CITY OF ILWACO

FOR CITY USE ONLY	
Date Received	
Fee Paid	
Type of Fee	
Receipt #	
Received By	

MASTER PLANNING PERMIT APPLICATION FORM

Application form must be accompanied by the **Master Planning Application Checklist** and all **application fees.**

GENERAL INFORMATION	
Type of Application	Shoreline Substantial Development Permit
Name of Project	Port of Ilwaco East Bulkhead Resilience Project

APPLICANT			
Name/Company	Port of Ilwaco		
Address	PO Box 307	City/State/Zip	Ilwaco, WA 98624
Telephone	360-642-3143	Cell Phone	
Fax	360-642-3148	Email	tlofstrom@portofilwaco.org
If owner is different from applicant, what is the legal relationship of the applicant to the owner that entitles the applicant to make applications?			
Applicant's Signature	Tracy Lofstrom	Date	6/30/23

REPRESENTATIVE (if different from Applicant)			
Name/Company	Victoria England, Moffatt & Nichol		
Address	600 University St, Suite 610	City/State/Zip	Seattle, WA 98101
Telephone	206-622-0222	Cell Phone	
Fax		Email	vengland@moffattnichol.com

CONTACT PERSON/ENTITY (designate a single person/entity to receive determinations and notices from the city.			
Name	Tracy Lofstrom, Port of Ilwaco		
Address	PO Box 307	City/State/Zip	Ilwaco, WA, 98624
Telephone	360-642-3143	Cell Phone	
Fax	360-642-3148	Email	tlofstrom@portofilwaco.org

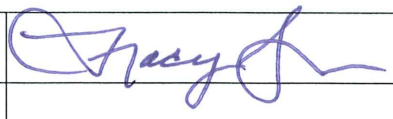
OWNER(S) (if different from Applicant)			
Name	WA DNR Aquatic Rivers Lands Lease [& Port of Ilwaco (applicant)]		
Address	601 Bond Road; PO Box 280, C		
City/State/Zip	Castle Rock, WA 98611		
Telephone	360-577-2025	Fax	
Email	aquaticleasing.rivers@dnr.wa.gov		
We, the undersigned, grant the applicant permission to use our property in the manner described in this application.			
Owner's Signature		Date	
Owner's Signature		Date	

PROPERTY INFORMATION	
Property Address/Location	117 Howerton Avenue Southeast, Ilwaco, WA
Assessor Parcel Nos.	73048003011, 73048003009, 73031013000
Current Zoning	High Intensity Shoreline
Current Land Use	Safe Coast Seafood processing facility and Port of Ilwaco Marina slip
Proposed Land Use	Safe Coast Seafood processing facility and Port of Ilwaco Marina slip

LEGAL/FINANCIAL RESPONSIBILITY/AUTHORITY TO ENTER PROPERTY

I/we acknowledge that by signing this application I/we are authorizing employees or agents of the City of Ilwaco to enter onto the property which is the subject of this application during the hours of 7:00 a.m. to 6:00 p.m., Monday through Friday, for the sole purpose of making any inspection of the limited area of the property which is necessary to process this application, including follow-up inspections after permit issuance. In the event the City determines that such an inspection is necessary during a different time or day, the applicant(s) further agrees that the City employees or agents may enter the property during such other times and days as necessary for such inspection upon 24 hours' notice to the applicant(s), which notice will be deemed received when given either verbally or in writing.

We, the undersigned, attest under penalty of perjury that the information in this application is true and accurate. We also acknowledge that it is our responsibility to understand and comply with all applicable federal, state and local regulations. Further, we agree that we shall be financially responsible for any and all engineering and planning services or other professional consulting/legal services deemed necessary by the city for the complete permit and plan review. These additional fees, if any, shall be paid in full prior to final signing of any permits, final plats, Mylar's, etc. (IMC 15-08-065).

Signature		Date	4/30/23
Signature		Date	

ATTACHMENT A: MASTER PLANNING APPLICATION CHECKLIST

CITY OF ILWACO	120 First Avenue North PO Box 548 Ilwaco, WA 98624 Phone: 360.624.3145 Fax: 360.642.3155 www.ilwaco-wa.gov	OFFICE USE ONLY

PROJECT / PROPERTY INFORMATION

Tax Parcel ID #: 73048003011, 73048003009, 73031013000

Project / Value: $3.5 Million

OWNER / APPLICANT INFORMATION

Owner: Port of Ilwaco

Applicant: Port of Ilwaco, Manager - Tracy Lofstrom

Contractor:

PROJECT INFORMATION - Failure to provide complete information will lead to a rejection of your permit

1. List of existing improvements, structures, and dimensions: Bulkhead ~160 LF, revetment 70 LF, drive 8,000 SF

2. Site Plan (See Site Plan Requirement Checklist) Attached? YES ☒ NO ☐ Additional design details are included in the 95% design set, expected submittal to the City Mid-July

3. Is the proposed development one phase of a larger project or larger development?: If yes, describe the entire project in detail: NO

4. Is there any surface water body on or within 300 feet of the proposed site, or within the immediate vicinity of the proposed site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands?: YES ☒ NO ☐ Ilwaco Marina in Baker Bay along the north shore of the Columbia River

5. Does the property have an existing driveway?: YES ☒ NO ☐

6. Will fill material be placed near or within a drainage way (ditch, swale, channel, etc.)?: YES ☒ NO ☐ approximately 450 cubic yards of free draining drainage rock backfill will be placed between the existing timber bulkhead and the replacement bulkhead

7. Are activities adjacent to unstable soils or slopes?: YES ☒ NO ☐

8. Will activities alter man-made or natural drainage features?: YES ☒ NO ☐

9. Will a sign be erected as a result of this project?: YES ☐ NO ☒

10. Will the project require working in a public right-of-way?: YES ☐ NO ☒

11. Does the project involve any clearing, filling, grading, paving, surface and/or dredging?: If Yes, answer the following. If No, go to number 13. Yes

A. If activities include clearing and grading greater than 1,000 sq. ft. Indicate SF: 8,000 SF

B. Will activities involve placing of fill materials? YES ☒ NO ☐

C. If fill materials exceed 20 cubic yards. Indicate Cubic Yards: 747 cy (718 cy bellow HTL, 29 cy above HTL)

D. If activities involve earth removal exceeding 2 feet in depth (Excluding foundation excavations). Indicate Maximum Depth FT: -NA-

12. Will the proposed activity require connection to City Water or Sewer?: YES ☐ NO ☒

13. Has the proposed site been flagged/staked? YES ☐ NO ☒ If No, contact the City when flagged/staked.

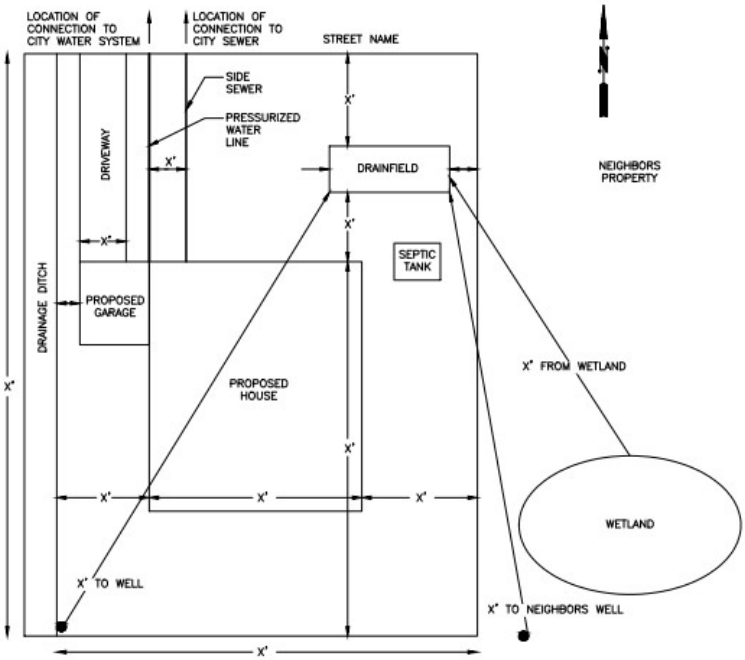
14. Indicate amount of new impervious area (areas covered by buildings, pavement, concrete, gravel, etc) SF: approximately 1,250 SF of new impervious surfaces including the new bulkhead cap and additional paving

CITY OF ILWACO

120 First Avenue North
PO Box 548 • Ilwaco, WA 98624
Phone: 360.642.3145
Fax: 360.642.3155
info@ilwaco-wa.gov
www.ilwaco-wa.gov

Example Site Plan

Follow Checklist when drawing site plan
Drawn to Scale 1" = 20ft
"X" = Distance
Note: Any changes to your site plan will require re-submittal and a re-submittal fee may be charged.



SITE PLAN REQUIREMENT CHECKLIST

All site plans shall be clearly and accurately drawn to scale on paper no larger than 11" x 17" and must indicate all of the information listed below. For ease of drawing the site plan, use the graph paper provided with your application packet. For each item, mark either "shown" or "N/A" as apporpriate for your project.

This checklist must be completed and included with all site plans. Any site plan without this checklist may be rejected and returned to the applicant for correction.

Parcel No.: 73048003011, 73048003009, 73031013000

A. General Property Information

Shown	N/A	
X		Property Lines, including dimensions.
X		North arrow & site plan scale.
X		Marine waters, lakes and ponds, streams, creeks & wetlands.
X		Locations & dimensions of all existing structures on the property.
	X	Location of any existing wells & their 100' well radius.

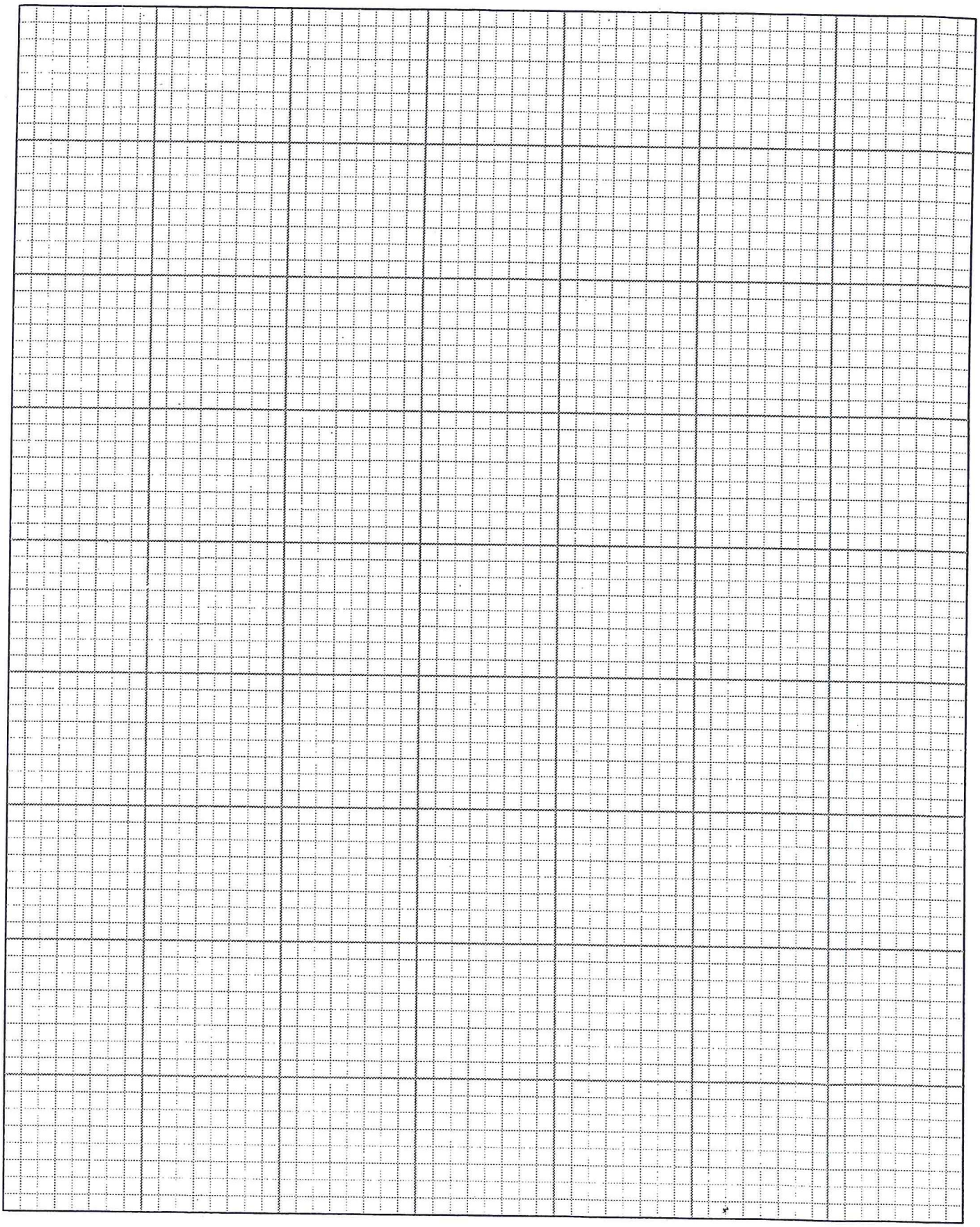
B. Existing Property Improvements

	X	Location of side sewer.
	X	Location of water meter & service lines.
	X	Location of all existing drain fields on the site.
	X	Location of existing drainage systems.
X		Location of all existing roads, driveways, utilities, easements, bridges.
X		Location & dimensions of all proposed structures in relation to property lines, other structures, wetlands, etc.

C. Proposed Property Improvements

	X	Minimum zoning setbacks shown.
	X	Location of proposed water meter & service lines, and connection to city water main.
	X	Location of proposed side sewer and connection to city sewer.
	X	Location & dimensions of all proposed drainage systems.
X		Location & dimensions of all roads, driveways, parking areas, utilities.
X		Location/extent of all clearing, grading, & filling

C ty of Ilwaco



120 First Avenue North
PO Box 548 ● Ilwaco, WA 98624
Phone: 360.642.3145
Fax: 360.642.3155
www.ilwaco-wa.gov

Shoreline Master Program
Conditional Use Permit Application

PROJECT/PROPERTY INFORMATION	OFFICE USE ONLY
Tax Parcel ID #: 73048003011, 73048003009, 73031013000	
Site Address: 117 Howerton Avenue Southeast, Ilwaco, WA	

OWNER/APPLICANT INFORMATION
Owner: Port of Ilwaco (& DNR Aquatic Lands Lease)
Applicant: Port of Ilwaco

The purpose of a conditional use permit is to provide a system within the shoreline master program that allows flexibility in the application of use regulations in a manner consistent with the policies of RCW 90.58. In authorizing a condition- al use, special conditions may be attached to the permit by the City of Ilwaco to prevent undesirable effects of the pro- posed use and/or to ensure consistency of the project with the Shoreline Management Act and the City of Ilwaco Shore- line Master Program.

DIRECTIONS: This Shoreline Master Program Conditional Use Permit Application shall accompany a completed Master Planning Permit Application, a SEPA Checklist, a JARPA and an accurate to scale Site Plan. Provide all of the requested information and answer the questions as thoroughly as possible. Attach supporting information, as necessary, to support the application. Contact the City Planner with any questions.

Project Description:

The proposed Port of Ilwaco East Bulkhead Resilience Project (herein referred to as the 'Project') would consist of three primary elements;

1.Replacing the failing east bulkhead with an anchored steel sheetpile bulkhead

2.Repairing slope protection north and south of the bulkhead

3.Paving and regrading the upland wharf area (access driveway) directly landward of the bulkhead to mitigate the effects of sea level rise.

Additional detail is provided in the attached project SEPA Checklist

Describe the requested conditional use:

The project will include drain rock backfill that must be placed between the existing bulkhead that will mostly remain in place and the, new replacement bulkhead. The new bulkhead must be placed waterward of the existing bulkhead due to the precarious, deteriorated condition of the existing bulkhead. The existing bulkhead cannot be removed without risking the failure of the slope beneath the wharf and Safe Coast Seafood facilities, potential damaging the building and infrastructure and endangering worker and public safety. The drain rock must be placed in the space between the new and existing bulkheads to prevent the buildup of water pressure behind the new bulkhead which could undermine the new bulkhead's stability. The new bulkhead will be located as close as practicable to the existing bulkhead while still maintaining its function as a temporary berth for vessels un/loading at the Safe Coast Seafood facility. The deteriorated nature of the existing bulkhead, leaning as much as 10° degrees waterward, also dictates the location of the new bulkhead

Describe how the proposed use is consistent with the policies of RCW 90.58 and the City of Ilwaco Shoreline Master Program:

The proposed use is the replacement of an existing structure that maintains the use of both the Safe Coast Seafood facility and the Ilwaco Marina, both of which are water dependent and critical to the Ilwaco economy. Additionally, the new bulkhead will replace the existing, failing bulkhead, providing a more stable shoreline and preliminary steps toward sea level rise resilience for the facility. The project will not interfere or change public access to the shoreline or the existing use of the project site.

Describe how the proposed use will not interfere with the normal public use of public shorelines:

The proposed resilience and maintenance project will return the shoreline to the same use as its current use, which is protecting the Safe Coast Seafood facility wharf and Ilwaco marina slip from the effects of potential slope failure and allowing ongoing operations at both facilities. Additionally, the work on the top of slope of the north end of the slip will maintain the same shoreline access as currently exists with an increased top of slope ' elevation as a first step in future sea level resilience planning. The project mitigation will also remove derelict creosote treated timber piles, revetment, floating timber debris on the south portion of the marina and features located within the slip, making the slip more accessible to marina patrons. A small area of existing concrete debris slope protection will be removed from the south side of the bulkhead to accommodate the new bulkhead. That material will be replaced with riprap. A fish mix layer will be placed as beach nourishment, over the shoreline protection proposed at the head of the adjacent slip.

Describe how the proposed use of the site and design of the project is compatible with other authorized uses within the area and with uses planned for the area under the Comprehensive Plan and the Shoreline Master Program:

The project will not change the use of the site from its existing use as shore protection and marina access. The project will restore the bulkhead's use as a temporary berth for Safe Coast Seafoods that can not be used currently due to the existing bulkheads deteriorated condition.

Describe how the proposed use will cause no significant adverse affects to the shoreline environment in which it is to be located, and how the public interest suffers no substantial detrimental effect:

The project will provide overall habitat value and function lift by removing creosote and concrete from the aquatic environment and providing added benefit with beach nourishment, fish mix layer over the new shoreline armoring at the head of the slip. The mitigation sequencing and No Net Loss narrative memorandum (attached) describes the avoidance, minimization, and mitigation actions that will be included as part of the project.

Signature:	
Print Name: Tracy Lofstrom, Port of Ilwaco Manager	Date: 4/30/23

CITY OF ILWACO

120 First Avenue North
PO Box 548 • Ilwaco, WA 98624
Phone: 360.642.3145
Fax: 360.642.3155
www.ilwaco-wa.gov

The City of Ilwaco is an equal opportunity provider and employer.

May 2, 2023

Port of Ilwaco
PO Box 307
Ilwaco, WA 98624

Subject: Port of Ilwaco East Bulkhead Resilience Project

Thank you for discussing this project at the pre-application meeting on April 12, 2023. As a follow up to the pre-application meeting, this letter provides comments from the City project review team in anticipation of formal application submittal, as well as initial comments from the Washington Department of Fish and Wildlife (WDFW).

The comments in this letter are the result of a preliminary review of materials provided by the applicant/contact. Additional review may disclose additional substantive or procedural requirements.

This letter contains several references to the City's Shoreline Master Program (SMP). The City's SMP can be found here:
https://www.ilwaco-wa.gov/wp-content/uploads/2017/09/Locally-adopted-SMP.pdf

Project Review Process

1. The project is not exempt under the State Environmental Policy Act (SEPA) and will require SEPA review.

2. The project is not eligible for a shoreline exemption under WAC 173-27-040(2).

3. The project will require a shoreline substantial development permit for activities including, but not necessarily limited to, shoreline stabilization (SMP Table 7-1).

4. The project will require a shoreline conditional use permit for fill below the ordinary high water mark in the Aquatic shoreline environment designation (SMP Table 7-1). The City's Hearing Examiner has the authority to grant or deny shoreline conditional use permits (SMP 8.1(3)A). The Washington State Department of Ecology must also approve the shoreline conditional use permit pursuant to WAC 173-27-200.

5. The project will require engineering review by the City.

Project Submittal Requirements

The following submittals are required for formal application review. Please ensure all submittals are consistent with one another. All submittals must be complete and signed and sealed as applicable.

1. Master Planning Permit Form and Checklist. This is available online here: https://cdn.townweb.com/ilwaco-wa.gov/wp-content/uploads/2022/03/Master-Planning-Permit-Application-Packet.pdf

2. SMP Conditional Use Permit Application. This is available online here: https://cdn.townweb.com/ilwaco-wa.gov/wp-content/uploads/2022/06/Shoreline-Master-Program-SMP-Conditional-Use.pdf

3. SEPA Checklist. This is available online here: https://cdn.townweb.com/ilwaco-wa.gov/wp-content/uploads/2022/06/SEPA-Checklist-with-added-help-links-and-instructions.pdf

4. Joint Aquatic Resource Permit Application (JARPA). Include in the JARPA a brief description of the predicted sea level rise scenario that the project is designed to accommodate and supporting methodology.

5. Geotechnical report. Demonstrate compliance with SMP 7.9(4), 7.18(3), (6) and (7). In demonstrating compliance with SMP 7.18(7), provide separate consideration of the area proposed for the sheetpile bulkhead, the adjacent shoreline area to the north, and the adjacent area to the south.

6. A narrative detailing how the proposed project will achieve no net loss of ecological functions prepared by a qualified professional. The narrative must consider aquatic habitat and vegetation. The City project review team, as well as other regulatory agencies with jurisdiction, have concerns about the adequacy of the mitigation currently proposed. Offsetting the aquatic area lost as a result of the proposed development with an equal or greater area of aquatic area gained would be expected to provide substantial support to a demonstration of no net loss of ecological functions. The letter from WDFW (Attachment A) provides several specific suggestions for mitigation measures that might be considered for demonstrating compliance with the requirement for no net loss of ecological functions in SMP 6.3(1).

7. A mitigation sequencing analysis, which is required when an action requires a conditional use permit (SMP 6.3(2)). See SMP 6.3(3) for specific instructions. This analysis may be included as a section in the no net loss narrative, above.

8. Biological Evaluation (referenced in JARPA).

9. Site plans, including the information in SMP 8.5(1)I, as applicable. Show proposed temporary erosion and sediment control (TESC) measures in the site plans.

10. Cultural resource survey (referenced in JARPA).

11. Fees payable to the City of Ilwaco in the amount of $2,250.00. The fee breakdown is as follows:
    - Shoreline Substantial Development Permit (Commercial): $1,000.00;
    - Shoreline Conditional Use Permit: $750.00; and
    - Hearing Examiner: $500.00.

    Further, the applicant shall be financially responsible for any engineering and planning services or other professional consulting/legal services deemed necessary by the City for the complete permit and plan review. These additional fees, if applicable, shall be paid in full prior to final signing of any permits.

Please contact the City with any questions.

Sincerely,

Holly Beller
City Administrator

Mark Daniel, AICP
Consultant Planner

Enclosures:
1. Attachment A, email from L. Bauernschmidt, WDFW, dated May 1, 2023

CC: Victoria England, Moffat & Nichol

From: Bauernschmidt, Lauren N (DFW) <Lauren.Bauernschmidt@dfw.wa.gov>
Sent: Monday, May 1, 2023 2:25 PM
To: Alexandra Plumb <aplumb@dcgwatershed.com>
Cc: Mark Daniel <mdaniel@dcgwatershed.com>; Holly Beller <treasurer@ilwaco-wa.gov>
Subject: RE: Port of Ilwaco Bulkhead Replacement

Hi Alexandra,

A short recap of the discussion we had on Thursday about the adequacy of the proposed mitigation for the Ilwaco Bulkhead Replacement.

The current proposal is not meeting WAC 220-660-080's requirement for no-net loss. The new permanent fill of 2,850 sq ft on the benthic habitat is not being offset by 165 sq ft of benthic habitat restored through piling and creosote removal. The mitigation is inadequate. I suggest the Port of Ilwaco reviews the requirements of compensatory mitigation as outlined in WAC 220-660-080. As the project currently stands, WDFW would not permit the work due to the project having unmitigated impacts.

I think there are additional ways to mitigate for the project, though these are only suggestions and will not necessarily meet the full need:

- Remove the scattered cement and marine debris bulkhead and restore the site.
- Remove any derelict piers or floats from the port.
- Incorporate grating into the project to prevent further shading of the benthic substrate.
- Wrap or remove the "abandoned in place" creosote pilings to prevent further leaching from occurring.
- Look for restoration areas in the flats outside of the marina.

Our preference for mitigation is in-kind, on-site but will consider mitigation that is out-of-kind and/or off-site if the Port can show limitations to meeting in-kind, on-site.

Please let me know if you have any questions, and I'm happy to discuss different options.
Thank you,

Lauren Bauernschmidt (she/her)
Pacific County Habitat Biologist
Washington Dept of Fish & Wildlife
Office: 360-249-1217
Mobile: 360-480-2558
Email: Lauren.Bauernschmidt@dfw.wa.gov
48 Devonshire Rd
Montesano, WA 98563

From: Bauernschmidt, Lauren N (DFW)
To: England, Victoria
Subject: RE: Port of Ilwaco Mitigation Follow-Up
Date: Wednesday, June 14, 2023 5:02:06 PM
Attachments: image001.jpg

Hi Victoria,

Yes, after further discussion we chose to consider the fish mix as part of the mitigation due to the proximity of the placement to the construction footprint. The placement is an on-site habitat benefit and therefore boosts the value of the action. I was also informed by some local restoration proponents that sand lance have been present in the area in the past, so there is a chance this placement could be utilized.

Thank you,
Lauren

From: England, Victoria <vengland@moffattnichol.com>
Sent: Wednesday, June 14, 2023 4:54 PM
To: Bauernschmidt, Lauren N (DFW) <Lauren.Bauernschmidt@dfw.wa.gov>
Subject: RE: Port of Ilwaco Mitigation Follow-Up

External Email

Hi Lauren,
One follow up question – during our recent call you had stated that fish mix would not be considered part of the mitigation based on WDFW's assessment that sand lance and smelt would not be likely to pass through the marina but you mention the fish mix in your email below. Will WDFW consider the fish mix layer as part of the mitigation after all? The Port just wants to make sure that they aren't including anything that won't be considered part of the mitigation if it doesn't serve any other project purpose.
Please let me know.
Thank you!
Victoria

From: Bauernschmidt, Lauren N (DFW) <Lauren.Bauernschmidt@dfw.wa.gov>
Sent: Wednesday, June 14, 2023 4:41 PM
To: England, Victoria <vengland@moffattnichol.com>
Subject: Port of Ilwaco Mitigation Follow-Up

CAUTION: This email originated from outside of the organization.

Good afternoon,

I was able to discuss the proposed mitigation, that you presented of behalf of the Port, with my team yesterday. To recap: the Port is proposing removal of the derelict pier/floats in the south area of the port (estimated to be 2,500 sq ft), creosote pile/timber and steel pile removal (165 sq ft), and fish mix placed on top of the rip-rap replacement (south shoreline). As per the draft JARPA, permanent impacts to waterbodies are 3,250 sq ft with 2,900 sq ft directly impacting benthic habitat.

I believe the proposed mitigation as listed above will collectively offset the permanent benthic habitat impacts from construction of the Ilwaco Port improvements. We still encourage the removal of the cement debris wall, but it is not required. When submitting the HPA application, please outline this mitigation plan in the application form. If you have any questions, please let me know.

Thank you,

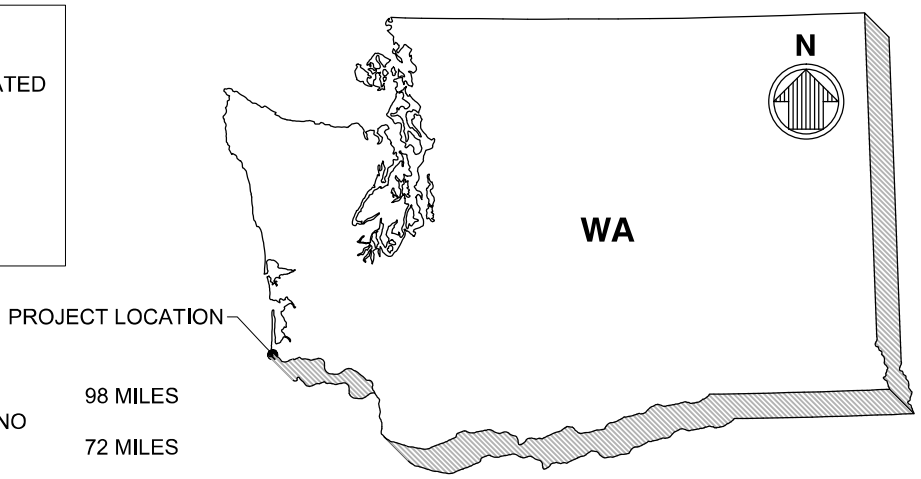
Lauren Bauernschmidt
(she/her/hers)
Pacific County & WIRA 24 Habitat Biologist

Office 360-249-1217
Mobile 360-480-2558
Region 6 – Coastal
48 Devonshire Rd, Montesano WA 98563

TIDAL DATUM:
BASED ON NOAA TIDAL STATION NO. 9440581, IN US FEET. HTL/OHW DELINEATED BY GEOENGINEERS DECEMBER, 2022.

LEVELS:

MHHW: +8.07'	MHW: +7.37'
MLW: 1.35'	MLLW: +0.00'
OHW (DELINEATED):	APPROX. +11.50'

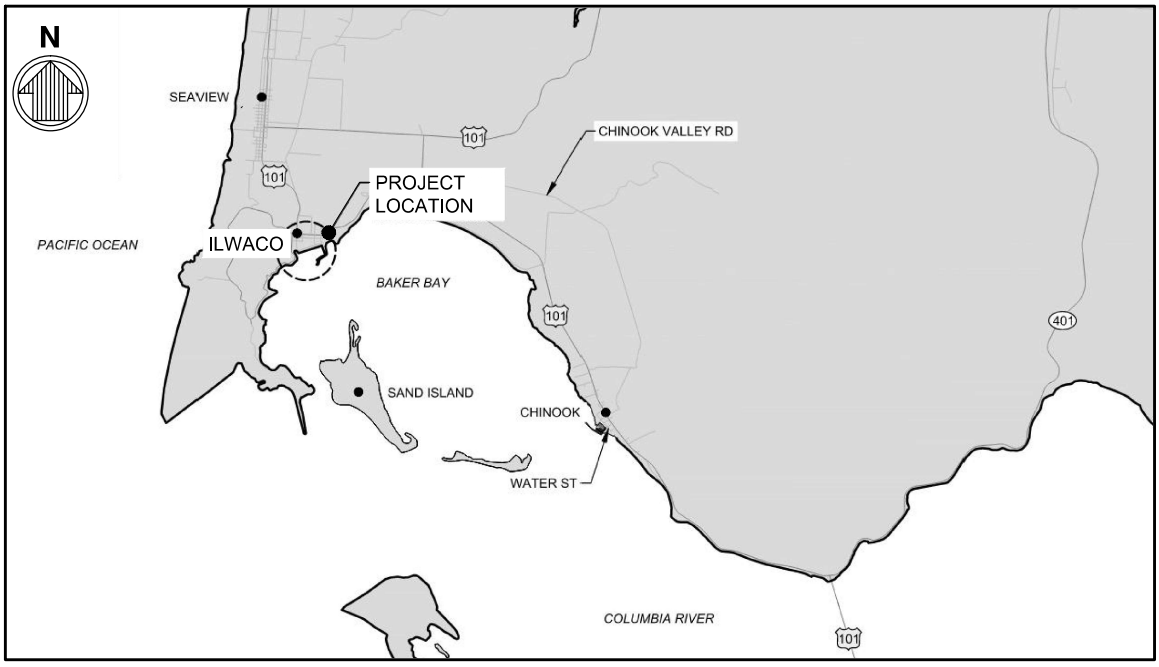


VICINITY MAP
SCALE: NTS

DIRECTIONS TO SITE FROM SEATTLE:

1. I-5 S, US-101, WA-8 AND US-12 TO WA-107 S/S MAIN ST IN MONTESANO — 98 MILES
2. TAKE US-101 TO ILWACO — 72 MILES
3. ARRIVE AT PROJECT SITE

PROJECT ADDRESS:
PORT OF ILWACO
117 HOWERTON AVE SE
ILWACO, WA 98624



LOCATION MAP
SCALE: NTS

APPLICANT: PORT OF ILWACO ADJACENT PROPERTY OWNERS: 1) PORT OF ILWACO	LOCATION: PORT OF ILWACO 117 HOWERTON AVE SE ILWACO, WA 98624 LAT/LONG: 46.30442 N, -124.03852 W DATUM: MLLW SHEET: 1 OF 9 DATE: JUNE 2023	PROPOSED PROJECT: PORT OF ILWACO EAST BULKHEAD RESILIENCE PROJECT IN: BAKER BAY NEAR/AT: ILWACO COUNTY: PACIFIC STATE: WA SEC: 33/34 T: 10 N R: 11 W

PURPOSE: PORT OF ILWACO BULKHEAD REPLACEMENT AND SEA LEVEL RISE RESILIENCE .

DATUM: MLLW

ADJACENT PROPERTY OWNERS:
1. CITY OF ILWACO
2. STATE OF WASHINGTON
3. STARLIGHT ONE LLC.

Port of Ilwaco East Bulkhead Resilience Project

Parcel Map

APPLICATION BY:
Port of Ilwaco

PROPOSED: DERELICT ILWACO E. BULKHEAD REPLACEMENT, DRIVEWAY REGRADING/ REPAVING, & SHORE PROTECTION REPLACEMENT

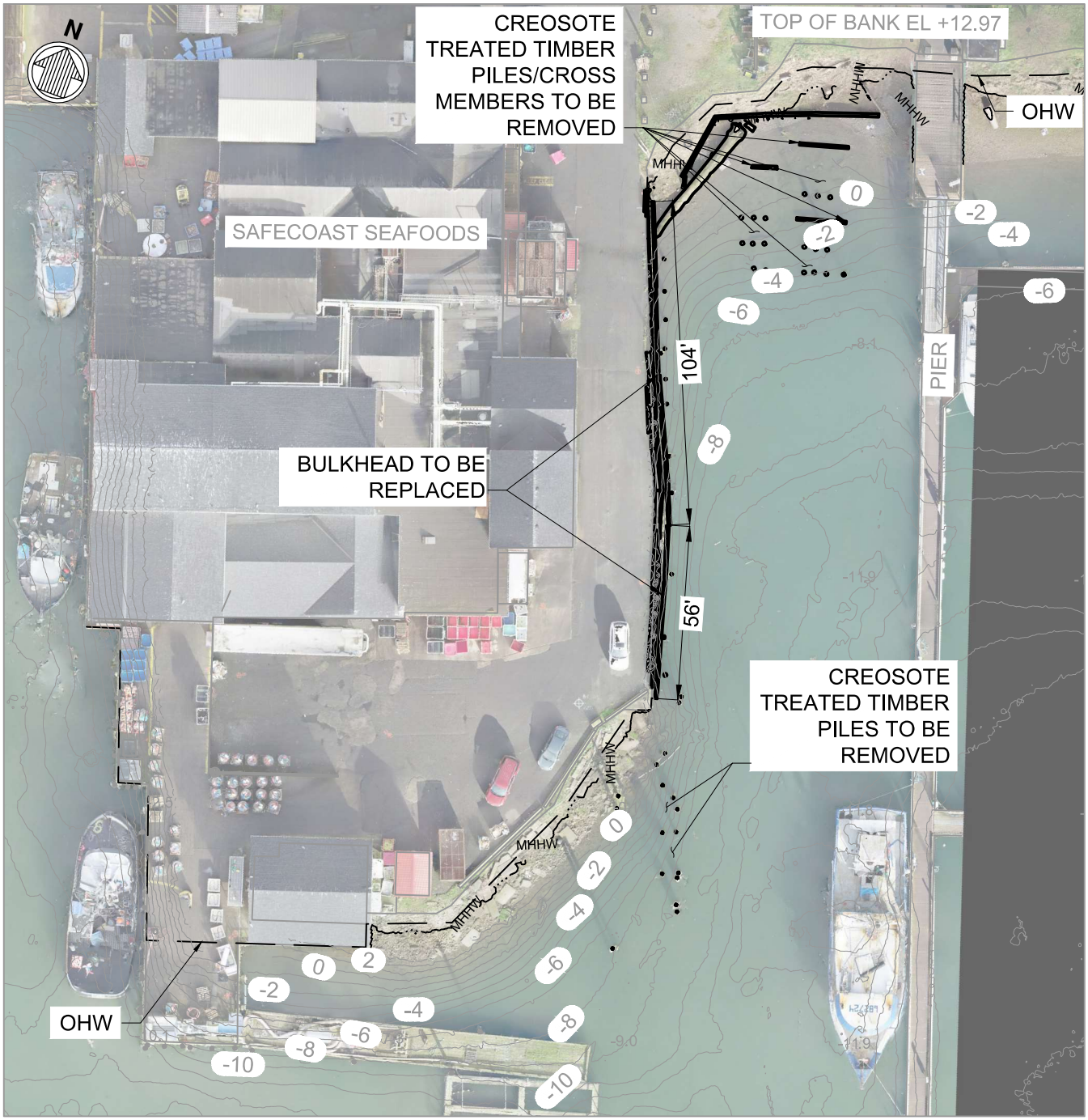
IN: BAKER BAY

AT: ILWACO

COUNTY: PACIFIC

SHEET 2 OF 9

DATE: JUNE 2023



LEGEND

- PILES
- CREOSOTE-TREATED REVETMENT (TO BE REMOVED)
- CREOSOTE-TREATED LOG (TO BE REMOVED)
- BULKHEAD (TO BE REMOVED)

A/2 PLAN - EXISTING CONDITIONS
SCALE: 1" = 50'

LEVELS:	
MHHW: +8.07'	MHW: +7.37'
MLW: 1.35'	MLLW: +0.00'
OHW (DELINEATED):	APPROX. +11.50'

50' 0' 50' 100'

SCALE: 1"=50'

APPLICANT:
PORT OF ILWACO

ADJACENT PROPERTY OWNERS:
1) PORT OF ILWACO

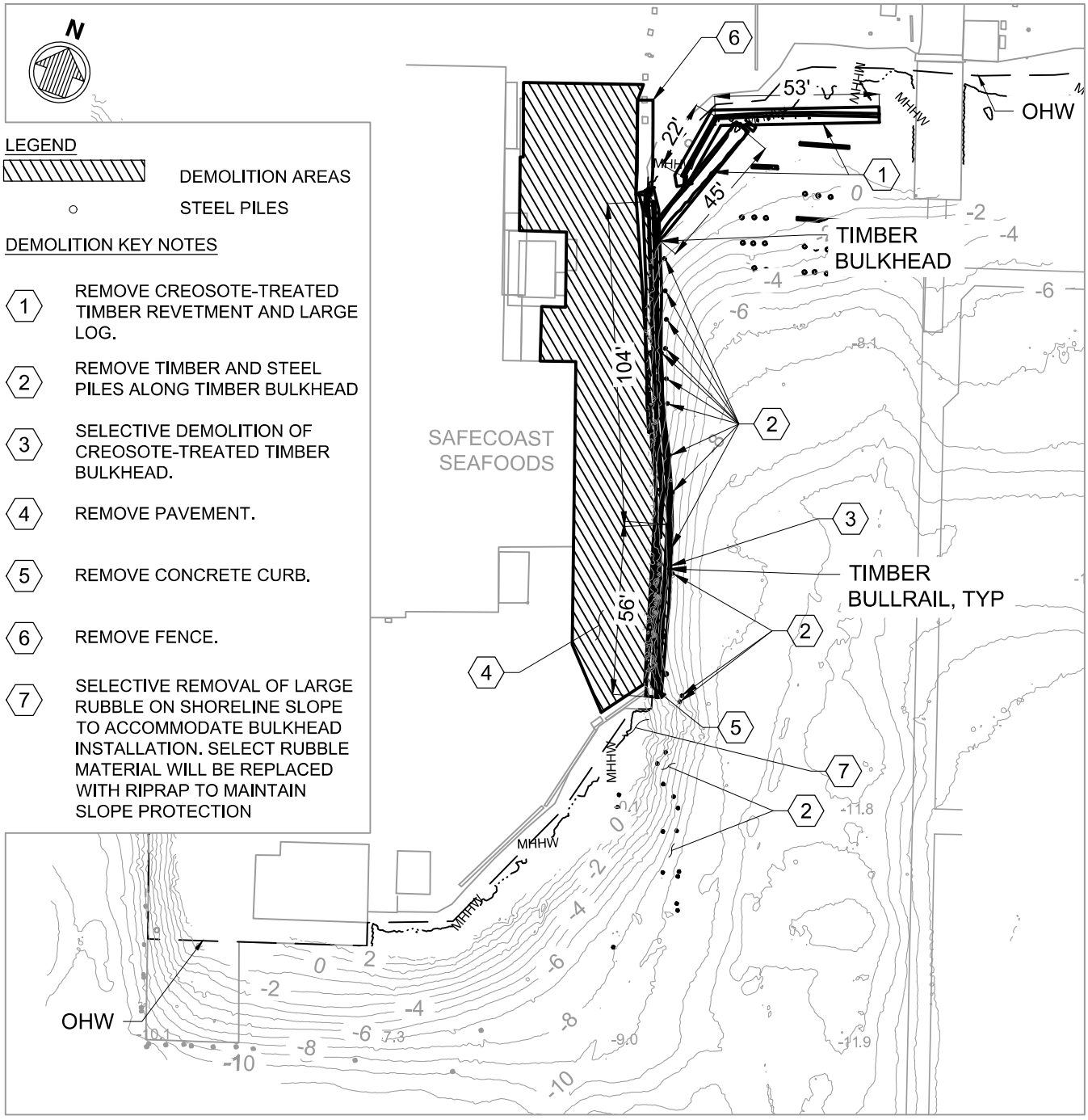
LOCATION: PORT OF ILWACO
117 HOWERTON AVE SE
ILWACO, WA 98624
LAT/LONG: 46.30442 N, -124.03852 W

DATUM: MLLW
SHEET: 3 OF 9 DATE: JUNE 2023

PROPOSED PROJECT: PORT OF ILWACO
EAST BULKHEAD RESILIENCE PROJECT

IN: BAKER BAY
NEAR/AT: ILWACO
COUNTY: PACIFIC STATE: WA
SEC: 33/34 T: 10 N R: 11 W

File: Q:\SEA\213282\20 CADD_Active_Permit_Sheetset\213282_F2



A/3 PLAN - DEMOLITION
SCALE: 1" = 50'

LEVELS:

MHHW: +8.07'	MHW: +7.37'
MLW: 1.35'	MLLW: +0.00'
OHW (DELINEATED):	APPROX. +11.50'

50' 0' 50' 100'

SCALE: 1"=50'

APPLICANT:
PORT OF ILWACO

ADJACENT PROPERTY OWNERS:
1) PORT OF ILWACO

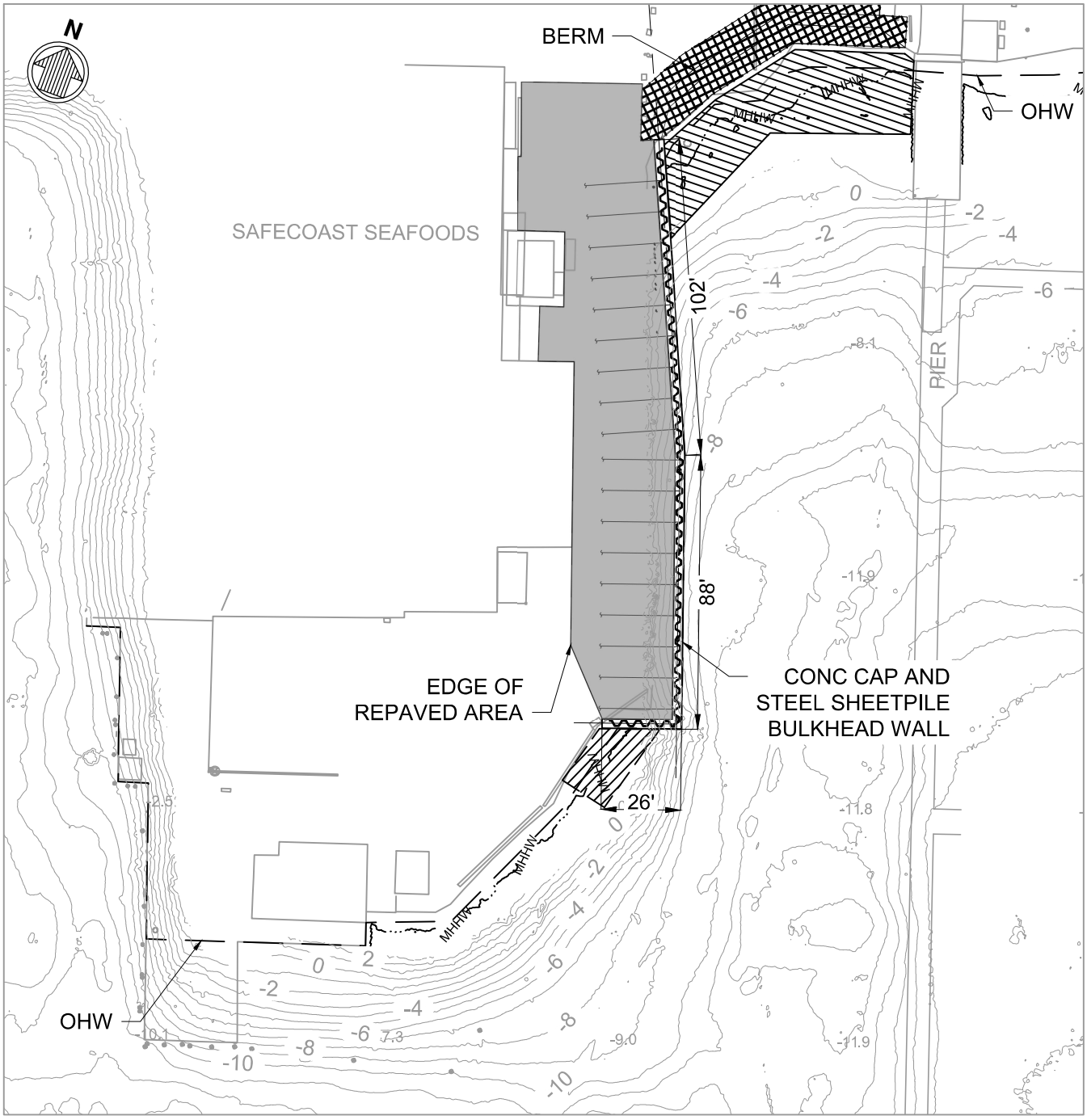
LOCATION: PORT OF ILWACO
117 HOWERTON AVE SE
ILWACO, WA 98624
LAT/LONG: 46.30442 N, -124.03852 W

DATUM: MLLW
SHEET: 4 OF 9 DATE: JUNE 2023

PROPOSED PROJECT: PORT OF ILWACO
EAST BULKHEAD RESILIENCE PROJECT

IN: BAKER BAY
NEAR/AT: ILWACO
COUNTY: PACIFIC STATE: WA
SEC: 33/34 T: 10 N R: 11 W

File: Q:\SEA\213282\20 CADD_Active_Permit_Sheetset\213282_F3



LEGEND

- PAVING AREA LIMITS
- BERM CONSTRUCTION
- SLOPE PROTECTION
- APPROXIMATE AREA OF SLOPE PROTECTION REPLACEMENT
- TIEBACKS
- PROPOSED BULKHEAD
- PILES

A/4 PLAN - PROPOSED
SCALE: 1" = 50'

LEVELS:	
MHHW: +8.07'	MHW: +7.37'
MLW: 1.35'	MLLW: +0.00'
OHW (DELINEATED):	APPROX. +11.50'

50' 0' 50' 100'

SCALE: 1"=50'

APPLICANT:
PORT OF ILWACO

ADJACENT PROPERTY OWNERS:
1) PORT OF ILWACO

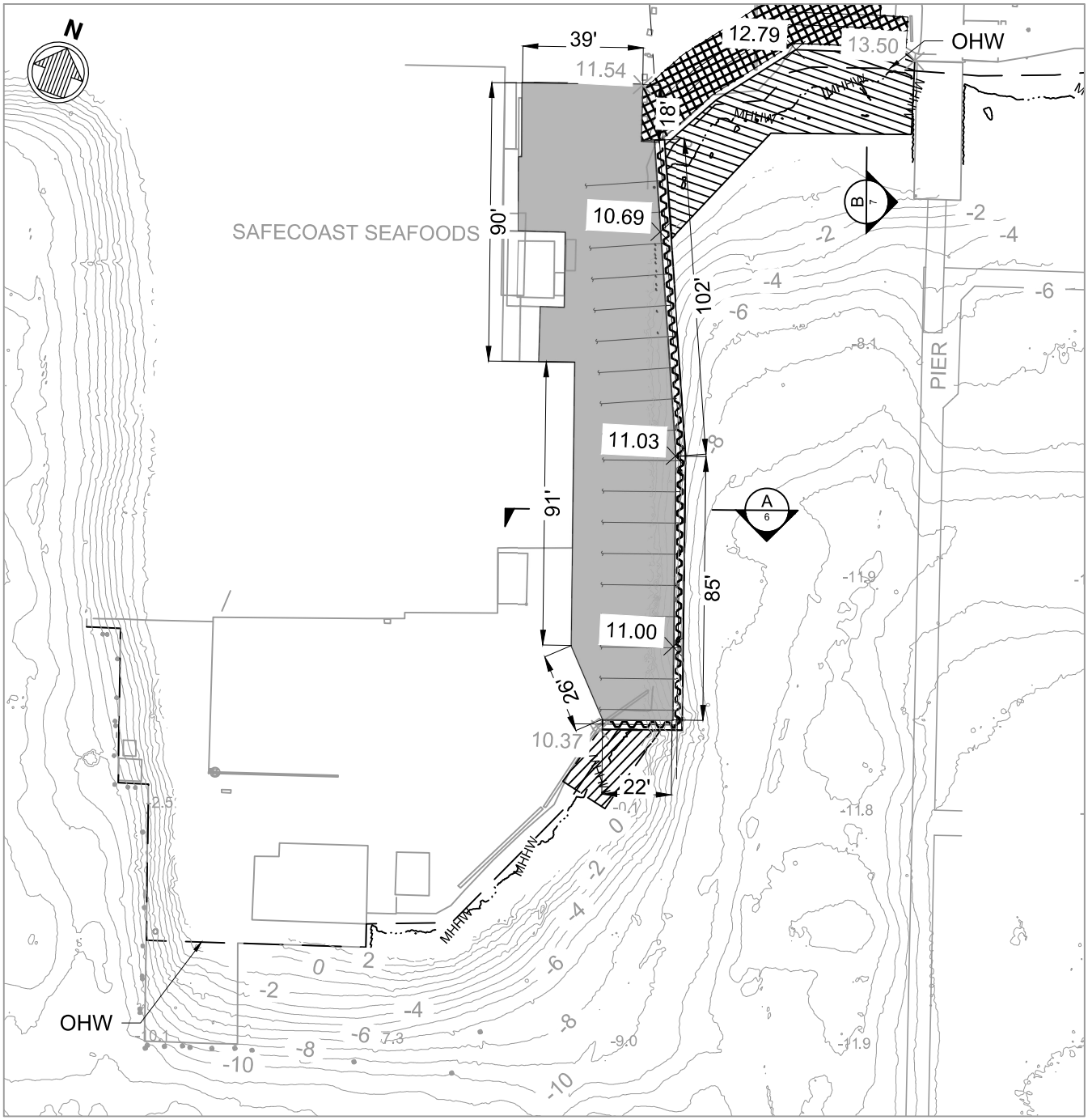
LOCATION: PORT OF ILWACO
117 HOWERTON AVE SE
ILWACO, WA 98624
LAT/LONG: 46.30442 N, -124.03852 W

DATUM: MLLW
SHEET: 5 OF 9 DATE: JUNE 2023

PROPOSED PROJECT: PORT OF ILWACO
EAST BULKHEAD RESILIENCE PROJECT

IN: BAKER BAY
NEAR/AT: ILWACO
COUNTY: PACIFIC STATE: WA
SEC: 33/34 T: 10 N R: 11 W

File: Q:\SEA\213282\20 CADD_Active_Permit_Sheetset\213282_F4



LEGEND

- PAVING AREA LIMITS
- BERM CONSTRUCTION
- SLOPE PROTECTION
- APPROXIMATE AREA OF SLOPE PROTECTION REPLACEMENT
- TIEBACKS
- PROPOSED BULKHEAD
- STEEL PILES
- 0.00 × EXISTING ELEVATION
- 0.00 × PROPOSED ELEVATION

A/5 PLAN - GRADING
SCALE: 1" = 50'

LEVELS:

MHHW: +8.07'	MHW: +7.37'
MLW: 1.35'	MLLW: +0.00'
OHW (DELINEATED):	APPROX. +11.50'

50' 0' 50' 100'

SCALE: 1"=50'

APPLICANT:
PORT OF ILWACO

ADJACENT PROPERTY OWNERS:
1) PORT OF ILWACO

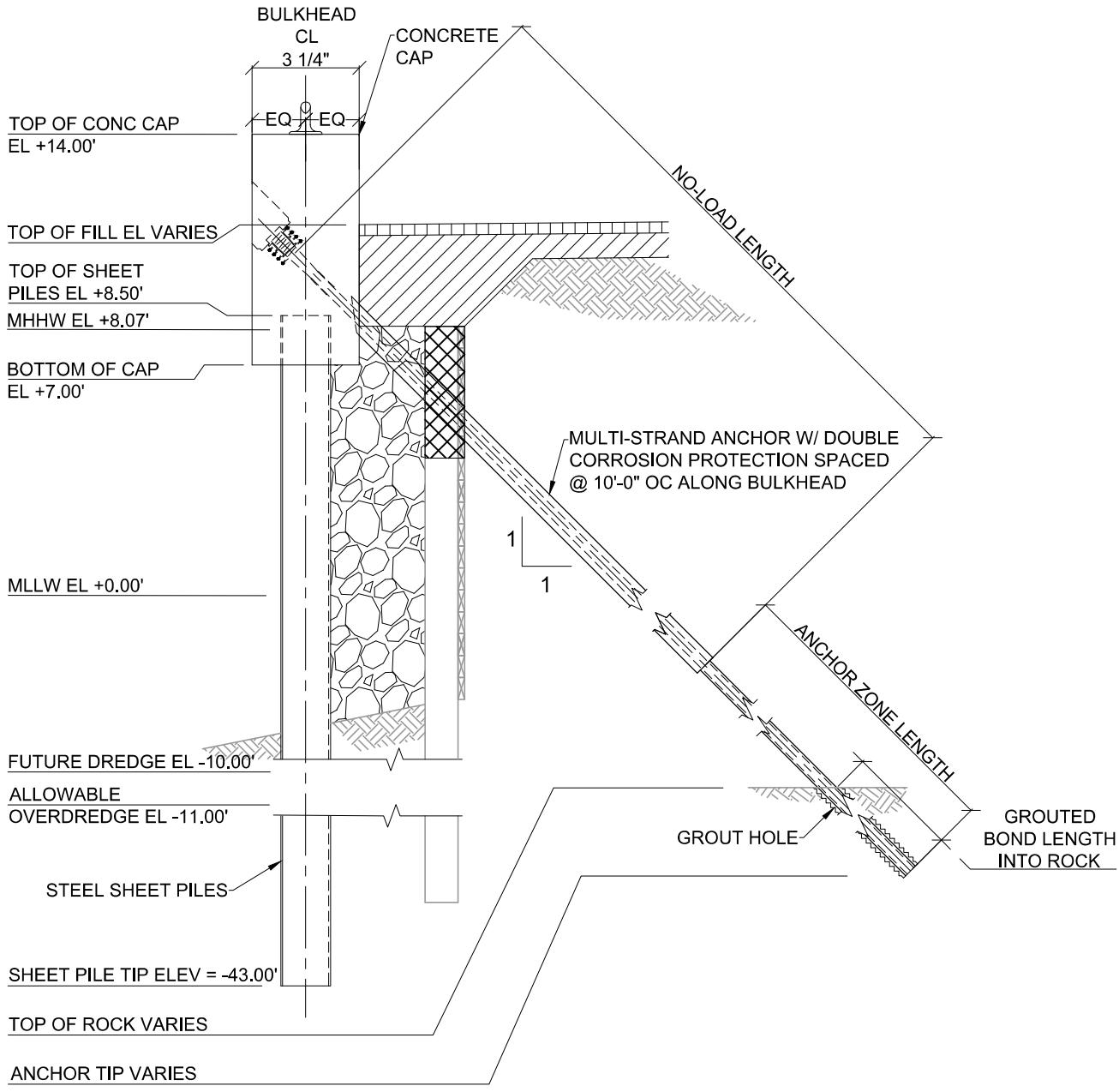
LOCATION: PORT OF ILWACO
117 HOWERTON AVE SE
ILWACO, WA 98624
LAT/LONG: 46.30442 N, -124.03852 W

DATUM: MLLW
SHEET: 6 OF 9 DATE: JUNE 2023

PROPOSED PROJECT: PORT OF ILWACO
EAST BULKHEAD RESILIENCE PROJECT

IN: BAKER BAY
NEAR/AT: ILWACO
COUNTY: PACIFIC STATE: WA
SEC: 33/34 T: 10 N R: 11 W

File: Q:\SEA\213282\20 CADD_Active_Permit_Sheetset\213282_F5



A/6 SECTION - TYP BULKHEAD
SCALE: NTS

LEGEND

- CLEAT
- EXISTING CREOSOTE-TREATED TIMBER BULKHEAD, LAGGING TO REMAIN
- DRAIN ROCK BACKFILL
- ASPHALT PAVING
- STRUCTURAL FILL
- LOCAL DEMOLITION/REMOVAL OF CREOSOTE-TREATED TIMBER BULKHEAD FOR INSTALLATION OF GROUND ANCHORS

APPLICANT:
PORT OF ILWACO

ADJACENT PROPERTY OWNERS:
1) PORT OF ILWACO

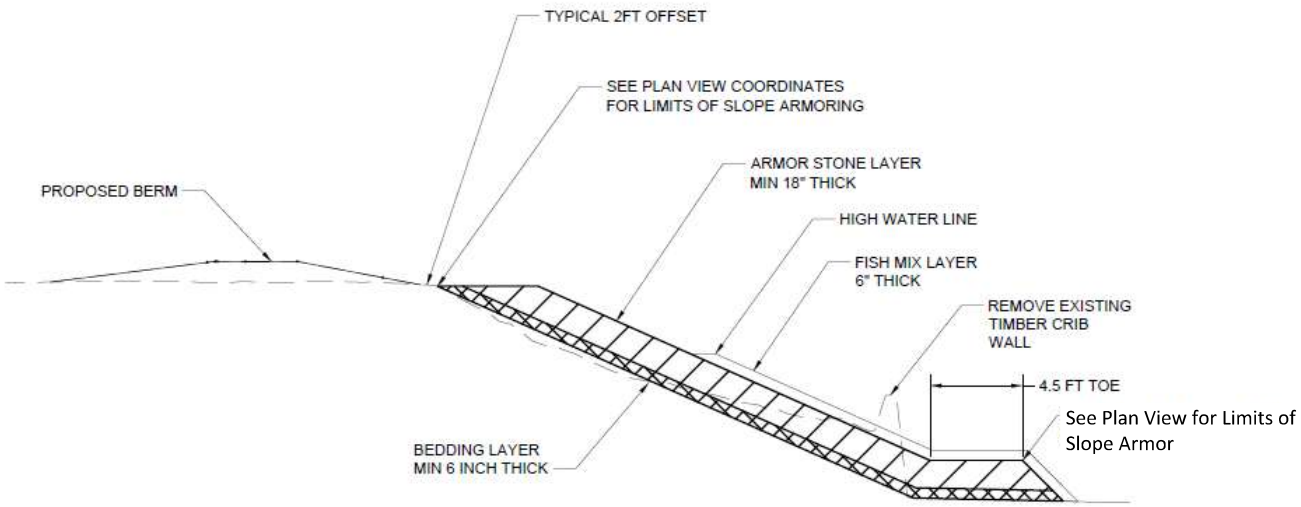
LOCATION: PORT OF ILWACO
117 HOWERTON AVE SE
ILWACO, WA 98624
LAT/LONG: 46.30442 N, -124.03852 W

DATUM: MLLW
SHEET: 7 OF 9 DATE: JUNE 2023

PROPOSED PROJECT: PORT OF ILWACO
EAST BULKHEAD RESILIENCE PROJECT

IN: BAKER BAY
NEAR/AT: ILWACO
COUNTY: PACIFIC STATE: WA
SEC: 33/34 T: 10 N R: 11 W

File: Q:\SEA\213282\20 CADD_Active_Permit_Sheetset\213282_F6



C1 / C-110 SLOPE ARMOR SECTION 2

SCALE:

APPLICANT: PORT OF ILWACO ADJACENT PROPERTY OWNERS: 1) PORT OF ILWACO	LOCATION: PORT OF ILWACO 117 HOWERTON AVE SE ILWACO, WA 98624 LAT/LONG: 46.30442 N, -124.03852 W DATUM: MLLW SHEET: 8 OF 9 DATE: JUNE 2023	PROPOSED PROJECT: PORT OF ILWACO EAST BULKHEAD RESILIENCE PROJECT IN: BAKER BAY NEAR/AT: ILWACO COUNTY: PACIFIC STATE: WA SEC: 33/34 T: 10 N R: 11 W

APPLICANT:
PORT OF ILWACO

ADJACNET PROPERTY OWNERS:
1) PORT OF ILWACO

LOCATION: PORT OF ILWACO
117 HOWERTON AVE SE
ILWACO, WA, 98624

LAT/LONG: 46.20442 N, -124.03852 W

DATUM: MLLW

SHEET: 9 OF 9 DATE: JUNE, 2023

PROPOSED: PORT OF ILWACO EAST BULKHEAD RESILIENCE PROJECT

IN: BAKER BAY
NEAR/AT: PORT OF ILWACO
COUNTY: PACIFIC
SEC: 33/34 T: 10 N
STATE: WA
R: 11 W

Q:\SEA\213282\21 GIS\mapsl\213282_IlwacoFigure_20230616\213282_IlwacoFigure_20230616.aprx

PORT OF ILWACO

MARINA STRUCTURES REPLACEMENT

PORT COMMISSIONERS
ALAN BENNETT
BUTCH SMITH

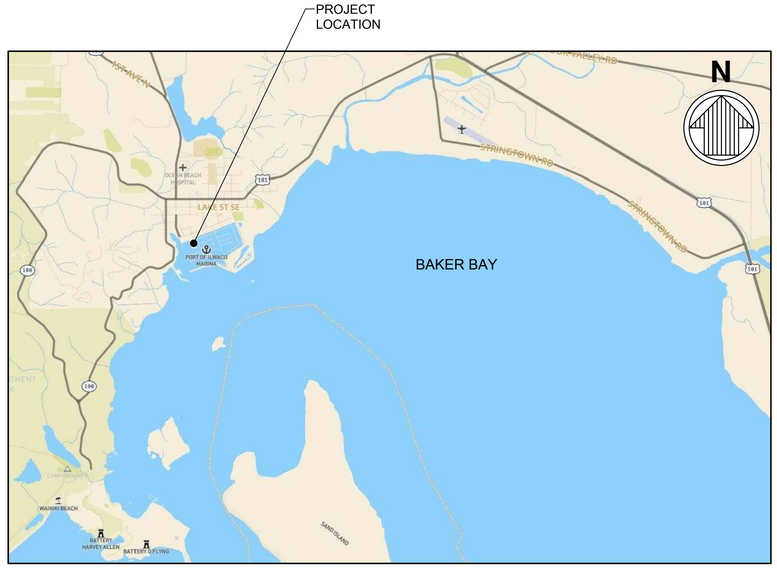
PORT MANAGER
TRACY LOFSTROM

CIVIL/STRUCTURAL ENGINEER
MOFFATT & NICHOL
600 UNIVERSITY STREET
SUITE 610
SEATTLE, WA 98101
(206) 622-0222

GEOTECHNICAL ENGINEER
GEOENGINEERS
1101 SOUTH FAWCETT AVE
SUITE 200
TACOMA, WA 98402
(206) 383-4940

VICINITY MAP
SCALE: NTS

SHEET INDEX		
INDEX NO.	SHEET REF. NO.	SHEET TITLE
1	G-001	COVER SHEET, VICINITY & LOCATION MAPS AND SHEET INDEX
2	G-002	GENERAL NOTES
3	G-003	STRUCTURAL NOTES & DESIGN CRITERIA
4	G-004	STRUCTURAL SPECIAL INSPECTION REQUIREMENTS & DETAILS
5	G-005	ABBREVIATIONS & LEGEND
6	G-100	CONTRACTOR SITE ACCESS & LAYDOWN AREAS
7	V-100	EXISTING SITE PLAN
8	CD-100	DEMOLITION SITE PLAN (1OF 2)
9	CD-101	DEMOLITION SITE PLAN (2 OF 2)
10	CD-901	DEMOLITION PHOTOS (1 OF 2)
11	CD-902	DEMOLITION PHOTOS (2 OF 2)
12	C-100	OVERALL SITE PLAN
13	C-110	GRADING SITE PLAN
14	C-120	GRADING & PAVING DETAILS
15	S-100	BULKHEAD LAYOUT
16	S-201	BULKHEAD PLAN & ELEVATION (1 OF 2)
17	S-202	BULKHEAD PLAN & ELEVATION (2 OF 2)
18	S-301	BULKHEAD TYPICAL SECTIONS
19	S-501	BULKHEAD DETAILS (1 OF 2)
20	S-502	BULKHEAD DETAILS (2 OF 2)
21	S-511	MISCELLANEOUS DETAILS



LOCATION MAP
SCALE: NTS

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

PORT OF ILWACO
MARINA STRUCTURES REPLACEMENT

COVER SHEET, VICINITY & LOCATION MAPS AND SHEET INDEX

Rev: -
Date: 10/6/2023
M&N Project No. 213282
Drawing code:
Drawing Scale: 1:1 (D SHEET)
Plot scale: 1:1 (D SHEET)
Designed by: S.STRINGER
Dwn by: CG
Cad by: CSB
Reviewed by: S.BRANKLUND
Submitted by: S.STRINGER MOFFATT & NICHOL

600 UNIVERSITY STREET SUITE 610
SEATTLE, WA 98101
(206) 622-0222
moffatt & nichol

NOT FOR CONSTRUCTION

Sheet Reference No.
G-001
INDEX: 1 OF 21

GENERAL

1. THESE NOTES CONTAIN GENERAL INFORMATION AND ARE NOT COMPLETE FOR CONSTRUCTION PURPOSES. VERIFY INFORMATION GIVEN HERE WITH SPECIFICATIONS, REFERENCE DRAWINGS, AND OTHER DOCUMENTS AND BRING ANY CONFLICTS TO THE ATTENTION OF THE PORT BEFORE BEGINNING AFFECTED WORK INCLUDING FABRICATION, DEMOLITION, OR CONSTRUCTION. THE PORT WILL RESOLVE ANY SUCH CONFLICT.

2. VERIFY LOCATIONS OF EXISTING UTILITIES AND RELATED FEATURES IN A MANNER SIMILAR TO NOTE 1 ABOVE. USE A LOCATOR SERVICE AND EXCAVATE TO EXPOSE UTILITY LINES. BRING ANY CONFLICTS BETWEEN EXISTING UTILITIES OR RELATED FEATURES AND NEW CONSTRUCTION TO THE ATTENTION OF THE PORT.

3. IMMEDIATELY REPAIR ANY DAMAGE TO EXISTING UTILITIES OR RELATED FEATURES BY THE CONTRACTOR TO THE SATISFACTION OF THE PORT AND AT NO EXPENSE TO THE PORT. DRAWING G-003 CONTAIN THE PROJECT STRUCTURAL NOTES ASSOCIATED WITH THE FACILITY. NOTES ON ALL OTHER DRAWINGS ARE SUPPLEMENTAL.

4. AREAS OF THE FACILITY NOT UNDER CONSTRUCTION SHALL REMAIN IN OPERATION DURING THIS PROJECT. KEEP ALL CONSTRUCTION ACTIVITIES AND PERSONNEL CLEAR OF FACILITY OPERATIONS.

5. DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, USE SIMILAR DETAILS OF CONSTRUCTION, SUBJECT TO REVIEW AND APPROVAL BY THE PORT.

6. VERIFY ALL SITE CONDITIONS, FEATURES, DIMENSIONS, AND ELEVATIONS PRIOR TO FABRICATION OF ASSEMBLIES OR CONSTRUCTION. COORDINATE THE SIZE AND LOCATION OPENINGS, AS WELL AS ALL OF ALL OPENINGS. VERIFY SIZE AND LOCATION OF ALL BY OTHER TRADES. THE CONDITIONS SHOWN ON THESE DRAWINGS ATTACHMENTS REQUIRED ARE BASED ON AVAILABLE EXISTING DATA. NOTIFY THE PORT IN WRITING OF ANY DISCREPANCIES BEFORE BEGINNING THE AFFECTED WORK. RESOLVE DISCREPANCIES AS APPROVED BY THE PORT BEGINNING THE AFFECTED WORK. RESOLVE DISCREPANCIES AS APPROVED BY THE PORT BEFORE BEGINNING THE AFFECTED WORK. LINES AND GRADES: ESTABLISH AND MAINTAIN THE DATUM AND CONSTRUCTION BASELINE.

7. SUBMIT SHOP DRAWINGS AND OTHER SUBMITTALS FOR REVIEW TO THE PORT PRIOR TO FABRICATION OF COMPONENTS. INCLUDE DEMOLITION PLANS, CONSTRUCTION JOINT LOCATIONS, AND CONSTRUCTION JOINT DETAILS. THE PORT WILL REVIEW THE SUBMITTALS.

8. SHOP DRAWING AND OTHER SUBMITTAL REVIEWS: REVIEW, VERIFY, AND STAMP BY BOTH THE CONTRACTOR AND THE CONTRACTORS QUALITY CONTROL MANAGER BEFORE SUBMITTING TO THE PORT. VERIFY CONFORMANCE WITH THE MEANS AND METHODS; TECHNIQUES, SEQUENCES, AND OPERATIONS OF CONSTRUCTION; AND ALL SAFETY PRECAUTIONS AND PROGRAMS INCIDENTAL THERETO. SUBMIT TO THE PORT FOR REVIEW WHEN COMPLETE.

9. BRING ALL OMISSIONS OR CONFLICTS BETWEEN THE VARIOUS ELEMENTS OF THE STRUCTURAL DRAWINGS OR BETWEEN THE STRUCTURAL DRAWINGS AND THE DRAWINGS OF OTHER TRADES (ELECTRICAL, MECHANICAL, PLUMBING, FIRE PROTECTION, ETC.) TO THE ATTENTION OF THE PORT BEFORE PROCEEDING WITH ANY WORK INVOLVED.

10. DO NOT SCALE WORKING DIMENSIONS FROM PLANS, SECTIONS OR DETAILS ON THE STRUCTURAL DRAWINGS.

11. SUBMIT CONTRACTOR-INITIATED CHANGES IN WRITING TO THE PORT FOR APPROVAL PRIOR TO SUBMITTAL OF SHOP DRAWINGS.

12. JOBSITE SAFETY; MEANS AND METHODS OF PERFORMING THE WORK; AND TECHNIQUES, SEQUENCES, AND PROCEDURES OF CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE PRESENCE OF THE PORT OR ITS REPRESENTATIVE DOES NOT NEGATE THE CONTRACTORS RESPONSIBILITY FOR JOBSITE SAFETY OR THE CONTRACTORS RESPONSIBILITY TO PERFORM ITS WORK IN COMPLIANCE WITH THE CONTRACT.

13. VERIFY THE STRUCTURAL CAPACITY OF EXISTING STRUCTURES FOR THE ANTICIPATED LOADS OF CONSTRUCTION EQUIPMENT AND OPERATIONS TO BE USED.

14. PROVIDE TEMPORARY BRACING TO UNFINISHED PORTIONS OF THE STRUCTURE. REMOVE TEMPORARY BRACING ONLY AFTER STABILITY OF THE FINISHED STRUCTURE IS ACHIEVED.

15. CONTRACTOR SHALL BE RESPONSIBLE TO PROTECT ALL EXISTING STRUCTURES THAT WILL REMAIN.

SURVEY NOTES:

1. EXISTING SITE INFORMATION SHOWN ON THESE DRAWINGS IS BASED ON SURVEY INFORMATION PROVIDED BY SOLMAR HYDRO, DATED 13 APRIL, 2022.

2. DATE OF SURVEY: TOPOGRAPHIC AND BATHYMETRIC SURVEYS CONDUCTED BETWEEN 15 FEB, 2022 AND 4 MARCH 2022

3. HORIZONTAL DATUM FOR THIS PROJECT IS NAD83/11 WITH PROJECTION STATE PLANE COORDINATE SYSTEM WASHINGTON SOUTH ZONE.

4. VERTICAL DATUM FOR THIS PROJECT IS MLLW BASED ON PUBLISHED NOAA TIDAL BENCHMARK 944 0581 C

5. UNITS: U.S FEET.

6. CONTOUR INTERVAL: 1 FOOT.

7. ALL UNDERGROUND UTILITY LOCATIONS ARE BASED ON OBSERVED EVIDENCE OF STRUCTURES. NO GUARANTEE IS MADE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED OR THAT THE UNDERGROUND UTILITIES ARE SHOWN IN THEIR EXACT LOCATION. FIELD VERIFY THE LOCATION,SIZE, MATERIAL, AND DEPTH OF UTILITIES.

8. CONTRACTOR IS RESPONSIBLE FOR REQUESTING AND MAINTAINING LOCATES ON ALL UNDERGROUND UTILITIES WITHIN THE PROJECT LIMITS.

CONTROL NOTES:

BASED STATION: SWLS ILWACO
NORTHING = 373487.13 FT
EASTING = 746918.05 FT
ELEVATION = 14.23 FT (NAVD88)

DATUM:

ELEVATION DATUM FOR THIS PROJECT IS 0.0' MEAN LOWER LOW WATER (MLLW).

TIDAL DATA:

TIDAL ELEVATIONS BASED ON NOAA TIDES AND CURRENTS DATUM FOR STATION 944 0581 CAPE DISAPPOINTMENT, WA EPOCH 1983 - 2001

ELEV(FT)	DATUM	DESCRIPTION
11.50	HOWL	HIGHEST OBSERVED WATER LEVEL
8.07	MHHW	MEAN HIGHER HIGH WATER
7.37	MHW	MEAN HIGH WATER
4.36	MTL	MEAN TIDAL LEVEL
1.35	MLW	MEAN LOW WATER
0.46	NAVD88	NORTH AMERICAN VERTICAL DATUM OF 1988
0.00	MLLW	MEAN LOWER LOW WATER
-2.95	LOWL	LOWEST OBSERVED WATER LEVEL

PERMIT REQUIREMENTS, BEST MANAGEMENT PRACTICES (BMPS) AND TEMPORARY EROSION & SEDIMENT CONTROL (TESC):

CONTRACTOR SHALL COMPLY WITH ALL PROJECT PERMIT CONDITIONS AND APPLICABLE BMPS LISTED BELOW AND IDENTIFIED IN THE SPECIFICATIONS, THE PROJECT STORM WATER POLLUTION PREVENTION PLAN, AND WATER QUALITY PROTECTION AND MONITORING PLAN.

1. DURING ANY IN-WATER AND EMBANKMENT WORK, CONTAINMENT BOOMS SHALL BE USED TO SURROUND THE WORK AREAS OR SEPARATE EMBANKMENT WORK FROM SURFACE WATER. THE BOOMS SHALL CONTAIN AND COLLECT ANY OILY OR SIMILAR MATERIALS RELEASED AS WELL AS FLOATING DEBRIS. OIL-ABSORBENT MATERIALS SHALL BE EMPLOYED IMMEDIATELY IF VISIBLE OILY OR SIMILAR MATERIALS ARE OBSERVED. ACCUMULATED DEBRIS SHALL BE COLLECTED DAILY AND DISPOSED OF AT A PERMITTED UPLAND SITE APPROVED BY THE PORT. SEE SPECIFICATION 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.

2. STEEL PILING MUST BE INSTALLED WITH VIBRATORY HAMMER AND IMPACT HAMMERS ACCORDING TO THE PROJECT SPECIFICATIONS. IMPACT HAMMERING SHALL START WITH LIGHT TAPPING, THEN INCREASE TO FULL FORCE GRADUALLY.

3. A BUBBLE CURTAIN AND ONE OR MORE OTHER NOISE ATTENUATION METHODS SHALL BE USED DURING IMPACT INSTALLATION OR PROOFING OF ALL STEEL PILING.

4. HYDRAULIC WATER JETS SHALL NOT BE USED TO INSTALL PILES.

5. WORK BARGES SHALL NOT BE GROUNDED DURING CONSTRUCTION.

6. EXCESS AND/OR WASTE MATERIALS GENERATED DURING CONSTRUCTION SHALL NOT BE DISPOSED OF OR ALLOWED TO ENTER STATE WATERS. EXCESS OR WASTE MATERIALS SHALL BE COLLECTED AND RECYCLED OR DISPOSED OF AT A PERMITTED UPLAND FACILITY APPROVED BY THE PORT DEMOLITION AND CONSTRUCTION MATERIALS SHALL NOT BE STORED WHERE WAVE ACTION OR UPLAND RUONFF CAN CAUSE MATERIALS TO ENTER SURFACE WATERS.

7. WATER QUALITY STANDARDS AND PROCEDURES THAT LIMIT THE IMPACT OF POLLUTANTS SHALL BE OBSERVED (WAC173-201A-210(1)(E)(I)).

8. LAND-BASED STAGING AREAS FOR ACTIVITIES, SUCH AS STORAGE OF MACHINERY, EQUIPMENT, MATERIALS, AND STOCKPILED SOILS SHALL BE ESTABLISHED LANDWARD OF THE TOP OF BANK IN ACCORDANCE WITH REQUIREMENTS IN THE SPECIFICATIONS. A SILT FENCE SHALL BE INSTALLED AROUND THE PERIMETER OF THE UPLAND WORK AREAS AND LOCATIONS WHERE MACHINERY, MATERIALS, AND STOCKPILED SOILS ARE SITUATED. ANY TEMPORARY STOCKPILES SHALL BE COVERED AND BERMED WHEN NOT IN USE.

9. WORK AREA TO BE CLEARLY DELINEATED IN THE FIELD WITH CONSTRUCTION FENCING OR OTHER APPROPRIATE MEASURES.

10. TESC BMPS (E.G. SILT FENCE, WATTLES) TO BE IMPLEMENTED AS APPLICABLE, SEE SPECIFICATION 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.

11. CATCH BASIN INLET PROTECTION TO BE INSTALLED WHERE APPLICABLE.

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Mark	Description	Date	Appr

PORT OF ILWACO
MARINA STRUCTURES
REPLACEMENT

GENERAL NOTES

Designed by: S.STRINGER	Dwn by: CG	Chkd by: CSB	Reviewed by: S.BRANLUND
Submitted by: S.STRINGER MOFFATT & NICHOL	Date: 10/6/2023	M&N Project No. 213282	Drawing code:
Drawing Scale:	Plot scale: 1:1 (D SHEET)	Rev: -	

600 UNIVERSITY
STREET SUITE 610
SEATTLE, WA 98101
(206) 622-0222

moffatt & nichol

STUART J. STRINGER — STATE OF WASHINGTON — 22367 — PROFESSIONAL ENGINEER — NOT FOR CONSTRUCTION

Sheet Reference No.
G-002
INDEX: 2 OF 21

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

CODES AND STANDARDS

ALL DESIGN AND CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF THE FOLLOWING CODES AND STANDARDS.

1. AMERICAN CONCRETE INSTITUTE (ACI) 318-14, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE & COMMENTARY.
2. ACI 301-20, SPECIFICATIONS FOR CONCRETE CONSTRUCTION.
3. ACI DETAILING MANUAL MNL(66)-20.
4. AISC 360-16, SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS.
5. AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE) STANDARD 7-16, MINIMUM DESIGN LOADS AND ASSOCIATED CRITERIA FOR BUILDINGS AND OTHER STRUCTURES.
6. AMERICAN WELDING SOCIETY (AWS), AWS D1.1-2020, STRUCTURAL WELDING CODE - STEEL.
7. AWS D1.4-2018, STRUCTURAL WELDING CODE - REINFORCING STEEL.
8. AWS D1.6-2017, STRUCTURAL WELDING CODE - STAINLESS STEEL.
9. INTERNATIONAL CODE COUNCIL (ICC), INTERNATIONAL BUILDING CODE (IBC), 2018.
10. US ARMY CORPS OF ENGINEERS - DESIGN OF SHEET PILE WALLS, EM 1110-2-2504
11. UFC 4-152-07, DESIGN SMALL CRAFT BERTHING FACILITIES, 1 SEPTEMBER 2012.
12. UFC 4-159-03, DESIGN: MOORINGS, 12 MARCH 2020.
13. WASHINGTON DEPARTMENT OF TRANSPORTATION (WSDOT), STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION, 2021.
14. CRSI- MANUAL OF STANDARD PRACTICE 29TH EDITION, 2018

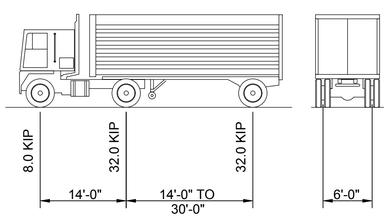
BULKHEAD DESIGN CRITERIA

1. THE BULKHEAD IS DESIGNED FOR STATIC, SEISMIC, AND LIQUEFACTION LATERAL LOADING CONDITIONS AS SPECIFIED IN THE GEOTECHNICAL ENGINEERING REPORT BY GEOENGINEERS INC, AUGUST 2022
2. BULKHEAD DESIGN IS IN ACCORDANCE WITH US ARMY CORPS OF ENGINEERS -DESIGN OF SHEET PILE WALLS (EM 1110-2-2504).
3. SUBMIT GROUTED TIE-BACK ANCHOR DESIGN CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF WASHINGTON TO THE PORT FOR REVIEW PRIOR TO THE START OF CONSTRUCTION. AT A MINIMUM PROVIDE: MATERIALS, DESIGN, STRESSING, LOAD TESTING, AND ACCEPTANCE CRITERIA IN ACCORDANCE WITH PTI RECOMMENDATIONS.
4. TIE-BACK ANCHOR ULTIMATE BOND STRENGTH OF 50PSI FOR MINIMUM 6 INCH DIAMETER ANCHOR.

   ASD DESIGN: FACTOR OF SAFETY FOR BOND STRENGTH = 2.0 FOR STATIC CONDITIONS, 1.5 FOR SEISMIC CONDITIONS.
5. BULKHEAD SURCHARGE LIVE LOADING:

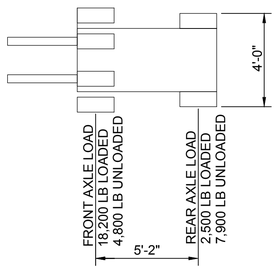
   CONSTRUCTION LOAD CASE = 80 PSF
   STATIC LOAD CASE = 300 PSF
   SEISMIC LOAD CASE = 100 PSF
   POST SEISMIC LOAD CASE = 100 PSF
6. VEHICLE LIVE LOADS, SEE DIAGRAMS BELOW.

HS20 DESIGN TRUCK (AASHTO)



BULKHEAD DESIGN CRITERIA (CONTINUED)

4 TON FORK LIFT



7. WIND (ASCE 7-16)

BASIC WIND ON STRUCTURE	95 MPH (3-SECOND GUST)
EXPOSURE	D

8. MOORING

TYPE I MILD WEATHER (UFC 4-159-03)	
WIND VELOCITY	35 KNOTS
CURRENT VELOCITY	1.0 KNOTS
WAVES	N/A FOR TYPE I MOORING
DESIGN VESSEL (FISHING VESSEL)	
DISPLACEMENT	40 LONG TON
LENGTH OVER ALL (LOA)	60 FEET
BEAM	22 FEET
DRAFT	12 FEET

9. SEISMIC (ASCE 7-16)
   RISK CATEGORY = II
   SHORT PERIOD SPECTRAL RESPONSE, Ss =1.427g
   ONE-SECOND PERIOD SPECTRAL RESPONSE, S1 =0.738 g
   SITE CLASS = F
   SPECTRAL RESPONSE COEFFICIENTS
   SHORT PERIOD, SDS = 1.142 g
   ONE-SECOND PERIOD, SD1 = 1.255 g

   MODIFIED PEAK GROUND ACCELERATION, PGAm = 0.798 g
   SEISMIC DESIGN CATEGORY = D

STEEL PILING

1. MATERIAL: SHEET PILES ASTM A572, GRADE 60, FY=60KSI. SEE SPECIFICATION 31 62 00 DRIVEN PILES.
2. DRIVE ALL PILES TO THE REQUIRED TIP ELEVATIONS AS INDICATED.
3. ULTIMATE STEEL PILE CAPACITY IS SPECIFIED BY GEOENGINEERS,INC GEOTECHNICAL ENGINEERING REPORT.
4. COATING DAMAGED DURING HANDLING, DRIVING, OR DUE TO FILED WELDING MUST BE RESTORED AS REQUIRED BY THE SPECIFICATIONS AND AS DIRECTED BY THE PORT. SEE SPECIFICATION 09 96 00 HIGH PERFORMANCE COATINGS.

STRUCTURAL STEEL AND MISCELLANEOUS METAL

1. CONFORM TO THE FOLLOWING, UON:

SHAPE	STANDARD, GRADE
PLATES	ASTM A572, GR 50
CHANNELS	ASTM A572, GR 50
W SECTIONS	ASTM A992, GR 50
ANGLES	ASTM A572, GR50
PIPE	ASTM A53, GR C
HSS RECTANGULAR	ASTM A500, GR C, FY=50 KSI
HSS ROUND	ASTM A500, GR C, FY=46 KSI

2. MACHINE BOLTS MUST CONFORM TO ASTM A307 GRADE A WITH COMPATIBLE ASTM A563 GRADE A NUTS AND ASTM F844 WASHERS.
3. HIGH STRENGTH BOLTS MUST CONFORM TO ASTM F3125, GRADE A325 WITH COMPATIBLE ASTM A563 NUTS AND ASTM F436 WASHERS.
4. ANCHOR BOLTS MUST CONFORM TO ASTM F 1554, GRADE 55, UON
5. WELDING MUST CONFORM TO AWS D1.1

STRUCTURAL STEEL AND MISCELLANEOUS METAL (CONTINUED)

6. WHERE INDICATED, EXPOSED STRUCTURAL STEEL MUST BE HOT-DIP GALVANIZED CONFORMING TO ASTM A123/A123M GRADE 100 FOR SHAPES, PLATES, AND FABRICATIONS, ASTM A153/153M CLASS C FOR HARDWARE, AND ASTM F2329.
7. SET ALL EMBEDDED ANCHOR BOLTS AND ANCHOR RODS USING TEMPLATES THAT ARE VERIFIED WITH CERTIFIED DRAWINGS OF THE EQUIPMENT, FRAMING, OR MOORING HARDWARE PRIOR TO THE CONCRETE POUR. NOTIFY THE PORT OF ANY CHANGES TO ANCHOR BOLT SIZES, SPACING, OR QUANTITIES FROM WHAT IS SHOWN ON THE DRAWINGS. TEMPLATES MUST BE ADEQUATE TO HOLD THE BOLTS ACCURATELY IN PLACE AND IN ALIGNMENT DURING THE CONCRETE POUR.
8. PROVIDE BLEED HOLES IN EMBEDDED PLATES AND SHAPES AT 2'-0" ON CENTER MAXIMUM.
9. STAINLESS STEEL MUST BE OF TYPE 316L, BARS AND SHAPES, BOLTS, NUTS, AND WASHERS MUST CONFORM TO ASTM A276/A276M, F593, F594, AND F844, RESPECTIVELY.

STRUCTURAL CONCRETE REINFORCEMENT

1. MATERIALS:

REINFORCEMENT	STANDARD	GRADE	NOTES
REINFORCING STEEL	ASTM A615	60	DEFORMED, UON
PREINFORCING STEEL TO BE WELDED	ASTM A706	60	DEFORMED
HEADED REINFORCEMENT (T-HEADS)	ASTM A970		CLASS HAS ROUND HEADS ONLY

2. PROVIDE MECHANICAL REINFORCING BAR CONNECTORS (COUPLERS) THAT DEVELOP A MINIMUM OF 1.25 TIMES THE YIELD STRENGTH OF REINFORCING BARS.
3. PLACEMENT:
   - A LAP SPLICE REINFORCING STEEL MARKED CONT (CONTINUOUS) WITH A MINIMUM LAP SPLICE ACCORDING TO SHEET G-005 UON.
   - B CONFORM TO ACI 301, ACI MNL(66)-20, AND ACI 318 FOR CONCRETE DETAILS. DO NOT SPLICE ANY REINFORCEMENT LESS THAN 40 FEET IN LENGTH UON.
   - C STAGGER SPLICES OF ADJACENT BARS SO NO MORE THAN 50% OF THE BARS ARE SPLICED AT ANY ONE LOCATION. PROVIDE A MINIMUM STAGGER BETWEEN LAP SPLICES OF 180 BAR DIAMETERS UON.
   - E PROVIDE CORNER BARS AT ALL WALL, CURB, AND CURB WALL CORNERS MATCH THE QUANTITY, SPACING, AND DIAMETER OF ALL HORIZONTAL REINFORCEMENT AT THE CORNER. EXTEND TERMINATED STRAIGHT BARS THE FULL AVAILABLE LENGTH INTO ADJOINING MEMBERS. SPLICE EACH CORNER BAR TO A TERMINATED STRAIGHT BAR WITH A MINIMUM SPLICE LENGTH OF 60 BAR DIAMETERS. IF SPLICE LENGTH IS NOT AVAILABLE, USE MECHANICAL REINFORCING BAR CONNECTORS.
   - F DO NOT WELD REINFORCING STEEL EXCEPT WHERE INDICATED OR BY APPROVAL OF THE PORT IN WRITING PRIOR TO CONSTRUCTION. IF AN ARC IS CREATED BETWEEN REINFORCING STEEL AND A WELDING ELECTRODE, REPLACE THE REINFORCING STEEL.

CAST-IN-PLACE CONCRETE

1. CAST-IN-PLACE CONCRETE MINIMUM 28 DAY COMPRESSIVE STRENGTH: 5000 PSI REFER TO SPECIFICATION 03 30 00 CAST-IN-PLACE CONCRETE.
2. COVER FOR REINFORCING STEEL: 3 INCH, UON.
3. CHAMFER ALL EXPOSED CORNERS 3/4 INCH, UON.
4. PROVIDE CONSTRUCTION JOINTS ONLY AS NOTED ON THE DRAWINGS OR AS SPECIFICALLY PERMITTED BY THE PORT.
5. ROUGHEN CONSTRUCTION JOINTS TO 1/4 IN AMPLITUDE, UON. CLEAN AND REMOVE LAITANCE, THEN CONTINUOUSLY SOAK WITH WATER FOR 12 HOURS PRIOR TO POUR, UON. REMOVE STANDING WATER JUST PRIOR TO PLACING NEW CONCRETE.

TIE BACK ANCHORS

1. TIE BACK ANCHORS INCLUDING STRAND, SHEATHING, AND ASSOCIATED HARDWARE MUST BE DYWIDAG MULTISTRAND, DOUBLE CORROSION PROTECTED OR APPROVED EQUAL MEETING ASTM A416.
2. GROUTED STRAND ANCHORS MUST CONFORM TO ASTM A416, GRADE 270, WITH COMPATIBLE HARDWARE AND ANCHORS. SYSTEM AS DESIGN IS PER DYWIDAG-SYSTEMS INTERNATIONAL. SUBMIT ALTERNATE SYSTEMS FOR APPROVAL PRIOR TO CONSTRUCTION.
3. TIE BACK ANCHOR SYSTEM AS SHOWN ON THE DRAWINGS IS FOR BID PURPOSES ONLY, FINAL DESIGN AND METHOD OF INSTALLTION IS TO BE DESIGNED BY THE CONTRACTOR. SEE G-004 FOR MINIMUM SPECIAL INSPECTION REQUIREMENTS.

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Rev.	Date	Description	Appr
-			

PORT OF ILWACO
MARINA STRUCTURES REPLACEMENT

STRUCTURAL NOTES & DESIGN CRITERIA

Designed by: S.STRINGER
Drawn by: CG
Checked by: CSB
Reviewed by: S.BRANLUND
Submitted by: S.STRINGER MOFFATT & NICHOL
Date: 10/6/2023
M&N Project No. 213282
Drawing scale:
Drawing Scale:
Plot scale: 1:1 (0 SHEET)

600 UNIVERSITY STREET SUITE 910 SEATTLE WA 98101 (206) 622-0222
moffatt & nichol

STUART J. STRINGER — STATE OF WASHINGTON — 22367 — PROFESSIONAL ENGINEER — NOT FOR CONSTRUCTION

Sheet Reference No.
G-003
INDEX: 3 OF 21

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

SPECIAL INSPECTION NOTES

1. THE ITEMS CHECKED WITH AN "X" MUST BE INSPECTED IN ACCORDANCE WITH IBC CHAPTER 17 BY AN INSPECTOR MEETING THE MINIMUM QUALIFICATIONS OUTLINED IN THE SPECIFICATIONS. FOR MATERIAL SAMPLING AND TESTING REQUIREMENTS, REFER TO THE PROJECT SPECIFICATIONS, THE SPECIFIC GENERAL NOTES SECTIONS, AND THE CODE SECTIONS REFERENCED. SEND COPIES OF ALL STRUCTURAL TESTING AND INSPECTION REPORTS DIRECTLY TO THE PORT. ANY MATERIALS WHICH FAIL TO MEET THE PROJECT SPECIFICATIONS MUST IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE PORT. SPECIAL INSPECTION TESTING REQUIREMENTS APPLY EQUALLY TO ALL BIDDER DESIGNED COMPONENTS.

2. CONTINUOUS SPECIAL INSPECTION MEANS THAT THE SPECIAL INSPECTOR IS ON THE SITE AT ALL TIMES OBSERVING THE WORK REQUIRING SPECIAL INSPECTION IBC SECTION 1702. PERIODIC SPECIAL INSPECTION MEANS THAT THE SPECIAL INSPECTOR IS ONSITE AT TIME INTERVALS NECESSARY TO CONFIRM THAT ALL WORK REQUIRING INSPECTION IS IN COMPLIANCE.

3. VISUALLY INSPECT ALL WELDS.

4. ALL COMPLETE PENETRATION WELDS MUST BE TESTED ULTRASONICALLY OR BY USE OF A COMPARABLE APPROVED METHOD.

5. CONTINUOUS SPECIAL INSPECTION BY A REGISTERED DEPUTY INSPECTOR IS REQUIRED FOR FIELD WELDING, CONCRETE STRENGTH, HIGH STRENGTH BOLTING, SPRAYED-ON FIREPROOFING, GROUTING.

TABLE 1705.3 REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD	IBC REFERENCE
1. INSPECT REINFORCEMENT, VERIFY PLACEMENT.	-	X	ACI 318: 20, 25.2, 25.3, 26.6.1-26.6.3	1908.4
2. REINFORCING BAR WELDING A. INSPECT SINGLE-PASS FILLET WELDS, MAXIMUM 5/16";AND B. INSPECT ALL OTHER WELDS.	-	X X	AWS D1.4 ACI 318: 26.6.4	-
3. REINFORCING BAR WELDING	-	X	ACI 318: 17.8.2	-
4. INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS. A. ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS. B. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 4.A.	X	X	ACI 318: 17.8.2.4 ACI 318: 17.8.2	-
5. VERIFY USE OF REQUIRED DESIGN MIX.	-	X	ACI 318: 19, 26.4.3, 26.4.4	1904.1 1904.2 1908.2 1908.3
6. PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGHT TESTS. PERFORM SLUMP AND AIR CONTENT TESTS. AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X	-	ASTM C172 ASTM C31 ACI 318: 26.4, 26.12	1908.10
7. INSPECT CONCRETE PLACEMENT FOR PROPER APPLICATION TECHINQUES.	X	-	ACI 318: 26.5	1908.6 1908.7 1908.8
8. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.	-	X	ACI 318: 26.5.3-26.5.5	1908.9
9. VERIFY IN-SITU CONCRETE STRENGTH, PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS.	-	X	ACI 318: 26.11.2	-
10. INSPECT FORMWORK FOR SHAPE, LOCATION, AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.	-	X	ACI 318: 26.11.1.2(b)	-

TABLE 1705.6 REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.	-	X
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER SUPPORTING MATERIAL.	-	X
3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.	-	X
4. VERIFY USE OF PROPER MATERIALS, DENSITIES, AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X	-
5. PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	-	X

TABLE 1705.7 REQUIRED SPECIAL INSPECTIONS AND TESTS OF DRIVEN DEEP FOUNDATION ELEMENTS

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1. VERIFY ELEMENT MATERIALS, SIZES, AND LENGTHS COMPLY WITH REQUIREMENTS.	X	-
2. DETERMINE CAPACITIES OF TEST ELEMENTS AND CONDUCT ADDITIONAL LOAD TESTS, AS REQUIRED.	X	-
3. INSPECT DRIVING OPERATIONS AND MAINTAIN COMPLETE AND ACCURATE RECORDS FOR EACH ELEMENT.	X	-
4. VERIFY PLACEMENT LOCATIONS AND PLUMBNESS, CONFIRM TYPE AND SIZE OF HAMMER, RECORD NUMBER OF BLOWS PER FOOT OF PENETRATION, DETERMINE REQUIRED PENETRATIONS TO ACHIEVE DESIGN CAPACITY, RECORD TIP AND BUTT ELEVATIONS, AND DOCUMENT ANY DAMAGE TO FOUNDATION ELEMENT.	X	-
5. FOR STEEL ELEMENTS, PERFORM ADDITIONAL SPECIAL INSPECTIONS IN ACCORDANCE WITH SECTION 1705.2 SEE QUALITY ASSURANCE INSPECTION REQUIREMENTS OF AISC-360.	-	-
6. FOR CONCRETE ELEMENTS AND CONCRETE-FILLED ELEMENTS, PERFORM TESTS AND ADDITIONAL SPECIAL INSPECTIONS IN ACCORDANCE WITH SECTION 1705.3.	-	-
7. FOR SPECIALTY ELEMENTS, PERFORM ADDITIONAL INSPECTIONS AS DETERMINED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE.	X	-

TIE-BACK ANCHORS TESTING AND INSPECTION

1. SUBMIT GROUTED TIE-BACK ANCHOR TESTING AND SPECIAL INSPECTION PROGRAM. CONTINUOUS SPECIAL INSPECTION IS REQUIRED FOR TIE-BACK ANCHOR INSTALLATION, GROUTING, AND TESTING. SEE SPECIFICATION 31 51 13 SOIL ANCHORS.

2. AT A MINIMUM, PERFORMANCE TESTING OF GROUTED TIE-BACK ANCHORS MUST OCCUR ON THE FIRST THREE ANCHORS INSTALLED AND THEN ON A MINIMUM OF TWO OF THE REMAINING ANCHORS.

3. PERFORMANCE AND PROOF TESTS MUST BE ACCOMPLISHED IN ACCORDANCE WITH THE POST-TENSIONING INSTITUTE RECOMMENDATIONS (PTI, 2014).

4. A MINIMUM OF THREE PRE-PRODUCTION OR VERIFICATION TESTS SHALL BE PERFORMED TO 200% OF THE DESIGN BOND STRENGTH.

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Rev.	Date	Description	Appr
-			

PORT OF ILWACO
MARINA STRUCTURES REPLACEMENT

STRUCTURAL SPECIAL INSPECTION REQUIREMENTS & DETAILS

Date: 10/6/2023	M&N Project No. 213282	Drawing code:	Drawing Scale:
Designed by: S.STRINGER	Cad by: CSB	Reviewed by: S.BRANLUND	Submitted by: S.STRINGER MOFFATT & NICHOL	Plot scale: 1:1 (D SHEET)
Dwn by: CG			

600 UNIVERSITY
STREET, SUITE 610
SEATTLE, WA 98101
(206) 622-0222
moffatt & nichol

SHAWN J. STRINGER — STATE OF WASHINGTON — 23367 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER
NOT FOR CONSTRUCTION

Sheet Reference No.
G-004
INDEX: 4 OF 21

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

ABBREVIATIONS

ACI	AMERICAN CONCRETE INSTITUTE
ADD	ADDITIONAL
APPROX	APPROXIMATE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWS	AMERICAN WELDING SOCIETY
BLDG	BUILDING
BMPS	BEST MANAGEMENT PRACTICES
C/C	CENTER ON CENTER
CL	CENTERLINE
CLR	CLEAR
CONC	CONCRETE
CONT	CONTINUOUS or CONTINUE
CSBC	CRUSHED SURFACING BASE COURSE
DACS	DRAWING AREA COORDINATE SYSTEM
E	EAST
EA	EACH
E.G.	FOR EXAMPLE
EG	EXISTING GRADE
ELEV/EL	ELEVATION
EQ	EQUAL
EQUIV	EQUIVALENT
ETC	ET CETERA
EX, (E)	EXISTING
EXP	EXPANSION
FG	FINISHED GRADE
FT	FOOT or FEET
FY	FORCE TO YIELD
GA	GAGE
GALV	GALVANIZED
GR	GRADE
HOWL	HIGHEST OBSERVED WATER LEVEL
HAS	HEADED ANCHOR STUD
HSS	HOLLOW STRUCTURAL SECTION
HORIZ	HORIZONTAL
IBC	INTERNATIONAL BUILDING CODE
ICC	INTERNATIONAL CODE COUNCIL
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN.	INCHES
KSI	KIPS PER SQUARE INCH
L	LENGTH
LOWL	LOWEST OBSERVED WATER LEVEL
LB	POUND
LF	LINEAR or LINEAL FEET
LG	LONG
LLH	LONG LEG HORIZONTAL
MAX	MAXIMUM
MHW	MEAN HIGH WATER
MHHW	MEAN HIGHER HIGH WATER
MIN	MINIMUM
MLW	MEAN LOW WATER
MLLW	MEAN LOWER LOW WATER
MTL	MEAN TIDE LINE
N	NORTH
NAVD	NORTH AMERICAN VERTICAL DATUM
N/A	NOT APPLICABLE
NE	NORTH EAST
NO.	NUMBER
NOAA	NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
PCF	POUND PER CUBIC FOOT
PL	PLATE or PROPERTY LINE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PTI	POST - TENSIONING INSTITUTE
REINF	REINFORCEMENT
REQD	REQUIRED
REF	REFERENCE
SCH	SCHEDULE
SE	SOUTH EAST
SEC	SECONDARY
SECT	SECTION
SPA	SPACE(S)
SPEC	SPECIFICATION
SS	STAINLESS STEEL or SANITARY SEWER
SST	STAINLESS STEEL
STD	STANDARD
STL	STEEL
T&B	TOP AND BOTTOM
TESC	TEMPORARY EROSION AND SEDIMENT CONTROL
THRU	THROUGH
TYP	TYPICAL
T/	TOP OF
UFC	UNIFIED FACILITY CRITERIA
UNO	UNLESS NOTED OTHERWISE
UON	UNLESS OTHERWISE NOTED
V/VERT	VERTICAL
WA	WASHINGTON
WP	WORK POINT
WSDOT	WASHINGTON DEPARTMENT OF TRANSPORTATION
W	WIDTH, WIDE
W/	WITH

BAR SIZE	LAP SPLICE LENGTH IN INCHES	
	OTHER BARS	TOP BARS
#3	19	24
#4	25	32
#5	31	40
#6	37	48
#7	54	70
#8	62	80
#9	70	91
#10	79	102
#11	87	113

NOTES:

1. THE ABOVE SPLICE LENGTHS APPLY TO BARS WITH A MINIMUM SPACING OF 3db INCHES ON CENTER.

   db = BAR NOMINAL DIAMETER

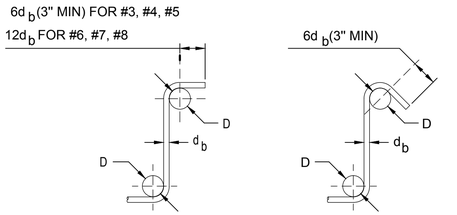
2. DEVELOPMENT LENGTH OF BARS SHALL EQUAL A MINIMUM OF 77% OF LAP SPLICE LENGTH.

3. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12 INCHES OF CONCRETE CAST BELOW THE BARS.

4. VALUES ARE BASED ON CLASS "B" SPLICES (MAX 50% OF BARS SPLICED AT ONE LOCATION).

TYPICAL REINFORCING BAR LAP SPLICE LENGTH

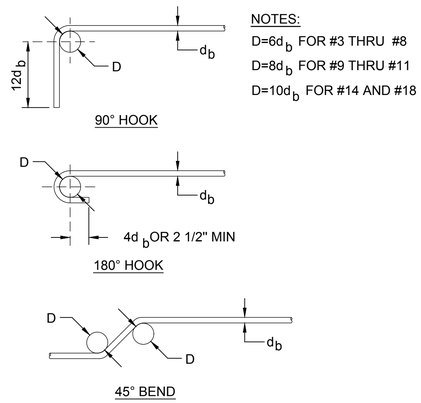
SCALE: NTS



BAR SIZE	#3	#4	#5	#6	#7	#8
D	1 1/2"	2"	2 1/2"	4 1/2"	5 1/4"	6"

TYPICAL STIRRUP & TIE HOOKS

SCALE: NTS



NOTES:
D=6d b FOR #3 THRU #8
D=8d b FOR #9 THRU #11
D=10d b FOR #14 AND #18

TYPICAL REINFORCING HOOKS

SCALE: NTS

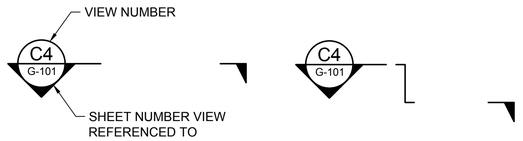
SHEET TYPE DESIGNATORS	
0	GENERAL (COVER SHEET, LEGEND, NOTES)
1	PLANS (HORIZONTAL VIEWS)
2	ELEVATIONS (NOT TYPICALLY USED)
3	SECTIONS (OVERALL VIEWS)
4	LARGE-SCALE VIEWS (PLANS, SECT. OR ELEV. - NOT DETAILS)
5	DETAILS (MAY BE PLAN, SECT. OR ELEV. VIEWS)
6	SCHEDULES
7	USER DEFINED
8	USER DEFINED
9	3D ISOMETRIC / PHOTOS

DISCIPLINE DESIGNATORS	
DISCIPLINE	DESIGNATOR
GENERAL	G
SURVEY/MAPPING	V
GEOTECHNICAL	B
CIVIL WORKS	W
CIVIL	C
STRUCTURAL	S
MECHANICAL	M
ELECTRICAL	E
OTHER DISCIPLINES	X

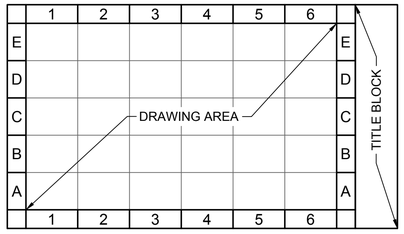
SECONDARY DESIGNATORS	
DEMOLITION	D
GENERAL	G
SUBSTRUCTURE	B
FRAMING	F
COMPONENT	C
SITE	S

REVISION NUMBERING	
A00, A01...	PRE-BID SUBMITTALS
B00, B01...	BID SUBMITTALS
000, 001...	CONSTRUCTION SUBMITTALS

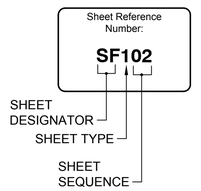
CROSS-REFERENCE LEGEND



* VIEW NUMBER IS BASED ON THE (DACS) LOCATION OF THE LOWER-LEFT EXTENTS OF THE VIEW ON THE REFERENCED SHEET. WHEN REFERENCING DRAWING INFORMATION BETWEEN SHEETS, BOTH THE VIEW AND SHEET NUMBERS MUST BE QUOTED TOGETHER - EITHER IN A CALLOUT FORMAT AS SHOWN ABOVE OR IN THE FORM;
"VIEW NO./SHEET NO." (EG A1/CS-5001)



DRAWING AREA COORDINATE SYSTEM (DACS)



SHEET NUMBERING

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Rev.	Date	Description	Appr
-			

Date: 10/6/2023
M&N Project No. 213282
Drawing code:
Drawing Scale:
Plot scale: 1:1 (0 SHEET)

Designed by: S.STRINGER
Dwn by: C/G
Ckd by: CSB
Reviewed by: S.BRANLUND
Submitted by: S.STRINGER MOFFATT & NICHOL

PORT OF ILWACO
MARINA STRUCTURES REPLACEMENT

ABBREVIATIONS
LEGEND & DETAILS

600 UNIVERSITY STREET SUITE 610
SEATTLE, WA 98101
(206) 622-0222
moffatt & nichol

STUART J. STRINGER — STATE OF WASHINGTON — 22367 — PROFESSIONAL ENGINEER — CIVIL STRUCTURAL ENGINEER
NOT FOR CONSTRUCTION

Sheet Reference No.
G-005
INDEX: 5 OF 21

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

LAYDOWN AREA KEY NOTES

THE FOLLOWING AREAS WILL BE AVAILABLE FOR CONTRACTOR LAYDOWN & STAGING.

1. UNFENCED GRAVEL LOT, APPROXIMATELY 72'x100'
2. UNFENCED PAVED PARKING LOT, APPROXIMATELY 116'x109'
3. FENCED GRAVEL LOT, APPROXIMATELY 154'x64'

LEGEND

- CONTRACTOR LAYDOWN AREA
- CONSTRUCTION ACCESS ROUTE

N

A1 - PLAN - CONTRACTOR SITE ACCESS & LAYDOWN AREAS
SCALE: NTS

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Mark	Description	Date	Appr

PORT OF ILWACO
MARINA STRUCTURES REPLACEMENT

CONTRACTOR SITE ACCESS & LAYDOWN AREAS

Designed by: S.STRINGER	Date: 10/6/2023
Drawn by: CG	Cad by: CSB
Reviewed by: S.BRANLUND	M&N Project No. 213282
Submitted by: S.STRINGER MOFFATT & NICHOL	Drawing scale:
	Drawing Scale:
	Plot scale: 1:1 (D SHEET)

Rev. -

600 UNIVERSITY
STREET SUITE 910
SEATTLE, WA 98101
(206) 622-0222
moffatt & nichol

STUART J. STRINGER — STATE OF WASHINGTON — 22367 — PROFESSIONAL ENGINEER
NOT FOR CONSTRUCTION
SIGN

Sheet Reference No.
G-100
INDEX: 6 OF 21

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

A1 - EXISTING SITE PLAN
SCALE: 1" = 20'

SURVEY LEGEND:

- STEEL PILE
- PILE
- SUBMERGED PILE
- UTILITY POLE
- HYDRANT
- WATER VALVE
- PATH LIGHT
- MHHW — MEAN HIGHER HIGH WATER (MHHW) (ELEV= +8.07' MLLW)

NOTES:

1. BATHYMETRY AND TOPOGRAPHY BASED ON A SURVEY PERFORMED BT SOLMAR HYDRO ON APRIL 13, 2022.
2. CONTOURS SHOWN ARE IN FEET RELATIVE TO MLLW.

N

20' 0' 20' 40'

SCALE: 1"=20'

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Mark	Description	Date	Appr

PORT OF ILWACO MARINA STRUCTURES REPLACEMENT

EXISTING SITE PLAN

Designed by: S.STRINGER
Drawn by: CG
Chd by: CSB
Reviewed by: S.BRANLUND
Submitted by: S.STRINGER MOFFATT & NICHOL
Date: 10/6/2023
M&N Project No. 213282
Drawing code:
Drawing Scale: Plot scale: 1:1 (D SHEET)
Rev. -

600 UNIVERSITY STREET SUITE 610 SEATTLE, WA 98101 (206) 622-0222

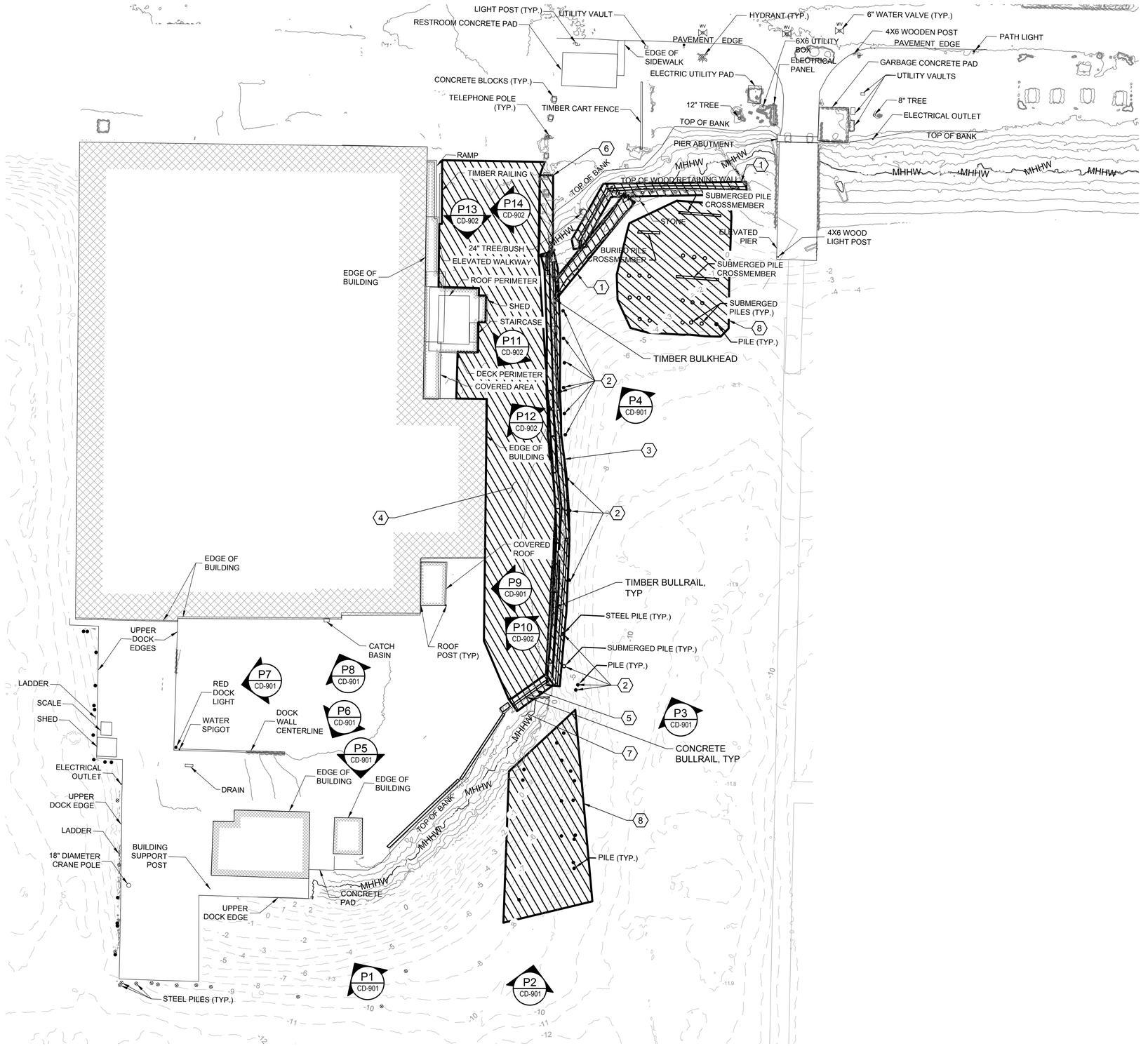
moffatt & nichol

STUART J. STRINGER — STATE OF WASHINGTON — 22367 — PROFESSIONAL ENGINEER — NOT FOR CONSTRUCTION

Sheet Reference No.
V-100
INDEX: 7 OF 21

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

File: Q:\SEA\213282\20 CADD_Active_SheetSet\213282_V-100 ; Plotted: 10/4/2023 1:41 PM by GREENE; CHRIS ; Saved: 8/3/2023 11:01 PM by CGREENE



A1 - DEMOLITION SITE PLAN
SCALE: 1" = 20'

DEMOLITION KEY NOTES

1. REMOVE TIMBER BULKHEAD AND LARGE LOG.
2. REMOVE TIMBER AND STEEL PILES ALONG TIMBER BULKHEAD
3. SELECTIVE DEMOLITION OF TIMBER BULKHEAD, SEE SHEET S-301.
4. REMOVE PAVEMENT.
5. REMOVE CONCRETE CURB.
6. REMOVE FENCE.
7. SELECTIVE REMOVAL OF LARGE RUBBLE ON SHORELINE SLOPE.
8. REMOVE DERELICT PILES AND TIMBERS ALONG SHORELINE.

NOTES:

1. COORDINATE DEMOLITION PHASING AND SCHEDULE WITH THE PORT PRIOR TO MOBILIZATION.
2. PROVIDE A DEMOLITION PLAN AS REQUIRED BY THE SPECIFICATIONS.
3. INSTALL DEBRIS BOOMS AND SILT CURTAINS AROUND EACH ACTIVE DEMOLITION AREA PRIOR TO DEMOLITION OF SPECIFIED MARINE STRUCTURES.
4. COMPLETE IN-WATER DEMOLITION ADJACENT TO (E) TIMBER BULKHEAD PRIOR TO INSTALLATION OF (N) SHEET PILE BULKHEAD.
5. DEBRIS TO BE REMOVED AT THE END OF EACH WORK DAY OR IMMEDIATELY IF WATERS ARE ROUGH AND THERE IS A CHANCE THAT DEBRIS MAY ESCAPE FROM THE WORK SITE.
6. WORK SURFACES ON BARGE DECK AND UPLAND STAGING AREAS SHALL INCLUDE CONTAINMENT FOR TEMPORARY STORAGE OF ALL DEMOLITION DEBRIS, TREATED MATERIALS, AND ALL OTHER DEBRIS/ MATERIALS/SPOIL PRIOR TO DISPOSAL AT AN APPROVED OFF-SITE FACILITY.

LEGEND

- DEMOLITION AREAS
- P# / CD-### — PHOTOGRAPH NUMBER
- SHEET NUMBER VIEW REFERENCED TO PHOTOGRAPH CALLOUT
- MHHW — MEAN HIGHER HIGH WATER

N

20' 0' 20' 40'

SCALE: 1"=20'

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Mark	Description	Date	Appr

PORT OF ILWACO
MARINA STRUCTURES REPLACEMENT

DEMOLITION SITE PLAN (1 OF 2)

Rev:	-
Date:	10/6/2023
M&N Project No.	213282
Drawing code:	
Drawing Scale:	1:1 (D SHEET)
Plot scale:	1:1 (D SHEET)
Designed by:	S.STRINGER
Dwn by:	CG
Cad by:	CSB
Reviewed by:	S.BRANLUND
Submitted by:	S.STRINGER MOFFATT & NICHOL

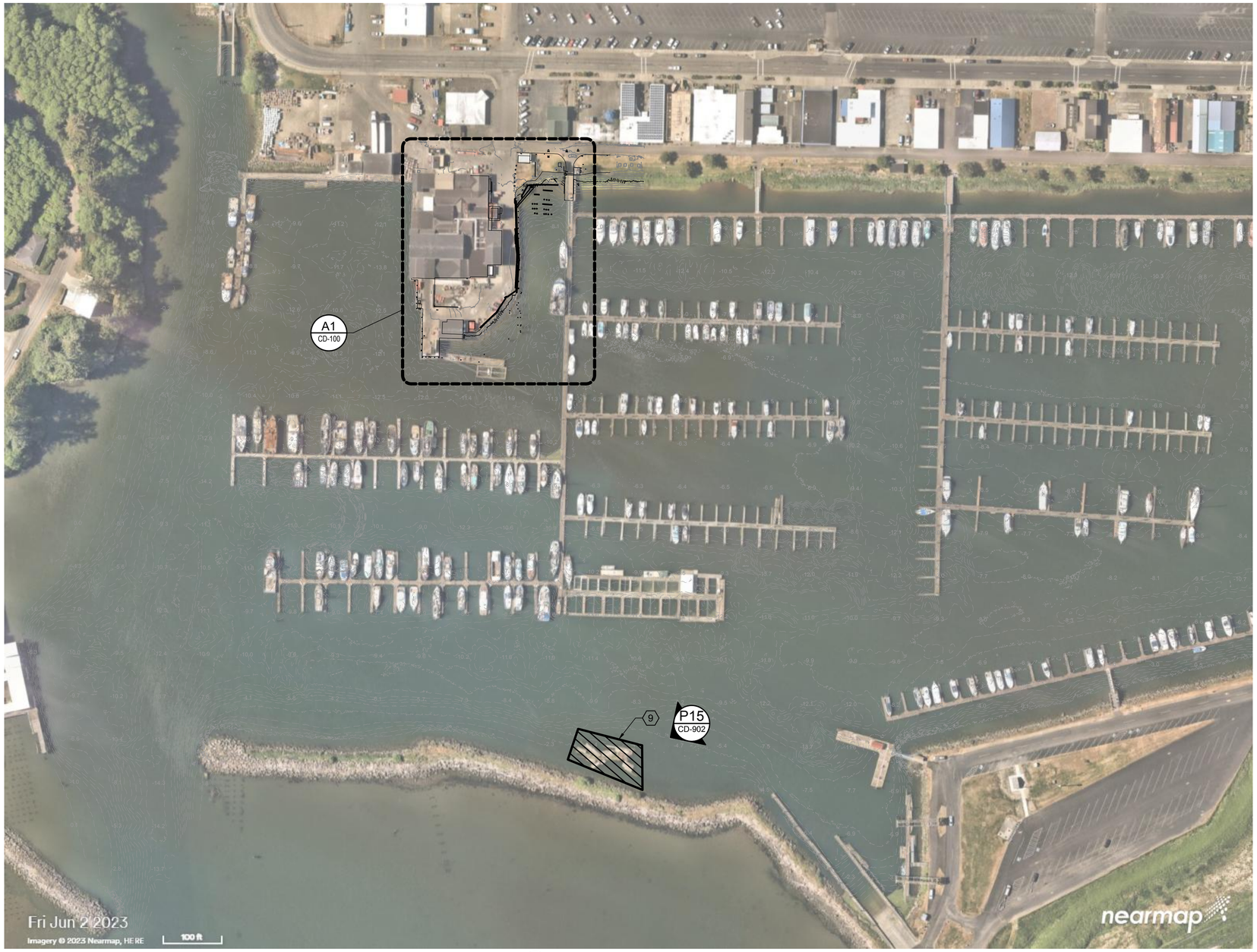
600 UNIVERSITY
STREET, SUITE 610
SEATTLE, WA 98101
(206) 622-0222
moffatt & nichol

STATE OF WASHINGTON — SHAWN J. STRINGER — 23367 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER
NOT FOR CONSTRUCTION

Sheet Reference No.
CD-100
INDEX: 8 OF 21

File: Q:\SEA\213282\20 CADD_Active_SheetSet\213282_CD-100 ; Plotted: 10/4/2023 1:37 PM by GREENE, CHRIS ; Saved: 7/6/2023 7:21 PM by DCORCORRAN

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



B1 - DEMOLITION SITE PLAN
SCALE: 1" = 100'

DEMOLITION KEY NOTES

(9) REMOVE DERELICT TIMBER FLOATS & OTHER DERELICT MATERIAL ALONG SHORELINE. APPROX 30'x100' PLAN AREA. APPROXIMATELY HALF OF TIMBER IS CREOSOTE TREATED. TIMBER PILES TO REMAIN.

NOTE:

1. SEE NOTES ON CD-100.

LEGEND

DEMOLITION AREAS

-7.7 BATHYMETRY POINTS

P# / CD-### — PHOTOGRAPH NUMBER; SHEET NUMBER VIEW REFERENCED TO

PHOTOGRAPH CALLOUT

N

100' 0' 100' 200'

SCALE: 1"=100'

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Mark	Description	Date	Appr

PORT OF ILWACO MARINA STRUCTURES REPLACEMENT

DEMOLITION SITE PLAN (2 OF 2)

Designed by: S.STRINGER	Cad by: CSB	Reviewed by: S.BRANKLUND	Submitted by: S.STRINGER MOFFATT & NICHOL
Dwn by: CG			
Date: 10/6/2023	M&N Project No. 213282	Drawing code:	Drawing Scale: Plot scale: 1:1 (D SHEET)
Rev: -			

600 UNIVERSITY STREET SUITE 610 SEATTLE, WA 98101 (206) 622-0222
moffatt & nichol

STUART J. STRINGER — STATE OF WASHINGTON — 23567 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER — NOT FOR CONSTRUCTION

Sheet Reference No.
CD-101
INDEX: 9 OF 21

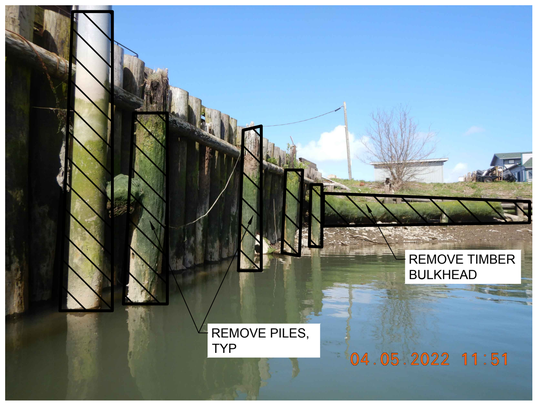
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

File: Q:\SEA\213282\20 CADD_Active_SheetSet\213282_CD-101 ; Plotted: 10/4/2023 1:37 PM by GREENE, CHRIS ; Saved: 8/3/2023 11:07 PM by CGREENE

P1 CD-100 SOUTH SHORLINE
LOOKING NORTHWEST

P2 CD-100 SOUTH SHORLINE
LOOKING NORTH

P3 CD-100 SOUTH END OF BULKHEAD
LOOKING NORTHWEST



P4 CD-100 NORTH END OF BULKHEAD
LOOKING NORTHWEST

P5 CD-100 SHED
LOOKING SOUTH

P6 CD-100 OFFICE BUILDING AND RAMP
LOOKING SOUTH

P7 CD-100 LOADING DOCK
LOOKING SOUTHWEST

P8 CD-100 CATCH BASIN
LOOKING NORTHWEST

P9 CD-100 RECESSED EQUIPMENT
LOOKING WEST

LEGEND

DEMOLITION AREAS

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Mark	Description	Date	Appr

PORT OF ILWACO
MARINA STRUCTURES
REPLACEMENT

DEMOLITION PHOTOS
(1 OF 2)

Date: 10/6/2023	M&N Project No. 213282	Drawing scale:	Drawing Scale: Plot scale: 1:1 (D SHEET)
Designed by: S.STRINGER	Dwn by: CG	Chd by: CSB	Reviewed by: S.BRANLUND
Submitted by: S.STRINGER MOFFATT & NICHOL			Rev. -

600 UNIVERSITY
STREET SUITE 610
SEATTLE, WA 98101
(206) 622-0222

moffatt & nichol

STUART J. STRINGER
STATE OF WASHINGTON
22367
PROFESSIONAL ENGINEER
NOT FOR CONSTRUCTION

Sheet
Reference No.
CD-901
INDEX: 10 OF 21

File: Q:\SEA\213282\20 CAD\01_Active_SheetSet\213282_CD-901 ; Plotted: 10/4/2023 1:37 PM by GREENE, CHRIS ; Saved: 8/3/2023 11:21 PM by CGREENE

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

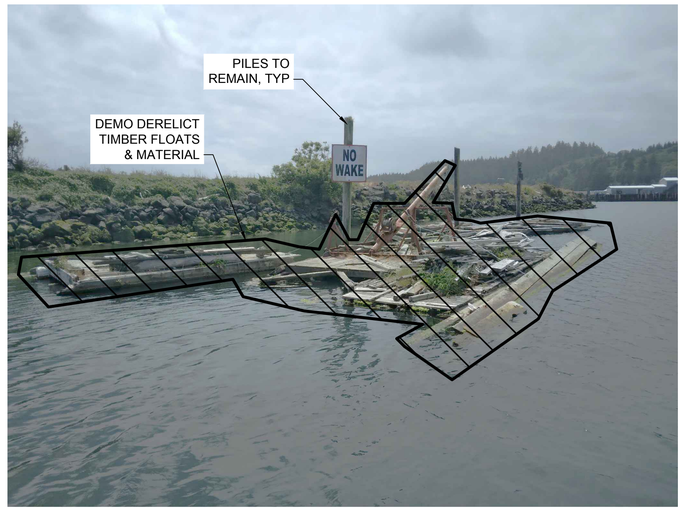
P10 CD-100 SE CORNER OF BLDG
LOOKING NORTHWEST

P11 CD-100 NE CORNER OF BLDG
LOOKING SOUTHWEST

P12 CD-100 EQUIPMENT TOWER AND UTILITIES
LOOKING NORTHWEST

P13 CD-100 EQUIPMENT
LOOKING SOUTHEAST

P14 CD-100 BLDG FOUNDATION AND UTILITIES
LOOKING WEST



P15 CD-101 DERELICT FLOATS
LOOKING SOUTHWEST

LEGEND

DEMOLITION AREAS

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Mark	Description	Date	Appr

PORT OF ILWACO
MARINA STRUCTURES
REPLACEMENT

DEMOLITION PHOTOS
(2 OF 2)

Designed by: S.STRINGER	Cad by: CSB	Reviewed by: S.BRANLUND	Submitted by: S.STRINGER MOFFATT & NICHOL
Drawn by: CG			
Date: 10/6/2023	M&N Project No. 213282	Drawing code:	Drawing Scale: Plot scale: 1:1 (D SHEET)
Rev: -			

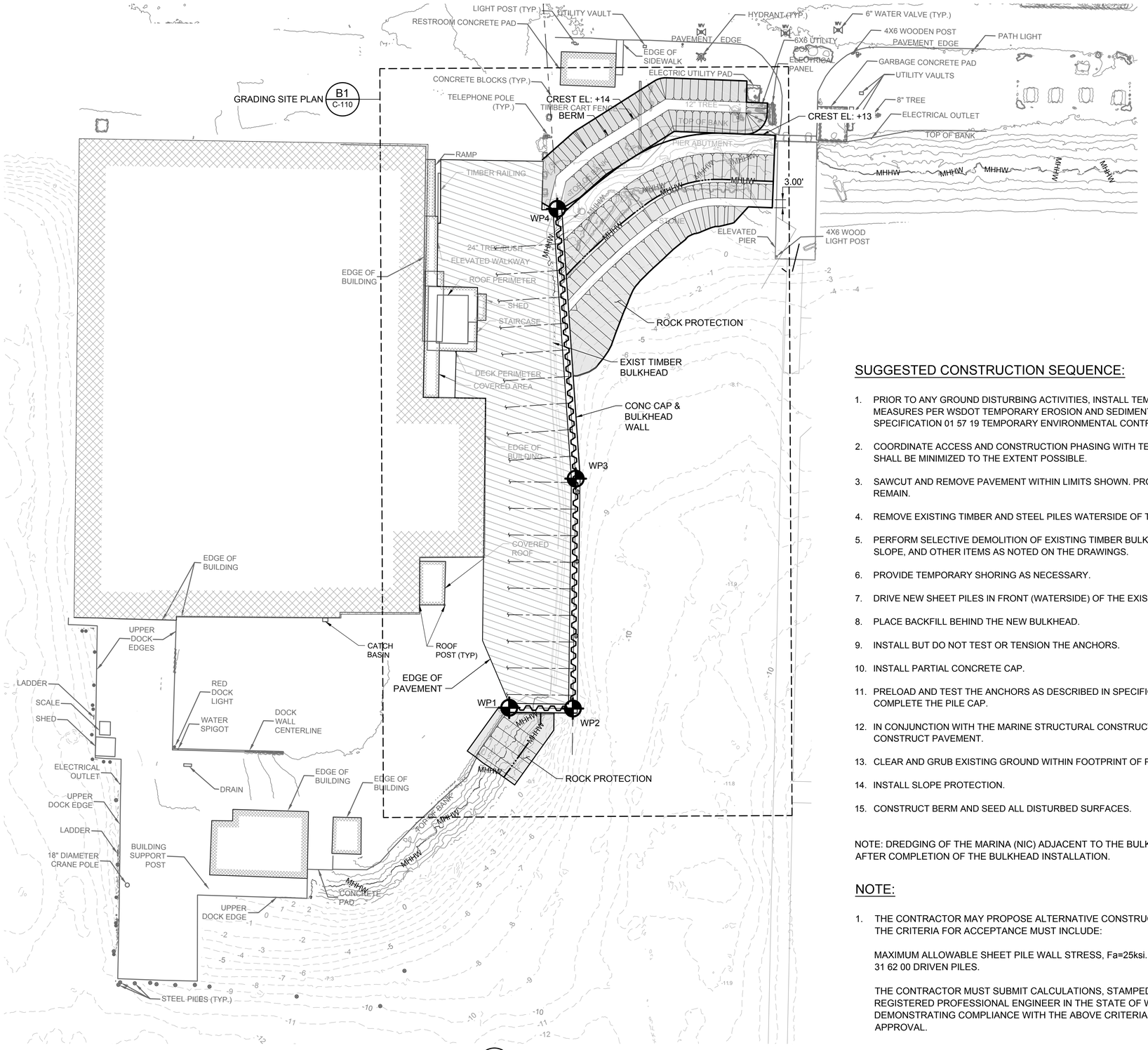
600 UNIVERSITY
STREET, SUITE 610
SEATTLE, WA 98101
(206) 622-0222
moffatt & nichol

STATE OF WASHINGTON
STEVEN J. STRINGER
23367
PROFESSIONAL ENGINEER
STRUCTURAL ENGINEER
NOT FOR CONSTRUCTION
SIGNED

Sheet
Reference No.
CD-902
INDEX: 11 OF 21

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

File: Q:\SEA\213282\20 CADD_Active_SheetSet\213282_CD-902 ; Plotted: 10/4/2023 1:37 PM by GREENE, CHRIS ; Saved: 8/3/2023 11:21 PM by CGREENE



A1 - OVERALL SITE PLAN
SCALE: 1" = 20'

WORKPOINT TABLE		
WORKPOINT	NORTHING	EASTING
1	374293.75	745889.35
2	374301.30	745912.08
3	374383.34	745884.80
4	374476.95	745845.02

LEGEND

- WORKPOINT, SEE TABLE ABOVE
- — MHHW — EXISTING MEAN HIGHER HIGH WATER (MHHW) (ELEV= +8.07' MLLW)
- — MHHW — PROPOSED MEAN HIGHER HIGH WATER (MHHW) (ELEV= +8.07' MLLW)
- PAVING AREA LIMITS
- BERM CONSTRUCTION
- ROCK SLOPE PROTECTION

SUGGESTED CONSTRUCTION SEQUENCE:

1. PRIOR TO ANY GROUND DISTURBING ACTIVITIES, INSTALL TEMPORARY EROSION CONTROL MEASURES PER WSDOT TEMPORARY EROSION AND SEDIMENT CONTROL MANUAL, MAY 2019. SEE SPECIFICATION 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.
2. COORDINATE ACCESS AND CONSTRUCTION PHASING WITH TENANT OPERATIONS. INTERRUPTIONS SHALL BE MINIMIZED TO THE EXTENT POSSIBLE.
3. SAWCUT AND REMOVE PAVEMENT WITHIN LIMITS SHOWN. PROTECT ALL SURFACE FEATURES TO REMAIN.
4. REMOVE EXISTING TIMBER AND STEEL PILES WATERSIDE OF THE EXISTING TIMBER BULKHEAD.
5. PERFORM SELECTIVE DEMOLITION OF EXISTING TIMBER BULKHEAD, LARGE RUBBLE ON SHORELINE SLOPE, AND OTHER ITEMS AS NOTED ON THE DRAWINGS.
6. PROVIDE TEMPORARY SHORING AS NECESSARY.
7. DRIVE NEW SHEET PILES IN FRONT (WATERSIDE) OF THE EXISTING BULKHEAD.
8. PLACE BACKFILL BEHIND THE NEW BULKHEAD.
9. INSTALL BUT DO NOT TEST OR TENSION THE ANCHORS.
10. INSTALL PARTIAL CONCRETE CAP.
11. PRELOAD AND TEST THE ANCHORS AS DESCRIBED IN SPECIFICATION 31 51 13 SOIL ANCHORS. COMPLETE THE PILE CAP.
12. IN CONJUNCTION WITH THE MARINE STRUCTURAL CONSTRUCTION, PLACE BACKFILL AND CONSTRUCT PAVEMENT.
13. CLEAR AND GRUB EXISTING GROUND WITHIN FOOTPRINT OF PROPOSED BERM.
14. INSTALL SLOPE PROTECTION.
15. CONSTRUCT BERM AND SEED ALL DISTURBED SURFACES.

NOTE: DREDGING OF THE MARINA (NIC) ADJACENT TO THE BULKHEAD MUST NOT OCCUR UNTIL AFTER COMPLETION OF THE BULKHEAD INSTALLATION.

NOTE:

1. THE CONTRACTOR MAY PROPOSE ALTERNATIVE CONSTRUCTION SEQUENCE, THE CRITERIA FOR ACCEPTANCE MUST INCLUDE:

   MAXIMUM ALLOWABLE SHEET PILE WALL STRESS, Fa=25ksi. SEE SPECIFICATION 31 62 00 DRIVEN PILES.

   THE CONTRACTOR MUST SUBMIT CALCULATIONS, STAMPED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF WASHINGTON DEMONSTRATING COMPLIANCE WITH THE ABOVE CRITERIA FOR ENGINEERS APPROVAL.

N

20' 0' 20' 40'

SCALE: 1"=20'

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Rev.	Date	Description	Appr
-			

PORT OF ILWACO
MARINA STRUCTURES REPLACEMENT

OVERALL SITE PLAN

Date: 10/6/2023
M&N Project No. 213282
Drawing code:
Drawing Scale:
Plot scale: 1:1 (D SHEET)
Designed by: S.STRINGER
Dwn by: CG
Ckd by: CSB
Reviewed by: S.BRANLUND
Submitted by: S.STRINGER MOFFATT & NICHOL

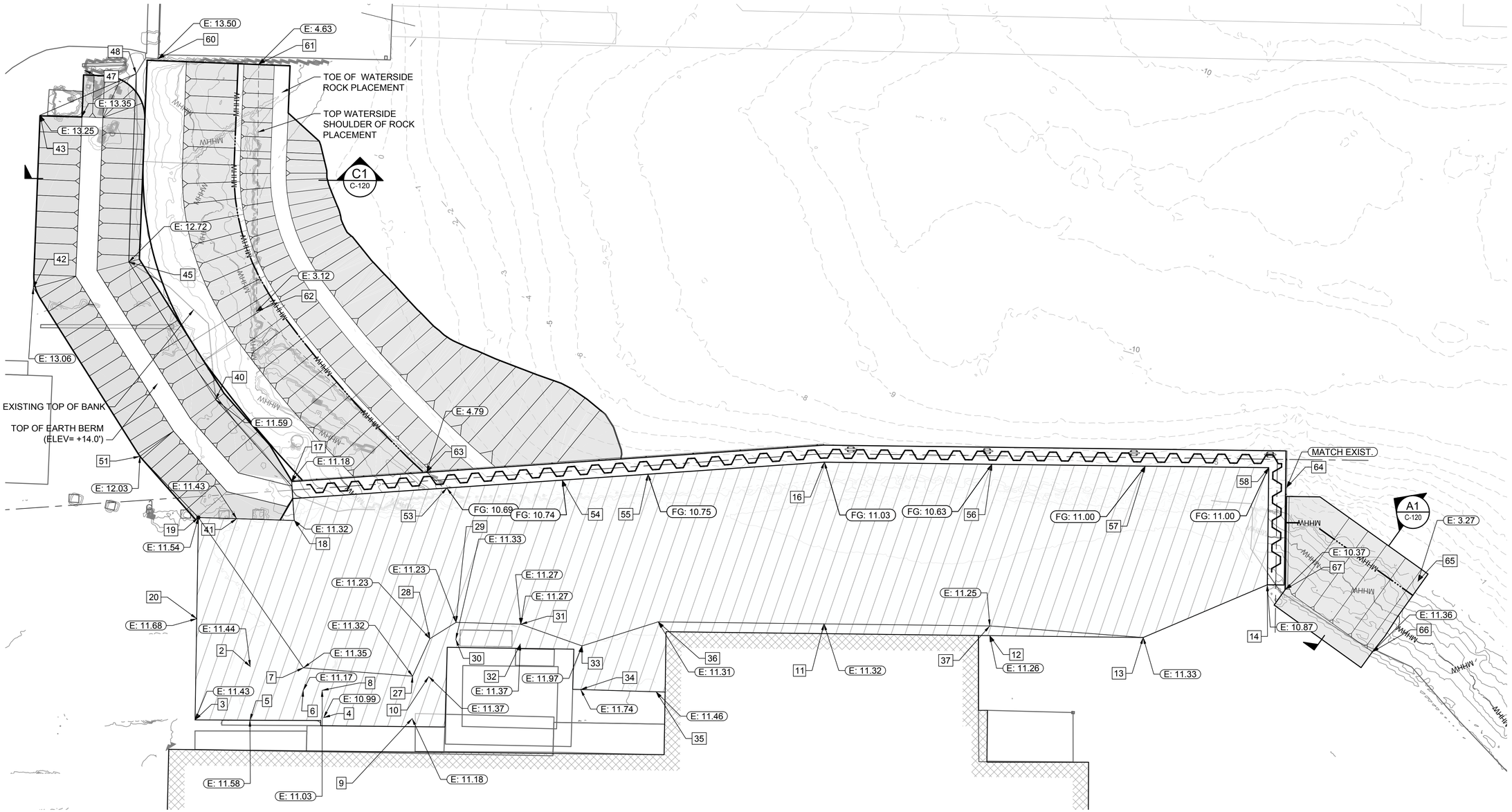
600 UNIVERSITY ST
STREET SUITE 6 10
SEATTLE, WA 9810
(206) 622-0222
moffatt & nichol

STUART J. STRINGER — STATE OF WASHINGTON — 22367 — PROFESSIONAL ENGINEER
NOT FOR CONSTRUCTION
SIGN

Sheet Reference No.
C-100
INDEX: 12 OF 21

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

File: Q:\SEA\213282\20 CADD_Active_SheetSet\213282_C-100 ; Plotted: 10/4/2023 1:35 PM by GREENE, CHRIS ; Saved: 9/28/2023 10:35 PM by RSAMANIEGO



B1 - GRADING SITE PLAN
SCALE: 1" = 10'

LEGEND

- FG: #.# — FINISHED GRADE ELEVATION
- E: #.# — EXISTING GRADE (MATCH NEW PAVEMENT)
- ## — CONSTRUCTION POINT (SEE TABLE ON C-120)
- — MHHW — EXISTING MEAN HIGHER HIGH WATER (MHHW) (ELEV= +8.07' MLLW)
- — MHHW — PROPOSED MEAN HIGHER HIGH WATER (MHHW) (ELEV= +8.07' MLLW)
- PAVING AREA LIMITS
- BERM CONSTRUCTION
- ROCK SLOPE PROTECTION

N

10' 0' 10' 20'

SCALE: 1"=10'

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Rev.	Description	Date	Appr
-			

PORT OF ILWACO MARINA STRUCTURES REPLACEMENT

GRADING SITE PLAN

Date: 10/6/2023
M&N Project No.: 213282
Drawing scale: 1" = 10'
Plot scale: 1:1 (0 SHEET)
Designed by: J.TODDY NOURI
Dwn by: CG
Cad by: CSB
Reviewed by: S.BRANLUND
Submitted by: S.STRINGER, MOFFATT & NICHOL
Drawing Scale:

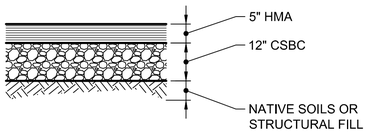
600 UNIVERSITY
STREET SUITE 610
SEATTLE, WA 98101
(206) 622-0222

moffatt & nichol

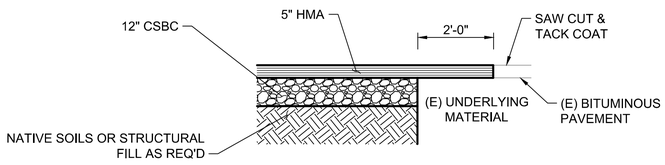
JAMES C. STRINGER — STATE OF WASHINGTON — 52342 — REGISTERED PROFESSIONAL ENGINEER
NOT FOR CONSTRUCTION
SEAL

Sheet Reference No.
C-110
INDEX: 13 OF 21

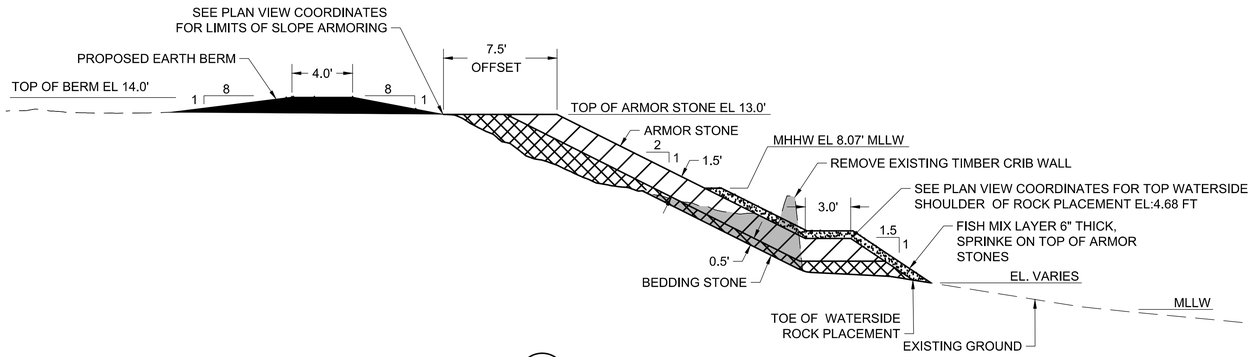
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



D1 - PAVING DETAIL
SCALE: 1/2"= 1'-0"



D4 - JUNCTURE OF NEW AND EXIST PAVEMENT
SCALE: 1/2"= 1'-0"



C1 C-110 ROCK SLOPE PROTECTION - SECTION
SCALE: 1" = 5'-0"

POINT TABLE		
POINT #	NORTHING	EASTING
2	374473.51	745810.63
3	374480.10	745797.57
4	374457.07	745806.00
5	374470.20	745800.95
6	374462.44	745809.66
7	374463.82	745813.71
8	374459.04	745810.82
9	374441.06	745811.35
10	374440.68	745819.95
11	374372.75	745854.12
12	374342.14	745862.35
13	374314.36	745871.60
14	374295.29	745888.84
15	374302.33	745910.02
16	374382.76	745883.28
17	374477.58	745846.51
18	374474.68	745839.68
19	374492.13	745834.23
20	374486.12	745815.90
21	374324.67	745902.59
22	374352.46	745893.35
23	374382.76	745883.28
24	374413.79	745870.09
25	374437.87	745859.86

POINT TABLE		
POINT #	NORTHING	EASTING
26	374449.19	745855.05
27	374443.63	745819.02
28	374442.85	745826.86
29	374439.15	745831.43
30	374438.13	745828.34
31	374427.36	745835.12
32	374426.23	745831.52
33	374414.98	745835.05
34	374412.49	745827.11
35	374398.77	745831.41
36	374402.76	745844.13
37	374342.73	745864.11
39	374428.88	745863.68
40	374496.38	745856.54
41	374485.16	745836.41
42	374536.22	745865.33
43	374545.77	745896.81
44	374487.73	745844.76
45	374520.62	745875.91
46	374529.29	745870.03
47	374540.55	745907.68
48	374531.05	745910.29
49	374525.82	745872.38
50	374501.99	745848.23

POINT TABLE		
POINT #	NORTHING	EASTING
51	374506.49	745841.58
52	374499.75	745851.55
53	374449.19	745855.05
54	374428.88	745863.68
55	374413.79	745870.09
56	374352.46	745893.35
57	374324.67	745902.59
58	374302.33	745910.02
59	374299.28	745640.68
60	374528.00	745914.34
61	374509.56	745919.65
62	374494.53	745875.01
63	374453.81	745856.67
64	374297.86	745907.57
65	374268.35	745898.89
66	374272.16	745883.31
67	374291.74	745889.15

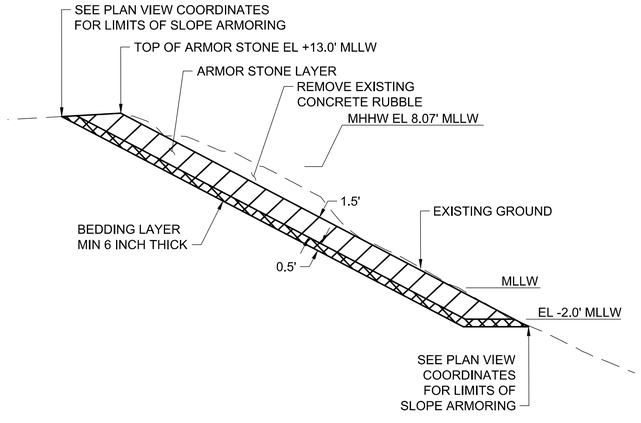
A4 C-110 GRADING POINTS DATA

GRADING AND LAYOUT POINTS:

1. SEE SHEET C-110 FOR LOCATION OF POINTS AND FEATURES. ELEVATIONS ARE SHOWN IN PLAN VIEW.
2. WHERE POINTS FOR EXISTING GROUND DO NOT HAVE ELEVATION DATA THE POINTS ARE CONSIDERED DIRECTIVE TO MATCH EXISTING GRADE WHEN CONSTRUCTING PAVEMENT FINISH GRADE.

LEGEND

- EXISTING TIMBER CRIB WALL LIMITS
- BEDDING STONE
- ARMOR STONE
- FISH MIX LAYER
- EARTH BERM



A1 C-110 ROCK SLOPE PROTECTION - SECTION
SCALE: 1" = 5'-0"

PAVEMENT DESIGN

BRETT EDWARD LAMPMAN — STATE OF WASHINGTON — 23210 — REGISTERED PROFESSIONAL ENGINEER — NOT FOR CONSTRUCTION

5' 0' 5' 10'
SCALE: 1"=5'

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

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Rev.	Date	Description	Appr
-			

PORT OF ILWACO
MARINA STRUCTURES
REPLACEMENT

GRADING & PAVING
DETAILS

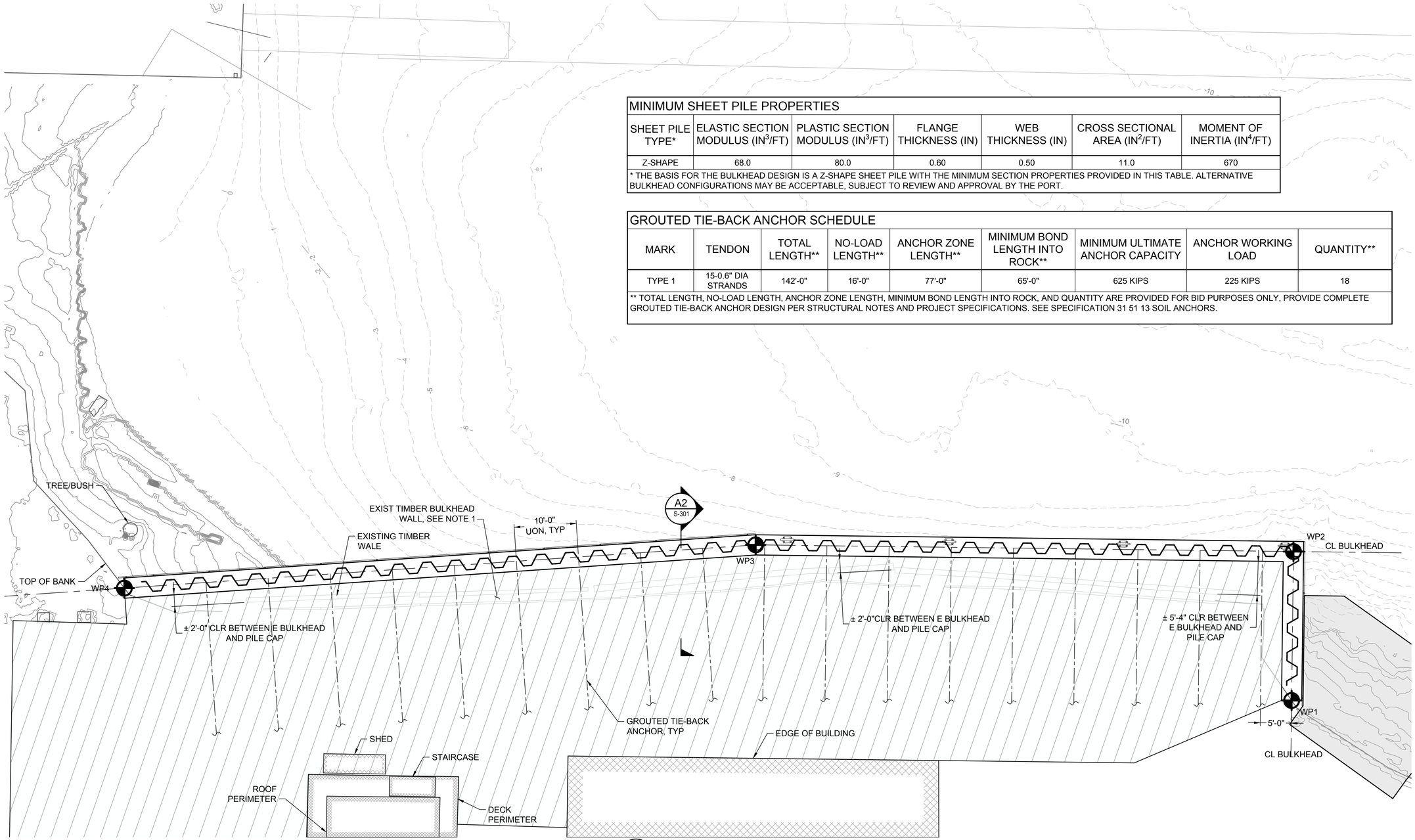
Designed by: J.TODDY;NOURI
Drawn by: CG
Cnd by: CSB
Reviewed by: S.BRANLUND
Submitted by: S.STRINGER MOFFATT & NICHOL
Date: 10/6/2023
M&N Project No. 213282
Drawing code:
Drawing Scale:
Plot scale: 1:1 (D SHEET)

600 UNIVERSITY
STREET SUITE 610
SEATTLE, WA 98101
(206) 622-0222
moffatt & nichol

JAMES A — STATE OF WASHINGTON — 23242 — REGISTERED PROFESSIONAL ENGINEER — NOT FOR CONSTRUCTION
SEAL

Sheet
Reference No.
C-120
INDEX: 14 OF 21

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



A1 - BULKHEAD LAYOUT
SCALE: 1/8"=1'-0"

MINIMUM SHEET PILE PROPERTIES

SHEET PILE TYPE*	ELASTIC SECTION MODULUS (IN^3/FT)	PLASTIC SECTION MODULUS (IN^3/FT)	FLANGE THICKNESS (IN)	WEB THICKNESS (IN)	CROSS SECTIONAL AREA (IN^2/FT)	MOMENT OF INERTIA (IN^4/FT)
Z-SHAPE	68.0	80.0	0.60	0.50	11.0	670

* THE BASIS FOR THE BULKHEAD DESIGN IS A Z-SHAPE SHEET PILE WITH THE MINIMUM SECTION PROPERTIES PROVIDED IN THIS TABLE. ALTERNATIVE BULKHEAD CONFIGURATIONS MAY BE ACCEPTABLE, SUBJECT TO REVIEW AND APPROVAL BY THE PORT.

GROUTED TIE-BACK ANCHOR SCHEDULE

MARK	TENDON	TOTAL LENGTH**	NO-LOAD LENGTH**	ANCHOR ZONE LENGTH**	MINIMUM BOND LENGTH INTO ROCK**	MINIMUM ULTIMATE ANCHOR CAPACITY	ANCHOR WORKING LOAD	QUANTITY**
TYPE 1	15-0.6" DIA STRANDS	142'-0"	16'-0"	77'-0"	65'-0"	625 KIPS	225 KIPS	18

** TOTAL LENGTH, NO-LOAD LENGTH, ANCHOR ZONE LENGTH, MINIMUM BOND LENGTH INTO ROCK, AND QUANTITY ARE PROVIDED FOR BID PURPOSES ONLY, PROVIDE COMPLETE GROUTED TIE-BACK ANCHOR DESIGN PER STRUCTURAL NOTES AND PROJECT SPECIFICATIONS. SEE SPECIFICATION 31 51 13 SOIL ANCHORS.

NOTES:

1. EXISTING TIMBER BULKHEAD WALL LOCATION IS APPROXIMATE. THE EXISTING STEEL CABLE TIE-BACK LOCATIONS VARY. THE EXISTING BULKHEAD ANCHOR SYSTEM IS UNKNOWN. PRIOR TO START OF CONSTRUCTION ACTIVITIES, LOCATIONS/ELEVATIONS OF EXISTING BULKHEAD COMPONENTS MUST BE FIELD VERIFIED.
2. PROVIDE FINAL GROUTED TIE-BACK ANCHOR AS-BUILT LOCATIONS, LENGTHS, AND GROUT VOLUMES TO THE PORT AND INDICATE ON THE RECORD DRAWINGS.
3. PROVIDE TIE-BACK INSTALLATION PROCEDURES TO THE PORT FOR APPROVAL PRIOR TO INSTALLATION.
4. COAT BOTH SIDES OF ALL SHEET PILE ELEMENTS PER THE SPECIFICATIONS. EXTEND THE COATING TO A FINAL ELEVATION OF EL -20' MLLW OR DEEPER. SEE SPECIFICATION 09 96 00 HIGH PERFORMANCE COATINGS.
5. THE SHEET PILE SECTION, INTERLOCKS, AND SHEET LAYOUT SHOWN IN THESE DRAWINGS IS SCHEMATIC. CONTRACTOR TO SUBMIT FINAL SHEET LAYOUT WITH THE FURNISHED SHEET SECTION AND INTERLOCKS FOR REVIEW AND APPROVAL BY THE PORT.

LEGEND

- WORKPOINT, SEE SHEET C-100
- PAVING AREA LIMITS
- BERM CONSTRUCTION
- SLOPE PROTECTION

N

8' 0'-0" 8' 16'
SCALE: 1/8"=1'-0"

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Mark	Description	Date	Appr
-			

PORT OF ILWACO
MARINA STRUCTURES REPLACEMENT

BULKHEAD LAYOUT

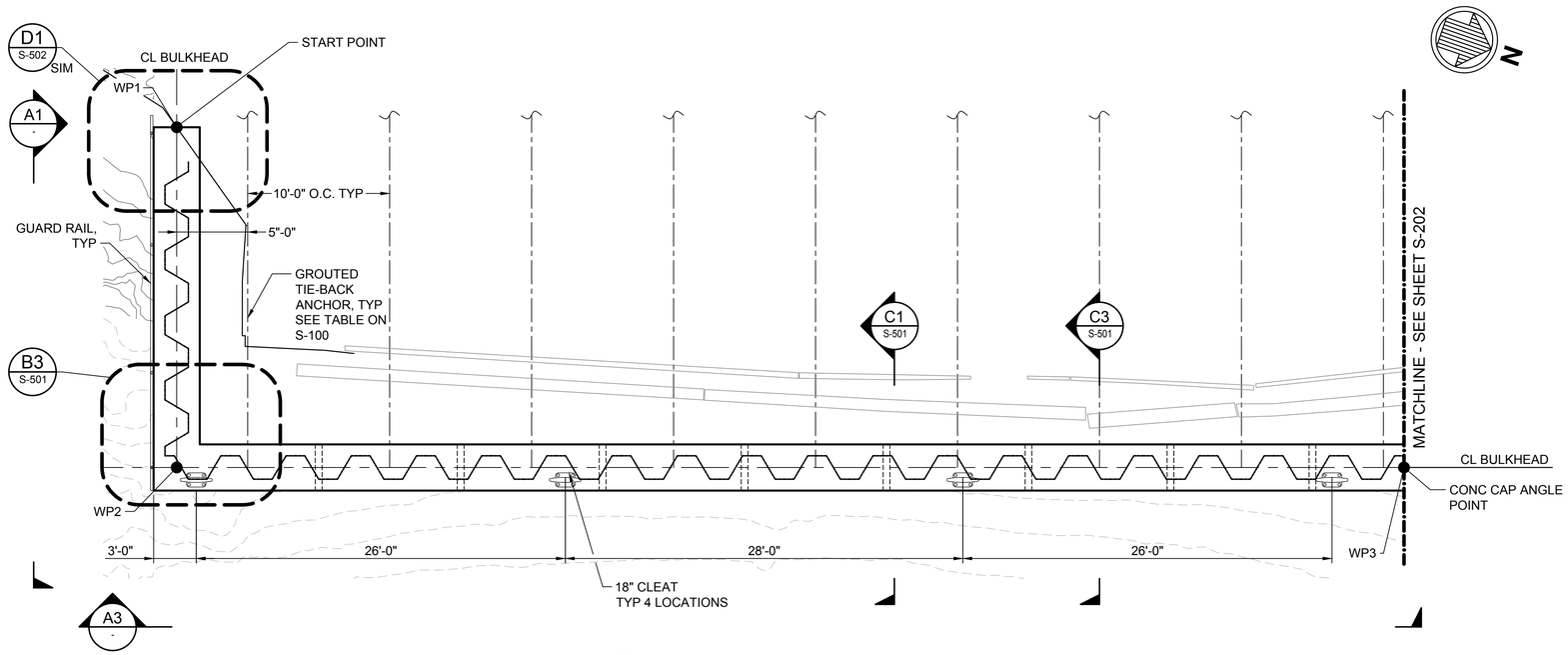
Rev.	-
Date:	10/6/2023
M&N Project No.	213282
Drawing scale:	AS SHOWN
Drawing Scale:	1:1 (D SHEET)
Plot scale:	1:1 (D SHEET)
Designed by:	S.STRINGER
Drwn by:	CG
Cad by:	CSB
Reviewed by:	S.BRANLUND
Submitted by:	S.STRINGER MOFFATT & NICHOL

600 UNIVERSITY
STREET SUITE 910
SEATTLE, WA 98101
(206) 622-0222
moffatt & nichol

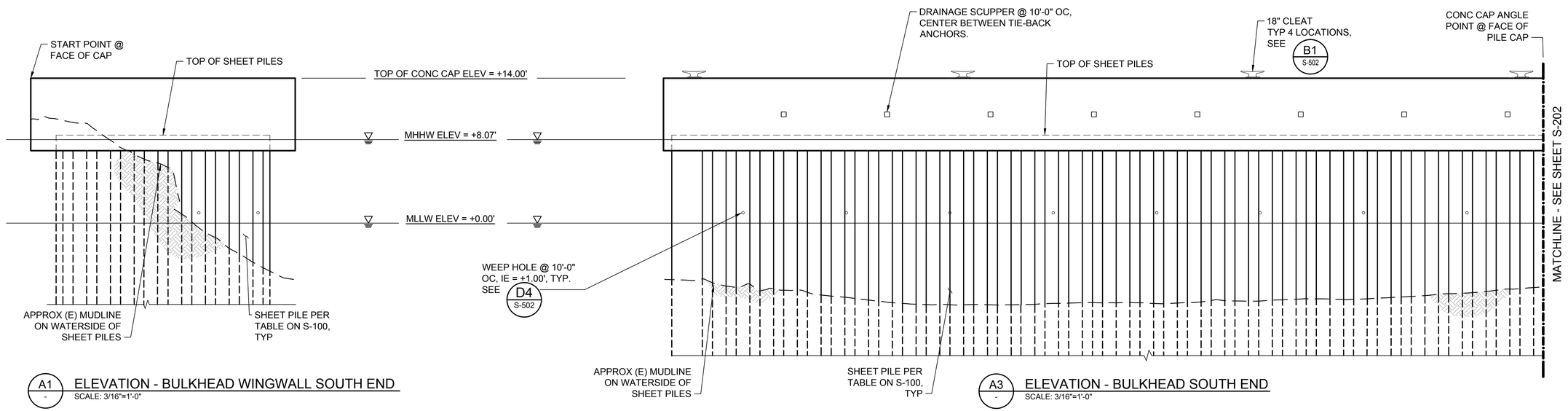
STUART J. STRINGER — STATE OF WASHINGTON — 22367 — PROFESSIONAL ENGINEER
NOT FOR CONSTRUCTION
SEAL

Sheet Reference No.
S-100
INDEX: 15 OF 21

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



C1 - PLAN - BULKHEAD SOUTH END
SCALE: 3/16"=1'-0"



A1 - ELEVATION - BULKHEAD WINGWALL SOUTH END
SCALE: 3/16"=1'-0"

A3 - ELEVATION - BULKHEAD SOUTH END
SCALE: 3/16"=1'-0"

8' 0'-0" 4' 8'
SCALE: 3/16"=1'-0"

NOTES:

1. BULKHEAD DEVELOPED ELEVATION AS VIEWED FROM THE WATERSIDE.
2. SEE SHEET C-100 FOR WORK POINT COORDINATES.

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Mark	Description	Date	Appr

PORT OF ILWACO
MARINA STRUCTURES REPLACEMENT

BULKHEAD PLAN & ELEVATION (1 OF 2)

Rev:	-
Date:	10/6/2023
M&N Project No.	213282
Drawing code:	
Drawing Scale:	Plot scale: 1:1 (D SHEET)
Designed by:	S.STRINGER
Dwn by:	CG
Ckd by:	CSB
Reviewed by:	S.BRANLUND
Submitted by:	S.STRINGER MOFFATT & NICHOL

600 UNIVERSITY
STREET, SUITE 610
SEATTLE, WA 98101
(206) 622-0222
moffatt & nichol

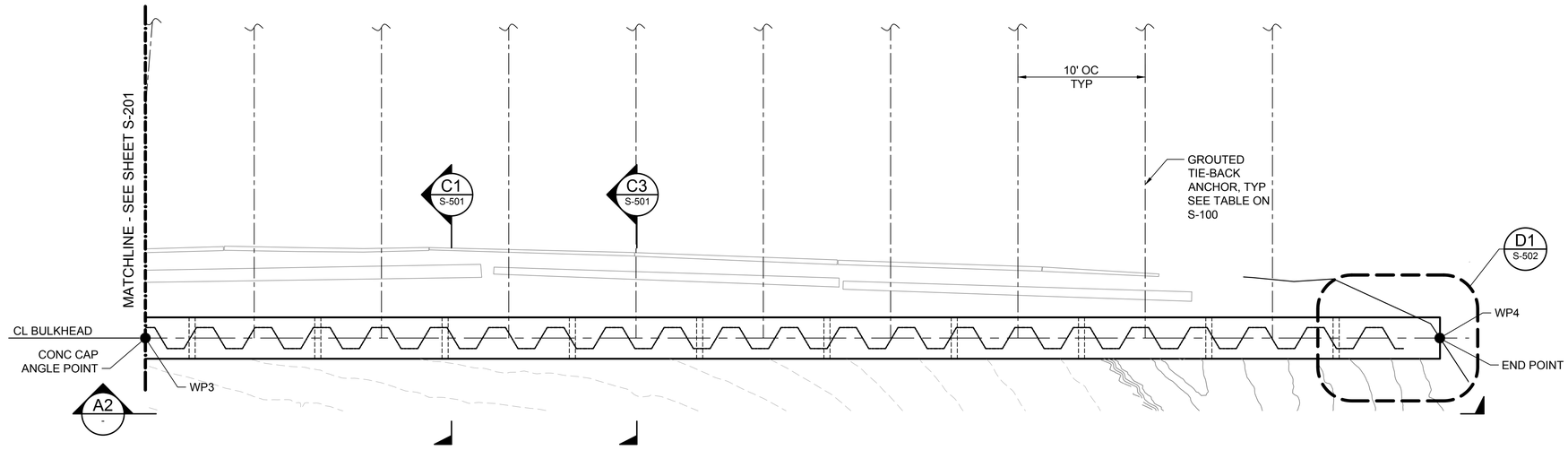
STEVEN J. STRINGER — STATE OF WASHINGTON — 23367 — CIVIL ENGINEER — PROFESSIONAL ENGINEER
NOT FOR CONSTRUCTION

Sheet Reference No.
S-201
INDEX: 16 OF 21

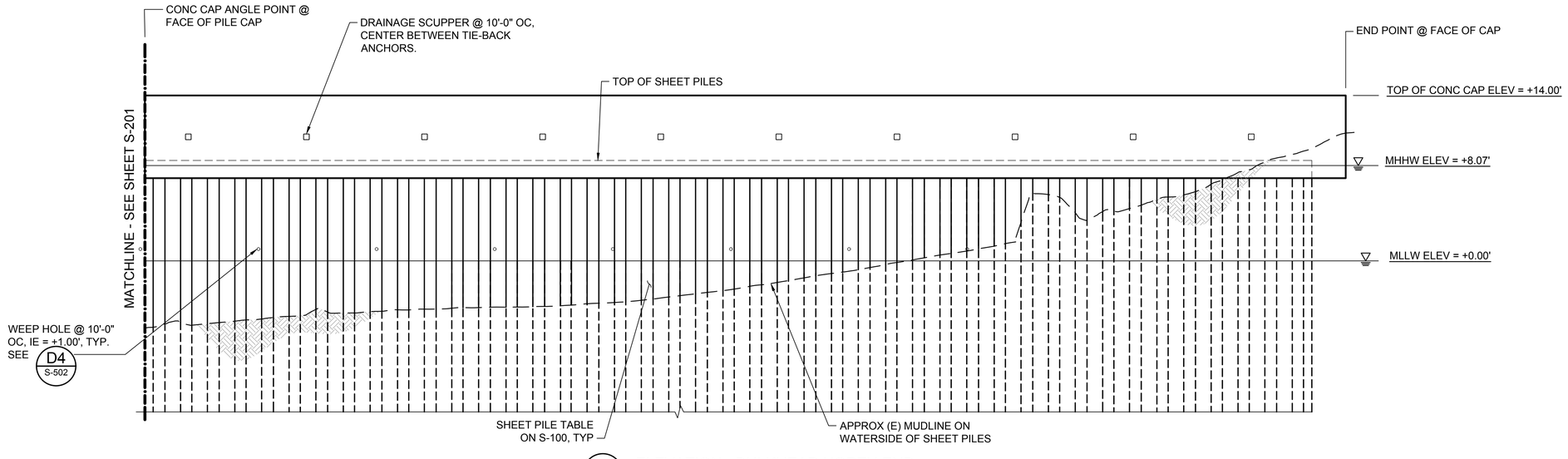
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

NOTE:

1. SEE SHEET S-201 FOR NOTES



C2 - PLAN - BULKHEAD NORTH END
SCALE: 3/16"=1'-0"



A2 - ELEVATION - BULKHEAD NORTH END
SCALE: 3/16"=1'-0"

8' 0'-0" 4' 8'
SCALE: 3/16"=1'-0"

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Mark	Description	Date	Appr

PORT OF ILWACO
MARINA STRUCTURES
REPLACEMENT

BULKHEAD PLAN &
ELEVATION (2 OF 2)

Designed by: S.STRINGER
Drawn by: CG
Chkd by: CSB
Reviewed by: S.BRANLUND
Submitted by: S.STRINGER MOFFATT & NICHOL
Date: 10/6/2023
M&N Project No. 213282
Drawing code:
Drawing Scale:
Plot scale: 1:1 (D SHEET)
Rev. -

600 UNIVERSITY
STREET SUITE 610
SEATTLE, WA 98101
(206) 622-0222
moffatt & nichol

STUART J. STRINGER
STATE OF WASHINGTON
22367
PROFESSIONAL ENGINEER
NOT FOR CONSTRUCTION

Sheet
Reference No.
S-202
INDEX: 17 OF 21

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

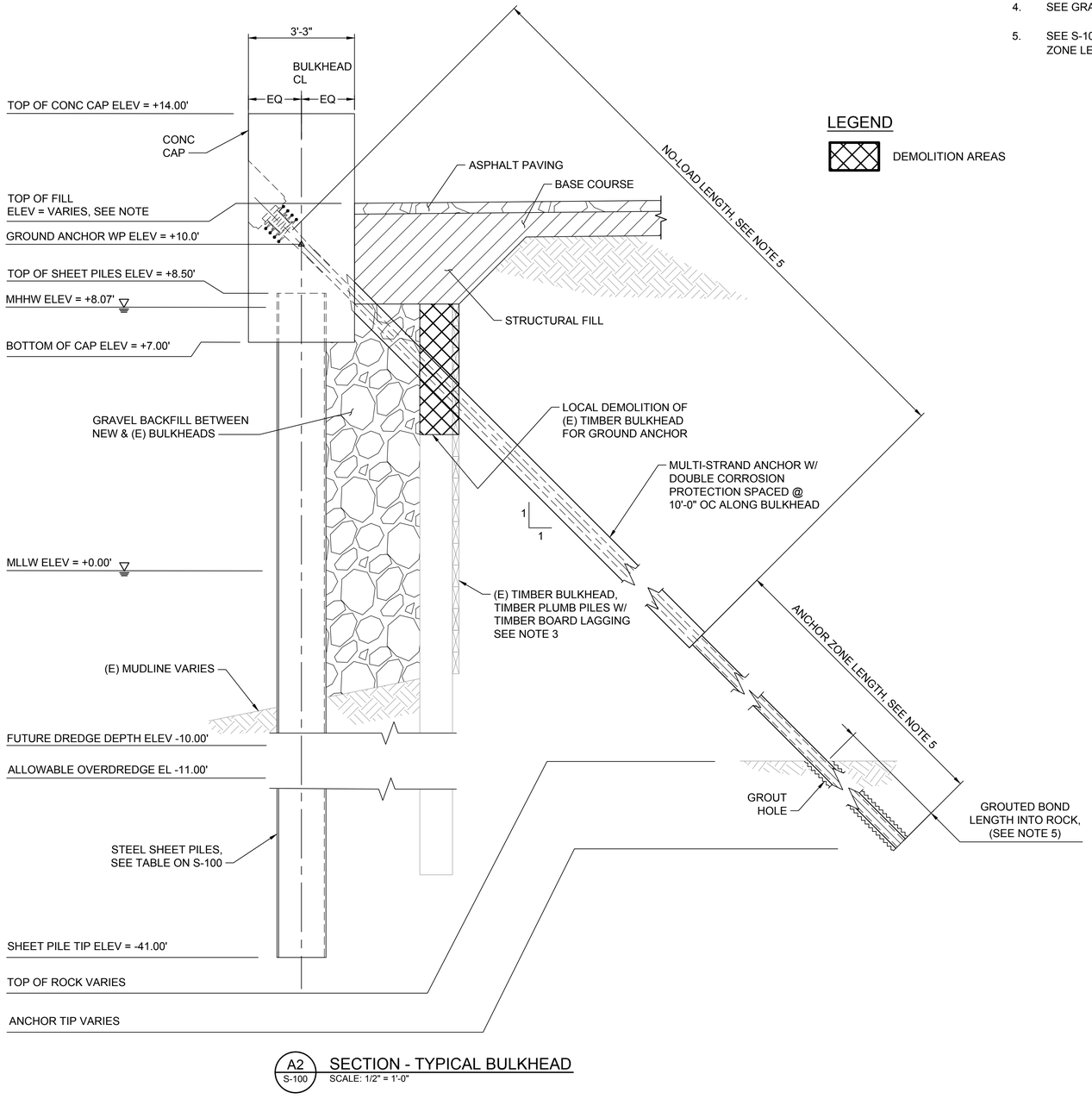
File: Q:\SEA\213282\20 CADD_Active_SheetSet\213282_S-202 ; Plotted: 10/4/2023 1:40 PM by GREENE, CHRIS ; Saved: 8/9/2023 5:00 PM by CGREENE

NOTES:

1. GROUTED TIE-BACK ANCHOR TIP ELEVATION IS SUBJECT TO CHANGE BASED ON TEST ANCHOR RESULTS.
2. REFER TO THE SPECIFICATIONS FOR ANCHOR TESTING PROCEDURES. SEE SPECIFICATION 31 51 13 SOIL ANCHORS.
3. TIP ELEVATION OF EXIST TIMBER PILES ARE UNKNOWN.
4. SEE GRADING PLAN ON C-110.
5. SEE S-100 FOR GROUTED TIE-BACK ANCHOR SCHEDULE, NO LOAD ZONE, ANCHOR ZONE LENGTH, BOND LENGTH INTO ROCK, AND ULTIMATE ANCHOR TENSION FORCE.

LEGEND

DEMOLITION AREAS



A2 / S-100 SECTION - TYPICAL BULKHEAD
SCALE: 1/2" = 1'-0"

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

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Mark	Description	Date	Appr

PORT OF ILWACO MARINA STRUCTURES REPLACEMENT

BULKHEAD TYPICAL SECTIONS

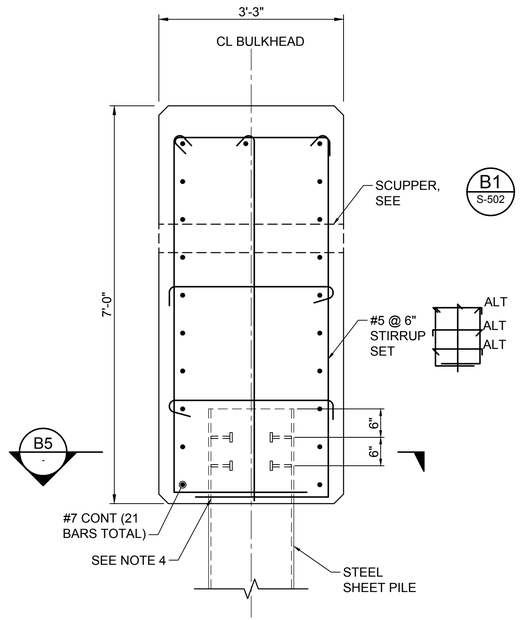
Designed by: S.STRINGER	Dwn by: CG	Chd by: CSB	Reviewed by: S.BRANLUND
Submitted by: S.STRINGER MOFFATT & NICHOL	Date: 10/6/2023	M&N Project No. 213282	Drawing code:
Drawing Scale: Plot scale: 1:1 (D SHEET)	Rev. -		

600 UNIVERSITY STREET SUITE 610 SEATTLE, WA 98101 (206) 622-0222
moffatt & nichol

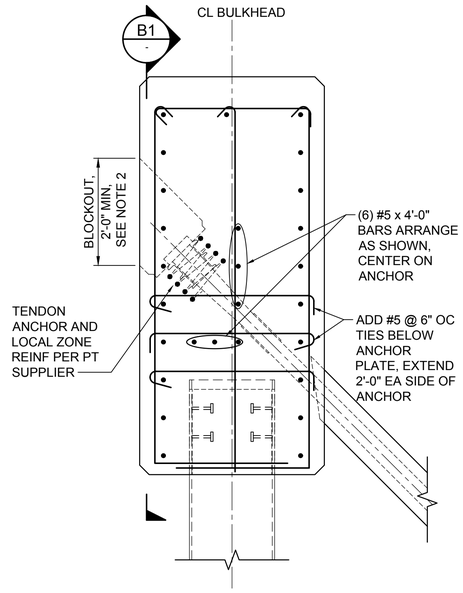
STUART J. STRINGER STATE OF WASHINGTON 22367 PROFESSIONAL ENGINEER
NOT FOR CONSTRUCTION
SIGNATURE

Sheet Reference No.
S-301
INDEX: 18 OF 21

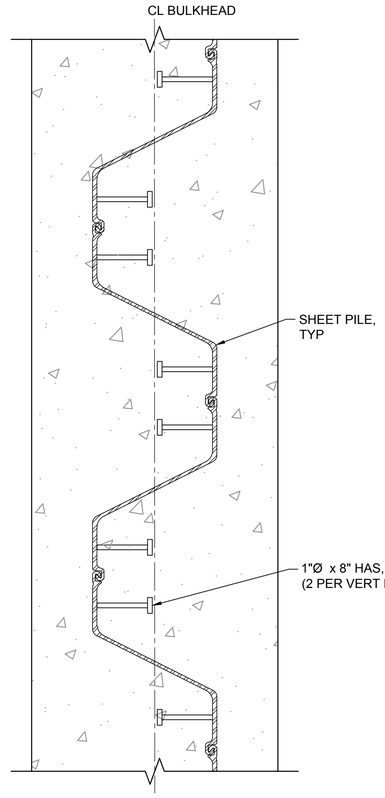
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



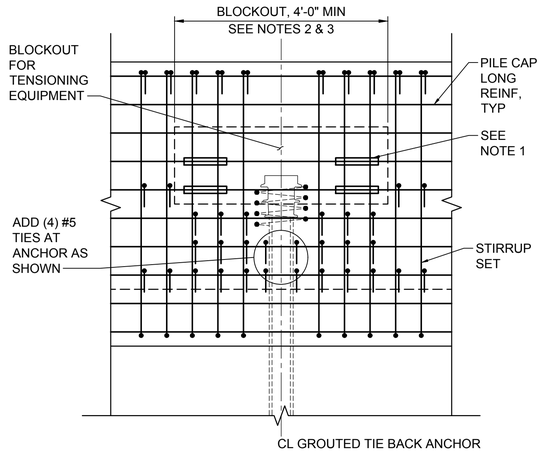
C1 S-201 SECTION - TYPICAL PILE CAP
SCALE: 3/4"" = 1'-0"'
S-202



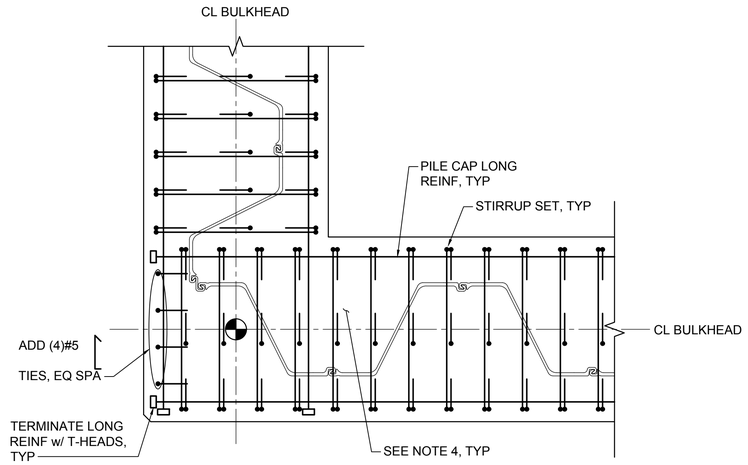
C3 S-201 SECTION - PILE CAP AT ANCHOR
SCALE: 3/4"" = 1'-0"'
S-202



B5 - DETAIL - HAS AT SHEET PILE
SCALE: 1" = 1'-0"'



B1 - SECTION - ANCHOR BLOCKOUT
SCALE: 3/4"" = 1'-0"'



B3 S-201 DETAIL - BULKHEAD CAP CORNER
SCALE: 3/4"" = 1'-0"'

NOTES:

1. USE MECHANICAL COUPLERS TO CONNECT MATCHING REINFORCING BARS.
2. SELECT BLOCKOUT SIZE TO ACCOMMODATE TENSIONING EQUIPMENT, BLOCKOUT MINIMUM DIMENSIONS SHOWN.
3. STIRRUP SPACING MAY BE ADJUSTED AT ANCHOR LOCATIONS TO ALLOW FOR TENSIONING EQUIPMENT.
4. DRILL HOLES IN SHEET PILE FOR PLACEMENT OF BULKHEAD CONCRETE CAP STIRRUPS AND LONG REINF.

2' 0'-0" 1' 2'
SCALE: 3/4"=1'-0"

1' 0'-0" 1' 2'
SCALE: 1"=1'-0"

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Rev.	Description	Date	Appr
-			

PORT OF ILWACO MARINA STRUCTURES REPLACEMENT

BULKHEAD DETAILS (1 OF 2)

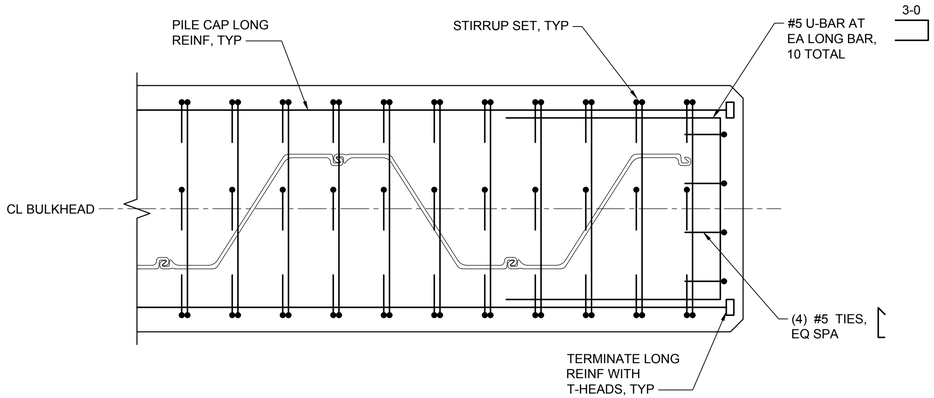
Designed by: S.STRINGER
Drawn by: CG
Cad by: CSB
Reviewed by: S.BRANLUND
Submitted by: S.STRINGER MOFFATT & NICHOL
Date: 10/6/2023
M&N Project No. 213282
Drawing code:
Drawing Scale: 1:1 (D SHEET)
Plot scale: 1:1 (D SHEET)

600 UNIVERSITY STREET SUITE 610 SEATTLE, WA 98101 (206) 622-0222
moffatt & nichol

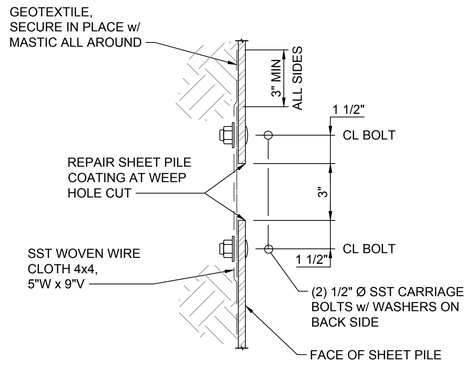
STATE OF WASHINGTON · STEVEN J. STRINGER · 23367 · PROFESSIONAL ENGINEER · STRUCTURAL ENGINEER
NOT FOR CONSTRUCTION

Sheet Reference No.
S-501
INDEX: 19 OF 21

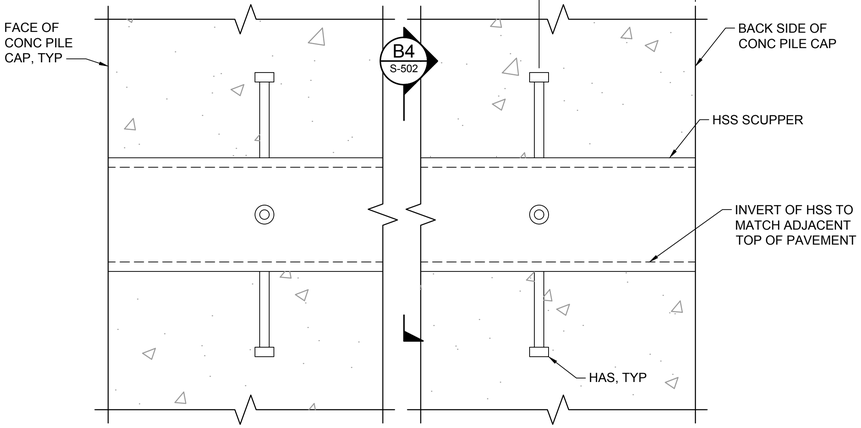
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



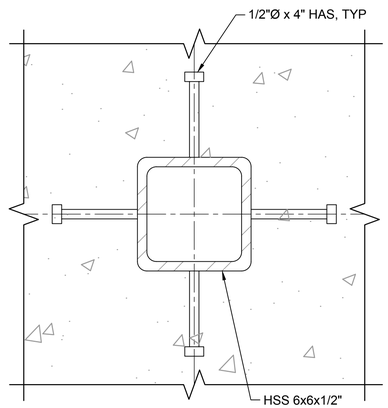
D1 S-202 DETAIL - BULKHEAD CAP TERMINATION
SCALE: 1" = 1'-0"



D4 S-201 DETAIL - WEEP HOLE
SCALE: 1" = 1'-0"
S-202



B1 S-501 DETAIL - SCUPPER
SCALE: 3" = 1'-0"



B4 - SECTION - SCUPPER
SCALE: 3" = 1'-0"

NOTES:

1. PREFABRICATED WEEP HOLE FILTERS MAY BE SUBSTITUTED FOR THE WEEP HOLE DETAIL SHOWN SUBJECT TO REVIEW AND APPROVAL BY THE PORT.

1' 0'-0" 1' 2'
SCALE: 1"=1'-0"

6" 0'-0" 3" 6"
SCALE: 3"=1'-0"

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Mark	Description	Date	Appr

PORT OF ILWACO
MARINA STRUCTURES REPLACEMENT

BULKHEAD DETAILS (2 OF 2)

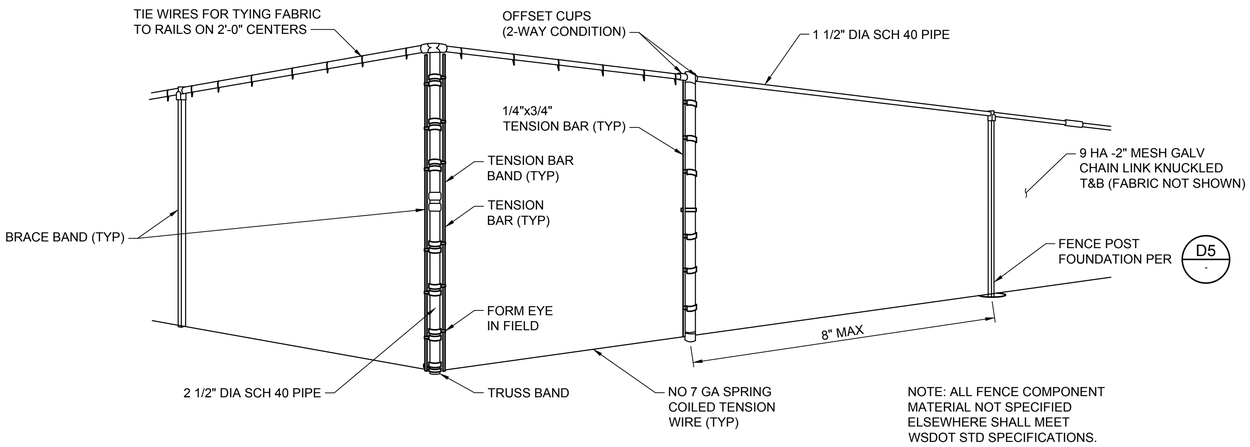
Designed by: S.STRINGER	Cad by: CSB	Date: 10/6/2023	Rev: -
Dwn by: CG		M&N Project No. 213282	
	Reviewed by: S.BRANLUND	Drawing scale:	
	Submitted by: S.STRINGER MOFFATT & NICHOL	Drawing Scale:	Plot scale: 1:1 (D SHEET)

600 UNIVERSITY STREET SUITE 910 SEATTLE, WA 98101 (206) 622-0222
moffatt & nichol

STUART J. STRINGER 22367 STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER
NOT FOR CONSTRUCTION
SIGNED

Sheet Reference No.
S-502
INDEX: 20 OF 21

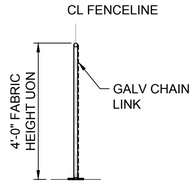
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



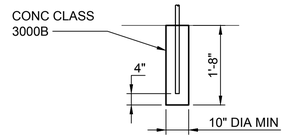
D1 - ISOMETRIC - TYPICAL FENCE CONFIGURATION
SCALE: N.T.S

NOTES:

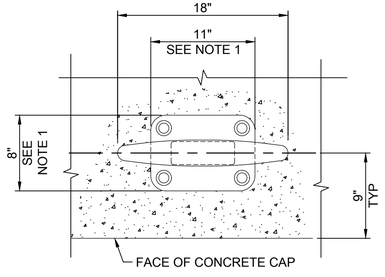
1. CLEAT MUST HAVE A MINIMUM OF 4 ANCHOR BOLTS. ALTERNATE CLEAT CONFIGURATIONS MAY BE ACCEPTABLE, SUBJECT TO REVIEW AND APPROVAL BY THE PORT.
2. 18" CLEAT SHALL HAVE A WORKING LINE LOAD CAPACITY OF 5 TONS.



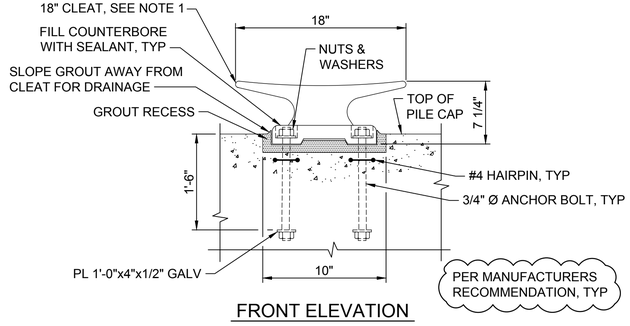
D4 - SECTION - TYPICAL FENCE
SCALE: N.T.S



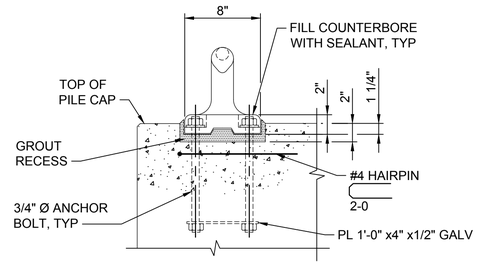
D5 - POST FOUNDATION
SCALE: N.T.S



PLAN



FRONT ELEVATION



END ELEVATION

B1 - DETAILS - 18" CLEAT
SCALE: 1" = 1'-0"

1' 0'-0" 1' 2'
SCALE: 1"=1'-0"

95% DESIGN SUBMITTAL
ISSUED: 10/6/2023
NOT TO BE USED FOR CONSTRUCTION

PORT OF ILWACO

Mark	Description	Date	Appr

PORT OF ILWACO
MARINA STRUCTURES REPLACEMENT

MISCELLANEOUS DETAILS

Designed by: S.STRINGER	Rev: -
Drawn by: CG	Chkd by: CSB
Reviewed by: S.BRANLUND	Date: 10/6/2023
Submitted by: S.STRINGER MOFFATT & NICHOL	M&N Project No. 213282
Drawing code:	Drawing Scale:
	Plot scale: 1:1 (D SHEET)

600 UNIVERSITY STREET SUITE 610 SEATTLE, WA 98101 (206) 622-0222
moffatt & nichol

STUART J. STRINGER — STATE OF WASHINGTON — 22367 — PROFESSIONAL ENGINEER — NOT FOR CONSTRUCTION

Sheet Reference No.
S-511
INDEX: 21 OF 21

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING