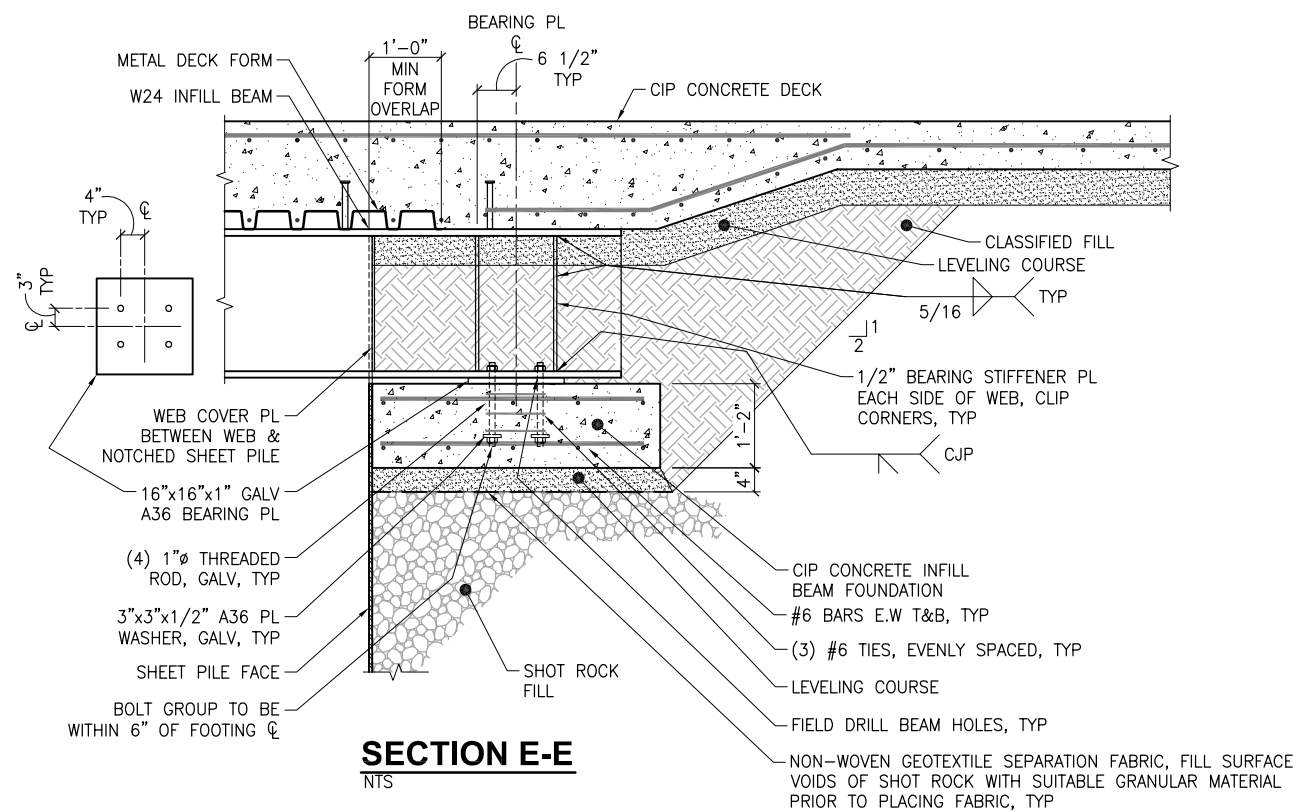


UHMW DETAIL
NTS

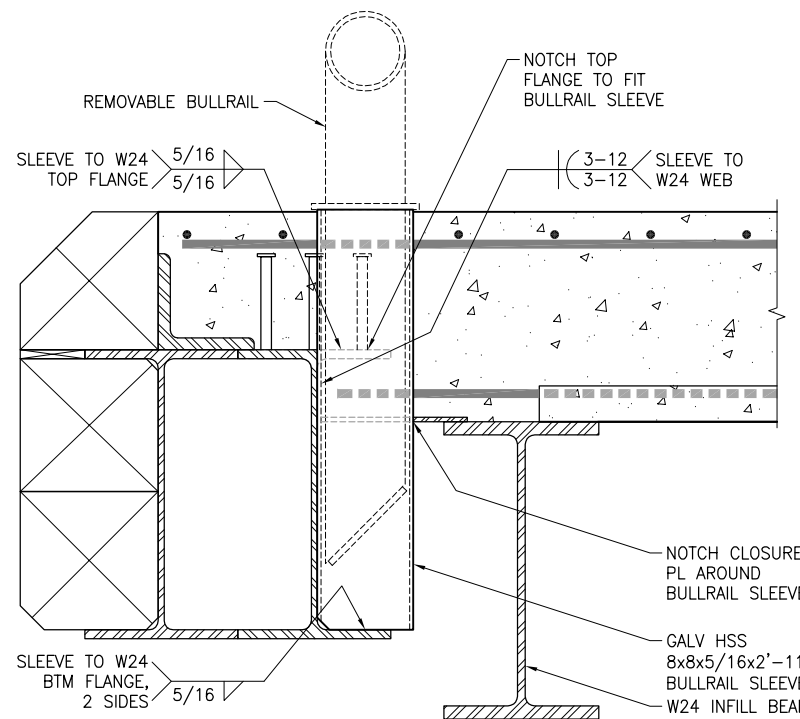
NOTCH SHEET PILE FOR W24 INFILL BEAM, TYP

DOCK FACE BOLT SCHEDULE

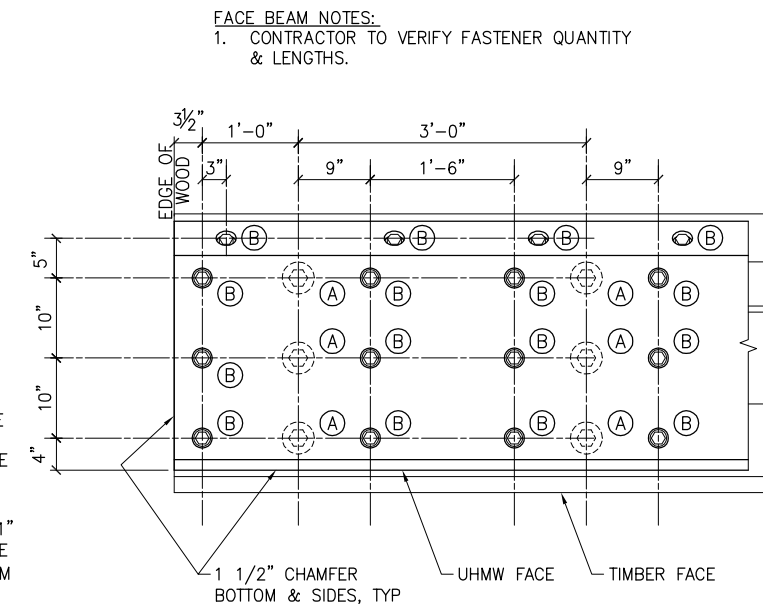
| MARK | TYPE | APPROX LENGTH | APPROX QUANTITY |
|------|----------------|---------------|-----------------|
| (A) | 3/4" BOLT | 12" | 150 |
| (B) | 3/4" LAG SCREW | 8" | 300 |



SECTION E-E
NTS



BULLRAIL SLEEVE DETAIL
NTS



DOCK FACE DETAIL
NTS



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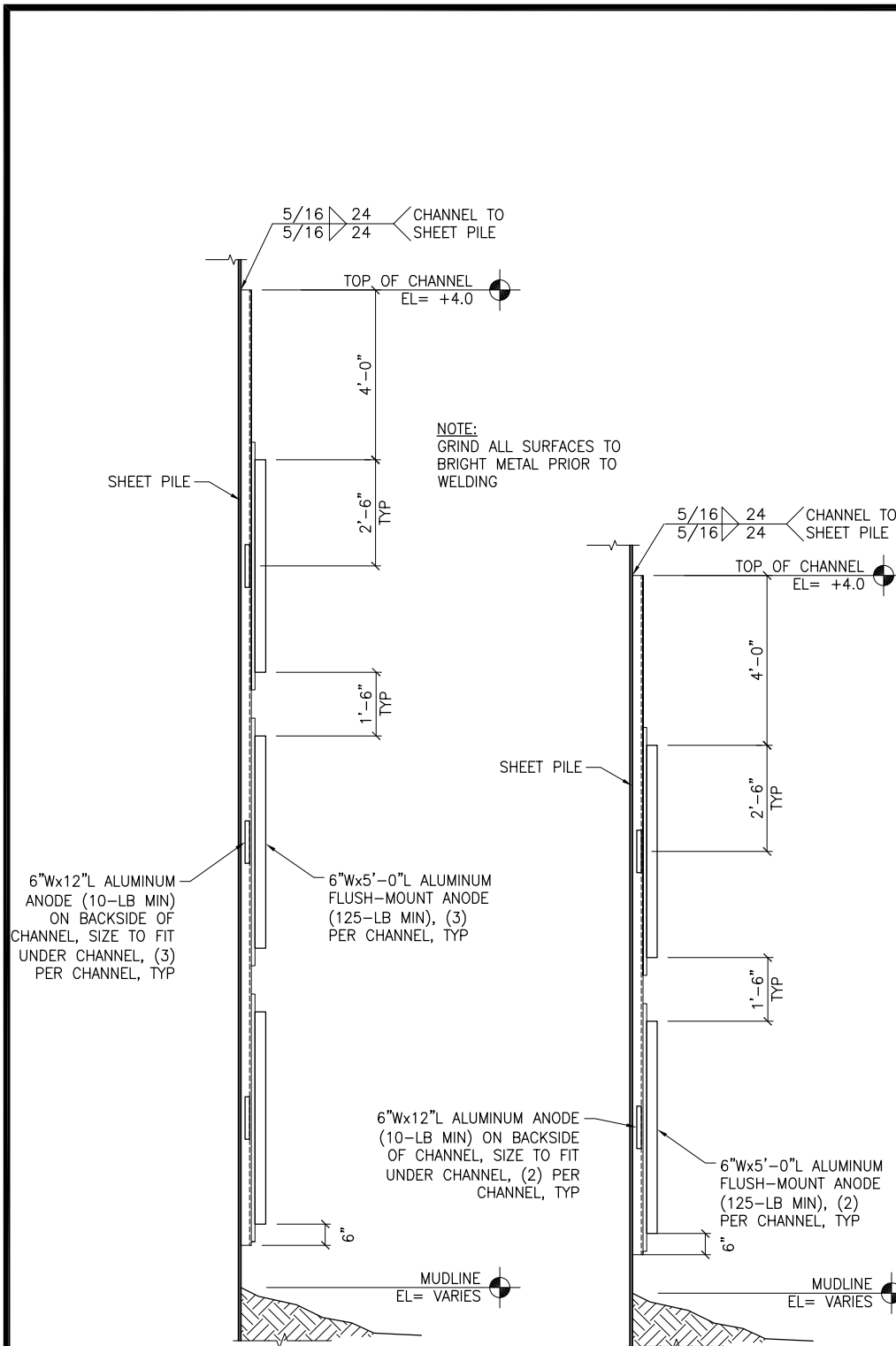


PROJECT: **CITY OF UNALASKA LIGHT CARGO DOCK EXPANSION**

TITLE: **DOCK SECTIONS (2 OF 2)**

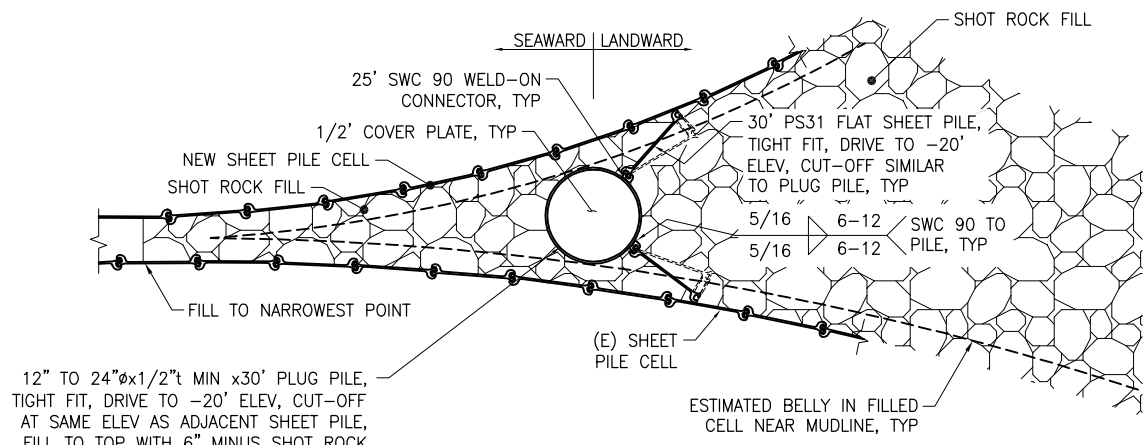
DESIGNED BY: CJR DATE: MAY 2016
CHECKED BY: DST PROJECT NO: 151125

SHEET NO: **8** OF 19



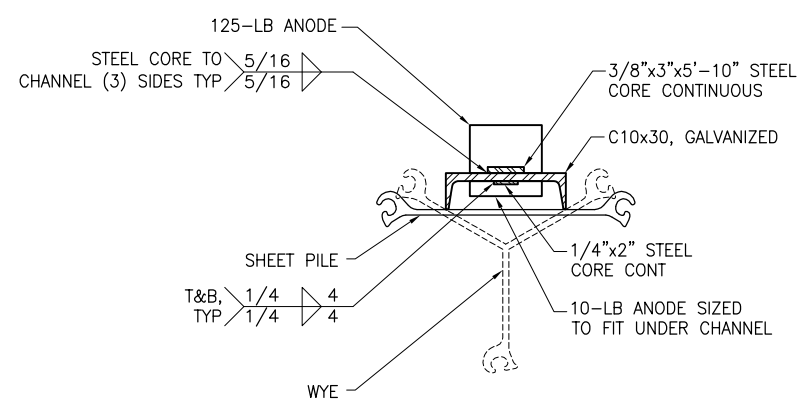
ANODE CHANNEL - TYPE A
NTS

ANODE CHANNEL - TYPE B
NTS



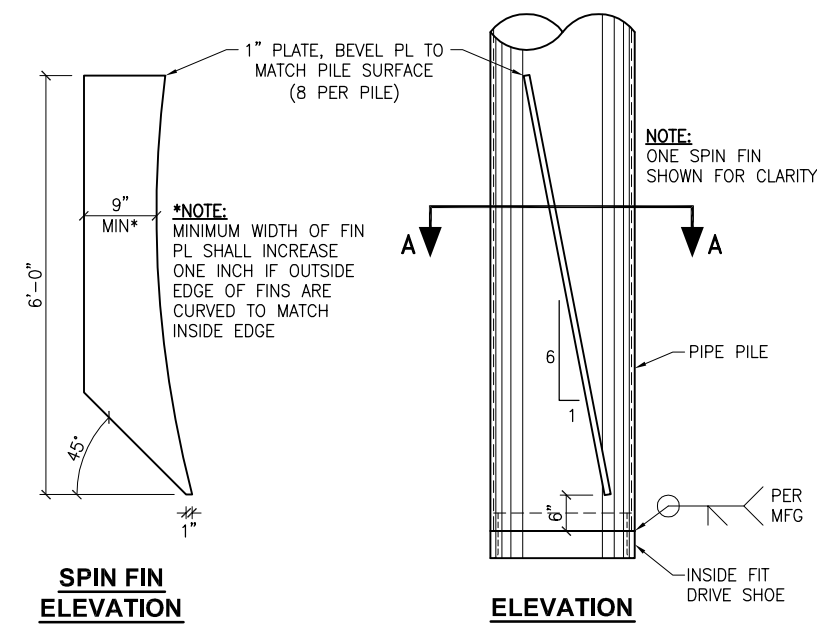
PLUG PILE CLOSURE PLAN
NTS

12" TO 24" x 1/2" MIN x 30' PLUG PILE, TIGHT FIT, DRIVE TO -20' ELEV, CUT-OFF AT SAME ELEV AS ADJACENT SHEET PILE, FILL TO TOP WITH 6" MINUS SHOT ROCK FILL, CONTRACTOR MAY ELECT TO USE SALVAGED DOLPHIN BATTER PILE WITH ENGINEER APPROVAL.



ANODE CHANNEL SECTION
NTS

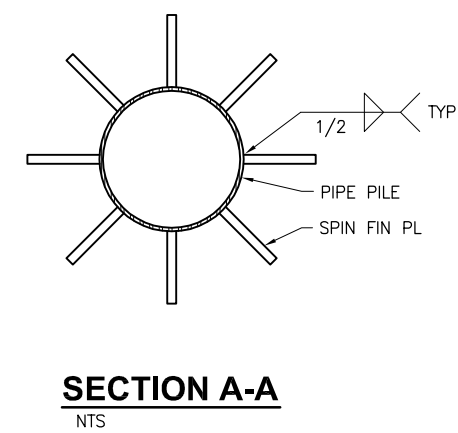
| PILE SCHEDULE | | | | | |
|-----------------------------|-----------|-----|--------------------|---------------------------|---------------------------|
| TYPE | SIZE | QTY | SUPPLY LENGTH (FT) | DESIGN TIP ELEVATION (FT) | SERVICE AXIAL LOAD (KIPS) |
| SLAB SUPPORT PILE (SPINFIN) | 24"Øx0.5" | 2 | 80 | -60 | 225 COMP |



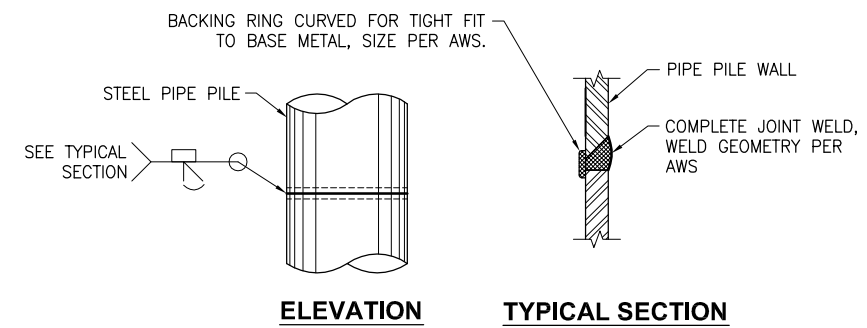
SPIN FIN ELEVATION

ELEVATION

SPIN FIN® PILE TIP DETAIL
NTS



SECTION A-A
NTS



ELEVATION

TYPICAL SECTION

TYPICAL PILE SPLICE WELD
NTS - TYPICAL FOR ALL SHOP & FIELD PIPE PILE SPLICES



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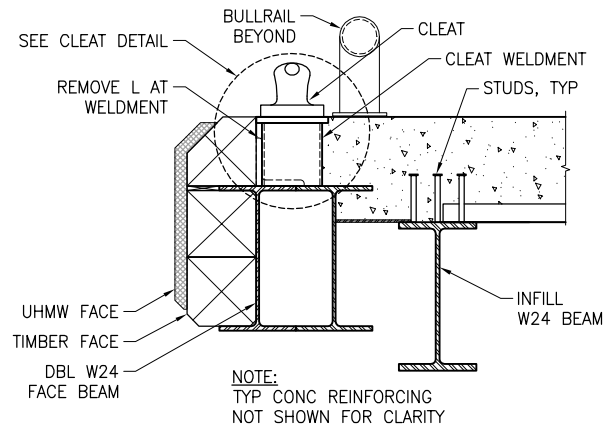
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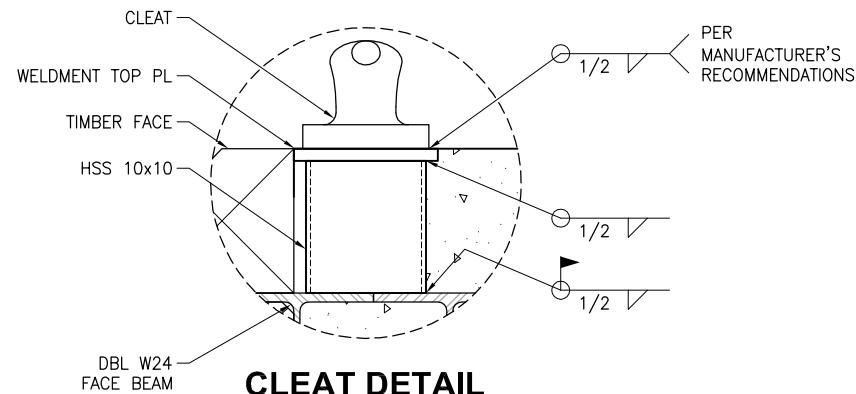
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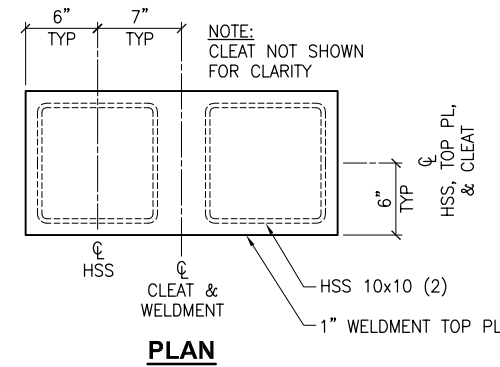
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|--|--------------------|-------------------|--|
| PROJECT: CITY OF UNALASKA LIGHT CARGO DOCK EXPANSION | | | |
| TITLE: DOCK DETAILS (1 OF 2) | | | |
| DESIGNED BY: CJR | DATE: MAY 2016 | SHEET NO: 9 OF 19 | |
| CHECKED BY: DST | PROJECT NO: 151125 | | |



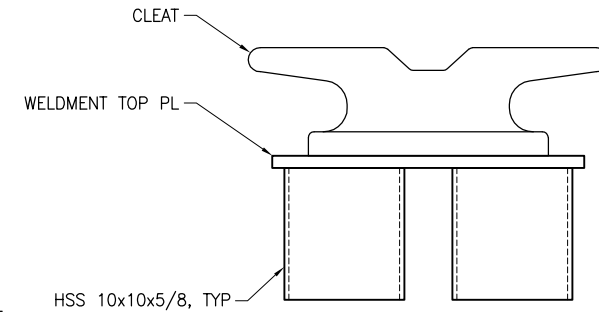
CLEAT ATTACHMENT DETAIL
NTS



CLEAT DETAIL
NTS

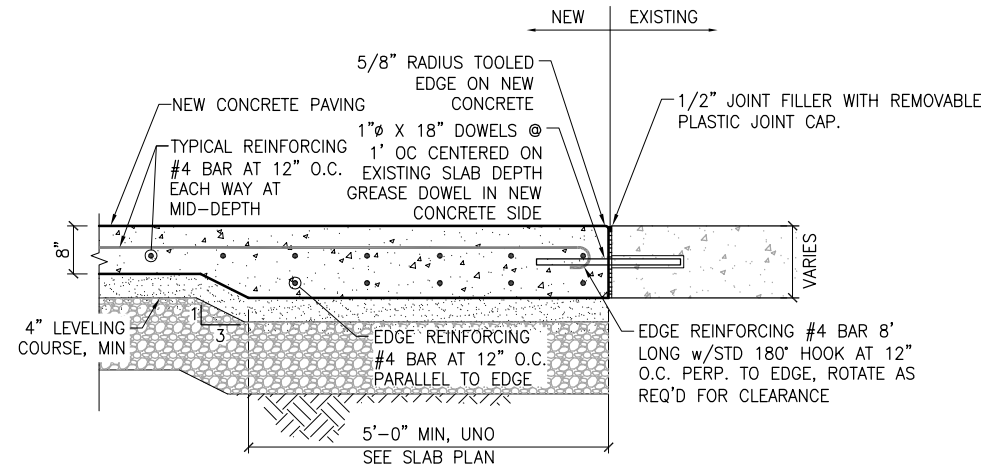


PLAN

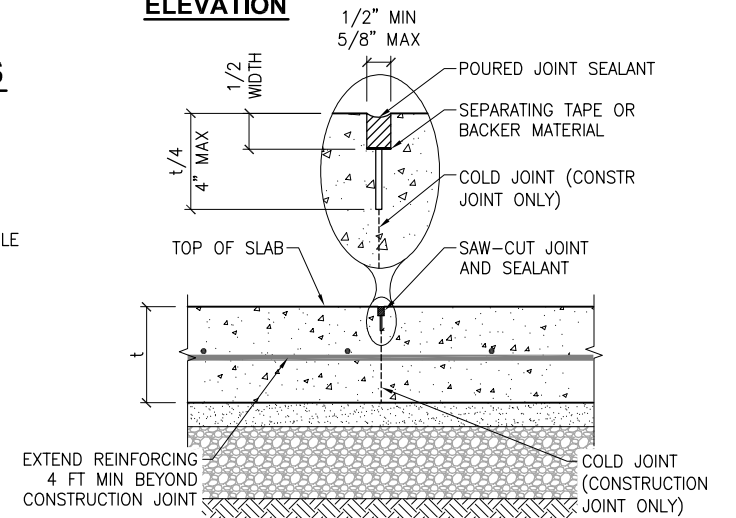


ELEVATION

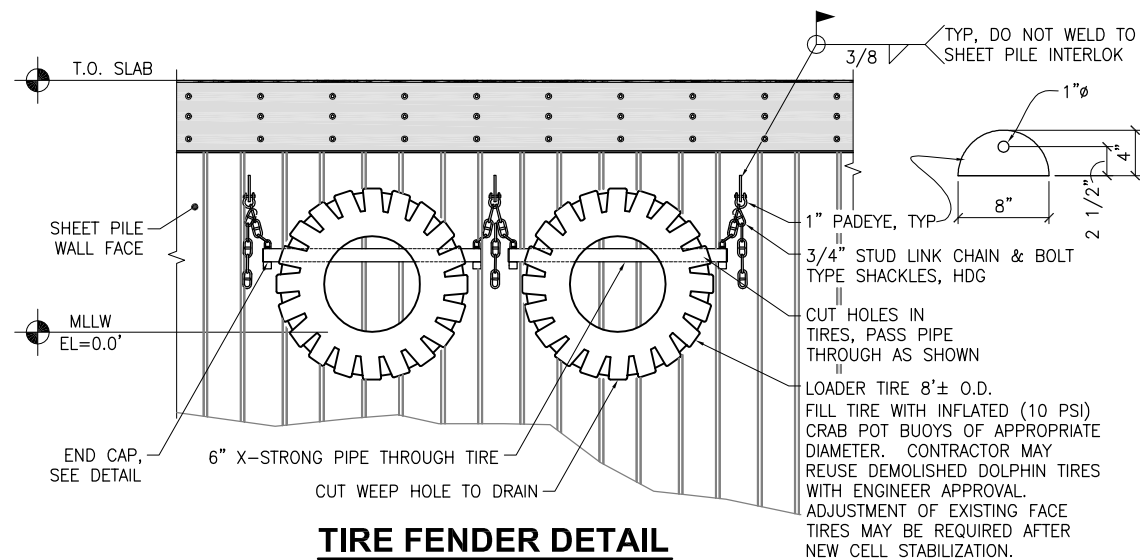
WELDMENT DETAILS
NTS



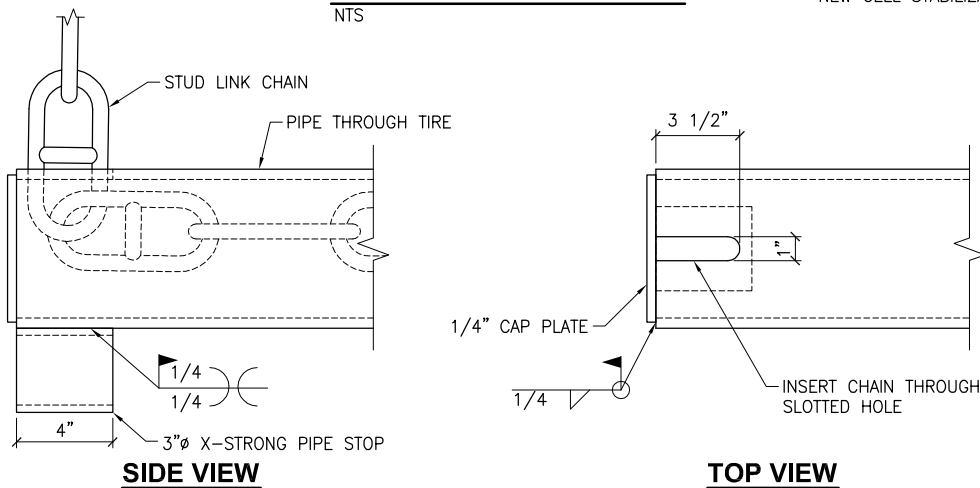
CONCRETE SLAB AT EXISTING
NTS



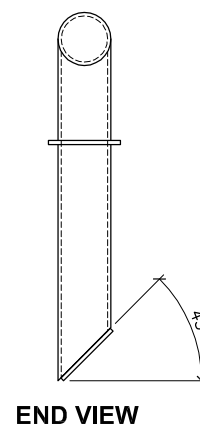
TYPICAL JOINT SECTION
NTS



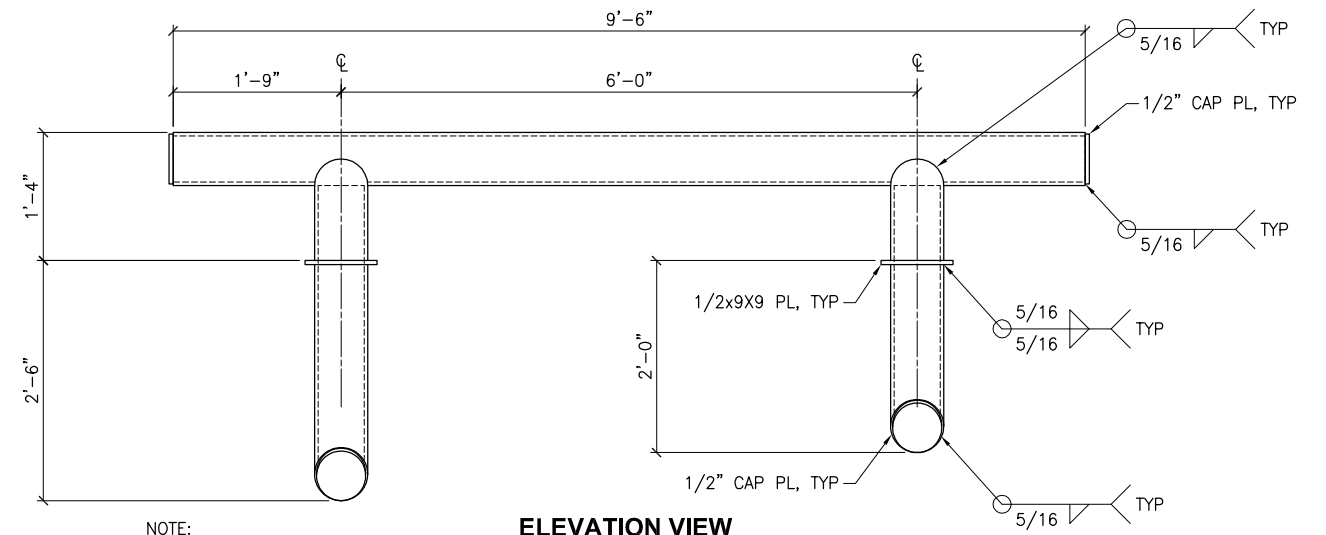
TIRE FENDER DETAIL
NTS



FENDER TIRE PIPE END CONNECTION
NTS



END VIEW



REMOVABLE BULLRAIL
NTS

NOTE:
ALL STEEL 6" Ø X-STRONG PIPE, UNO, GALVANIZED



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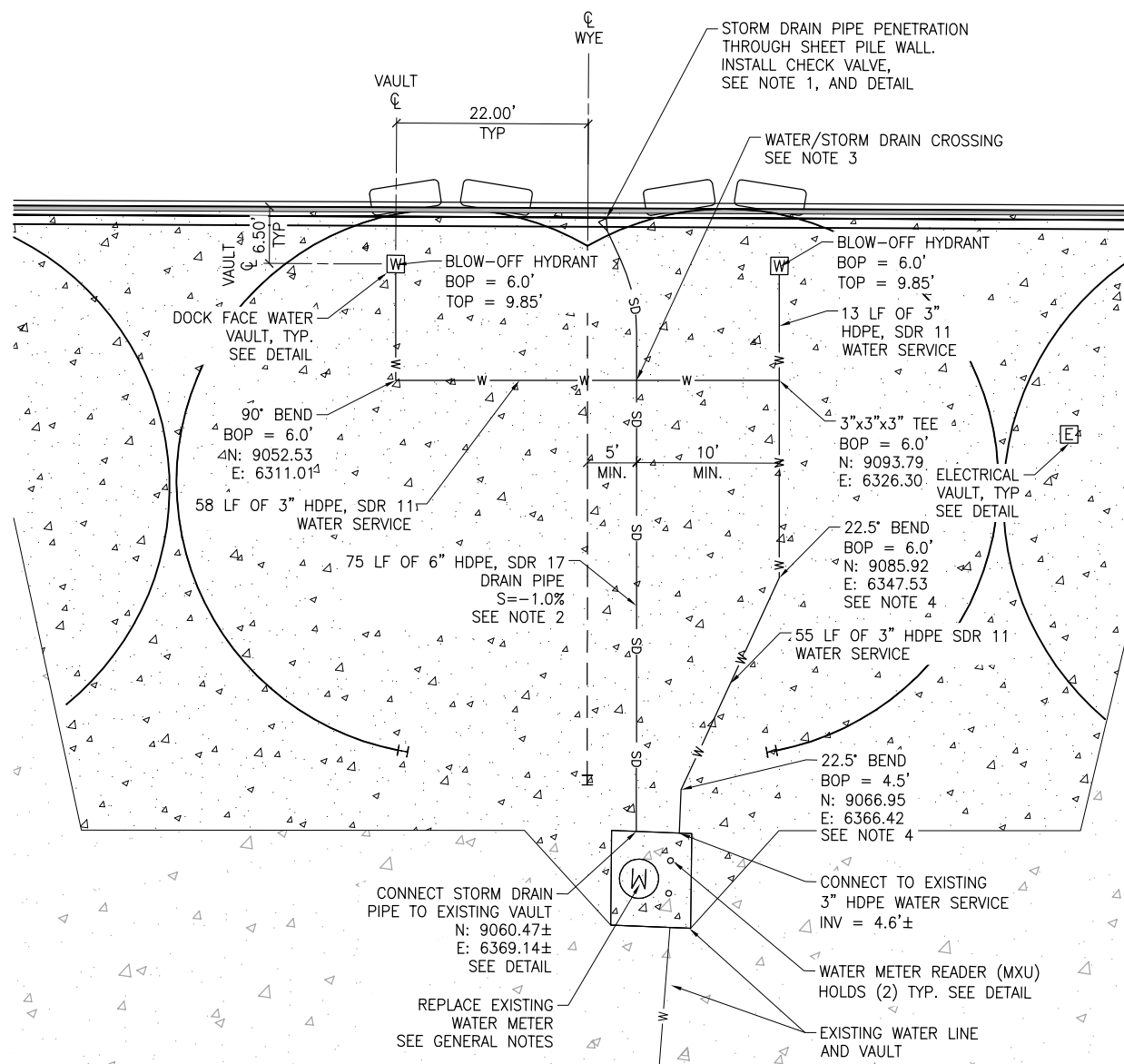


PROJECT: **CITY OF UNALASKA LIGHT CARGO DOCK EXPANSION**

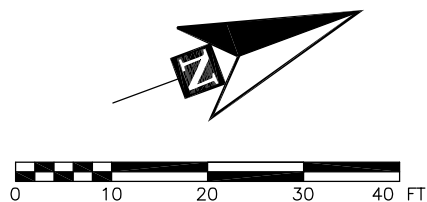
TITLE: **DOCK DETAILS (2 OF 2)**

DESIGNED BY: CJR DATE: MAY 2016
CHECKED BY: DST PROJECT NO: 151125

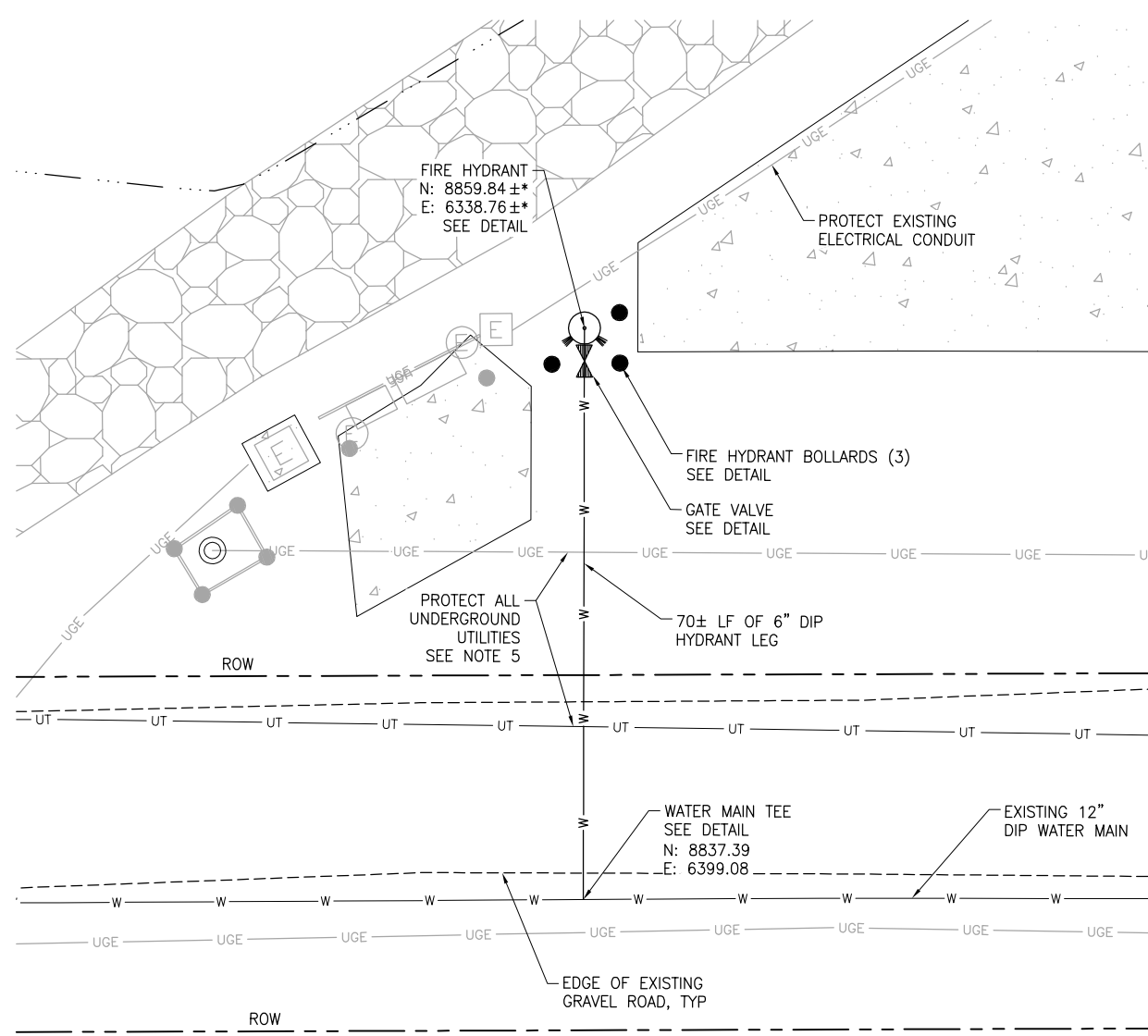
SHEET NO: **10** OF 19



UTILITY PLAN



- NOTES:**
1. SHEET PILE PENETRATION SHALL BE INSTALLED CENTERED ON THE SECOND FULL SHEET FROM THE WYE. SEE GENERAL NOTES AND DETAIL FOR SHEET PILE PENETRATION AND CHECK VALVE INSTALLATION. INVERT IS APPROXIMATE. FINAL INVERT SHALL BE BASED UPON LINE AND GRADE AS SPECIFIED FROM BOTTOM OF VAULT TIE-IN.
 2. RUN STORM DRAIN PIPE PARALLEL TO SHEET PILE TAIL WALL. BEND PIPE TO EXIT SHEET PILE WALL PERPENDICULAR TO THE SHEET FACE. PIPE BEND SHALL NOT BE LESS THAN THE MINIMUM ALLOWABLE RADIUS ACCORDING TO THE MANUFACTURERS WRITTEN INSTRUCTIONS.
 3. PROVIDE A MINIMUM OF 18" VERTICAL SEPARATION BETWEEN WATER AND STORM DRAIN PIPES.
 4. CONTRACTOR MAY BEND WATER SERVICE PIPE IN LIEU OF 22.5' BEND FITTINGS TO ACHIEVE LINE AND GRADE AS SHOWN ON THE PLANS. PIPE BENDS SHALL NOT BE LESS THAN THE MINIMUM ALLOWABLE RADIUS ACCORDING TO THE MANUFACTURERS WRITTEN INSTRUCTIONS.
 5. WATER LINE CROSSINGS WITH TELEPHONE OR ELECTRICAL UTILITIES MAY REQUIRE MINOR REALIGNMENT OF CONDUIT TO AVOID CONFLICT.



FIRE HYDRANT PLAN

* ELECTRICAL CONDUIT EXISTS IN AREA. FIELD ADJUST HYDRANT LOCATION AS REQUIRED AFTER EXPOSING ELECTRICAL CONDUIT WITH ENGINEER APPROVAL.



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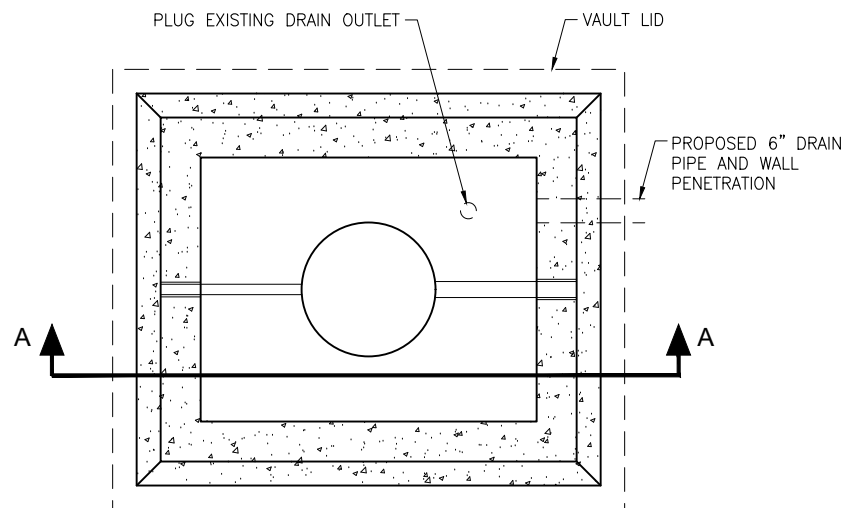
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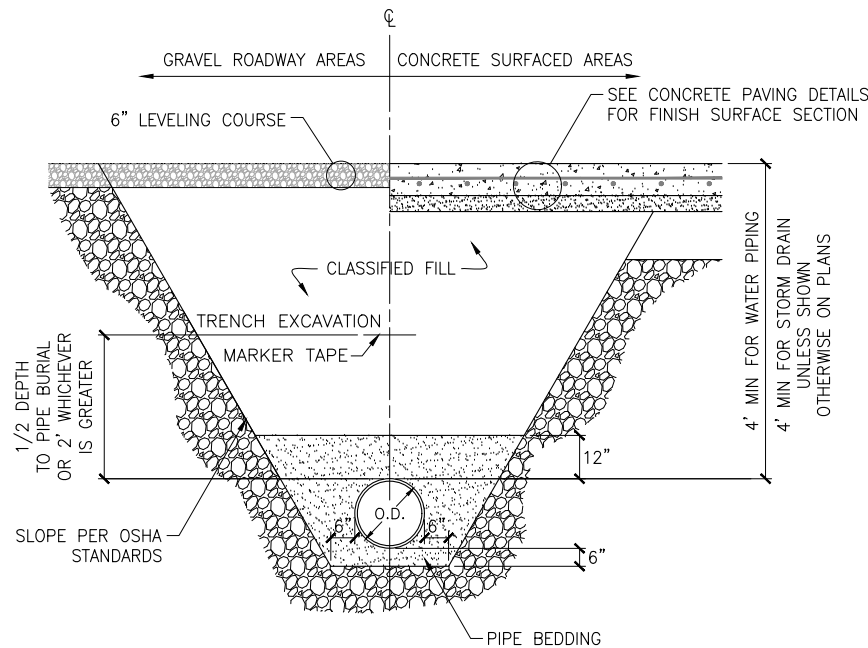


| | |
|--|--------------------|
| PROJECT: CITY OF UNALASKA LIGHT CARGO DOCK EXPANSION | |
| TITLE: UTILITY PLAN | |
| DESIGNED BY: CJR | DATE: MAY 2016 |
| CHECKED BY: DST | PROJECT NO: 151125 |
| SHEET NO: 11 OF 19 | |



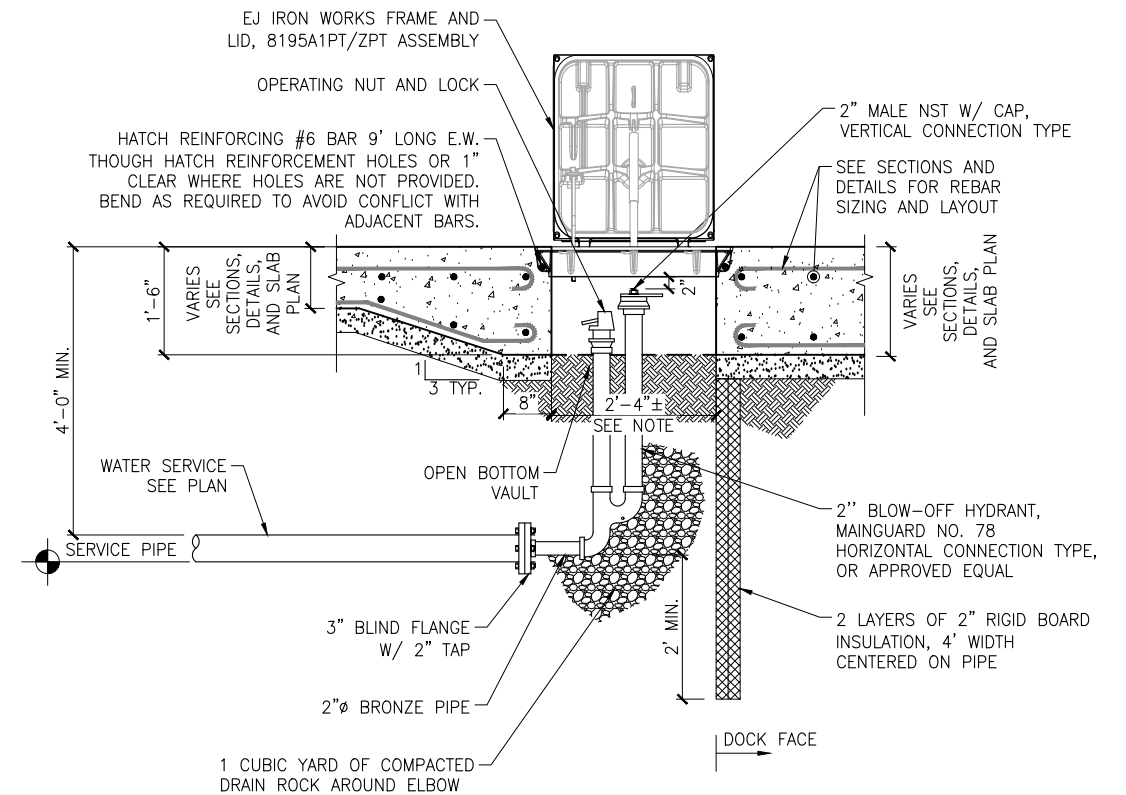
MODIFIED WATER VAULT PLAN

NTS



TYPICAL TRENCH PIPING SECTION

NTS

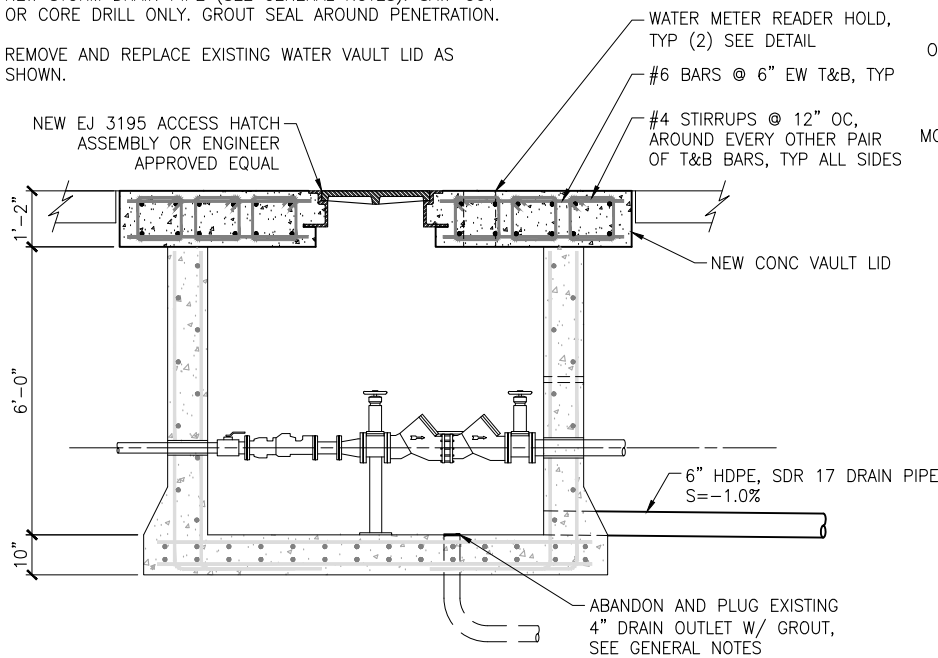


NOTE:
VAULT INTERNAL OPENING SHALL MATCH
FRAME ASSEMBLY WIDTH, EACH WAY.

DOCK FACE WATER VAULT SECTION

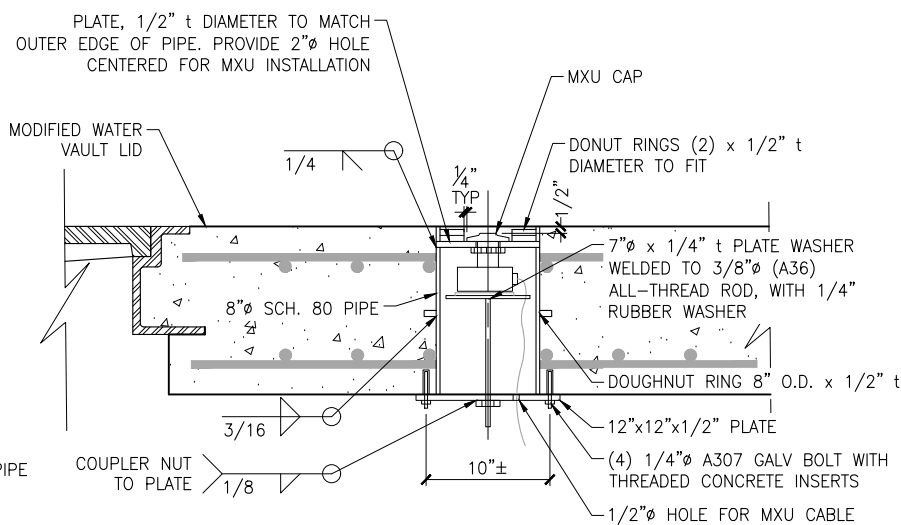
NTS

- NOTE FOR WATER VAULT:**
- CONSTRUCT WALL PENETRATION AS REQUIRED TO INSTALL NEW STORM DRAIN PIPE (SEE GENERAL NOTES). SAW-CUT OR CORE DRILL ONLY. GROUT SEAL AROUND PENETRATION.
 - REMOVE AND REPLACE EXISTING WATER VAULT LID AS SHOWN.



MODIFIED WATER VAULT SECTION A-A

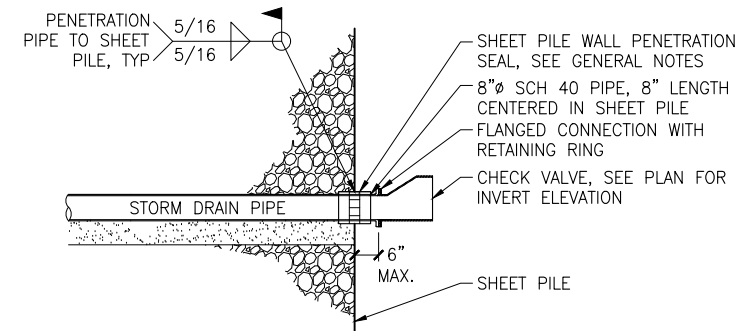
NTS



- NOTE:**
- PROVIDE TWO WATER METER READER HOLDS TO HOUSE MXU'S PROVIDED BY THE WATER DEPARTMENT.
 - CENTER MXU PENETRATION PIPE IN BETWEEN 6x6 REBAR GRID, AND REALIGN REBAR AS NECESSARY

WATER METER READER HOLD

NTS



- NOTES:**
- LONGITUDINAL HARDWARE NOT SHOWN FOR CLARITY. USE BOLTS, LOCK WASHERS, AND NUTS.
 - ALL HARDWARE 316L STAINLESS STEEL SIZED IN ACCORDANCE WITH MANUFACTURERS INSTALLATION INSTRUCTIONS
 - CHECK VALVE - TIDEFLEX 35-1 100% EPDM
 - RETAINING RING - TIDEFLEX 316L SS
 - BUTT-FUSE FLANGE CONNECTION TO STORM DRAIN PIPE W/ ANSI B16.10, CLASS 150#, BOLT PATTERN
 - USE SPECIFIED PARTS OR APPROVED EQUAL

STORM DRAIN OUTFALL

NTS



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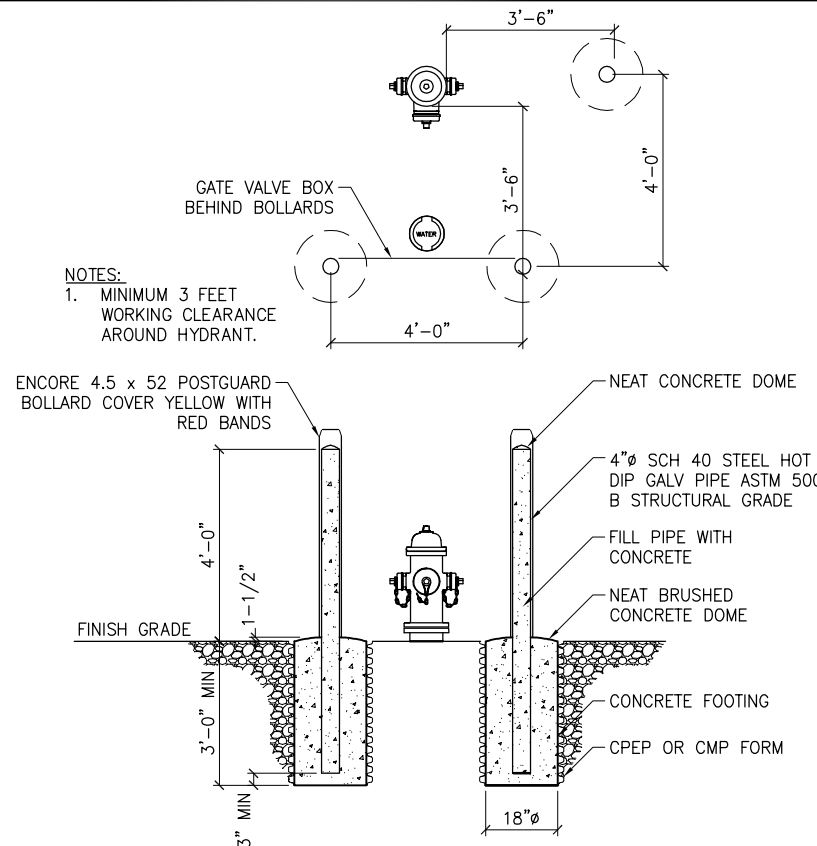


PROJECT: **CITY OF UNALASKA LIGHT CARGO DOCK EXPANSION**

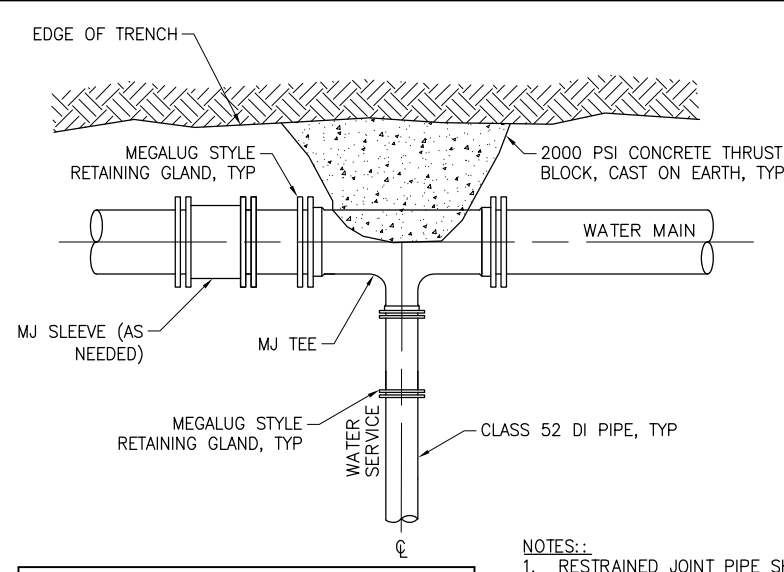
TITLE: **UTILITY DETAILS (1 OF 2)**

DESIGNED BY: CJR DATE: MAY 2016
CHECKED BY: DST PROJECT NO: 151125

SHEET NO: **12** OF 19



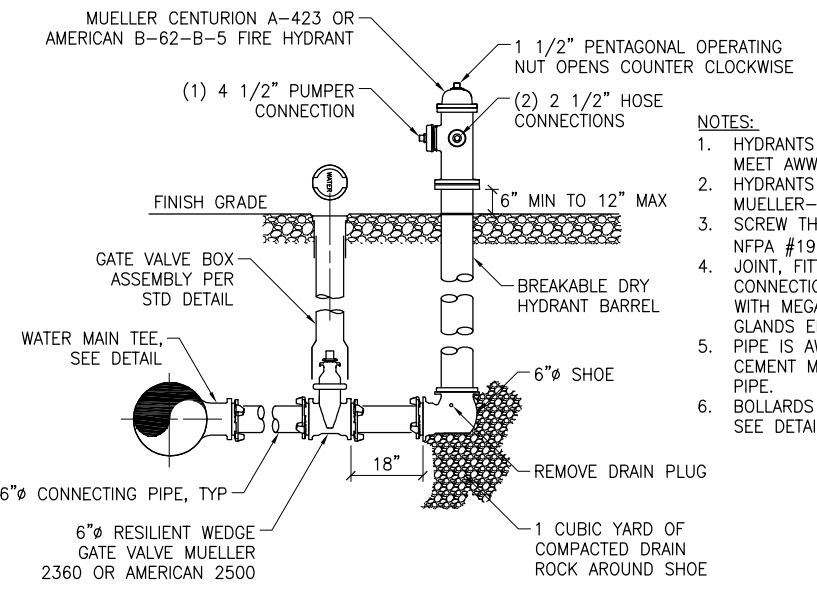
FIRE HYDRANT AND BOLLARDS
NTS



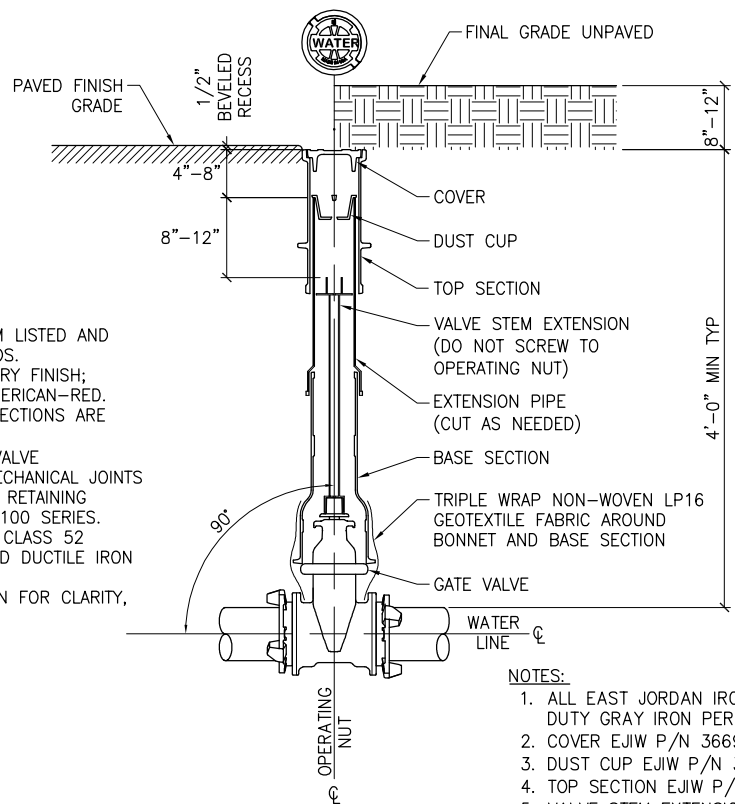
| THRUST BLOCK SIZE TABLE | | |
|-------------------------|---------------------------|------------------|
| SERVICE | MIN CONC BASE AREA SQ.FT. | TEE PIPE FITTING |
| 6" | | 2.0 |

- NOTES:**
1. RESTRAINED JOINT PIPE SHALL BE RESTRAINED WITH MEGALUG STYLE GLANDS OR EQUAL.
2. ALL PIPE SHALL BE WRAPPED WITH AN 8 MIL POLYETHYLENE WRAP.

WATER MAIN TEE PLAN VIEW
NTS

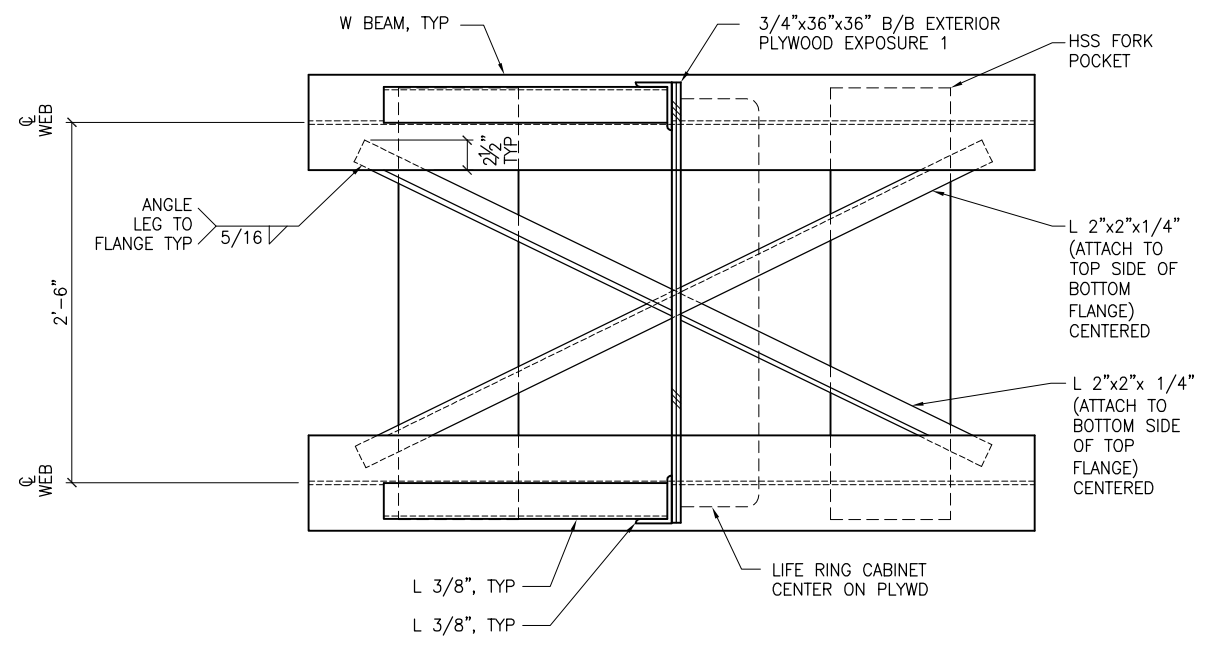


FIRE HYDRANT
NTS



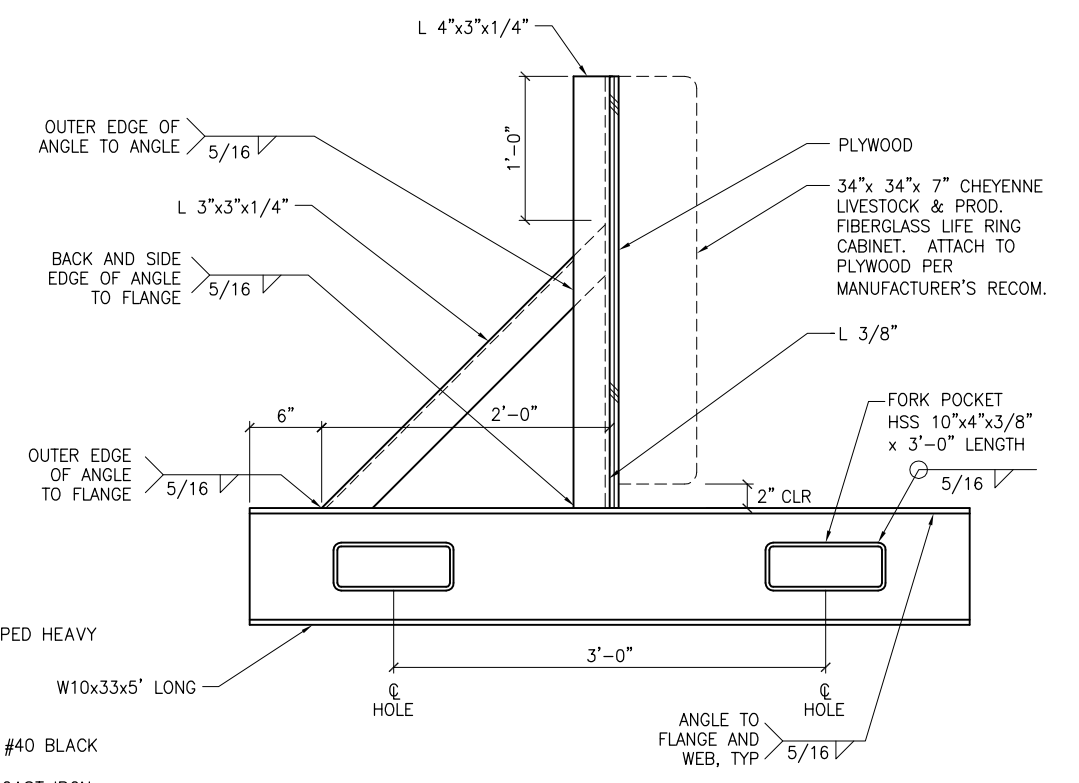
GATE VALVE BOX
NTS

- NOTES:**
1. ALL EAST JORDAN IRON WORKS (EJIW) PARTS DIPPED HEAVY DUTY GRAY IRON PER ASTM A48 CL35B.
2. COVER EJIW P/N 366952.
3. DUST CUP EJIW P/N 366980.
4. TOP SECTION EJIW P/N 366918.
5. VALVE STEM EXTENSION WESTEEL MILD STEEL W/ #40 BLACK VITONIC PAINT.
6. EXTENSION PIPE ASTM A 74 5"Ø SINGLE HUB SV CAST IRON SOIL PIPE.
7. BASE SECTION EJIW P/N 85556024.



MOBILE LIFE RING STAND - PLAN

- NOTES:**
1. ALL STANDS SHALL CONTAIN COAST GUARD APPROVED 30" LIFE RINGS AND 100' OF 1/2" DIA. FLEXIBLE NYLON ROPE. STANDS SHALL BE PAINTED CAUTION ORANGE.
2. (4) TOTAL LIFE RING STANDS ON LIGHT CARGO DOCK DOCK.



MOBILE LIFE RING STAND - ELEVATION
(4 TOTAL)



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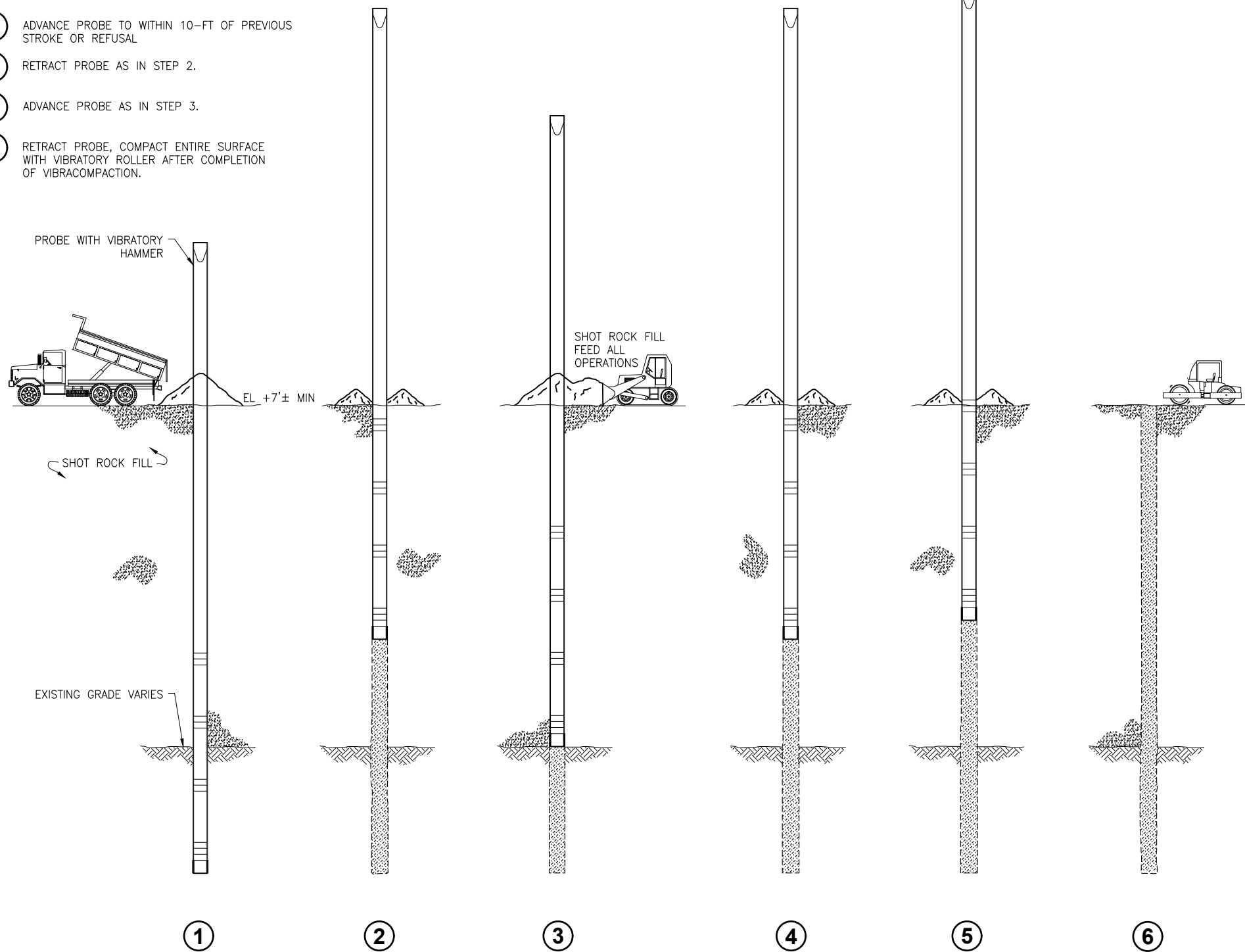
PROJECT: CITY OF UNALASKA
LIGHT CARGO DOCK EXPANSION

TITLE: UTILITY DETAILS
(2 OF 2)

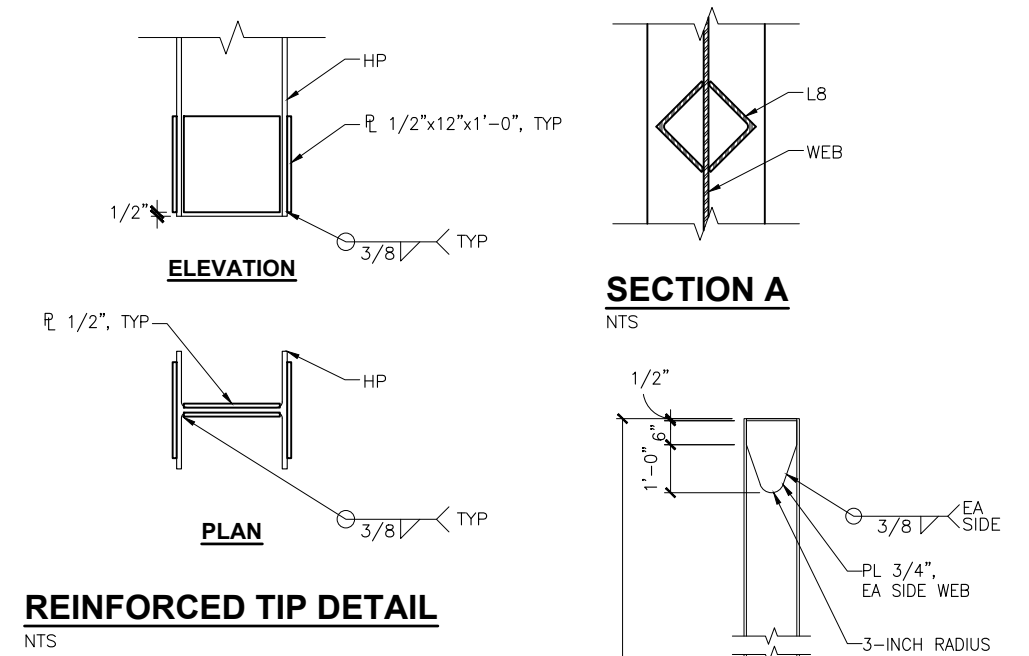
DESIGNED BY: CJR DATE: MAY 2016
CHECKED BY: DST PROJECT NO: 151125

SHEET NO: **13** OF 19

- 1 ADVANCE PROBE TO REFUSAL OR ELEV -40'.
- 2 RETRACT PROBE TO SURFACE.
- 3 ADVANCE PROBE TO WITHIN 10-FT OF PREVIOUS STROKE OR REFUSAL.
- 4 RETRACT PROBE AS IN STEP 2.
- 5 ADVANCE PROBE AS IN STEP 3.
- 6 RETRACT PROBE, COMPACT ENTIRE SURFACE WITH VIBRATORY ROLLER AFTER COMPLETION OF VIBRACOMPACTION.



VIBRACOMPACTION PROCEDURE
MODIFY AS REQUIRED BY ENGINEER IN FIELD



REINFORCED TIP DETAIL
NTS

VIBRACOMPACTION PROBE
NTS NOTE: FIELD MODIFY PROBE AS REQUIRED BY ENGINEER.



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| PROJECT: CITY OF UNALASKA LIGHT CARGO DOCK EXPANSION | |
| TITLE: VIBRACOMPACTION DETAILS | |
| DESIGNED BY: CJR | DATE: MAY 2016 |
| CHECKED BY: DST | PROJECT NO: 151125 |
| SHEET NO: 14 OF 19 | |

GENERAL NOTES:

PROJECT OWNER – CITY OF UNALASKA

NOTICE TO CONTRACTOR –

THE DESIGN DRAWINGS AND SPECIFICATIONS SHALL BE POSTED PROMINENTLY AT THE CONTRACTOR'S ONSITE PROJECT OFFICE.

ANY DISCREPANCIES FOUND AMONG THE DRAWINGS, SPECIFICATIONS, SITE CONDITIONS, AND THESE GENERAL NOTES SHALL BE REPORTED TO THE ENGINEER AT ONCE. ANY FURTHER WORK DONE BY THE CONTRACTOR AFTER FINDING SUCH DISCREPANCIES SHALL BE DONE AT HIS OWN RISK.

TRADEMARK & PATENT INFORMATION –

OPEN CELL™ AND OPEN CELL SHEET PILE™ ARE REGISTERED TRADEMARKS OF PND ENGINEERS, INC. THE OPEN CELL SYSTEM IS PATENTED UNDER THE FOLLOWING PATENTS:

- PATENT – US 6,715,964 B2
- PATENT – US 8,950,981 B2
- PATENT – US 7,488,140 B2

APPLICABLE CODES –

ALL LOCAL CODES PLUS THE FOLLOWING SPECIFICATIONS, STANDARDS, AND CODES ARE PART OF THESE GENERAL NOTES:

1. INTERNATIONAL BUILDING CODE, 2009 EDITION
2. AWS D1.1 STRUCTURAL STEEL WELDING CODE, CURRENT EDITION
3. ACI 318, CURRENT EDITION
4. ASTM SPECIFICATIONS, CURRENT EDITIONS
5. AISC STEEL CONSTRUCTION MANUAL, CURRENT EDITION
6. INTERNATIONAL FIRE CODE, CURRENT EDITION
7. UNIFORM PLUMBING CODE
8. INTERNATIONAL MECHANICAL CODE

IN THE EVENT THAT THERE IS A CONFLICT BETWEEN THE ABOVE REFERENCES AND THESE GENERAL NOTES, THE FOLLOWING PRIORITY WILL BE FOLLOWED:

1. ALL PROJECT PERMIT REQUIREMENTS
2. THESE GENERAL NOTES AND PLANS
3. SUPPLEMENTAL CONDITIONS
4. GENERAL CONDITIONS

DESIGN CRITERIA

DESIGN LIFE – 50 YEARS

DOCK LIVE LOADS – 750 PSF UNIFORM; 245,000–LB AXLE CONTAINER HANDLER; 250,000–LB CONCENTRATED LOAD DISTRIBUTED OVER A 2.5'x2.5' AREA.

EARTHQUAKE – SEISMIC PEAK HORIZONTAL GROUND ACCELERATIONS (PHGA): OPERATIONAL PHGA = 0.20g (72–YR), CONTINGENCY PHGA = 0.37g (475–YR), SITE CLASS = D.

DEFORMATIONS OF UP TO 6 INCHES OF THE OPEN CELL STRUCTURE SHOULD BE EXPECTED UNDER CONTINGENCY LEVEL EARTHQUAKE. GLOBAL DISPLACEMENT SLIGHTLY OVER 1 FOOT SHOULD BE EXPECTED DURING THE MAXIMUM CONSIDERED EARTHQUAKE EVENT. SEISMIC HAZARD LEVEL AND PERFORMANCE IS DESIGNATED FOR THIS TERMINAL IS MODERATE PER ASCE 61–14.

MOORING CLEATS – 30 TON HORIZONTAL.

TIDE LEVELS –

ELEVATION DATUM FOR THIS PROJECT IS 0.00 MEAN LOWER LOW WATER (MLLW).

NOAA TIDAL DATUM FOR 1983–2001 EPOCH AT UNALASKA, DUTCH HARBOR (STATION ID# 9462620):

| | |
|-------------------------------|-----------------|
| EXTREME HIGH WATER (EHW) | +6.70 FT |
| MEAN HIGHER HIGH WATER (MHHW) | +3.60 FT |
| MEAN HIGH WATER (MHW) | +3.32 FT |
| MEAN SEA LEVEL (MSL) | +2.08 FT |
| MEAN TIDE LEVEL (MTL) | +2.12 FT |
| MEAN LOW WATER (MLW) | +0.93 FT |
| MEAN LOWER LOW WATER (MLLW) | +0.00 FT |
| EXTREME LOW WATER (ELW) | –2.78 FT |

MATERIALS AND CONSTRUCTION

GENERAL –

ALL MATERIALS SHALL BE NEW AND PROVIDED BY THE CONTRACTOR UNLESS NOTED OTHERWISE.

MATERIALS NOT SPECIFICALLY NOTED IN THESE GENERAL NOTES OR ELSEWHERE ON THE DRAWINGS SHALL BE SUBMITTED FOR APPROVAL. APPROVAL WILL BE BASED ON CONFORMANCE TO CURRENT STANDARDS UTILIZED BY THE OWNER. ALL MATERIALS MUST CONFORM TO GOOD WORKMANSHIP, ACCEPTABLE INDUSTRY STANDARDS AND MANUFACTURERS RECOMMENDATIONS.

SALVAGED ARMOR ROCK –

EXISTING ARMOR ROCK MATERIAL SHALL BE SALVAGED AND TRANSPORTED APPROXIMATELY TWO (2) MILES TO THE OWNER DESIGNATED STOCKPILE LOCATION.

SHOT ROCK FILL –

SHOT ROCK FILL SHALL CONSIST OF SOUND ANGULAR ROCK, WITH A WELL GRADED GRADATION, WITH NO MORE THAN 10% PASSING THE #200 SIEVE, AND SHALL BE FREE OF ORGANICS, ICE, SNOW, OR OTHER DELETERIOUS MATERIALS. SHOT ROCK FILL BELOW ELEVATION +7 FILL SHALL BE 18–INCH MINUS. SHOT ROCK FILL ABOVE ELEVATION +7 SHALL BE 12–INCH MINUS. CARE SHALL BE TAKEN TO AVOID PLACING LARGER ROCK WHERE THEY MAY INTERFERE WITH SHEET AND PIPE PILE DRIVING.

CLASSIFIED FILL –

CRUSHED AGGREGATE CONTAINING NO MUCK, FROZEN MATERIAL, ROOTS, SOD OR OTHER DELETERIOUS MATTER AND WITH A PLASTICITY INDEX NOT GREATER THAN 6 AS TESTED BY WAQTC FOPS FOR AASHTO T 89 AND T 90. CLASSIFIED FILL SHALL MEET THE FOLLOWING GRADATION AS TESTED BY WAQTC FOP FOR AASHTO T 27/T 11:

| SIEVE | PERCENT PASSING BY WEIGHT |
|---------|---------------------------|
| 4" | 100% |
| NO. 4 | 20–55% |
| NO. 200 | 0–6% |

CLASSIFIED FILL MATERIAL SHALL BE PLACED IN LAYERS NOT TO EXCEED 12 INCH THICKNESS AND COMPACTED BY NO LESS THAN EIGHT PASSES WITH A 10–TON VIBRATORY ROLLER. ONE PASS SHALL CONSIST OF THE VIBRATORY COMPACTOR TRAVELING OVER AN AREA ONCE WITH THE VIBRATORY SYSTEM OPERATING AND AT LESS THAN 2.0 FT/SEC (1.5 MPH). THE COMPACTED SOIL SHALL NOT EXHIBIT YIELDING OR PUMPING. SOIL LAYERS UNDER SLABS AND PAVEMENTS SHALL NOT RUT UNDER LOADING AND HAULING EQUIPMENT.

LEVELING COURSE –

MATERIAL SHALL CONSIST OF 1–INCH MINUS, WELL GRADED CRUSHED GRAVEL CONFORMING TO THE REQUIREMENTS OF AKDOT/PF SPECIFICATIONS SECTION 703 AND SHALL MEET THE GRADATION REQUIREMENTS FOR BASE AND SURFACE COURSE GRADATION "D–1", WITH 0% TO 6% PASSING THE #200 SIEVE. THE DEGRADATION VALUE MAY BE REDUCED TO 45 MIN. LEVELING COURSE SHALL BE PLACED IN LAYERS NOT TO EXCEED 6 INCH THICKNESS AND COMPACTED TO 95% OPTIMUM DRY DENSITY.

PIPE BEDDING –

PIPE BEDDING SHALL MEET THE GRADATION OF LEVELING COURSE, AND SHALL BE PLACED IN LAYERS NOT TO EXCEED 4 INCH THICKNESS. EACH LIFT OF MATERIAL SHALL BE COMPACTED BY NO LESS THAN EIGHT PASSES WITH HAND OPERATED TAMPER WITHIN 12 INCHES HORIZONTAL AND VERTICAL DISTANCE FROM THE PIPE. REMAINING COMPACTION SHALL BE PER THE REQUIREMENTS OF CLASSIFIED FILL.

DRAIN ROCK –

GRAVEL CONSISTING OF CRUSHED OR NATURALLY OCCURRING GRANULAR MATERIAL CONTAINING NOT MORE THAN 1% CLAY LUMPS OR OTHER READILY COMPOSED MATERIAL (AASHTO T 112). DRAIN ROCK SHALL MEET THE FOLLOWING GRADING AS TESTED BY WAQTC FOP FOR AASHTO T 27/T 11:

| SIEVE | PERCENT PASSING BY WEIGHT |
|---------|---------------------------|
| 3" | 100% |
| 1" | 0–10% |
| NO. 200 | 0–5% |

DRAIN ROCK SHALL BE PLACED IN LIFTS NOT TO EXCEED 6 INCH THICKNESS AND SHALL BE COMPACTED PER THE REQUIREMENTS OF PIPE BEDDING MATERIAL.

COMPACTION TESTING –

OPTIMUM DRY DENSITY SHALL BE DETERMINED BY ASTM D1557, AND DENSITY TESTS SHALL BE PERFORMED ACCORDING TO ASTM D6938. CONTRACTOR SHALL PROVIDE DENSITY TESTING AND SUBMIT COMPACTION TEST RESULTS TO OWNER. COMPACTION TEST FREQUENCY SHALL BE AT LEAST ONCE PER DAY DURING COMPACTION OPERATIONS OR ONE TEST PER EVERY 30 CY OF PLACED MATERIAL REQUIRING COMPACTION TESTING. PROVIDE AT LEAST ONE COMPACTION TEST IN AREAS USING LEVELING COURSE AS SURFACING MATERIAL.

SEPARATION FABRIC –

SEPARATION FABRIC SHALL BE MIRAFI 180N OR APPROVED EQUAL.

BOLTS –

ALL BOLTS CONNECTING STEEL TO STEEL OR STEEL TO CONCRETE SHALL BE ASTM A325 OR A449, GALVANIZED, UNLESS OTHERWISE NOTED. ALL A325 OR A449 BOLTS SHALL BE INSTALLED PER AISC RCSC TURN–OF–NUT TIGHTENING, OR OTHER ENGINEER–APPROVED METHODS UNLESS OTHERWISE NOTED.

ALL OTHER BOLTS SHALL BE ASTM A307, GALVANIZED, UNLESS OTHERWISE NOTED. GALVANIZED WASHERS SHALL BE USED IN ALL AREAS WHERE THE BOLT HEAD OR NUT SHALL BEAR AGAINST TIMBER OR CONCRETE OR AGAINST OVERSIZED HOLES IN STEEL (I.E., HOLE MORE THAN 1/16–INCH LARGER THAN BOLT DIAMETER). GALVANIZED NUTS AND WASHERS SHALL CONFORM TO THE SPECIFICATION FOR THE CORRESPONDING BOLT. GALVANIZED MALLEABLE IRON WASHERS, PLATE WASHERS, OR ECONOMY HEADS ARE REQUIRED WHEREVER BOLT HEADS OR NUTS BEAR AGAINST TIMBER.

GALVANIZING –

ALL STEEL PRODUCTS TO BE GALVANIZED SHALL BE HOT–DIPPED GALVANIZED (HDG) PER ASTM A385 AND A123. ALL STEEL HARDWARE AND FASTENERS TO BE GALVANIZED SHALL BE HDG PER ASTM A385, A153, AND F2329 AS APPROPRIATE. GALVANIZING SHALL BE AFTER FABRICATION UNLESS OTHERWISE NOTED. DAMAGED GALVANIZING, INCLUDING THAT REMOVED FOR WELDING, SHALL BE REPAIRED BY THE CONTRACTOR PER THE PROJECT SPECIFICATION.

GALVANIZING/METALIZING REPAIR –

CONTRACTOR SHALL TAKE NECESSARY MEANS TO PROTECT COATINGS DURING TRANSPORTATION, HANDLING, WELDING, CUTTING, AND INSTALLATION. GALVANIZING DAMAGED, INCLUDING THAT REMOVED FOR WELDING, BY WELDS, CUTS, GOUGES, OR OTHER HOLIDAYS IN THE COATINGS SHALL BE REPAIRED BY THE CONTRACTOR.

SHOP REPAIR OF GALVANIZING/METALIZING SHALL BE SPRAY METALIZING. FIELD REPAIR DAMAGED GALVANIZING BY SPRAY METALIZING IF OVER 50 SQUARE INCHES. "GALV–STICK" OR ENGINEER APPROVED EQUAL MAY BE USED FOR FIELD REPAIR UNDER 50 SQUARE INCHES. CONTRACTOR SHALL SUBMIT REPAIR MATERIALS AND METHODS OF REPAIRS TO ENGINEER FOR REVIEW AND APPROVAL.

GALV–STICK –

GALV–STICK SHALL BE ZINC OR ALUMINUM ALLOY. PREPARE DAMAGED GALVANIZING WITH A GRINDER AND THEN ABRASE THE ENTIRE SURFACE WITH A WIRE BRUSH WHERE APPLICATION OF THE GALVANIZING REPAIR IS REQUIRED. CLEAN THE SURFACE TO REMOVE ALL GREASE, OIL, AND SURFACE DEPOSITS. HEAT LOCAL AREA TO MANUFACTURER SUGGESTED TEMPERATURE AND APPLY GALV–STICK IN MANNER TO ACHIEVE MINIMUM 10 MIL TOTAL FINAL THICKNESS. AFTER COOLING, APPLY 2 COATS OF ZINC–RICH PAINT. ZINC–RICH PAINT SHALL CONTAIN 95% METALLIC ZINC BY WEIGHT IN THE DRY FILM. ALLOW EACH COATING TO DRY THOROUGHLY BETWEEN APPLICATIONS.

SPRAY METALIZING AND NON–SKID SURFACING –

ALL SPRAY METALIZING SHALL BE PERFORMED PER AWS C2.23. STEEL SUBSTRATE SHALL BE PREPARED TO SSPC–SP5/NACE NO.1 WHITE METAL BLAST FINISH WITH A MINIMUM ANGULAR PROFILE DEPTH OF 2.5 MILS. BLAST MEDIA SHALL BE KLEEN BLAST SIZE 16–30 AS MANUFACTURED BY KLEEN INDUSTRIAL SERVICES (800–227–1134) OR ENGINEER–APPROVED EQUAL. AFTER BLASTING REMOVE DUST AND SPENT ABRASIVE FROM THE SURFACE BY USING OIL–FREE PRESSURIZED AIR, BRUSHING, OR VACUUM CLEANING. THE STEEL SURFACE TEMPERATURE SHALL BE AT LEAST 5 DEGREES F ABOVE THE DEW POINT OF THE AMBIENT AIR TEMPERATURE. FOR FLAMESPRAYING THE INITIAL STARTING AREA SHALL BE PREHEATED TO 250 DEGREES F. FEEDSTOCK SHALL BE 100–PERCENT ZINC APPLIED IN SEVERAL PASSES (APPROXIMATELY 2–4 MILS/PASS) TO A MINIMUM DRY COATING FILM THICKNESS OF 12 MILS. DURING APPLICATION, SPRAY GUN SHALL BE HELD PERPENDICULAR TO THE SUBSTRATE AT A STAND–OFF DISTANCE OF 6 TO 10 INCHES. THE CONTRACTOR SHALL PERIODICALLY VERIFY PASS AND TOTAL COATING THICKNESS. TENSILE BOND STRENGTH SHALL MEASURED PER ASTM D4541 AT THE START OF EACH SHIFT, AFTER ANY CHANGE TO THE APPLICATION METHOD, OR EVERY 500 SQUARE FEET. THE MINIMUM TENSILE BOND SHALL BE 500 PSI. FIELD METALIZING SHALL BE BOND TESTED BY AN OWNER'S REPRESENTATIVE WITH THE CONTRACTOR'S ASSISTANCE. CONTRACTOR SHALL SUBMIT METALIZING EQUIPMENT, BLAST MEDIA, FEEDSTOCK MATERIAL CERTIFICATION, APPLICATION AND QUALITY CONTROL METHOD FOR ENGINEER REVIEW AND APPROVAL.

STRUCTURAL STEEL –

ALL STRUCTURAL STEEL SHAPES (W, HP, L, C, ST) AND PLATES SHALL BE ASTM A572 GRADE 50 UNLESS NOTED OTHERWISE. ALL STEEL FABRICATION AND ERECTION SHALL BE PER THE LATEST AISC SPECIFICATIONS. SHEAR STUDS SHALL CONFORM TO ASTM A108 GRADE 1015. STRUCTURAL STEEL SHALL BE GALVANIZED UNLESS NOTED OTHERWISE.

STRUCTURAL STEEL WELDING –

ALL WELDING SHALL BE PERFORMED PER LATEST AWS D1.1 BY WELDERS QUALIFIED PER AWS FOR THE TYPE AND POSITION OF THE WELDS. ALL FILLER METAL SHALL HAVE CHARPY IMPACT CRITERIA OF 20 FT–LBS AT –20 DEGREES F AND SHALL HAVE A MAXIMUM CARBON CONTENT OF 0.20%. ALL SMAW ELECTRODES SHALL BE PROPERLY CONDITIONED LOW HYDROGEN. SUBMIT WELDER QUALIFICATIONS AND WELDING PROCEDURES TO ENGINEER FOR APPROVAL AT LEAST 15 DAYS PRIOR TO WELDING.

A CERTIFIED WELDING INSPECTOR (CWI) SHALL INSPECT ALL SHOP WELDS. CONTRACTOR WILL PROVIDE CWI FOR ALL FIELD WELDS. ALL WELDS SHALL BE 100% VISUALLY INSPECTED. IN ADDITION 10% OF ALL CJP SHOP WELDS SHALL BE TESTED BY UT EXAMINATION OR OTHER NDT METHODS APPROVED BY ENGINEER BY AN INDEPENDENT QUALIFIED THIRD PARTY INSPECTOR. CONTRACTOR SHALL SUBMIT WELD INSPECTION/NDT REPORTS TO THE OWNER FOR REVIEW.

ANY WELD FAILING INSPECTION SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE, WHICH WILL INCLUDE THE COST FOR RETESTING. THE OWNER MAY PROVIDE ADDITIONAL INSPECTION OF SHOP AND FIELD WELDS AS REQUIRED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL REPAIRS REQUIRED AS A RESULT OF ADDITIONAL OWNER INSPECTIONS. ACCEPTANCE CRITERIA FOR ALL WELD INSPECTIONS SHALL CONFORM TO AWS D1.1 CRITERIA FOR STATICALLY LOADED STRUCTURES.

PIPE PILES –

PIPE PILES MAY BE STRAIGHT SEAM OR SPIRAL WELD. STRAIGHT SEAM PIPE SHALL BE ASTM A252 GRADE 3 WITH WELDABLE CHEMISTRY SIMILAR TO ASTM A36 WITH A MINIMUM YIELD STRENGTH OF 50 KSI (CE = 0.45 MAX, CALCULATED PER AWS).

SPIRAL WELD PIPE BASE METAL SHALL CONFORM TO ASTM A709 GRADE 50 T2 OR ASTM A572 GRADE 50 AND MANUFACTURED TO ASTM A252 GRADE 3 AS MODIFIED IN THIS SECTION. BUTT JOINTS IN THE BASE METAL SHALL BE NO CLOSER THAN ONE PIPE DIAMETER FROM THE PIPE END. THE CONTRACTOR SHALL ENSURE FIT–UP OF SPIRAL SEAM PIPE TO ADJOINING ELEMENTS DOES NOT EXCEED THE WELDING AND ERECTION TOLERANCES SPECIFIED IN AWS D1.1 AND AISC 303–05. THE OUTSIDE DIAMETER AT ANY POINT IN A LENGTH OF PIPE SHALL BE WITHIN +/- 3/16 INCH OF THE NOMINAL DIAMETER. THE MAXIMUM LATERAL OFFSET MEASURED FROM A STRAIGHT CHORD LINE SHALL NOT EXCEED 0.2 PERCENT OF THE PIPE LENGTH, NOT TO EXCEED 3/8 INCH IN ANY



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| PROJECT: | | CITY OF UNALASKA | |
| | | LIGHT CARGO DOCK EXPANSION | |
| TITLE: | | GENERAL NOTES | |
| | | (1 OF 5) | |
| DESIGNED BY: | CJR | DATE: | MAY 2016 |
| CHECKED BY: | DST | PROJECT NO: | 151125 |
| | | SHEET NO: | 15 OF 19 |

GENERAL NOTES (CONT.):

40-FOOT LENGTH. PROVIDE PILE LENGTHS WITHIN +/- 2 INCHES FROM SPECIFIED LENGTHS. FABRICATE PIPE USING THE AUTOMATIC SUBMERGED ARC WELDING OR AUTOMATIC GAS METAL ARC WELDING PROCESS. VISUALLY INSPECT 100 PERCENT OF SEAM WELDS ON THE INTERIOR AND EXTERIOR SURFACES. WELDS SHALL BE ACCEPTABLE IF THE CRITERIA OF AWS D1.1 SECTION 6, TABLE 6.1 STATICALLY LOADED CONNECTIONS ARE SATISFIED. PERFORM UT INSPECTION OF 10 PERCENT OF SEAM WELDS ON EACH LENGTH OF PIPE USING ACCEPTANCE CRITERIA OF AWS D1.1 SECTION 6, TABLE 6.2. EVALUATE THE MECHANICAL PROPERTIES OF THE BASE METAL AND WELD IN ACCORDANCE WITH ASTM A370 AND AWS D1.1 SECTION 4.8.3. PERFORM DESTRUCTIVE TESTING OF A FABRICATED PIPE SECTION FOR EACH DIAMETER OF PIPE FURNISHED. A SINGLE TEST CONSISTS OF:

ONE BASE METAL YIELD, ONE TENSILE, AND ONE ELONGATION TEST, TWO REDUCED SECTION ACROSS THE WELD TENSILE TESTS, AND ONE SIDE BEND WELD TEST.

THE STRENGTH AND ELONGATION OF THE BASE METAL SHALL BE NO LESS THAN THE MINIMUM VALUES OF THE SPECIFIED RANGE.

EVALUATE THE PERFORMANCE OF THE WELD USING THE ACCEPTANCE CRITERIA OF AWS D1.1.

PILE SPLICES SHALL BE AS SHOWN IN THE DRAWINGS AND PER AWS SPECIFICATIONS. CARE SHALL BE TAKEN THAT PILING REMAINS IN STRAIGHT ALIGNMENT THROUGH SPLICES. NO PIECE OF PILE LESS THAN 10 FEET LONG SHALL BE SPLICED INTO A PILE.

PIPE PILE DRIVING –

ALL PILE DRIVING SHALL BE IN COMPLIANCE WITH THE PROJECT PERMITS INCLUDING BUT NOT LIMITED TO PROTECTED SPECIES MOTORING, REQUIRED WORK SHUT DOWNS, AND RAMP UP PROCEDURES.

ALL PILES SHALL BE DRIVEN. THE CONTRACTOR SHALL SUBMIT A PLAN FOR PIPE PILE DRIVING. THE PLAN SHALL CONTAIN HAMMER TYPE AND DRIVING METHOD FOR ALL PILE TYPES. THE CONTRACTOR SHALL NOT MOBILIZE HAMMERS AND RELATED EQUIPMENT PRIOR TO RECEIVING WRITTEN APPROVAL OF THE PLAN. THE CONTRACTOR SHOULD ALLOW ONE WEEK FOR REVIEW OF THE PLAN BY THE ENGINEER. ALL PILE DRIVING METHODS SHALL MEET THE REQUIREMENTS OF THE PERMITS ISSUED FOR THIS PROJECT. IMPACT HAMMERS SHALL NOT BE USED FOR PIPE PILE DRIVING WITHOUT REVIEW AND APPROVAL FROM THE ENGINEER. ANY HAMMER THAT CAUSES DAMAGE TO THE PILES DURING DRIVING OPERATIONS SHALL BE SUBSTITUTED WITH AN ACCEPTABLE ALTERNATE HAMMER AT NO ADDITIONAL EXPENSE TO THE OWNER. IMPACT HAMMERS SHALL BE SUPPLIED WITH NEW CAPBLOCK CUSHIONS, WHICH SHALL BE CHANGED AT THE MANUFACTURER'S RECOMMENDED CYCLE. THE CONTRACTOR'S DRIVING PLAN SHALL INCLUDE MANUFACTURER'S RECOMMENDATIONS AND INFORMATION ON HAMMER CUSHION.

PILES SHALL BE PLACED WITHIN 1% OF SPECIFIED VERTICAL ALIGNMENT AND WITHIN 2 INCHES OF SPECIFIED LOCATION AT CUT-OFF. PILES HITTING OBSTACLES PRIOR TO DESIGN TIP ELEVATION AND MISALIGNED PILES SHALL BE PULLED BY THE CONTRACTOR WITH A VIBRATORY HAMMER AND RE-DRIVEN AT NO ADDITIONAL COST TO THE OWNER. A VIBRATORY HAMMER WITH MINIMUM OF 300 HORSEPOWER AND MINIMUM ECCENTRIC MOMENT OF 2,200 IN-LBS SHALL BE AVAILABLE AND ON-SITE DURING ALL PIPE PILE DRIVING OPERATIONS.

ALL PILE INSTALLATION SHALL BE CONDUCTED WITH ENGINEER PRESENT. THE CONTRACTOR SHALL ASSIST ENGINEER IN MONITORING THE PILE DRIVING. THE CONTRACTOR SHALL MARK EACH PILE WITH ONE-FOOT INCREMENTS WITH EVERY FIVE-FOOT INCREMENT NUMBERED. FOR DETERMINATION OF PILE REFUSAL OR CAPACITY, THE CONTRACTOR SHALL MARK THE PILES WITH ONE-INCH INCREMENTS DURING THE FINAL DRIVE. THE MARKS SHALL BE VISIBLE/READABLE FROM ALL SIDES OF THE PILE.

ALL STEEL PIPE PILE CUT-OFFS ON THIS PROJECT SHALL BECOME THE PROPERTY OF THE CONTRACTOR. THE CONTRACTOR SHALL REMOVE THE PIPE FROM THE PROJECT SITE.

MISCELLANEOUS PIPE –

ASTM A53 GRADE B, OR ASTM A252 GRADE 2 OR 3, AND GALVANIZED OR SPRAY METALIZED UNLESS NOTED OTHERWISE.

FLAT SHEET PILE MATERIALS –

FLAT WEB SHEET PILE SHALL CONFORM TO REQUIREMENTS OF ASTM A572 GRADE 50. SHEETS SHALL BE NEW, UNCOATED (UNLESS OTHERWISE SPECIFIED) PS31/PS27.5 AS REQUIRED ON THE DRAWINGS AND PROVIDED FROM A SINGLE MANUFACTURER. ALL SHEETS SHALL MEET ASTM A6/A6M REQUIREMENTS FOR ROLLED SHEET PILING, AND SHALL BE TESTED IN ACCORDANCE WITH ASTM A370 FOR MECHANICAL TESTING AND ASTM A673 FOR SAMPLING AND IMPACT TESTING.

SHEET PILE SHALL HAVE A MINIMUM CHARPY V-NOTCH IMPACT VALUE OF 15/12 (AVERAGE/MINIMUM) FT-LBS AT +20 DEGREES F IN ACCORDANCE WITH ASTM A673. SHEET PILE SHALL HAVE A MINIMUM INTERLOCK TENSILE STRENGTH OF 20,000 LBS PER INCH, AND INTERLOCK SWING ANGLE OF 7 DEGREES MINIMUM FROM CENTER (NEUTRAL POSITION) MEASURED EACH WAY BASED UPON A 3-INCH LONG SECTION OF PILE.

QUALITY CONTROL SHALL BE MAINTAINED ON ALL SHEET PILING. INTERLOCK SAMPLING AND TENSION, CHARPY V-NOTCH, AND SWING ANGLE TESTING PROCEDURES SHALL BE SUBMITTED BY THE CONTRACTOR TO ENGINEER FOR APPROVAL.

QUALITY CONTROL TEST SAMPLES SHALL BE 3-INCHES WIDE +/-0.25 INCHES. MAXIMUM STRAIN RATE OF INTERLOCK TESTING SHALL BE 0.5-INCHES PER MINUTE. INTERLOCK TEST SPECIMENS SHALL BE INTERLOCKED AT 180 DEGREES.

INTERLOCK TESTS SHALL OCCUR IN SETS. AT A MINIMUM, EACH SET SHALL CONSIST OF THREE INTERLOCK TENSION TESTS. ONE TEST SHALL BE PERFORMED ON KNUCKLES FROM THE SAME SIDE OF THE SHEET PILE (SIDE A TO SIDE A). A SECOND TEST SHALL BE PERFORMED ON BOTH KNUCKLES FROM THE OTHER SIDE OF THE SAME SHEET PILE (SIDE B TO SIDE B). THE THIRD TEST SHALL BE PERFORMED USING OPPOSITE KNUCKLES ON THE SAME SHEET (SIDE A TO SIDE B).

OWNER RESERVES THE RIGHT TO PERFORM SUPPLEMENTAL TESTING OF SUPPLIED MATERIALS. ANY MATERIALS FOUND NOT TO MEET SPECIFICATIONS SHALL BE REPLACED AT NO ADDITIONAL COST TO THE OWNER. IF REJECTABLE MATERIALS ARE DISCOVERED, ADDITIONAL TESTING MAY BE REQUIRED (AT NO ADDITIONAL COST TO THE OWNER) AT THE DISCRETION OF THE OWNER.

MANUFACTURER IS RESPONSIBLE FOR QUALITY CONTROL TESTING AND ENSURING SUPPLIED MATERIAL MEETS PROJECT SPECIFICATIONS. INTERLOCK TEST FREQUENCY, AT A MINIMUM, SHALL BE PERFORMED TO ENSURE REPORTED DATA INCORPORATES ALL VARIABILITY IN MANUFACTURING PROCESSES. ONE TENSION TEST SET SHALL BE PERFORMED FOR EACH HEAT IN EACH ROLLING, A MINIMUM OF ONE TENSION TEST SET FOR EVERY 4,000 LINEAR FEET OF SHEET PILE, AND A TOTAL MINIMUM OF TWO TENSION TEST SETS FOR THIS PROJECT.

CONTRACTOR SHALL ALSO PROVIDE SWING ANGLE TEST RESULTS FOR EACH INTERLOCK TEST PAIR UTILIZED IN TENSION TESTING. ALL TEST RESULTS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

SHEET PILE SHALL BE PROVIDED WITH A 2-INCH DIAMETER PICKING EYE LOCATED AT THE TOP OF THE SHEET, WITH A CENTER HOLE TO END DISTANCE OF 6 INCHES.

FLAT SHEET PILE FABRICATION –

ALL SHEET PILE AND FABRICATED ELEMENTS OF SHEET PILE SHALL BE FABRICATED SUCH THAT THE FINISHED SHEET PILE CAMBER OR FINISHED SHEET PILE SWEEP DOES NOT VARY BY MORE THAN 0.2 PERCENT IN THE LENGTH. CONTROL HEAT INPUT TO MINIMIZE DISTORTION. HEAT STRAIGHTEN PER AWS D1.1 AS REQUIRED. ALL FABRICATED ELEMENTS SHALL BE VISUALLY EXAMINED FOR KINKS AND, PRIOR TO FABRICATION, AND SHALL HAVE A 2-FOOT SECTION OF SHEET PILE RUN THRU THE ENTIRE LENGTH OF THE INTERLOCK TO ENSURE FREE SLIDING. FABRICATOR SHALL SUBMIT A DETAILED FABRICATION AND QUALITY CONTROL PLAN FOR APPROVAL

PRIOR TO FABRICATION. GALVANIZING/METALIZING SHALL OCCUR AFTER FABRICATION, WHEN SPECIFIED.

FLAT SHEET PILE DELIVERY, STORAGE, & HANDLING –

THE CONTRACTOR SHALL SUBMIT A DELIVERY, STORAGE, AND HANDLING PLAN. THE PLAN SHALL INCLUDE: STORAGE, STACKING, HANDLING, TRANSPORTATION, AND LOFTING PLAN. PILE LOFTING PLANS SHALL INCLUDE: LIFTING APPARATUS DRAWINGS, SPECIAL HANDLING PROCEDURES, AND MEANS TO MINIMIZE COATING DAMAGE. CONTRACTOR SHALL PROVIDE CALCULATIONS ON PILE STRESSES FOR THEIR INTENDED HANDLING OPERATIONS.

TRANSPORTATION AND HANDLING PLAN: STORE AND HANDLE SHEET PILE IN MANNER RECOMMENDED BY THE MANUFACTURER TO PREVENT PERMANENT DEFLECTION, DISTORTION, OR DAMAGE. DURING TRANSPORTATION AND STORAGE, SHEET PILE SHALL BE BUNKED WITH DUNNAGE SPACED AT 10- FEET ON CENTER MAXIMUM AND WITHIN 5 FEET OF THE ENDS. ALIGN DUNNAGE VERTICALLY. PROVIDE ADEQUATE GROUND DUNNAGE TO MINIMIZE LOCALIZED SETTLEMENT. SHEET PILE SHALL BE STACKED IN FLAT, HORIZONTAL LAYERS. STACKS SHALL BE ADEQUATELY SPACED TO PERMIT INSPECTION.

MATERIALS DELIVERED TO THE SITE SHALL BE ACCOMPANIED BY CERTIFIED TEST REPORTS. PROVIDE A UNIQUE IDENTIFICATION MARK AS REQUIRED BY THE REFERENCED SPECIFICATIONS. IDENTIFICATION MARKS SHALL ALSO INCLUDE THE LENGTH OF SUPPLIED SHEET PILE.

SHEET PILE DAMAGED DURING TRANSPORTATION, DELIVERY, STORAGE, OR HANDLING SHALL BE REPLACED OR, WITH ENGINEER AND MANUFACTURER APPROVAL, REPAIRED.

OPEN CELL FLAT SHEET PILE INSTALLATION –

THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MEANS AND METHODS OF SHEET PILE INSTALLATION INCLUDING STABILITY OF SHEET PILE, TEMPORARY STRUCTURES, AND FILL EMBANKMENTS UTILIZED DURING SHEET PILE INSTALLATION. ENGINEER SHALL BE PRESENT DURING ALL SHEET PILE INSTALLATION. ALL PILE DRIVING SHALL BE IN COMPLIANCE WITH THE PROJECT PERMITS INCLUDING BUT NOT LIMITED TO PROTECTED SPECIES MONITORING, REQUIRED WORK SHUT DOWNS, AND RAMP UP PROCEDURES.

THE CONTRACTOR SHALL MAINTAIN SHEET PILE IN AN UNDAMAGED STATE UNTIL THE STRUCTURE IS COMPLETE. CELLULAR STRUCTURES MAY BE SUSCEPTIBLE TO DISTORTION AND MAY BE UNSTABLE PRIOR TO COMPLETION OF BACKFILLING. CONTRACTOR SHALL PLACE AND COMPACT FILL IN ACCORDANCE WITH THESE SPECIFICATIONS AS SOON AS PRACTICAL UPON COMPLETION OF EACH INDIVIDUAL SHEET PILE CELL. CONTRACTOR'S INSTALLATION PLAN SHALL CLEARLY IDENTIFY SEQUENCING AND TIMING ASSOCIATED WITH PILE INSTALLATION, BACKFILLING OPERATIONS, AND ANY PROPOSED TEMPORARY SUPPORT SYSTEM.

CONTRACTOR SHALL DETERMINE IF TEMPORARY SUPPORT WILL BE REQUIRED FOR UNFINISHED STRUCTURES. WHERE UTILIZED, TEMPORARY SUPPORT SYSTEMS SHALL BE ANALYZED, DESIGNED, AND CONSTRUCTED BY THE CONTRACTOR TO PROVIDE ADEQUATE STRENGTH, STIFFNESS, AND STABILITY TO ACCOMMODATE ALL ANTICIPATED EXTERNAL LOADS INCLUDING BUT NOT LIMITED TO CONSTRUCTION LOADS, WATER PRESSURES, SOIL PRESSURES, OTHER ENVIRONMENTAL FORCES, AND PILE INSTALLATION FORCES DURING CONSTRUCTION IN ORDER TO MAINTAIN PLAN WYE LOCATIONS. THE TEMPORARY SUPPORT STRUCTURE MAY SERVE A DUAL PURPOSE AS A SHEET PILE TEMPLATE.

FILL PLACED TO SUPPORT PILE DRIVING ACTIVITIES SHALL BE LOCATED SUFFICIENTLY BEHIND THE BULKHEAD TO PREVENT MATERIAL FROM SLOUGHING AND APPLYING ANY PRESSURE AGAINST THE BULKHEAD FACE. THE SIDE SLOPES SHALL BE DRESSED AT AN ANGLE TO PREVENT SLOUGHING AND/OR PROTECTED FROM ANTICIPATED MARINE ENVIRONMENT CONDITIONS. FILL SHALL NOT BE PERMITTED TO BEAR AGAINST THE FACE SHEETS OF A CELL UNTIL ALL SHEET PILES COMPRISING THAT CELL (FACE AND BOTH ADJACENT TAILWALLS) ARE FULLY INSTALLED TO THE REQUIRED PLAN ELEVATION.

CONTRACTOR'S ON-SITE PILE DRIVING SUPERINTENDENT AND PROJECT MANAGER FOR THIS PROJECT SHALL HAVE EXPERIENCE WITH INSTALLATION OF AT LEAST THREE (3) OPEN CELL SHEET PILE OR CLOSED CELL BULKHEADS OF SIMILAR MAGNITUDE WITHIN THE LAST EIGHT (8) YEARS. SUBMIT QUALIFICATIONS AND RESUMES AS REQUIRED IN THE CONTRACT DOCUMENTS.

SHEET PILES SHALL BE PLACED, DRIVEN, AND FULLY INTERLOCKED THROUGHOUT THEIR LENGTH WITH A VIBRATORY HAMMER, UNLESS APPROVED OTHERWISE BY ENGINEER, BY METHODS WHICH WILL ACHIEVE PENETRATION WITHOUT PILE DAMAGE TO FORM A CONTINUOUS WALL. THE NECESSARY DRIVING ENERGY OF THE HAMMER SHALL BE DETERMINED BY THE CONTRACTOR FOR THE CONDITIONS, PILING TYPE, DEPTH, AND SOIL TYPE. ANY PILE WHICH IS DAMAGED BY THE CONTRACTOR, IS OUT OF LOCATION, OR IS OTHERWISE OUT OF SPECIFICATION SHALL BE PULLED, AND REPAIRED OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

DRIVING HAMMERS SHALL MAINTAIN PROPER ALIGNMENT DURING DRIVING OPERATIONS. PILES SHALL BE STAGGER DRIVEN SUCH THAT THE TIPS OF ADJACENT PILES DO NOT VARY MORE THAN 5 FEET. IF THE PILING NEXT TO THE PILE BEING DRIVEN TENDS TO SETTLE BELOW FINAL ELEVATION IT MAY BE SECURED UTILIZING ATTACHMENT TO THE WEB ONLY (I.E., WELDING OF INTERLOCKS IS PROHIBITED).

THE CONTRACTOR SHALL HAVE ON-SITE BOTH A VIBRATORY AND IMPACT HAMMER WITH SUITABLE DRIVING HEADS FOR ALL PILES APPROPRIATE FOR FULL DRIVING AND EXTRACTION OPERATIONS. THE CONTRACTOR SHALL NOT USE ANY HAMMER OR OTHER EQUIPMENT THAT CAUSES DAMAGE TO A PILE.

EQUIPMENT FOR SPUDDING, DRILLING, AND/OR PRE-BORING MAY BE REQUIRED TO ACHIEVE PILE PENETRATION. ADDITIONALLY, INSTALLATION MAY REQUIRE TRENCHING AND BACKFILLING.

ALL SHEET PILE CUT-OFFS ON THIS PROJECT SHALL BECOME THE PROPERTY OF THE CONTRACTOR. THE CONTRACTOR SHALL REMOVE THE PILE CUTOFFS FROM THE PROJECT SITE.

SHEET PILE INSTALLATION PLAN –

THE CONTRACTOR SHALL PREPARE AND SUBMIT A PILE INSTALLATION PLAN FOR OWNER REVIEW AND APPROVAL. ANY PROPOSED CHANGES TO THE PILE DRIVING PLAN SHALL BE SUBMITTED IN WRITING FOR OWNER APPROVAL PRIOR TO MOBILIZATION. CONTRACTOR SHALL REFERENCE THE NORTH AMERICAN STEEL SHEET PILING ASSOCIATION (NASSPA) STEEL SHEET PILING INSTALLATION GUIDE. AT A MINIMUM, THE PLAN SHALL INCLUDE:

- LIST OF ALL EQUIPMENT TO BE USED DURING PILE DRIVING ACTIVITIES.
- LIMITATIONS AND CAPACITIES OF LISTED EQUIPMENT INCLUDING, BUT NOT LIMITED TO: CRANE CAPACITY AND MAXIMUM REACH WITH SPECIFIED HAMMER AND MAXIMUM LENGTH OF SHEET PILE, AND PILE DRIVING HAMMER RATED ENERGY.
- DEBRIS REMOVAL AND DISPOSAL PLAN INCLUDING EQUIPMENT AND INTENDED METHODS.
- PROPOSED MEANS OF ACCESS TO FACE OF BULKHEAD INCLUDING GENERAL DESCRIPTION OF STRUCTURES OR EMBANKMENTS TO BE UTILIZED TO PROVIDE ACCESS.
- PROPOSED TEMPLATE CONFIGURATION INCLUDING NUMBER OF TEMPLATES TO BE USED ON THE PROJECT, SEQUENCE FOR INSTALLATION OF TEMPLATES, AND TEMPLATE SHOP DRAWINGS.
- SHEET PILE HANDLING AND METHODS TO BE UTILIZED TO PREVENT DISTORTION OF SHEET PILE.
- PILE DRIVING METHODS AND SEQUENCE OF INSTALLATION.
- PILE DRIVING QUALITY CONTROL AND DOCUMENTATION METHODS.
- PROPOSED METHODS FOR CORRECTING DEFECTIVE WORK INCLUDING PILES INSTALLED OUTSIDE OF PLUMB TOLERANCE, PILES INSTALLED OUTSIDE OF PLAN LOCATION TOLERANCE, AND PILES DAMAGED DURING INSTALLATION.
- RESUMES FOR PILE DRIVING SUPERINTENDENT AND PROJECT MANAGER.
- INSTALLATION PLAN AND DETAILS FOR HARD DRIVING.

SHEET PILE THREADING –

IT IS RECOMMENDED THAT A SHEET PILE THREADER (STAB CAT® OR SIMILAR) BE USED FOR THREADING OF ALL SHEET PILE. SNIPING OF SHEET PILE SHALL ONLY OCCUR AT THE TOP OF THE SHEET PILE WITHIN THE PORTION OF SHEET ABOVE FINAL CUT-OFF ELEVATION PER THE PROVIDED DETAILS, UNLESS NOTED OTHERWISE. THE CONTRACTOR SHALL CHECK THE INTERLOCKS PRIOR TO LIFTING TO ENSURE THEY ARE CLEAR AND WILL FUNCTION PROPERLY. ALL SHEETS, ANCHORS AND WYES SHALL BE ABLE TO SLIDE TO GRADE UNDER THEIR OWN WEIGHT WHEN INTERLOCKED AND SHALL NOT BIND DURING DRIVING (FREE SLIDING).



OPEN CELL™ AND OPEN CELL SHEET PILE™ ARE
 PND ENGINEERS, INC. REGISTERED TRADEMARKS
 PND ENGINEERS, INC.'S OPEN CELL TECHNOLOGY IS PATENTED
 PATENT – US 6,715,964 B2
 PATENT – US 7,488,140 B2
 PATENT – US 8,950,981 B2

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PROJECT: **CITY OF UNALASKA
 LIGHT CARGO DOCK EXPANSION**

TITLE: **GENERAL NOTE
 (2 OF 5)**

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| DESIGNED BY: CJR | DATE: MAY 2016 | SHEET NO: 16 |
| CHECKED BY: DST | PROJECT NO: 151125 | |

GENERAL NOTES (CONT.):

SHEET PILE TEMPLATE –

ALL SHEET PILE SHALL BE DRIVEN USING A TEMPLATE TO MAINTAIN TOLERANCES AND STABILITY DURING DRIVING. TEMPLATES SHALL BE ANALYZED AND DESIGNED BY THE CONTRACTOR TO PROVIDE ADEQUATE LATERAL STRENGTH, STIFFNESS, AND STABILITY TO ACCOMMODATE WATER PRESSURES, ENVIRONMENTAL FORCES, AND PILE INSTALLATION FORCES IN ORDER TO MAINTAIN PLAN WYE LOCATIONS.

SHEET PILE TEMPORARY WELDS –

TEMPORARY WELDS SHALL NOT BE PERFORMED ON SHEET PILE INTERLOCKS. TEMPORARY WELDS LOCATED ON THE SHEET PILE WEB SHALL BE REMOVED BY GRINDING AND SHALL BE FLUSH WITH THE ORIGINAL SURFACE. TEMPORARY WELDS SHALL NOT BE INTENTIONALLY BROKEN (I.E., DRIVEN THROUGH) DURING SHEET PILE DRIVING.

HARD DRIVING –

HARD DRIVING SHALL BE DEFINED AS A PENETRATION RATE DURING VIBRATORY DRIVING OF 2 FEET OR LESS PER MINUTE OR ANY INSTANCE WHEN AN IMPACT HAMMER IS IN USE. ENGINEER SHALL BE NOTIFIED AND PRESENT IN HARD DRIVING SITUATIONS AND THE TIP OF ANY SHEET SHALL NOT BE ADVANCED MORE THAN 2–FEET BEYOND THE ADJACENT SHEET. CARE SHALL BE TAKEN DURING HARD DRIVING TO AVOID INTERLOCK–MELT OR DAMAGE.

IF OBSTACLES ARE ENCOUNTERED ALONG THE CELL FACE THAT INTERFERE WITH SHEET DRIVING, THE DEBRIS SHALL BE EXCAVATED, REMOVED, AND THE SUBSEQUENT VOID REFILLED. IF OBSTACLES ARE ENCOUNTERED ALONG THE TAILWALL, THE DEBRIS WILL BE REMOVED AS PREVIOUSLY STATED, OR THE WALL ALIGNMENT MAY BE CURVED AWAY FROM THE OBSTACLE IN A SMOOTH CURVE AS APPROVED BY THE ENGINEER. IN SUCH EVENTS, THE ENGINEER SHALL BE CONTACTED IN ADVANCE OF REMOVING THE OBSTACLE OR REALIGNING THE TAILWALL. SHOULD SOFT SOILS BE ENCOUNTERED, FACE SHEETS MAY REQUIRE SUPPORT FROM THE TEMPLATE BEFORE FILLING.

ADDITIONAL ASSISTIVE METHODS SUCH AS: CHANGING OF VIBRATORY HAMMER FREQUENCY, USE OF IMPACT HAMMER, PILE PROBING, PRE–DRILLING, EXCAVATION, OR WATER JETTING MAY BE REQUIRED DURING HARD DRIVING AS APPROVED BY ENGINEER. CONTRACTOR SHALL NOT PROCEED WITH THESE METHODS UNTIL APPROVED BY ENGINEER. THE ENGINEER SHALL BE CONTACTED IMMEDIATELY IF HARD DRIVING IS ENCOUNTERED. THE CONTRACTOR MAY BE REQUIRED TO EXTRACT PILES EXPERIENCING HARD DRIVING TO VERIFY INTERLOCK INTEGRITY. PILES DRIVEN OUT OF INTERLOCK SHALL BE REMOVED AND REPLACED. WHERE IMPACT HAMMER IS UTILIZED, CONTRACTOR SHALL MAINTAIN 100–PERCENT DRIVING RECORDS FOR EACH PILE THAT SHALL INCLUDE DIMENSIONS OF DRIVING HELMET AND CAP, BLOWS–PER–FOOT FOR EACH FOOT OF PENETRATION, AND FINAL DRIVING RESISTANCE IN BLOWS–PER–INCH FOR THE FINAL 6 INCHES.

TIDAL VARIATION –

TIDAL VARIATION WILL AFFECT SHEET PILE CONSTRUCTION. RESULTING POTENTIAL DIFFERENTIAL WATER HEAD INSIDE AND OUTSIDE CELL CONSTRUCTION MUST BE MINIMIZED. TO ACCOMPLISH THIS, HOLES UP TO 12 INCHES IN DIAMETER MAY BE CUT THROUGH TAILWALLS AT LOCATIONS APPROVED BY THE ENGINEER.

FLAT SHEET PILE INSTALLATION SURVEY –

CONTRACTOR SHALL PROVIDE A REGISTERED PROFESSIONAL SURVEYOR TO ESTABLISH CELL LAYOUT PRIOR TO INSTALLING SHEET PILE AND PROVIDE PERIODIC (MINIMUM FREQUENCY OF ONCE PER WEEK) SURVEY OF LAYOUT AND ALIGNMENT DURING INSTALLATION. SURVEY SHALL, AT A MINIMUM, INCLUDE LOCATION AND ELEVATION OF ALL WYES, CELL APEX AND MIDPOINT AND END OF ALL TAILWALLS. SURVEYED LOCATIONS SHALL BE SUBMITTED TO THE OWNER WITHIN 1 DAY OF PERFORMING SURVEY. PRIOR TO COMPLETION OF BACKFILLING, A REGISTERED SURVEYOR SHALL PERFORM SURVEY AS DESCRIBED IN THE OPEN CELL BULKHEAD STABILIZATION SECTION.

FLAT SHEET PILE INSTALLATION TOLERANCE –

FACE SHEET PILES SHALL BE INSTALLED IN A SMOOTH CURVE BETWEEN WYE PILE AND ANCHOR PILES AND NOT MORE THAN 1/4–INCH PER FOOT LENGTH OUT OF PLUMB IN ANY DIRECTION. FACE AND ENDWALL SHEETS SHALL BE DRIVEN AND LEFT 1–FOOT ABOVE PLANNED CUT–OFF ELEVATION AND MONITORED AS DESCRIBED BELOW BEFORE CUT–OFF.

TAILWALL SHEET PILES SHALL BE DRIVEN IN A STRAIGHT LINE OR SMOOTH CURVE AS SHOWN, NOT MORE THAN 2 FEET FROM PLAN LOCATION, NOR MORE THAN 1/2–INCH PER FOOT LENGTH OUT OF PLUMB IN ANY DIRECTION. DRIVING SEQUENCE OF TAILWALL SHEETS SHALL BE FROM THE MOST CONSTRAINED END

TOWARDS THE FREE END (I.E., FROM WYE TOWARDS ANCHOR).

WYE PILES SHALL BE DRIVEN NOT MORE THAN 2 INCHES FROM PLAN LOCATION AT CUT–OFF ELEVATION, AND NOT MORE THAN 1/4–INCH PER FOOT OF LENGTH OUT OF PLUMB. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE RIGID BRACING, AS REQUIRED, TO MAINTAIN CELL GEOMETRY AND STABILITY DURING DRIVING AND BACKFILLING OPERATIONS.

FLAT SHEET PILE INSTALLATION RECORDS –

CONTRACTOR SHALL MAINTAIN A WRITTEN PILE DRIVING RECORD FOR 20% OF ALL SHEET PILE DRIVEN. INDICATE ON THE INSTALLATION RECORD THE FOLLOWING: INSTALLATION DATES AND TIMES, TYPE AND SIZE OF HAMMER, PENETRATION RATE, TOTAL DRIVING TIME, PILE LOCATIONS, TIP ELEVATIONS, GROUND ELEVATIONS, CUT–OFF ELEVATIONS, AND ANY RE–HEADING OR CUTTING OF PILES.

AS–BUILT TIP ELEVATION SHALL BE PROVIDED FOR EVERY PILE. AS–BUILT LOCATIONS OF TAILWALLS AND ANCHOR PILES SHALL ALSO BE PROVIDED. RECORD ANY UNUSUAL PILE DRIVING CONDITIONS. SUBMIT COMPLETE RECORDS TO THE ENGINEER.

ANODES –

ANODES SHALL BE ALUMINUM ALLOY OF THE SPECIFIED WEIGHT AND NOMINAL DIMENSIONS SHOWN ON THE PLANS AND HAVE THE FOLLOWING PROPERTIES:

- ELECTROCHEMICAL CAPACITY GREATER THAN OR EQUAL TO 1,150 A–HR/LB
- CONSUMPTION RATE LESS THAN OR EQUAL TO 7.6 LBS/A–YR
- OPEN CIRCUIT POTENTIAL MORE ELECTRONEGATIVE THAN OR EQUAL TO –1.05 V (AG/AGCL)

ANODES SHALL CONFORM TO NACE RP0387 AND THE COMPOSITION SPECIFIED IN THE FOLLOWING TABLE. SUBMIT A MANUFACTURER’S CERTIFICATE OF CONFORMITY.

| ELEMENT | PERCENT BY WEIGHT |
|---------------|-------------------|
| ZINC (ZN) | 2.5 – 5.75% |
| SILICON (SI) | 0.08 – 0.12% |
| IRON (FE) | 0.09% MAXIMUM |
| CADMIUM (CD) | 0.002% MAXIMUM |
| MERCURY (HG) | 0.001% MAXIMUM |
| TIN (SN) | 0.001% MAXIMUM |
| INDIUM (IN) | 0.015 – 0.020% |
| COPPER (CU) | 0.003% MAXIMUM |
| LEAD (PB) | N/A |
| ALUMINUM (AL) | REMAINDER BALANCE |

THE RECOMMENDED ALUMINUM ANODE MANUFACTURERS/TYPES ARE ALOLINE (FARWEST CORROSION CONTROL CO.), GALVALUME III, OR CORRPRO ALLOY 2, BUT OTHERS MAY BE USED. SUBMIT FOR APPROVAL.

THE STEEL CORE FOR ANODES SHALL BE ASTM A36 OR OTHER ENGINEER–APPROVED EQUAL FOR MILD STEEL BAR STOCK. THE CORE SHALL BE PLACED LONGITUDINALLY IN THE ANODE MATERIAL AND BE ABRASIVE BLASTED TO NEAR–WHITE FINISH IN ACCORDANCE WITH SSPC SP–10/NACE NO. 2. THE CORE SHALL BE CAST WITH THE ANODE MATERIAL WITHIN FOUR (4) HOURS OF BLASTING.

IF ANODES ARE NOT STORED INSIDE A BUILDING, TARPS OR SIMILAR PROTECTION SHALL BE USED TO PROTECT ANODES FROM INCLEMENT WEATHER.

ANODE CHANNELS OF THE SPECIFIED LENGTH/SIZE SHALL BE INSTALLED AT THE DEPTH INDICATED AND AT THE LOCATIONS SHOWN ON THE PLANS. LOCATIONS AND/OR DEPTHS MAY BE ADJUSTED TO CLEAR OBSTRUCTIONS OR MUDLINE WITH THE APPROVAL OF THE ENGINEER.

ANODE CHANNELS SHALL BE INSTALLED BY WELDING ABOVE WATER. GRIND LOCALIZED AREA OF SHEET PILE PRIOR TO WELDING TO ENSURE METALLIC CONTACT BETWEEN ANODE CHANNEL AND SHEET PILE. REMOVE MARINE GROWTH AS NECESSARY FOR INSTALLATION OF ANODE CHANNELS.

OPEN CELL SHEET PILE FILLING –

FILL WITHIN THE SHEET PILE CELLS SHALL CONSIST OF MATERIALS AS INDICATED IN THE PLANS. THE INITIAL FILL FROM EXISTING MUDLINE TO ELEVATION +7 MLLW SHALL NOT BE DUMPED INTO FINAL POSITION, BUT SHALL BE DUMPED ON TOP OF THE EMBANKMENT AND PUSHED INTO PLACE IN A MANNER THAT WILL ENSURE PROPER PLACEMENT SUCH THAT VOIDS, POCKETS, SEGREGATION AND BRIDGING WILL BE REDUCED TO A MINIMUM.

BULK FILL PLACED AFTER SHEET PILE INSTALLATION UP TO ELEVATION +7 MAY BE 18–INCH MINUS MATERIAL, OCCASIONAL STONES MEASURING 24” ARE ALLOWED IN AREAS AWAY FROM TAILWALLS. ALL BULK FILL BELOW ELEVATION +7 SHALL BE PLACED IN 18–INCH THICK MAXIMUM HORIZONTAL LIFTS. FILL ABOVE +7 SHALL BE WELL GRADED 12–INCH MINUS SHOT ROCK FILL PLACED IN 12–INCH MAXIMUM HORIZONTAL LIFTS.

EACH LIFT ABOVE +4 MLLW SHALL BE COMPACTED BY NO LESS THAN 5 PASSES OF A 10–TON VIBRATORY ROLLER, COMPACTING BEHIND THE TAILWALL FIRST, THEN DOWN BOTH SIDES OF THE TAILWALL WORKING TOWARDS THE CELL FACE. COMPACT THE MIDDLE OF THE CELL WORKING FROM THE BACK OF THE TAILWALL TOWARDS THE FACE. SMALLER COMPACTORS AND ADDITIONAL CARE SHALL BE USED TO COMPACT WITHIN 3–FEET OF THE FACE SHEET PILES TO PREVENT DAMAGE OR DISTORTION TO THE BULKHEAD FACE. SPECIAL CARE SHALL ALSO BE USED TO OBTAIN THOROUGH COMPACTION AGAINST TAILWALL SHEET PILES. ONE PASS SHALL CONSIST OF THE COMPACTOR TRAVELING OVER AN AREA ONCE WITH THE VIBRATORY SYSTEM OPERATING AND AT LESS THAN 2.0 FT/SEC (1.5 MPH).

FILL SHALL BE PLACED AS FOLLOWS AROUND SHEET PILE CELLS TO PREVENT DISTORTION OF THE BULKHEAD. ALL FACE AND ADJACENT TAILWALL SHEETS IN A CELL SHALL BE INSTALLED TO REQUIRED ELEVATION PRIOR TO PLACING FILL AGAINST THE FACE OF THE CELL. TEMPORARY WORK PADS SHALL BE PLACED SUCH THAT SOIL PRESSURE IS NOT APPLIED TO SHEET PILE FACE. PLACE FILL IN APPROXIMATELY LEVEL LIFTS ACROSS THE ENTIRE CELL AREA WITH NO MORE THAN 3 FEET OF ELEVATION DIFFERENCE BETWEEN EACH ADJACENT CELL.

DO NOT PLACE OVER–STEEPENED FILL IN OR BEHIND THE CELLS. SPREAD FILL IN LEVEL LIFTS STARTING AROUND THE END OF THE ANCHORS AND EVENLY GRADING INTO PLACE. WORK FORWARD ALONG THE TAILWALLS TOWARD THE FACE OF THE CELL. DO NOT PUSH FILL DIRECTLY AGAINST THE FACE SHEETS. THE CONTRACTOR IS CAUTIONED THAT UNEVEN FILLING OF CELLS OR FAILURE TO MAINTAIN PLAN DISTANCE BETWEEN WYES WILL RESULT IN UNDESIRABLE DISTORTIONS OF THE SHEET PILE WALL WHICH THE CONTRACTOR SHALL BE REQUIRED TO CORRECT. MATERIAL THAT IS LOST TO TIDE OR WAVE ACTION SHALL BE INCIDENTAL TO THE CONTRACT SUM. IF CELLS DISTORT DURING DRIVING OR FILL PLACEMENT, THE CONTRACTOR (AT CONTRACTORS EXPENSE) SHALL EXCAVATE FILL, CORRECT THE SHEETS, AND REFILL AS DIRECTED BY THE ENGINEER.

VIBRACOMPACTION –

VIBRACOMPACTION SHALL BE PERFORMED AROUND THE ENTIRETY OF THE SHEET PILE WALL STRUCTURES IN THE AREAS DESIGNATED ON THE PLANS. VIBRACOMPACTION SHALL CONSIST OF DRIVING A STEEL PILE PROBE WITH A VIBRATORY HAMMER THROUGHOUT THE DESIGNATED AREA. THE PROBE SHALL BE AS DETAILED & UTILIZED FOLLOWING THE PROCEDURE ON THE PLANS.

VIBRACOMPACTION SHALL ONLY BE PERFORMED ONCE FILL HAS REACHED THE ELEVATION SHOWN ON THE PLANS.

THE VIBRATORY HAMMER UTILIZED FOR VIBRACOMPACTION SHALL HAVE A MINIMUM HORSEPOWER OF 300 HP AND MINIMUM ECCENTRIC MOMENT OF 2,000 IN–LBS OR AS OTHERWISE APPROVED BY THE ENGINEER.

OPEN CELL BULKHEAD STABILIZATION –

OPEN CELL SHEET PILE STRUCTURES ARE SUSCEPTIBLE TO DISTORTION AND DAMAGE PRIOR TO COMPLETION OF BACKFILLING. CONTRACTOR SHALL PROTECT SHEET PILE, PLACE, AND COMPACT FILL IN ACCORDANCE WITH SPECIFICATION AS SOON AS PRACTICAL UPON COMPLETION OF EACH INDIVIDUAL CELL. IN SOME INSTANCES, BRACING MAY BE REQUIRED UNTIL AFTER BACKFILLING AND COMPACTION IS COMPLETE. CELL SETTLEMENT SHALL BE CONSIDERED STABILIZED AFTER ALL ADJACENT PILES ARE INSTALLED AND DIRECTIONAL MOVEMENT (HORIZONTAL AND VERTICAL) RATES SLOW TO 0.02–FEET OR LESS PER TWO WEEKS. SHEET PILE CUT–OFF, WELDING ON FACE SHEETS, AND INSTALLATION OF MOVEMENT SENSITIVE APPURTENANCES SHALL NOT OCCUR UNTIL CELL STABILIZATION AND AFTER ENGINEER APPROVAL.

DURING AND AFTER FILLING, THE BULKHEAD FACE IS EXPECTED TO MOVE 6 INCHES OR MORE OUTWARD (SEE FIGURE FOR ANTICIPATED CELL MOVEMENT) AND TO SETTLE VERTICALLY. AFTER FILLING TO GRADE, VERTICAL AND HORIZONTAL MOVEMENT OF THE CELLS SHALL BE MEASURED BY THE CONTRACTOR’S SURVEYOR AT LEAST ONCE EVERY WEEK. PROVIDE LOCATIONS OF WYES AND CENTER OF CELLS TO WITHIN 0.02 FEET IN THE X, Y, AND Z PLANES. COORDINATES SHALL BE SUBMITTED TO ENGINEER WITHIN ONE DAY OF SURVEY COMPLETION. SURVEYING SHALL CONTINUE UNTIL ENGINEER HAS DETERMINED THE CELL HAS STABILIZED. ADDITIONAL GRADING MAY BE REQUIRED TO COMPENSATE FOR BULKHEAD SETTLEMENT AND SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT SUM.

FACE BEAM ALIGNMENT –

AFTER CELL SETTLEMENT HAS STABILIZED AS DEFINED IN “OPEN CELL BULKHEAD STABILIZATION”, THE CONTRACTOR SHALL PROVIDE AN AS–BUILT SURVEY OF THE CONSTRUCTED SHEET PILE DOCK SPECIFICALLY IDENTIFYING ALL FINAL WYE LOCATIONS AND THE SEAWARD APEX AND QUARTER POINTS OF EACH CELL TO THE ENGINEER. A FINAL FACE ALIGNMENT SHALL BE ESTABLISHED AND APPROVED BY THE ENGINEER TO WHICH THE FACE BEAM SHALL BE ALIGNED.

MOORING CLEAT –

ALL MOORING CLEATS SHALL BE 24” WASHINGTON CHAIN AND SUPPLY DOMESTIC “WELD ON DECK CLEATS” OR ENGINEER APPROVED EQUAL.

TIMBER FACING –

ALL SAWN TIMBER SHALL BE SURFACED FOUR SIDES (S4S), UNLESS OTHERWISE NOTED ON THE PLANS, AND CONFORM TO NO. 1 AND BETTER COASTAL REGION DOUGLAS FIR, ACCORDING TO WHPA GRADING RULES. NO INDIVIDUAL TIMBER SHALL FALL OUTSIDE THE SPECIFIED GRADE. EACH PIECE OF LUMBER SHALL BE STAMPED WITH A GRADE MARK, WHICH IDENTIFIES THE GRADING AND CERTIFICATION, AND SHALL BE SO MARKED AS TO BE LEGIBLE AFTER PRESSURE TREATMENT. ALL SAWN TIMBER SHALL BE PRESSURE TREATED. SAWN TIMBERS SHALL BE PRESSURE TREATED WITH ACZA PER CURRENT AWWA U1 AND T1 SPECIFICATIONS TO A NET DRY SALT RETENTION OF NOT LESS THAN 0.6 POUNDS PER CUBIC FOOT. FABRICATION AND DRILLING OF TIMBER SHALL BE DONE AS MUCH AS POSSIBLE BEFORE PRESSURE TREATMENT. ALL DRILLED HOLES, CUTS AND MINOR DAMAGED AREAS THAT OCCUR POST PRESSURE TREATMENT SHALL BE FIELD TREATED PER AWWA M–4, WITH AN ENGINEER APPROVED TREATMENT PRODUCT. BOLT HOLES SHALL BE 1/8 INCH OVERSIZED.

UHMW–PE FENDER FACING –

PROTECTIVE FACING SHALL BE YELLOW IN COLOR, MADE OF 100% UHMW POLYETHYLENE WITH 2.5% BY WEIGHT UV–STABILIZATION COMPOUND, SHALL BE PARTIALLY OR FULLY CROSSLINKED, HAVE UV–STABILIZING DYES, AND BE SUITABLE FOR LONG TERM EXTERIOR EXPOSURE

UHMW–PE PANELS SHALL CONFORM TO ASTM D3035 AND F714 AND MEET THE FOLLOWING REQUIREMENTS:

| TEST | STANDARD | REQUIREMENT |
|--|-------------|------------------|
| SPECIFIC GRAVITY | ASTM D792 | 0.94 MIN |
| MOLECULAR WEIGHT | N/A | 3,000,000 MIN |
| ULTIMATE TENSILE STRENGTH | ASTM D638 | 4,000 PSI MIN |
| IZOD IMPACT, DOUBLE NOTCH | ASTM D256A | 18 FT–LBS/IN MIN |
| COEFFICIENT OF FRICTION | ASTM D1894 | 0.20 MAX |
| ABRASION INDEX (CARBON STL=100) | SAND SLURRY | 18 MAX |
| ABRASION TABER (CS17 WHEEL, 1000G, 5000 REVOLUTIONS) | ASTM D4060 | WGT LOSS <30mg |

STORM DRAIN CONNECTION TO EXISTING WATER VAULT –

CONNECTIONS TO EXISTING WATER VAULT SHALL BE MADE IN A WORKMANLIKE MANNER. THE DRAIN LINE INVERT SHALL BE BROUGHT INTO THE EXISTING WATER VAULT FLUSH TO THE BOTTOM OF THE VAULT. THE INSTALLED DRAIN PIPE SHALL BE SCREENED TO PREVENT ENTRY OF GROUT OR OTHER DEBRIS FROM ENTERING THE SYSTEM. AFTER CONNECTION IS MADE TO THE WATER VAULT AND THE MORTAR HOLDING THE PIPE IN PLACE HAS SET, CUT THE PIPE OFF EVENLY SO THAT NO MORE THAN TWO INCHES (2”) OF PIPE PROTRUDES INTO THE VAULT AND ANY SCREENING SHALL BE REMOVED. FINAL INVERT ELEVATION SHALL BE FIELD VERIFIED PRIOR TO INSTALLING THE CONNECTION. THE EXISTING DRAIN HOLE



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ENGINBBS, INC.

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|--------------|-----|--|-----------------|
| PROJECT: | | CITY OF UNALASKA LIGHT CARGO DOCK EXPANSION | |
| TITLE: | | GENERAL NOTE (3 OF 5) | |
| DESIGNED BY: | CJR | DATE: | MAY 2016 |
| CHECKED BY: | DST | PROJECT NO: | 151125 |
| SHEET NO: | | | 17 OF 19 |

GENERAL NOTES (CONT.):

SHALL BE CAPPED WITH AN INTERNAL END PLUG AND SEALED WITH GROUT.

STORM DRAIN PIPE –

STORM DRAIN PIPE SHALL BE HDPE SDR 17. ALL PIPE AND FITTINGS SHALL BE IN ACCORDANCE WITH ASTM D3350. HDPE PIPE AND FITTING MATERIAL COMPOUND IS TO CONTAIN COLOR AND ULTRAVIOLET (UV) STABILIZER MEETING OR EXCEEDING THE REQUIREMENTS OF CODE C PER ASTM D3350.

STORM DRAIN PIPE TO BE INSTALLED AS SHOWN IN PLANS. CONTRACTOR SHALL JOIN PIPE LENGTHS BY BUTT FUSION OR ELECTROFUSION COUPLINGS PER THE MANUFACTURERS WRITTEN RECOMMENDATIONS. FOR FLANGED FITTINGS AT VALVES AND OTHER APPURTENANCES PROVIDE A STUB END WITH 316 STAINLESS STEEL RETAINING RING AT MINIMUM OPERATING PRESSURE OF 250 PSI WITH GASKETS PER PIPE MANUFACTURER'S WRITTEN INSTRUCTIONS.

VARIANCE OF INDIVIDUAL PIPE SECTIONS FROM ESTABLISHED LINE AND GRADE SHALL NOT BE GREATER THAN 0.03 FEET, PROVIDING THAT SUCH VARIANCE DOES NOT RESULT IN A LEVEL OR REVERSE SLOPING INVERT. THE BOTTOM OF THE PIPE SHALL BE IN CONTACT WITH THE BEDDING MATERIAL THROUGHOUT ITS FULL LENGTH. FINAL INVERT LOCATIONS, ELEVATIONS, AND LENGTH SHALL BE FIELD VERIFIED AND RECORDED AS PART OF THE AS-BUILT SURVEY.

STORM DRAIN CHECK VALVE –

CHECK VALVE SHALL BE SIX (6) INCH TIDEFLEX SERIES 35–1' FLANGED CONNECTION, ECCENTRIC FLAT BOTTOM VALVE CONSTRUCTED OF EPDM WITH 316 STAINLESS STEEL RETAINING RING.

CONNECT TIDEFLEX DIRECTLY TO A FLANGED FITTING THAT IS BUTT FUSED TO THE DRAIN LINE. INSTALL 316 STAINLESS STEEL RETAINING RING, NUTS, BOLTS, AND WASHERS PER MANUFACTURERS WRITTEN INSTRUCTIONS.

SHEET PILE WALL PENETRATION PIPE SEAL –

SHEET PILE WALL PENETRATION SEAL SHALL BE 'INNERLYNX IL310–S316', OR ENGINEER APPROVED EQUAL.

INSTALL WALL PENETRATION SEAL AT LOCATION SHOWN ON THE PLANS AND PER MANUFACTURERS WRITTEN RECOMMENDATIONS.

DUCTILE IRON PIPE –

DUCTILE IRON PIPE SHALL BE CLASS 52, AWWA C–150, DUCTILE IRON PIPE MANUFACTURED IN ACCORDANCE WITH AWWA C151. USE U.S. PIPE TYTON JOINT. RESTRAIN JOINTS A MINIMUM OF 75 FEET FROM FITTINGS AND VALVES. USE U.S. PIPE FIELD LOK 350 GASKETS WITH U.S. PIPE TYTON JOINT PIPE OR USE U.S. PIPE MECHANICAL JOINT PIPE. FITTINGS SHALL BE MECHANICAL JOINT CONFORMING TO AWWA C110 OR AWWA C153, WITH EBAA IRON MEGALUG JOINT RESTRAINT PACKAGE. EXTERIOR OF PIPE AND FITTINGS SHALL HAVE BITUMINOUS COATINGS IN ACCORDANCE WITH AWWA C104 FOR PIPE AND AWWA C110 FOR FITTINGS. INTERIOR OF PIPE AND FITTINGS SHALL BE CEMENT MORTAR LINED IN ACCORDANCE WITH AWWA C104. WHERE RESTRAINED JOINT PIPE IS NOT REQUIRED, USE U.S. PIPE TYTON GASKETS. PROVIDE POLYETHYLENE ENCASEMENT OVER ALL PIPE AND FITTINGS CONFORMING TO AWWA C105.

ALL DUCTILE IRON PIPE SHALL BE INSTALLED PER ANSI/AWWA C600 AND PER THE LINE AND GRADE AS SHOWN ON THE PLANS. PIPE AND MATERIAL HANDLING AND STORAGE SHALL BE PER THE MANUFACTURERS WRITTEN INSTRUCTIONS AND TO THE SATISFACTION OF THE ENGINEER. STORE RUBBER GASKETS IN A COOL, DARK PLACE OUT OF EXPOSURE TO SUNLIGHT.

THE TRENCH BOTTOM SHALL BE GRADED TO PROVIDE UNIFORM SUPPORT FOR THE PIPE AND APPURTENANCES. DUCTILE IRON PIPE SPIGOTS SHALL BE INSERTED THE PROPER LENGTH INTO BELLS AS RECOMMENDED BY THE PIPE MANUFACTURER. BELL AND SPIGOT GASKETS SHALL BE PROPERLY LUBRICATED WITH A NON–TOXIC LUBRICANT APPROVED BY THE MANUFACTURER.

AT A SUFFICIENT DISTANCE TO AN OBSTACLE OR TYING INTO AN EXISTING WATER LINE, THE CONTRACTOR SHALL EXPOSE AND VERIFY THE EXACT LOCATION AND ELEVATION OF THE OBSTACLE OR EXISTING WATER LINE SO THAT ALIGNMENT AND/OR GRADE OF THE NEW WATER LINE CAN BE SUITABLY ADJUSTED. EXTRA COSTS INCURRED BY THE CONTRACTOR DUE TO INADEQUATE VERIFICATION OF OBSTACLES OR TIE–IN LINES SHALL BE AT HIS OR HER EXPENSE.

ALL ADJUSTMENTS TO LINE AND GRADE SHALL BE DONE BY CAREFULLY

EXCAVATING TRENCH BOTTOM OR SIDEWALL EARTHEN MATERIAL OR FILLING WITH SUITABLE COMPACTED EARTH UNDER THE BODY OF THE PIPE.

A MAXIMUM 0.2–FEET DEVIATION FROM DESIGN ELEVATION AND ALIGNMENT WILL BE ALLOWED. THE PIPE SHALL BE GENERALLY STRAIGHT TO VISUAL OBSERVATION AS DETERMINED BY THE ENGINEER.

ANGULAR DEFLECTION OF WATER LINE JOINTS, AS REQUIRED FOR VERTICAL GRADE CHANGES OR HORIZONTAL CURVES, SHALL BE LIMITED TO 50% OF THE MANUFACTURERS MAXIMUM RECOMMENDED DEFLECTION.

POLYETHYLENE ENCASEMENT SHALL BE INSTALLED ON DUCTILE IRON WATER LINE. POLYETHYLENE CASEMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE METHODS DESCRIBED IN AWWA C105/ANSI A21.1.

PROVIDE BLUE 4–MIL THICK BY 6–INCH WIDE POLYETHYLENE UNDERGROUND WARNING TAPE WITH THE WORDS "CAUTION – BURIED WATER LINE" 6–INCHES ABOVE THE TOP OF PIPE.

CONTINUITY STRAPS –

PROVIDE TWO BRONZE WEDGES PER JOINT OR TWO CADWELDED INSULATED 00 AWG COPPER WIRE PER JOINT. FIELD COAT CADWELDS WITH A BITUMINOUS COATING TO PREVENT CORROSION.

HDPE WATER SERVICE PIPE –

WATER SERVICE PIPE SHALL BE HDPE SDR 11, WITH A MINIMUM PRESSURE RATING OF 160 PSI. ALL HDPE PIPE AND FITTINGS SHALL CONFORM TO AWWA C906 AND SHALL BE MANUFACTURED FROM PE4710 POLYETHYLENE COMPOUNDS THAT MEET OR EXCEED ASTM D3350 CELL CLASSIFICATION 445574, BUTT–FUSION TYPE. HDPE PIPE AND FITTING MATERIAL COMPOUND IS TO CONTAIN COLOR AND ULTRAVIOLET (UV) STABILIZER MEETING OR EXCEEDING THE REQUIREMENTS OF CODE C PER ASTM D3350. ALL FITTINGS ARE TO HAVE PRESSURE CLASS RATINGS NOT LESS THAN THE PRESSURE CLASS RATING OF THE PIPE TO WHICH THEY ARE ADJOINING.

ALL WATER SERVICE PIPE SHALL BE CERTIFIED BY THE NSF FOR POTABLE WATER SERVICE. ALL OUTSIDE DIAMETERS SHALL CONFORM TO IRON PIPE SIZE (IPS). FOR FLANGED FITTINGS AT VALVES AND OTHER APPURTENANCES PROVIDE A STUB END WITH CONVOLUTED DUCTILE IRON BACK–UP RING AT MINIMUM OPERATING PRESSURE OF 250 PSI WITH GASKETS PER PIPE MANUFACTURER'S WRITTEN INSTRUCTIONS.

ALL HDPE WATER LINE SHALL BE INSTALLED ACCORDING TO ASTM D 2774 AND ASTM F 645. WATER LINE PIPE TO BE INSTALLED AS SHOWN IN PLANS. CONTRACTOR SHALL FURNISH AND INSTALL PIPE BENDS, FITTINGS, AND ANY OTHER PARTS REQUIRED TO INSTALL WATER SYSTEM. COORDINATE WITH WATER UTILITY DIVISION FOR OPERATION OF VALVES REQUIRED FOR INSTALLATION. PROVIDE REQUEST TO THE WATER UTILITY DIVISION A MINIMUM OF SEVENTY–TWO (72) HOURS PRIOR TO PLANNED START OF WATER PIPE INSTALLATION WORK. FINAL INVERT LOCATIONS, ELEVATIONS, AND LENGTHS SHALL BE FIELD VERIFIED AND RECORDED AS PART OF THE AS–BUILT SURVEY.

WATER LINE PRESSURE TESTING AND DISINFECTION –

PRIOR TO ACCEPTANCE, CONTRACTOR SHALL "OPEN–BORE" FLUSH THE WATER PIPE, THEN PERFORM HYDROSTATIC TESTS AND DISINFECTION. CONTRACTOR SHALL FURNISH, INSTALL, AND REMOVE ALL PUMPS, FITTINGS, AND PIPES NECESSARY TO PERFORM THE FLUSHING; AND SHALL DISPOSE OF ALL WATER AND DEBRIS FLUSHED FROM THE PIPE. HYDROSTATIC TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH AWWA C600 FOR DUCTILE IRON PIPE AND AS STATED HERE AFTER. THE HYDROSTATIC PRESSURE SHALL BE A MINIMUM OF 150 PSI OR 1–1/2 TIMES THE OPERATING PRESSURE OF THE WATER PIPE, WHICHEVER IS GREATER, UNLESS OTHERWISE DIRECTED BY THE ENGINEER. OWNERS REPRESENTATIVE SHALL BE PRESENT TO WITNESS DISINFECTION, FLUSHING, AND PRESSURE TESTING. ALL TEST RESULTS AND LAB TESTING, INCLUDING COLIFORM AND CHLORINE RESIDUALS, MUST BE SIGNED AND SUBMITTED TO THE OWNER. HDPE PIPE TESTING SHALL BE PERFORMED IN COMPLIANCE WITH PRINTED MANUFACTURERS SPECIFICATIONS. ACCEPTABLE PRESSURE AND LEAKAGE LOSSES FOR HDPE PIPE SHALL BE DETERMINED PER PIPE MANUFACTURERS PRINTED SPECIFICATIONS.

DISINFECTION BY CHLORINATION OF ALL NEW WATER PIPE SHALL BE COMPLETED AND A SATISFACTORY REPORT OBTAINED PRIOR TO PLACING THE PIPE IN SERVICE. "OPEN–BORE" FLUSHING SHALL BE COMPLETED BEFORE CHLORINATION HAS BEGUN. DECHLORINATE DISINFECTION WATER PRIOR TO DISCHARGE. CONTRACTOR

SHALL USE CONTINUOUS FEED METHOD AS SPECIFIED IN AWWA C651 TO DISINFECT THE NEWLY INSTALLED WATER SERVICE. AFTER DECHLORINATION IS COMPLETE, SAMPLES SHALL BE TAKEN AND TESTED ACCORDING TO AWWA C651. SAMPLES SHALL BE COLLECTED AND TESTED BY A QUALIFIED PERSON AND PROCESSED IN A CERTIFIED LAB.

THE CONTRACTOR MAY SUBMIT A DEVIATION REQUEST TO THE ENGINEER FOR REVIEW AND APPROVAL FOR ALTERNATE DISINFECTION PLANS THAT MEET THE REQUIREMENTS OF ANSI/AWWA C651.

WATER SERVICE BLOW OFF HYDRANT –

BLOW–OFF HYDRANT SHALL BE NON–FREEZING, SELF DRAINING TYPE WITH A MINIMUM DEPTH OF BURY OF 4 FEET. SET UNDERGROUND IN A VAULT WITH HINGE ACCESS LID. THE HYDRANT WILL BE FURNISHED WITH A 2" FIP VERTICAL INLET, A NON–TURNING OPERATING ROD, AND SHALL OPEN TO THE LEFT. ALL WORKING PARTS SHALL BE BRONZE–TO–BRONZE DESIGN WITH AN ALUMINUM PLUNGER AND BE SERVICEABLE FROM ABOVE GRADE WITHOUT DIGGING. THE OUTLET SHALL BE BRONZE AND BE 2" NST. HYDRANTS SHALL BE LOCKABLE TO PREVENT UNAUTHORIZED USE AS MANUFACTURED BY KUPFERLE FOUNDRY CO., MAINGUARD NO. #78, OR APPROVED EQUAL.

WATER METER AND METER TRANSCIVER UNIT –

WATER METER PROVIDED BY WATER UTILITY DIVISION. TWO WATER METER TRANSCIVER UNITS (MXU) TO BE PROVIDED BY WATER UTILITY DIVISION.

DISCONNECT EXISTING WATER METER WITHIN VAULT. REPLACE EXISTING WATER METER WITH METER PROVIDED BY WATER UTILITY DIVISION. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL LABOR AND MATERIALS REQUIRED TO REMOVE AND REPLACE WATER METER.

ASSEMBLE METER TRANSCIVER UNIT (MXU). PLACE MXU CAP AS SHOWN IN DETAIL AND INSTALL RETAINING RING. RAISE MXU INTO POSITION UNTIL IT IS SEATED WITHIN CAP, VERIFY VERTICAL POSITION WILL NOT DAMAGE MXU.

PULL CABLE FROM MXU INTO VAULT. DO NOT CONNECT MXU.

RIGID BOARD INSULATION –

RIGID BOARD INSULATION SHALL BE RIGID BOARD INSULFOAM R TECH, 40 PSI OR ENGINEER APPROVED EQUAL.

INSULATION SHALL BE INSTALLED WITH STAGGERED JOINTS AND PER THE MANUFACTURERS WRITTEN INSTRUCTIONS.

CAST–IN–PLACE (CIP) / PRECAST CONCRETE –

CEMENT SHALL CONFORM TO ASTM C150 TYPE II, OR TYPE I OR III WITH TRI–CALCIUM ALUMINATE CONTENT BELOW 8%. AGGREGATE SHALL CONFORM TO ASTM C33 WITH MAXIMUM SIZE OF 1 INCH. CONCRETE SHALL HAVE A MINIMUM 28–DAY COMPRESSIVE STRENGTH OF 6,000 PSI. ENTRAINED AIR SHALL BE 5% TO 8%. CONCRETE SHALL CONTAIN: A MINIMUM OF 6.5 SACKS CEMENT/CUBIC YARD; WATER/CEMENTITIOUS RATIO OF 0.40 MAXIMUM; AND A MINIMUM OF 35 LBS SILICA FUME/CUBIC YARD OF CONCRETE. MIX DESIGN, MIXING, FORMING, PLACING, CURING, TESTING, ETC., SHALL FOLLOW THE STANDARDS SET BY ACI 318, 301, 306, AND 117 AND ASTM C94.

CONCRETE JOINT SEALANT –

ALL JOINTS SHALL BE SEALED WITH SONNEBORN SONOMERIC 1 OR APPROVED EQUAL. INSTALL PER MANUFACTURER RECOMMENDATIONS.

EXPANSION JOINT BACKER MATERIAL –

USE 1/2" CERAMAR EXPANSION JOINT FILLER, AS MANUFACTURED BY W.R. MEADOWS, SEALTIGHT OR ENGINEER APPROVED EQUAL.

REMOVABLE PLASTIC JOINT CAP –

REMOVABLE PLASTIC JOINT CAP SHALL BE SNAP–CAP AS MANUFACTURED BY W.R. MEADOWS, SEALTIGHT OR ENGINEER APPROVED EQUAL.

EXPANSION JOINT DOWEL EPOXY –

HILTY HIT–RE 100 OR ENGINEER APPROVED EQUAL.

REINFORCING STEEL –

ALL REINFORCING SHALL BE NEW BILLET STOCK GALVANIZED/METALIZED ASTM A706 GRADE 60 WITH A CARBON EQUIVALENCY NOT TO EXCEED 0.55 (AS CALCULATED PER AWS). REINFORCING SHALL BE GALVANIZED PER ASTM A767 WITH THE CHROMATING REQUIREMENTS OF SECTION 4.3 OMITTED. ALL COATED REINFORCING BAR SHALL BE COATED AFTER ANY REQUIRED BENDING OR FABRICATION. BARS SHALL BE SUPPORTED ON APPROVED CHAIRS OR WELL–CURED CONCRETE BLOCKS. TIE WIRES SHALL BE GALVANIZED. REINFORCING STEEL SHALL BE DETAILED, BENT, AND PLACED IN ACCORDANCE WITH THE LATEST ACI 318 AND 117. CONCRETE REINFORCING SHALL HAVE 3–INCH MINIMUM CLEARANCE WHEN CAST AGAINST THE EARTH AND 2–INCH MINIMUM CLEARANCE ELSEWHERE UNLESS NOTED OTHERWISE. REINFORCEMENT SHALL BE LAP–SPICED FOR TENSION PER ACI 318 AND BE A MINIMUM LENGTH OF 24 INCHES UNLESS OTHERWISE NOTED ON THE DRAWINGS. BARS SHALL BE CLEAN AND FREE FROM CUTTING OIL OR OTHER DELETERIOUS MATERIAL.

CONCRETE SEALING TREATMENT –

APPLY SILOXA–TEK 8500 AS MANUFACTURED BY GHOSTSHIELD, OR ENGINEER APPROVED EQUAL, TO CONCRETE SURFACE AFTER CURING FOR A MINIMUM OF 28 DAYS. PREPARE AND CLEAN THE CONCRETE SURFACE PRIOR TO APPLICATION OF SEALANT IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDED INSTRUCTIONS.

IF TEMPERATURE OR WEATHER CONDITIONS DO NOT ALLOW FOR SEALANT APPLICATION, THE SEALANT SHALL BE INSTALLED THE FOLLOWING SUMMER ON WARRANTY.

CAST–IN–PLACE (CIP) CONCRETE INSTALLATION –

MIX DESIGN, MIXING, FORMING, PLACING, CURING, TESTING, ETC., SHALL FOLLOW THE STANDARDS SET BY ACI 318, 301, 306, AND 117 AND ASTM C94. BATCH PLANT OPERATOR SHALL BE ACI CERTIFIED, AND QUALIFICATIONS SHALL BE INCLUDED IN SUBMITTAL TO OWNER. CONTRACTOR SHALL SUBMIT MIX DESIGN, TEST RESULTS, AND CONCRETE PLACEMENT PLAN AT LEAST TWO WEEKS PRIOR TO PLACEMENT. CONCRETE PLACEMENT PLAN SHALL INCLUDE – LOCATION OF BATCH PLANT, ESTIMATED TRUCK TIME, ESTIMATED VOLUME OF DAILY POURS, LOCATION AND DETAIL OF CONTRACTION JOINTS AND ANY REQUIRED CONSTRUCTION JOINTS.

A MINIMUM OF ONE SET OF FOUR (4) CONCRETE TEST CYLINDERS SHALL BE TAKEN PER DAY OF CONCRETE PLACEMENT. AN ADDITIONAL SET SHALL BE TAKEN PER 30 CUBIC YARDS/DAY PLACED. CONCRETE TESTING SHALL BE PERFORMED BY THE CONTRACTOR AND INCLUDE SLUMP, AIR ENTRAINMENT, TEMPERATURE, AND COMPRESSIVE STRENGTH. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE TESTING WITH THE OWNER'S REPRESENTATIVE.

FORMS SHALL BE FREE OF WATER, SNOW, AND/OR ICE PRIOR TO PLACEMENT OF CONCRETE. EUCLID COMPANY EUCO #452 EPOXY BONDING AGENT OR ENGINEER APPROVED EQUAL SHALL BE APPLIED AT CONSTRUCTION JOINT LOCATIONS PER MANUFACTURER'S SPECIFICATIONS. ALL EXPOSED CONCRETE SHALL RECEIVE A HEAVY BROOM FINISH IN THE DIRECTION OF SLOPE AFTER STEEL TROWELING. FINISHED SURFACES SHALL BE TRUE PLANES WITHIN 1/4–INCH IN 10 FEET IN ANY DIRECTION. ALL CONCRETE FINISHING WORK SHALL BE PERFORMED DIRECTLY UNDER THE SUPERVISION OF AN ACI CERTIFIED FLATWORK FINISHER. ALL CONCRETE FINISHERS SHALL BE ACI CERTIFIED FLATWORK TECHNICIANS AT MINIMUM.

WET CURING OF THE CIP CONCRETE SHALL BEGIN IMMEDIATELY AFTER FINISHING ITS SURFACE. WET CURING SHALL CONSIST OF WET BURLAP OR COTTON MATS THAT ARE KEPT IN CONTINUOUS CONTACT WITH THE ENTIRE EXPOSED SURFACE OF THE CONCRETE. WET CURING MATS SHALL BE ON SITE AND READY TO BE POSITIONED PRIOR TO THE START OF CONCRETE PLACEMENT. THE CONTRACTOR SHALL MONITOR THE CURING PROCESS AND KEEP THE MATS WETTED SO THAT THE SURFACE OF THE CONCRETE APPEARS WET. WET CURE SHALL CONTINUE FOR 14 DAYS AFTER PLACEMENT OF CONCRETE. AT NO TIME SHALL WATER BE ADDED TO AID IN CONCRETE FINISHING.



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PROJECT:

**CITY OF UNALASKA
LIGHT CARGO DOCK EXPANSION**

TITLE:

**GENERAL NOTES
(4 OF 5)**

| DESIGNED BY: | CJR | DATE: | MAY 2016 |
|--------------|-----|-------------|----------|
| CHECKED BY: | DST | PROJECT NO: | 151125 |

SHEET NO:

18

OF 19

GENERAL NOTES (CONT.):

EXPANSION/CONSTRUCTION JOINTS AND SAW-CUT CONTRACTION JOINTS SHALL BE INSTALLED WHERE APPROVED BY THE ENGINEER AND/OR AS SHOWN ON THE DRAWINGS.

DIVER QUALIFICATIONS –

DIVING OPERATIONS SHALL MEET THE REQUIREMENTS AS OUTLINED IN THE ASSOCIATION OF DIVING CONTRACTORS INTERNATIONAL (ADCI) CONSENSUS STANDARDS. DIVERS AND SUPPORT PERSONNEL MUST BE CERTIFIED BY ADCI FOR THE LEVEL OF WORK TO BE PERFORMED.

QUALITY CONTROL (QC) AND QUALITY ASSURANCE (QA) –

THE CONTRACTOR SHALL BE RESPONSIBLE FOR QUALITY CONTROL OF ALL WORK PERFORMED BY THE CONTRACTOR AND SUBCONTRACTORS EMPLOYED BY THE CONTRACTOR. THE OWNER, OR ITS REPRESENTATIVE, MAY PERFORM ADDITIONAL QUALITY ASSURANCE INSPECTION, TESTS OR APPROVALS ON MATERIALS AND WORK PERFORMED BY THE CONTRACTOR. IF OWNER PROVIDED QUALITY ASSURANCE INDICATE MATERIALS OR WORK ARE OUT OF SPECIFICATION, THE CONTRACTOR SHALL REPAIR OR REPLACE SAID MATERIALS OR WORK AT NO ADDITIONAL COST TO THE OWNER.

THE CONTRACTOR SHALL DEVELOP AND SUBMIT A PROJECT SPECIFIC QUALITY CONTROL PLAN TO THE OWNER PRIOR TO MOBILIZATION. THE QUALITY CONTROL PLAN, AT A MINIMUM, SHALL INCLUDE:

- KEY PERSONNEL, INCLUDING CONTRACTOR'S QUALITY CONTROL POINT OF CONTACT FOR THE PROJECT
- QUALITY CONTROL TESTING AND INSPECTIONS – COMPREHENSIVE SCHEDULE OF WORK REQUIRING TESTING OR INSPECTION
- DESCRIPTION OF PROCESS FOR INSPECTION DURING CONSTRUCTION TO IDENTIFY AND CORRECT DEFICIENCIES IN WORKMANSHIP AND TYPES OF CORRECTIVE ACTIONS THAT MAY BE TAKEN TO BRING WORK IN COMPLIANCE WITH SPECIFICATIONS AND STANDARDS
- RECORD AND DOCUMENTATION PROCEDURES

THE CONTRACTOR SHALL PREPARE AND SUBMIT SIGNED WEEKLY QUALITY CONTROL REPORTS FOR OWNER REVIEW.

CONSTRUCTION SURVEY –

ALL CONSTRUCTION SURVEYS SHALL BE PERFORMED BY OR UNDER THE DIRECT SUPERVISION OF A SURVEYOR LICENSED IN THE STATE OF ALASKA.

THE CONTRACTOR SHALL MAINTAIN THE CONTROL SYSTEM THROUGHOUT THE PROJECT. IF AT ANY TIME THE SURVEY METHODS UTILIZED FAIL TO PROVIDE ACCURATE LOCATION THE CONTRACTOR MAY BE REQUIRED TO SUSPEND WORK. THE CONTRACTOR SHALL LAY OUT THE WORK FROM OWNER ESTABLISHED CONTROL POINTS AND SHALL BE RESPONSIBLE FOR ALL REQUIRED MEASUREMENTS TAKEN FROM THESE POINTS.

THE CONTRACTOR SHALL FURNISH AT ITS OWN EXPENSE ALL STAKES, TEMPLATES, PLATFORMS, EQUIPMENT, RANGE MARKERS, AND LABOR AS MAY BE REQUIRED TO LAY OUT THE WORK FROM THE CONTROL POINTS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN THE CONTROL POINTS UNTIL AUTHORIZED TO REMOVE THEM. IF SUCH POINTS ARE DESTROYED OR DISTURBED THEY SHALL BE REESTABLISHED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

PROTECTED SPECIES OBSERVER (PSO) –

THE CONTRACTOR SHALL PROVIDE A SUFFICIENT NUMBER OF QUALIFIED PROTECTED SPECIES OBSERVERS TO SATISFY THE PROJECT PERMIT REQUIREMENTS. THE OBSERVERS SHALL BE ADEQUATELY EQUIPPED AND COMPLY WITH ALL DUTIES AS REQUIRED BY THE PROJECT PERMITS.

PERMITS

THE CONTRACTOR SHALL COMPLY WITH ALL PERMIT REQUIREMENTS. THE FOLLOWING PERMITS HAVE BEEN OBTAINED BY THE OWNER:

1. US ARMY CORPS OF ENGINEERS PERMIT
2. CITY OF UNALASKA UTILITY PERMIT
3. CITY OF UNALASKA BUILDING PERMIT

SUBMITTALS

SUBMITTALS –

THE ENGINEER'S REVIEW OF SUBMITTALS WILL BE FOR GENERAL CONFORMANCE ONLY AND IT SHALL REMAIN THE RESPONSIBILITY OF THE CONTRACTOR TO CONFORM TO ALL REQUIREMENTS OF THE PLANS AND SPECIFICATIONS. ANY INTENDED DEVIATION FROM THE PLANS AND SPECIFICATIONS MUST BE SPECIFICALLY IDENTIFIED BY THE CONTRACTOR AND SPECIFICALLY APPROVED BY THE ENGINEER TO BE ACCEPTABLE.

THE CONTRACTOR SHALL FULLY REVIEW AND STAMP SHOP DRAWINGS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS PRIOR TO SUBMITTING DRAWINGS TO THE ENGINEER. SHOP DRAWINGS OF ALL FABRICATED MATERIALS SHALL BE SUBMITTED TO THE ENGINEER FOR WRITTEN APPROVAL PRIOR TO FABRICATION OR MOBILIZATION OF ANY ITEM. THE CONTRACTOR SHOULD ALLOW TWO WEEKS FROM THE TIME OF RECEIPT FOR REVIEW OF SUBMITTALS BY THE ENGINEER FOR A REASONABLE NUMBER OF DRAWINGS. THE CONTRACTOR AND FABRICATOR ARE RESPONSIBLE FOR PROVIDING SHOP DRAWINGS THAT ACCURATELY SHOW THE APPROPRIATE DETAILS, DIMENSIONS, ASSEMBLY, MATERIAL REQUIREMENTS, AND OTHER REQUIREMENTS NECESSARY TO FABRICATE AND ERECT COMPONENTS OF THE STRUCTURE IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. AT THE JUDGMENT OF THE ENGINEER, SHOP DRAWINGS SHALL BE REJECTED WHEN THEY EITHER DEVIATE SIGNIFICANTLY FROM THE CONTRACT REQUIREMENTS WITHOUT THE ENGINEER'S PRIOR APPROVAL, OR ARE UNACCEPTABLE DUE TO INCOMPLETENESS, LEGIBILITY, OR NUMBER OF ERRORS.

CERTIFICATIONS, MANUFACTURER'S DATA AND OTHER INFORMATION FOR ALL MATERIALS, INCLUDING THOSE NOT SPECIFICALLY SHOWN IN THESE NOTES OR ON INDIVIDUAL DRAWINGS, SHALL BE SUBMITTED TO THE ENGINEER FOR WRITTEN APPROVAL TO VERIFY CONFORMANCE WITH THE PLANS AND SPECIFICATIONS. IN THE EVENT THAT THE PLANS OR SPECIFICATIONS DO NOT SPECIFICALLY REFERENCE A MATERIAL, THE APPROVAL OF MATERIALS WILL BE BASED ON ITS CONFORMANCE TO THE INTERNATIONAL BUILDING CODE. ALL METHODS AND MATERIALS SHALL CONFORM TO THESE GENERAL NOTES, GOOD WORKMANSHIP, GENERALLY ACCEPTED INDUSTRY STANDARDS, AND MANUFACTURER'S RECOMMENDATIONS.

WORK PERFORMED BY THE CONTRACTOR PRIOR TO RECEIVING OWNER/ENGINEER WRITTEN APPROVAL OF REQUIRED SUBMITTALS SHALL BE AT THE CONTRACTORS OWN RISK. ANY SUCH WORK REQUIRED BY THE OWNER/ENGINEER TO BE REMOVED AND/OR REPLACED SHALL BE AT THE EXPENSE OF THE CONTRACTOR AT NO EXPENSE TO THE OWNER.

THE FOLLOWING IS A PARTIAL LIST OF REQUIRED SUBMITTALS FOR THIS PROJECT. THIS DOES NOT CONSTITUTE A COMPLETE LIST AS IT WILL VARY DEPENDING UPON THE CONTRACTOR'S METHODS.

CONSTRUCTION PLANS (INCLUDES PLAN DRAWINGS AND WRITTEN DESCRIPTION OF METHODS):

1. SHEET PILE INSTALLATION PLAN
2. PILE INSTALLATION PLAN
3. DEBRIS REMOVAL PLAN (FOR SHEET PILE LOCATIONS)
4. QUALITY CONTROL PLAN
5. WYE PILE FABRICATION PLAN
6. GALVANIZING/METALIZING REPAIR PLAN
7. DETAILED CONSTRUCTION SCHEDULE USING CRITICAL PATH METHOD
8. VIBRACOMPACTION PLAN
9. CONCRETE PLACEMENT PLAN
10. WATER UTILITY TESTING PLAN

SHOP DRAWINGS AND MATERIAL CERTIFICATIONS:

1. STEEL MATERIAL CERTIFICATIONS
2. REINFORCING STEEL STEEL CERTIFICATIONS
3. SOIL MATERIAL TEST REPORTS AND CERTIFICATIONS
4. GALVANIZING CERTIFICATION AND/OR METALIZING CERTIFICATION
5. GALVANIZING/METALIZING REPAIR MATERIALS
6. AWS WELDING CERTIFICATION FOR ALL WELDERS UTILIZED ON THE PROJECT
7. WELDING PROCEDURES FOR ALL SHOP AND FIELD WELDS

8. STEEL FABRICATION DRAWINGS
9. DRIVING TEMPLATE SHOP DRAWINGS
10. VIBRACOMPACTION PROBE SHOP DRAWINGS
11. STEEL PILE SHOES
12. CHAIN AND SHACKLE MATERIAL CERTIFICATIONS
13. FENDER MATERIALS
14. UHMW-PE MATERIAL CERTIFICATIONS
15. UHMW-PE SHOP DRAWINGS
16. TIMBER PRESERVATIVE MATERIAL CERTIFICATIONS
17. MANHOLE AND RELATED MATERIAL SHOP DRAWINGS
18. STORM DRAIN SYSTEM MATERIALS
19. WATER SYSTEM MATERIALS
20. CONCRETE BATCH PLANT OPERATOR ACI CERTIFICATION
21. CONCRETE MIX DESIGNS
22. CONCRETE BONDING AGENT, CURING AGENT (IF USED), JOINT FILLER, AND JOINT SEALANT MATERIALS
23. CJP SHOP WELD INSPECTION/NDT REPORTS
24. SIGN SHOP DRAWINGS
25. ANODE MATERIALS & SHOP DRAWINGS
26. DIVER CERTIFICATIONS
27. WATER LINE TESTING CERTIFICATIONS AND RESULTS
28. RED-LINED AS-BUILT DRAWINGS

PROGRESS REPORTING –

THE CONTRACTOR SHALL SUBMIT WEEKLY PROGRESS REPORTS FOR OWNER REVIEW. PROGRESS REPORTS SHALL INCLUDE AN OVERVIEW OF WORK PERFORMED, ANTICIPATED FORECAST OF WORK TO BE COMPLETED, AND UPDATED PROJECT SCHEDULE AS APPLICABLE.

AS-BUILT PLANS –

THE CONTRACTOR SHALL MAINTAIN A SET OF AS-BUILT PLANS IN THE ONSITE PROJECT OFFICE. THE AS-BUILT PLANS SHALL BE KEPT UP TO DATE THROUGHOUT THE PROJECT WITH THE LATEST AS-BUILT DIMENSIONS AND DETAILS AS APPROVED BY THE ENGINEER AND SHALL BE SUBMITTED TO THE OWNER AT THE END OF THE PROJECT. FINAL PROJECT PAYMENT SHALL NOT BE MADE TO THE CONTRACTOR UNTIL RED-LINED AS-BUILT DRAWINGS HAVE BEEN SUBMITTED BY THE CONTRACTOR AND APPROVED BY THE OWNER/ENGINEER.



OPEN CELL™ AND OPEN CELL SHEET PILE™ ARE PND ENGINEERS, INC. REGISTERED TRADEMARKS PND ENGINEERS, INC.'S OPEN CELL TECHNOLOGY IS PATENTED PATENT – US 6,715,964 B2 PATENT – US 7,488,140 B2 PATENT – US 8,950,981 B2

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05/17/2016

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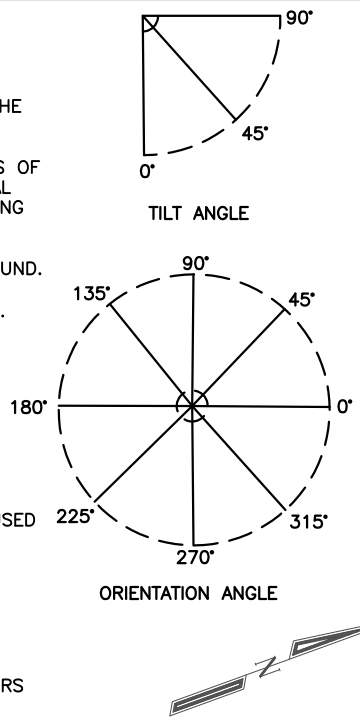
**CITY OF UNALASKA
LIGHT CARGO DOCK EXPANSION**

GENERAL NOTES
(5 OF 5)

| | | |
|------------------|--------------------|---------------------------|
| DESIGNED BY: CJR | DATE: MAY 2016 | SHEET NO: 19 OF 19 |
| CHECKED BY: DST | PROJECT NO: 151125 | |

NOTES:

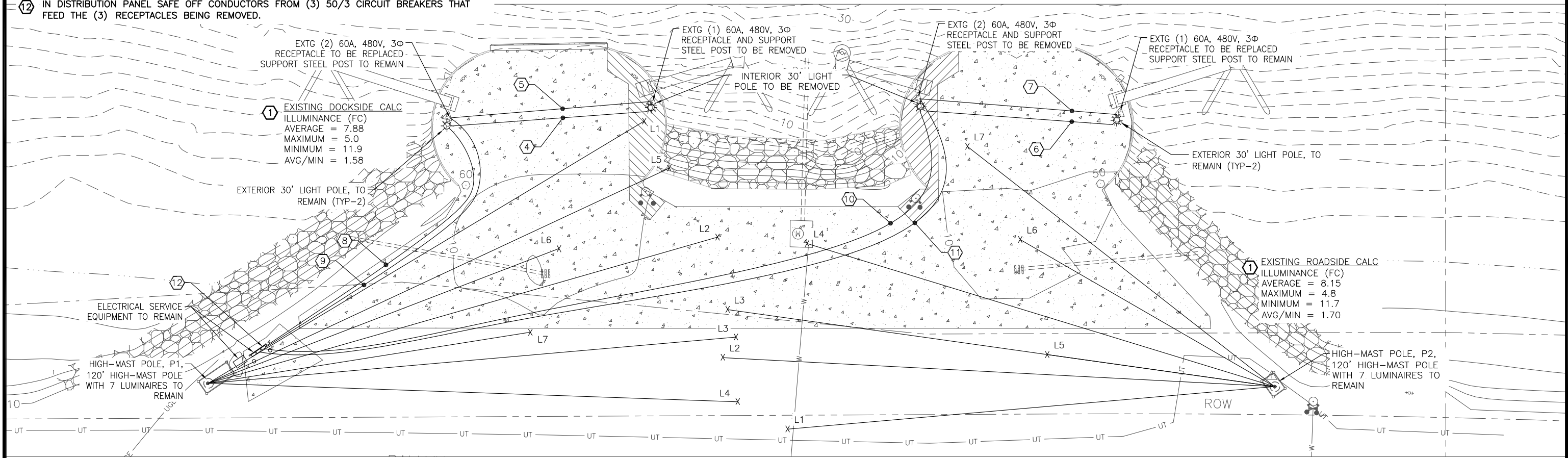
- ① LIGHTING CALCULATIONS EXCLUDE EXISTING EXTERIOR AND INTERIOR 30' LIGHT POLES.
- ② EACH OF THE 7 LUMINAIRES ON EACH 120' POLE SHALL BE RE-AIMED AS SHOWN ON THE NEW LIGHTING ORIENTATION SITE PLAN AND ORIENTATION TABLES ON SHEET E2.
3. LOCATION OF EXISTING UNDERGROUND ELECTRICAL IS UNKNOWN. OBTAIN PRIVATE LOCATES OF EXISTING UNDERGROUND ELECTRICAL PRIOR TO CONSTRUCTION. COORDINATE WITH GENERAL CONTRACTOR TO PROTECT EXISTING ELECTRICAL. REPLACE ALL ELECTRICAL DAMAGED DURING CONSTRUCTION.
- ④ 3/4" C, 2 NO. 8 & 1 NO. 10 GND. REMOVE CONDUCTORS ABANDON CONDUIT UNDERGROUND.
- ⑤ 1" C, 3 NO. 6 & 1 NO. 8 GND. REMOVE CONDUCTORS ABANDON CONDUIT UNDERGROUND.
- ⑥ 3/4" C, 2 NO. 8 & 1 NO. 10 GND (LIGHTING). REROUTE INTO NEW HANDHOLD EXTEND CONDUIT. REPLACE CONDUCTORS AS REQUIRED. SPLICE CONDUCTORS IN HANDHOLD.
- ⑦ 1" C, 3 NO. 6 & 1 NO. 8 GND. REROUTE TO NEW HANDHOLD EXTEND CONDUIT AND REPLACE CONDUCTORS AS REQUIRED. SPLICE CONDUCTORS IN HANDHOLD.
- ⑧ 3/4" C, 2 NO. 8 & 1 NO. 10 GND (LIGHTING) TO REMAIN. CONDUIT ROUTING UNKNOWN.
- ⑨ 2" C, 9 NO. 6 & 1 NO. 6 GND TO REMAIN. CONDUIT ROUTING UNKNOWN. SAFE OFF UNUSED CONDUCTORS FOR RECEPTACLE TO BE REMOVED.
- ⑩ 3/4" C, 2 NO. 8 & 1 NO. 10 GND TO REMAIN (LIGHTING). CONDUIT ROUTING UNKNOWN. REROUTE CONDUIT TO NEW HANDHOLD. EXTEND CONDUIT. REPLACE CONDUCTORS AS REQUIRED.
- ⑪ 2" C, 9 NO. 6 & 1 NO. 6 GND TO REMAIN (RECEPTACLE POWER). CONDUIT ROUTING UNKNOWN. REROUTE CONDUIT TO NEW HANDHOLD. EXTEND CONDUIT. REPLACE CONDUCTORS AS REQUIRED.
- ⑫ IN DISTRIBUTION PANEL SAFE OFF CONDUCTORS FROM (3) 50/3 CIRCUIT BREAKERS THAT FEED THE (3) RECEPTACLES BEING REMOVED.



| EXISTING ORIENTATION HIGH-MAST 1 | | | | |
|----------------------------------|---------------|-------------|------|------|
| POLE NO. | LUMINAIRE NO. | ORIENTATION | TILT | TYPE |
| P1 | L1 | 31 | 60 | A |
| P1 | L2 | 16 | 61 | A |
| P1 | L3 | 5 | 61 | A |
| P1 | L4 | 358 | 61 | A |
| P1 | L5 | 25 | 60 | A |
| P1 | L6 | 21 | 52 | A1 |
| P1 | L7 | 9 | 48 | A1 |

| EXISTING ORIENTATION HIGH-MAST 2 | | | | |
|----------------------------------|---------------|-------------|------|------|
| POLE NO. | LUMINAIRE NO. | ORIENTATION | TILT | TYPE |
| P2 | L1 | 185 | 59 | A |
| P2 | L2 | 177 | 62 | A |
| P2 | L3 | 172 | 62 | A |
| P2 | L4 | 163 | 59 | A |
| P2 | L5 | 172 | 38 | A1 |
| P2 | L6 | 150 | 45 | A1 |
| P2 | L7 | 142 | 53 | A |

| EXISTING LUMINAIRE SCHEDULE | | | | |
|-----------------------------|-----------------------------------|----------------------------------|-----------|---|
| TYPE | DESCRIPTION | MANUFACTURER | LAMPS | REMARKS |
| A | HIGH OUTPUT SPORTS FLOOD 15' BEAM | CAROLINA HIGH MAST DSF640GL57015 | LED 5700K | INSTALL NEW TOP VISOR TO EACH EXISTING LUMINAIRE, OPTION "TV" FOR DSF640 HIGH OUTPUT SPORTS FLOOD |
| A1 | HIGH OUTPUT SPORTS FLOOD 45' BEAM | CAROLINA HIGH MAST DSF640GL57045 | LED 5700K | INSTALL NEW TOP VISOR TO EACH EXISTING LUMINAIRE, OPTION "TV" FOR DSF640 HIGH OUTPUT SPORTS FLOOD |



DEMOLITION SITE PLAN



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PROJECT: **CITY OF UNALASKA LIGHT CARGO DOCK EXPANSION**

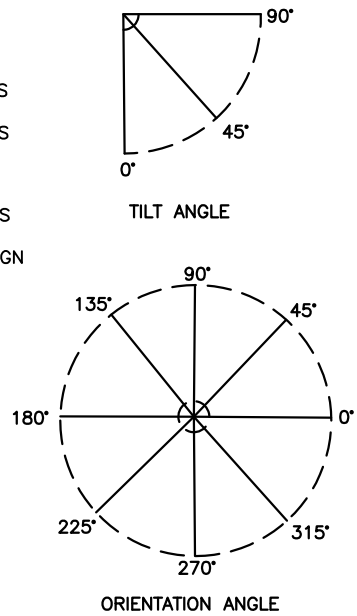
TITLE: **DEMOLITION SITE PLAN**

DESIGNED BY: MCM DATE: APRIL 2016 SHEET NO: E1 OF 3

CHECKED BY: LDS PROJECT NO: 151125

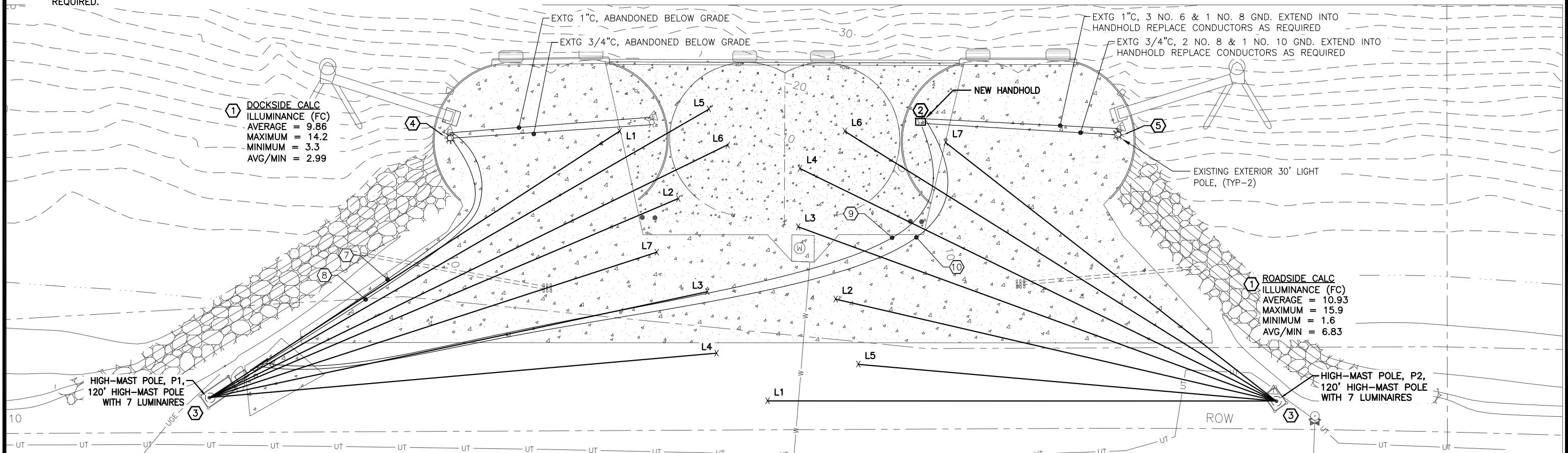
NOTES:

- ① LIGHTING CALCULATIONS EXCLUDE EXISTING EXTERIOR 30' LIGHT POLES.
- ② AT THE LOCATION OF THE DEMOLISHED INTERIOR 30' LIGHT POLES, INSTALL HANDHOLD PER DETAILS ON SHEET E3. SPLICE EXISTING CONDUCTORS TO MAINTAIN CIRCUIT FOR EXISTING EXTERIOR 30' LIGHT POLE AND RECEPTACLE. EXTEND AND REPLACE CONDUIT AS REQUIRED. REPLACE CONDUCTORS AS REQUIRED.
- ③ INSTALL NEW TOP VISORS ONTO EACH EXISTING LUMINAIRE, OPTION "TV" FOR CAROLINA HIGH MAST DSF640 HIGH OUTPUT SPORTS FLOOD OR CUSTOM MANUFACTURED VISOR WITH NOMINAL DIMENSIONS OF 6" LONG X 8" TALL AND A 45° SLOPE FROM THE TOP OF THE VISOR TO THE BOTTOM. MANUFACTURER SHALL SHOW THAT THE NEW TOP VISORS DO NOT EXCEED THE WIND LOADING DESIGN FOR THE EXISTING HIGH MAST POLES. RE-AIM EACH LUMINAIRE TO NEW AIMING POINTS SHOWN IN SITE PLAN AND LISTED IN NEW ORIENTATION TABLES.
- ④ REPLACE 60A, 480V, 3Φ, 4 WIRE RECEPTACLE WITH HUBBELL INTERLOCK 60A, 480V, 3Φ, 4 WIRE RECEPTACLE (TYP-2). HUBBELL HBL460M17W. REPLACE CONDUIT FEEDING RECEPTACLE AND CONDUCTORS AS REQUIRED.
- ⑤ REPLACE 60A, 480V, 3Φ, 4 WIRE RECEPTACLE WITH HUBBELL INTERLOCK 60A, 480V, 3Φ, 4 WIRE RECEPTACLE (TYP-1). HUBBELL HBL460M17W. REPLACE CONDUIT FEEDING RECEPTACLE AND CONDUCTORS AS REQUIRED.
- 6. PROVIDE (3) SPARE MALE PLUGS. HUBBELL HBL460P7W.
- ⑦ EXISTING 3/4"C, 2 NO. 8 & 1 NO. 10 GND.
- ⑧ EXISTING 2"C, 9 NO. 6 & 1 NO. 6 GND.
- ⑨ EXISTING 3/4"C, 2 NO. 8 & 1 NO. 10 GND. ROUTE INTO HANDHOLD. REPLACE CONDUCTORS AS REQUIRED.
- ⑩ EXISTING 2"C, 9 NO. 6 & 1 NO. 6 GND. ROUTE INTO HANDHOLD. REPLACE CONDUCTORS AS REQUIRED.



| NEW ORIENTATION HIGH-MAST 1 | | | | |
|-----------------------------|---------------|-------------|------|------|
| POLE NO. | LUMINAIRE NO. | ORIENTATION | TILT | TYPE |
| P1 | L1 | 33 | 59 | A |
| P1 | L2 | 23 | 60 | A |
| P1 | L3 | 12 | 60 | A |
| P1 | L4 | 5 | 60 | A |
| P1 | L5 | 30 | 63 | A |
| P1 | L6 | 26 | 63 | A1 |
| P1 | L7 | 18 | 58 | A1 |

| NEW ORIENTATION HIGH-MAST 2 | | | | |
|-----------------------------|---------------|-------------|------|------|
| POLE NO. | LUMINAIRE NO. | ORIENTATION | TILT | TYPE |
| P2 | L1 | 180 | 60 | A |
| P2 | L2 | 167 | 57 | A |
| P2 | L3 | 160 | 60 | A |
| P2 | L4 | 154 | 61 | A |
| P2 | L5 | 175 | 55 | A1 |
| P2 | L6 | 148 | 60 | A1 |
| P2 | L7 | 142 | 55 | A |



NEW LIGHTING ORIENTATION - SITE PLAN



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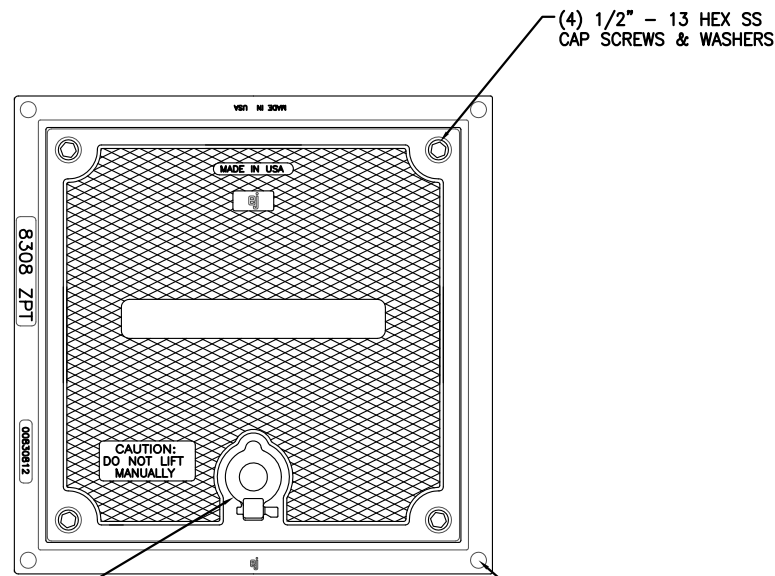


PROJECT: CITY OF UNALASKA
LIGHT CARGO DOCK EXPANSION

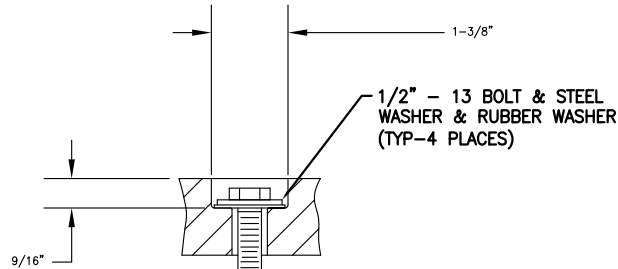
TITLE: NEW LIGHTING ORIENTATION - SITE PLAN

DESIGNED BY: MCM DATE: APRIL 2016
CHECKED BY: LDS PROJECT NO: 151125

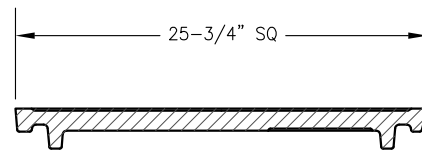
SHEET NO: E2 OF 3



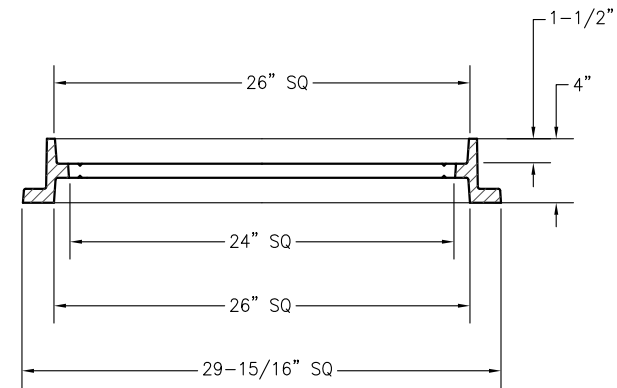
LID DETAIL
NOT TO SCALE



BOLT DETAIL
NOT TO SCALE



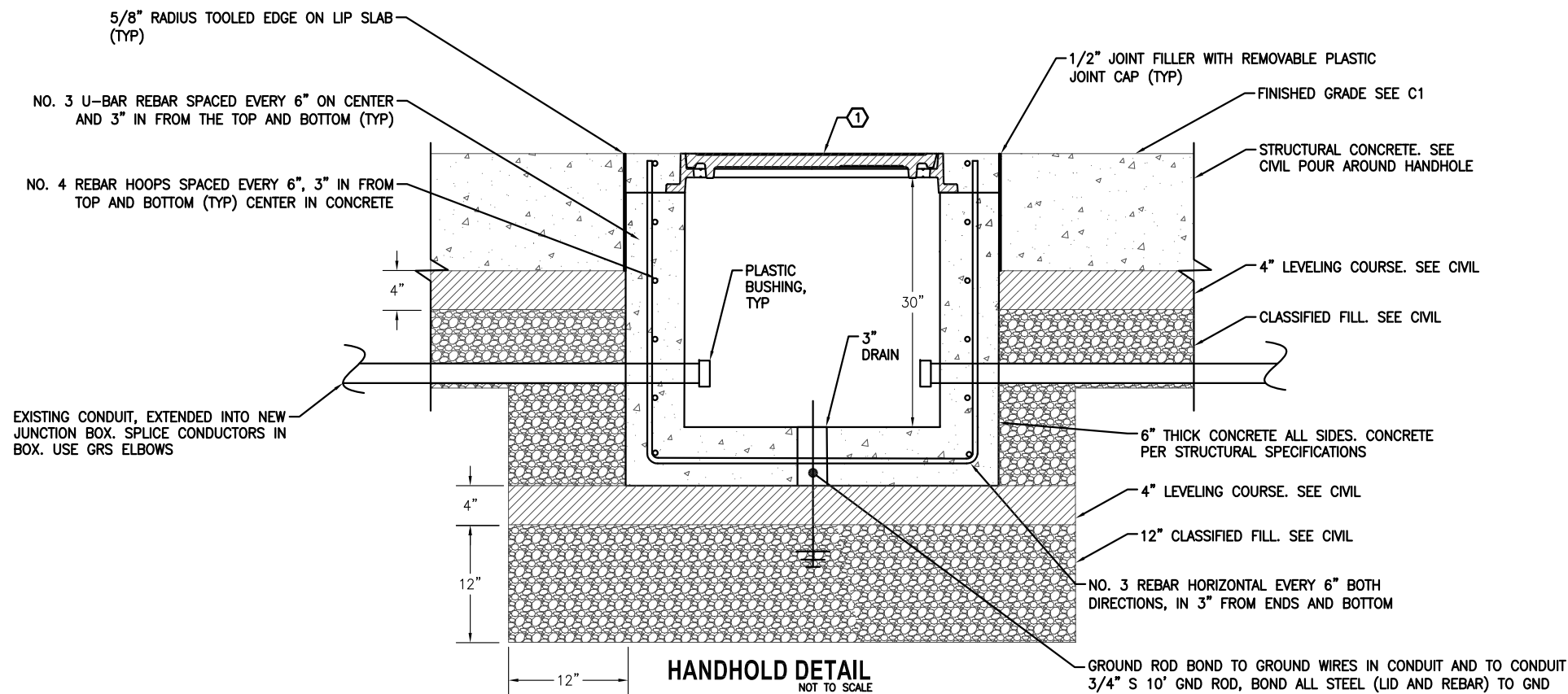
COVER SECTION
NOT TO SCALE



FRAME SECTION
NOT TO SCALE

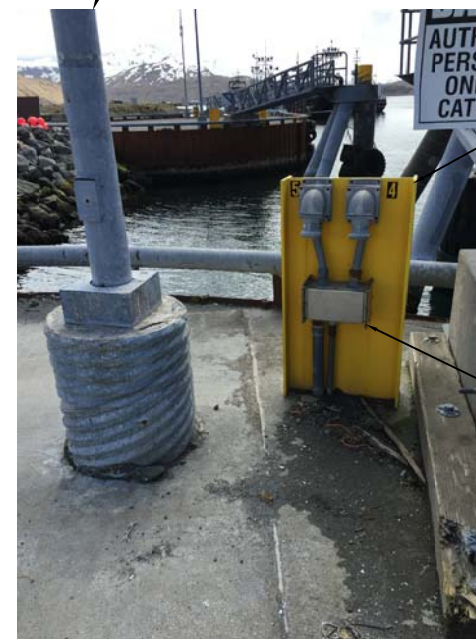
NOTES:

- ① EJ 8085APT 8308ZPT ASSEMBLY HEAVY DUTY AIRPORT RATED OR EQUAL (240,000 LB LOAD RATING MINIMUM). EJCO.COM 1-800-626-4653.
2. FRAME IS REVERSIBLE AND CAN BE INSTALLED AS A BOTTOM FLANGE UNIT.
3. SPLICE CONDUCTORS IN HANDHOLE TO FEED EXISTING POLE.
4. INSTALL HANDHOLD/LID ASSEMBLY FLUSH WITH SLAB SURFACE, +/- 48"



HANDHOLE DETAIL
NOT TO SCALE

EXISTING LIGHT POLE AND BASE. REMOVE WHERE SHOWN ON E1 (TYP-2). RETAIN WHERE SHOWN ON E1 (TYP-2).



REMOVE EXISTING RECEPTACLES AND SUPPORT STEEL POST IN TWO LOCATIONS. REPLACE RECEPTACLES AND RETAIN SUPPORT STEEL POST IN TWO LOCATIONS. THE WIREWAY IS NOT INSTALLED WHERE ONLY ONE RECEPTACLE IS PRESENT (TWO LOCATIONS). SEE SHEETS E1 & E2 FOR RECEPTACLE LOCATIONS.

WIREWAY

EXISTING RECEPTACLES AND SUPPORT STEEL



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**CITY OF UNALASKA
LIGHT CARGO DOCK EXPANSION**

HANDHOLE DETAILS

| | | |
|------------------|--------------------|--------------|
| DESIGNED BY: MCM | DATE: APRIL 2016 | SHEET NO: E3 |
| CHECKED BY: LDS | PROJECT NO: 151125 | OF 3 |