

VOLUME III
PRELIMINARY SPECIFICATIONS AND DRAWINGS
DRAFT 50% REMEDIAL DESIGN

REMEDIAL DESIGN SERVICES
SWAN ISLAND BASIN PROJECT AREA
CERCLA DOCKET NO. 10-2021-001

PORTLAND HARBOR SUPERFUND SITE
PORTLAND, MULTNOMAH COUNTY, OREGON

Prepared for:

Swan Island Basin Remedial Design Group

Prepared by:

11107 Sunset Hills Road, Suite 400
Reston, Virginia 20190

With assistance from:

PACIFIC groundwater GROUP · MOTT MACDONALD · BRIDGEWATER GROUP · COAST & HARBOR ENGINEERING

March 2025

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APPENDIX S

PRELIMINARY SPECIFICATIONS

This is a placeholder for specifications that will be submitted on 03/27/2025.



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SECTION 01 00 50

ABBREVIATIONS, ACRONYMS, AND DEFINITIONS

PART 1 GENERAL

1.01 SUMMARY

A. Wherever the following terms are used in these Specifications or other Contract documents, the intent and meaning will be interoperated as shown within this Section.

1.02 ABBREVIATIONS/ACRONYMS

A. Abbreviations used in these Contract documents are listed below.

ABBREVIATION/ ACRONYM	DEFINITION
%	percent
cfu	colony-forming unit
CY	cubic yard
ft	feet
ft^{t2}	feet squared
gal	gallons
lb	pound
max	maximum
min	minute
mm	millimeter
oz	ounce
psi	pounds per square inch
sq ft	square feet
yd	yard
ACI	American Concrete Institute
AGC	Associated General Contractors of America
AIDP	Archaeological Inadvertent Discovery Pl
AIS	Automated Identification System
ANLMP	Air Pollution, Noise, and Light Monitoring Plan
ANSI	American Standard for Nursery Stock
ARARs	Applicable or Relevant and Appropriate Requirements
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASTM	ASTM International
BEHP	bis(2-ethylhexyl)phthalate
BMPs	Best Management Practices
BODR	Basis of Design Report
CIL	Chemical Isolation Layer
CBR	California Bearing Ratio
CCU	Cap Certification Unit

ABBREVIATION/ ACRONYM	DEFINITION
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CPM	Construction Progress Documentation
CQA/QCP	Construction Quality Assurance/ Quality Control Plan
CRD	Columbia River Datum
CRD	Contract Requirements Document
CPT	Cone Penetration Testing
CSP	Construction Site Plan
CUL	Cleanup Level
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DCU	Dredge Certification Units
DEQ	Department of Environmental Quality
DFW	Oregon Fish and Wildlife
DMP	Data Management Plan
DOC/DOCX	Microsoft Word file type extension
DOR	Designer of Record
DOT	Department of Transportation
DSL	Department of State Lands
EFH	Essential Fish Habitat
EMB	Environmental Mitigation Binder
EMP	Environmental Management Plan
ENR	Enhanced Natural Recovery
EPA	U.S. Environmental Protection Agency
EPL	Erosion Protection Layer
ERB	Environmental Records Binder
ESA	Endangered Species Act
ESD	Explanation of Significant Difference
FEMA	Federal Emergency Management Agency
FNC	Federal Navigation Channel
GAC	granular activated carbon
GPS	Global Positioning System
GST	General Submittal Transmittal form.
ICs	Institutional Controls
MAF	Monthly Adjustment Factor
MARV	Minimum Average Roll Values
MCL	Maximum contaminant levels

ABBREVIATION/ ACRONYM	DEFINITION
MCLG	maximum contaminant level goals
MUTCD	Manual on Uniform Traffic Control Devices
NA	Not Applicable
NAD 83	North American Datum of 1983
NAVD 88	North American Vertical Datum of 1988
NCR	Non-conformance Reports
NEPA	National Environmental Policy Act
NFPA	The National Fire Protection Association
NGVD47	National Geodetic Vertical Datum of 1947
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRWQC	National Recommended Water Quality Criteria
O&M	Operations and Maintenance
OAR	Oregon Administrative Rules
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation
ORS	Oregon Revised Statutes
OSHA	Occupational Safety and Health Administration
OWOW	Office of Wetlands, Oceans, and Watersheds
PAH	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PCC	Portland City Code
PDF	Portable Document Format
PHSS	Portland Harbor Superfund Site
PPE	Personal protective equipment
PVC	polyvinyl chloride
RA	Remedial Action
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RCU	Riverbank Certification Unit
RD	Remedial Design
RFI	Request for Information
RM	river mile
ROD	Record of Decision
SFT	Secure File Transfer
SIB	Swan Island Basin
SMA	sediment management area
SMS	Safety Management System
SPCC	Spill Prevention, Control, and Countermeasure Plan
SPT	Standard Penetration Testing

ABBREVIATION/ ACRONYM	DEFINITION
TBC	to be confirmed
TCP	Traffic Control plan
TESC	Temporary Erosion and Sediment Controls
TPH-Dx	total petroleum hydrocarbons - diesel range hydrocarbons
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
VMP	Vessel Management plan
WQC	Water Quality Criteria
WQMP	Water Quality Monitoring Plan
XLS/XLSX	Microsoft Excel file type extension

1.03 DEFINITIONS

A. [To be completed following completion and review of drafts - compiled from other sections]

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION [NOT USED]

END OF SECTION

SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.01 SUMMARY

A. This Section provides a description of the overall Project, including descriptions of Work by Remedial Action (RA) Performing Parties and Work by Others.

1.02 PROJECT DESCRIPTION

A. The Work Area is the Swan Island Basin (SIB) Project Area within the Portland Harbor Superfund Site, located on the northeast side of the Willamette River, spanning approximately 1.1 miles between river miles 8.1 and 9.2. This 117-acre area encompasses riverbanks from the top of the bank to the river. A federal navigation channel, with authorized depth -45 feet (ft) Columbia River Datum authorized depth, exists within the Willamette River and extends from the confluence of the Lower Willamette River with the Columbia River to RM 11.6. The U.S. Army Corps of Engineers (USACE) maintains the navigation channel, which does not extend into the SIB.

B. As described in Section 2 of the SIB Basis of Design Report (BODR; HGL, 2024), the SIB Project Area is a roughly rectangular lagoon that is backwatered from the main Willamette River Channel. It is bounded by the uplands of Swan Island to the southwest and Mocks Bottom to the northeast. The entire shoreline was constructed by fill placement and other modifications that occurred over many decades. The Portland Harbor reach of the Willamette River, including the SIB Project Area, has been extensively altered since 1888. These changes have significantly reshaped the landscape and waterways of the SIB Project Area. Currently, the SIB is an active navigable industrial waterway, and the SIB Project Area hosts light and heavy industrial activities, with limited commercial use. The shoreline supports various industrial structures and activities, reflecting its importance as a hub for industrial operations in the Portland area. This mix of industrial and limited commercial uses characterizes the current state of the SIB Project Area and its immediate surroundings.

C. Contaminants of concern (COCs) for the SIB Project Area are described in the 50% Remedial Design Criteria Report (HGL, 2025) and summarized below.

1. COCs in sediment included various dioxins/furans, total petroleum hydrocarbons - diesel range hydrocarbons (TPH-Dx), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), metals, and tributyltin.
2. COCs in stormwater samples included PCBs, dioxins/furans, pesticides, PAHs; hexachlorobenzene, metals, and bis(2-ethylhexyl)phthalate (BEHP).
3. COCs in stormwater solids included PCBs, dioxins/furans, pesticides, metals, BEHP, and TPH-Dx.
4. COCs present in riverbank soils included PCBs, dioxins/furans, pesticides, metals, BEHP, and TPH-Dx.

D. Environmental impacts to the Work Area will be remediated by the RA Performing Parties. Prior to Contractor performing the Remedial Construction, Contractor will produce pre-construction submittals, a pre-construction survey, and obtaining or otherwise meeting the substantive requirements of required permits. In accordance with Contractor's Remedial Action Work Plan (RAWP) and the Design Drawings and Specifications, Contractor will mobilize and construct temporary facilities to support the work; install environmental controls; perform structure demolition or temporary relocation; riverbank dredging/excavation and disposal, soil cover/cap construction, and riverbank slope revegetation and revetment construction; submerged debris removal, sediment dredging, and dredged materials management and disposal; engineered cap construction; and site restoration.

PART 2 CONSTRUCTION SEQUENCING AND PHASING

2.01 SEQUENCING

A. The Work will be sequenced in a way to avoid the recontamination of the SIB Project Area during each in-water work window and during the off season between subsequent in-water work windows. The Contractor will produce a Remedial Action Work Plan (RAWP) per Section 01 14 00 that provides the Contractor's sequencing plan for the Work. This Plan will detail the activities to be performed each year to complete the Work in accordance with the Contractor's Construction Schedule (Section 01 32 00). The RAWP will provide the Contractor's Dredge Plan Area unit approach to allow work to be completed within the In-Water Work Period. It is anticipated that work will be completed by the Contractor in sub-areas of the Project Area, as generally described below.

B. The general sequence of work for the RA is expected to start with a pre-construction survey, establishment of Contractor's temporary facilities, and removal of Large Debris. Then, any required demolition or structural work would occur followed by upland excavation and soil cover/restoration. Contractor will then dredge below the water line, and place material for the cap and erosion protection layer (EPL). A post-dredge survey will occur prior to material placement with any necessary re-dredging occurring prior to the placement of material. Quality Control methods during the material placement work will ensure adherence to the construction performance standards, and the Contractor will provide another bathymetric survey to determine completeness. If additional material placement for the Work Period is not required, the Work Period would culminate with implementation of monitoring until the next in-water work window as described in the Construction Quality Assurance/Quality Control Plan (Appendix L, Volume II of the Remedial Design [RD] Package).

C. While certain construction sequence items are expected to be specified by the RA Contractor in the RAWP depending on their means and methods, obtaining material, transload capacity, and/or property access, the 50% Preliminary RA Schedule will be further refined at the Pre-Final 90% RD milestone and the Final 100% RA Schedule and will outline the expected sequence of work for the entirety of the RA at the SIB Project Area.

D. The general sequence expected for the Work (as of the 50% RD) is expected to be as follows:

1. Development and approval of the RA Contractor's RAWP;
2. Notification sent to required parties including property owners/operators and agencies;
3. Procurement of placement material and completion of any necessary testing;
4. Pre-dredging preparation, including Pre-construction bathymetric survey (per Section 02 21 00); Large Debris removal from the Work Area; and Structural work (demolition and/or construction);
5. Upland excavation (may occur simultaneously with structural work);
6. Dredging below 0 ft Columbia River Datum occurring simultaneously with removal of Incidental Debris, in-water transport, transload of material, disposal, and water treatment and disposal;
7. Post-dredge survey (per Section 02 21 00);
8. Re-dredging and survey, if needed;
9. Material placement;
10. Post-material placement survey (per Section 02 21 00);
11. Additional material placement and surveys, if needed;
12. Reconstruction of structures removed as part of the Work;
13. Inspections and corrective measures; and
14. Site cleanup and demobilization of equipment.

E. Some of the sequenced items may occur simultaneously depending on the means and methods of the RA Contractor, ability of transload site, equipment capabilities, and access to properties.

2.02 WORK COVERED BY CONTRACT DOCUMENTS

A. The 50% Preliminary RA Schedule was developed by using the estimated dredging production rates in the Dredging Desing Technical Memorandum (Appendix G, Volume I of the RD Package) and the Oregon Fish and Wildlife (DFW) specified in-water work windows. Unless otherwise permitted by EPA, the in-water work windows anticipated for the SIB Project Area occur from July 31 through October 31 and December 1 through January 31 (below 20 ft National Geodetic Vertical Datum of 1947 [NGVD47]). Each In-Water Work Period was estimated to be defined by a total of 128 working days. The 128-day time frame begins July 31 and ends January 31 and excludes weekends, federal holidays, and the month of November.

B. Work Restrictions are covered in Section 01 14 00.

2.03 PROJECT DESCRIPTION

A. The SIB Project Area is located in an area with multiple property owners, privately-owned submerged and submersible land, and submerged and submersible land owned by the State of Oregon. The RA Performing Parties are responsible for obtaining access for the Work. Contractor shall notify Project Representative within 24 hours of determining that any access issues will impact the schedule arise during the execution of the Work.

B. The RA Performing Parties will coordinate with SIB Project Area property owners and operators to establish access for the RA, which may be accomplished through access agreements, leases, and/or easements. Depending on the owner and the nature and duration of the access, written agreements or other legal documentation (e.g., leases, easements, deed restrictions) may be required. The RA Performing Parties will engage Oregon Department of State Lands and other property owners to identify potential RA constraints and requirements. It is crucial to begin communications early with property owners to avoid potential delays in the RA work. Contractor will work with the Project Representative to coordinate with the EPA and the Oregon DEQ.

END OF SECTION

SECTION 01 13 00

REFERENCE MATERIAL

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes lists of all documents related to the Project. These documents are provided for Bid information purposes only.

B. Reference materials are provided for informational purposes only and are not to be considered Contract Documents.

1.02 DESCRIPTION OF WORK

A. The Work is described in Section 01 00 50. The reference documents listed below are available on the Project Website at [https://swanislandbasin.org/], U.S. Environmental Protection Agency (EPA) Portland Harbor Superfund Site website [https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1002155]. All other procurement documents are available at [Additional Links].

B. For the Work related to the Contract, the following reference materials are available:

1. Portland Harbor Superfund Site Decision Documents

   a. Portland Harbor Record of Decision, Record of Decision, Portland Harbor Superfund Site, Portland Oregon. U.S. Environmental Protection Agency Region 10, Seattle, Washington. January 3, 2017.

   b. Errata #2 for Portland Harbor Superfund Site Record of Decision, Table 17. January 14, 2020.

   c. Errata #3 for Portland Harbor Superfund Site Record of Decision, Table 6 and Table 21. September 7, 2022.

2. Environmental Data:

   a. Pre-Design Investigation Evaluation Report, Revision 2, for Swan Island Basin Project Area of the Portland Harbor Superfund Site, December 2024.

   b. Basis of Design Report, Revision 1, for the Swan Island Basin Project Area of the Portland Harbor Superfund Site, November 2024.

3. 50% Remedial Design Volume 1 through 3:

   a. Volume 1 (Design Criteria Report):

      1) Appendix A: Achieved Sediment Sample Analysis Technical Memorandum

      2) Appendix B: Non-Aqueous Phase Liquid Technical Memorandum

      3) Appendix C: Habitat Impact Evaluation Technical Memorandum

      4) Appendix D: Cap Design Technical Memorandum

      5) Appendix E: Waste Designation Memorandum

      6) Appendix F: Clean Water Act Analysis Technical Memorandum

      7) Appendix G: Dredging Design Technical Memorandum

      8) Appendix H: Geotechnical Design Technical Memorandum

      9) Appendix I: Structural Design Technical Memorandum

10) Appendix J: Cost Analysis Technical Memorandum

11) Appendix K: Value Engineering Screening

b. Volume 2 (Plans):

1) Appendix L: Construction Quality Assurance/Quality Control Plan

2) Appendix M: Transport and Offsite Disposal Plan

3) Appendix N: Project Area Monitoring Plan

4) Appendix O: Green Remediation Plan

5) Appendix P: Institutional Controls Implementation and Assurance Plan

6) Appendix Q: Operation and Maintenance Plan

7) Appendix R: Operation and Maintenance Manual

c. Volume 3 (Specifications and Drawings):

1) Appendix S: Specifications (including this Section 01 13 00 - Reference Materials)

2) Appendix T: Drawings

4. [Other Reference Materials]:

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION [NOT USED]

END OF SECTION

SECTION 01 14 00

WORK RESTRICTIONS

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies completion times, milestones, constraints, hours of Work, construction sequencing, and liquidated damages.

1.02 DESCRIPTION OF WORK

A. Schedule and conduct all Work in a manner consistent with the Contract, and comply with the construction scheduling requirements, Contract milestones, and constraints on the Work as specified.

1.03 DEFINITIONS

A. Refer to Section 01 11 00 (Summary of Work) for definitions related to the Contract Documents.

B. In-Water Construction: Construction that requires use of heavy construction equipment for remediation activities is allowed to be conducted by the Contractor within the In-Water Work Period.

1. Pre-construction and post-construction activities, which do not require the use of heavy construction equipment (including Work that is administrative in nature; procurement/testing/characterization of imported materials; mobilization and demobilization of equipment, materials, and supplies; Work Area preparation; setup/decommissioning of temporary construction facilities, Staging and Stockpile Area(s), Work Period Pre- and Post-Construction Surveys; Pre-Construction and Post-Construction Structural Conditions Inspections; development of Contractor's pre-construction submittals, post-construction submittals, closeout submittals, and preparation of Project Record Documents) are allowed to occur outside of the In-Water Work Period, with the Project Representative's acceptance.

    a. Pre-construction activities shall not begin until the Contractor receives notification from the Project Representative to start these activities.

2. The following timelines describe each Work Period for the Project:

    a. Work Period 1: The first Work Period of the Contract, which starts upon the effective date of the Notice to Proceed of Contract Award and finishes [to be inserted at Pre-Final 90% RD] calendar months after the end of the In- Water Work Window of the next calendar year in which construction begins.

    b. Work Periods 2-10: The second through the tenth Work Period of the Contract, which starts [to be inserted at Pre-Final 90% RD] calendar months prior to the start of and ends [to be inserted at Pre-Final 90% RD] calendar months after the end of the In-Water Work Period of the next calendar year after completion of Work Periods 1 through 9.

C. Inherent Delays: Refers to delays that should be anticipated while conducting in-water work including inclement weather and coordination with commercial vessel activities.

D. In-Water Work: Refers to construction activities that occur below the ordinary high water elevation (i.e., dredging, placement, Piling removal, Steel Pipe Piling installation, Incidental Debris and Identified Debris removal, bulkhead wall installation, outfall energy dissipation structure installation).

E. In-Water Work Period: Refers to the period when In-Water Work is allowed: generally from July 1 to October 31, and from December 1 to January 3 (although in December-January, Work is restricted to areas above -20 ft National Geodetic Vertical Datum of 1929).

1.04 SUBMITTALS

A. Refer to Section 01 33 00 (Submittal Procedures).

1.05 WORK PERIOD AND IN-WATER WORK PERIOD

A. In-Water Work described in this Contract shall be performed during the In-Water Work Period, as defined above:

1. The Contractor shall complete the Project within an estimated [to be inserted in Pre-Final 90% RD] consecutive Work Periods, but the detailed Construction Schedule within the Contractor's Remedial Action Work Plan (RAWP) will determine the actual Work periods.

B. In the event the Contractor proposes to complete the Work for the Project faster than the estimated Work Periods, the Contractor shall provide detailed rationale in the RAWP, including the detailed Draft Project Schedule (that describes the sequencing of Work, milestones, etc.) and areas of Work where multiple equipment sets would be used. Any alternate Project duration proposed by the Contractor will be subject to the Project Representative's review and acceptance, prior to the start of any Work.

C. The actual start date of each In-Water Work Period will be coordinated between the Project Representative and U.S. Environmental Protection Agency (EPA).

1. Although the formal In-Water Work Period should allow for construction to start as early as July 1 of any Work Period, the Project Representative will coordinate with EPA if there is any variation of when In-Water Work can start.

2. In light of this uncertainty, the Contractor shall assume, for bidding purposes only, that that the Contractor will be unable to conduct any In-Water Work during [#] working days each Work Period (either consecutively or non-consecutively; referred to as downtime)

3. The Contractor may request an extension of each In-Water Work Period to the Project Representative. The Project Representative will coordinate with EPA to determine whether an extension will be granted. There is no guarantee an extension will be granted, and the Contractor shall assume no extensions for bidding purposes.

D. The Contractor will be required to relocate its equipment outside of the Work Area after the In-Water Work for each Work Period is completed, in compliance with Section 01 70 00 (Closeout Requirements).

Refer to Article 1.10 of this Section for general Project construction sequencing requirements that define the start of general Work activities and In-Water Work Period activities.

1.06 COMPLETION TIMES

A. Achieve Substantial Completion of the Project on or before [to be inserted by Final 100% RD].

B. Achieve Final Acceptance of the Project within 90 calendar days of Substantial Completion.

1.07 MILESTONES

A. Milestone 1:

1. The Contractor shall complete the Draft RAWP for submittal to Project Representative within 30 calendar days after the effective date of the Notice to Proceed of Contract Award.

B. Milestone 2:

1. The Contractor shall complete the Contractor's Annual Construction Summary Report at the end of each Work Period (to document the Work completed in that Work Period) within 45 calendar days after completion of construction activities (including disposal of Dredged Material) and demobilization from the Work Area.

C. Milestone 3:

1. The Contractor shall complete all Required Dredging activities for the final Work Period by [to be inserted by Final 100% RD].

D. Milestone 4:

1. The Contractor shall complete all In-Water Work activities for the Project by [to be inserted by Final 100% RD].

1.08 CONSTRAINTS

A. The Contractor shall indicate in its construction sequencing approach and Draft Construction Schedule (both to be submitted as part of the Draft RAWP) a reasonable progress of the Work toward Project completion, through demonstrating the even distribution of Dredge Pay Volume removed and Engineering Capping Pay Volume placed in the multiple Work Periods.

1. The Contractor shall define specific targets (percentage of overall Project completion) in each Work Period in order to achieve the proposed Dredge and Capping Pay Volumes in each of the Work Periods.

2. Any Contractor proposal with a significant unbalanced distribution of the Work that shows a majority of the Work being conducted in a single Work Period may be cause for rejection of the Draft Project Schedule (and the Draft RAWP) by the Project Representative.

B. Provide written notice to the Project Representative a minimum of 3 weeks prior to all planned shutdowns and/or outages of Portland facilities necessary to complete the Work, unless noted otherwise.

C. All Work shall be completed within the Contractor's Construction Schedule.

1. For each Dredge Certification Unit (DCU) that the Contractor starts construction on, the Contractor shall complete all Work related to that DCU (including dredging) within the same Work Period and In-Water Work Period and obtain acceptance of completion from the Project Representative. This includes completing Required Dredging, Contingency Re-Dredging, and DCU-specific cap material placement to complete a Cap Certification Unit (CCU) within a single Work Period.

2. The Contractor shall plan its construction sequencing approach and Draft Project Schedule (as part of the Draft RAWP) to fully complete all remedial activities for a discrete DCU within the same Work Period.

D. The Contractor shall coordinate with the U.S. Coast Guard (USCG) in accordance with USCG regulations in advance of each In-Water Work Period so that USCG can issue a Notice to Mariners prior to the start of each Work Period and comply with marine vessel requirements during construction (refer to Section 01 31 00 – Project Management and Coordination).

E. The Contractor shall notify the Harbor Master in accordance with the U.S EPA Portland Harbor Superfund Sitewide Community Impacts Mitigation Plan in advance of each In-Water Work Period and provide the following information:

1. Location, description and timing of anticipated work

2. Contact information (both on-site construction manager and project manager) including: name, role, mobile phone number, and VHF channel

3. Any temporary us restrictions during work

F. The Contractor's movement of materials into and out of the Work Area is subject to the use of approved upland haul routes as described in Section 01 52 00 (Construction Facilities).

1.09 HOURS OF WORK

A. Hours of Work are restricted for this Project as follows:

1. In accordance with the Draft Portland Harbor Superfund Sitewide Community Impacts Mitigation Plan, standard In-Water Work hours are 7:00 a.m. to 6:00 p.m., Monday

through Saturday, for a 6-day-per-week Work schedule.

2. The Contractor may not work outside these normal Work hours without prior written approval by the Project Representative.

   a. If the Contractor anticipates needing to conduct In-Water Work during the nighttime or on Sundays and legal holidays to conduct bank excavation activities due to the timing of low tides or to perform occasional Work to meet the Baseline Project Schedule and support progress of activities within the In-water Work Period, the Contractor shall obtain Project Representative (in coordination with the EPA) approval.

   b. The Contractor shall notify the Project Representative in advance a minimum of 72 hours prior to the start of that Work) of any proposed after-hours Work, including Sundays and holidays, to obtain written approval from the Project Representative prior to initiating such Work.

      1) EPA coordination and approval will also be required for these events. It is the sole discretion of the Project Representative and EPA to approve after-hours Work outside the standard hours allowed by this Contract.

3. If the Contractor works unscheduled hours and/or if the Contractor has not obtained the Project Representative's approval at least 72 hours prior to the start of unscheduled after-hours Work, the Contractor shall be liable for the costs of the Project Representative's overtime inspection at the rate of $XXX for each hour for each person performing such inspection.

B. Submit a Draft Project Schedule of working hours within the RAWP accordance with Sections 01 32 00 (Construction Progress Documentation) and 01 33 00 (Submittal Procedures).

1.10 CONSTRUCTION SEQUENCING

A. Prepare a construction sequencing approach as part of the Draft Project Schedule (in the Draft RAWP submittal) that describes the Contractor's implementation approach for all construction activities and how this approach will meet the sequencing requirements of these Specifications, including the Substantial Completion and Final Acceptance dates.

1. Refer to Section 01 32 00 (Construction Progress Documentation) for specific requirements for Draft Project Schedule development, including but not limited to sequencing and schedules for each of the Work Periods by DCU.

B. The Contractor shall perform the Work activities according to the following overall Project Area sequencing requirements:

1. Complete all required Work at the Work Area in a continuous manner (i.e., do not leave gaps in time between In-Water Work activities unless directed by the Project Representative or between Work Periods).

2. Start Work activities from upstream to downstream unless otherwise accepted by the Project Representative.

3. The Contractor is allowed to temporarily relocate its equipment to perform Work activities in other parts of the Work Area (e.g., during the Contingency Re-Dredging Decision Duration period) to minimize equipment downtime to achieve the Substantial Completion date. The Contractor may also Work concurrently in multiple DCUs.

4. The Contractor shall minimize impacts to SIB navigation and vessel operations (refer to Section 01 31 00 – Project Management and Coordination and Part 3.01 in this Section).

C. The Contractor shall include allowances for Inherent Delays in the Draft Project Schedule.

D. The Contractor shall bid and perform the Work as described in the Contract under the following general sequencing requirements for each Work Period. The specified sequencing listed below does not identify all necessary Work elements and is only intended to provide an overview of the required sequence of construction and key Work elements. The Contractor may propose an

alternate sequencing approach in its Draft RAWP for Project Representative review and approval prior to a Deviation from the following specified sequencing:

1. Following review and approval by the Project Representative of the required pre-construction submittals, the Contractor shall commence Construction Work at the Work Area.
    a. Construction activities conducted above the ordinary high water elevation may occur during In-Water Work Periods and at any other time.
    b. In-Water Work shall start on July 1 or after (as directed by the Project Representative) each In-Water Work Period.
2. The Contractor shall conduct the Work Period Pre-Construction Survey for each Work Period to document bathymetric and topographic conditions within the DCUs to be remediated in advance of conducting any In-Water Work each Work Period, as required in Section 02 21 00 (Site Surveys and Positioning Control).
3. The Contractor shall notify the Project Representative 10 working days in advance of anticipated Work at the Work Area.
4. The Contractor shall provide notifications to property owners that require notifications as required per site access agreements, and the USCG. Notifications to regulatory agencies in accordance with Applicable or Relevant and Appropriate Requirements (refer to Section 01 41 00 – Regulatory Requirements for applicable environmental laws, statutes, ordinances, and associated regulatory requirements) for the Portland Harbor Superfund Site cleanup remedy will be completed by the Project Representative.
5. The Contractor shall procure and conduct testing of clean placement materials before any placement activities are conducted (refer to Section 35 37 10 – Engineered Caps and, Section 31 00 00 – Earthworks, and Section 31 37 00 Rock Revetment).
6. The Contractor shall conduct a Pre-Construction Structural Condition Inspection of existing structures and facilities within the Work Area (as described in Section 31 09 00 – Geotechnical Instrumentation, Condition Inspections, and Monitoring), which shall include collecting pre-construction photographs and videos. The Contractor shall provide the Pre-Construction Structural Condition Report (including associated documentation and photographs/videos) to the Project Representative for acceptance prior to commencing the In-Water Work of each Work Period.
7. The Project Representative reserves the right to inspect all Contractor quality control and environmental protection measures to confirm they are in place and working properly prior to initiating any construction activities (including in-water or upland). Construction activities may not begin until all Contractor quality control and environmental protection measures and components are in place and working properly.
8. The Contractor shall conduct removal of Piling and Identified Debris in the locations shown on the Drawings. The Contractor shall describe the sequencing of the removal of Piling and Identified Debris relative to Required Dredging.
9. The Contractor shall conduct any required bulkhead strengthening and reinforcement in the location shown on the Drawings prior to any dredging activities in the associated DCUs.
10. The Contractor shall describe the sequencing of bulkhead installation relative to removal of adjacent Identified Debris for review and acceptance by the Project Representative. If partial removal of Identified Debris is proposed prior to bulkhead wall installation, the Contractor shall demonstrate controlled methods to minimize the potential for damaging the existing wall.
11. The Contractor shall perform Required Dredging (including excavation), barge dewatering, and in-water transportation of Dredged Material, Identified Debris, and Incidental Debris to the Transload Facility(ies), as described in Section 35 24 20 (Remedial Dredging, Barge Dewatering, and In-Water Transportation).

12. The Contractor shall perform Required Excavation and upland transportation of contaminated soil as described in Section 02 61 00 (Removal and Disposal of Contaminated Soils).

13. The Contractor shall conduct transloading, upland transportation, and off-site disposal of Dredge Material, Incidental Debris, Identified Debris, and Piling at an approved Disposal Facility(ies), as described in Section 35 20 23.01 (Transloading, Upland Transportation, and Disposal).

14. The Contractor shall conduct Required Dredging Post-Construction surveys for review and acceptance by the Project Representative. Post-dredge construction sediment sampling/testing will be performed by the Project Representative

15. The Contractor shall account for the Contingency Re-Dredge Decision Duration (## working days), in which the Project Representative will review the post-dredge construction sediment sampling/testing results of a specific DCU and will direct the Contractor as to whether Contingency Re-Dredging activities will be required. During this period, the Contractor shall not perform any Work within the associated DCU and shall perform Work in other DCUs.

16. Contingency Re-Dredging may be directed by the Project Representative in specified location(s) of the DCU or perimeter areas, or limited locations outside the DCU perimeters, based on post-dredge construction sediment sampling/testing results.

17. The Contractor shall conduct Contingency Re-Dredging Post-Construction Surveys for review and acceptance by the Project Representative.

18. After completion of all dredging activities for an individual DCU, and acceptance by the Project Representative and EPA, the Contractor shall conduct applicable material placement of Engineered Cap materials as shown on the Drawings and described in Section 35 37 10 (Engineered Caps) within the individual Cap Certification Unit (CCU).

19. Dredging and placement activities conducted in an DCU/CCU shall be completed in the same Work Period.

20. The Contractor shall conduct material placement of Enhanced Natural Recovery (ENR) as shown on the Drawings and described in Section 35 37 10 (Engineered Capping) [to be updated during Pre-Final 90% RD]

21. The Contractor shall conduct Placement Post-Construction Surveys for review and acceptance by the Project Representative.

22. The Contractor shall install outfall energy dissipation structures in the locations and sequencing as shown on the Drawings.

23. The Contractor shall install Steel Pipe Piling in the locations shown on the Drawings.

24. The Contractor shall conduct the Work Period Post-Construction Survey for each Work Period to document bathymetric and topographic conditions within DCUs remediated each Work Period, as required in Section 02 21 00 (Site Surveys and Positioning Control).

25. The Contractor shall conduct a Post-Construction Structural Condition Inspection of existing structures and facilities within the Work Area (as described in Section 31 09 00 – Geotechnical Instrumentation, Condition Inspections, and Monitoring), which shall include collecting post-construction photographs and videos (as described in Section 01 32 33 – Photographs and Videos).

26. The Contractor shall provide the Post-Construction Structural Condition Report (including associated documentation and photographs/videos) to the Project Representative for acceptance after completion of all In-Water Work of each Work Period.

27. The Contractor shall conduct inspections (Contractor inspection and pre-final and final inspections with the Project Representative) and implement any necessary corrective

measures to the Project Representative's satisfaction to obtain final approval.

28. The Contractor shall conduct demobilization and Work Area cleanup to the satisfaction of the Project Representative, as described in Section 01 74 23 (Final Cleaning).

E. The Contractor shall comply with closeout requirements for the Project and for each Work Period as described in Section 01 70 00 (Closeout Requirements).

F. The Contractor shall comply with Project Record Document requirements for the Project and for each Work Period as described in Section 01 78 39 (Project Record Documents).

1.11 LIQUIDATED DAMAGES [TO BE INSERTED AT PRE-FINAL 90% RD]

A. Liquidated damages for failure to achieve Milestone 1: [XXXXX PER DAY]

B. Liquidated damages for failure to achieve Milestone 2 for each Work Period: [XXXXX PER DAY]

C. Liquidated damages for failure to achieve Milestone 3: [XXXXX PER DAY]

D. Liquidated damages for failure to achieve Milestone 4: [XXXXX PER DAY]

E. Liquidated damages for failure to achieve Substantial Completion: [XXXXX PER DAY]

F. Liquidated damages for failure to achieve Final Acceptance: [XXXXX PER DAY]

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION

3.01 COORDINATION WITH OTHERS

A. The Contractor shall coordinate all activities with the Project Representative so that navigation interference will be minimized. In addition, the Contractor shall carry out Work in a manner that minimizes navigation interference and does not delay commercial operations (e.g., commercial vessels and businesses located adjacent to the Work Area, see Article 1.08 of this Section).

B. The Contractor shall coordinate all their marine activity and vessel movements, frequency, and operations with USCG.

C. The SIB is an active navigable industrial waterway with active light and heavy industrial activities. Upland businesses use the waterway for transfer of commercial materials, for shipyard operations (such as maintenance and repair), and for vessel storage.

Commerce and businesses (upland owners and tenants) will remain open during the duration of the Work Period and through completion of the Work, shall have access through the Work Area, and shall take priority over the Contractor's operations, unless otherwise described in Project-specific Work Area access agreements.

1. The Contractor shall be required to stop, move, adjust, and slow down to accommodate industrial operation vessel movement and in accordance with project-specific agreements.

2. The Contractor shall adhere to specific sequencing requirements (see Part 1.10 of this Section) to conduct its remedial operations in a manner that will minimize interference with those industrial activities (see Section 01 31 00).

3. The Contractor shall conduct operations in a manner that will minimize interferences with other waterway users by monitoring and observing for vessel activity and warning vessels from entering the Work Area or temporarily modifying operations if necessary to prevent unsafe navigation in the Work Area for transiting (e.g., recreational, industrial, commercial) vessels around its floating equipment at all times.

D. Adjacent tenants and other property owners will be using in-water portions and adjacent uplands of the Work Area for their operations, as shown on the Drawings. The Project Representative will

coordinate with these parties on their operations to avoid and/or minimize impacts to their activities. The Project Representative will then coordinate with the Contractor for access and timing of this Project Work and operations. The Contractor shall comply with site access agreement requirements for Project Representative and Contractor-obtained agreements (if applicable) as described in Section 01 41 26 (Permits, Easements, and Right-of-Entry Agreements). The Contractor shall notify the Project Representative at least 14 working days in advance of any need for access to a portion of the Work Area that requires coordination with the property owner.

E. The Contractor is responsible for coordinating Work Area construction activities with operational activities that occur on a regular basis within the SIB Project Area and completing the Work in accordance with the Project construction sequencing requirements provided in Article 1.10 of this Section and in a manner that minimizes disruption to ongoing operational uses of the waterway and shoreline areas.

1. Share Work Area access areas with tenants and property owners and other vessels that utilize the waterway for commercial operations.

2. Coordinate Work Area upland construction activities, including Work Area access, parking, and lay down areas, with other operational activities, and keep disruptions to other activities to a minimum.

F. The Contractor shall coordinate Work of sub-trades.

1. The Project Representative is not responsible or accountable for extra costs incurred as a result of the Contractor's failure to coordinate Work among trades and subcontractors.

G. All costs associated with coordination of the Work shall be considered incidental to the lump sum and unit prices set forth in the Bidding Schedule.

END OF SECTION

SECTION 01 19 50

PROTECTION AND MAINTENANCE OF PROPERTY AND WORK

PART 1 GENERAL

1.01 SUMMARY

A. In this Section, the protection and maintenance of property in the Swan Island Basin Project Area (Work Area) that could be impacted by Remedial Action construction is specified including the requirements for Contractor disposition of third-party claims. Potentially impacted property includes underground and aboveground utilities, structures, fences, parking strips driveways, streets, and other improvements in upland areas that may be affected by construction activities.

1.02 REFERENCED STANDARDS

A. Work to be performed shall be conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Compliance will be in accordance with the Applicable or Relevant and Appropriate Requirements for the Portland Harbor Superfund Site cleanup remedy during the execution of the Project and will comply with the EPA Record of Decision (EPA, 2017; see document in Section 01 13 00 – Reference Material). Relevant local, state, and federal regulations, as listed in Section 01 41 00 (Environmental Regulatory Requirements), will provide the environmental provisions of compliance pertaining to the Work described in this Section. The more stringent requirements will always apply in any instance of conflict between the requirements of this Section and those listed in Section 01 41 00 (Environmental Regulatory Requirements). Applicable laws and regulations will in no way be overruled by the requirements described in this Section.

B. Additional standards referenced in and applicable to this Section include, but are not limited to, the following:

REFERENCE	TITLE
ORS Chapter 757	Utility Regulation Generally
OAR Chapter 437-004-3100	Excavation
City of Portland Administrative Rule TRN 10.19	Utility Permits in the Right-of-Way
PCC 17.32	Public Sewer and Drainage Systems Permits, Connections, Maintenance, and Damage
PCC 17.40	Protection of Public Right of Way
PCC 17.44	Street Obstructions

Notes:
ORS: Oregon Revised Statutes
OAR: Oregon Administrative Rules
PCC: Portland City Code

1.03 SUBMITTALS

A. Refer to Section 01 33 00 (Submittal Procedures).

B. Construction submittals:

1. The following shall be submitted as part of the Weekly Construction Report:
    a. Listing and schedule of all activities intended for the location of potential underground and underwater utilities
    b. Account of the utilities/facilities identified for physical protection and relocation.
2. Detailed drawings of proposed methods supporting, protecting, and buttressing the utilities potentially affected by the Work per Paragraph 1.05 of this Section.

1.04 PROTECTION OF EXISTING STRUCTURES AND FACILITIES TO REMAIN

A. Repairs, as deemed necessary by the Project Representative shall be performed to mitigate damage to existing structures and/or existing facilities caused by the Contractor's operations, to the functional equivalent of the pre-Project condition. Repairs will be performed at the Contractor's expense and within a reasonable timeframe determined to be acceptable by the Project Representative.

1.05 LOCATION OF EXISTING UTILITIES

A. The existence of underground and underwater utilities within the proposed areas of excavation and dredging that are known to the RA Performing Parties will be indicated on the Swan Island Basin Remedial Design Drawings (Drawings) .

B. The location of existing underground utilities will be coordinated with the Project Representative and the locations of existing utilities in relation to the new construction will be evaluated for potential areas of conflict.

C. Written approval from the Project Representative shall be obtained prior to removing or relocating existing utilities not identified or otherwise shown on the Drawings to be removed or relocated.

D. Construction activities shall comply with the applicable requirements of Oregon Revised Statutes (ORS) Chapter 757.

E. Oregon 811 shall be called a minimum of 5 working days prior to the initiation of excavation operations. In the event that the Contractor discovers underground utilities that were not previously identified, utility owner and the Utility Underground Notification Center shall immediately be notified regarding the discovery. Utility owners may be liable for costs incurred by the Contractor if they fail to locate their utilities on public lands accordance with this requirement.

F. The Contractor shall be responsible for the location of all existing utilities to verify and determine utility elevations in relation to the new utilities prior to new construction.

G. The condition of all exposed utilities shall be examined and documented prior to utilities being buried.

H. The following table provides a list of utilities that may serve the SIB Project Area. This table is provided for the Contractor's convenience. For each utility listed, a name and telephone number of a contact person for each utility/facility owner or operator are provided. Under no circumstances shall this list be considered to be comprehensive or complete. Other utilities may be within the Work Area that are not listed below, and contact information may change after information was compiled. The RA Performing Parties will assume no responsibility for the accuracy or completeness of the information on the list.

UTILITY	OWNER OR AGENCY	CONTACT PERSON	CONTACT INFORMATION
Gas pipeline	NW Natural		(503) 226-4211
Power	Portland General Electric		(503) 228 6322
Power	Pacific Power		(888) 228-6322
Water	Portland Water Bureau		(503) 823-7770
Additional Utilities	To Be Confirmed		

I. All existing utilities required to complete the Work shall be protected, modified, and/or relocated unless otherwise specified or approved by the Project Representative.

J. With the exception of overhead power or other aboveground utilities supported on power/telephone poles, the locations of known existing major aboveground or underground utilities are indicated on the Drawings and were obtained from utility maps and field surveys. The accuracy or completeness of this information is not guaranteed by the RA Performing Parties. Other aboveground or underground utilities not shown on the Drawings may be encountered during the course of the Work. The Contractor shall be responsible for protection and maintenance of the utility as required in this Section If unknown utilities are encountered.

K. Utility and property owners or operators having underground utilities within the Work Area will be contacted to request the marking of their utilities. The Contractor shall be responsible for damages resulting from any failure to contact utility owners for location, route, and marking of a specific utility and its subsequent effects. If a utility owner fails to meet its obligations under ORS Chapter 952-001-0090, the Contractor will promptly notify the Project Representative prior to conducting any Work in the vicinity of a utility.

L. Unless otherwise specified, the Contractor shall be responsible for all the relocations of underground utilities called out in the Drawings prior to commencing Work in the area.

M. The Contractor is responsible for the protection, modification, and relocation of existing utilities as well as any utilities that are required to accommodate means and methods to perform the Work. The RA Performing Parties cannot predict the specific means and methods to be utilized by the Contractor . Due to this lack of information, the RA Performing Parties will not be liable for any utility protection, modification, or relocation prompted by the Contractor's means and methods but not shown on the Drawings. It is the responsibility of the Contractor to determine the requirements of the Work required by the Contract Documents and prepare for the protection, modification, and relocation of utilities required to perform the Work as well as the coordination of all protection, modification, and relocation work with the affected utility owner/operator. Work is to be completed to the utility owners' requirements and standards.

N. Major underground utilities

1. For the purpose of this Section, a major underground utility is defined as a distribution , collection, or transmission line.
2. If an existing major underground utility crosses or projects into the specified excavation it is considered to be in conflict. No conflict exists if the existing major underground utility does not meet those requirements.
3. The Contractor will be responsible for the protection of, effects on, and damages to utilities not in conflict.
4. The Contractor will confer with the Project Representative when a major underground utility is discovered which is not shown on the Drawings and in conflict,. Reimbursement for additional Work will be per Section 00 72 00 (General Terms and Conditions).
5. When not shown on the Drawings and no conflict, no additional payment will be considered.
6. When a major underground utility is discovered in a substantially different location and in conflict, reimbursement for additional Work will be per Section 00 72 00 (General Terms and Conditions).

O. Minor Underground Utilities

1. For the purpose of this Section, a minor underground utility is defined as services from a collection or distribution line.
2. Costs resulting from conflicts with minor underground utilities are not the responsibility of the RA Performing Parties.

P. The Contractor shall immediately notify the Project Representative in the event of unanticipated utilities (such as outfalls otherwise not indicated in the Drawings) being discovered during dredging activities. The Contractor will be notified by the Project Representative if Work stoppage is needed and further direction will be provided to the Contractor, as described in Section 35 24 20 (Remedial Dredging, Barge Dewatering, and In-Water Transportation).

Q. The Contractor will coordinate efforts with the Project Representative to locate existing upland underground utilities with field staking, and review the locations of existing utilities in relation to the new construction and evaluate areas of conflict.

R. Temporary Support Systems:

1. Detail drawings of proposed methods to support, protect, and buttress utilities affected by the Work will be submitted by the Contractor. Methods proposed are required to be reviewed and accepted by the affected utility prior to submittal per Section 01 33 00 (Submittal Procedures).

S. Storm and sanitary sewers:

1. Live sewers in existence within the Work Area shall remain in service. Provisions shall be made for the disposal of existing sewage flow. Construction damage to the existing sewer system and manholes will be immediately repaired to a condition equal to or better than that existing prior to the damage. Repair all damage that results from the disturbance of the existing sewer.
2. Water accumulating during construction from any repaired sewers will be removed and prevented from entering existing lines. Existing pipes affected by construction activities will be flushed to the point of the next upstream connection, and repairs will be performed to any pipelines or manholes damaged by gravel, rocks, or other debris that has entered the existing system during construction. The physical connection shall not be made to an existing manhole or sewer line until authorized by the Project Representative.

T. Underground electrical, cable, communication, and gas utilities

1. The Contractor will determine the required protection to safely proceed in a manner to protect underground utilities.
2. Consultation with utility providers prior to any dredging, digging, and excavation within 30 feet of crossing is required as accuracy of maps provided for these utilities are considered semi-accurate.
3. Spudding restrictions associated with active utility requirements will apply to the Contractor's equipment while in operation on the waterway bed.
4. The Project Representative will be notified immediately in the event there is damage to existing utilities.
5. The Contractor will observe and investigate the presence of utilities that may be affected by the Work. To determine the extent of any hazards and measures required, the Contractor will consult with and rely on the information provided by utility owners and operators.
6. Contractor will utilize on-site assistance/scheduling through the Oregon Utility Notification Center (811)for any Work near underground utility crossings.
7. Contractor will complete utility notification 811 tickets. Communication response times can extend to 2 weeks. Contractor will not proceed with Work until notified specifically by the utility-locating contractor for each telecom provider.

U. Water

1. Contractor will protect, maintain, support in place, or relocate all water pipelines as required by the appropriate utility affected by the Work.
2. Contractor will maintain water service along the alignment of riverbank Work at all times.
3. Drawings do not detail the location of thrust blocks and Contractor shall be assumed their presence at all water line deflections of 12.5 or greater.
4. The Project Representative will be notified immediately of any damage to any water pipeline. Contractor will begin repairs immediately, and ensure that water service has been restored prior to leaving the Work Site.

V. Roadways

1. Adequate precautions will be taken to protect existing sidewalks, curbs, pavements, utilities, adjoining property, and structures.
2. Contractor shall protect and replace (if necessary) traffic signage, paint striping, and channelization impacted by Work.
3. The existing pattern of illumination for signs and roads will be maintained at all times unless otherwise specified.
4. Temporary roadway lighting will be installed by the Contractor as necessary.

5. Contractor will maintain access for emergency equipment at all times.

6. Damage caused by any Contractor's activities will be repaired.

1.06 SHORING AND BRACING

A. Foundations as well as other parts of existing structures in the vicinity of the Work Area may be affected by the Work and will be shored up, braced, underpinned, and protected as necessary consistent with Sections 31 62 16.19 (Steel Sheet Piles) and 31 62 16.13 (Steel Pipe Piles). Contractor is responsible for any damages caused by settlements or the loss of lateral or subjacent support of adjoining property and from all loss and damages to adjoining and adjacent structures and their premises. Refer to Sections 01 33 00 (Submittal Procedure) and 01 33 16.00 (Design Data).

B. Contractor will comply with OAR Chapter 437-004-3100 as applicable and Chapter 279C.535 (Steel Pipe Piling) and Oregon Structural Specialty code 14-03 (Retaining Wall Systems).

1.07 PROTECTION OF PROPERTY

A. The Project Representative shall be notified and all prudent actions will be taken immediately when conditions present a potential danger to the adjoining property or property in the immediate proximity of the Work,.

1.08 PROTECTION OF TREES AND VEGETATION

A. Per Section 31 11 00 (Clearing and Grubbing).

1.09 PROTECTION AND RESTORATION OF THIRD-PARTY PROPERTY

A. Contractor shall comply with Section 01 41 26 (Permits, Easements, and Right-of-Entry Agreements) and Section 01 70 00 (Closeout Requirements).

B. As agreed upon in access agreements, Contractor shall comply with acceptable restoration criteria for third-party properties impacted by the Work.

C. Contractor shall repair and/or restore third-party properties to the conditions observed prior to construction. Additional requirements specific to restoration actions will be negotiated between the appropriate third parties and the Contractor.

1.10 DISPOSITION OF THIRD-PARTY CLAIMS

A. All damage related to prosecution of the Work is the responsibility of the Contractor. Third parties may provide written notification of damages caused by Work performed as third-party claims to the RA Performing Parties . When the RA Performing Parties receive third-party claims , they will be tendered to the Contractor. Within 30 days of receipt of the claim from the Project Representative, the Contractor is required to contact the claimant. The Project Representative will receive a report from the Contractor within 45 working days of receipt with the proposed action on the claim to be performed by the Contractor. The RA Performing Parties may disposition the claim with the third-party claimant and withhold the amount of the settlement from the disposition from the next Application for Payment if the Contractor fails to contact the claimant within the time stipulated above or disposition the claim within 90 days of receipt.

B. The Contractor shall keep the Project Representative informed of the plan and actual progress during all the procedural requirements listed above.

PART 2 EXECUTION

2.01 GENERAL

A. Oregon Utility Notification Center (811) will be contacted prior to an excavation per the requirements in Part 1 of this Section.

B. Prior to new construction, Contractor will employ a licensed third-party utility locator to locate and expose all utility locations (upland and underwater) to be affected by the Work. Work shall be adjusted by the Contractor when the location of a utility is differs from what is shown on the Drawings and materially impacts construction. If Contractor incurs additional cost due to a utility that is not shown on the Drawings and requires relocation, then the RA Performing Parties will consider additional costs.

1. Minor utilities such as irrigation lines with diameters less than 4 inches, water service lines, building drainage pipes, and direct burial cable requiring relocation will be considered incidental and will not be considered for additional costs.

C. In the event that a utility is damaged during the Work, the Contractor will repair the damage to the requirements of the utility owner prior to backfilling said utility.

END OF SECTION

SECTION 01 29 00

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1. SUMMARY

A. Measurement is described under each Bid Item in this Section. This is an example of a typical Measurement and Payment specification for a dredging and capping remediation project such as the Swan Island Basin Remedial Action. During the Pre-Final 90 % Remedial Design (RD) preparation the Bid Items will be developed further and cover the full Remedial Action (RA) scope including excavation, dredging, capping, demolition, structures replacement and planting.

B. As further specified herein, payment for the various items on the Bidding Schedule shall include all compensation to be received by the Contractor for furnishing all equipment, supplies, tools, and structures, and for all operations, labor, and incidentals appurtenant to the items of Work being described, as necessary to complete the various items of the RA.

1.2. ADMINISTRATIVE

A. All costs shall be included in the prices named in the Bidding Schedule for the various appurtenant items of Work. No separate payment will be made for any Bid Item that is not specifically set forth in the Bidding Schedule,

B. No separate payment will be made to the Contractor for indirect costs, such as supervision and overheads, profit, and the general conditions specified in the Contract. All shall be allocated to each Bid Item as applicable for Work defined in the Bid Item.

C. Should unforeseen conditions necessitate changes, the RA Performing Parties reserve the right to make said changes. The actual quantities occasioned by such changes shall govern the compensation where Work is on a unit price basis,.

1.3. BID ITEM MEASUREMENT AND PAYMENT FOR BASE WORK

A. There are numerous Bid Items which constitute the Bidding Schedule and that are defined as follows. Bid Item Nos. 1 through [XX] represent the entire scope of Work covered by the Contract Documents.

B. Bid Item No. X.X – Mobilization and Demobilization (Work Period 1) thru Bid Item No. XX– Mobilization and Demobilization (Work Period 10)

1. Mobilization to the Work area shall entail the Work necessary for each Work Period to organize and mobilize the Contractor's excavation, dredging and material placement equipment, and all other needed equipment, labor, supplies, and incidentals for transit to the Work area. Demobilization shall entail Project closeout; any task required for the removal of construction equipment and residual materials from the Work area; and the cleanup of the Work area to a condition satisfactory to the Project Representative at completion of the Work. The Bid Items shall also include costs for each Work Period related to development and implementation of all environmental protection measures, preparation of pre-construction (including the Remedial Action Work Plan [RAWP]) and post-construction submittals, closeout submittals, Project Record Documents, and maintaining bonds and insurance, as required.

    a. Any portion of the Work covered by a specific Bid Item or other incidental Work which is to be included in another Bid Item are not included in the Mobilization and Demobilization Bid Item.

    b. The preparation and subsequent revisions of the RAWP shall be accounted by the Contractor in Work Period1 Work under Bid Item No. XX – Mobilization and Demobilization (Work Period1).

2. Mobilization and demobilization for each Work Period will not be measured for payment.

3. Payment specific to the Mobilization and Demobilization Bid Items will be based on the

percent complete estimated by the Contractor and agreed to by the RA Performing Parties, as part of each monthly progress payment and shall be made as lump sum payments, as accrued for each Work Period.

4. The actual mobilization and demobilization costs for each of the [to be inserted in Pre-Final 90% RD] Work Periods shall be reflected in the total prices for Bid Items No. XX .

C. Bid Item No. XX – Work Area Preparation and Temporary Facilities Setup and Operations (Work Period1), Bid Item No. XX – Work Area Preparation and Temporary Facilities Setup and Operations (Work Period 2), and Bid Item No. XX – Work Area Preparation and Temporary Facilities Setup and Operations (Work Period 3):

1. The Bidding Schedule for these Bid Items presents the lump sum prices that shall include all materials, labor, and equipment needed to complete the following Work for each Work Period:

    a. Staging and Stockpile Area(s), Contractor field locations of the existing utilities, Transload Facility(ies), and Work Area features in adjacent upland areas

    b. Staging Area(s) setup, maintenance, operation, and deconstruction and the Contractor Transload Facility(ies) throughout each of the [to be inserted in Pre-Final 90% RD] Work Periods of the RA

    c. Establishment, maintenance, operation of temporary facilities necessary for Work on the Project, including provision for installation of temporary utilities, as described in Sections 01 52 00 (Construction Facilities)

    d. Electrical work which may entail the relocation and/or removal of existing electrical equipment, and systems, , as well as new Work to support the relocation of existing items.

2. Site preparation and the establishment of temporary facilities and operations for each Work Period will not be measured for payment.

3. Payment for specific to the Work Area Preparation and Temporary Facilities Setup and Operations Bid Items will be based on the percentage complete estimated by the Contractor and agreed to by the Project Representative, as part of each monthly progress payment and made as lump sum payments, as accrued for each Work Period.

4. The costs for furnishing all labor, materials, equipment, and incidentals required to complete the Work under these Bid Items will be reflected in lump sum prices for these Bid Items .

D. Bid Item No. X – Surveying and Positioning Control:

1. Surveying payments will be based on the percent complete estimated by the Contractor and agreed to by the Project Representative, as part of each monthly progress payment and paid as monthly payments as accrued for each Work Period.

2. Payment for this Bid Item as accrued for each Construction Work Period, as part of each monthly progress payment will be made as monthly payments.

3. Included in the monthly price are all costs related to the collection, processing, and reporting of all survey data (Pre-Construction, Progress, and Post Construction Surveys) that shall be used to calculate or verify progress and measurement and payment volumes, setup of Work Area survey control monuments, areas, limits, positions, and other aspects of the Work, and calculating quantities for progress reporting and measurement and payment purposes, as described in this Section.

E. Bid Item No. X – Identified Debris Removal, Upland Transportation, and Disposal:

1. Units of Measurement specific to this Bid Item shall be in Tons of Identified Debris (as shown on the Drawings) removed and segregated, as determined from certified scales, verified by disposal weight tickets, and as accepted by the Project Representative.

a. Incidental Debris is incidental to the Work and not measured or paid for separately. Any failure to segregate Identified Debris from Incidental Debris shall result in the combined Debris material to be considered Incidental Debris.

2. Payment for the Work under this Bid Item will be made when the Contractor provides the Certificate of Disposal from the Disposal Facility(ies). Certificates of Disposal will be reported as a tonnage measurement. Payment for this Bid Item will be made by the Ton at the quantity reported by the Disposal Facility(ies) to the maximum tonnage shown in the Bidding Schedule. Payment will be full compensation for removal and segregation of Identified Debris and transloading, upland transportation, and disposal.

F. Bid Item No. X – Remedial Dredging and In-Water Transportation:

1. Quantity assumptions for Bid Item No. X:

a. The estimated Dredge Pay Volume for Required Dredging associated with Bid Item No. X consists of the total amount of in situ cubic yards (CY) of Dredged Material and Incidental Debris, including neatline volume (to either the Required Dredge Elevation or the Required Dredge Thickness) and all required external Side Slopes around the perimeter of the extents of Required Dredging.

2. Measurement for this Bid Item (and inclusive of any barge dewatering) shall be by the in situ CY of Dredged Material and Incidental Debris, based on comparison of the accepted Work Period Pre-Construction Survey and accepted Required Dredging Post-Construction Survey (following completion of Required Dredging), minus deductions for Excessive Dredging.

3. Payment for this Bid Item (and inclusive of any barge dewatering) will be made by the in situ CY of Dredged Material and Incidental Debris at the measured quantity.

a. Final payment for this Bid Item will be based on the final measurement of Dredge Pay Volume, and final payment will be reconciled with monthly progress payments (submitted by the Contractor and accepted by the Project Representative) to determine the amount of final payment.

b. No separate payment will be made for Work associated with removal, barge movement, and in-water transportation of Incidental Debris during Required Dredging. Activities associated with the removal, barge management, and in-water transportation of Incidental Debris during Required Dredging is considered part of Required Dredging Work and will be paid under this Bid Item.

G. Bid Item No. X– Contingency Re-Dredging and In-Water Transportation:

1. Quantity assumptions for Bid Item No. X:

a. The potential Contingency Re-Dredge Pay Volume may vary depending on Contingency Re-Dredging activities directed by the Project Representative (based on post-dredge confirmatory sampling/testing results performed by the Project Representative. Payment will be made at the actual measured quantity.

2. Measurement for this Bid Item (and inclusive of any barge dewatering) shall be by the in situ CY of Dredged Material, based on comparison of the accepted Required Dredging Post-Construction Survey and accepted Contingency Re-Dredging Post-Construction Survey (following completion of Contingency Re-Dredging), minus Excessive Dredging.

3. The Contractor shall assume a Contingency Re-Dredge Decision Duration of 15 working days (as described in Section 35 24 20 (Remedial Dredging, Barge Dewatering, and In-Water Transportation) and shall account for this time in this Bid Item.

4. Payment for this Bid Item (and inclusive of any barge dewatering) will be made by the in situ CY of Dredged Material at the actual measured quantity.

a. Final payment for this Bid Item will be based on the final measurement of Contingency Re-Dredge Pay Volume, and final payment will be reconciled with monthly progress payments (submitted by the Contractor and accepted by the Project Representative) to determine the amount of final payment.

b. No separate payment will be made for Work associated with removal, barge management, and in-water transportation of Incidental Debris during Contingency Re-Dredging. Activities associated with removal, barge management, and in-water transportation of Incidental Debris during Contingency Re-Dredging is considered part of the Contingency Re-Dredging Work and will be paid under this Bid Item.

c. Bid unit price for Bid Item No. X will be constant, regardless of the actual measured quantity. No negotiation on the Bid unit price for this Bid Item is allowed for variation on the Bid volume presented in the Bidding Schedule.

H. Bid Item No. X – Transloading, Upland Transportation, and Disposal:

1. Measurement for this Bid Item shall be the sum of the Dredge Pay Volume (associated with Required Dredging Work) and the potential Contingency Re-Dredge Pay Volume (associated with Contingency

2. Re-Dredging Work, measured by the Ton, as determined from certified scales, verified by disposal weight tickets, and as accepted by the Project Representative.

3. Payment for this Bid Item will be made by the Ton at the quantity reported by the Disposal Facility to the maximum tonnage shown in the Bidding Schedule. Payment will be full compensation for transloading, upland transportation, and disposal of the equivalent tonnage of the sum of the Dredge Pay Volume (associated with Required Dredging Work) and the potential Contingency Re-Dredge Pay Volume (associated with Contingency Re-Dredging Work).

    a. Payment for the Work will be made when the Contractor provides the Certificate of Disposal from the Disposal Facility. Certificates of Disposal will be reported as a tonnage measurement.

4. The Bid unit price for this Bid Item will not be adjusted for any reason.

I. Bid Item No. X– Purchase and Placement of Backfill Material:

1. Quantity assumptions for Bid Item No. X:

    a. Assumed volume associated with Bid Item No. X includes volume to restore the dredge footprints (from the 1-foot Payable Over dredge Allowance surface) to backfill design placement elevations and grades (either to a Targeted Placement Thickness or to a Targeted Placement Elevation) and includes a volume for a +0.5-foot Vertical Placement Tolerance, as described in the Specifications and as shown on the Drawings.

2. Measurement for this Bid Item placed within the placement areas shown on the Drawings will be made by the in-situ CY.

    a. Measurement will be based on comparison of the Placement Pre-Construction Survey (as defined in Section 02 21 00 – Site Surveys and Positioning Control) and Placement Post-Construction Survey, with deductions made for Excessive Over placement.

3. Payment for this Bid Item will be made by the in-situ CY at the measured quantities.

    a. It is the Contractor's responsibility to calculate and plan for the actual volumes and/or tonnage of Backfill Material that are required to achieve either the Targeted Placement Thickness or Targeted Placement Elevation (as shown on the Drawings), taking into consideration material consolidation and overall material loss.

J. Bid Item No. X – Purchase and Placement of Engineered Caps Material:

1. Measurement for this Bid Item placed within the placement areas shown on the Drawings will be made by the square yard (SY). Measurements will be based on comparison of Placement Pre-Construction Surveys (as defined in Section 02 21 00 – Site Surveys and Positioning Control) and Placement Post-Construction Surveys for Engineered Caps materials placed, complying with either the Minimum Required Placement Thicknesses or the Targeted Placement Thicknesses and within the limits shown on the Drawings, to determine the

surface area to be accepted as complete by the Project Representative.

2. The Bid unit prices presented in the Bidding Schedule for Bid Item No. X– Purchase and Placement of Engineered Caps Material shall include all materials, labor, and equipment needed (including any incidentals) to complete Engineered Caps placement Work:

    a. The Contractor shall be responsible for calculating the placement volumes of Engineered Caps materials necessary to meet the requirements of the Work, as shown on the Drawings and as described in Section 35 37 10 (Engineered Caps).

3. The Bid unit price for Bid Item No. X will be constant, regardless of the actual measured quantity. No negotiation on the Bid unit price for this Bid Item is allowed for variation on the Bid quantity presented in the Bidding Schedule.

K. Bid Item No. X – Purchase and Placement of ENR Material:

1. Measurement for this Bid Item for ENR material placed within the placement areas shown on the Drawings will be made by the SY. Measurements will be based on comparison of Work Period Pre- Construction Surveys and Placement Post-Construction Surveys for ENR material placed, complying with the Targeted Placement Thickness and within the limits shown on the Drawings, to determine the surface area to be accepted as complete by the Project Representative.

2. The Bid unit price presented in the Bidding Schedule for Bid Item No. X – Purchase and Placement of ENR Material shall include all materials, labor, and equipment needed (including any incidentals) to complete ENR placement Work:

    a. The Contractor shall be responsible for calculating the placement volumes of ENR material necessary to meet the requirements of the Work, as shown on the Drawings and as described in Section 35 37 10 (Engineered Caps).

3. Payment for this Bid Item will be made by the SY at the quantities measured to the maximum SY shown in the Bidding Schedule.

L. Bid Item No. X – Piling Removal:

1. Measurement for this Bid Item shall be by Piling unit. Dismantling, extraction, and removal of designated treated and untreated timber Piling located in remedial areas, as shown on the Drawings and required by the Specifications, regardless of the method of extraction/removal and Piling material, will be measured individually per Piling removed.

2. Payment for this Bid Item will be made by the pile unit (timber Piling).

    a. Payment by the Piling unit includes all equipment, labor, methods, and materials necessary for Piling removal.

M. Bid Item No. X – Piling Transloading, Upland Transportation, and Disposal :

1. Measurement for this Bid Item shall be by the Ton of Piling (as shown on the Drawings) transloaded, transported, and disposed, as determined from certified scales, verified by disposal weight tickets, and as accepted by the Project Representative.

2. Payment for this Bid Item will be made by the Ton at the quantity reported by the Disposal Facility to the maximum tonnage shown in the Bidding Schedule. Payment will be full compensation for transloading, upland transportation, and disposal of Piling. Payment for the Work will be made when the Contractor provides the Certificate of Disposal from the Disposal Facility. Certificates of Disposal will be reported as a tonnage measurement.

N. Bid Item No. X – Steel Pipe Piling Replacement :

1. Measurement for Steel Pipe Piling for this Bid Item shall be by Steel Pipe Piling unit.

2. Payment for this Bid Item will be made by Steel Pipe Piling installed.

    a. Payment for Steel Pipe Piling shall include all equipment, labor, and materials necessary to construct the Steel Pipe Piling, as indicated on the Drawings and

required by the Specifications, including but not limited to coating and accessories, to complete the Work.

O. Bid Item No. X – Outfall Energy Dissipation Structures:

1. This Bid Item will not be measured for payment of activities associated with outfall energy dissipation structure.
2. Payment for this Bid Item will be made by lump sum.
    a. Payment for this Bid Item shall include all equipment, labor, and materials to construct the outfall energy dissipation structure, as indicated on the Drawings and described in the Specifications, including but not limited to excavation, installation of geotextile filter fabric, Gabions, Gabion Mattresses, stone fill, and removal and disposal of excess construction material.
    b. The Bid unit price for this Bid Item will not be adjusted, regardless of the actual quantity used by the Contractor.
3. Measurement for this Bid Item shall be by the working day for the duration in which the Contractor's In-Water Work is temporarily suspended, as approved by the Project Representative.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION [NOT USED]

END OF SECTION

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract specified in other Division 01 specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section specifies coordination of Work of Contract from beginning of Swan Island Basin RA construction through Project closeout as defined in Section 01 77 00. Administrative provisions for coordinating construction operations include:

1. General Work coordination procedures
2. Coordination Drawings
3. Administrative and supervisory personnel
4. Requests for information (RFIs)
5. Subcontractor List
6. Project Website
7. Project meetings
8. Conservation

1.03 GENERAL PROJECT MANAGEMENT AND COORDINATION PROCEDURES

A. RA Project Representative: The Project Representative selected by RA Performing Parties shall be responsible for overall management and coordination of the Work.

B. The Project Representative shall designate administrative and supervisory personnel as required for proper performance of the Work.

C. The Project Representative shall supervise the work of all Project Subcontractors, unless otherwise clearly specified.

D. Project Website: Project Website shall be specified by Project Representative. Access will be provided to RA Contractor and all Subcontractors essential to complete the Work. The Project Website shall contain all updated Project information, including:

1. Project directory and correspondence,
2. Schedule and task management,
3. Drawings and specifications,
4. Submittal, contract modification and RFI forms and logs,
5. Meeting minutes,
6. Photo documentation,
7. Contract modification and logs,
8. Payment forms, and
9. Reminders and archived files.

1.04 SUBMITTALS

A. Coordination Drawings: Coordination Drawings shall be prepared in accordance with requirements in individual sections to anticipate staging and sequence needed to complete the Work. Coordination drawing shall be used to compile efforts from different trades to avoid potential clashes in schedule or constructability issues.

B. Personnel names and responsibilities: Within ten (10) workdays of receipt of the Contract Notice to Proceed (NTP). The RA Contractor shall submit a list of key personnel names and expertise as it pertains to the Work. For each key personnel individual, key duties and assignments shall be identified and contact information shall be provided to RA Performing Party, including e-mail address and office or cell phone number. This information shall be kept readily accessible during Project duration.

C. Vessel Management Plan: Submit a Vessel Management Plan (VMP) as part of the Remedial Action Work Plan.

D. RFI: Request from RA Contractor seeking information required by or clarifications of the Contract Documents. RFI shall be submitted promptly to avoid schedule delays.

E. Subcontractor List: RA Contractor shall prepare a summary of Subcontractors responsible for each subcontracted portion of Work, or equipment needed to complete the Work.

F. Project Website: Project Representative shall ensure that Project Website contains the most updated information pertinent to the project.

1.05 PROJECT OPERATIONS

A. Work shall be complete in coordination and cooperation with the Project Representative, and other RA Contractors so that normal operations may be carried out without interruption.

B. The RA Contractor reserves the right to award work to Subcontractors for work in the vicinity of work covered by this contract. This award shall be coordinated with Project Representative.

C. RA Project Representative, all Contractors and Subcontractors shall adhere to communication type, protocols and frequency as outlined in Division 27 Section Communications.

D. The Project Representative, RA Contractor, and Subcontractors shall mutually establish a schedule of construction for the use of common Work areas.

E. The drawings and specifications are arranged for convenience only and do not necessarily determine which trades perform the various Project Tasks of the Work. Coordination Drawings shall be prepared with Project Representative's oversight to assist in these determinations.

F. Project operations may require that certain of the RA Contractor's operations be scheduled around SIB Owners and Operators activities. Certain areas of work may be required to be scheduled around Owners and Operator activities. Project Representative is responsible for coordination of schedules between Work of Contract and activities by Owners and Operators, to the extent practicable.

G. Conservation: Project Representative will coordinate RA construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

1.06 PROJECT MEETINGS

A. Pre-RA Construction Conference: Pre-RA Construction Conference shall be scheduled by Project Representative and held at least one month prior to start of the RA Construction. Project Representative shall consider attendees, agenda, and minutes. Attendees shall include all individuals whose presence is required. Project Representative shall inform the attendees of agenda ahead of time. Agenda may include, but is not introduction of personnel, discussion of contract status, procedures, schedule, and process, determination of communication chain of command, and information about emergency contacts. Meeting minutes shall be recorded and distributed to all meeting attendees within one week of the meeting.

B. Construction Activity Conference: Project Representative shall schedule a Construction Activity Conference for each construction activity requiring coordination with a different Contractor or Subcontractor. The Construction Activity Conference shall be scheduled no later than two weeks prior to start of the specific activity. Project Representative shall consider attendees, agenda, and minutes. Attendees shall include all individuals whose presence is required. Project Representative shall inform the attendees of agenda ahead of time. Meeting minutes shall be recorded and distributed to all meeting attendees within one week of the meeting.

C. Progress Meetings: Project Representative shall schedule and conduct reoccurring weekly progress meetings, unless otherwise agreed upon and indicated. For each project meeting, Project Representative shall consider attendees, agenda, and minutes. Attendees shall include all Contractor(s) whose presence is required and individuals authorized to act and make informed and knowledgeable decisions and commitments with respect to working agreements discussed at the meetings. Project Representative will be responsible for resolving issues in the event that satisfactory working agreements cannot be reached. Project Representative shall inform the attendees of meeting date and time for each meeting. Project Representative shall prepare the meeting agenda and shall distribute this agenda ahead of each meeting. The meeting agenda topics will include all topics pertinent to progress the co-ordination and execution of work. The meeting minutes shall be recorded, including topic covered and agreements achieved. Project Representative shall be responsible for distributing meeting minutes to all meeting attendees within one week of the meeting.

1.07 VESSEL MANAGEMENT PLAN

A. Provide a VMP showing procedures, documentation, certifications, restrictions, and notifications necessary for operating vessels in Swan Island Basin during all phases of work. Update and reissue the VMP with changes to procedures. The VMP shall contain the following information:

1. Operating procedures for the vessel and the use of checklists.
2. Maintenance procedures for the vessel and its associated equipment.
3. Documentation and recordkeeping procedures.
4. Procedures for identifying hazards and managing risks.
5. Procedures, including training and familiarization for the vessel’s crew, to prepare for and respond to emergency situations and drills.
6. Certifications of barges obtained from a certified marine surveyor, including, but not limited to, certified barge displacement charts for all barges to be used for tracking tonnage of Dredge Material, Dredge Incidental Debris, Identified Debris, and Piling.
7. Notifications and procedures to be used for vessel movements for all portions of the Project, including moving dredging/material placement equipment to accommodate inbound and outbound commercial waterway traffic with other Project and non-Project vessels (commercial and Tribal fishing vessels).
8. Procedures for daily compliance with all in-water navigation and spudding/anchoring activities in accordance with applicable USCG regulations (including vessel flagging and Automated Identification System [AIS] coding to denote encumbered [anchored/spudded] vessels) and state and local regulations.
9. Proposed notification and coordination procedures with USCG, including information needed for USCG issuance of the Notice to Mariners in accordance with USCG requirements.
10. Proposed aids to navigation.
11. Map(s) depicting primary vessel routes within, into, and out of the SIB, as well as vessel routes to all proposed facilities (i.e., Contractor Transload Facility[ies]).
12. Towing arrangements, both within and out of the SIB, under anticipated travel scenarios, including number, capacity, and power requirements for tugs used and length of towline.

13. Limitations on vessel movement under low visibility conditions (e.g., sufficient visibility to ensure safe operations at all times).

14. Speed limits when repositioning vessels.

15. Speed limit throughout the SIB.

16. Proposed location(s) for overnight or temporary mooring of the Contractor's dredging equipment and haul barge(s) when not in operation.

17. Methods, frequency, and rationale for communications between the Contractor and vessel operators.

18. Emergency management procedures for extreme weather (e.g., wind warnings, gale warnings, high-flow events, or sinking of vessels).

19. Marine emergency response resources.

20. Identification of procedures for monitoring Contractor vessels and for ensuring that marine equipment in the SIB is secure and seaworthy at all times, including after working hours, on the weekend, and during periods when the Contractor has no active In-Water Work; the Contractor shall also include contact information for after-hours workers who will be available to respond to, mitigate, and correct any issues if equipment is not secure and seaworthy as required.

21. Description of the number, types, and size/capacity of marine vessel equipment to be used, including names and registration numbers, prior to bringing any vessel (e.g., dredge plant, barges, tugboats, bathymetric survey boat, and Work boats) to the Work Site.

22. Methods, procedures, and equipment to prevent unsafe navigation around floating equipment for other waterway users.

23. Description of the approach for establishing buffer zones around Work areas and for placing, operating, maintaining, and moving markings (including marker buoys, signage [e.g., wake restriction, speed limit signs], lights, lighted buoys, or other required markings) to notify other vessels and waterway users of the presence of floating equipment and spuds and to keep a safe distance away from the construction activities.

24. Methods and procedures to monitor and warn waterway users (e.g., commercial and recreational users) to prevent unsafe transit around the Contractor's equipment.

25. General marine condition survey.

26. Key personnel and specific roles for all navigation vessels, including single point of contact for coordinating the Contractor's vessels, other SIB traffic (Project and non-Project vessels), and Contractor Transload Facility(ies) operations.

27. Personnel experience:

28. The Contractor shall employ properly trained and experienced pilots and crews responsible for knowing and being able to report the real-time position of all of the Contractor's vessels using a real-time vessel tracking system on a continuous 24 hour basis.

29. The crew member shall have demonstrated knowledge of vessel navigation and location regulations.

1.08 MARINE SAFETY MANAGEMENT

A. Any near miss or actual incidents related to marine safety shall be reported to the Project Representative immediately. The Contractor shall follow up each incident following the requirements detailed in Section 01 35 29 (Health and Safety).

1.09 JOB CONDITIONS

A. The SIB Project Area spans approximately 1.1 miles between river miles (RMs) 8.1 and 9.2. A federal navigation channel, with a -45 feet (ft) Columbia River Datum (CRD) authorized depth, exists within the Willamette River and extends from the confluence of the Lower Willamette River with the Columbia River to RM 11.6. The U.S. Army Corps of Engineers (USACE) maintains the navigation channel, which does not extend into the SIB.

B. The Contractor shall closely coordinate with the Project Representative to understand the Work Site usage and frequency of vessel calls at and around the facilities where remediation Work is required to be performed and to coordinate its Work around the active Work Site use.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION [NOT USED]

END OF SECTION

SECTION 01 32 00

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.01 DESCRIPTION

A. The work progress schedule requirement is established to ensure adequate planning, scheduling, management, and execution of the work by the Contractor, and to enable the Project Representative to evaluate work progress and make contract time adjustments. The work specified in this section consists of submitting a contract schedule, monthly updates, four-week schedules for progress meetings, and a final as-built schedule. The planning, scheduling, management, and execution of the work in accordance with the contract is the responsibility of the Contractor.

1.02 SUBMITTALS

A. Except as modified in this section, the procedures required by Section 01 33 00, Submittal Procedures, shall be observed.

B. Within 30 days following the Project Representative's delivery of the fully executed contract, the Contractor shall submit a communication stating they have in-house capability, or if not, naming a scheduling subcontractor to be employed by the Contractor to prepare the schedules required. Include with this submittal the scheduler's name and list of qualifications demonstrating that the scheduler has performed scheduling for projects of the same magnitude and complexity of this project. Failure to provide this information may result in disqualification of the proposed scheduler.

C. At the preconstruction meeting, submit for review by Project Representative a work progress schedule meeting the requirements below.

D. Within 10 days of receipt of review comments from Project Representative, incorporate Project Representative's comments, finalize, and resubmit the work progress schedule for Project Representative's approval.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION

3.01 CONTRACT SCHEDULE SUBMITTAL REQUIREMENTS

A. Develop the contract schedule submittal in CPM format using (P6), Microsoft Project, or equal. It shall include:

1. A CPM Network Diagram:

   a. Time-scaled (by week, starting Monday), grouped by Work areas and sorted by early start dates.

   b. The diagram shall be clear, neat, and legible. Each sheet shall contain a title block, a revision block, project name and contract number, Contractor, type of tabulation (initial, update, project status), project duration, scheduled substantial completion date, and a legend explaining the basic notation, terms, and codes used.

   c. Identify critical path activities, including critical paths to contract milestone dates.

   d. Activity durations shall not exceed 10 days. Should an activity require more than 10 days, it shall be subdivided to define appropriate activities. The Project Representative may approve using longer durations on non-construction activities such as the procurement and fabrication of materials and equipment.

e. All activity descriptions shall clearly define the location and type of work to be performed.

f. Show schedule critical deliverables (i.e., permits, submittals, etc.).

g. Schedule fabrication and delivery of all materials and equipment.

h. Scheduled start or completion dates imposed on the schedule by the Contractor shall be consistent with contract milestone dates and other restrictions. Contract milestone dates are the Work Area starting and completion dates and shall be clearly identified and connected to the appropriate activities.

i. Schedule shall include contingencies for normal weather delays and seasonal periods of heavy traffic flow.

j. Schedule shall list resources required to perform work within durations shown. Indicate the estimated quantities of work anticipated where applicable.

k. Failure to include any element of work required for performance of this contract shall not excuse the Contractor from timely completion of work required to achieve the contract milestones, notwithstanding the acceptance of the contract schedule submittal.

l. The contract duration shall be the duration specified in the contract documents and awarded by Project Representative.

m. Schedules extending beyond the contract completion date will not be accepted.

n. Schedules showing the work completed in less than the contract duration may be found by Project Representative to be impractical, requiring resubmittal.

o. Schedules showing the work completed in less than the contract duration, if practical to Project Representative, shall be considered to have Float. Float is the time between the scheduled duration of the work and the contract duration. Float is a resource available to both the contractor and Project Representative and is non-compensable. Acceptance of a schedule showing the work completed in less than the contract duration shall not constitute a change to the contract completion date.

p. Schedule shall be coded by activity identifying shift work, restricted hours, electrical work, etc.

q. All Project Representative-required activities including reviews, approvals and decisions shall be shown as part of the critical path.

2. Narrative: The contract schedule submittal shall include a “stand-alone” document that conveys, in writing:

a. The Contractor’s schedule assumptions; constraints; critical path/critical activities and why they are critical; permit requirements; coordination required with Project Representative, other contractors, utilities or any other parties; and long lead delivery items.

b. Basis for resources. Include anticipated quantities of work for each activity and the production rates used in determining resource allocation for activities.

3. The contract schedule submittal shall include the location of electronic storage of a backup of the schedule. All data shall be stored via Primavera Project Management (P6), Microsoft Project Backup, or equal utility.

B. The final, accepted work progress schedule shall be the baseline from which changes in duration and logic shall be determined and shall be the basis for planning, scheduling, managing and executing the work.

3.02 MONTHLY UPDATE REPORT

A. No later than 30 days after acceptance of the contract schedule and monthly thereafter, the Contractor shall submit a Monthly Update Report within 15 days of month end.

B. The Monthly Update Report shall consist of:

1. An updated CPM Network Diagram of the contract schedule, format as previously specified herein, and an electronic transmittal providing an exact copy of the submittal. All data shall be stored and available to Project Representative electronically via Primavera Project Management (P6), Microsoft Project Backup, or equal utility.

2. A narrative which identifies the work actually completed and reflects the progress along the critical path in terms of days ahead of or behind the contract milestone dates. Specific requirements of the narrative are as follows:

a. If the Monthly Update Report indicates an actual or potential delay to the contract milestone dates, the narrative shall identify the problem, cause, and the activities affected.

b. The narrative shall also address the following:

1) A detailed change in duration of any activity and/or logic changes to activities which were performed in a sequence different from the accepted contract schedule.

2) Activities proposed to be added to or deleted from the contract schedule.

3) Identification of executed change orders.

3. Incorporation of all Project Representative-accepted schedule revisions.

4. The mutually agreed-to Monthly Update Report shall be the basis for evaluating the Contractor's progress. Documents in a single Monthly Update Report shall have the same data date irrespective of the dates of preparation of the individual documents.

5. If the latest completion time for any required contract milestone date as indicated by the current Monthly Update Report does not fall within the time allowed by the contract, the Contractor shall prepare and submit a plan to recover the lost time.

C. Project Representative may call for more frequent status meetings (weekly, biweekly, etc.), at no additional cost to Project Representative, at which the Contractor shall provide the required information.

D. Review of Monthly Update Report:

1. Project Representative will review the monthly report and respond within 7 days after receipt.

2. If necessary, the Contractor shall resubmit within 7 days of receipt of review comments.

E. Applications for Payment: Submission of monthly schedule updates shall accompany applications for progress payments and will be a condition of payment.

3.03 PROGRESS MEETING SCHEDULES

A. During on-site construction, at each progress meeting, provide a one week back and three-week forward activity schedule. This schedule shall be in Gantt bar chart form and include, but not be limited to, reporting of the following:

1. Detailed listing of specific work items, duration of work items, actual work hours, resources to be used in accomplishing work items, Work Area closing and opening dates and times, operational impacts, and other pertinent items.

2. The weekly progress meeting schedules shall be submitted not less than 24 hours in advance of the scheduled progress meeting.

3.04 SCHEDULE MONITORING

A. If the progress of critical path activities falls behind the time lines shown on the latest, accepted version of the CPM schedule by 7 days, the Contractor shall document the means it will employ to bring work back on schedule.

3.05 CONTRACT SCHEDULE REVISIONS

A. Proposed revisions to the accepted contract schedule shall be submitted to Project Representative on a separate fragnet for review and acceptance prior to incorporation into the current contract schedule. This fragnet shall clearly outline the impact of the revision within the context of the contract schedule. Each proposed revision shall be submitted with the following minimum components:

1. A CPM Network Diagram showing revised and affected activities.

2. An Activity Report and Predecessor/Successor Report for all revised and affected activities.

3.06 CONTRACT TIME ADJUSTMENTS

A. Float is not for the exclusive use or benefit of either Project Representative or the contractor. Extensions of time for contract performance as specified in the contract will be granted only to the extent that time adjustments to the affected work items exceed the total float time along the affected path(s) of the contract schedule current at the time of the delay.

3.07 AS-BUILT SCHEDULE AND DOCUMENTATION

A. Within 15 days after substantial completion, the Contractor shall submit for Project Representative's acceptance a final, as-built CPM Network Diagram.

3.08 SUSPENSION OF PAYMENTS

A. If the Contractor fails at any time to submit a schedule or update as noted above, Project Representative reserves the right to suspend progress payments wholly or in part until the Contractor submits a schedule which is accepted by Project Representative.

SECTION 01 32 00

CONSTRUCTION PROGRESS DOCUMENTATION

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 DESCRIPTION

A. This section describes administrative and procedural requirements for all types of submittals.

1.02 ABBREVIATIONS

A. DOC/DOCX – Microsoft Word file type extension

B. GST – General Submittal Transmittal form

C. PDF – Portable Document Format

D. SFT – Secure File Transfer

E. XLS/XLSX – Microsoft Excel file type extension

1.03 PROCESS, CONTENT, AND FORMAT – ALL SUBMITTALS

A. Pre-Construction Submittal:

1. Submit the Draft Master Submittal List for Contractor submittal tracking purposes, as part of the Remedial Action Work Plan (RAWP), as described in Article 1.05 of this Section.

B. Construction Submittals:

1. Submittal Register - Prepare and maintain submittal register, as the work progresses in accordance with Section 01 45 00.1.06 Quality Control (QC).

2. The Contractor is to track all submittals by maintaining a complete list, including completion of all data columns, including dates on which submittals are received and returned by the Government.

3. The submittal register shall be submitted with the Construction Quality Assurance (QA)/QC Plan (CQA/QCP) and project schedule. Verify that all submittals required for project are listed and add missing submittals and track the following:

   a. Activity Number: Activity number from the project schedule.

   b. Contractor Submit Date: Scheduled date for approving authority to receive submittals.

   c. Contractor Approval Date: Date Contractor needs approval of submittal.

   d. Contractor Material: Date that Contractor needs material delivered to Contractor control.

4. Update the following with each submittal throughout contract:

   a. Transmittal Number: Contractor assigned list of consecutive numbers.

   b. Action Code: Date of action used to record Contractor's review when forwarding submittals to QC.

   c. List date transmitted to Government.

   d. Date approval received.

5. Government Review Action Codes

6. The following action codes shall be used to track the status of submittals:

   a. "A" - "Approved as submitted"; "Completed"

b. "B" - "Approved, except as noted on drawings"; "Completed"

c. "C" - "Approved, resubmission required"; "Resubmit"

d. "D" - "Returned by correspondence"; "Completed"

e. "E" - "Disapproved (See attached)"; "Resubmit"

f. "F" - "Receipt acknowledged"; "Completed"

g. "G" - "Other (Specify)"; "Resubmit"

h. "X" - "Receipt acknowledged, does not comply"; "Resubmit"

7. 2. Prepare and submit a Daily Construction Report in accordance with the CQA/QCP, that documents all activities associated with the Work that is completed each day. Daily Construction Reports shall be submitted the next scheduled work day.

8. 3. Prepare and submit a Weekly Construction Report in accordance with the CQA/QCP, that provides a summary of the week's construction activities that were completed as part of the Contract and anticipated Work to be completed in the following week.

9. 4. Submit a Cash Flow Report that includes a forecast, by month, based on the current schedule, of cash requirements to complete the Contract. Cash Flow Report shall be submitted quarterly.

C. Post-Construction Submittal:

1. The Contractor shall submit the Contractor's Annual Construction Summary Report for the Work completed in each Construction Work Period related to this Section, as described in CQA/QCP. The Contractor's Annual Construction Summary Report shall include the final Master Submittal List for each Construction Season.

1.04 MATERIAL SUPPLIERS/SUBCONTRACTORS LIST

A. Provide a complete list of material suppliers and subcontractors to the Project Representative at the preconstruction conference.

1.05 SHOP DRAWINGS

A. Submit complete shop drawings as required by the applicable technical sections.

B. Present data in a clear and thorough manner.

1. Drawings shall be identified by reference to the specification section and paragraph number when the item is called out in the specifications and by the original sheet and detail number, schedule when the item is shown on the drawings.

2. Structural items shall be identified by location in the completed structure.

C. Shop drawing quality:

1. All line work shall be clean and crisp with no feathering or fading.

2. Line work important to the drawing shall be emphasized by increasing the line weight and density.

3. Text shall be Helvetica, size 10 font.

4. Notes shall be clear and concise.

5. CAD-generated drawings are preferred.

1.06 PRODUCT/MATERIAL DATA AND OTHER INFORMATION

A. Submit for Project Representative review prior to commencement of related on-site work all product/material data and other information required by the applicable technical sections.

B. Product/material data consists of manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, and other standard descriptive data. Catalog cuts or brochures for items which are standard products shall show the type, size ratings, style, color, manufacturer, and catalog number of each item and be complete enough to provide for positive and rapid identification in the field. Catalog data shall be organized by specification section and paragraph number. Each product/material data item shall be clearly marked and annotated with the appropriate specification section and paragraph number. General catalogs or partial lists will not be accepted.

1. Clearly mark each copy to identify pertinent product, or models.
2. Show dimensions, weights, and clearances required.
3. Show applicable performance data conforming as closely as possible to the test methods referenced in the drawings and specifications.
4. Modify manufacturer's standard schematic drawings and diagrams to indicate which information is not applicable.
5. Supplement standard information to provide information specifically applicable to the work.

1.07 WARRANTY OUTLINE

A. Within 30 days of Notice to Proceed, submit an outline of warranties required in the contract documents. Include a list of associated products and services, and available warranty requirements such as for registration, inspection, installation, etc.

B. See the technical specification sections for specific warranty requirements.

1.08 SAMPLES

A. Where "match sample" is specified, the Contractor's samples shall match the Owner's existing sample.

B. Field Samples and Mock-Ups:

1. Construct, at the Work Area, at a location acceptable to Owner.
2. Size or Area: As specified in the respective specification section.

C. Submit the number and type stated in each specification section, or seven copies, whichever is greater.

1.09 SURVEY NOTES

A. Submit – Project Representative two copies of the original construction survey notes and one copy of the plotting. Both shall also be submitted electronically in the manner described in this section. No construction shall begin until the survey notes have been reviewed and accepted by Project Representative .

1.10 REDLINE (AS CONSTRUCTED) DRAWINGS

A. At the start of construction, Project Representative ill provide the Contractor with a full-sized set of drawings for use in recording changes that develop during construction. These changes shall be shown on the drawings as “redlines” using red pencil or pen to indicate the actual installation where it varies appreciably from the installation shown originally.

1. Special attention shall be paid to legibility and reproducibility of redline drawings. Give particular attention to information on concealed elements which would be difficult to identify or measure and record later. Items required to be marked include but are not limited to:

   a. Dimensional changes to the original drawings.

   b. Changes to details shown on the original drawings.

   c. Locations and depths of underground utilities (if different by more than 1 inch in depth or more than 1 foot in location).

   d. Changes to routing of piping and conduits (if different by more than 1 foot from where shown).

   e. Routing and size of ductwork, piping, and conduit (located to within 1 inch).

   f. Locations of concealed internal utilities (located to within 1 inch).

   g. Details not on original drawings.

2. Completely and accurately redline contract drawings.

3. All attached documents to the redline drawings shall reference original drawings and sheet numbers.

4. Redline important additional information which was either shown schematically or omitted from original drawings.

5. Note construction contract change numbers, alternate numbers, change order numbers, RFI numbers, and similar identification.

6. Accurately record information in an understandable drawing technique.

7. Record data as soon as possible after it has been obtained. In the case of concealed installations, record and check the redline prior to concealment.

B. Store the Contractor’s redline drawings in the field office, apart from contract documents used for construction. Do not permit redline drawings to be used for construction purposes. Maintain redline drawings in good order, and in a clean, dry, legible condition.

C. The Contractor’s redline drawings shall be available at all times for inspection by the Project Representative.

D. As a condition of final acceptance:

1. Submit the final redline drawings in both electronic and hardcopy format for Project Representative review and approval. Revise and resubmit any items noted as deficient.

2. Submit final updated shop drawings.

GENERAL SUBMITTAL TRANSMITTAL FORM

Please fill in all information as completely as possible. One "submittal type" per form. Highlighted areas are information necessary for documents sent to the

Submittal Type: þ All that	**Submittal**	**Project Name**	**Business Unit:**	**EAN**
¨ **Material Description**				
¨ **Shop Drawing**				
¨ **O&M Manual**	**Submitted By (name of person)**	**Gen**	Contractor Job No.	
¨ **Specification**		Subcontractor		
¨ **Calculations**	**Drawing Reference**	Rout er		
¨ **Warranty**	**Drawing** / **Sht.**	**Pri**		
¨ **Other:**				

Transmittal Routing ("From" > "To")	Copies	Attention (destination	Date Sent	Date Rec'd	Date Due
		Specialist			

Specification			**Action**			
Section No.	**Paragraph**	**Submittal Title or Description**	**A**	**B**	**C**	**D**

	¨	SUBMITTAL REVIEW SUBJECT TO ALL CONTRACT
Date Rec'd At :	¨	A NO EXCEPTIONS TAKEN
Index No:	¨	B CORRECT AS NOTED
Document Quality	¨	C REVISE AND RESUBMIT
OK / Resubmit	¨	D FOR INFORMATION ONLY
	¨	REVIEWED BY / DATE

END OF SECTION

SECTION 01 33 16

DESIGN DATA (DESIGN AFTER AWARD)

PART 1 GENERAL

1.01 SUMMARY

A. After award, develop the accepted proposal into the completed design, as described herein. Use a collaborative, integrated design process for all stages of project delivery with comprehensive performance goals for site remediation, energy, water, material selection, and waste diversion. Ensure incorporation of these goals in project delivery.

1.02 DESCRIPTION OF WORK

B. Design after award will apply to the development of retrofits or replacement to structures, as well as in-water controls [THIS SECTION WILL BE EXPANDED TO INCLUDE ANY ELEMENTS THAT ARE CONSIDERED TO BE “CONTRACTOR DESIGN”].

1.03 DEFINITIONS

C. Designer of Record (DOR)

1. Professional Registered members of the Contractor’s Design or Design-Build team that check, approve, sign, date, and certify, prior to submitting the deliverables to the RA Performing Parties, that the design submittals comply with the contract requirements.

2. The DOR's stamp, sign, and date each design drawing and other design deliverables under their responsible discipline at each design submittal stage. The DOR(s) are responsible for maintaining the integrity of the design and for compliance with the contract requirements through construction and documentation of the as-built condition by coordination, review and approval of extensions of design, material, equipment and other construction submittals, review and approval or disapproval of requested deviations to the accepted design or to the contract, coordination with the RA Performing Parties of the above activities, and by performing other typical professional design responsibilities.

1.04 ORDER OF PRECEDENCE

A. In the event of a conflict or inconsistency between any of the requirements within the Contract, precedence is applied:

B. Any portions of the accepted proposal which both conform to and exceed the requirements of the solicitation.

C. The provisions of the solicitation.

D. All other provisions of the accepted proposal.

E. Any design products including, but not limited to, plans, specifications, engineering studies and analyses, shop drawings, and equipment installation drawings.

F. These are "deliverables" under the contract are not part of the contract itself.

G. Design products must conform to all provisions of the contract, in the order of precedence.

1.05 PRECONSTRUCTION ACTIVITIES

A. Design Quality Control Plan

1. Submit a Design Quality Control Plan in accordance with Section 01 45 00 – Quality Control before design may proceed.

B. Meetings and Conferences

1. Post Award Conference

2. The RA Performing Parties will conduct a post award conference as soon as possible

after Contract award, coordinated with issuance of the notice to proceed (NTP). Participation by the Contractor and major subcontractor representatives is mandatory. All designers need not attend this first meeting. The RA Performing Parties will provide an agenda, meeting goals, meeting place, and meeting time to participants prior to the meeting.

3. As a minimum the following will be addressed during the conference: determination and introduction of contact person and their authorities; contract administration requirements; discussion of expected project progress processes; and coordination of subsequent meeting.

4. The RA Performing Parties will introduce the project delivery team members, project representatives, and installation representatives.

5. Introduce key personal, major subcontractors and other needed staff.

6. Define expectations and duties of each participant.

7. Develop a meeting roster with complete contact information including name, office, project role, phone, mailing and physical address, and e-mail address for distribution to all participants.

8. Also, provide minutes of the meeting to all participants.

C. Initial Design Conference

1. After Contract award, conduct the initial design conference, and provide a record of the meeting. All Designers of Record must participate in the conference. The primary purpose of the meeting is to make sure any needs are assigned and due dates established, as well as points of contact identified. The initial design conference may be scheduled and conducted at the project installation after the Post Award Conference and prior to initiation of significant preliminary design development, although it is recommended that the partnering process be initiated at the time of or before the initial design conference. Limit any design work conducted after award and prior to this conference to site work.

D. Pre-Construction Conference

1. Before starting any construction activities, jointly conduct an administrative conference with the RA Performing Parties to discuss any outstanding requirements and to review local installation requirements. It is possible there will be multiple Pre-Construction Conferences based on the configuration of the design packages. Provide minutes of the meeting(s) to all participants.

1.06 SUBMITTALS

A. SD-01 Preconstruction Submittals

1. Quality Control Plan

2. Initial Design Conference

3. Preconstruction Conference

4. Submittal Register

B. SD-05 Design Data

1. Design and Code Checklists

2. Sustainable Design

3. Interim Design Submittals

4. Final Design Submittals

5. Design Complete Documents

1.07 DESIGN QUALITY CONTROL

A. Design And Code Checklists

B. Develop and utilize appropriate discipline-specific checklists during the design and quality control of each submittal. Submit these completed checklists with each design submittal, as applicable, as part of the project documentation.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Electronic Design Submittal

1. Provide identical copies of electronic packages for approval, for each submittal required. Provide quantities and sizes indicated in Section - 01 33 00 Submittal Procedures.

B. PDF File Packaging

1. Provide files from original sources, text-searchable, and saved in "Standard" (uncompressed) resolution whenever possible.

C. Hardcopy Design Submittal

1. Print hard copy submittals directly from the electronically packaged PDF files. Provide quantities and sizes as indicated in Section 01 33 00 – Submittal Procedures.

2. The Designer(s) of Record stamps and signs the original full size hard copy sheets as Released For Construction. Provide distribution from this set.

PART 2 PRODUCTS

2.01 DESIGN DRAWINGS

A. Produce design drawings that describe the scope of the Contract for all required submittals including all interim and final deliverables.

B. Electronic Drawing Files

1. Provide electronic drawing files in PDF format for each project drawing in the design set.

C. Drawing Index

1. Provide an index of drawings sheet as part of the drawing set, and an electronic table of all drawings submitted. Include the electronic file name, the sheet reference number, the sheet number, and the sheet title containing the data for each drawing.

D. Seal on Documents

1. Sign, date and seal all Contractor-originated design drawings by the registered engineer of the respective discipline. This is the seal of the Designer of Record for that drawing. Application of the electronic seal and signature accepts responsibility for the work shown thereon.

2.02 SPECIFICATIONS

A. Provide design specifications in accordance with Design Manual. Provide a Contractor-originated design specification that, in conjunction with the drawings, demonstrates compliance with materials, equipment, execution, and field quality control requirements.

B. Specifications Format

1. Utilize CSI MasterFormat for specification formatting.

C. Identification of Manufacturer's Product Data Used as Specifications.

1. Provide complete and legible catalog cut sheets, product data, installation instructions, operation and maintenance instructions, warranty, and certifications for products and equipment for which final material and equipment choices have been made.

2. Indicate, by prominent notation, each product that is being submitted including optional manufacturer's features, and indicate where the product data shows compliance with the Contract requirements.

D. Specifications Packaging

1. Provide specifications to include the following:

a. Cover sheet and project table of contents.

b. Specification sections.

c. Manufacturer's Product Data. If providing as attachments to the applicable specification section, incorporate as attachment reference within the section and section table of contents.

E. Specification Deliverable

1. Submit a bundled specification package in PDF format for each design package. As a minimum, bookmark each specification section in the bundled package. Also, submit the source files, in the processing system format, used to create the PDF.

2.03 DESIGN ANALYSIS

A. Prepare, organize, and present a design analysis that will document the general parameters, functional and technical requirements, design objectives, design assumptions, and provides design calculations applicable to a project's design. Organize the design analysis into three parts; Part 1 - General Description; Part 2 - Design Requirements and Provisions; and Part 3 - O&M Provisions.

B. The design analysis states the purpose, authorization, applicable criteria and the project description for the project, and provides a summary of the factors influencing the choice of the civil, environmental, structural, and sustainable design features used in the project along with an indication of how the initial costs and life cycle costs were factored into final selections. In the final design analysis clearly and succinctly include:

1. An introductory description of the project concepts that addresses the salient points of the design

2. An orderly and comprehensive documentation of criteria and rationale for system selection, supported by life cycle cost analysis.

3. The identification of any necessary licenses and permits that are anticipated to be required as a part of the design and/or construction process.

4. Identify all applicable codes and criteria and highlight specific requirements within these codes and criteria for critical design issues.

5. Required calculations as specified and as needed to support the design.

6. Sustainable design documentation must support requirements in Section - 01 35 43 – Environmental Protection Procedures.

C. Design Requirements and Provisions

1. Include subparts for each major design discipline and basic project design requirements for each discipline that justify and validate design decisions to include, but not limited to: life cycle cost effectiveness [to be expanded in Pre-Final 90% RD].

2. Civil

a. Includes soil analysis and survey data, site design, site improvements, planting and landscaping, paving, grading and drainage, water, wastewater and soil treatment, contaminant containment, utilities systems analysis and design, and provisions for airfields, ports and railroads, if required.

3. Environmental

a. Include an impact assessment checklist covering air, water and noise effects from the project and construction; worker health and safety; HTRW remediation cleanup and action levels; transportation and disposal regulation requirements; quality control for chemical sampling/analysis; wetlands determination (tidal and nontidal); special wildlife, plant, and endangered species considerations; ground water, waterway and floodplain protection assessment; pollution prevention control requirements; and design measures to be implemented (i.e., construction site sediment and erosion control requirements by Federal, state and local governments); and hazardous material management, natural and cultural resources, and environmental permits.

4. Structural

a. Include foundation, structural, seismic, hardened structure, nuclear radiation and blast protection systems analysis and design.

5. Operations and Maintenance (O&M) Provisions

a. Identify design provisions made to enhance and to reduce the cost of operating and maintaining the facility when completed. Identify any special safety considerations or occupational health related considerations that may affect operation and maintenance activities as a result of the final design.

D. Design Analysis Packaging

1. Assembly and Identification

a. Assemble design analysis in a single volume with a table of contents if possible. Include a cover page in the basis of design for each discipline indicating the project title and locations, contract number, table of contents, and tabbed separations or bookmarks for quick reference. At a minimum tab or bookmark for each discipline.

2. Calculations

a. Place the signature and seal of the designer of record responsible for the work on the cover page of the calculations for the respective design discipline.

PART 3 EXECUTION

3.01 DESIGN SUBMITTALS

A. Include all deliverable products and associated support documents described in Part 2 of this specification with each design submittal.

3.02 DESIGN SUBMITTALS PHASES

A. The stages of design submittals described below define requirements with respect to process and content. Determine how to best plan and execute the design and review process for the project, within the parameters listed below. As a minimum, provide at least one interim design submittal, at least one final design submittal before construction of a design package may proceed, and at least one Design Complete submittal that documents the accepted design.

B. Interim Design Submittals

1. Submit a single interim design for review, representing a complete package with all design disciplines. This is not necessarily a hold point for the design process; the Contractor may designate the interim design submittal(s) as a snapshot and proceed with design development at its own risk.

2. Interim Design Development Management - Maintain a fully functional configuration management system as described herein to track design revisions, regardless of whether or not there is a need for a formal interim design development review

C. Final Design Submissions

1. After acceptance of the interim design package, revise the design package to incorporate the comments generated and resolved, perform and document a back-check review and submit the final design package.

D. Design Complete Submittals

1. After the final design submission and review conference for a design package, revise the design package to incorporate the comments generated and resolved in the final review conferences, perform and document a back-check review and submit the final, design complete documents, which represents released for construction documents.

3.03 DESIGN PLATFORM AND FILE FORMATS

A. CAD

1. All content produced through CAD authoring software Coordinate System: NAD 1983 U.S State Plane
2. Zone (for State Plane or UTM): U.S. State Plane, Oregon North
3. Horizontal Units of Measure: International Feet
4. Vertical Units of Measure: International Feet
5. Horizontal Datum: NAD 83
6. Vertical Datum: NAVD 88

3.04 DISCIPLINE DESIGN REQUIREMENTS

A. Provide interim design deliverables that include drawings, specifications, and design analysis for the part of design that the Contractor considers ready for review.

1. Drawings: Include comments from any previous design conferences incorporated into the documents to provide an interim design for the feature of work submitted.
2. Specifications: Provide specifications to ensure that all project design features are addressed, meeting current code requirements, and regulatory requirements. Use the track changes feature (redlines) to facilitate review of additions and deletions.
3. Design Analysis: Prepare and present design analysis under the authority of the DOR, with calculations necessary to substantiate and support all design documents submitted. Address design substantiation required by the applicable codes and references.

B. Geotechnical Investigations and Reports

1. Perform additional geotechnical investigations, as necessary, to determine the conditions for the actual locations of footings, other foundations and site paving features and other site features.
2. Submit a final geotechnical evaluation report, prepared by the licensed geotechnical engineer, along with the first foundation design submittal. Make this information available as early as possible during the over-the-shoulder progress review process.
    a. Summarize the subsurface conditions and provide recommendations for the design of appropriate utilities, foundations, floor slabs, retaining walls, embankments, and pavements.
    b. Include compaction requirements for fill and backfill under buildings, sidewalks, other structures and open areas.
    c. Recommend foundation systems to be used, allowable bearing pressures for footings, lateral load resistance capacities for foundation systems, elevations for footings, grade beams, slabs, etc.
    d. Provide an assessment of post-construction settlement potential including total

and differential.

e. Provide recommendations regarding lateral earth pressures (active, at-rest, passive) to be used in the design of retaining walls. Include the recommended spectral accelerations and Site Class for seismic design along with an evaluation of any seismic hazards and recommendations for mitigation, if required.

f. Include calculations to support the recommendations for bearing capacity, settlement, and pavement sections.

g. Include supporting documentation for all recommended design parameters such as Site Class, shear strength, earth pressure coefficients, friction factors, subgrade modulus, California Bearing Ratio (CBR).

h. Provide earthwork recommendations, expected frost penetration, expected groundwater levels, recommendations for dewatering and groundwater control and the possible presence of any surface or subsurface features that may affect the construction of the project such as sinkholes, boulders, shallow rock, old fill, old structures, soft areas, or unusual soil conditions.

i. Include pH tests, salinity tests, resistivity measurements, etc., required to design corrosion control and grounding systems.

j. Include the raw field data.

3. Inconsistency with the Preliminary Soils Information

a. Arrange a meeting with the RA Performing Parties subsequent to completion and evaluation of the site specific geotechnical exploration to outline any differences encountered that are inconsistent with the RA Performing Parties provided preliminary soils information. Clearly outline differences which require changes in the foundation type, or pavement and earthwork requirements from that possible and contemplated using the RA Performing Parties furnished preliminary soils investigation, which result in a change to the design or construction.

4. Certification

a. With the professional geotechnical engineer consultant, certify in writing that the design of the project has been developed consistent with the Contractor's final geotechnical report. Submit the certification, stamped by the consulting professional geotechnical engineer, with the first design submission. If revisions are made to the initial design submission, provide a new certification with the final design submission.

C. Civil Site and Utilities Design Contents

Include the following in the interim design for the site and utilities ass applicable. This list is not intended to limit the contractor from providing different or additional information as needed to support the design presented.

1. Storm drainage design

2. Pavement design in coordination with the geotechnical investigation report.

3. Location and vicinity maps

4. Removal and/or relocation plan

5. Layout plan

6. Grading and drainage plan

7. Utility Plan: Identify and locate water lines, sanitary sewer lines, force mains, industrial waste lines, and other subsurface utility features

8. Road and parking area profiles

9. Utility Profiles: Indicate invert elevations of all drainage structures, manholes, storm

drainpipe with size and invert elevations, ground profile, and new or existing structures or utilities crossing the new utilities.

10. Civil details sheet
11. Erosion and Sediment Control Plan
12. Lawn and landscaping irrigation system
13. Landscape, planting and turfing
14. Site specific civil calculations

D. Structural Systems

1. Identify all loads to be used for design.
2. Describe the method of providing lateral stability for the structural system to meet seismic and wind load requirements. Include sufficient calculations to verify the adequacy of the method.
3. Calculations for all principal roof, floor, and foundation members and bracing and secondary members.
4. Drawings showing principal members for roof and floor framing plans as applicable.
5. Foundation plan showing main foundation elements where applicable.
6. Complete seismic analyses for all structural, mechanical, electrical, architectural, and building features as dictated by the seismic zone in which the facility is being constructed.
7. Identify the program name, source, and version used for computer generated calculations. Provide input data, including loads, loading diagrams, node diagrams, and documentation to illustrate the design. On the schematic models used for input, show, as a minimum, nodes/joints, element/members, materials/properties, and all loadings; induced settlements/deflections; and a list of load combinations.
8. Include an output listing for maximum and minimum stresses, forces, and deflections for each element, and the reactions for each loading case and combination.

3.05 INTERIM DESIGN REQUIREMENTS

A. At least one interim design submittal, review and review conference is required for each design package (except that the Contractor may, upon RA Performing Parties approval, skip the interim design submission and proceed directly to final design of the sitework and utilities package).

B. Additional interim design conferences or over-the-shoulder reviews may be scheduled, as needed, to assure continued RA Performing Parties concurrence with the design work. Include the interim submittal review periods and conferences in the Section 01 32 00 Construction Progress Documentation and indicate in periodic schedule updates what part of the design work is at what percentage of completion.

C. Submission Review

1. After receipt of an Interim Design submission, the RA Performing Parties require [##] calendar days after receipt of the submission to review and comment on the interim design submittal. For smaller design packages, especially those that involve only one or a few separate design disciplines, the parties may agree on a shorter review period or alternative review methods (e.g., over-the -shoulder or electronic file sharing), through the partnering process.
2. For each interim design review submittal, the Project Representative will furnish a single consolidated, validated set of comments from the various design sections and from other concerned agencies involved in the review process. The review will be for conformance with the technical requirements of the Contract.
3. The RA Performing Parties reserve the right to reject design document submittals if

comments are deemed significant.

4. Furnish disposition of all comments, in writing. If there are technical disagreements with any comments, clearly outline, with justification, the reasons for disagreement and noncompliance within ## calendar days after receipt of these comments.

5. The Contractor is cautioned that if it believes the action required by any comment exceeds the requirements of this contract, that it should take no action and notify the Project Representative in writing immediately.

D. Interim Review Conference

1. Hold an Interim Review conference for each design submittal at either the installation or as agreed upon as part of the partnering process. Attendees include, at a minimum, the DOR(s) involved in development of the design submittal. Schedule the conference to take place the week after the receipt of the comments. Notify the Project Representative of any comments that with concurrence would require further design development.

2. For smaller fast-track packages that involve only a few reviewers, the parties may agree to alternative conferencing methods, such as teleconferencing, or televideo, where available, as determined through Partnering.

E. Conference Documentation

1. Minutes and Comment Process.

a. Provide meeting minutes within [##] work days after the conference adjourns, and enter final resolution of all comments. Include copies of comments, annotated with comment action agreed on, with the minutes.

b. Resolve issues remaining open after the conference adjourns by immediate follow-on action to close the issue within 30 calendar days.

c. Incorporate comments as agreed upon during the conference.

3.06 FINAL DESIGN REQUIREMENTS

A. Provide final design submittals that consist of 100% complete drawings, specifications, submittal register, design analyses for RA Performing Parties review and acceptance.

1. Include any permits required by the contract for each package submitted.

2. In order to expedite the final design review, prior to the conference, ensure that the design configuration management data and all review comment resolutions are up-to-date.

3. Perform independent technical reviews and back-checks of previous comment resolutions, as required by Section 01 45 00 – Quality Control.

B. Design Drawings.

1. Submit drawings complete with all contract requirements incorporated into the documents to provide a 100% design for each package submitted. In addition to all native Advanced Modeling files, provide separate electronic files in a PDF format.

2. Geo-Referenced Data

a. Capture geo-referenced coordinates of all changes that will be made to the existing site (facility footprint, utility line installations and alterations, roads, parking areas, etc.) as a result of this contract.

b. Close-out requirements at the as-built stage, require final geo-referenced GIS Database of the new facility along with all exterior modifications. The RA Performing Parties will incorporate this data set into the Site's GIS Masterplan.

C. Design Analysis

1. Provide a design analysis with calculations necessary to validate and support all design work submitted. Expand and advance calculations and information presented in the

interim design stage to the current level of design. The responsible DOR(s) stamp, sign and date the design analysis.

D. Specifications

1. Provide specifications 100% complete and in final form.

E. Submittal Register

1. Provide an updated, cumulative submittal register with each design package that identifies the design and construction submittals required by that design package.

F. Final Framed Rendering and Copies

1. Provide the final original color rendering, one full size photographic reproduction(s) of the original rendering, and the photographic negative. Mount original and reproductions on acid free board, matted with metal frames, and utilizing non-glare glass. Print the project name, location, and Architect/Engineer/Contractor firm's name on the matting.

2. Ship the rendering, the photographic copies, and the negative in resilient packaging to ensure damage-free delivery. Deliver to the party identified by the Project Representative.

3.07 DESIGN COMPLETE CONSTRUCTION DOCUMENT REQUIREMENTS

A. After the Final Design Submission and Review Conference, revise the design documents for the design package to incorporate the comments generated and resolved in the final review conference. Perform and document a back-check review and submit the final, design complete documents. The deliverable includes all documentation and supporting design analysis in final form, as well as the final review comments, disposition and the back-check. As part of the quality assurance process, the RA Performing Parties may perform a review of the released for construction documentation. Promptly correct any errors or omissions found during the RA Performing Parties review.

3.08 ACCEPTANCE AND RELEASE FOR CONSTRUCTION

A. After acceptance of the Design Complete Construction Document(s) the Project Representative will allow construction to start for that design package.

B. RA Performing Parties review and acceptance of design submittals is for contract conformance only and does not relieve the Contractor from responsibility to fully adhere to the requirements of the contract, including the Contractor's accepted proposal, or limit the Contractor's responsibility of design .

END OF SECTION

SECTION 01 35 29

HEALTH AND SAFETY

PART 1 GENERAL

1.01. SUMMARY

A. This Section specifies the requirements for health and safety provisions necessary for all Work at the Work Site for this Project and procedures for complying with applicable laws and regulations related to worker safety and health. The Contractor shall adhere to applicable federal, state, and local safety and health standards. For In-Water Work health and safety requirements, the Contractor shall also refer to Section 35 10 00 (Navigation Safety and Marine Traffic Control).

1.02. DESCRIPTION OF WORK

A. It is not the intent of the Project Representative to develop, manage, direct, and administer the health and safety programs of contractors or in any way assume the responsibility for the health and safety of their employees. It is the Contractor's responsibility to ensure that all workers are qualified, competent, and certified to perform the Work.

B. It is not the intent of the Project Representative to list and identify applicable safety codes, standards, and regulations requiring compliance by the Contractor and subcontractor groups. The Contractor shall be solely responsible for identifying and determining all safety codes, standards, and regulations that are applicable to the Work.

C. This Section describes the requirements for submittal of the Contractor's Site-Specific Health and Safety Plan (HASP). A Site-Specific HASP is a supplement to a Contractor's Accident Prevention Program (APP); however, it need not duplicate material in the APP. The Site-Specific HASP identifies all real and potential hazards during each phase of execution of the Work and provides a specific plan to deal with each hazard. The Site-Specific HASP shall clearly define responsibilities for Contractor and subcontractor employees per Chapter 437 General Occupational Safety and Health Rules Oregon Administrative Rules (OAR).

D. The Work of the Contractor is described elsewhere in these Specifications. Precautions to prevent all anticipated physical and other hazards, including heavy equipment and vessels, shall be addressed in the Site-Specific HASP.

E. No separate payment will be made for effort associated with Work described in this Section. Work required to comply with this Section is considered incidental to all other activities described in the Contract Documents.

1.03. REFERENCED STANDARDS

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the EPA *Record of Decision* (EPA, 2017; see document in Section 01 13 00 – Reference Material); therefore, compliance with Applicable or Relevant and Appropriate Requirements (ARARs) for the Portland Harbor Superfund Site cleanup remedy is required. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 (Environmental Regulatory Requirements). In case of conflict between the requirements of this Section and those listed in Section 01 41 00 (Environmental Regulatory Requirements), the more stringent requirement shall prevail. No requirement in this Section shall be construed to contravene applicable laws and regulations. In the event that the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

B. This Section incorporates by reference (but are not limited to) the latest revisions of the embedded health and safety standard referenced herein.

REFERENCE	TITLE
29 CFR 1926.106	Working Over or Near Water
29 CFR 1910.119 Appendix C	Compliance Guidelines and Recommendations for Process Safety Management
29 CFR 1910.120	Hazardous Waste Operations and Emergency Response (HAZWOPER)
29 CFR 1910.146	Permit-Required Confined Spaces
29 CFR 1910.147	Control of Hazardous Energy (lockout/tagout)
29 CFR 1915, 1917, and 1918	Maritime Industry Standards
29 CFR 1919	Gear Certification Standards
29 CFR 1926	Safety and Health Regulations for Construction
Chapter 333 OAR	Public Health Division
Chapter 437-002 OAR	General Occupational Safety and Health Rules
Chapter 437-002-0020 to 0033 OAR	Walking-Working Surfaces
Chapter 437-002-0040 to 0043	Means of Egress
Chapter 437-002-0100 to 0122 OAR	Hazardous Materials (including HAZWOPER)
Chapter 437-002-0220 to 0235 OAR	Material Handling and Storage
Chapter 437-002-1081 OAR	Protection from Wildfire Smoke
Chapter 437-002-0140 to 0156 OAR	General Environmental Controls
Chapter 437-002-0340 to 0355 OAR	Commercial Diving Operations.
Chapter 437-002-1030 OAR	Additional Oregon Rules for Bloodborne Pathogens (AO 3-2019)
Chapter 437-003-1139 OAR	Working Over or In Water
Chapter 437-002-2224 OAR	Vehicle Drivers and Riders
Chapter 437-003 OAR	Construction
Chapter 437-003-0015 to 0035 OAR	Occupational Health and Environmental Controls
Chapter 437 1926.651, 1926.652, 437-003-0096 OAR	Excavations
Chapter 4347-003-0905 to 0920 OAR	Genera Safety and Health Provisions
Chapter 437-003-0134 OAR	Personal Protective Equipment
Chapter 437-003-0139 OAR	Working Underway on Water
Chapter 437-003-0420 OAR	Traffic Control
Chapter 437-003-1000 OAR	Oregon Rules for Air Contaminants
NFPA 51B	Standard for Fire Prevention during Welding, Cutting, and Other Hot Work
NFPA 70E	Standards for Electrical Safety in the Workplace
NFPA 241	Standard for Safeguarding Construction, Alteration, and Demolition Operations
Chapter 654 ORS	The Oregon Safe Employment Act (OSEA)

Notes:
CFR: Code of Federal Regulations
NFPA: National Fire Protection Association
OSHA: Occupational Safety and Health Administration
OAR: Oregon Administrative Rules
ORS: Oregon Revised Statutes

1.04. SUBMITTALS

A. Refer to Section 01 33 00 (Submittals) for all submittals and associated timelines related to the Contract Documents.

B. Pre-Construction Submittals:

1. Site-Specific HASP: The Contractor shall submit, as part of the Remedial Action Work Plan (RAWP), a detailed, written Site-Specific HASP. Pre-construction activities (as defined in Section 01 1 00 – Work Restrictions) for the Project shall not begin until the Contractor receives the Project Representative's acceptance of the Contractor's Site-Specific HASP.

2. Submittal requirements for the Site-Specific HASP are listed in Articles 1.06 and 1.08 of this Section.

3. Emergency Response Plan (ERP): The Contractor shall submit, as part of the RAWP, a detailed, written ERP that meets the requirements of 29 CFR 1910.120 (l) and 29 CFR 1926.65 (l). In the event of any emergency associated with remedial action, without delay, alert all onsite employees and as necessary offsite emergency responders that there is an emergency situation; take action to remove or otherwise minimize the cause of the emergency and institute measures necessary to prevent repetition of the conditions or actions leading to, or resulting in, the emergency. Train employees that are required to respond to hazardous emergency situations to their level of responsibility according to 29 CFR 1910.120 (q) and 29 CFR 1926.65 (q) requirements. Rehearse the plan regularly as part of the overall training program for Work Site operations. Review the plan periodically and revised as necessary to reflect new or changing Work Site conditions or information. Provide copies of the ERP to the affected local emergency response agencies. Address, as a minimum, the following elements in the plan:

a. Pre-emergency planning. Coordinate with local emergency response providers during preparation of the Emergency Response Plan. At a minimum, coordinate with local fire, rescue, hazardous materials response teams, police and emergency medical providers to assure all organizations are capable and willing to respond to and provide services for on-site emergencies. Ensure the Emergency Response Plan for the site is compatible and integrated with the local fire, rescue, medical and police security services available from local emergency response planning agencies.

b. Personnel roles, lines of authority, communications for emergencies.

c. Emergency recognition and prevention.

d. Work Site topography, layout, and prevailing weather conditions.

e. Criteria and procedures for Work Site evacuation (emergency alerting procedures, employee alarm system, emergency PPE and equipment, safe distances, places of refuge, evacuation routes, Work Site security and control).

f. Specific procedures for decontamination and medical treatment of injured personnel.

g. Route maps to nearest pre-notified medical facility. Work Site-support vehicles must be equipped with maps. At the beginning of project operations, drivers of the support vehicles must become familiar with the emergency route and the travel time required.

h. Emergency alerting and response procedures including posted instructions and a list of names and telephone numbers of emergency contacts.

i. Criteria for initiating community alert program, contacts, and responsibilities.

j. Procedures for reporting incidents to appropriate government agencies. In the event that an incident such as an explosion or fire, or a spill or release of toxic materials occurs during the course of the project, the appropriate government

agencies must be immediately notified. In addition, verbally notify the Government the same day as the incident and submit a draft incident report to the Government within 24 hours. The Final Incident Report can be provided at a later date. Include within the report the following items:

1) Name, organization, telephone number, and location of the RA Contractor.

2) Name and title of the person(s) reporting.

3) Date and time of the incident.

4) Location of the incident, i.e., Work Site location, facility name.

5) Brief summary of the incident giving pertinent details including type of operation ongoing at the time of the incident.

6) Cause of the incident, if known.

7) Casualties (fatalities, disabling injuries).

8) Details of any existing chemical hazard or contamination.

9) Estimated property damage, if applicable.

10) Nature of damage, effect on contract schedule.

11) Action taken to ensure safety and security.

12) Other damage or injuries sustained, public or private.

k. Construction activities for the Project shall not begin until the ERP has been reviewed and accepted by the Project Representative.

4. Submission of the Site-Specific HASP and ERP, and any revised version, to the Project Representative is for information and reference purposes only. It shall not:

a. Be construed to imply acceptance by the Project Representative.

b. Be interpreted as a warranty of being complete, accurate, and regulatorily compliant.

c. Relieve the Contractor of its legal obligations for the provision of health and safety on the Project.

C. Construction Submittals:

1. Revised Site-Specific HASP that addresses changes in the Work

2. Accident/Incident Report(s)

3. Minutes and list of attendees of the daily safety Tailgate Meeting

4. Weekly summary of the daily Work Site safety walk-through

5. Notice and listing of flammable liquids and liquefied petroleum gases

6. Summary of the day's safety concerns including safety infractions, near misses, and accidents/incidents as a part of the Daily Construction Report (see Section 01 33 00 – Submittals)

7. Summary of the week's safety concerns and anticipated safety measures to be completed in the following week as a part of the Weekly Construction Report (see Section 01 33 00 – Submittals)

D. Post-Construction Submittal:

1. The Contractor shall submit the Contractor's Annual Construction Summary Report for the Work completed in each Construction Work Period related to this Section, as described in Section 01 78 39 (Project Record Documents). The Contractor's Annual Construction Summary Report shall include a summary of the Work completed under this

Section and any relevant record information.

1.05. QUALITY ASSURANCE

A. Qualifications for the Contractor's personnel shall be as follows:

1. The Contractor Site Health and Safety Officer shall possess the following qualifications:

   a. A minimum of 10 years of progressive safety experience on projects similar in nature to the Work to be done on this Contract

   b. Knowledge of all federal and state regulations applicable to safety

   c. Current 40-Hour HAZWOPER training

   d. Valid completed 8-Hour HAZWOPER Supervisor training

   e. Competent person certification in construction safety disciplines related to the Work to be performed and ability to identify competent persons required by federal and state safety standards for which they are not certified.

   f. Training in and current certification for CPR and First Aid

   g. Training in and capability of performing accident investigations and developing a concise report

   h. Training in the development and presentation of safety training meetings

2. Shift Safety Officers must possess the following:

   a. A minimum of 3 years of progressive safety experience on projects similar in nature to the Work to be done on this Contract.

   b. Knowledge of all federal and state regulations applicable to safety

   c. Current 40-Hour HAZWOPER training

   d. Valid completed 8-Hour HAZWOPER Supervisor training

   e. Competent person certification in construction safety disciplines related to the Work to be performed and ability to identify competent persons required by federal and state safety standards for which they are not certified

   f. Training in and current certification for CPR and First Aid

3. Although not required, the following qualifications may be considered as contributing to the relevant experience required:

   a. Certified Safety Professional (CSP) certification from the American Society of Safety Engineers (ASSE)

   b. Degree from an institution of higher learning in Occupational Safety and Health

   c. ASSE Certified Safety Technician (CST)

   d. Qualification as an instructor in CPR/First Aid or the Occupational Safety and Health Administration (OSHA) 30-hour program

B. Work shall meet the requirements of the following:

1. 29 Code of Federal Regulations (CFR) 1910

2. 29 CFR 1926

3. Chapter 437 Oregon Administrative Rules (OAR)

1.06. SITE-SPECIFIC HEALTH AND SAFETY PLAN

A. A comprehensive Site-Specific HASP covers all aspects of the Contractor's Work activities related specifically and distinctly to the Work and Work Site conditions. The Site-Specific HASP shall be based on a site-specific hazard analysis and shall explain how the site-specific safety procedures shall be applied to the identified hazards in the Work. Additionally, the Site-Specific HASP shall meet the requirements of Chapter 437 OAR at a minimum.

B. At a minimum, the Site-Specific HASP shall contain the following information:

1. Details of the safe work procedures and the safety preventive measures to be taken to provide an appropriate work environment for employees, as well as Project Representative and EPA oversight staff at the Work Site.

2. The Site-Specific HASP shall be descriptive in nature, to provide the appropriate level of understanding for the potential chemical and/or physical hazards associated with the Work to be performed at all stages and phases.

    a. Provide a map of the Work Site illustrating the location of the anticipated hazards and areas of control for those hazards.

3. Identify personnel and alternates responsible for Work Site safety and health.

    a. Provide name and qualifications of the Contractor’s proposed Contractor Site Health and Safety Officer. The Project Representative has the right to reject the Contractor’s proposed Contractor Site Health and Safety Officer and require the Contractor to provide an alternate at no additional cost to the RA Performing Parties.

    b. Provide organization chart identifying the Contractor’s Health and Safety lines of reporting internal to the Contractor’s team and externally, including the U.S. Coast Guard and other regulatory agencies as appropriate.

    c. Provide a 24-hour, 7-day contact and alternate personnel with on-call availability to return to the Work Site to mitigate problems overnight and on weekends and holidays during and after the period when Work is performed.

4. Description of the following:

    a. Hazardous material inventory and material Safety Data Sheets (SDS) for all chemicals that will be brought to the Work Site

    b. Engineering and administrative control measures to be implemented at the Work Site for managing identified risks and hazards

    c. Signage to warn Work Site personnel and visitors of anticipated Work Site hazards

    d. Contractor-provided monitoring to be used to evaluate actual hazards compared with anticipated conditions, as follows:

        1) Access procedures for floating equipment

        2) Work Site housekeeping procedures and personal hygiene practices

        3) Personnel and Equipment Decontamination Plan (as described in Section 01 35 43 – Environmental Procedures)

        4) Medical surveillance program for Work Site personnel before, during, and after completion of Work, if required

    e. Record keeping including the following:

        1) Documentation of appropriate employee training

        2) Respirator fit testing (if appropriate)

        3) Copies of incident and accident reports

4) Signatory page for Work Site personnel to acknowledge receipt, understanding, and agreement to comply with the Site-Specific HASP

5. Safety procedures for maritime navigation and vessel operation in accordance with Section 35 10 00 (Navigation Safety and Marine Traffic Control)

C. Additional Site-Specific HASP content is described in Article 1.08 of this Section.

1. If any diving operations are proposed by the Contractor, a Safe Practices Manual for Diving Operations Plan shall be provided.

1. Additional Consideration for the Site-Specific HASP:

2. Provide an appropriate work environment for all persons on site including Contractor and subcontractor employees, Project Representative staff, and authorized individuals.

3. Address all necessary personal protective equipment (PPE), and clothing (including head, foot, skin, eye, and respiratory protection and personal flotation device [PFD] as applicable), safety equipment and tools, and safety planning and coordination necessary to perform the Work safely.

4. During the Work, update as an addendum to the Site-Specific HASP, changes in conditions or scope of Work before continuing Work.

5. Before beginning the Work addressed in the Site-Specific HASP, meet the requirements of Section 01 33 00 (Submittals) that indicate a Review Action marking of a “1” or a “2” indicating “No Exceptions Taken” or “Note Markings,” respectively.

D. Site-Specific HASP organization shall be as follows:

1. Organized and bound to readily accept revisions and additions

2. Outline form

3. Table of contents

4. Numbered pages

E. The Contractor and subcontractors are encouraged to use the consulting services of the Oregon Occupational Safety and Health (OOSHA). The Portland Metro area: Tigard Field Office’s location and contact information is as follows:

16760 SW Upper Boones Ferry Rd, Suite 200
Tigard, OR 97224-7696
(503)229-5910
https://osha.oregon.gov

F. Call or write for assistance with the requirements of this Section.

1.07. CONTRACTOR SAFETY QUALITY ASSURANCE

A. Review the entire scope of Work and applicable Contract requirements.

B. Inspect the Work Site location and adjacent structures and systems to ensure that all safety considerations and requirements are addressed and planned prior to the start of Work.

C. Ensure that all Contractor and subcontractor employees comply with the Site-Specific HASP.

D. Designate a Contractor Site Health and Safety Officer on site with appropriate training, responsibility, and full authority to coordinate, implement, and enforce the Contractor's Site-Specific HASP for the duration of the Work.

E. In the APP and Site-Specific HASP, provide the name and telephone number of the Contractor Site Health and Safety Officer and the resume reflecting experience and training for the position. If there will be an alternate or additional staff with safety responsibilities, provide name and telephone number and qualifications in the Site-Specific HASP.

F. Ensure that safe work principles and practices are followed in completing Work tasks.

G. Document a daily Work Site safety walk-through noting observations and corrective actions.

H. If the Contractor Site Health and Safety Officer is to be changed during the Contract, submit Qualifications per this Section of the proposed officer prior to implementation on the Contract.

I. Be responsible for correcting hazardous conditions and practices. When more than one contractor is working within a given area, identify which personnel have the authority to take action to prevent physical harm and property damage.

1.08. ADDITIONAL CONSIDERATIONS FOR SITE-SPECIFIC HASP CONTENT

A. The following describes certain minimum precautions for consideration in developing a Site-Specific HASP. Include in the Site-Specific HASP all of the items which may apply to the Work. There may be other items not indicated below that shall be addressed in the Site-Specific HASP. The items indicated below do not cover every possible situation or hazard.

B. Hazard Communication (Chapter 437, Division 2, Subdivision Z OAR):

1. If hazardous or toxic agents (any chemical which is a physical/health hazard) are present, stored or used at the Work Area, the RA Contractor shall prepare a written Hazard Communication Program in accordance with 29 CFR 1910.1200 and 437-002-0377 OAR.

2. For Work requiring use of hazardous materials and chemicals, provide a list and corresponding SDS for hazardous chemicals to be used on site. If no hazardous chemicals are to be used, provide statement to that effect. The list of chemicals should also include:

   a. Explanation of how the chemicals are to be used at the project,

   b. Approximate quantities for each material that are on site or will be on site at any one given time, for emergency response purposes, and

   c. A site map showing where the inventoried chemicals are stored.

3. Procedures shall be included for assuring that containers used to store or transport hazardous or toxic chemicals around the Work Area are appropriately labeled to communicate the physical and health hazards associated with the agents in the containers.

4. Procedures shall be included to ensure SDSs are maintained at the Work Area for each chemical, combustible dust, or product. The SDS shall meet the OSHA globally harmonized system standard.

5. Procedures shall be included to ensure employees are trained initially and periodically when use of hazardous or toxic chemicals is altered or modified to accommodate changing on-site work procedures. Training shall be provided to employees working with or in the area of use of any potentially hazardous chemical.

C. Working Underway on Water and Working Over or In Water (Chapter 437-002-0139 and 437-002-1139 OAR)

1. “Underway” on water refers to when a boat is not at anchor, moored, or made fast to the shore or aground.

2. “Over and in water” applies to piers, docks, wharves and Work sites along developed shorelines.

3. For Work requiring underway activities, workers must have USCG approved PFD and rescue devices must be available within 200 feet of the water or shoreline Work Area.

4. In-water work shall also comply with requirements of Section 35 10 00 (Navigation Safety and Marine Traffic Control).

D. Confined Space (Chapter 437 002-0146 OAR):

1. "Confined space" refers to all confined spaces (including but not limited to dewatering storage tanks or manholes) that are designated and classified as Permit-Required Confined Spaces (PRCS).

2. The nature of the Work may expose workers to PRCS having possible explosive, toxic, and oxygen deficient atmospheric conditions.

3. Provide a written PRCS Safety Program that meets the requirements of Chapter 437 002-0146 OAR:

   a. Documentation of entry permit procedures.

   b. Measures taken to prohibit unauthorized persons from entering permit spaces.

   c. Designation of employee roles, such as entrants, attendants, entry supervisors, rescuers, or those who test or monitor the atmosphere in a permit space.

   d. Identification of designated employee duties.

   e. Training on the written program and entry permits.

   f. Training employees on their designated roles.

   g. Instructions to identify and evaluate hazards.

   h. Methods to eliminate and/or control hazards.

   i. Instructions on equipment use and maintenance.

   j. Instructions to coordinate entry with another employer.

   k. Procedures necessary for concluding the entry and canceling the permit after entry operations have been completed.

E. Lockout Tagout (Hazardous Energy Control) (29 CFR 1910.147 and Chapter 437-002-0154 OAR):

1. The nature of the Work may expose workers to hazardous energy sources that include, but are not limited to, electrical, mechanical, pneumatic, hydraulic, thermal, and computerized systems.

2. Provide a written plan outlining safe Work practices addressing hazardous energy control procedures that meet the requirements of 29 CFR 1910.147 and Chapter 437-002-0154 OAR.

F. Fall Prevention and Protection (29 CFR 1910.140):

1. The nature of the Work may expose workers to fall hazards.

2. If required based on anticipated Work activities, establish a fall protection program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify roles and responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and evacuation procedures in accordance with 29 CFR 1910.140.

G. Personal Protective Equipment (PPE) (Chapter 437-003-0134 OAR):

1. The nature of the Work may expose workers to miscellaneous injury hazards that include, but are not limited to, head, hands, feet, body, eyes, and ears. PPE shall include respiratory protection and PFD as applicable.

2. Onsite personnel exposed to contaminants must be supplied with appropriate PPE. Components of levels of protection (B, C, D and modifications) must be relevant to site-specific conditions, including heat and cold stress potential and safety hazards.

H. Fire Protection (NFPA 51B, 241, Chapter 437-002-0180 to 0187 OAR):

1. The Contractor shall develop a fire prevention plan in accordance with NFPA 51B, 241 and Chapter 437, Division 2, Subdivision L. The Fire Prevention Plan shall include as a minimum the following information:

   a. List of major Work Area fire hazards;

   b. Potential ignition sources;

   c. Types of fire suppression equipment appropriate to control the fire;

   d. Assignments of responsibilities for maintaining the fire control equipment;

   e. Personnel responsible for controlling the fuel source hazards; and

   f. Housekeeping procedures, including removal of waste materials.

I. Commercial Diving Operations (Chapter 437-002-0340 to 0355 OAR):

1. Due to the hazards associated with commercial diving operations, specific safety protocols and procedures are required to ensure worker and diver safety.

2. If the Contractor proposes any diving operations for the Work, the Contractor shall provide a Diving Operations Plan that includes

   a. General provisions (regulatory and personnel compliance requirements);
   b. Scope of diving operations;
   c. Diving and decompression mode;
   d. Ingress and egress;
   e. Operational roles and responsibilities;
   f. Job hazard analysis(es);
   g. Environmental controls management;
   h. Vessel traffic;
   i. Weather contingencies;
   j. Decontamination;
   k. Emergency management plan; and
   l. Emergency procedures.

J. Excavation, Trenching and Shoring (Chapter 437 1926.651, 1926.652, 437-003-0096 OAR):

1. Due to the hazards associated with excavation, trenching, and shoring, specific safety protocols and procedures are required to ensure worker safety.

2. Each worker in a trench shall be protected from a cave-in by an adequate protective system.

3. A trench that is 4 feet or more in depth shall have a safe means for workers to get in and out of the trench. A means of egress is required to be within 25 feet of lateral travel.

4. When excavation operations approach the location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.

5. Follow the requirements in Chapter 437 OAR in developing an Excavation/Trenching Plan designed by a registered professional engineer:

   a. Sizes, types, and configurations of the materials to be used in the protective system;

   b. Identity of the excavation competent person that will be onsite during excavation activities to perform soil classification and excavation inspections; and

   c. Identity of the registered professional engineer approving the design.

6. At least one copy of the Excavation/Trenching Plan shall be maintained at the Work Site during construction of the protective system.

K. Suspect Material:

1. The Contractor is responsible for reviewing the materials to be encountered at the Work Site to inform the Contractor's Work. All information is provided in these Specifications (included in Section 01 13 00 – Reference Material) and other Contract Documents. Should material not identified in these Specifications such as asbestos-containing materials, lead-based coatings, creosote and other wood treating chemicals, polychlorinated biphenyl-containing equipment be encountered, immediately notify the Project Representative of unusual conditions so that the proper actions are implemented.

L. Traffic Control (Chapter 437-003-0420 OAR):

1. The needs and control of all road users (motorists, bicyclists, and pedestrians) within the highway, or on private roads open to public travel, including persons with disabilities, through a temporary Traffic Control zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.

2. When the Work requires the occupation of traffic lanes, parking lanes, parkways, or other public right-of way closures, it shall be per the local authority having jurisdiction. See Section 01 55 26 (Traffic Control) for specific traffic control requirements.

M. A Personnel and Equipment Decontamination Plan (see Section 01 35 43 – Environmental Procedures) shall be implemented for specific personnel and equipment decontamination requirements.

N. Medical Surveillance Program

1. Meet 29 CFR 1910.120/29 CFR 1926.65 (f) and the following requirements for medical surveillance program for workers performing cleanup operations and who will be exposed to contaminants. Assure the Occupational Physician or the physician's designee performs the physical examinations and reviews examination results. Participation in the medical surveillance program will be without cost to the employee, without loss of pay, and at a reasonable time and place.

2. Frequency of Examinations

a. Medical surveillance program participants must receive medical examinations and consultations on the following schedule:

b. At least once every twelve months for each employee covered unless the attending physician believes a longer interval (not greater than biennially) is appropriate.

c. If and when the participant develops signs and symptoms indicating a possible overexposure due to an uncontrolled release of a hazardous substance on the project.

d. Upon termination or reassignment to a job where medical surveillance program participation is not required, unless his/her previous annual examination/consultation was less than 6 months prior to reassignment or termination.

e. On a schedule specified by the occupational physician.

3. Content of Physical Examinations/Consultation

a. Verify the following information about medical surveillance program participants:

b. Baseline health conditions and medical exposure history questionnaire.

c. Allergies/sensitivity/susceptibility to hazardous substances exposure.

d. Ability to wear personal protective equipment inclusive of NIOSH certified respirators under extreme temperature conditions.

e. Fitness to perform assigned duties.

4. Provide the occupational physician with the following information for each medical surveillance program participant:

5. Information on the employee's anticipated or measured exposure.

    a. A description of any PPE used or to be used.

    b. A description of the employee's duties as they relate to the employee's exposures (including physical demands on the employee and heat/cold stress)

    c. A copy of 29 CFR 1910.120, or 29 CFR 1926.65.

    d. Information from previous examinations not readily available to the examining physician.

    e. A copy of Section 5.0 of NIOSH 85-115.

    f. Information required by 29 CFR 1910 Section .134.

6. Maintains copies of the physician's written opinion for each employee. Address the employee's ability to perform hazardous waste site remediation work and containing the following:

    a. The physician's verification of the employee's fitness to perform duties as well as recommended limitations upon the employee's assigned work and/or PPE usage.

    b. The physician's opinion about increased risk to the employee's health resulting from work; and

    c. A statement that the employee has been informed and advised about the results of the examination.

7. Employee Certificates

    a. Provide employee certificates for each worker performing cleanup operations with potential for contaminant-related occupational exposure signed by the safety and health manager and the occupational physician indicating the workers meet the training and medical surveillance requirements of this contract.

O. Electrical Safety:

1. If required based on anticipated activities, perform electrical work in accordance with Chapter 437, Division 3, Subdivision K. Additional standards that shall apply to electrical work include OSHA Construction Industry Standard 29 CFR 1926: Subpart K - Electrical; 29 CFR 1910 - General Industry Standard, 1910.269 - Electric Power Generation, Transmission, and Distribution.

2. No employer shall permit an employee to work in such proximity to any part of an electric power circuit that the employee could contact the electric power circuit in the course of work, unless the employee is protected against electric shock by deenergizing the circuit and grounding it or by guarding it effectively by insulation or other means.

3. In Work areas where the exact location of underground electric powerlines is unknown, employees using jack-hammers, bars, or other hand tools which may contact a line shall be provided with insulated protective gloves.

4. Before work is begun the Contractor shall ascertain by inquiry or direct observation, or by instruments, whether any part of an energized electric power circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool, or machine into physical or electrical contact with the electric power circuit. The Contractor shall post and maintain proper warning signs where such a circuit exists. The Contractor shall advise employees of the location of such lines, the hazards involved, and the protective measures to be taken.

P. Wildfire Smoke (Chapter 437-002-1081 OAR).

1. Applies to employees who are or will be exposed to wildfire smoke where the ambient air concentration for fine particulate matter (PM2.5) is at or above 35.5 micrograms per cubic meter (µg/m3) (Air Quality Index value of 101 for PM2.5).

2. Monitor employee exposure to wildfire smoke when employees are, or are likely to be, exposed to an ambient air concentration for PM2.5 at or above 35.5 µg/m3 (AQI 101). This monitoring must be performed at the start of each shift, and as needed, to comply with the applicable requirements of sections (6) and (7) Chapter 437-002-1081 OAR.

3. Implement engineering and administrative controls to reduce employee PM2.5 exposure to less than 35.5 µg/m3 (AQI 101), unless the Contractor can demonstrate that such controls are functionally impossible, or would prevent the completion of Work.

Q. Heat Illness Prevention (Chapter 437-002-0156 OAR)

1. Work activities may be performed when the heat index (apparent temperature) equals or exceeds 80 degrees Fahrenheit for periods greater than 15 minutes per 60 minutes.

2. The procedures in Chapter 437-002-0156 OAR must be followed and include:

a. Establishing and maintaining the appropriately accessible shaded areas, open to the outside air.

b. Ensure that a sufficient supply of drinking water is immediately and readily available to exposed employees at all times, at no cost.

c. If exposure cannot be reduced to a heat index less than 90 degrees Fahrenheit, implement and maintain high heat practices.

d. Document the heat illness prevention plan in the Site-Specific HASP.

R. Public Health Emergency Reporting and Notification Requirements for Infectious and Contagious Diseases: Comply with Chapter 333 Division 18 OAR.

1.09. UTILITIES

A. The Contractor shall not rely upon Drawings or other information provided with utility locations.

B. Call the Utilities Underground Location Center before you dig, phone number 811.

C. During the performance of the Work, take appropriate precautions when working near, around, and with utilities, in order to protect the health and safety of the worker, the public, property, and the environment.

D. The Contractor is solely responsible for utility clearance. Provide a flagged warning line for all Work conducted in proximity to power lines. Coordinate and meet the requirements of the utility owner for this Work.

E. Coordinate and meet the requirements of the utility owner and the Project Representative to obtain acceptance to disconnect or reconnect utilities.

PART 2 PRODUCTS

2.01. PRODUCTS SPECIFIED FOR HEALTH AND SAFETY

A. Provide the equipment and supplies necessary to support the Work as described in the Site-Specific HASP. Equipment and supplies may include, but are not limited to, the following:

1. Chemicals to be used on site, including dust suppressants/wetting agents and cleaning, degreasing, and/or welding or cutting supplies

2. Hazardous materials inventory and SDS for the chemicals brought to the Work Site

3. Enclosure equipment

4. Fencing and barriers
5. Warning signs and labels
6. Trenching equipment
7. Fire extinguishers
8. Equipment to support hot work
9. Equipment to support lockout/tagout procedures
10. Scaffolding and fall protection equipment
11. PPE (e.g., hard hats; foot gear; and skin, eye, and respiratory protection) and PFDs
12. Area and personnel exposure monitoring equipment
13. Odor control materials if necessary for sediment stockpiles
14. Removal equipment and supplies
15. Decontamination equipment and supplies
16. First aid equipment
17. Release prevention equipment
18. Field documentation logs and supplies

PART 3 EXECUTION

3.01. SAFETY AND HEALTH COMPLIANCE

A. The Project Representative reserves the right to implement the Site-Specific HASP.

B. Ongoing Work and hazardous situations that are considered a health and safety risk by the Project Representative shall be corrected immediately.

C. Be responsible to stop that portion of the Work that is determined to be an imminent or immediate threat to worker health and safety.

D. Ensure that necessary air monitoring, ventilation equipment; protective clothing, hazardous energy control devices, fall prevention, and other specified supplies and equipment are made readily available to employees to facilitate implementation of the Site-Specific HASP.

E. Incidents:

1. Notify the Project Representative immediately of all near miss incidents and all accidents involving personal injury and property damage.
2. Provide a written report known as the Incident Report within 24 hours of any incident. Report for each incident occurrence shall include the following:
    a. Description of the event
    b. Names of personnel involved
    c. Description of injuries and treatment required (short term and long term)
    d. Description of property damage
    e. Work Site visits and inspections of other agencies as a result of an incident. Include names of the persons, purpose of the visit, and any other pertinent information.

F. Conduct a pre-construction safety meeting with Contractor staff and with all subcontractor staff at the beginning of each Construction Work Period. Submit list of attendees and minutes of pre-construction safety meeting.

G. Conduct all Tailgate Meetings including job safety at the beginning of each Work shift. Submit list of attendees and minutes of daily safety Tailgate Meetings.

H. Submit a Monthly Contractor Injury Report on Form 01 35 29-A in Section 01 33 10 (Standard Forms). consisting of a summary of the current month's injury accidents.

I. Use of intoxicants or of illegal or debilitating drugs while working on this Contract is prohibited.

J. No Contractor Site Health and Safety Officer shall be assigned that does not meet the requirements of this Section.

K. Submit all safety related citations received for Contract Work immediately upon receipt. If appealed to the State of Oregon, notify the Project Representative a minimum of every month updating the status of the appeal until resolved. Submit documentation of the findings when resolved.

3.02. SITE-SPECIFIC HEALTH AND SAFETY PLAN REVISIONS

A. In the event that the Project Representative, regulatory agencies, or jurisdictions determine the Site-Specific HASP, associated documents, or organizational structure to be inadequate to protect employees and the public, the Contractor shall do the following:

1. Modify the Site-Specific HASP to meet the requirements of said regulatory agencies, jurisdictions, and the Project Representative.

2. Provide a submittal for revisions to the Site-Specific HASP within 7 days of the notice of a required modification.

3.03. DISPOSAL OF PERSONALLY IDENTIFIABLE INFORMATION

A. Documents containing personally identifiable information (e.g., medical information) shall be shredded and properly disposed of.

3.04. POSTING

A. Provide and maintain a copy of the most up-to-date Site-Specific HASP at the Contractor's Work Site office and at each of the subcontractors' offices. If the Contractor or subcontractor does not have an on-site office, the Site-Specific HASP will be maintained on site each working day in a vehicle or other suitable location. The Contractor shall maintain a current copy of the Site-Specific HASP on vessels where Contract Work is performed.

3.05. CORRECTION OF NON-COMPLIANCE

A. Failure to comply with this Section will result in Work suspension until adequate health and safety measures are implemented.

B. Immediately address health and safety non-compliance issues identified by the Project Representative.

C. Provide the Project Representative with a written report of action taken to correct non-compliance with health and safety issues identified.

D. The Project Representative may issue a “stop work order” if non-compliance of health and safety regulations is not corrected immediately or within posted time. The Contractor/subcontractors will be responsible for any costs arising from such a “stop work order.”

3.06. TECHNICAL ASSISTANCE

A. Technical assistance is available from the following:

[To be filled out by the Project Representative]

END OF SECTION

SECTION 01 35 43

ENVIRONMENTAL PROTECTION PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies environmental monitoring and required plans describing how the Contractor shall manage environmental protection and controls during the Work to ensure is complies with the substantive and administrative requirements of the Applicable or Relevant and Appropriate Requirements (ARARs). The Contractor shall be responsible for adhering to these environmental compliance and monitoring plans while completing all Work under this Contract.

1.02 DESCRIPTION OF WORK

A. The Contractor shall prepare plans that inform environmental protection measures and monitoring activities that are required to be implemented during the Work, specifically addressing the following: water quality and monitoring; erosion and sediment control and stormwater management; spill prevention, control and countermeasures; air quality and odor control; noise and light control; and cultural resources preservation.

B. The Contractor is responsible for environmental protection during all construction activities at all locations where the Contractor performs Work. Work locations include, but are not limited to, the Swan Island Basin (SIB) Project Area (Work Area), Staging and Stockpile Area(s), Disposal Facility(ies), and during barge transport over water and land-based transportation of Dredged Material, Incidental Debris, Identified Debris, and Piling. This Section primarily addresses Work conducted at the Work Area, but the Contractor is responsible for complying with environmental protection regulations at all locations that are used.

C. No separate payment will be made for effort associated with Work described in this Section. Work required to comply with this Section is considered incidental to the Work described in the Contract Documents.

1.03 REFERENCED STANDARDS

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the EPA Record of Decision (EPA, 2017, see document citation in Section 01 13 00 – Reference Material); therefore, compliance with ARARs for the Portland Harbor Superfund Site cleanup remedy is required. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 (Environmental Regulatory Requirements). In case of conflict between the requirements of this Section and those listed in Section 01 41 00 (Environmental Regulatory Requirements), the more stringent requirement shall prevail. No requirement in this Section shall be construed to contravene applicable laws and regulations. In the event that the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

1.04 MISPLACED MATERIALS

A. Should the Contractor, during the execution of the Work in this Section, lose, dump, throw overboard, sink, or misplace any material, dredge, barge, machinery, or appliance (collectively termed as misplaced materials), the Contractor shall promptly recover and remove the same. The Contractor shall give immediate verbal notice, followed by written confirmation, of the description and location of such obstructions to the Project Representative and shall mark and buoy such obstructions until removed.

B. Should the Contractor refuse, neglect, or delay compliance with this requirement, such obstructions may be removed by the Project Representative or its agents, and the cost of such operations may be deducted from any money due to the Contractor or may be recovered from the Contractor’s bond.

C. The liability of the Contractor for the removal of a vessel wrecked or sunk without its fault or negligence shall be limited to that provided in Sections 15, 19, and 20 of the River and Harbors Act of 3 March 1899 (33 United States Code [USC] 410 et seq.).

D. The Contractor shall be responsible for any fees, fines, penalties, or other costs resulting from misplaced materials and shall not pass costs to the Project Representative.

1.05 SUBMITTALS

A. Refer to Section 01 33 00 (Submittal Procedures) for all submittals and associated timelines related to the Contract Documents.

B. Pre-Construction Submittals:

1. Submit a detailed, written Environmental Records Binder (ERB), as part of the Contractor's Remedial Action Work Plan (RAWP), in conformance with Section 1.06 Construction activities shall not begin until the ERB has been reviewed and accepted by the Project Representative.

2. Specific requirements for the ERB are detailed in Article 1.06 of this Section.

C. Construction Submittals:

1. Submit a daily record of compliance with air, light, noise, and odor criteria requirements and any implemented measures, controls, and actions to address air, light, noise, and odor issues during construction as part of the Daily Construction Report (see Section 01 33 00 – Submittal Procedures).

2. Submit a daily record of environmental inspection and monitoring activities for water quality monitoring, stormwater management, spills, and any implemented measures, controls, and actions to address these issues during construction as part of the Daily Construction Report (see Section 01 33 00 – Submittal Procedures)

3. Submit the Contractor's environmental inspection and monitoring report on a weekly basis, as part of the Weekly Construction Report (see Section 01 33 00 – Submittal Procedures).

D. Post-Construction Submittals:

1. Submit the Contractor's Annual Construction Summary Report, as described in Section 01 78 39 (Project Record Documents). As part of environmental compliance with the Project, the Contractor's Annual Construction Summary Report shall summarize the environmental activities completed during the Construction Work Period.

1.06 ENVIRONMENTAL RECORDS BINDER (ERB)

A. Develop and maintain for the duration of the Contract an ERB that comprehensively incorporates plans and procedures for implementing all required environmental controls, maintains environmental quality and protection during all construction activities, and complies with all applicable federal, state, and local statutes, ordinances, and regulations.

B. At a minimum, the ERB shall contain the following information:

1. Organization chart and names of persons responsible for ERB compliance:

a. Names and qualifications of person(s) responsible for providing Certificates of Disposal (or waste manifests) for material to be removed from the Work Area.

b. A list of key personnel, including phone numbers (mobile and office) and email addresses, qualified for ERB compliance.

c. Name, qualification, and affiliation of person (including 24-hour-access phone number) who will act as the emergency coordinator and will be available 24 hours per day to supervise and enforce compliance with the ERB (the Contractor shall coordinate with the Project Representative to designate a temporary substitute, if required).

2. The following plans and subsequent revisions shall be submitted as a part of the ERB:

   a. Water Quality Monitoring Plan (WQMP)

   b. Data Management Plan (DMP)

   c. Temporary Erosion and Sediment Control Plan

   d. Stormwater Management Plan

   e. Spill Prevention, Control, and Countermeasure Plan (SPCC)

   f. Air Pollution, Noise, and Light Monitoring Plan (ANLMP)

   g. Archaeological and Inadvertent Discovery Plan (AIDP)

   h. Traffic Control Plan (refer to Section 01 55 26 – Traffic Control)

   i. Green Remediation Plan

C. In the event that the Project Representative, EPA, or jurisdictions determine any of the plans within the ERB or the Contractor's activities to be inadequate to protect the environment (i.e. the Project Representative instructs Contractor that a substantial environmental problem requires stop work condition):

   1. Stop the Work in progress until adequate environmental protection measures are implemented.

   2. Modify the plans and/or ERB to meet the requirements of EPA, jurisdictions, and the RA Performing Parties.

   3. Submit and receive acceptance of modifications to the plans and/or ERB prior to restarting the Work.

1.07 WATER QUALITY MONITORING PLAN (WQMP)

A. Prepare and submit a WQMP, to be included in the ERB, to be used for the duration of the Work.

B. Describe the best management practices (BMPs), including operational controls and equipment controls; specialized equipment; means, methods, and procedures; and construction sequencing used to prevent water quality criteria exceedances during completion of dredging, material placement, and other In-Water Work Period activities.

C. Describe the Contractor’s contingency actions that will be taken to restore compliance with water quality criteria should water quality exceedances occur during any In-Water Work Period activities.

D. Detail monitoring locations; depths, frequency, and methods for conventional parameters (turbidity, dissolved oxygen, temperature and pH) as well as site-specific chemical as described below:

   1. [Additional details on locations, frequency, and analytical to be inserted in Pre-Final 90% RD]

E. Monitoring requirements of the WQMP shall be incorporated into the Contractor’s Uniform Federal Policy Quality Assurance Project Plan including the following :

   1. Chemistry analysis quality control requirements (field duplicates, laboratory QC)

   2. Monitoring instruments to be used

   3. Calibration and Maintenance requirements for monitoring equipment

F. A Data Management Plan (DMP) discussing project reporting requirements, frequencies, exceedance reports, and laboratory report requirements as detailed below

   1. [DMP requirements to be inserted in Pre-Final 90% RD]

1.08 EROSION AND SEDIMENT CONTROL PLAN

A. Prepare and submit a Temporary Erosion and Sediment Control (TESC) Plan, as required per Section 31 25 00 (Erosion and Sedimentation Control), and subsequent revisions, to be included in the ERB.

1.09 STORMWATER MANAGEMENT PLAN

A. Prepare and submit a Stormwater Management Plan, to be included in the ERB, to be used for the duration of the Work. The Stormwater Management Plan shall specify management, controls, and treatment for stormwater within the Work Area.

B. At a minimum, the Stormwater Management Plan shall include the following:

1. Work Area layout, including locations of Staging and Stockpile Area(s) (used exclusively for clean material) and stockpile areas (used for contaminated materials at the Work Area)

2. Methods to contain, collect, and divert stormwater from up-gradient locations away from exposed materials during execution of Work to minimize stormwater runoff.

3. Identification of potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharge from the Work Area

4. Methods to manage discharge including stormwater discharge at the Work Area to comply with all applicable laws and regulations

5. Methods to direct surface waters that have not contacted potentially contaminated materials to existing surface drainage systems

6. Required inspections, documentation, and reporting of stormwater management activities as described below :

    a. [Additional details on inspection, documentation, and reporting requirements to be inserted in Pre-Final 90% RD]

1.10 SPILL PREVENTION, CONTROL, AND COUNTERMEASURE PLAN (SPCC)

A. Prepare and submit a SPCC as a part of the ERB, to be used for the duration of the Work. The SPCC shall contain, at a minimum, the following information and address the following requirements:

1. Spill Prevention:

    a. Identify personnel responsible for managing and implementing the Spill Plan, any containment of spills, and cleanup for both In-Water Work and upland work activities.

    b. Identify any potentially hazardous substances to be used on the SIB Project Area; identify intended actions to prevent introduction of such materials into air, water, or ground; and detail provisions for compliance with federal, state, and local ordinances, laws, and regulations for storage and handling of these materials.

    c. Identify spill prevention and containment methods to be used.

    d. Identify security measures, inspection procedures, and personnel training procedures as they relate to spill prevention, containment, response, management, and cleanup.

    e. Describe procedures for in-water refueling of marine equipment within the SIB Project Area and within the SIB.

    f. Address equipment maintenance, refueling, and cleaning activities and on-site storage areas for hazardous materials.

2. Spill Response:

a. Outline spill response procedures, including assessment of the hazard; securing of spill response and personal protective equipment; containment and elimination of the spill source; and mitigation, removal, and disposal of the material.

b. Include the following:

1) Methods for immediately containing all visible floating oils with booms, dikes, or other appropriate means.

2) Methods for immediately containing all visible oils on land using dikes, straw bales, or other appropriate means.

3) Identification of the equipment and materials to be maintained at the Work Area to carry out the responsive measures.

4) Location of disposal of waste materials at an existing Disposal Facility(ies) with active permits in place that accepts the waste.

5) List of 24-hour response numbers for agency notification in the event or imminent risk of any unforeseen oil, substance, or other product discharges into public water, or onto land with a potential for entry into public waters.

1.11 AIR POLLUTION, NOISE, AND LIGHT MONITORING PLAN (ANLMP)

A. Prepare and submit an ANLMP as a part of the ERB, to be used for the duration of the Work. The ANLMP shall contain the following information and address the following requirements:

B. Air pollution monitoring

1. At a minimum, the Air Pollution section shall include the following information:

a. Identification of potential air pollution and odor-generating sources (equipment, activities, stockpiles, etc.).

b. Location of potential generating sources.

c. Methods, procedures, equipment, and materials to be used for air pollution and odor prevention and mitigation for each source to minimize air pollution and odors at the Work Area

d. Hours of Work operation, including daytime and nighttime hours

e. Description of dust minimization practices

f. Method for establishing a baseline Air Pollution level for the SIB Project Area prior to commencement of work

g. Best management practices for reduction of air pollution during execution of Work.

h. Establishment of dust control screening criteria for air pollution at the Work Area.

i. The Contractor shall update and modify identified mitigation measures whenever major activity changes or air pollution is detected greater than established screening criteria.

j. Monitoring procedures for air pollution including equipment to be used, equipment calibration, and maintenance.

C. Noise monitoring

1. At a minimum, the Noise Monitoring section shall include the following information:

a. Methods, procedures, and equipment to be used for noise measurement, mitigation and control.

b. Hours of Work operation, including daytime and nighttime hours.

c. Identification of noise-generating equipment and associated sound levels during their operation.

d. Layout of equipment, including anticipated changes in layout.

e. Hours of operation of each piece of equipment.

f. Noise prevention and mitigation measures for each piece of equipment to minimize noise pollution at and beyond the Work Area.

g. Any additional preventive and mitigation measures for noise not related to a specific piece of equipment.

h. Description of the baseline noise monitoring approach at the beginning of In-Water Work activities.

i. The contractor shall comply with Portland City Noise Control Ordinance outlined in City Code Chapter 18.10.060 for Construction Activities and Equipment, which establishes permissible sound levels based on zoning categories at the property line during between the hours of 7 a.m and 10 p.m.

j. The Contractor shall update and modify identified mitigation measures whenever major activity changes or different noise-generating equipment is mobilized to the Work Area from the equipment previously submitted.

k. Mitigation measures for each location and for each change in major activities to be performed at the Work Area.

D. Light monitoring

1. At a minimum, the Light Monitoring Section shall include the following information:

a. Methods, procedures, and equipment to be used for light mitigation and control.

b. Hours of Work operation, including daytime and nighttime hours.

c. Hours during which lights will be used to illuminate the Work, including seasonal changes.

d. Layout of existing and temporary lights to be used.

e. Preventive and mitigation measures to minimize light pollution at the Work Area.

f. Light monitoring approach on an as-needed basis if community nuisance feedback has been received.

2. Update and modify identified light control measures to address deficiencies, to adjust for seasonal changes, and as appropriate when there are major changes in the Work.

1.12 ARCHAEOLOGICAL AND INADVERTANT DISCOVERY PLAN (AIDP)

A. To address cultural resources monitoring requirements, the Contractor shall prepare and submit an AIDP as part of the ERB to identify the steps to be followed if a cultural resource item of interest is discovered at the Work Area. The AIDP shall be used for the duration of the Work.

B. The AIDP shall include the following sections:

1. Introduction describing the objectives of the AIDP

2. Background summarizing the history of cultural resources at the Work Area.

3. Anticipated Ground Disturbing Activities listing all ground-disturbing activities expected during the execution of Work

4. Procedures Within the SIB Project Area – summary of the protocols and procedures including the following: archaeological resources that may be encountered; procedures for notification of ground-disturbing activities; details concerning a retained professional

archaeologist available for monitoring; discovery procedures for archaeological resources; and procedures on-site staging and coordination of archaeological resources

5. Other Issues sections describing procedures and protocols for handling artifacts and archaeological deposits if they are discovered during the execution of Work

6. Confidentiality statement that any discovery of suspected archaeological resources will remain confidential.

C. An example AIDP is available as a reference document (refer to Appendix C of the Construction Quality Assurance/Quality Control Plan [CQA/QCP]; in Section 01 13 00 – Reference Material).

1.13 TRAFFIC CONTROL PLAN

A. Prepare and submit a Traffic Control Plan, as required per Section 01 55 26 (Traffic Control), and subsequent revisions, in the ERB.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION

3.01 PERSON RESPONSIBLE

A. The person responsible for implementation of the plans in the ERB shall be given the authority to take appropriate actions to safeguard the environment during the Work. The materials, equipment, and supplies necessary to implement the plans shall be readily available at all times.

3.02 WORK AREA MAINTENANCE

A. Maintain lids on all refuse containers.

B. Handle fuel, oil, and other construction materials with care to prevent entry of contaminants into storm drains, surface waters, or soils.

C. Remove materials and equipment from the Work Area when they are no longer necessary. Do not allow waste material to remain on or adjacent to the Work Area.

3.03 STREET CLEANING

A. Street cleaning requirements described in this Article apply to the street entrances to the Contractor Work Area.

B. Prevent dirt and dust from escaping trucks and/or railcars by covering all loads, scrubbing and/or washing truck tires and undercarriages before leaving the Work Area, using crushed rock at entrances, or other reasonable methods.

C. When operating dump trucks and other equipment on paved streets and roadways, the Contractor shall clean the entrance streets no later than at the end of each day's operations and at such additional interim periods as required by the Project Representative. The Contractor shall clean the entrance areas using a vacuum sweeping truck. Cleaning equipment shall be available 24 hours per day while upland haul routes are in use.

D. The Contractor may use power washing trucks to clean entrance surfaces only after receiving acceptance from the Project Representative and only if following the BMPs to prevent exceedance of state or local water quality standards.

E. All street entrances to the Work Area used by the Contractor's trucks or any other equipment hauling material to and from the area shall be kept clean and shall be continuously serviced by the Contractor's use of sprinkling trucks to control dust.

F. Violations of the above requirements are sufficient grounds for the Project Representative to order the streets in question to be cleaned by others with all costs withheld from the Application for Payment.

G. Do not flush untreated solid material or soils or water containing solid material or sediment/soils into receiving SIB waters.

3.04 EROSION AND SEDIMENT CONTROL

A. Comply with requirements of Section 31 25 00 (Erosion and Sedimentation Control) and the Portland City Code Title 10 Erosion and Sediment Control Regulations.

B. Implement the ESC Plan, and other construction stormwater management plans if required by the Contract, as accepted. The Contractor shall modify as necessary to meet changing conditions.

C. Applicable erosion control measures shall be installed prior to excavation, clearing, grubbing, or grading activities.

D. Do not allow Work Area erosion to cause a violation of the state or local water quality standards.

3.05 WATER QUALITY CONTROLS

A. The Contractor shall be responsible for meeting water quality criteria specified in Appendix L – Attachment C – Water Quality Management Plan (see Section 01 13 00)

3.06 WATER MANAGEMENT CONTROLS

A. Stockpile and Equipment Decontamination Areas Wastewater Control Measures:

1. Fully contain all stockpile and equipment decontamination area(s) located within the Staging and Stockpile Area(s) to prevent release of unfiltered effluent and suspended sediments, or other potentially contaminated materials from the stockpile area.

2. Provide impermeable barriers (e.g., impermeable liner) to prevent effluent from infiltrating into groundwater or escaping through containment barriers (e.g., Jersey barriers).

3. Cover exposed stockpiles when runoff from rain is, or would be likely to, cause turbid waters to enter the SIB at all times except when working the pile. Suspend Work in the rain if such Work cannot be performed without causing turbid runoff for any off-site facility.

B. Drainage and Surface Water Management:

1. Conform to the regulations and requirements of legally authorized surface water management agencies.

2. Divert stormwater runoff from upslope areas away from contaminated stockpile and/or excavation areas. Implement structural practices to divert flows from exposed soils or temporary storage flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the Work Area.

3. Before construction begins, establish appropriate perimeter barriers to prevent excess surface water flows from causing erosion. Work areas shall be kept free of surface water run-on from adjacent upland areas. Unless otherwise specified, all temporary facilities, equipment, and structures for care and diversion of water shall be removed upon completion of the Work.

4. To avoid solids or turbid runoff from entering the SIB, cover, secure, and/or berm stockpiles and employ other methods as necessary such as straw bales around storm drains or around excavated areas; use of cut and cover construction methods; or use of sedimentation basins.

5. Prevent Work Area runoff from directly entering any storm drain or the waterway; use straw bales or other filtration method suitable to the Project Representative.

3.07 WATER QUALITY PROTECTION

A. The Contractor shall conform to the regulations and requirements of legally authorized surface water management agencies. The Contractor shall not allow water discharges to exceed the state or local water quality standards.

B. If water quality standards or permit conditions are violated, the Contractor shall shut down Work causing the violation until protection and remediation is completed. The Contractor is responsible for all associated impacts.

C. The Contractor is responsible for the overflow of any storm drains resulting from the addition of flow from Contractor's activities and any damages associated with such overflow.

D. The Contractor shall conduct operations in such a manner as to prevent sediment, construction equipment decontamination water, and other pollutants from reaching existing sewers, storm drains, and surface waters.

E. The Contractor shall prevent additional construction wastes such as paper, wood, garbage, sanitary wastes, and fertilizer from leaving the Work Area and entering waterways. The Contractor shall dispose of all debris on land in such a manner that it cannot enter the SIB or cause water quality degradation.

3.08 SPILL PREVENTION, CONTROL, AND COUNTERMEASURE RESPONSE

A. Implement the SPCC as accepted and modify as required.

B. The Contractor shall have a marine spill response contractor on call during all on-water construction activities.

C. The Contractor shall immediately contain and assess any identified spills, provide appropriate notifications, and take the necessary steps to prevent further discharge. The Contractor is responsible for immediate cleanup of the spill and restoration of the area to the satisfaction of the Project Representative and other regulatory agencies, where involved.

D. The Contractor shall, at a minimum, take the following measures regarding oil spill prevention, containment, and cleanup:

1. Fuel hoses, lubrication equipment, hydraulically operated equipment, oil drums, and other equipment and facilities shall be inspected regularly for drips, leaks, or signs of damage and shall be maintained and stored properly to prevent spills. Proper security shall be maintained to discourage vandalism.

2. All land-based oil and product storage tanks shall be diked or located so as to prevent spills from escaping to the water. Diking and sub-soils shall be lined with impervious material to prevent oil from seeping through the ground and dikes.

3. All visible floating oils shall be immediately contained with booms, dikes, or other appropriate means and removed from the water prior to discharge into state waters. All visible oils on land shall be immediately

4. The Contractor shall use environmentally sensitive hydraulic fluids that are non-toxic to aquatic life and that are readily or inherently biodegradable.

5. In the event of any oil or product discharges into public waters, or onto land with a potential for entry into public waters, the Contractor shall immediately notify the Project Representative and other required reporting agencies at their listed 24-hour response numbers, including but not limited to the following:

   a. National Response Center: (800) 424-8802

   b. City of Portland Emergency Services Pollution Control Hotline (503) 823-7180

   c. Oregon Emergency Management Division: (503)-378-2911

   d. U.S. Coast Guard: (206) 217-6002

6. The Contractor shall maintain on the Work Area the following equipment and materials in

sufficient quantities to address potential spills from Contractor's floating and land-based equipment:

a. Oil-absorbent booms

b. Oil-absorbent pads or bulk material

c. Oil-skimming system

d. Straw bales

e. Oil dry-all, gloves, and plastic bags

f. Contractor employee PPE for emergency spill response

g. Concentrated odor neutralizer

E. All workers shall be fully aware of the spill prevention and response procedures, including notification of the Project Representative.

F. Take due care to ensure that no deleterious materials, including sediment-laden runoff, leave the Work Area or any upland facility used for the Contract during performance of the Work or enter any surface water, stormwater, or sanitary sewers at or near the Work Area or any upland facility used for the Contract during performance of the Work.

G. Protect roadways at any upland facility used for the Contract during performance of the Work from tracking of mud, soil, sediment, and debris throughout the Work. All pollutants that occur on site during construction shall be handled and disposed of in a manner that does not cause contamination of stormwater or groundwater.

H. Prevent, contain, and be responsible for spill cleanup of pollutants. Pollutant discharge into state waters or onto adjacent land is not permitted and violates state water quality standards.

I. Store solid chemicals, liquid chemicals, paints, petroleum products, caustic solutions, and waste materials, including batteries and electronic components, to prevent entry of contaminants into all SIB waters.

J. Spill Prevention:

1. Store liquid and solid Hazardous Materials and other pollutants on durable impervious surfaces and within manufactured secondary containment vessels capable of containing 110% of the largest single container stored in the containment vessel. Plastic sheeting is not an acceptable product for use in a containment system for long-term storage of chemicals or equipment with fuel tanks.

2. Store waste liquids under cover, such as tarpaulins or roofed structures, to prevent entry of rainwater into the containment vessel.

3. Place equipment with fuel tanks in secondary containment vessels, or if the equipment is moved often, attach spill pads under the fuel tank.

4. Segregate non-compatible or reactive chemicals to prevent possibility of mixing.

5. Clearly designate all waste storage areas, whether for waste oil or hazardous waste, as such and keep segregated from new product storage.

6. Label all containers with the type of material being stored and post Safety Data Sheets (SDS) near the storage areas.

7. Store all "empty" containers not cleaned in an upright secure manner. Label the containers "Empty."

8. Locate materials, refueling locations, and equipment away from drainage pathways, waterways, and other sensitive areas to the maximum extent possible.

9. Identify and implement reasonable steps to be taken to prevent releases of liquid products from malicious tampering or vandalism.

10. Inspect secondary containment vessels, fuel hoses, lubrication equipment, hydraulically

operated equipment, oil drums, and other equipment and facilities regularly for drips, leaks, or signs of damage and maintain and store properly to prevent spills.

11. Any land-based equipment remaining on site overnight shall have appropriately placed drip pans.

12. During the purging of tanks and associated lines, procedures shall prevent the release of any fuels to the surface, surface water, catch basins, or soils within or surrounding the Work Area or any upland facility used for the Contract during performance of the Work.

13. Prevent discharges containing asphalt, grout, concrete, or other waste materials from reaching storm drains or the marine environment. This includes, but is not limited to, the following:

    a. Minimizing the washing of sand or gravel from new asphalt, debris from drilling or cutting, or other materials into storm drains and the marine environment by sweeping

    b. Applying fog seals, tack coats, or other coatings, if required, during periods when rainfall is unlikely to occur during application

    c. Cleaning equipment off site

    d. Protecting drainage structures with filter fences, if required

    e. Water displaced during tremie grout placement

14. Temporarily store waste materials in drums or other leak-proof containers after cleanup and during transport to disposal.

15. Dispose of waste materials at an approved and permitted Disposal Facility(ies) and obtain Certificates of Disposal.

16. Inspect fuel hoses, oil or fuel transfer valves and fittings, lubrication equipment, hydraulically operated equipment, and oil drums on a regular basis for drips, leaks, or signs of damage.

K. Spill Response:

1. Maintain at each Work Area during the duration of the Work for all Project phases, and restock as necessary to ensure an adequate and continuous supply, a spill kit containing the following materials at a minimum:

    a. Oil-absorbent booms: Four each, 5 feet long

    b. Oil-absorbent pads or bulk material, adequate for coverage of 200 square feet of surface area

    c. Oil-skimming system, if appropriate

    d. Sandbags

    e. Oil absorbent material, such as cat litter or sawdust, for material spills on land

    f. Oil dry-all gloves for use when performing the Work

    g. Plastic bags to collect the used material

2. Place spill kits near locations of chemical storage, fuel tanks, and fuel refilling stations. Identify the locations of spill kits on the SPCC Plan.

3. In the event of a spill: Immediately contain all visible pollutants on the water with booms, dikes, oil absorbent pads, or other appropriate means.

4. In the event of a spill: Immediately contain all visible pollutants on land using dikes, straw bales, sand bags, or other appropriate means and remove using sand, ground clay, cat litter, sawdust, or other absorbent material.

5. Remove oil sheens from water in secondary containment vessels prior to discharge into

state waters.

6. Temporarily store cleaned up waste materials in drums or other leak-proof containers after cleanup and during transport to disposal. Dispose of waste materials properly at an approved Disposal Facility(ies).

7. In the event of any oil or other chemical discharges into public waters, or onto land with a potential for entry into public waters, immediately notify the following agencies at their listed 24-hour response numbers:

   a. City of Portland Emergency Services Pollution Control Hotline (503) 823-7180

   b. U.S. Coast Guard Sector Columbia River (800) 424-8802

   c. Oregon Department of Emergency Management: (503) 378-2911

   d. National Response Center: (800) 424-8802

L. Equipment Fueling and Refueling Requirements:

1. All areas for fuel storage and refueling and servicing of construction equipment and vehicles shall be located at least 150 feet from any open water, with the exception of refueling of barge derricks, which can be refueled and serviced while in the water.

2. All equipment fueling operations shall utilize pumps, funnels, absorbent pads, and/or drip pans. The Contractor shall not drain and replace engine fluids at the Work Area.

3. Fueling shall not take place within 100 feet of any natural or human-made drainage conveyance, including ditches, catch basins, ponds, and pipes.

4. Fueling shall be restricted to designated fueling areas as accepted by the Project Representative as a part of the Spill Plan.

5. A spill kit will be located within 100 feet of the fueling operation.

3.09 AIR POLLUTION CONTROL

A. Implement the Air Pollution controls as detailed in the ANLMP and modify as required.

B. The Contractor shall implement the following air pollution mitigation measures and BMPs:

1. Do not discharge smoke, dust, or other contaminants into the atmosphere that violate the regulations of the authorities having jurisdiction. The Contractor shall prevent smoke, dust, engine exhaust fumes, or other contaminants from entering building spaces by directing them away from building intake plenums, building doors, or openings.

2. Provide preventative vehicle maintenance to ensure peak operating efficiency. When exhaust emissions are determined to be excessive by the Project Representative, the Contractor shall repair or replace equipment.

3. Employ effective fleet management by planning to minimize fuel consumption through efficient transportation routes, transfer of only full loads when feasible, selection of appropriately sized vehicles, and encouragement of low-carbon commuting and travel by workers.

4. Encourage use of clean diesel technologies (e.g., diesel oxidation catalysts, diesel particulate filters, partial diesel particulate filters, and selective catalytic reduction), alternative fuels (e.g., biofuels and biodiesel blends), and fuel additives (e.g., emulsified diesel).

5. Consider optimizing fuel efficiency by replacing aging vehicles with newer ones with more fuel efficient engines, deploying vehicles with high fuel efficiency for on-site and off-site activities, and utilizing alternative vehicles that use electric, hybrid gasoline/electric, or compressed natural gas fuel systems.

6. Limit engine idling time of on-road vehicles, including delivery and haul trucks, to 5 minutes maximum (not a requirement for heavy marine construction equipment).

7. Adjust upland traffic haul routes or vessel positioning, as needed.

8. Use electrically powered equipment where practicable.

9. Minimize dust nuisance by wetting excavation areas, unpaved traffic lanes, and soil stockpiles. The use of water in amounts resulting in mud on public streets is not acceptable as a substitute for sweeping or other methods. Make equipment for this operation available at all times.

10. Protect existing facilities and equipment from dust generated from the Contractor's activities.

11. Transport soils emitting odors off site as soon as possible.

12. Cover truck loads to prevent the escape of dust-bearing materials.

13. Cover stockpiles with plastic sheeting when loading and stockpiling activities are not occurring (i.e., inactive for a specified period of time) or if nuisance odors are encountered prior to transportation off site.

14. Use Work Area controls such as ceasing above-water excavation during high winds or limiting the number and size of excavations open at one time.

C. Additional methods for emission reduction controls and policies shall to comply with the Contractor's Green Remediation Plan include the following:

1. Contractor shall provide construction equipment that meets the following minimum EPA Tier engine requirements in table below, based on construction activity of the Project where the equipment is used. Air pollution compliance for the Project will be based on a required number of hours the construction equipment will operate at a specific required engine Tier [table below to be updated as part of Pre-Final 90% RD]:

CONSTRUCTION EQUIPMENT TYPE	CONSTRUCTION ACTIVITY(IES)	MINIMUM REQUIRED ENGINE TIER	REQUIRED USAGE AT REQUIRED ENGINE TIER (% OF TOTAL EQUIPMENT OPERATING HOURS WITHIN CONSTRUCTION EQUIPMENT TYPE)
Cranes	Demolition, Dredging, Material Placement	Tier 2 Engine	
Hydraulic Excavators	Dredging, Material Placement	Tier 2 Engine	
Tugboats, Push Boats, Work Boats	Transportation of Sediment and Clean Placement Materials, Surveying, Monitoring/Sampling Activities	Pre-Tier Engine	
Front-End Loaders	Miscellaneous Activities	Tier 2 Engine	
Trucks (On-road, Off-road)	Upland Transportation	Tier 4 Engine	
Train (Locomotive)	Upland Transportation	Tier 4 Engine	

3.10 NOISE CONTROL

A. Implement the Noise Controls as detailed in the ANLMP and modify as required.

B. Unless otherwise indicated through a noise variance, the Contractor shall comply with local controls and noise maximum permissible sound level rules, regulations, and ordinances that apply to Work performed.

C. Schedule noisy activities to minimize their duration, to the extent possible.

D. Noise-generating construction activities will be limited to standard working hours as defined in Section 01 14 00 (Work Restrictions) between the hours of 7:00 a.m. and 6:00 p.m., to reduce potential noise impacts to the community. The Contractor shall notify the Project Representative prior to conducting any planned noise-generating activities outside of the standard working hours associated with Project construction and obtain Project Representative approval per Section 01 14 00 (Work Restrictions).

E. Provide notification of special circumstances or emergency conditions that require Work beyond the hours specified as follows:

1. Notify the Project Representative and local authority in advance of any proposed extended Work hours for preauthorization. Include a written request for authorization per Section 01 14 00 (Work Restrictions) to perform Work specified and the circumstances that warrant this request. The Contractor shall include any additional measures to mitigate noise generated by this construction activity if deemed necessary by the Project Representative.

2. If an emergency situation occurs that warrants extended hours, the Contractor shall notify the Project Representative immediately upon determining the need for this Work.

F. Noise complaints received by the Project Representative during the Work will be shared with the Contractor. The Contractor shall work with the Project Representative, as required, to resolve noise related complaints. The Contractor shall modify the Noise Control Plan to reflect major changes.

G. The Contractor shall implement the following noise mitigation measures and BMPs:

1. Use electric or hydraulic tools and equipment as practicable.

2. Adjust noisy operations within the hours of Work.

3. Install individual noise barriers or enclosures around equipment.

4. Use the best available equipment and technology that assist in meeting noise requirements.

5. Provide equipment with properly sized and maintained mufflers and silencers as appropriate.

6. Use broadband alarms on equipment with backup alarms.

7. Limit engine idling time of on-road vehicles, including delivery and haul trucks, to 5 minutes maximum (not a requirement for heavy marine construction equipment).

8. Reduce vehicle speeds when transiting near residential areas (if applicable).

9. Phase Work to avoid high noise level equipment operating concurrently.

10. Potentially limit Work hours or certain activities in locations near residential or liveaboard occupancy.

3.11 VIBRATION AND SETTLEMENT CONTROL

A. Comply with Section 31 09 00 (Geotechnical Instrumentation, Condition Inspections, and Monitoring).

B. Coordinate construction activities with business operations within the Work corridor that may be sensitive to construction-related vibrations.

C. Limit construction activities around vibration-sensitive businesses or buildings. Where appropriate, use construction techniques that modify the propagation paths of the ground waves associated with vibration.

3.12 LIGHT CONTROL

A. The Contractor shall comply with light requirements, regulations, and local ordinances regarding light control while conducting activities at the Work Area.

B. Light-generating construction activities shall be limited to normal working hours (between the standard hours of 7:00 a.m. and 6:00 p.m. to the extent possible to reduce potential light impacts to the community.

C. The Contractor shall implement the following light control measures and BMPs:

1. Provide shielding to help direct light into the Work areas.
2. Provide light shrouds or barriers to help direct light into the Work areas.
3. Control glare.
4. Choose specific lamp types.
5. Choose downcast, rather than upcast, lights.
6. Reposition lighting equipment to avoid directing light outside of the immediate Work Area.
7. Re-sequence Work during the day (if feasible) to avoid Work outside of standard Work hours in areas more sensitive to light disturbance.
8. Reposition equipment, such as material barges or dredging equipment, relative to the lighting source.
9. Apply other appropriate means.

3.13 CULTURAL RESOURCES

A. An example of the AIDP is available as a reference document (refer to Appendix C of the RD CQA/QCP; in Section 01 13 00 – Reference Material). The Contractor shall prepare and comply with the Inadvertent Discovery Plan (see Attachment D.1 to the AIDP) and applicable local and state regulations.

B. The Contractor may encounter a cultural resource discovery during construction activities. According to the AIDP, examples of archaeological materials may include the following:

1. An accumulation of shell, burned rocks, or other food-related materials
2. Bones or small pieces of bone
3. An area of charcoal or very dark stained soil with artifacts
4. Stone tools or waste flakes (i.e., an arrowhead or stone chips)
5. Clusters of tin cans or bottles or logging or agricultural equipment that appear to be older than 50 years
6. Buried railroad tracks, decking, or other industrial materials
7. Historic structures, portions of historic structures, or associated utilities aged 50 years or older

C. Archaeological Monitoring:

1. If artifacts or other potential archaeological deposits are observed during dredging/excavation, the Contractor shall temporarily cease Work in the immediate vicinity while the archaeological monitor conducts a close inspection.
2. In the event that potentially significant archaeological deposits are discovered by the County's archaeological monitor, the monitor will coordinate with the Project Representative to direct the Contractor to cordon off the area within 30 feet of the discovery.

D. Contractor Responsibilities

1. If the Contractor, subcontractor, or any representatives on site believe that may have uncovered cultural materials (as defined in Paragraph 3.16.B of this Section), the Contractor shall immediately halt Work activities adjacent to the discovery, and the Contractor shall keep the discovery location secure at all times.

2. The Contractor shall immediately notify the Project Representative of the discovery.

3. Work in the protected area shall remain suspended until the Project Representative authorizes that the Work may resume.

3.14 FINES

A. Be responsible for all fines incurred from noncompliance with regulations of governing authorities.

END OF SECTION

SECTION 01 41 00

ENVIRONMENTAL REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01. SUMMARY

A. This Section outlines the regulatory requirements for in-water construction activities associated with dredging, contaminated sediment removal, and habitat restoration.

B. The Contractor shall comply with all applicable federal, state, and local environmental laws, permits, and regulatory agency requirements.

C. The Contractor shall coordinate with U.S. Environmental Protection Agency (EPA) to engage regulatory agencies as required and obtain all necessary approvals before commencing in-water work.

1.02. APPLICABLE REGULATIONS AND STANDARDS

A. The Contractor shall comply with all applicable federal regulations, including but not limited to:

1. Clean Water Act (CWA), Sections 401 and 404 – U.S. Army Corps of Engineers (USACE) and Oregon Department of Environmental Quality (DEQ)
2. Rivers and Harbors Act, Section 10 – USACE
3. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
4. Resource Conservation and Recovery Act (RCRA) – For handling and disposal of hazardous wastes
5. Endangered Species Act (ESA) – National Marine Fisheries Service (NMFS) and U.S. Fish & Wildlife Service (USFWS)
6. National Environmental Policy Act (NEPA) – If federal funding or approvals are involved
7. National Pollutant Discharge Elimination System (NPDES) Permits – Administered by Oregon DEQ
8. Coastal Zone Management Act (CZMA) – If project is within Oregon's coastal zone

B. The Contractor shall comply with Oregon state and local regulations, including but not limited to:

1. Oregon Removal-Fill Law (ORS 196.800 - 196.990) – Administered by Oregon Department of State Lands (DSL)
2. Oregon Water Quality Standards and Section 401 Water Quality Certification – Oregon DEQ
3. Oregon Hazardous Waste Regulations – If contaminated sediments are classified as hazardous
4. Oregon Statewide Planning Goals for Estuarine and Coastal Resources
5. Oregon Department of Fish and Wildlife (ODFW) Habitat Protection Guidelines

1.03. PERMITS AND APPROVALS

A. The Contractor shall obtain and comply with all required permits identified in the Contract Documents (see Section 01 13 00 Reference Material).

B. Copies of all permits shall be submitted to the Project Representative before the start of construction.

C. The Contractor shall comply with permit conditions throughout construction and provide periodic compliance reports.

1.04. COORDINATION WITH REGULATORY AGENCIES

A. The Contractor shall coordinate with EPA as EPA leads the coordination with:

1. USACE – Dredging and fill placement
2. Oregon DEQ – Water quality, hazardous waste, and sediment characterization
3. Oregon DSL – Removal-Fill compliance and access agreements for work performed on lands managed by DSL
4. ODFW – Aquatic species protection and habitat restoration
5. NMFS and USFWS – ESA compliance under the programmatic site-wide Biological Opinion

B. The Contractor shall coordinate directly with the City of Portland for work on City of Portland Property, work requiring temporary road closures, and work that affects City of Portland Infrastructure (e.g., city utilities including stormwater outfalls). EPA and Project Representative should be included in all correspondence between the Contractor and City of Portland.

C. The Contractor shall provide required notifications and facilitate inspections during construction.

1.05. ENVIRONMENTAL PROTECTION MEASURES

A. The Contractor shall implement Best Management Practices (BMPs) for dredging, sediment removal, and habitat restoration, in accordance with the Construction Quality Assurance Quality Control Plan (CQA/QCP) and as specified in the Construction Drawings.

1.06. COMPLIANCE MONITORING AND REPORTING

A. The Contractor shall conduct compliance monitoring in accordance with the CQA/QCP.

B. The Contractor shall participate in regulatory agency inspections and provide required documentation.

1.07. INCIDENT RESPONSE AND REPORTING

A. The Contractor shall develop and implement an emergency response plan for:

1. Spills of hazardous materials
2. Unauthorized discharges or permit violations

B. Any unpermitted discharge or violation shall be reported to EPA within the required timeframe an in accordance with the requirements of the CQA/QCP.

C. The Contractor shall take immediate corrective actions to mitigate impacts.

1.08. PROJECT CLOSEOUT

A. Upon completion of in-water work, the Contractor shall:

1. Submit final compliance documentation, including monitoring data and agency approvals, in accordance with the requirements of the CQA/QCP.
2. Remove all temporary containment measures (silt curtains, turbidity barriers, etc.)
3. Restore habitat features per Construction Drawings and regulatory requirements

END OF SECTION

SECTION 01 41 26

PERMITS, EASEMENTS, AND RIGHT-OF-ENTRY AGREEMENTS

PART 1 GENERAL

1.01. SUMMARY

A. This Section specifies permits, easements, and right-of-entry agreements requirements for the Project.

1.02. REFERENCED STANDARDS

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the EPA *Record of Decision* (EPA, 2017; see document in Section 01 13 00 – Reference Material); therefore, compliance with Applicable or Relevant and Appropriate Requirements (ARARs) for the Portland Harbor Superfund Site Swan Island Basin cleanup remedy is required. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 (Environmental Regulatory Requirements). In case of conflict between the requirements of this Section and those listed in Section 01 41 00 (Environmental Regulatory Requirements), the more stringent requirement shall prevail. No requirement in this Section shall be construed to contravene applicable laws and regulations. In the event that the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

B. Additional referenced standards applicable to this Section include, but are not limited to, the following:

REFERENCE	TITLE
33 CFR Part 105	Maritime Security: Facilities
ORS Chapter 459	Solid Waste Management
OAR 141-145	Access Authorization: Uses of state-owned submerged and submersible land
PCC 17.24.017	Temporary Street Closure Permits
PCC 17.44	Street Obstructions
City of Portland	Traffic Design Manual – Volume 2

Note:
CFR: Code Federal Regulations
OAR: Oregon Administrative Rules
ORS: Oregon Revised Statutes
PCC: Portland City Code

1.03. PERMITS

A. The Contractor shall obtain from the Authority Having Jurisdiction any permits required to perform the Contract Work outside of the Work Area, such as for the Contractor Transload Facility(ies) and Disposal Facility(ies) (as described in Section 35 24 20.01 – Transloading, Upland Transportation, and Disposal), Staging and Stockpile Area(s) and the Contractor's and Project Representative's field offices (as described in Section 01 52 00 – Construction Facilities). The Contractor shall obtain the needed permits in accordance with Section 00 72 00 (General Terms and Conditions) and Article 1.05 of this Section.

1.04. EASEMENTS AND RIGHT-OF-ENTRY AGREEMENTS

A. The Contractor shall coordinate with the Project Representative and SIB property owners and operators to conduct dredging; Survey Monitoring, Pre-Construction Structural Condition Inspection, and Post-Construction Structural Condition Inspection in accordance with Section 31 09 00 (Geotechnical Instrumentation and Condition Inspections); and other remedial actions. The Contractor shall inform them of Work Area access needs as the Contractor develops its Remedial Action Work Plan (RAWP; refer to Section 01 11 00 – Summary of Work) and Draft Project

Schedule (refer to Section 01 32 16 – Construction Progress Schedules). Property owners may identify preferred periods of access (to reduce business impacts) during negotiations with the Contractor, which shall be incorporated as needed into the RAWP.

1. The Project Representative will negotiate draft easements and/or right-of-entry agreements with associated draft exhibits detailing anticipated construction operations and needs. The Project Representative will acquire final easements and/or right-of-entry agreements before construction begins at the affected facilities at no additional expense to the Contractor. Because construction schedules are subject to change over the Project duration, final access agreements may be executed (or revised) as the construction schedule becomes firm at each affected facility.
2. Contacts for the affected property owners will be provided to the Contractor prior to the start of Work.
3. Copies of the easements and right-of-entry agreements obtained by the Project Representative will be provided to the Contractor prior to the start of the applicable Work at each affected facility. Unless otherwise indicated, the terms, conditions, and requirements of all easements and right-of-entry agreements are requirements of this Contract, and the Contractor shall comply with the terms, conditions, and requirements contained in each easement and right-of-entry agreement.
    a. Should site access timing and conditions identified in the final agreements be different than the Baseline Project Schedule accepted by the Project Representative, the Contractor may work with the Project Representative to change the Project Schedule and request equitable adjustment, if determined to be appropriate by the Project Representative.

B. The Contractor shall comply with the requirements of each easement and right-of entry agreement as required in Section 00 72 00 (General Terms and Conditions) and shall account for such compliance for the purposes of bidding.

1.05. PERMITS, EASEMENTS, AND RIGHT-OF-ENTRY AGREEMENTS OBTAINED BY THE CONTRACTOR

A. The Contractor shall provide and certify that it has obtained all necessary permits to complete the Work as part of its RAWP submittal, including but not limited to development of the Contractor Transload Facility(ies), Staging and Stockpile Area(s), Disposal Facility(ies) and establishment of the Project Representative field office and Contractor field office. For any Contractor-provided facilities (such as the Contractor Transload Facility(ies), located on site or off site), permits and approvals are required to operate these facilities for the Project, as described in Paragraph 1.05.C of this Section. All space used for Staging and Stockpile Area(s) shall be within local land use and permitting requirements at the Contractor's expense.

B. The Contractor shall notify the Project Representative of and shall describe in the RAWP any additional easements and/or right-of-entry agreements needed by the Contractor to access other proposed locations where land-based construction activities would be conducted. It is the Contractor's responsibility to coordinate with the associated property owners as needed to obtain site access to perform the Work.

C. The Contractor's selected Transload Facility(ies) will be required to have appropriate permits, including but not limited to the following:

1. Solid Waste Facility Permit or certification that the Contractor's selected Transload Facility(ies) will be operated to comply with Oregon Revised Statutes (ORS) 468B and 466.
2. Industrial Stormwater General Permit
3. Discharge Authorization if connected to the sewer

D. The Contractor's selected Disposal Facility(ies) will be required to have appropriate permits, including but not limited to the following:

1. Solid Waste Disposal Site Permit
2. Compliance with applicable permits, as verified by an EPA Region 10 Off-Site Contact

E. The above permit lists are presented for Contractor convenience only. The Contractor shall be responsible for providing documentation that the selected Transload Facility(ies) and Disposal Facility(ies) are operating within their jurisdiction and in compliance with federal, state, and local regulations for the activities undertaken.

F. The Contractor shall include a dedicated activity for the Contractor to prepare, submit, and obtain each Contractor-obtained permit, easement, and/or right-of-entry agreement required to perform the Work in the Draft Project Schedule (as required in Section 01 32 00 – Construction Progress Documentation).

G. The Contractor shall prepare and submit to the proper authority or owner all information required for the issuance of such permit, easement, or right-of-entry agreement. The Contractor shall pay all costs thereof, including agency inspections and easement costs, unless specifically provided otherwise in the Contract.

H. The Contractor shall provide a copy of each permit, easement, and right-of-entry agreement to the Project Representative prior to pursuing any Work covered by the permit or easement.

I. The SIB RD Performing Parties established access agreements necessary to conduct the RD activities during the Pre-Design Investigation. Separate future access agreements will be required for all areas of RA operations. RA must also be coordinated with shoreline property owners and operators to minimize disruption to operations to the extent practicable.

J. The State of Oregon owns the submerged aquatic lands in the project area and manages them through the Oregon Department of State Lands (DSL). The placement of caps or in situ remedial technologies requiring long-term maintenance on state-owned lands will likely require an easement or access authorization from DSL, in accordance with OAR 141-145.

1.06. SUBMITTALS

A. Refer to Section 01 33 00 (Submittal Procedures).

B. Pre-Construction Submittals:

1. As part of the RAWP, the Contractor shall identify any permits, easements, and right-of-entry agreements to be obtained by the Contractor to be used during the duration of the Project

2. As part of the RAWP, the Contractor shall submit a copy of each Contractor-obtained permit, easement, and right-of-entry agreement for the proposed Contractor Transload Facility(ies) and Disposal Facility(ies) as described in this Section.

C. Construction Submittals:

1. A copy of each Contractor-obtained permit, easement, and right-of-entry agreement to be submitted to the Project Representative in advance of applicable Work conducted at the affected location

D. Post-Construction Submittal:

1. Easement releases

2. Written Construction Restoration Acceptance Form (Standard Form 01 XX XX-X; see Attachment A of Section 01 33 XXX – Standard Forms)

1.07. POSTING PERMITS AND EASEMENTS

A. Permits and easements, including those obtained by the Contractor, shall be posted at the Work Area.

1.08. CONSTRUCTION RESTORATION ACCEPTANCE FORM

A. Whenever Work is performed on property other than street right of way, submit to Project Representative a written Construction Restoration Acceptance Form (Standard Form 01 XX XX-X; see Attachment A of Section 01 33 XXX – Standard Forms) from the easement grantor or easement grantors agent for each property, parcel, or area certifying that the restoration of

structures and/or surfaces has been completed to the satisfaction of the property owner and that the owner has no claims for damages on account of such restoration.

B. The easement restoration acceptance shall comply with the requirements as set forth in the Construction Restoration Acceptance Form provided by the Project Representative. If, in the opinion of the Project Representative, the release is unreasonably withheld by the easement owner, the Project Representative may, at its sole discretion, not require the easement restoration acceptance to be completed.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION [NOT USED]

END OF SECTION

SECTION 01 45 00

QUALITY CONTROL

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies the requirements for the Contractor's quality control program (including coordination with material suppliers, testing agencies, and other entities that may be employed by the Project Representative), as well as the Contractor's duties and responsibilities during execution of the Work.

B. This Section includes requirements for preparation, review, and approval of the Construction Quality Assurance/Quality Control Plan (CQA/QCP).

1.02 DESCRIPTION OF WORK

A. Quality control services include inspections, tests, and related actions, including reports performed by Contractor, by independent agencies, and by governing authorities. They do not include contract enforcement activities performed by Project Representative.

B. The intent of this Section is to require the Contractor to establish a necessary level of quality control that will provide sufficient information to assure both the Contractor and Project Representative that the Specification requirements are being and have been met. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with Contract Document requirements.

C. Establish, provide, and maintain a CQA/QCP as specified herein, detailing the methods and procedures that will be taken to ensure all materials and completed construction elements conform to the Drawings, Specifications, and other requirements. Although guidelines are established and certain minimum requirements are specified herein and elsewhere in the Specifications, it is the responsibility of the Contractor to ensure that construction and construction quality control are accomplished in accordance with the stated purpose and Specifications as described herein.

D. Be prepared to discuss and present, at the Pre-Construction Meeting, an understanding of the quality control requirements. The Contractor shall not begin any construction until the CQA/QCP has been reviewed and accepted by the Project Representative.

E. No separate measurement or payment will be made for effort associated with quality control Work required in this Section. Work required to comply with this Section is considered incidental of all other activities described in the Contract Documents.

1.03 REFERENCED STANDARDS

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the EPA Record of Decision (EPA, 2017; see document location in Section 01 13 00 – Reference Material); therefore, compliance with Applicable or Relevant and Appropriate Requirements for the Portland Harbor Superfund Site cleanup remedy is required. The Work described in this Section will be conducted in accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 (Environmental Regulatory Requirements). In case of conflict between the requirements of this Section and those listed in Section 01 41 00 (Environmental Regulatory Requirements), the more stringent requirement shall prevail. No requirement in this Section shall be construed to contravene applicable laws and regulations. If the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

B. All pertinent laws, ordinances, rules, regulations, and codes shall govern construction activities at the Work Area.

C. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

REFERENCE	TITLE
ASTM D3740	(2019) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E329	(2021) Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
EPA SW-846 Update V	(2014) Test Methods for Evaluating Solid Waste: Physical/Chemical Methods Compendium

D. Other Referenced Standards:

1. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

2. Conform to the referenced standards by date of issue current on date of Contract Documents, except where a specific date is established by code.

3. Neither the contractual relationships, duties, nor responsibilities of the parties in the Contract, nor those of the RA Performing Parties, shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.04 DEFINITIONS

A. Refer to Section 01 11 00 (Summary of Work) for definitions related to the Contract Documents.

B. CQA/QCP: The Contractor shall submit a CQA/QCP (refer to Article 1.06 of this Section for details) describing the Contractor's means and methods by which completion of construction activities will be monitored for compliance with the Contract.

1.05 CONTRACTOR PERSONNEL REQUIREMENTS

A. All Contractor personnel shall be trained, experienced, and qualified to perform the tasks assigned to them.

B. Submit the qualifications of the proposed Contractor Quality Control Officer to the Project Representative for review and acceptance. The Project Representative reserves the right to reject the proposed Contractor Quality Control Officer or other key personnel for any reason.

1. The Contractor shall provide a Contractor Quality Control Officer who is acceptable to the Project Representative and who shall be the full-time Contractor Quality Control Officer for this Project.

2. The Contractor may not remove and replace the Contractor Quality Control Officer from the Project without submitting a formal request to the Project Representative. Any proposed replacement Contractor Quality Control Officer shall be accepted by the Project Representative before they can take over the role of Contractor Quality Control Officer.

3. The proposed Contractor Quality Control Officer shall have successfully completed three projects of similar type, complexity, and scope. Each project shall have managed contaminated sediment, involved dredging and upland disposal and/or engineered capping of contaminated sediment. The Contractor shall provide documentation of the Contractor Quality Control Officer's qualifications as required in this Section as part of the Pre-Construction Submittals.

1.06 SUBMITTALS

A. Refer to Section 01 33 00 (Submittal Procedures)

B. Pre-Construction Submittals:

1. Submit a detailed, written CQA/QCP, as part of the Remedial Action Work Plan, in conformance with the Specifications, for review and acceptance by the Project Representative.

2. The CQA/QCP will be used to document inspections, monitoring, surveys, and other actions to be taken by the Contractor to ensure that the Work complies with all Contract Document requirements. At a minimum, the CQA/QCP shall include the following information:

a. Identification of personnel, procedures, methods, instructions, and forms to be used to provide quality control and verification of the Work.

b. Contractor Quality Control Officer personnel qualifications (as described in Article 1.05 of this Section).

c. Identification of Quality Control Records (as described in Article 3.01 of this Section).

d. Description of document control procedures: The following types of documents shall be on controlled distribution to ensure that changes to them are transmitted and received when applicable:

1) Manuals

2) Instructions

3) Procedures

4) Specifications

5) Drawings

6) Inspection and test plans

7) Field change requests

e. Description of the quality control organization (as required in Article 1.07 of this Section), including an organization chart showing the various quality control team members along with their designated responsibilities and lines of authority. At a minimum, the Contractor shall identify the following key personnel:

1) Contractor Quality Control Officer.

2) Contractor Site Health and Safety Officer.

3) Professional Land Surveyor (third party firm the Contractor has hired to perform measurement and payment surveys).

4) Transportation and Disposal Coordinator.

5) Other key personnel deemed necessary by the Contractor for the successful implementation and completion of this Work.

f. Description of procedures for describing and communicating quality control testing and related data with the Project Representative.

g. Quality control methods and procedures to ensure compliance with the Specifications.

h. Acknowledgement that the quality control staff will conduct inspections for all aspects of the Work specified and shall report to the Contractor Quality Control Officer or someone of higher authority in the Contractor's organization.

i. The name, qualifications, duties, responsibilities, and authorities of each person assigned a primary quality control function.

j. A summary of the delegated responsibilities of the Contractor Quality Control Officer signed by an authorized official of the firm.

k. Procedures for scheduling and managing submittals, including those of subcontractors, off-site fabricators, and material suppliers.

l. Testing methods, schedules, and procedures used to report quality control information to the Project Representative, including samples of the various reporting forms.

m. A description of the personnel and/or methods used for maintaining the daily records and reporting required to be completed as part of the Project records.

3. The Contractor is encouraged to add any additional elements to the CQA/QCP deemed necessary to adequately control all production and/or construction processes required by this Contract.

C. Construction Submittals:

1. A Daily Construction Report recording daily quality control activities.

2. A Weekly Construction Report summarizing weekly quality control activities.

D. Post-Construction Submittals:

1. The Contractor shall submit the Contractor's Annual Construction Summary Report for the Work completed in each Construction Work Period related to this Section, as described in Section 01 78 39 (Project Record Documents). The Contractor's Annual Construction Summary Report shall include the summary of the Work completed under this Section, including all Quality Control Records maintained in the Contractor's Work Area files. Upon completion of the Contractor's contractual activities, these files shall be turned over to the Project Representative.

1.07 QUALITY CONTROL ORGANIZATION

A. Contractor Quality Control Officer: As part of the CQA/QCP, the Contractor shall identify an individual within the Contractor's organization, located at the Work Area, who is responsible for overall quality control management for the Contract and has the authority to act in all quality control matters for the Contractor.

B. Personnel: As part of the CQA/QCP, the Contractor shall identify staff that shall be maintained under the direction of the Contractor Quality Control Officer to perform all quality control activities. The actual number of the staff during any specific work period may vary to cover shift needs and rates of performance. The personnel of this staff shall be fully qualified by experience and technical training to perform their assigned responsibilities and shall be directly hired for the work by the Contractor.

C. Submit the qualifications in resume format of the personnel identified in this Section as part of the CQA/QCP.

1.08 INSPECTION

A. Allow the Project Representative access to the Work being performed. If part of the Work is in preparation at locations other than the Work Area (e.g., Staging and Stockpile Area[s], Contractor Transload Facility[ies], or Disposal Facility[ies]), the Contractor shall plan for access to such Work whenever and wherever it is in progress.

B. Give timely notice requesting inspection if Work is designated for special tests, inspections, or reviews by the Project Representative's instructions.

C. If the Contractor covers, or allows to be covered, Work that has been designated for special tests, inspections, or reviews before such is made, the Contractor shall uncover such Work, have inspections or tests satisfactorily completed, and make good such Work.

1.09 INDEPENDENT INSPECTION AND TESTING

A. Independent inspection/testing agencies will be engaged by the Project Representative, on behalf of the RA Performing Parties, for the purpose of inspecting or testing portions of the Work, as applicable. The cost of such services will be borne by the RA Performing Parties.

B. Procedures:

1. Notify the Project Representative in advance of requirements for inspections or testing so that attendance arrangements can be made.

2. Submit samples or materials required for inspection or testing, as requested in the Specifications. The Contractor shall submit with reasonable promptness and in orderly sequence to avoid causing delays in Work.

3. Provide labor and facilities to obtain and handle samples and materials at the Work Area, Staging and Stockpile Area(s), and Contractor Transload Facility(ies). The Contractor shall provide sufficient space to store samples as necessary.

4. Complete required materials testing as described in the Specifications for which the Work applies. Results of laboratory testing shall be reviewed by the Project Representative to determine compliance with the requirements of the Work.

C. Employment of inspection/testing agencies does not relieve the Contractor's responsibility to perform Work in accordance with Contract Documents.

D. Access to the area necessary to perform the testing and/or to secure the material for testing shall be provided by the Contractor.

E. If defects are revealed during inspection or testing, additional inspection or testing will be required to ascertain the full degree of defect. The Contractor shall correct defects and irregularities as advised by the Project Representative at no extra cost to the RA Performing Parties. The Contractor shall pay costs for retesting and reinspection as necessary.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION

3.01 DOCUMENTATION

A. Quality Control Records are documents that have been reviewed and accepted by the Contractor as complete, correct, and legible. Specific Contractor Quality Control Records required for the Contract shall include, but are not necessarily limited to, the following records:

1. Drawings, Specifications, procedures used for construction, procurement documents, inspections, and test records

2. Submittals

3. Personnel and procedure qualification records

4. Material, chemical, and physical property test results

5. Certificates of Compliance and shipment releases

6. Disposal Facility(ies) certified weight tickets

7. Contractor on-site weight scale reports

8. Noncompliance reports and corrective action

B. The Project Representative shall be provided access to the Quality Control Record when requested.

3.02 CORRECTIVE ACTION REQUIREMENTS

A. The CQA/QCP shall indicate the appropriate action to be taken when a process is deemed or believed to be out of control (out of tolerance) and detail what action will be taken to bring the process into control.

B. Comply with specified standards as minimum quality for the Work, except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

C. Perform Work by persons qualified to produce required and specified quality.

D. Verify field measurements are as indicated on shop drawings or as instructed by the manufacturer.

E. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

F. Be familiar with pertinent codes and standards:

1. In procuring all items used in this Work, it is the Contractor's responsibility to verify the detailed requirements of the specifically named codes and standards and to verify that the items procured for use in this Work meet or exceed the specified requirements.

3.03 QUALITY CONTROL – CONTROL OF DREDGING

A. The CQA/QCP shall indicate the inspection and control methods the Contractor will use to assure compliance with Dredging design:

1. Dredge prism elevation.

2. Dredge prism completeness for the Dredge Certification Units (DCU) to be completed in each Work Period.

3. Post-dredge sediment concentrations.

3.04 QUALITY CONTROL – CONTROL OF RIVERBANK WORK

A. The CQA/QCP shall indicate the inspection and control methods the Contractor will use to assure compliance with Riverbank remediation requirements:

1. Post-excavation soil concentrations

2. Geotextile material placement is in accordance with material supplier instructions

3. Soil cover thickness

4. Soil cover material chemistry/composition

5. Finished grading depth/elevations

6. Vegetation type, placement, and installation

7. Vegetation establishment post-construction

3.05 QUALITY CONTROL – CONTROL OF CAPPING SYSTEM INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, Work Area conditions, and workmanship to produce work of specified quality.

B. Comply with capping and erosion protection layer material placement, including each step in sequence.

C. The CQA/QCP shall indicate the inspection and control methods the Contractor will use to assure compliance with Riverbank remediation requirements:

1. Cap material chemistry (ex situ)

2. Cap thickness and layer mixing

3. Armor layer thickness

4. Cap evaluation using physical and hydrographic surveys at completion of Capping Certification Unit

5. Armor layer elevation/thickness using physical and hydrographic surveys at completion of Capping Certification Unit

3.06 OVERSIGHT BY THE PROJECT REPRESENTATIVE

A. All items of material and equipment shall be subject to oversight by the Project Representative at the point of production, manufacture, or shipment to determine if the Contractor, producer, manufacturer, or shipper maintains an adequate quality control system in conformance with the requirements detailed herein and the applicable Specifications and Drawings. In addition, all items of materials, equipment, and Work in place shall be subject to inspection by the Project Representative at the Work Area for the same purpose.

B. Rejection of noncomplying items by the Project Representative:

1. The Project Representative reserves the right to reject items incorporated into the Work that fail to meet the specified minimum requirements. The Project Representative further reserves the right, and without prejudice to other recourse the RA Performing Parties may take, to accept noncomplying items subject to an adjustment in the Awarded Contract Price as approved by the Project Representative.

C. To facilitate oversight by the Project Representative, the Contractor shall plan for the Project Representative access to any equipment at their request while the Work is being performed.

D. In cases of dispute, decisions as to standard or quality of Work rest solely with the Project Representative, whose decision is final.

E. Oversight by the Project Representative does not relieve the Contractor of performing quality control inspections or testing of either the on-site or off-site Contractor's or subcontractor's Work.

3.07 NONCOMPLIANCE

A. The Project Representative will notify the Contractor of any noncompliance with any of the foregoing requirements. After receipt of such notice, immediately take corrective action. Any notice, when delivered by the Project Representative or their authorized representative to the Contractor or their authorized representative at the Work Area, shall be considered sufficient notice.

END OF SECTION

SECTION 01 52 00

CONSTRUCTION FACILITIES

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies the Contractor's temporary construction facilities for Swan Island Basin (SIB) Project Area (Work Area) Remedial Action (RA) and access to the Work Area locations. It includes temporary utility connections, temporary roads, and related items.

1.02 DESCRIPTION OF WORK

A. Construction facilities for the Project include the following:

1. Establishment of any and all material handling areas including Loading, Unloading Staging and Stockpile Area(s)
2. Temporary utilities: Power, heating, ventilation, telephone, water, sanitary facilities and lighting for Work Site offices and temporary structures
3. Work Site access control: concrete barriers, fencing, and security
4. Miscellaneous related items: contractor parking, staging, cleaning, Project signage, and Contractor office
5. Temporary roads: access roads for staging areas, upland excavation access

B. Locations for temporary construction facilities, Staging and Stockpile Area(s), temporary utility connections, and temporary facilities shall be identified and provided by the Contractor as part of the Construction Site Plan, as described in Article 1.04 of this Section.

C. The Contractor shall install, maintain, and operate all temporary construction facilities and controls as long as needed for the safe and proper completion of the work for the project. The Contractor shall decommission all in-water temporary construction facilities and controls at the end of Work Periods. Shoreline and upland facilities may be maintained by the Contractor, if Contractor makes agreements with property owners.

D. Unless otherwise noted, the Contractor shall be responsible for all costs for utility usage and permitting associated with the requirements of this Section.

E. Unless otherwise noted, the RA Performing Parties will not furnish any materials, facilities, utilities, or services.

F. Work under this Section is paid under Bid Item No. XXX– Work Site Preparation and Temporary Facilities Setup and Operations [EXPAND TO INCLUDE BID ITEMS FOR ALL CONSTURCTION PERIODS], as shown on the Bidding Schedule and described in Section 01 29 00 (Measurement and Payment).

G. Details regarding environmental procedures and protection measures associated with temporary construction facilities are described in Section 01 35 43 (Environmental Procedures).

1.03 REFERENCED STANDARDS

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the EPA Record of Decision (ROD) (EPA, 2017); therefore, compliance with Applicable or Relevant and Appropriate Requirements (ARARs) for the SIB Project Area within the Portland Harbor Superfund Site (PHSS) cleanup remedy is required. See Section 01 13 00 – Reference Material for additional information on the ROD. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 - Environmental Regulatory Requirements. In case of conflict between the requirements of this Section and those listed in Section 01 41 00 - Environmental Regulatory Requirements, the more stringent requirement shall prevail. If the Contractor identifies a more

stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

B. Additional referenced standards applicable to this Section include, but are not limited to, the following:

REFERENCE	TITLE
PCC Chapter 19.16.305	Closing and Lighting Docks and Wharves
Oregon OSHA Chapter 437 Division 3	Rules for the Administration of Oregon Safe Employment Act - Construction
ASTM A392-06	Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric
City of Portland	Traffic Design Manual – Volume 2

Notes:
PCC: Portland City Code
Oregon OSHA: Oregon Occupational Safety and Health Division: Oregon Administrative Rules
ASTM: ASTM International

1.04 DEFINITIONS

A. Refer to Section 01 11 00 (Summary of Work) for definitions related to the Contract Documents.

B. Staging and Stockpile Area(s): The Staging and Stockpile Area(s) will potentially be located [TBD in Pre-Final 90% RD] where the Contractor may stage equipment and imported clean materials. Stockpiling of Dredged Material, Incidental Debris, Identified Debris, and extracted Piling is prohibited within the Staging and Stockpile Area(s).

1.05 SUBMITTALS

A. Refer to Section 01 33 00 (Submittals) for all submittals and associated timelines related to the Contract Documents.

B. Construction Site Plan

1. Submit a Construction Site Plan within the Contractor's RA Work Plan (RAWP) prior to commencement of work that includes the following details: a site plan showing the locations and dimensions of temporary facilities (including layouts and details, equipment and material storage area (onsite and offsite), and access and haul routes, avenues of ingress/egress to the fenced area and details of the fence installation. Indicate if the use of a supplemental or other staging area is desired. Show locations of safety and construction fences, site trailers, construction entrances, trash dumpsters, temporary sanitary facilities, and worker parking areas. The plan shall also include grading, including contours, required to construct temporary facilities Provide temporary facilities drawings to illustrate the layout and dimensions of all temporary facilities, including fencing, ingress, and egress locations. Provide temporary utility connection locations. The plan shall also provide methods for temporary facilities maintenance and security

2. The Contractor shall not begin temporary facilities construction until receiving the Project Representative's acceptance of the Construction Site Plan including access and any required traffic controls. The Project Representative will provide notification to start these pre-construction activities related to this Section (refer to Section 01 11 00 – Summary of Work).

C. Traffic Control Plan

1. The Traffic Control Plan shall detail routes that shall be used for deliveries of equipment and imported materials to the Site. This plan shall also detail locations of temporary haul roads, construction entrances for the site, and alternate access driveways for adjacent businesses as needed. The Traffic Control Plan shall ensure that adverse impacts to local properties adjacent to the Site from movement of vehicles are minimized during construction by identifying methods that shall be used to ensure minimization of disruption to local traffic patterns, including risks to pedestrians and motorists adjacent to the work site. The Traffic Control Plan shall include detail to ensure compliance with

EPA's Clean Diesel requirements, or reference the Contractors Green Remediation Plan, also included in RAWP. Refer to section 01 55 26 – Traffic Control for additional requirements.

PART 2 PRODUCTS

2.01 TEMPORARY SIGNAGE

A. Bulletin Board

1. Within one calendar day of mobilization on site and prior to the commencement of Work activities, provide a clear weatherproof covered bulletin board not less than 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, Wage Rate Information poster, Safety and Health Information, and other information approved by the Project Representative. Locate the bulletin board at the Work Area in a conspicuous place easily accessible to all employees, as approved by the EPA. For additional signage requirements refer to section 01 58 13 – Temporary Project Signage

B. Warning Signs

1. Post temporary signs, tags, and labels to give workers and the public adequate warning and caution of construction hazards. Attach signs to the perimeter fencing every 150 feet warning the public of the presence of potential area hazards. Signs must require unauthorized persons to keep out of the work site. For additional signage requirements refer to section 01 58 13 – Temporary Project Signage.

2.02 TEMPORARY TRAFFIC CONTROL

A. Haul Roads

1. Construct access and haul roads necessary for proper implementation of the work under this contract in accordance with the Contractor's approved Construction Site Plan and Traffic Control Plan. Construct with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided. Submit the Traffic Control Plan for approval within the Construction Site Plan. Provide necessary lighting, signs, and distinctive markings for the safe movement of traffic. The method of dust control, although optional, must be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads, temporary construction entrances, and alternate access driveways for adjacent residents are subject to approval by the Project Representative. Refer to section 01 55 26 – Traffic Control for additional requirements.

2.03 TEMPORARY FENCING

A. Place temporary fencing during the entire duration of construction around the temporary construction facilities and the Work Area as needed in coordination with the Project Representative to enclose the areas of construction and prevent unauthorized entry to construction areas. The temporary chain link fencing shall conform to ASTM A392-06 requirements and shall be a minimum of 6-feet in height. Gates shall be provided at access points where required, and these shall be kept locked during off-work hours. A lock key or lock combination shall be provided to the Project Representative. Refer to section 01 56 00 – Temporary Barriers and Enclosures for additional requirements.

B. Chain Link Panel Fencing

1. Temporary panel fencing must be galvanized steel chain link panels 6 feet high. Multiple fencing panels may be linked together at the bases to form long spans as needed. Each panel base must be weighted down using sand bags or other suitable materials in order for the fencing to withstand anticipated winds while remaining upright. Fencing must remain rigid and taut with a minimum of 200 pounds of force exerted on it from any

direction with less than 4 inches of deflection. Fencing must have fabric screen. Chain link fence fabric shall have a minimum breakload of 740 pounds. Refer to section 01 56 00 – Temporary Barriers and Enclosures for additional requirements.

C. Concrete Barriers

1. Erect and maintain concrete barriers to limit access to excavations and hazardous areas, to protect existing facilities from damage during construction and demolition operations, and at locations identified in the Temporary Facilities and Control Plan.

2.04 ADMINISTRATIVE FIELD OFFICES

A. Provide and maintain administrative field office facilities within the construction area at the designated site. Review the Office plans with the Project Representative before installation. Unless otherwise directed by the Project Representative, remove the building(s) from the site upon completion and acceptance of the work.

B. Copies of the Drawings, Specifications, and Site-Specific Health and Safety Plan per Section 01 35 29 (Health, Safety, and Emergency Response Procedures); regulatory required items; and other Contract Documents shall be kept at the Administrative Field Offices and available for use at all times.

C. If the Contractor's office is located in the Work Site, the Contractor's office shall be equipped with energy efficient lighting, Energy Star-rated appliances and electronics, and WaterSense-rated water fixtures.

D. Temporary Work Site facilities must present a clean and neat exterior appearance and be in a state of good repair. Maintain the temporary facilities. Failure to do so will be sufficient reason to require their removal at the Contractor's expense.

2.05 SANITARY FACILITIES

A. Provide toilet and wash-up facilities for the crew and subcontractors at the Work Area. Comply with applicable laws, ordinances, and regulations pertaining to the public health, sanitation, and access.

2.06 POWER

A. Connect to existing or new utility owned power service.

B. Provide power requirements and coordinate with the electrical utility for power takeoff points, voltage and phasing requirements, transformers, and metering installation.

C. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required. The Contractor shall provide flexible power cords as required.

2.07 TEMPORARY LIGHTING

A. Provide and maintain fluorescent/LED lighting for construction operations to achieve minimum lighting levels required by the Safety Standards for Construction Work (Oregon OSHA Chapter 437 Division 3 1926.56).

B. Maintain lighting and provide routine repairs.

2.08 HEATING, COOLING, AND VENTILATION

A. Provide and pay for temporary heating, cooling, and ventilating of the temporary construction facilities as necessary to maintain safe conditions for construction operations, protect Work and material against damage by dampness and cold, and facilitate completion of the Work.

B. Supply the fuel, equipment, and materials required for temporary heating, cooling, and ventilating Prior to operation of temporary equipment for heating, cooling, or ventilating purposes, the Contractor shall verify that installation is approved for operation, equipment is lubricated, and filters are in place. The Contractor shall provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

C. Maintain strict supervision of operation of temporary heating and ventilating equipment to do the following:

1. Conform with applicable codes and standards.
2. Enforce safe practices.
3. Prevent abuse of services.
4. Prevent damage to finishes.
5. Vent direct-fired combustion units to outside.

D. Be responsible for damage to Work due to failure to provide adequate heat and protection during construction.

2.09 COMMUNICATIONS AND CELLPHONE SERVICE

A. Provide, for the Contractor's own use, its own cell phone and data services at the Contractor's Work Area office.

B. Provide standalone Wi-Fi network for use of Contractor's and Project Representative's personnel. Network access must be available throughout the jobsite and for the entire Contract period. The Contractor and Project Representative will use the Wi-Fi service for coordination in the field and related activities.

2.10 WATER SERVICE

A. Provide and maintain suitable quality water service required for construction operations, in addition to all necessary water, piping, and special connections to an existing water supply.

1. The Contractor will be responsible for fees for construction Work activities associated with water usage and disconnecting, reconnecting, or installing water mains, services, and meters.
2. Provide backflow preventers for any connections to municipal or domestic water lines.

2.11 BACKFLOW PREVENTER

A. Only State of Oregon Department of Human Services and Portland Bureau of Water Works approved backflow preventer assemblies may be installed. Applicable backflow assembly installation requirements must comply with both the Oregon Administrative Rules Chapter 333 and City of Portland Bureau of Water Works Title 21.

2.12 FIRE PROTECTION

A. Provide adequate firefighting equipment to contain an equipment fire. Make available and accessible at the Work Site.

B. Provide fire protection as required by Oregon Administrative Rules, Division 3, Chapter 437, Subdivision F, for building construction and demolition.

C. Remove debris and flammable materials weekly to minimize potential hazards.

PART 3 EXECUTION

3.01 RESPONSIBILITIES

A. Ensure that all subcontractors, suppliers, and individuals associated with Contract activities use accepted daily travel routes.

B. Provide required signage and Contractor oversight for accepted upland haul routes to ensure compliance with local traffic routing requirements and environmental controls during transportation as defined in Section 01 35 43 (Environmental Procedures). If the Contractor fails to abide by the accepted upland haul routes and controls, the Project Representative will assign

alternative enforcement personnel of truck haul route restrictions at the expense of the Contractor.

C. Inspect truck haul routes daily to assure compliance with Section 01 55 26 (Traffic Control).

3.02 IMPROVEMENT, MAINTENANCE AND RESTORATION OF TRUCK HAUL ROUTES

A. Be responsible for any improvements, maintenance, and restoration of truck haul routes related to construction use.

B. Share truck haul routes with business traffic and maintain in good condition. Truck haul routes shall remain smooth, level, and suitable for the public to drive passenger cars on without damage to vehicles. If pavement damage is minor due to the Contractor's Work, plane existing asphalt and resurface. If pavement damage is major due to the Contractor's Work, remove existing asphalt and replace with a minimum of 4 inches of asphalt.

C. Restore truck haul routes to their initial condition after they are no longer needed for construction purposes.

3.03 CONTRACTOR'S PROVIDED-SECURITY

A. Provide security and facilities to protect the Work, all temporary construction facilities, and existing facilities from unauthorized entry, vandalism, or theft.

B. Ensure the security of neighboring facilities in the event that construction activities endanger those facilities or commodities.

C. Abide by special requests of security personnel and Police and Fire Departments.

D. Verify all Work Site access and security requirements for the different Work Site areas with the Project Representative.

E. Notify the U.S. Coast Guard (USCG) as required to comply with USCG, Maritime Security, and other regulations for operating within the Swan Island Basin. All costs associated with implementation of required security measures will be considered incidental to the Contract and should be included in the Contractor's Bid.

3.04 CONTRACTOR OFFICE, PARKING, AND STAGINGE AREAS

A. Location(s) of the Office Building, parking, and Staging and Stockpile Area(s) shall be shown in the Temporary Facilities and Control Plan.

B. The Contractor shall be responsible for obtaining and maintaining parking and staging areas unless otherwise specified.

3.05 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. The Contractor shall maintain the Work Site in a clean and orderly condition.

B. Collect and remove waste materials, debris, and rubbish from the Work Site and dispose off site in a legal manner.

3.06 USE AND OCCUPANCY

A. Materials Storage, Staging, and Parking

B. The Contractor shall provide space for the storage of materials and provide the location of the storage and staging areas in the Temporary Facilities and Control Plan.

C. Contractor employee parking will be confined to the areas shown in the Temporary Facilities and Control Plan.

D. The Contractor shall be allowed additional space for the storage of materials and the pursuance of Work under this Contract in areas accepted by the Project Representative.

E. Limit storage of materials, tools, and other items necessary to the Work to areas within the Project boundaries. Items stored outside the designated areas shall be prohibited without prior acceptance of the Project Representative.

3.07 MAINTENANCE OF TRAFFIC AND TRAFFIC CONTROL

A. Conduct the Work to interfere minimally with public travel, whether vehicular or pedestrian.

B. Refer to Section 01 55 26 (Traffic Control) for requirements associated with traffic control and associated procedures.

3.08 HAUL ROUTE(S)

A. The Contractor shall identify and propose truck haul routes in the Construction Site Plan, subject to acceptance by the Project Representative, beyond those shown on the Drawings.

B. Upland haul routes shall be operated in a manner to minimize impacts to residential neighborhoods to the extent practicable. Refer to the Drawings for pre-approved Work Site access for use by construction trucks.

C. All traffic controls, maintenance, signage, and safety operations associated with the proposed trucking haul routes shall comply with the requirements of Section 01 55 26 (Traffic Control).

3.09 RESTORATION OF ROADS

A. Clean and repair any damage to road surfaces used by the Contractor from the direct or indirect result of the Contractor's operations as required during and completion of the Work, to the requirements of the Project Representative.

B. Unless otherwise noted, resurface paved roadways, and bring to original grade and section roads that are not paved, where the surface has been removed, broken, damaged, caved, or settled during the Work.

3.10 RESTORATION OF STORAGE AREA

A. Upon completion of the project, remove the bulletin board, signs, barricades, haul roads, and any other temporary products from the site. After removal of trailers, materials, and equipment from within the fenced area, remove the fence. Restore areas used during the performance of the contract to the original or better condition. Remove gravel used to traverse grassed areas and restore the area to its original condition, including topsoil and seeding, as necessary.

3.11 GENERAL ACCESS TO WORK SITE

A. The Contractor will have access to the Work Site via water from Swan Island Basin and via land from North Basin Avenue.

3.12 ROAD CLOSURES

A. Temporary detours and road closures due to work of others shall be anticipated by the Contractor. The Contractor is responsible for planning and coordinating all its operations to work with possible temporary detours and road closures.

B. Contractor is responsible for all additional costs resulting from temporary road closures.

3.13 PRIVATE ACCESS

A. The Project Representative will obtain easements and right-of-entry agreements necessary to conduct Work, prior to the start of the applicable Work at each affected facility, as described in Section 01 41 26 (Permits, Easements, and Right-of-Entry Agreements).

B. The Contractor may identify the need to obtain additional permits, easements, and/or right-of-entry agreements to conduct the Work as part of the RAWP and in accordance with Section 01 41 26 (Permits, Easements, and Right-of-Entry Agreements), in which case the access shall be

maintained by and at the expense of the Contractor. Contractor shall notify Project Representative of any access agreements necessary to the Work.

C. The Contractor shall comply with all requirements of Section 01 41 26 (Permits, Easements, and Right-of-Entry Agreements).

3.14 CONSTRUCTION SIGNS

A. Commercial or advertising signs shall not be allowed in the Work Site.

B. Erect and maintain all construction signs.

3.15 BARGE STAGING AND VESSEL TRAFFIC

A. Refer to Section 01 31 00 (Project Management and Coordination) for requirements associated with barge staging and marine traffic control procedures.

END OF SECTION

SECTION 01 55 26

TRAFFIC CONTROL

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies the requirements for upland traffic control during construction activities, including but not limited to material delivery, upland excavation, surveying and monitoring, and upland disposal, and for submittal of the Traffic Control Plan.

1.02 DESCRIPTION OF WORK

A. The Contractor is responsible for notification schedules, upland traffic control equipment (such as temporary barricades, signs, flaggers, lights, road surfaces, detours, and maintenance) and other safeguards necessary to protect life and related health and safety as specified in this Section.

B. No separate payment will be made for effort associated with Work described in this Section. Work required to comply with this Section is considered incidental to the Work described in the Contract Documents.

1.03 REFERENCED STANDARDS

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the EPA Record of Decision (ROD) (EPA, 2017); therefore, compliance with Applicable or Relevant and Appropriate Requirements (ARARs) for the Swan Island Basin (SIB) Project Area within the Portland Harbor Superfund Site (PHSS) cleanup remedy is required. See Section 01 13 00 – Reference Material for additional information on the ROD. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 - Environmental Regulatory Requirements. In case of conflict between the requirements of this Section and those listed in Section 01 41 00 - Environmental Regulatory Requirements, the more stringent requirement shall prevail. If the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

B. Additional referenced standards applicable to this Section include, but are not limited to, the following:

REFERENCE	TITLE
City of Portland	Traffic Design Manual – Volume 2
City of Portland	Transportation System Plan Chapter 3: Street Classifications
MUTCD	U.S. Department of Transportation, Federal Highway Administration: Manual on Uniform Traffic Control Devices, Part VI "Work Zone Traffic Control Standards and Guidelines"
ODOT	Traffic Manual, June 2024 Edition
ODOT	Traffic Control Plan Design Manual, January 2024 Edition
PCC 16.20.550	Travel Lane Parking Permit
PCC 17.44.020	Street Obstructions
TRN-2.08	Traffic Control Plan Rules and Procedures

Notes:
MUTCD: Manual on Uniform Traffic Control Devices
ODOT: Oregon Department of Transportation
PCC: Portland City Code

1.04 SUBMITTALS

A. Refer to Section 01 33 00 (Submittal Procedures).

B. Pre-Construction Submittals

1. The Contractor shall submit a Traffic Control Plan in accordance with the requirements of this Section.

2. Submit an initial Notification Plan and initial Notification Schedule, as part of the Traffic Control Plan.

C. Construction Submittals

1. Submit updated Notification Plan and Notification Schedule as part of Progress Meetings, as described in Article 1.8 of this Section.

1.05 TRAFFIC CONTROL PLAN

A. Comply with the requirements of the Oregon Department of Transportation and City of Portland.

B. Identify specific streets that the Contractor determines will have a traffic impact.

C. Annotate proposed location of barricades, lighting, signing, temporary striping, and other traffic control devices.

D. Anticipate traffic, bus zone, and driveway relocation resulting from construction operations. Include anticipated loss of bus, passenger, and truck loading zones.

E. Provide location of on-street parking.

F. Identify entress/egress routes to the work site.

G. Describe in detail routes that delivery trucks are anticipated to take entering and leaving site

H. If required, identify staging areas for delivery trucks for imports of materials.

1.06 TRAFFIC CONTROL REQUIREMENTS

A. Work crews shall not impact two consecutive street intersections at the same time.

B. Maintain pedestrian and bicycle access at all times. Work with the Project Representative if pedestrian and bicycle pathways require temporary rerouting or closure.

C. Traffic flow on streets where Work is not being performed shall not be impeded.

D. Unless otherwise indicated, provide for passage and access of emergency vehicles and police, fire, and disaster units at all times. Assume liability for damages resulting from failure to provide said access.

E. Use off-duty police officers when affecting normal traffic operation at a signalized intersection.

F. Vehicular and pedestrian routing on streets where the Work is not being performed shall not be revised.

G. At each Work Site where a two-way roadway is restricted to one lane of two-way traffic, provide a minimum of two certified flaggers to ensure safe and effective planning of traffic through the constricted zone. Provide three certified flaggers when the construction zone length causes sight distance or communication problems between a two-member team of flaggers to operate safely.

H. Lane restrictions for specific roadways shall be the following unless otherwise approved by the jurisdiction in writing:

1. Maintain two-way traffic during hours required by the local jurisdiction. Refer to Section 01 14 00 (Work Restrictions) for the approved working hours. Lanes shall be at least 12 feet in width.

2. Maintain one lane with flaggers at all other times. Lane shall be at least 12 feet in width.

I. When driveways are impacted, provide the following:

1. A minimum of 3 weeks' notice when driveway access will be restricted
2. Clear residential driveway access at the end of every workday, unless otherwise noted
3. Access to driveways for businesses, public service buildings, and industrial sites during their operating hours
4. Signage (including its maintenance) in accordance with this Section and as shown on the Traffic Control Plan

J. Notify and obtain appropriate approvals from both the Police Department and the Fire Department of street closures.

K. Within the construction zones, provide parking restrictions and easels in accordance with the requirements of the local jurisdiction. If there are no local jurisdictional requirements, at a minimum, provide parking easels within 48 hours in advance of the need to clear parking. Keep parking restrictions to a minimum.

L. Provide the services of a uniformed police officer during working hours in the construction zone when signalized intersections are affected by construction to direct traffic, countermand the traffic signal, and if necessary, clear traffic backups. This officer is not for the convenience of the Contractor but rather to facilitate traffic movements.

M. Provide local access to all businesses, industrial sites, and residences. Provide a certified flagger to prevent any conflicts between local access traffic and construction crews and/or heavy equipment whenever local access is required into/out of the construction zone.

N. Provide road closure plans and provide for the type of traffic impacted. Provide design of the detour route for local access.

O. Provide concrete barriers to separate traffic flow from construction work.

P. Channel traffic flow into the work zone per the accepted Traffic Control Plan.

Q. Provide a temporary 5-foot wide alternate pathway on the same side of the street when construction interferes with the usual pedestrian/cyclist pathways. Keep pedestrians/cyclists, vehicles, and open excavations along the arterial all separate from one another to meet safety requirements. Maintain minimum of three crosswalks at all affected intersections.

1.07 JOB COORDINATION

A. Coordinate construction to offer the least possible obstruction and inconvenience to the public.

B. Obtain all necessary street use permits in connection with the Contractor's operations and in accordance with Section 01 41 26 (Permits, Easements, and Right-of-Entry Agreements).

C. Coordinate with property and business owners to maintain convenient access for local traffic to private properties along the line of Work at all times and/or as specified in this Section.

D. Keep existing street lighting systems in operation during progress of the Work at all times.

E. Coordinate revisions to existing traffic control with the affected agencies. Keep traffic controls in operation, unless otherwise required by the Project Representative, for the benefit of the traveling public during progress of the Work.

F. As Work progresses and as conditions permit, reset temporarily relocated or removed traffic and street name signs in their permanent location. Replace or repair signs and other traffic control devices that are damaged or lost.

G. Coordinate with property owners or designated representatives and service providers for uninterrupted garbage/recycling collection, mail, and other delivery services.

1.08 NOTIFICATION PLAN AND NOTIFICATION SCHEDULE

A. Submit a Notification Plan (as part of the Traffic Control Plan) and update for Progress Meetings a Notification Schedule to maintain access for adjacent or affected properties and businesses.

B. Update the Notification Plan and Notification Schedule as necessary for the Progress Meetings and include the addresses of affected business/property owners and the estimated dates and number of days construction will be within 150 feet of the addresses and fronting the properties.

C. The Notification Plan and Notification Schedule shall include the following:

1. Name of affected business/property owner
2. Mailing address of business or property owner
3. Address of affected property if different
4. Contact name and phone number
5. Estimated week of construction within 150 feet of affected property
6. Estimated number of days that construction will be fronting the property
7. Special issues for maintaining access

D. Request and obtain written acceptance from the Owner's Representative before partially or completely closing any street.

E. Notifications regarding Work performed in street areas shall be in such detail as to give the time of commencement and completion of the Work, names of streets to be closed, schedule of operation, routes of detours, etc.

F. To accommodate emergency vehicle rerouting, notify the Project Representative, local fire and law enforcement authorities and other affected agencies in writing not less than 72 hours prior to construction operations that deviate or delay traffic from the existing traffic patterns.

PART 2 PRODUCTS

2.01 SIGNS

A. Signs with special or non-standard messages shall be included in the TCP as required to properly convey information to the motorist or pedestrian. Be responsible for installing and maintaining these signs. Signs shall be in accordance with the requirements of the standards referenced in Part 1 of this Section or as required by the business or property owner.

B. Signs shall meet the following criteria:

C. 24 inches wide by 36 inches high, free standing, with lettering large enough to be visible for 150 feet

D. Readable from two directions

E. Sign message to be coordinated with the Project Representative prior to fabrication.

F. For additional information regarding signs refer to Section 01 58 13 – Temporary Project Signage.

PART 3 EXECUTION

3.01 PROTECTION OF TRAFFIC

A. Maintain and protect traffic on all affected roads during the period of work except as otherwise specifically directed by the Owner. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, placing of lights around and in front of equipment, and the erection and maintenance of adequate warning, danger, and direction signs, will be as required by the state and local authorities having jurisdiction. Protect the traveling public from damage to person and property. Minimize the interference with public traffic on roads selected for hauling

material to and from the site. Investigate the adequacy of existing roads and their allowable load limit. The Contractor is responsible for the repair of any damage to roads caused by construction operations.

3.02 DUST CONTROL

A. Dust control methods and procedures must be approved by the Project Representative and be specified in the Contractor's Environmental Control Plan. See Section 01 35 43 – Environmental Procedures for additional requirements.

3.03 ACCESS

A. Refer to Section 01 41 26 - Permits, Easements, and Right-of-Entry Agreements for the Contractor's responsibility to obtain all right-of-entry agreements, easements.

3.04 SAFETY

A. Use adequate safeguards, safety devices, and protective equipment and take other needed actions to protect life, health, and safety and to protect property in connection with the performance of the Work.

B. Use flaggers, signs, and other devices, and erect and maintain barricades, guards, signs, warning signs, and detour signs, as are necessary to warn and protect the public at all times from injury or damage as a result of the Contractor's operations, which may occur on streets affected by such operations.

C. Where flaggers are employed, the flaggers' equipment and training shall be in accordance with the applicable laws and regulations. All required equipment shall be used by flaggers while actually flagging traffic.

D. All flaggers are required to possess a current flagging certification card.

E. Provide standard signs as well as other appropriate signs prescribed by the Project Representative as applicable and necessary for the Work. Erect signs on posts and supports and maintain them in a neat and presentable condition until the necessity for them has ceased. When the need for a sign has ceased, the Contractor, upon approval by the Project Representative, shall take down such sign. Control signs necessary for nighttime traffic control, or remaining in place during the night, shall be fully reflectorized.

F. Safeguard and direct traffic after the existing signs have been removed. Preservation and maintenance of traffic control and street name signs shall be the sole responsibility of the Contractor.

G. Provide and maintain temporary and permanent pavement markings including traffic markers, delineators, thermoplastic stop bars, and crosswalks to meet the City of Portland current standards.

H. When required by the Project Representative, provide flaggers immediately; provide, erect, maintain and remove barricades and lights; and erect, maintain and remove standard signs.

I. In the event that a traffic signal or beacon is made inoperative by or at the request of the Contractor, provide an off-duty police officer as per laws and regulations, or provide suitable traffic control devices for control and movement of traffic during the time that the signal or beacon is inoperative.

J. Provide traffic control during the hours of construction and in a safe, prudent operating manner. During the hours of non-construction, maintain all existing traffic lanes safe for vehicular traffic. Leave all unfinished Work in a safe, non-hazardous condition to the public.

3.05 SIGNS

A. Check each item daily, including weekends and holidays. Replace signs that are missing, vandalized, damaged, or not functioning properly within 24 hours of such act.

B. Non-applicable signs shall be removed or covered during periods not needed.

3.06 CONSTRUCTION AND MAINTENANCE OF DETOURS

A. Construct, maintain in a safe condition, and keep open to traffic detours that will accommodate traffic diverted from the roadway during construction.

B. Provide for all on-site or off-site detours required or necessitated by the Work, including side street crossings.

C. Keep roadways clean to assure the safe passage of pedestrians and vehicles.

END OF SECTION

SECTION 01 56 00

TEMPORARY BARRIERS AND ENCLOSURES

PART 1 GENERAL

1.01. SUMMARY

A. This section specified the requirements for installation and erection of temporary barriers, barricades, enclosures, and temporary construction fencing.

1.02 DESCRIPTION OF WORK

A. Temporary barriers and enclosures should be used the entire duration of construction around temporary construction facilities and Work areas as needed in coordination with the Project Representative to enclose the areas of construction and prevent unauthorized entry to construction areas.

B. Temporary barriers and barricades should be placed around open work areas during trenching and excavation activities to prevent entry of unauthorized personnel into active Work areas.

C. Temporary barriers should be erected and installed per requirements of this Section as well as any requirements referred to in Section 01 52 00 – Construction Facilities.

D. Use of Barriers and Enclosures: The Contractor shall furnish, erect and maintain temporary barriers, barricades, enclosures, and temporary construction fencing as required for the following:

1. To protect the health and safety of occupants and the general public from exposure to immediate physical harm as well as to noise, dust, and fumes.
2. To protect new and pre-existing adjacent construction from exposure to physical damage, dust, dirt, and water.
3. To provide security of valuable property.

1.02. REFERENCED STANDARDS

A. Refenced standards applicable to this Section include, but are not limited to the following:

REFERENCE	TITLE
ASTM A392-06	Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric
ASTM C825-19	Standard Specification for Precast Concrete Barriers
ASTM F3342-19	Standard Guide for Temporary Fence Applications for Construction Sites

Notes:
ASTM: ASTM International

1.03. SUBMITTALS

A. Refer to Section 01 33 00 (Submittal Procedures).

B. Locations and design of temporary barriers, barricades, enclosures, and temporary construction fencing should be included as part of the Construction Site Plan, refer to Section 01 52 00 for additional requirements.

PART 2 PART 2 PRODUCTS

2.01. GENERAL FABRICATION

A. Substantial Construction: Barriers and enclosures shall be constructed to serve their purpose without failure throughout the duration of their use.

B. Rigid Fencing: The general public, as well as adjacent lawns and plantings, shall be protected from harm by the installation of continuous, durable, rigid fencing at the limit lines of each construction area, at locations identified in the Temporary Facilities and Control Plan.

C. Fencing should be installed in accordance with ASTM F3342-19 – Standard for Temporary Fence Applications for Construction Sites

2.02. FENCING

A. Temporary chain link fencing shall conform to ASTM A392-06 requirements and shall be a minimum of 6-feet in height. Gates shall be provided at access points where required, and these shall be kept locked during off-work hours. A lock key or lock combination shall be provided to the Project Representative. Multiple fencing panels may be linked together at the bases to form long spans as needed. Each panel base must be weighted down using sand bags or other suitable materials in order for the fencing to withstand anticipated winds while remaining upright. Fencing must remain rigid and taut with a minimum of 200 pounds of force exerted on it from any direction with less than 4 inches of deflection. Fencing must have fabric screen. Chain link fence fabric shall have a minimum breakload of 740 pounds.

2.03. CONCRETE BARRIERS

A. Erect and maintain concrete barriers to limit access to excavations and hazardous areas, to protect existing facilities from damage during construction and demolition operations, and at locations identified in the Temporary Facilities and Control Plan.

B. Concrete barriers shall confirm for ASTM C825-19 requirements.

PART 3 PART 3 EXECUTION

3.01. TEPORARY BARRIER REQUIREMENTS

A. Install facilities of a neat and reasonable uniform appearance, structurally adequate for required purposes.

B. Install barriers and enclosures so as to not create new hazards such as tripping or protrusions that might be a source of safety concern to pedestrians or passers-by.

C. When necessary due to placement of barriers, establish reasonable alternative access and traffic control for vehicles and pedestrians.

D. When barriers are in the public right of way or on adjacent private property, obtain construction easements / licensing agreements / permits for the use prior to placement of the barriers.

E. Maintain barriers during entire Work Period.

F. Relocate barriers as required by progress of construction.

3.02. TEMPORARY FENCING REQUIREMENTS

A. Temporary fencing should be reasonably uniform in appearance and structurally adequate for required purposes.

B. Temporary fencing should be installed in a manner to restrict access to Work Area to protect general health and safety of the public and provide adequate security.

C. Access through temporary fencing should be limited only to specified gates. All gates should be equipped with lock key or lock combination to restrict access. Contractor should provide the Project Representative with keys or lock combinations to access the Work Area.

D. Fabric on fencing should be installed along any public roadways or sections of fencing adjacent to pedestrian and vehicle traffic.

E. Maintain fencing during entire Work Period.

3.03. SITE STAGING

A. Install temporary barriers, barricades, enclosures, and temporary construction fencing in accordance with the Construction Site Plan.

B. If any portion of a municipal or state right-of-way will be used or affected during construction operations, insert the requirements as prescribed by the right-of-way authority. Contact information and links to city or state websites are encouraged.

3.04. REMOVAL

A. Completely remove temporary barriers, barricades, enclosures, and temporary construction fencing, including foundations, when construction has progressed to the point that they are no longer needed, and when approved by the Owner.

B. Clean and repair damage caused by installation, fill and grade areas of the Work Area to the required elevations and slopes, and clean the area.

END OF SECTION

SECTION 01 58 13

TEMPORARY PROJECT SIGNAGE

PART 1 GENERAL

1.01 SUMMARY

A. This section specifies the Contractor's requirements for materials and locations of project identification sign, project informational signs, work site bulletin board, traffic control signs, and warning signs.

1.02 DESCRIPTION OF WORK

A. Temporary signage includes the following:

1. Project Identification Sign
2. Project Information Signs
3. Work Site Bulletin Boards
4. Traffic Control Signs
5. Warning Signs

B. Location of project signage shall be identified and provided by the Contractor as part of the Construction Site Plan. Refer to section 01 52 00 – Construction Facilities and section 01 55 26 Traffic Control for additional requirements.

C. The contractor shall install and maintain all project identification signs, project informational signs, work site bulletin board, traffic control signs, and warning signs for duration of construction or as required by Construction Site Plan or Traffic Control Plan

1.03 REFERENCED STANDARDS

A. Referenced standards applicable to this Section include, but are not limited to, the following:

REFERENCE	TITLE
Manual on Uniform Traffic Control Devices (MUTCD)	U.S. Department of Transportation, Federal Highway Administration: Manual on Uniform Traffic Control Devices, Part VI "Work Zone Traffic Control Standards and Guidelines"

1.04 SUBMITTALS

A. See Section 01 33 00 (Submittal Procedures).

B. Show content, layout, lettering, color, foundation, structure, sizes and grades of members.

PART 2 PRODUCTS

2.01 SIGN MATERIALS

A. Structure and Framing: New, wood, structurally adequate.

B. Sign Surfaces: Exterior grade plywood with medium density overlay, minimum 3/4 inch thick, standard large sizes to minimize joints.

C. Rough Hardware: Galvanized.

D. Paint and Primers: Exterior quality, two coats; sign background of color as selected.

E. Lettering: Exterior quality paint, contrasting colors.

F. Design sign and structure to withstand 90 miles/hr wind velocity.

2.02 PROJECT IDENTIFICATION SIGN

A. One painted sign, 48 sq ft area, bottom 6 feet above ground.

B. Content:

1. Project title, logo and name of Project Representative as indicated on Contract Documents.

2. Names and titles of authorities.

3. Name of Prime Contractor.

C. Graphic Design, Colors, Style of Lettering:

2.03 PROJECT INFORMATIONAL SIGNS

A. Painted informational signs of same colors and lettering as Project Identification sign, or standard products; size lettering to provide legibility at 100 foot distance.

B. Provide at each field office, storage shed, and directional signs to direct traffic into and within site. Relocate as Work progress requires.

2.04 TEMPORARY SIGNAGE

A. Bulletin Board

1. Within one calendar day of mobilization on site and prior to the commencement of Work activities, provide a clear weatherproof covered bulletin board not less than 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, Wage Rate Information poster, Safety and Health Information, and other information approved by the Owner. Locate the bulletin board at the Work Area in a conspicuous place easily accessible to all employees, as approved by the EPA. For additional signage requirements refer to section 01 58 13 – Temporary Project Signage

B. Warning Signs

2. Post temporary signs, tags, and labels to give workers and the public adequate warning and caution of construction hazards. Attach signs to the perimeter fencing every 150 feet warning the public of the presence of potential area hazards. Signs must require unauthorized persons to keep out of the work site. For additional signage requirements refer to section 01 58 13 – Temporary Project Signage

2.05 TRAFFIC CONTROL SIGNS

A. Signs with special or non-standard messages shall be included in the Traffic Control Plan as required to properly convey information to the motorist or pedestrian. Be responsible for installing and maintaining these signs. Signs shall be in accordance with the requirements of the standards referenced in Part 1 of this Section or as required by the business or property owner.

B. Signs shall meet the following criteria:

1. 24 inches wide by 36 inches high, free standing, with lettering large enough to be visible for 150 feet

2. Readable from two directions

C. Sign message to be coordinated with Project Representative prior to fabrication.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install project identification sign within 30 days after date fixed by Notice to Proceed.

B. Erect at designated location.

C. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.

D. Install sign surface plumb and level, with butt joints. Anchor securely.

E. Paint exposed surfaces of sign, supports, and framing.

3.02 MAINTENANCE

A. Maintain clean signs and supports , repair deterioration and damage.

3.03 REMOVAL

A. Remove signs, framing, supports, and foundations at completion of Project and restore the area.

END OF SECTION

SECTION 01 71 00

EXAMINATION AND PREPARATION

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies the Examination and Preparation requirements of Work areas prior to installing, applying and placing products or materials to determine acceptable conditions of the Work, including layout of the Work and engineering services necessary to accomplish the Work.

1.02 DESCRIPTION OF WORK

A. The purpose of examination and preparation is to ensure that Work in areas, including but not limited to dredging areas, excavation areas, and fill/cap areas, has been completed to satisfaction of design specifications as detailed in applicable Design Drawings.

B. Following completion of Work Area, including but not limited to dredging areas, excavation areas, and fill/cap areas, the Contractor shall complete field engineering and surveying of the Work completed to evaluate the following conditions: preparations of work surfaces for placement of materials and products; field measurements of work completed within the area to verify grades of required excavation, dredging, capping, or fill meet design specifications; and continued verification of overall construction layout to ensure Work is being completed consistent with the Construction Drawings.

C. Surveyor: Contractor shall select and pay for services of a surveyor, registered in the State of Oregon, for proper performance of the Work.

1. Services of surveyor shall be suitable for layout and verification of site elements.

2. For the Project record, Contractor shall submit the name, address and telephone number of the surveyor before starting survey Work.

3. For additional requirement for Site Surveys refer to Section 02 21 00 – Site Surveys and Positioning Controls.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION

3.01 PREPARATION

A. Contractor shall determine product manufacturer's requirements and recommendations prior to commencing Work related to placing materials. The following sections should be referred to for material and product requirements in conjunction with the Contract Drawings prior to placement/installation:

1. Section 31 05 19 – Geosynthetics for Earthwork

2. Section 31 25 00 – Erosion and Sediment Control

3. Section 31 34 19 – Geosynthetic Soil Reinforcement

4. Section 31 37 00 Rock Revetment

5. Section 31 41 16 – Metal Sheet Piling

6. Section 31 62.16.14 – Steel Pipe Piles

7. Section 32 90 00 – Irrigation

8. Section 32 90 00 – Planting

9. Section 35 37 10 – Engineered Caps

10. Section 35 43 35 – Scour Protection Mat

B. Preparations: Contractor shall perform preparation actions according to manufacturer's instructions and recommendations and according to specified procedures.

1. Contractor shall perform surface preparation as necessary to create suitable substrates for application, installation and placement of products.

2. Contractor shall notify Project Representative in writing of unsuitable conditions preventing proper performance of the Work.

C. Existing Utility Information: Contractor shall furnish information to serving utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Contractor shall coordinate with Project Representative and with authorities having jurisdiction.

D. Existing Utility Interruptions: Contractor shall not interrupt utilities serving facilities occupied by Project Representative or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Contractor shall notify Project Representative not less than two working days in advance of proposed utility interruptions.

2. Contractor shall not proceed with utility interruptions without written permission from Project Representative.

E. Field Measurements: Contractor shall take field measurements as required to fit the Work properly. Contractor shall recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, Contractor shall verify dimensions of other construction by field measurements before installation/placement. Contractor shall coordinate installation/placement schedule with construction progress to avoid delaying the Work.

F. Space Requirements: Contractor shall verify space requirements and dimensions of items shown diagrammatically on Drawings.

G. Verification of Construction Layout: Before proceeding to layout the Work, Contractor shall verify layout information shown on Drawings, in relation to the property survey and existing benchmarks, and locate survey reference points. If discrepancies are discovered, Contractor shall promptly notify the Project Representative.

3.02 FIELD ENGINEERING

A. Examination: Contractor shall verify locations of survey control and reference points prior to starting Work. If discrepancies are discovered, Contractor shall promptly notify the Project Representative.

B. Refer to Section 02 21 00 – Site Surveying and Positioning Control for additional requirements for survey controls and reference points.

3.03 SURVEYING AND FIELD ENGINEERING SERVICES

A. Surveying and Field Engineering Services: Contractor shall provide surveying and field engineering services as necessary for performance of the Work. Refer to Section 02 21 00 – Site Surveying and Positioning Control for surveying requirements.

1. Contractor shall be responsible for the accuracy and adequacy of surveying and field engineering services.

2. Contractor shall utilize recognized engineering practices.

3. Contractor shall check the location, level and plumb, of every major element as the Work progresses.

4. Contractor shall preserve construction survey stakes and marks for the duration of their usefulness.

5. If construction survey stakes are lost or disturbed, and require replacement, Contractor shall perform replacement at no change in Contract Sum and Contract Time.

6. Contractor shall excavate all holes necessary for line and grade stakes.

B. Surveying for Layout and Control of the Work: Contractor shall establish elevations, lines and levels for all Work under the Contract. Contractor shall locate and lay out by instrumentation and similar appropriate means:

1. Site improvements, including structures, erosion controls, soil stabilization, soil reinforcement, slope protection, riprap, sheet piling, geosynthetics, soil/sediment caps, and any planting. Note on Project Record Drawings utility locations, slopes and invert elevations.

2. Stakes for cutting, filling, grading and material placement, to establish finished grade or flow line indicated on Contract Drawings.

a. Contractor shall preserve construction survey stakes and marks for the duration of their usefulness.

b. If construction survey stakes are lost or disturbed, and require replacement, Contractor shall perform replacement at no change in Contract Sum and Contract Time.

c. Contractor shall excavate all holes necessary for line and grade stakes.

d. Contractor shall establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Work.

e. Contractor shall establish dimensions within tolerances indicated.

f. Contractor shall inform installers of lines and levels to which they must comply.

g. When deviations from required lines and levels exceed allowable tolerances, Contractor shall notify the Project Representative.

h. Contractor shall close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Monuments: Contractor shall establish a minimum of two permanent monuments on the Work Site, referenced to established control points. Contractor shall record locations, with horizontal and vertical data, on Project Record Drawings.

1. Any monument set by a licensed land surveyor or registered civil engineer to mark or reference a point on a property or land line shall be permanently and visibly marked or tagged with the certificate number of the surveyor or civil engineer setting it, each number preceded by the letters "L.S." or "R.C.E." respectively, as the case may be, or, if the monument is set by a public agency, it shall be marked with the name of the agency and the political subdivision it serves.

2. Nothing in this Section shall prevent the inclusion of other information on the tag, which will assist in the tracing, or location of survey records, which relate to the tagged monument.

3. Contractor shall ensure that centerline ties filed with the Project Representative will be checked for compliance with this law.

D. Verification of Work: Contractor shall periodically verify layout and completed conditions of the Work by same means.

END OF SECTION

SECTION 01 74 23

FINAL CLEANING

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies the final cleaning for equipment used during the Swan Island Basin (SIB) Project Area (Work Area) Remedial Action (RA) construction. It is to be conducted within the Work Area during performance of the Work prior to completion of project closeout (as described in Section 01 70 00 – Closeout Requirements).

1.02 DESCRIPTION OF WORK

A. The purpose of the final cleaning of the Work Area is to clean up from the construction activities that occurred during the RA construction required under this Contract. Final cleaning consists of decontamination of equipment that has been in contact with impacted soils and dredged materials, including but not limited to the dredge/excavator bucket, haul barges (during in-water transportation), haul vehicles, dewatering equipment, and any other tools/equipment. All impacted materials and/or fluid collected in the decontamination process shall be collected and disposed of appropriately. Refer to following sections for requirements on impacted material removal and disposal: Section 02 42 00 – Removal and Diversion of Construction Materials, Section 02 60 00 – Contaminated Site Material Removal, Section 02 61 00 – Removal and Disposal of Contaminated Soils, Section 02 81 00 – Transportation and Disposal of Hazardous Materials, and Section 35 24 20.01 – Transloading, Upland Transportation, and Disposal.

B. The Work Area shall be maintained in a neat and organized condition, free from accumulation of waste products and debris.

C. Remove waste materials from the Work Area, Staging and Stockpile Area(s), and the Contractor Transload Facility(ies) at daily regularly scheduled times or dispose of as directed by the Project Representative. The Contractor shall not burn waste materials at the Work Area.

D. Make arrangements for off-site disposal of impacted soils at an approved Disposal Facility(ies) as described in Section 02 61 00 – Removal and Disposal of Contaminated Soils

E. Make arrangements for off-site disposal of Dredge Material, Incidental Debris, Identified Debris, and Piling at an approved Disposal Facility(ies) as described in Section 35 24 20.01 (Transloading, Upland Transportation, and Disposal).

F. Provide appropriate containers with secure lids for collections and disposal of PPE, disposable equipment that has come in contact with impacted materials, and any other impacted debris or materials requiring containment in accordance with Section 02 42 00 (Removal and Disposal of Construction Materials) and Section 02 61 00 (Removal and Disposal of Contaminated Soils).

G. Provide and use marked separate bins for recycling (if applicable).

H. Schedule regular cleaning operations (including all vessels, barges, and any other equipment operating at the Work Area) so that resulting dust, debris, and other contaminants are properly contained and disposed of.

I. Take due care that materials purchased under this Contract remain undamaged and free of dust and dirt at all times.

1.03 CLEANING REQUIREMENTS

A. Clean all items affected by the Work and ensure they are free of litter, trash, dust, dirt, stains, damage, or defects.

B. Wash, sweep, or otherwise clean all new and existing equipment. This includes decontamination of dredge bucket(s) and haul barges.

C. Replace damaged, defaced, or marred items.

PART 2 PRODUCTS

2.01 CLEANING MATERIALS

A. The Contractor shall clean equipment that has come into contact with contaminated debris or materials as follows.(Pressure washing may be required):

1. Use a brush, scrub pad, or other tool to remove particulate matter
2. Rinse with water from a clean source
3. Scrub equipment with biodegradable soap and brush
4. Solvent/Chemical use may be required following soap decontamination depending on specific contaminants.
5. Complete final rinse from a clean water source
6. Dry equipment using a heat source or allow time for evaporation

B. The use of solvents shall be limited to surfaces and contaminants that will not come clean with soap and water. The Contractor shall contain and dispose of spent solvents in accordance with regulatory requirements. Depending on regulatory requirements, solvent use may be required to decontaminate certain equipment that has come into contact with materials deemed hazardous.

PART 3 EXECUTION

3.01 TIMING

A. Upon acceptance of the final inspection by the Project Representative (as described in Section 01 70 00 – Closeout Requirements), the Contractor shall clean all construction areas within the Work Area, Staging and Stockpile Area(s), and Contractor Transload Facility(ies), pavement, equipment, piping, and tanks used during each Work Period.

3.02 CLEANING

A. Decontaminate equipment according to methods and procedures as defined by the Personnel and Equipment and Decontamination Plan per Section 01 35 43 (Environmental Procedures).

B. The Contractor shall do the following for each Work Period:

1. Remove surplus products, tools, construction machinery, and equipment not required for performance of remaining Work.
2. Use experienced workers or professional cleaners.
3. Broom clean paved surfaces; rake clean other surfaces of grounds.
4. Pressure wash, as appropriate, all surfaces of buckets, haul trucks/barges, dewatering equipment, and other equipment that has been in contact with contaminated materials and debris.
5. Collect wastewater and sediments/soils from cleaning equipment and properly dispose of such materials at the Disposal Facility(ies).
6. Prior to final project demobilization reinstate Work Area areas to pre-construction conditions to restore similar Work Area function to the satisfaction of the Project Representative

END OF SECTION

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. This Section provides Project closeout requirements for inspection and declaration that the Swan Island Basin (SIB) Project Area (Work Area) Remedial Action (RA)construction has been completed as required by the Contract Documents. Upon formal review and acceptance of the Work by the Project Representative, the RA Performing Parties and U.S. Environmental Protection Agency (EPA) Region 10 the Work will be determined to be complete, and the Contractor shall then demobilize from the Work Site.

B. Upon completion of the Work, and as a requirement of final acceptance, submit to the Project Representative a drawing set showing all as-constructed changes and information.

1.02 DESCRIPTION OF WORK

A. Work under this Section shall be performed by the Contractor to include furnishing all labor, materials, tools, equipment, and incidentals required to conduct inspections and prepare post-construction submittals in support of the overall Project as described in the Drawings and in these Specifications.

B. The Contractor shall ensure that all procedures and actions identified in this Section and elsewhere in the Contract Documents necessary to fully complete the Work are accomplished in a timely and effective manner.

C. The preparation and submittal of closeout submittals is incidental to the Work and will not be paid separately.

1.03 SUBMITTALS

A. Refer to Section 01 33 00 (Submittal Procedures).

B. Post-Construction Submittals:

1. Contractor Inspection

   a. For each Work Period, the Contractor and its subcontractors shall conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to requirements of the Contract Documents.

   b. The Contractor shall prepare a punchlist prior to requesting an inspection by the Project Representative. Inspection shall only be completed on Work that has been completed.

   c. Notify the Project Representative, in writing, of satisfactory completion of Contractor inspection, including notes of any deficiencies, defects, and repairs made to amend them.

   d. Contractor shall notify the Project Representative a minimum of 3 working days prior to requested final-inspection.

2. Pre-Final Inspection

   a. Contractor shall submit the Redline Drawings maintained by the Contractor on the Work Area during the Work that depict actual conditions and deviations from the Contract Documents. These deviations and additions may result from coordination required by, but not limited to: contract modifications; official responses to submitted Requests for Information (RFIs); direction from the EPA; design that is the responsibility of the Contractor, and differing site conditions. Maintain the as-builts throughout the construction activities through completion of the final site inspection. These files serve as the basis for the creation of the record drawings. Redline Drawings shall be submitted at least 10 days prior to scheduled Pre-Final

Inspection.

b. The Project Representative and Contractor will perform inspection of the Work completed in each Work Period to identify defects or deficiencies. The Contractor shall compile a deficiency list describing all noted defects and deficiencies for review and acceptance by the Project Representative. The Contractor shall correct deficient Work accordingly, as required by the Project Representative, at no cost to the RA Performing Parties.

c. The Contractor shall correct all defect and deficiencies notes in the deficiency list within 30 working days of the pre-final inspection

3. Final Inspection

a. When items noted in the deficiency list above are completed, the Contractor shall request final inspection of Work by the Project Representative at least 3 working days prior to the requested final inspection date for each Work Period. If Work is deemed incomplete by the Project Representative, complete outstanding deficient items and request reinspection at no cost to the RA Performing Parties.

1.04 FINAL ACCEPTANCE

A. Final Acceptance is the stage in the progress of the Work in which the Project Representative determines that the Work is complete (including Substantial Completion and other administrative work), in accordance with the Contract Documents. Final Acceptance represents the end of the Contract Time and the start of the warranty period.

B. The date of Final Acceptance is established in a Notice of Final Acceptance letter issued by the Project Representative.

C. To achieve Final Acceptance, the Contractor shall satisfactorily pass the final inspection and receive the Notice of Final Acceptance from the Project Representative on behalf of the RA Performing Parties.

1.05 CERTIFICATES OF FINAL APPROVAL

A. Submit originals or clearly readable copies of Certificates of Approval from the Project Representative prior to application for final payment.

1.06 CERTIFICATES OF COMPLETION

A. Obtain Certificate of Completion from the Project Representative. Certificate of Completion is required as a condition of final acceptance.

1.07 WARRANTIES, BONDS, TEST RESULTS, AND INSPECTION REPORTS

A. Promptly (within 48 hours), repair or replace all defective or damaged items delivered under the Contract Documents.

B. Remove all defective or damaged items prior to Substantial Completion of the Work.

C. Obtain warranties, bonds, test results, and inspection reports executed in duplicate by subcontractors, suppliers, manufacturers, and inspection agencies within 14 calendar days after completion of the applicable item of Work.

1.08 CLEANUP

A. Prior to requesting for final inspection complete final cleaning as required in Section 01 74 23 – Final Cleaning.

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION [NOT USED]

END OF SECTION

SECTION 01 78 23

OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.01 SUMMARY

A. This section is a placeholder. The need for this section will be determined during the development of the Pre-Final 90% RD Plan Set.

END OF SECTION

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies requirements for the Contractor to provide Project Record Documents (including As-Built Drawings and record information), showing as-built conditions of the Swan Island Basin (SIB) Project Area (Work Area).

1.02 DESCRIPTION OF WORK

A. Project Record Documents refer to the sum of all As-Built Drawings and record information specified in this Section.

B. Throughout progress of the Work of this Contract, the Contractor shall maintain for each Work Period an updated and accurate record of all Project Record Documents.

C. No separate measurement or payment will be made for Project Record Documents required by this Section. Work under this Section is paid under Bid Items [TO BE FILLED WITH BID ITEMS FOR INDIVIDUAL WORK PERIODS WHEN NUMBER OF APPROXIMATE WORK PERIODS IS DECIDED] for Project Record Documents prepared and submitted in each of the Work Periods, as described in Section 01 29 00 (Measurement and Payment).

1.03 SUBMITTALS

A. Refer to Section 01 33 00 (Submittal Procedures).

B. Construction Submittals:

1. Prior to submitting each request for progress payment, the Contractor shall obtain the Project Representative's acceptance of the working As-Built Drawings as currently maintained.

C. Post-Construction Submittals:

1. The Contractor shall submit to the Project Representative Project Record Documents (including As-Built Drawings and any additional record information) for all elements of the Work, as required by the Contract Documents.

2. The Contractor shall complete a Contractor's Annual Construction Summary Report for each Work Period, following completion of construction activities for the specified Work Period. The Contractor's Annual Construction Summary Report shall contain, at a minimum, the following elements below; the Contractor shall provide additional information at the request of the Project Representative.

    a. Summary of remediation activities completed, specifying Dredge and Cap Certification Units completed within the Work Period

    b. Summary of the area(s) cleared and grubbed that were completed within each Work Period, including quantities of Cleared and Grubbed Material disposed for composting

    c. Summary of total volumes dredged (including Dredge Pay Volume, potential Contingency Re-Dredge Pay Volume, and Excessive Dredging volume) and disposed, and surface area completed (% complete)

    d. Summary of total volumes of capping and erosion protection material placed (achieving Required Placement Thicknesses, Targeted Placement Elevations, Targeted Placement Thicknesses, and Excessive Overplacement), and surface area completed (% complete)

    e. Summary of removal and disposal Work for Piling and Identified Debris completed within each Work Period

f. Summary of any structural Work activities, such as bulkhead strengthening and reinforcement, Piling replacement, Steel Pipe Piling installation, riprap, geosynthetics, and soil stabilization measures installed.

g. Summary of the environmental activities completed, including representative Work Site photographs, a summary of environmental inspections and monitoring data collected by the Contractor, and environmental management and issues during construction and how these issues were managed

h. Summary of environmental compliance in each Work Period as described in Section 01 35 43 - Environmental Procedures.

i. Summary of Deviations from the Contract Documents or the Contractor's Remedial Action (RA) Work Plan, if any, and corrective actions taken to reconcile the Deviations so that remediation objectives were met

j. As-Built Drawings (stamped by a Professional Engineer) for the Work completed in the Work Period (see specific As-Built Drawing requirements in Article 2.01 of this Section), including the following:

    1) As-Built Drawings for all SMAs completed

    2) As-Built Drawings for all installed earthwork, bulkhead wall, Steel Pipe Piling, soil stabilization devices, rip-rap, geosynthetics, and utilities

k. Record Information provided by the Contractor shall include the following:

    1) Surveys (stamped by a Professional Land Surveyor licensed in Oregon State), as described in Section 02 21 00 - Site Surveys and Positioning Control:

        i. Work Period Pre-Construction Survey documenting pre-construction conditions for each Work Period

        ii. Work Period Post-Construction Survey documenting post-construction conditions for completion of dredging and material placement Work elements for each Work Period

    2) Surveys shall be those may be used for the basis of measurement and payment of the Work, as described in Section 01 29 00 - Measurement and Payment.

    3) Pre-Construction and Post-Construction Structural Condition Reports

    4) All Daily and Weekly Construction Reports

    5) Any electronic records from dredge positioning software (e.g., bucket maps)

    6) Summary of weight tickets and Certificates of Disposal generated from the disposal of Dredge Material, Soils, Incidental Debris, Identified Debris, and Piling at the Disposal Facility(ies)

    7) Weight tickets for imported placement materials

    8) Summary of geotechnical monitoring data

    9) Health and safety summary: include incidents and follow-up, monitoring results, and changes in Work activities

    10) Final Master Submittal List for each Work Period

    11) All quality control records maintained in the Contractor's Work Area files

    12) Any additional data or recordkeeping documents requested by the Project Representative during construction

13) Summary of corrective actions implemented by the Contractor at the direction of the Project Representative

l. Additional Submittal Requirements:

3. For manually produced As-Built Drawings (full-size, 22- by 34-inch As-Built Drawings):

a. Provide plan view contour As-Built Drawing using 1-foot contour intervals.

b. Provide plan view spot elevation As-Built Drawing.

c. Provide cross-sections through the area where Work was completed at no greater than 50-foot spacing between cross sections unless otherwise accepted by the Project Representative. Cross-section information shall show the pre-construction elevations and grades, progress or post-construction elevations and grades, and the design template (elevations and grades).

d. Indicate on As-Built Drawings, at a minimum, the date of survey, datums, extent of survey coverage, elevation markings (for spot elevations and contour lines), location of cross-sections, scale bar, and licensed professional surveyor stamp and signature (for Pre-Construction and Post-Construction Surveys).

4. For CAD-produced electronic files of as-constructed information:

a. Submit all survey data in AutoCAD Civil3D 2012 or older format if acceptable to the Project Representative.

b. Submit all survey data in a separate ASCII text file with XYZ spot elevation data.

c. The Project Representative will provide the Contractor with the Work Area basemap file in *.dwg format for Contractor use.

5. Application software and configuration files in native file format

6. Electronic files distributed through a web link, FTP site, or cloud-based file-sharing site

1.04 QUALITY ASSURANCE/QUALITY CONTROL

A. The Contractor will provide all necessary quality controls to successfully complete the Project Record Documents including the Quality Control Records to comply with the Construction Quality Control Plan as specified in Section - 01 45 00 Quality Control.

B. The responsibility for maintenance of changes to the Project Record Documents shall be assigned to one person on the Contractor’s staff.

C. Survey Work requirements and surveyor qualifications shall meet all requirements of Section 02 21 00 - Site Surveys and Positioning Control.

PART 2 PRODUCTS

2.01 AS-BUILT DRAWINGS AND RECORD INFORMATION

A. Continuously maintain, update, and correct full-sized As-Built Drawings to reflect the Project as-built conditions.

1. Keep these working marked As-Built Drawings current on a weekly basis and at least one set available at the Work Area at all times.

2. Changes from the Contact Drawings made in the Work or additional information that might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes.

B. Working record information shall be continuously updated by the Contractor to show the following:

1. Work accomplished in the prior month to verify payment due

2. Field changes of dimensions and details made by the Contractor

3. Changes made by Change Order, responses to Requests for Information, or Field Directives.

4. Record locations of all embedded, buried, and concealed features dimensioned relative to visible features as prescribed in this Section, including the following:

   a. Items located or shown on the Drawings

   b. Items not located or shown on the Drawings but placed by Contractor

C. Show, but do not limit to, the following information on the working and final As-Built Drawings:

1. Correct grade, elevations, cross section, or alignment of earthwork, structures, or utilities if any changes were made from the Contract Drawings

2. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor including, but not limited to, fabrication, erection, installation plans, and placing details

3. Topography, invert elevations, and grades of drainage installed or modified as part of the Project construction

4. Changes or modifications that result from the final inspection

5. Where Contract Drawings or Specifications present options, show only the option selected for construction on the final as-built prints.

D. Prepare final As-Built Drawings after the completion of each definable feature of Work as listed in the CQCP as appropriate for the Project.

E. The working as-built marked prints and final As-Built Drawings will be jointly reviewed for accuracy and completeness by the Project Representative and Contractor prior to submission of each monthly pay estimate.

F. If the Contractor fails to maintain the working and final As-Built Drawings as specified herein, the Project Representative will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the As-Built Drawings. This monthly deduction will continue until an agreement can be reached between the Project Representative and the Contractor regarding the accuracy and completeness of updated As-Built Drawings.

2.02 SUPPLEMENTAL CONTRACTOR-PRODUCED DOCUMENTS

A. When the Specifications require the Contractor to produce information supplemental to that in the Project Record Documents, the Contractor shall produce and submit per the following CAD Construction Detail Drawings and Records requirements:

1. Drawings shall be provided in AutoCAD 2018 or newer *.dwg format.

2. Information prepared by the Contractor for construction or installation, which is supplemental to the information and detail on the As-Built Drawings and as required in the Specifications.

3. Reference appropriate Contract Drawings that show the Work.

PART 3 EXECUTION

3.01 MARKING DRAWINGS

A. For markups or revisions (i.e., changes, corrections, additions, and deletions) to the hard-copy Project Record Documents, use waterproof felt-tip pens as required to maintain As-Built Drawings described in this Section using the following color coding:

1. Red: Document changes

2. Blue: Dimensional and other notations

3. Green: Work deleted

B. For any electronic documents, mark-ups in PDF format must be completed in a platform that records the date and user information, when the markup is made.

C. When final markups or revisions have been completed, the Contractor shall show the wording "AS-BUILT DRAWINGS / AS-BUILT CONDITIONS," followed by the name of the Contractor in letters at least 3/16-inch high on the cover sheet drawing. The Contractor shall mark all other As-Built Drawings either "As-Built" Drawing, denoting no revisions on the sheet, or "Revised As-Built Drawing," denoting one or more revisions. The date of the original Contract Drawings should be in the revision block.

3.02 DRAWING PREPARATION

A. To prepare As-Built Drawings, the Contractor shall modify the Contract Drawings as may be necessary to correctly show the features of the Project as it has been constructed by bringing the Contract set into agreement with approved working as-built prints and adding such additional drawings as may be necessary.

B. The Contractor will be furnished with "as-designed" Contract Drawings in electronic format.

C. The working As-Built Drawings (marked prints) shall be neat, legible, and accurate. These As-Built Drawings are part of the permanent records of this Project and shall be returned to the Project Representative after acceptance.

D. Any drawings damaged or lost by the Contractor shall be satisfactorily replaced by the Contractor at no expense to the RA Performing Parties.

3.03 CAD DRAWING REQUIREMENTS

A. Only employ personnel proficient in the preparation of CAD drawings to modify the Contract Drawings or prepare additional new As-Built Drawings.

B. Additions and corrections to the As-Built Drawings shall be equal in quality and detail to that of the original Contract Drawings.

C. Line colors, line weights, lettering, layering conventions, and symbols shall be the same as the original line colors, line weights, lettering, layering conventions, and symbols.

D. If additional Drawings are required, prepare them using the specified electronic file format, applying the same graphic standards specified for original Contract Drawings.

E. The title block and drawing border to be used for any new final As-Built Drawings shall be identical to that used on the Contract Drawings.

F. Accomplish additions and corrections to the Contract Drawings using CAD files.

G. Provide all program files, software, and hardware necessary to prepare final As-Built Drawings.

3.04 ELECTRONIC MEDIA DRAWINGS

A. All As-Built Drawings shall be provided in electronic format in AutoCAD, Release 2018 or newer, *.dwg and PDF format files with borders and title blocks clearly identifying the Contract and drawing number. Each file shall include the drawing number and drawing title in the file name. The equipment and scope of the drawing shall be as required in the Specifications.

B. Drawing quality and size of presentation shall be legible at a 50% reduction of such drawings.

C. Text size: 0.125 inch for 22- by 34-inch drawings, 0.063 inch for 11- by 17-inch drawings

D. When requested by the Contractor, the Project Representative will provide electronic copies of the original As-Built Drawings in AutoCAD *.dwg format or Specifications as developed by the design team in Microsoft Word or Excel format.

3.05 RECORD INFORMATION

A. Record information concurrently with construction progress. No Work shall be concealed until the required information is recorded. Payment for Work or structure element placed without recording the location may not be made for the remedial Work or structure until the information is documented to the satisfaction of the Project Representative.

B. Mark each item in the As-Built Drawings to record actual construction, including the following:

1. Measured thicknesses and elevations of dredged area in relation to Project vertical datum
2. Measured horizontal and vertical locations of each dredged area
3. Measured elevations and thicknesses of backfill material, Engineered Cap material for soil and sediment caps. All placement areas should be in relation to Project vertical datum
4. Measured horizontal and vertical locations of each material placement area
5. Measured locations, slope angle, or grade of Side Slopes
6. Measured locations of Piling replacement, Steel Pipe Piling installation, soil/sediment stabilization materials, bank stabilization materials, installed geosynthetics, utilities, and appurtenances referenced to visible and accessible features of construction
7. Measured bathymetry, including metadata, the date of survey(s), datums, extent of survey coverage, elevation markings, scale bar, licensed Professional Land Surveyor stamp, and signature
8. Changes made by field conditions
9. Changes made by Change Orders
10. Details not on original Contract Drawings
11. References to related shop drawings and modifications

C. Include the following in other Project Record Documents: manufacturer’s certifications, inspection certifications, and field test records required by individual Sections of the Specifications.

D. Provide digital photos for Work Area records as described in Section 01 32 33 – Construction Progress Documentation.

E. Provide the Annual Construction Summary Report and all its contents (including record information) in a digital format.

3.06 DELIVERY TO PROJECT REPRESENTATIVE

A. As-Built Drawings will be used to verify and document progress as stated in the progress payment request. Work not included in the As-Built Drawings is not documented as performed and will not be included for payment in progress payment requests.

B. Prior to request for a Notice of Substantial Completion of the Work for the Project, the Contractor shall transmit Project Record Documents (including As-Built Drawings and any additional record information) for all elements of the Work as required by the Contract Documents, including Contract title, date, Contractor's name and address, index with title and number of each Project Record Document, and statement indicating completion of record information for specific areas or, if for Project closeout, indicating that the documentation is completed and in compliance with Contract Document requirements, attested by the signature of the Contractor or the Contractor's authorized representative.

C. Commissioning will not begin until draft copies of electronic and hard copy Project Record Documents are received and accepted by the Project Representative. The Contractor shall revise the Project Record Documents as a result of any changes made or discovered during commissioning.

D. Changes Subsequent to Substantial Completion:

1. The Contractor shall be responsible for recording changes in the Work subsequent to Substantial Completion, including changes resulting from replacements, repairs, and alterations made by the Contractor as part of its warranty.

END OF SECTION

SECTION 02 21 00

SITE SURVEYS AND POSITIONING CONTROL

PART 1 GENERAL

1.01 SUMMARY

A. This section specifies the requirements for conducting site surveys and establishing positioning control systems for construction projects.

B. The Contractor is responsible for providing precise and reliable positioning data for all construction activities and shall ensure that all construction elements within the project are constructed within tolerances specified.

C. Section includes:

1. Description of Work
2. Work Area
3. Referenced Standards
4. Submittals

1.02 DESCRIPTION OF WORK

A. Site surveys and positioning control systems should be implemented throughout the construction phase to ensure accurate layout and alignment of construction work.

B. Contractor shall provide services of a third-party survey firm to perform the following surveys:

1. Project Area pre-dredge survey
2. Post-dredge survey(s) for each Dredge Certification Unit (DCU)
3. Post-capping placement survey for each completed Cap Certification Unit (CCU).
4. Riverbank excavation extents surface.
5. Riverbank construction completion surface.

C. The purpose of the survey items 1 - 3 is to document site bathymetry at various stages of work. The pre-dredge and post-dredge survey surfaces will be used to calculate the volume of material removed from discrete dredged areas as discussed in Section 35 24 20. Contractor shall conduct a pre-dredging survey for review and acceptance by the Project Representative.

D. The final post-capping placement survey shall accurately reflect site bathymetry at the conclusion of all capping/erosion protection layer placements. The purpose of the post-capping placement survey is to provide baseline bathymetry for future monitoring and site surveying, certification of the CCU, and measurement of material placed for payment application.

E. The purpose of survey items 4 and 5 is to document site topography at various stages of work. Contractor has the option to use the existing riverbank topographic surface provided within the Drawings (and available electronically) or to provide their own pre-removal survey for review and acceptance by the Project Representative.

F. RA Contractor’s selected Surveyor shall develop and make detailed surveys and measurements under the direction of a Licensed Surveyor in the State of Oregon who has verifiable experience with dredging and capping projects. These survey measurements are required for quality control, payment, and documentation.

G. Use of Surveying Equipment and Control Systems: The Contractor shall provide and maintain the necessary equipment, tools, and personnel to perform all survey-related tasks, including but not limited to:

1. Establishing and maintaining accurate site control points.
2. Ensuring proper layout and positioning of all major construction elements.

3. Coordinating with other trades and departments to ensure alignment of work.

1.03 WORK AREA

A. The SIB Project Area (Work Area) is the active cleanup area within the PHSS that lies between approximately river mile (RM) 8.1 and RM 9.2 on the northeast side of the Willamette River. The Work Area is approximately 1.1 miles in length and 117 acres in size and includes riverbanks from the top of the bank to the river. The SIB Project Area is adjacent to a federal navigation channel within the main channel of the Willamette River. The U.S. Army Corps of Engineers (USACE) maintains the navigation channel, which does not extend into SIB.

B. The baseline surveys on the Drawings were completed using NAVD88 datum. All horizontal coordinates refer to the US State Plane Zone (NAD 1983) Oregon North. All coordinates use units of International Feet. All surveys performed for the project shall reference the same datum and benchmarks.

1.04 REFERENCED STANDARDS

A. Refenced standards applicable to this Section include, but are not limited to the following:

REFERENCE	TITLE
ASTM E280-22	Standard Guide for Surveying and Positioning Control
ASTM F2347-15	Standard Guide for the Use of GPS and Geodetic Control for Site Positioning
US Army Corps of Engineers (USACE) Manual EM 1110-2-1003, November 2013	USACE Engineer Manual Hydrographic Surveying

Notes:
ASTM: American Society for Testing and Materials

1.05 SUBMITTALS

A. Refer to Section 01 33 00 - Submittals for all submittals and associated timelines related to the Contract Documents.

B. The Contractor must provide the layout, design, and implementation plans for the Work Area survey and positioning control system, including coordinates, reference points, and control networks, as part of the Construction Site Plan (CSP) in the RAWP. Refer to Section 01 52 00 for additional requirements.

C. Submittals to the RA Performing Party shall be presented in both graphical (survey sounding sheets in PDF and AutoCAD 2020, or earlier version) and digital formats. The digital sounding data shall be ASCII X, Y, and Z in the project datum, and shall include both raw and edited data, compiled in separate files. For each survey, the Contractor shall also submit a separate file of tide data for the same timeframe the survey was completed in ASCII format.

D. Electronic transmittals containing all of the required survey information shall be submitted to the Client no later than 10 calendar days following completion of the survey. The submittal may be part of the Weekly Construction Report.

PART 2 PRODUCTS

2.01 GENERAL

A. Surveying Equipment: The Contractor shall provide surveying equipment that meets or exceeds the standards for accuracy and reliability required for the project.

B. Control Network: The control network shall be established using appropriate surveying techniques (e.g., total station, GPS, laser scanning) to ensure adequate level of accuracy for the measurement. All survey control points shall be properly monumented and identified.

C. The Contractor shall furnish, set and maintain in good order, all ranges, buoys and other In-Water markers necessary to define the Project Area and to facilitate the Work in accordance with Section 35 10 00.

2.02 SURVEYING EQUIPMENT

A. Total Station: A total station or other suitable electronic surveying device shall be used to perform measurements for precise alignment and positioning of construction elements. The equipment should have a minimum accuracy of ± 1/16 inch per 100 feet for setting and benchmarking monuments.

B. GPS Systems: For large-scale projects, GPS-based positioning systems should be used to establish control points and for real-time monitoring of construction progress. The GPS system must comply with ASTM F2347-15 requirements for geodetic control.

C. Data Logging and Processing Software: The Contractor shall use reliable data logging and processing software to ensure accurate data collection, analysis, and reporting of survey results.

D. In-Water Surveys shall be conducted using a survey-grade fathometer and electronic horizontal positioning device (DGPS) and shall meet the minimum standards required by the US Army Corps of Engineers Manual EM 1110-2-1003, January 2002.

E. The horizontal accuracy of the In-Water surveying equipment shall match the accuracy of the dredging equipment, as specified in Section 35 24 20. The vertical accuracy for all acoustic sounding equipment shall be +/- 0.1 feet.

F. The equipment used in the performance of all surveys shall be of the same type for each successive survey and calibrated utilizing accepted industry standards and practices. The locations of survey track lines should be similarly located to the extents practical.

2.03 CONTROL POINTS AND REFERENCE MARKS

A. Control points and reference marks should be established at key locations on the construction site, including grid intersections, boundary lines, and critical infrastructure.

B. Survey points shall be marked with permanent, durable monuments (e.g., brass caps, concrete markers) to withstand construction activities and environmental conditions.

C. The control network must be tied to a known reference system, such as a state or national geodetic reference, ensuring consistency with other surveyed areas.

PART 3 EXECUTION

3.01 SURVEYING AND POSITIONING CONTROL REQUIREMENTS

A. Establish control points at the outset of the project, ensuring sufficient density to accommodate accurate layout and positioning of all construction elements.

B. Perform an initial site survey to verify existing conditions, including topography, utilities, and any existing structures that may affect the construction process.

C. Maintain a record of all surveyed points and control benchmarks, including coordinates, elevations, and descriptions, for reference throughout the construction process.

D. Ensure proper alignment of construction elements according to the established survey control points, regularly checking and adjusting as needed.

3.02 LAYOUT AND ALIGNMENT

A. Layout of construction elements, including foundations, structural components, and utilities, should be performed with required accuracy according to the control points and grid system.

B. Verify all layout dimensions before beginning any work, ensuring all points are within the specified tolerance limits.

C. Re-check positions and elevations throughout the construction process to avoid any misalignment or errors that could affect the integrity of the project.

D. Bathymetry will be determined using depth soundings and tide gauge reading for each track line. Water level and other corrections will be applied and corrected depth shown on the survey sounding sheets.

E. Track lines shall run perpendicular to the predominant contour lines. The orientation system shall be configured such that the nominal track line spacing does not exceed 20 feet with minor track deviations (defined as 5 feet or less). All track lines shall include the entire area within the limits of Work, and track lines shall extend 25 feet beyond the limits of Work except where restricted by topography or structures.

F. All survey plots shall consist of fathometer soundings collected. Survey plots shall include, but not be limited to, horizontal and vertical survey data control references, Work limits, and sounding data.

G. The post-dredge and post-capping placement surveys shall be taken on the same lines established and used for the pre-dredge survey, unless otherwise determined by the Project Representative.

H. If required, manual depth measurement techniques shall be used by Contractor in shallow water locations inaccessible to sounding equipment in order to meet survey requirements listed in this Section. Data produced by these techniques shall be incorporated with sounding data and referenced to the same horizontal and vertical datums. Manual depth measurement techniques shall meet minimum guidelines as designated in Chapter 8 of EM 1110-2-1003.

I. Manual depth measurement techniques shall be used to verify that the required area for placement of stone has been achieved. Measurement shall be taken by lead line, sounding disk, or sounding pole methods. Contractor shall take up to eight manual depth measurements at locations, within stone layer, determined by the Project Representative. Each location shall have a depth measurement taken before and after stone has been placed.

3.03 PRE-DREDGE SURVEY

A. The Contractor shall conduct a pre-dredge survey to serve as a basis for comparison of surface conditions as obtained in a post-dredge survey(s) for determination of amount of material removed within the contract limits of the Work. The existing conditions surface provided in the Drawings is provided for reference during project planning, but will not the basis for determining dredge volumes for payment purposes.

B. Contractor shall provide to the Project Representative the pre-dredge survey no later than 7 calendar days prior to the commencement of dredging, graphical and digital copies of the pre-dredge survey, to be reviewed and approved by the Project Representative.

3.04 POST-DREDGE SURVEY(S)

A. The Contractor shall perform the post-dredge survey(s) for the working Dredge Certification Unit(s) no later than 7 calendar days after completion of the particular DCU dredging, or after completion of segments of dredging.

B. The post-dredge surface will be used to determine the acceptability of the dredging activity and, when approved, will serve as the record of the removal surface/bottom of the engineered cap.

C. The post-dredge survey(s) shall be compared with the pre-dredge survey and serve as a basis for comparison with the pre-dredge conditions for determination of amount of material removed from within the contract limits of dredging.

D. Payment for dredging will not be authorized without the review and approval of the survey by the Project Representative.

E. Within the RAWP, the Contractor is responsible for developing a sequence of Work that identifies approximate areas of dredging that will correspond with requests for payment. When applying for

payment, the areas of dredging must be clearly identified on the submittal for payment documents.

3.05 POST-CAPPING MATERIAL PLACEMENT LAYER SURVEY(S)

A. The Contractor shall perform the post-cap placement survey for the CCU no later than 14 calendar days after completion of the entire sand and stone placement portion of the project.

3.06 COORDINATION AND DOCUMENTATION

A. Coordinate the positioning control system with other trades and subcontractors to ensure proper placement of all systems and components.

B. Maintain and provide accurate records of all surveys, layout plans, and control point adjustments throughout the project.

C. Provide the Project Representative and Engineer with survey reports as required, including data on control points, gridline locations, and construction layout accuracy.

3.07 REMOVAL AND RELOCATION OF CONTROL POINTS

A. Remove temporary control points or reference marks once they are no longer required, ensuring that permanent benchmarks are left intact and undisturbed.

B. Relocate survey control points as construction progresses, ensuring that new work aligns with the established reference system.

END OF SECTION

SECTION 02 32 00

GEOTECHNICAL INFORMATION

PART 1 GENERAL

1.01 SUMMARY

A. This section specifies the requirements for conducting geotechnical investigations and establishing geotechnical parameters supporting the replacement and mitigation of Remedial Action (RA) - impacted structures in the SIB Project Area (Work Area).

B. The purpose of the geotechnical investigation is to provide information on subsurface conditions to assist in the design and construction of the RA impacted structures, particularly regarding foundation design, soil stability, and groundwater conditions.

C. The Swan Island Basin (SIB) Project Area has an extensive infrastructure which will be impacted by the implementation of RA. Remedial Design (RD) evaluates structures that, to accommodate the RA, will require removal, replacement, and/or mitigation measures to be implemented. Final Design of structural mitigation measures and replacement structures will be procured through a performance-based model. Final Design will be completed by the contracted party (Final Designer) procured by the RA Performing Parties based on Reference Structural Design Measures produced in the Draft 50% RD. The Reference Structural Design Measures will be developed to a preliminary (30%) level, furnished with performance specifications to be used by the Final Designer.

1.02 DESCRIPTION OF WORK

A. The required geotechnical investigations should be conducted before construction to assess subsurface conditions, including soil composition, groundwater levels, and potential issues such as soil settlement, expansive soils, and groundwater flow.

B. Geotechnical activities will include soil sampling, soil testing, borehole drilling, and any other necessary methods to determine the properties of the soil.

C. The contractor or geotechnical engineer is responsible for providing geotechnical data to inform decisions related to existing structures subsurface stability conditions, structural modifications, foundation stability and design, excavation methods, and structural support systems.

D. Use of Geotechnical Equipment and Testing Systems: The contractor shall provide and maintain necessary equipment, tools, and personnel to perform all geotechnical tasks, including but not limited to:

1. Drilling and sampling subsurface materials.
2. Conducting laboratory and field tests to determine soil properties (e.g., compaction, shear strength, permeability).
3. Analyzing soil stability and the potential for settlement or other subsurface issues.
4. Preparing geotechnical reports and recommendations for foundation systems, excavation, and soil treatments.

1.03 REFERENCED STANDARDS

A. Refenced standards applicable to this Section include, but are not limited to the following:

1. ASTM International (ASTM):
    a. D420-19, Standard Guide for Site Characterization
    b. D2487-17, Standard Practice for Classification of Soils for Engineering Purposes
    c. D1586-22, Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils
    d. D1143-18, Standard Test Methods for Deep Foundations Under Lateral Load

1.04 SUBMITTALS

A. Refer to Section 01 33 00 (Submittal Procedures)

B. The Contractor must provide the geotechnical investigation report, including findings on soil conditions, groundwater levels, and any required soil treatments.

PART 2 PRODUCTS

2.01 GENERAL FABRICATION

A. Geotechnical Equipment: The contractor shall provide geotechnical testing equipment that meets or exceeds the standards for accuracy and reliability.

B. Testing Laboratories: All soil samples must be tested at accredited laboratories in accordance with industry standards, ensuring accurate and reliable results for all tests.

2.02 GEOTECHNICAL TESTING EQUIPMENT

A. Soil Sampling Equipment: Suitable drilling rigs, augers, and core sampling equipment shall be used to collect soil samples at various depths.

B. Field Testing Equipment: Equipment such as standard penetration test (SPT) hammers, cone penetration testing (CPT) systems, and vane shear devices shall be used to assess soil strength and compaction.

C. Laboratory Testing: All soil samples should be analyzed for properties such as grain size distribution, Atterberg limits, shear strength, compaction, and consolidation behavior.

2.03 GEOTECHNICAL REPORTS AND RECOMMENDATIONS

A. The Contractor shall submit a detailed geotechnical report that includes the following:

1. A description of soil conditions encountered.
2. Recommendations for foundation design, excavation techniques, and potential soil stabilization or improvement measures.
3. An analysis of groundwater conditions, including potential issues with water table fluctuations.
4. Identification of any geotechnical hazards (e.g., expansive soils, slope failure risk).

PART 3 EXECUTION

3.01 GEOTECHNICAL INVESTIGATION REQUIREMENTS

A. Perform a subsurface investigation prior to the start of final design to determine soil and sediment properties affecting modification or replacement of RA impacted structures.

B. Boreholes should be drilled to a sufficient depth to assess soil conditions beneath the proposed foundation or excavation areas.

C. Perform field and laboratory tests on soil samples, such as moisture content, grain size analysis, and shear strength, to determine suitability for construction.

D. Maintain a record of all soil samples, test results, and site conditions throughout the investigation phase.

3.02 FOUNDATION AND STRUCTURAL DESIGN RECOMMENDATIONS

A. The geotechnical engineer shall provide recommendations for foundation types (e.g., shallow or deep foundations), based on soil bearing capacity and settlement considerations.

B. The contractor shall use the geotechnical report to ensure that construction methods and materials are suitable for the identified soil conditions.

C. If subsurface issues such as high groundwater levels or unstable soil are identified, implement the necessary mitigation measures (e.g., dewatering, soil stabilization).

3.03 COORDINATION AND DOCUMENTATION

A. Coordinate the timing and sequence of geotechnical investigations with the RA project activities ensuring alignment of testing and findings with other project disciplines (e.g., structural engineering, civil engineering, remedial construction).

B. Maintain and provide accurate records of all geotechnical data, including test results, recommendations, and any necessary adjustments to construction methods.

C. Provide the Project Representative and Engineer with geotechnical reports as required, including findings on soil conditions, recommendations for foundations, and any concerns related to soil stability or groundwater.

3.04 REMOVAL AND RELOCATION OF MONUMENTS AND TESTING EQUIPMENT

A. After the investigation is complete, remove any temporary soil testing equipment or test sites, ensuring that permanent markers (if applicable) are maintained.

B. Relocate any monitoring equipment as needed during the construction process to verify ongoing soil stability or groundwater conditions.

END OF SECTION

SECTION 02 41 00

DEMOLITION

PART 1 GENERAL

1.01 SUMMARY

A. This section specifies the requirements for the selective demolition of structures and other features as part of the construction process within the Swan Island Basin Project Area (Work Area)

B. Work includes the removal, disposal, and recycling of materials, as well as preparation for new construction or renovation activities. The Contractor must follow all safety guidelines, environmental considerations, and regulatory requirements during demolition.

1.02 DESCRIPTION OF WORK

A. Contractor is responsible for demolishing the specified structures, elements, and site features, including but not limited to walls, decks, roofs, utilities, pilings and other foundation structures, as required by the Contract Documents.

B. Demolition should be conducted in a systematic and controlled manner, ensuring that all hazardous materials (e.g., asbestos, lead paint) are handled appropriately.

C. Contractor must protect adjacent structures and site features that are to remain intact and ensure that the Work Area is safe and secure during the demolition process.

D. Contractor must provide continuous and effective environmental controls during demolition to prevent release of contaminated sediment to the water column.

E. Contractor will be responsible for the proper disposal, recycling, and/or salvaging of materials in accordance with local regulations and green remediation goals.

F. The Work includes providing equipment, personnel, safety measures, and any necessary permits for the safe and efficient completion of the demolition tasks.

1.03 REFERENCED STANDARDS

A. Refenced standards applicable to this Section include, but are not limited to the following:

1. Occupational Safety and Health Administration (OSHA) 1926.820, Safety and Health Regulations for Construction: Demolition
2. 40 CFR 61, National Emission Standards for Hazardous Air Pollutants (Asbestos)
3. National Fire Protection Association (NFPA) 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations
4. ASTM International (ASTM) E3073-17, Standard Guide for Development of Waste Management Plan for Construction, Deconstruction, or Demolition Projects

1.04 SUBMITTALS

A. Refer to Section 01 33 00 – Submittal Procedures

B. The Contractor must provide the following as part of the demolition submittals:

1. A detailed demolition plan within the Remedial Action Work Plan (RAWP) outlining the sequence of work, methods, environmental controls and monitoring, and equipment to be used.
2. Safety plans addressing potential hazards including dust control, noise mitigation, water quality monitoring, and handling of hazardous materials.
3. Waste management plan specifying the disposal, recycling, or salvaging of materials.
4. Permits or documentation required by local authorities for the demolition process.

PART 2 PRODUCTS

2.01 DEMOLITION EQUIPMENT AND MATERIALS

A. The Contractor must use appropriate demolition equipment, including but not limited to:

1. Hydraulic excavators, backhoes, bulldozers, cranes, and wrecking balls.
2. Hand tools, saws, jackhammers, and cutting torches for selective demolition.
3. Equipment for dust control, such as water sprays or dust suppression systems.

B. The Contractor shall use only properly maintained and suitable equipment for the demolition work, ensuring that all equipment meets safety and performance standards.

2.02 DEMOLITION MATERIALS AND WASTE MANAGEMENT

A. The Contractor shall establish a waste management program to recycle, reuse, or dispose of materials as required by local regulations and the project's sustainability goals. Materials may include concrete, brick, wood, metal, glass, and other construction debris.

B. The Contractor shall segregate materials on-site to facilitate recycling and reduce landfill waste. Any hazardous materials identified during the demolition process must be handled, removed, and disposed of in compliance with applicable regulations (e.g., asbestos, lead-based paint, PCBs).

2.03 TEMPORARY STRUCTURES AND SAFETY MEASURES

A. Temporary protective barriers or fencing shall be erected to secure the demolition site and ensure safety for workers and the public.

B. If necessary, temporary bracing or shoring shall be provided for remaining structures or features that may be impacted by the demolition work.

C. For in-water demolition work, Contractor shall establish environmental controls to meet water quality protection requirements in accordance with Section 01 35 44 and as detailed in Contractor's RAWP and Construction Quality Assurance/Quality Control Plan.

PART 3 EXECUTION

3.01 DEMOLITION REQUIREMENTS

A. The Contractor shall conduct a site survey to document existing conditions before starting demolition, including identification of any hazardous materials.

B. Perform selective demolition in accordance with the demolition plan, ensuring that only specified structures and materials are removed.

C. All demolition work must be performed in a controlled, phased manner to ensure the safety of workers and minimize damage to existing, adjacent structures.

D. Prior to demolition, isolate and disconnect utilities such as water, gas, electricity, and sewage lines to prevent accidents or damage.

E. If hazardous materials (e.g., asbestos, lead paint) are encountered, work shall cease immediately, and the Contractor shall follow all regulatory procedures for handling and disposal.

F. Provide adequate dust control measures throughout the demolition process, such as water spraying, dust barriers, or air filtration systems, to minimize air pollution and impacts on the surrounding environment.

G. Ensure proper disposal of all debris, recycling as required, and transportation to approved disposal sites.

3.02 PROTECTION OF EXISTING STRUCTURES AND SITE FEATURES

A. Existing structures and site features that are to remain shall be protected from damage during demolition.

B. Use protective coverings, barriers, and/or shoring where necessary to shield adjacent walls, roofs, foundations or other structures, and surface water from impact or debris.

C. If partial demolition is required, ensure that structural integrity is maintained and that no damage occurs to portions of the building or site to remain.

3.03 COORDINATION AND DOCUMENTATION

A. Coordinate with the Project Representative, RA Performing Parties, and other contractors to ensure that demolition activities do not conflict with ongoing or future construction activities.

B. Maintain a daily log documenting the progress of demolition, any encountered issues (e.g., hazardous materials), and safety incidents.

C. Provide the Project Representative with reports on demolition progress and any unforeseen conditions or changes to the scope of work.

D. Provide final documentation, including confirmation that all hazardous materials have been properly disposed of, and that the site is cleared and ready for new construction.

3.04 CLEAN-UP AND SITE RESTORATION

A. At the completion of demolition, clear the site of all debris and unused materials.

B. Restore the site to a clean condition, removing any temporary barriers, equipment, or shoring devices used during the demolition process.

C. If required, perform final grading or leveling to prepare the site for subsequent construction activities.

3.05 REMOVAL OF TEMPORARY STRUCTURES

A. Remove any temporary structures, bracing, fencing, and in-water controls after demolition is complete and the site is secure.

B. Ensure that any remaining materials or equipment are properly disposed of or relocated in accordance with project guidelines.

END OF SECTION

SECTION 02 42 00

REMOVAL AND DIVERSION OF CONSTRUCTION MATERIALS

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies the requirements for the removal, recycling, and diversion of construction and demolition materials from the Swan Island Basin (SIB) Project Area (Work Area)

B. The work includes identification, collection, sorting, and processing of construction debris, with an emphasis on maximizing the diversion of materials from landfills through recycling, reuse, or donation.

C. The contractor shall ensure compliance with all local, state, and federal regulations related to the disposal of construction debris and hazardous materials, while promoting sustainability and minimizing waste.

1.02 DESCRIPTION OF WORK

A. The contractor is responsible for implementing a comprehensive waste diversion plan to minimize the environmental impact of construction and demolition activities. Refer to Section 01 35 43 (Environmental Procedures) and Green Remediation Plan.

B. The work includes the removal, sorting, and diversion of construction materials such as wood, metal, concrete, drywall, glass, insulation, plastics, and other debris.

C. Materials should be recycled, reused, or salvaged whenever possible, in accordance with project sustainability goals.

D. The contractor will provide all necessary personnel, equipment, and logistics for sorting, transporting, and processing construction materials.

E. Hazardous materials (e.g., asbestos, lead-based paint) identified during the removal process must be handled according to applicable regulations.

F. The contractor shall provide periodic reports on the amounts of materials diverted from the landfill, along with proof of recycling or disposal.

1.03 SUBMITTALS

A. Refer to Section 01 33 00 – Submittal Procedures

B. The contractor shall submit the following:

1. Green Remediation Plan update within the Environmental Records Binder (ERB) (Section 01 35 43) outlining the materials to be removed, sorted, and diverted, as well as the methods of recycling, reuse, or disposal.

2. Documentation demonstrating compliance with local waste diversion ordinances or sustainability goals.

3. A report at the completion of the project detailing the total volume of materials diverted, including copies of receipts, certifications, or other documentation from recycling facilities.

4. Safety protocols and procedures for handling hazardous materials encountered during the diversion process.

PART 2 PRODUCTS

2.01 MATERIALS AND WASTE MANAGEMENT SYSTEMS

A. Waste Management Equipment: The contractor shall provide sorting bins, containers, or designated storage areas for the segregation of different types of construction materials (e.g., metals, wood, concrete, drywall).

B. Recycling and Reuse:

1. Recyclable materials shall include, but are not limited to, metals, wood, concrete, glass, and drywall.

2. Salvageable materials (e.g., structural beams) should be identified for potential reuse.

3. Temporary Storage Areas: Provide temporary on-site storage areas for segregated materials before they are transported to appropriate recycling or disposal facilities. These areas should be secure, well-marked, and organized to minimize contamination and maximize efficiency.

4. Hazardous Material Disposal: The Contractor shall provide suitable containers for the safe collection and disposal of hazardous materials, including asbestos, lead-based paint, and other regulated substances, following all regulatory requirements.

2.02 WASTE DIVERSION AND RECYCLING FACILITIES

A. The Contractor shall utilize certified and approved recycling facilities for all recyclable materials and provide documentation of materials accepted by these facilities.

B. Materials that cannot be recycled locally should be transported to approved facilities, and the Contractor must ensure proper tracking and documentation for such materials.

2.03 REUSABLE MATERIALS

A. Materials identified for reuse shall be carefully removed, stored, and transported to appropriate locations for future use in the project or on other construction sites.

B. Salvaged items should be documented and included in the final waste diversion report, specifying quantities and the condition of items for reuse (e.g., structural components,).

PART 3 EXECUTION

3.01 WASTE DIVERSION REQUIREMENTS

A. Prior to starting construction activities, the Contractor shall develop and implement a waste diversion plan as part of the Green Remediation Plan update that prioritizes the recycling, reuse, and diversion of materials from landfills.

B. Materials to be diverted from the site include, but are not limited to, the following:

1. Concrete and masonry.

2. Metals (steel, aluminum, copper, etc.).

3. Wood and lumber.

4. Glass and windows.

5. Gypsum board (drywall).

6. Insulation.

7. Asphalt.

8. Hazardous materials, as defined by local regulations.

C. Segregate materials into appropriate categories on-site for efficient diversion and processing.

D. Establish a regular schedule for transporting segregated materials to recycling facilities and document all recycling and diversion activities.

3.02 MATERIAL HANDLING AND STORAGE

A. Store materials to be recycled or reused in designated, secure areas away from construction activities.

B. Ensure that materials are protected from damage and contamination during storage.

C. Recyclable and reusable materials should be clearly labeled and organized to facilitate easy identification and removal.

D. Ensure that hazardous materials are safely stored and segregated in accordance with applicable safety standards and regulations

3.03 COORDINATION AND DOCUMENTATION

A. Coordinate with the Project team, including architects and engineers, to ensure that salvaged materials are identified for reuse in the project.

B. Maintain accurate records of materials diverted from the Work Site, including quantities and types of materials, and submit periodic reports to the Project Representative.

C. Provide the Project Representative with final documentation, including receipts from recycling facilities, disposal manifests, and a summary of the total amount of materials diverted, as well as the final disposition of all materials.

3.04 SAFETY AND COMPLIANCE

A. Ensure that all materials are handled in compliance with relevant safety regulations, including those for hazardous materials, dust control, and worker protection.

B. The contractor shall follow all local, state, and federal regulations related to the management, diversion, and disposal of construction materials and hazardous substances.

C. The contractor shall implement appropriate dust and noise control measures to minimize the environmental impact of construction activities

3.05 FINAL CLEAN-UP AND SITE RESTORATION

A. Upon completion of the project, the contractor shall remove any remaining waste and materials that have not been diverted, ensuring that the site is left in a clean, orderly condition.

B. The contractor shall restore the Work Area to its original state or as otherwise specified in the contract documents, ensuring that no debris or construction waste remains.

END OF SECTION

SECTION 02 61 00

REMOVAL AND DISPOSAL OF CONTAMINATED SOILS

PART 1 GENERAL

1.01 SUMMARY

A. This section specifies the requirements for the proper removal, handling, staging, and disposal of contaminated soils from riverbank remediation within the Swan Island Basin (SIB) Project Area. Soil excavation areas are shown on the Swan Island Basin Remedial Design Drawings.

B. The Contractor shall ensure that contaminated soils are removed and disposed of in compliance with all relevant federal, state, and local environmental regulations.

C. The Work includes excavation and transportation of contaminated soils to approved disposal facility(ies).

1.02 DESCRIPTION OF WORK

A. The Contractor is responsible for removing contaminated soils in accordance with the Drawings, Specifications, and environmental regulations. The Waste Designation Memorandum provides the preliminary waste designation screening results to help inform the plan for excavated material management.

B. The Contractor shall provide all necessary equipment, personnel, and materials to safely handle, transport, and dispose of contaminated soils.

C. The contractor must adhere to all safety procedures during the removal process, including dust control, spill containment, and the use of personal protective equipment (PPE).

D. Staging areas shall be designated for contaminated soils to ensure containment and prevent cross-contamination with other materials.

E. All contaminated soil removal and disposal shall be documented, and the Contractor must provide final disposal manifests and certificates of disposal for the Project Representative's records.

1.03 REFERENCED STANDARDS

A. Refenced standards applicable to this Section include, but are not limited to the following:

REFERENCE	TITLE
EPA 40 CFR 261	Identification and Listing of Hazardous Waste
EPA 40 CFR 262	Standards Applicable to Generators of Hazardous Waste
OSHA 1910.120	Hazardous Waste Operations and Emergency Response (HAZWOPER)
ASTM D2487-17	Standard Practice for Classification of Soils for Engineering Purposes
ASTM E1527-13	Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process

Notes:
ASTM: ASTM International

1.04 SUBMITTALS

A. Refer to Section 01 33 00 – Submittals Procedure

B. The Contractor shall submit the following:

1. The Remedial Action Work Plan shall include the methods for identifying, handling, testing, and disposing of contaminated soils.
2. Final Waste Designation Memorandum.

3. Transportation and Off-Site Disposal Plan.
4. Copies of permits, certifications, and any regulatory approvals required for the removal and disposal of contaminated soils.
5. Documentation of the testing and characterization of soils, including laboratory analysis results for contaminants.
6. A final disposal report with manifests and receipts from disposal or treatment facilities.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. The Contractor shall use appropriate equipment for the safe excavation, handling, and transportation of contaminated soils, including:

1. Excavators, backhoes, and loaders for excavation and removal of contaminated soils.
2. Dump trucks or specialized vehicles for transporting contaminated soils to approved disposal facilities.
3. Temporary containment structures (e.g., roll-off containers, sealed bins, or lined stockpiles) to ensure proper staging of contaminated soils on-site.
4. Dust control systems (e.g., water trucks, misting systems) to minimize airborne contamination during excavation and transportation.

B. PPE: The contractor shall provide necessary PPE for all workers involved in the contaminated soil removal process (01 35 29 Health, Safety, and Emergency Response Procedures).

2.02 CONTAINMENT MATERIALS

A. Temporary containment materials (e.g., plastic sheeting, tarps, or geotextile fabric) shall be used to prevent contamination from spreading during excavation, staging, and transportation of contaminated soils.

B. Materials used for containment shall be compatible with the type of contamination and shall be disposed of in accordance with applicable regulations once the work is complete.

2.03 TRANSPORTATION AND DISPOSAL FACILITIES

A. The Contractor shall use transportation vehicles that are suitable for the transport of contaminated soils and comply with applicable regulations (e.g., Department of Transportation [DOT] standards).

B. The Contractor must ensure that the disposal facilities are properly licensed and approved to accept the type of contaminated soils generated from the project.

C. The Contractor shall provide documentation from the disposal facility indicating that the contaminated soils have been properly treated or disposed of in accordance with local, state, and federal regulations.

PART 3 EXECUTION

3.01 REMOVAL OF CONTAMINATED SOILS

A. The Contractor shall excavate contaminated soils in accordance with the approved plan, ensuring that contaminated materials are kept separate from non-contaminated materials.

B. Excavation should be done carefully to minimize the spread of contamination. If necessary, the Contractor shall use appropriate barriers (e.g., berms or excavated trenches) to contain soil runoff.

C. Contaminated soils shall be placed into designated containers or vehicles for transport, ensuring that these materials are securely contained and do not spill or leak.

3.02 STAGING AND CONTAINMENT

A. Contaminated soils should be staged in an area that is isolated from other construction activities, using temporary containment structures (e.g., roll-off containers or lined stockpiles) to prevent soil erosion and cross-contamination.

B. The Contractor shall ensure that staging areas are adequately marked and secured to prevent unauthorized access and environmental exposure.

C. The Contractor shall implement dust control measures during the handling and staging of contaminated soils to minimize airborne contamination (01 35 43 Environmental Protection Procedures).

3.03 TRANSPORTATION OF CONTAMINATED SOILS

A. The Contractor shall transport contaminated soils using vehicles that are properly sealed to prevent leakage or spillage.

B. The transportation vehicles must comply with local, state, and federal regulations governing the transport of hazardous materials.

C. The Contractor shall provide documentation of transportation, including waste manifests, receipts from disposal facilities, and any regulatory certifications.

3.04 DISPOSAL OF CONTAMINATED SOILS

A. The Contractor shall dispose of contaminated soils at licensed facilities approved to handle such materials.

B. The Contractor must provide the Project Representative with a final report, including documentation that all contaminated soils were properly disposed of in accordance with regulatory requirements.

3.05 SITE RESTORATION

A. After the removal of contaminated soils, the contractor shall follow requirements of Section 31 Earthwork Specifications and Drawings for completion of the soil remediation.

B. All staging and containment areas for contaminated soils must be cleared, and any temporary structures used for containment shall be properly disposed of in compliance with environmental regulations.

END OF SECTION

SECTION 03 01 00

REHABILITATION OF CONCRETE

PART 1 GENERAL

1.01 SUMMARY

A. This section specifies the requirements for the rehabilitation of structural concrete that has been damaged or deteriorated due to factors such as environmental exposure, load stresses, or material deficiencies.

B. The scope of work includes the assessment, preparation, repair, and protection of concrete surfaces, with an emphasis on restoring the structural integrity and durability of the affected concrete elements.

C. The contractor shall employ suitable methods, materials, and techniques for rehabilitation to ensure that the repaired concrete meets the specified performance standards and complies with all relevant codes and regulations.

1.02 DESCRIPTION OF WORK

A. The work includes, but is not limited to, the following:

1. Evaluation of damaged concrete areas, including visual inspection and non-destructive testing.
2. Removal of deteriorated or damaged concrete to a depth necessary to achieve a sound and stable substrate.
3. Preparation of surfaces to receive new repair materials, ensuring proper bonding between the existing concrete and the rehabilitation materials.
4. Application of repair materials, such as repair mortars, patching compounds, or concrete overlays, in accordance with the manufacturer's recommendations.
5. Curing and finishing of the repaired areas to ensure durability and aesthetic uniformity.
6. Protection of repaired areas during the curing process to prevent premature damage or cracking.

B. The contractor shall ensure that all rehabilitation work adheres to project specifications and is completed to the satisfaction of the Project Representative overseeing the project.

1.03 REFERENCED STANDARDS

A. Refenced standards applicable to this Section include, but are not limited to the following:

REFERENCE	TITLE
ACI 318	Building Code Requirements for Structural Concrete
ACI 546R-14	Guide to Repair of Concrete Structures
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C881	Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete
ASTM C293	Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)

Notes:
ASTM: ASTM International

1.04 SUBMITTALS

A. Refer to Section 01 33 00 -Submittals for all submittals and associated timelines related to the Contract Documents.

B. The contractor shall submit the following for approval prior to the commencement of rehabilitation work:

1. A detailed Concrete Rehabilitation Plan, including methods, materials, and a timeline for repairs.
2. Product data sheets and technical specifications for all repair materials, including mortars, adhesives, or bonding agents.
3. Manufacturer's instructions for any proprietary repair systems or materials.
4. Quality control procedures, including methods for surface preparation, application, and curing.
5. Samples of repair materials for approval by the project engineer or architect.

PART 2 PRODUCTS

2.01 REPAIR MATERIALS

A. Concrete Repair Mortars:

1. Repair mortars should be suitable for the intended exposure conditions, such as freeze-thaw, chemical exposure, or high traffic.
2. Mortars should be compatible with the existing concrete in terms of thermal expansion, permeability, and bonding characteristics.
3. Materials must meet the requirements of ASTM C387, ASTM C928, or other applicable standards for repair mortars.

B. Epoxy and Bonding Agents:

1. Epoxy-based bonding agents should be used where necessary to promote strong adhesion between the existing concrete and the repair material.
2. Epoxies shall conform to ASTM C881 and be compatible with the repair mortar or other systems used.

C. Surface Sealers and Protective Coatings:

1. The contractor shall apply protective coatings or sealers to the repaired concrete areas to enhance durability and resist environmental degradation.
2. Sealing materials should be chosen based on the exposure conditions and may include silane, siloxane, or urethane-based products.

2.02 EQUIPMENT

A. The contractor shall use the following equipment for surface preparation and application of repair materials:

1. Pressure washers or sandblasters for cleaning and preparing surfaces.
2. Surface grinders or scarifiers for removing damaged or deteriorated concrete.
3. Mechanical mixers and hand tools for mixing and applying repair mortars.
4. Trowels, finishing tools, and other implements for shaping and finishing repaired concrete surfaces.

PART 3 EXECUTION

3.01 EVALUATION AND INSPECTION OF DAMAGED CONCRETE

A. The contractor shall conduct a thorough evaluation of the damaged concrete areas before proceeding with repairs. This may include:

1. Visual inspection to identify visible cracks, spalls, and surface deterioration.
2. Non-destructive testing methods, such as ultrasonic testing or rebound hammer testing, to assess the condition of the concrete.
3. Core sampling and laboratory testing for concrete strength or to identify the presence of corrosion, moisture content, or other factors affecting concrete durability.

B. The contractor shall submit a report to the Project representative on the condition of the concrete, including recommendations for repair based on the findings of the evaluation.

3.02 REMOVAL OF DAMAGED CONCRETE

A. The contractor shall remove all deteriorated concrete to sound, undamaged concrete using appropriate methods, such as mechanical grinding, chiseling, or hydro-demolition.

B. The depth of removal should be sufficient to ensure that only sound concrete remains to receive the repair materials.

C. The edges of the removed areas should be squared off to ensure proper bonding of the repair material.

D. All debris, dust, and contaminants shall be removed from the area, and the surface should be cleaned thoroughly before applying any repair material.

3.03 SURFACE PREPARATION

A. The contractor shall prepare the surface of the existing concrete to ensure a strong bond between the substrate and the repair material. Preparation may include:

1. Sandblasting, shot blasting, or grinding to remove laitance, coatings, or contaminants from the concrete surface.
2. Washing the surface to remove dust, dirt, or oils.
3. Roughening the surface, where required, to provide better adhesion for the repair materials.

B. For surfaces requiring bonding agents (e.g., epoxy), the contractor shall apply the bonding agent in accordance with the manufacturer's instructions and allow it to cure before applying the repair material.

3.04 APPLICATION OF REPAIR MATERIALS

A. The contractor shall mix and apply the repair material according to the manufacturer's specifications and the requirements of the project.

B. Repair materials should be applied in layers, with each layer allowed to cure before applying additional layers, ensuring the proper thickness and strength of the repair.

C. The contractor shall ensure that all repairs are smooth, level, and match the surrounding concrete in terms of texture and finish.

D. If required, formwork shall be installed to contain the repair material during application.

3.05 CURING AND PROTECTION

A. The contractor shall cure the repaired concrete according to the specifications for the repair material being used. Curing methods may include:

1. Covering the repaired areas with plastic sheeting to retain moisture.
2. Using curing compounds that form a moisture-retaining film on the surface.
3. Spraying the surface with a water mist or applying wet burlap.

B. The contractor shall protect the repaired areas from premature damage, including vehicular traffic, freezing temperatures, or direct sunlight, until the repairs have fully cured and gained adequate strength.

3.06 QUALITY CONTROL AND INSPECTION

A. The contractor shall provide quality control throughout the repair process, ensuring that all work meets the specified requirements for material application, curing, and final appearance.

B. The contractor shall notify the Project Representative of periodic inspections during and after repair activities to ensure the work complies with the contract documents.

C. Testing of repaired concrete for strength, durability, or other properties may be required based on project specifications.

3.07 FINAL CLEANUP AND SITE RESTORATION

A. After completion of the rehabilitation work, the contractor shall clean the Work Area of any tools, equipment, or materials used during the repair process.

B. The contractor shall ensure that all repaired areas are free of debris and that the surrounding area is returned to its original condition or as specified in the contract documents.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY

A. This section specifies the requirements for cast-in-place concrete, covering the preparation, placement, and finishing of concrete elements in structural applications.

B. The scope of work includes, but is not limited to, the procurement of materials, formwork, reinforcing steel, placement, curing, and finishing of cast-in-place concrete, with an emphasis on ensuring durability, strength, and compliance with relevant standards.

C. The contractor shall employ suitable methods, materials, and techniques for concrete construction to meet the specified performance standards, ensuring that the work adheres to all applicable codes and regulations.

1.02 DESCRIPTION OF WORK

A. The work includes, but is not limited to, the following:

1. Preparation of Work Area and materials, including quality control measures.
2. Formwork and reinforcement installation.
3. Mixing, placing, and finishing of concrete according to specified requirements.
4. Curing of concrete and protection from environmental effects until adequate strength is attained.
5. Final inspection, testing, and acceptance of cast-in-place concrete.

B. The contractor shall ensure that all work is completed according to project specifications and is accepted by the Project Representative.

1.03 REFERENCED STANDARDS

A. Refenced standards applicable to this Section include, but are not limited to the following:

REFERENCE	TITLE
ACI 117 (2010; R 2015)	Specifications for Tolerances for Concrete Construction and Materials and Commentary
ACI 121R (2008)	Guide for Concrete Construction Quality Systems in Conformance with ISO 9001
ACI 213R (2014; E2017)	Guide for Structural Lightweight-Aggregate Concrete
ACI 301 (2020)	Specifications for Structural Concrete
ACI 302.1R (2015)	Guide for Concrete Floor and Slab Construction
ACI 304.2R (2017)	Guide to Placing Concrete by Pumping Methods
ACI 305.1 (2014)	Specification for Hot Weather Concreting
ACI 306.1 (1990; R 2002)	Standard Specification for Cold Weather Concreting
ACI 308.1 (2023)	Specification for Curing Concrete
ACI 347R (2014; Errata 1 2017)	Guide to Formwork for Concrete
ASTM C31/C31M (2024b)	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33/C33M (2024)	Standard Specification for Concrete Aggregates
ASTM C150/C150M (2024)	Standard Specification for Portland Cement
ASTM C172/C172M (2017)	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C94/C94M (2024c)	Standard Specification for Ready-Mixed Concrete

REFERENCE	TITLE
ASTM C136/C136M (2019)	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM A615/A615M (2024)	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A184/A184M (2024)	Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A767/A767M (2019)	Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement

Notes:
ASTM: ASTM International

1.04 SUBMITTALS

A. Refer to Section 01 33 00 -Submittals for all submittals and associated timelines related to the Contract Documents.

B. The contractor shall submit the following to the Project Representative for approval prior to the commencement of rehabilitation work:

1. Concrete Mix Design, including proportions, material types, and supplier certifications.
2. Detailed Concrete Placement and Curing Plan, addressing site conditions, weather forecasts, and curing methods.
3. Shop drawings of formwork, reinforcing steel, and any embedded items.
4. Material certification for cement, aggregates, admixtures, and reinforcing steel, confirming conformance with ASTM and ACI standards.
5. Manufacturer's data sheets and technical specifications for any proprietary systems or materials.

PART 2 PRODUCTS

2.01 CONCRETE MATERIALS

A. Cement:

1. Cement shall conform to ASTM C150 (Portland Cement) or ASTM C595 (Blended Hydraulic Cement) as appropriate for project requirements.

B. Aggregates:

1. Fine aggregates shall conform to ASTM C33.
2. Coarse aggregates shall conform to ASTM C33.

C. Admixtures:

1. Chemical admixtures, if used, shall conform to ASTM C494.
2. Air-entraining admixtures shall conform to ASTM C260.

2.02 REINFORCING STEEL

A. Reinforcing steel shall conform to ASTM A615, ASTM A706 (low-alloy steel), or ASTM A775 for epoxy-coated bars as required by the project.

B. Welded wire reinforcement shall conform to ASTM A1064/A1064M, ASTM A884/A884M, or other applicable standards.

2.03 FORMWORK MATERIALS

A. Formwork materials shall conform to ACI 347R guidelines and meet tolerances specified in ACI 117.

B. Form release agents shall be non-staining, non-toxic, and approved by the engineer.

PART 3 EXECUTION

3.01 PREPARATION OF CONCRETE

A. The contractor shall ensure that concrete mix designs are approved by the Project Representative before use. The mix design shall meet the requirements for strength, durability, and workability.

B. Concrete materials, including aggregates, shall be properly stored to prevent contamination or degradation.

3.02 PLACING CONCRETE

A. Concrete shall be placed in accordance with ACI 304R, ACI 304.2R, and ACI 301 to ensure uniform distribution, proper consolidation, and adequate coverage of reinforcement.

B. Concrete shall be placed continuously to avoid cold joints. If delays occur, fresh concrete shall be placed while the previously placed concrete is still plastic.

3.03 CURING AND PROTECTION

A. Curing shall comply with ACI 308.1. Methods such as moist curing, curing compounds, or insulated covers shall be employed to maintain the required temperature and moisture conditions.

B. Concrete shall be protected from adverse weather conditions (hot, cold, or wet) as specified in ACI 305R and ACI 306R.

3.04 FINISHING

A. Concrete surfaces shall be finished in accordance with ACI 301. The surface finish shall be smooth, uniform, and free of defects such as honeycombing or excessive laitance.

B. Edges, joints, and other features shall be formed to the specified dimensions, ensuring compliance with ACI 117 tolerances.

3.05 INSPECTION AND TESTING

A. The contractor shall provide access for periodic inspection by the Project Representative during placement and curing operations.

B. Concrete shall be tested for compressive strength as per ASTM C39 or ASTM C873. The contractor shall take concrete samples as required for strength testing and submit them to an accredited testing agency for evaluation.

C. Quality control testing, such as slump, air content, and temperature, shall be performed in accordance with ASTM C143, ASTM C231, and other relevant standards.

3.06 FINAL CLEANUP AND SITE RESTORATION

A. The contractor shall remove all debris, formwork, and excess materials from the Work Area upon completion of the concrete work.

B. The site shall be restored to its original condition or as specified in the contract documents.

END OF SECTION

SECTION 05 00 00

METALS

PART 1 GENERAL

1.01 SUMMARY

A. This section is a placeholder. The need for this section will be determined during the development of the Pre-Final 90% RD Plan Set.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION [NOT USED]

END OF SECTION

SECTION 06 00 00

WOODS, PLASTICS, AND COMPOSITES

PART 1 GENERAL

1.01 SUMMARY

A. This section is a placeholder. The need for this section will be determined during the development of the Pre-Final 90% RD Plan Set.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION [NOT USED]

END OF SECTION

SECTION 09 90 00

PAINTING AND COATING

PART 1 GENERAL

1.01 SUMMARY

A. This section is a placeholder. The need for this section will be determined during the development of the Pre-Final 90% RD Plan Set.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION [NOT USED]

END OF SECTION

SECTION 22 00 00

PLUMBING

PART 1 GENERAL

1.01 SUMMARY

A. This section is a placeholder. The need for this section will be determined during the development of the Pre-Final 90% RD Plan Set.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION [NOT USED]

END OF SECTION

SECTION 26 00 00

ELECTRICAL

PART 1 GENERAL

1.01 SUMMARY

A. This section is a placeholder. The need for this section will be determined during the development of the Pre-Final 90% RD Plan Set.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION [NOT USED]

END OF SECTION

SECTION 27 00 00

COMMUNICATION

PART 1 GENERAL

1.01 SUMMARY

A. This section is a placeholder. The need for this section will be determined during the development of the Pre-Final 90% RD Plan Set.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION [NOT USED]

END OF SECTION

SECTION 31 00 00

EARTHWORK

PART 1 GENERAL

1.01 SUMMARY

A. Construction of the Remedial Design (RD) for the Swan Island Basin (SIB) Project Area requires excavation, grading and backfill to achieve underlying grades. Backfill may be needed to bring existing grades to reasonable elevations for constructing revetment (riprap), upland topsoil and the sediment cap. In addition, structural fill is required around new foundations and retaining walls. This section includes the Project conditions and requirements for backfill and topsoil placement of all upland works.

1.02 DESCRIPTION OF WORK

A. The work described in this section includes earthwork general requirements, subsurface extraction, rough grading and filling, excavation, and foundation.

1.03 RELATED SECTIONS

A. Section 01: General Requirements

B. Section 31 05 19: Geosynthetics for Earthworks

C. Section 31 09 00: Condition Inspections and Monitoring

D. Section 31 11 00: Clearing and Grubbing

E. Section 31 25 00: Erosion and Sedimentation Control

F. Section 31 37 00: Rock Revetment

G. Section 31 62 10: Steel Pipe Piling

H. Section 31 62 16.19: Steel Sheet Piles

I. Section 35 37 10: Engineered Caps

J. Section 35 24 20: Remedial Dredging, Barge Dewatering, and In-Water Transportation

K. Section 35 53 64: Sediment Cap Construction

1.04 REFERENCE STANDARDS

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the EPA Record of Decision (ROD) (EPA, 2017); therefore, compliance with Applicable or Relevant and Appropriate Requirements (ARARs) for the Swan Island Basin (SIB) Project Area within the Portland Harbor Superfund Site (PHSS) cleanup remedy is required. See Section 01 13 00 – Reference Material for additional information on the ROD. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 - Environmental Regulatory Requirements. In case of conflict between the requirements of this Section and those listed in Section 01 41 00 - Environmental Regulatory Requirements, the more stringent requirement shall prevail. If the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

B. The following is a list of standards that may be referenced in this Section:

1. ASTM International (ASTM):

a. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.

b. D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

c. D2974, Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils.

d. D4318, Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

e. D4972, Standard Test Method for pH of Soils.

f. D653, Standard Terminology Relating to Soil, Rock, and Contained Fluids.

g. D6913, Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis.

h. D6938, Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods.

i. D7928, Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis.

j. F1647, Standard Test Methods for Organic Matter Content of Athletic Field Rootzone Mixes.

1.05 DEFINITIONS

A. Earthwork Terminology: Terms used in this Section and not defined herein shall be interpreted in accordance with the definitions given in ASTM D653.

B. Soil Classification: Soil Classification is based on the Unified Soil Classification system given in ASTM D2487.

C. Excavation: Work involves earth moving and grading for the construction of all upland works.

D. Subsurface Extraction: Work involves the removal of abandoned utilities, tanks, walls foundations and other below grade obstructions that interfere with the new construction.

E. General Backfill: Soil or soil-rock material used to backfill excavations and to raise grade to reasonable elevations to construct revetment and bedding stone and topsoil.

F. Structural Backfill: Soil or soil-rock material used to backfill excavations and to backfill excavated spaces around foundations and retaining walls.

G. Armor Stone: Large stone (nominal 8 – 12 inches) used as on-slope revetment.

H. Bedding Stone: Smaller stone used for the bedding of the rock revetment.

I. Rock Revetment: On-slope revetment including armor stone and bedding stone.

J. Erosion Protection Stone: Stone used as armor layer of the Sediment Cap.

K. GAC Amended Sand: Coarse sand amended with Granulated Active Carbon (GAC).

L. Sediment Cap: Containment cap including GAC-amended sand layer and erosion protection layer.

M. GAC Geotextile Mat: A composite geotextile mat which encapsulates GAC between two layers of geotextile.

N. Topsoil: Upper layer of soil with highest concentration of organic matter required for vegetation growth.

1.06 SUBMITTALS

A. Action submittals:

1. Submit gradations and sieve analyses, Atterberg limits, and Proctor densities to demonstrate conformance with these requirements.

2. Submit name of imported materials source.

3. Submit mineral analysis and nutrient content.

B. Informational submittals:

1. Copies of agreements between Contractor and private landowner accepting spoil material.

1.07 QUALITY ASSURANCE

A. Construction Quality Assurance and Quality Control Plan (See Specification Sections 01 43 00 and 01 45 00) shall be provided.

B. Services of an approved independent soils testing laboratory shall be engaged to perform tests

C. Tolerances:

1. Tolerances to be confirmed at Pre-Final 90% RD.

PART 2 PRODUCTS

2.01 MATERIALS: GENERAL REQUIREMENTS

A. Material used (imported or native) for backfilling construction shall meet the Contract Documents requirements.

B. Inert, inorganic soil, free of deleterious substances, shall be used for backfill (Inorganic soil is soil containing less than three percent by dry weight of organic material when tested in accordance with ASTM D2974).

C. All material to be used for backfilling requires written approval of the Project Representative.

2.02 FILL AND BACKFILL MATERIALS: SPECIFIC REQUIREMENTS

A. General Backfill:

1. Specifications for physical and chemical properties to be documented at Pre-Final 90% RD.

B. Structural backfill:

1. Specification for physical and chemical properties to be documented at Pre-Final 90% RD.

C. Riprap

1. Refer to Section 31 37 00: Rock Revetment

D. Bedding Stone

1. Refer to Section 31 37 00: Rock Revetment

E. GAC-Amended Sand:

1. Refer to Section 35 53 64: Sediment Cap Construction

2.03 TOPSOIL MATERIALS: SPECIFIC REQUIREMENTS

A. Native topsoil:

1. Excavated and reused material, graded.
2. Free of roots, rocks larger than 2-inch, subsoil, debris, large weeds and foreign matter.
3. Screening: Double screened.
4. Conforming to ASTM D2487 Group Symbol OH or PT.
5. Acidity range (pH) of 5.0 to 7.0.
6. Containing minimum of 2 percent and maximum of 20 percent organic matter.

B. Imported topsoil:

1. Imported borrow, from approved borrow site.
2. Friable loam.
3. Reasonably free of roots, rocks larger than 2-inch, subsoil, debris, large weeds, and foreign matter.
4. Screening: Double screened.
5. Acidity range (pH) of 5.0 to 7.0.
6. Containing minimum of 2% and a maximum of 20% of organic material.
7. Conforming to ASTM D2487 Group Symbol OH or PT.

2.04 SOURCE QUALITY CONTROL

A. Furnish materials of each type from the same source throughout work.

B. Backfill materials proposed to be used for construction shall be verified and tested by approved Independent Testing laboratory, for compliance with the Contract Documents.

C. Testing and analysis of topsoil: Perform in accordance with ASTM D2487, ASTM F1647, and ASTM D4972.

D. When tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.01 GENERAL

A. The Contractor shall be aware that existing conditions at the Work Area are dynamic and subject to change. The existing ground conditions along the shoreline area are subject to change with tidal and weather conditions.

B. Placement of backfill material shall be suspended when weather or tidal conditions will not allow the proper placement of fill material.

C. All materials shall be stockpiled (temporarily) at locations that will be protected from erosion caused by currents, boat wakes, and wind waves.

D. Survey requirements to be provided at Pre-Final 90% RD.

3.02 EXAMINATION

A. Establish bench marks, grading stakes and other markers required.

3.03 PREPARATION

A. Provide erosion protection, refer to Section 31 25 00

B. Clear and grub areas as indicated on the Contract Drawings, refer to Section 31 11 00.

3.04 EARTHWORKS GENERAL REQURIMENTS

A. Provide dust control, requirements will be provided at Pre-Final 90% RD

B. Provide erosion protection, refer to Section 31 25 00

C. Disperse travel paths of construction traffic and construction equipment over entire width of compacted surface to aid in obtaining uniform compaction.

D. Excavate and remove materials outside the limits of the excavation, only if they are unstable and may potentially slide during the operation. Maintain slopes until substantial completion and acceptance of work.

E. Promptly repair slides, washouts, settlement and subsidence that occur for any reason, and refinish the slope or embankment to the indicated lines and grades.

F. Salvage Topsoil

G. Remove excess excavated materials not intended for reuse from the Work Site.

H. All spoil materials shall be lawfully disposed off-site at appropriate locations selected and obtained by Contractor

3.05 DEWATERING

A. Prevent surface and subsurface water from flowing into excavations.

B. Provide and maintain pumps, sumps, suction and discharge lines, and other dewatering system components required to convey water away from excavations.

C. Establish and maintain temporary drainage ditches and other diversions to convey water away from excavations. Excavations made as part of the permanent works are not to be used as temporary drainage ditches or surface water storage.

3.06 EXCAVATION

A. Excavate subsoil and/or topsoil from areas designated in the Contract Drawings. Strip topsoil to full depth of topsoil in designated areas.

B. Perform excavation to lines and grades indicated on the Contract Drawings.

C. Preserve material below and beyond the lines of excavations, where an excavation is carried beyond the limit, backfill with structural fill to the indicate grades.

D. Place excavated material at least 3 feet away from the excavation edge, to prevent cave-ins or bank slides.

3.07 SUBSURFACE EXTRACTION

A. Remove subsurface facilities and obstructions to the extent indicated.

B. When subsurface facilities or obstructions are encountered unexpectedly and they are interfering with new construction, notify the Resident Engineer promptly for corrective determination.

3.08 SUBGRADE PREPARATION

A. Subgrade preparation details will be provided at Pre-Final 90% RD.

3.09 BACKFILL

A. Place backfill in layers no more than 8 inches of loose material, when heavy equipment is used for compaction. Place backfill in layers no more than 4 inches of loose material, when hand-operated tampers are used for compaction.

B. Place and compact backfill material in ways that the unbalanced horizontal loads will not be applied to the newly-placed structure or utility.

3.10 COMPACTION

A. Compaction requirements to be determined at Pre-Final 90% RD.

3.11 FINISH GRADING

A. Finish grading areas to elevations and slopes as indicated on contract Drawings, within the specified tolerance.

3.12 PLACEMENT OF TOPOSIL

A. TBC – Placeholder

3.13 FIELD QUALITY CONTROL

A. TBC – Placeholder

END OF SECTION

SECTION 31 05 19

GEOSYNTHETICS FOR EARTHWORKS

PART 1 GENERAL

1.01 SUMMARY

A. Construction of the Remedial Design (RD) for the Swan Island Basin (SIB) Project Area requires placement of geotextiles and geo-grids for use in up-land earthworks. The Project also includes a composite geotextile mat which encapsulates granular activated carbon (GAC) between two layers of geotextile.

1.02 DESCRIPTION OF WORK

A. This Section specifies the procedures and requirements for procuring and installing geosynthetics for earthwork activities.

1.03 RELATED SECTIONS

A. Division 01: General Requirements

B. Division 31 00 00: Earthworks

C. Division 31 25 00: Erosion and Sedimentation Control

D. Division 31 37 00: Rock Revetment

E. Division 35 37 10: Engineered Caps

F. Division 35 24 20: Remedial Dredging, Barge Dewatering, and In-Water Transportation

1.04 REFERENCE STANDARDS

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the EPA Record of Decision (ROD) (EPA, 2017); therefore, compliance with Applicable or Relevant and Appropriate Requirements (ARARs) for the SIB Project Area within the Portland Harbor Superfund Site (PHSS) cleanup remedy is required. See Section 01 13 00 – Reference Material for additional information on the ROD. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 - Environmental Regulatory Requirements. In case of conflict between the requirements of this Section and those listed in Section 01 41 00 - Environmental Regulatory Requirements, the more stringent requirement shall prevail. If the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

B. Standards referenced in this Section are listed below:

1. ASTM International (ASTM).

   a. ASTM D 1117, Test Methods for Non-Woven Fabrics.

   b. ASTM D 3776, Test Methods for Mass per Unit Area (Weight) of Woven Fabric.

   c. ASTM D4873, Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples.

   d. ASTM D 5034, Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test).

1.05 DEFINITIONS

A. Rock Revetment: On-slope revetment including armor stone and bedding stone.

B. Sediment Cap: Containment cap including GAC amended sand layer and erosion protection layer.

C. Geogrid: A planar geosynthetic formed into a very open, grid-like configuration having large apertures, generally made of high-density polyethylene (HDPE) and/or polypropylene (PP).

D. Geotextile: Geotextiles are either woven or nonwoven fabrics, generally made of polypropylene (PP) or polyester (PET).

E. Reactive core mat: A composite geotextile mat with active adsorptive media embedded between layers of geotextiles.

F. Geosynthetics: Permeable textiles used in earthworks in a separating and/or stabilizing function, includes Geogrid and Geotextile.

1.06 SUBMITTALS

A. Action Submittals: Submit the following:

1. Product Data:

a. Submit geotextile manufacturer's data, specifications, installation instructions and dimensions.

B. Informational Submittals: Submit the following:

1. Certificates:

a. Submit an affidavit certifying that the filter fabric furnished complies with all requirements specified herein.

C. No fabric shall be shipped until the affidavit is submitted to the Project Representative.

1.07 QUALITY ASSURANCE

A. Manufacturer's Qualifications:

1. Geotextile manufacturer shall be a specialist in the manufacture of geotextile cushion fabric, and have produced and successfully installed a minimum of five million square feet.

PART 2 PRODUCTS

2.01 MATERIALS: GEOTEXTILE

A. TBC – Specifications to be confirmed at Pre-Final 90% RD.

2.02 MATERIALS: GEOGRID

A. TBC – Specifications to be confirmed at Pre-Final 90% RD.

2.03 MATERIALS: REACTIVE CORE MAT

A. TBC – Specifications to be confirmed at Pre-Final 90% RD.

2.04 SOURCE QUALITY CONTROL

A. Furnish materials of each type from the same source throughout work.

PART 3 EXECUTION

3.01 DELIVERY, STORAGE, AND HANDILING

A. All delivery, storage, and handling of Materials shall be in accordance with the manufacturer’s written recommendations.

B. Geosynthetic Materials shall be kept dry and wrapped such that it is protected from the elements during shipping and storage. At no time shall the fabric be exposed to ultraviolet (sun) Light for a period exceeding 14 days. The geocomposite shall be labeled per ASTM D4873.

C. Prevent excessive mud, wet concrete, epoxy, or other deleterious materials from coming in contact with and affixing to Materials.

D. Store at temperatures above –20 degrees Fahrenheit (-29 degrees Celsius).

E. Rolled Materials may be laid flat.

3.02 GENERAL INSTALLATION

A. The Contractor shall check the Materials upon delivery to verify that the proper material has been received. These Materials shall be inspected by the Contractor to be free of flaws or damage occurring during manufacturing, shipping, or handling.

B. At the time of installation, the Materials shall be rejected if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacture, transportation or storage. The Materials shall be protected at all times during construction to ensure that the geosynthetic's original chemical and physical properties are not changed.

C. The Materials shall be placed in the manner and at the locations shown on the Plans. The Contractor shall prepare the surface to receive the Materials to ensure that the surface is relatively smooth and free of obstructions, depressions, debris, or stone which could damage the geotextile during placement.

D. All wrinkles and sags shall be stretched out immediately before Rock Revetment is placed on the Materials. Materials shall be protected from damage during placement of Rock Revetment. This shall be accomplished by limiting the height of drop to less than 1-foot. In the event that this damages the Materials, the Rock Revetment shall be placed directly on the Materials with zero height of drop. Contractor shall use placement techniques that will not damage the Materials. Any geotextile or geogrid that is rejected or damaged shall be replaced by the Contractor at no additional expense to the Owner.

E. Should the Material be torn or punctured, Rock Revetment placed around the damaged area shall be removed and the damaged area repaired by the Contractor. The repair shall consist of a patch of the same type of Material, which replaced the ruptured area. All Material within 2 feet of the ruptured area shall be removed from the fabric by cutting the Geotextile or Geogrid using a method which produces a smooth edge and does not cause ripping or tearing. The patch shall be sewn onto the fabric.

F. Materials shall be temporarily anchored into its final position, using sandbags or other methods that won't rupture the Materials, prior to the placement of Rock Revetment as shown on the Plans.

3.03 GEOTEXTILE AND GEOGRID INSTALLATION

A. TBC in Pre-Final 90% RD.

3.04 GAC GEOTEXTILE MAT INSTALLATION

A. TBC in Pre-Final 90% RD.

END OF SECTION

SECTION 31 09 00

GEOTECHNICAL INSTRUMENTATION, CONDITION INSPECTIONS, AND MONITORING

PART 1 GENERAL

1.01 SUMMARY

A. The construction of the Remedial Design (RD) Swan Island Basin (SIB) Project Area interfaces with both in-water and upland infrastructure. The condition of this infrastructure is required to be inspected and monitored at the start, during and end of construction.

1.02 DESCRIPTION OF WORK

A. This Section describes the qualifications of inspection and monitoring personnel, installation, monitoring, protection, maintenance, reporting, and removal requirements for instruments to measure ground and structure displacement, as well as the performance of conditions inspections of identified structures and utilities**.**

1.03 RELATED SECTIONS

A. Section 01: General Requirements

B. Section 01 19 50: Protection and Maintenance of Property

C. Section 31 00 00: Earthworks

D. Section 31 11 00: Clearing and Grubbing

E. Section 31 62 16.13: Steel Sheet Piles

F. Section 31 62 16.16: Steel Pipe Piles

G. Section 35 53 64: Sediment Cap Construction

H. Section 35 24 20: Remedial Dredging, Barge Dewatering, and In-Water Transportation

1.04 REFERENCED STANDARDS

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the EPA Record of Decision (ROD) (EPA, 2017); therefore, compliance with Applicable or Relevant and Appropriate Requirements (ARARs) for the SIB Project Area within the Portland Harbor Superfund Site (PHSS) cleanup remedy is required. See Section 01 13 00 – Reference Material for additional information on the ROD. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 - Environmental Regulatory Requirements. In case of conflict between the requirements of this Section and those listed in Section 01 41 00 - Environmental Regulatory Requirements, the more stringent requirement shall prevail. If the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

B. Standards referenced in this Section are listed below:

1. American Society of Civil Engineers, (ASCE).

    a. ASCE Manual of Practice 130 - Waterfront Facilities Inspection and Assessment.

1.05 DEFINITIONS

A. Refer to Section 01 11 00 (Summary of Work) for definitions related to the Contract Documents.

B. Action Levels: Tiered, relative displacement thresholds beyond which specific monitoring, reporting, mitigation, and/or remediation actions are required; the two Action Levels are Trigger Level and Maximum Level.

C. Monitoring Points: Fixed markers placed on utilities, structures, or otherwise noted facilities or features for the purpose of monitoring relative vertical and/or horizontal displacement.

D. Survey Monitoring: Precise field measurements using survey techniques for determination of elevations, horizontal coordinates, and distances for performing geotechnical monitoring

1.06 SUBMITTALS

A. Refer to Section 01 33 00 (Submittals)

B. Pre-Construction Submittals

1. Structural Condition Inspections Personnel Qualifications:

   a. Condition Inspection Engineer: The individual who will be in responsible charge for the performance of Structural Condition Inspections, including before and after construction activities have been completed, shall be licensed in the State of Oregon per Section 02 21 00 (Site Surveys and Positioning Control). Additionally, the Condition Inspection Engineer shall have performed structural condition inspections for no less than five waterfront or marine facility projects involving reinforced concrete, structural timber pile supported structures, and steel pile supported structures. They shall have a minimum of 5 years of inspection experience of waterfront structures.

   b. Lead Engineer Diver: The Lead Engineer Diver may be the Condition Inspection Engineer. They shall meet the qualifications of the Condition Inspection Engineer and have a minimum of 5 years of experience conducting dive inspections on waterfront or marine structures. They shall be a certified commercial diver.

   c. The Contractor shall submit structural condition inspections personnel qualifications as part of the Remedial Action Work Plan (RAWP) to the Project Representative for review and acceptance prior to conducting any pre-construction activities related to this Section (i.e., Pre-Construction Condition Inspections; refer to Section 01 11 00 – Summary of Work).

   d. Dive inspection qualifications TBC in Pre-Final 90% RD.

2. The Contractor shall submit a detailed, written Instrumentation and Monitoring Plan as part of the RAWP for Project Representative review and acceptance. No monitoring activities shall begin until the Project Representative has accepted the Instrumentation and Monitoring Plan and the Pre-Construction Condition Inspection Report has been reviewed and accepted. At a minimum, the Instrumentation and Monitoring Plan shall contain the following information:

   a. The following personnel qualifications:

      1) Monitoring Superintendent: The individual who will be in responsible charge for the performance of the Instrumentation and Monitoring Plan shall possess no less than 3 years of experience with similar programs and no less than 1 year in a supervisory role.

      2) Monitoring Surveyor: The individual who will be in responsible charge for obtaining and processing displacement measurements shall be licensed in the State of Oregon per Section 02 21 00 (Site Surveys and Positioning Control). Additionally, the Monitoring Surveyor shall possess no less than 3 years of experience utilizing the methods and equipment prescribed in the Instrumentation and Monitoring Plan and no less than 1 year of experience for programs including monitoring of slopes, walls, and/or structures proximate to excavations.

   b. A Contractor-Designed Program to monitor displacement of identified surfaces and/or structures within or proximate to ground-disturbing activities or other Project Work

c. Descriptions of the proposed monitoring locations, including the following details:

1) All Monitoring Points shown on the Drawings

2) Any additional Monitoring Points planned by the Contractor

3) Monitoring Point attachment details

4) Planned instrument type(s) and setup locations relative to identified Monitoring Points

5) Monitoring schedule

6) Action Levels

d. A schedule and outline of procedures for implementation of the Instrumentation and Monitoring Plan, including a summary table indicating the following by number and location:

1) Timing of installation

2) Baseline reading schedule

3) Timing of monitoring commencement and schedule of monitoring

4) Timing of decommissioning/removal

e. Manufacturer's descriptive literature for proposed instruments, including the following:

1) Technical specifications

2) Calibration certificates

3) Installation procedures

4) Operation manuals

f. Sample reports showing how acquired data shall be represented for each instrument type

g. Replacement procedures, as follows:

1) In the case of a damaged or removed Monitoring Point:

i. Identify the cause of the damage or removal.
ii. Install a replacement Monitoring Point and identify the date and location of installation.
iii. Calibrate with baseline readings.
iv. Mitigate against potential future damage or removal.

2) In the case that an instrument must be moved, or at any time requires repair or replacement:

i. Identify the reason(s) for moving, repairing, and/or replacing the original instrument.
ii. Submit new instrumentation type and/or location.
iii. Identify the date the moved, repaired, or new instrument was operational.

h. Preliminary Corrective Action Plan: Supplemental plan providing actions to be taken in response to any reading that exceeds one of the defined Action Levels indicated in this Section, which shall include the following:

1) Investigation procedures pertaining to the cause(s) of the of the Action Level exceedance

2) Preliminary list of probable actions to be taken, according to structure type and construction activity, if recorded displacements exceeded the Trigger Level indicated in Article 3.04 of this Section

3) Preliminary list of probable actions to be taken, according to structure type and construction activity, if recorded displacements exceeded the Maximum Level indicated in Article 3.04 of this Section

3. Monitoring data including baseline readings:

a. The Monitoring Surveyor shall set control for Monitoring Points and supervise surveying of displacement monitoring.

b. Baseline and monitoring data shall be presented using the Project horizontal and vertical datums.

c. Electronic monitoring data shall be conveyed to the Project Representative by the end of the shift immediately following that during which the readings were taken. Electronic monitoring data shall be readable in Microsoft Excel.

d. At a minimum, the following shall be included with each set of data:

1) The Monitoring Point identification number and location

2) Any change in Monitoring Point location, including direction(s) of movement, relative to the original Monitoring Point position

3) The date and time that the readings were taken

4) The names of individuals who obtained the reading

5) Distance between the instrument and construction activities at the time of the reading

6) Distance between the Monitoring Point and construction activities at the time of the reading

7) Tables of current readings and Action Levels for each instrument

8) Plots of all measured data versus date for each Monitoring Point

4. Pre-Construction Structural Condition Report: Refer to Article 3.06 of this Section for requirements.

C. Construction Submittals

1. Site-Specific Corrective Action Plan. Refer to Article 3.04 of this Section for requirements.

D. Post-Construction Submittals

1. Post-Construction Structural Condition Report. Refer to Article 3.06 of this Section for requirements.

2. The Contractor shall submit the Contractor's Annual Construction Summary Report for the Work completed in each Construction Work Period related to this Section, as described in Section 01 78 39 (Project Record Documents). The Contractor's Annual Construction Summary Report shall include the summary of the Work completed under this Section and any relevant record information.

1.07 PROJECT CONDITIONS

A. Identification of locations of inspection and monitoring by Project Representative will not relieve the Contractor of its responsibility for the Work and shall not be regarded as an assumption of risks or liability by the RA Performing Parties.

B. Availability of Data:

1. Monitoring data become the property of the Project Representative and are not to be disclosed to third parties or published without written permission of the Project Representative.

C. Permits and Coordination:

1. Permits, easements, and rights-of entry obtained by Project Representative are defined in Section 01 41 26 (Permits, Easements, and Right-of-Entry Agreements). All other permits and easements required to perform the Work shall be obtained by the Contractor.

2. Coordinate activities affecting utilities with the appropriate utility company.

PART 2 PRODUCTS

2.01 GENERAL

A. All reading devices, fixtures, cables, and necessary software for the various monitoring systems are to be provided by the Contractor.

B. Instruments and equipment that are the manufacturer's standard products without modifications.

2.02 MONITORING SYSTEMS

A. Monitoring System shall be located as indicated in the Drawings and described in this Section.

1. Total Station - AT:

a. Manual (MDC) or automatic (RDC) stations to provide reading from retro reflective targets

2. Retro Reflective Target – RP (MDC/RDC):

a. Survey targets located on structures at two levels, one above the other so that tilt values can also be determined. Adhesive-backed reflective targets (Leica Models or Approved Equal) that will not damage the feature on which they are installed.

3. Settlement Monument – SM (MDC):

a. Ground surface precise levelling points installed to soil (with concrete pad) to determine vertical movements.

B. Instruments shall be installed as described in table below:

INSTRUMENT		LOCATION		
ID	**DEFINITION**	**MARINE STRUCTURE ABOVE OLW**	**MARINE STRUCTURE BELOW OLW**	**UPLAND**
TS	Total Station	x		
RP	Retro Reflective Target	x		
SM	Settlement Monument	x		x

2.03 SURVEY SYSTEM

A. System Accuracy Requirements:

1. The accuracy requirements established in this Section apply to the final data, including the composite effects of reflectors, readout instruments, measurement methods, temperature, operator variability, and other contributing factors.

2. Maintain an associated confidence level of 90% for all accuracies specified in this Section.

3. Surveyed Monitoring Points shall be as follows:

a. Within 0.01 foot vertical

b. Within 0.01 foot horizontal

PART 3 EXECUTION

3.01 GENERAL

A. Provide the Project Representative with access to view Monitoring Points and review data.

B. Be responsible for safety during all installation and monitoring activities, and conduct all activities in accordance with applicable federal, state, and local regulations and all Project-specific health and safety plans. The most stringent regulations and plans apply where conflicting requirements are encountered.

C. Allow time for and include installation and monitoring baseline readings in the construction schedule.

D. Notify the Project Representative at least 7 working days prior to the start of Work and for any installations located on private property.

E. Obtain stable baseline readings at least 3 working days prior to commencing proximate ground- or structure- disturbing activities.

3.02 MONITORING POINT INSTALLATION

A. General locations of Monitoring Points are shown on the Drawings. Locate Monitoring Points for outfalls as close as practicable to the locations shown on the Drawings. For locations where new bulkhead walls will be installed in front of an existing wall, the Contractor shall locate Monitoring Points such that ongoing monitoring of the existing wall may be conducted prior to and subsequent to the installation of the new bulkhead wall. For all other Monitoring Points, locate within 10 feet of the locations shown on the Drawings. Locate instruments to allow for readings at the specified frequencies during all phases of construction.

B. Install Monitoring Points in accordance with the manufacturer's recommendations and requirements unless otherwise specified.

C. Verify the suitability of planned monitoring locations for the equipment and systems to be used. The Contractor is solely responsible for damage to utilities, structures, or other facilities.

3.03 MAINTENANCE

A. Maintain and protect all Monitoring Points and replace damaged instrumentation at no additional cost to the RA Performing Parties.

B. Maintain all instrumentation in accordance with manufacturer's recommended procedures and schedule, or as directed by the Project Representative.

C. Immediately report all damaged or non-functional instrumentation to the Project Representative.

D. Repair or replace damaged instruments within 48 hours of detection.

3.04 INSTRUMENT MONITORING

A. General

1. The Project Representative will observe monitoring activities.

2. The Project Representative may conduct quality assurance monitoring.

3. Provide all necessary assistance in the form of labor and equipment to enable access by the Project Representative.

B. Obtain readings at the locations shown on the Drawings, in accordance with the accepted Instrumentation and Monitoring Plan and this Section.

C. Monitoring Points shall be measured relative to survey benchmarks, as follows:

D. Survey benchmarks shall be located more than 150 feet away from excavations and other on-site or off-site ground-disturbing activities.

E. Pre-construction / Baseline Readings:

1. Pre-construction monitoring is required prior to construction works in order to identify naturally occurring background movements, to detect inconsistencies in surveying techniques and to identify potential on-going trends.

2. Provide baseline readings by conducting three separate and complete sets of readings on each instrument. Readings shall be conducted at least 1 day apart each and shall be taken with sufficient accuracy to produce similar results in each of the three readings.

3. Baseline readings shall be comparable and equal within the rated instrument accuracy.

4. For any locations at which a new bulkhead wall is installed, two sets of baseline readings shall be obtained, one prior to and one after installation of the new bulkhead wall. Production readings and relative Action Levels shall be referenced to the baseline readings obtained prior to new bulkhead wall installation; however, relative changes in deflection rates or patterns during or after new bulkhead wall installation shall be noted.

F. Production Readings:

1. Obtain production readings for the structures identified in the Drawings and listed below, according to the following schedule:

   a. TBC in Pre-Final 90% RD.

2. Obtain and report production readings with reference to each relative movement orientation component (vertical and horizontal; X-Y-Z) as well as the vector sum of vertical and horizontal movements.

G. Action Levels:

1. Action Levels are based on the vector sum of vertical and horizontal movements.

2. Action Levels are as follows:

   a. TBC in Pre-Final 90% RD.

H. Exceeding Trigger Level:

1. Take immediate steps to stop the cause of exceedance.

2. Notify the Project Representative immediately.

3. Immediately implement, as appropriate, actions identified within the Preliminary Corrective Action Plan.

4. Develop and provide a Site-Specific Corrective Action Plan within 24 hours with the Project Representative. Include the identified cause of the exceedance.

5. Verify measurement.

6. For instruments read less than every other day, increase frequency of readings to daily. For all other reading frequencies, double the frequency of readings. Continue increased frequency of monitoring until the relative incremental change of movement has returned to the pre-action Trigger Level rate or stabilized as determined by the Project Representative.

7. If the Site-Specific Corrective Action Plan identifies corrective actions beyond or differing from those in the Preliminary Corrective Action Plan, implement corrective actions in accordance with the Site-Specific Corrective Action Plan. Under some circumstances, corrective actions may require modification of construction procedures.

8. Verify success of corrective actions.

I. Exceeding Maximum Level:

1. Take immediate steps to stop the cause of exceedance.

2. Notify the Project Representative immediately.

3. Immediately implement, as appropriate, actions identified within the Preliminary Corrective Action Plan.

4. Develop and provide a Site-Specific Corrective Action Plan within 24 hours to the Project Representative. Include the identified cause of the exceedance.

5. Verify measurement.

6. For instruments read less than every other day, increase frequency of readings to daily. For all other reading frequencies, double the frequency of readings. Continue increased frequency of monitoring until the relative incremental change of movement has returned to the pre-action Trigger Level rate or stabilized as determined by the Project Representative.

7. If the Site-Specific Corrective Action Plan identifies corrective actions beyond or differing from those in the Preliminary Corrective Action Plan, implement corrective actions in accordance with the Site-Specific Corrective Action Plan.

8. Verify success of corrective actions.

9. The Project Representative may suspend Work activities at that location and require the submittal of alternative proposals for minimizing further movements.

10. If Work activities are suspended, obtain approval from the Project Representative prior to restarting Work activities at that location, under approved procedures.

11. With the Project Representative, contact the owners of any damaged or affected facilities and structures and perform corrective and restorative measures on an agreed timetable at no cost to the RA Performing Parties.

3.05 REMOVAL OF MONITORING POINTS

A. The removal of Monitoring Points shall be completed within 30 calendar days following the completion of monitoring, as accepted by the Project Representative.

B. Remove Monitoring Points and, if required, restore disturbed or damaged surfaces to the conditions existing before installation of Monitoring Points. The Contractor shall not conduct the Pre-Construction Structural Condition Inspections until receiving the Project Representative's acceptance of the Instrumentation and Monitoring Plan and the Project Representative's notification to start these pre-construction activities (refer to Section 01 11 00 – Summary of Work).

3.06 PRE-CONSTRUCTION AND POST-CONSTRUCTION STRUCTURAL CONDITION INSPECTIONS

A. Pre-Construction Structural Condition Inspections and Reporting:

1. Complete Pre-Construction Structural Condition Inspections of existing structures and facilities, as identified in the Drawings and in Paragraph 3.06.C of this Section, to document pre-construction conditions.

   a. The Contractor shall not begin the Pre-Construction Condition Inspections until structural condition inspections personnel qualifications have been reviewed and accepted by the Project Representative as described in Subparagraph 1.04.B.1 of this Section.

2. Submit Pre-Construction Structural Condition Reports, for Project Representative acceptance, at least 14 calendar days prior to the passage of Contractor equipment or materials by a structure identified for inspection, or the start of any In-Water Work proximate to the identified structure. The Contractor shall not pass equipment or materials by a structure identified for inspection, or start any dredging and material placement Work proximate to the identified structure, until the relevant Pre-Construction Structural Condition Reports have been submitted and accepted by the Project Representative.

B. Post-Construction Structural Condition Inspections and Reporting:

1. Complete Post-Construction Structural Condition Inspections of existing structures and facilities, as identified in the Drawings and Paragraph 3.06.C of this Section, within 10 working days after all dredging and material placement Work proximate to the identified structure has been completed and accepted by the Project Representative and no further passage of equipment or materials by the identified structure is planned.

2. Submit Post-Construction Structural Condition Reports, for Project Representative acceptance, for each structure within 5 working days after completing each Post-Construction Structural Condition Inspection.

C. Requirements applicable to all Pre-Construction and Post-Construction Structural Condition Inspections:

1. All reports shall be prepared, dated, and signed by the Condition Inspection Engineer.

2. Complete structural condition inspections of, and prepare Pre- and Post-Construction Structural Condition Reports for, the structures and active outfalls identified in the Drawings and listed as follows:

3. TBC in Pre-Final 90% RD.

4. The condition inspection of each structure shall be performed by the Condition Inspection Engineer.

   a. Include visual observations of the condition of the main structural components (e.g., piles, beams, deck slabs, fender pile system, fender logs, camel fenders, and marine hardware) and their coating systems (where relevant), representative photographs identifying areas of significant deterioration or physical damage, with tables describing the damage in detail at each location (e.g., “XYZ Dock, pile bent XX row YY, 200 mm wide by 100 mm high by 25 mm deep concrete spall, no rebar exposed”) and supporting sketch drawings or reference drawings.

      1) Inspections of structural elements that are below water or below the waterway bed are not required.

5. Photographs and video documentation shall be taken by, or under the supervision of, the Condition Inspection Engineer in accordance with the requirements specified in Section 01 32 33 (Construction Progress Documentation, Photographs, Videos).

END OF SECTION

SECTION 31 11 00

CLEARING AND GRUBBING

PART 1 GENERAL

1.01 SUMMARY

A. The Remedial Design (RD) for the Swan Island Basin (SIB) Project Area requires the preparation of the Work Area for remedial works construction.

1.02 DESCRIPTION OF WORK

A. The Work in this Section describes the requirements of clearing and grubbing in preparation for construction and earthmoving operations. This includes trees, fences, trash and other materials. Additionally it includes selective clearing and selective tree and shrub removal.

1.03 RELATED SECTIONS

A. Section 01: General Requirements

B. Section 31 00 00: Earthworks

1.04 REFERENCE STANDARDS

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the EPA Record of Decision (ROD) (EPA, 2017); therefore, compliance with Applicable or Relevant and Appropriate Requirements (ARARs) for the SIB Project Area within the Portland Harbor Superfund (PHSS) cleanup remedy is required. See Section 01 13 00 – Reference Material for additional information on the ROD. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 - Environmental Regulatory Requirements. In case of conflict between the requirements of this Section and those listed in Section 01 41 00 - Environmental Regulatory Requirements, the more stringent requirement shall prevail. If the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

1.05 DEFINITIONS

A. Cleared and Grubbed Material: Cleared and Grubbed Material is defined as topsoil, brush, trees, logs, stumps, roots, heavy sod, vegetation, rock, stones larger than 6 inches in any dimension, broken or old concrete and pavement, debris, objects, and structures which must be removed to prepare the Work Site for remedial activities.

B. Relic Structures: TBC

1.06 SUBMITTALS

A. Refer to Section 01 33 00 (Submittal Procedures)

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. The Contractor shall furnish all material, tools, equipment, facilities, and services as required for performing Work Area clearing, grubbing and other preparation work.

PART 3 EXECUTION

3.01 CLEARING AND GRUBBING

A. Perform clearing and grubbing as necessary to remove vegetation and objectionable material from the site. Clear Work Area within the limits indicated and remove cleared materials and debris from the site.

B. Remove stumps and roots completely in excavation areas.

C. Do not start earthwork operations in areas where clearing and grubbing are not complete, except that stumps and large roots may be removed concurrently with excavation.

3.02 TREE REMOVAL

A. Where indicated or directed, remove trees and stumps that are designated from areas outside those areas designated for clearing and grubbing. This Work includes the felling of such trees and the removal of their stumps and roots.

3.03 DEMOLITION AND REMOVAL

A. TBC – Removal of relic structures

3.04 UTILITY LINES

A. Existing Utilities

1. Verify Work Area location and depth (elevation) of existing utilities and services before performing earth moving work. Perform work by hand, when excavating within 3 feet of an active utility line. Protect active utilities from potential damage created by operation. Refer to Section 33 00 00 (Utilities).

2. Report immediately the discovery of active utility lines which are not indicated on the Contract Drawings, to the Project Representative and utility owners involved. Provide the Project Representative and utility owners free access to determine the measures deemed necessary to repair, relocate or remove utility.

3.05 DISPOSAL OF REMOVED MATERIALS AND DEBRIS

A. TBC in Pre-Final 90% RD.

3.06 SALVAGE

A. TBC in Pre-Final 90% RD.

3.07 BACKFILL

A. Backfill trenches and excavations resulting from work under this Section in accordance with applicable requirements of Section 31 00 00, Earthwork.

END OF SECTION

SECTION 31 25 00

EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies requirements for constructing and maintaining the upland surface water drainage and temporary erosion and sediment control system for the Work Area, referred to as Temporary Erosion and Sediment Control (TESC). These apply to Work conducted above the Ordinary High Water elevation (+20.14 ft NAVD 88).

B. This Section consists of the requirements for planning, installing, inspecting, maintaining, upgrading, and removing erosion and sediment control systems. It includes best management practices (BMPs) for upland work as shown on the Drawings, and in the TESC Plan or as directed by the Project Representative to prevent pollution of water and to control, respond to, and dispose of eroded sediment and turbid water during the life of the Contract.

1.02 DESCRIPTION OF WORK

A. To comply with the requirements of this Section, the Contractor shall:

1. Develop and submit a Project-specific TESC Plan in accordance with the Construction Quality Assurance/Quality Control Plan (CQA/QCP) (see Section 01 35 43) and as shown on Draft 50% RD Drawings TESC Plans 1 through 5 and TESC Details 1 thru 3.
2. Revise and modify the TESC Plan during the life of the Contract and maintain records.
3. Install, maintain, and remove all erosion prevention, containment, and countermeasures BMPs during the life of the Contract.
4. Contain, clean up, and dispose of all sediment and turbid water as necessary to prevent water containing suspended materials from entering public or private roadways, waterways, sewers, or drainage systems.
5. Perform other Work shown on the Drawings, in the TESC Plan, or as directed by the Project Representative.
6. Properly inspect TESC Plan requirements, including BMPs as required; facilitate, participate in, and implement corrective actions, as directed by the Project Representative.
7. Educate all Contractor and subcontractor staff in environmental compliance issues at weekly meetings and document attendance and content.
8. Comply with the requirements of Section 31 11 00 (Clearing and Grubbing).

1.02 REFERENCED STANDARDS

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the EPA Record of Decision (ROD) (EPA, 2017); therefore, compliance with Applicable or Relevant and Appropriate Requirements (ARARs) for the Swan Island Basin (SIB) Project Area within the Portland Harbor Superfund Site (PHSS) cleanup remedy is required. See Section 01 13 00 – Reference Material for additional information on the ROD. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 - Environmental Regulatory Requirements. In case of conflict between the requirements of this Section and those listed in Section 01 41 00 - Environmental Regulatory Requirements, the more stringent requirement shall prevail. If the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

B. The following is a list of standards that may be referenced in this Section:

1. ASTM International (ASTM):

a. D1777, Standard Test Method for Thickness of Textile Materials

b. D3776, Standard Test Method for Mass Per Unit Area (Weight) of Fabric

c. D3786, Standard Test Method for Bursting Strength of Textile Fabrics – Diaphragm Bursting Strength Tester Method

d. D4355, Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus

e. D4491, Standard Test Methods for Water Permeability of Geotextiles by Permittivity

f. D4632, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles

2. 40 CFR Part 131.36 Toxics Criteria for Those States Not Complying with Clean Water Act Section 303(c)(2)(B)

3. Oregon Administrative Rules (OAR) Chapter 340, Division 41: Water Quality Standards

4. Oregon Department of Transportation (ODOT) Section 00280 (Erosion and Sediment Control)

5. Oregon Department of Environmental Quality (DEQ) Construction Stormwater Best Practices Manual

6. City of Portland Erosion and Sediment Control Manual

1.03 DEFINITIONS

A. Refer to Section 01 11 00 (Summary of Work) for definitions related to the Contract Documents.

1.04 SUBMITTALS

A. Refer to Section 01 33 00 (Submittal Procedures)

B. Pre-Construction Submittals:

1. Submit a detailed, written TESC Plan, in conformance with the Specifications and CQA/QCP.

C. Construction Submittals:

1. Provide updated Drawings and details of the constructed erosion control BMPs.

2. Submit the Stormwater Inspection Checklist on a weekly basis as part of the Weekly Construction Report (see Section 01 33 00 – Submittals).

1.05 TEMPORARY EROSION AND SEDIMENT CONTROL PLAN

A. The TESC Plan consists of BMPs that control erosion and sedimentation from the Contractor's activities and treats stormwater to meet discharge requirements during each phase of construction as identified by the Contractor in the Baseline Project Schedule.

B. Submit the TESC Plan and corresponding TESC drawings for review and acceptance by the Project Representative.

C. During the Construction Work Period, the BMPs shall be upgraded and modified as needed to meet discharge requirements for changing construction activities, storm events, and changing SIB Project Area conditions.

1. Indicate the minimum requirements at the start of Work.

D. Maintain a copy of the current TESC Plan for the SIB Project Area (Work Area) at all times. Refer to Section 01 35 43 (Environmental Procedures).

E. Provide at a minimum, the following information:

1. All requirements in the Drawings and Specifications
2. Locations and construction details of all proposed TESC Plan BMPs
3. Schedules for accomplishment of temporary and permanent erosion control Work
4. Approximate slopes, contours, and direction of stormwater flow
5. Location of off-site material, stockpiles, waste storage, borrow areas, and vehicle/equipment storage areas
6. Location of all surface waterbodies, including drainage ditches and catch basins
7. Measures to prevent the addition of process water or domestic wastewater into the stormwater line
8. Maintenance schedule of TESC Plan
9. Staging areas, chemical storage areas, fuel tanks, and refueling locations, and their relationship to drainage pathways, waterways, and other sensitive areas

PART 2 PRODUCTS

2.01 MATERIALS

A. All erosion control materials shall comply with Oregon DEQ - Construction Stormwater Best Practices Manual and City of Portland Erosion and Sediment Control Manual. Material specifications will be included in Pre-Final 90% RD based on the 90% Drawings.

PART 3 EXECUTION

3.01 SEQUENCING AND SCHEDULING

A. Define the rationale for sequencing construction of the temporary erosion and sediment control system in the TESC Plan. The sequencing shall consider existing Work Area conditions, material and equipment staging, Work Area drainage, BMPs, and waste storage and disposal.

B. Maintain a detailed schedule of all erosion and sediment control activities in the RA Work Plan. The schedule shall include anticipated start and end dates for sequencing ground disturbing activities and dates for installation, inspections, routine maintenance, and removal of erosion and sediment control measures.

3.02 PROTECTION OF ADJACENT PROPERTIES

A. The TESC Plan shall describe how upland adjacent properties will be protected from both erosion and sedimentation and measures employed to minimize erosion and sedimentation.

B. Prior to initiating Work activities, ensure that measures to protect adjacent properties are implemented in accordance with the TESC Plan.

3.03 CONSTRUCTION

A. A preconstruction inspection of BMPs shall be conducted and documented prior to commencing ground disturbing activities initially and at the start of each new construction Work Period.

B. Installation of TESC measures shall be completed in accordance with the TESC Plan, including the proper sequencing and scheduling. BMP construction requirements will be included in Pre-Final 90% RD based on the 90% Drawings.

3.04 MAINTENANCE

A. The Contractor shall be responsible for the implementation of the TESC Plan. Specifications for BMP-specific maintenance activities will be included in Pre-Final 90% RD based on the 90% Drawings.

B. General maintenance activities:

1. Inspect BMPs as follows:

a. Weekly from October 1 through April 30.

b. Monthly from May 1 through September 30.

c. Within 24 hours following a storm event exceeding ½ inch of rain measured within a 24-hour period. The depth of rain will be determined from the nearest active rain gauge.

d. Following removal of BMPs as work is completed and/or as TESCs are converted to permanent ESCs.

2. Document inspections in the Stormwater Inspection Checklist.

3. Repair or replace damaged or missing BMPs immediately following inspection.

4. Replace geotextiles in accordance with manufacturer's instructions.

5. Maintain seeded surfaces throughout construction.

6. Remove accumulated sediment.

C. The Contractor shall perform the required BMP maintenance as defined in the TESC Plan and in general accordance with within the Oregon DEQ - Construction Stormwater Best Practices Manual and City of Portland – Erosion and Sediment Control Manual.

3.05 COMPLETION OF CONSTRUCTION

A. General applicability:

1. Applies to conclusion of annual construction Work Period as well as conclusion of all conduction activities.

B. Remove and properly dispose of temporary BMPs or convert temporary BMPs to permanent conditions prior to installation of permanent stabilization measures.

C. Install permanent stabilization BMPs, as necessary.

D. Prepare the Work Period final inspection report to be included as part of the Annual Construction Summary Report.

E. Prepare the final inspection report to be included as part of the Construction Completion Report.

3.06 SYSTEM COMPLIANCE

A. The TESC Plan shall be prepared for approval by the Project Representative and regulatory agencies.

B. Noncompliance may result in stoppage of Work.

END OF SECTION

SECTION 31 34 19

GEOSYNTHETIC SOIL REINFORCEMENT

PART 1 GENERAL

1.01 SUMMARY

A. This section is a placeholder. The need for this section will be determined during the development of the Pre-Final 90% RD Plan Set.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION [NOT USED]

END OF SECTION

SECTION 31 37 00

ROCK REVETMENT

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies the procedures and requirements for procuring and installing riprap and bedding.

1.02 DESCRIPTION OF WORK

A. The Work includes excavation, grading, and installation of riprap, and bedding placed at the locations shown on the Swan Island Basin (SIB) Project Area Remedial Design (RD) Drawings. The materials to be used and the construction of such structures shall be as specified herein.

1.03 RELATED SECTIONS

A. The following is a list of SPECIFICATIONS, which may be related to this section:

1. Section 01: General Requirements, especially Sections 01 14 00: Work Restrictions, 01 33 00: Submittal Procedures, 01 35 43: Environmental Procedures
2. Section 31 00 00: Earthworks
3. Section 31 05 19: Geosynthetics for Earthworks
4. Section 31 09 00: Geotechnical Instrumentation and Condition Inspections
5. Section 31 11 00: Clearing and Grubbing
6. Section 31 25 00: Erosion and Sedimentation Control
7. Section 35 37 10: Engineered Caps
8. Section 35 24 20: Remedial Dredging, Barge Dewatering, and In-Water Transportation

1.04 REFERENCE STANDARDS

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the EPA Record of Decision (ROD) (EPA, 2017); therefore, compliance with Applicable or Relevant and Appropriate Requirements (ARARs) for the SIB Project Area within the Portland Harbor Superfund Site (PHSS) cleanup remedy is required. See Section 01 13 00 – Reference Material for additional information on the ROD. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 - Environmental Regulatory Requirements. In case of conflict between the requirements of this Section and those listed in Section 01 41 00 - Environmental Regulatory Requirements, the more stringent requirement shall prevail. If the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

B. The following is a list of standards which may be referenced in this section:

1. ASTM International (ASTM):
    a. C88: Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
    b. C127: Specific Gravity and Absorption of Coarse Aggregates.
    c. C131: Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
    d. C535: Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
    e. D2938: Unconfined Compressive Strength of Intact Rock Core Specimens.

f. D4992: Evaluation of Rock to be Used for Erosion Control.

2. U.S. Army Corps of Engineers Handbook for Concrete and Cement (CRD-C)

   a. CRD-C 148-69 Method of Testing Stone for Expansive Breakdown on Soaking in Ethylene Glycol.

   b. CRD-C 144-92 Resistance of Rock to Freezing and Thawing.

3. ASTM International (ASTM): D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft^3 (600 kN-m/m^3)).

1.05 DEFINITIONS

A. Earthwork Terminology: Terms used in this Section and not defined herein shall be interpreted in accordance with the definitions given in ASTM D653.

B. Soil Classification: Soil Classification is based on the Unified Soil Classification system given in ASTM D2487.

C. Armor Stone: Large stone (nominal 8 – 12 inches) used as on-slope revetment.

D. Bedding Stone: Smaller stone used for the bedding of the revetment.

E. Rock Revetment: On-slope revetment including armor stone and bedding stone.

F. Geotextile: Geotextiles are either woven or nonwoven fabrics, generally made of polypropylene (PP) or polyester (PET).

G. GAC Geotextile Mat: A composite geotextile mat which encapsulates Granular Activated Carbon (GAC) between two layers of geotextile.

1.06 SUBMITTALS

A. Refer to Section 01 33 00 (Submittal Procedures)

B. The Contractor shall cooperate with the Project Representative in obtaining and providing samples of all specified materials.

C. The Contractor shall submit certified laboratory test certificates for all items required in this section.

1.07 QUALITY ASSURANCE

A. Construction Quality Assurance/ Quality Control Plan shall be provided.

B. Services of an approved independent soils testing laboratory shall be engaged to perform tests

PART 2 PRODUCTS

2.01 MATERIAL SOURCES

A. There is no designated stone source for the Project at the Draft 50% RD stage.

B. The Contractor shall obtain stone that meets all requirements specified herein. The Contractor shall identify its proposed stone source. The Contractor shall comply with all federal, state, and local laws and regulations pertaining to surface mining, safety, and protection of the environment. The Contractor shall be responsible for obtaining all permits and/or easements for the stone source.

C. Development of a new or existing off-site quarry for furnishing stone required by this Contract may require review by local, state, and federal agencies. The Contractor shall be responsible for investigating and obtaining all necessary reviews and permits from local, state, and federal agencies.

D. Quarry sites shall be evaluated in accordance with ASTM D4992-07 Standard Practice for Evaluation of Stone to be Used for Erosion Control.

2.02 SAMPLING, STONE QUALITY TESTING, AND ACCEPTANCE OF STONES

A. Stone Quality

1. Stone shall be rough, angular (unless otherwise specified), dense, sound, and durable. Stone shall be fine grained and free from faults, fissures, seams, laminations, planes of weakness, or bands of minerals or deleterious materials that would result in breakage during or after placement. Stone shall be free of expansive or other materials that would cause accelerated deterioration by exposure to project conditions.

2. The greatest dimension of each stone shall be no greater than three times the least dimension.

3. All stone will be accepted or rejected before transportation from the quarry site based on test results and visual geologic examinations by the Project Representative. All stone must be approved by the Project Representative before placement on a barge for transport. Stone shall be tested as specified below.

4. No further laboratory testing of stone will be necessary if results meet the requirements specified and a continuous visual geologic examination of the stone by the Contractor indicates no change in stone type or quality for stone passing the laboratory tests. Stone exhibiting significant changes in type or quality will be rejected unless additional testing shows that the stone meets the specified requirements. Stone shall meet the test requirements for quality.

5. A test result that indicates the stone does not meet a standard for quality will not necessarily mean that the stone source is rejected. Stone will be accepted or rejected by the Project Representative based on evaluation of all test results and visual geologic examination of the stone at the quarry.

6. Test requirements are summarized below:

TEST	RESULTS
Specific Gravity	Not less than 2.6
BSSD ASTM C 127-88 (R93) Stone density not less than 165 lbs per cubic foot	
Absorption	Not greater than 6%
ASTM C 127-88 (R93)	
Wetting-Drying (80 cycles)	Not greater than 15% loss
ASTM D5313-12 (2013)	
L.A. Abrasion	less than 20%
ASTM C535 loss in 500 revs	

Testing shall be the responsibility of the Contractor and shall be performed by an independent commercial test laboratory. The Contractor shall furnish certified, complete copies of all test results to the Project Representative. Previous tests for an existing quarry dated within 12 months of the Contract are acceptable.

2.03 STONE GRADATION

A. The stone shall conform to the following size gradation for the in-place condition on the Revetment and/or Sediment Cap. The percent smaller value shall not be less than that listed for each weight category for the materials described below.

1. Type 1 armor stone shall be angular stone meeting the following gradation (to be documented in Pre-Final 90% RD):

SIEVE SIZE	PERCENT PASSING

2. Type 2 armor stone shall be angular stone meeting the following gradation (to be documented in Pre-Final 90% RD):

SIEVE SIZE	PERCENT PASSING

3. Bedding stone shall be angular stone meeting the following gradation (to be documented in Pre-Final 90% RD):

SIEVE SIZE	PERCENT PASSING

PART 3 EXECUTION

3.01 3.1 SITE PREPARATION

A. All deteriorated structures, concrete rubble, paving, concrete slabs, debris, and derelict piling that lie within the template of the Riprap areas or interfere with construction shall be removed and disposed of in accordance with Section 31 11 00: Clearing and Grubbing. Immediately before placing stone, the area to receive the stone will be inspected by the Project Representative, and no stone shall be placed thereon until that area has been approved.

3.02 GEOSYNTHETICS PLACEMENT

A. Where required geotextiles including GAC geotextile mat, below the bedding stone will be placed in accordance with Section 31 05 19: Geosynthetics for Earthworks

3.03 GENERAL STONE PLACING

A. Stone shall be placed to the lines and grades indicated on the Drawings. The finished slope shall form a uniform and regular surface not steeper than the slopes indicated on the Drawings.

B. All armor stone shall be stable, keyed, and interlocked with neighboring stones. Armor stone placement shall be without overhanging or "floater" stones and without voids underneath a layer of stone. Armor stone shall be seated on the bedding stone to prevent slipping, rocking, or displacement under wave action or the weight of overlying stone. All armor stone shall be placed individually, and in a manner to avoid displacing underlying materials or placing undue impact force on underlying material. Armor stone shall not be dropped.

C. Armor stone shall have Selective Placement as follows: place stone side by side with staggered vertical joints. All stones shall be interlocked and keyed into adjacent stones. The stones shall be placed with maximum interlocking of stones and maximum points of contact with adjacent stones. Re-handling of individual stones after initial placement may be required to achieve the above requirements.

D. Photographs showing examples of Selective Placement are included in the following reference: U.S. Army Corps of Engineers, Coastal Engineering Manual (EM 1110-2-1100, revised April 1, 2010), Part VI-Chapter 4, Materials and Construction Aspects, page VI-4-23. “Placement Considerations for Stone.”

E. Equipment proposed for use shall be capable of placing the armor stone near its final position before release and capable of moving and manipulating the armor stone to its final position if necessary. Dragline buckets and skips shall not be used for placement of armor stone. Placement shall begin at the bottom of the slope and proceed up the slope placing stone to the full armor thickness in one operation. Casting or dropping of stone from a height greater than 1 foot or moving by drifting or manipulating down the slope shall not be permitted.

F. Bedding stone and armor stone may be placed by clamshell or other methods to meet the lines and grades shown on the plans.

3.04 TOLERANCES

A. Vertical

1. A tolerance of plus 6 inches or minus 3 inches from the surface plane of the armor layer shown will be allowed for the armor stone layer. The armor stone surface shall be shaped with plating equipment or bucketing to achieve a uniform surface with no stones protruding more than 6 inches from the average surface area.

2. A tolerance of plus 3 inches from the surface plane of the bedding layer shown will be allowed for the bedding stone layer.

3. A tolerance of plus 3 inches or minus 3 inches will be allowed for any Backfill placed prior to placement of bedding stone.

4. For both layers in the Riprap (armor stone and bedding stone), either extreme of such tolerances noted above shall not be continuous over an area greater than 200 square feet. The tolerance limit will be determined based on the average surface elevation within 10 square feet.

B. Horizontal

1. The horizontal location tolerance of individual material layers will be plus or minus 6 inches.

3.05 PROTECTION OF SLOPES

A. Alteration or disturbance of the bank shall be limited to that necessary to construct the project to the lines and grade shown on the Drawings. Excavated slopes shall be protected from erosion during construction. The stone protection shall be maintained until accepted, and any material displaced shall be replaced to the lines and grades shown.

B. Excavated slopes, placed backfill, GAC amended sand, bedding stone, armor stone, and backfill shall be protected from erosion and native material infilling. Refer to Section 31 00 00: Earthworks and Section 35 53 64: Sediment Cap Construction.

3.06 INSPECTION

A. Following each layer of material placement, measurements and surveys shall be performed by the Contractor to confirm that the thickness and quality of the material placement is within specified tolerances. The Contractor shall provide written notification (email is acceptable) to the Project Representative when individual areas and layers of the Riprap are complete and ready for review and approval.

B. Final surveys for the top surface of the Riprap shall be performed, reviewed, and approved in accordance with Section 02 321 00 (Site Survey and Positioning Control).

C. If the interlocking of the stone placement and/or the geometric configuration of the Riprap is/are determined unacceptable, the Contractor shall correct at their own cost and within the time constraints of this Contract.

END OF SECTION

SECTION 31 62 10

STEEL PIPE PILING

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies the requirements for furnishing and driving Steel Pipe Piling of the type and dimensions indicated on the Swan Island Basin (SIB) Project Area (Work Area) Remedial Design (RD) Drawings. It also includes the requirements for cutting off or building up of the piling as necessary.

1.02 DESCRIPTION OF WORK

A. The Work includes installation of Steel Pipe Pilings at the locations indicated on the SIB Project Area RD Drawings. The materials and construction shall be as specified herein.

B. The Work includes the requirements for furnishing, transporting, handling, and installing open-ended steel pipe piles, including design and installation of pile driving attachments and templates.

1.03 REFERENCED STANDARDS

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the EPA Record of Decision (ROD) (EPA, 2017); therefore, compliance with Applicable or Relevant and Appropriate Requirements (ARARs) for the SIB Project Area within the Portland Harbor Superfund Site (PHSS) cleanup remedy is required. See Section 01 13 00 – Reference Material for additional information on the ROD. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 - Environmental Regulatory Requirements. In case of conflict between the requirements of this Section and those listed in Section 01 41 00 - Environmental Regulatory Requirements, the more stringent requirement shall prevail. If the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

B. The following is a list of standards which may be referenced in this section:

1. American Petroleum Institute (API) 5L, Specification for Line Pipe
2. ASTM International (ASTM):
    a. A53/A53M, Standard Specification for Pipe, Steel, Black and Hod-Dipped, Zinc-Coated, Welded and Seamless
    b. A252, Standard Specification for Welded and Seamless Steel Pipe Piles
    c. D 4945, Standard Test Method for High-Strain Dynamic Testing of Deep Foundations
3. American Welding Society (AWS) D1.1/D1.1M, Structural Welding Code
4. International Building Code (IBC) Chapter 17, Structural Tests and Special Inspections

1.04 DEFINITIONS

A. Refer to Section 01 11 00 (Summary of Work) for definitions related to the Contract Documents.

B. “Driving piles” refers to installation by vibratory hammer and traditional methods using impact hammer.

1.05 SUBMITTALS

A. Refer to Section 01 33 00 (Submittal Procedures)

B. Pre-Construction Submittals:

1. As part of the Remedial Action Work Plan, the Contractor shall submit a detailed, written plan describing the following:

   a. Proposed methodology to install Steel Pipe Piling to the depths shown;

   b. List, description, and capacities of proposed equipment for Steel Pipe Piling installation, including, but not limited to, cranes, type of pile driver, maximum rated energy, hammers, rams, driving cushions, pile caps, and cap blocks; and

   c. Piling installer qualification: welding certificates for anyone assigned to work on the Project.

C. Construction Submittals:

1. Product Data: For each type of Steel Pipe Piling product and accessory:

   a. Material Certificates: Provide Manufacturer's mill certificates giving the chemical and physical properties of the steel to be used in the Work, including certification of Charpy V-notch ductility and elongation.

   b. Certification of yield strength and weldability of steel products.

2. Driving Template: Provide pile driving template details and calculations.

3. Shop drawings: Show fabrication and installation details for Steel Pipe Piling, including driving points

   a. Indicate welds by standard American Welding Society (AWS) symbols, distinguishing between shop and field welds, and show size, length, and type of each weld

   b. Provide prequalified welding procedure specification (WPS) for all welding processes.

   c. Provide splice details.

4. Reports for each Steel Pipe Piling Installation: Submit a report in electronic or quadruplicate hard copy to the Project Representative for each pile installed. Report shall include full length installation records including the following minimum information: final tip elevation, cut-off elevation, description on unusual installation behavior or conditions, pile material and dimensional properties, elevations at welded joints, driving time, penetration rate (feet per minute, or inches per minute as appropriate), total penetration depth, and any other pertinent information. Include time and duration when pile driving is interrupted and penetration rate per minute when driving resumes, pile location plumbness, and welding.

5. Submit drawings showing the physical arrangement details of any sound pressure attenuation devices employed for driving piles with an impact hammer. If a bubble curtain is used, submit complete details of the bubble curtains including number, sizes, connections, hole diameter and spacing, pump data, and all accessories.

6. Submit a summary of daily Steel Pipe Piling installation, including location and description of Work performed, as part of the Daily Construction Report.

7. Submit a summary of the week's Steel Pipe Piling installation activities and anticipated Steel Pipe Piling to be installed in the following week as part of the Weekly Construction Report.

8. Submit As-Built Drawings to the Project Representative showing actual Steel Pipe Piling locations with respect to the planned pile locations and indicating plumbness of the piles.

9. Non-conformance Reports (NCR's): Submit all Non-conformance Reports, including proposed remediation, repair or replacement (as applicable) to the Project Representative for approval prior to undertaking any remedial works.

D. Post-Construction Submittals:

1. The Contractor shall submit the Contractor's Annual Construction Summary Report for the Work completed in each Work Period related to this Section, as described in Section 01 78 39 (Project Record Documents). The Contractor's Annual Construction Summary Report shall include the summary of the Work completed under this Section, any As-Built Drawings, and any relevant record information.

1.06 QUALITY ASSURANCE

A. The Contractor shall provide at least one qualified person who shall have a minimum of five (5) years' experience with driving steel piling in marine conditions at the piling lengths, sizes, and installation methods to be used on the project and who shall supervise and direct all work performed under this section.

B. The Contractor shall provide at least one qualified person who shall have a minimum of five (5) years of experience in steel pile installation and who shall keep detailed driving records and logs for each pile from the time the pile is picked until installation is complete.

C. It is the Contractor's responsibility to install in an acceptable condition and location all the piles to the required embedments and cut-off elevations indicated on the Drawings. The Contractor shall operate the pile driving system so that piles can be installed without damage.

D. The Contractor shall conduct a WEAP analysis to develop refusal criteria for review by the Project Representative. If a pile reaches the refusal criteria before reaching the minimum tip elevation, the Project Representative shall be notified immediately for direction.

E. The contractor shall furnish all materials, labor, tools, equipment, services and incidentals necessary to perform Dynamic Pile Testing using the Pile Driving Analyzer (PDA) and Case Pile Wave Analysis Program (CAPWAP). All equipment necessary for the dynamic pile testing shall conform to ASTM D 4945.

F. The Project Representative may suspend piling construction if the Contractor substitutes unqualified personnel. The Contractor shall be fully liable for additional costs resulting from suspension of Work, and no adjustments in Contract duration will be allowed resulting from suspension of Work.

G. Pre-Installation Conference: The Contractor shall host, and any subcontractors shall attend, a conference at the SIB Project Area prior to Steel Pipe Piling installation.

H. Steel Pipe Piling shall not be installed except in the presence of the Project Representative. The Contractor shall notify the Project Representative in writing at least 3 days before commencing Steel Pipe Piling installation.

I. Coordinate with the Project Representative throughout Steel Pipe Piling installation. Adjustments to the embedment length of the Steel Pipe Piling may be required based upon the actual soil conditions encountered. The Contractor shall maintain contact with and follow requirements as issued by the Project Representative during Steel Pipe Piling installation activities.

J. The Project Representative may suspend piling pulling or installation if field observations indicate performance issues, including material, subsurface conditions, or other issues that otherwise may cause unsatisfactory pile performance.

K. Welding Inspection: All welding inspection shall be completed by the Independent Welding Compliance testing agency.

1.07 TOLERANCES

A. Deviation of pile head of piles may be 2 inches from plan position in any direction and ¼-inch from the cut-off elevation shown on the Drawings.

1. Piles out of tolerance will be rejected and shall be removed and replaced with new piles.

2. Plumb piles shall not exceed a deviation from vertical alignment of more than 0.5%.

3. Battered piles shall not exceed a deviation from the required batter alignment of more than 0.5%.

B. Tolerances shall be measured when piles are released from the driving template.

1.08 PILE DRIVING TEMPLATE

A. To ensure accurate installation of the piles, the Contractor shall construct and use a driving frame template. The template shall be designed to withstand all loads anticipated during pile placement and driving. Any contact points with the permanent piles shall have UHMW or other approved contact methods to protect the pile.

B. The Contractor shall supply calculations stamped by an Oregon State Professional Engineer verifying the template is adequate for the expected driving forces. The template details and supporting calculations shall be submitted to the Project Representative for review. The template shall be located by surveying prior to placement of the first pile and checked for movement prior to placing subsequent piles.

C. Alternatively, Contractor may propose to drive piles using fixed leads in lieu of using a template provided the specified pile installation tolerances are met.

1.09 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall deliver Steel Pipe Piling to the SIB Project Area in such quantities and at such times to ensure continuity of installation.

B. Handle and store Steel Pipe Piling at the SIB Project Area to prevent physical damage. Store piles in orderly groups above ground and blocked during storage to minimize possible distortion of members. Piles exhibiting variations beyond tolerance limits will be considered distorted and may not be used in the Work.

1.10 PROJECT CONDITIONS

A. The SIB is an active navigable industrial waterway with active light and heavy industrial activities. Upland businesses use the waterway for transfer of commercial materials, for operations (such as maintenance and repair of vessels), and for vessel storage.

1. Commerce and businesses (upland Project Representatives and tenants) will remain open during the duration of the Construction Work Period and through completion of the Work, shall have access through the Work Area, and shall take priority over the Contractor's operations, unless otherwise described in Project-specific Work Area access agreements.

2. The Contractor shall be required to stop, move, adjust, and/or slow down to accommodate industrial operation vessel movement and in accordance with project-specific agreements.

3. The Contractor shall adhere to specific sequencing requirements to conduct its remedial operations in a manner that will minimize interference with those industrial activities.

4. The Contractor shall conduct operations in a manner that will minimize interferences with other waterway users by monitoring and observing for vessel activity and warning vessels from entering the Work Area or temporarily modifying operations if necessary to prevent unsafe navigation in the SIB Project Area for transiting (e.g., recreational, industrial, commercial) vessels around its floating equipment at all times.

B. Subsurface Conditions:

1. Subsurface conditions have been explored at the Work Area. See the Project Geotechnical Data Report. Additional soils reports from previous projects in the vicinity are also available for review.

2. The Contractor shall make its own determinations and conclusions regarding the nature of the materials and the methods and procedures to be utilized in performing the pile driving work, based upon all the available project information.

3. The Contractor shall investigate, interpret, evaluate, and plan for pile driving conditions that may be affected by remnant timber piles from historical site use, cutoff timber piles from prior timber docks and dolphins, or buried infrastructure, and the impacts there may be on methods of pile installation.

C. Equipment Restrictions: If land-based equipment is used to assist in pile driving, the Contractor shall verify that pile driving and construction equipment will not over-load existing structures. Calculations stamped by a Professional Engineer in the state of Oregon shall be submitted to the Project Representative verifying the Contractor's actions will not damage existing structures and slopes.

D. The Contractor shall closely coordinate with the Project Representative to understand the SIB Project Area usage and frequency of vessel calls at and around the facilities where remediation Work is required to be performed and to coordinate its Work around the active SIB Project Area use.

E. The Contractor shall protect structures and other construction from damage caused by Steel Pipe Piling installation.

F. The Contractor shall remove existing piles, as shown on the Drawings, by vibratory method unless otherwise accepted by the Project Representative (see Section 02 41 00 – Demolition).

1.11 SOUND PRESSURE ATTENUATION

A. If required by permits, for pile driving using impact hammers, attenuation devices shall be employed to reduce sound pressure levels.

PART 2 PRODUCTS

2.01 STEEL PIPE PILING

A. Steel Pipe Piling:

1. Steel Pipe Piling shall be fabricated from steel plate and have a minimum diameter and wall thickness indicated on the Drawings. Steel Pipe Piling shall conform to one the following standards:

   a. ASTM A252 Grade 3, seamless or welded

   b. American Petroleum Institute (API): API 5L PSL2 X42N, API 5L PSL2 X46N, or API 5L PSL2 X52N. All pipe shall be seamless or welded pipe produced by the SAWL or SAWH processes, certified in accordance with Annex N of the standard for applications requiring longitudinal plastic strain capacity.

2. Steel Pipe Piling shall meet the following chemical requirements, unless a stricter requirement applies in the manufacturing standard:

   a. The carbon equivalent of steel in steel pipe piles must not exceed 0.45% as defined in AWS D1.1, Section X15.1.

   b. Sulfur content of steel in steel pipe piles must not exceed 0.05%.

   c. Boron content shall not exceed 0.0005%. Boron shall not be intentionally added to any steel.

3. Steel Pipe Piling shall meet the following dimensional tolerances, unless a stricter requirement applies in the manufacturing standard:

    a. Outside diameter: ±0.75% of the specified outer diameter

    b. Wall thickness: -5% to +10% of the specified wall thickness

    c. Straightness: ±1.0% over the length of the pipe

    d. The radial offset of the weld seams, height of the weld seams, and misalignment of the weld beads shall not exceed the limits specified in API 5L, Sections 9.13.1, 9.13.2 and 9.13.3 respectively.

    e. The ends of steel pipe piles shall conform to the dimensional tolerances and fit-up requirements of AWS D1.1 Section 5.22.3.1

4. Splice welds shall be shop produced, complete penetration welds which develop the full strength of the pile section.

5. Steel Pipe Piling shall be installed with bottom ends open.

6. Steel Pipe Piling shall be installed using a vibratory hammer only to required penetration without distortion or damage. Tip reinforcement shall be provided as required; no jetting is permitted. Establish and maintain axial alignment of leads and piles before and during driving.

7. Steel Pipe Piling shall be supplied and driven in single length. Driving surfaces of shell shall be square cut.

8. All welding shall be performed by Oregon Building Officials Association (OBOA)-certified welders or those holding American Welding Society (AWS) certifications, in accordance with AWS codes.

9. Coating:

    a. All structural steel shall be painted as specified in Section 09 90 00 (Painting and Coating). Paint color to be selected by the Project Representative.

10. Piling Caps:

    a. Provide and install High Density Polyethylene (HDPE), flat or cone pile cap where indicated on the Drawings. Shape and color to be selected by the Project Representative.

PART 3 EXECUTION

3.01 GENERAL

A. It shall be the Contractor's responsibility to furnish the specified Steel Pipe Piling and all labor, equipment, and materials necessary to install the Steel Pipe Piling.

B. Survey: Oregon Registered Professional Land Surveyor shall establish Steel Pipe Piling locations.

C. The Contractor shall provide a single point of contact for coordinating the Contractor’s vessels and other SIB traffic (Project and non-Project vessels).

1. The Contractor shall continuously monitor the SIB Project Area for the presence of other waterway users and shall warn waterway users (e.g., commercial and recreational users) of In-Water Work activities occurring. The Contractor shall modify operations if necessary to protect the safety of other waterway users.

2. The Contractor shall notify the Project Representative of planned vessel movements on a weekly basis for all portions of the Project.

3. The Contractor shall provide daily coordination of all vessel traffic transiting through the Work Area, including tracking and maintaining communication with Project and non-Project vessels.

D. All pile installation work shall be coordinated and performed in strict accordance with the permit requirements. This specification section does not include all required protection measures, mitigation measures, and BMPs associated with this project. The Contractor shall pay particular attention to the conditions of issued permits and applicable regulations and authorizations associated with this project. All protection measures, mitigation measures, and BMPs included in these documents shall be implemented by the Contractor. A containment boom shall be deployed in the water around the work where pile driving equipment will be utilized and around any active work barges.

3.02 SEQUENCING

A. Refer to Section 01 14 00 (Work Restrictions) for construction sequencing requirements in relation to the overall sequencing of the Project Work.

3.03 PILE DRIVING PLANT

A. Piles may be driven with a combination of vibratory and impact hammers capable of driving the piles to the desired tip elevation without damage. Regardless of whether vibratory hammers are used, impact hammers shall be used for at least the final 5 feet of penetration to estimate pile axial capacities with dynamic formula and/or PDA testing. The impact hammer shall be capable of developing an energy per blow of at least xxx,000 ft-lbs, or as needed to drive the pile to the required minimum pile tip elevation and required axial capacity.

B. Provide equipment of adequate size and capacity to handle, place, drive, and hold the piles to the required penetration and alignment. This equipment shall be able to maintain the alignment of the pile and hammer without damage to either.

C. Driving equipment shall be in good repair and operating condition and shall be capable of being operated as recommended by the manufacturer.

D. Maintain all pile-driving equipment in safe operating condition at all times.

3.04 INSTALLATION AND DRIVING CRITERIA

A. All piles shall be driven in approved pile driving templates or with fixed leads.

B. Mark each pile with horizontal lines at 1-foot intervals for the full pile length, beginning at the bottom. Pile lengths shall be marked on the pile at 5-foot intervals. Marks and numbers shall be readily seen from a minimum distance of 15 feet.

C. Care shall be exercised in the first 10 to 15 feet of pile penetration. The Contractor shall pre-excavate when there may be obstructions to pile driving.

D. Continuously drive each pile to tip elevation as shown on the Drawings, and to satisfactory embedment and driving resistance.

1. Drive piles to embedment lengths or blow counts that achieve pile capacity.

2. The Contractor shall modify driving criteria depending on the equipment used, field conditions encountered, and observations made during pile installation.

E. Carefully plumb the leads and the pile before driving. Take care during driving to prevent and to correct any tendency of piles to twist or rotate.

F. Jetting for installation of piling is prohibited.

G. Avoid excessive driving.

H. If rapid penetration to specified tip depth occurs, return after 24 hours and continue driving piles using vibratory hammer to evaluate pile setup or freeze-back as requested by the Project Representative to confirm that pile capacity is satisfactory.

I. Make no penetration measurements for the purpose of determining driving resistance when pile heads are damaged to the extent that may affect measured penetration. Make measurements with minimum interruption of driving.

J. Withdraw damaged or defective piles and piles that exceed driving tolerances and install new Steel Pipe Piling within driving tolerances. Fill holes left by withdrawn piles as directed by the Project Representative.

K. After Steel Pipe Piling are driven and installed, an Oregon-registered Professional Land Surveyor shall make a field survey of completed Steel Pipe Piling Work.

3.05 WELDING

A. Fabricate to lines and dimensions shown on the Drawings.

B. Make no more than one field splice and one shop splice per pile. Splice piles by complete joint penetration groove weld. Carefully align and hold pieces firm and concentric until welding is complete. Provide backing bar (minimum 1/4-inch thick) for all splices. Underwater welding for pile splicing is prohibited. Splices shall develop the full strength of the pile in tension, bending, and bearing.

3.06 GENERAL ASSEMBLY AND FIT-UP

A. Dents, gouges, or arc strikes in the piling greater than 1/8 inch shall be removed or repaired as required under AWS. Pile deficiencies greater than 1/8 inch will be rejected and pile shall be removed from the Work Area and replaced by the Contractor at no additional cost.

B. The Contractor shall align field splices by means that will hold both the receiving end and adjoining end in concentric alignment without deflections due to pile dead load or construction techniques or equipment. Alignment measurements shall be taken and recorded after tack welding and after final joining weld. Any out-of-tolerance assembly will be rejected. The Contractor shall remove sections and repair or replace sections and reassemble at no additional cost. If misalignment of pile sections is found either by the Contractor's inspection or the Project Representative's inspection, work will be stopped, the Contractor shall submit a work plan for correcting alignment and for eliminating future alignment problems, including equipment modifications, installation procedural changes, and labor practices before work may be started again.

3.07 CUTTING OF PILES

A. Cut off tops of piles square with the pile axis and at the elevations indicated.

3.08 OBSTRUCTIONS DURING DRIVING

A. To be completed at 90% RD.

3.09 FIELD QUALITY CONTROL

A. Monitoring of Steel Pipe Piling installation will be performed by the Project Representative.

B. Weld Testing:

1. All structural welds (steel pipe pile splice welds, shear ring welds) shall be subject to 100% visual scanning and 100% visual examination.

2. In addition to visual examination, All structural welds shall be inspected according to AWS D1.1, at the Project Representative's direction. A minimum of 25% of all structural welds shall be subject to Ultrasonic (UT) examination.

3. The Contractor shall correct deficiencies in Work that test reports and inspections indicate do not comply with the Contract Documents. Cracks or zones of incomplete fusion or penetration will not be accepted.

3.10 DISPOSAL

A. The Contractor shall remove withdrawn piles and cutoff sections of piles from SIB Project Area and legally dispose of at an approved Disposal Facility(ies) (see Section 35 24 20.01 – Transloading, Upland Transportation, and Disposal).

END OF SECTION

SECTION 31 62 16.19

STEEL SHEET PILES

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies the requirements for permanent earth structures constructed from steel sheet piles such as retaining walls and bulkhead walls within the Swan Island Basin (SIB) Project Area (Work Area), Portland Harbor Superfund Site. The extents and locations of the Work are indicated on the Drawings and include the installation of the following sheet pile walls (To Be Confirmed):

1. New bulkhead wall with capping to support the operational apron south of the SCC Floating Docks and which supports the floating docks access gangway
2. Mid-slope pile pinning bulkhead walls along the riverbank between the Lagoon Wharf and Wind Tunnel structures.
3. Mid-slope pile pinning bulkhead walls along the riverbank directly adjacent to and beneath the Marine Consortium Pier structure.
4. Below-water toe walls, directly adjacent the USCG Pier to support the deepening of the berth pocket and stabilization of the embankment.

B. Temporary structures such as shoring and sheeting are the responsibility of the Contractor and, unless required by conditions of the project, are not to be covered by this section

1.02 DESCRIPTION OF WORK

A. Design, furnish, install and test steel sheet piles at the locations indicated on the Drawings and specified herein. This section includes installation of reinforcement and cast-in-place concrete capping beams, as specified herein and indicated on the Drawings.

B. This Section also includes furnishing all labor, materials, and equipment required for completing the Work.

1.03 REFERENCED STANDARDS

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the EPA Record of Decision (ROD) (EPA, 2017); therefore, compliance with Applicable or Relevant and Appropriate Requirements (ARARs) for the Swan Island Basin (SIB) Project Area within the Portland Harbor Superfund Site (PHSS) cleanup remedy is required. See Section 01 13 00 – Reference Material for additional information on the ROD. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 - Environmental Regulatory Requirements. In case of conflict between the requirements of this Section and those listed in Section 01 41 00 - Environmental Regulatory Requirements, the more stringent requirement shall prevail. If the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

B. The following is a list of standards that may be referenced in this Section. Reference Standard editions shall be the latest edition issued for industry use at the time of construction.

1. ACI 318 American Concrete Institute Building Code Portal
2. ASTM International (ASTM):
    a. A328/A328M, Standard Specification for Steel Sheet Piling
    b. A572/A572M, Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel

c. A6/A6M, Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling

d. A615, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

e. A857/A857M, Standard Specification for Steel Sheet Piling, Cold-Formed, Light Gage

f. C33, Standard Specification for Concrete Aggregates

g. C1107, Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink)

h. D945, Standard Test Method for High-Strain Dynamic Testing of Deep Foundations

i. E329, Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

3. American Welding Society (AWS):

a. AWS D1.1/D1.1M, Structural Welding Code

b. AWS D1.5/D1.5M, Bridge Welding Code

4. U.S. Army Corps of Engineers Contract Requirements Document (CRD)-C-621, Specification for Non-Shrink Grout

5. Concrete Reinforcing Steel Institute (CRSI), CRSI Handbook

1.04 CONTRACTOR'S GEOTECHNICAL CONSULTANT

A. The Contractor shall hire the services of an independent, Registered Professional Geotechnical Engineer, experienced in soil mechanics and Pile Dynamic Analysis, to observe test pile installation and production pile installation as specified herein. The Contractor's Geotechnical Consultant must be independent of the Contractor and must have no employee of employer relationship which could constitute a conflict of interest.

1.05 TESTING

A. Testing Agency Qualifications: An independent testing agency(ies) qualified according to ASTM C1077 (Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation) and ASTM E329 (Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection) for testing indicated, shall be engaged by the Contractor and accepted by the Project Representative to certify that the works are in accordance with the Project Requirements. The following certification shall be provided:

1. Independent Welding Compliance

1.06 SUBMITTALS

A. Refer to Section 01 33 00 (Submittal Procedures)

B. Pre-Construction Submittals:

1. Include in the Remedial Action (RA) Work Plan, description of qualifications of installer, testing agency, and geotechnical consultant; shop drawings for steel sheet piles, corner piles, tip protection/pile shoes, and other structural steel components, indicating all welding with AWS symbols; installation procedures; pile driving equipment including name, model number, capacity, rated energy and verification of hammer energy; and cut sheets.

2. Product Data

a. Material Mill certificates and Test certificates

b. Interlock tension strength test report conforming to steel sheet piling manufacturer's standard test

c. Delivery, Storage and Handling

d. Driving, Pulling and Redriving

C. Construction Submittals:

1. The Contractor shall furnish the Project Representative with As-Built Drawings showing the location, depth, finished level and extent of all sheet pile walls.

2. The Contractor shall furnish the Project Representative with field monitoring stations results including, but not limited to, the following:

a. Rate of cast-in-place concrete placement

b. Concrete delivery system

c. Occurrences of:

1) Possible cold joint

2) Delays in concrete placement

3) Equipment malfunction

4) Restarts

5) Loss of tremie seal

3. Submit a summary of daily sheet pile installation activities as part of the Daily Construction Report.

4. Submit a summary of the week's sheet pile installation activities and anticipated installation activities to be completed in the following week as part of the Weekly Construction Report.

5. Welding Certification

6. Pile shoe certificates

D. Post-Construction Submittals:

1. The Contractor shall include the Work completed in each Work Period related to this Section in the Annual Construction Summary Report, as described in Section 01 78 39 (Project Record Documents). The Contractor's Annual Construction Summary Report shall include the summary of the Work completed under this Section, any As-Built Drawings, Pile Driving records and any other relevant record information.

1.07 TOLERANCES

A. The Contractor shall install piling to form a straight line between termini points and within 6 inches of the face indicated on the Drawings. Steel Sheet Piles shall not be out of plumb more than 2%. Top of pile at elevation of cut-off shall be within 1/2 inch horizontally and 2 inches vertically of the location indicated

1.08 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Storage

1. Develop and submit plans for the delivery, storage, and handling of piles. Submit delivery, storage, and handling plans for piles at least 30 days prior to delivery of piles to the Work Site.

2. Materials delivered to the site shall be new and undamaged and must be accompanied by certified test reports. Provide the manufacturer's logo and mill identification mark on the sheet piling as required by the referenced specifications. Store and handle sheet piling in the manner recommended by the manufacturer to prevent permanent deflection, distortion or damage to the interlocks; as a minimum, support on level blocks or racks spaced not more than 10 feet apart and not more than 2 feet from the ends. Storage of sheet piling should also facilitate required inspection activities and prevent damage to coatings and corrosion protection prior to installation.

3. Deliver materials to the Work Area in such quantities and at such times to ensure continuity of installation.

B. Handling

1. Lift piles to ensure that the maximum permissible curvature is not exceeded. Holes may be burned above the cutoff length for lifting piles into the leads. If there is evidence of pile damage during driving due to the holes, Project Representative may forbid the burning of holes. Do not damage piles when dragging piles across the ground or barge deck.

2. Inspect piles for excessive curvature and for damage before transporting them from the storage area to the driving area and immediately prior to placement in the driving leads. Curvature in the pile must be measured with the pile laying on a flat surface and is the distance between the pile at the mid-length of the pile and the flat surface. Straightness of the sections of piles must conform to AWS D1.5M/D1.5, Section 3.5.1.1. Piles having excessive curvature will be rejected.

C. Damaged Piles

1. Bring any damage to the attention of the Project Representative. Piles which are damaged during delivery, storage, or handling to the extent they are rendered unsuitable for the work, in the opinion of the Project Representative, will be rejected and removed from the Work Area, or may be repaired, if approved.

2. Any pile damaged by reason of internal defects or by improper driving shall be corrected by one of the following methods as approved by the Project Representative:

   a. The pile is withdrawn, if practicable, and replaced by a new and, if necessary, longer pile.

   b. One or more replacement piles are driven adjacent to the defective pile.

   c. A Pile Dynamic Analysis and/or low integrity testing must be performed by the Contractor's Geotechnical Consultant to assess the structural integrity of the driven pile(s).

3. A pile driven below the specified butt elevation must be corrected by one of the following methods approved by the Project Representative:

   a. The pile is spliced (if approved).

   b. A sufficient portion of the footing is extended down to properly embed the pile.

4. A pile driven out of its proper location or out of plumb, shall be corrected by one of the following methods approved by the Project Representative:

   a. One or more replacement piles are driven next to the pile in question.

   b. As directed by the Project Representative.

1.09 PROJECT CONDITIONS

A. The SIB is an active navigable industrial waterway with light and heavy industrial activities. Upland businesses use the waterway for transfer of commercial materials, for boatyard operations (such as maintenance and repair), and for vessel storage.

1. Commerce and businesses (upland owners and tenants) will remain open during the duration of the Work Period and through completion of the Work and shall have access

through the Work Area, and shall take priority over the Contractor's operations, unless otherwise described in Project-specific Work Area access agreements.

2. The Contractor shall be required to stop, move, adjust, and/or slow down to accommodate SIB industrial vessel operations and movement in accordance with project-specific agreements.

3. The Contractor shall adhere to specific sequencing requirements (see Article 3.02 of this Section) to conduct its remedial operations in a manner that will minimize interference with those industrial activities (see Article 3.01 of this Section).

4. The Contractor shall conduct operations in a manner that will minimize interferences with other waterway users by monitoring and observing vessel activity and warning vessels from entering the Work Area. If necessary, the contractor shall temporarily modify operations to prevent unsafe navigation in the Work Area for transiting (e.g., recreational, industrial, commercial) vessels around its floating equipment at all times.

B. The Contractor shall closely coordinate with the Project Representative to understand the Work Area usage and frequency of vessel calls at and around the facilities where remediation Work is required to be performed and to coordinate its Work around the active Work Area use.

C. Locate and protect structures, utilities, and other construction from damage caused by bulkhead installation.

D. The alignment of sheet pile walls may encounter Identified and/or Unidentified Debris. The Contractor shall familiarize themselves with the character of the Identified Debris when selecting installation methods and shall sequence work so that the risk of damaging existing construction is minimized during the removal of all Debris and installation of the sheet pile walls.

PART 2 PRODUCTS

2.01 GENERAL

A. Material Certification

1. For each shipment, submit certificates identified with specific lots prior to installing piling. Include in the identification data piling type, dimensions, chemical composition, mechanical properties, section properties, heat number, and mill identification mark.

B. Submit detail drawings for sheet piling, including fabricated sections, showing complete piling dimensions and details, driving sequence and location of installed piling. Include details of top protection, special reinforcing tips, tip protection, lagging, splices, fabricated additions to plain piles, cut-off method, corrosion protection, and dimensions of templates and other temporary guide structures for installing piling. Provide details of the method for handling piling to prevent permanent deflection, distortion or damage to piling interlocks.

C. Steel Sheet Piles:

1. Sheet piles shall be hot-rolled steel sections conforming to ASTM A690/A690M, or ASTM A572/A572M, Grade 50.

2. Provide sheet piles with minimum section modulus, moment of inertia, shape, and size as specified in the Drawings. Sheet piling must be full-length sections of the dimensions shown. Provide sheet piling with standard lifting holes.

3. Interlocks shall be free-sliding, allowing a swing angle suitable for the installation, but not less than 5 degrees when interlocked, and maintain continuous interlocking when installed.

4. Corner piles shall conform to ASTM A328, Grade 50 with minimum web thickness of 1/2 inches.

5. Sheet Piles shall be coated in accordance with Section 09 90 00.

D. Metal plates, shapes, bolts, nuts, rivets and other appurtenant fabrication and installation materials shall conform to the manufacturer's standards and to the requirements specified in the respective sheet piling standards. Unless noted otherwise, appurtenance shall conform to ASTM A572/A572M, Grade 50.

E. Cast-in-place concrete for capping beams and other adjoining structures shall be in accordance with Section 03 30 00.

F. Reinforcement:

1. Comply with the following as minimums:

a. Bars: ASTM A615, grade 60

b. Bending: ACI 318

Fabricate reinforcement to the required shapes and dimensions, within fabrication tolerances stated in the CRSI Handbook.

2. Do not use reinforcement having any of the following defects:

a. Bar lengths, depths, or bends exceeding the specified fabricating tolerances

b. Bends or kinks not indicated on the Drawings or required for this Work

c. Bars with cross sections reduced due to excessive rust or other causes

2.02 MATERIAL TESTS

A. Submit certified materials tests reports showing that sheet piling and appurtenant metal materials meet the specified requirements, for each shipment and identified with specific lots prior to installing materials. All testing and Material test reports shall meet the requirements of ASTM A6/A6M.

B. Sheet piling and appurtenant materials must be tested and certified by the manufacturer to meet the specified chemical, mechanical and section property requirements prior to delivery to the site.

C. Testing of sheet piling for mechanical properties must be performed after the completion of all rolling and forming operations.

2.03 PILE DRIVING EQUIPMENT

A. Submit complete descriptions of sheet piling driving equipment including vibratory hammers, extractors, protection caps and other installation appurtenances, at least 30 days prior to commencement of work. Descriptive information includes manufacturer's name, model numbers, capacity, rated energy, hammer details, cushion material, helmet, and templates.

B. Driving methods shall be vibratory only. Impact hammers, jetting or preboring shall not be permitted.

PART 3 EXECUTION

3.01 GENERAL

A. It shall be the Contractor's responsibility to furnish all labor, equipment, and material necessary to install sheet piles.

B. Survey: Registered Professional Land Surveyor shall establish Steel Sheet Piling locations (02 21 00 [Site Surveys and Positioning Controls]).

C. Welding (Shop and Field): Qualification of welding procedures, welders, and operators shall comply with requirements of AWS D1.1. The Contractor shall keep records of test results of welding procedures and submit copies of each qualified welding operator to the Project Representative for acceptance before starting welding.

D. The Contractor shall provide a single point of contact for coordinating the Contractor's vessels, other SIB traffic (Project and non-Project vessels), and Contractor Transload Facility(ies) operations.

3. The Contractor shall continuously monitor the Work Area for the presence of other waterway users and shall warn waterway users (e.g., commercial and recreational users) of In-Water Work activities occurring. The Contractor shall modify operations if necessary to protect the safety of other waterway users.

4. The Contractor shall notify the Project Representative of planned vessel movements on a weekly basis for all portions of the Project, including moving dredging/material placement equipment to accommodate inbound and outbound commercial waterway traffic with other Project and non-Project vessels (industrial and commercial vessels).

5. The Contractor shall communicate daily with the Transload Facility(ies) . Prior to the end of the shift, the Contractor shall coordinate with the Transload Facility(ies) for any barge transport to be made during the night shift to sustain transloading operations overnight until the beginning of the next day shift.

3.02 SEQUENCING

A. Refer to Section 01 14 00 (Work Restrictions) for construction sequencing requirements in relation to the overall sequencing of the Project Work.

3.03 MONITORING

A. Existing construction shall be monitored for movement during construction as indicated on the Drawings and in Section 31 09 00 (Geotechnical Instrumentation, Condition Inspections and Monitoring of Earthwork).

3.04 SHEET PILES

A. The Contractor shall locate the presence of all buried article (services, utilities and construction) which may conflict with and be damaged by the installation of new sheet pile walls. The Contractor shall use methods and equipment that protect all buried articles.

B. All fabricated steel plate connections shall be welded or connected with high-strength bolts as accepted by the Project Representative.

C. Reports: Submit a report to the Project Representative for each sheet pile detailing cross section, length, make and model of hammer, driving time, penetration rate (feet per minute or inches per minute, as appropriate), total penetration depth, and any other pertinent information. Include time and duration when pile driving is interrupted and penetration rate per minute when driving resumes.

D. Preliminary Work:

1. Prior to driving, sheet piles shall be marked at 1-foot intervals for the full pile length, beginning at the bottom. Sheet pile lengths shall be marked on the sheet pile at 5-foot intervals.

E. Earthwork:

1. Any excavation required within the area where sheet pilings are to be installed must be completed prior to placing sheet pilings.

F. Installation:

1. Placing:

a. Submit a written description of the site-specific pile installation procedures for the Project Representatives approval. Pile placement installation drawings and details must also be provided.

b. Pilings must be carefully located as indicated on the Drawings

2. Driving

a. Measure the vertical distance from the driving platform to the waterway bed.

b. Lift and set up sheet pile with its tip touching the waterway bed.

c. Drop the sheet pile under its own weight; measure the penetration depth after the downward movement stops.

d. Install the sheet pile to the required embedment depth.

e. Drive all piles plumb, to form a relatively straight line between the termini points and within the tolerances specified. Manipulation of piles to force them into position will not be permitted. Check all piles for heave. Re-drive all heaved piles to the required tip elevation.

f. Maintain driving hammers in proper alignment during driving operations by use of leads or guides attached to the hammer. Caution must be taken in the sustained use of vibratory hammers when a hard driving condition is encountered to avoid interlock-melt or damages. Discontinue the use of driving when the penetration rate due to vibratory loading is one foot or less per minute and refer to the Project Representative.

g. Wherever possible, drive piles with the ball end leading. If the socket end is leading, place a bolt or similar object in the bottom of the interlock to minimize material packing into it and to ease driving for the next sheet.

h. If at any time the forward or leading edge of the piling wall is found to be out-of-plumb in the plane of the wall the piling being driven must be driven to the required depth and tapered pilings must be provided and driven to interlock with the out-of-plumb leading edge or other approved corrective measures must be taken to insure the plumbness of succeeding pilings. The maximum permissible taper for any tapered piling shall be 1/8 inch per foot of length.

i. Pilings in each run or continuous length of piling wall shall be driven alternately in increments of depth to the required depth or elevation. No piling will be driven to a lower elevation than those behind it in the same run except when the pilings behind it cannot be driven deeper. Incrementally sequence driving of individual piles such that the tip of any sheet pile must not be more than 4 feet below that of any adjacent sheet pile. When the penetration resistance exceeds five blows per inch, the tip of any sheet pile must not be more than 2 feet below any adjacent sheet pile. If the piling next to the one being driven tends to follow below final elevation it may be pinned to the next adjacent piling.

j. If obstructions restrict driving a piling to the specified penetration, the obstructions must be removed or penetrated with a chisel beam. If the Contractor demonstrates that removal or penetration is impractical, make changes in the design alignment of the piling structure as directed to ensure the adequacy and stability of the structure. Pilings must be driven to depths shown and must extend up to the elevation indicated for the top of pilings. Pilings must not be driven within 100 feet of concrete less than 7 days old.

3. Cutting-Off and Splicing

a. Pilings driven to refusal or to the point where additional penetration cannot be attained and are extending above the required top elevation in excess of the specified tolerance must be cut off to the required elevation. Pilings driven below the required top elevation and pilings damaged by driving and cut off to permit further driving must be extended as required to reach the top elevation by splicing when directed by the Project Representative. Submit procedure for insufficient pile length. Provide pile splicing information and details for approval prior to installation.

b. Pilings adjoining spliced pilings must be full length unless otherwise approved. Splicing of pilings must be as indicated. Ends of pilings to be spliced must be squared before splicing to eliminate dips or camber. Pilings must be spliced together with concentric alignment of the interlocks so that there are no discontinuities, dips or camber at the abutting interlocks. Spliced pilings must be free sliding and able to obtain the maximum swing with contiguous pilings.

c. Qualification of welding procedures, welders, and welding operators shall be in accordance with AWS D1.1/D1.1M. Submit welding certifications for all welders and welding operators for review and approval.

d. The tops of pilings excessively battered during driving must be trimmed when directed.

e. Cut holes in pilings for bolts, rods, drains or utilities in a neat and professional manner, as shown or as directed. Use a straight edge in cuts made by burning to avoid abrupt nicks. Bolt holes in steel piling must be drilled or may be burned and reamed by approved methods which will not damage the surrounding metal.

4. Inspection of Driven Piling

a. Perform continuous inspection during pile driving. Inspect all piles for compliance with tolerance requirements. Bring any unusual problems which may occur to the attention of the Project representative. Inspect the interlocked joints of driven pilings extending above ground. Pilings found to be out of interlock shall be removed and replaced at the Contractor's expense.

5. Pulling and Redriving

a. Submit the proposed method of pulling sheet piling, prior to pulling any piling. Pull, as directed, selected pilings after driving to determine the condition of the underground portions of pilings. Any piling so pulled and found to be damaged, to the extent that its usefulness in the structure is impaired, must be removed and replaced at the Contractor's expense. Pilings pulled and found to be in satisfactory condition must be redriven when directed.

b. Withdraw damaged or defective sheet piles and sheet piles that exceed driving tolerances and install new Steel Sheet Piles within driving tolerances. Fill holes left by withdrawn piles as directed by the Project Representative.

6. Survey

a. After the driving of each pile group is complete and before superimposed concrete is placed, provide the Project Representative with an as-driven survey showing actual location and top elevation of each pile within 7 calendar days of completing the pile installation. Do not proceed with placing concrete until the Project Representative has reviewed the survey and verified the safe load for the pile group driven. Present a survey in such form that it gives deviation from plan location in two perpendicular directions and elevations of each pile to nearest half inch. The survey must be prepared and certified by a Professional Land Surveyor.

G. Drainage:

1. Backfill material behind the sheet piling must be free draining and in accordance with Section 31 00 00 Earthworks. Install drainage system and weep holes as shown in the Drawings.

H. Removal:

1. The removal of sheet pilings must consist of pulling, sorting, cleaning the interlocks, inventorying and storing previously installed sheet pilings as shown and directed.

I. Pulling:

1. The method of pulling piling must be approved. Provide pulling holes in pilings, as required. Extractors must be of suitable type and size. Exercise care during pulling of pilings to avoid damaging piling interlocks and adjacent construction. If the Project Representative determines that adjacent permanent construction has been damaged during pulling, the Contractor will be required to repair this construction at no cost. Pull pilings one sheet at a time. Pilings fused together must be separated prior to pulling, unless the Contractor demonstrates, to the satisfaction of the Project Representative, that the pilings cannot be separated. The Contractor will not be paid for the removal of pilings damaged beyond structural use due to proper care not being exercised during pulling.

2. Sorting, Cleaning, Inventorying and Storing

   a. Pulled pilings must be sorted, cleaned, inventoried and stored by type into groups as:

      1) Piling usable without reconditioning.

      2) Piling requiring reconditioning.

3. Piling damaged beyond structural use.

4. Installation Records:

5. Maintain pile driving records for each sheet pile driven. Indicate on the installation record: installation dates and times, type and size of hammer, rate of operation, total driving time, dimensions of driving helmet and cap used, blows required per foot for each foot of penetration, final driving resistance in blows for final 6 inches, pile locations, tip elevations, ground elevations, cut-off elevations, and any reheading or cutting of piles. Record any unusual pile driving problems during driving. Submit complete records to the Project Representative.

J. Vibration Control:

1. Perform vibration monitoring at the locations indicated in the Drawings. during the pile driving operations. Perform vibration monitoring within a distance of 200 feet from the pile driving activity.

2. Engage the services of a qualified, independent vibration consultant, acceptable to the Project Representative, to conduct the vibration monitoring. The vibration consultant must have minimum of five years of experience in vibration monitoring. A minimum of 28 days before the installation of vibration monitors, submit to the Project Representative the name of the vibration consultant and a list of at least three previously completed projects of similar scope and purpose.]

3. Prior to the pile driving activities, obtain baseline readings of ambient vibrations. The vibration during the pile driving activities must be limited to a peak particle velocity of not more than 2 inches per second. During pile driving activities, monitor the vibrations to ensure the limits are not exceeded. If the limits are exceeded, cease the pile driving activity causing the vibration until the Vibration consultant and the Project Representative are on site to observe the structures nearest to the vibration monitor which has exceeded the limits.

4. The Contractor shall be responsible for all damages resulting from the pile driving operations and must take whatever measures necessary to maintain peak particle velocity within the specified limit.After completion of the project, remove the vibration monitors off the site and restore the monitoring locations back to their original condition.

K. Preconstruction Condition Survey

1. Perform preconstruction condition survey of structures and utilities in accordance with Section 31 09 00 - Condition Inspections and Monitoring.

L. Instrumentation and Monitoring

1. Carry out Instrumentation and Monitoring in accordance with Section 31 09 00 - Condition Inspections and Monitoring.

3.05 PLACEMENT OF CAST-IN-PLACE CONCRETE

A. See Section 03 30 00 (Cast-in-place Concrete).

END OF SECTION

SECTION 32 80 00

IRRIGATION

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies irrigation and maintenance systems within the planting areas as shown on Contract Drawings and described in Contract Documents for the SIB Project Area (Work Area).

1.02 DESCRIPTION OF WORK

A. The Work described in this Section includes but is not limited to temporary irrigation or watering.

B. Work under this Section is paid under Bid Item XXXXX, as shown on the Bidding Schedule and described in Section 01 29 00 (Measurement and Payment).

1.03 REFERENCED STANDARDS

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the EPA Record of Decision (ROD) (EPA, 2017); therefore, compliance with Applicable or Relevant and Appropriate Requirements (ARARs) for the Swan Island Basin (SIB) Project Area within the Portland Harbor Superfund Site (PHSS) cleanup remedy is required. See Section 01 13 00 – Reference Material for additional information on the ROD. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 - Regulatory Requirements. In case of conflict between the requirements of this Section and those listed in Section 01 41 00 - Regulatory Requirements, the more stringent requirement shall prevail. If the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

1.04 Definitions

A. Maintenance Period: The Maintenance Period shall be a 1-year period for the maintenance of the temporary irrigation, beginning upon the Project Representative’s acceptance of the plant installation activities.

B. Watering Events: One Watering Event includes providing Planting Areas with full irrigation coverage and minimum amounts of water.

1.05 SUBMITTALS

A. Refer to Section 01 33 00 (Submittals) for all submittals and associated timelines related to the Contract Documents.

B. Pre-Construction Submittals:

1. Submit a detailed, written Temporary Irrigation Plan, as part of the Remedial Action Work Plan, in conformance with the Specifications, for review and acceptance by the Project Representative.

C. Construction Submittals:

1. Temporary Irrigation System Designer
2. Monthly Maintenance Period punchlist

1.06 QUALITY ASSURANCE

A. The Temporary Irrigation System Designer shall have demonstrated experience on three projects of similar scope over the last 5 years. The Contractor shall coordinate and identify a source of potable water for connection if a temporary irrigation system is proposed.

B. Adhere to manufacturer's instructions for product handling, assembly and installation, and maintenance.

C. Manufacturer's original factory finish shall be intact for the installation to be considered satisfactory. On-site touch-up will not be accepted.

1.07 PRODUCT HANDLING

A. Delivery and Storage:

1. Furnish standard products in manufacturer's standard containers bearing original labels showing quantity, analysis, and name of manufacturer.

2. Store products with protection from weather or other conditions that would damage or impair the effectiveness of the product.

1.08 TEMPORARY IRRIGATION PLAN

A. The Contractor shall prepare a Temporary Irrigation Plan, which describes the methods of irrigation and/or watering schedule, to the Project Representative for acceptance. Project Representative acceptance is required prior to completion of planting preparation and installation of plantings.

B. Methods could include but are not limited to hand watering from water truck, temporary irrigation system with water truck, or temporary water tank located on site. Location of watering truck or temporary water tank shall be coordinated with the Project Representative as applicable.

C. Implementation of the Temporary Irrigation Plan shall meet the criteria described in Part 3 of this Section.

PART 2 PRODUCTS

2.01 GENERAL

A. Purchased materials are to be the product of firms regularly engaged in the manufacture of a specified material.

2.02 DELIVERY, STORAGE, AND HANDLING

A. Deliver temporary irrigation materials and equipment in original, unopened, and undamaged containers showing product description and name of manufacturer. Store in such a manner as to prevent deterioration of the materials and equipment.

2.03 MATERIALS

A. Irrigation materials and equipment should be those described in the Temporary Irrigation Plan and shown on irrigation plan drawings and design.

PART 3 EXECUTION

3.01 TEMPORARY IRRIGATION

A. Work shall include the provision of water to all planted areas as shown on the Drawings and as described in the design criteria below.

B. Design Criteria:

1. The frequency of the watering shall depend on current weather patterns and site-specific moisture conditions. Planted areas shall receive a minimum of 2 inches of water each week. Total water volumes shall be distributed evenly across watering events.

2. At a minimum, the Contractor shall conduct Watering Events from June to September to support plant establishment. Additional Watering Events may be required in late spring and early fall if natural precipitation does not provide adequate water. Watering shall be conducted as follows:
3. April through May: Apply 2 inches of water weekly with at minimum one watering event per week, if not provided by natural precipitation.
4. June through September: Apply a total of 2 inches of water per week with a minimum of two watering events per week.
5. October: Apply 2 inches of water with at minimum one watering event per week, if not provided by natural precipitation.

C. Temporary Irrigation System: If temporary irrigation is installed, the system shall meet the following requirements:
1. The Contractor shall identify and coordinate a water source for the temporary irrigation system.
2. Pressure throughout the system shall comply with manufacturer's recommended minimum requirements.
3. Sprinkling time shall be adjusted to soil type to avoid water runoff.
4. Design for automatic operation using a battery operated automatic controller and automatic remote control valves. The battery shall last 6 months.
5. Design for winterizing such that water in irrigation pipes may be removed effectively to prevent water freezing and cracking pipes. The design shall include the following:
6. A shut-off valve
7. A drain valve (gravity) location
8. The temporary irrigation system design shall use Schedule 40 PVC pipe.
9. The major components for the system shall be manufactured by one manufacturer.
10. Provide accurately scaled irrigation plans showing locations connections, backflow prevention controllers, sprinkler heads, pipes, valves, electrical supply, and connection points.
11. The temporary irrigation system shall be accompanied by a list of all irrigation equipment that the Contractor proposes using.
12. Provide operating, programming, and maintenance data.
13. Provide As-Built Drawings of installed irrigation system with time and flow rates of each station.
14. Provide copies of Contractor-obtained permits.

D. Installation:
1. Confirm existence and location of all existing and newly installed utilities prior to the commencement of Work.
2. Provide protection at all times sufficient to keep rock, dirt, gravel, debris, and other foreign materials from entering piping, valves, and other irrigation equipment.
3. All plastic valve boxes in the Planting Area shall be installed with valve box tops 2 inches above finished grade.
4. Valves shall be located for water drainage. Pipes and valves shall be located away from trees to prevent root damage.
5. Weld pipe only during non-freezing weather, and cover Work during rainy weather.
6. End drains (quick coupler) for winterization shall be located at the end of main lines.
7. Isolation valves shall be installed upstream of each control valve.
8. Cover or enclose Work only after it has been fully inspected and tested and after the Project Representative has accepted the irrigation systems.

9. Temporary piping and sprinklers shall be installed above ground.

E. Flushing and Testing:

1. Submit a plan to the Project Representative for inspections related to flushing, water pressure, irrigation coverage, and overall operation. Conduct tests in the presence of the Project Representative. Notify the Project Representative at least 48 hours prior to all tests.
2. Provide all necessary equipment and perform all Work associated with the testing.
3. Irrigation main lines shall withstand a pressure test of 100 pounds per square inch for 5 minutes, and the system shall pass an electrical test by testing wires for conductivity with a multimeter.
4. Test backflow prevention devices and provide certification.

F. Maintenance:

1. Temporary irrigation shall be guaranteed by the Contractor to operate from the time of installation until the end of the Maintenance Period.

G. Operation:

1. Starting at the time of planting and ending at completion of Maintenance Period, irrigate all planted areas using watering requirements defined in Design Criteria unless otherwise directed by the Project Representative.
2. Pay for water use until completion of planting Work.
3. Plant Disturbance or Damage Caused by Irrigation System Repair:
4. If in the opinion of the Project Representative, irrigation system or repair Work has damaged plants installed as part of the irrigation system installation or repair, the Contractor shall replace the damaged plants at the Contractor's expense.
5. All planting Work resulting from irrigation system installation or repair Work shall comply with the Contract Documents.

H. Hand Watering:

1. Throughout the Contract period, the Contractor shall hand water plants in areas that are not reached by the temporary irrigation system, a watering truck, or other means. Additionally, the Contractor shall provide hand watering for replacement plants, late-planted plants, or certain species or individual plants that require watering after most other plants are weaned.

END OF SECTION

SECTION 32 90 00

PLANTING

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies planting and maintenance activities within the planting areas as shown on Contract Drawings and described in Contract Documents for the Swan Island Basin (SIB) Project Area (Work Area).

1.02 DESCRIPTION OF WORK

A. The Work described in this Section includes, but is not limited to, inspection of nursery plant material, installation of groundcover, trees, shrubs, and seeding, application of fertilizer to tree pits, staking of trees, installation of wire mesh fencing for herbivore exclusion, and Maintenance Period activities. Maintenance Period activities include temporary irrigation or watering.

B. Work under this Section is paid under Bid Item XXXXX, as shown on the Bidding Schedule and described in Section 01 29 00 (Measurement and Payment).

C. Refer to section 32 80 00 for details and requirements of temporary irrigation systems to be used concurrently with planting requirements.

1.03 REFERENCED STANDARDS

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the EPA Record of Decision (ROD) (EPA, 2017); therefore, compliance with Applicable or Relevant and Appropriate Requirements (ARARs) for the Swan Island Basin (SIB) Project Area within the Portland Harbor Superfund Site (PHSS) cleanup remedy is required. See Section 01 13 00 – Reference Material for additional information on the ROD. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 - Regulatory Requirements. In case of conflict between the requirements of this Section and those listed in Section 01 41 00 - Regulatory Requirements, the more stringent requirement shall prevail. If the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

B. Additional referenced standards applicable to this Section include, but are not limited to, the following:

REFERENCE	TITLE
ANSI Z60.1	American Standard for Nursery Stock
Flora of the Pacific Northwest, 2nd Edition, 2018	*Flora of the Pacific Northwest: An Illustrated Manual*
Hortus Third, 1976	*Hortus Third: A Concise Dictionary of Plants Cultivated in the United States and Canada*
East Multnomah Soil and Water Conservation District	Policy 2.0.01 – *Integrated Pest Management*
4-County Cooperative Weed Management Area, Weed Treatment Calendar	*Weed Treatment Calendar, 2020*
OAR Chapter 603 Division 59	Fertilizers, Agricultural Minerals, and Limes
OAR Chapter 603 Division 52	Noxious Weed Policy and Classification
OAR Chapter 603 Division 57	Pesticide Control
OAR Chapter 603 Division 56	Hay and Seed
ORS Chapter 569	Weed Control
Bureau of Planning and Sustainability, City of Portland,	*Portland Plant List*, 2016

REFERENCE	TITLE
Oregon	

Notes:
ANSI: American National Standards Institute OAR: Oregon Administrative Rules
ORS: Oregon Revised
Statutes

1.04 DEFINITIONS

A. Maintenance Period: The Maintenance Period shall be a 1-year period for the maintenance of the Planting Area and temporary irrigation, beginning upon the Project Representative's acceptance of the plant installation activities.

B. Healthy Plants: Healthy Plants shall be those that are free of disease and insect infestation, are robust, and have vigorous growth of foliage.

C. Riparian Seed Mix: The Riparian Seed Mix is a seed mixture of grasses and forbs.

D. Wood Chip Mulch: Wood Chip Mulch is coarse ground wood chips used to reduce weeds and conserve soil moisture.

E. Weeding Events: One Weeding Event includes removing all noxious, invasive, and non-native weeds from the Planting Area.

F. Watering Events: One Watering Event includes providing Planting Area with full irrigation coverage and minimum amounts of water. Refer to section 32 80 00 – Irrigation – for requirements of temporary irrigation.

1.05 SUBMITTALS

A. Refer to Section 01 33 00 (Submittal Procedures).

B. Construction Submittals:

1. Qualifications:
    a. Landscaping Company
2. Weed Removal Plan
3. Herbicide Application Work Plan, if herbicide application is proposed by the Contractor
4. Material Samples:
    a. Wood Chip Mulch
        1) The Contractor shall notify the Project Representative of the source of supply and provide a 1-gallon sample for acceptance before installation.
5. Product Data:
    a. Plants:
        1) List suppliers' names, addresses, and phone numbers.
        2) List respective growing and storage locations.
        3) Include count of plants supplied and installed by species.
        4) Submit representative color, dated photographs of each plant species.
    b. Riparian Seed Mix:
        1) Provide seed vendor's certification for required seed mixture, indicating percentage by weight and percentages of purity, rumination, and weed seed for each species,
        2) Seed shall be furnished in containers that show the following information: seed name, lot number, net weight, percentage of purity, germination, weed seed, and

insert material.

c. Fertilizer:
    1) Material certification/data sheet
    2) Fertilizer material safety data sheets
    3) Wire Mesh Fencing for Herbivore Exclusion:
    4) Manufacturer’s product data
    5) Manufacturer's Installation Instructions
d. Tackifier:
    1) Tackifier safety data sheets
e. Straw:
    1) Supplier’s product data
f. Monthly Maintenance Period punch list

1.06 QUALITY ASSURANCE

A. Materials to be provided under this Section are to be the product of nurseries regularly engaged in the cultivation of the specified species and have a minimum of 5 years’ experience.

B. Riparian Seed Mix:
    1. Riparian Seed Mix shall be furnished in containers that show the following information:
        a. Common and botanical names of seed
        b. Lot number
        c. Net weight
        d. Percentage of purity
        e. Percentage of germination
        f. Percentage of weed seed
        g. Percentage of inert material
    2. Seed that has become wet, moldy, or otherwise damaged will not be accepted.
    3. Riparian Seed Mix shall conform to the requirements of the Oregon State Seed Law [SPECIFIC SEED REQUIREMENTS TO BE INCLUDED IN PRE-FINAL 90% RD] and, when applicable, the Federal Seed Act, and it shall be “certified” grade or better.

C. Landscaping Company shall have demonstrated experience on three projects of similar native riparian planting and maintenance scope over the last 5 years.

D. Adhere to manufacturer’s instructions for product handling, assembly and installation, and maintenance.

E. Manufacturer’s original factory finish shall be intact for the installation to be considered satisfactory. On-site touch-up will not be accepted.

1.07 PRODUCT HANDLING

A. Delivery and Storage:
    1. Furnish standard products in manufacturer’s standard containers bearing original labels showing quantity, analysis, and name of manufacturer.
    2. Store products with protection from weather or other conditions that would damage or impair the effectiveness of the product.

B. Deliver fertilizer materials in original, unopened, and undamaged containers showing weight, analysis, and name of manufacturer. Store in such a manner as to prevent wetting and deterioration of the fertilizer.

1.08 WEED REMOVAL PLAN

A. For weed removal within Planting Area before plant installation see Section 31 11 00 (Clearing and Grubbing).

B. Weed Removal Plan Criteria: Weed control shall consist of maintaining the Planting Area for the duration of the Maintenance Period. Weed control shall consist of mechanical or manual methods to maintain the Planting Area free of weeds for the duration of the Maintenance Period. Invasive vegetation, non-native grass, and broadleaf weeds shall at no time exceed 6 inches in height or occupy more than 10% of the ground cover in the Planting Area. All invasive vegetation, non-native grass, and broadleaf weeds shall be removed before they set seed.

1. Use of pesticides is prohibited.
2. Herbicide:
    a. Use of herbicides to accomplish weed removal is prohibited. Treat weeds using guidance provided by the 4-County Cooperative Weed Management Area *Weed Treatment Calendar* (2020) or as accepted by the Project Representative.
    b. If herbicide application is accepted by the Project Representative, the Contractor shall submit a Herbicide Application Work Plan for review and acceptance prior to herbicide application.
3. Weeding Events:
    a. April through October: The Contractor shall conduct a minimum of seven Work Area-wide Weeding Events.
    b. October through April: The Contractor shall conduct a minimum of five Work Area-wide Weeding Events.
4. Species: Weed control shall consist of removal and control of non-native invasive species and other noxious weed species growing within the planted and seeded areas. Said species shall be immediately removed if they are found to be within the Planting Area.
5. Techniques: Weed control techniques shall consist of manual efforts, hand operated tools, and weed whacking. Mowers shall not be permitted.
6. Individual Planting Sites: Throughout the Maintenance Period, weed removal within the root zone of individual plants shall be conducted by hand pulling. At no time shall weed removal disrupt the root systems of the installed plants.
7. Cleanup: Dead weed material and material containing any non-native seed shall be removed from the Work Area and disposed of off site at an appropriate Disposal Facility(ies) during weeding efforts.

PART 2 MAINTENANCE

2.01 MAINTENANCE SUMMARY

A. Remove plants that are impaired, dead, or dying and replace with new plants during the 1-year Maintenance Period.

B. Replacement materials and methods shall be consistent with those prescribed in Paragraph 3.04.D of this Section.

PART 3 PRODUCTS

3.01 GENERAL

A. Purchased materials are to be the product of firms regularly engaged in the cultivation of the specified species or manufacture of a specified material.

B. For native plants, refer to the following documents:

1. Botanical identification and nomenclature of plant materials shall be based on descriptions in [TO BE DETERMINED AS PART OF PRE-FINAL 90% RD].

3.02 DELIVERY, STORAGE, AND HANDLING

A. Deliver fertilizer materials in original, unopened, and undamaged containers showing weight, analysis, and name of manufacturer. Store in such a manner as to prevent wetting and deterioration of the fertilizer.

B. Dig, pack, transport, and handle plants with care to ensure protection against injury. Inspection certificates required by law shall accompany each shipment invoice or order to stock. On arrival, the certificate shall be filed with the Project Representative. Protect all plants from desiccation. Antidesiccant shall be applied only with acceptance of the Project Representative. If plants cannot be planted immediately upon delivery, properly protect them with soil, wet peat moss, or in a manner acceptable to the Project Representative. Water heeled-in plantings daily. No plant shall be bound with rope or wire in a manner that could damage or break the branches.

C. Cover plants transported on open vehicles with a protective covering to prevent windburn.

D. Provide dry, loose soils for planting. Frozen or muddy soil is not acceptable.

E. Stock shall be handled by the root ball only, not the trunks, stems, or tops.

3.03 MATERIALS

A. Fertilizers:

1. Fertilizer shall conform to Oregon State Department of Agriculture laws and rules. Fertilizer for all tree plantings shall be [TO BE DETERMINED AS PART OF PRE-FINAL 90% RD].

2. Soil conditioner shall consist of [TO BE DETERMINED AS PART OF PRE-FINAL 90% RD] or Approved Equal consisting of the following:

SOIL CONDITIONER CONTENT	SOIL CONDITIONER RATIOS
Ectomycorrhizal Fungi	
Vesicular Arbuscular Mycorrhizal Fungi	
Rhizosphere Bacillus	
Potassium Polyacrylamide	
Formononetin	
Microbial Nutrients	
Inert Ingredients	

Notes:
cfu: colony-forming unit lb: pound

B. Plants:

1. Plants shall be grown in the states of Oregon or Washington north of the 44th parallel, in nurseries west of the Cascade Mountain Range Crest, and/or in nurseries in British Columbia, Canada, south of the 51st parallel and west of the Coast Mountain Range Crest.

2. Species, Quantity, and Sizes:

a. Provide the quantity and sizes of trees, shrubs, and groundcovers indicated on the Drawings per the plant schedule and details.

b. Provide quantities based on spacing where the on-center spacing indicated on the Drawings is one side of the triangle.

c. Provide plant quantities as required to obtain full coverage of the Planting Area.

d. Size, genus, species, variety/cultivar, and quantity shall be indicated and in compliance with recommendations and requirements of ANSI Z60.1

e. Plant substitutions will not be allowed without written acceptance of the Project Representative.

C. Tagging:

1. Legibly tag plants.
2. Tag by species or variety with a minimum of one tag per 10 trees or shrubs.
3. Remove tags once plants are installed.
4. Trees:
   a. Single leader, straight trunk (unless otherwise indicated in plant list)
   b. Symmetrical growth
5. Shrubs:
   a. Numerous and vigorous branches
   b. Symmetrical growth
6. Plants shall be in vigorous health and free of pests, disease, rot, blight, and/or other pathogenic fungi; disfiguring knots; sun scalds; abrasions of bark; broken tops; torn roots; or other objectionable features.
7. Plants cut back or pruned from large sizes to meet specified sizes will not be accepted.
8. Plants shall not have cuts over 1/4-inch in diameter that have not healed over.

D. Container-Grown Plants:

1. Roots well established in soil, but not root bound
2. Grown in container for at least one growing season

E. Riparian Seed Mix:

1. Riparian Seed Mix for restored areas shall be composed of the following species, by weight:

SPECIES	PURE LIVE SEED (PERCENT BY WEIGHT)
Lupinus polyphyllus (large-leaved lupine)	5
Aquilegia Formosa (red columbine)	10
Chamerion angustifolium (fireweed)	10
Achillea millefolium (common yarrow)	15
Festuca roemeri (Roemer's fescue)	20
Leymus mollis (American dune grass)	40

2. Riparian Seed Mix content shall also meet or exceed the following:
   a. Minimum pure live seed: 98%
   b. Minimum germination: 90%
   c. Maximum weed seed: 0.5%
3. Upon request, the Contractor shall furnish to the Project Representative duplicate copies of a statement signed by the vendor certifying that each lot of seed has been tested by a recognized seed-testing laboratory. Seed that has become wet, moldy, or otherwise damaged in transit or storage will not be accepted.

F. Tackifier:

1. Organic tackifier shall be derived from natural plant sources and shall have a Material Safety Data Sheet that demonstrates to the satisfaction of the Project Representative that the product is not harmful to plants, animals, or aquatic life.
2. It shall contain no growth or germination-inhibiting materials and shall not reduce infiltration rates.
3. It shall hydrate in water and readily blend with other slurry materials.

G. Straw:

1. Straw shall be in air-dried condition, free of noxious weeds, seeds, and other materials detrimental to plant life.
2. Hay is not acceptable.
3. All straw material shall be Certified Weed-Free Straw using North American Weed Management Association standards.

H. Wood Chip Mulch:

1. Wood Chip Mulch shall be coarse ground wood chips (approximately 1/2 inch by 4 inches) derived from the mechanical grinding or shredding of whole trees or portions of trees.
2. It may contain wood, wood fiber, roots, bark, branches, and leaves but may not contain visible amounts of soil.
3. It shall be free of weeds and weed seeds and may not contain manufactured inert material (plastic, concrete, ceramics, metal, rubber, etc.).
4. Wood Chip Mulch, when tested, shall meet the following loose volume gradation:

PART 2 U.S. STANDARD SIEVE SIZE	PART 3 PERCENT BY DRY WEIGHT, PASSING
2 inch	95 to 100
No. 4	0 to 20
No. 200	0 to 5

I. Tree Stakes: As shown on Drawings

J. Tree Ties: As shown on Drawings

3.04 PLANT LIST

A. See Construction Drawings for plant list.

3.05 WIRE MESH FENCING FOR HERBIVORE EXCLUSION

A. Wire mesh fencing fabric shall be a welded, 2-inch- by 2-inch-square mesh, 0.092-inch-diameter wire. Steel wire shall be plain carbon steel, hot-dip galvanized after fabrication.

B. Wire mesh fencing fabric shall be 4 feet high, standard roll length.

C. Fence Posts:

1. 6-foot total length "T" post, agricultural fence post with welded steel plate for belowground stability, designed for supporting 4-foot aboveground fencing
2. Plain carbon steel with factory applied back enamel finish paint

D. Fasteners:

1. 12-inch-long by 1/4-inch-wide self locking "zip ties" at spacing shown on the Drawings.
2. UV stabilized 6/6 minimum grade nylon with 50-lb minimum tensile strength

PART 4 EXECUTION

4.01 PLANTING OPERATIONS

A. Planting Schedule Constraints:

1. Planting shall occur from October 15 to November 30 and from February 15 to March 31.
2. Planting outside of specified dates will not be allowed without written acceptance of the Project Representative.

B. Planting Trees, Shrubs and Groundcovers:

1. Obtain Project Representative acceptance of plant material prior to planting.
2. Remove rejected plants from Work Areas immediately and replace with specified plant materials within the planting window.
3. Transport plant materials to their final location with care. Plant materials shall not be removed from the containers until immediately before they are planted. Root systems shall always be kept covered and damp.
4. Do not drag plants on the ground.
5. Do not carry plants by stems or trunks.
6. Install plantings only after the soil has been prepared.
7. Under no circumstances will planting be permitted during unsuitable soil or weather conditions as determined by the Project Representative. Unsuitable conditions include frozen soil, heavy rains, high water levels, wind velocity that exceeds 30 miles per hour, and ambient temperatures below 35°F and above 80°F.

C. General:

1. Tie down branches, if necessary, and protect bark with burlap bags to prevent damage from chafing by ropes and wires.
2. Properly place in a manner which provides complete protection for the roots and branches.

D. Pruning:

1. When delivered, no pruning shall be necessary for the newly installed trees and shrubs.
2. However, if pruning becomes necessary to improve plant health, prune as requested by the Project Representative.
3. Cut branches with sharp pruning instruments; do not break or chop.

E. Layout: Stake all plant material locations and lay out bedlines prior to beginning installation. The Project Representative may accept layout or make adjustments to plant material locations to meet field conditions.

F. Planting in Pits:

1. Rake back Wood Chip Mulch to expose an amount of soil surface two times the diameter of the planting pit.
2. Excavate the pit for trees and shrubs so that the vertical sides are twice the width of the root ball and the same depth of the root ball from each plant container.
3. Scarify the pit sides to allow for root expansion and tamp bottom to prevent plants from settling.
4. Set plant material in the pit to proper grade and alignment. Plants shall be upright and plumb, and the top of the surface of the soil in the containers shall be flush with the planting bed surface. Place specified Topsoil for use around the balls and roots of the plants.
5. Install fertilizer packets around plant root balls based on plant size and manufacturer recommendations.

6. Backfill the pit and tamp into place with foot. If more soil is needed to meet final grade in the pit, Topsoil may be added.
7. Replace and feather Wood Chip Mulch around each plant, and do not let mulch come in contact within 2 inches of the plant stem.
8. If mulch layer is less than 3 inches thick, supplement Wood Chip Mulch around each plant to achieve a 3-inch minimum thickness.
9. In their final position, plants shall have their top true root (not adventitious root) no more than 1 inch below the soil surface, no matter where that root was located in the original root ball or container.
10. Root ball shall be thoroughly watered two times on the same day that planting occurs regardless of season.
11. Stake trees and shrubs only if the plant cannot remain straight and upright without staking.

G. Seeding:

1. The Contractor shall sow seed by hand method at all areas indicated on the Drawings. When seeding by hand, the seed shall be incorporated into the top 1/4 inch of soil by hand raking or other method that is allowed by the Project Representative. Install tackifier per manufacturer's instructions and recommendations.
2. The seeding area shall be covered by a layer of straw mulch after sowing is completed. The seeding rate is 5 pounds pure live seed per 2,650 square feet.
3. Application of moisture retention agents, and/or provision for supplemental watering, may be required by the Project Representative should the Contractor schedule this portion of the Work outside the time frames outside Planting Schedule Constraints.
4. All areas that are completed to grade shall be prepared and seeded during the planting period and shall not be allowed to sit idle for long periods of time without receiving the erosion control specified in the Contract.
5. When environmental conditions are not conducive to acceptable results from seeding operations, the Project Representative may suspend the planting Work, and it shall be resumed only when the desired results are likely to be obtained.

H. Inspection:

1. Following the installation completion of at least one area in each planting zone, notify the Project Representative. The Project Representative will make an inspection of the planting Work within 2 working days of notification and will notify the Contractor in writing of any corrective action necessary.
2. Correct unsatisfactory conditions and request re-inspection.

I. Staking:

1. Stake trees and shrubs only if the plant cannot remain straight and upright without staking.
2. Set stakes securely.
3. Tree stakes shall be removed at the end of the Maintenance Period.

4.02 WIRE MESH FENCING FOR HERBIVORE EXCLUSION

A. Installation:

1. Install wire mesh fencing for herbivore exclusion, as shown in the Drawings.

B. Examination:

2. Verify installation conditions as satisfactory to receive Work of this Section. Do not install until unsatisfactory conditions are corrected. Beginning the Work constitutes acceptance of conditions as satisfactory.
3. Obtain Project Representative's acceptance of all fence alignments prior to commencing Work.

C. Cleanup:

1. Remove all metal, wood, and concrete debris; protective wrappings and coverings; and shipping materials from Wo Areas. Remove all residues and repair all stains, scuffs, abrasions, and marks from the finished product prior to requesting inspection. Fully restore all Work Areas that were impacted by the installation activities.

4.03 MAINTENANCE AND PLANT REPLACEMENT

A. General:

1. The Maintenance Period will commence upon completion of planting Work and acceptance by the Project Representative.
2. The Maintenance Period shall consist of providing adequate maintenance and proper care of all plant materials to ensure the resumption of growth of transplanted material and weed-free conditions.
3. Maintain planted trees and shrubs in a vigorous, thriving condition by watering, pruning, cultivating, controlling weeds, remulching, and repairing stakes. Maintenance shall also include treatment for fungus, diseases, rodents, insects, herbivory, and repair of vandalism.
4. Maintain plants against defects including distress, disease, and mortality.

B. During the Maintenance Period, the Planting Area as shown on the Drawings shall be maintained:

1. The Contractor shall implement the Weed Removal Plan and maintain the Planting Area free of weeds.
    a. Do not leave weed plant residues in landscaped areas.
    b. Dispose of weed plant residues in an approved landfill.
    c. Do not allow weeds to form seeds before removing them.
    d. Remove weeds in seeded areas no later than 2 weeks after they germinate.
    e. At no time shall weed plant areal leaf coverage exceed 10% of the total planted area.
2. Water plants regularly as described in this Section.
3. Maintain Wood Chip Mulch at a 3-inch depth.
4. Replace plants that do not meet the requirements for new plants as described in this Section.
5. Protect trees and shrubs from damage by erosion or trespassing.
6. Erect proper safeguards.

C. Regular Inspections:

1. Meet monthly with the Project Representative for the duration of the Maintenance Period with the purpose of joint inspection of the planting zones on a mutually agreed-upon schedule. Inspections shall be scheduled a minimum of 14 working days in advance.
2. Record punchlist of observed conditions that to do not conform to the requirements of this Section and submit to the Project Representative.
3. Correct unsatisfactory conditions within a 10-working-day period immediately following the inspection.
4. Notify the Project Representative after corrections are made.

D. Plant Replacement:

1. Any seeded areas that do not establish at least 85% cover or have bare spots greater than 5 square feet shall be reseeded.
2. Replace distressed, diseased, dying or dead plants including plants with greater than 25% dead stems; plants with insect infestation or disease; and plants observed during growing season with non-vigorous foliage including spotty, discolored, brown, or chlorotic leaves.
3. Replace plants that have been eaten or damaged by animals; such damage may include missing

branches, damage to bark, or girdling at base of plants.

4. Replace missing plants.
5. Replace plants of the wrong species, types, or sizes unless Contractor has received prior written acceptance from the Project Representative.
6. Replace plants that do not leaf out or do not appear to be in healthy condition at the start of the growing season.
7. The Project Representative has authority to designate plants requiring replacement.
8. Plants requiring replacement shall be flagged, tallied, and recorded by the plant zone shown on the Drawings. Submit a list of plant replacements to the Project Representative for review prior to ordering plants.
9. Replacement plants shall be of the same species, size, and quality as the plants replaced, unless otherwise indicated by the Project Representative.
10. 100% of plants shall be found healthy and vigorous at the end of the Maintenance Period.

4.04 MAINTENANCE TRANSFER MEETING AT THE END OF MAINTENANCE PERIOD

A. Maintenance Transfer Meeting:

1. Schedule meeting to be held at least 14 working days prior to the end of the Maintenance Period.
2. Schedule meeting with the Project Representative.
3. The Contractor shall be liable for damages or losses resulting from failure to schedule the maintenance transfer meeting.

B. Agenda:

1. Perform a Work Area walk-through to evaluate the condition of existing plantings.
2. Tag plants that are subject to replacement based on the conditions described above.

END OF SECTION

SECTION 33 05 25

OUTFALL ENERGY DISSIPATION STRUCTURES

PART 1 GENERAL

1.01 SUMMARY

A. This section is a placeholder. The need for this section will be determined after development of the Draft 50% RD plan set. This Work consists of construction of outfall outlet energy dissipation structures as indicated on the Drawings.

1.02 DESCRIPTION OF WORK

A. Outfall energy dissipation structures shall be installed in the locations identified on the Drawings.

1.03 REFERENCED STANDARDS

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the EPA Record of Decision (ROD) (EPA, 2017); therefore, compliance with Applicable or Relevant and Appropriate Requirements (ARARs) for the Swan Island Basin (SIB) Project Area within the Portland Harbor Superfund Site (PHSS) cleanup remedy is required. See Section 01 13 00 – Reference Material for additional information on the ROD. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 - Regulatory Requirements. In case of conflict between the requirements of this Section and those listed in Section 01 41 00 - Regulatory Requirements, the more stringent requirement shall prevail. If the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

B. Reference Standards listed below form part of this specification. Reference Standard editions shall be the latest edition issued for industry use at the time of construction.

REFERENCE	TITLE
ASTM A641	Standard Specification for Zinc–Coated (Galvanized) Carbon Steel Wire
ASTM A853	Standard Specification for Steel Wire, Carbon, for General Use
ASTM A974	Standard Specification for Welded Wire Fabric Gabions and Gabion Mattresses (Metallic-Coated or Polyvinyl Chloride (PVC) Coated)
ASTM A975	Standard Specification for Double-Twisted Hexagonal Mesh Gabions and Revet Mattresses (Metallic- Coated Steel Wire or Metallic-Coated Steel Wire with Poly (Vinyl Chloride) (PVC) Coating)
ASTM D4491	Standard Test Method for Water Permeability of Geotextiles by Permittivity
ASTM D4533	Standard Test Method for Trapezoid Tearing Strength of Geotextiles
ASTM D4632	Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
ASTM D4751	Standard Test Method for Determining Apparent Opening Size of a Geotextile
ASTM D6241	Standard Test Method for Measuring Static Puncture Strength of Geotextiles and Geosynthetic- Related Products Using a 50 mm Probe
ASTM D6711	Standard Practice for Specifying Rock to Fill Gabions, Revet Mattresses, and Gabion Mattresses

Note:
ASTM: ASTM International

1.04 DEFINITIONS

A. Refer to Section 01 11 00 (Summary of Work) for definitions related to the Contract Documents.

B. Gabion: Gabion is a rectangular or double-twisted wire mesh container of variable sizes, uniformly partitioned into internal cells by diaphragms positioned approximately 3 feet on centers, interconnected with other similar units, and filled with stone at the Work Area to form a flexible and permeable structure. It is intended for high-strength installations in both horizontal and vertical structures.

C. Gabion Mattress: A Gabion Mattress is a rectangular or double-twisted mesh container uniformly partitioned into internal cells by diaphragms positioned approximately 3 feet on centers, with relatively small height in relation to other dimensions, having smaller openings than the mesh used for Gabions; interconnected with other similar units, and filled with stone at the Work Area to form a flexible permeable structure. It is intended for lower-strength horizontal or nearly horizontal structures.

1.05 SUBMITTALS

A. Refer to Section 01 33 00 (Submittals) for all submittals and associated timelines related to the Contract Documents.

B. Pre-Construction Submittals:
   1. As part of the Remedial Action Work Plan, the Contractor shall provide the installation plan for outfall outlet energy dissipation structures.

C. Construction Submittals:
   1. Energy dissipation structure shop drawings:
      a. Show shop drawings, elevations and fabrication details.
      b. Include material test reports and certifications for materials and similar items.
   2. As-Built Drawings showing the location and extent of the installed outfall outlet energy dissipation structures
   3. Summary of daily outfall outlet energy dissipation structure installation activities, including location(s) installed, as part of the Daily Construction Report.
   4. Summary of the week's outfall outlet energy dissipation structure installation activities and anticipated structures to be installed in the following week as part of the Weekly Construction Report.

D. Post-Construction Submittal:
   1. The Contractor shall submit the Contractor's Annual Construction Summary Report for the Work completed in each Construction Work Period related to this Section, as described in Section 01 78 39 (Project Record Documents). The Contractor's Annual Construction Summary Report shall include the summary of the Work completed under this Section, any As-Built Drawings, and any relevant record information.

PART 2 PRODUCTS

2.01 MATERIALS

A. Gabions and Gabion Mattresses:
   1. Baskets for Gabions and Gabion Mattresses shall be rectangular, variable in size, and manufactured from the following:
      a. Welded wire fabric meeting the requirements of ASTM International (ASTM) A974, Style 2, fabricated using uncoated steel wire conforming to ASTM A853, with the fabric subsequently zinc-coated by the hot dip process, and overcoated with polyvinyl chloride (PVC)
      b. Double-twisted hexagonal wire mesh meeting the requirements of ASTM A975, Style 1 or Style 3, fabricated using soft-temper galvanized steel wire, Class 3 coating, in accordance with ASTM A641, and overcoated with High Abrasion Resistant polymer
   2. For Gabions, the mesh opening shall not exceed 4-1/2 inches, and its area shall not exceed

10 square inches.

3. For Gabion Mattresses, the maximum linear dimension of mesh opening shall not exceed 3-1/4 inches.
4. At the Contractor's option, for lid fastening at edges and diaphragms, either the "Lacing Wire" or the " Steel Ring Fastener System" may be used.
5. Wire for Gabions, Gabion Mattresses, and lacing shall have a minimum tensile strength of 60,000 pounds per square inch.
6. Edge, selvage wire, and ring shall be made from the same material used for the wire mesh.

B. Bedding Material, when specified.

C. Geotextile Filter Fabric:

1. The geotextile filter fabric shall meet the minimum physical requirements listed in table below:

PHYSICAL PROPERTY	TEST PROCEDURE	MINIMUM VALUE
Grab Tensile Strength	ASTM D4632	200 lbs minimum (in machine and x-machine direction)
Grab Failure Stain	ASTM D4632	50% min (in machine and x-machine direction)
Tear Strength	ASTM D4533	80 lbs minimum
Puncture Strength	ASTM D6241	430 lbs minimum
Apparent Opening Size, U.S. Standard Sieve	ASTM D4751	80 max
Permittivity	ASTM D4491	1.0 sec^{-1}

Notes:
%: percent
lb: pound
max: maximum
sec: second
ASTM: ASTM International

2. The geotextile fiber shall consist of a long-chain synthetic polymer composed of at least 85% by weight of propylene, ethylene, ester, or amide. The edges of the geotextiles shall be finished to prevent the outer fiber from pulling away from the geotextiles.
3. During all periods of shipment and storage, the filter fabric shall be protected from direct sunlight, ultraviolet rays, and temperatures greater than 140°F. The fabric shall be maintained wrapped in its protective covering. The geotextile shall not be exposed to sunlight ultraviolet rays until the installation process begins.

D. Stone Fill:

1. Rocks shall be hard, angular to round, durable, and of such quality that they shall not disintegrate on exposure to water or weathering during the life of the structure. Fill shall conform to the requirements of ASTM D6711.
2. Gradation:
   a. Gabion basket, 4 to 8 inches
   b. Gabion Mattress basket, 3 to 5 inches
   c. The range in sizes shall allow for a variation of 5% oversize and/or 5% undersize rock by weight. In all cases, the sizes of any oversize rock shall allow for the placement of three or more layers of rock within each compartment. In all cases, undersize rock shall be placed within the interior of the compartment and shall not be placed on the exposed surface of the structure.
3. Source:
   a. The Contractor shall propose a source for Gabion stone fill material.

PART 3 EXECUTION

3.01 GABIONS AND GABION MATTRESSES INSTALLATION

A. The area shall be smoothed by relocating surface projections (debris, riprap, etc.), as necessary for proper placement of the Gabions or Gabion Mattresses, as indicated on the Drawings or as directed by the Project Representative. Surface preparation or placement of selected or special bedding material in preparing the surface shall be as indicated on the Drawings or as directed by the Project Representative. Where sediment cap is used, sediment cap shall be placed and smoothed as the Gabion bedding material as depicted on the Drawings.

B. When designated on the Drawings or directed by the Project Representative, geotextile fabric shall be placed under and behind the baskets. The fabric shall be placed in strips transverse to the outfall flow line lapped at least 12 inches with the strip to the outside of the structure.

C. The baskets shall be assembled at the Work Area into rectangular baskets of the specified sizes. They shall be of single-unit construction; the base, lid, and sides shall be woven into a single unit; and the ends shall be connected to the base section, in a manner so that strength and flexibility at the point of connection is at least equal to that of the mesh.

D. Prior to installation of Gabions or Gabion Mattresses, the prepared surface shall be inspected and accepted by the Project Representative, and no material shall be placed thereon until that area has been accepted. The baskets shall be carefully placed into their proper positions for slope and alignment as shown on the Drawings or as directed by the Project Representative. When the slope is not shown, the faces of Gabions shall be sloped 1 (horizontal) to 6 (vertical).

E. Adjacent baskets shall be connected in a manner so that the connection is strong enough that a failure will occur in the mesh, rather than the lacing. Adjoining Gabions and Gabion Mattresses are to be connected at vertical corner edges and diaphragms. Stacked Gabions are also to be connected at the horizontal edges, front and back. All connections shall be laced with loops at approximate 4-inch intervals and as recommended by the manufacturer. Gabions 3 feet high placed in a line shall be tensioned during filling to achieve proper alignment.

F. Each basket shall be carefully filled with the stone fill specified. Machine placement will be permitted. However, considerable handwork is necessary and will be required to assure orientation for maximum density without bulges, a compact and dense exposed face, and maximum aggregate contact with the lid and other baskets placed or to be placed in the structure.

G. Gabions 3 feet high shall be filled in three lifts, 1 foot at a time, orienting the stones within each lift as necessary.

H. When a 3-foot-high cell is to be exposed in the finished structure, two connecting wires shall be securely installed between each lift, connecting each cell face to be exposed with the opposite face or diaphragm. The wires shall be located with equal horizontal spacing. The wires shall be installed by looping each end around two mesh openings, then wrapping the wire tightly around itself with at least four full wraps. The end of the wire shall be locked in place by lacing it under the previous lap. For each 3-foot-high cell with one face to be exposed, four connecting wires are required. For the same cell as an end unit, there are two exposed faces, and eight connecting wires are required.

I. Connecting wires are not required for Gabion Mattresses.

J. The lids shall be fastened in place at edges and diaphragms as specified above.

K. If steel ring fasteners are used, spacing shall not exceed nominal 5 inches (±1.0 inch).

L. Special features or details may also be required. These shall be constructed as indicated on the Drawings or as directed by the Project Representative.

M. The use of concrete grout is not permitted.

N. When the structure is completed, the earthwork shall be finished as indicated on the Drawings or as directed by the Project Representative.

3.02 PROTECTION OF EXISTING UTILITIES

A. The Contractor shall be responsible for the protection and proper maintenance of all existing active utilities and structures and landscapes from any kind of damage during construction. Any damage shall be repaired at the Contractor's expense.

3.03 FABRICATION

A. Baskets shall be fabricated into panels in such a manner that the base, sides, and ends can be assembled into a single rectangular unit of the specified size. All perimeter edges of the baskets shall be salvaged with the specified wire so that the salvaged connections have the same strengths as the body of the mesh.

B. Furnished baskets in bundles of flat panels of appropriate sizes for on-site assembly.

C. The Gabion units shall be furnished with the necessary diaphragms secured in proper position on the base, in a manner so that no additional tying at this juncture will be necessary.

D. The Gabion Mattress units shall be subdivided into compartments by the insertion of diaphragms made of the same mesh as the rest of the Gabion Mattress. The diaphragms shall be factory-secured in proper position at the base with a continuous spiral wire, in such a manner that no additional tying at this junction will be necessary.

3.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver Gabions and Gabion Mattresses to Work Area labeled in bundles. Labels to show number and dimensions of material included.

B. Store and handle materials in a manner that prevents damage. Damaged materials will be rejected and shall be replaced by the Contractor at its own expense.

END OF SECTION

SECTION 35 24 20

REMEDIAL DREDGING, BARGE DEWATERING, AND IN-WATER TRANSPORTATION

PART 1 GENERAL

1.01 SUMMARY

A. This Section establishes requirements for:

1. Pre-dredge baseline Hydrographic Survey.
2. Remedial dredging operations, including:
    a. Mechanical excavation and environmental dredging
    b. Removal of Dredged Material, Incidental Debris, and Identified Debris
    c. Potential Contingency Re-Dredging for Generated Residuals or Missed Inventory
3. Material handling, including:
    d. Barge dewatering procedures
    e. Dredge return water treatment when required
    f. In-water transportation of materials to Contractor or other Transload Facility
4. Post-dredge verification, including:
    a. Sediment sampling and testing
    b. Assessment of Contingency Re-Dredging requirements

1.02 DESCRIPTION OF WORK

A. This Project involves environmental dredging and excavation of contaminated sediment (Dredged Material) and upland soils within the Swan Island Basin (SIB) Project Area of the Portland Harbor Superfund Site (PHSS). The Contractor shall conduct all Work with level of care suitable for environmental remediation.

B. The SIB Project Area is the active cleanup area within the PHSS that lies between approximately river mile (RM) 8.1 and RM 9.2 on the northeast side of the Willamette River.

C. Material to be dredged within the SIB Project Area:

1. May be located adjacent to and beneath shoreline structures and on sloped shorelines.
2. Is contaminated with various chemicals of concern as listed in the PHSS Record of Decision Tables 17 and 21 Cleanup Criteria and Threshold Values.
3. May contain debris in specified locations shown on the Drawings and in other areas within SIB.

D. The Contractor shall minimize resuspension and redistribution of contaminated sediment to the greatest extent practicable and comply with all environmental protection requirements specified herein.

E. Work under this Section includes furnishing all labor, materials, tools, equipment and incidentals required for remedial dredging, barge dewatering, and in-water transportation of Dredged Material and debris to the Transload Facility, as described in the Drawings and these Specifications.

F. Remedial dredging activities shall comply with:

1. General Project and specific dredging sequencing requirements in Section 01 14 00 (Work Restrictions)
2. Access requirements in Section 01 41 26 (Permits, Easements, and Right-Of-Entry Agreements)
3. Temporary facility requirements in Section 01 52 00 (Construction Facilities)

4. The Drawings

5. The approach described in the Contractor's Remedial Action Work Plan (RAWP)

G. The Contractor is responsible for:

1. Selecting appropriate means, methods, and equipment including:

a. Number and types of dredging/excavation equipment.

2. Determining if specialized equipment or techniques are needed for nearshore areas or for work near and beneath structures.

3. Installing all slope stability structural elements identified in the Drawings prior to dredging adjacent to slopes and structures.

4. Protecting existing structures from damage or destabilization during and after excavation and dredging.

5. Preventing grounding of in-water equipment within SIB .

6. Completing all dredging/excavation Work according to:

a. Requirements in Part 3 (Execution) of this Section

b. Work sequencing and milestones in Section 01 14 00 (Work Restrictions)

H. By submitting its Bid, the Contractor acknowledges careful consideration of:

1. SIB Project Area conditions

2. Character of materials

3. Facilities usage

4. Existing structures adjacent to Dredge Plan Areas

5. Other Project considerations

I. The Drawings include [# to be included at Pre-Final 90% RD] separate Dredging Plan Areas with [# to be included at Pre-Final 90% RD] different dredge elevations. EPA's PHSS Remedial Design Guidelines and Considerations require each Dredging Area be divided into Dredge Certification Units (DCUs) for control and review of the dredging progress.

J. Table below provides estimated values for each elevation based dredging area shown on the Dredging Plan Drawings. The Contractor shall identify DCUs in its RAWP for EPA approval. Each DCU can be a maximum of 1 acre in size.

This table is for Contractor convenience only. The Contractor shall determine actual volumes needed to achieve Required Dredge Elevations, Required Dredge Thicknesses, and Required Excavation Line as shown in the Drawings, considering details in these Specifications.

SURFACE AREA ASSOCIATED WITH REQUIRED DREDGING (SQ. FT.)	DREDGE PAY VOLUME (CY)	POTENTIAL CONTINGENCY RE-DREDGE PAY VOLUME (CY)
TBD		--
		--
		--
		--
		--

Notes:
CY: cubic yard
TBD: to be determined in Pre-Final 90% RD
SQ FT.: square feet

1.03 REFERENCED STANDARDS

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the EPA ROD (EPA, 2017) ; therefore, compliance with Applicable or Relevant and Appropriate Requirements (ARARs) for the SIB Project Area within the PHSS cleanup remedy is required. See Section 01 13 00 – Reference Material for additional information on the ROD. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 - Regulatory Requirements. In case of conflict between the requirements of this Section and those listed in Section 01 41 00 - Regulatory Requirements, the more stringent requirement shall prevail. If the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

1.04 DEFINITIONS

A. Refer to Section 01 11 00 (Summary of Work) for definitions related to the Contract Documents and for items not covered in this Section.

B. Contingency Re-Dredge Decision Duration: Period between Project Representative's acceptance of Required Dredging Post-Construction Survey and direction regarding Contingency Re-Dredging activities.

C. Contingency Re-Dredging: Additional dredging specified by Project Representative after:

1. Required Dredging completion

2. Post-dredge construction sediment sampling/testing result.

D. Debris: Debris consists of the following types of materials at the SIB Project Area:

1. Identified Debris: Debris targets shown on the Drawings. Identified debris in the SIB Project Area includes logs, piles, platforms, tires, and boats. This debris is to be targeted for removal by the Contractor pre-dredging to maximize dredging efficiency.

2.

3. Incidental Debris: Solid waste materials other than sediment or soil excavated during dredging operations.

E. Dredging Areas: Specified area shown on Drawings with assigned Required Dredge Elevation(s) or Thickness(es), including Side Slopes for Required Dredging completion.

F. Dredged Material: Contaminated sediment to be removed from the areas shown in Drawings including Contingency Re-Dredging.

G. Dredge Prism: Area defined by horizontal and vertical dredging limits shown on Drawings,

H. Excessive Dredging: Material dredged outside Dredge Prism limits and/or below Maximum Overdredge Allowance or Required Excavation Line.

I. Generated Residuals: Contaminated post-dredging sediments that are dislodged by dredging activities and redeposited at the bottom of the water body.

J. Required Dredge Elevation: Elevation to be achieved by dredging/excavation within specific dredging areas as shown on Drawings.

K. Required Dredge Thickness: Surface developed assuming minimum cut thicknesses shown on Drawings, compared to design bathymetric survey.

L. Required Dredging: Initial dredging/excavation within horizontal extents and to Required Dredge Elevations or Thicknesses shown on Drawings. Includes Contingency Re-Dredging as directed by Project Representative.

M. Side Slope: Exterior slope to be excavated between toe of dredge cut at Required Dredge Elevation, Required Dredge Thickness, or Required Excavation Line and intersect point at original ground level (top of slope), as shown on Drawings.

1.05 SUBMITTALS

A. Refer to Section 01 33 00 (Submittals Procedures).

B. Pre-Construction Submittals:

1. Pre-construction Hydrographic Survey

2. Dredging and Excavation Plan, as part of the RAWP, that includes the following information:

a. Project Approach and Methods

1) Overall strategy for Required Dredging and Contingency Re-Dredging

2) Sequence of Dredging (Dredging shall proceed from higher elevation areas to lower elevation areas to prevent recontamination of dredged areas)

3) Methods for removal and handling of Dredged Material, Debris, and Piling

4) Barge dewatering procedures

5) In-water transportation to Transload Facility

6) Specific approaches to prevent cross-contamination of clean areas

7) Procedures for slope dredging and excavation

8) Plans for both land-based excavation and water-based dredging

9) Methods for anchoring floating equipment

b. Equipment Details

1) Number, types, and capacities of all equipment

2) Specifications for dredges, tugboats, workboats, barges, and vessels

3) Details of land-based equipment

4) Size and type of dredge buckets

c. Material Handling and Processing

1) Barge dewatering methods (passive or amendment-based)

2) Dredge return water treatment procedures if applicable

3) Procedures for collecting and disposing of extracted water

4) If using amendments:

i) Manufacturer information

ii) Safety data sheets

iii) Application procedures

d. Transportation and Debris Management

1) Methods for in-water transportation

2) Procedures for material rehandling

3) Transportation route to Transload Facility

4) Protocols to prevent material/water release during transport

5) Procedures for managing Debris

6) Methods for maintaining debris segregation

e. Protection Measures

1) Methods to protect existing structures and facilities

2) Procedures for safeguarding utilities, outfalls, piles

3) Protection of wharves, bulkheads, and boat ramps

f. Work Planning

1) Detailed sequencing of all dredging activities

2) Integration with other major project elements

3) Operating hours and activity durations

C. Construction Documentation Requirements:

1. Daily Construction Report including:

a. Dredge Name-Size CY

b. Barges Used -Size and Number

c. Areas and CY dredged

d. Periods of Work

e. Barge dewatering (Volumes Treated , Discharged, Amended)

f. Dewatering Amendments (Masses Used)

g. Dredged Material Transported (TON, CY Unloaded)

h. Tons Transported to Transload Facility

i. Progress Survey results

j. Electronic dredging records

2. Weekly Construction Report summarizing:

a. Week's dredging activities

b. Latest progress and post-construction surveys

c. Calculated quantities

d. Planned work for following week

3. Survey, Inspection, Sampling, and Monitoring Report

a. Latest Progress and Post-Construction Surveys

b. Latest inspections conducted

c. Latest sampling conducted

d. Latest monitoring conducted

4. Annual Construction Summary Report:

a. Summary of completed work under this Section

b. Relevant record information

1.06 WORK PERIOD

A. As described in Section 01 14 00 (Work Restrictions), the Work included in this Section (with the exception of the pre-construction and post-construction submittals) occurring below the ordinary high water elevation shall be completed by the Contractor only during the In-Water Work Period. In SIB, the In-Water Work Period extends from July 1 to October 31, and from December 1 to January 3 (although in December-January, Work is restricted to areas above -20 ft National Geodetic Vertical Datum of 1929).

1.07 SITE CONDITIONS

A. Site Conditions Review

1. The Contractor shall review all SIB Project Area conditions to inform their Work, including:

    a. Water depths and tidal elevations

    b. Commercial and recreational vessel activity

    c. Presence and elevations of structures relative to the Dredge Prism

    d. All information provided in Section 01 13 00 (Reference Material) and other Contract Documents

2. This review shall inform:

    a. Selection of appropriate dredging equipment

    b. Design of barge dewatering methods

    c. Selection of in-water transportation equipment

    d. Development of Draft Project Schedule

B. Material Characteristics

1. Material Documentation

    a. References describing Dredged Material are provided in Section 01 13 00 (Reference Material)

    b. The Contractor shall verify material conditions prior to bidding

    c. Minor variations from documented conditions will not constitute basis for claims

2. Material Types and Management

    a. Dredged Material, Incidental debris, and Identified Debris are expected to be nonhazardous waste

    b. Contractor shall perform final waste determination per Section 02 42 00

    c. Material along shorelines and banks may be light, loose material with low bearing capacity

    d. Contractor shall determine appropriate equipment for all material conditions

3. Debris Management

    a. Identified Debris

    b. Incidental Debris

C. Navigation Requirements

1. Follow requirements in Section 35 10 00 for all dredging, dewatering, and transportation activities

D. Protection Requirements

1. Existing Structures and Facilities

    a. Repair any damage per Section 01 19 50

    b. Coordinate with utility providers for work within 30 feet of active utilities

    c. Complete Pre-Construction Structural Condition Inspection per Section 31 09 00

2. Utility Management

    a. Abandoned Utilities

b. Unanticipated Utilities

E. Adjacent Property Considerations

1. Tenants and property owners will continue operations in adjacent areas

2. Comply with site access and timing requirements per Section 01 41 26

1.08 MISPLACED MATERIALS

A. Manage and remediate any misplaced materials according to requirements specified in Section 01 35 43 (Environmental Procedures).

1.09 ENVIRONMENTAL PROTECTION

A. Perform all Work in compliance with:

1. Environmental protection requirements in Section 01 35 43 (Environmental Procedures)

2. Accepted Environmental Records Binder (ERB)

3. All ARARs for the PHSS cleanup remedy, as specified in Section 01 41 00 (Environmental Regulatory Requirements)

1.10 QUALITY ASSURANCE/QUALITY CONTROL

A. The Contractor shall:

1. Implement quality control measures in accordance with Section 01 45 00 (Quality Control)

2. Follow the Construction Quality Assurance/Quality Control Plan

3. Maintain responsibility for quality control throughout project completion

B. The Project Representative:

1. May conduct quality assurance inspections at any time for:

a. Dredging operations

b. Barge dewatering

c. Dredge return water treatment (if applicable)

d. In-water transportation work

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL SEQUENCING

A. Prior to beginning Work described in this Section, the following prerequisites must be completed:

1. Project Representative's review and acceptance of the Excavation and Dredging Plan.

2. Work Period Pre-Construction Survey, completed by Contractor and accepted by Project Representative per Section 02 21 00 (Site Surveys and Positioning Control)

3. Pre-Construction Structural Condition Inspection of existing structures and facilities within the SIB Project Area, per Article 3.06 of Section 31 09 00 (Geotechnical Instrumentation and Condition Inspections)

B. Refer to Section 01 14 00 (Work Restrictions) for:

1. Construction sequencing requirements for dredging activities

2. General Project sequencing requirements for all Work activities

C. The Contractor shall perform required dredging to remove material within the SIB Project Area to:

a. Required Dredge Elevations

b. Required Dredge Thickness surfaces as shown on the Drawings

c. Contingency Re-Dredging as directed by Project Representative

D. The Dredging Area completion and acceptance process shall be performed according to Article 3.02 of this Section.

3.02 PROCESS FOR DREDGING AREA COMPLETION AND ACCEPTANCE

A. Specific DCUs for Work acceptance within the Project Area have not yet been defined. Establishment of specific DCUs for acceptance of dredging/contingency re-dredging, as well as Engineered Cap placement, shall be the responsibility of the Contractor and described in the Excavation and Dredging Plan in the RAWP.

B. The Contractor shall conduct Required Dredging Progress Surveys and maintain associated field data (e.g., bucket maps) to verify achievement of:

1. Required Dredge Elevations

2. Required Dredge Thicknesses

3. Side Slopes

C. Upon completing Required Dredging within a DCU, the Contractor shall:

1. Notify Project Representative 2 working days before completing Required Dredging Post-Construction Survey

2. Conduct Required Dredging Post-Construction Survey within 1 working day of completion

3. Submit survey to Project Representative within 1 working day of conducting survey

4. Allow 2 working days for Project Representative review

D. The Project Representative shall either:

1. Accept the Work as complete for Required Dredging in that DCU, or

2. Identify high spots requiring removal

3. If high spots are identified, the Contractor shall:

a. Remove high spots at no additional expense to the RA Performing Parties

b. Notify Project Representative 2 working days before new Required Dredging Post-Construction Survey

c. Conduct new survey within 1 working day of completion

d. Submit new survey within 1 working day of conducting survey

e. Allow 2 working days for Project Representative review

f. Repeat process until Project Representative accepts Work as complete

E. Following Project Representative's acceptance of Required Dredging Post-Construction Survey(s):

1. The Project Representative will conduct post-dredge construction sediment sampling/testing within the DCU

2. The Contractor shall plan for Contingency Re-Dredge Decision Duration of up to 15 working days

3. No Work shall occur within the DCU during this period

F. During the Contingency Re-Dredge Decision Duration, the Contractor shall:

1. Complete all required Work continuously
2. Relocate equipment to other DCUs as allowed by construction sequencing requirements
3. Follow decontamination requirements if removing equipment from SIB Project Area
4. Relocate dredging equipment to provide access for Project Representative sampling
5. Maintain dredging equipment within SIB Project Area
6. Account for possible extension beyond 15 working days in Project Schedule

G. Based on sampling results, the Project Representative will direct one or more of the following:

1. Complete Contingency Re-Dredging to remove Generated Residuals
2. Complete Contingency Re-Dredging to remove Missed Inventory
3. Proceed to material placement with no additional dredging

H. For Contingency Re-Dredging completion, the Contractor shall:

1. Notify Project Representative 2 working days before Post-Construction Survey
2. Conduct Contingency Re-Dredging Post-Construction Survey within 1 working day
3. Submit survey within 1 working day of completion
4. Allow 2 working days for Project Representative review
5. Complete additional Work if required at no additional expense

I. Upon acceptance of Contingency Re-Dredging:

1. The Project Representative will collect post-contingency re-dredging construction sediment samples
2. Contractor shall plan for 2 working days of sampling
3. Contractor shall provide access for sample collection
4. No additional Contingency Re-Dredging will be required based on these samples

3.03 SURVEYS

A. All survey and positioning control requirements for dredging operations shall comply with Section 02 21 00 - Site Surveys and Positioning Control.

3.04 CONDUCT OF WORK

A. Equipment Positioning and Layout:

1. Follow equipment positioning and methods requirements in Section 02 21 00 (Site Surveys and Positioning Control).

B. Environmental Protection Requirements:

1. Follow environmental regulatory requirements per Section 01 41 00 and ERB
2. Implement required Best Management Practices (BMPs):
    a. Select appropriate dredge bucket for site-specific conditions
    b. Remove Identified Debris before performing Required Dredging in areas with Identified Debris
    c. Prohibit multiple bucket bites before surfacing
    d. Prohibit “sweeping” or leveling of waterway bed
    e. Prohibit interim underwater stockpiling

f. Prevent bucket overfilling through reduced cut thickness or descent rate

g. Maintain stable Side Slopes using shallow top-to-bottom cuts

3. Implement additional BMPs when directed:

a. Slow bucket descent/ascent through water column

b. Hold opened bucket above barge for residual drainage

c. Clean bucket between cycles by opening/closing above barge

C. Required Dredging Operations:

1. Use mechanical dredging methods with environmental (closed) bucket and Real Time GPS positioning as primary removal tool whenever practicable. Other dredging methods may be proposed by the Contractor in the RAWP. Other bucket types (e.g., clamshell) may be used with Project Representative acceptance when needed to:

a. Achieve Required Dredge Elevations and Thicknesses

b. Meet environmental protection criteria including water quality criteria (see 01 35 00 Regulatory Protection Requirements)

c. Address specific SIB Project Area conditions including shorelines and riverbanks

2. Remove Identified Debris, Dredged Material, and Incidental Debris to Required Dredge extents, elevations and thicknesses within Dredge Prism boundaries shown on Drawings:

a. Remove sediment to specified elevations throughout entire Dredge Prism

b. Do not directly remove material outside Dredge Prism

c. Conduct slope dredging from top to bottom

d. Prevent adverse impacts to slope stability and nearby structures

e. Do not undercut Side Slopes or toe of dredge cuts resulting in Excessive Dredging

f. Achieve specified elevations for Work acceptance by Project Representative

g. Achieve thickness necessary by comparing thickness surface to Work Period Pre-Construction Survey

h. Meet thickness requirements shown on Drawings for Work acceptance

i. Remove sediment to specified thickness throughout entire Dredge Prism

3. Follow dredge offset setback requirements near existing structures:

a. Verify field dimensions, elevations, horizontal and vertical clearances, and under structure access

b. Exercise caution when operating equipment near structures

c. Prevent equipment from entering restricted offset zones or contacting structures

d. Repair any damage caused by failure to follow requirements at no additional expense to RA Performing Parties

e. Review structural as-builts and conditions documentation per Section 01 13 00

f. Account for tidal fluctuations and limited access when working under structures

g. Protect and immediately report any damage to existing structures

h. Be solely responsible for corrective actions to repair damage

D. Excavation of Soil or Sediment Using Land Based Equipment

1. Comply with access agreements per Section 01 41 26

2. Obtain Project Representative acceptance and necessary agreements
3. Place material directly into floating transport barge when feasible

E. Debris Removal Requirements:
1. Conduct Identified Debris removal during daylight hours to ensure:
a. Proper identification and cataloging
b. Proper sizing to meet landfill requirements (e.g., less than 8 feet in length)
c. Contractor quality control and inspection
d. Project Representative observation
e. Night work allowed only with Project Representative acceptance if needed for tidal conditions
2. Remove additional Identified Debris as directed by Project Representative:
3. Remove all Incidental debris within cleanup areas shown on Drawings:
a. Use appropriate equipment
b. Keep separate from Identified Debris
c. Consider incidental to dredging work
4. For structure-contact debris removal [to be detailed at Pre-Final 90% RD]:
a. Coordinate with Project Representative for structure owner observation
b. Be prepared to immediately suspend work if latent detrimental conditions found
c. Coordinate with Project Representative for contingency measures if directed

F. During the Contingency Re-Dredge Decision Duration:
a. No work shall be performed in the DCU during this period

G. Contingency Re-Dredging:
1. Following Required Dredging completion and post-dredge sampling, conduct re-dredging as directed for:
a. Generated Residuals removal
b. Missed Inventory removal
c. Areas outside dredging areas for Generated Residuals as directed
2. Re-occupy specified locations and dredge to specified limits
3. Conduct Progress Surveys to document Contingency Re-Dredging progress

H. Barge Dewatering Requirements:
1. Submit detailed dewatering plan as part of Dredging and Excavation Plan
2. Conduct dewatering within or near dredging areas unless otherwise approved
3. Filter return water to meet quality criteria and applicable standards
4. Use accepted methods:
a. Passive dewatering meeting water quality criteria
b. Filter media with activated carbon component for dissolved contaminants
c. Amendment addition in sealed barges if elected, with:
1) No water discharge during amendment use

2) Contractor responsibility for proper storage, handling, usage, containment

3) Contractor responsibility for cleanup and damage costs

4) Verification of disposal facility acceptance

5. Maintain proper containment:

a. Use watertight barges with sealed scuppers and sideboards

b. Prevent overtopping

c. Prevent material loss

d. Change filter media regularly

e. Demonstrate operational filtering system before material placement

I. In-Water Transportation:

1. Transport materials following approved RAWP methods

2. Use certified watertight barges with:

a. Fixed permanent containment walls on all sides

b. Proper freeboard as determined by certified marine surveyor

c. No discharge during transport

d. Water collection and storage as needed

3. Implement required safety measures:

a. Inspect loads before transport for adhered sediment

b. Follow proper barge management including even filling

c. Account for current and forecasted weather conditions

d. Comply with all local, state, and federal regulations

e. Document transported water volumes in Daily Construction Report

3.05 WATER QUALITY CRITERIA

A. The Contractor shall comply with all water quality performance standards (See 01 41 00 Regulatory Requirements)

B. The Contractor shall prepare and submit detailed procedures and methods to prevent water quality criteria exceedances (See 01 35 43 Environmental Protection Procedures).

C. Conduct water quality monitoring for quality assurance per the Water Quality Monitoring Plan (WQMP)

1. Review monitoring results regularly during construction

2. Notify Contractor when corrective actions are needed

3. Specific contingency corrective measures to be implemented if:

a. Water quality exceedances occur

b. Visible plumes develop during dredging

c. Visible plumes develop during barge dewatering

END OF SECTION

SECTION 35 24 20.01

TRANSLOADING, UPLAND TRANSPORTATION, AND DISPOSAL

PART 1 GENERAL

1.01 SUMMARY

A. This Section establishes requirements for:

1. Transloading operations including:

   a. Offloading of materials,

   b. Temporary stockpiling,

   c. Dewatering (if applicable),

   d. Rehandling of Dredged Material, Incidental Debris, Identified Debris, and Piling at the Transload Facility,

2. Upland transportation for:

   a. Delivery to approved upland Disposal Facility

   b. Final disposal at approved upland Disposal Facility

3. Documentation requirements including:

   a. Recording quantities of materials shipped

   b. Reconciling quantities of materials disposed.

1.02 DESCRIPTION OF WORK

A. Contractor shall perform Work under this Section to include furnishing all labor, materials, tools, equipment, and incidentals required for transloading, upland transportation, and disposal of Dredged Material, Incidental Debris, Identified Debris, and Piling as described on the Drawings and in these Specifications.

B. Transloading, upland transportation, and disposal activities shall comply with:

1. General Project sequencing requirements in Section 01 14 00 (Work Restrictions)

2. Access requirements in Section 01 52 00 (Construction Facilities)

3. The Drawings

4. The approach described in the Contractor's Remedial Action Work Plan (RAWP)

C. Contractor shall propose a Transload Facility that shall:

1. Transfer materials between the Contractor's floating equipment and land,

2. Offload Contractor's haul barges of Dredged Material, Incidental Debris, Identified Debris, and Piling,

3. Transfer excavated materials arriving via upland transportation,

4. Serve for temporary stockpiling, dewatering (if applicable), and rehandling of materials, and

5. Operate in compliance with federal, state, and local regulations

6. Meet all applicable requirements within the U.S. Environmental Protection Agency (EPA) Record of Decision (ROD) (EPA, 2017) and Applicable or Relevant and Appropriate Requirements (ARARs) for the Swan Island Basin (SIB) Project Area within the Portland Harbor Superfund Site (PHSS).

D. Contractor shall have ownership or lease documentation demonstrating that activities to be conducted at the Transload Facility are allowed or accepted by the property owner and shall provide this documentation to the Project Representative in the RAWP.

E. Contractor shall not begin transloading, upland transportation, and disposal activities until the Project Representative has accepted the Transloading, Upland Transportation, Waste Characterization, and Disposal Plan (to be submitted as part of the RAWP), see Article 1.05.B of this Section.

F. Waste designation:

1. Waste Determination conclusions for suitability of disposal at landfills to be included here at Pre-Final 90% RD.

2. Contractor is responsible for performing a final waste determination to demonstrate to the satisfaction of the Disposal Facility that all materials intended for disposal meet all Disposal Facility requirements.

3. The preliminary waste determination, including all supporting data, is provided in the documents described in Section 01 13 00 (Reference Material) for the Contractor's information.

4. Waste determination data provided in the Specifications does not alleviate the Contractor's responsibility to perform the final waste determination in consultation with the operators of the Transload Facility and Disposal Facility.

5. If the Disposal Facility requests additional waste characterization, the Contractor shall directly coordinate with the Disposal Facility for any additional waste characterization and comply with Paragraph 1.05.B of this Section

6. If any Dredged Material, Incidental Debris, or Identified Debris is found to require management and disposal as hazardous waste, the Contractor shall manage such material in accordance with all applicable requirements and regulations.

1.03 REFERENCED STANDARDS

A. This Project is conducted under the jurisdiction of EPA Region 10. Work for this Project will be performed in accordance with the EPA ROD (EPA, 2017); therefore, compliance with ARARs for the SIB Project Area within the PHSS cleanup remedy is required. See Section 01 13 00 – Reference Material for additional information on the ROD. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 - Regulatory Requirements. In case of conflict between the requirements of this Section and those listed in Section 01 41 00 - Regulatory Requirements, the more stringent requirement shall prevail. If the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

B. Additional referenced standards applicable to this Section include, but are not limited to, the following:

REFERENCE	TITLE
CERCLA 121(d)(3)	CERCLA Off-Site Rule
40 CFR 257-258	Criteria for Classification of Solid Waste Disposal Facilities and Practices; Criteria for Municipal Solid Waste Landfills
40 CFR 260-279	Hazardous Waste Management System: General
40 CFR 300.440	Procedures for Planning and Implementing Off-Site Response Actions

Notes:
CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act
CFR: Code of Federal Regulations.

1.04 DEFINITIONS

A. Refer to Section 01 11 00 (Summary of Work) for definitions related to the Contract Documents.

B. Transload Facility: The upland location(s) provided or coordinated by the Contractor where materials from the Work Area (including Dredged Material, Incidental Debris, Identified Debris, and Piling) are:

1. Offloaded from barges,
2. Stockpiled,
3. Dewatered (if applicable),
4. Rehandled, and
5. Transferred onto trucks or railcars (if rail access is available) for upland transport to an approved Disposal Facility.

C. Transload Facility shall:

1. Be appropriately permitted in accordance with Section 01 41 26 (Permits, Easements, and Right-of-Entry Agreements),
2. Operate in compliance with federal, state, and local regulations for all activities undertaken,
3. Be Contractor-verified as operating in compliance with its permits by obtaining evidence of facility approval from the appropriate jurisdiction,
4. Be shown by documentation provided the Contractor to have sufficient throughput capacity to process the daily volumes of Dredged Material and tonnages of Incidental Debris, Identified Debris, and Piling that are anticipated to be generated on the project.

D. Disposal Facility: An upland landfill facility that:

1. Is located within the United States,
2. Is permitted by the appropriate jurisdiction in accordance with Section 01 41 26 (Permits, Easements, and Right-of-Entry) and Resource Conservation and Recovery Act (RCRA), and
3. Operates in compliance with federal, state, and local regulations for all activities undertaken.

E. Disposal Facility shall:

1. Be verified by the Contractor as operating in compliance with its permits,
2. Be documented (name/address) by the Contractor to the Project Representative for review and acceptance as part of the Transportation and Off-Site Disposal Plan (included in the RAWP),
3. Receive EPA approval according to EPA's Off-Site Rule, CFR Title 40 Part 300.440 and CERCLA 121(d)(3), as ensured by the Contractor.

1.05 SUBMITTALS

A. Refer to Section 01 33 00 (Submittal Procedures).

B. Pre-Construction Submittals:

1. Transloading and Off-Site Disposal Plan:
   a. Contractor shall submit this detailed, written plan as part of the RAWP, in conformance with the Specifications.
   b. Transloading, upland transportation, and disposal activities shall not begin until:
      1) The plan has been reviewed and accepted by the Project Representative, and
      2) The EPA Region 10 Off-Site Contact has determined that the designated Disposal Facility is compliant with the Off-Site Rule (40 CFR 300.440

and CERCLA 121(d)(3)).

c. The plan shall contain, at a minimum, the following information:

1) General approach for transloading, upland transportation, and disposal of Dredged Material, Incidental Debris, Identified Debris, and Piling

2) Transload Facility and Disposal Facility information as required by Article 1.07 of this Section.

3) Transload Facility layout, including:

i. Existing conditions, facilities, construction facilities, and temporary environmental controls

ii. Drawings showing temporary stockpile area(s), barriers, fencing, access locations, and truck routing

iii. Barge landing, moorage, and offload areas; environmental protection zones; decontamination areas; and wastewater treatment and storage areas

4) Identification of the timing and sequencing for completion of transloading, upland transportation, and disposal activities, including:

i. Reference to the Draft Project Schedule

ii. Hours of operation

iii. Time required to complete each activity cycle

5) Means and methods for operating Transload Facility:

i. Description of proposed perimeter containment for materials and water effluent

ii. Description of temporary stockpiling operations (if used), including number, sizes, and locations

iii. Methods, procedures, and equipment for:

a) Dewatering Dredged Material and managing Incidental Debris, Identified Debris, and Piling
b) Treating water effluent to meet NPDES permit criteria prior to discharge
c) Information on amendments proposed for dewatering (if applicable), including manufacturer information and safety data sheets

iv. Spill prevention methods to prevent untreated sediment and water effluent release

v. Methods, procedures, and equipment for rehandling and loading materials onto railcars and/or trucks

6) Methods, procedures, and equipment for barge offloading, including:

i. Spill prevention measures to prevent material loss

ii. Barge water management methods and measures, including volume tracking procedures

7) Measures to prevent spillage during upland transport and procedures for preventing, capturing, and cleaning up accidental spills

8) Methods and procedures for lining, covering, and securing trucks and railcars

9) Methods, procedures, and equipment for loading and upland transport to

meet regulations preventing release of water, dust, and materials

10) Methods and procedures for segregating potentially recyclable materials from other waste streams

11) Upland transportation details, including:

i. Methods of transportation, transport times, and safety measures

ii. Proposed truck transportation routes (if used)

iii. Required street use permits

iv. Proposed railroad line and route (if used) with description of rail use and capacity

12) Name and qualifications of Transportation and Disposal Coordinator responsible for waste management. Coordinator must have at least 1 year of specialized experience in managing and transporting CERCLA wastes.

13) Methods, procedures, and equipment for cleanup and removal of the Transload Facility.

14) Framework for additional waste characterization (if requested by Disposal Facility), including:

i. Sampling frequency and collection methods

ii. Chemical analyte list and testing methods

iii. Quality assurance procedures

iv. Laboratory turnaround times

v. Schedule accommodations for potential delays

vi. Confirmation of adequate stockpile area to support additional characterization

15) Disposal Facility description, including name, address, and copies of existing permits and approvals

2. Off-Site Rule Determination Information - Contractor shall submit the following prior to the In-Water Work Period of each Work Period to support EPA approval:

a. Name of the Disposal Facility

b. EPA ID number(s) or other unique identifying number(s)

c. City and state location of each facility

d. Type of waste(s) to be shipped

e. Approximate amount of each waste type to be generated per Work Period

f. Waste shipment schedule

g. Method of waste transportation

3. Transload Facility Open-Up Certification

a. Contractor shall submit certification of pre-construction conditions at the Transload Facility documenting levels of contamination and other conditions [requirements to be document in Pre-Final 90% RD].

C. Construction Submittals:

1. Daily Records - Contractor shall maintain daily records of all transloading, upland transportation, and disposal activities as part of the Daily Construction Report, including:

a. Full barge displacement measurements with corresponding tonnage for each barge received

b. Empty barge displacement measurements with corresponding tonnage of material offloaded

c. Weekly Summary - Contractor shall include in the Weekly Construction Report:

d. Summary of the week's transloading, upland transportation, and disposal activities

e. Work completed to date

f. Latest Certificates of Disposal or other documentation tracking final disposition of materials

D. Post-Construction Submittals:

1. Disposal Documentation:

a. Contractor shall submit copies of all Certificates of Disposal, manifests, and/or weight tickets no later than 30 calendar days after material delivery to the Disposal Facility.

b. Documentation must account for all Dredged Material, Incidental Debris, Identified Debris, and Piling in relation to Section 35 24 20 (Remedial Dredging, Barge Dewatering, and In-Water Transportation)

2. Annual Construction Summary Report:

a. Contractor shall submit this report for Work completed in each Work Period as described in Section 01 78 39 (Project Record Documents)

b. Report shall include summary of Work completed under this Section and any relevant record information

3. Transload Facility Close-Out Certification

a. Contractor shall submit certification of close-out and completion of activities, documenting no residual contamination and other conditions at the Transload Facility [requirements to be document in Pre-Final 90% RD].

1.06 WORK PERIODS

A. Contractor shall complete all Work in accordance with the Work Period requirements as follows:

1. In-water Work Period activities - All offloading Work (defined as offloading in-water transportation barges at the Transload Facility) shall be completed during the In-Water Work Period as specified in Section 01 14 00 (Work Restrictions).

2. Activities permitted outside the In-Water Work Period:

a. General upland transloading operations

b. Stockpile management

c. Dewatering

d. Truck or railcar loading at the Transload Facility

e. Upland transportation

f. Disposal activities

B. Completion requirements - All activities described in this Section shall be completed for each Work Period to achieve Substantial Completion in compliance with:

1. Section 01 14 00 (Work Restrictions)

2. Section 01 70 00 (Closeout Requirements)

1.07 PROPOSED FACILITY(IES) REQUIREMENTS

A. Contractor shall propose a Transload Facility and Disposal Facility as part of the Transloading, Upland Transportation, Waste Characterization, and Disposal Plan for review and acceptance by the Project Representative.

B. Transload Facility Requirements:

1. Contractor shall propose an existing Transload Facility that has already been permitted or an alternate Contractor-provided Transload Facility.

2. Contractor shall provide the following information as part of the RAWP:

Location, address, and owner of proposed Transload Facility

a. Documentation of all necessary permits or substantive equivalence per Section 01 41 26 (Permits, Easements, and Right-of-Entry Agreements)

b. For each Work Period :

1) Estimated weekly capacity (in cubic yards [CY]) to transload and transport dredged materials considering facility characteristics and upland transportation capacities

2) Estimated storage capacity (in CY) for Dredged Material stockpiling in the event of transportation delays, including available stockpile capacity at the Transload Facility or off site in railcars staged in the railyard

C. Disposal Facility Requirements:

1. Contractor shall provide the following information:

a. Location and owner of proposed Disposal Facility

b. Documentation of all necessary permits or substantive equivalence per Section 01 41 26 (Permits, Easements, and Right-of-Entry Agreements)

c. Documentation that the proposed Disposal Facility is licensed and suitable for accepting and disposing of the Dredged Material, Incidental Debris, Identified Debris, and Piling from a Superfund site (see specific requirements in Subparagraph 1.05.B.3 of this Section)

1.08 INSPECTION OF FACILITIES

A. The Project Representative reserves the right to inspect the proposed Transload Facility and Disposal Facility prior to the start of each Work Period to verify compliance with:

1. Requirements in these Specifications

2. Applicable federal, state, and local regulations

B. Contractor shall:

1. Provide access to the Project Representative or designee for inspection purposes

2. Furnish health and safety orientation as required for site access

3. Allow access to machinery and equipment to facilitate:

a. Sampling activities

b. Assessment procedures

c. Documentation of facility conditions

4. Provide access to EPA representatives for inspection purposes, in coordination with the Project Representative.

1.09 ENVIRONMENTAL PROTECTION

A. Contractor shall perform all transloading, upland transportation, and disposal activities in accordance with:

1. Environmental protection requirements specified in Section 01 35 43 (Environmental Procedures)

2. All ARARs for the PHSS cleanup remedy, as specified in Section 01 41 00 (Environmental Regulatory Requirements)

3. Additional requirements are under review and development during Pre-Final 90% RD.

1.10 QUALITY CONTROL

A. Contractor shall:

1. Provide all necessary quality controls to successfully complete the Work

2. Comply with its Construction Quality Assurance/Quality Control Plan

3. Adhere to quality control requirements as specified in Section 01 45 00 (Quality Control)

B. Project Representative may inspect transloading, upland transportation, and disposal Work at any time for quality assurance purposes.

C. Project Representative shall not, through inspections:

1. Release Contractor from quality control obligations required by the Specifications

2. Provide any form of Work acceptance

PART 2 PRODUCTS [NOT USED]

PART 3 PART 3 EXECUTION

3.01 SEQUENCING

A. Refer to Section 01 14 00 (Work Restrictions) for construction sequencing requirements associated with transload, upland transportation, and disposal activities in relation to the overall sequencing of the Work.

3.02 GENERAL

1. The provisions apply only to Dredged Material, Incidental Debris, Identified Debris, and Piling that will be managed as non-hazardous waste. Contractor shall perform a final waste determination and dispose of all Dredged Material, Incidental Debris, Identified Debris, and Piling in accordance with all federal, state, and local regulations, as described in Paragraph 1.02.E of this Section.

B. Transload Facility Options:

1. Commercial transload facility options:

a. Contractor may identify and propose a commercial transload facility

b. All proposed facilities are subject to review and approval by the Project Representative and EPA.

2. Alternate transload facility options:

a. Contractor may propose to use an alternate (non-commercial) transload facility

b. Contractor must obtain all necessary permits for alternate facilities

c. Development of alternate facilities must be substantially complete to avoid

Project delays

d. Use of alternate facilities is subject to review and approval by the Project Representative and EPA

C. Disposal Facility Requirements:

1. Contractor shall confirm that the Disposal Facility:

a. Is currently in compliance with its operating permits

b. Can accept nonhazardous waste from a Superfund site

c. Has been verified by contacting the EPA Regional Contact.

2. Acceptable nonhazardous waste Disposal Facility locations include:

a. [Locations to be documented during Pre-Final 90% RD]

3. Contractor may propose an alternate Disposal Facility:

a. Any proposed alternate facility shall be documented in the RAWP

b. The Project Representative will consider alternate facilities with proper Contractor-provided documentation

c. Contractor shall arrange for transportation and disposal with the facility operator(s)

d. Responsibility for satisfactory disposal remains with the Contractor.

3.03 CONDUCT OF WORK

A. Transloading:

1. Contractor shall offload in-water transportation barges at the Transload Facility using spill prevention measures that:

a. Prior to beginning offloading, have been reviewed and accepted by the Project Representative

b. Prevent spillage of material or effluent water to any receiving waters

c. Always include a spill apron (or equivalent measure) during offloading

2. Contractor shall measure barge displacement:

a. When loaded barges arrive at the Transload Facility

b. When barges are empty after offload is complete

3. Contractor shall document and report:

a. Estimated tonnage offloaded from each barge in the Daily Construction Report

b. Estimated volume of barge water transported to, offloaded, treated and/or disposed of at the Transload Facility

4. Contractor shall manage spillage by:

a. Removing any spillage on the spill apron as soon as practicable with proper disposal

b. Formally documenting and promptly cleaning up any spillage outside the enclosed stockpile area(s)

c. Treating all spillage cleanup as incidental to the Work

5. Contractor shall load trucks (or railcars) within an enclosed loading area that:

a. Controls spillage of Dredged Material, Incidental Debris, Identified Debris, Piling, and water effluent

b. Contains all spilled sediment, debris, and water effluent

c. Prevents loss of materials and effluent

d. Is swept regularly, and has water effluent collected as needed to prevent tracking of contaminated material

6. Contractor shall:

a. Determine and understand the structural capacity of the Transload Facility

b. Not exceed the maximum structural capacity of these facilities

c. Employ all best management practices (BMPs) as described in Section 01 35 43 (Environmental Procedures)

d. Segregate any material encountered that is visibly not Dredged Material, Incidental Debris, nor Identified Debris

e. Appropriately manage segregated material and determine proper disposal at a permitted Disposal Facility.

7. If Contractor proposes to perform additional Dredged Material dewatering (passive, mechanical, etc.) at the Transload Facility, Contractor shall:

a. Submit a detailed dewatering plan [Requirements to be documented at Pre-Final 90% RD]

b. [Requirements to be documented at Pre-Final 90% RD]

B. Temporary Stockpiling:

1. Contractor shall construct temporary stockpile area(s) at the Transload Facility that:

a. Are enclosed by a suitable barrier (e.g., Jersey Barrier, “Ecology” blocks, or similar method)

b. Are lined along the inside of the enclosure with an impermeable liner of polypropylene or similar material accepted by the Project Representative

c. Have signs, placards, or reflective barriers that are highly visible at night placed around the area

d. Have temporarily plugged storm drains, drainage ports, or other stormwater collection and discharge openings

2. Contractor shall manage water in stockpile areas by:

a. Constructing, operating, and maintaining the temporary stockpile area(s) to collect all effluent drainage water, stormwater, or other discharges

b. Ensuring proper treatment and disposal of collected water

c. Complying with permit requirements for surface water management outside temporary stockpile areas but within the Transload Facility as specified in Section 01 35 43 (Environmental Procedures)

3. Contractor may propose to mix additives with the Dredged Material to bind available dredge effluent water:

a. The type, amount, and mixing methods shall be reviewed and accepted by the Project Representative

b. Contractor has sole responsibility for proper storage, handling, usage, and containment of additives

c. Contractor must ensure additives are acceptable to the Disposal Facility and meet all regulatory requirements

d. Use of amendments is considered incidental to the Work

e. Contractor has sole responsibility for cleanup and damage costs related to additive use

4. Contractor shall upon completion of the Work:

a. Remove all vestiges of Dredged Material, Incidental Debris, Identified Debris, Piling, liner, pump, discharge pipe, and other materials

b. Clean up the temporary stockpile area(s) to pre-Project condition to the satisfaction of the Project Representative

c. Treat this cleanup as incidental to the Work

d. Employ all BMPs as described in Section 01 35 43 (Environmental Procedures)

C. Upland Transportation:

1. Contractor shall select appropriate transportation methods based on facility locations:

a. For a Transload Facility greater than [distance to be confirmed in Pre-Final 90% RD] miles from the Disposal Facility, rail shall be the primary transportation method

b. For facilities without rail access, Contractor may use trucks to transport materials to a rail transfer station, subject to Project Representative approval

c. For a Transload Facility less than [distance to be confirmed in Pre-Final 90% RD] miles from the Disposal Facility, truck transportation may be allowed with Project Representative approval

d. Barge transportation from the Transload Facility to the Disposal Facility operator's transfer station may be permitted.

2. Contractor shall handle Dredged Material and Incidental Debris by:

a. Placing material directly into a floating transport barge when feasible

b. Using trucks for upland transportation only when Work Area conditions limit barge access

c. Complying with access easements and/or right-of-entry agreements as described in Section 01 41 26 (Permits, Easements, and Right of Entry Agreements)

d. Decontaminating and inspecting trucks within a designated contained footprint before trucks leave the transfer area

3. Contractor shall manage transportation documentation by:

a. Preparing and signing all Certificates of Disposal (or waste manifests)

b. Obtaining all acceptances for the transportation of all materials

c. Submitting Certificates of Disposal to the Project Representative in the Weekly Construction Report within 30 calendar days after disposal

d. Providing sufficient documentation to track all upland material transport

4. Contractor shall prevent material loss during transport by:

a. Utilizing appropriate controls as described in the RAWP and approved by the Project Representative

b. Lining transport vehicles with an impermeable liner and securely covering them to prevent leakage and material loss

c. Inspecting each load for evidence of leakage and repairing any observed leakage before departure

d. Documenting and promptly cleaning up any spillage, as incidental to the Work

e. Inspecting and cleaning transport vehicles to remove spilled materials

f. Employing all BMPs as described in Section 01 35 43 (Environmental Procedures)

g. Identifying proposed truck haul routes in accordance with Section 01 52 00 (Construction Facilities)

h. Ensuring safe transport in accordance with federal, state, and local laws and regulations

D. Disposal and Recycling:

1. Contractor shall coordinate with the Disposal Facility to:

a. Determine acceptable characteristics, including water content, of all materials

b. Ensure materials meet requirements such as the Paint Filter Liquids Test (EPA Method 9095A, Revision 1, December 1996)

c. Determine if materials are suitable for final disposal

d. Identify any additional associated testing requirements

2. Contractor shall manage recyclable materials by:

a. Utilizing a Disposal Facility that may include recycling facilities for applicable materials (such as non-creosote Piling and concrete Identified Debris)

b. Considering composting facilities for green materials (such as Cleared and Grubbed Material)

c. Conducting recycling and/or composting at off-site locations in accordance with applicable regulations

d. Obtaining Project Representative acceptance for any recycling and/or composting facility

e. Separating potential recyclable and compostable materials from all other waste streams

f. Maintaining segregation during upland transportation until disposal

g. Segregating significant large-dimensional steel Incidental Debris (e.g., beams, sheet pile) encountered during dredging

h. Recycling segregated Debris to the extent practicable

END OF SECTION

SECTION 35 37 10

ENGINEERED CAPS

PART 1 GENERAL

1.01 SUMMARY

A. This Section establishes requirements for:

1. Placement of Engineered Caps within the Capping Areas.
2. Engineered Cap material placement methods and equipment.
3. Quality control for underwater material placement.
4. Verification of material thickness and coverage.

1.02 DESCRIPTION OF WORK

A. The Work under this Section shall be performed by the Contractor and includes furnishing all labor, materials, tools, equipment, and incidentals required for Engineered Cap placement within the Swan Island Basin (SIB) Project Area of the Portland Harbor Superfund Site (PHSS) as described on the Drawings and in these Specifications.

B. The Contractor shall conduct practice Engineered Cap placement, as described in Article 3.01 of this Section, prior to starting any Engineered Cap placement. In dredging areas, the Contractor shall conduct Engineered Cap placement only following acceptance of required remedial dredging activities by the Project Representative.

C. The Contractor is required to assess potential material supply sources to confirm that only clean material will be used in Engineered Caps. Contractor shall collect and analyze samples from potential material supply sources and identify physical and geochemical characteristics of potential imported material to demonstrate that the material meets PHSS Record of Decision (ROD) (EPA, 2017) Table 17 requirements. Additional details regarding sampling, testing, and testing frequency will be documented in Pre-Final 90% RD.

D. Engineered Cap placement shall be completed according to the general Project and specific material placement sequencing requirements in Section 01 14 00 (Work Restrictions), access requirements in Section 01 41 26 (Permits, Easements, and Right-of-Entry Agreements), temporary facility requirements in Section 01 52 00 (Construction Facilities), the Drawings, and the approach described in the Contractor's Remedial Action Work Plan (RAWP).

E. The Contractor shall:

1. Select the appropriate means and methods, number, and types of placement equipment and determining whether specialized equipment or techniques may be required to conduct the material placement in open-water, nearshore, bank, and shoreline areas;
2. Protect existing structures from damage or destabilization;
3. Prevent grounding of in-water equipment within the SIB;
4. Complete all Engineered Cap placement following requirements in Part 3 (Execution) and the Work sequencing and milestones provided in Section 01 14 00 (Work Restrictions).

F. Anticipated volumes of all material types are provided in table below for Contractor convenience only. The Contractor shall determine the actual volume of materials that may be needed to achieve acceptable Engineered Cap placement as shown on the Drawings, considering all placement requirements, potential losses due to resuspension, settlement and consolidation of underlying sediments, and placement tolerances described in these Specifications. All such quantity shall be included in the Contractor's Bid.

MATERIAL TYPE	APPLICATION TECHNOLOGY	GENERAL DESCRIPTION	APPROXIMATE VOLUMES (CY)
1	Sand for chemical isolation layer (CIL)	Medium-to-coarse sand (to be documented in Pre-Final 90% RD)	To be documented at Pre-Final 90% RD
2	GAC for chemical isolation layer (CIL)	Granular Activated Carbon (GAC) (details to be documented in Pre-Final 90% RD)	To be documented at Pre-Final 90% RD
3	Chemical Isolation Layer (CIL)	Material Type 1, blended with Material Type 2	To be documented at Pre-Final 90% RD
4	Erosion Protection Layer (EPL), Shallow Water	Habitat mix (<2.5" diameter rounded gravel, to provide appropriate substrate for foraging habitat, gradation to be documented in Pre-Final 90% RD)	To be documented at Pre-Final 90% RD
5	Erosion Protection Layer (EPL), Deep Water	Angular gravel/rock (gradation to be documented in Pre-Final 90% RD)	To be documented at Pre-Final 90% RD

Notes:
CY: cubic yard

1.03 REFERENCED STANDARDS

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the ROD (EPA, 2017); therefore, compliance with Applicable or Relevant and Appropriate Requirements (ARARs) for the SIB Project Area within the PHSS cleanup remedy is required. See Section 01 13 00 – Reference Material for additional information on the ROD. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 – Regulatory Requirements. In case of conflict between the requirements of this Section and those listed in Section 01 41 00 - Regulatory Requirements, the more stringent requirement shall prevail. If the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

1.04 DEFINITIONS

A. Refer to Section 01 11 00 (Summary of Work) and Section 00 (Procurement and Contracting Documents) for definitions related to the Contract Documents.

B. Minimum Placement Thickness: Minimum thickness of any layer in the Engineered Cap (CIL, EPL) that shall be approved by the Project Representative.

C. Paid Overplacement Allowance: Maximum additional thickness placed in any Engineered Cap layer (CIL, EPL), above the Minimum Placement Thickness, that will be paid.

D. Maximum Allowed Overplacement: Maximum additional thickness placed, in addition to the Minimum Placement Thickness, that will be allowed. Material placed greater than this thickness shall be considered Excessive Overplacement and the Project Representative may require the Contractor to remove Excessive Overplacement material. The Contractor will be responsible for any regulatory agency fees and/or fines incurred as a result of Excessive Overplacement.

E. Engineered Caps:

1. Engineered Cap Type 1 shall consist of the following two layers of clean imported

materials:

a. Chemical Isolation layer (Material Type 3 – Amended Sand).

b. Erosion Protection Layer (Material Type 4 – Habitat Mix).

2. Engineered Cap Type 2 shall consist of the following two layers of clean imported materials:

a. Chemical Isolation layer (Material Type 3 – Amended Sand).

b. Erosion Protection Layer (Material Type 5 – Angular Gravel/Rock).

F. Engineered Cap Certification Units: Engineered Cap (Type 1 and Type 2) shall be placed as shown on the Drawings within Cap Certification Units (CCUs) within the SIB Project Area which are under development during Pre-Final 90% RD.

G. Enhanced Natural Recovery (ENR): Clean sand placed on top of native sediments. The 50% RD does not contain ENR, hence this is a contingency material type, but ENR may be considered during Pre-Final 90% RD.

H. Residuals Management Layer (RML): Clean sand placed on top of dredged sediments, in the case where Dredge to remedial action level (RAL) is an applied technology assignment.

1.05 SUBMITTALS

A. Refer to Section 01 33 00 (Submittal Procedures).

B. Pre-Construction Submittals:

1. Submit a detailed written Engineered Cap Placement Plan, as part of the RAWP, in conformance with the Specifications. Placement activities under this Section shall not begin until the following has taken place:

a. Engineered Cap Placement Plan has been reviewed and accepted by the Project Representative; and

b. All Required Dredging, Contingency Re-Dredging, and removal of Excessive Overplacement material has been completed and accepted by the Project Representative (see 35 24 20 Remedial Dredging, Barge Dewatering, and In-Water Transportation).

2. At a minimum, the Engineered Cap Placement Plan shall contain the following information:

a. General approach that will be implemented for placement of materials.

b. Equipment identification, including the number, types (and names, if applicable), and capacity of equipment to be used.

c. Work in sequence in each Work Period to identify timing and sequencing for completion of material placement of Engineered Cap Types 1 and 2 as related to other major elements of the Work; the Contractor shall reference the Draft Project Schedule and indicate hours of operation and the time required to complete each placement activity.

d. Procedures and equipment to be used for all Engineered Cap placement activities, so that Work is completed within the tolerances described in this Section and shown on the Drawings.

e. Practice Placement Plan, detailing the methods, procedures, and equipment to conduct practice Engineered Cap placement to meet requirements described in Part 3 (Execution).

f. Description of the approach for protecting existing structures.

g. Methods, procedures, and equipment to be used for transporting materials to the SIB Project Area

h. Methods, procedures, equipment, and proposed location for preparation and mixing of GAC, and the quality control process, to meet chemical isolation layer requirements described in Part 3 (Execution).

i. Placement methods/techniques to prevent separation of GAC from the sand (in the Amended Sand) when placed in-water.

j. Documentation for an established source for materials included in Engineered Cap Types 1 and 2, including testing certificates provided by the supplier for the Project Representative's review and acceptance prior to the start of Engineered Cap placement.

k. Methods and procedures for collecting representative samples of material for chemical testing.

l. Identification (name and location) and certification of accreditation documents for any independent, certified analytical laboratory that will conduct required testing for all imported materials that will be used for the Work, as described in this Section.

C. Construction Submittals

1. **Imported Material Samples**. The Contractor shall provide a physical sample of each Material Type to be used for the Work to the Project Representative prior to the start of Engineered Cap placement at the SIB Project Area. Each sample shall comply with requirements in Article 2.9 of this Section and consist of approximately [volume to be documented in Pre-Final 90% RD] cubic foot of material composited from no less than [number to be documented in Pre-Final 90% RD] subsamples from any one source of imported material. The Contractor shall ensure that the sample is representative of the capping material to be imported. The Contractor shall ensure that the source of each Material Type will not change once the sample has been submitted or shall submit a new separate sample for review and acceptance by the Project Representative if a new source is used. The Contractor shall provide additional imported capping material samples to the Project Representative upon request.

2. **Laboratory Test Results.** The Contractor shall provide laboratory test reports for the imported capping materials, as described in Article 2.9 of this Section. All laboratory test results shall be submitted to the Project Representative for review and acceptance prior to the start of any Engineered Cap placement activities.

3. **GAC Material Sample.** The Contractor shall submit a sample of GAC material, vendor's name, manufacturer's name, manufacturer's specification sheet, and grain-size testing results to the Project Representative prior to ordering GAC for review and acceptance of proposed GAC material.

4. **Contractor's Daily Construction Report.** The Contractor shall submit the following as part of the Daily Construction Report:

a. Area(s) where each layer (chemical isolation layer, and erosion protection layer) was placed, for both Engineered Cap Types 1 and 2, including approximate placed quantities;

b. Progress Surveys;

c. Supplemental documentation such as electronic placement records (i.e., "bucket maps");

d. Calculated quantities; and

e. Summary of other details of the Work completed. Summaries that aggregate all Material Types into a single total daily quantity and/or a single daily placement area will not be accepted.

5. **Material Delivery Daily Records.** The Contractor shall submit a daily record of imported Engineered Cap material delivery to the SIB Project Area (whether by barge or by truck),

including delivery time, and material source by Material Type as part of the Contractor's Daily Construction Report. Material Types shall not be aggregated into a single total daily quantity, and/or a single placement area.

6. **Weekly Construction Report.** The Contractor shall summarize the week's Engineered Cap placement activities in its Weekly Construction Report, including the latest Progress Surveys, Post-Construction Surveys, calculated quantities, Work completed to date, and Work anticipated to be completed the following week.

D. Post-Construction Submittals:

1. **Annual Construction Summary Report.** The Contractor shall submit the Annual Construction Summary Report for the Work completed in each Work Period related to this Section. The Contractor's Annual Construction Summary Report shall include the summary of the Work completed under this Section and any relevant record information.

1.06 WORK PERIOD

A. As described in Section 01 14 00 (Work Restrictions), the Work included in this Section (with the exception of the pre-construction and post-construction submittals and potential delivery/stockpile of products described in Part 2 – Products) occurring below the ordinary high water elevation shall be completed by the Contractor only during the In-Water Work Period. In SIB, the In-Water Work Period extends from July 1 to October 31, and from December 1 to January 3 (although in December-January, Work is restricted to areas above -20 ft National Geodetic Vertical Datum of 1929).

1.07 PROJECT AREA CONDITIONS

A. Navigation Interference: Refer to Section 01 31 00 (Project Management and Coordination) for all requirements related to interference with navigation during Engineered Cap placement activities.

B. Protection of Existing Structures and Facilities to Remain

1. Any damage to existing structures and/or existing facilities caused by the Contractor's placement operations shall be repaired in accordance with requirements in Section 01 19 50 (Protection and Maintenance of Property and Work).

C. Adjacent Tenants and Property Owners

1. Tenants and property owners adjacent to the SIB Project Area will be using in-water portions of the SIB Project Area and other adjacent upland and in-water areas for their operations. The Contractor shall comply with site access and timing requirements described in Section 01 41 26 – Permits, Easements, and Right-of-Entry Agreements).

1.08 ENVIRONMENTAL PROTECTION

A. Work described in this Section shall be performed in accordance with environmental protection requirements, as stated in Section 01 35 43 (Environmental Protection Procedures) and the Contractor's accepted Environmental Records Binder (ERB), and in accordance with all ARARs for SIB Project Area as specified in Section 01 41 00 (Environmental Regulatory Requirements).

1.09 QUALITY CONTROL

A. Contractor shall be responsible for providing all necessary quality controls to successfully complete the Work and to comply with the Construction Quality Assurance/Quality Control Plan, as specified in Section 01 45 00 (Quality Control).

B. The Project Representative will inspect at any time the material placement Work for quality assurance purposes. The Project Representative's inspections shall in no way release the Contractor from its obligation to comply with the Specifications and will in no way be construed as acceptance of the Work.

PART 2 PRODUCTS

2.01 GENERAL

A. Contractor shall provide all required Engineered Cap materials for the Project, which shall be of the specified quality, size, shape, and gradation. Imported aggregates to be used for construction shall be clean, granular material free of debris, roots, organic material, contaminants, and all other deleterious and objectionable material.

2.02 MATERIAL SOURCES

A. Contractor shall list acceptable established upland material supply sources in the RAWP. Prior to ordering/purchasing placement materials, the Contractor shall verify that the material supplier has the capacity to meet the design quantities, delivery schedules, gradations, and chemical quality criteria established for each Material Type.

2.03 INSPECTION OF CAPPING MATERIALS

A. Pre-Construction Inspection of Imported Material Source Locations

1. Contractor shall submit a list of the suppliers and locations for all materials to be imported for use on the project, prior to any construction activities.

2. Contractor shall inspect the capping material source location prior to delivering material to the SIB Project Area. During such inspection, the Contractor shall confirm that the materials meet the requirements of this Section.

3. Contractor shall provide notice to the Project Representative within 5 working days of such inspections. At the Project Representative's discretion, the Project Representative or other designated representative may accompany the Contractor to witness such inspections. This witnessing will in no way release the Contractor from complying with the Specifications, and the Contractor shall not construe this witnessing as acceptance of any particular material for use on the project.

B. Barges loaded with Engineered Cap materials shall be visually inspected by the Contractor upon delivery to the SIB Project Area. Engineered Cap materials shall be inspected by the Contractor to ensure the material meets the requirements of this Section. The Contractor shall report any presence of foreign, recycled, or reprocessed materials or debris to the Project Representative, who will determine if the placement materials are acceptable. In the event of rejections, it is the responsibility of the Contractor to remove all rejected material from the SIB Project Area at no extra cost to the RA Performing Parties. Acceptance or rejection of imported Engineered Cap materials brought to the SIB Project Area will be provided within 1 working day of the Contractor's submittal of its material inspection report to the Project Representative.

C. The Project Representative may, at any time, perform an independent inspection or conduct sampling/testing of any imported Engineered Cap materials. Materials may be rejected if identified as substandard, based on the sole discretion of the Project Representative. The Project Representative may collect samples from the Contractor's stockpile of imported materials and test the samples for quality assurance purposes at the Project Representative's discretion. The Contractor shall provide safe access for the Project Representative to collect samples from the Contractor's imported Engineered Cap material stockpiles. Sampling and testing by the Project Representative does not alleviate the Contractor's responsibility to conduct the required material testing and characterization described in Article 2.9 of this Section. Inspection and testing by the Project Representative shall not be used by the Contractor as a delay claim.

2.04 MATERIAL TYPE 1

A. Material Type 1 shall be clean imported sand [size and gradation to be documented in Pre-Final 90% RD] to be amended with GAC for use in the CIL for both Engineered Cap Type 1 and Type 2. The material shall not contain organic matter, deleterious materials, or soft friable particles in quantities considered objectionable by the Project Representative. Material Type 1 shall conform to the following gradation:

U.S. STANDARD SIEVE SIZE	PERCENT PASSING BY DRY WEIGHT
1-1/2 inches	
3/4 inch	
5/8 inch	
1/2 inch	
1/4 inch	
U.S. No. 4	
U.S. No. 10	
U.S. No. 40	
U.S. No. 200	

2.05 GRANULAR ACTIVATED CARBON (MATERIAL TYPE 2)

A. GAC shall be a virgin carbon (not regenerated). Contractor shall submit a sample of material, vendor's name, manufacturer's name, manufacturer's specification sheet, and grain size testing results to Project Representative, prior to ordering GAC, for review and acceptance. Contractor shall not order GAC material for Project use until Contractor has received written acceptance from the Project Representative. GAC shall be washed and free of floatable material. [GAC grain sizes and water-soluble ash content will be documented in Pre-Final 90% RD]. Contractor may propose an alternative GAC material for the purpose of minimizing or eliminating blending or pre-soaking of the GAC material prior to placement, but this material must be accepted by the Project Representative prior to procurement.

B. GAC material shall be suitably packaged prior to shipment to isolate the material from the environment, to preserve its efficacy for the duration of storage. Each package will include the following information:

1. Manufacturer name
2. Manufacturer address
3. Product code and lot number

C. Contractor shall conduct a visual inspection of the imported packaged GAC material upon delivery to the location where blending with sand is proposed to create CIL materials, to identify if any packaging has been damaged. The Contractor shall notify the Project Representative of any damaged GAC material packaging. The individual packaging shall be marked and further inspected for product integrity.

2.06 MATERIAL TYPE 3

A. Material Type 3 is a specified mixture of Material Type 1 (clean imported sand) and Material Type 2 (GAC).

B. Percent by weight of Material Type 2 (GAC) to be mixed with Material Type 1 (clean imported sand) to create Material Type 3 is under development during Pre-Final 90% RD.

2.07 MATERIAL TYPE 4 – EROSION PROTECTION LAYER, AREA 1

A. Material Type 4 ("Habitat Mix") shall be imported clean, free-draining, rounded gravel [size and gradation to be documented in Pre-Final 90% RD] that serves as erosion protection for Engineered Cap Type 1, but also provides habitat-friendly leave surface in shallow water areas. The material shall not contain organic matter, deleterious materials, of soft friable particles in quantities considered objectionable by the Project Representative. Material Type 4 shall conform to the following gradation:

U.S. STANDARD SIEVE SIZE	PERCENT PASSING BY DRY WEIGHT

2.08 MATERIAL TYPE 5 – EROSION PROTECTION LAYER, AREA 2

A. Material Type 5 shall be clean, free-draining, angular gravel/rock [size and gradation to be documented in Pre-Final 90% RD] that serves as erosion protection for Engineered Cap Type 1. The material shall not contain organic matter, deleterious materials, of soft friable particles in quantities considered objectionable by the Project Representative. Material Type 4 shall conform to the following gradation (to be further documented in the Pre-Final 90% RD).

U.S. STANDARD SIEVE SIZE	PERCENT PASSING BY DRY WEIGHT

2.09 MATERIAL TESTING AND CHARACTERIZATION

A. The Contractor shall utilize an analytical laboratory with current environmental laboratory accreditation for the analysis of the matrix of solid and chemical materials using the specified analytical methods for physical and chemical testing.

B. The Contractor shall test samples of all Material Types to be imported for the chemical concentrations provided in the ROD (EPA, 2017), Table 17. Imported material shall have chemical concentrations equal to or lower than the chemical quality criteria for CULs presented in the ROD (EPA, 2017), Table 17. Material sizes too large to be sampled and tested for chemical concentrations could potentially be crushed prior to sampling, or only fines from the samples can be tested.

C. The Contractor shall test samples of all materials to be imported capping materials for Grain Size Distribution (ASTM D6913).

D. The Contractor shall submit one physical sample of each imported Material Type to be used for the Work, prior to placement activities (refer to Article 1.05 of this Section).

E. The Contractor shall collect and analyze one sample for every 10,000 cubic yards (CY) per the above physical and chemical tests, with an absolute minimum of two samples of each imported Material Type. The frequency of testing may be increased or decreased by the Project Representative if considered appropriate based on testing or visual assessment results.

F. The Contractor shall provide the results of such tests to the Project Representative for review and acceptance prior to any placement activities at the SIB Project Area. The results shall be provided in report form, with the reports clearly identifying the following:

1. Source of samples
2. Sampling dates
3. Chain of custody
4. Sampling locations
5. Material Certification from supplier stating that the materials meet specification requirements for gradation and chemical testing.

PART 3 EXECUTION

3.01 GENERAL SEQUENCING

A. Refer to Section 01 14 00 (Work Restrictions) for general Project sequencing requirements associated with all Work activities.

B. Engineered Cap placement shall not begin until the Project Representative has completed its review and accepted the Engineered Cap Placement Plan, and all Required Dredging and Contingency Re-Dredging has been completed by the Contractor and accepted by the Project Representative per Sections 35 24 20 (Remedial Dredging, Barge Dewatering, and In-Water Transportation) and 02 21 00 (Site Surveys and Positioning Control).

C. Practice Placement: Prior to initiation of any material placement activities at the SIB Project Area, the Contractor shall demonstrate to the Project Representative that the Contractor's proposed placement means and methods are adequate and effective in meeting the placement thickness requirements for each layer of Engineered Cap Type 1 and Type 2.

1. The practice placement shall be conducted using the same proposed equipment, materials, and placement methods that will be used for full-scale placement in the areas shown on the Drawings.
2. The practice placement shall be conducted above-water, on a flat working area to allow visual observations and thickness measurements.
3. Practice placement area location and size shall be proposed by the Contractor and needs to be accepted by the Project Representative.
4. The Contractor shall provide visible measurement of the practice placement for observation and acceptance by the Project Representative.
5. If the practice placement does not meet the required thicknesses, the Contractor shall modify its means and methods and conduct additional practice placement to demonstrate compliance with the Specification requirements at no additional cost to the RA Performing Parties.
6. Practice placement is considered incidental to placement Work in this Section, and the Contractor shall account for this cost [to be updated in Pre-Final 90% RD].

D. Placement sequencing for Engineered Cap layers:

1. Post-Construction Surveys shall be completed by the Contractor following placement of each layer of the Engineered Cap (first CIL, then EPL).

2. Each layer of the Engineered Cap shall meet the placement requirements as shown on the Drawings and in these Specifications, and receive approval from the Project Representative, prior to placing any materials for the next Engineered Cap layer in that area.

3. Any material placed that exceeds the Maximum Allowed Overplacement Thickness for each layer shall be removed upon direction from the Project Representative before placement of the subsequent layer, or before approval of the Work.

E. All material placement activities for a specific Cap Certification Unit (CCU) within the Project Area shall occur in the same Work Period as dredging and contingency re-dredging for that same CCU (refer to Section 01 14 00 – Work Restrictions).

F. The Contractor shall perform a Post-Construction Structural Condition Inspection described in Section 31 09 00 (Condition Inspections and Monitoring) after all placement activities have been completed within 100 feet of structures.

3.02 PROCESS FOR ENGINEERED CAP PLACEMENT COMPLETION AND ACCEPTANCE

A. Specific placement of CCU or Dredge Certification Unit (DCU) for Work acceptance within the Project Area have not yet been defined. Establishment of specific DCU/CCU for acceptance of dredging/contingency re-dredging, as well as Engineered Cap placement, shall be the responsibility of the Contractor and described in the Cap Placement Plan in the RAWP.

B. Engineered Cap placement activities shall not begin within a previously dredged area (or DCU) until the Project Representative has completed review and accepted all dredging post-construction surveys in that DCU.

C. The post-dredging (or post-contingency re-dredging) survey will serve as a pre-construction survey for Engineered Cap placement on top of the dredged surface in each CCU, see Section 02 21 00 (Site Surveys and Positioning Control), unless Engineered Cap placement does not occur until a subsequent In-Water Work Period; in that case, Contractor shall perform a separate pre-construction survey prior to Engineered Cap placement.

D. The Contractor shall conduct Placement Progress Surveys and Placement Post-Construction Surveys and associated field data (e.g., bucket maps, barge displacement/volume estimates) to assess compliance with Minimum Placement Thickness and Overplacement requirements in accordance with Section 02 21 00 (Site Surveys and Positioning Control). Once the Contractor completes material placement activities within a CCU, the Contractor shall conduct, within one (1) working day, a Placement Post-Construction Survey and submit this survey to the Project Representative for review and acceptance within one (1) working day after conducting the survey. The Contractor shall notify the Project Representative two (2) working days prior to completing material placement. The Contractor shall plan for the Project Representative to take 2 working days to review the Placement Post-Construction Survey and provide acceptance of the Work as complete for material placement in that CCU.

E. The Placement Post-Construction Survey (after approval by the Project Representative) will be used to compare against the applicable Pre-Construction Survey, as defined in Section 02 21 00 (Site Surveys and Positioning Control) for measurement and payment purposes for each application placement area. The Project Representative will review the Placement Post-Construction Survey and associated field data and, if satisfactorily completed, will accept the Engineered Cap placement activities for each CCU as complete.

F. Material placement acceptance criteria: The Contractor shall meet the material placement acceptance criteria in table below for both Engineered Cap layers (CIL and EPL). Placement tolerances will be measured using analysis of high-resolution multibeam hydrographic survey data (see Section 02 21 00 (Site Surveys and Positioning Control). Survey data will be processed by the Contractor, and elevations clearly shown on a grid with resolution of at least 3 feet (or smaller grid cells). Digital gridded survey data will be provided by the Contractor to the Project Representative.

CAP LAYER	TARGET THICKNESS	VERTICAL PLACEMENT TOLERANCE, MAXIMUM OVERPLACEMENT ALLOWANCE
CIL	12 inches	• Tolerance +3/-0 inches • Paid Overplacement Thickness +3 inches • Maximum Allowed Overplacement +6 inches
EPL (Applies to both Type 1 and Type 2)	2 feet	• Tolerance +6/-6 inches • Paid Overplacement Thickness +6 inches • Maximum Allowed Overplacement +6 inches • No encroachment into 1-ft FMD clearance in navigation areas.

Notes:
EPL materials for Engineered Caps Type 1 and Type 2 are different, however placement tolerances are identical.

G. If the Engineered Cap placement tolerances are not achieved in all placement areas as shown on the Drawings, or placement above the Maximum Allowed Overplacement occurred, the Contractor shall correct placement deficiencies and conduct additional associated Placement Post-Construction Surveys to the satisfaction of the Project Representative and at no extra cost to the RA Performing Parties.

3.03 SURVEYS

A. Refer to Section 02 21 00 (Site Surveys and Positioning Control) for all survey and positioning control requirements related to the placement activities.

3.04 CONDUCT OF WORK

A. GAC (Material Type 2) Preparation and Blending to Create Material Type 3:

1. Contractor shall generate Material Type 3 (Amended Sand) by uniformly blending GAC (Material Type 2) with Material Type 1 (sand), at a minimum dosage of [X]% (by dry weight, to be documented during Pre-Final 90% RD).

2. Contractor shall propose methodology and location for preparation of Material Type 3 for the Project Representative to review and approve.

3. Contractor shall provide a means of verification of the GAC content within Material Type 3, subject to acceptance by the Project Representative.

B. Engineered Cap Material Placement

1. Contractor shall conduct practice placement, as described in Article 3.01 of this Section, and obtain the Project Representative's acceptance of its placement methods prior to starting any Engineered Cap placement.

2. Contractor shall place Engineered Cap in a manner that does not result in mixing of the subgrade sediments with Engineered Cap materials. Placement via bottom dump barge is forbidden. Only equipment accepted by the Project Representative in the Engineered Cap Placement Plan can be used for the Work.

3. The Contractor shall not place any material at thicknesses above the upper end of the Vertical Placement Tolerance. Any material placed above this limit may require the Contractor to remove the material upon direction from the Project Representative.

4. Residuals Management Layer placement and verification - not incorporated into 50% RD but may be included in Pre-Final 90% RD.

5. Contractor may be allowed to place Engineered Caps by land-based methods if the Contractor receives acceptance from the Project Representative and provided that access agreements are in place. For any other location where the Contractor proposes land-based access and a Project Representative-provided access agreement is not provided, the Contractor is responsible for obtaining such access agreements in accordance with Section 01 41 26 (Permits, Easements, and Right-of-Entry Agreements).

6. Contractor shall place Engineered Cap materials in accordance with the requirements of

these Specifications to protect water quality during the completion of the Work. The Contractor shall minimize sediment resuspension and losses of capping material during placement.

7. Contractor shall describe Best Management Practices (BMPs) in its Engineered Cap Placement Plan to meet water quality criteria. These BMPs may be modified upon acceptance by the Project Representative, but must include at a minimum:

    a. Placing materials from bottom (toe) of the slope and working up the slope, allowing complete coverage of the designated area, and minimizing disturbance to existing sediments.

    b. Placing materials in a controlled manner. Contractor shall not place materials by rapid dumping of a barge or bucket load.

    c. Placing materials to avoid damage to previously placed Engineered Cap layers.

8. Contractor shall not drag equipment over areas with placed material to even out high spots.

9. Placement of Material Type 3 (Chemical Isolation Layer):

    a. Contractor shall place Material Type 3 at lowest possible water level.

    b. Contractor shall quickly lower equipment (bucket, etc.) below the water surface, and place Material Type 3 in a controlled manner.

    c. Contractor shall not touch the riverbed with placement equipment at any time.

    d. Contractor shall not release Material Type 3 from above the water surface or from higher than 2 feet above the riverbed.

    e. Placement of Material Type 3 adjacent to City Outfalls and under scour protection mattresses is under development during Pre-Final 90% RD.

10. Contractor shall collect and provide barge displacement measurements for all loaded material barges as they arrive at the Site. Barge displacement measurements, both empty and full, shall also be collected and provided as part of the Daily Construction Report at the end of each work shift and following placement of all materials stockpiled on the Contractor material barges.

11. The Contractor shall collect and store electronic records showing each placement location (i.e., “bucket maps”) and include such information in a format acceptable to the Project Representative as part of the Daily Construction Report. Bucket map reports shall clearly indicate the Material Type associated with each bucket.

C. Material placement under existing structures:

1. Contractor is responsible for field-verifying dimensions, elevations, and horizontal and vertical clearances beneath structures prior to placing Engineered Cap materials.

2. Contractor shall proceed with caution when placing materials and maintaining, navigating, or repositioning floating vessels or other equipment around structures.

3. Contractor shall protect all existing structures during under-pier placement and immediately report any incidents that may have caused damage to the Project Representative.

    a. Contractor is responsible for reviewing the structural as-built drawings and other conditions under the structures to be encountered during placement activities (see Section 01 13 00 – Reference Material).

    b. Contractor will be solely responsible for performing any corrective actions to repair damage caused by Contractor.

4. Contractor shall carefully select and implement effective means and methods for placing materials under existing structures that account for both the tidal and river stage fluctuations that may occur during construction, and potentially limited access under the structures, to prevent damage to any portion of the existing structures. Physical access is anticipated to be limited, and clearances are anticipated to fluctuate rapidly.

END OF SECTION

SECTION 35 43 35

SCOUR PROTECTION MATTRESSES

PART 1 GENERAL

1.01 SUMMARY

A. This Work consists of construction of scour protection mattresses as indicated on the Drawings.

1.02 DESCRIPTION OF WORK

A. The Work under this section consists of furnishing all labor, materials, equipment, and incidentals required and performing all operations in connection with the installation of the concrete mattress scour protection system in accordance with the lines, grades, design, and dimensions shown on the Contract Drawings and as specified herein. If the contractor has less than 3 years' experience installing similar mats, they must request the selected fabric formed concrete manufacturer's representative provide on-site technical assistance at the beginning of the installation until the contractor is sufficiently experienced to complete the remaining installation to the satisfaction of the manufacturer's representative and the Project Representative.

1.03 RELATED SECTIONS

A. Remedial Dredging, Barge Dewatering, and In-Water Transportation – Section 35 24 20

B. Engineered Caps – Section 35 3710.

C. Cast-In-Place Concrete – Section 03 30 00

1.04 REFERENCES

A. This Project is conducted under the jurisdiction of U.S. Environmental Protection Agency (EPA) Region 10. Work for this Project will be performed in accordance with the EPA Record of Decision (ROD) (EPA, 2017); therefore, compliance with Applicable or Relevant and Appropriate Requirements (ARARs) for the Swan Island Basin (SIB) Project Area within the Portland Harbor Superfund Site (PHSS) cleanup remedy is required. See Section 01 13 00 – Reference Material for additional information on the ROD. The Work described in this Section will be conducted in general accordance with the environmental provisions of relevant local, state, and federal regulations, as listed in Section 01 41 00 - Regulatory Requirements. In case of conflict between the requirements of this Section and those listed in Section 01 41 00 - Regulatory Requirements, the more stringent requirement shall prevail. If the Contractor identifies a more stringent requirement within the laws and regulations, the Contractor shall fully comply with such requirement.

B. Additional referenced standards applicable to this Section include, but are not limited to, the following:

1. ASTM International (ASTM):

   a. C31, Making and Curing Concrete Test Specimens in the Field.

   b. C33, Concrete Aggregates.

   c. C94, Ready-Mixed Concrete.

   d. C109, Compressive Strength of Hydraulic Cement Mortars.

   e. C150, Portland Cement.

   f. C260, Air-Entraining Admixtures for Concrete.

   g. C494, Chemical Admixtures for Concrete.

   h. C618, Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.

   i. C685, Standard Specification for Concrete Made by Volumetric Batching and

Continuous Mixing

j. C1602, Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete

k. C1603, Standard Test Method for Measurement of Solids in Water

l. D2061, Standard Test Methods of Strength Tests for Zippers

m. D2256, Standard Test Method for Tensile Properties of Yarns by the Single-Strand Method.

n. D4354, Standard Practice for Sampling of Geosynthetics and Rolled Erosion Control Products for Testing.

o. D4491, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.

p. D4533, Standard Test Method for Trapezoidal Tearing Strength of Geotextiles.

q. D4595, Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Method.

r. D4632, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.

s. D4751, Standard Test Methods for Determining Apparent Opening Size of a Geotextile.

t. D4759, Standard Practice for Determining the Specification Conformance of Geosynthetics.

u. D4873, Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples.

v. D4884, Standard Test Method for Strength of Sewn or Bonded Seams of Geotextiles.

w. D5199, Standard Test Method for Measuring the Nominal Thickness of Geosynthetics.

x. D5261, Standard Test Method for Measuring Mass per Unit Area of Geotextiles.

y. D6241, Standard Test Method for Measuring Static Puncture Strength of Geotextiles and Geosynthetic-Related Products Using a 50-mm Probe.

1.05 DEFINITIONS

A. For this section, the following definitions shall apply:

1. Compaction: The densification of a soil by means of mechanical manipulation.

2. Subgrade: The ground surface usually specially prepared against which mattress lining shall be placed. In cases where lining is to be retained the same shall be considered as subgrade.

3. Fabric Form: The fabric used in the manufacture of fabric formwork units shall be a specially woven polyamide/polypropylene/polyester fabric that is designed to avoid entrapped water voids. The porous fabric shall allow the concrete to bleed, giving off its surface free water and thus reducing the pressures acting upon it. This allows the strength of the concrete to be higher than normal for a given concrete mix, while retaining fluidity during placement and allow for the bleeding described above. In addition, the fabric shall allow the concrete to be protected from scour and erosion until the mix acquires sufficient strength. Concrete mattress linings are installed by positioning fabric forms over the areas to be protected and then pumping, high-strength, fine aggregate concrete into the forms. The fabric forms can be placed and filled either underwater or in-the-dry. The high-strength, fine aggregate concrete is used in place of conventional concrete because of its pumpability, high-strength, impermeability, and absorption resistance.

4. Concrete Mattress: Concrete Mattress is an erosion protection system with many applications in hydraulic engineering and coastal protection. The fabric mattress consists of two high-strength polyamide and/or polyethylene woven layers connected together by

interwoven thickness ties. This forms a uniform space between the two layers so that they act as a flexible formwork. Once filled, the concrete mattress linings become a pillow shaped mattress.

5. Linings: Linings that provide an erosion resistant, impermeable concrete lining having a brick pattern surface and a relatively low coefficient of hydraulic friction. The thickness and weight of the lining is controlled by spacer cords.

6. Baffle: Baffles are flow-directing vertical geotextile walls constructed between fabric form sections and the top and bottom layers. Baffles are an integral part of the fabric form design. Baffles are designed to support the panel section, determine the concrete area of the section and direct the flow of fine aggregate concrete for maximum efficiency.

7. Slide Fastener (Zipper): A zipper or zipper like devise having two grooved plastic edges joined by a sliding tab or pull.

1.06 SUBMITTALS

B. Refer to Section 01 33 00 (Submittal Procedures).

C. Pre-Construction Submittals:

1. Product Data: Manufacturers specifications, product performance test data, and installation instructions; technical data substantiation that products comply with design requirements; fabric porosity test, and any recommendations, if applicable, that are specifically related to the project.

2. Mat Manufacturer's Certificate: Manufacturer's statement that the supplied fabric forms meet the performance and dimensional criteria of this specification, as measured in full accordance with the test methods and standards referenced herein.

3. Shop Drawings: Complete layout and details for fabrication and assembly of mat system.

   a. Indicate the type and size of components and verification that mattress seam dimensions will permit filling with the required volume of grout to achieve the required weight per unit area for each type of mat supplied.

   b. Provide setup and sequencing drawings and directions for installation of mats.

4. Concrete Design and Concrete Batch Ticket Information.

   a. Type, brand, and amount of cement,

   a. Class, brand, and amount of coal fly ash, or raw or calcined natural pozzolans,

   b. Type, brand, and quantity of admixtures.

   c. Source and amount of batch water.

   d. Information necessary to calculate the total mixing water. Total mixing water includes water on fine aggregates, batch water (metered or weighted) including ice batched at the plant, wash water retained in the mixing drum, and water added by the truck operator from the mixer tank,

   e. Amount of fine aggregate,

   f. Ingredients certified as being previously approved, and

   g. Signature or initials of manufacturer's' representative.

5. The manufacturer, prior to the actual delivery of the fine aggregate concrete, shall furnish a statement to the contractor, giving the dry mass of cement and saturated surface-dry-mass of fine aggregate and quantities, type, and name of admixtures (if any) and the water per cubic yard (or cubic meter) of fine aggregate concrete that will be used in the manufacture. The manufacturer shall furnish evidence satisfactory to the contractor that the materials to be used and proportions selected will produce fine aggregate concrete of the quality specified in this specifications and Contract Drawings.

6. Material testing reports prepared by a certified geotextile laboratory attesting to the fabric form material's compliance with this Specification. Material laboratory testing shall have been performed within 90 days of the bid date.

7. Installer Qualifications.

1.07 QUALITY ASSURANCE

A. Installer Qualifications: Firm with minimum 5 years successful experience in installation of scour protection projects similar to this project, including minimum 3 years successful experience in installation of the specified system.

1. Installer shall be approved in writing by manufacturer of specified system.

2. Underwater divers shall be commercially certified by an accredited school and provide written certification(s).

B. Contractor shall conform to requirements referenced in Section 3.6, Field Quality Control – Concrete Mat.

1.08 JOB CONDITIONS

A. Navigation Interference: Refer to Section 01 31 00 (Project Management and Coordination) for all requirements related to interference with navigation during Engineered Cap placement activities.

B. Adjacent Tenants and Property Owners

1. Tenants and property owners adjacent to the SIB Project Area will be using in-water portions of the SIB Project Area and other adjacent upland and in-water areas for their operations. The Contractor shall comply with site access and timing requirements described in Section 01 41 26 – Permits, Easements, and Right-of-Entry Agreements).

PART 2 PRODUCTS

2.01 FABRIC MATERIAL FOR CONCRETE MAT

A. Characteristics: Woven polyamide/polypropylene/polyester fabric joined in a mat configuration. The opening size in the fabric, O_{90}, should be less than the D_{50} size of the sand in the micro concrete mix to ensure micro concrete tightness.

1. The fabric forms for casting the concrete lining(s) shall be as specified herein, as manufactured by Proserve Ltd (https://proserveltd.co.uk, office@proserveltd.co.uk) or approved equal.

2. Mattress Thickness: The local surface undulation of the constant thickness mattress is to be less than 20 mm, surface undulation factor I_Q = 1.15. See table below and Drawings for Minimum Nominal Dimensions.

PHYSICAL PROPERTIES	M1	M2	M3	S2
Average Thickness (in)	22	22	14	14
Mass Per Unit Area (lb/sq ft)	90	135	226	226
Nominal Mattress Dimensions (min)	50' x 65'	40' x 70'	36' x 55'	20' x 70'
Hydraulic Design Properties				
Shear Resistance (lb/sq ft)	52	78	14	14

B. The fabric forms for casting the concrete linings shall be as specified in the following table. The fabric forms shall be composed of synthetic yarns formed into a woven fabric. Yarns used in the manufacture of the fabric shall be composed of polyester. Each layer of fabric shall conform to the physical, mechanical, and hydraulic requirements, Minimum Average Roll Values (MARV) listed in table below. The fabric forms shall be free of defects or flaws which significantly affect their physical, mechanical, or hydraulic properties.

	TEST METHOD	UNITS	MARV
PHYSICAL PROPERTIES			
Composition of Yarns	NA	NA	Polyester
Mass Per Unit Area (double-layer)	ASTM D 5261	oz/CY	12
Thickness (single-layer)	ASTM D 5199	mils	15
Mill Width (Woven)		inch	196
Mechanical Properties			
Wide-Width Strip Tensile Strength - MD | TD	ASTM D 4595	lbs/inch	250 - 140
Elongation at Break - MD | TD - Max.		%	20 - 20
Trapezoidal Tear Strength - MD | TD	ASTM D 4533	lbs	150 -175
CBR Puncture Strength	ASTM D 6241	lbs	1250
Mullen Burst Strength	ASTM D 3786 (Mod.)	psi	500
HYDRAULIC PROPERTIES			
Apparent Opening Size (AOS)	ASTM D 4751	U.S. Standard Sieve	30 - 40
Flow Rate	ASTM D 4491	gal/min/ft^2	30 - 55

Notes:
Conformance of fabric to specification property requirements shall be based on ASTM D 4759.
All numerical values represent minimum average roll values (i.e., average of test results from any sample roll in a lot shall meet or exceed the minimum values). Lots shall be sampled according to ASTM D 4354.
%: percent
CY: cubic yard
Ft^2: square foot
gal: gallon
lbs: pounds
min: minute
NA: not applicable
oz: ounce
psi: pounds per square inch

2.02 FINE AGGREGATE CONCRETE FOR FILLING CONCRETE MATS

A. Fine aggregate concrete shall consist of a mixture of Portland cement, fine aggregate (sand) and water, so proportioned and mixed as to provide a pumpable fine aggregate concrete.

B. The water/cement ratio of the fine aggregate concrete shall be specified by the ready-mix manufacturer, and submitted for approval per paragraph 1.06 SUBMITTALS. The pumping of fine aggregate concrete into the fabric forms causes a reduction in the water content by filtering excess mixing water through the permeable fabric. The reduction of mixing water substantially improves the water/cement ratio of the in-place fine aggregate concrete thereby increasing its strength and durability. The sand/cement ratio should be specified by the ready-mix manufacturer and should be submitted for approval per paragraph 1.06 SUBMITTALS.

C. The consistency of the fine aggregate concrete delivered to the concrete pump should be proportioned and mixed as to have a flow time of 7-9 seconds when passed through the ¾-inch [19 mm] orifice of the standard flow cone that is described in ASTM C6449-99. Additional Pozzolan and/or admixtures may be used with the approval of the Project Representative. The water/cement ratio varies with the exact granulometry of the fine aggregate (sand) and should be specified by the ready-mix manufacturer using the above referenced flow cone.

D. The Contractor should demonstrate the suitability by placing the proposed fine aggregate concrete mix into concrete grout prisms per ASTM C1019. The mix should exhibit a minimum compressive strength of 4,000 psi at 28 days, when made and tested in accordance ASTM C1019. As a result of the process outlined in the following paragraph, the actual compressive strength inside the fabric forms will be higher than that determined through the sampling and testing.

E. A typical loss of approximately 15% of the total mixing water is to be expected and accounted for

in the mix design. The mixing water reduction will also result in an increase of approximately 8% in the sand and cement per cubic foot of concrete. The range of fine aggregate concrete mix proportions provided in table below has been developed under a variety of field conditions as a reference only. The ready mix manufacturer shall be responsible for providing an adequate mix design for this application.

MATERIAL	AS DELIVERED MIX PROPORTIONS (LB/CY)	AFTER PLACEMENT MIX PROPORTIONS (CY)
Cement	750-850	805-915
Sand	2120-2030	2290-2190
Water	540-555	460-470
Air	As Required	As Required

2.03 FINE AGGREGATE CONCRETE COMPONENTS

A. The contractor shall delegate full responsibility for the selection of the proportions for the concrete mixture to the concrete manufacturer.

B. Portland cement should conform to ASTM C 150/150M, Type I, II or V. Pozzolan grade fly ash may be substituted for up to 35% of the cement as an aid to pumpability. (The pumpability of fine aggregate concrete mixes containing course sand is improved by the addition of fly ash.) Pozzolan, if used, should conform to ASTM C 618, Class C, F or N.

C. Mix Design: Comply with ASTM C 476 for fine consistency.

1. Compressive Strength: 4,000 psi at 28 days.

2. Slump: The specified concrete mix is highly fluid self-levelling (collapse slump). Fluidity is to be controlled by flow time of 7-9 seconds when passed through the ¾-inch [19 mm] orifice of the standard flow cone that is described in ASTM C6449-99.

3. Do not add admixtures unless approved in writing by the Project Representative.

D. Fine Aggregate: Fine aggregate should consist of suitable clean, hard, strong and durable natural or manufactured sand. It should not contain dust, lumps, soft or flaky materials, mica or other deleterious materials in such quantities as to reduce the strength and durability of the concrete, or to attack any embedded steel, neoprene, rubber, plastic, etc. Motorized sand washing machines should be used to remove impurities from the fine aggregate. Fine aggregate having positive alkali-silica reaction should not be used. All fine aggregates should conform to ASTM C33/C33M-13. The fine aggregate should not have more than 45% passing any sieve and retained on the next consecutive sieve of those shown in table below. The fineness modulus of fine aggregate should neither be less than 2.3 nor greater than 3.1. Fine aggregate with grading near the minimum for passing the No. 50 and No. 100 sieve sometimes have difficulties with workability or pumping. The additions of entrained air, additional cement, or the addition of an approved mineral admixture to supply the deficient fines, are methods used to alleviate such difficulties.

SIEVE	PERCENT BY WEIGHT PASSING THE SIEVE
9.5-mm (3/8-in.)	100
4.75-mm (No. 4)	95 to 100
2.36-mm (No. 8)	80 to 100
1.18-mm (No. 16)	50 to 85
600-µm (No. 30)	25 to 60
300-µm (No. 50)	5 to 30
150-µm (No. 100)	0 to 10
75-µm (No. 200)	0 to 3

Notes:
µm: micrometer
mm: millimeter

E. Fine aggregate failing to meet these grading requirements can be utilized provided that the supplier can demonstrate to the specifier that fine aggregate concrete of the class specified, made with fine aggregate under consideration, will have relevant properties at least equal to those of fine aggregate concrete made with same ingredients, with the exception that the referenced fine aggregate will be selected from a source having an acceptable performance record in similar fine aggregate construction.

F. ASTM C33/C33M-13 defines the requirements for grading and quality of fine aggregate for use in fine aggregate concrete and is for use by a contractor as part of the purchase document describing the material to be furnished.

G. Water used for mixing and curing shall be clean and free from injurious amounts of oils, acids, alkalis, salts, sugar, organic materials or other substances that may be deleterious to concrete.

ASTM C1602/C1602M-12 covers the compositional and performance requirements for water used as mixing water in hydraulic cement fine aggregate concrete. It defines sources of water and provides requirements and testing frequencies for qualified individual or combined water sources.

H. Plasticizing and Air Entraining Admixtures:

Grout/Cement fluidifier, water reducing or set time controlling agents may be used as recommended by their manufacturers to improve the pumpability and set time of the fine aggregate concrete.

Any air entraining agent or any other admixture may be used, as approved, by the Project Representative to increase workability, to make concrete impervious and more durable. Air entraining admixture should conform to ASTM C494/C494M and ASTM C260/C260M, respectively. Mixes designed with 5% to 8% air content will improve the pumpability of the fine aggregate concrete, freeze-thaw and sulfate resistance of the hardened concrete.

2.04 ACCESSORIES

A. Fine aggregate fill valves: Fabric manufacturer shall supply integrated fine aggregate filler valves/ports with the fabric mats. Valves are to be capped securely upon completion of the filling of each mat section.

2.05 GEOTEXTILE FABRIC

A. Constant-thickness fabric-formed concrete mattresses are required. An additional geotextile layer is not needed under this type of mattress, as the continuous concrete slab prevents any erosion or suffusion through the mattress.

PART 3 EXECUTION

3.01 EXAMINATION AND PREPARATION

A. Verify that surfaces to be protected with scour protection system have been prepared and graded to the slopes and depths required by pre-survey. Areas on which fabric forms are to be placed shall be constructed to the lines, grades, contours, and dimensions shown on the Contract Drawings. The areas shall be excavated to a flat, plane surface with an allowable tolerance of plus or minus 0.3 feet from the design grade.

B. Reshape slopes if shifted or changed.

C. Trenches shall be excavated around the external perimeter of the scour protection mat system per the drawings to bury and anchor the Mat ends. All excavation work shall be consistent with Section 35 24 20 Remedial Dredging, Barge Dewatering, and In-Water Transportation.

D. The areas shall be free of any debris, obstructions, and organic material , such as concrete, timber, and projecting stones. Where required by Related Sections, soft and otherwise unsuitable subgrade soils shall be identified, excavated and replaced with select materials in accordance with the Contract Specifications and Drawings. Where areas are below the indicated grades, the system shall be installed per the drawings and these specs from the existing grade level. No fill shall be placed in the area of Fabric Mat placement other than for localized leveling to aid in the mat placement.

E. Material such as fabric panels and geotextile filter fabric shall be stored at the job site, or nearby, in a clean, dry area, not exposed to moisture or direct sunlight.

F. Do not begin placement of scour protection system until unsatisfactory conditions have been corrected and field-verified by the Project Representative.

G. The terminal edges of the fabric form lining should be keyed into the subgrade to the lines, grades, and dimensions shown on the Contract Drawings.

3.02 WORK AREA ISOLATION

A. So that construction operations progress successfully, the excavation areas shall be isolated and protected from impacts from hydrodynamic conditions to prevent sloughing of excavation slopes and deposition of suspended sediments. The Contractor shall use an isolation system capable of withstanding the hydrodynamic conditions at the Work Area during the construction of the scour protection structure to protect the excavation and installed materials. A description of the proposed work isolation method, if required, shall be submitted to the Project Representative.

3.03 GEOTEXTILE FILTER FABRIC PLACEMENT

A. The Geotextile filter fabric is to be mechanically attached to the scour protection mat under which it is to be placed, and free of folds and wrinkles prior to in-water placement.

B. The geotextile filter fabric and mat shall be placed so that the upstream roll of geotextile fabric overlaps the downstream roll. The longitudinal and transverse joints will be overlapped at least two (2) feet. The geotextile will extend at least one (1) foot beyond the top and bottom concrete lining termination points, or as required by the Project Representative.

C. Placement of geotextile fabric shall be performed only after review of post-dredging multi-beam survey and approval by the Project Representative (see Section 35 24 20 Remedial Dredging, Barge Dewatering, and In-Water Transportation .

3.04 INSTALLATION – FABRIC FORMWORK PLACEMENT FOR CONCRETE MATS

A. Factory assembled fabric form panels with the pre-attached geotextile fabric shall be placed within the limits shown on the Contract Drawings. Perimeter termination of the fabric forms shall be accomplished through the use of anchor, flank and toe trenches, as shown on the Contract Drawings. When placing panels, an allowance for contraction of the form in each direction which will occur as a result of fine aggregate concrete filling, should be identified and accounted for. The contractor shall gather and fold the additional slope direction fabric form in the anchor trench to be secured in such a manner as to be gradually released as fabric forms contract during filling.

The contractor shall gather the additional transverse direction fabric form at each baffle for self release during filling.

B. Adjacent fabric form panels shall be joined in the field by means of sewing before in-water placement or zippering in-water. Adjacent panels shall be joined top layer to top layer and bottom layer to bottom layer. All field seams shall be made using two lines of U.S. Federal Standard Type 101 stitches. All sewn seams shall be downward facing.

C. Immediately prior to filling with fine aggregate concrete, the assembled fabric forms shall be inspected by the commercially certified divers retained by contract or survey for verification, and no fine aggregate concrete shall be pumped therein until the fabric seams between panels have been approved.

D. At no time shall the unfilled fabric forms be exposed to ultraviolet light (including direct sunlight) for a period exceeding five (5) days.

E. Fine Aggregate Concrete Placement

1. Following the placement of the fabric forms with attached geotextile filter fabric, fine aggregate concrete shall be pumped between the top and bottom layers of the fabric form through the manufacturer supplied fill-valves/ports, filling the forms to the recommended thickness and configuration. No cuts shall be made in the fabric for the purpose of filling.

2. Manufacturer installed fill-valves/ports are to be securely capped after the removal of the filling pipe.

3. Fine aggregate concrete shall be pumped in such a manner that excessive pressure on the fabric forms is avoided. Consultation with the fabric form manufacturer regarding the selection of grout/concrete pumps is recommended.

4. Cold joints shall be avoided. A cold joint is defined as one in which the pumping of the fine aggregate concrete into a given section of form is discontinued or interrupted for an interval of forty-five (45) or more minutes.

5. The sequence of fine aggregate concrete shall be such as to ensure complete filling of the fabric formed concrete lining to the thickness specified by the Engineer. The flow of the fine aggregate concrete shall first be directed into the lower edge of the fabric form and working back up the slope, followed by redirecting the flow into the anchor trench.

6. Prior to removing the filling pipe from the current concrete lining section and proceeding to the fine aggregate concrete filling of the adjacent lining section, the thickness of the current lining section shall be measured by inserting a length of stiff wire through the lining at several locations from the crest to the toe of the slope. The average of all thickness measurements shall be not less than the specified average thickness of the concrete lining. Should the measurements not meet the specified average thickness, pumping shall continue until the specified average thickness has been attained.

7. Excessive fine aggregate concrete that has inadvertently spilled on the concrete lining surface shall be removed. The use of a high-pressure water hose to remove spilled fine aggregate concrete from the surface of the freshly pumped concrete lining is not permitted. Collect in accordance with the permit requirements.

8. No placement of any items of any kind will be permitted on the freshly pumped concrete lining when such placement will cause permanent indentations in the lining surface.

9. After the fine aggregate concrete has set, all anchor, flank and toe trenches shall be backfilled and compacted flush with the top of the concrete lining and as shown in the drawings. The integrity of the trench backfill must be maintained so as to ensure a surface that is flush with the top surface of the concrete lining for its entire service life. Toe trenches shall be backfilled as shown on the Contract Drawings. Backfilling of trenches shall be completed in a timely fashion to protect the completed concrete lining. No more than five hundred (500) linear feet of pumped concrete lining with non-completed anchor, anchor, flank, or toe trenches will be permitted at any time.

3.05 FIELD QUALITY CONTROL - CONCRETE MAT

A. The Contractor shall employ an independent testing laboratory to perform field tests and to submit test reports, except as designated otherwise.

B. Sampling Fresh Fine Aggregate concrete/Grout: ASTM C 172, except modified for slump to comply with ASTM C 94.

1. Slump: ASTM C 143; one test at point of discharge for each set of compression cylinders taken; additional tests when grout consistency appears to have changed. In addition, Contractor shall perform one test on each truck load of grout delivered to the site.

2. Molded Grout Compression Cylinders: Sample in accordance with ASTM C 172; process and cure in accordance with ASTM C 31; prepare and test in accordance with ASTM C 39.

a. Obtain one set of 4 cylinders for every 50 cu. Yd. or fraction thereof of each mix design.

b. Test one cylinder at age 7 days, and 2 cylinders for one valid strength test at 28 days.

c. Cure and hold fourth cylinder for testing at 42 days if 28 day test indicated deficient results, or as a spare in case of cylinder damage.

C. Sampling Underwater Concrete: Sample and test in accordance with section entitled "Cast In-Place Concrete" – Section 03 30 00.

D. Underwater Camera Review:

1. Provide and maintain at the site an underwater closed-circuit television for monitoring the Work. Provide special underwater television review at any time during construction upon request by the Project Representative.

2. The following activities shall be checked and recorded during the installation of each mattress panel:

a. Trench preparation,

d. Placement of fabric mat in trench,

e. Underwater zipping of adjacent sections,

f. Fine aggregate filling of each section,

g. Capping of the fill valves/ports,

h. Mat thickness verification,

i. Back fill of trench

j. Capping of trench.

3. Final record video: Upon completion of Work at each site, provide video record of installation, in digital mpeg format. Record video shall include entire toe of mat, joints between mat and other structures, including but not limited to bulkhead walls and pilings, and above water slope. Record video shall be clearly labeled for each site and date of recording.

E. Final Survey: [Requirements to be determined at Pre-Final 90% RD].

END OF SECTION

APPENDIX T

PRELIMINARY DRAWINGS

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PRELIMINARY DRAWINGS
DRAFT 50% REMEDIAL DESIGN

REMEDIAL DESIGN SERVICES
SWAN ISLAND BASIN PROJECT AREA
CERCLA DOCKET NO. 10-2021-001

PORTLAND HARBOR SUPERFUND SITE
PORTLAND, MULTNOMAH COUNTY, OREGON

Prepared for:

Swan Island Basin Remedial Design Group

Prepared by:

11107 Sunset Hills Road, Suite 400
Reston, Virginia 20190

With assistance from:

PACIFIC groundwater GROUP · MOTT MACDONALD · BRIDGEWATER GROUP · COAST & HARBOR ENGINEERING

March 2025

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PRELIMINARY DRAWINGS
DRAFT 50% REMEDIAL DESIGN

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PORTLAND HARBOR SUPERFUND SITE
PORTLAND, MULTNOMAH COUNTY, OREGON

Prepared for:

Swan Island Basin Remedial Design Group

Prepared by:

HydroGeoLogic, Inc.
11107 Sunset Hills Road, Suite 400
Reston, Virginia 20190

With assistance from:

Mott MacDonald
Pacific Groundwater Group
Coast & Harbor Engineering
Bridgewater Group

March 2025

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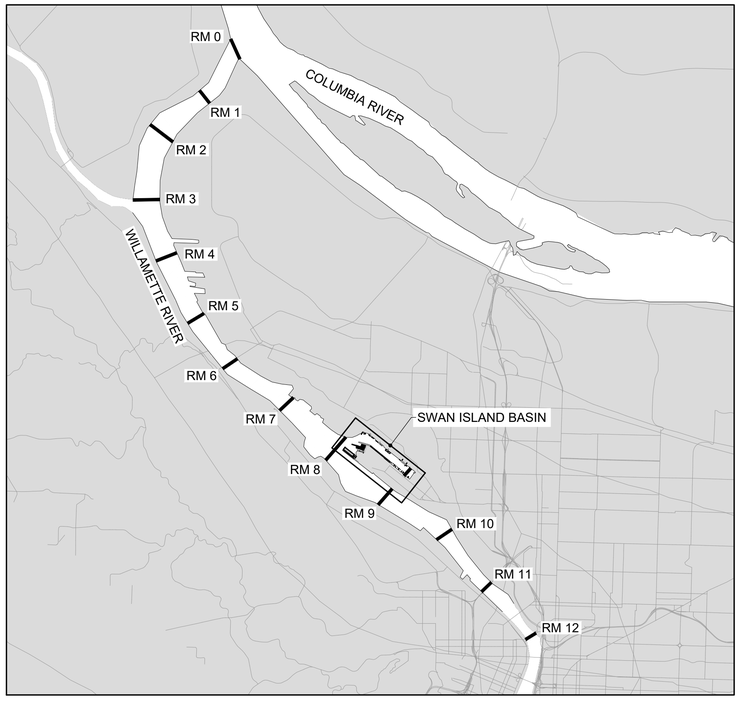
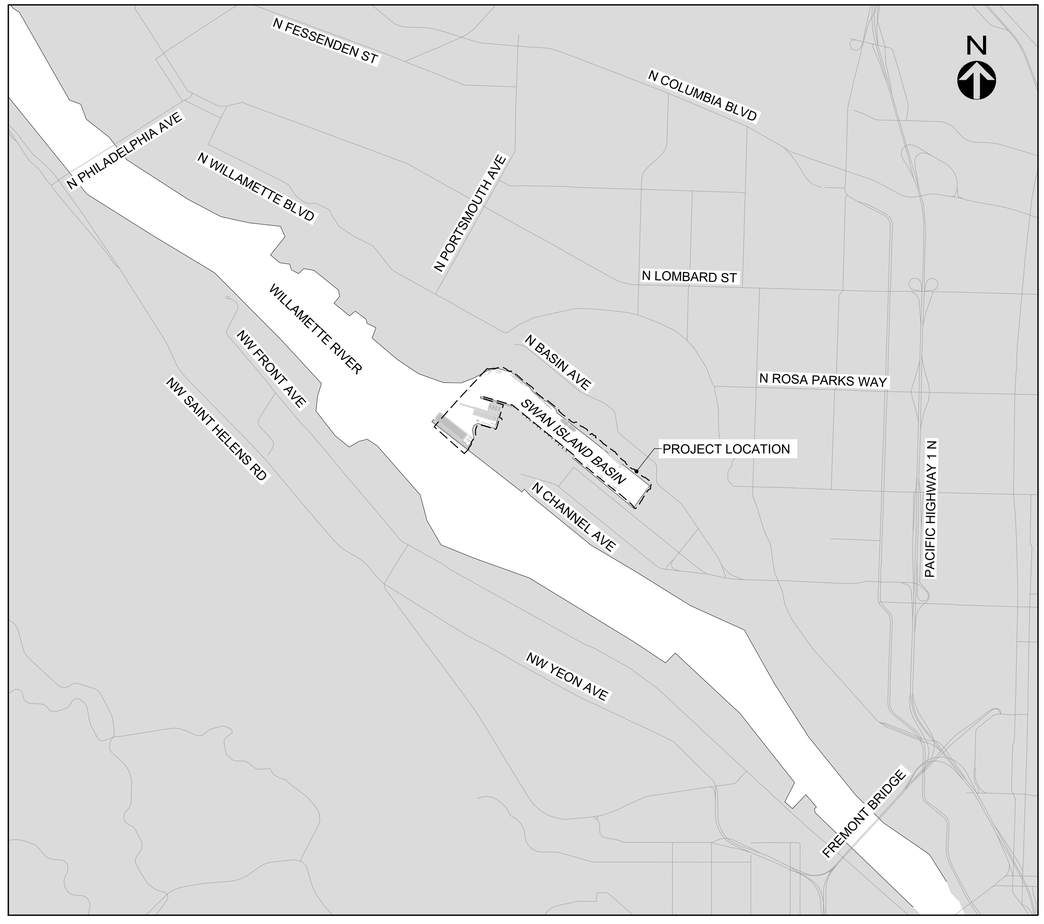
SWAN ISLAND BASIN PROJECT AREA
REMEDIAL DESIGN

PORTLAND, OREGON

CERCLA DOCKET NO. 10-2021-001



LOCATION MAP
NOT TO SCALE



VICINITY MAP
0 2000 4000
SCALE IN FEET

PROJECT CONTACTS:

CLIENT:

SWAN ISLAND BASIN REMEDIAL DESIGN GROUP

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Designed			Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: As Noted	Status		Rev		Security

Project Number	B/O	Total
507100742	1	134

Drawing Number: GI100

Title: Swan Island Basin Project Area Remedial Design

Cover Sheet and Vicinity Map

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	2	134

Designed			Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	

Drawing Number: GI101

Title: Swan Island Basin Project Area Remedial Design

Drawing Index

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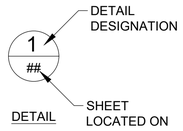
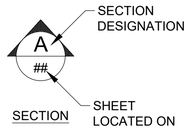
ABBREVIATIONS

ADJ	ADJACENT
APPROX	APPROXIMATE
B/	BOTTOM
BLDG	BUILDING
BM	BENCHMARK
B.O.	BOTTOM OF
BODR	BASIS OF DESIGN REPORT
BTM	BOTTOM
CFR	CODE OF FEDERAL REGULATIONS
CIL	CHEMICAL ISOLATION LAYER
CIMP	COMMUNITY IMPACTS MITIGATION PLAN
CL	CENTERLINE
CLR	CLEAR
CONC	CONCRETE
CONT	CONTINUOUS
COP	CITY OF PORTLAND
CP	CONTROL POINT
COR.	CORRIDOR
CT	COURT
CTR	CENTER
DWG	DRAWING
E	EAST/EASTING
EA	EACH
EL / ELEV	ELEVATION
EOP	EDGE OF PAVEMENT
ENC	ELECTRONIC NAVIGATION CHART
ENT	ENTRANCE
EPL	EROSION PROTECTION LAYER
EQ	EQUAL
EX	EXISTING
EXT	EXENSION
F.H.	FIRE HYDRANT
FRP	FIBER REINFORCED POLYMER
FT	FEET
GAC	GRANULAR ACTIVATED CARBON
HORIZ	HORIZONTAL
HTL	HIGH TIDE LINE
HW	HIGH WATER
IN	INCH
LOC	LIMIT OF CONSTRUCTION
LT	LEFT
MAX	MAXIMUM
MC	MARINE CONSORTIUM
MHW	MEAN HIGH WATER, DEFINED AS +13 FT NAVD88
MHHW	MEAN HIGHER HIGH WATER
MIN	MINIMUM
MLW	MEAN LOW WATER
MLLW	MEAN LOWER LOW WATER
N	NORTH/NORTHING
NAD83	NORTH AMERICAN DATUM OF 1983
NAVD88	NORTH AMERICAN VERTICAL DATUM OF 1988
NAV	NAVIGATION
NE	NORTHEAST
NO	NUMBER
NTS	NOT TO SCALE
NW	NORTHWEST
OC	ON CENTER
OHL	OVER HEAD LINE
OHSA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OHW	ORDINARY HIGH WATER
OLW	ORDINARY LOW WATER
OPP	OPPOSITE
PAV'T	PAVEMENT
PC	POINT OF CURVATURE
PHSS	PORTLAND HARBOR SUPERFUND SITE
POP	PORT OF PORTLAND
RDWP	REMEDIAL DESIGN WORK PLAN
RECT	RECTANGLE
REF	FOR REFERENCE ONLY
REG.	REGULAR
REQ/REQ'D	REQUIRED
REV	REVISION
RFP	REQUEST FOR PROPOSAL
ROW	RIGHT OF WAY
R.R.	RAILROAD
RT	RIGHT
S	SOUTH
SD	STORMDRAIN
SE	SOUTHWEST
SHLDR	SHOULDER
SIM	SIMILAR
SMA	SEDIMENT MANAGEMENT AREA
SQ	SQUARE
SS	STAINLESS STEEL OR SEWER SYSTEM OR SANITARY SEWER
ST	STREET
STA	STATION
STD	STANDARD
SW	SOUTHWEST
SWDM	SURFACE WATER DESIGN MANUAL
SWPPS	STORMWATER POLLUTION PREVENTION PLANS
T	THICK
T/	TOP
TCB	TO BE CONFIRED
TBD	TO BE DETERMINED
TEMP	TEMPORARY
TESC	TEMPORARY EROSION AND SEDIMENT CONTROL
T.O.	TOP OF
TOC	TOP OF CAP
TRKS	TRACKS
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
US	UNITED STATES
USCG	UNITED STATES COAST GUARD
UXOS	UNEXPLODED ORDNANCE
VERT	VERTICAL
W	WATER LINE
WP	WORKING POINT
W/	WITH
WS	WATER SURFACE
YR	YEAR
@	AT
'	MINUTES OR FEET
"	SECONDS OR INCHES
°	DEGREES
%	PERCENT

TYPICAL REFERENCE SYMBOL (2-PART)





LEGEND

- PROJECT AREA
- FEDERAL NAVIGATION CHANNEL
- PROJECT BASE LINE
- PROPERTY LINE
- R# — PARCEL NUMBER
- BENCHMARK
- DEBRIS GREATER THAN 5'
- VEGETATION
- RIPRAP SHORELINE
- WOOD DEBRIS
- FINAL BERTH POCKET
- NEW ROCK REVETMENT TYPE 1
- NEW ROCK REVETMENT TYPE 2, ROCK REVETMENT SHEAR KEY
- PLANTED SLOPE
- SAND
- BACKFILL
- MATERIAL PROCESSING AREA
- CAP TYPE 1
- CAP TYPE 2
- RAMP REPLACEMENT MATERIAL
- A — A — AIR LINES
- E — E — ELECTRIC LINES
- HE — HE — HIGH VOLTAGE ELECTRIC LINES
- HEAT LINES
- FIRE LINES
- G — G — GAS LINES
- O — O — O — OXYGEN LINES
- SS — SANITARY LINES
- SPRINKLER LINES
- ST — ST — STEAM LINES
- SD — STORM DRAINS
- TEL — TELECOMMUNICATION LINES
- W — W — WATER LINES
- MIXED UTILITIES
- UTILITY EASEMENT

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507100742	3	134

Designed	-		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	

Drawing Number: GI102

Title: Swan Island Basin Project Area Remedial Design

Abbreviations and Symbols Legend

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GENERAL REQUIREMENTS:

1. THE DETAILED REQUIREMENTS FOR ITEMS DESCRIBED IN THESE GENERAL NOTES ARE CONTAINED IN THE PROJECT SPECIFICATIONS.
2. DO NOT COMMENCE ANY CONSTRUCTION OPERATION UNTIL VERIFYING THAT ALL OF THE APPROPRIATE PERMITS FOR THIS PROJECT HAVE BEEN ACQUIRED.
3. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE STATE AND LOCAL CODES AND STANDARDS, THE PROJECT SPECIFICATIONS, AND PROJECT DRAWINGS. NOTES PROVIDED IN DRAWINGS SHALL TAKE PRECEDENCE OVER PROJECT SPECIFICATION DOCUMENTS. STATE AND LOCAL CODES SHALL TAKE PRECEDENCE OVER PROJECT SPECIFICATIONS AND NOTES ON DRAWINGS. NOTIFY PROJECT REPRESENTATIVE IMMEDIATELY OF ANY CONFLICTS BETWEEN STATE AND LOCAL CODES, PROJECT SPECIFICATIONS, AND PROJECT DRAWINGS PRIOR TO STARTING CONSTRUCTION.
4. FIELD CHECK AND VERIFY ALL ELEVATIONS, COORDINATES, DIMENSIONS, EXISTING CONDITIONS, AND INFORMATION CONTAINED IN THE CONTRACT DOCUMENTS PRIOR TO COMMENCEMENT OF WORK. NOTIFY THE PROJECT REPRESENTATIVE IMMEDIATELY OF ANY DISCREPANCIES FOUND ON THE CONTRACT DOCUMENTS OR FOUND TO EXIST BETWEEN THE FIELD CONDITIONS AND THE CONTRACT DOCUMENTS. TAKE CORRECTIVE ACTION AS DIRECTED BY THE PROJECT REPRESENTATIVE.
5. THE LOCATION AND DEPTH OF UTILITIES AND EASEMENT SHOWN ARE APPROXIMATE AND SHALL BE VERIFIED BEFORE WORK COMMENCES. PRIOR TO BEGINNING ANY EXCAVATION WORK IN THE AREA OF EXISTING UTILITIES, CONTACT THE APPROPRIATE UTILITY COMPANY(IES) FOR EXACT LOCATIONS AND DEPTHS TO PREVENT ANY DAMAGE OR INTERFERENCE WITH PRESENT FACILITIES.
6. NOTIFY OREGON UTILITY NOTIFICATION CENTER (DIAL 811 OR 800-332-2344) AND ALL KNOWN UTILITY OWNERS WITHIN THE WORK AREA AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION, PILING, OR OTHER DIGGING OPERATIONS. THIS ACTION SHALL IN NO WAY BE INTERPRETED AS RELIEVING THE CONTRACTOR OF THE RESPONSIBILITY UNDER THE TERMS OF THE CONTRACT AS SET OUT IN THE PLANS AND SPECIFICATIONS. REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION OPERATIONS AT NO EXPENSE TO THE OWNER AND TO THE SATISFACTION OF THE UTILITY COMPANY INVOLVED.
7. PROVIDE AND MAINTAIN ALL TRAFFIC CONTROL DEVICES DURING THE COURSE OF THE CONSTRUCTION PERIOD.
8. ALL COORDINATION REGARDING TRAFFIC WITHIN PHSS TO BE IN ACCORDANCE WITH PHSS CIMP.
9. COORDINATE WITH LOCAL PILOT AND HARBOR MASTER AND USCG ON MARINE TRAFFIC/MOVEMENTS SCHEDULES WHICH MAY AFFECT CONSTRUCTION WORKS OR TRAFFIC WITHIN THE FEDERAL CHANNEL.
10. ALL EXISTING ROADWAYS AND EXISTING FEATURES WHICH ARE DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED AT NO EXPENSE TO THE RA PERFORMING PARTIES TO THE SATISFACTION OF THE PROJECT REPRESENTATIVE.
11. CONTRACTOR SHALL MAINTAIN ALL REGULATORY AND WARNING SIGNS DURING THE CONSTRUCTION PERIOD.
12. SUBMIT ALL MATERIAL CERTIFICATES TO PROJECT REPRESENTATIVE FOR APPROVAL .
13. CONDUCT OPERATIONS SO AS TO NOT INTERFERE WITH, OR BE DETRIMENTAL TO, VESSEL AND VEHICULAR TRAFFIC AND THE DAILY OPERATION OF THE OWNER/OPERATORS DURING THE COURSE OF THE WORK.
14. PROVIDE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) - APPROVED WORKER SAFETY MEASURES FOR EXCAVATIONS AND TRENCHES IN ACCORDANCE WITH STANDARDS, 29 CFR 1926.650, 29 CFR 1926.651, AND 29 CFR 1926.652. COMPLY WITH ALL APPLICABLE STATE AND LOCAL REQUIREMENTS. THE GEOTECHNICAL REPORT IS INCLUDED IN THESE CONTRACT DOCUMENTS.
15. DRAWINGS REFLECT APPROXIMATE EXISTING CONDITIONS AS OF JANUARY 2025. FIELD INVESTIGATIONS WERE CONDUCTED BETWEEN 2022 AND 2024. CONDITIONS MAY BE SUBJECT TO CHANGE. CONTRACTOR TO VERIFY SITE CONDITIONS PRIOR TO START OF WORK.

HORIZONTAL AND VERTICAL CONTROL:

1. EXISTING ELEVATIONS SHOWN ON THE PLANS FROM THE UNIFIED ELEVATION MODEL (SEE BODR). ELEVATION DATA SOURCES USED IN COMPILATION OF THE UNIFIED ELEVATION MODEL INCLUDED THE FOLLOWING, IN ORDER OF PRIORITY:
   A. DAVID EVANS AND ASSOCIATES, 2015
   B. DAVID EVANS AND ASSOCIATES, 2018
   C. CITY OF PORTLAND, 2019
   D. HYDROGEOLOGIC, 2022

   THIS DATA IS SHOWN FOR INFORMATION ONLY. CONTRACTOR SHALL COMPLETE BATHYMETRIC AND TOPOGRAPHIC SURVEY PRIOR TO COMMENCING WORK.
2. ELEMENTS SHOWN ON DRAWINGS THAT ARE OUTSIDE OF THE SURVEYED BOUNDARIES ARE BASED ON INFORMATION FROM 2022 ETRAC MOBILE TERRESTRIAL LIDAR.
4. HORIZONTAL COORDINATES SHOWN ARE U.S. STATE PLANE ZONE (NAD 1983), OREGON NORTH, IN INTERNATIONAL FEET.
5. VERTICAL DATUM SHOWN ON THESE DRAWINGS REFERS TO NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 1988), IN INTERNATIONAL FEET.
6. MONUMENTS USED FOR HORIZONTAL AND VERTICAL CONTROL ARE AS FOLLOWS:

BENCHMARK #	NORTHING	EASTING	ELEVATION (FT)	DESCRIPTION
1585	699778.716	7634700.503	34.366	N.CURB; 54'N.-R.R.TRKS, F.H.#5; OPP.NW M-I WKS, BAY12
2081	700431.845	7633127.819	34.917	END PIER "C", TRIANGULATION POINT
2146	699867.105	7636891.856	33.821	E.CURB, BETWEEN BLDG 5820A & 5940
2315	700442.472	7633130.991	35.546	CURB; SE COR. OF PIER "C"
2395	702660.425	7633535.622	32.810	N SIDE SWAN ISLAND; 13'S OF ENT, 1.6'IN FROM W WING
2733	701434.455	7635216.254	34.436	SE COR.; 8' S OF PC
2777	702362.708	7634099.774	33.312	W.CURB; APPROX. 73'N.C/L FATHOM EXT
3157	702258.506	7634173.652	33.888	SE COR.; 1' S OF PC - REPLACES BM #2732
4643	699340.673	7635162.666	33.424	IN E. CURB, SE COR., 42' S. OF C/L DOLPHIN ST EXT

   FOR BENCHMARK LOCATION, SEE DRAWING NO. EX100
7. DATUM CORRELATION TABLE:

DATUM	VALUE	DESCRIPTION
OHW	+20.08	ORDINARY HIGH WATER
MHW	+13.00	MEAN HIGH WATER
OLW	+5.10	ORDINARY LOW WATER
COP	-2.10	CITY OF PORTLAND DATUM
NAVD 88	0.00	NORTH AMERICAN VERTICAL DATUM OF 1988

   WATER SURFACE LEVELS RANGE BETWEEN OLW AND OHW REPRESENTS A NORMAL STATISTICAL WATER SURFACE RANGE. THE WATER SURFACE WILL ON OCCASION BE HIGHER OR LOWER THAN THIS RANGE.
8. CONTRACTOR SHALL SET OR REFERENCE CONTROL POINTS OFF THE SITE WHICH WILL NOT BE AFFECTED BY THE NEW WORK.

SOIL BORINGS:

1. GEOTECHNICAL DATA REPORTS, INCLUDING BORING LOGS, FIELD AND LABORATORY TEST RESULTS, ARE INCLUDED IN APPENDIX OF RFP.

REFERENCE DOCUMENTS:

EPA, 2017. RECORD OF DECISION, PORTLAND HARBOR SUPERFUND SITE, PORTLAND OREGON. U.S. ENVIRONMENTAL PROTECTION AGENCY REGION 10, SEATTLE, WASHINGTON. JANUARY.

EPA, 2021A. ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT FOR REMEDIAL DESIGN. SWAN ISLAND BASIN PROJECT AREA, CERCLA DOCKET NO. 10-2021-001 - 7, REGION 10. JANUARY 20.

EPA, 2021B. REMEDIAL DESIGN GUIDELINES AND CONSIDERATIONS, PORTLAND HARBOR SUPERFUND SITE. PORTLAND, OREGON. APRIL 23.

HGL, 2024B. PRE-DESIGN INVESTIGATION EVALUATION REPORT. REVISION 1. PRELIMINARY REMEDIAL DESIGN SERVICES SWAN ISLAND BASIN PROJECT AREA CERCLA DOCKET NO. 10-2021-001. APRIL.

HGL, 2024A. FINAL SUFFICIENCY ASSESSMENT REPORT REVISION 0. PRELIMINARY REMEDIAL DESIGN SERVICES SWAN ISLAND BASIN PROJECT AREA CERCLA DOCKET NO. 10-2021-001. AUGUST.

HGL, 2024C. BASIS OF DESIGN REPORT. REVISION 1. PRELIMINARY REMEDIAL DESIGN SERVICES SWAN ISLAND BASIN PROJECT AREA CERCLA DOCKET NO. 10-2021-001. SEPTEMBER.

HGL, 2025A. REMEDIAL DESIGN WORK PLAN. REVISION 1. PRELIMINARY REMEDIAL DESIGN SERVICES SWAN ISLAND BASIN PROJECT AREA CERCLA DOCKET NO. 10-2021-001. FEBRUARY.

ACCOMPANYING 50% RD DOCUMENT:

HGL, 2025B. 50% REMEDIAL DESIGN CRITERIA REPORT . REVISION 0. PRELIMINARY REMEDIAL DESIGN SERVICES SWAN ISLAND BASIN PROJECT AREA CERCLA DOCKET NO. 10-2021-001. JANUARY.

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Rev	Date	Drawn	Description	Ch'k'd	App'd

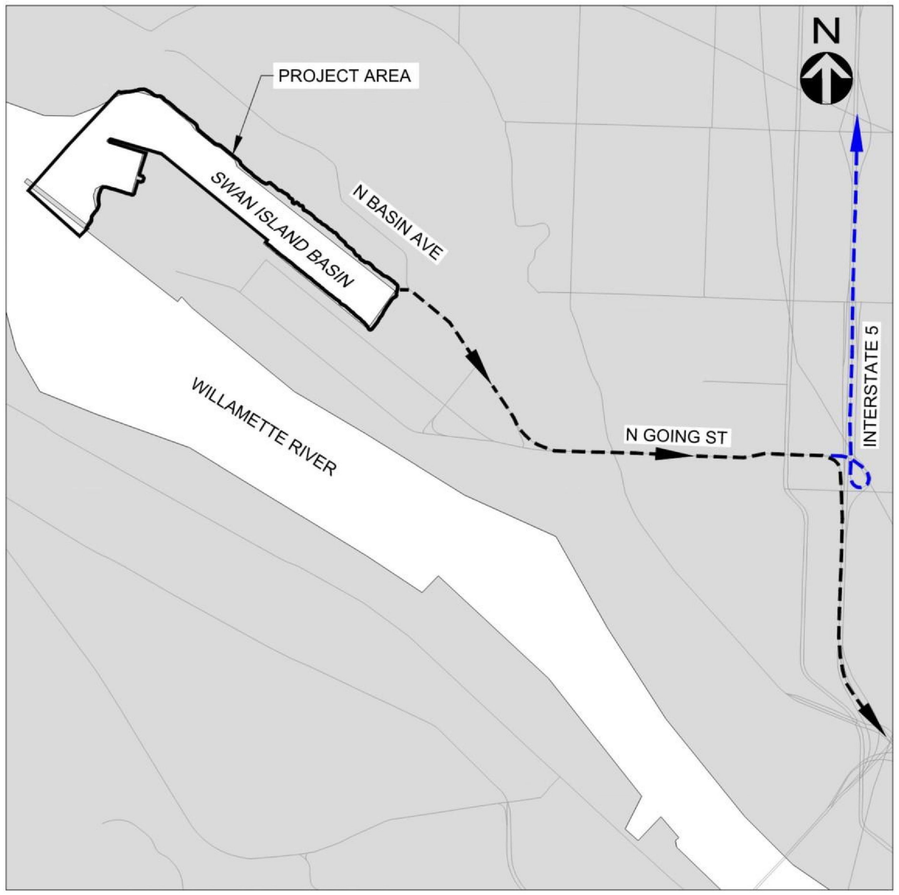
Project Number	B/O	Total
507100742	4	134

Designed	-		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	

Drawing Number: GI103

Title: Swan Island Basin Project Area Remedial Design

General Notes



ROUTE TO I-5 NORTH AND SOUTH

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	5	134

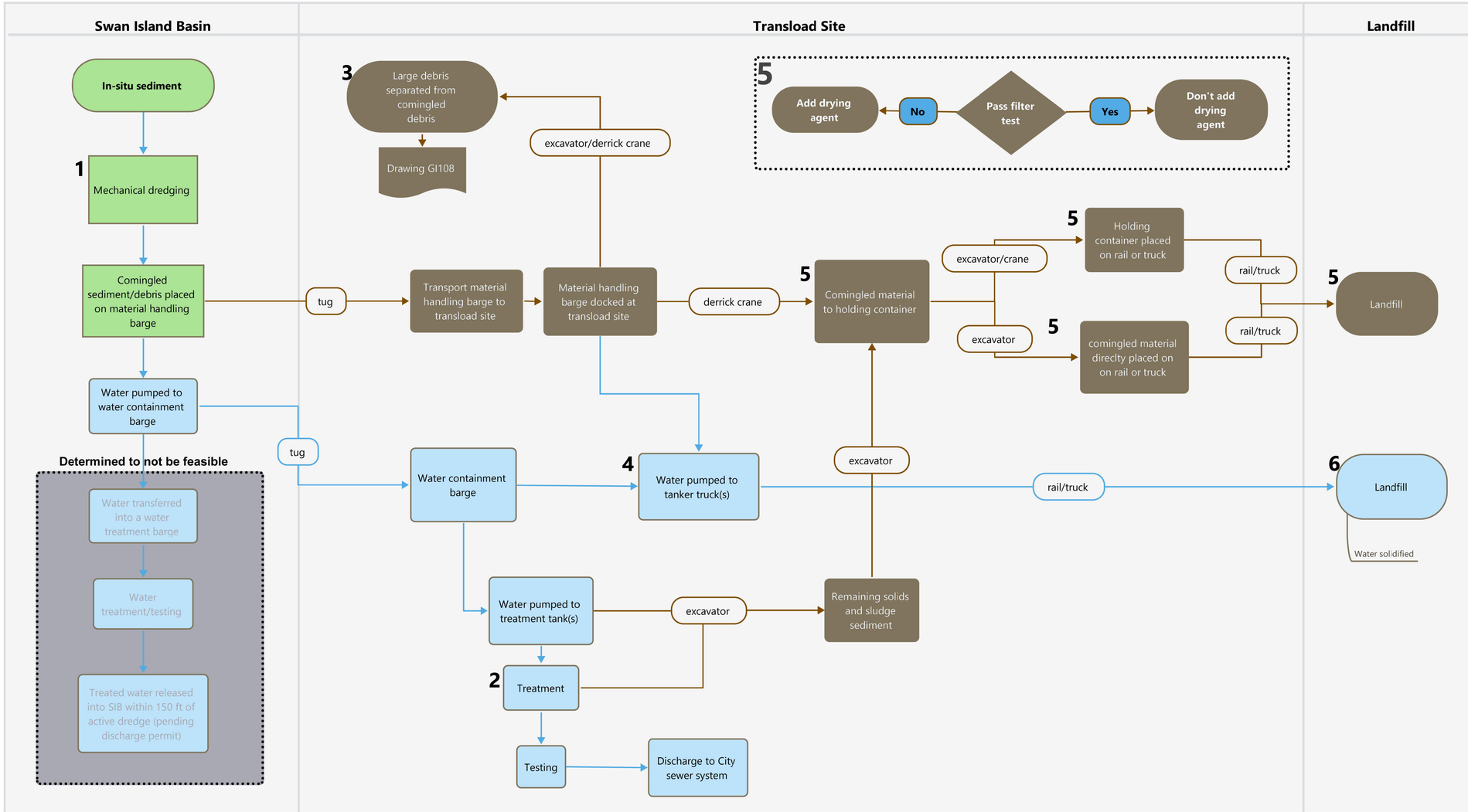
Designed	-		Eng check	A. Cairns	
Drawn	M. Corman		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 60'	Status		Rev		Security
Drawing Number: GI104					

Title

Swan Island Basin Project Area
Remedial Design

Contractor Access Plan

C:\pwworking\ihmm\ports_harbors\mor69830\dms62385\GI104.dwg Mar 11, 2025 - 6:17PM NG85190



1

Category	In-Situ Sediment [cy]	Free Water [cy]	Dredge Volume [cy]	Entrained Water [cy]
Under/Around Structures	307,500	251,600	559,100	123,000
Open Basin	322,900	264,200	587,100	129,200
Shoreline	102,700	84,000	186,700	41,100
Combined	733,100	599,800	1,332,900	293,300

Fill factor [Ff]: 0.55

Using a preliminary value of 40% for entrained water based on equations from Fuglevand, Paul F. and Webb, Robert S. (2006) Water Management During Mechanical Dredging of Contaminated Material and moisture content from geotechnical boring data at SIB (by volume).

Estimated 20% of free water to be pumped at transload site (preliminary value and will be refined at 90% RD Drawings).

Shoreline is defined as top of bank and extends past the waterline down to a variable depth that is a function of slope.

Under/Around Structures is defined as all overwater and bank structures.

2 Treatment of water and rate of release will depend on RA Contractor. Estimates may be included in the 90% RD Drawings set. Including additional steps, such as addition of flocculents.

3 Large debris is defined as any piece of debris that is greater than 6 ft in any dimension. Large debris is a separate bill item.

Estimated minimum number of large debris items is 650.

4 -Estimated free water from the table: 599,800cy
-Estimated 20% of the entrained water becomes free :
293,300 cy * 20% = 58,660 cy
-Total estimated free water volume: 658,460 cy

Water volume estimate assumes 100% water capture and 20% of entrained water becoming free water during transport. Values will be updated for 90% RD Drawings.

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Designed			Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev		Security

Project Number	B/O	Total
507100742	6	134

Drawing Number: GI105

Title: Swan Island Basin Project Area Remedial Design

Process Flow Diagram Alternative 1

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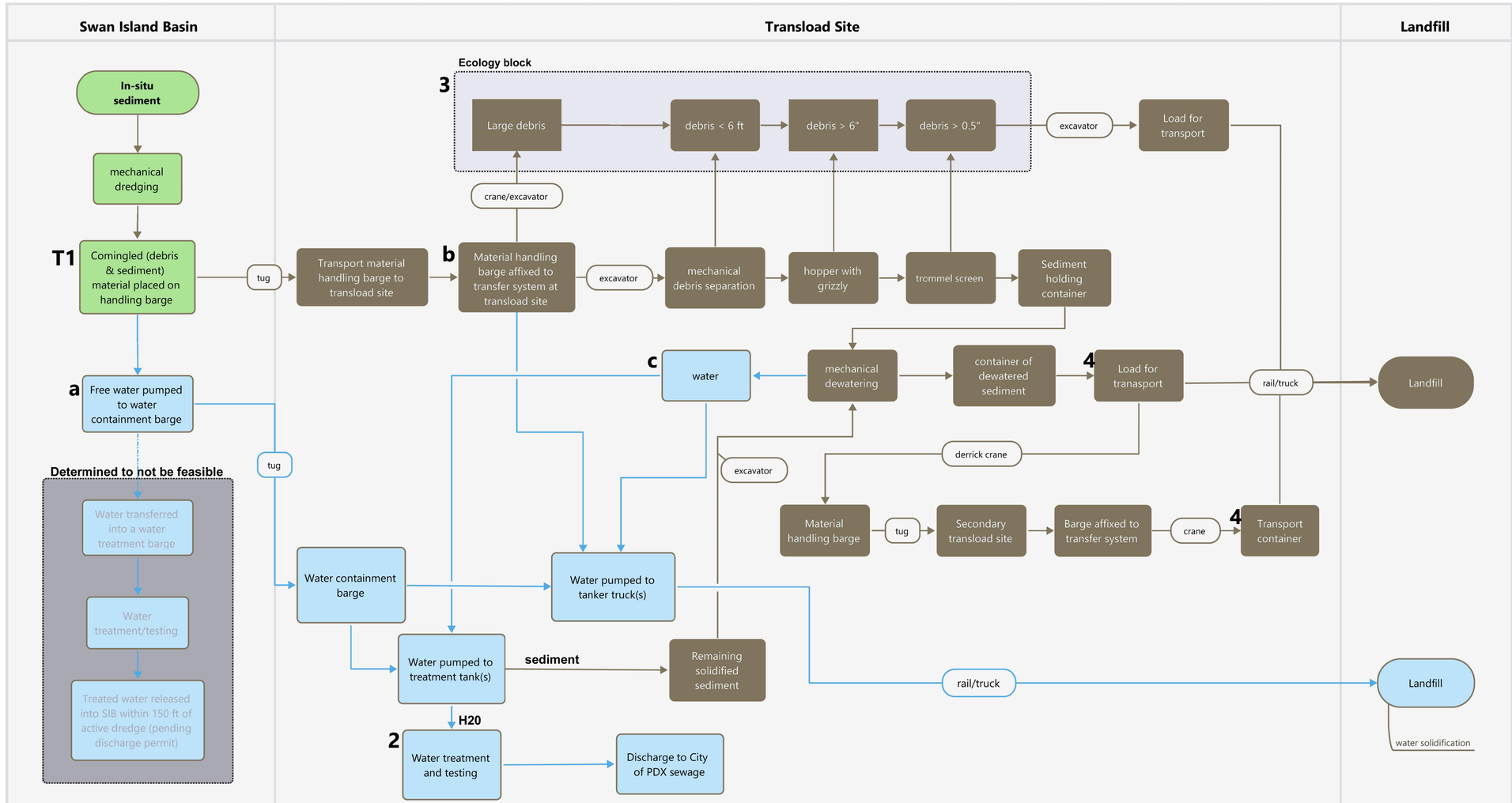

T1

Category	In-Situ Sediment [cy]	Free Water [cy]	Dredge Volume [cy]	Entrained Water [cy]
Under/Around Structures	307,500	251,600	559,100	123,000
Open Basin	322,900	264,200	587,100	129,200
Shoreline	102,700	84,000	186,700	41,100
Combined	733,100	599,800	1,332,900	293,300

Fill factor [Ff]: 0.55

Captured Water Ratio [Rcw]: 0.818

Using a preliminary value of 40% for entrained water based on equations from Fuglevand, Paul F. and Webb, Robert S. (2006) Water Management During Mechanical Dredging of Contaminated Material and moisture content from geotechnical boring data at SIB (by volume).

Estimated 20% of free water to be pumped at transload site (preliminary value and will be refined at 90% RD Drawings).

Shoreline is defined as top of bank and extends past the waterline down to a variable depth that is a function of slope.

Under/Around Structures is defined as all overwater and bank structures.

2 Treatment of water and rate of release will depend on RA Contractor. Estimates may be included in the 90% RD Drawings set. Including additional steps, such as addition of flocculents.

3 Large debris is defined as any piece of debris that is greater than 6 ft in any dimension. Large debris is a separate bill item.

Estimated minimum number of large debris items is 650.

Category	a	b	c
In-Situ Sediment [cy]	0.0	733,100	0.0
Free Water [cy]	599,800	58,660	0.0
Entrained Water [cy]	0.0	234,640	TBD

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	7	134

Designed			Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	

Drawing Number: GI106

Title: Swan Island Basin Project Area Remedial Design

Process Flow Diagram Alternative 2

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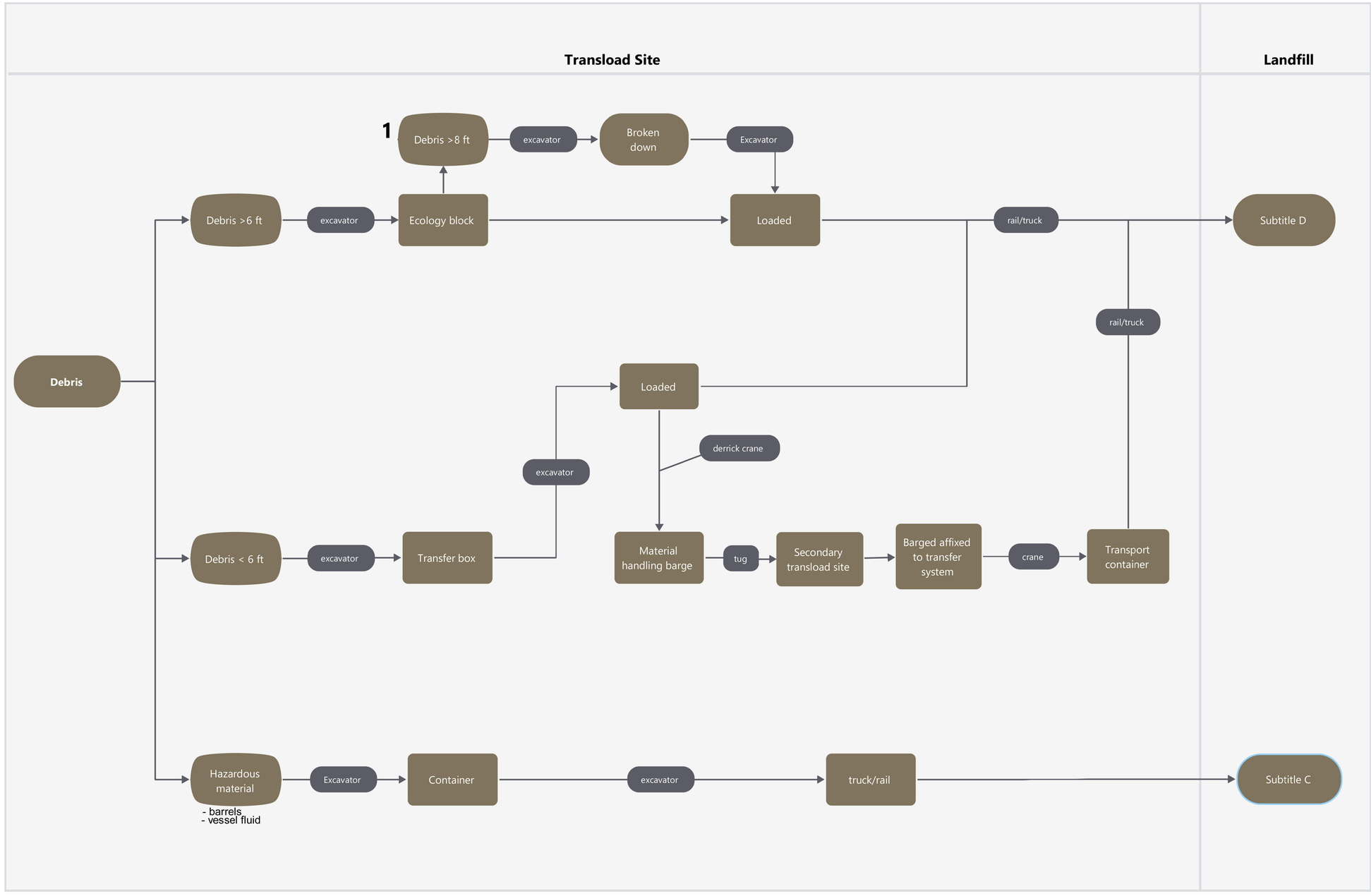

1 Classification of large debris is intended for separate pay items.
Large items are defined as any debris greater than 6 ft in any dimension.
Estimated minimum number of large items in areas covered by survey: 650
Large debris items may be weighed at transload site or landfill.

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number 507100742 | B/O 8 | Total 134

Designed			Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D | Status | Rev | Security

Drawing Number GI107

Title
Swan Island Basin Project Area
Remedial Design

Process Flow Diagram - Debris

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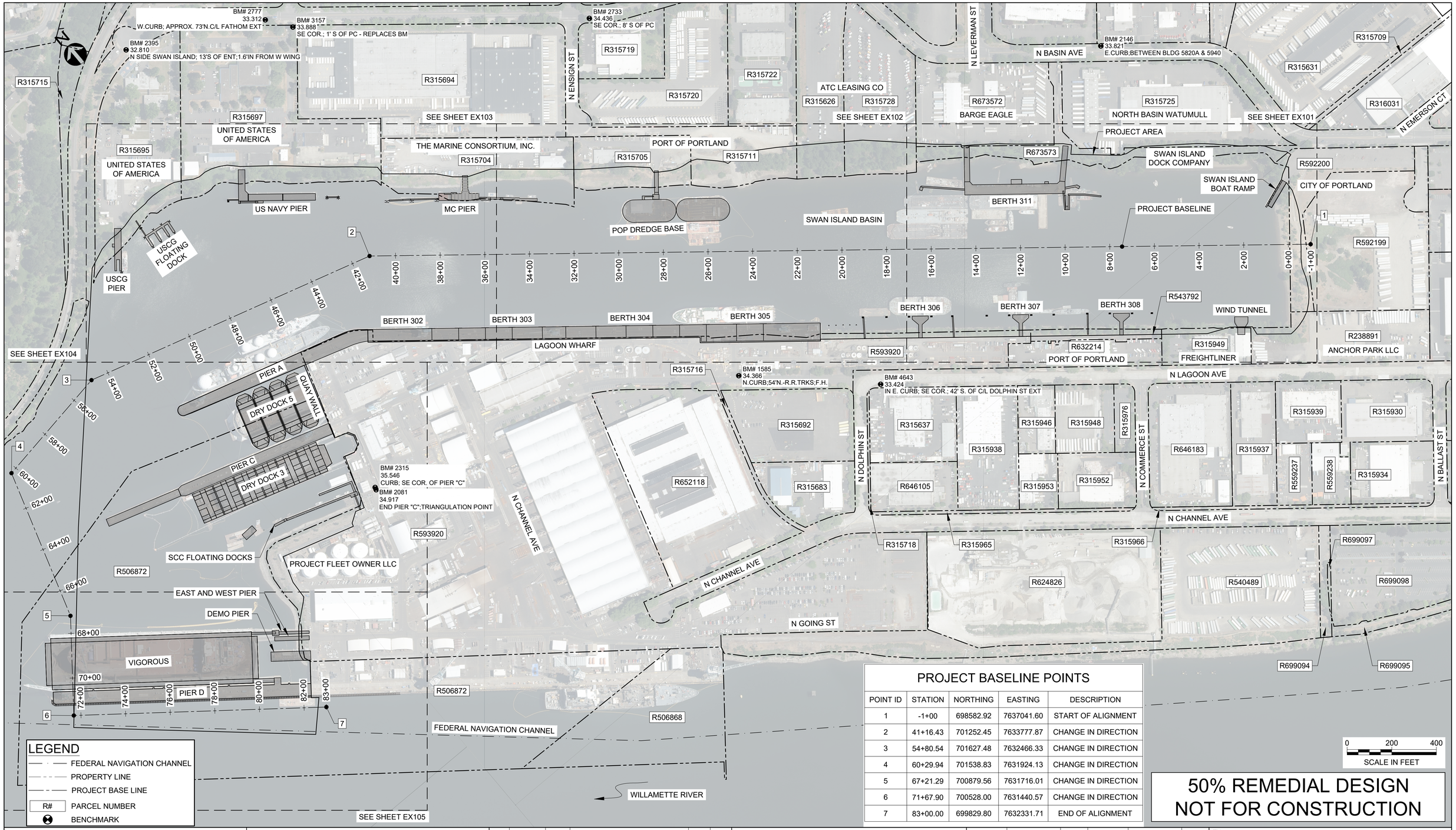

PROJECT BASELINE POINTS

POINT ID	STATION	NORTHING	EASTING	DESCRIPTION
1	-1+00	698582.92	7637041.60	START OF ALIGNMENT
2	41+16.43	701252.45	7633777.87	CHANGE IN DIRECTION
3	54+80.54	701627.48	7632466.33	CHANGE IN DIRECTION
4	60+29.94	701538.83	7631924.13	CHANGE IN DIRECTION
5	67+21.29	700879.56	7631716.01	CHANGE IN DIRECTION
6	71+67.90	700528.00	7631440.57	CHANGE IN DIRECTION
7	83+00.00	699829.80	7632331.71	END OF ALIGNMENT

LEGEND
- FEDERAL NAVIGATION CHANNEL
- PROPERTY LINE
- PROJECT BASE LINE
- R# PARCEL NUMBER
- BENCHMARK

0 200 400
SCALE IN FEET

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Designed	-		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 200'	Status		Rev		Security

Project Number	B/O	Total
507100742	9	134

Drawing Number: EX100

Title: Swan Island Basin Project Area Remedial Design

Overall Existing Conditions Site Plan

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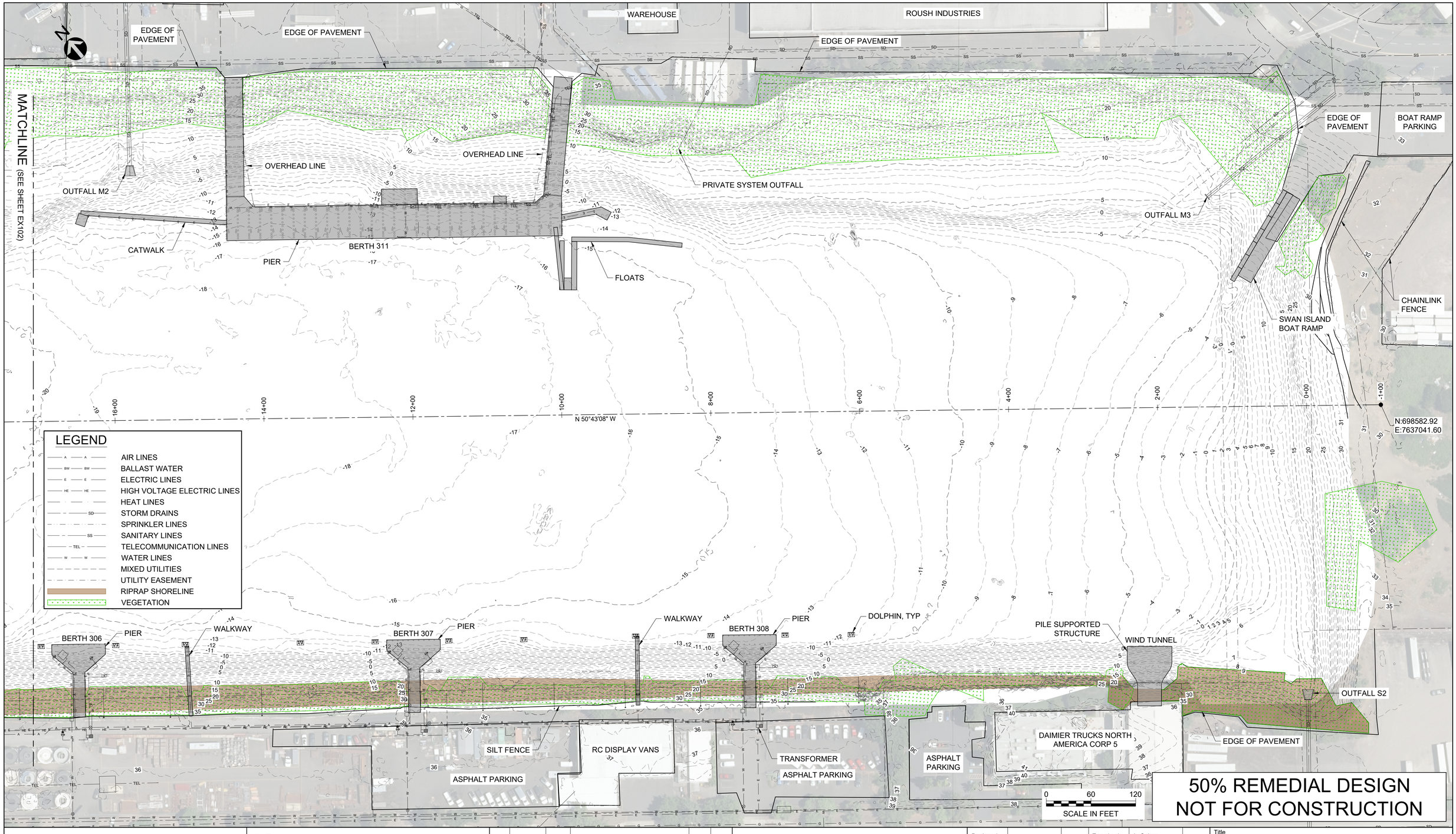

LEGEND

- AIR LINES
- BALLAST WATER
- ELECTRIC LINES
- HIGH VOLTAGE ELECTRIC LINES
- HEAT LINES
- STORM DRAINS
- SPRINKLER LINES
- SANITARY LINES
- TELECOMMUNICATION LINES
- WATER LINES
- MIXED UTILITIES
- UTILITY EASEMENT
- RIPRAP SHORELINE
- VEGETATION

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Designed	-		Eng check	A. Cairns	
Drawn	P. Ng		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	1" = 60'	Status		Rev	Security

Project Number	B/O	Total
507100742	10	134

Drawing Number: EX101

Title: Swan Island Basin Project Area Remedial Design

Existing Conditions Plan Area 1

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NRC ENVIRONMENTAL SERVICES

EDGE OF PAVEMENT

ASPHALT PARKING

NRC ENVIRONMENTAL SERVICES

CATCH BASIN

CATCH BASIN

PORT OF PORTLAND NAVIGATION OFFICE

EDGE OF PAVEMENT

GRAVEL PATH

GRAVEL PATH

GRAVEL PARKING

BOAT RAMP

MATCHLINE (SEE SHEET EX103)

MATCHLINE (SEE SHEET EX101)

OUTFALL M1

FLOATING WALKWAY AND SUPPORT PILES

POP DREDGE BASE

FLOATING BARGES

N 50°43'08" W

36+00 34+00 32+00 30+00 28+00 26+00 24+00 22+00 20+00

OUTFALL S1

BERTH 303

BERTH 304

BERTH 305

LAGOON WHARF

EDGE OF PAVEMENT

SILT FENCE

0 60 120

SCALE IN FEET

LEGEND

- AIR LINES
- BALLAST WATER
- ELECTRIC LINES
- HIGH VOLTAGE ELECTRIC LINES
- FIRE LINES
- SANITARY LINES
- SPRINKLER LINES
- STEAM LINES
- STORM DRAINS
- TELECOMMUNICATION LINES
- WATER LINES
- MIXED UTILITIES
- UTILITY EASEMENT
- RIPRAP SHORELINE
- VEGETATION

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Designed	-		Eng check	A. Cairns	
Drawn	P. NG		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 60'			

Project Number	B/O	Total
507100742	11	134

Drawing Number: EX102

Title: Swan Island Basin Project Area Remedial Design

Existing Conditions Plan Area 2

C:\pwworking\hmm\ports_harbors\mor69830\dms82131\EX102.dwg Mar 11, 2025 - 6:19PM NG85190

N

ASPHALT PARKING

STEAM PLANT

ASPHALT PARKING

EDGE OF PAVEMENT

NRC ENVIRONMENTAL SERVICES

ASPHALT PARKING

FENCE

EDGE OF PAVEMENT

MATCHLINE (SEE SHEET EX102)

USCG OUTFALL 1

USCG OUTFALL 2

EDGE OF PAVEMENT

USCG OUTFALL 3

USCG OUTFALL 4

USCG FLOATING DOCK

USCG PIER

US NAVY PIER

FLOATING DOCK

WALKWAY AND DOLPHIN

US NAVY WALKWAY AND DOLPHINS

MC PIER

FLOATING WALKWAY AND SUPPORT PILES

N 50°43'08" W

N:701252.45
E:7633777.87

N 74°02'33" W

BERTH 302

BUILDING

BUILDING

MATCHLINE (SEE SHEET EX104)

0 60 120
SCALE IN FEET

LEGEND

- ELECTRIC LINES
- BALLAST WATER
- HIGH VOLTAGE ELECTRIC LINES
- FIRE LINES
- GAS LINES
- SANITARY LINES
- SPRINKLER LINES
- STEAM LINES
- STORM DRAINS
- TELECOMMUNICATION LINES
- WATER LINES
- UTILITY EASEMENT
- RIPRAP SHORELINE
- VEGETATION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Designed	-		Eng check	A. Cairns	
Drawn	P. Ng		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	1" = 60'	Status		Rev	Security

Project Number	B/O	Total
507100742	12	134

Drawing Number: EX103

Title: Swan Island Basin Project Area Remedial Design

Existing Conditions Plan Area 3

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MATCHLINE (SEE SHEET EX103)

N:701627.48
E:7632466.33

54+00

N 74°02'33" W

56+00

S 80°42'53" W

58+00

N:701538.83
E:7631924.13

60+00

62+00

S 17°31'09" W

64+00

66+00

PIER A

DRY DOCK 5

QUAY WALL

ASPHALT PARKING

BUILDING

BUILDING

PIER C

DRY DOCK 3

SCC FLOATING DOCKS

FENCE

EDGE OF PAVEMENT

MATCHLINE (SEE SHEET EX105)

0 60 120
SCALE IN FEET

LEGEND

- AIR LINES
- BALLAST WATER
- ELECTRIC LINES
- FIRE LINES
- OXYGEN LINES
- SANITARY LINES
- STEAM LINES
- STORM LINES
- TELECOMMUNICATION LINES
- WATER LINES
- MIXED UTILITIES
- UTILITY EASEMENT
- RIPRAP SHORELINE
- VEGETATION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Designed	-		Eng check	A. Cairns	
Drawn	P. Ng		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 60'			

Project Number	B/O	Total
507100742	13	134

Drawing Number: EX104

Title: Swan Island Basin Project Area Remedial Design

Existing Conditions Plan Area 4

C:\pwworking\hmm\ports_harbors\mor69830\dms82131\EX104.dwg Mar 11, 2025 - 6:20PM NG85190

MATCHLINE (SEE SHEET EX104)

N

60+00

S 17°31'09" W

N:700879.56
E:7631716.01

S 38°04'42" W

68+00

VIGOROUS
DRY DOCK

70+00

PIER D

EDGE OF PAVEMENT

BUILDING

STEEL SCAFFOLDING
SHORELINE LADDER

EAST PIER

WEST PIER

DEMO PIER

S 51°55'18" E

72+00

74+00

76+00

78+00

80+00

82+00

83+00

N:699829.80
E:7632331.71

N:700528.00
E:7631440.57

LEGEND

- AIR LINES
- BALLAST WATER
- ELECTRIC LINES
- FIRE LINES
- OXYGEN LINES
- SANITARY LINES
- STEAM LINES
- STORM LINES
- TELECOMMUNICATION LINES
- WATER LINES
- MIXED UTILITIES
- UTILITY EASEMENT
- RIPRAP SHORELINE
- VEGETATION

0 60 120
SCALE IN FEET

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	14	134

Designed	-		Eng check	A. Cairns	
Drawn	P. Ng		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 60'			

Drawing Number: EX105

Title: Swan Island Basin Project Area
Remedial Design

Existing Conditions Plan Area 5

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LEGEND

ORIENTATION VIEW

(#) PHOTO NUMBER

NOTE

1. PHOTOS TAKEN FROM 2012 TO 2024

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Designed	-		Eng check	A. Cairns	
Drawn	P. Ng		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	1" = 200'	Status		Rev	Security

Project Number	B/O	Total
507100742	15	134

Drawing Number: EX200

Title: Swan Island Basin Project Area Remedial Design

Photo Plan

C:\pwworking\hmm\ports_harbors\mor69830\dms82131\EX200.dwg Mar 11, 2025 - 6:20PM NG85190



PHOTO 1 05/16/2022
SOUTH SIDE OF PIER D AND THE VIGOROUS DRY DOCK, LOOKING NORTHEAST



PHOTO 2 05/16/2022
SOUTH SIDE OF PIER D AND THE VIGOROUS DRY DOCK, LOOKING EAST

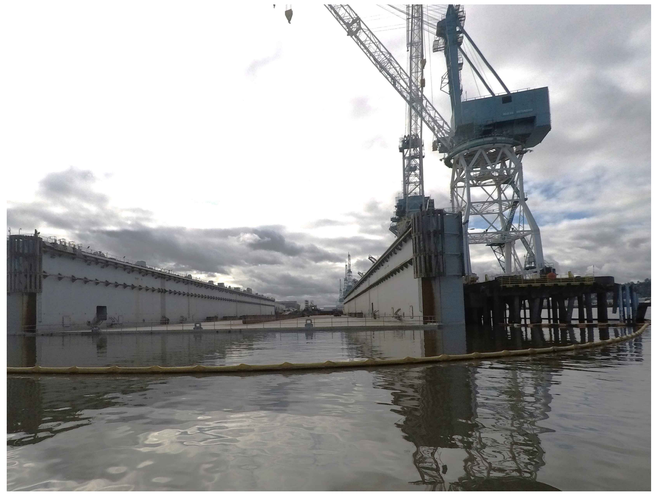

PHOTO 3 05/16/2022
FRONT VIEW OF THE VIGOROUS DRY DOCK AND PIER D, LOOKING SOUTHEAST

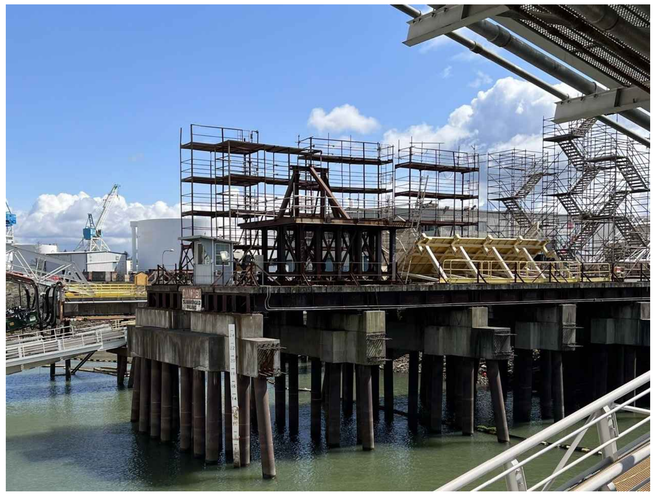

PHOTO 4 04/27/2022
SOUTH SIDE OF DEMO PIER, LOOKING NORTHEAST



PHOTO 5 05/23/2022
SHORELINE AND SOUTH VIEW OF DEMO PIER, LOOKING NORTHEAST

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	16	134

Designed	-		Eng check	A. Cairns	
Drawn	P. Ng		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	
Drawing Number	EX201				

Title
Swan Island Basin Project Area
Remedial Design

Photo Sheet 1

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PHOTO 6 05/23/2022
SHORELINE AND SOUTH VIEW OF WEST PIER, LOOKING EAST



PHOTO 7 05/23/2022
SHORELINE BEHIND EAST PIER, LOOKING SOUTHEAST



PHOTO 8 04/14/2022
SHORELINE BETWEEN EAST PIER AND SCC FLOATING DOCKS, LOOKING NORTH

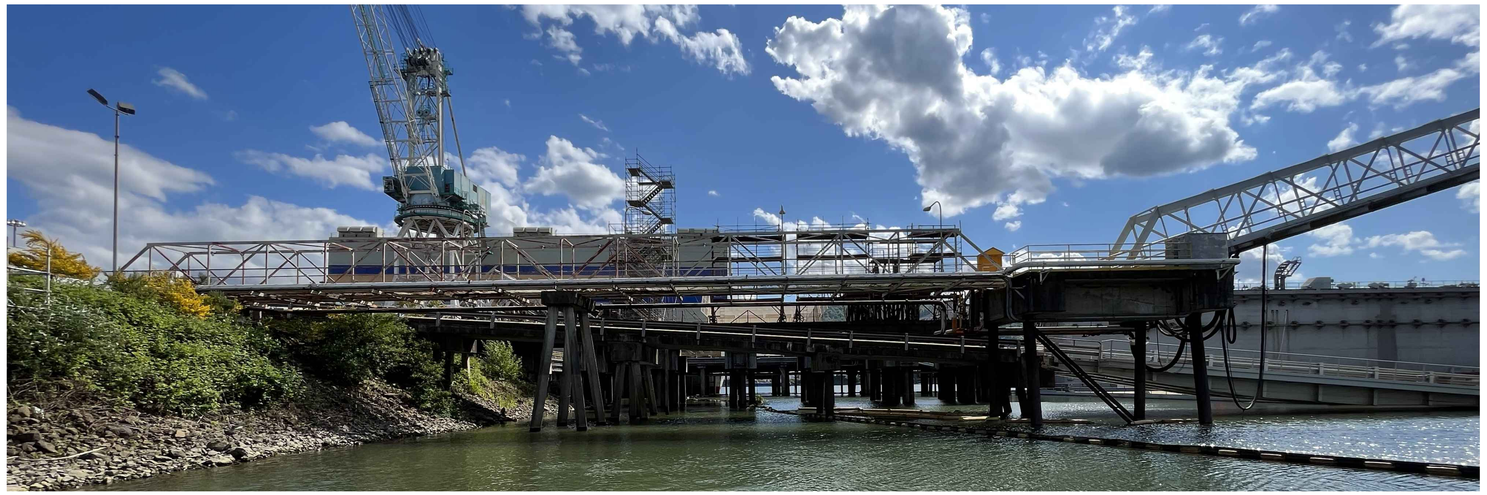

PHOTO 9 05/23/2022
NORTH SIDE OF EAST PIER, LOOKING SOUTHWEST



PHOTO 10 05/23/2022
SHORELINE NEAR SCC FLOATING DOCKS, LOOKING EAST

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	17	134

Designed	-		Eng check	A. Cairns	
Drawn	P. Ng		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	

Drawing Number: EX202

Title: Swan Island Basin Project Area Remedial Design

Photo Sheet 2

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PHOTO 11 10/22/2024
SHORELINE ON THE NORTHEAST SIDE OF EAST PIER, LOOKING SOUTHEAST



PHOTO 12 05/23/2022
FRONT VIEW OF SCC FLOATING DOCKS, LOOKING EAST



PHOTO 13 05/16/2022
PIER C AND DRYDOCK 3, LOOKING EAST



PHOTO 14 05/16/2022
PIER C AND DRYDOCK 5, LOOKING SOUTHEAST



PHOTO 15 05/23/2022
BACKVIEW OF DRYDOCK 3, LOOKING NORTHEAST

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	18	134

Designed	-		Eng check	A. Cairns	
Drawn	P. Ng		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	

Drawing Number EX203

Title
Swan Island Basin Project Area
Remedial Design

Photo Sheet 3

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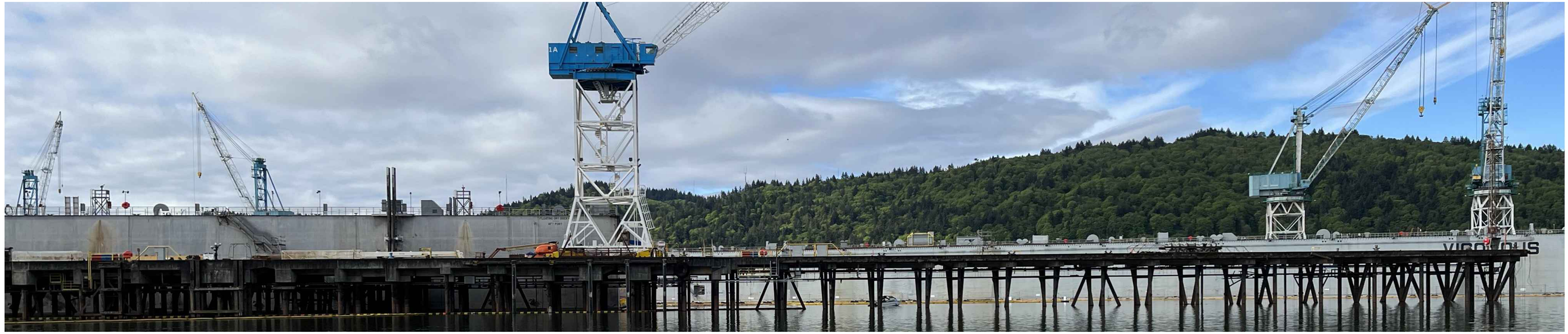

PHOTO 16 05/16/2022
NORTH SIDE OF PIER C, LOOKING SOUTHWEST



PHOTO 17 05/16/2022
DRYDOCK 5 AND NORTH SIDE OF PIER C, LOOKING SOUTHEAST



PHOTO 18 05/23/2022
QUAY WALL, LOOKING NORTHEAST

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	19	134

Designed	-		Eng check	A. Cairns	
Drawn	P. Ng		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	
Drawing Number	EX204				

Title
Swan Island Basin Project Area
Remedial Design

Photo Sheet 4

C:\pwworking\hmm\ports_harbors\mor69830\dms82131\EX204.dwg Mar 11, 2025 - 6:21PM NG85190

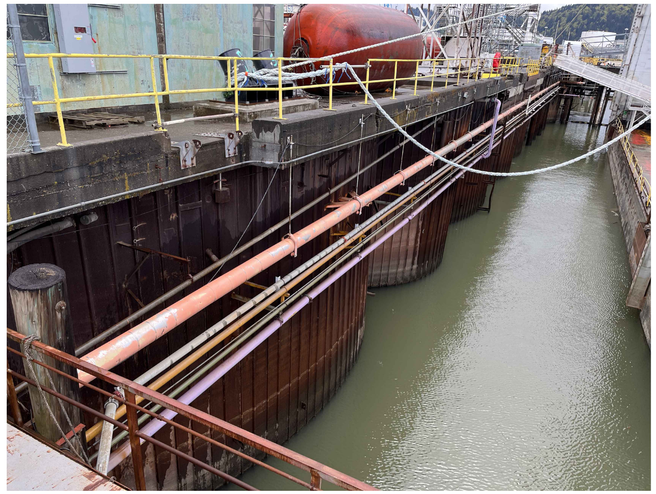

PHOTO 19 04/26/2022
QUAY WALL, LOOKING SOUTH



PHOTO 20 04/14/2022
DRYDOCK 5 AND NORTH SIDE OF PIER C, LOOKING WEST



PHOTO 21 04/14/2022
PIER A SOUTH SIDE, LOOKING NORTHWEST



PHOTO 22 05/16/2022
PIER A SOUTH SIDE, LOOKING EAST



PHOTO 23 05/16/2022
PIER A NORTH SIDE LOOKING SOUTHEAST



PHOTO 24 05/23/2022
PIER A NORTH SIDE, LOOKING WEST

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Project Number	B/O	Total
507100742	20	134

Designed	-		Eng check	A. Cairns	
Drawn	P. Ng		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	
Drawing Number	EX205				

Title
Swan Island Basin Project Area
Remedial Design

Photo Sheet 5

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PHOTO 25 05/25/2022
INTERSECTION BETWEEN LAGOON WHARF AND PIER A, LOOKING WEST



PHOTO 26 05/25/2022
BENT 7 TO 10 OF LAGOON WHARF, LOOKING SOUTHWEST



PHOTO 27 05/25/2022
BENT 15 TO 17 OF LAGOON WHARF, LOOKING SOUTHWEST



PHOTO 28 05/25/2022
BENT 31 TO 34 OF LAGOON WHARF, LOOKING SOUTHWEST



PHOTO 29 05/25/2022
BENT 40 TO 43 OF LAGOON WHARF, LOOKING SOUTHWEST



PHOTO 30 05/25/2022
BENT 60 TO 63 OF LAGOON WHARF, LOOKING SOUTHWEST

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	21	134

Designed	-		Eng check	A. Cairns	
Drawn	P. Ng		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	
Drawing Number	EX206				

Title
Swan Island Basin Project Area
Remedial Design

Photo Sheet 6

C:\pwworking\hmm\ports_harbors\mor69830\dms82131\EX206.dwg Mar 11, 2025 - 6:21PM NG85190

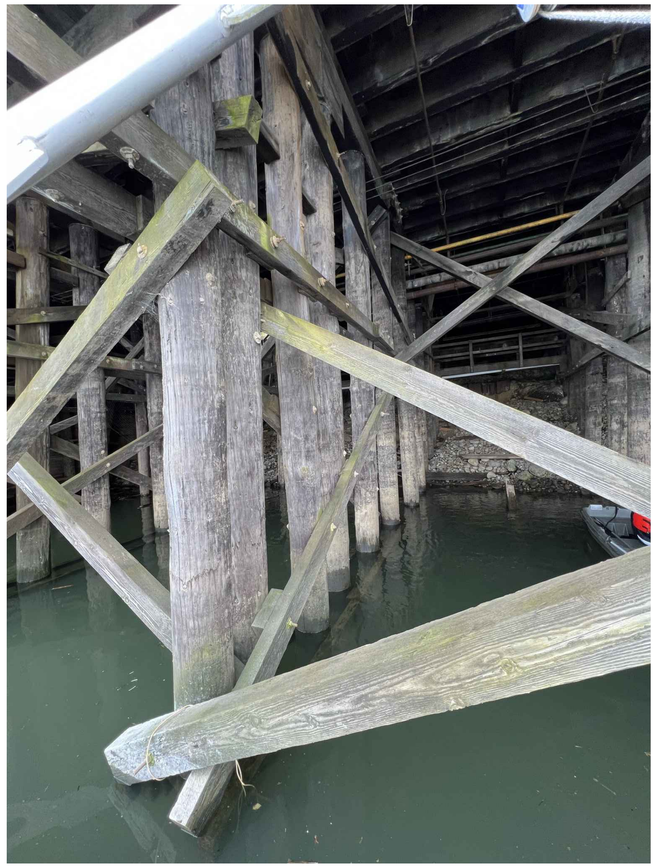

PHOTO 31 05/25/2022
BENT 114 TO 116 OF LAGOON WHARF, LOOKING SOUTHWEST



PHOTO 32 05/25/2022
BENT 79 TO 82 OF LAGOON WHARF, LOOKING SOUTHWEST



PHOTO 34 05/16/2022
SHORELINE NEAR EAST END OF LAGOON WHARF, LOOKING WEST



PHOTO 33 05/16/2022
BENT 133 TO 135 OF LAGOON WHARF, LOOKING SOUTHWEST



PHOTO 35 05/16/2022
DOLPHINS BETWEEN LAGOON WHARF AND BERTH 306, LOOKING SOUTH

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	22	134

Designed	-		Eng check	A. Cairns	
Drawn	P. Ng		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	

Drawing Number: EX207

Title: Swan Island Basin Project Area Remedial Design

Photo Sheet 7

C:\pwworking\hmm\ports_harbors\mor69830\dms82131\EX207.dwg Mar 11, 2025 - 6:22PM NG85190



PHOTO 36 04/14/2022
SHORELINE BETWEEN WALKWAY AND BERTH 306, LOOKING NORTH



PHOTO 37 05/16/2022
SHORELINE NEAR THE BERTH 306, LOOKING WEST



PHOTO 38 05/16/2022
SHORELINE NEAR THE BERTH 307, LOOKING SOUTH



PHOTO 39 05/25/2022
SOUTH SIDE OF BERTH 307, LOOKING SOUTHEAST



PHOTO 40 05/25/2022
NORTH SIDE OF BERTH 307, LOOKING NORTHWEST



PHOTO 41 05/16/2022
NORTH SIDE OF THE WALKWAY ON THE EAST SIDE OF BERTH 307, LOOKING SOUTHEAST

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	23	134

Designed	-		Eng check	A. Cairns	
Drawn	P. Ng		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	
Drawing Number	EX208				

Title
Swan Island Basin Project Area
Remedial Design

Photo Sheet 8

C:\pwworking\hmm\ports_harbors\mor69830\dms82131\EX208.dwg Mar 11, 2025 - 6:22PM NG85190



PHOTO 42 05/25/2022
NORTH SIDE OF BERTH 308, LOOKING SOUTHEAST



PHOTO 43 05/16/2022
FRONT VIEW OF BERTH 308, LOOKING SOUTHWEST



PHOTO 44 05/16/2022
SHORELINE NEAR BERTH 308, LOOKING WEST



PHOTO 45 05/16/2022
SHORELINE BEHIND SOUTH DOLPHIN OF BERTH 308, LOOKING SOUTHWEST



PHOTO 46 05/16/2022
WIND TUNNEL, LOOKING SOUTH



PHOTO 47 05/24/2022
SHORELINE AND FRONT VIEW OF WIND TUNNEL, LOOKING SOUTHWEST

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	24	134

Designed	-		Eng check	A. Cairns	
Drawn	P. Ng		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	
Drawing Number	EX209				

Title
Swan Island Basin Project Area
Remedial Design

Photo Sheet 9

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PHOTO 48 10/25/2012
SHORELINE ON THE SOUTH SIDE OF WIND TUNNEL, LOOKING SOUTH



PHOTO 49 05/16/2022
SWAN ISLAND BOAT RAMP, LOOKING EAST



PHOTO 50 05/16/2022
FRONT VIEW OF SWAN ISLAND BOAT RAMP, LOOKING EAST



PHOTO 51 10/25/2012
OUTFALL NEAR SWAN ISLAND BOAT RAMP, LOOKING SOUTHEAST



PHOTO 52 10/25/2012
SHORELINE BETWEEN SWAN ISLAND BOAT RAMP AND BERTH 311, LOOKING NORTHEAST



PHOTO 53 10/25/2012
SHORELINE BETWEEN SWAN ISLAND BOAT RAMP AND BERTH 311, LOOKING NORTH

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	25	134

Designed	-		Eng check	A. Cairns	
Drawn	P. Ng		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	
Drawing Number	EX210				

Title
Swan Island Basin Project Area
Remedial Design

Photo Sheet 10

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PHOTO 54 05/16/2022
TRESTLE OF BERTH 311, LOOKING NORTHWEST



PHOTO 55 05/16/2022
FRONT VIEW OF BERTH 311, LOOKING NORTHEAST



PHOTO 56 05/18/2022
BACKVIEW OF BERTH 311, LOOKING SOUTHEAST



PHOTO 57 10/25/2012
DOLPHIN ON THE NORTH SIDE OF BERTH 311, LOOKING EAST



PHOTO 58 10/14/2024
SHORELINE BETWEEN BERTH 311 AND POP DREDGE BASE, LOOKING SOUTHEAST



PHOTO 59 10/14/2024
RAMP NEAR POP DREDGE BASE, LOOKING NORTH

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	26	134

Designed	-		Eng check	A. Cairns	
Drawn	P. Ng		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	
Drawing Number	EX211				

Title
Swan Island Basin Project Area
Remedial Design

Photo Sheet 11

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PHOTO 60 10/14/2024
FRONT VIEW OF POP DREDGE BASE, LOOKING EAST



PHOTO 61 05/16/2022
SIDE VIEW OF POP DREDGE BASE, LOOKING SOUTHEAST



PHOTO 62 02/28/2019
SHORELINE BETWEEN POP DREDGE BASE AND MC PIER, LOOKING NORTHWEST



PHOTO 63 10/14/2024
EAST FLOATING DOCK OF MC PIER, LOOKING EAST



PHOTO 64 05/16/2022
FRONT VIEW OF MC PIER, LOOKING NORTHEAST

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	27	134

Designed	-		Eng check	A. Cairns	
Drawn	P. Ng		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	
Drawing Number	EX212				

Title
Swan Island Basin Project Area
Remedial Design

Photo Sheet 12

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PHOTO 65 05/16/2022
SIDE VIEW OF MC PIER, LOOKING SOUTHEAST



PHOTO 66 05/16/2022
US NAVY PIER, LOOKING NORTH



PHOTO 67 10/14/2024
SHORELINE BEHIND US NAVY PIER, LOOKING NORTHWEST



PHOTO 68 05/16/2022
SHORELINE BEHIND US NAVY PIER LOOKING SOUTHEAST



PHOTO 69 10/14/2024
US NAVY PIER AND DOLPHINS, LOOKING EAST



PHOTO 70 10/14/2024
US COAST GUARD FLOATING DOCK, LOOKING NORTHWEST

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Project Number	B/O	Total
507100742	28	134

Designed	-		Eng check	A. Cairns	
Drawn	P. Ng		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	

Drawing Number EX213

Title
Swan Island Basin Project Area
Remedial Design

Photo Sheet 13

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PHOTO 71 10/14/2024
SHORELINE NEAR US COAST GUARD DOCK, LOOKING NORTHEAST



PHOTO 72 10/14/2024
US COAST GUARD PIER, LOOKING NORTHEAST



PHOTO 73 10/25/2012
SHORELINE NEAR US COAST GUARD PIER LOOKING EAST

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number 507100742 | B/O 29 | Total 134

Designed	-		Eng check	A. Cairns	
Drawn	P. Ng		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	

Drawing Number EX214

Title
Swan Island Basin Project Area
Remedial Design

Photo Sheet 14

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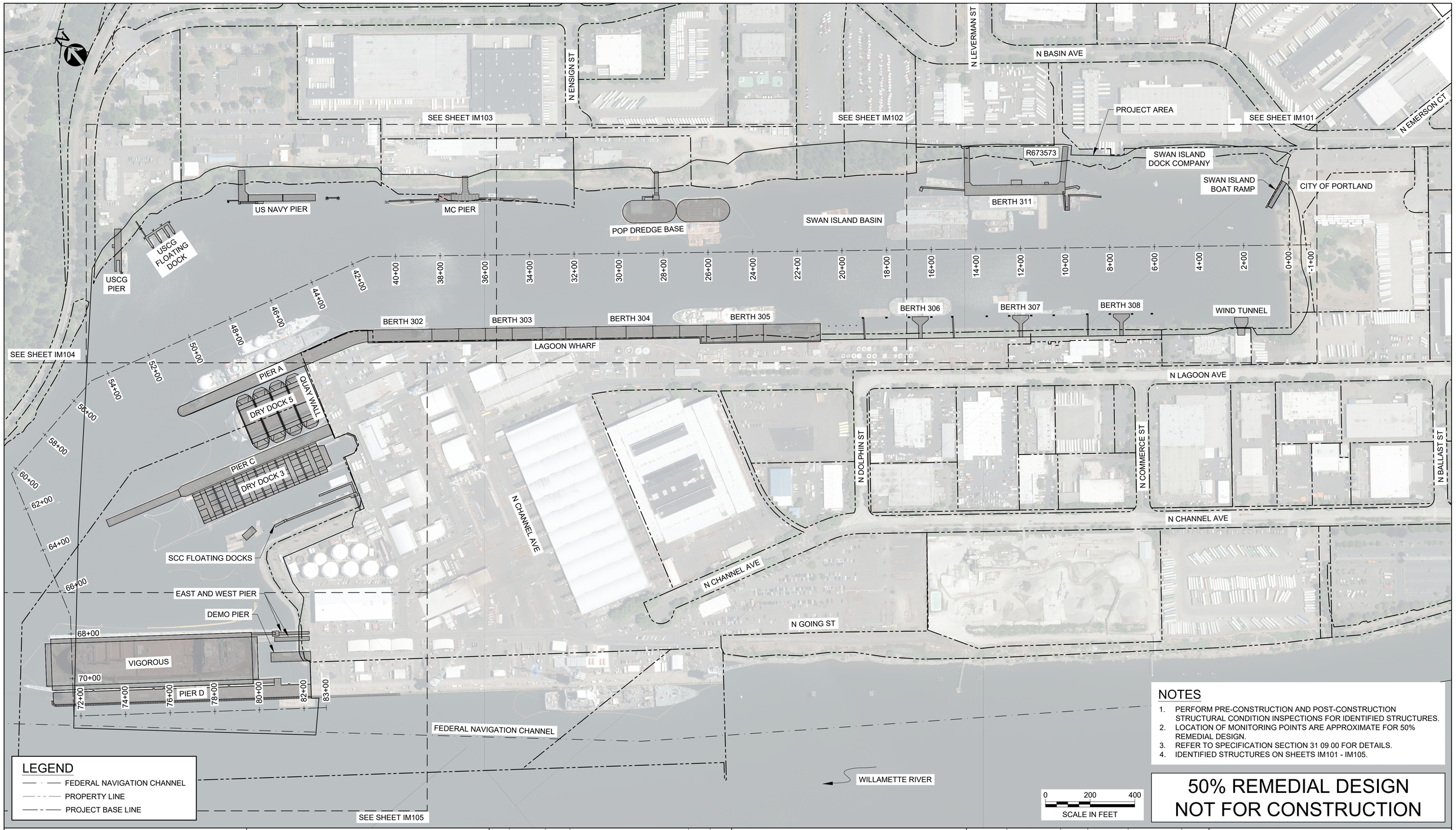

LEGEND

- FEDERAL NAVIGATION CHANNEL
- PROPERTY LINE
- PROJECT BASE LINE

NOTES

1. PERFORM PRE-CONSTRUCTION AND POST-CONSTRUCTION STRUCTURAL CONDITION INSPECTIONS FOR IDENTIFIED STRUCTURES.
2. LOCATION OF MONITORING POINTS ARE APPROXIMATE FOR 50% REMEDIAL DESIGN.
3. REFER TO SPECIFICATION SECTION 31 09 00 FOR DETAILS.
4. IDENTIFIED STRUCTURES ON SHEETS IM101 - IM105.

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Designed			Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 200'			

Project Number	B/O	Total
507100742	30	134

Drawing Number: IM100

Title: Swan Island Basin Project Area Remedial Design

Overall Inspection and Monitoring Plan

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MATCHLINE (SEE SHEET IM102)

OUTFALL M2

CATWALK

PIER

BERTH 311

FLOATS

OUTFALL M3

BOAT RAMP PARKING

SWAN ISLAND BOAT RAMP

N 50°43'08" W

BERTH 306

PIER

WALKWAY

BERTH 307

PIER

WALKWAY

BERTH 308

PIER

DOLPHIN, TYP

PILE SUPPORTED STRUCTURE

WIND TUNNEL

OUTFALL S2

NOTES

1. PERFORM PRE-CONSTRUCTION AND POST-CONSTRUCTION STRUCTURAL CONDITION INSPECTIONS FOR IDENTIFIED STRUCTURES.
2. LOCATION OF MONITORING POINTS ARE APPROXIMATE FOR 50% REMEDIAL DESIGN.
3. REFER TO SPECIFICATION SECTION 31 09 00 FOR DETAILS.

LEGEND

- MARINE STRUCTURE DESIGNATED FOR PRE-CONSTRUCTION AND POST-CONSTRUCTION STRUCTURAL CONDITION INSPECTIONS
- MARINE STRUCTURE MONITORING POINT LOCATED ABOVE OLW
- MARINE STRUCTURE MONITORING POINT LOCATED BELOW OLW
- UPLAND MONITORING POINT

0 60 120
SCALE IN FEET

50% REMEDIAL DESIGN NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	31	134

Designed			Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 60'	Status		Rev		Security

Drawing Number: IM101

Title: Swan Island Basin Project Area Remedial Design

Inspection and Monitoring Plan Area 1

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MATCHLINE (SEE SHEET IM103)

MATCHLINE (SEE SHEET IM101)

OUTFALL M1

FLOATING WALKWAY AND SUPPORT PILES

FLOATING BARGES

N 50°43'08" W

36+00 34+00 32+00 30+00 28+00 26+00 24+00 22+00 20+00 18+00

BERTH 303 BERTH 304 BERTH 305

LAGOON WHARF

OUTFALL S1

NOTES

1. PERFORM PRE-CONSTRUCTION AND POST-CONSTRUCTION STRUCTURAL CONDITION INSPECTIONS FOR IDENTIFIED STRUCTURES.
2. LOCATION OF MONITORING POINTS ARE APPROXIMATE FOR 50% REMEDIAL DESIGN.
3. REFER TO SPECIFICATION SECTION 31 09 00 FOR DETAILS.

LEGEND

- MARINE STRUCTURE DESIGNATED FOR PRE-CONSTRUCTION AND POST-CONSTRUCTION STRUCTURAL CONDITION INSPECTIONS
- MARINE STRUCTURE MONITORING POINT LOCATED ABOVE OLW
- MARINE STRUCTURE MONITORING POINT LOCATED BELOW OLW
- UPLAND MONITORING POINT

0 60 120
SCALE IN FEET

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Designed			Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 60'	Status		Rev		Security

Project Number	B/O	Total
507100742	32	134

Drawing Number: IM102

Title: Swan Island Basin Project Area Remedial Design

Inspection and Monitoring Plan Area 2

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N

WALKWAY AND DOLPHIN

US NAVY PIER

FLOATING DOCK

US NAVY WALKWAY AND DOLPHINS

MC PIER

FLOATING WALKWAY AND SUPPORT PILES

MATCHLINE (SEE SHEET IM102)

USCG FLOATING DOCK

USCG PIER

N 50°43'08" W

N 74°02'33" W

BERTH 302

40+00

38+00

36+00

42+00

44+00

46+00

48+00

50+00

52+00

54+00

MATCHLINE (SEE SHEET IM104)

NOTES

1. PERFORM PRE-CONSTRUCTION AND POST-CONSTRUCTION STRUCTURAL CONDITION INSPECTIONS FOR IDENTIFIED STRUCTURES.
2. LOCATION OF MONITORING POINTS ARE APPROXIMATE FOR 50% REMEDIAL DESIGN.
3. REFER TO SPECIFICATION SECTION 31 09 00 FOR DETAILS.

LEGEND

- MARINE STRUCTURE DESIGNATED FOR PRE-CONSTRUCTION AND POST-CONSTRUCTION STRUCTURAL CONDITION INSPECTIONS
- MARINE STRUCTURE MONITORING POINT LOCATED ABOVE OLW
- MARINE STRUCTURE MONITORING POINT LOCATED BELOW OLW
- UPLAND MONITORING POINT

0 60 120
SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	33	134

Designed			Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	1" = 60'	Status		Rev	Security
Drawing Number	IM103				

Title

Swan Island Basin Project Area
Remedial Design

Inspection and Monitoring Plan Area 3

C:\pwworking\hmm\ports_harbors\mor69830\dms83141\IM103.dwg Mar 11, 2025 - 6:24PM NG85190

MATCHLINE (SEE SHEET IM103)

N 74°02'33" W

S 80°42'53" W

S 17°31'09" W

54+00

56+00

58+00

60+00

62+00

64+00

66+00

PIER A

DRY DOCK 5

QUAY WALL

PIER C

DRY DOCK 3

SCC FLOATING DOCKS

LEGEND

- MARINE STRUCTURE DESIGNATED FOR PRE-CONSTRUCTION AND POST-CONSTRUCTION STRUCTURAL CONDITION INSPECTIONS
- A — MARINE STRUCTURE MONITORING POINT LOCATED ABOVE OLW
- B — MARINE STRUCTURE MONITORING POINT LOCATED BELOW OLW
- U — UPLAND MONITORING POINT

NOTES

1. PERFORM PRE-CONSTRUCTION AND POST-CONSTRUCTION STRUCTURAL CONDITION INSPECTIONS FOR IDENTIFIED STRUCTURES.
2. LOCATION OF MONITORING POINTS ARE APPROXIMATE FOR 50% REMEDIAL DESIGN.
3. REFER TO SPECIFICATION SECTION 31 09 00 FOR DETAILS.

0 60 120

SCALE IN FEET

MATCHLINE (SEE SHEET IM105)

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

HGL

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Designed			Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 60'			

Project Number	B/O	Total
507100742	34	134

Drawing Number: IM104

Title: Swan Island Basin Project Area Remedial Design

Inspection and Monitoring Plan Area 4

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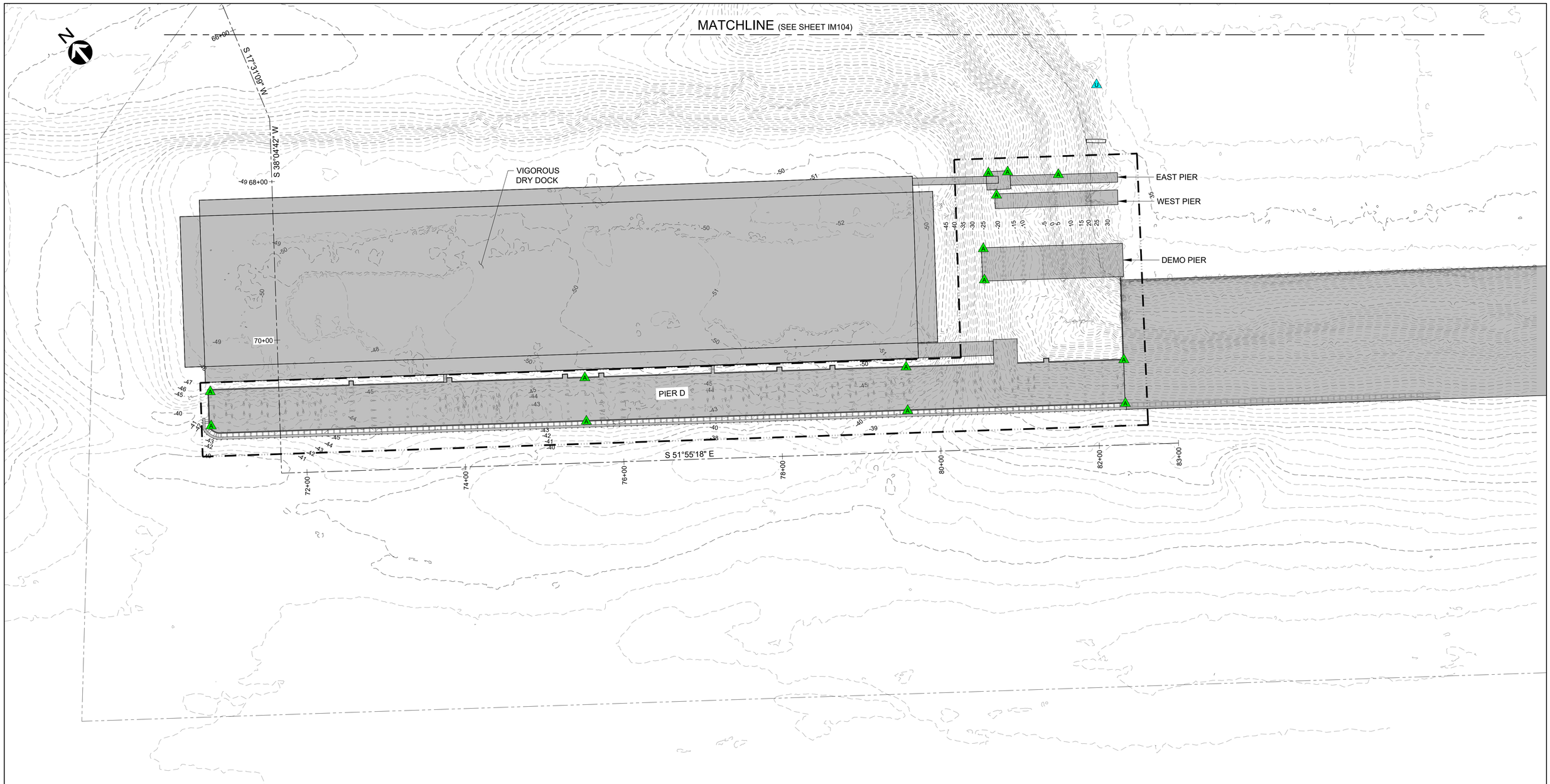

NOTES

1. PERFORM PRE-CONSTRUCTION AND POST-CONSTRUCTION STRUCTURAL CONDITION INSPECTIONS FOR IDENTIFIED STRUCTURES.
2. LOCATION OF MONITORING POINTS ARE APPROXIMATE FOR 50% REMEDIAL DESIGN.
3. REFER TO SPECIFICATION SECTION 31 09 00 FOR DETAILS.

LEGEND

- MARINE STRUCTURE DESIGNATED FOR PRE-CONSTRUCTION AND POST-CONSTRUCTION STRUCTURAL CONDITION INSPECTIONS
- A — MARINE STRUCTURE MONITORING POINT LOCATED ABOVE OLW
- B — MARINE STRUCTURE MONITORING POINT LOCATED BELOW OLW
- U — UPLAND MONITORING POINT

0 60 120
SCALE IN FEET

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	35	134

Designed			Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

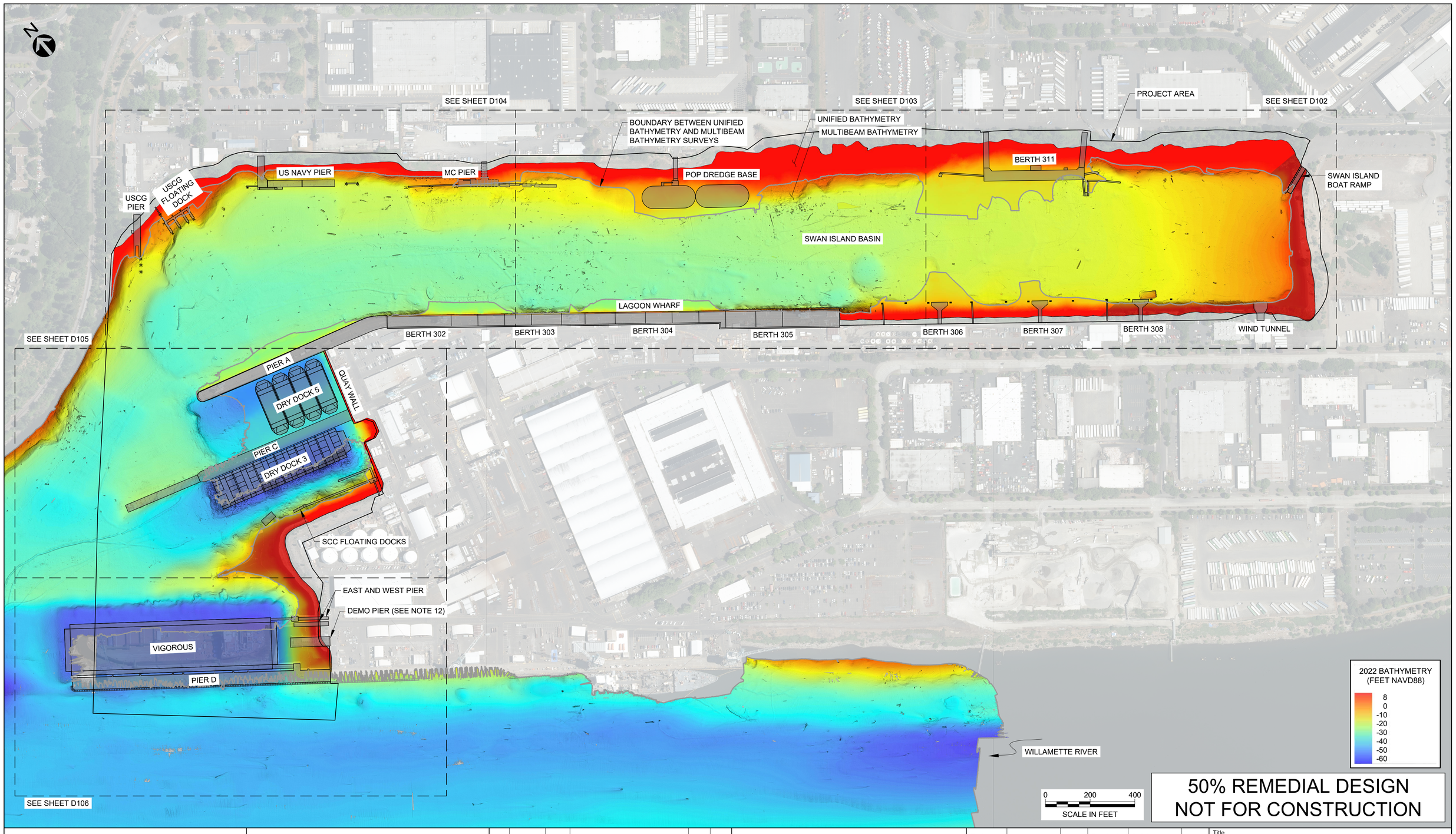
Scale at ANSI D	Status	Rev	Security
1" = 60'			

Drawing Number: IM105

Title: Swan Island Basin Project Area Remedial Design

Inspection and Monitoring Plan Area 5

C:\pwworking\hmm\ports_harbors\mor69830\dms83141\IM105.dwg Mar 11, 2025 - 6:25PM NG85190



50% REMEDIAL DESIGN
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Project Number	B/O	Total
507100742	36	134

Designed	-		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	1" = 200'	Status		Rev	Security
Drawing Number	D100				

Title

Swan Island Basin Project Area
Remedial Design

Overall Debris and Demolition Plan

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NOTES

1. POTENTIAL DEBRIS IDENTIFIED USING:
   - ETRAC MULTIBEAM BATHYMETRIC SURVEY CONDUCTED APRIL 2022.
2. MORE THAN 1,500 PIECES OF POTENTIAL DEBRIS IDENTIFIED. CONTRACTOR SHALL ANTICIPATE ADDITIONAL PIECES BEYOND THE EXTENT OF THE SURVEY SURFACE SHOWN ON DRAWING. SURVEY EXTENTS LIMITED DUE TO ACCESS AT TIME OF SURVEY.
3. ALL DEBRIS SHOWN IS GREATER THAN 5 FT IN LENGTH. DEBRIS COULD BE LARGER THAN ESTIMATED.
4. DEBRIS 0-5 FT IN LENGTH NOT SHOWN. DEBRIS EQUAL TO OR LESS THAN 5 FT MAY INCLUDE A MINIMUM OF 800 PIECES OF DEBRIS.
5. CONTRACTOR MAY ANTICIPATE TO ENCOUNTER LARGE DEBRIS GREATER THAN 70 FT IN LENGTH INCLUDING, BUT NOT LIMITED TO, SUNKEN BARGE(S).
6. POTENTIAL FOR UNEXPLODED ORDNANCE TO BE PRESENT ON PREMISES. SEE PROJECT SPECIFICATIONS.
7. POSSIBILITY OF SEVERAL SUNKEN VESSELS IN PROJECT AREA WITH ONE KNOWN ENC WRECK NOT VISIBLE IN BATHYMETRIC DATA. POTENTIALLY REMOVED AND/OR BURIED.
8. SUBSURFACE DEBRIS TYPE AND VOLUME UNKNOWN.
9. DEBRIS MAY INCLUDE WOODY DEBRIS, VESSELS, BARGES, PILES, LOGS, BRICK, METAL, TIRES, RIPRAP, HAZARDOUS ITEMS, AND OTHER UNIDENTIFIED ITEMS.
10. POTENTIAL IDENTIFIED DEBRIS SHALL BE CONFIRMED BY CONTRACTOR.
11. ALL LARGE DEBRIS SHALL BE REMOVED AND PROPERLY TRANSPORTED AND DISPOSED OF PRIOR TO DREDGING ACTIVITIES. DEFINITION OF LARGE DEBRIS TO BE DETERMINED BY CONTRACTOR.
12. "DEMO PIER" IS NAME OF STRUCTURE, STRUCTURE TO BE PROTECTED AND REMAIN IN PLACE.
13. CLASSIFICATION AND IDENTIFICATION OF DEBRIS IS DESCRIBED IN THE BODR AND RDWP.
14. EXISTING TIMBER PILES SHALL BE EXTRACTED IN THEIR ENTIRETY, REFER TO DEBRIS AND DEMOLITION PLANS. USE VIBRATORY EXTRACTION METHODS OR SIMILAR. IF EXTRACTION IS NOT POSSIBLE, CUTOFF A MINIMUM 2 FT BELOW EXISTING MUDLINE OR BELOW FUTURE NAVIGATION DEPTH (WHICHEVER IS DEEPER). ALL LOCATIONS OF PILES WHICH ARE NOT EXTRACTED IN THEIR ENTIRETY SHALL BE COPIED TO THE PROJECT REPRESENTATIVE FOR REVIEW.

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	37	134

Designed			Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	

Drawing Number: D101

Title: Swan Island Basin Project Area Remedial Design

Debris and Demolition Notes

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N

MATCHLINE (SEE SHEET DR103)

WOOD DEBRIS

BERTH 311

ASSUMED SUNKEN VESSEL

ASSUMED LARGE DEBRIS GREATER THAN 60 FT

ASSUMED SUNKEN VESSEL

WOOD DEBRIS

WOOD DEBRIS

DEMOLISH AND REPLACE-IN-KIND OUTFALL M3 CONCRETE HEADWALL

BOAT RAMP PARKING

DEMOLISH AND REPLACE-IN-KIND OUTFALL M2 CONCRETE HEADWALL

ASSUMED LARGE DEBRIS GREATER THAN 60 FT

SWAN ISLAND BOAT RAMP

ASSUMED SUNKEN VESSEL

PROJECT AREA

ASSUMED LARGE DEBRIS GREATER THAN 60 FT

ASSUMED SUNKEN BARGE 70 FT+ IN LENGTH

DEMOLISH BERTH 308

WOOD DEBRIS

DEMOLISH DOLPHINS

DEMOLISH DOLPHIN

DEMOLISH DOLPHINS

DEMOLISH DOLPHINS

DEMOLISH DOLPHINS

WIND TUNNEL

DEMOLISH BERTH 306

DEMOLISH CATWALK

DEMOLISH DOLPHIN

DEMOLISH BERTH 307

DEMOLISH CATWALK

DEMOLISH DOLPHINS

POTENTIAL SUNKEN VESSEL

DEMOLISH AND REPLACE-IN-KIND OUTFALL S2 CONCRETE HEADWALL

BERTH 306

BERTH 307

BERTH 308

1 D201

TIMBER PILE FIELD DETERMINED FROM AERIAL

BERTH 306, 307, 308 UNDER REVIEW

1 D201 SIM.

RC DISPLAY VANS

1 D201 SIM.

ASPHALT PARKING

ASPHALT PARKING

ASPHALT PARKING

DAIMIER TRUCKS NORTH AMERICA CORP 5

LEGEND

- DEBRIS GREATER THAN 5FT IN SIZE
- RIPRAP SHORELINE
- VEGETATION
- WOOD DEBRIS
- STRUCTURES TO BE DEMOLISHED

0 60 120

SCALE IN FEET

50% REMEDIAL DESIGN
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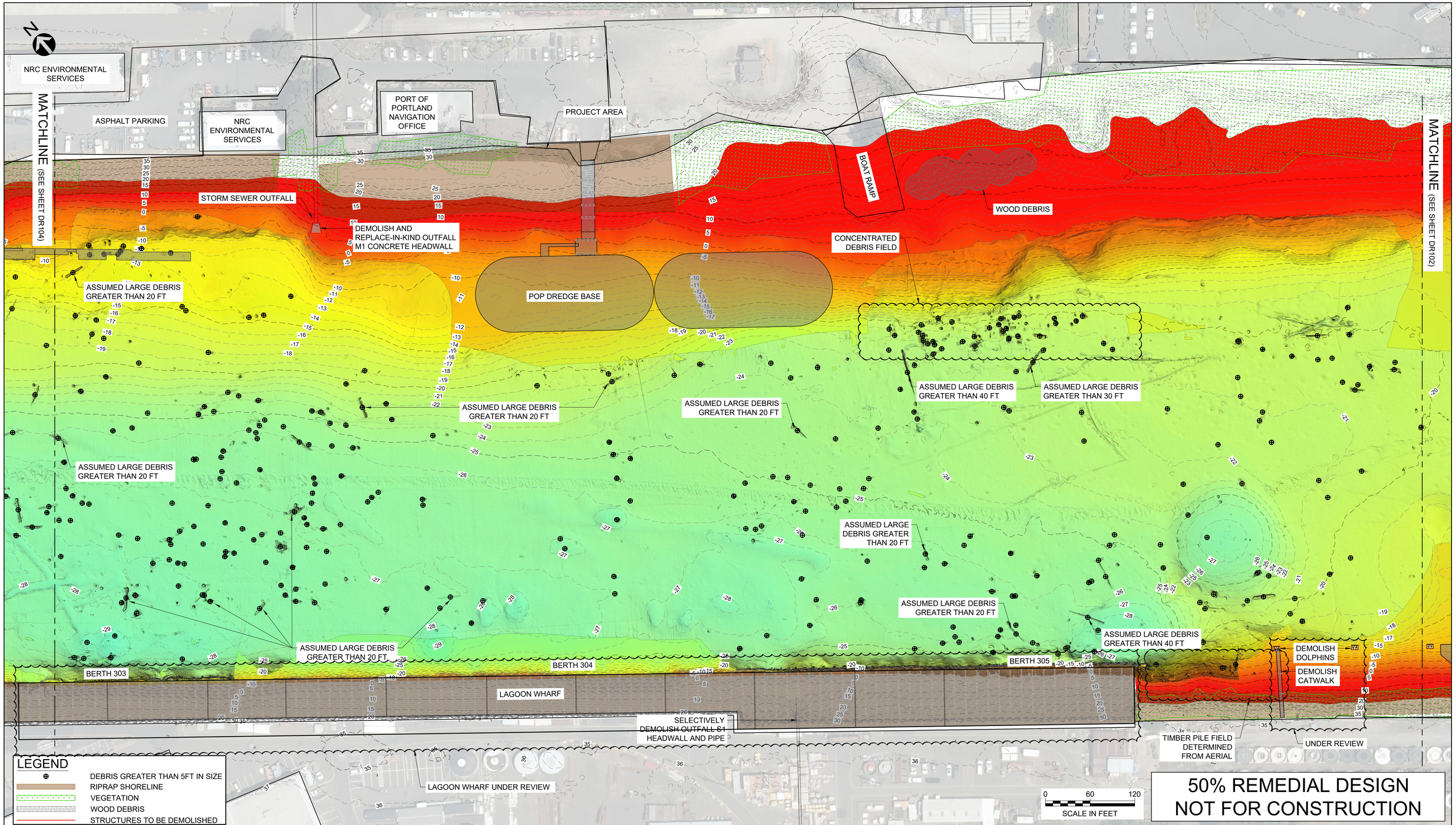
Project Number	B/O	Total
507100742	38	134

Designed			Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	
1" = 60'					

Drawing Number: D102

Title: Swan Island Basin Project Area Remedial Design

Debris and Demolition Plan Area 1



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Designed			Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 60'			

Project Number	B/O	Total
507100742	39	134

Drawing Number: D103

Title: Swan Island Basin Project Area Remedial Design

Debris and Demolition Plan Area 2

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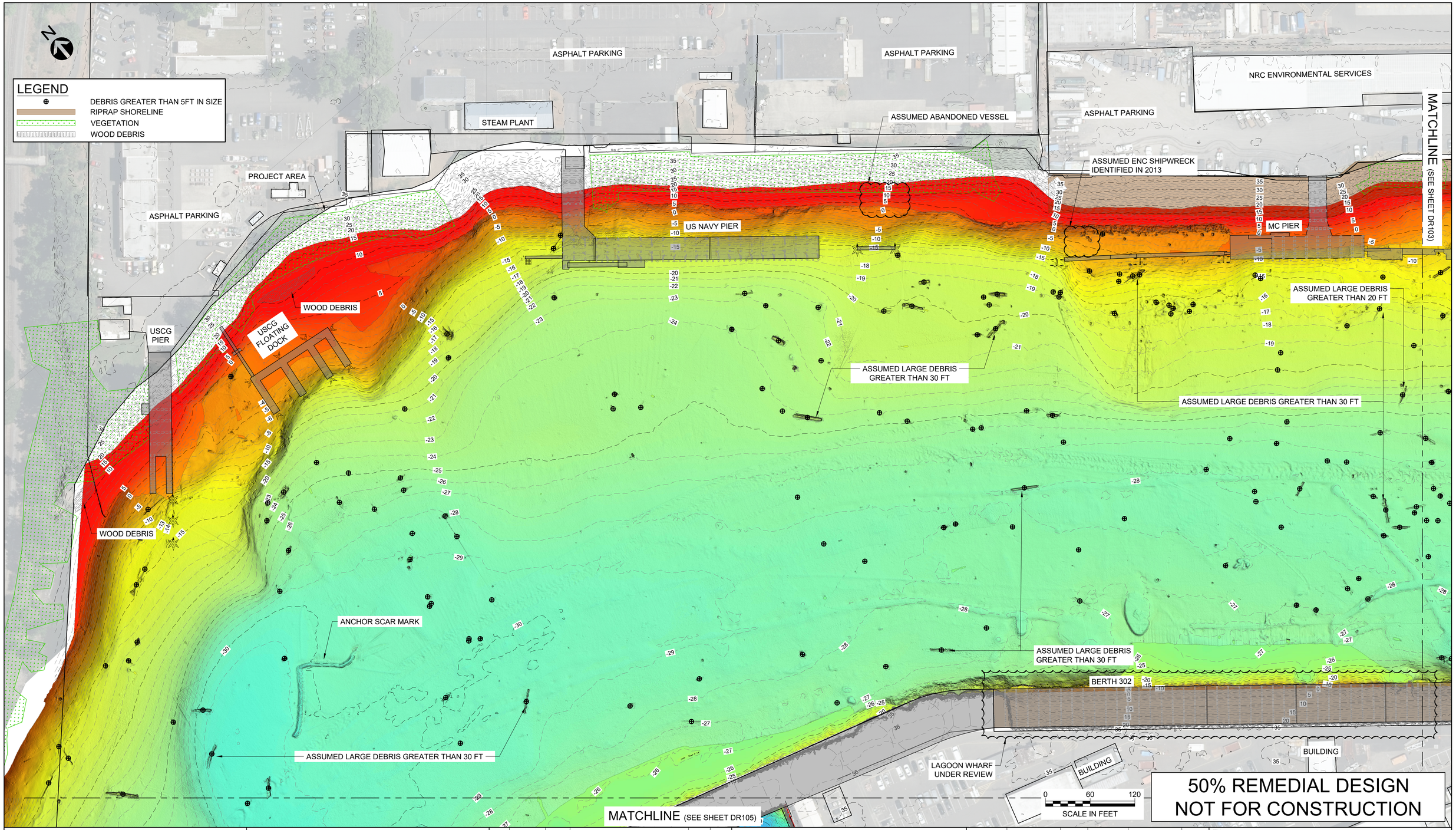

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Designed			Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Project Number	B/O	Total
507100742	40	134

Scale at ANSI D	Status	Rev	Security
1" = 60'			

Drawing Number: D104

Title: Swan Island Basin Project Area Remedial Design

Debris and Demolition Plan Area 3

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MATCHLINE (SEE SHEET DR104)

ASSUMED LARGE DEBRIS GREATER THAN 30 FT

PILE SHAPE DEBRIS GREATER THAN 30 FT

CONCENTRATED DEBRIS FIELD

PROJECT AREA

PIER A

PIER C

DRY DOCK 5

DRY DOCK 3

QUAY WALL

ASPHALT PARKING

ASSUMED LARGE DEBRIS GREATER THAN 40 FT

ASSUMED LARGE DEBRIS FIELD

SCC FLOATING DOCKS

TIMBER PILE FIELD OR WOOD DEBRIS DETERMINED FROM AERIAL

MATCHLINE (SEE SHEET DR106)

LEGEND

- DEBRIS GREATER THAN 5FT IN SIZE
- RIPRAP SHORELINE
- VEGETATION
- WOOD DEBRIS

0 60 120

SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	41	134

Designed			Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 60'			

Drawing Number: D105

Title: Swan Island Basin Project Area Remedial Design

Debris and Demolition Plan Area 4

C:\pwworking\hmm\ports_harbors\mor69830\dms82461\D105.dwg Mar 11, 2025 - 6:29PM NG85190

MATCHLINE (SEE SHEET DR105)

BUILDING

STEEL SCAFFOLDING
SHORELINE LADDER

EAST PIER

WEST PIER

DEMO PIER (SEE NOTE 12)

VIGOROUS

PIER D

PROJECT AREA

ASSUMED LARGE DEBRIS
GREATER THAN 20-30 FT

LEGEND

- DEBRIS GREATER THAN 5FT IN SIZE
- RIPRAP SHORELINE
- VEGETATION
- WOOD DEBRIS

0 60 120
SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

HGL

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	42	134

Designed			Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 60'			

Drawing Number: D106

Title: Swan Island Basin Project Area
Remedial Design

Debris and Demolition Plan Area 5

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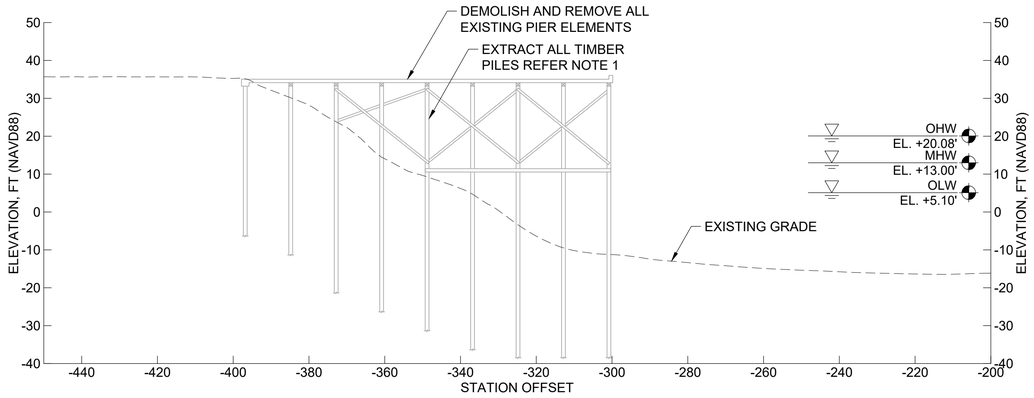

1 SECTION BERTH 306, 307, 308 DEMOLITION
SCALE: 1" = 20'

NOTES:

1. EXISTING TIMBER PILES SHALL BE EXTRACTED IN THEIR ENTIRETY, REFER TO DEBRIS AND DEMOLITION PLANS. USE VIBRATORY EXTRACTION METHODS OR SIMILAR. IF EXTRACTION IS NOT POSSIBLE, CUTOFF A MINIMUM 2FT BELOW EXISTING MUDLINE OR BELOW FUTURE NAVIGATION DEPTH (WHICHEVER IS DEEPER). ALL LOCATIONS OF PILES WHICH ARE NOT EXTRACTED IN THEIR ENTIRETY SHALL BE COPIED TO THE PROJECT REPRESENTATIVE FOR REVIEW.

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number 507100742 | B/O 43 | Total 134

Designed	-		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D: 1" = 20' | Status | Rev | Security

Drawing Number: D201

Title: Swan Island Basin Project Area Remedial Design

Debris and Demolition Sections 1

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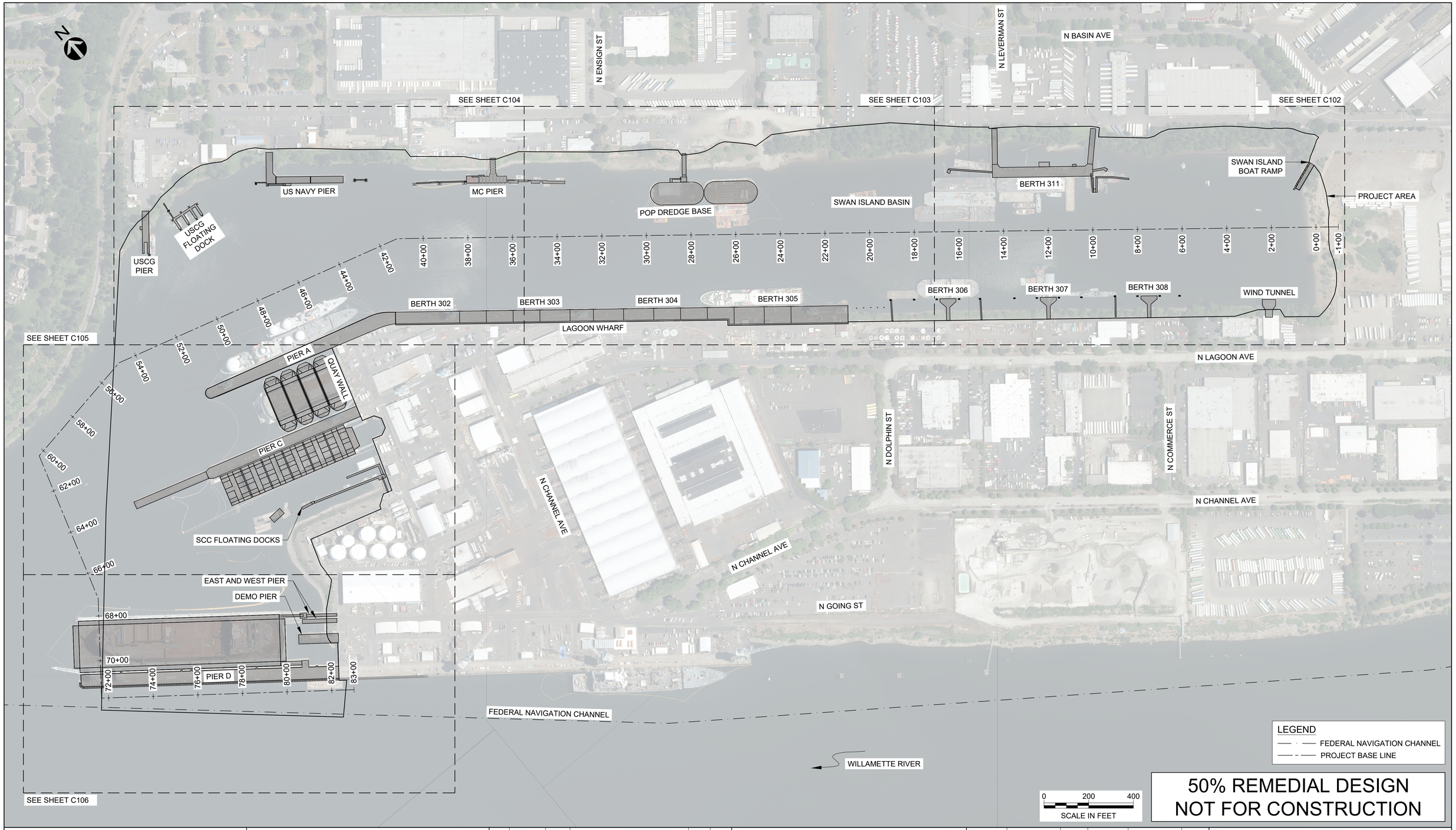

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	44	134

Designed	-		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 200'			

Drawing Number: C100

Title

Swan Island Basin Project Area
Remedial Design

Overall Civil Site Plan

C:\pwworking\hmm\ports_harbors\mor69830\dms62381\C100.dwg Mar 11, 2025 - 6:30PM NG85190

TESC NOTES:

1. CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES (BMPS) AND INSTALL EROSION CONTROL MEASURES PER THE STORMWATER MANAGEMENT MANUAL FOR PORTLAND PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITIES AS WELL AS MAINTENANCE AND REPAIR OF NEW AND EXISTING EROSION CONTROL MEASURES.

    A. FROM (OCTOBER 1 TO APRIL 30) NO SOIL MAY REMAIN EXPOSED FOR MORE THAN 2 DAYS. SOIL STABILIZATION TECHNIQUES (SUCH AS PLASTIC SHEETING, MULCH, ETC) SHALL BE EMPLOYED IF LEFT EXPOSED FOR TIME PERIOD GREATER THAN SPECIFIED.
    B. FROM (MAY 1 TO SEPTEMBER 30) NO SOIL MAY REMAIN EXPOSED FOR MORE THAN 7 DAYS. SOIL STABILIZATION TECHNIQUES (SUCH AS PLASTIC SHEETING, MULCH, ETC) SHALL BE EMPLOYED IF LEFT EXPOSED FOR TIME PERIOD GREATER THAN SPECIFIED.
    C. SILT FENCING AND OTHER EROSION/SEDIMENTATION CONTROL SYSTEMS SHALL BE INSTALLED DOWNSTREAM OF ACTIVE EARTH DISTURBANCE AREAS.

2. THE IMPLEMENTATION OF THESE TESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE TESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED.

3. THE TESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL DEMOLITION AND CUTTING, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DOES NOT ENTER THE DRAINAGE SYSTEM, ADJACENT WATER BODIES, OR VIOLATE APPLICABLE WATER STANDARDS.

4. THE TESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE TESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE. THE CONTRACTOR SHALL INSTALL ADDITIONAL FACILITIES AS NECESSARY TO PROTECT ADJACENT PROPERTIES, SENSITIVE AREAS, NATURAL WATER COURSES, AND/OR STORM DRAINAGE SYSTEMS.

5. THE TESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR.

6. THE TESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN 48 HOURS FOLLOWING A MAJOR STORM EVENT.

7. ALL TEMPORARY EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMPS) SHALL BE MAINTAINED AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. ALL MAINTENANCE AND REPAIR SHALL BE CONDUCTED IN ACCORDANCE WITH ALL APPLICABLE COUNTY AND STATE STORMWATER CONTROL STANDARDS AND REGULATIONS.

8. IF SEDIMENT IS TRANSPORTED ONTO A PAVED SURFACE, THE PAVEMENT SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM PAVED AREAS BY A METHOD AS APPROVED BY THE CITY AND BE TRANSPORTED TO A DISPOSAL AREA APPROVED FOR DISPOSAL OF THE MATERIAL REMOVED. PAVEMENT WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER.

9. ALL TEMPORARY EROSION AND SEDIMENT CONTROLS SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY CONTROLS ARE NO LONGER NEEDED, WHICHEVER IS LATER. TRAPPED SEDIMENT SHALL BE REMOVED OR STABILIZED ON SITE. TESC FACILITIES SHALL BE COMPLETELY REMOVED AT THE COMPLETION OF THE WORK.

10. WHEN EROSION OR SEDIMENTATION OCCURS TO ADJACENT PROPERTY OWNERS, ALL CONSTRUCTION WORK WITHIN THE DEVELOPMENT THAT AGGRAVATES THE SITUATION SHALL CEASE AND THE CONTRACTOR WILL IMMEDIATELY COMMENCE RESTORATION METHODS. RESTORATION ACTIVITY WILL CONTINUE UNTIL SUCH TIME AS THE AFFECTED PROPERTY OWNER IS SATISFIED.

11. IN ANY AREA WHICH HAS BEEN STRIPPED OF VEGETATION AND WHERE NO FURTHER WORK IS ANTICIPATED FOR A PERIOD OF TWO TO SEVEN DAYS OR MORE, ALL DISTURBED AREAS MUST BE IMMEDIATELY STABILIZED WITH MULCHING, GRASS PLANTING, OR OTHER APPROVED EROSION CONTROL TREATMENT APPLICABLE TO THE TIME OF YEAR IN QUESTION. GRASS SEEDING ALONE WILL BE ACCEPTABLE ONLY DURING THE MONTHS OF APRIL THROUGH SEPTEMBER. SEEDING MAY PROCEED, WHENEVER IT IS IN THE INTEREST OF THE APPLICANT/CONTRACTOR, BUT MUST BE AUGMENTED WITH MULCHING, NETTING, OR OTHER TREATMENT FOR THE REST OF THE MONTHS.

12. THE CONTRACTOR WILL BE RESPONSIBLE FOR FIELD LOCATING THE CLEARING LIMITS AND ESTABLISHING THOSE BOUNDARIES WITH BRIGHT COLORED FLAGGING. THE CONTRACTOR SHALL CLEAR TO THE LIMITS AS ESTABLISHED ON THIS PLAN AND FLAGGING IN THE FIELD.

13. ALL WORK ASSOCIATED WITH STABILIZING THE DISTURBED AREAS SHALL BE IN ACCORDANCE WITH OREGON DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION, THEREOF, UNLESS APPROVED OTHERWISE BY THE CITY.

14. THE NECESSARY FACILITIES SHALL BE MAINTAINED ON SITE TO PREVENT DEBRIS, DUST, AND MUD FROM ACCUMULATING ON CITY RIGHT-OF-WAY.

15. AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A TRAPPED CATCH BASIN. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT LADEN WATER INTO THE DOWNSTREAM SYSTEM.

16. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURE MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

CONSTRUCTION SWPPP

1. MARK CLEARING LIMITS: CLEARING LIMITS SHALL BE CLEARLY MARKED PRIOR TO ANY SOIL DISTURBANCE AS SHOWN ON THE TESC.

2. ESTABLISH CONSTRUCTION ACCESS: CONSTRUCTION ACCESS WILL BE PROVIDED FROM EXISTING ROADS AND PARKING AREA LOCATED ON THE LANDWARD SIDE OF THE WORK AREA.

3. INSTALL SEDIMENT CONTROLS: SILT FENCING SHALL BE INSTALLED AT THE DOWNSTREAM EDGE OF THE DISPOSAL AREA LIMITS AT LOCATIONS SHOWN ON THE TESC PLAN AND OTHER LOCATIONS AS NECESSARY TO CONTROL SEDIMENT RUNOFF BASED ON CONTRACTORS WORK PLAN. THE SILT FENCE SHALL HAVE NO GAPS ALONG ITS LENGTH, BE DUG INTO THE EXISTING SOIL, AND BE INSPECTED DAILY FOR INTEGRITY. ALL STORMWATER THAT COLLECTS ON DISTURBED SOIL SHALL PASS THROUGH A SILT FENCE PRIOR TO DOWNSTREAM DRAINAGE.

4. STABILIZE SOILS: DISTURBED SOILS (TEMPORARY REHANDLING AND DISPOSAL SITE) SHALL BE STABILIZED AS SOON AS POSSIBLE AND STOCKPILES SHALL BE TEMPORARILY COVERED WITH PLASTIC SHEETING. ANY DISTURBED SOIL AREAS LEFT EXPOSED FOR MORE THAN 10 DAYS IN DRY SEASON AND 5 DAYS IN WET SEASON SHALL BE PROTECTED WITH STANDARD BMPS SUCH AS MULCH, PLASTIC TARPS OR SIMILAR DEVICES. AFTER COMPLETION OF THE WORK, ALL DISTURBED SOILS SHALL BE STABILIZED AND TREATED WITH BMPS SUCH AS STRAW MULCH AND GRASS SEEDING. DISTURBED PARKING AREA GRAVEL SHALL BE REPLACED WITH GRAVEL WITHIN 2 DAYS OF COMPLETION OF THE WORK.

5. PROTECT SLOPES: TEMPORARY CONSTRUCTION SLOPES SHALL BE PROTECTED THROUGH ROUGHENING (TRACKING) OF SLOPES, DIVERTING UPSLOPE DRAINAGE AT TOP OF SLOPE, STABILIZATION OF SLOPES (SEE STABILIZE SOILS BMPS, ABOVE), OR USE OF PLASTIC SHEETING. THE PLASTIC SHEETING SHALL COVER THE ENTIRE AREA OF EXPOSED SOILS AND BE WEIGHTED TO KEEP IT IN PLACE.

6. STABILIZE CHANNELS AND OUTLETS: ALL CHANNELS AND OUTLETS LOCATED WITHIN THE PROJECT AREA WILL BE PROTECTED USING APPROPRIATE BMPS FROM STORMWATER MANAGEMENT MANUAL FOR PORTLAND.

7. MANAGE THE PROJECT: A CERTIFIED EROSION CONTROL LEAD SHALL REVIEW THE INSTALLED SWPPP ELEMENTS PRIOR TO THE START OF CONSTRUCTION AND PERIODICALLY THROUGHOUT CONSTRUCTION AND WITHIN 24 HOURS OF ANY STORMWATER DISCHARGE FROM THE SITE. A PRECONSTRUCTION CONFERENCE SHALL BE HELD WITH THE DESIGNATED CONTRACTOR SPECIALIST. THE CONTRACTOR SHALL DESIGNATE THEIR OWN SITE REPRESENTATIVE WHO WILL BE RESPONSIBLE FOR REVIEWING THE INSTALLED BMPS AND SWPPP ELEMENTS ON A DAILY BASIS AND WHO IS RESPONSIBLE FOR MAKING THE APPROPRIATE CORRECTIONS WHEN NEEDED.

8. CONTROL DEWATERING: HIGHLY TURBID WATER FROM CONSTRUCTION EQUIPMENT OPERATION AND EXCAVATED MATERIAL SHALL BE HANDLED SEPARATELY FROM STORMWATER. UTILIZE CONTAINMENT BERMS AND SILT FENCE AS SPECIFIED HEREIN. CONTROL OF DEWATERING MAY INCLUDE FILTRATION WITH BERMS, GROUND INFILTRATION, ONSITE TANK TREATMENT OR OTHER SIMILAR SYSTEMS PRIOR TO DISCHARGE BACK INTO SURFACE WATERS.

9. SILT FENCE: SILT FENCES SHALL BE INSTALLED DOWNSLOPE OF ALL ACTIVE DEMOLITION, EXCAVATION, FILLING, AND MATERIAL OFFLOADING WORK AREAS. CONTRACTOR SHALL MAINTAIN THE FENCE THROUGHOUT DURATION OF ALL CONSTRUCTION ACTIVITIES.

10. MATERIAL SPILL: SPILLS THAT OCCUR DURING OFFLOADING AND TRANSFER SHALL DRAIN WITHIN THE CONTAINED UPLAND AREA.

11. FLOATING DEBRIS BOOM/SILT CURTAIN: DEBRIS BOOM/SILT CURTAIN SHALL BE INSTALLED AROUND THE WETTED PERIMETER OF ALL ACTIVE DEMOLITION, EXCAVATION, FILLING, AND MATERIAL WORK AREAS.

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Rev	Date	Drawn	Description	Ch'k'd	App'd

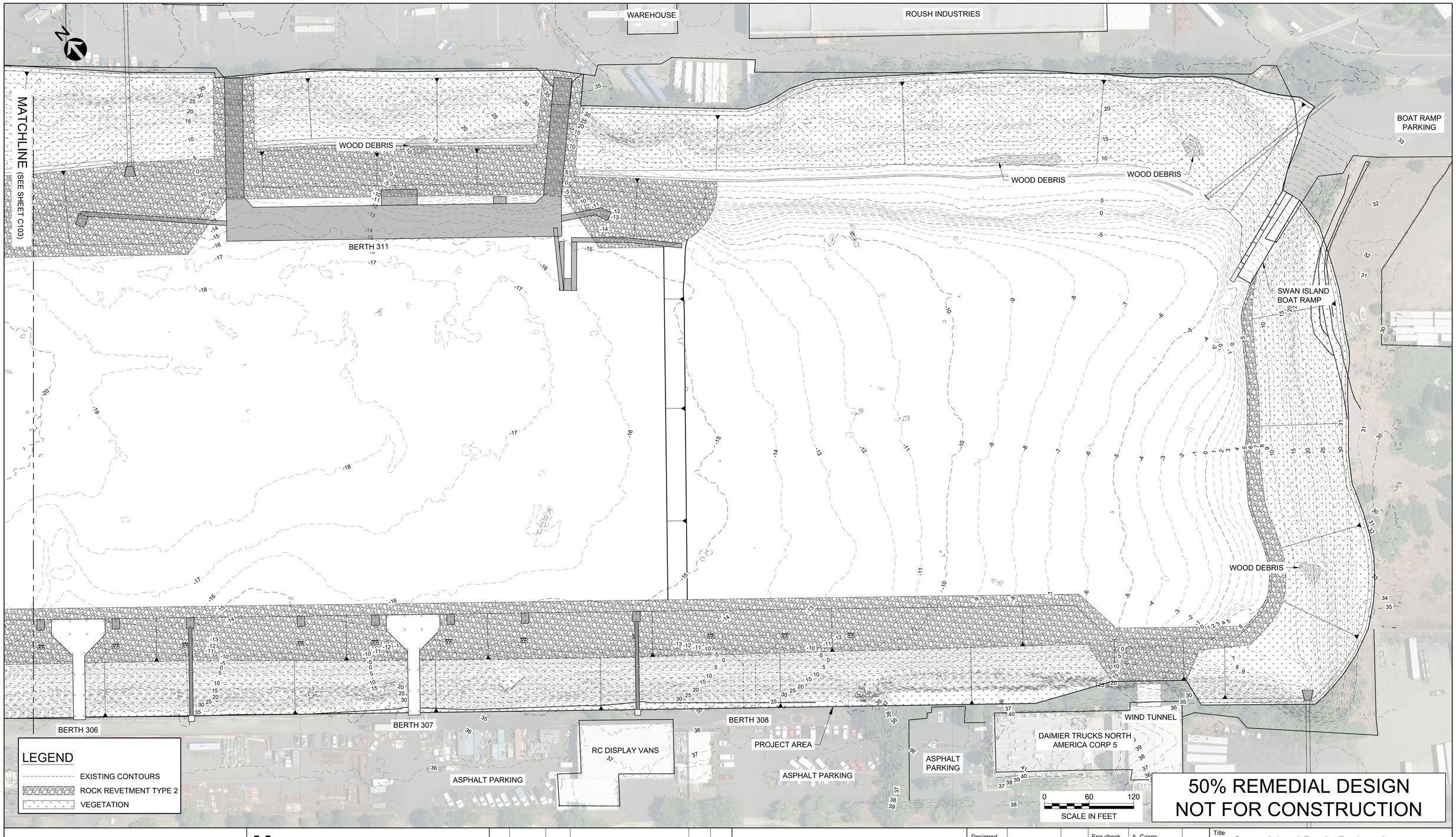
Project Number	507100742	B/O	45	Total	134

Designed	-		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	
Drawing Number	C101				

Title

Swan Island Basin Project Area
Remedial Design

Civil Notes



50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

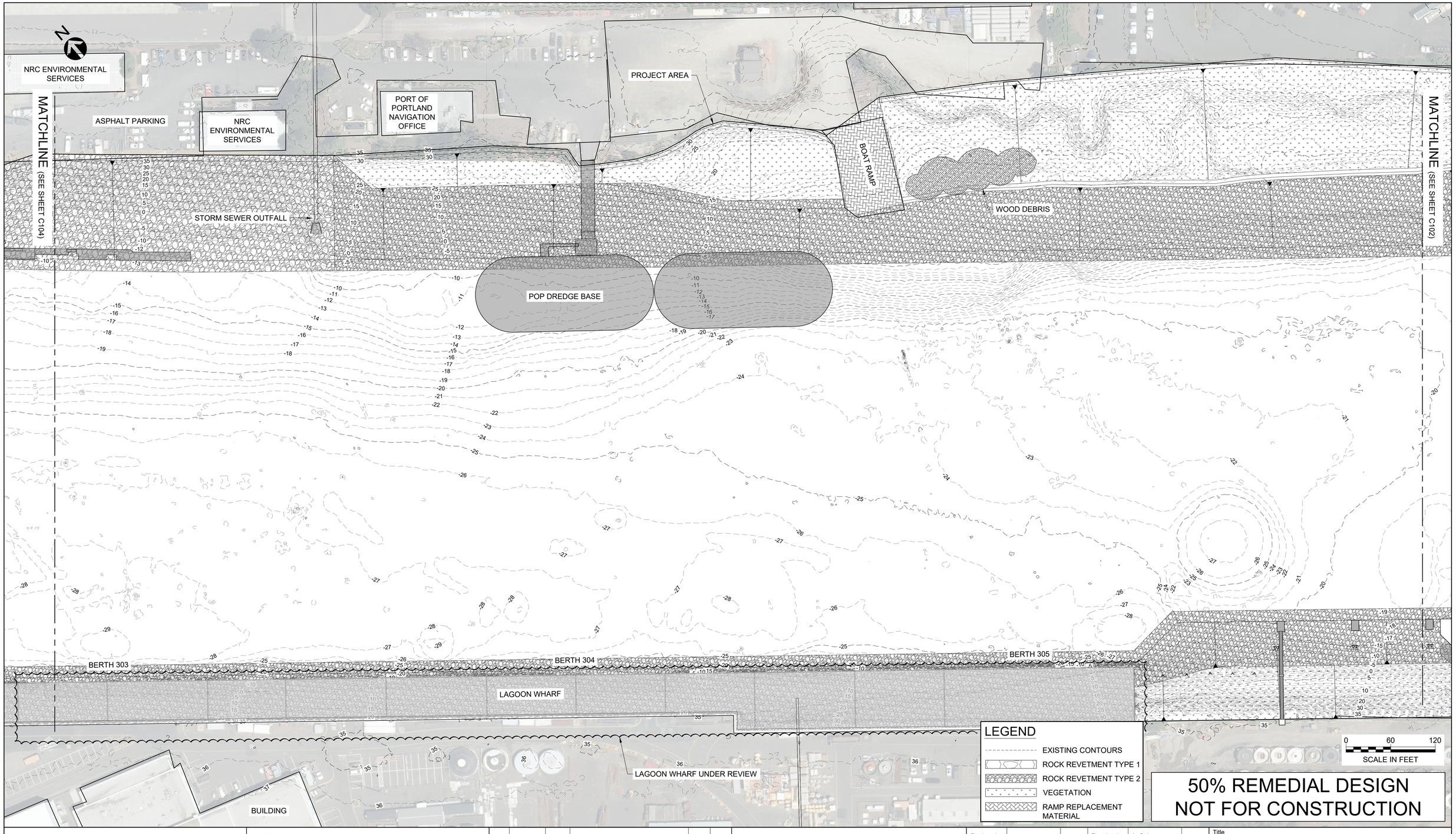
Designed	-		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	1" = 60'	Status		Rev	Security

Project Number	B/O	Total
507100742	46	134

Drawing Number: C102

Title: Swan Island Basin Project Area Remedial Design

Grading and TESC Plan 1



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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	47	134

Designed	-		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 60'	Status		Rev		Security
Drawing Number: C103					

Title

Swan Island Basin Project Area
Remedial Design

Grading and TESC Plan 2

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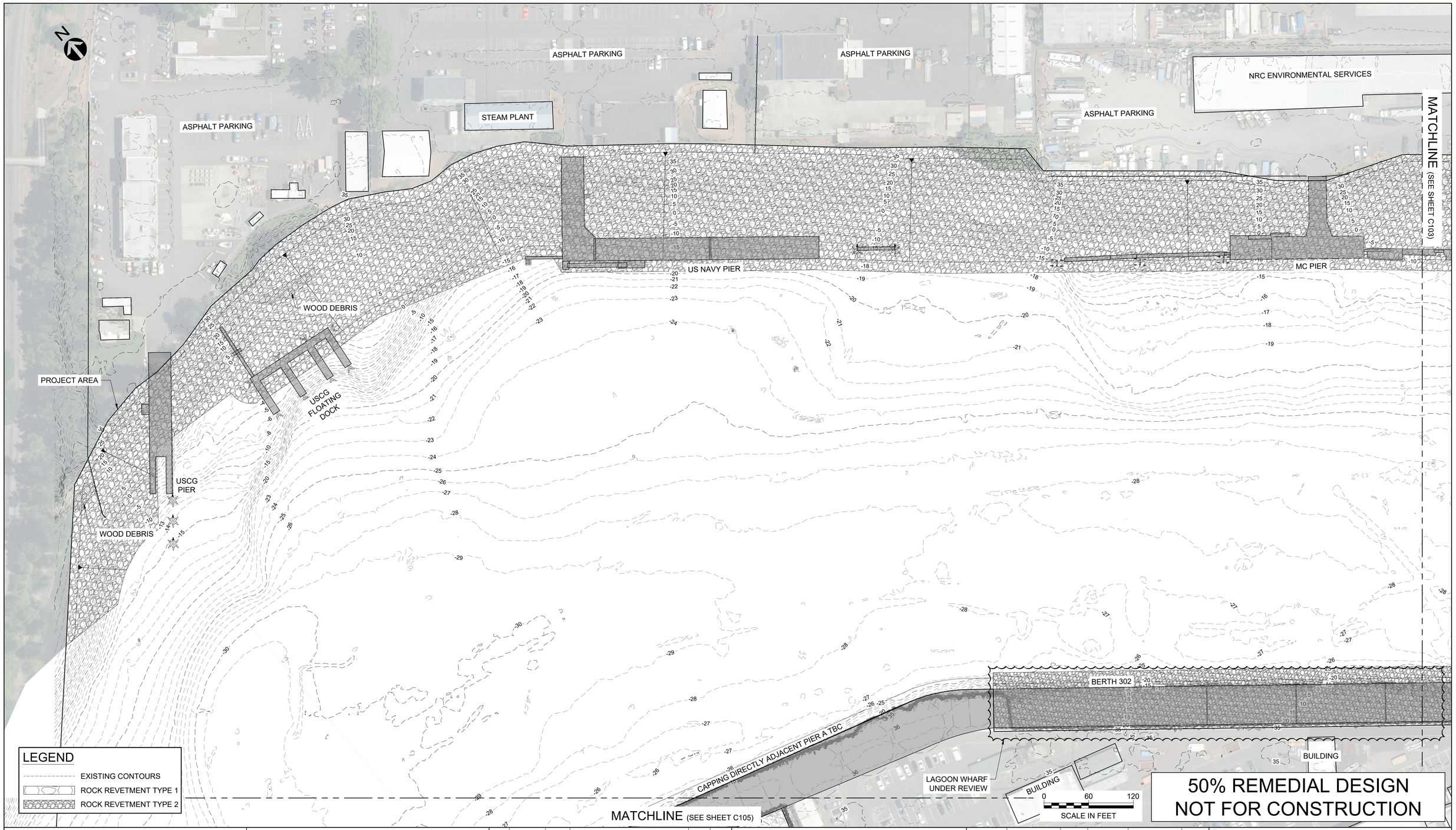

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Designed	-		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Project Number	B/O	Total
507100742	48	134

Scale at ANSI D	Status	Rev	Security
1" = 60'			

Drawing Number: C104

Title: Swan Island Basin Project Area Remedial Design

Grading and TESC Plan 3

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MATCHLINE (SEE SHEET C104)

CAPPING DIRECTLY ADJACENT PIER A TBC

PIER A

PIER C

QUAY WALL

ASPHALT PARKING

BUILDING

BUILDING

SCC FLOATIN DOCKS

PROJECT AREA

LEGEND

EXISTING CONTOURS

ROCK REVETMENT TYPE 1

MATCHLINE (SEE SHEET C106)

0 60 120

SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	49	134

Designed	-		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	1" = 60'	Status		Rev	Security
Drawing Number	C105				

Title

Swan Island Basin Project Area
Remedial Design

Grading and TESC Plan 4

C:\pwworking\hmm\ports_harbors\mor69830\dms62381\C105.dwg Mar 11, 2025 - 6:33PM NG85190

MATCHLINE (SEE SHEET C105)

BUILDING

STEEL SCAFFOLDING
SHORELINE LADDER

EAST PIER

WEST PIER

DEMO PIER

PROJECT AREA

PIER D

LEGEND

EXISTING CONTOURS

ROCK REVETMENT TYPE 1

0 60 120

SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

HGL

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Rev	Date	Drawn	Description	Ch'k'd	App'd

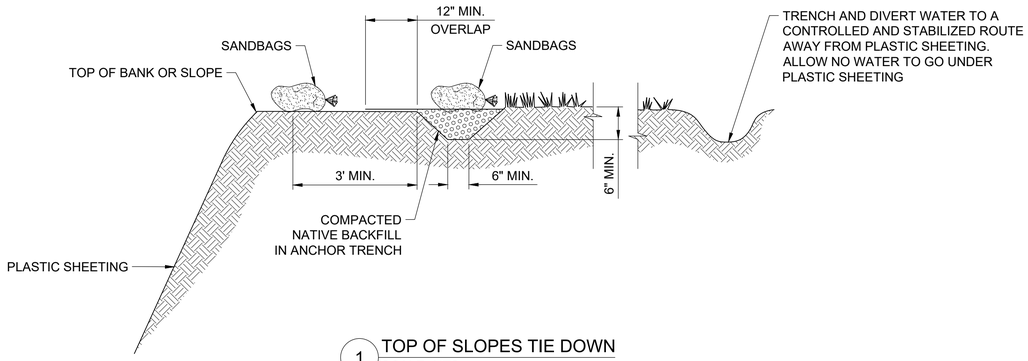
Project Number	B/O	Total
507100742	50	134

Designed	-		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 60'	Status		Rev		Security
Drawing Number: C106					

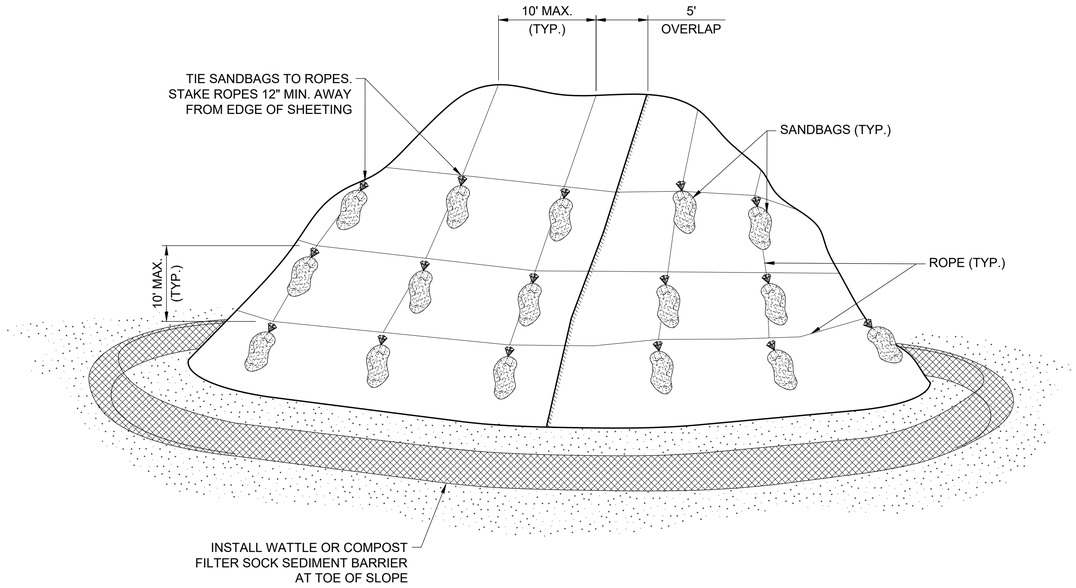
Title

Swan Island Basin Project Area
Remedial Design

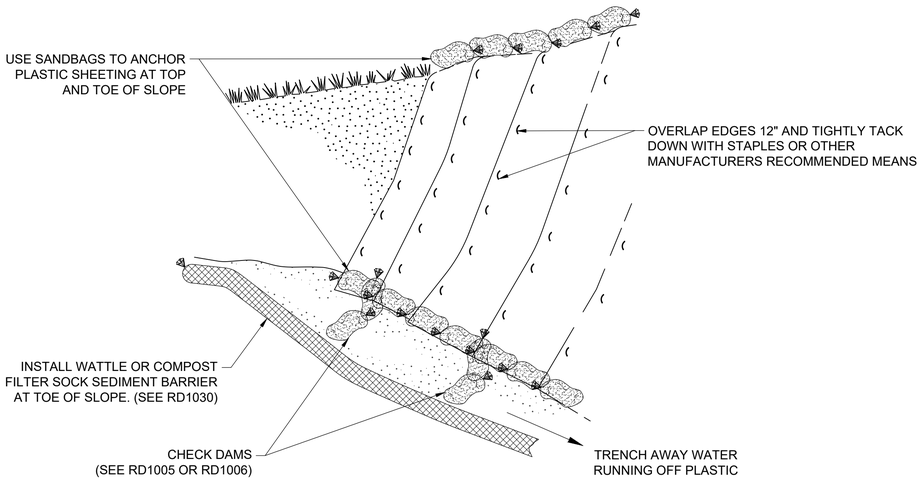
Grading and TESC Plan 5



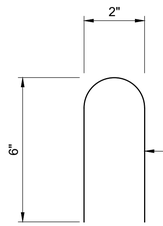
1 TOP OF SLOPES TIE DOWN
SCALE: NTS



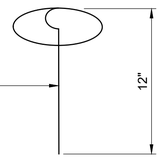
3 STOCKPILE
SCALE: NTS



2 SLOPES
SCALE: NTS



4 STAPLE DETAIL
SCALE: NTS



5 PIN STAPLE DETAIL
SCALE: NTS

NOTES

1. INSTALL PLASTIC SHEETING VERTICALLY DOWN SLOPE.
2. INSTALL PLASTIC SHEETING SO EDGES OVERLAP AND ARE SHINGLED AWAY FROM PREVAILING WINDS.

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	51	134

Designed	-		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
N.T.S.			

Drawing Number: S201

Title: Swan Island Basin Project Area Remedial Design

TESC Details 1

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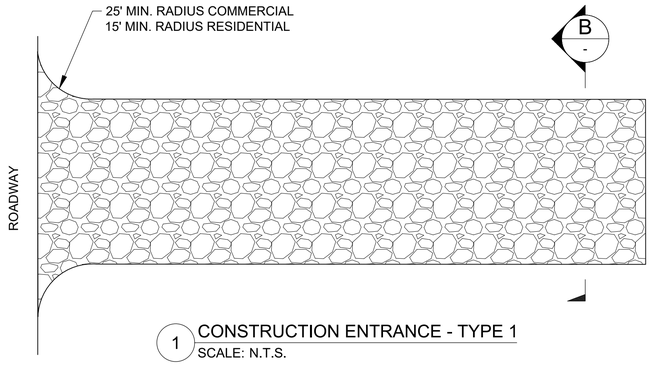
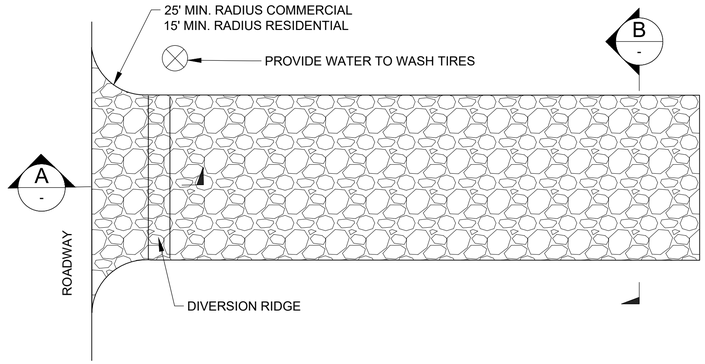
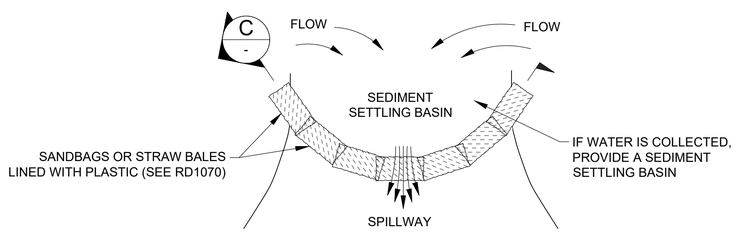
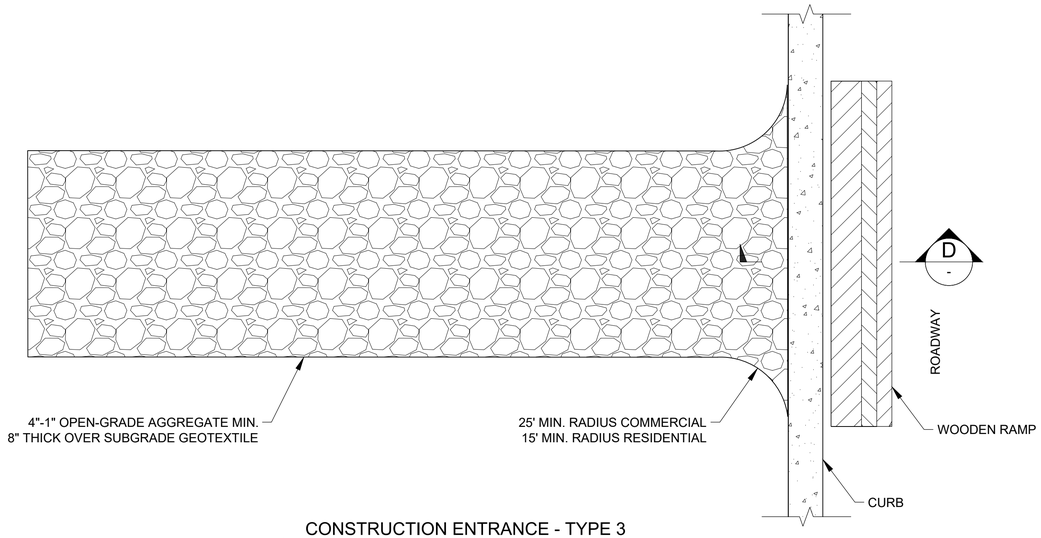


1 CONSTRUCTION ENTRANCE - TYPE 1
SCALE: N.T.S.

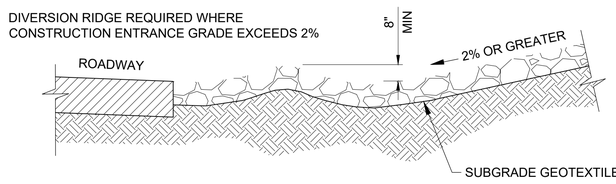




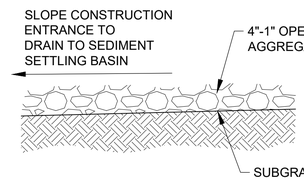
2 CONSTRUCTION ENTRANCE - TYPE 2
SCALE: N.T.S.



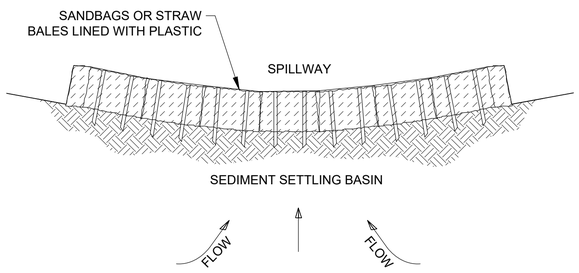
3 CONSTRUCTION ENTRANCE - TYPE 3
(TYPE 1 0R 2 WITH EXISTING CURB)
SCALE: N.T.S.



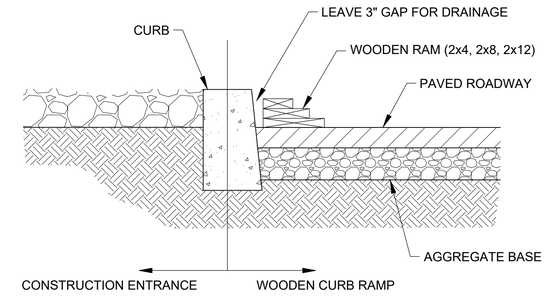
A SECTION
SCALE: N.T.S.



B SECTION
SCALE: N.T.S.



C SECTION
SCALE: N.T.S.



D WOODEN CURB RAMP SECTION
SCALE: N.T.S.

NOTES

1. THE TYPE 1 ENTRANCE IS A SIMPLE ENTRANCE WITHOUT A DIVERSION RIDGE OR SETTLING BASIN.
2. THE WOODEN RAMP MAY BE USED ON EITHER TYPE 1 OR TYPE 2 ENTRANCES IN SITUATIONS WHERE THERE IS CURB AND THE CURB IS NOT REMOVED FOR THE CONSTRUCTION ENTRANCE.

CONSTRUCTION ENTRANCE TABLE MINIMUM LENGTH	
LENGTH (FT)	AREA OF EXPOSED SOIL (ACRE)
20	0.25
50	0.25 < A < 1.0
100	A > 1.0

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

HGL

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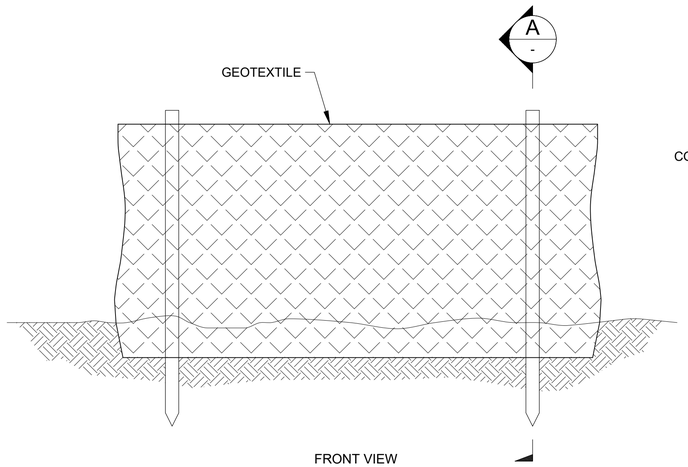
Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	52	134

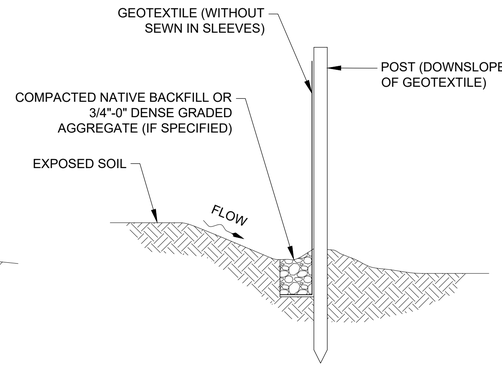
Designed	-		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: N.T.S.	Status		Rev	Security	
Drawing Number: C202					

Title
Swan Island Basin Project Area
Remedial Design

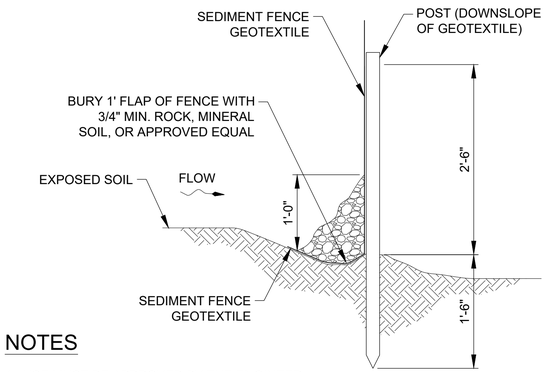
TESC Details 2



1 SEDIMENT FENCE AND GEOTEXTILE BURY DETAIL - TYPE 1
SCALE: N.T.S.



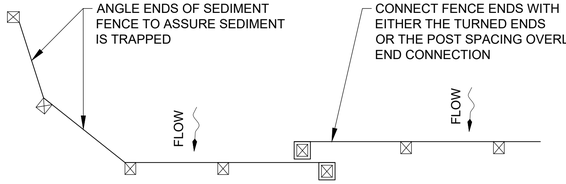
A SECTION
SCALE: N.T.S.



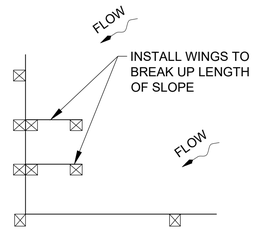
NOTES

1. USE MUST BE APPROVED BY THE ENGINEER.
2. NOT APPROVED FOR USE WITH SEDIMENT FENCING WITH SEWN-IN POST SLEEVES.

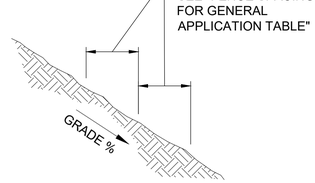
2 ALTERNATE SEDIMENT FENCE WITHOUT TRENCHING - TYPE 2
SCALE: N.T.S.

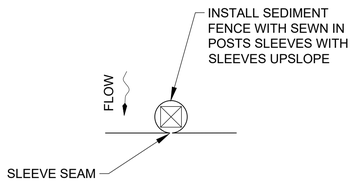


PLAN VIEW

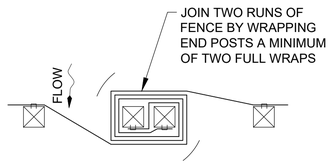


TERMINATION AT CORNER OR PROPERTY LINE

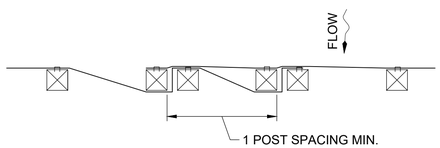




GEOTEXTILE WITH POST SLEEVES



TURNED ENDS CONNECTION



POST SPACING OVERLAP CONNECTION

3 GEOTEXTILE END CONNECTIONS
SCALE: N.T.S.

FENCE SPACING FOR GENERAL APPLICATION TABLE	
INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS	
GRADE	MAXIMUM SPACING ON GRADE
GRADE < 10%	300'
10% ≤ GRADE < 15%	150'
15% ≤ GRADE < 20%	100'
20% ≤ GRADE < 30%	50'
30% ≤ GRADE	25'

POST SPACING TABLE	
6'	SEDIMENT FENCE WITH GEOTEXTILE ELONGATION LESS THAN 50%
4'	SEDIMENT FENCE WITH GEOTEXTILE ELONGATION 50% OR MORE

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	53	134

Designed	-		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: N.T.S.	Status		Rev		Security
Drawing Number: C203					

Title
Swan Island Basin Project Area
Remedial Design

TESC Details 3

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N

SEE SHEET DR104

SEE SHEET DR103

SEE SHEET DR102

PROJECT AREA

US NAVY PIER

MC PIER

POP DREDGE BASE

BERTH 311

SWAN ISLAND BOAT RAMP

USCG FLOATING DOCK

USCG PIER

PLAN AREA 3

PLAN AREA 2

PLAN AREA 1

42+00 40+00 38+00 36+00 34+00 32+00 30+00 28+0 26+00 24+00 22+00 20+00 18+00 16+00 14+00 12+00 10+00 8+00 6+00 4+00 2+00 0+00 -1+00

44+00 46+00 48+00 50+00 52+00 54+00

BERTH 302 BERTH 303 BERTH 304 BERTH 305 BERTH 306 BERTH 307 BERTH 308 WIND TUNNEL

LAGOON WHARF

SEE SHEET DR105

PIER A

QUAY WALL

DRY DOCK 5

56+00 58+00 60+00 62+00 64+00 66+00 68+00 70+00 72+00 74+00 76+00 78+00 80+00 82+00 83+00

PLAN AREA 4

PIER C

DRY DOCK 3

SCC FLOATIN DOCKS

EAST PIER

WEST PIER

DEMO PIER

VIGOROUS

PIER D

PLAN AREA 5

SEE SHEET DR106

0 200 400

SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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COAST & HARBOR ENGINEERING

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	54	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 200'			

Drawing Number: DR100

Title: Swan Island Basin Project Area
Remedial Design

Overall Dredging Plan

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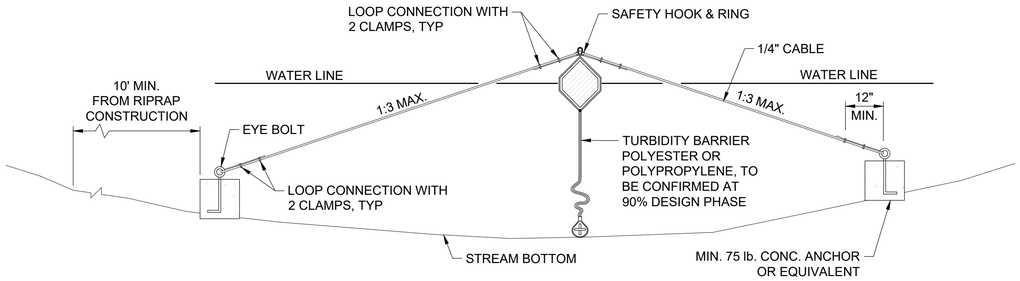
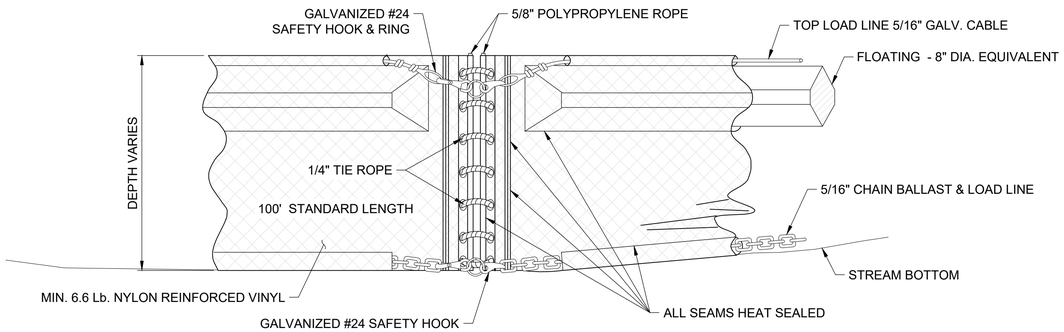
NOTES

1. TRANSITIONS BETWEEN BOTTOMS OF DREDGE AREAS ARE 3H:1V, UNLESS OTHERWISE NOTED.
2. DREDGE CUT SLOPES AROUND DRY DOCKS TO BE DETERMINED AT 90% DESIGN SUBMITTAL.
3. ALL DREDGING WILL ALLOW 0.5 FT PAID OVER-DEPTH, AND MAXIMUM ALLOWED TOTAL 1 FT OVER-DEPTH.
4. TURBIDITY BARRIER SHOWN AT RIGHT IS TYPICAL GEOTEXTILE FABRIC BASED CONCEPT AND IS REPRESENTATIVE. ALTERNATIVE CONCEPTS SUCH AS TURBIDITY BARRIER WITH TEMPORARY SUPPORT PILE ARE UNDER CONSIDERATION. APPLICABLE DEPTHS FOR TURBIDITY BARRIER USE TO BE CONFIRMED.
5. IN AREAS WHERE DREDGING EXTENDS TO PROJECT AREA NOT ADJACENT TO FEDERAL NAVIGATION CHANNEL, DREDGING TO SPECIFIED ELEVATION SHALL CONTINUE A MINIMUM OF 10 FT BEYOND PROJECT AREA.
6. IN AREAS WHERE DREDGING AND CAPPING EXTENDS TO PROJECT AREA ON THE FEDERAL NAVIGATION CHANNEL, DREDGING TO SPECIFIED ELEVATION SHALL CONTINUE A MINIMUM BUFFER DISTANCE BEYOND PROJECT AREA (TO BE DETERMINED).
7. MINIMUM DREDGE DEPTH REFERS TO MINIMUM ALLOWABLE DEPTH IN EACH AREA POST-DREDGING.



1 SEDIMENT BARRIER FLOATING
SCALE: NTS SIDE VIEW



NOTE
COMPONENTS OF THIS BARRIER MAY BE SIMILAR OR IDENTICAL TO PROPRIETARY DESIGNS. ANY INFRINGEMENT ON THE PROPRIETARY RIGHTS OF THE DESIGNER SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. SUBSTITUTIONS SHALL BE AS APPROVED BY THE ENGINEER.

2 TURBIDITY BARRIER - ANCHOR ASSEMBLY
SCALE: NTS

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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MOTT MACDONALD
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	55	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security

Drawing Number: DR101

Title
Swan Island Basin Project Area
Remedial Design

Dredging Notes

C:\pwworking\hmm\ports_harbors\mor69830\dms82129\DR101.dwg Mar 11, 2025 - 6:34PM MOR69830



NOTES

1. DREDGE POLYGONS SHOWN APPLY TO AREAS AWAY FROM STRUCTURES, TYPICALLY 20 FT. REFER TO STRUCTURAL SERIES DRAWINGS FOR DREDGE PROFILES ADJACENT STRUCTURES, BENEATH STRUCTURES AND FOR SHORELINE EXCAVATION.

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	56	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 60'			

Drawing Number: DR102

Title: Swan Island Basin Project Area
Remedial Design

Dredging Plan Area 1

C:\pwworking\hmm\ports_harbors\mor69830\dms82129\DR102.dwg Mar 11, 2025 - 6:34PM NG85190

MATCHLINE (SEE SHEET DR104)
STATION 35+47.79

MATCHLINE (SEE SHEET DR102)
STATION 17+09.79

PROJECT AREA

2
DR202

DREDGE DEPTH 18.7 FT
(EL. -18.7 FT NAVD88)

DREDGE DEPTH 13.7 FT
(EL. -13.7 FT NAVD88)

POP DREDGE BASE

DREDGE DEPTH 23.7 FT
(EL. -23.7 FT NAVD88)

3H:1V MAX, TYP.

DREDGE DEPTH 29.7 FT
(EL. -29.7 FT NAVD88)

DREDGE DEPTH 18.7 FT
(EL. -18.7 FT NAVD88)

BERTH 303

BERTH 304

BERTH 305

LAGOON WHARF

LAGOON WHARF UNDER REVIEW

LEGEND

- DREDGE DEPTH 13.7 FT
- DREDGE DEPTH 18.7 FT
- DREDGE DEPTH 23.7 FT
- DREDGE DEPTH 29.7 FT

NOTES

1. DREDGE POLYGONS SHOWN APPLY TO AREAS AWAY FROM STRUCTURES, TYPICALLY 20 FT. REFER TO STRUCTURAL SERIES DRAWINGS FOR DREDGE PROFILES ADJACENT STRUCTURES, BENEATH STRUCTURES AND FOR SHORELINE EXCAVATION.

0 60 120
SCALE IN FEET

**50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	57	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 60'			

Drawing Number: DR103

Title: Swan Island Basin Project Area
Remedial Design

Dredging Plan Area 2

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NOTES

1. DREDGE POLYGONS SHOWN APPLY TO AREAS AWAY FROM STRUCTURES, TYPICALLY 20 FT. REFER TO STRUCTURAL SERIES DRAWINGS FOR DREDGE PROFILES ADJACENT STRUCTURES, BENEATH STRUCTURES AND FOR SHORELINE EXCAVATION.

LEGEND

- DREDGE DEPTH 10.7 FT
- DREDGE DEPTH 18.7 FT
- DREDGE DEPTH 23.7 FT
- DREDGE DEPTH 29.7 FT

PROJECT AREA

3 DR203

4 DR204

5 DR205

US NAVY PIER

MC PIER

MATCHLINE (SEE SHEET DR103)
STATION 35+47.79

DREDGE DEPTH 18.7 FT
(EL. -18.7 FT NAVD88)

DREDGE DEPTH 10.7 FT
(EL. -10.7 FT NAVD88)

3H:1V MAX, TYP.

USCG FLOATING DOCK

USCG PIER

DREDGE DEPTH 23.7 FT
(EL. -23.7 FT NAVD88)

DREDGE DEPTH 29.7 FT
(EL. -29.7 FT NAVD88)

BERTH 302

DREDGING DIRECTLY ADJACENT TO PIER A TBC

LAGOON WHARF
UNDER REVIEW

MATCHLINE (SEE SHEET DR105)
STATION 52+83.13

0 60 120
SCALE IN FEET

50% REMEDIAL DESIGN
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COAST & HARBOR ENGINEERING

Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	58	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 60'	Status		Rev		Security
Drawing Number: DR104					

Title
Swan Island Basin Project Area
Remedial Design

Dredging Plan Area 3

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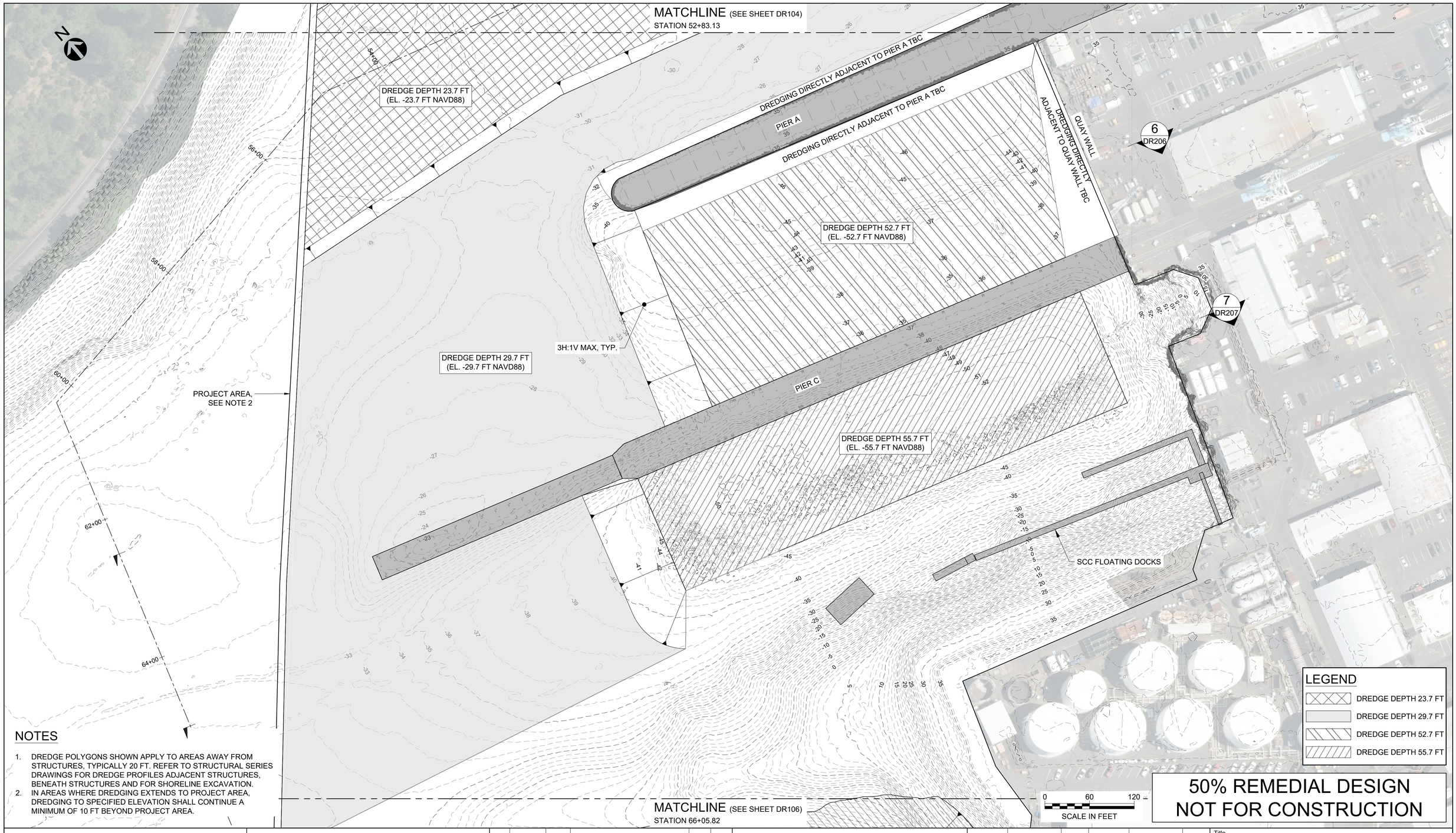

NOTES

1. DREDGE POLYGONS SHOWN APPLY TO AREAS AWAY FROM STRUCTURES, TYPICALLY 20 FT. REFER TO STRUCTURAL SERIES DRAWINGS FOR DREDGE PROFILES ADJACENT STRUCTURES, BENEATH STRUCTURES AND FOR SHORELINE EXCAVATION.
2. IN AREAS WHERE DREDGING EXTENDS TO PROJECT AREA, DREDGING TO SPECIFIED ELEVATION SHALL CONTINUE A MINIMUM OF 10 FT BEYOND PROJECT AREA.

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	59	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 60'	Status		Rev		Security
Drawing Number: DR105					

Title

Swan Island Basin Project Area
Remedial Design

Dredging Plan Area 4

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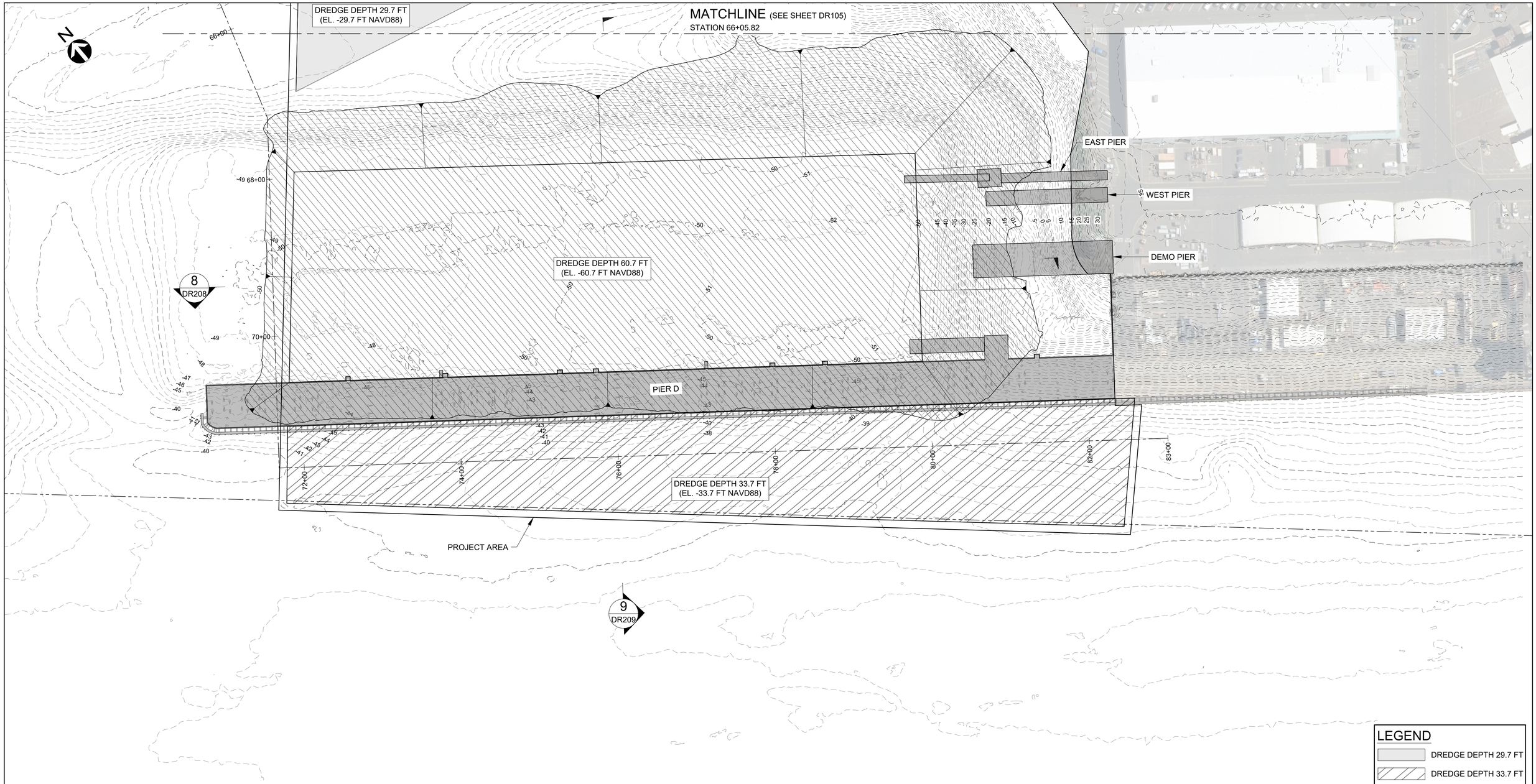

NOTES

1. DREDGE POLYGONS SHOWN APPLY TO AREAS AWAY FROM STRUCTURES, TYPICALLY 20 FT. REFER TO STRUCTURAL SERIES DRAWINGS FOR DREDGE PROFILES ADJACENT STRUCTURES, BENEATH STRUCTURES AND FOR SHORELINE EXCAVATION.

LEGEND

- DREDGE DEPTH 29.7 FT
- DREDGE DEPTH 33.7 FT
- DREDGE DEPTH 60.7 FT

0 60 120
SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Project Number	B/O	Total
507100742	60	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 60'			

Drawing Number: DR106

Title: Swan Island Basin Project Area
Remedial Design

Dredging Plan Area 5

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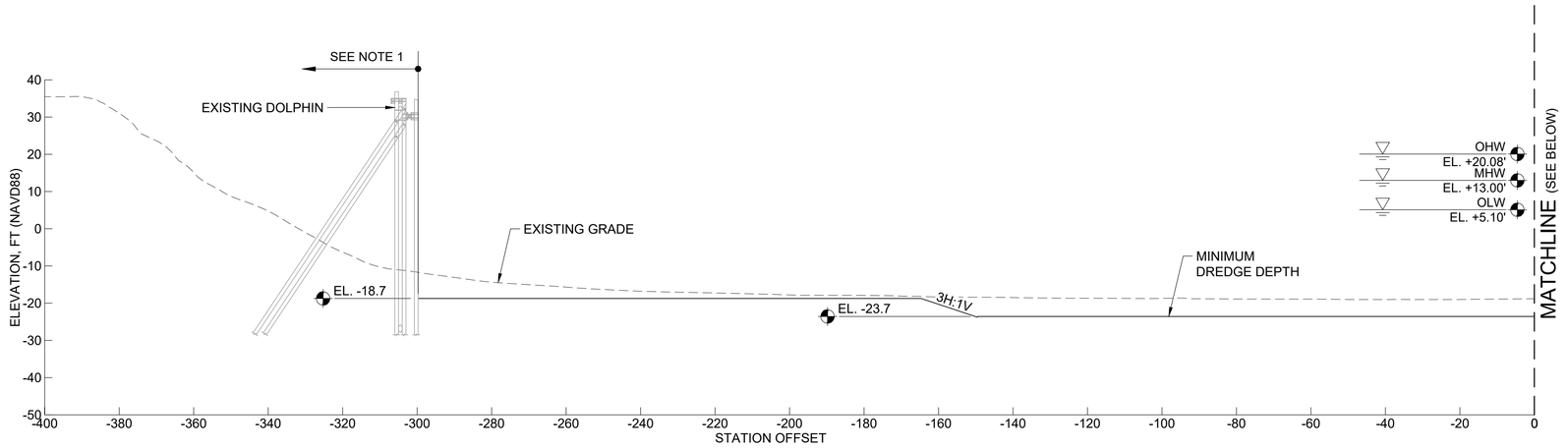

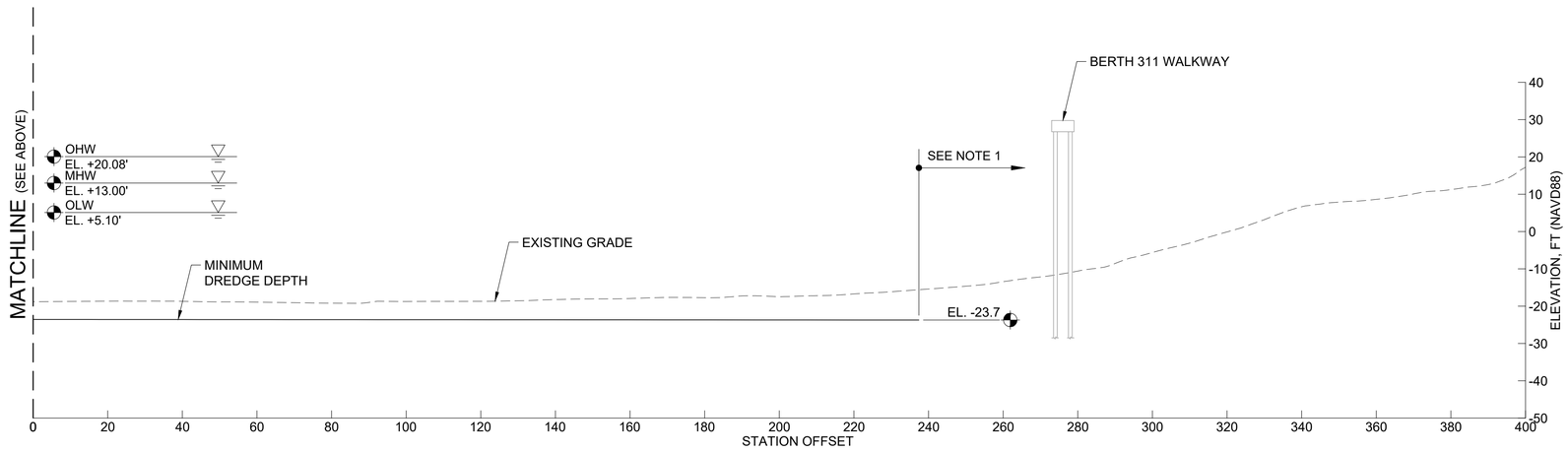

1 STATION 16+00
DREDGE SECTION
SCALE: 1" = 20'

NOTES

1. DREDGE POLYGONS SHOWN APPLY TO AREAS AWAY FROM STRUCTURES, TYPICALLY 20 FT. REFER TO STRUCTURAL SERIES DRAWINGS FOR DREDGE PROFILES ADJACENT STRUCTURES, BENEATH STRUCTURES AND FOR SHORELINE EXCAVATION.

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	61	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 20'	Status		Rev		Security

Drawing Number: DR201

Title
Swan Island Basin Project Area
Remedial Design

Dredging Area Sections 1

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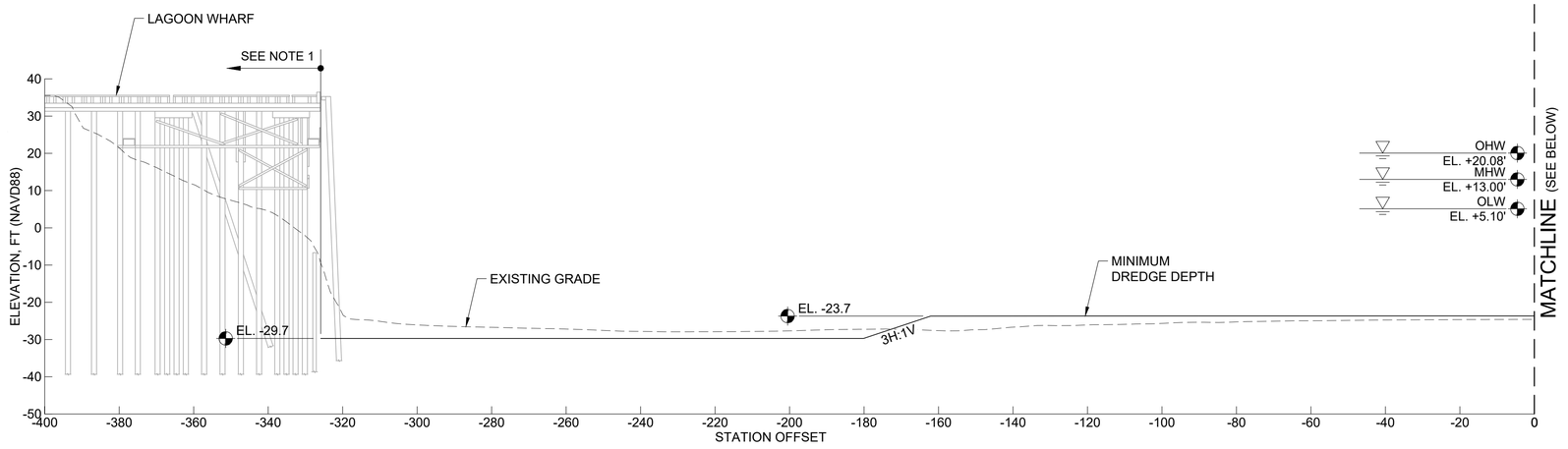

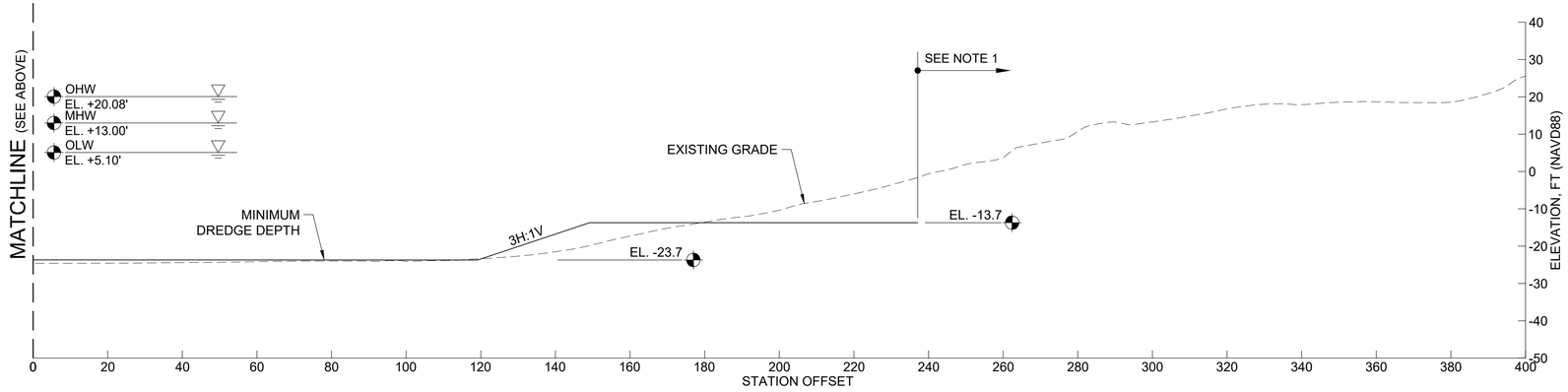

2 STATION 26+00
DREDGE SECTION
SCALE: 1" = 20'

NOTES

1. DREDGE POLYGONS SHOWN APPLY TO AREAS AWAY FROM STRUCTURES, TYPICALLY 20 FT. REFER TO STRUCTURAL SERIES DRAWINGS FOR DREDGE PROFILES ADJACENT STRUCTURES, BENEATH STRUCTURES AND FOR SHORELINE EXCAVATION.

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	62	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 20'	Status		Rev		Security
Drawing Number: DR202					

Title
Swan Island Basin Project Area
Remedial Design

Dredging Area Sections 2

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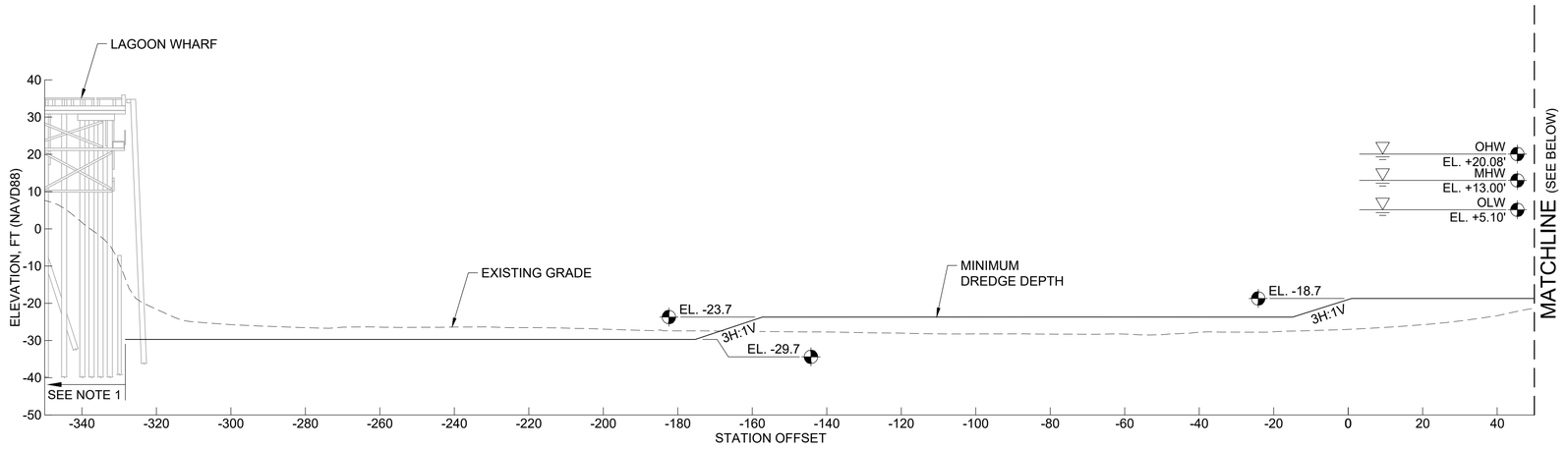

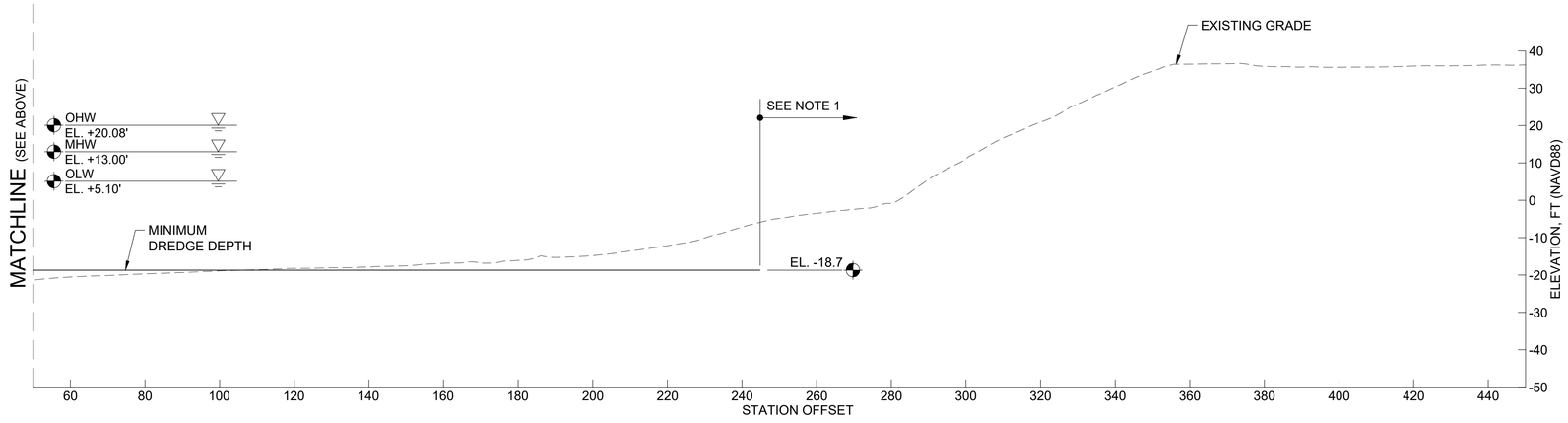

3 STATION 39+00
DREDGE SECTION
SCALE: 1" = 20'

NOTES

1. DREDGE POLYGONS SHOWN APPLY TO AREAS AWAY FROM STRUCTURES, TYPICALLY 20 FT. REFER TO STRUCTURAL SERIES DRAWINGS FOR DREDGE PROFILES ADJACENT STRUCTURES, BENEATH STRUCTURES AND FOR SHORELINE EXCAVATION.

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	63	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: DR203

Title: Swan Island Basin Project Area
Remedial Design

Dredging Area Sections 3

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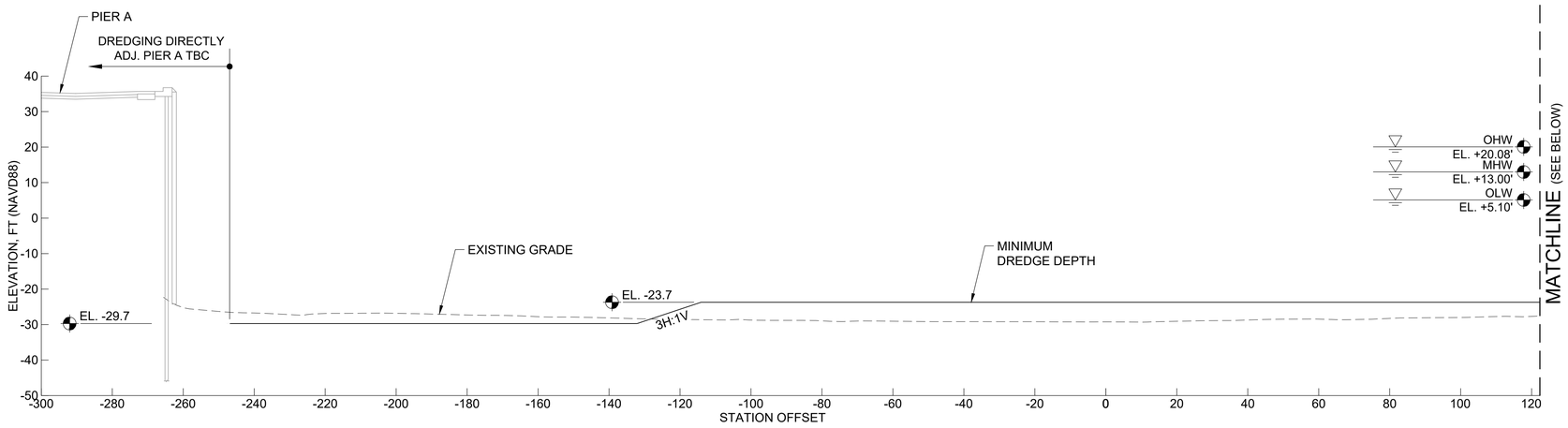

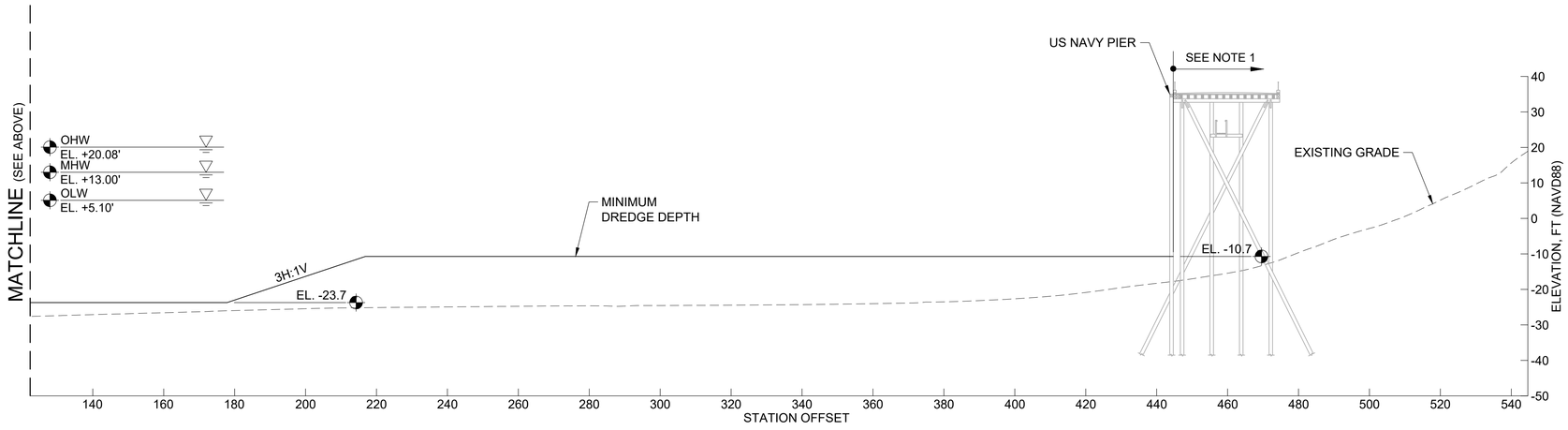

4 STATION 46+00 DREDGE SECTION
SCALE: 1" = 20'

NOTES

1. DREDGE POLYGONS SHOWN APPLY TO AREAS AWAY FROM STRUCTURES, TYPICALLY 20 FT. REFER TO STRUCTURAL SERIES DRAWINGS FOR DREDGE PROFILES ADJACENT STRUCTURES, BENEATH STRUCTURES AND FOR SHORELINE EXCAVATION.

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 20'	Status		Rev		Security
Project Number: 507100742	B/O: 64	Total: 134	Drawing Number: DR204		

Title
Swan Island Basin Project Area
Remedial Design

Dredging Area Sections 4

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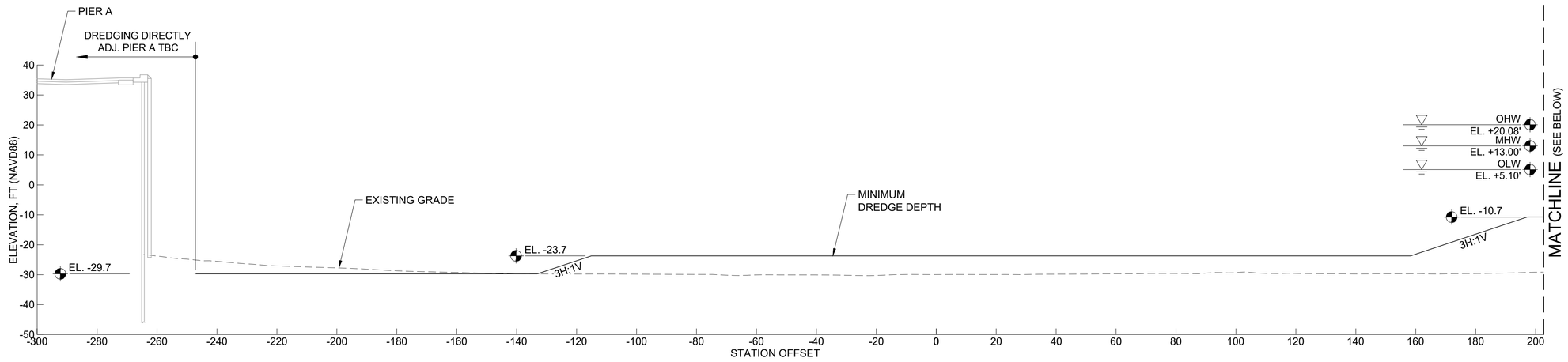

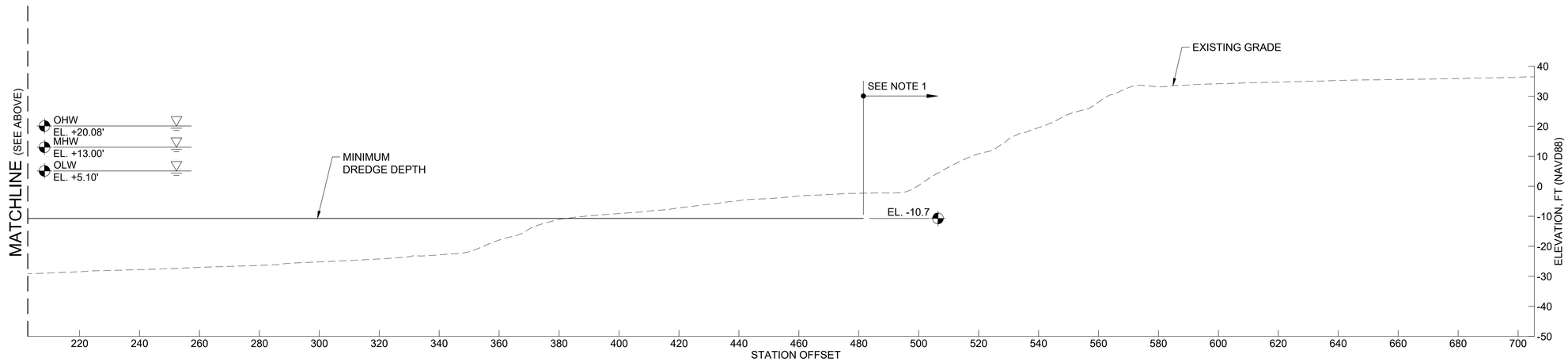

5 STATION 50+00
DREDGE SECTION
SCALE: 1" = 20'

NOTES

1. DREDGE POLYGONS SHOWN APPLY TO AREAS AWAY FROM STRUCTURES, TYPICALLY 20 FT REFER TO STRUCTURAL SERIES DRAWINGS FOR DREDGE PROFILES ADJACENT STRUCTURES, BENEATH STRUCTURES AND FOR SHORELINE EXCAVATION.

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

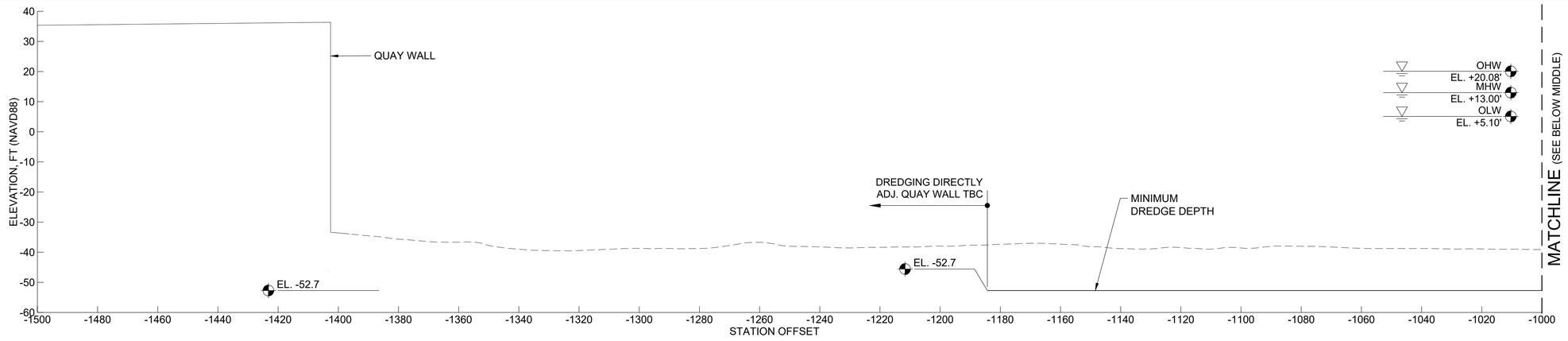
Project Number	B/O	Total
507100742	65	134

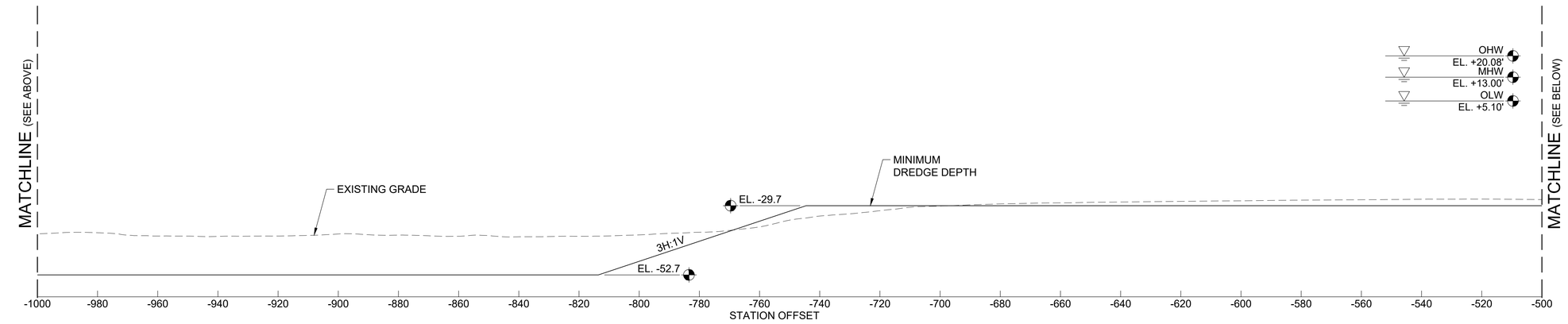
Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 20'	Status		Rev		Security
Drawing Number: DR205					

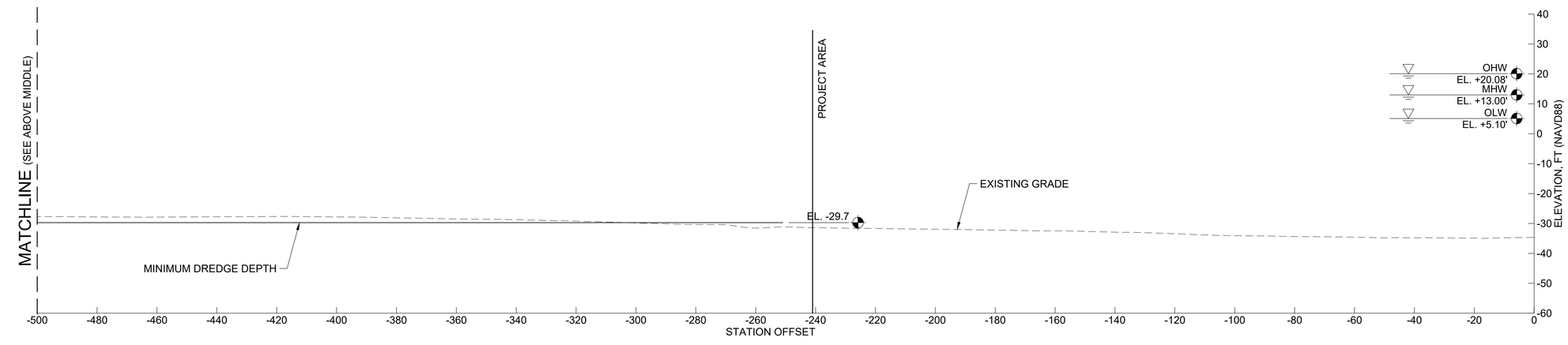
Title
Swan Island Basin Project Area
Remedial Design

Dredging Area Sections 5

C:\pwworking\hmm\ports_harbors\mor69830\dms82129\DR205.dwg Mar 11, 2025 - 6:38PM MOR69830







NOTES

1. DREDGE POLYGONS SHOWN APPLY TO AREAS AWAY FROM STRUCTURES, TYPICALLY 20 FT. REFER TO STRUCTURAL SERIES DRAWINGS FOR DREDGE PROFILES ADJACENT STRUCTURES, BENEATH STRUCTURES AND FOR SHORELINE EXCAVATION.

6 STATION 62+50
DREDGE SECTION
SCALE: 1" = 20'

0 20 40
SCALE IN FEET

**50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	66	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

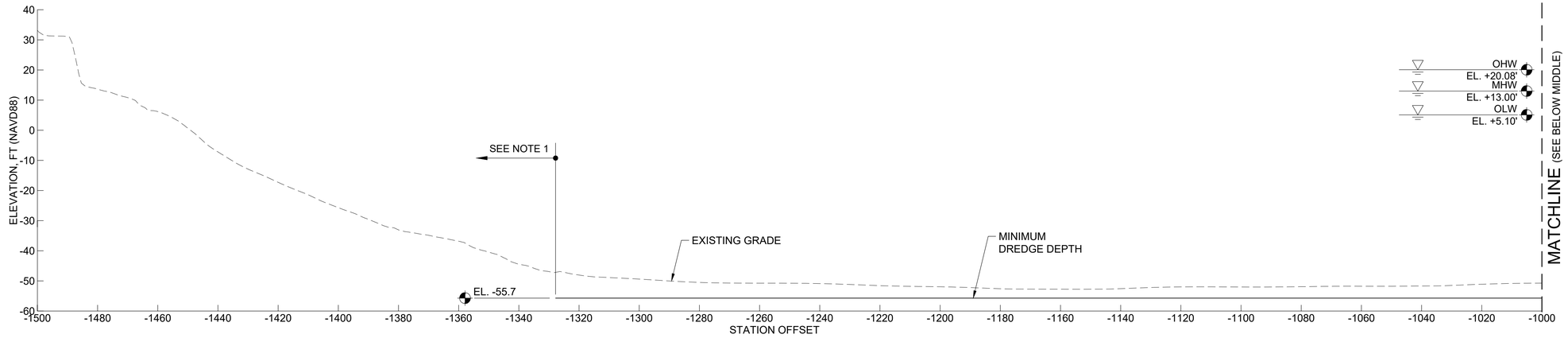
Scale at ANSI D	Status	Rev	Security
1" = 20"			

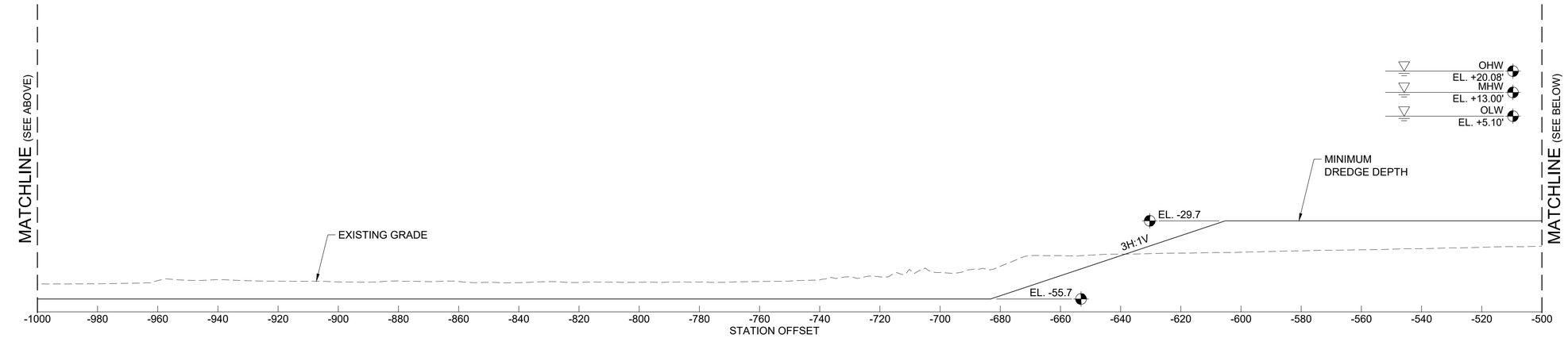
Drawing Number: DR206

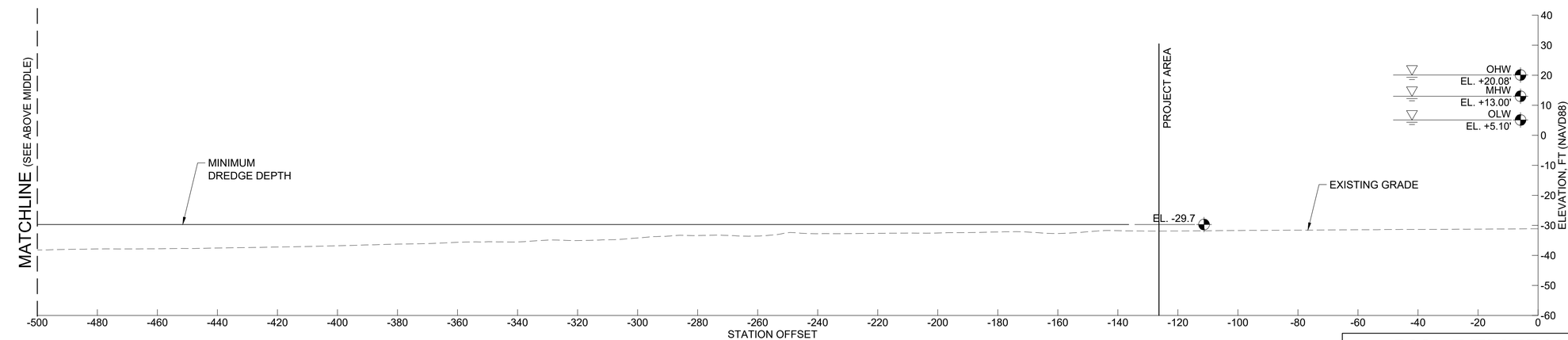
Title: Swan Island Basin Project Area
Remedial Design

Dredging Area Sections 6

C:\pwworking\hmm\ports_harbors\mor69830\dms82129\DR206.dwg Mar 11, 2025 - 6:39PM MOR69830







NOTES

1. DREDGE POLYGONS SHOWN APPLY TO AREAS AWAY FROM STRUCTURES, TYPICALLY 20 FT. REFER TO STRUCTURAL SERIES DRAWINGS FOR DREDGE PROFILES ADJACENT STRUCTURES, BENEATH STRUCTURES AND FOR SHORELINE EXCAVATION.

7 STATION 65+00
DREDGE SECTION
SCALE: 1" = 20'

0 20 40
SCALE IN FEET

**50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION**

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COAST & HARBOR ENGINEERING

Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	67	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

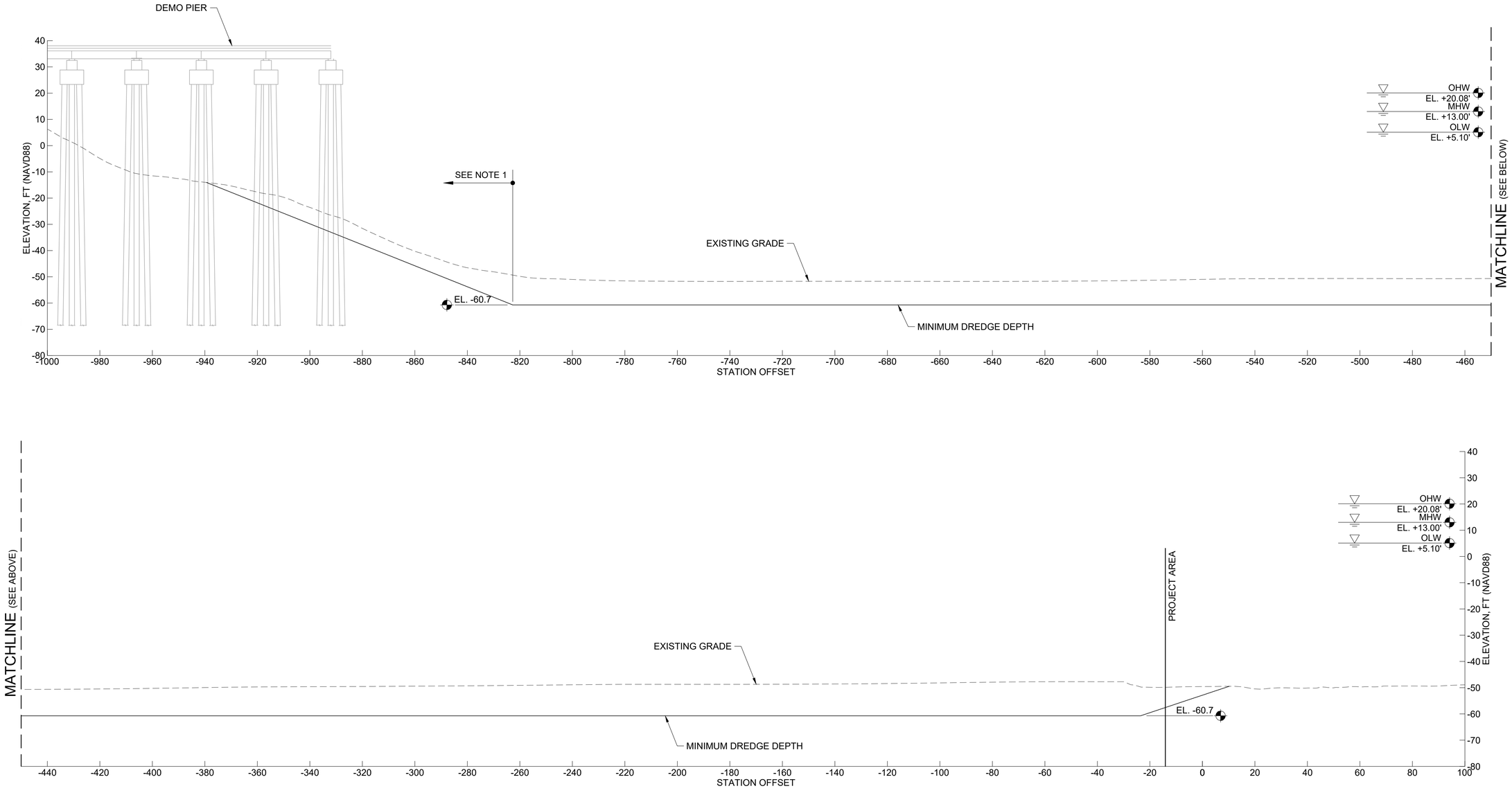
Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: DR207

Title: Swan Island Basin Project Area
Remedial Design

Dredging Area Sections 7

C:\pwworking\hmm\ports_harbors\mor69830\dms82129\DR207.dwg Mar 11, 2025 - 6:39PM MOR69830



8 STATION 69+35
DREDGE SECTION
SCALE: 1" = 20'

NOTES

1. DREDGE POLYGONS SHOWN APPLY TO AREAS AWAY FROM STRUCTURES, TYPICALLY 20 FT. REFER TO STRUCTURAL SERIES DRAWINGS FOR DREDGE PROFILES ADJACENT STRUCTURES, BENEATH STRUCTURES AND FOR SHORELINE EXCAVATION.

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	68	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: DR208

Title: Swan Island Basin Project Area Remedial Design

Dredging Area Sections 8

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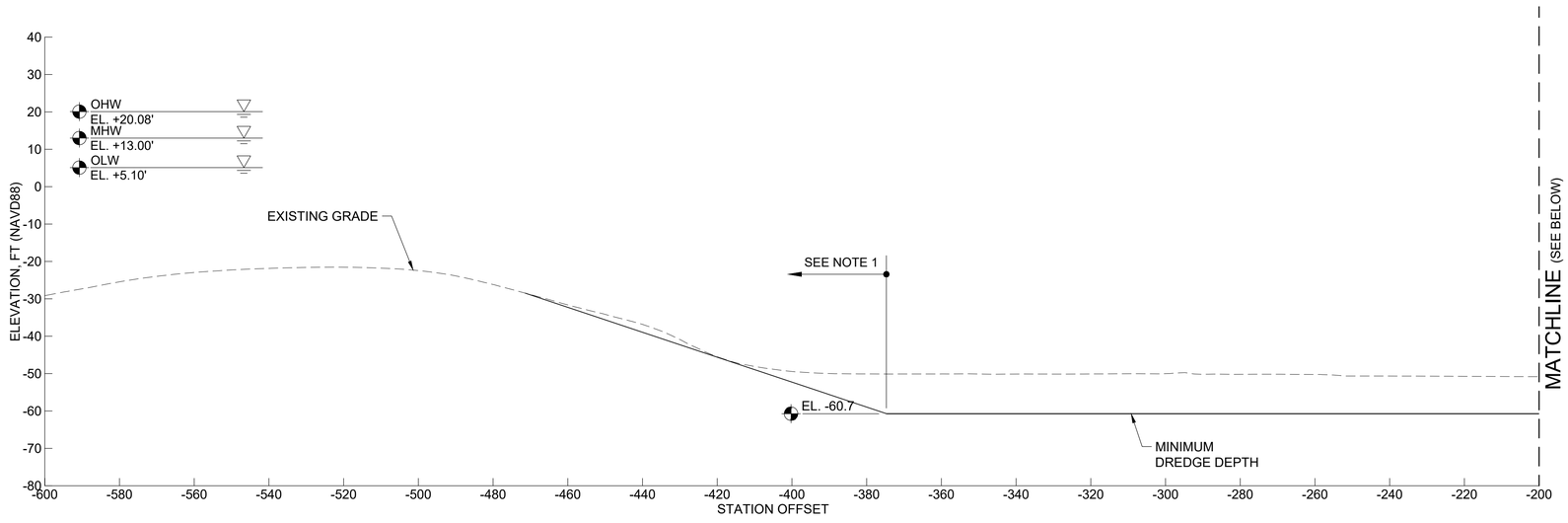

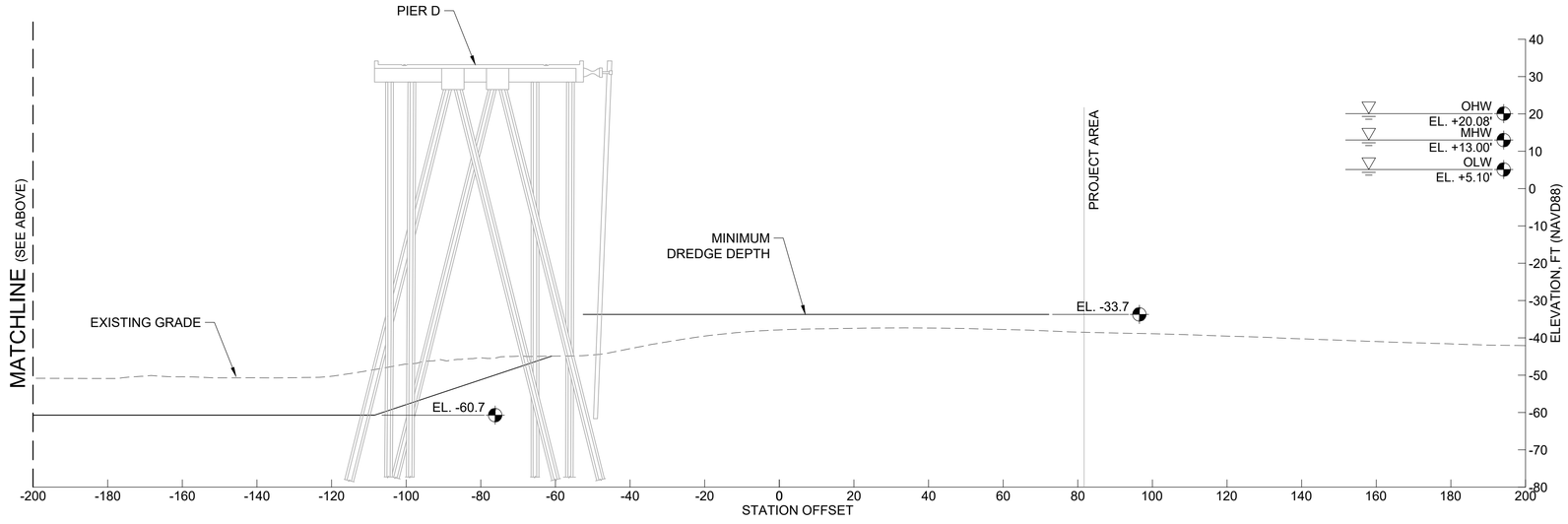

9 STATION 76+00
DREDGE SECTION
SCALE: 1" = 20'

NOTES

1. DREDGE POLYGONS SHOWN APPLY TO AREAS AWAY FROM STRUCTURES, TYPICALLY 20 FT. REFER TO STRUCTURAL SERIES DRAWINGS FOR DREDGE PROFILES ADJACENT STRUCTURES, BENEATH STRUCTURES AND FOR SHORELINE EXCAVATION.

0 20 40
SCALE IN FEET

**50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	69	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 20'	Status		Rev		Security

Drawing Number: DR209

Title: Swan Island Basin Project Area Remedial Design

Dredging Area Sections 9

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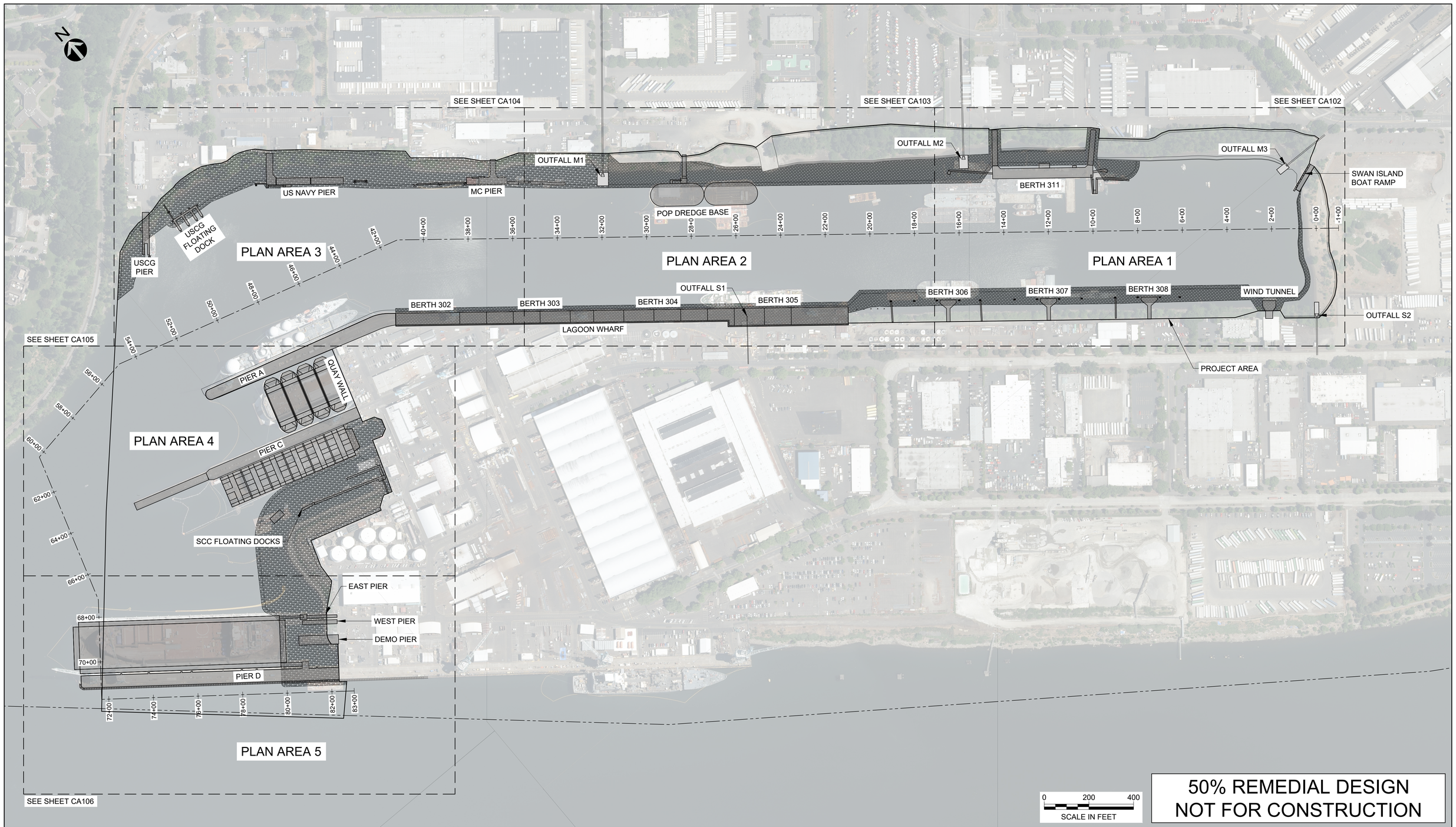

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	70	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 200'	Status		Rev		Security

Drawing Number: CA100

Title: Swan Island Basin Project Area Remedial Design

Overall Capping, Shoreline Protection and Outfall Scour Protection Plan

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NOTES

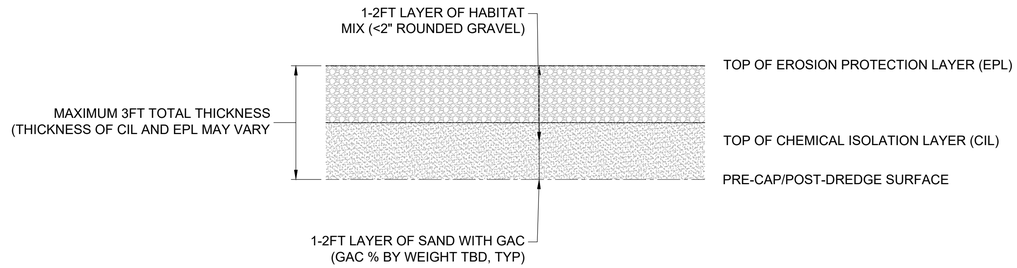
1. CHEMICAL ISOLATION REQUIREMENTS ABOVE MHW (EL. +13.00' NAVD88) INCLUDING USE OF GAC GEOTEXTILE MATS TO BE DETERMINED DURING 90% RD.

SAND (CHEMICAL ISOLATION LAYER FOR CAP TYPES 1 AND 2) SHALL CONFORM TO THE FOLLOWING GRADATION	
U.S. STANDARD SIEVE SIZE	PERCENT BY DRY WEIGHT, PASSING

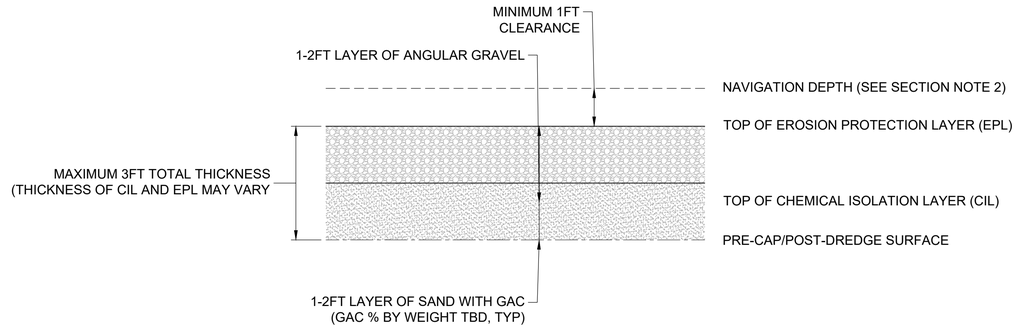
HABITAT MIX (EROSION PROTECTION LAYER FOR CAP TYPE 1) SHALL CONFORM TO THE FOLLOWING GRADATION	
U.S. STANDARD SIEVE SIZE	PERCENT BY DRY WEIGHT, PASSING

ANGULAR GRAVEL (EROSION PROTECTION LAYER FOR CAP TYPE 2) SHALL CONFORM TO THE FOLLOWING GRADATION	
U.S. STANDARD SIEVE SIZE	PERCENT BY DRY WEIGHT, PASSING

2. RIVERBANK REMEDIATION DETAILS INCLUDING PLANTING, TOP ELEVATIONS AND TOP-OF-GRADE INTERFACES, AS WELL AS GEOTEXTILE TERMINATION AND ANCHORING, ARE TO BE DEVELOPED.
3. MATERIAL PLACEMENT EXTENTS ARE APPROXIMATE AND WILL BE ADJUSTED BASED ON ACTUAL EXTENTS OF DREDGING.
4. NO MATERIAL PLACEMENT ALLOWED UNTIL AUTHORIZED BY THE PROJECT REPRESENTATIVE.
5. IN AREAS WHERE CAPPING EXTENDS TO PROJECT AREA NOT ADJACENT TO FEDERAL NAVIGATION CHANNEL, CAPPING CONTINUE A MINIMUM OF 10 FT BEYOND PROJECT AREA.
6. IN AREAS WHERE CAPPING EXTENDS TO PROJECT AREA ON THE FEDERAL NAVIGATION CHANNEL, CAPPING TO SPECIFIED ELEVATION SHALL CONTINUE A MINIMUM BUFFER DISTANCE BEYOND PROJECT AREA (TO BE DETERMINED).
7. PLACEMENT OF THE CHEMICAL ISOLATION LAYER SHALL BE PERFORMED IN A MANNER THAT DOES NOT ALLOW SEPARATION OF THE SAND/GAC MIXTURE. CONTRACTOR SHALL DEMONSTRATE METHODOLOGY AND/OR USE OF AMENDMENTS OR OTHER PROEJCTS THAT ALLOW ACCURATE PLACEMENT OF THE CHEMICAL ISOLATION LAYER, AND PAST PERFORMANCE DEMONSTRATING THAT SEPARATION WILL NOT OCCUR UNDER RELEVANT SITE CONDITIONS.



1 DETAIL - CAP TYPE 1
SCALE: NTS



2 DETAIL - CAP TYPE 2 (NAVIGATION AREAS)
SCALE: NTS

SECTION NOTES

1. HABITAT MIX MATERIAL TYPE AND SUITABILITY FOR USE AS EROSION PROTECTION UNDER REVIEW DURING 90% RD.
2. WHERE NAVIGATION AREAS ARE PRESENT, TOP OF CAP SHALL NOT ENCROACH ON MINIMUM 1-FT CLEARANCE BELOW NAVIGATION DEPTH TO ALLOW FOR FUTURE MAINTENANCE DREDGING.

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	71	134

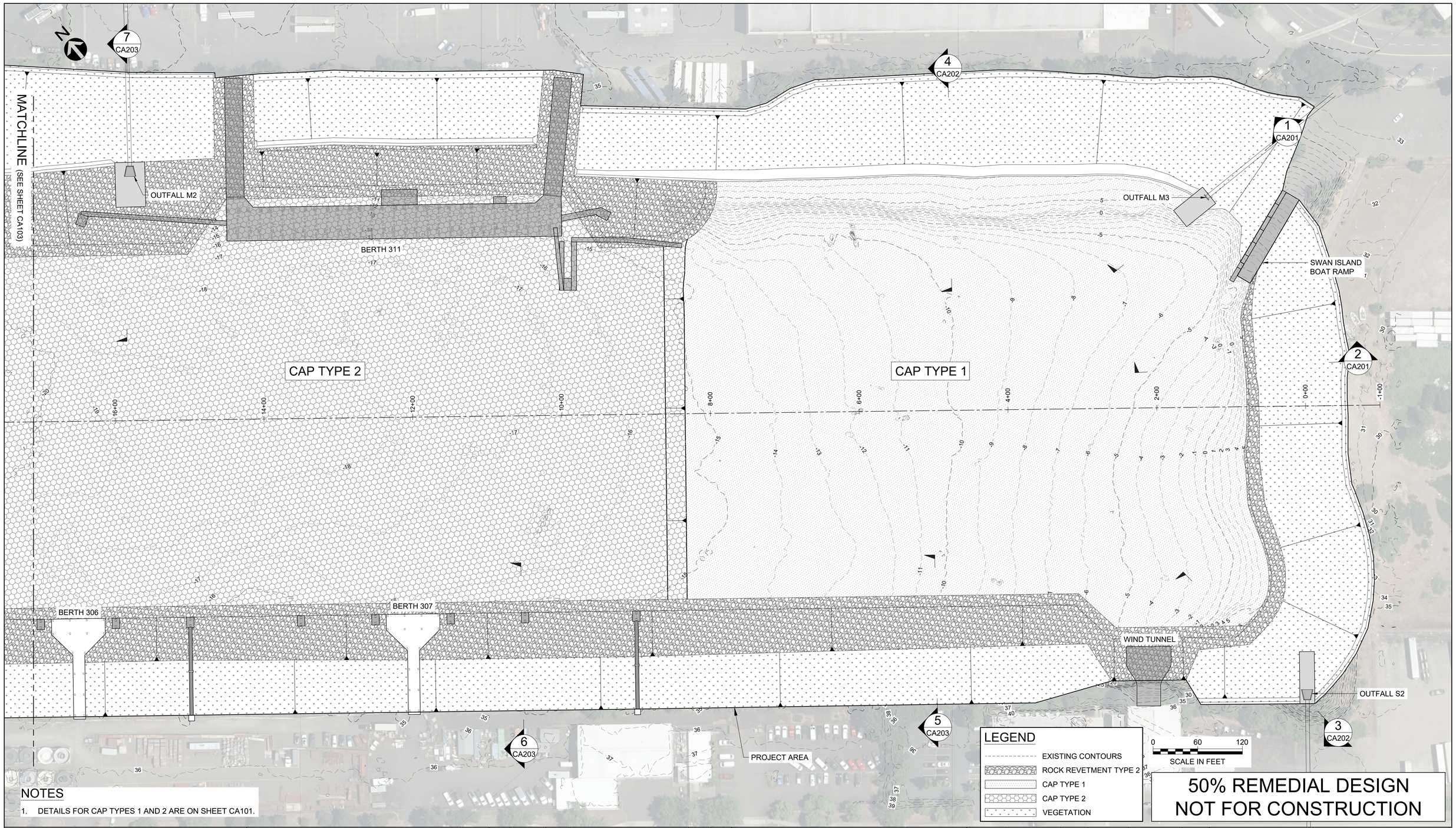
Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security

Drawing Number: CA101

Title: Swan Island Basin Project Area Remedial Design

Capping Notes and Details



NOTES

1. DETAILS FOR CAP TYPES 1 AND 2 ARE ON SHEET CA101.

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 60'			

Project Number	B/O	Total
507100742	72	134

Drawing Number: CA102

Title: Swan Island Basin Project Area
Remedial Design

Capping Plan Area 1

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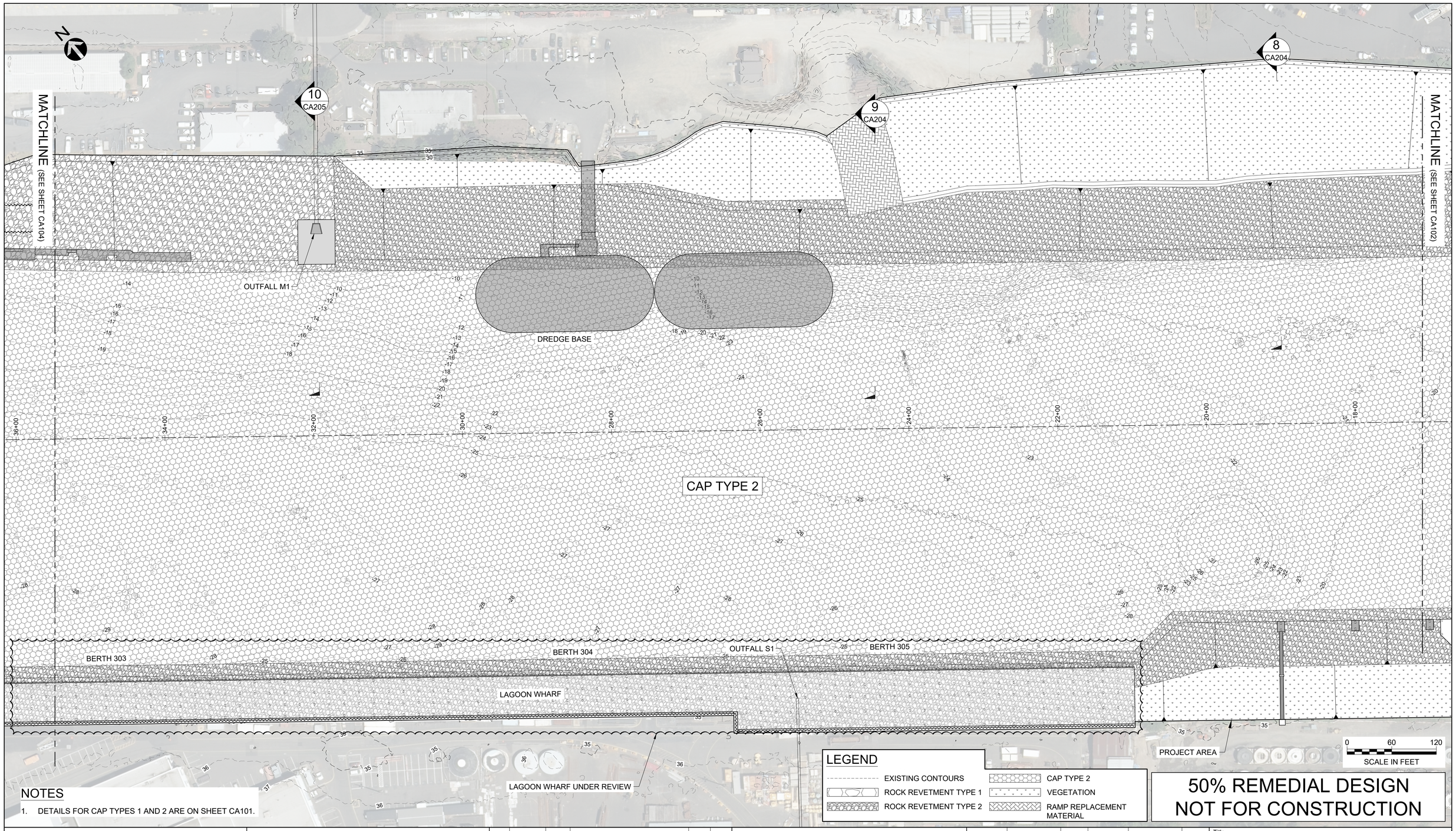

NOTES

1. DETAILS FOR CAP TYPES 1 AND 2 ARE ON SHEET CA101.

LEGEND

- EXISTING CONTOURS
- ROCK REVETMENT TYPE 1
- ROCK REVETMENT TYPE 2
- CAP TYPE 2
- VEGETATION
- RAMP REPLACEMENT MATERIAL

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	73	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 60'			

Drawing Number: CA103

Title: Swan Island Basin Project Area Remedial Design

Capping Plan Area 2

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NOTES

1. DETAILS FOR CAP TYPES 1 AND 2 ARE ON SHEET CA101.
2. CAP TYPE 2 TO EXTEND 10 FEET BEYOND PROJECT AREA.

N

13 CA206

12 CA206

14 CA207

MATCHLINE (SEE SHEET CA103)

US NAVY PIER

MC PIER

PROJECT AREA

USCG FLOATING DOCK

USCG PIER

CAP TYPE 2

36+00

38+00

40+00

42+00

44+00

46+00

48+00

50+00

52+00

54+00

LAGOON WHARF UNDER REVIEW

BERTH 302

CAPPING DIRECTLY ADJACENT PIER A TBC

MATCHLINE (SEE SHEET CA105)

11 CA205

0 60 120

SCALE IN FEET

LEGEND

- EXISTING CONTOURS
- ROCK REVETMENT TYPE 1
- CAP TYPE 2

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 60'			

Project Number	B/O	Total
507100742	74	134

Drawing Number: CA104

Title: Swan Island Basin Project Area Remedial Design

Capping Plan Area 3

C:\pwworking\hmm\ports_harbors\mor69830\dms82133\CA104.dwg Mar 11, 2025 - 6:43PM MOR69830

MATCHLINE (SEE SHEET CA104)

54+00

56+00

58+00

60+00

62+00

64+00

66+00

CAPPING DIRECTLY ADJACENT TO PIER A TBC

PIER A

QUAY WALL

CAP TYPE 2

PIER C

SEE NOTE 2

PROJECT AREA

SCC FLOATING DOCKS

15
CA207

16
CA208

MATCHLINE (SEE SHEET CA106)

0 60 120
SCALE IN FEET

LEGEND

- EXISTING CONTOURS
- ROCK REVETMENT TYPE 1
- CAP TYPE 2

NOTES

1. DETAILS FOR CAP TYPES 1 AND 2 ARE ON SHEET CA101.
2. CAP TYPE 2 TO EXTEND 10 FEET BEYOND PROJECT AREA.

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	75	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 60'			

Drawing Number: CA105

Title: Swan Island Basin Project Area Remedial Design

Capping Plan Area 4

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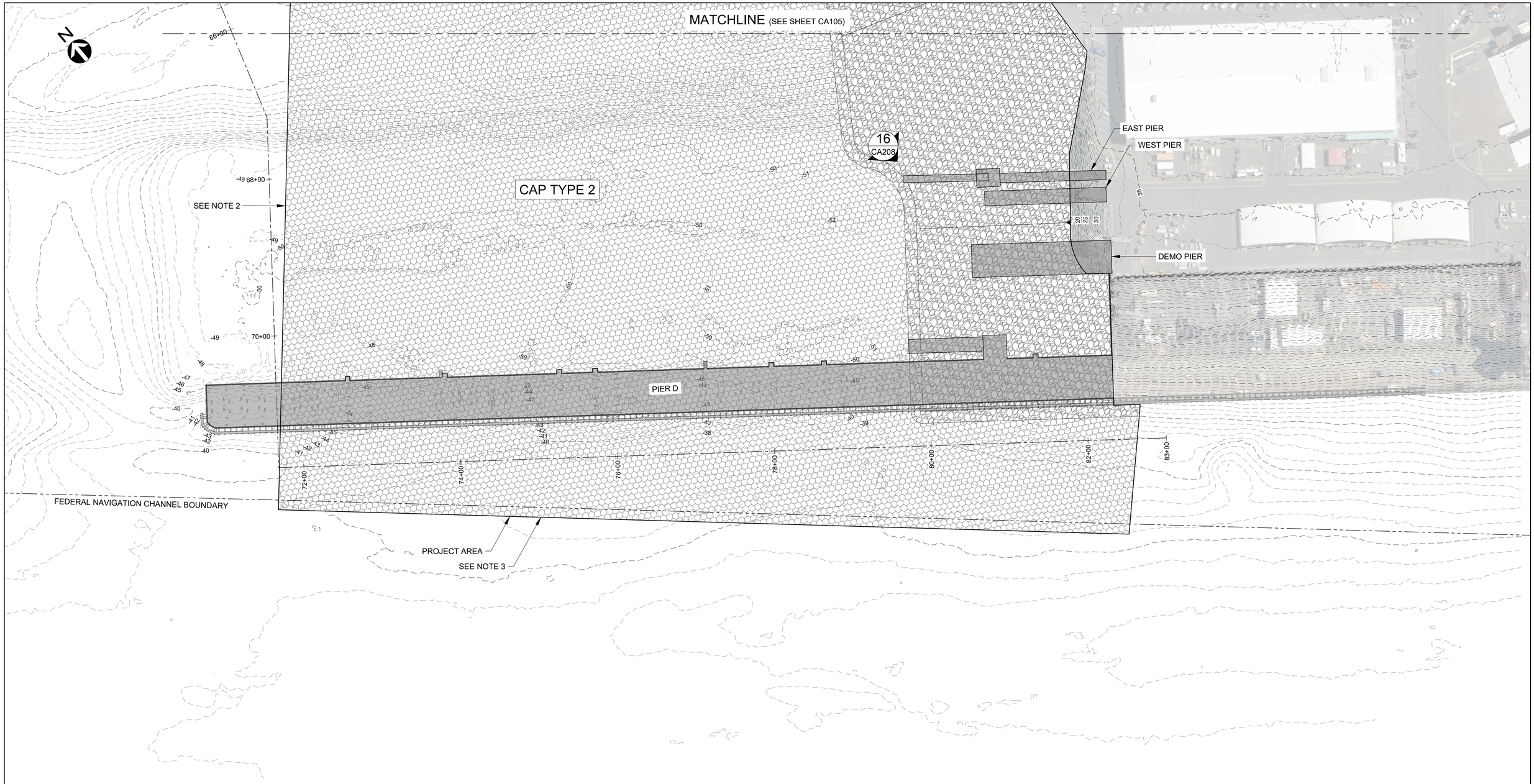

NOTES

1. DETAILS FOR CAP TYPES 1 AND 2 ARE ON SHEET CA101.
2. CAP TYPE 2 TO EXTEND 10 FEET BEYOND PROJECT AREA.
3. EXTENT OF CAPPING WITHIN FEDERAL NAVIGATION CHANNEL IS UNDER DEVELOPMENT CONSIDERING AUTHORIZED CHANNEL DEPTH 45 FT (CRD) AND BUFFER REQUIREMENTS.

LEGEND

- EXISTING CONTOURS
- ROCK REVETMENT TYPE 1
- CAP TYPE 2

0 60 120
SCALE IN FEET

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	76	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 60'			

Drawing Number: CA106

Title: Swan Island Basin Project Area Remedial Design

Capping Plan Area 5

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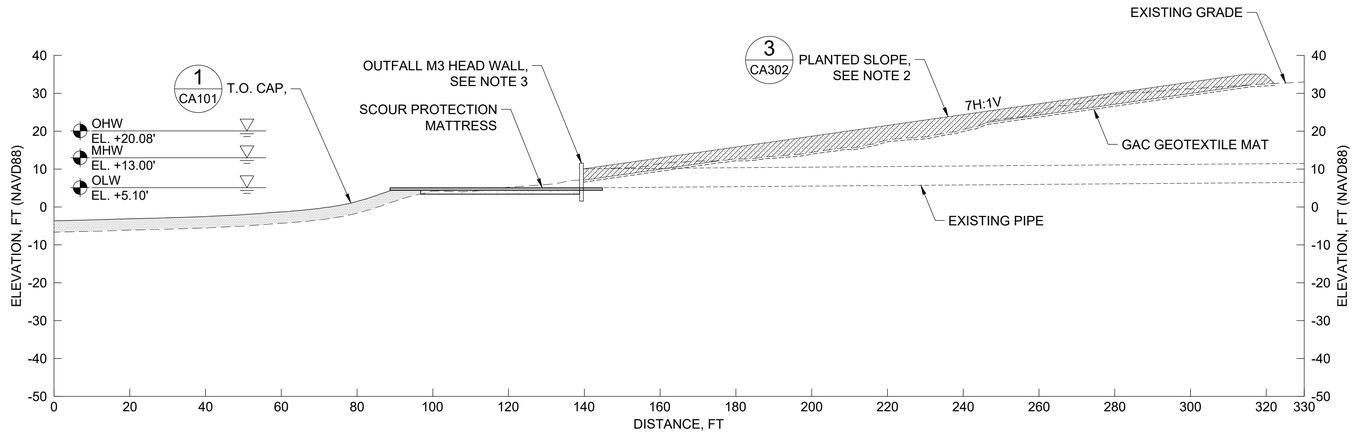
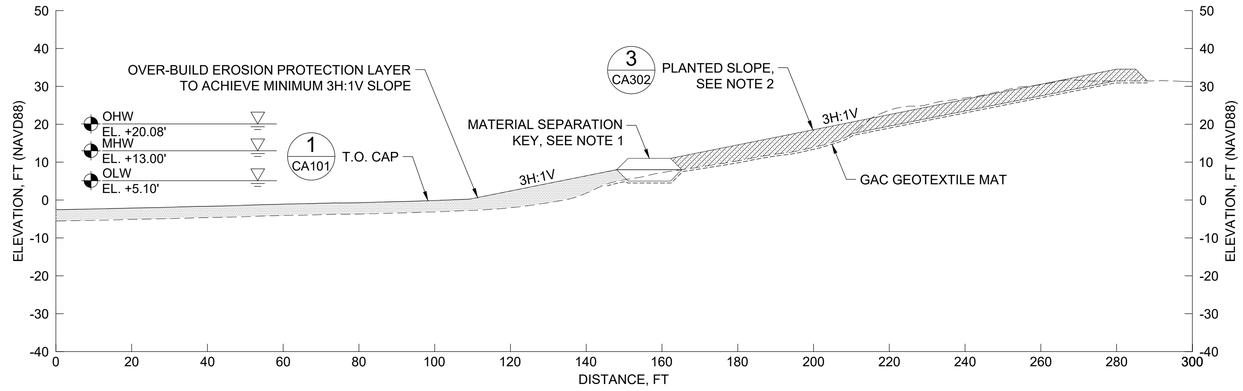


1 SECTION - OUTFALL M3
SCALE: 1" = 20'



2 SECTION SHORELINE
SCALE: 1" = 20'

NOTES

1. POTENTIAL SHALLOW WATER HABITAT ENHANCEMENT AREA.
2. VEGETATION TYPES AND REINFORCEMENT TO BE DETERMINED.
3. OUTFALL CONCRETE EXISTING STRUCTURE TO BE REPLACED IN-KIND. NO MODIFICATIONS OF OUTFALL PIPE OR DISCHARGE LOCATION IS PLANNED.

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	77	134

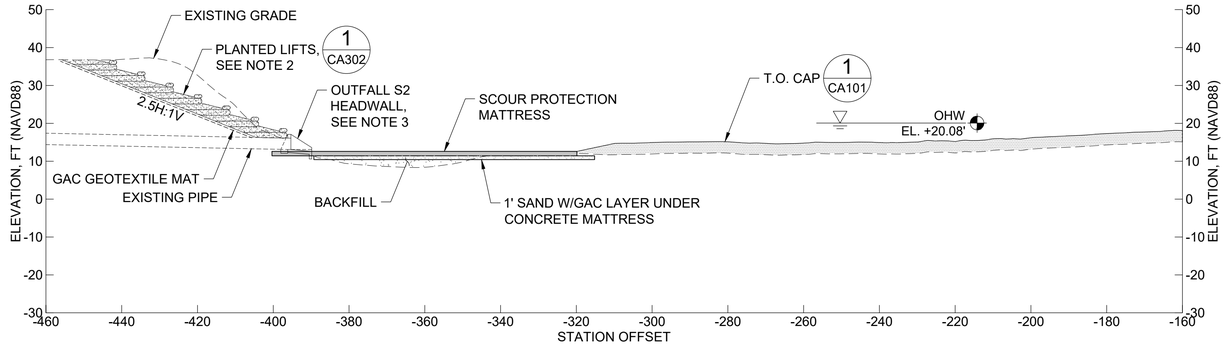
Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 20'	Status		Rev	Security	

Drawing Number: CA201

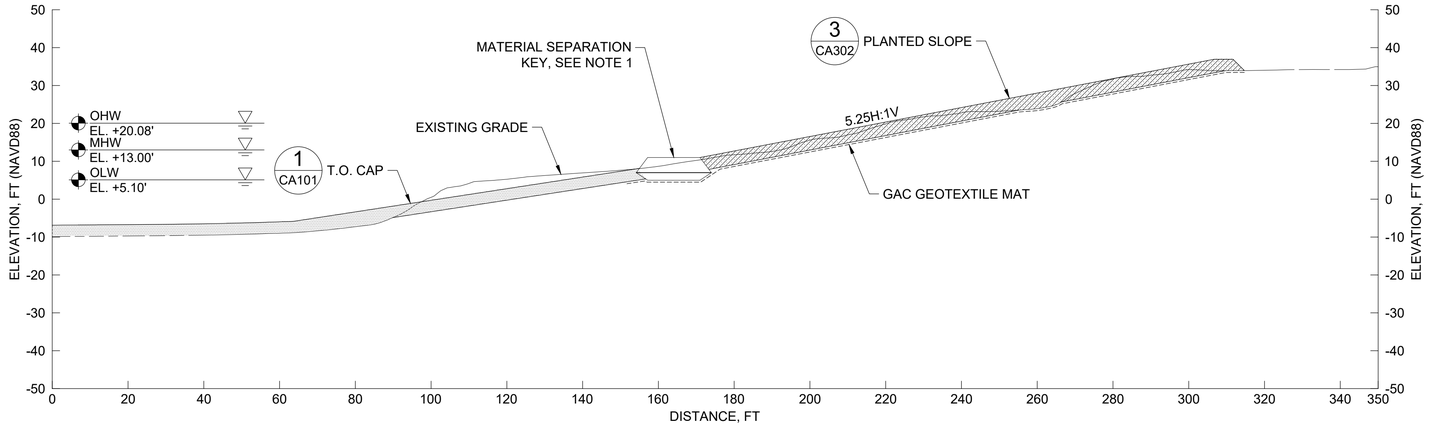
Title: Swan Island Basin Project Area Remedial Design

Capping Sections 1

C:\pwworking\hmm\ports_harbors\mor69830\dms82133\CA201.dwg Mar 11, 2025 - 6:44PM MOR69830



3 SECTION - OUTFALL S2
SCALE: 1" = 20'



4 SECTION SHORELINE
SCALE: 1" = 20'

NOTES

1. POTENTIAL SHALLOW WATER HABITAT ENHANCEMENT AREA.
2. VEGETATION TYPES AND REINFORCEMENT TO BE DETERMINED.
3. OUTFALL CONCRETE EXISTING STRUCTURE TO BE REPLACED IN-KIND. NO MODIFICATIONS OF OUTFALL PIPE OR DISCHARGE LOCATION IS PLANNED.

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	78	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: CA202

Title: Swan Island Basin Project Area Remedial Design

Capping Sections 2

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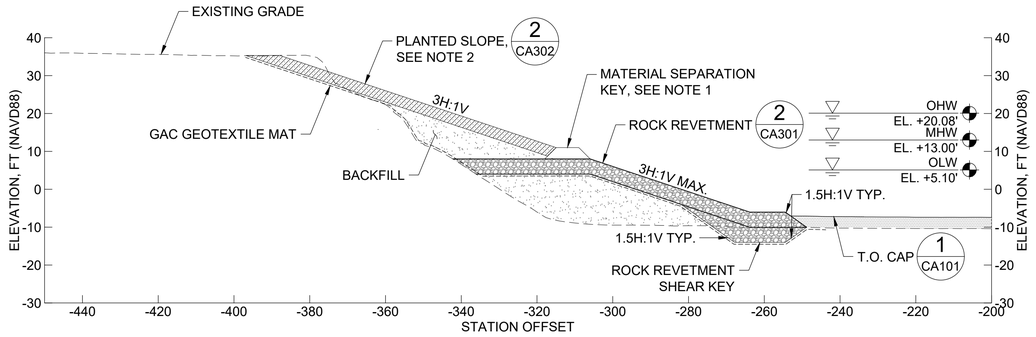
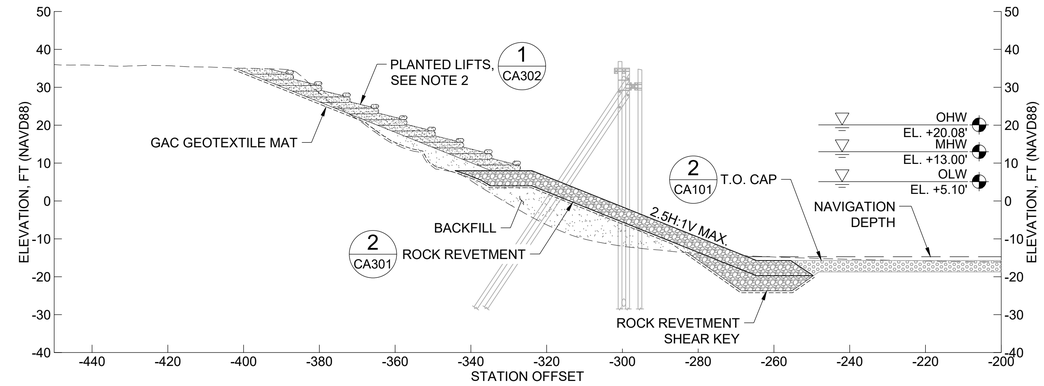
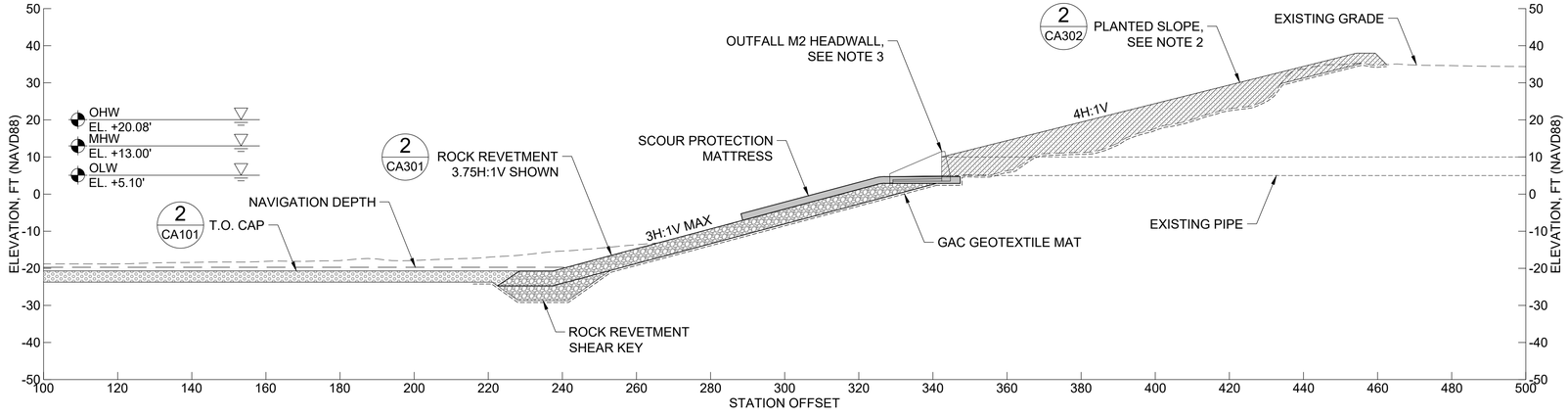


5 STATION 5+00 SECTION SHORELINE
SCALE: 1" = 20'



6 STATION 10+55 SECTION SHOERLINE
SCALE: 1" = 20'



7 SECTION - OUTFALL M2
SCALE: 1" = 20'

NOTES

1. POTENTIAL SHALLOW WATER HABITAT ENHANCEMENT AREA.
2. VEGETATION TYPES AND REINFORCEMENT TO BE DETERMINED.
3. OUTFALL CONCRETE EXISTING STRUCTURE TO BE REPLACED IN-KIND. NO MODIFICATIONS OF OUTFALL PIPE OR DISCHARGE LOCATION IS PLANNED.

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	79	134

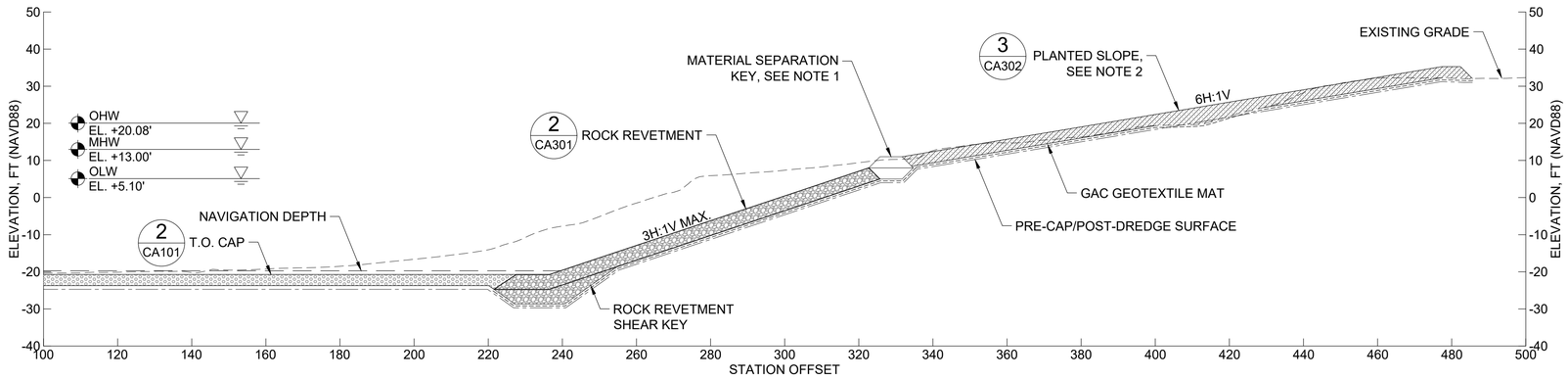
Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	#		Approved		
Scale at ANSI D: 1" = 20'	Status		Rev		Security

Drawing Number: CA203

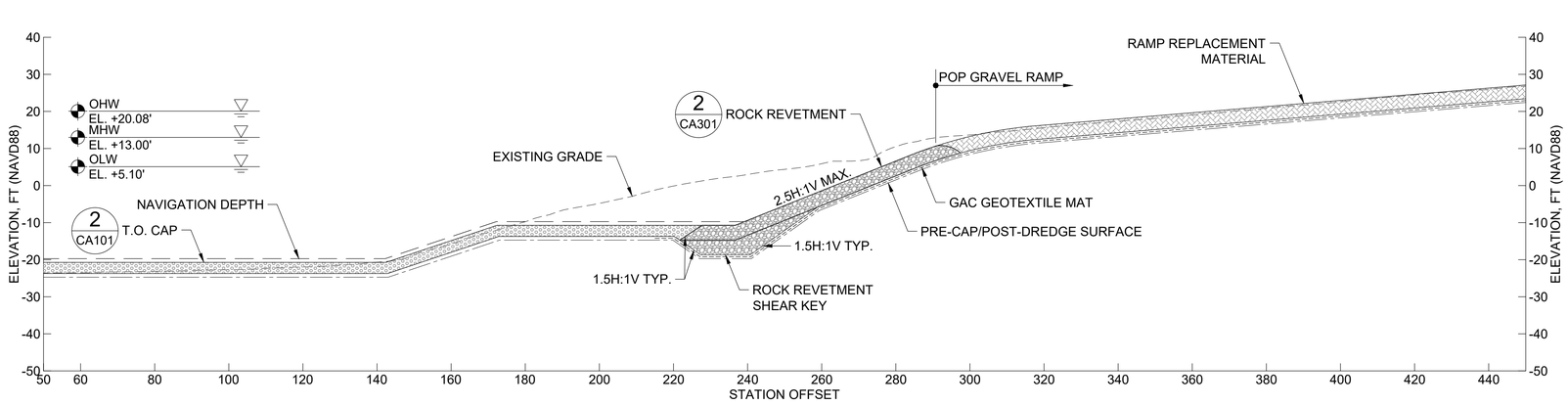
Title: Swan Island Basin Project Area Remedial Design

Capping Sections 3

C:\pwworking\hmm\ports_harbors\mor69830\dms82133\CA203.dwg Mar 11, 2025 - 6:45PM MOR69830



STATION 19+00
SECTION SHORELINE
8 SCALE: 1" = 20'



STATION 24+45
SECTION SHORELINE
9 SCALE: 1" = 20'

NOTES

1. POTENTIAL SHALLOW WATER HABITAT ENHANCEMENT AREA.
2. VEGETATION TYPES AND REINFORCEMENT TO BE DETERMINED.

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

HGL

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	80	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: CA204

Title: Swan Island Basin Project Area Remedial Design

Capping Sections 4

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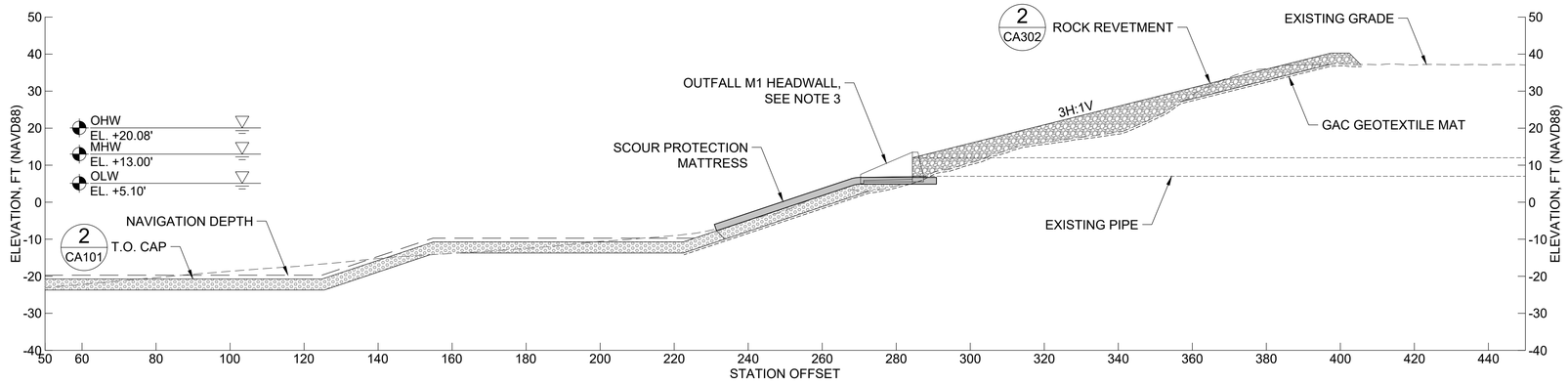
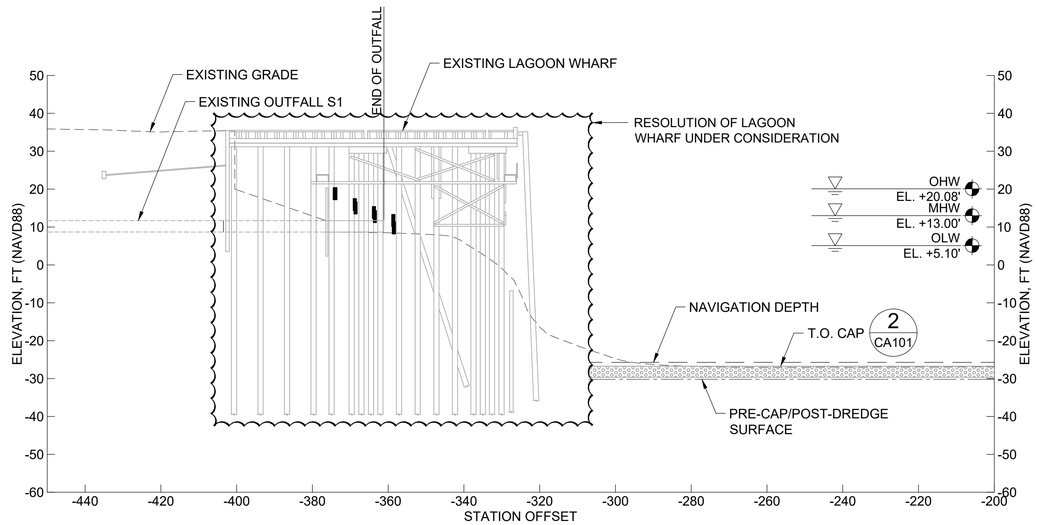


STATION 31+93
SECTION - OUTFALL M1
10 SCALE: 1" = 20'



STATION 25+55
SECTION - OUTFALL S1
11 SCALE: 1" = 20'

NOTES

1. POTENTIAL SHALLOW WATER HABITAT ENHANCEMENT AREA.
2. VEGETATION TYPES AND REINFORCEMENT TO BE DETERMINED.
3. OUTFALL CONCRETE EXISTING STRUCTURE TO BE REPLACED IN-KIND. NO MODIFICATIONS OF OUTFALL PIPE OR DISCHARGE LOCATION IS PLANNED.

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	81	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: CA205

Title: Swan Island Basin Project Area
Remedial Design

Capping Sections 5

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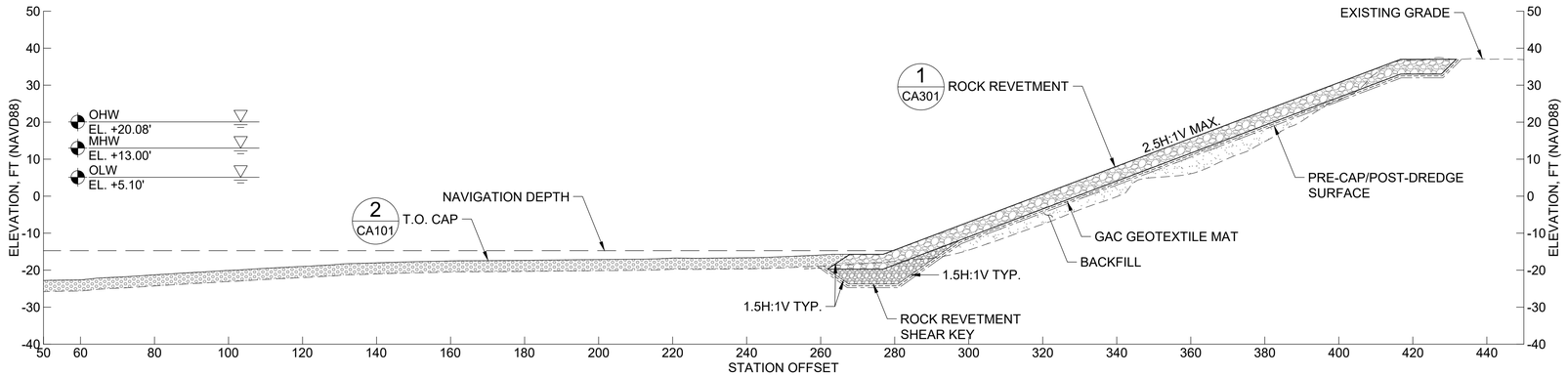
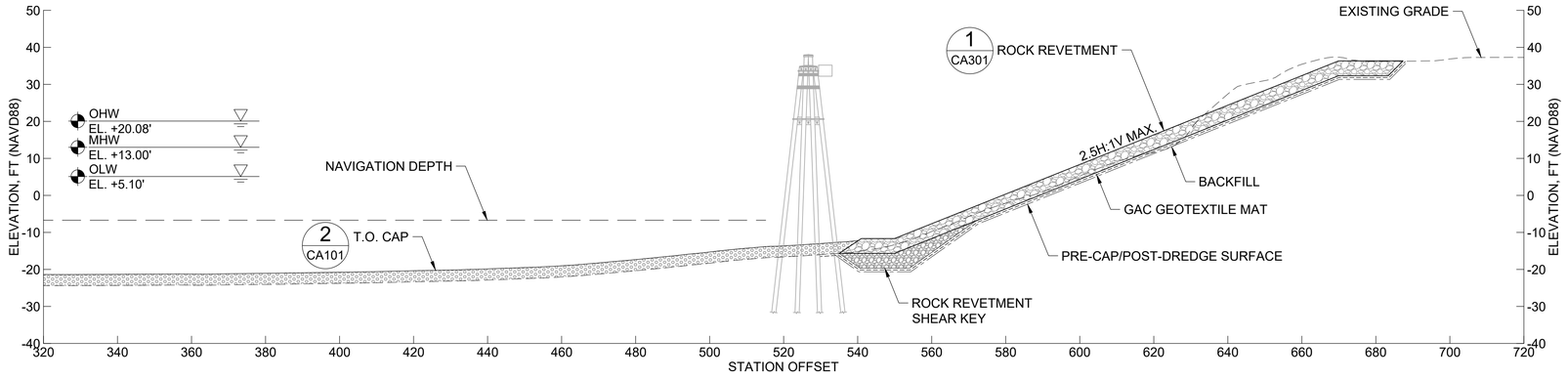


STATION 41+95
SECTION SHORELINE
12 SCALE: 1" = 20'



STATION 48+05
SECTION SHORELINE
13 SCALE: 1" = 20'

0 20 40
SCALE IN FEET

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	82	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

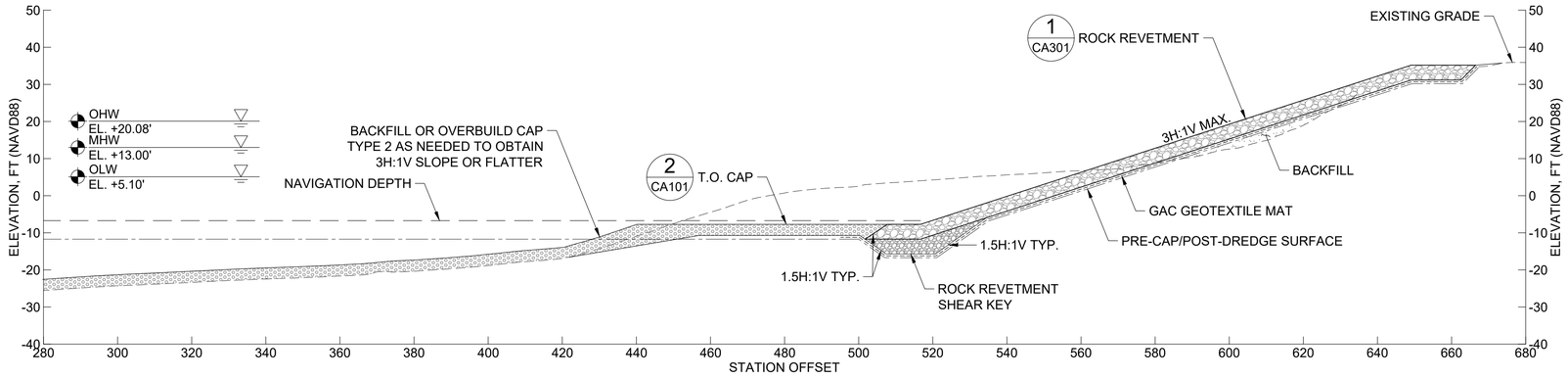
Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: CA206

Title: Swan Island Basin Project Area Remedial Design

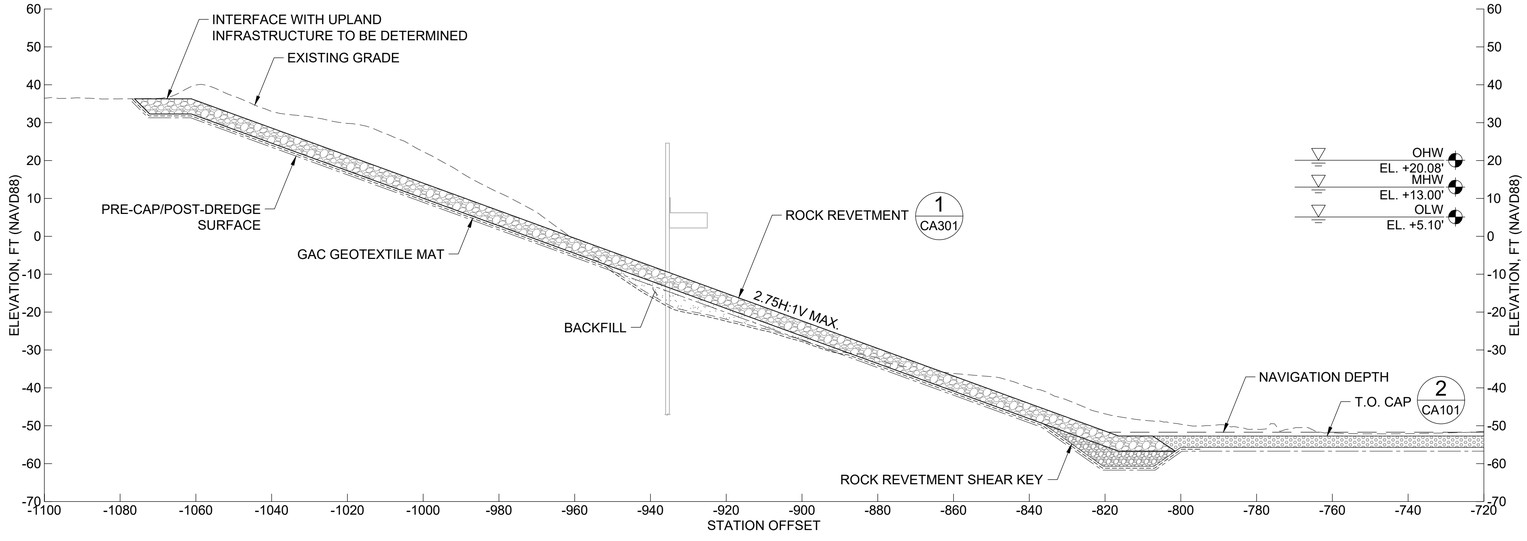
Capping Sections 6

C:\pwworking\hmm\ports_harbors\mor69830\dms82133\CA206.dwg Mar 11, 2025 - 6:46PM NG85190



STATION 48+81
SECTION SHORELINE

14 SCALE: 1" = 20'



STATION 49+05
SECTION SHORELINE

15 SCALE: 1" = 20'

0 20 40

SCALE IN FEET

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	83	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 20'	Status		Rev		Security

Drawing Number: CA207

Title: Swan Island Basin Project Area Remedial Design

Capping Sections 7

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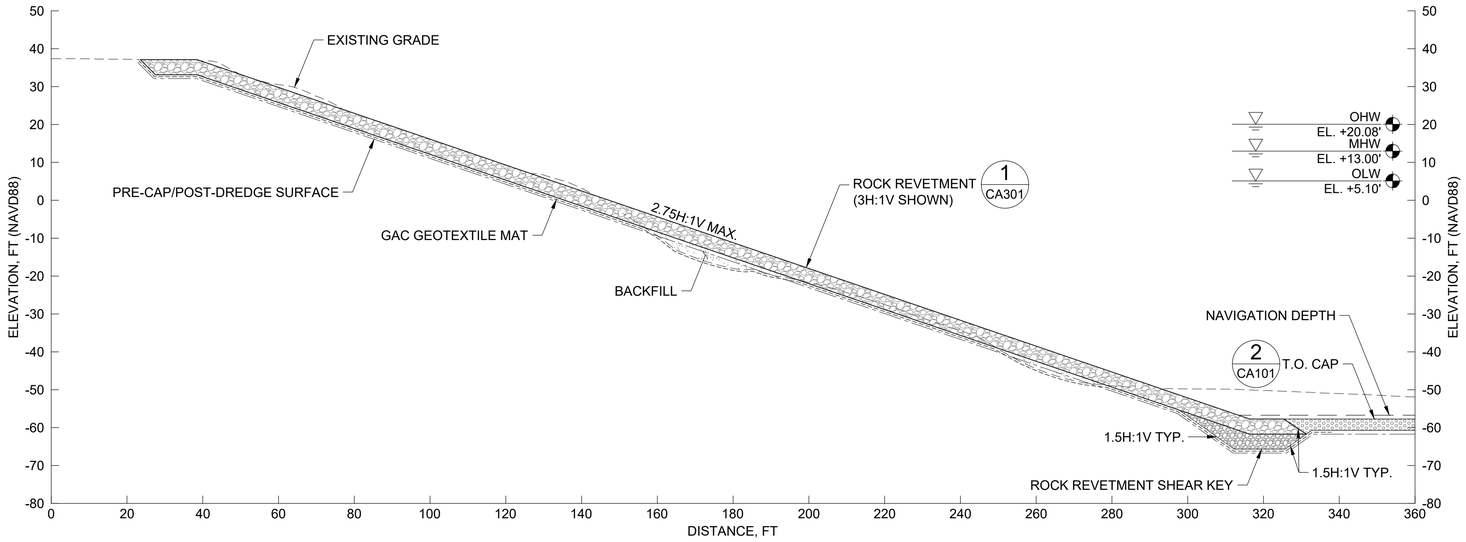

16 SECTION SHORELINE
SCALE: 1" = 20'

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	84	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

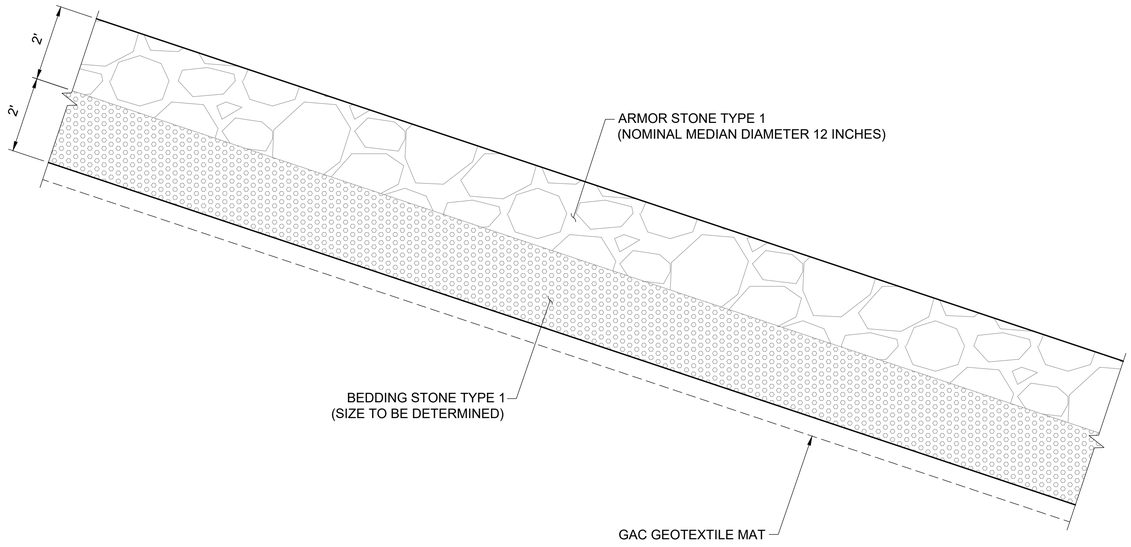
Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: CA208

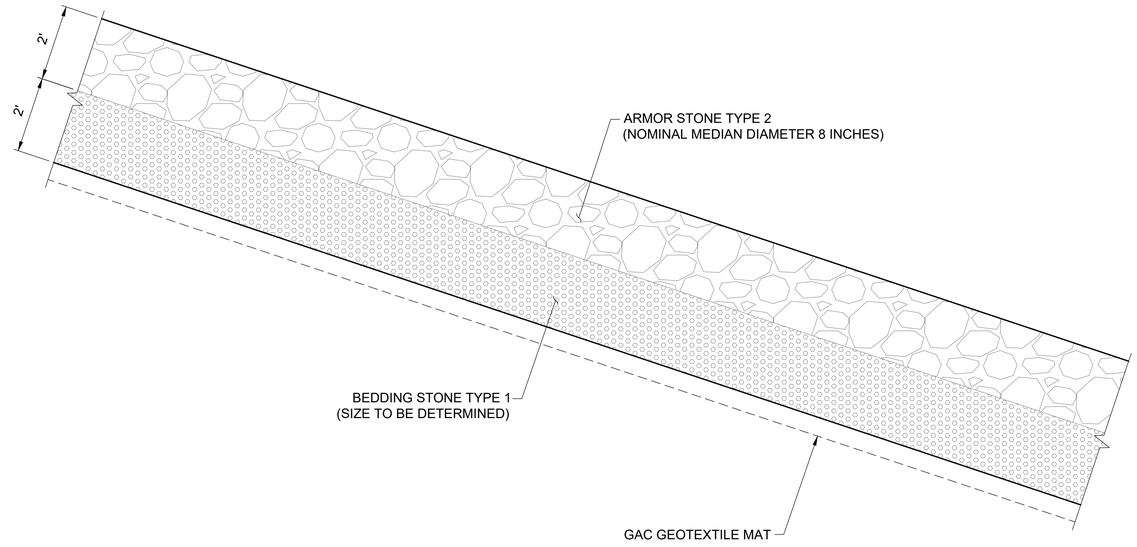
Title: Swan Island Basin Project Area Remedial Design

Capping Sections 8

C:\pwworking\hmm\ports_harbors\mor69830\dms82133\CA208.dwg Mar 11, 2025 - 6:47PM NG85190



1 DETAIL - ROCK REVETMENT TYPE 1 SECTION
SCALE: NTS



2 DETAIL - ROCK REVETMENT TYPE 2 SECTION
SCALE: NTS

NOTES

1. REVETMENT TYPE 1 TO BE INSTALLED AT USCG, NAVY, SHIPYARD AREA: 2-FT ARMOR LAYER (12" DN50), 2-FT BEDDING LAYER
2. REVETMENT TYPE 2 TO BE INSTALLED AT ALL OTHER AREAS: 2-FT ARMOR LAYER (8" DN50), 2-FT BEDDING LAYER
3. REVETMENT TOTAL THICKNESS (4 FEET) PER GEOTECHNICAL DESIGN MEMORANDUM, REVISION 0.

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	85	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security

Drawing Number: CA301

Title: Swan Island Basin Project Area Remedial Design

Revetment Details 1

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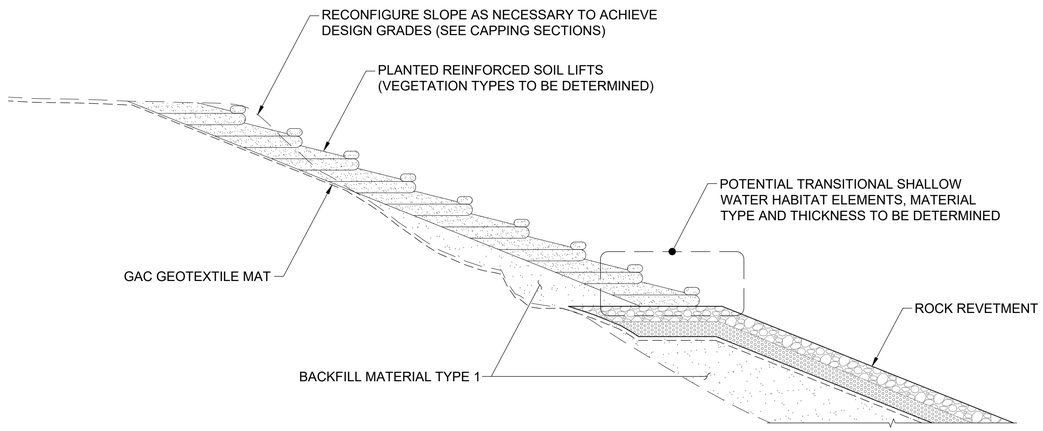
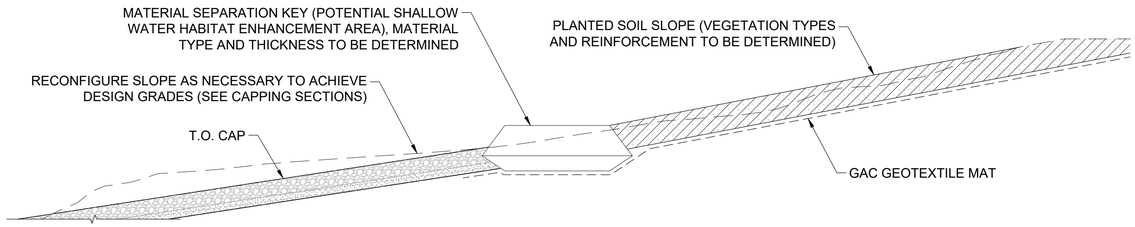
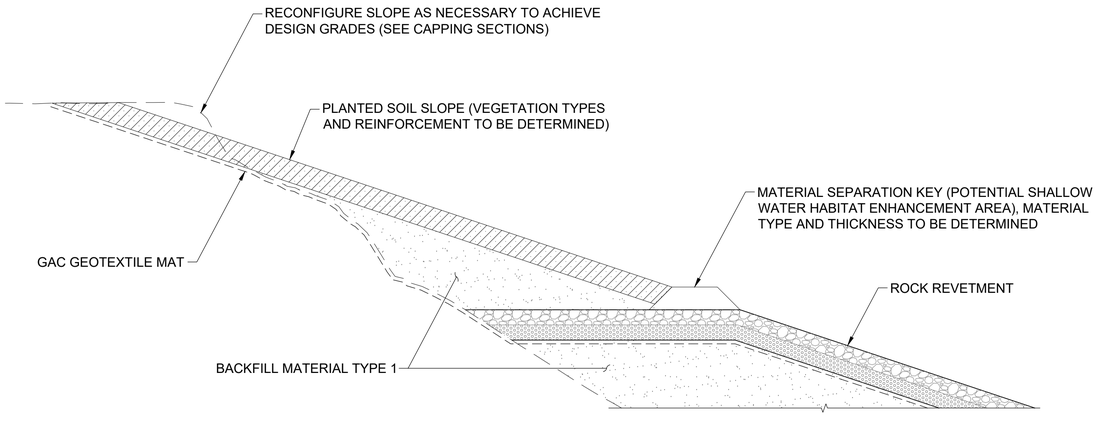


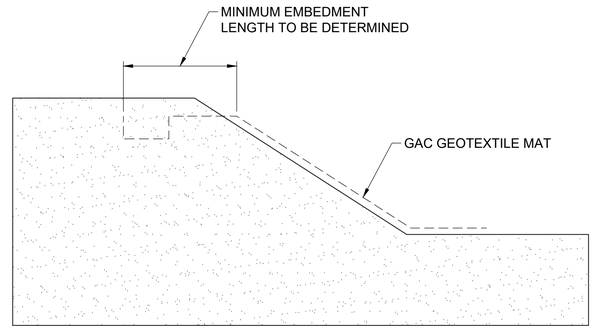
1 DETAIL - PLANTED BANK SLOPES STEEPER THAN 3H:1V WITH REVETMENT
SCALE: NTS



3 DETAIL - PLANTED BANK SLOPES FLATTER THAN 3H:1V WITH CAP TYPE 1
SCALE: NTS



2 DETAIL - PLANTED BANK SLOPES 3H:1V WITH REVETMENT
SCALE: NTS



4 DETAIL - CONCEPTUAL TOP ANCHORING OF GAC GEOTEXILE MAT TO PREVENT SLIDING PRIOR TO PLACEMENT OF ROCK
SCALE: NTS

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	86	134

Designed	S. Fenical		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	

Drawing Number: CA302

Title: Swan Island Basin Project Area Remedial Design

Planted Bank Details 1

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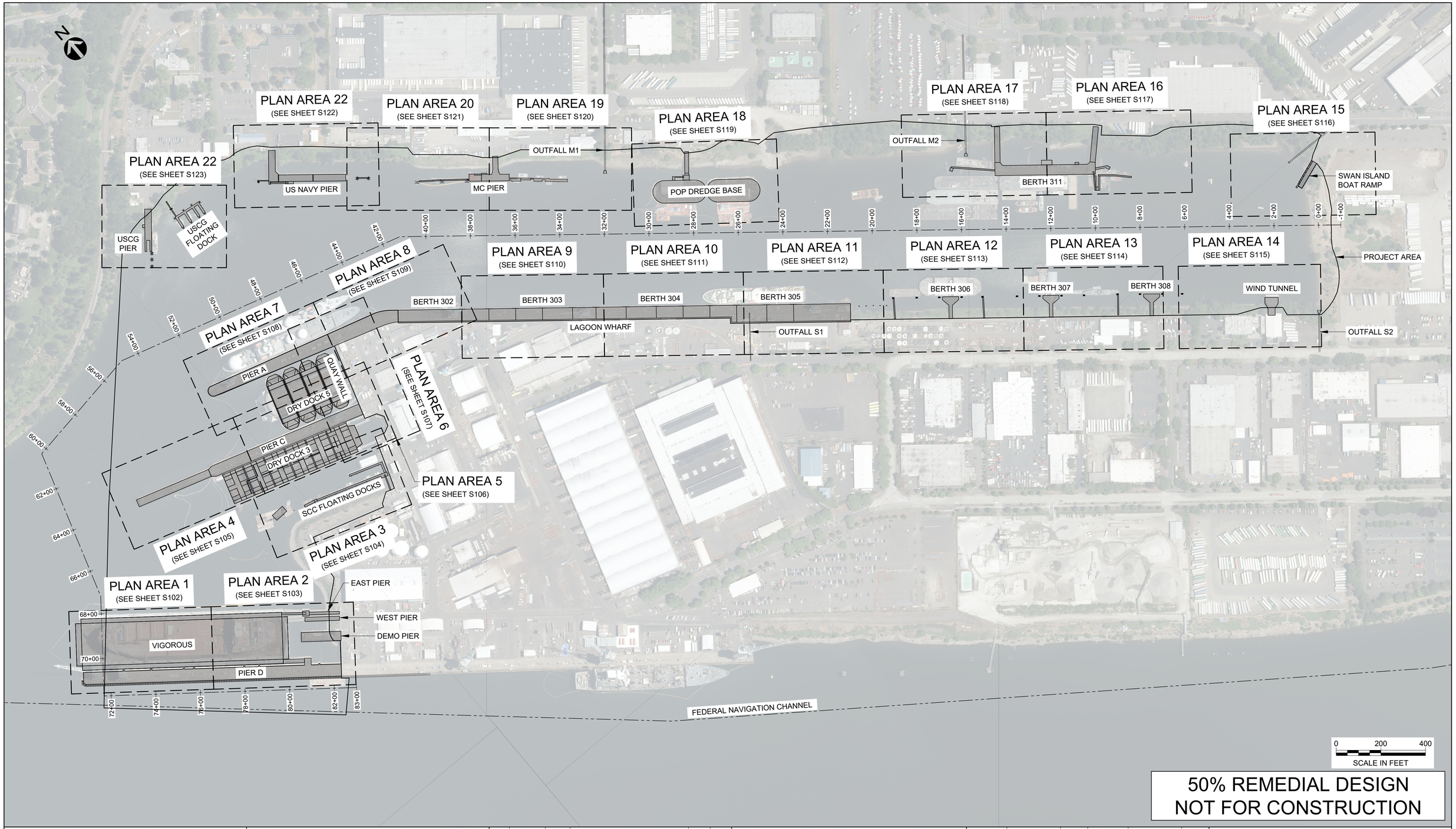

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	87	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S100

Title

Swan Island Basin Project Area Remedial Design

Overall Structural Plan

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GENERAL REQUIREMENTS:

1. DESIGN AND CONSTRUCTION SHALL COMPLY WITH THE PROJECT SPECIFICATIONS CONTAINED IN THE PROJECT SPECIFICATIONS AND THE PROJECT DRAWINGS. ANY DISCREPANCIES OR CONFLICTS BETWEEN PROJECT SPECIFICATIONS AND PROJECT DRAWINGS SHALL BROUGHT TO THE ATTENTION OF THE PROJECT REPRESENTATIVE IN WRITING FOR CLARIFICATION PRIOR TO PROCEEDING.

2. REFER TO DRAWING 507100742-GI103 FOR ALL GENERAL REQUIREMENTS WHICH APPLY.

EXISTING SITE CONDITIONS:

1. REFER TO DRAWING 507100742-GI103 FOR EXISTING SITE CONDITIONS.
2. SEE STRUCTURAL DESIGN TECHNICAL MEMORANDUM, HGL (2025B) APPENDIX I - STRUCTURAL DESIGN TECHNICAL MEMORANDUM IN 50% REMEDIAL DESIGN CRITERIA REPORT (REVISION 0, PRELIMINARY REMEDIAL DESIGN SERVICES SWAN ISLAND BASIN PROJECT AREA CERCLA DOCKET NO. 10-2021-001) JANUARY FOR A SUMMARY OF THE CONDITIONS OF EXISTING STRUCTURES

CONTRACTOR RESPONSIBILITIES:

1. DRAWINGS REPRESENT DESIGN OF STRUCTURAL MODIFICATIONS TO EXISTING STRUCTURES AND DESIGN OF NEW STRUCTURES WHICH ARE DEVELOPED TO PRELIMINARY DESIGN (30%) DEVELOPMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR THE DETAILED DESIGN AND CONSTRUCTION OF ALL STRUCTURES.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR:
   A. DESIGN AND CONSTRUCTION OF ALL PERMANENT STRUCTURAL MODIFICATIONS AND RETROFITS OF EXISTING STRUCTURES TO SUPPORT COMPLETION OF THE REMEDIAL OBJECTIVES AND PROTECTION IN PLACE OF ALL EXISTING STRUCTURES IDENTIFIED TO REMAIN. DESIGN OF STRUCTURAL RETROFITS/MODIFICATIONS TO PROTECT EXISTING STRUCTURES SHALL BE IN ACCORDANCE WITH THE DESIGN REQUIREMENTS AND APPLICABLE CODES.
   B. ALL FIELD INVESTIGATIONS, INCLUDING BUT NOT LIMITED TO VISUAL AND/OR INTRUSIVE STRUCTURAL INSPECTIONS, GEOTECHNICAL INVESTIGATIONS, LABORATORY TESTING, ETC. WHICH IS REQUIRED TO PERFORM THE WORKS IN ACCORDANCE WITH THE DESIGN REQUIREMENTS.
   C. DESIGN AND CONSTRUCTION OF NEW STRUCTURES TO REPLACE THOSE DEMOLISHED AS INDICATED ON THE DRAWINGS. DESIGN OF ALL NEW STRUCTURES SHALL BE IN ACCORDANCE WITH THE DESIGN REQUIREMENTS AND APPLICABLE CODES.
   D. COORDINATION WITH OWNERS/OPERATORS DURING DESIGN AND CONSTRUCTION OF ALL WORKS.
   E. TEMPORARY SHORING AND BRACING OF ALL STRUCTURAL MEMBERS, EXISTING CONSTRUCTION, AND SOIL EXCAVATION AS REQUIRED. SHORING AND BRACING SHALL NOT BE REMOVED UNTIL ALL FINAL CONSTRUCTION HAS BEEN COMPLETED AND MATERIALS HAVE ACHIEVED DESIGN STRENGTH.
   F. PROTECTION IN PLACE OF ALL EXISTING STRUCTURES NOT IDENTIFIED TO BE DEMOLISHED, INCLUDING ALL INFRASTRUCTURE, ASSETS AND LANDS ADJACENT TO THE WORK AREA.

3. THE CONTRACTOR SHALL ENSURE THE PROTECTION AND STABILITY OF ALL STRUCTURES TO REMAIN DURING THE REMEDIAL WORKS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY INSTABILITY OR DAMAGE CAUSED TO EXISTING STRUCTURES DURING REMEDIATION WORKS AND SHALL BE RESPONSIBLE FOR REPAIRS TO DAMAGED STRUCTURES TO THE SATISFACTION OF THE PROJECT REPRESENTATIVE.

4. DREDGING/REMOVAL OF EXISTING MATERIAL BENEATH STRUCTURES AND AROUND PILES SHALL COMMENCE FROM TOP OF SLOPE TO BOTTOM OF SLOPE TO ENSURE EXISTING PILES ARE NOT SUBJECT TO MATERIAL RETENTION LOADS DURING WORKS.

5. THE CONTRACTOR SHALL SUBMIT A WORK PLAN FOR DREDGING/REMOVAL OF EXISTING MATERIAL AND CONSTRUCTION OF CAP/ROCK REVETMENT FOR PROJECT REPRESENTATIVE REVIEW.

PROJECT SPECIFICATIONS:

1. APPLICABLE CODES
   THE LATEST EDITION OF ALL APPLICABLE CODES, EFFECTIVE THE DATE OF COMMENCEMENT OF DETAILED DESIGN SHALL BE USED.

   A. GENERAL
   - OREGON STRUCTURAL SPECIALTY CODE (OSSC) 2022
   - INTERNATIONAL BUILDING CODE (IBC) 2021
   - ASCE 7-22 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES 2022
   - CALIFORNIA BUILDING CODE (CBC) (2022) “CHAPTER 31F [FOR SLC], MARINE OIL TERMINALS,” JANUARY 2023 (MOTEMS 2022).
   - OREGON DEPARTMENT OF TRANSPORT, GEOTECHNICAL DESIGN MANUAL, MAY 2024
   - AISC STEEL CONSTRUCTION MANUAL, 14TH EDITION
   - 2020 AWS D1.1 STRUCTURAL WELDING CODE
   - 2019 ACI 318 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE

   B. STRUCTURAL MODIFICATIONS AND RETROFITS OF EXISTING STRUCTURES
   - OREGON EXISTING BUILDING CODE 2021
   - INTERNATIONAL EXISTING BUILDING CODE (IEBC) 2021
   - ASCE 41 2017 - SEISMIC EVALUATION AND RETROFIT OF EXISTING BUILDINGS
   - CITY OF PORTLAND TITLE CODES:
     a. TITLE 24 BUILDING REGULATIONS
     b. TITLE 28 FLOATING STRUCTURES

   C. NEW STRUCTURES
   - UNIFIED FACILITIES CRITERIA PIERS AND WHARVES (UFC 4-152-01), AUGUST 2024.
   - PORT OF LONG BEACH WHARF DESIGN CRITERIA, MAY 20, 2015 (POLB 2015)
   - ASCE 61-14 - SEISMIC DESIGN OF PIERS AND WHARVES

2. MINIMUM DESIGN REQUIREMENTS

   A. EXISTING STRUCTURES:

      a. FOLLOWING IMPLEMENTATION OF THE RA, EXISTING STRUCTURES THAT REQUIRE MITIGATION MEASURES OR MODIFICATION WILL MEET THE REQUIREMENTS OF CITY OF PORTLAND BUILDING CODE TITLE 24. THE CONTRACTOR SHALL DEMONSTRATE CONFORMANCE BY COMPLETING STRUCTURAL DEMAND/CAPACITY ASSESSMENTS OF THE STRUCTURES IN THEIR AS-BUILT (ORIGINAL) CONDITION AND THEIR FINAL CONDITION, FOLLOWING REMEDIATION. SEE PROJECT SPECIFICATIONS FOR REQUIREMENTS.

      b. DESIGN LIFE OF STRUCTURAL MODIFICATIONS/RETROFITS: TO BE DETERMINED IN CONSULTATION WITH EACH OWNER/OPERATOR.

   B. NEW STRUCTURES:

      a. SEISMIC DESIGN CRITERIA:
         1. RISK CATEGORY: TO BE CONFIRMED AT 90% DESIGN STAGE
         2. DESIGN CLASSIFICATION: TO BE CONFIRMED AT 90% DESIGN STAGE

      b. DESIGN LOADS: TO BE CONFIRMED AT 90% DESIGN STAGE
         1. DEAD LOADS: TO BE CONFIRMED AT 90% DESIGN STAGE
         2. LIVE LOADS: TO BE CONFIRMED AT 90% DESIGN STAGE
         3. EQUIPMENT LOADS: TO BE CONFIRMED AT 90% DESIGN STAGE
         4. WIND LOADS: TO BE CONFIRMED AT 90% DESIGN STAGE
         5. SNOW LOADS: TO BE CONFIRMED AT 90% DESIGN STAGE
         6. CURRENT LOADS: TO BE CONFIRMED AT 90% DESIGN STAGE
         7. WAVE LOADS: TO BE CONFIRMED AT 90% DESIGN STAGE
         8. DESIGN VESSELS: TO BE CONFIRMED AT 90% DESIGN STAGE
         9. BERTHING LOADS: TO BE CONFIRMED AT 90% DESIGN STAGE
         10. MOORING LOADS: TO BE CONFIRMED AT 90% DESIGN STAGE
         11. SOIL PRESSURES: TO BE CONFIRMED AT 90% DESIGN STAGE

   C. CONSTRUCTION LOADS

      a. CONSIDERATION FOR LOADS THAT WILL BE INDUCED BY CONSTRUCTION AND ERECTION PROCEDURES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL VERIFY TO THEIR OWN SATISFACTION THE ABILITY OF THE STRUCTURE TO RESIST ALL CONSTRUCTION AND ERECTION LOADS WITHOUT COLLAPSE, OR MISALIGNMENT OF THE STRUCTURE, OR EXCEEDING THE ALLOWABLE STRESSES OF THE MATERIALS USED. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING, BRACING, AND GUYING OF STRUCTURAL COMPONENTS IN ACCORDANCE WITH SOUND PRACTICE AND ALL NATIONAL, STATE AND LOCAL SAFETY CODE REQUIREMENTS.

   D. SURVEY:
   TO BE CONFIRMED AT 90% DESIGN STAGE

   E. GEOTECHNICAL CONDITIONS:
   TO BE CONFIRMED AT 90% DESIGN STAGE

   F. PILE DRIVING:
   TO BE CONFIRMED AT 90% DESIGN STAGE

   G. PILING:
   ALL STEEL PILING SHALL CONFORM TO THE FOLLOWING MINIMUM REQUIREMENTS:
      b. ASTM, GRADE 3, FY = 45KSI MINIMUM, FY = 52KSI MAXIMUM

   H. REINFORCED CONCRETE:

REINFORCED CONCRETE:

1. ALL CONCRETE SHALL MEET REQUIREMENTS FOR EXPOSURE CLASS C1, SEE ACI 318 TABLE 4.3.1.

2. CAST-IN-PLACE CONCRETE

   CONCRETE SHALL HAVE THE FOLLOWING MINIMUM CHARACTERISTICS:

	MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS
A. CAST-IN-PLACE CONCRETE	TBD AT 90% DESIGN STAGE

3. PRECAST CONCRETE

	MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS
A. PRECAST CONCRETE	TBD AT 90% DESIGN STAGE

4. REINFORCING STEEL

   A. ALL REINFORCING STEEL SHALL BE DEFORMED STEEL BARS CONFORMING TO ASTM A615, GRADE 60.

   B. PRESTRESSING STEEL SHALL BE UNCOATED LOW-RELAXATION SEVEN-WIRE STRAND CONFORMING TO ASTM A416, GRADE 270.

   C. NO FIELD WELDING OF REBAR SHALL BE PERMITTED.

   D. WIRE FOR SPIRAL REINFORCEMENT SHALL CONFORM TO ASTM A1064 AND BE DEFORMED BARS.

   E. WELD WIRE FABRIC (WWF) REINFORCING SHALL BE IN THE TOPPING SLAB AND SHALL BE W4 DIAMETER WITH 6"X6" WIRE SPACING, MEET ASTM A497, AND SHALL BE HOT DIP GALVANIZED TO ASTM A123.

   F. PROVIDE CORNER BARS AT ALL CORNERS. CORNER BARS SHALL MATCH THE NUMBER/SPACING AND DIAMETER OF ALL HORIZONTAL REINFORCEMENT AT THE CORNER. TERMINATED STRAIGHT BARS SHALL EXTEND FULL AVAILABLE LENGTH INTO ADJOINING MEMBERS. SPLICE LENGTH SHALL BE INCREASED FOR TOP BAR CONDITIONS AS PER ACI 318. SPLICE CORNER BAR TO TERMINATED STRAIGHT BAR WITH A MINIMUM SPLICE LENGTH OF 50 BAR DIAMETERS.

5. CONCRETE TESTING

   A. SLUMP AND AIR TESTS SHALL BE CONDUCTED FOR EACH BATCH OR TRUCK DELIVERY OF CONCRETE. ALL CONCRETE TESTING SHALL BE PERFORMED BY OR UNDER THE DIRECTION OF CERTIFIED PERSONNEL IN ACCORDANCE WITH THE SPECIFICATIONS.

   B. ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".

   C. CONSTRUCTION JOINTS SHALL BE PROVIDED ONLY AS NOTED ON THE DRAWINGS AND AS SPECIFICALLY PERMITTED BY THE ENGINEER.

WELDING:

ALL FIELD AND SHOP WELDING SHALL CONFORM TO AWS D1.1 AND AWS D1.6 STRUCTURAL WELDING CODE AND SHALL BE PERFORMED BY AWS OR WABO QUALIFIED WELDERS USING APPROVED WELDING PROCEDURES. WELDER QUALIFICATIONS AND WELDING PROCEDURES SHALL BE SUBMITTED WITH THE STEEL SHOP DRAWINGS FOR APPROVAL.

WELDING PROCEDURES PROVIDED BY THE CONTRACTOR TO BE STAMPED BY THE CONTRACTOR'S CERTIFIED WELD INSPECTOR.

MISCELLANEOUS STEEL:

1. ALL MISCELLANEOUS STEEL SHAPES, PLATES, AND BOLTS SHALL BE STAINLESS STEEL UNLESS OTHERWISE NOTED.
2. ALL STAINLESS STEEL (SS) SHALL BE TYPE 316.
3. ALL BOLTS AND NUTS NOT SS SHALL CONFORM TO ASTM A307.
4. ALL OTHER MISCELLANEOUS STEEL NOT SS SHALL BE A36.
5. THREADED ROD SHALL BE ASTM F1554 GR. 105 ksi.
6. ALL MISCELLANEOUS PIPE SHALL CONFORM TO ASTM A53, GRADE B.
7. HEADED STUDS SHALL CONFORM TO ASTM A108.

TIMBER:

1. ALL SAWN LUMBER SHALL BE MINIMUM #1 WEST COAST DOUGLAS-FIR. ALL SAWN LUMBER SHALL BE INCISED AND PRESSURE-TREATED WITH AZCA TO 0.6 PCF IN ACCORDANCE WITH AWPA STANDARD U1, USE CATEGORY 4C. ALL CUTTING, DRILLING AND OTHER FABRICATION SHALL BE PERFORMED, UNLESS OTHERWISE APPROVED, PRIOR TO PRESSURE TREATING. ANY FIELD DRILLING OR OTHER DAMAGE TO THE PRESSURE TREATMENT SHALL BE FIELD REPAIRED USING TWO HEAVY COATS OF COPPER NAPTHENATE IN ACCORDANCE WITH AWPA M4.

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Rev	Date	Drawn	Description	Ch'k'd	App'd

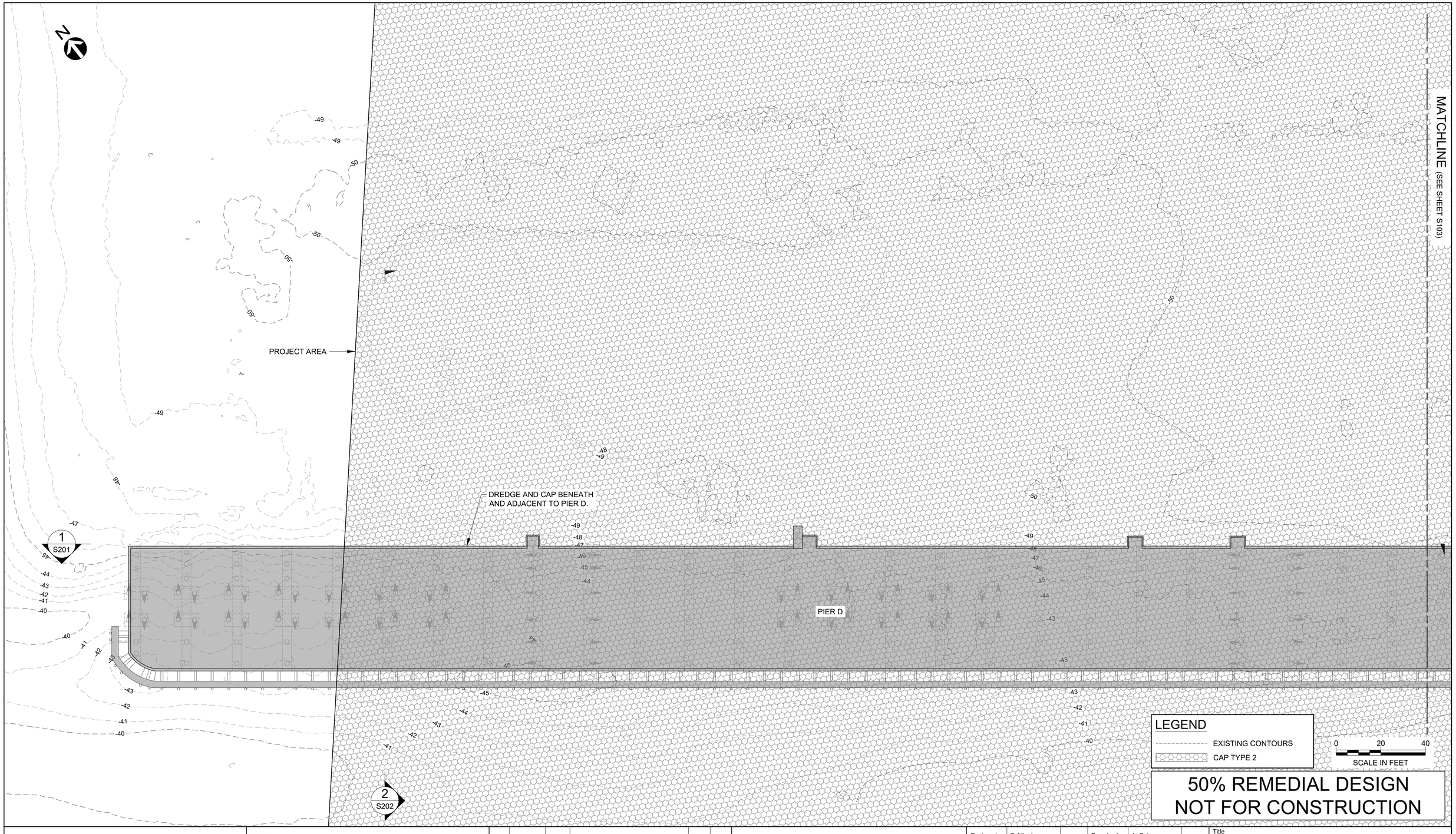
Project Number	B/O	Total
507100742	88	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	Status		Rev	Security	

Drawing Number: S101

Title: Swan Island Basin Project Area Remedial Design

Structural Notes



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Project Number	B/O	Total
507100742	89	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S102

Title: Swan Island Basin Project Area
Remedial Design

Structural Plan Area 1

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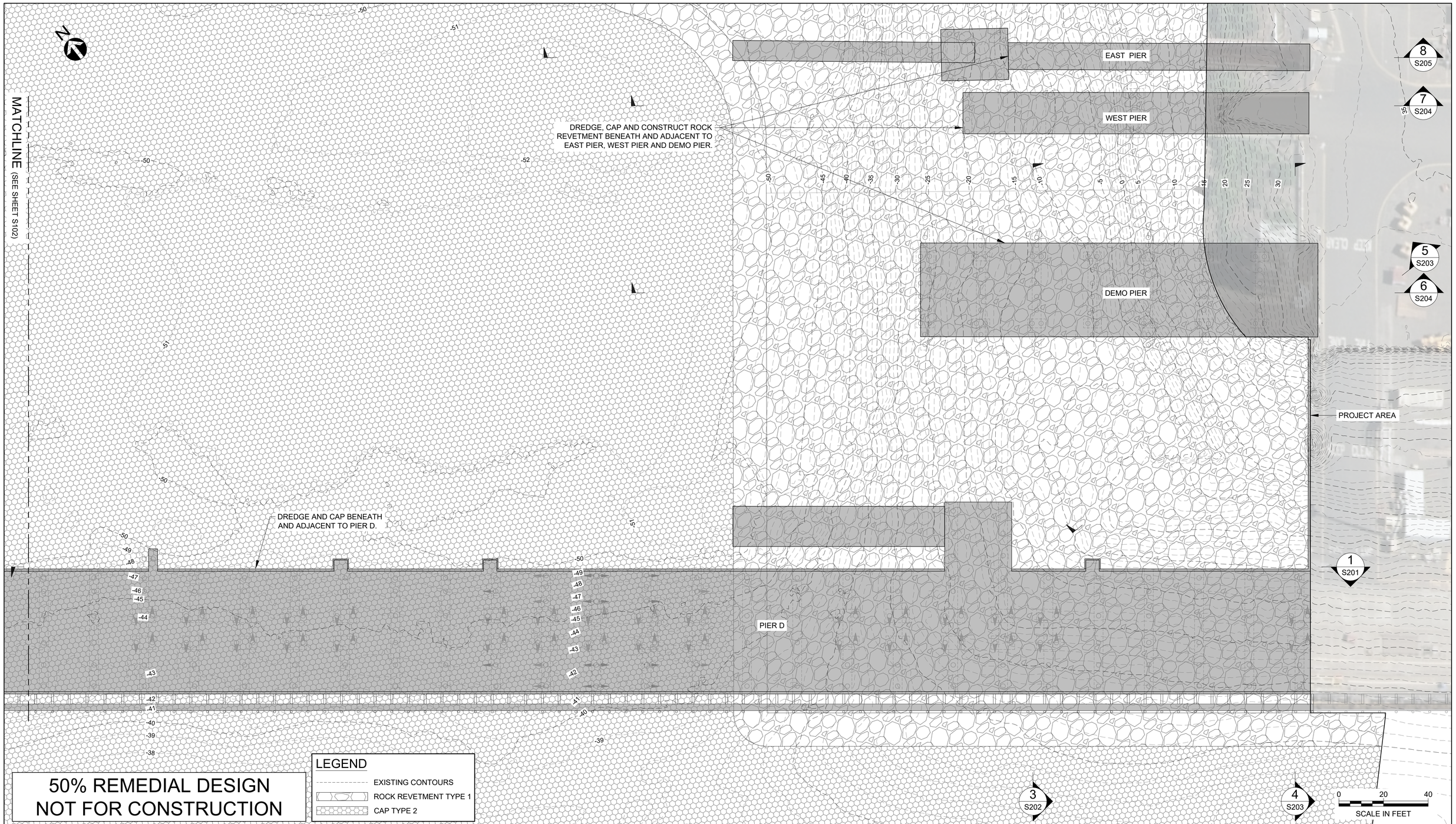

LEGEND

- EXISTING CONTOURS
- ROCK REVETMENT TYPE 1
- CAP TYPE 2

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Project Number	B/O	Total
507100742	90	134

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Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S103

Title: Swan Island Basin Project Area Remedial Design

Structural Plan Area 2

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N

DREDGE, CAP AND CONSTRUCT ROCK REVETMENT BENEATH SCC FLOATING DOCKS. TEMPORARILY RELOCATE AND STORE FLOATING DOCKS DURING REMEDIAL WORKS

SCC FLOATING DOCKS

NEW BULKHEADWALL WITH ACCESS GANGWAY ABUTMENT

PROJECT AREA

9 S205

10 S206

11 S207

0 20 40

SCALE IN FEET

LEGEND

EXISTING CONTOURS

ROCK REVETMENT TYPE 1

CAP TYPE 2

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Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Project Number	B/O	Total
507100742	91	134

Drawing Number: S104

Title: Swan Island Basin Project Area Remedial Design

Structural Plan Area 3

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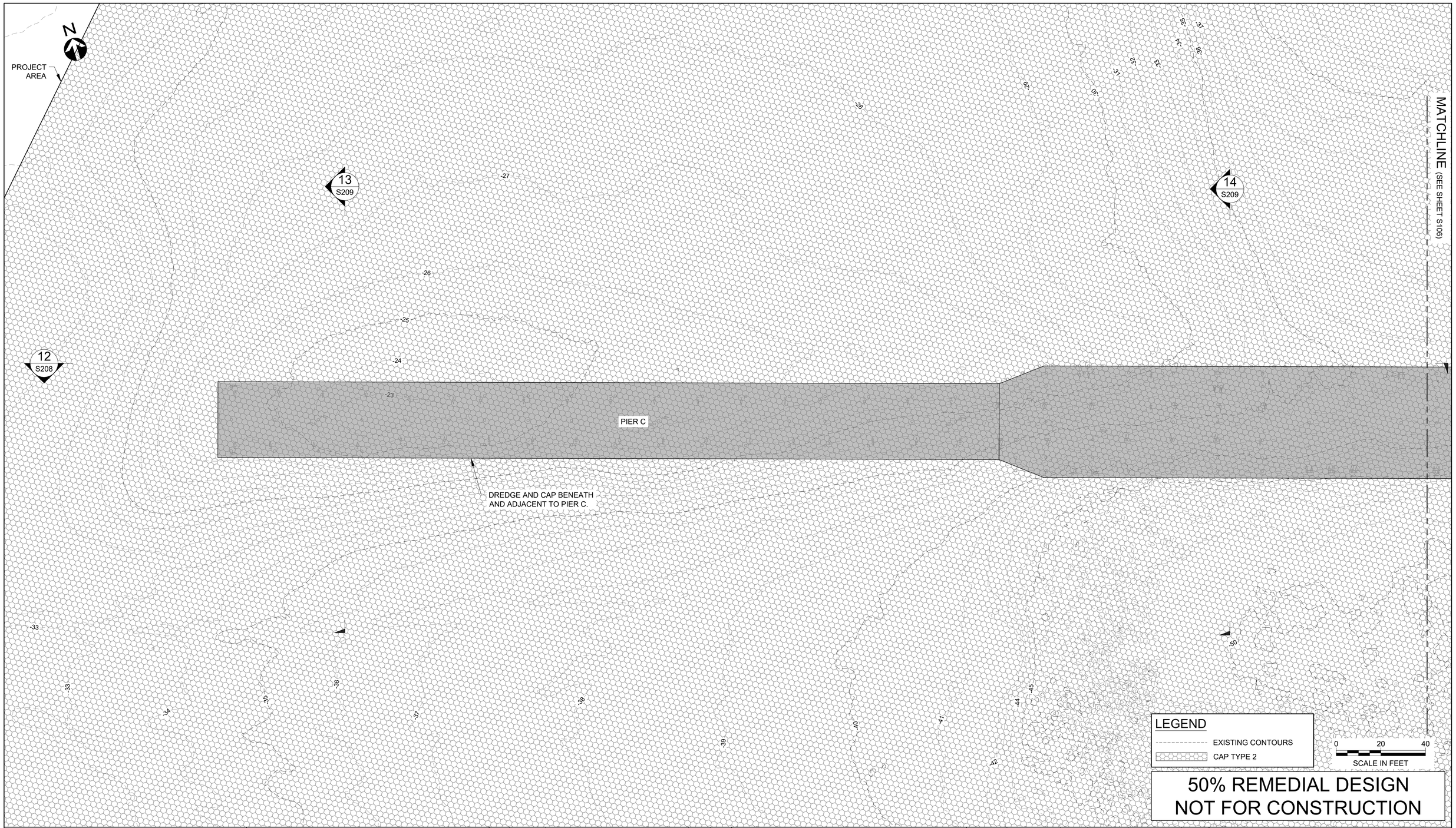

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Project Number	B/O	Total
507100742	92	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S105

Title

Swan Island Basin Project Area Remedial Design

Structural Plan Area 4

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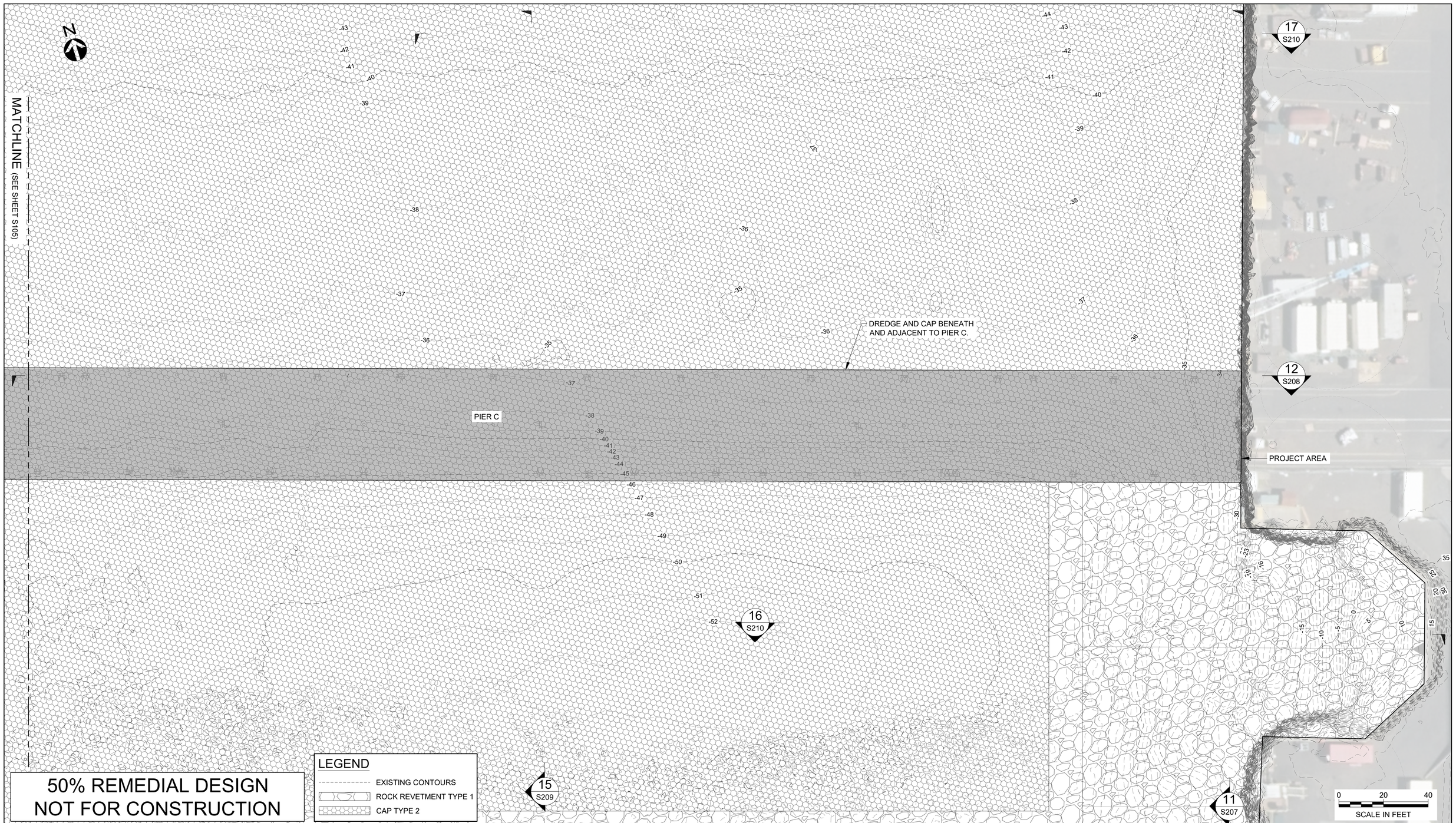

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LEGEND

- EXISTING CONTOURS
- ROCK REVETMENT TYPE 1
- CAP TYPE 2

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Project Number	B/O	Total
507100742	93	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S106

Title

Swan Island Basin Project Area Remedial Design

Structural Plan Area 5

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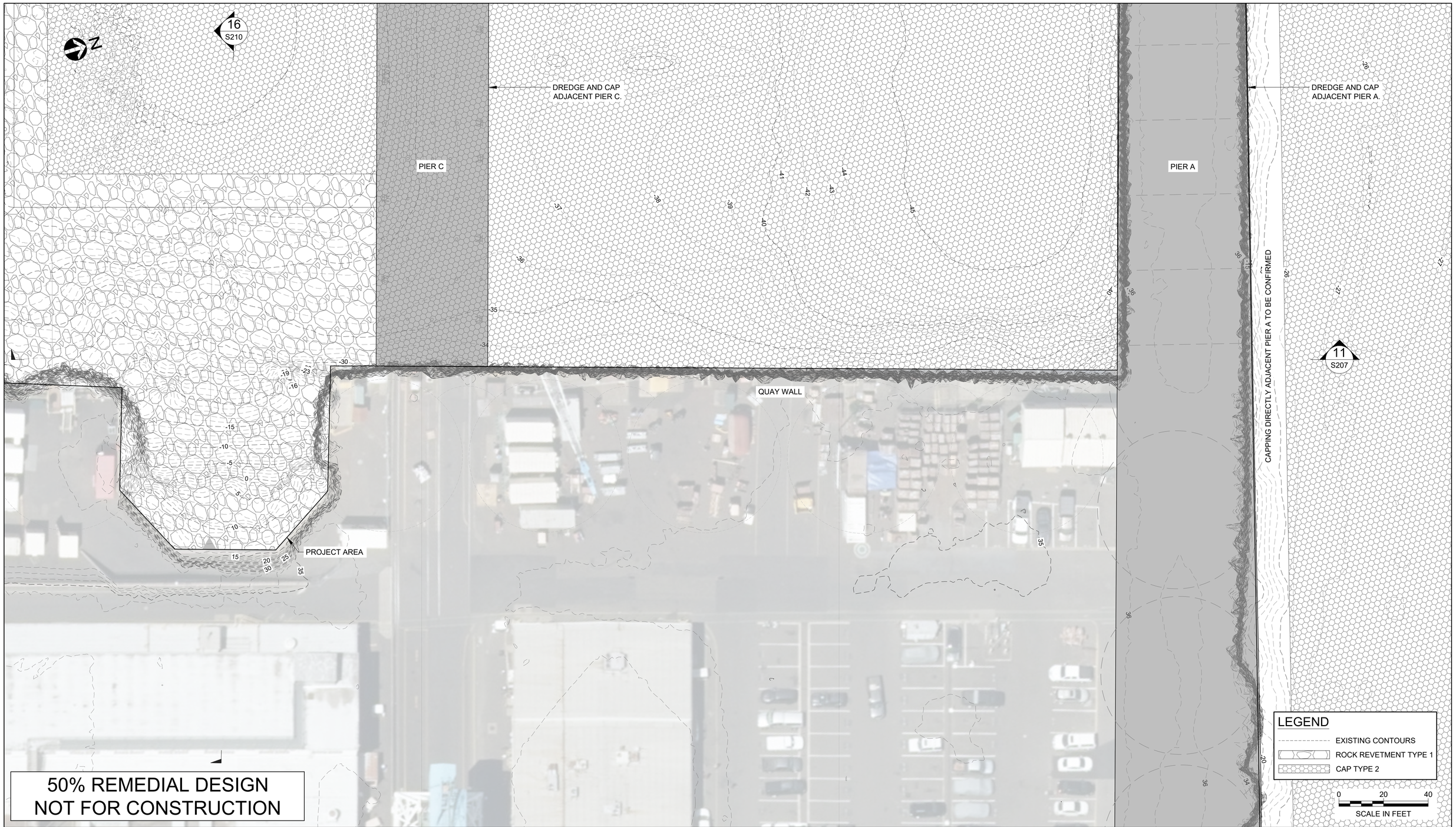

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Project Number	B/O	Total
507100742	94	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 20'	Status		Rev		Security

Drawing Number: S107

Title

Swan Island Basin Project Area Remedial Design

Structural Plan Area 6

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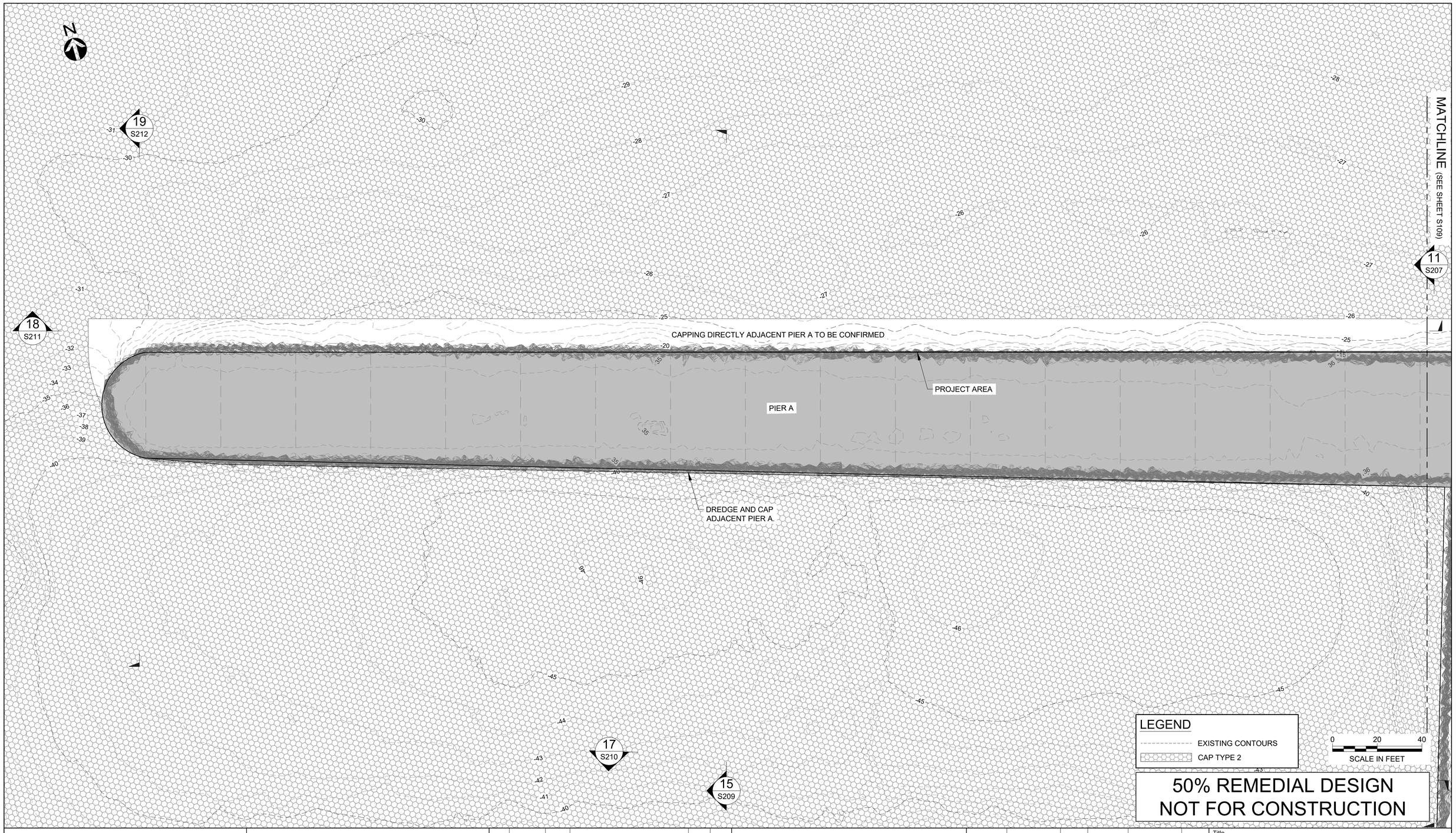

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Project Number	B/O	Total
507100742	95	134

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Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S108

Title: Swan Island Basin Project Area Remedial Design

Structural Plan Area 7

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N

MATCHLINE (SEE SHEET S108)

20 S212

21 S212

22 S212

11 S207

18 S211

CAPPING DIRECTLY ADJACENT PIER A TO BE CONFIRMED

PIER A

LAGOON WHARF

BERTH 302

DREDGE AND CAP ADJACENT TO PIER A.

PROJECT AREA

RESOLUTION OF LAGOON WHARF UNDER CONSIDERATION

MATCHLINE (SEE SHEET S110)

-20 -22 -25 -26 -27 -28 34 36 35

LEGEND

EXISTING CONTOURS

ROCK REVETMENT TYPE 2

CAP TYPE 2

0 20 40

SCALE IN FEET

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Project Number	B/O	Total
507100742	96	134

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Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S109

Title

Swan Island Basin Project Area Remedial Design

Structural Plan Area 8

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N

MATCHLINE (SEE SHEET S109)

MATCHLINE (SEE SHEET S111)

23
S213

24
S213

RESOLUTION OF LAGOON
WHARF UNDER CONSIDERATION

BERTH 303

PROJECT AREA

LEGEND

EXISTING CONTOURS

ROCK REVETMENT TYPE 2

CAP TYPE 2

0 20 40
SCALE IN FEET

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Project Number	B/O	Total
507100742	97	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S110

Title

Swan Island Basin Project Area
Remedial Design

Structural Plan Area 9

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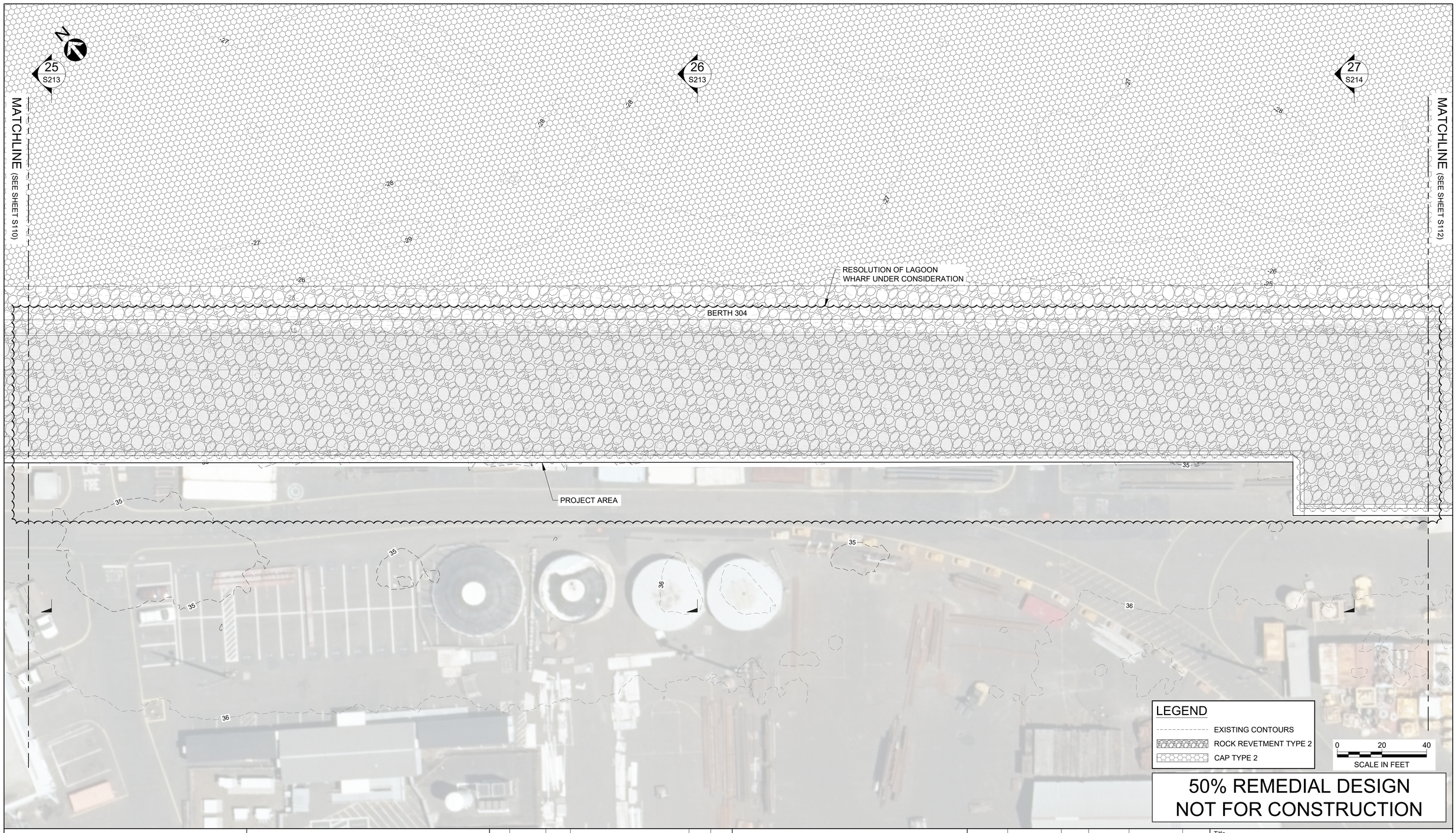

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Project Number	B/O	Total
507100742	98	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S111

Title

Swan Island Basin Project Area Remedial Design

Structural Plan Area 10

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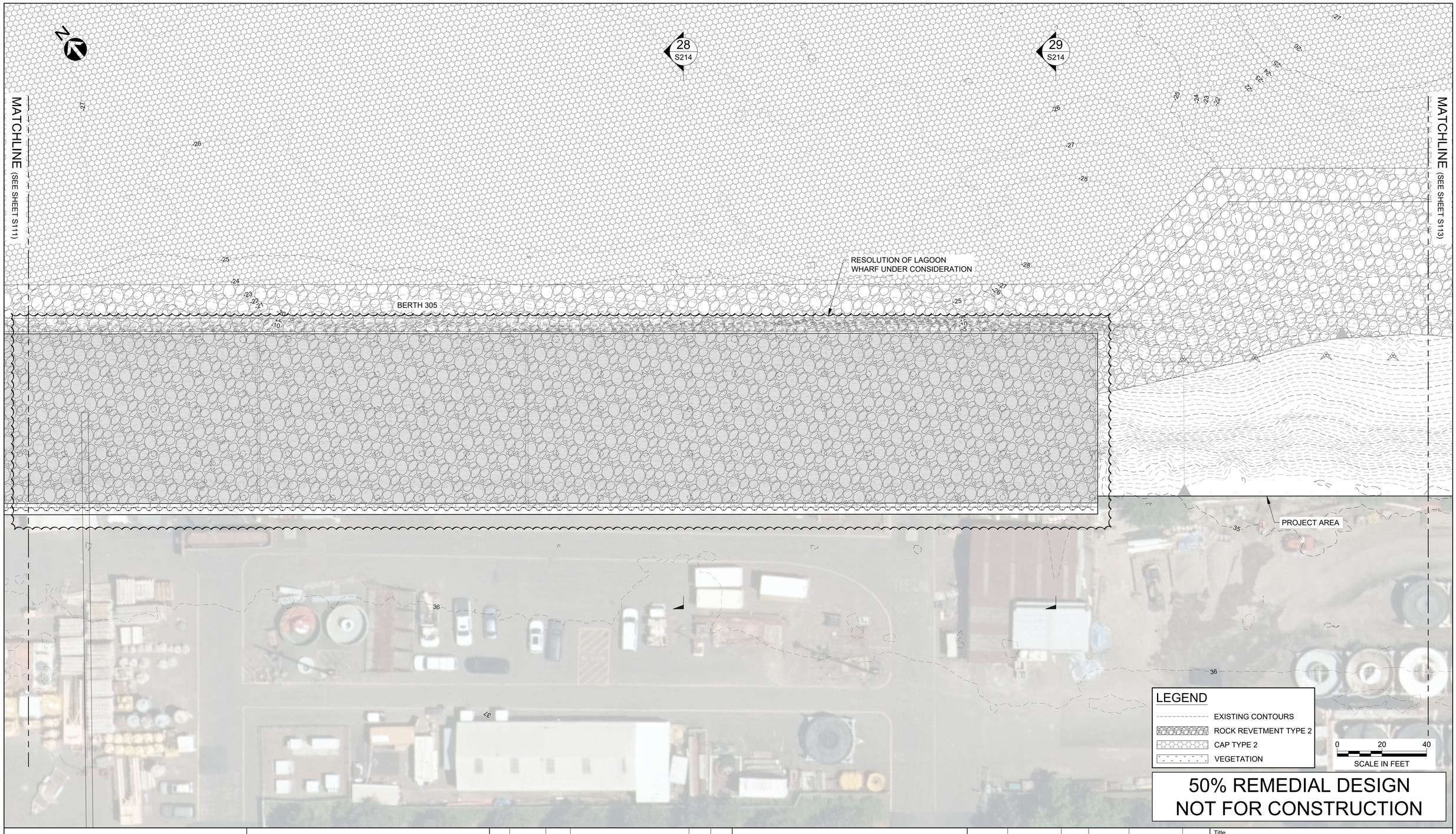

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Project Number 507100742 | B/O 99 | Total 134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D: 1" = 20' | Status | Rev | Security

Drawing Number: S112

Title
Swan Island Basin Project Area
Remedial Design

Structural Plan Area 11

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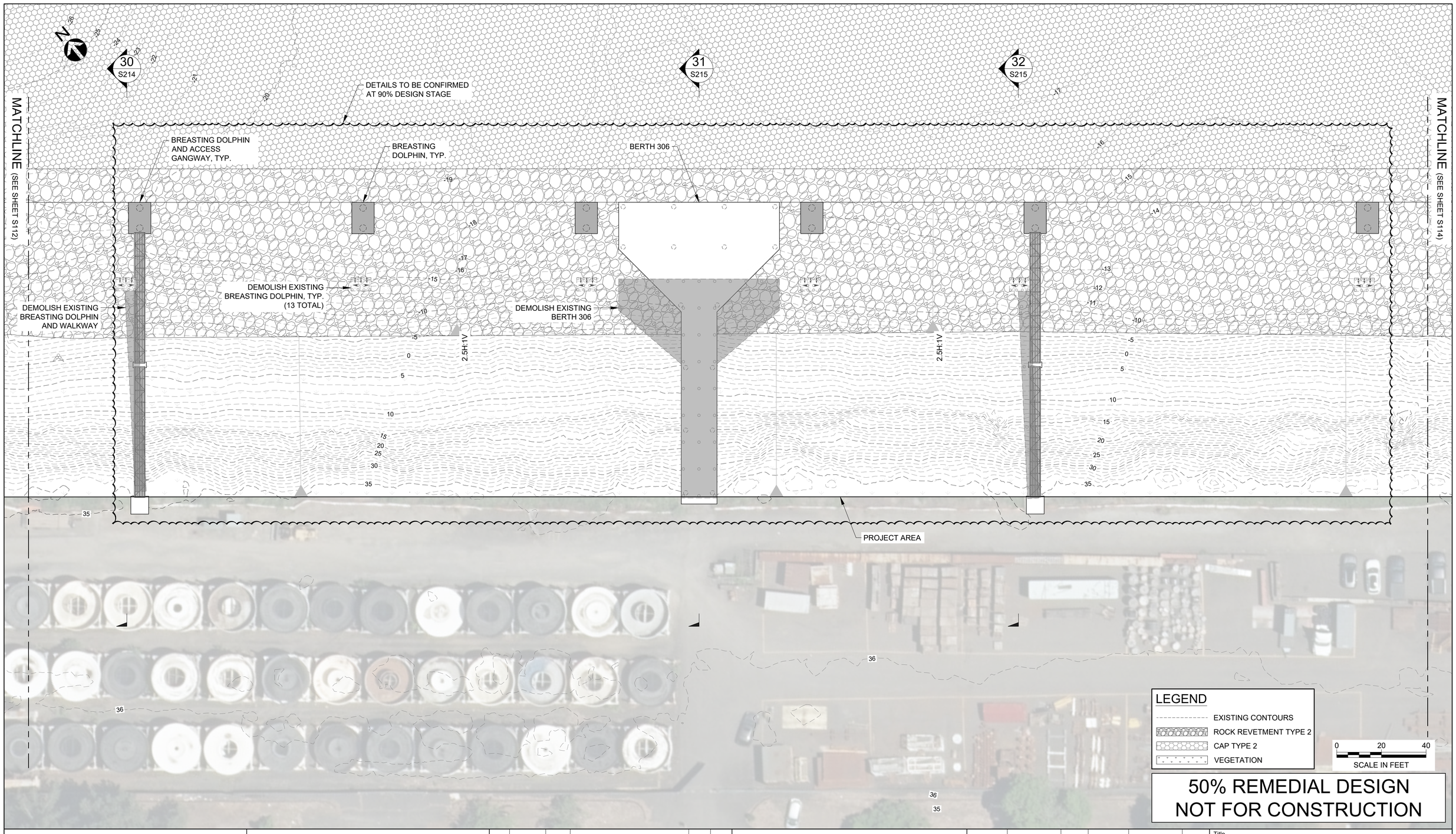

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	100	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S113

Title: Swan Island Basin Project Area Remedial Design

Structural Plan Area 12

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Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Project Number	B/O	Total
507100742	101	134

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S114

Title: Swan Island Basin Project Area Remedial Design

Structural Plan Area 13

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N

36
S216

DEMOLISH EXISTING BREASTING DOLPHIN, TYP. (13 TOTAL)

DREDGE, CAP AND CONSTRUCT ROCK REVETMENT BENEATH AND ADJACENT TO THE WIND TUNNEL.

WIND TUNNEL

PROJECT AREA

20'-0"

70'-0"

SCOUR PROTECTION

OUTFALL S2
(SEE SECTION 3/CA202)

LEGEND

- EXISTING CONTOURS
- ROCK REVETMENT TYPE 2
- CAP TYPE 1
- VEGETATION

0 20 40
SCALE IN FEET

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Project Number	B/O	Total
507100742	102	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S115

Title: Swan Island Basin Project Area Remedial Design

Structural Plan Area 14

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N

37
S216

SWAN ISLAND BOAT RAMP

OUTFALL M3
(SEE SECTION 1/CA201)

DREDGE AND CAP BENEATH SWAN ISLAND BOAT RAMP FLOATING DOCKS. TEMPORARILY RELOCATE AND STORE FLOATING DOCKS DURING REMEDIAL WORKS.

PROJECT AREA

LEGEND

- EXISTING CONTOURS
- CAP TYPE 1
- VEGETATION

0 20 40
SCALE IN FEET

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Project Number	B/O	Total
507100742	103	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number
S116

Title
Swan Island Basin Project Area
Remedial Design

Structural Plan Area 15

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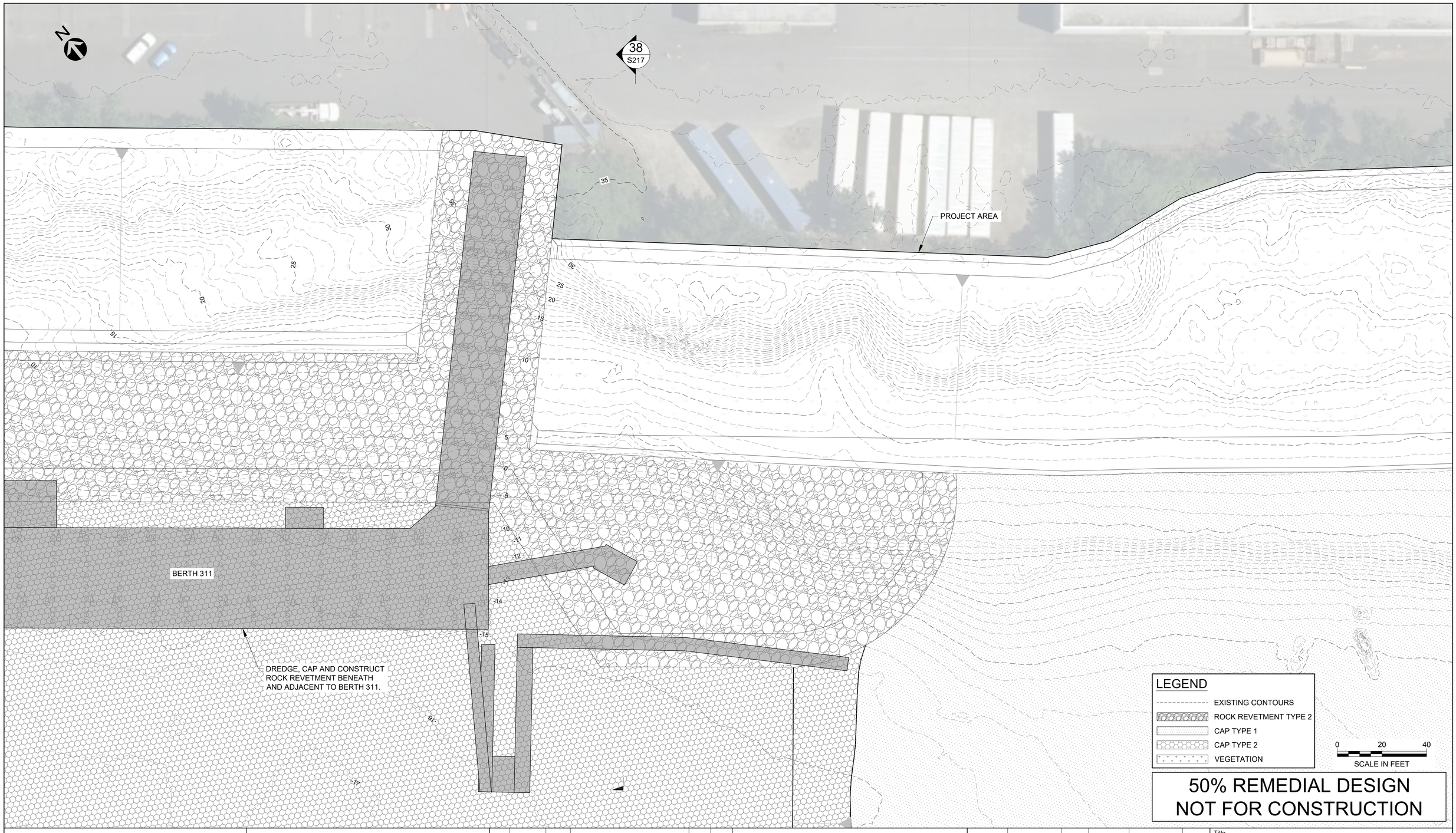

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Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Project Number	B/O	Total
507100742	104	134

Scale at ANSI D	Status	Rev	Security
1" =20'			

Drawing Number: S117

Title: Swan Island Basin Project Area
Remedial Design

Structural Plan Area 16

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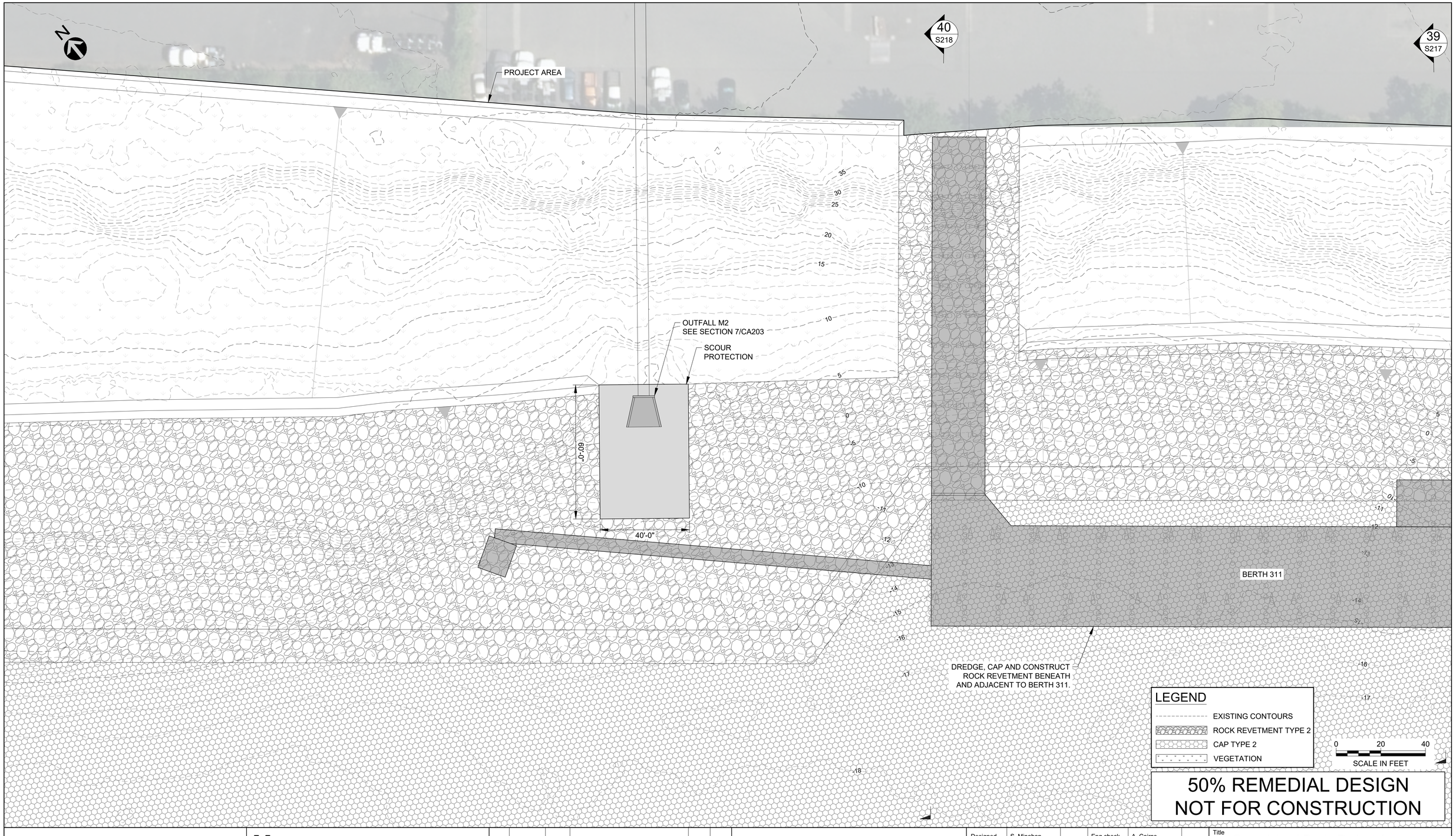

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Project Number	B/O	Total
507100742	105	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S118

Title: Swan Island Basin Project Area
Remedial Design

Structural Plan Area 17

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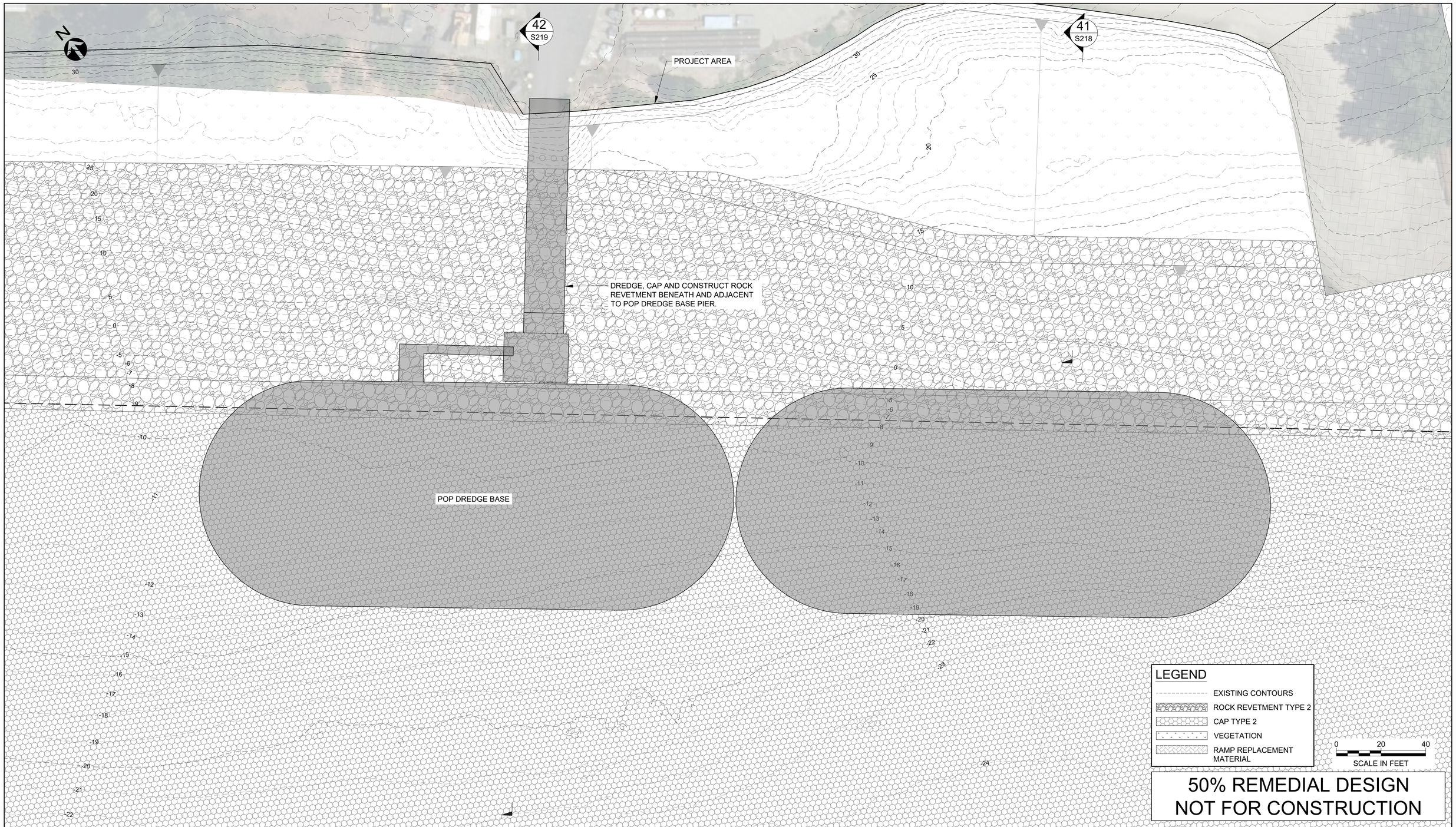

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Project Number	B/O	Total
507100742	106	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S119

Title

Swan Island Basin Project Area
Remedial Design

Structural Plan Area 18

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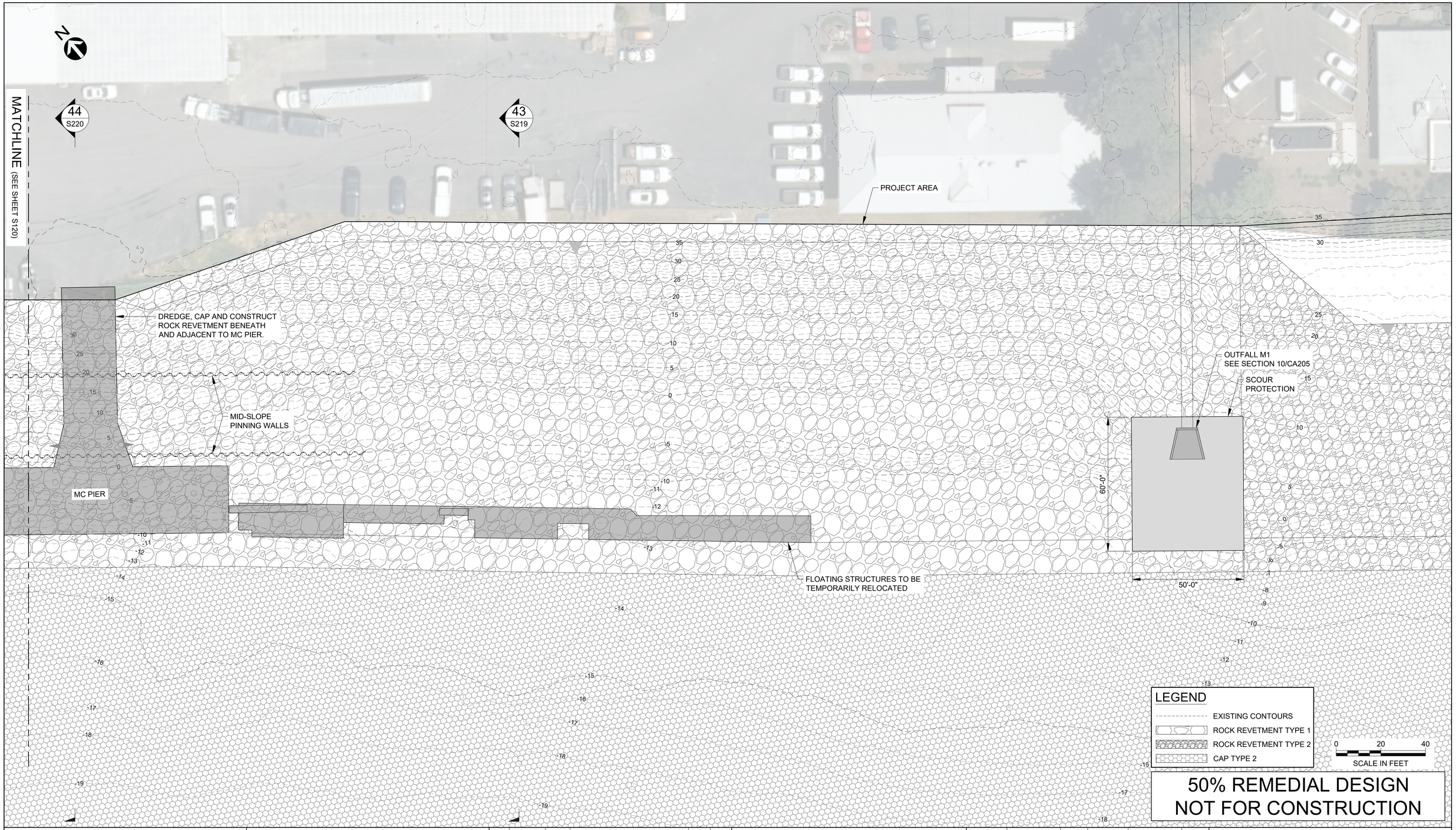

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Project Number	B/O	Total
507100742	107	134

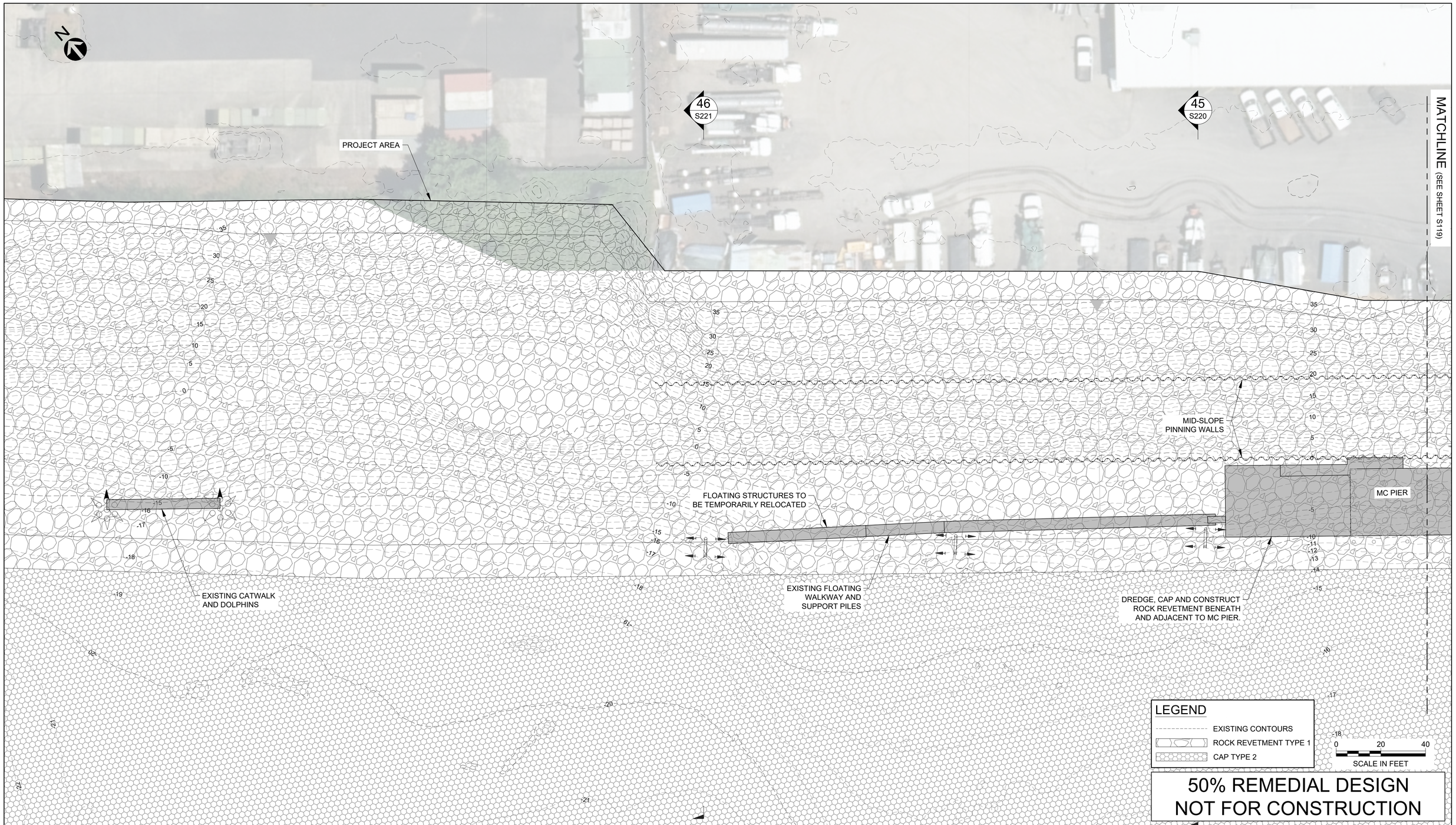
Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S120

Title: Swan Island Basin Project Area Remedial Design

Structural Plan Area 19

C:\pwworking\hmm\ports_harbors\mor69830\dms82128\S120.dwg Mar 11, 2025 - 6:56PM NG85190



50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Project Number	B/O	Total
507100742	108	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

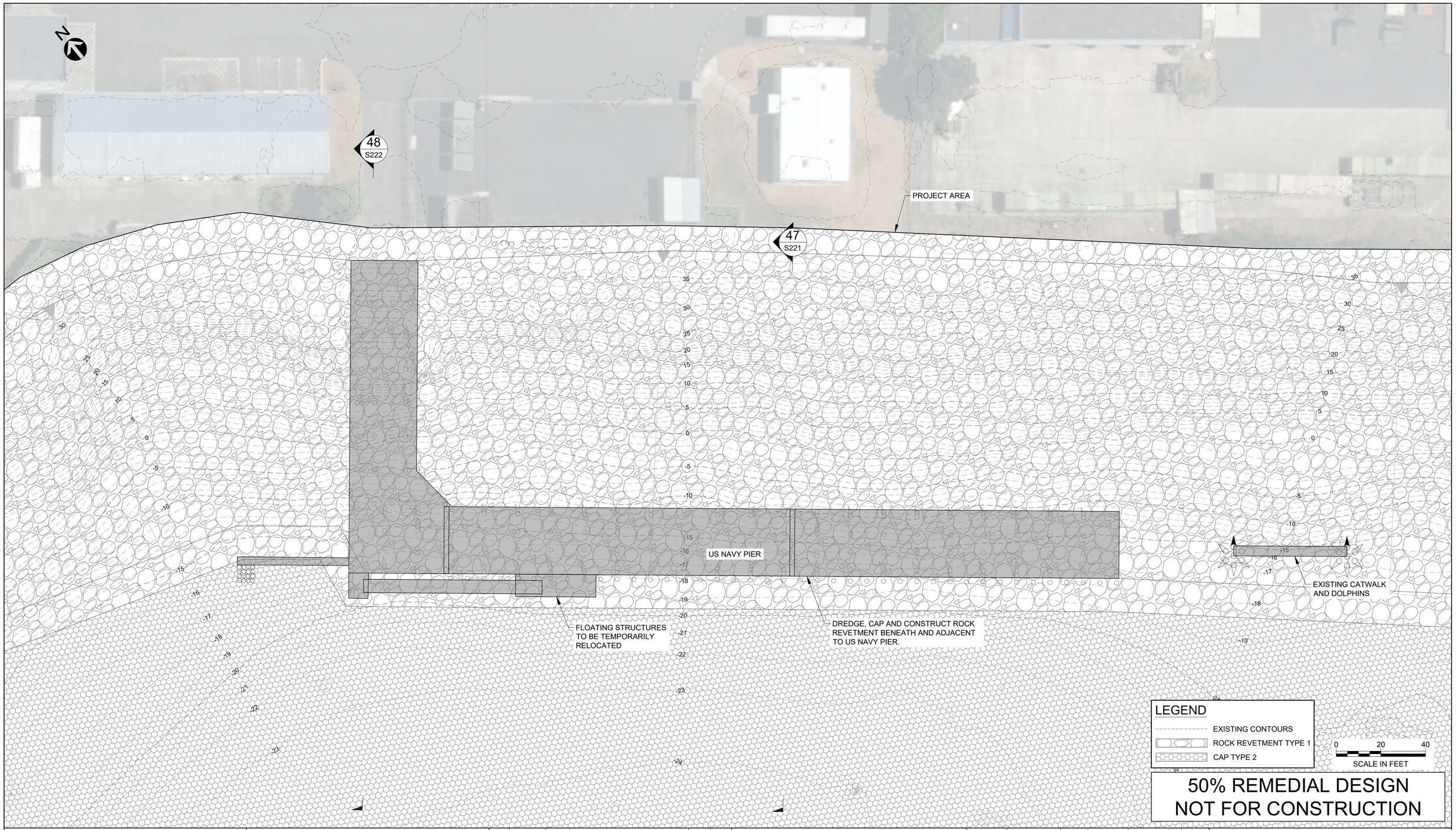
Scale at ANSI D	Status	Rev	Security
1" =20'			

Drawing Number: S121

Title: Swan Island Basin Project Area
Remedial Design

Structural Plan Area 20

C:\pwworking\hmm\ports_harbors\mor69830\dms82128\S121.dwg Mar 11, 2025 - 6:56PM NG85190



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Project Number	B/O	Total
507100742	109	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

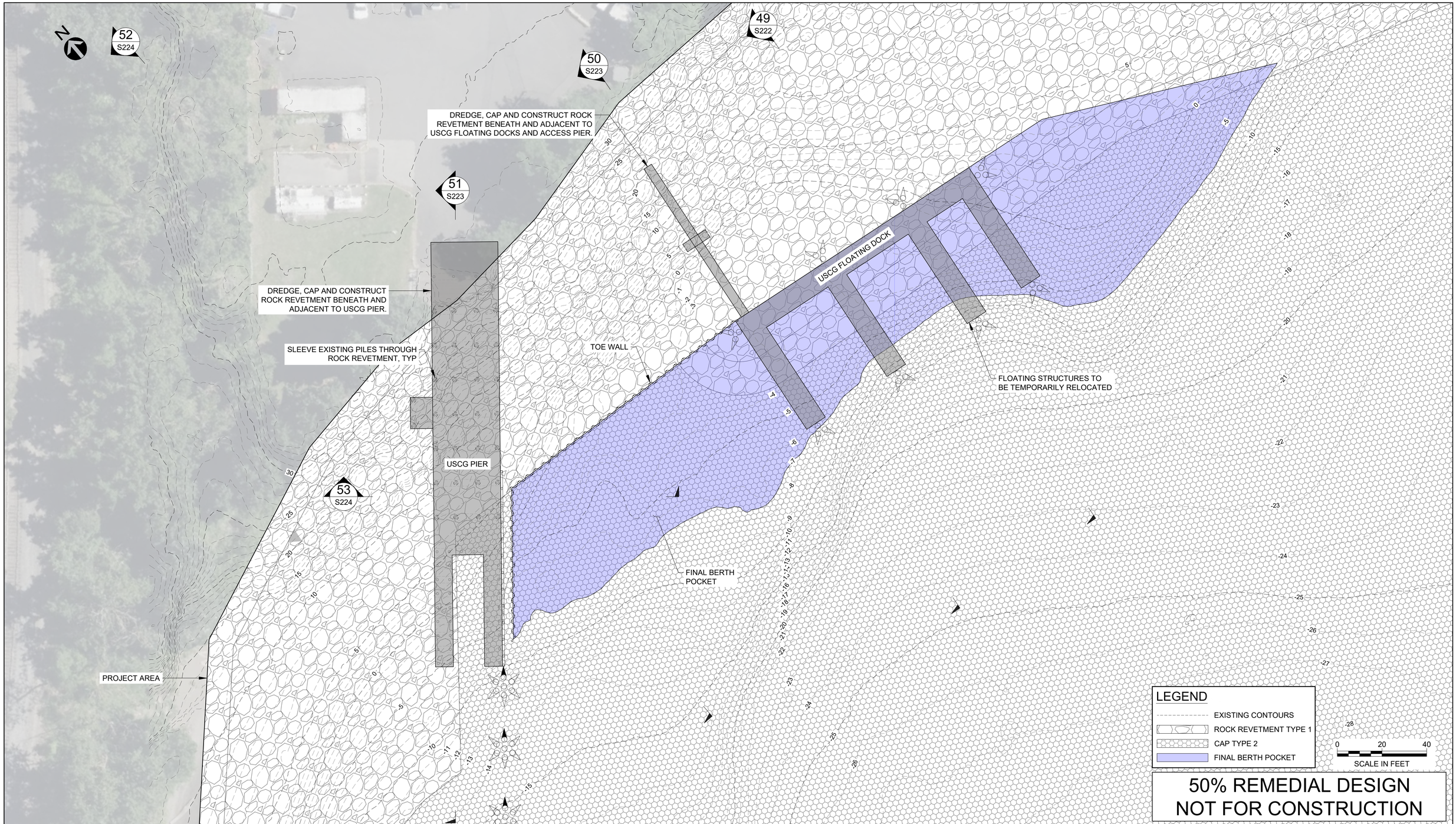
Drawing Number: S122

Title

Swan Island Basin Project Area Remedial Design

Structural Plan Area 21

C:\pwworking\hmm\ports_harbors\mor69830\dms82128\S122.dwg Mar 11, 2025 - 6:57PM NG85190



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Rev	Date	Drawn	Description	Ch'k'd	App'd

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

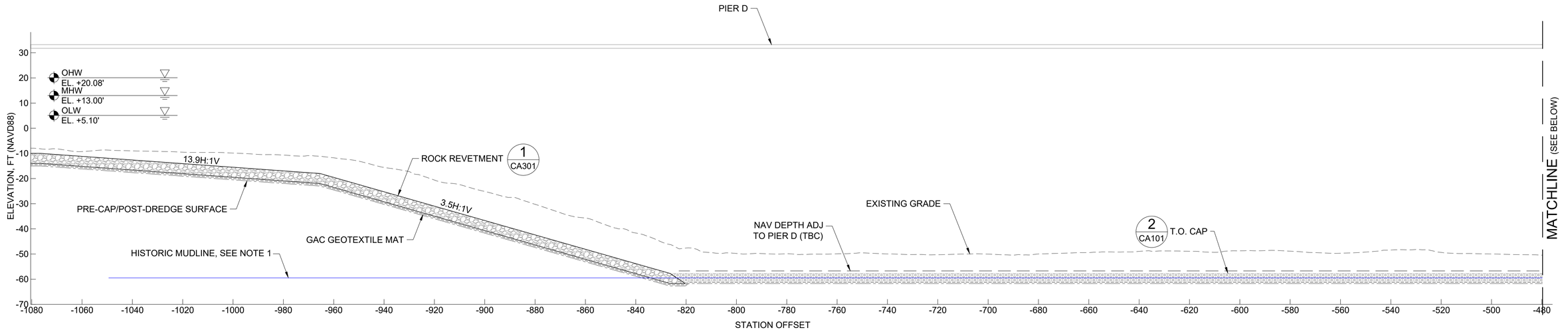
Project Number	B/O	Total
507100742	110	134

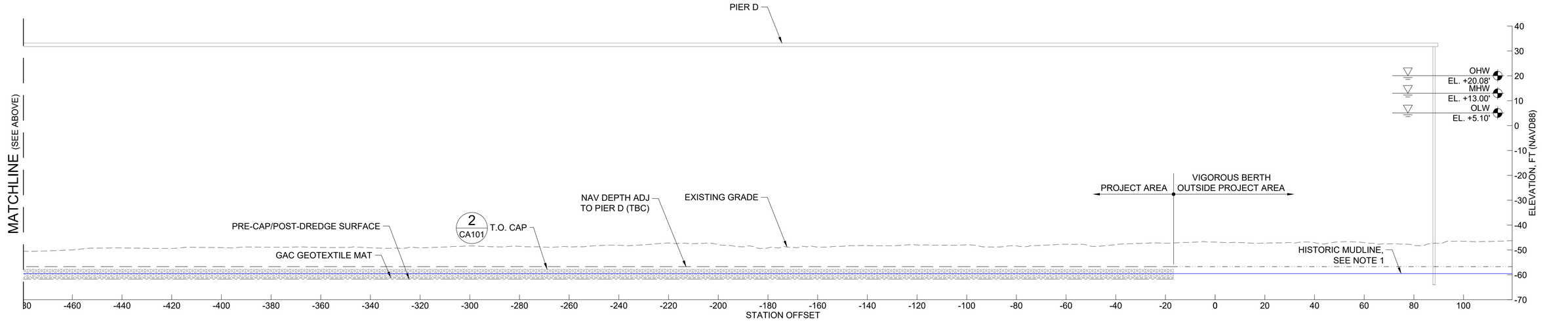
Drawing Number: S123

Title: Swan Island Basin Project Area
Remedial Design

Structural Plan Area 22

C:\pwworking\hmm\ports_harbors\mor69830\dms82128\S123.dwg Mar 11, 2025 - 6:57PM NG85190





NOTE

1. HISTORIC MUDLINE BASED ON 1977 DRAWINGS.

1 STATION 70+55
SECTION PIER D
SCALE: 1" = 20'

0 20 40
SCALE IN FEET

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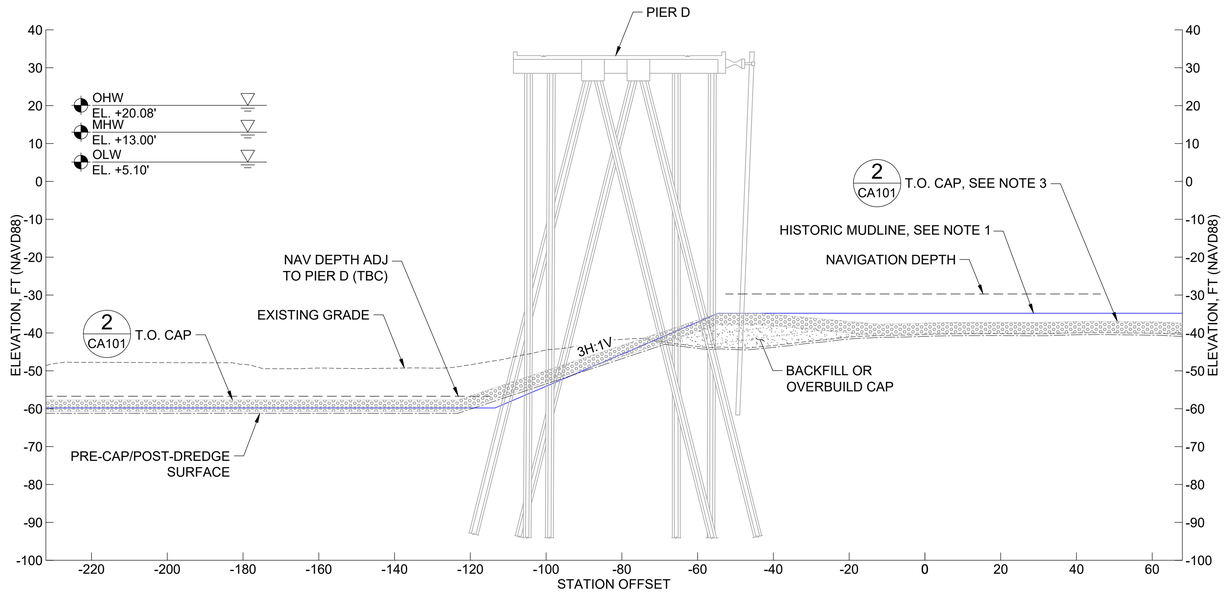
Project Number	B/O	Total
507100742	111	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 20'	Status		Rev		Security

Drawing Number: S201

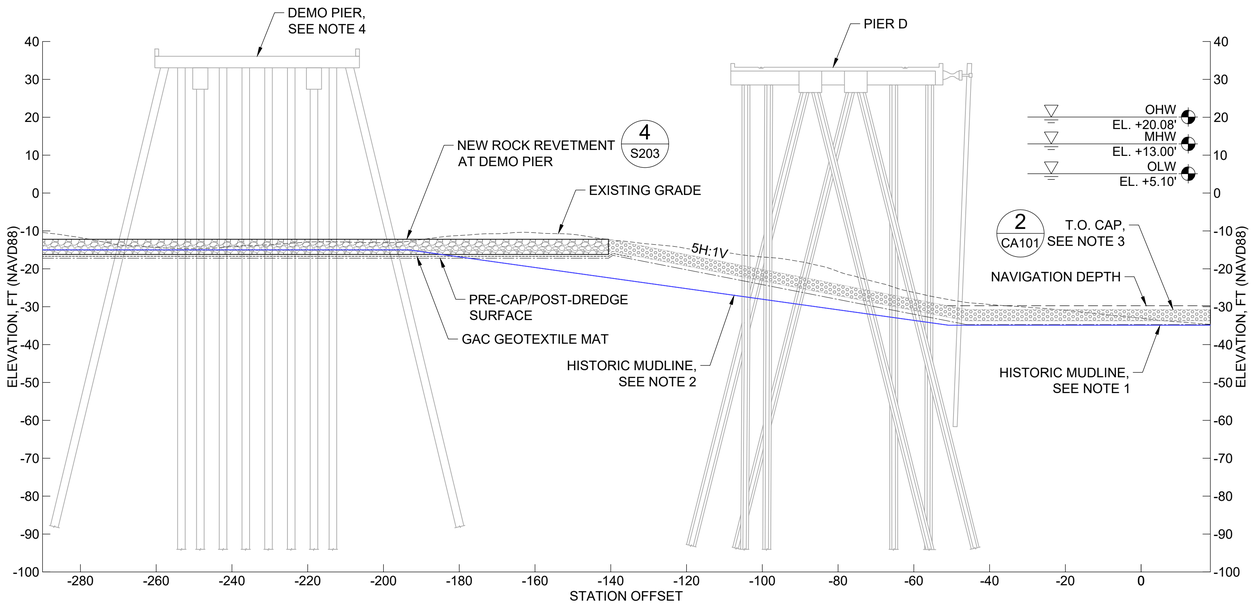
Title: Swan Island Basin Project Area Remedial Design

Structural Sections 1



STATION 71+95
SECTION PIER D

2 SCALE: 1" = 20'



STATION 81+10
SECTION PIER D

3 SCALE: 1" = 20'

NOTES

1. HISTORIC MUDLINE BASED ON 1977 DRAWINGS.
2. HISTORIC MUDLINE INFERRED FROM 1986 DEMO PIER AND 1977 PIER D DRAWINGS.
3. CONTRACTOR TO CONFIRM PRESENCE OF EXISTING SCOUR PROTECTION AROUND PIER PILES. WHERE SCOUR PROTECTION EXISTS IT SHALL BE REPLACED IN-KIND IN ADDITION TO TYPE 2 CAPPING.
4. "DEMO PIER" IS NAME OF STRUCTURE, STRUCTURE TO BE PROTECTED AND REMAIN IN PLACE

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
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Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

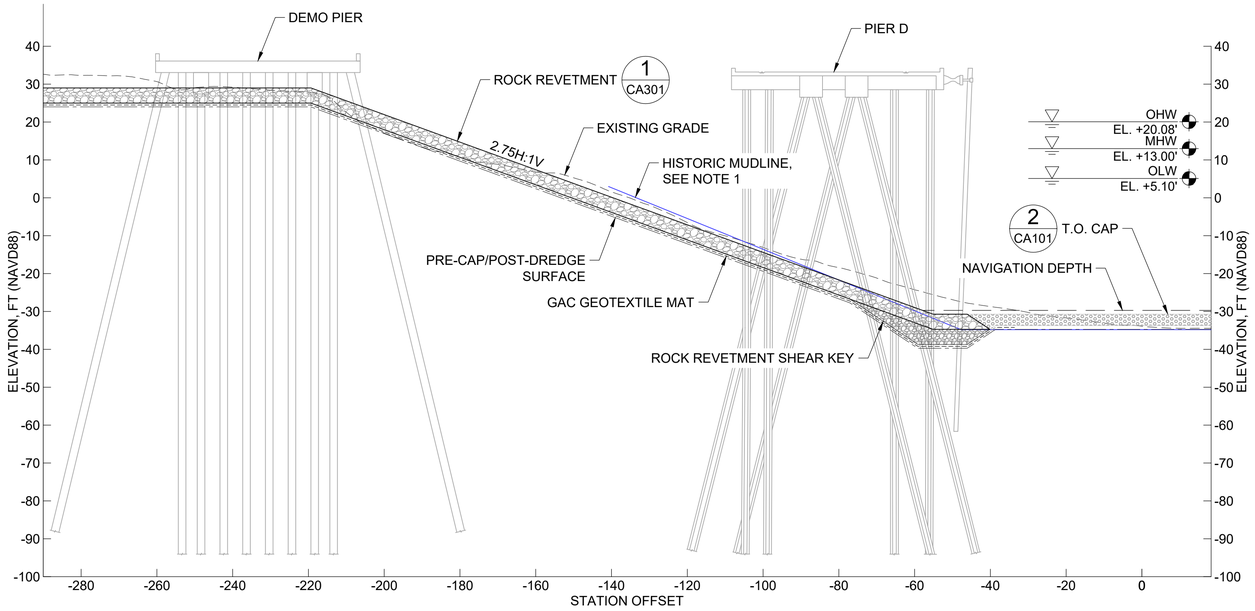
Project Number	B/O	Total
507100742	112	134

Drawing Number: S202

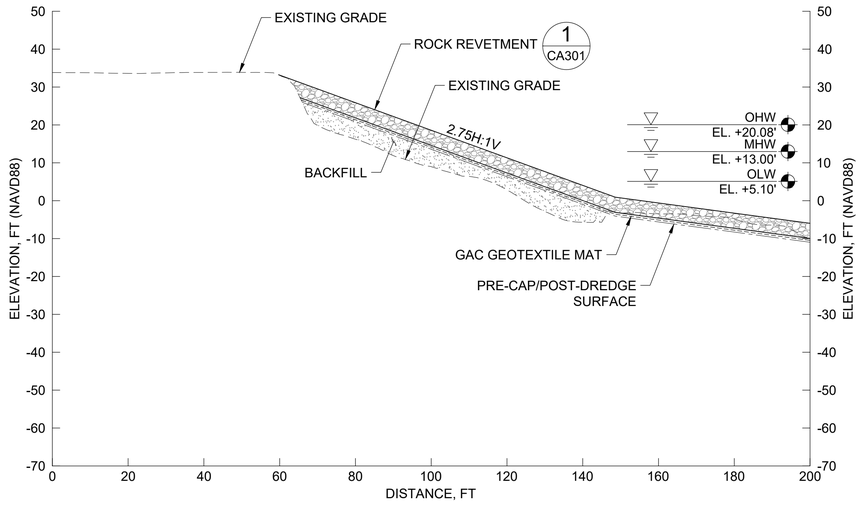
Title: Swan Island Basin Project Area Remedial Design

Structural Sections 2

C:\pwworking\hmm\ports_harbors\mor69830\dms82128\S202.dwg Mar 11, 2025 - 7:01PM NG85190



4 STATION 82+27
SECTION DEMO PIER
SCALE: 1" = 20'



5 SECTION SHORELINE AT DEMO PIER
SCALE: 1" = 20'

NOTE

1. HISTORIC RIPRAP PROFILE BASED ON 1977 DRAWINGS.

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	113	134

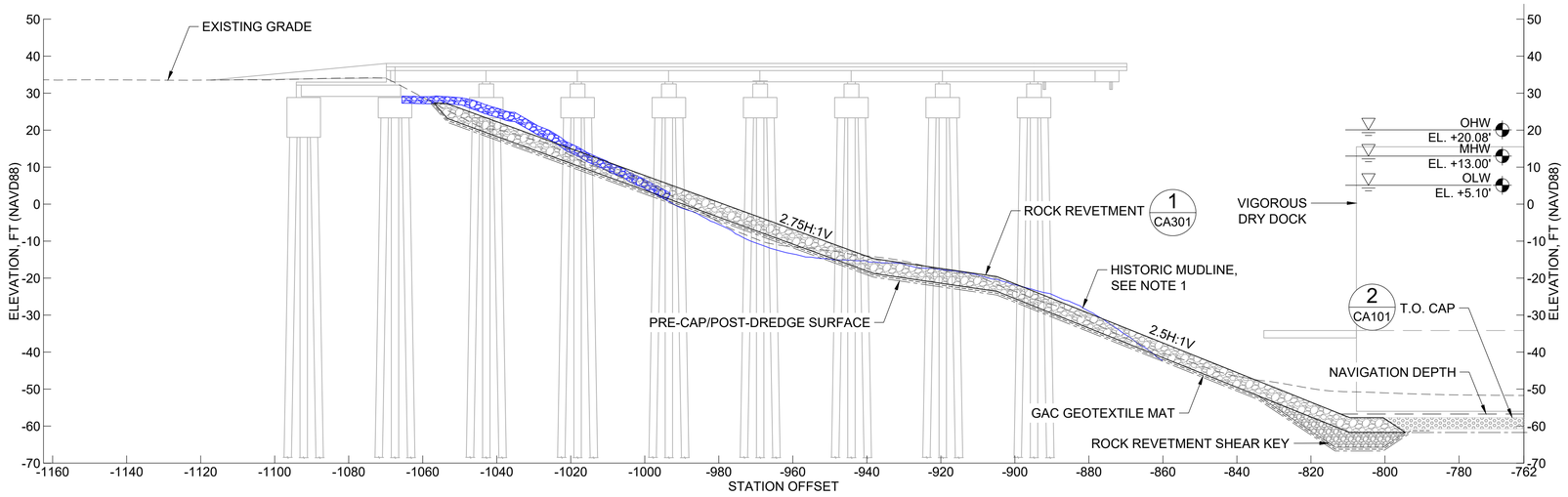
Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S203

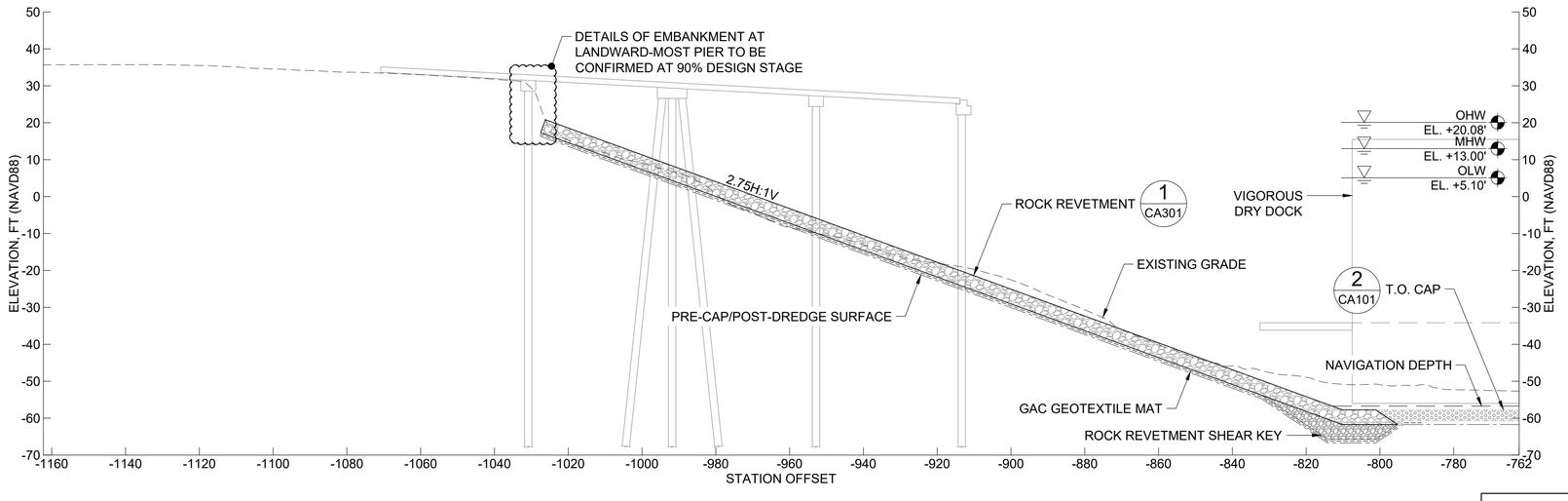
Title: Swan Island Basin Project Area Remedial Design

Structural Sections 3



STATION 69+35
SECTION DEMO PIER

6 SCALE: 1" = 20'



STATION 68+55
SECTION WEST PIER

7 SCALE: 1" = 20'

0 20 40
SCALE IN FEET

NOTE

1. HISTORIC MUDLINE AND RIPRAP PROFILE BASED ON 1986 DRAWINGS.

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Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Project Number	B/O	Total
507100742	114	134

Drawing Number: S204

Title: Swan Island Basin Project Area Remedial Design

Structural Sections 4

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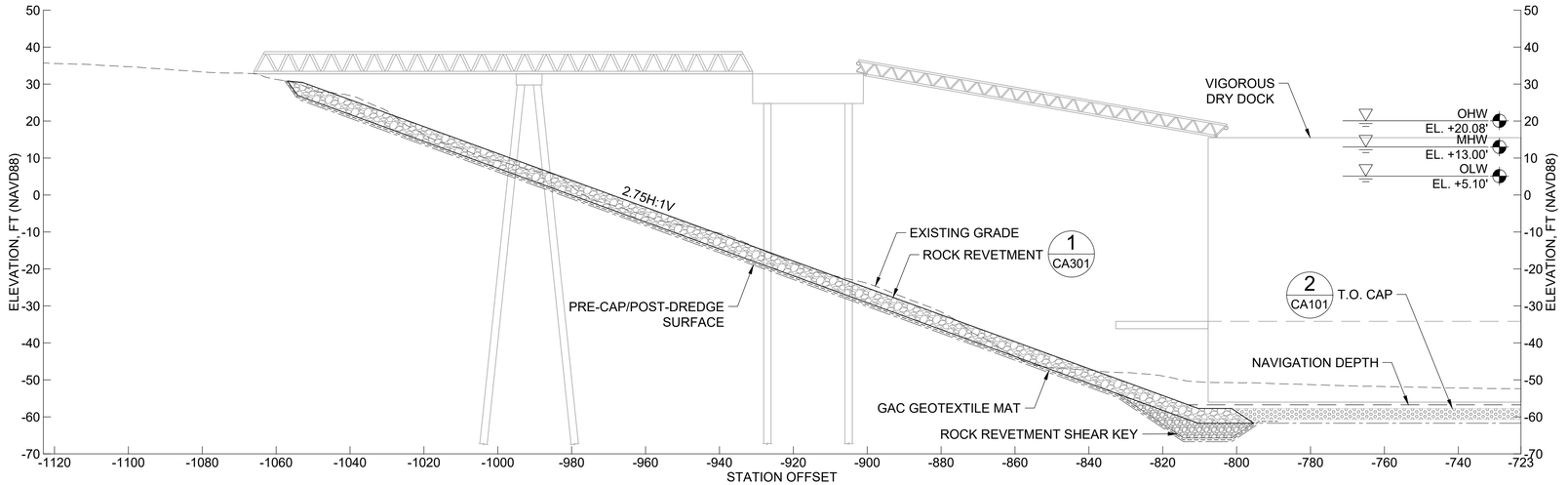
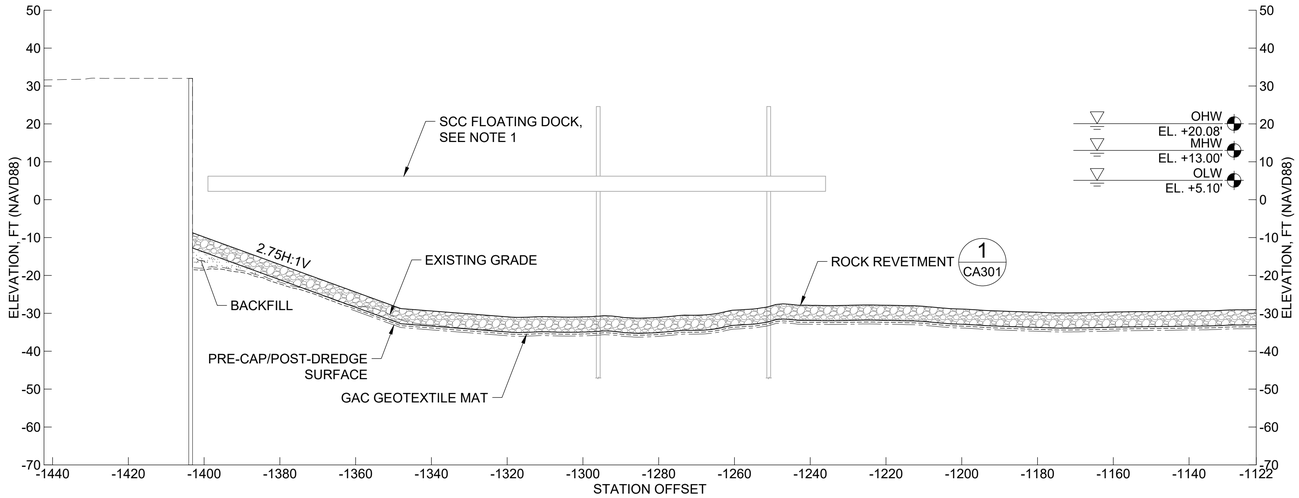


STATION 68+30
SECTION EAST PIER

8

SCALE: 1" = 20'



STATION 66+45
SECTION SCC FLOATING DOCK

9

SCALE: 1" = 20'

NOTE

1. EXISTING FLOATING STRUCTURES SHALL BE TEMPORARILY RELOCATED AND STORED DURING REMEDIAL WORK.

0 20 40

SCALE IN FEET

50% REMEDIAL DESIGN
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Project Number	B/O	Total
507100742	115	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

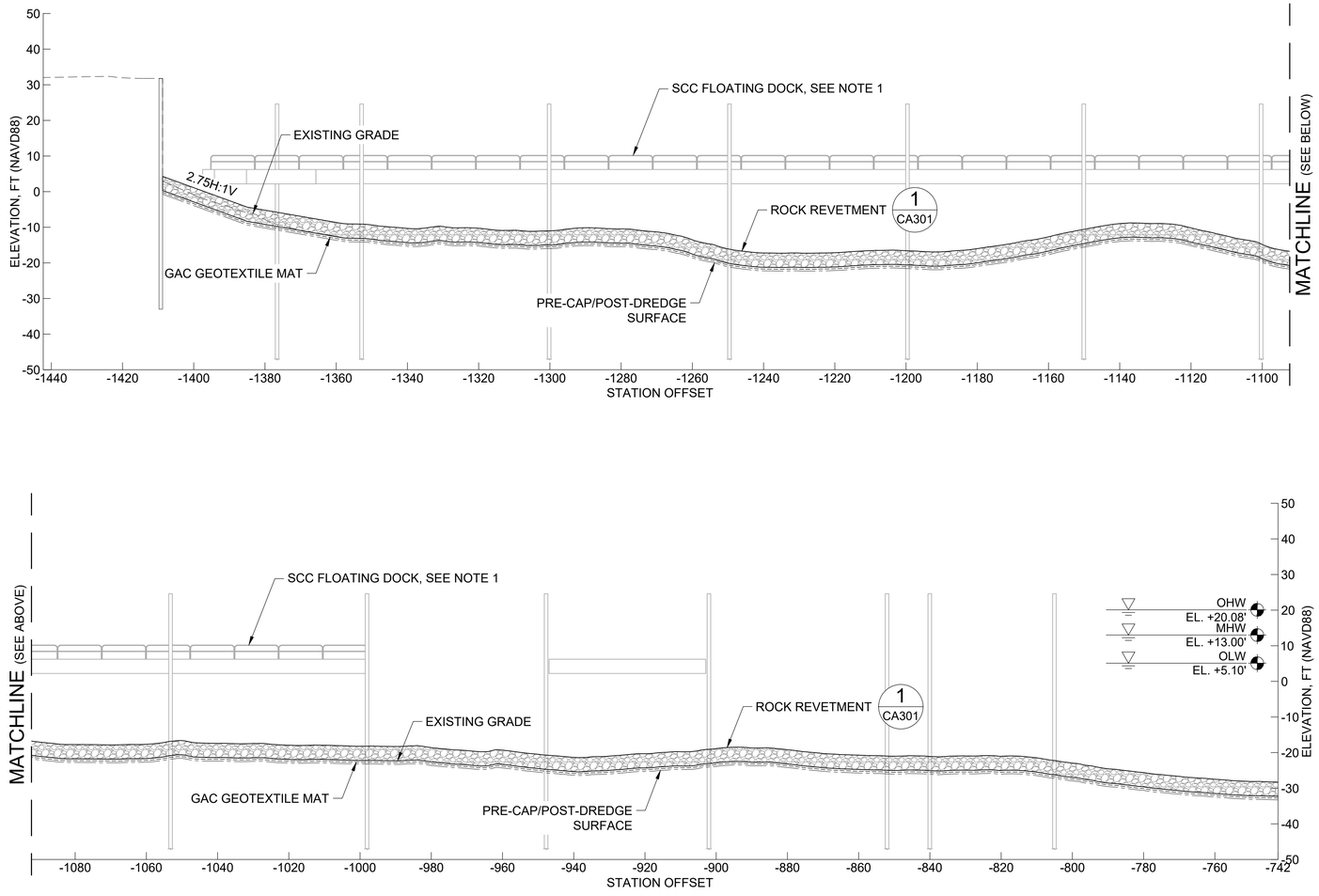
Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S205

Title: Swan Island Basin Project Area Remedial Design

Structural Sections 5

C:\pwworking\hmm\ports_harbors\mor69830\dms82128\S205.dwg Mar 11, 2025 - 7:08PM NG85190



STATION 66+90
SECTION SCC FLOATING DOCK
10
SCALE: 1" = 20'

NOTE

1. EXISTING FLOATING STRUCTURES SHALL BE TEMPORARILY RELOCATED AND STORED DURING REMEDIAL WORK.

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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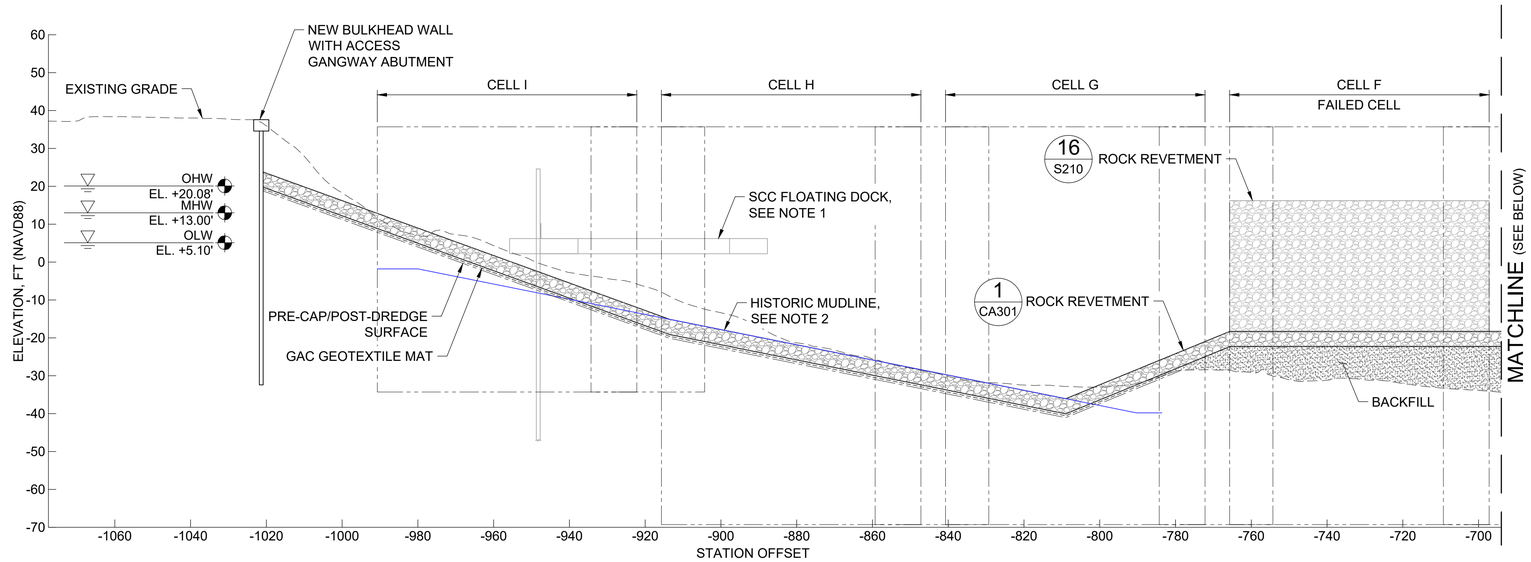
Rev	Date	Drawn	Description	Ch'k'd	App'd

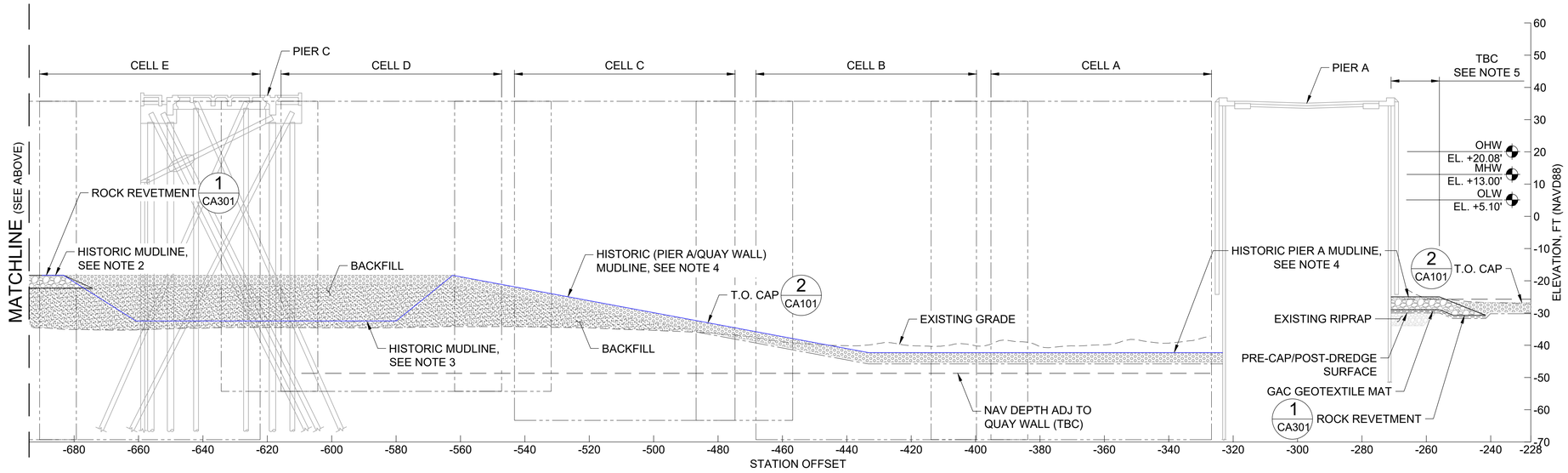
Project Number	B/O	Total
507100742	116	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 20'	Status		Rev		Security
Drawing Number: S206					

Title
Swan Island Basin Project Area
Remedial Design

Structural Sections 6





NOTES

1. EXISTING FLOATING STRUCTURES SHALL BE TEMPORARILY RELOCATED AND STORED DURING REMEDIAL WORKS.
2. HISTORIC MUDLINE BASED ON 1975 DRAWINGS (INFERRED).
3. HISTORIC MUDLINE BASED ON 1962 PIER C DRAWINGS.
4. HISTORIC MUDLINE BASED ON 1944 PIER A/QUAY WALL DRAWINGS.
5. WIDTH OF RIPRAP BUTTRESSING AND NAV DEPTH DIRECTLY ADJACENT PIER A AND QUAY WALL TO BE CONFIRMED AT 90% DESIGN STAGE

11 STATION 46+05
SECTION QUAY WALL
SCALE: 1" = 20'

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Project Number	B/O	Total
507100742	117	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 20'	Status		Rev		Security
Drawing Number: S207					

Title

Swan Island Basin Project Area
Remedial Design

Structural Sections 7

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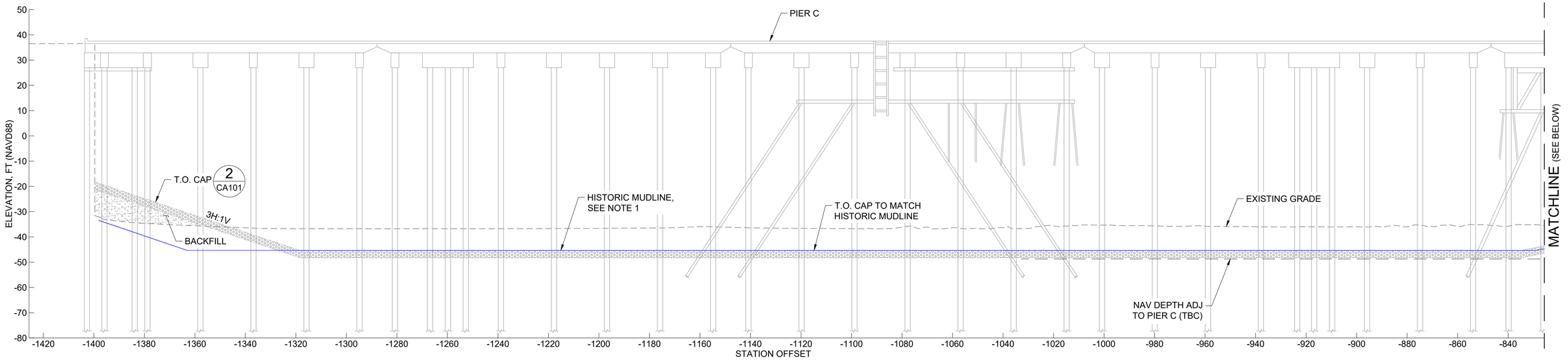

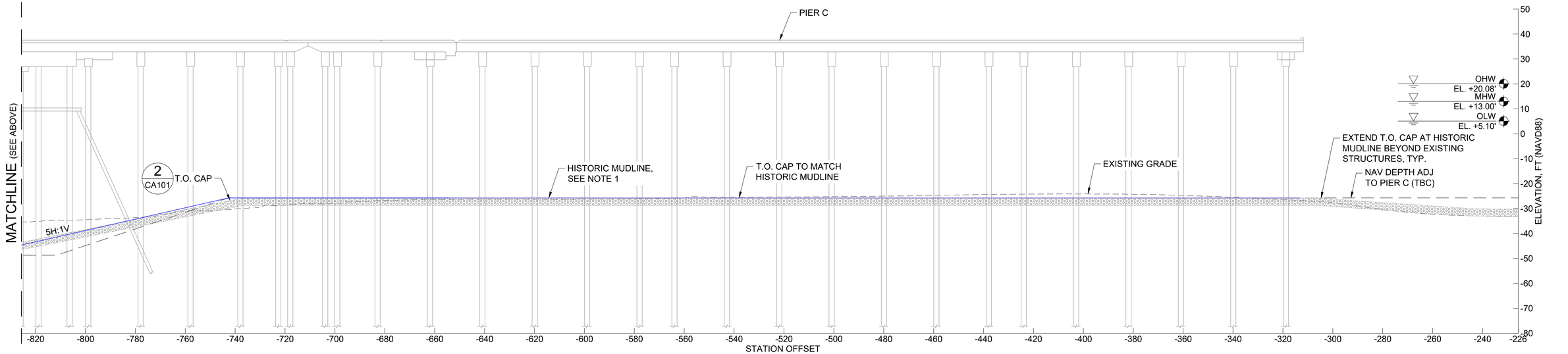

0 20 40
SCALE IN FEET

NOTE

1. HISTORIC MUDLINE BASED ON 1962 DRAWINGS.

12 STATION 63+55
SECTION PIER C THRU NORTHERN EXTENTS
SCALE: 1" = 20'

50% REMEDIAL DESIGN
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Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

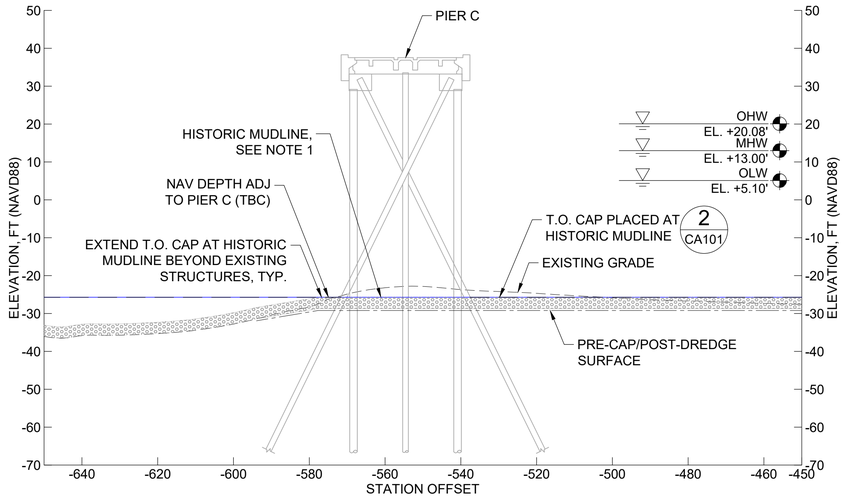
Project Number	B/O	Total
507100742	118	134

Drawing Number: S208

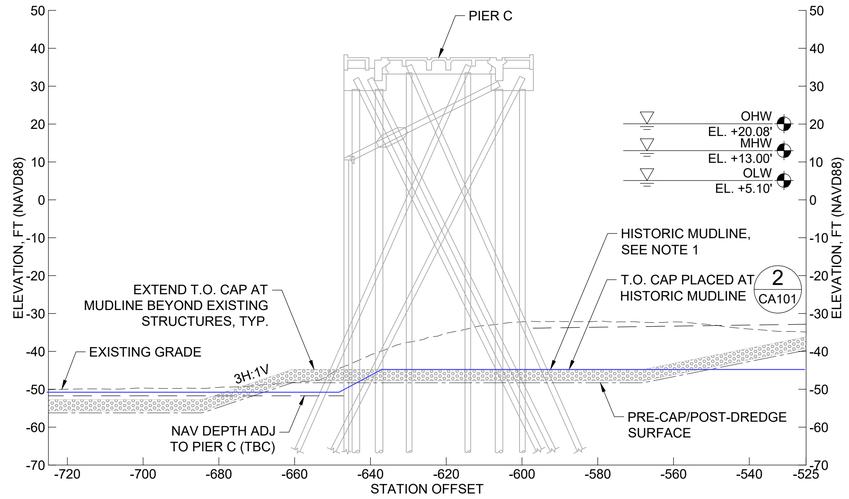
Title: Swan Island Basin Project Area
Remedial Design

Structural Sections 8

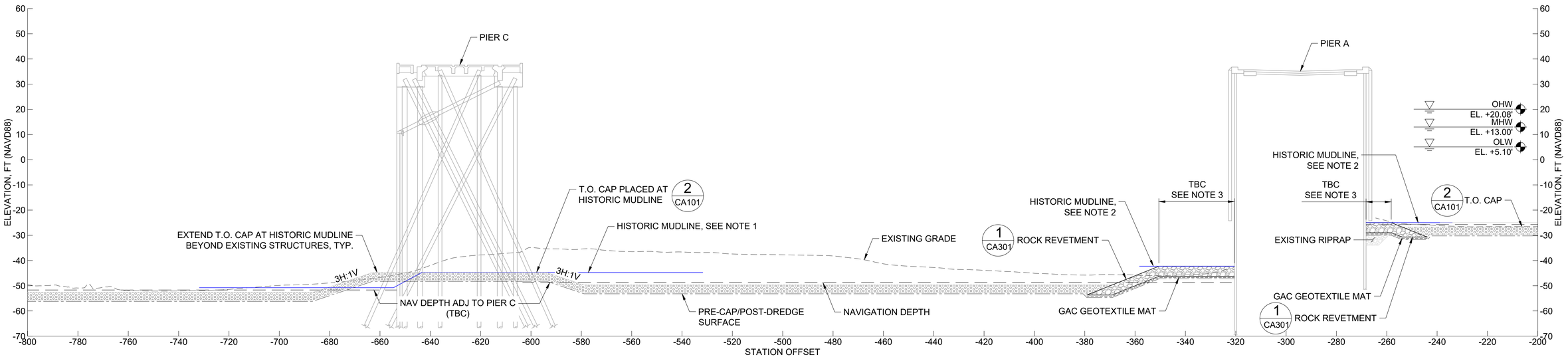
C:\pwworking\hmm\ports_harbors\mor69830\dms82128\S208.dwg Mar 11, 2025 - 7:11PM NG85190



13 STATION 56+20
SECTION PIER C
SCALE: 1" = 20'



14 STATION 52+20
SECTION PIER C
SCALE: 1" = 20'



15 STATION 49+05
SECTION PIER C AND PIER A
SCALE: 1" = 20'

0 20 40
SCALE IN FEET

NOTES

1. HISTORIC MUDLINE BASED ON 1962 DRAWINGS.
2. HISTORIC MUDLINE BASED ON 1944 DRAWINGS.
3. WIDTH OF RIPRAP BUTTRESSING AND NAV DEPTH DIRECTLY ADJACENT PIER A TO BE CONFIRMED AT 90% DESIGN STAGE

50% REMEDIAL DESIGN
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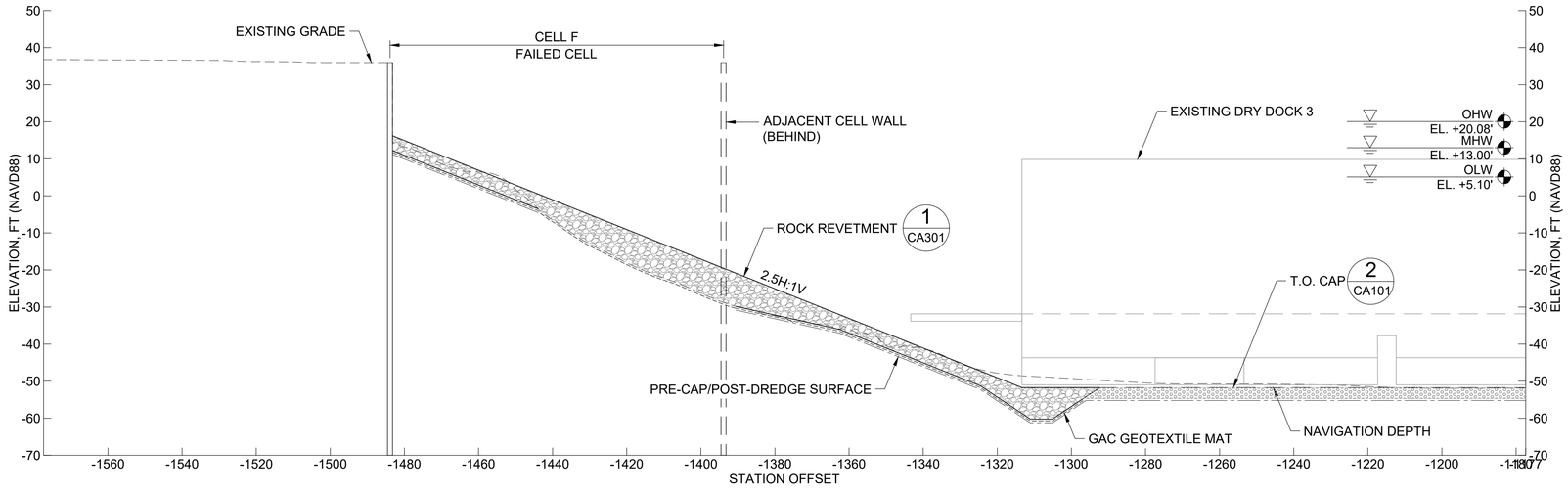
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D: 1" = 20'	Status		Rev		Security

Project Number	B/O	Total
507100742	119	134

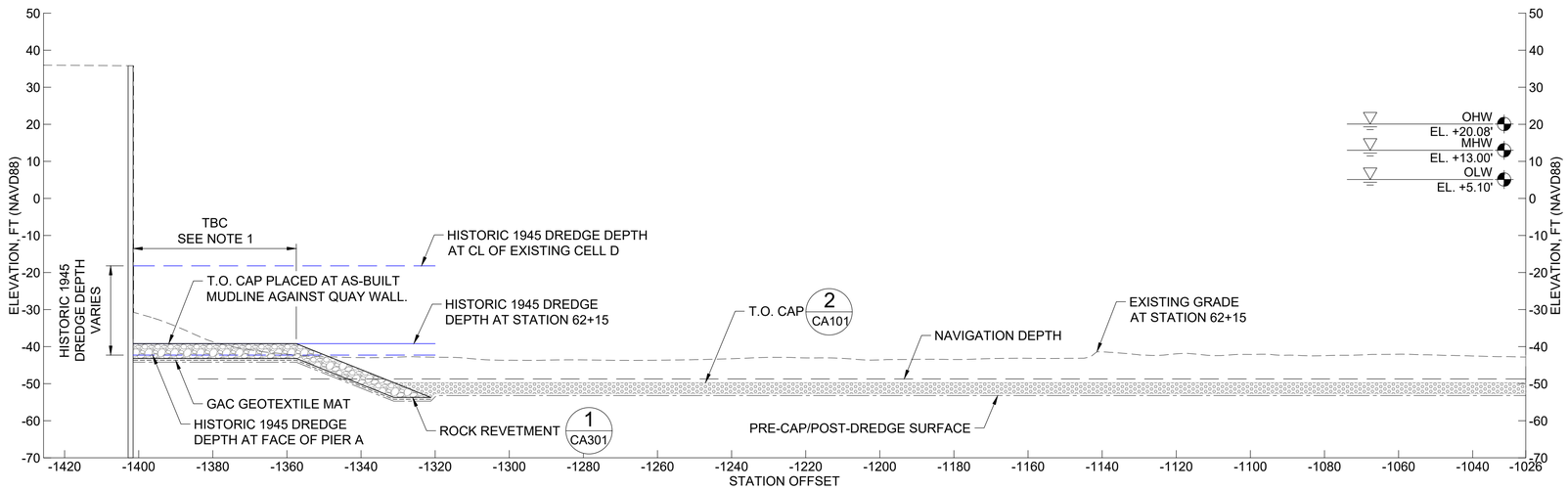
Drawing Number: S209

Title: Swan Island Basin Project Area Remedial Design

Structural Sections 9



STATION 64+85
SECTION DRY DOCK
16
SCALE: 1" = 20'



STATION 62+15
SECTION DRY DOCK
17
SCALE: 1" = 20'

NOTES

1. WIDTH OF RIPRAP BUTTRESSING AND NAV DEPTH DIRECTLY ADJACENT QUAY WALL TO BE CONFIRMED AT 90% DESIGN STAGE

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
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Rev	Date	Drawn	Description	Ch'k'd	App'd

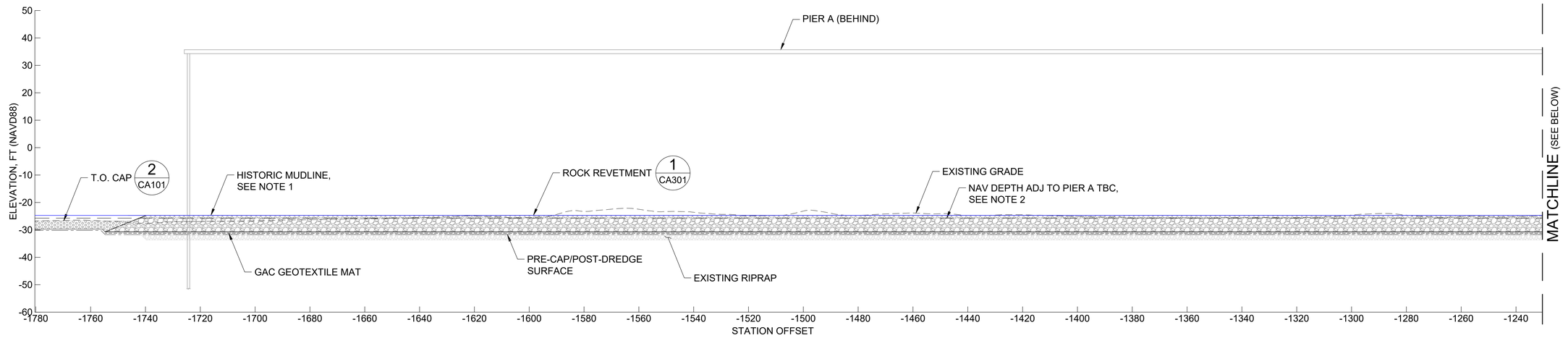
Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		
Scale at ANSI D	1" = 20'	Status		Rev	Security

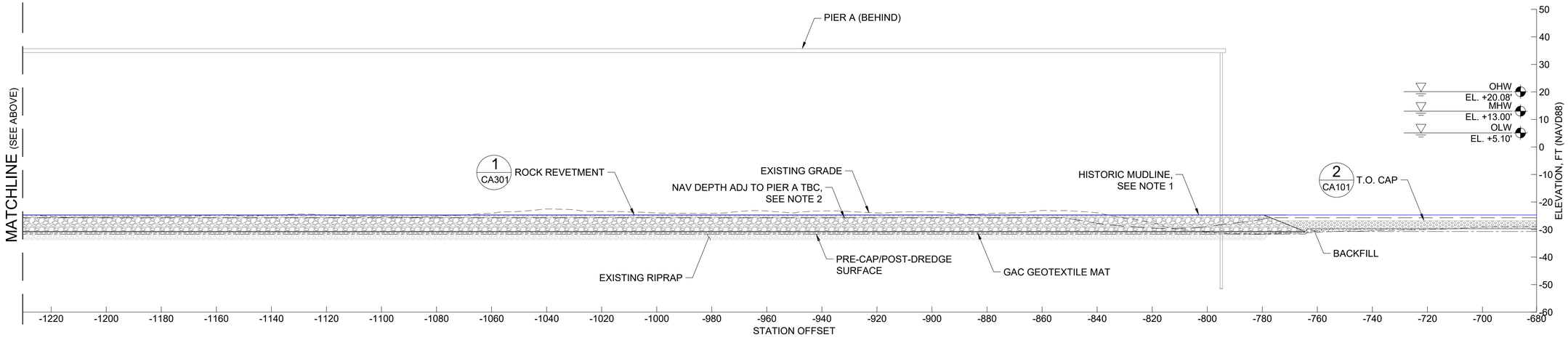
Project Number	B/O	Total
507100742	120	134

Drawing Number: S210

Title: Swan Island Basin Project Area Remedial Design

Structural Sections 10





STATION 60+53
SECTION PIER A
18
SCALE: 1" = 20'

0 20 40
SCALE IN FEET

NOTES

1. HISTORIC MUDLINE BASED ON 1944 DRAWINGS.
2. WIDTH OF RIPRAP BUTTRESSING AND NAV DEPTH DIRECTLY ADJACENT PIER A TO BE CONFIRMED AT 90% DESIGN STAGE

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Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

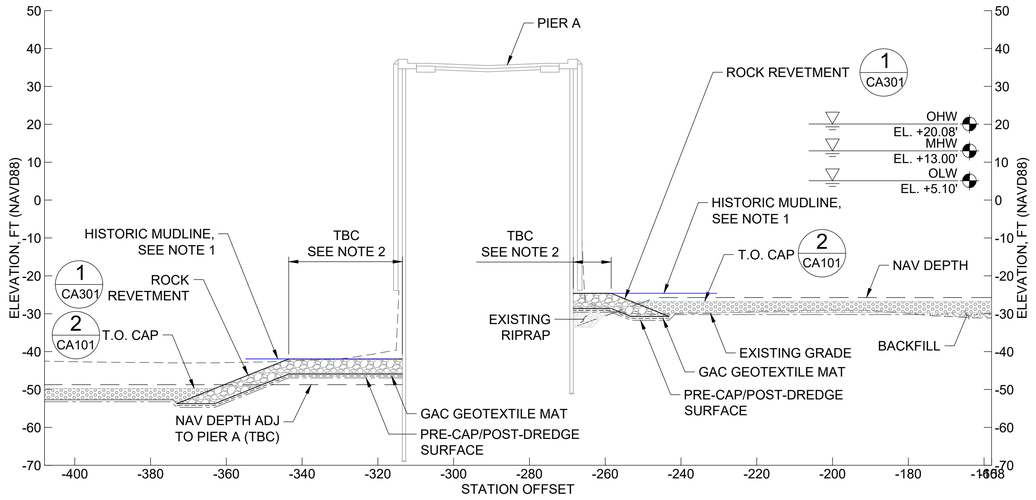
Project Number	B/O	Total
507100742	121	134

Drawing Number: S211

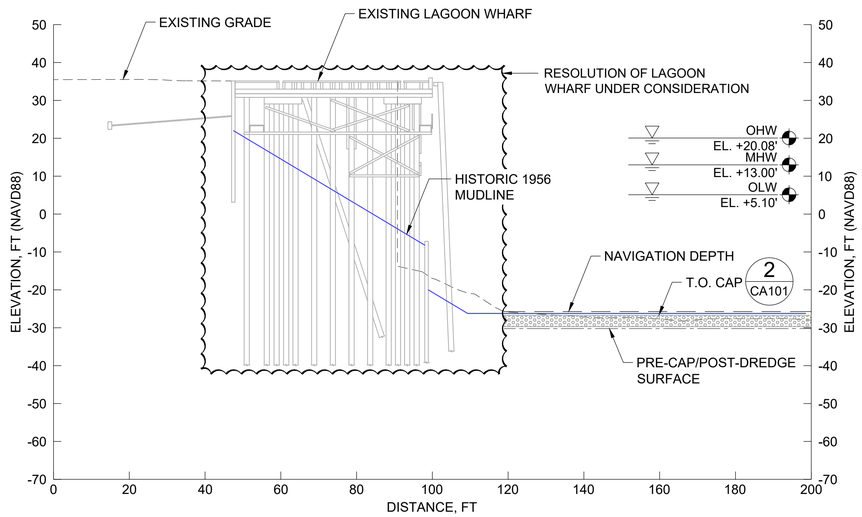
Title: Swan Island Basin Project Area Remedial Design

Structural Sections 11

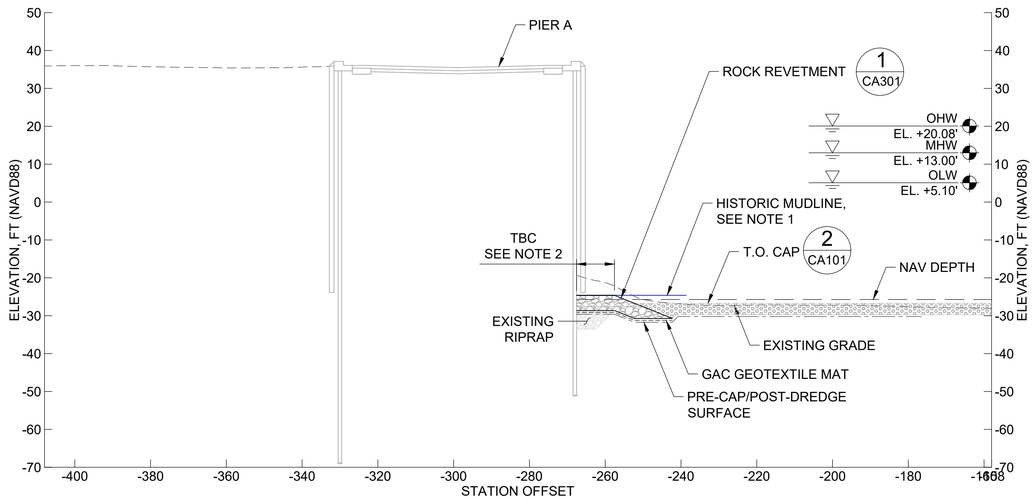
C:\pwworking\hmm\ports_harbors\mor69830\dms82128\S211.dwg Mar 11, 2025 - 7:13PM NG85190



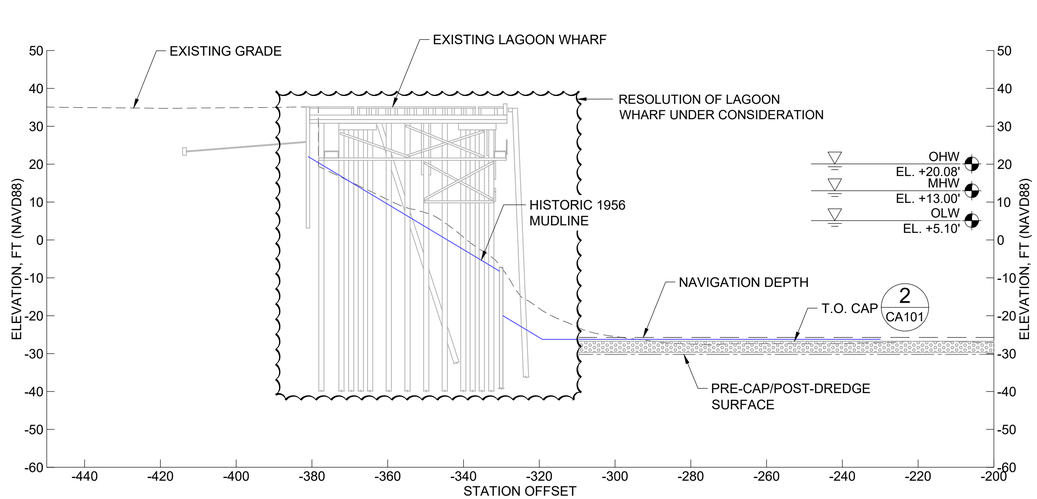
19 STATION 51+65
SECTION PIER A
SCALE: 1" = 20'



21 SECTION LAGOON WHARF
SCALE: 1" = 20'



20 STATION 44+10
SECTION PIER A
SCALE: 1" = 20'



22 STATION 39+80
SECTION LAGOON WHARF
SCALE: 1" = 20'

0 20 40
SCALE IN FEET

NOTES

1. HISTORIC MUDLINE BASED ON 1944 DRAWINGS.
2. WIDTH OF RIPRAP BUTTRESSING AND NAV DEPTH DIRECTLY ADJACENT PIER A TO BE CONFIRMED AT 90% DESIGN STAGE

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

HGL

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	122	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	#		Approved		

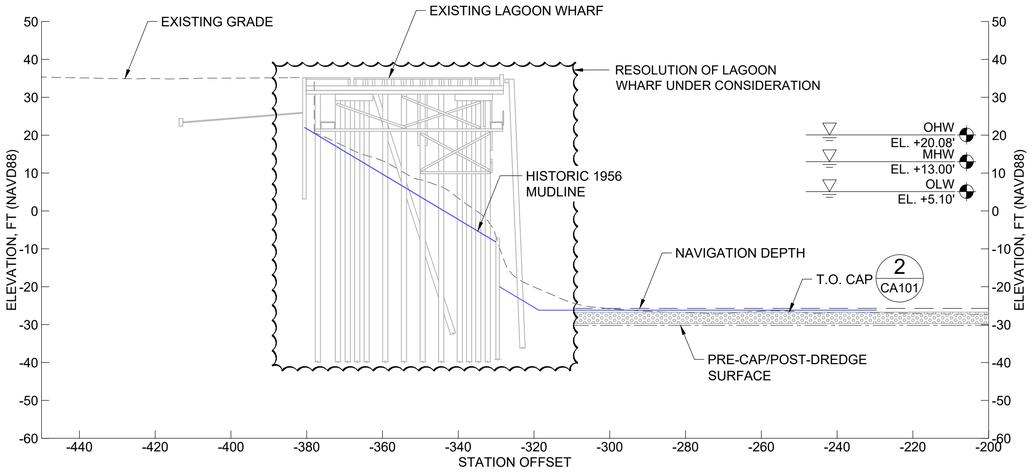
Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S212

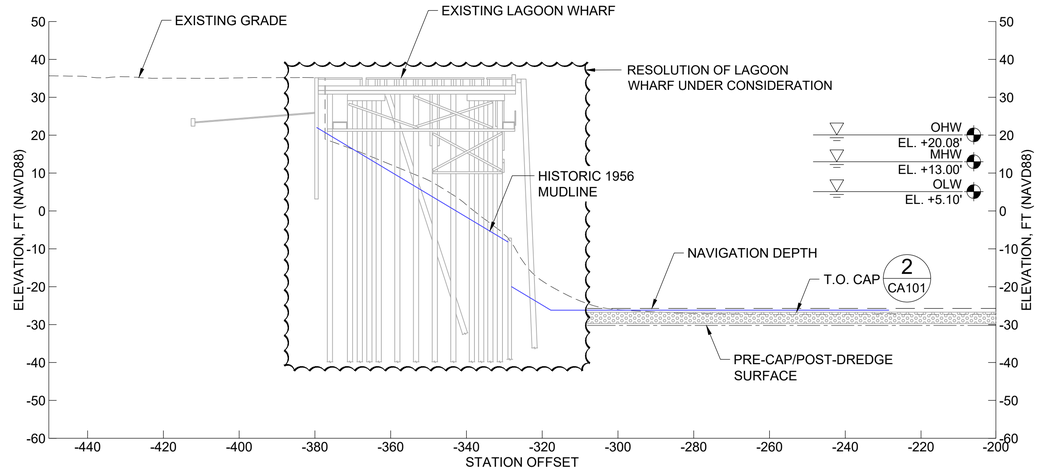
Title: Swan Island Basin Project Area
Remedial Design

Structural Sections 12

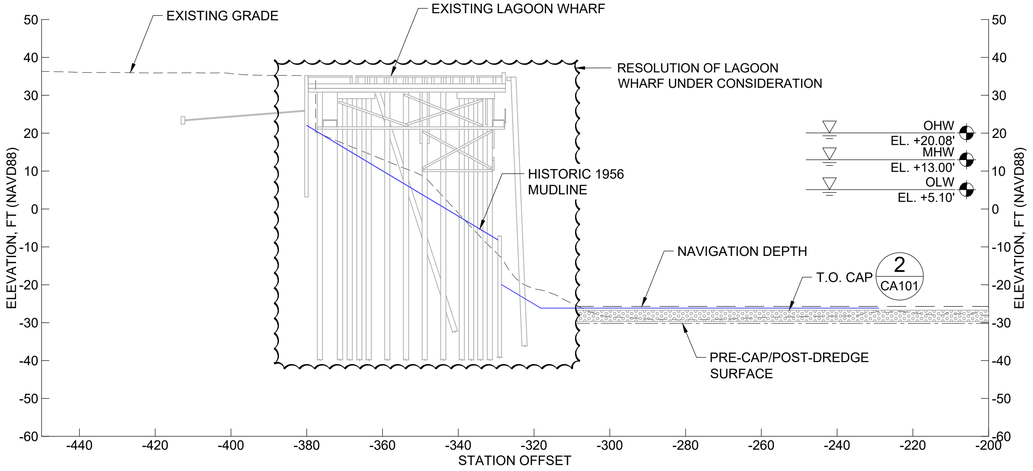
C:\pwworking\hmm\ports_harbors\mor69830\dms82128\S212.dwg Mar 11, 2025 - 7:14PM NG85190



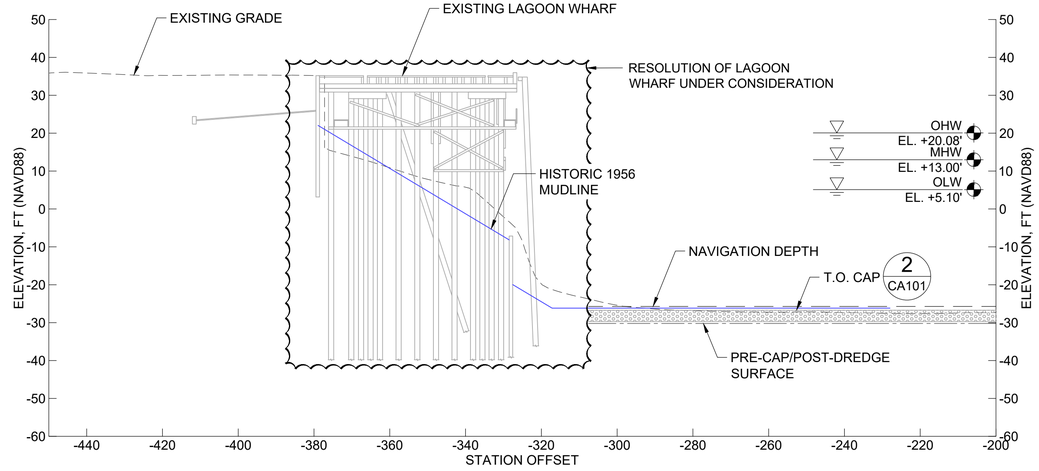
23 STATION 37+35
SECTION LAGOON WHARF
SCALE: 1" = 20'



25 STATION 31+95
SECTION LAGOON WHARF
SCALE: 1" = 20'



24 STATION 34+55
SECTION LAGOON WHARF
SCALE: 1" = 20'



26 STATION 29+05
SECTION LAGOON WHARF
SCALE: 1" = 20'

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	123	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

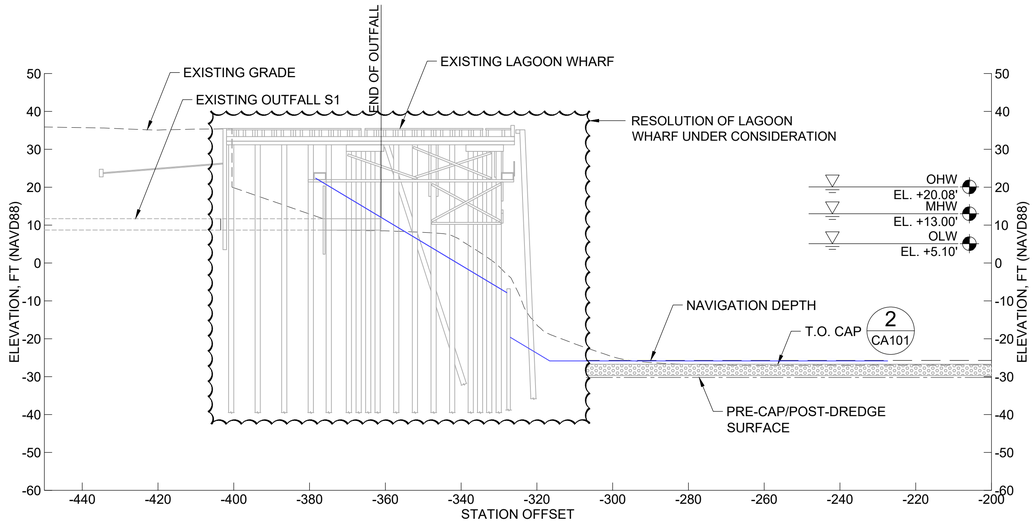
Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S213

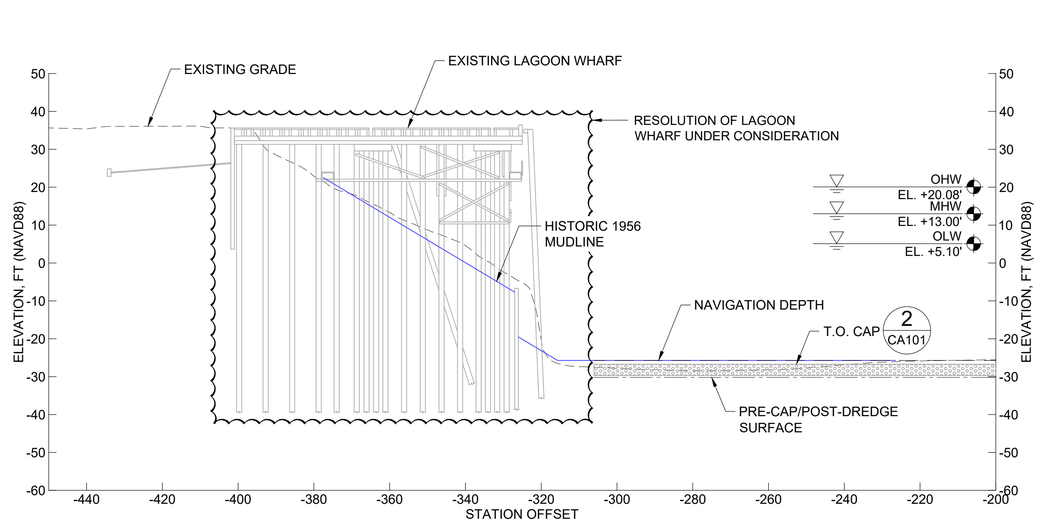
Title: Swan Island Basin Project Area
Remedial Design

Structural Sections 13

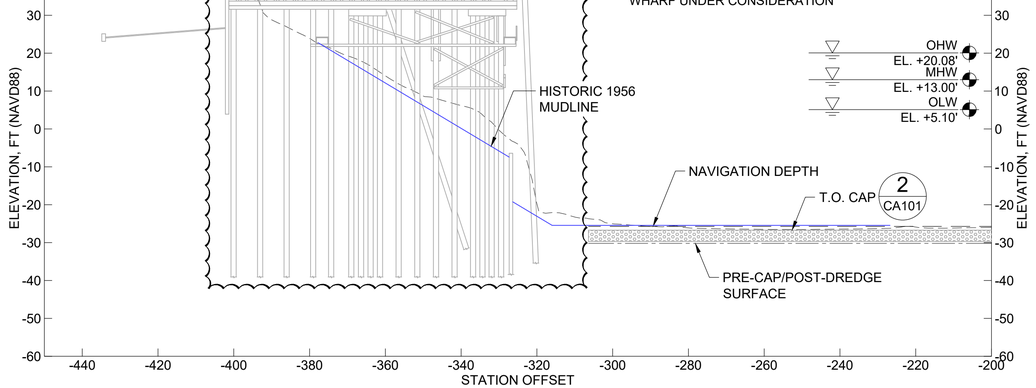
C:\pwworking\hmm\ports_harbors\mor69830\dms82128\S213.dwg Mar 11, 2025 - 7:14PM NG85190



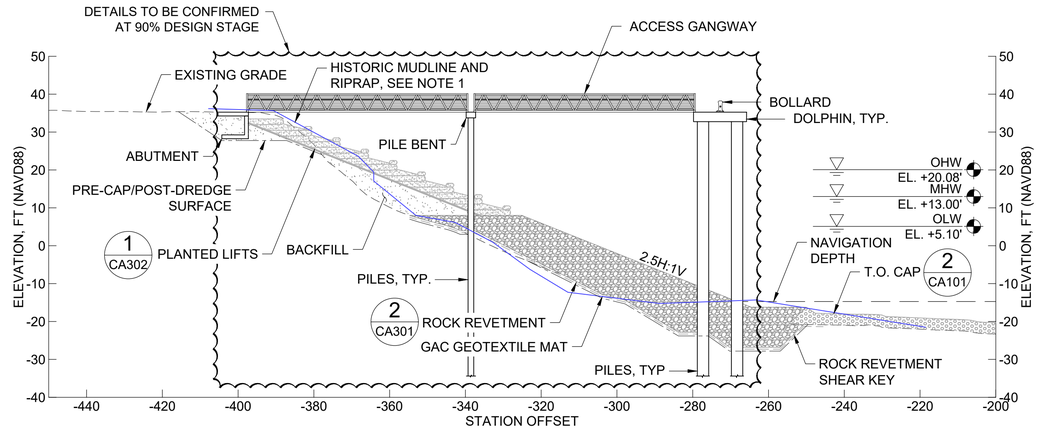
STATION 26+15
SECTION LAGOON WHARF
27 SCALE: 1" = 20'



STATION 21+20
SECTION LAGOON WHARF
29 SCALE: 1" = 20'



STATION 22+85
SECTION LAGOON WHARF
28 SCALE: 1" = 20'



STATION 19+10
SECTION BERTH 306
30 SCALE: 1" = 20'

NOTE

1. HISTORIC MUDLINE AND RIPRAP PROFILE BASED ON 1971 BERTH 306, 307, 308 DRAWINGS.

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	124	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S214

Title: Swan Island Basin Project Area Remedial Design

Structural Sections 14

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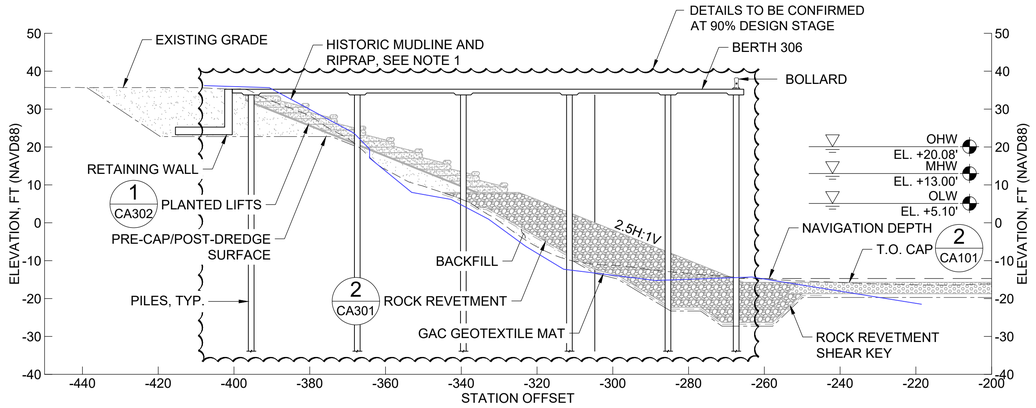
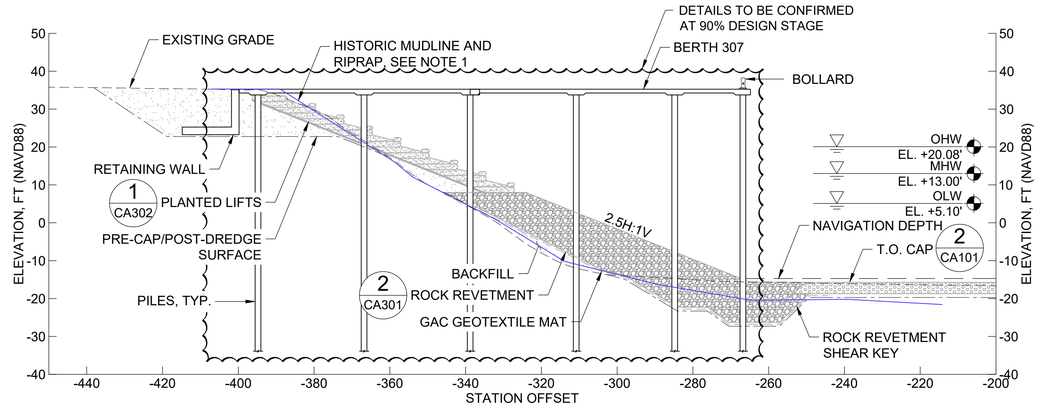
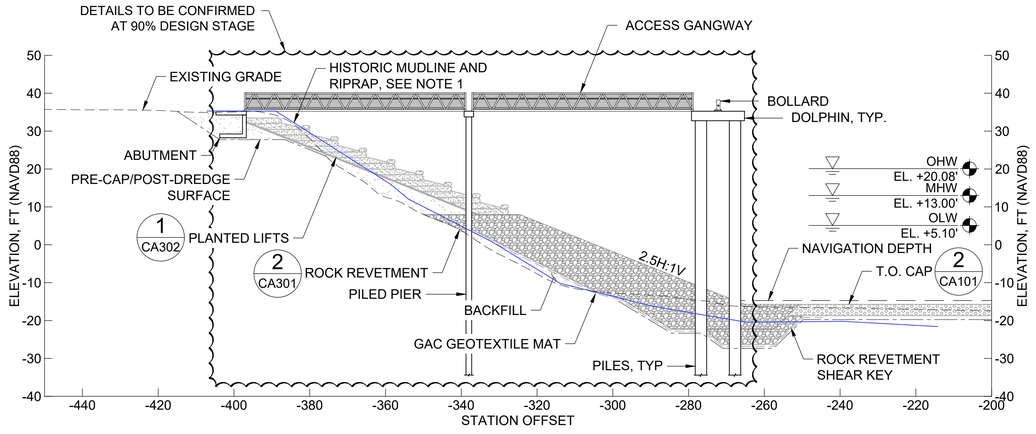


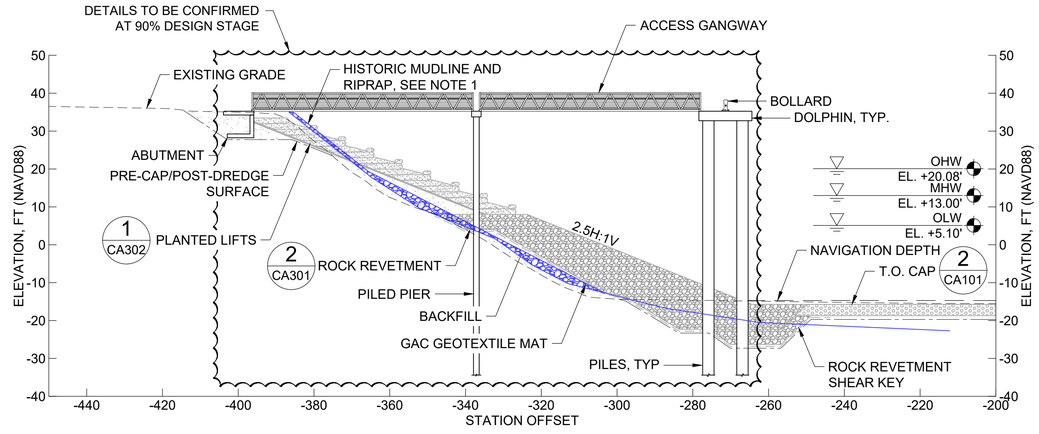
STATION 16+55
SECTION BERTH 306
31 SCALE: 1" = 20'



STATION 12+05
SECTION BERTH 307
33 SCALE: 1" = 20'



STATION 15+10
SECTION BERTH 307
32 SCALE: 1" = 20'



STATION 9+05
SECTION BERTH 308
34 SCALE: 1" = 20'

NOTE

1. HISTORIC MUDLINE AND RIPRAP PROFILE BASED ON 1971 BERTH 306, 307, 308 DRAWINGS.

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	125	134

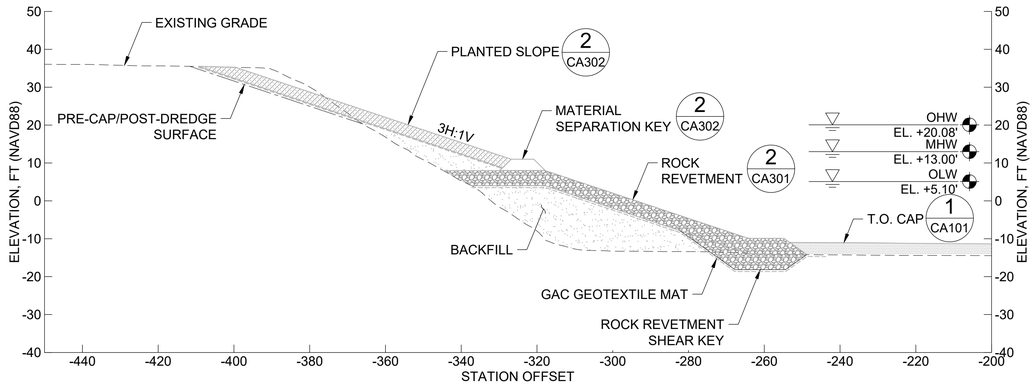
Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

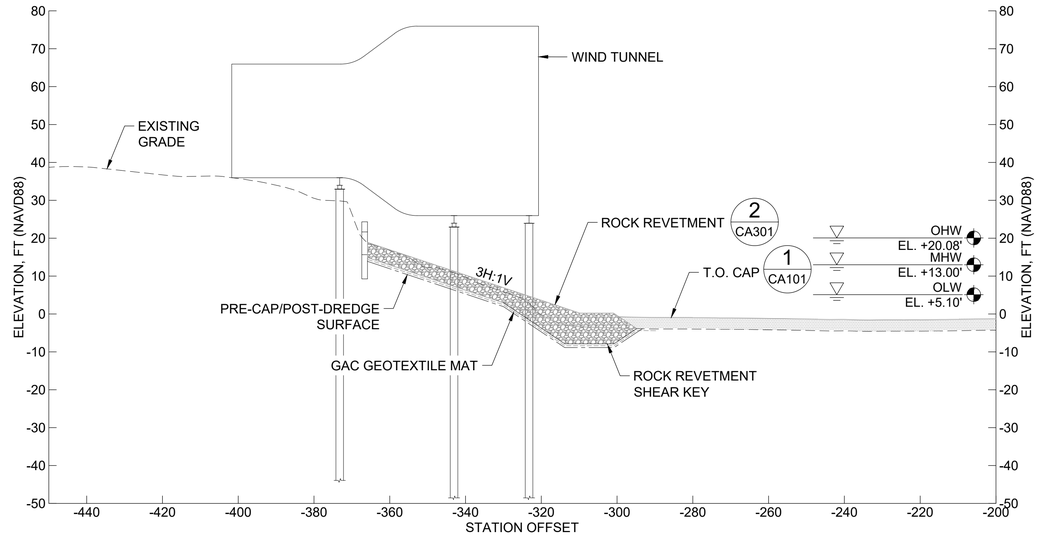
Drawing Number: S215

Title: Swan Island Basin Project Area Remedial Design

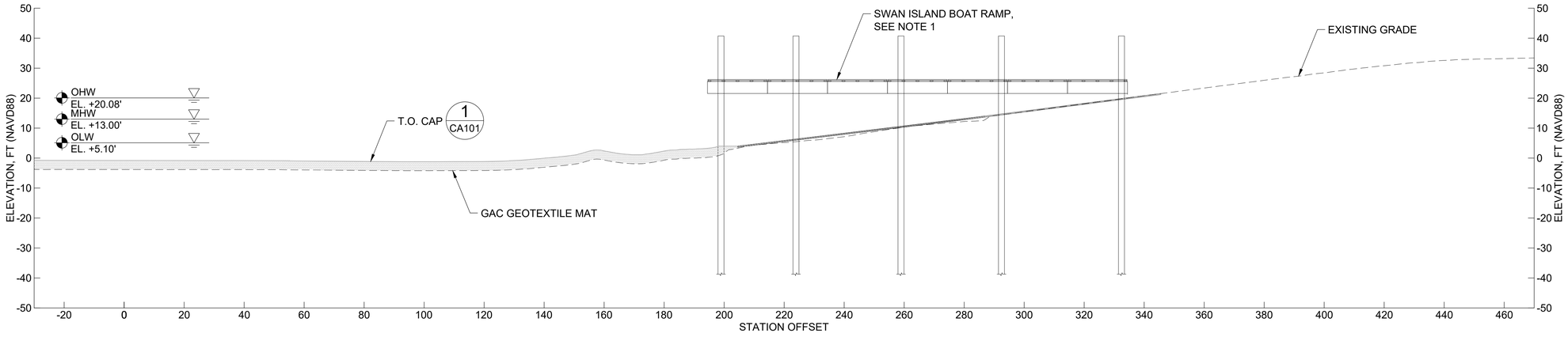
Structural Sections 15



35 STATION 7+55
SECTION BERTH 308
SCALE: 1" = 20'



36 STATION 2+15
SECTION WIND TUNNEL DOCK
SCALE: 1" = 20'



37 STATION 1+93
SECTION SWAN ISLAND BOAT RAMP
SCALE: 1" = 20'

0 20 40
SCALE IN FEET

NOTE

1. EXISTING FLOATING STRUCTURES SHALL BE TEMPORARILY RELOCATED AND STORED DURING REMEDIAL WORKS.

**50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION**

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	126	134

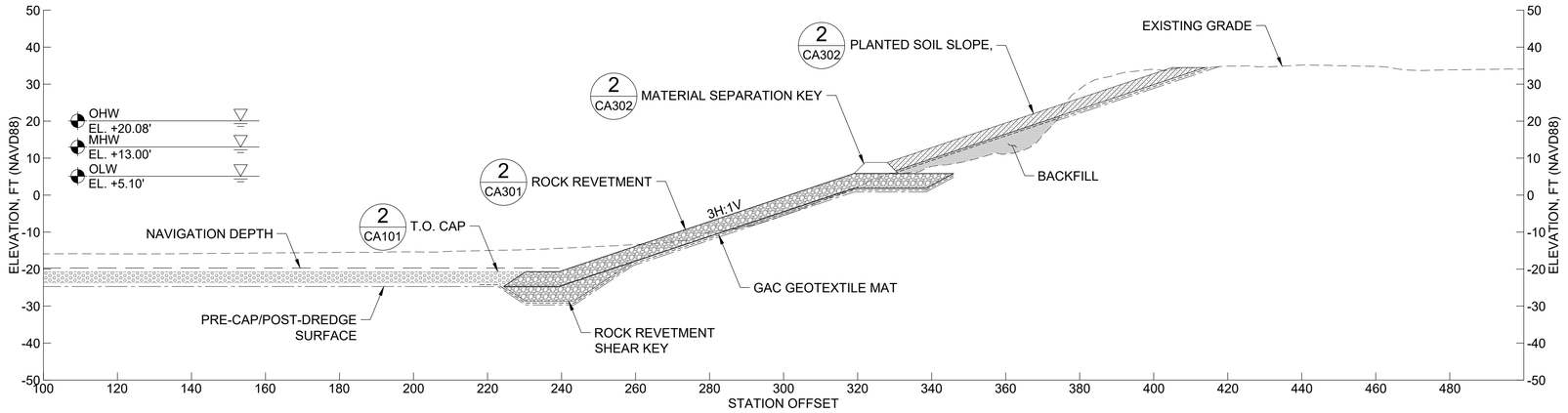
Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

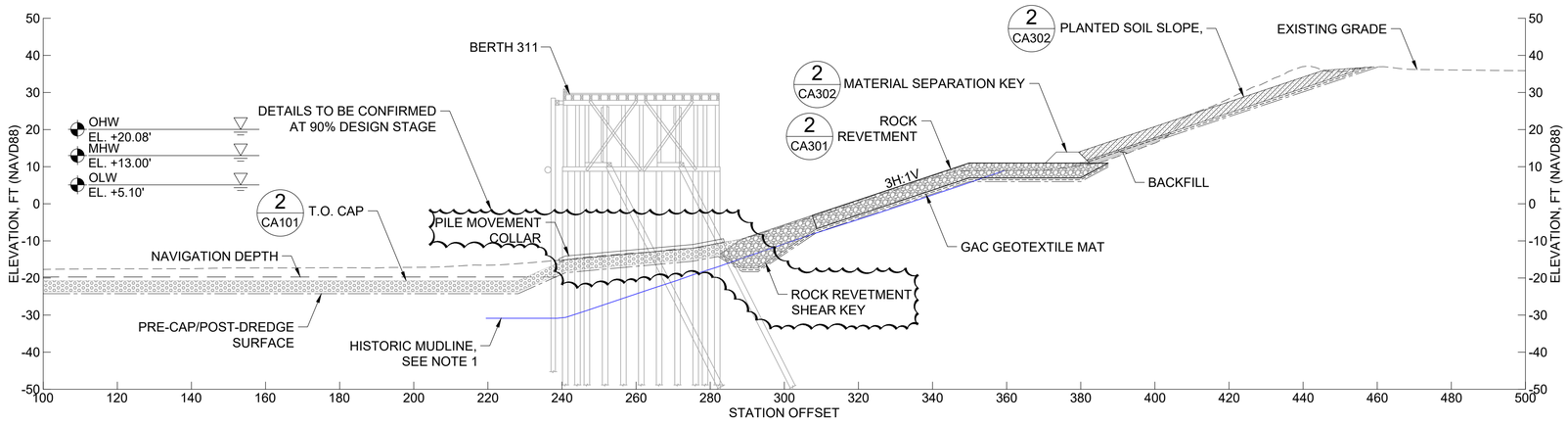
Drawing Number: S216

Title: Swan Island Basin Project Area
Remedial Design

Structural Sections 16



38 STATION 9+30
SECTION BERTH 311
SCALE: 1" = 20'



39 STATION 12+10
SECTION BERTH 311
SCALE: 1" = 20'

NOTE

1. HISTORIC MUDLINE BASED ON 1968 DRAWINGS.

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	127	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S217

Title: Swan Island Basin Project Area Remedial Design

Structural Sections 17

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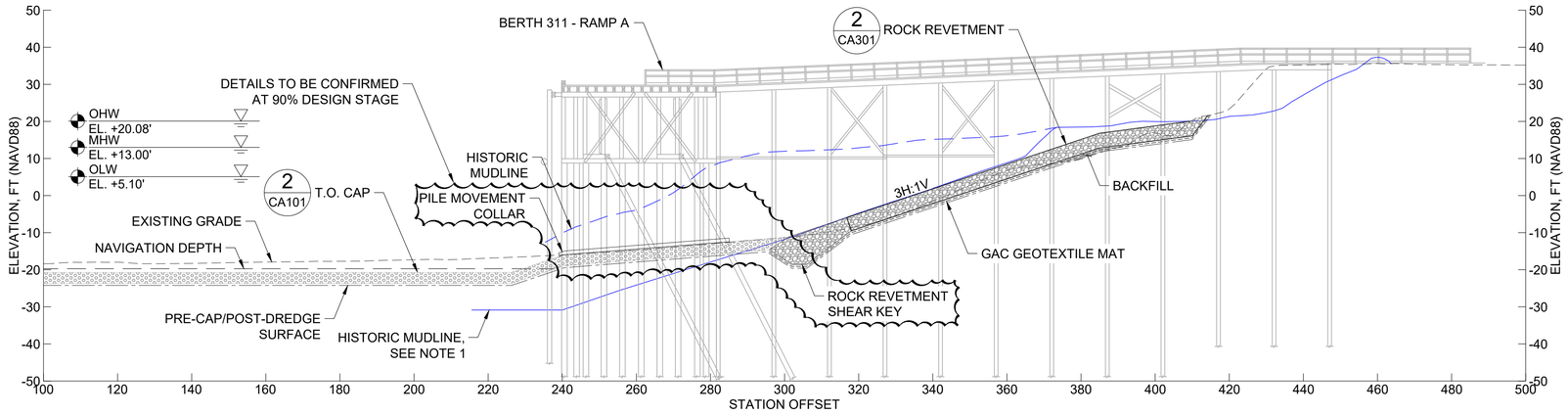
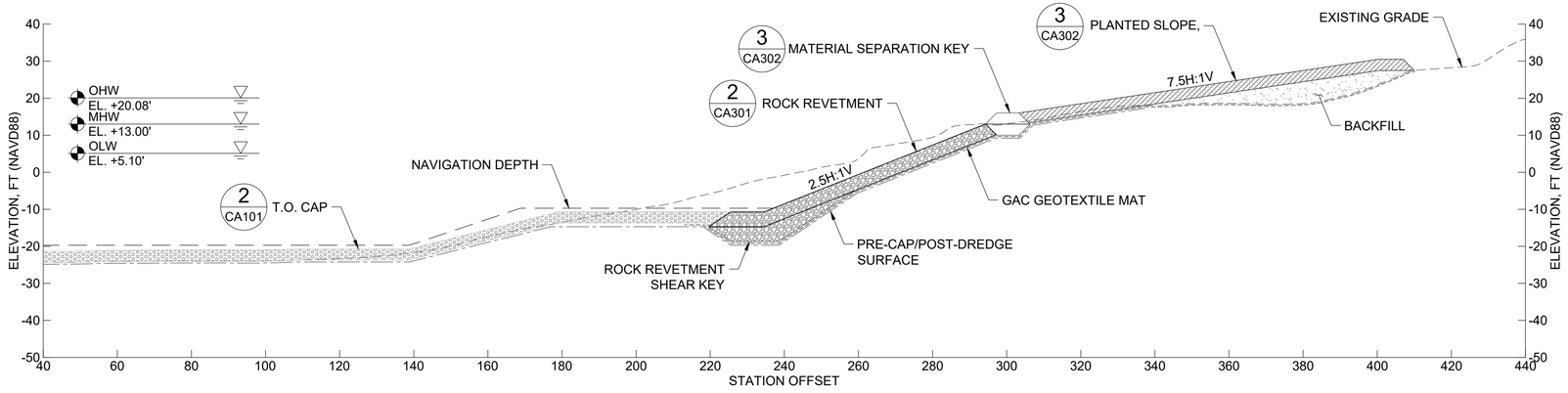


STATION 14+40
SECTION BERTH 311
40 SCALE: 1" = 20'



STATION 25+90
SECTION SHORELINE
41 SCALE: 1" = 20'

0 20 40
SCALE IN FEET

NOTE

1. HISTORIC MUDLINE BASED ON 1968 DRAWINGS.

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	128	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" =20'			

Drawing Number: S218

Title: Swan Island Basin Project Area Remedial Design

Structural Sections 18

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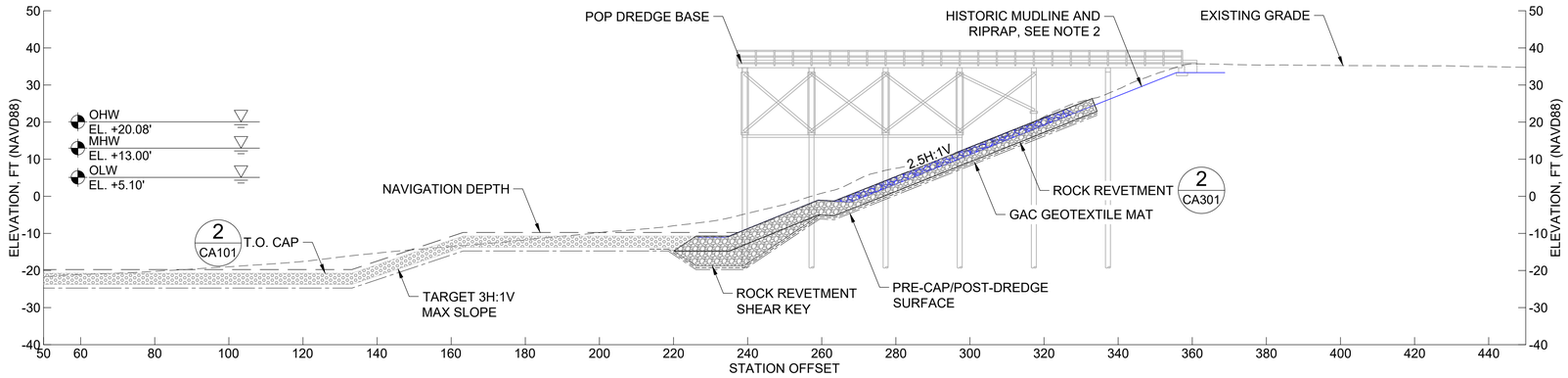
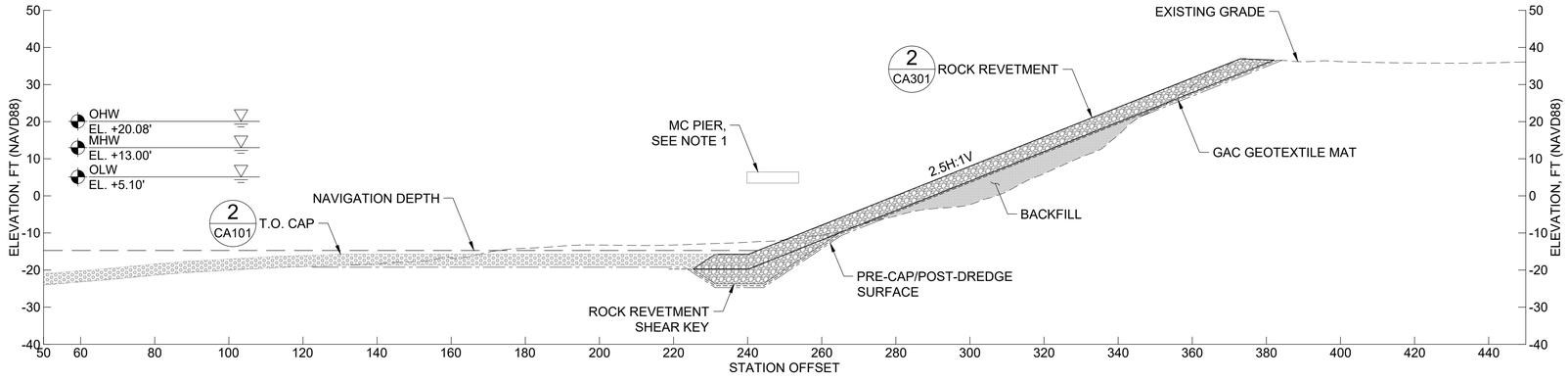


42 STATION 28+30
SECTION POP DREDGE BASE
SCALE: 1" = 20'



43 STATION 34+90
SECTION MC PIER
SCALE: 1" = 20'

NOTES

1. EXISTING FLOATING STRUCTURES SHALL BE TEMPORARILY RELOCATED AND STORED DURING REMEDIAL WORKS.
2. HISTORIC MUDLINE BASED ON 2019 DRAWINGS.

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Project Number	B/O	Total
507100742	129	134

Drawing Number: S219

Title: Swan Island Basin Project Area Remedial Design

Structural Sections 19

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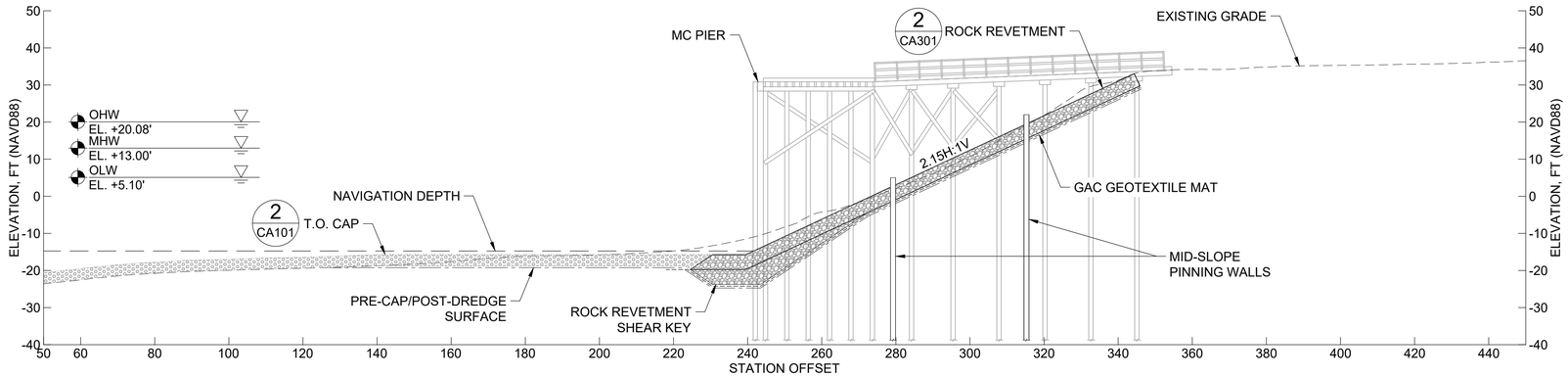
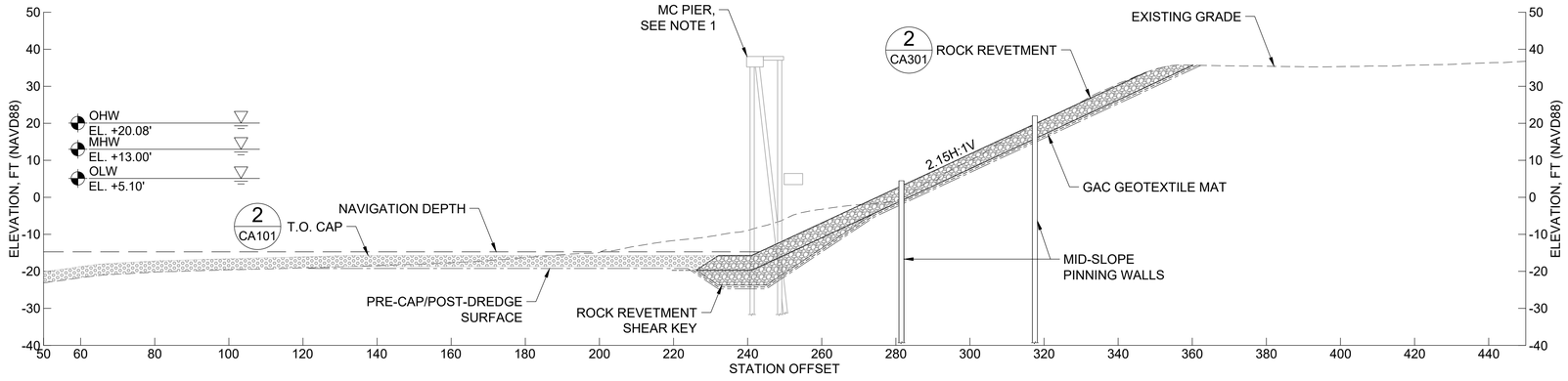


STATION 36+90
SECTION MC PIER
44
SCALE: 1" = 20'



STATION 38+15
SECTION MC PIER
45
SCALE: 1" = 20'

0 20 40
SCALE IN FEET

NOTE

1. EXISTING FLOATING STRUCTURES SHALL BE TEMPORARILY RELOCATED AND STORED DURING REMEDIAL WORKS.

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	130	134

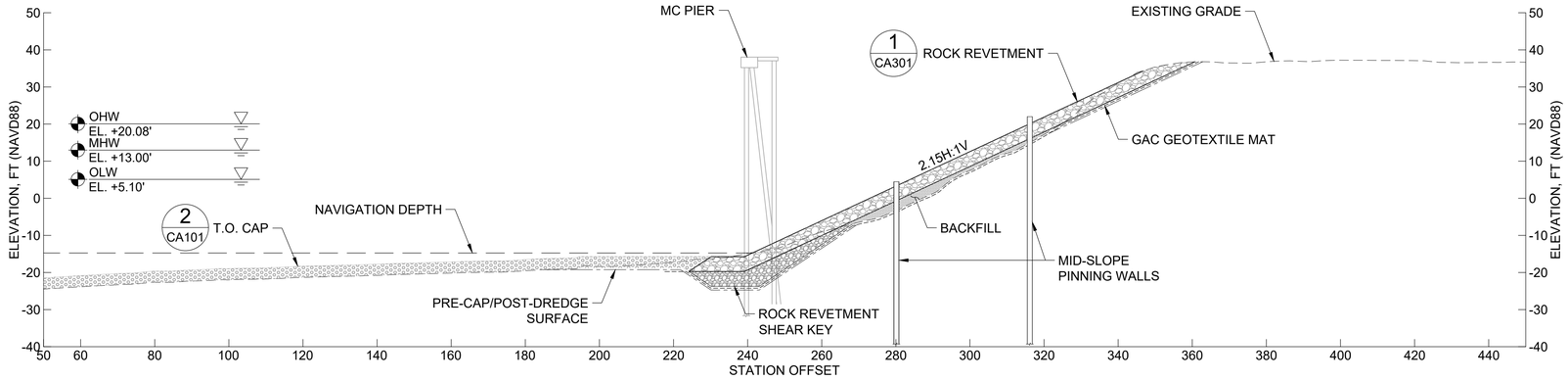
Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

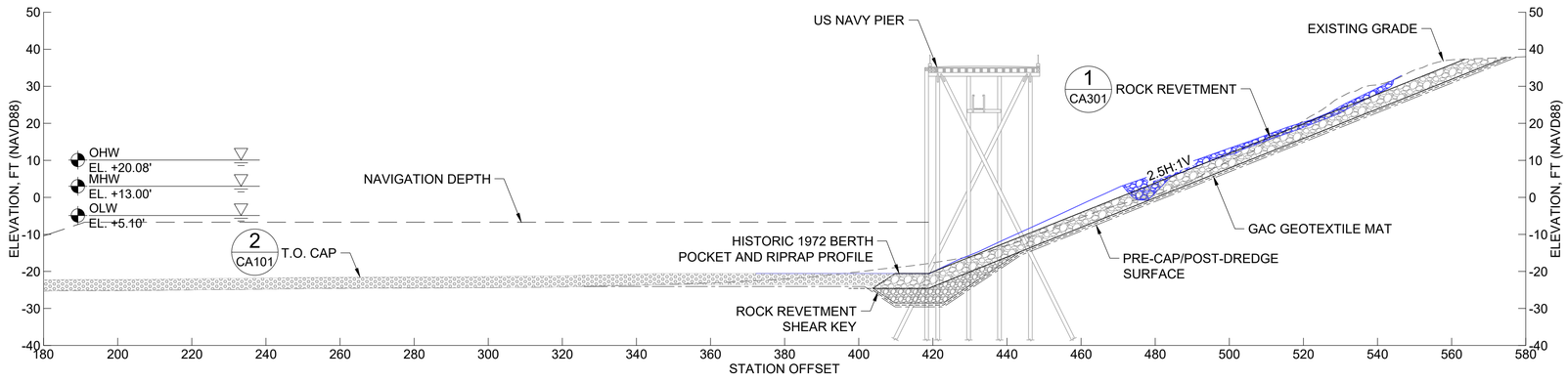
Drawing Number: S220

Title: Swan Island Basin Project Area Remedial Design

Structural Sections 20



STATION 40+35
SECTION MC PIER
46
SCALE: 1" = 20'



STATION 45+35
SECTION US NAVY PIER
47
SCALE: 1" = 20'

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

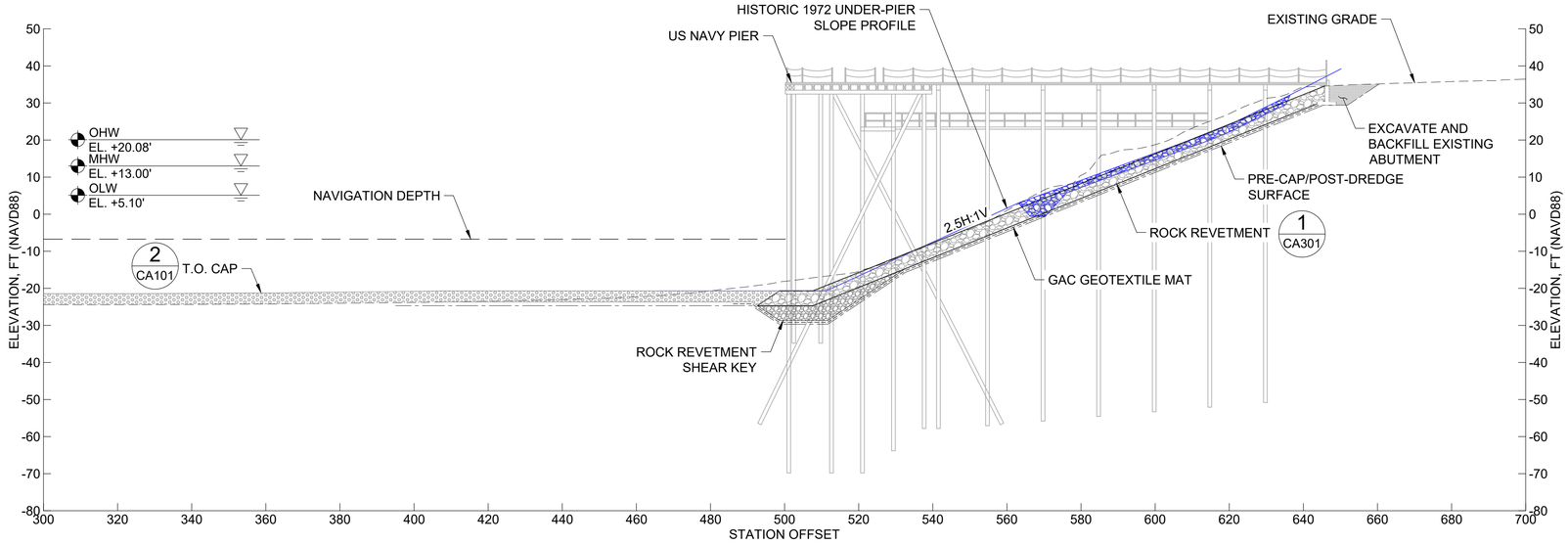
Project Number	B/O	Total
507100742	131	134

Drawing Number: S221

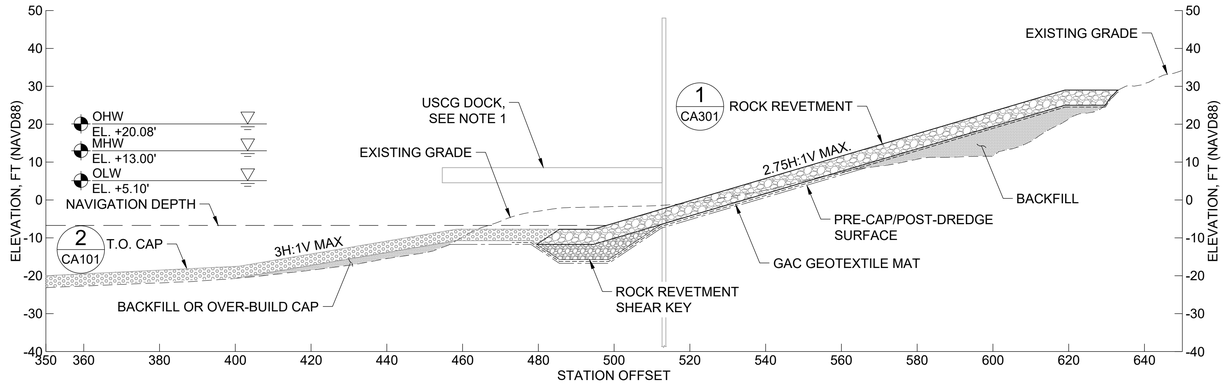
Title: Swan Island Basin Project Area Remedial Design

Structural Sections 21

C:\pwworking\hmm\ports_harbors\mor69830\dms82128\S221.dwg Mar 11, 2025 - 7:20PM NG85190



STATION 47+40
48 SECTION US NAVY PIER
SCALE: 1" = 20'



STATION 48+25
49 SECTION USCG FLOATING DOCK
SCALE: 1" = 20'

0 20 40
SCALE IN FEET

NOTE

1. EXISTING FLOATING STRUCTURES SHALL BE TEMPORARILY RELOCATED AND STORED DURING REMEDIAL WORKS.

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	132	134

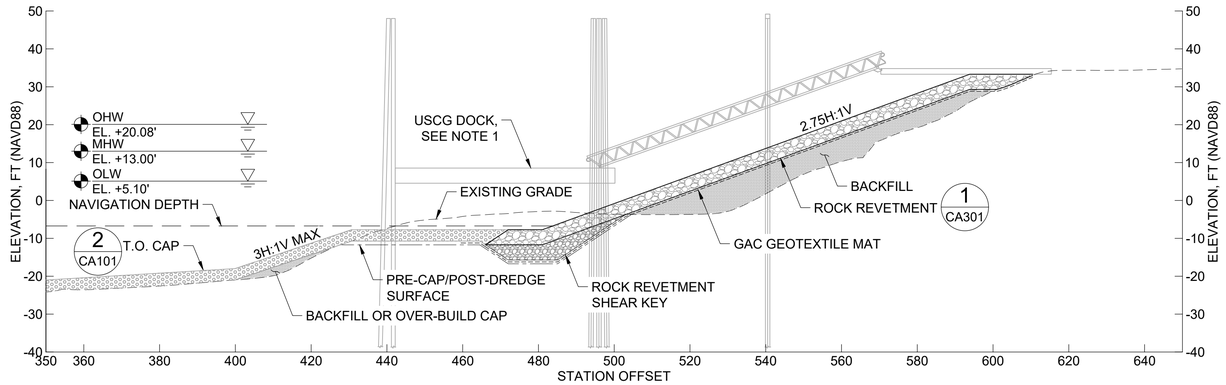
Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

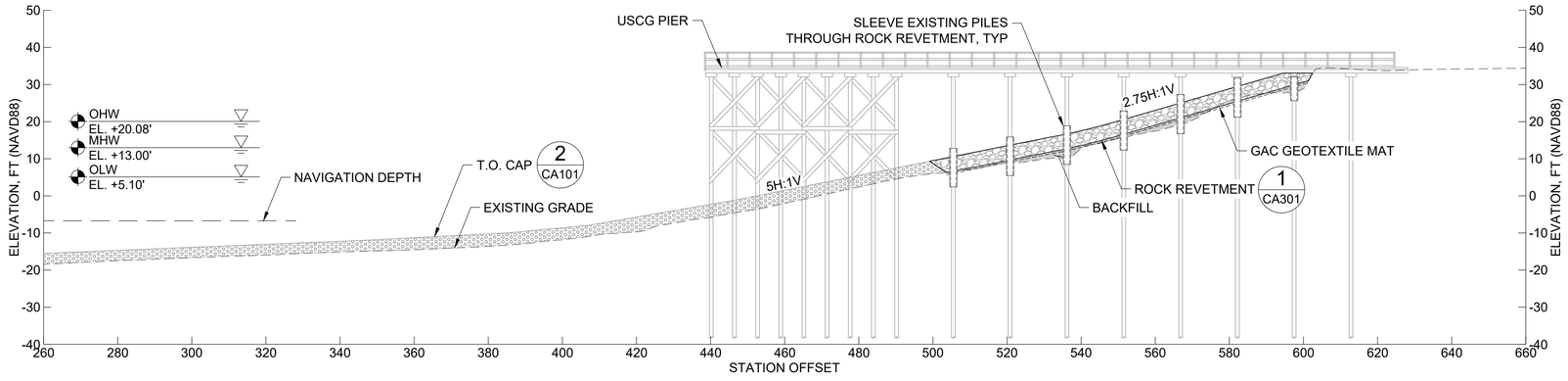
Drawing Number: S222

Title: Swan Island Basin Project Area Remedial Design

Structural Sections 22



50 STATION 49+02
SECTION USCG DOCK
SCALE: 1" = 20'



51 STATION 53+56
SECTION USCG PIER
SCALE: 1" = 20'

0 20 40
SCALE IN FEET

NOTE

1. EXISTING FLOATING STRUCTURES SHALL BE TEMPORARILY RELOCATED AND STORED DURING REMEDIAL WORKS.

50% REMEDIAL DESIGN
NOT FOR CONSTRUCTION

HGL

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Portland, Oregon 97204

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Rev	Date	Drawn	Description	Ch'k'd	App'd

Project Number	B/O	Total
507100742	133	134

Designed	S. Minahan		Eng check	A. Cairns	
Drawn	T. Morrison		Coordination	E. Edgecomb	
Dwg check	E. White		Approved		

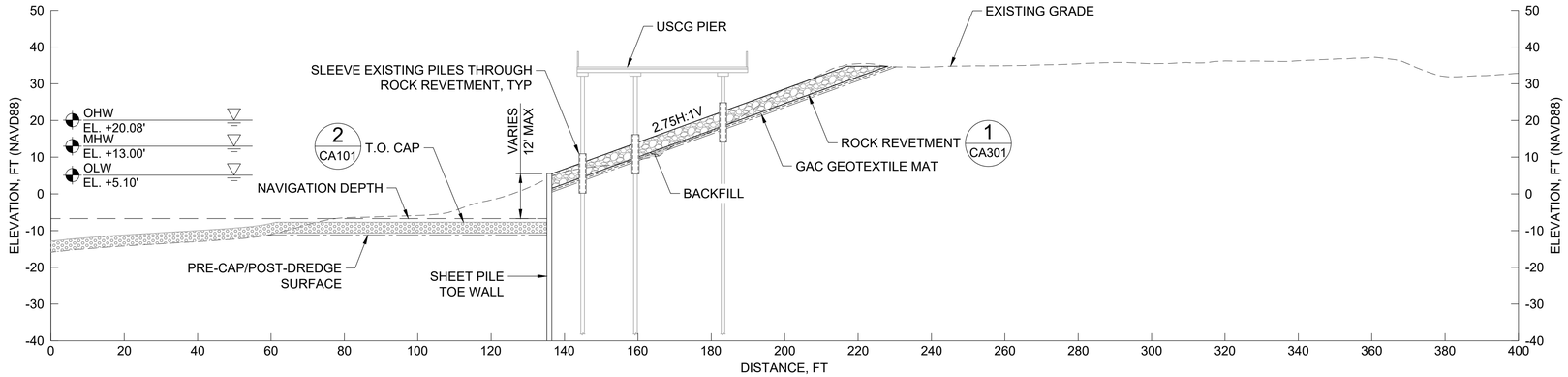
Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S223

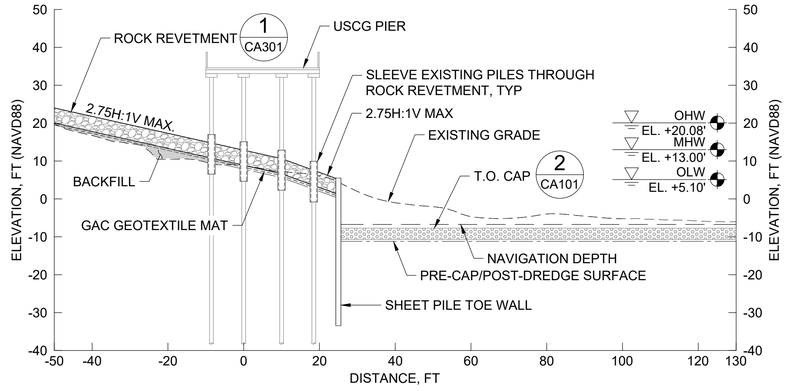
Title: Swan Island Basin Project Area
Remedial Design

Structural Sections 23

C:\pwworking\hmm\ports_harbors\mor69830\dms82128\S223.dwg Mar 11, 2025 - 7:21PM NG85190



52 SECTION USCG PIER
SCALE: 1" = 20'



53 SECTION USCG PIER
SCALE: 1" = 20'

0 20 40
SCALE IN FEET

50% REMEDIAL DESIGN
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Dwg check	E. White		Approved		

Scale at ANSI D	Status	Rev	Security
1" = 20'			

Drawing Number: S224

Title: Swan Island Basin Project Area Remedial Design

Structural Sections 24

C:\pwworking\hmm\ports_harbors\mor69830\dms82128\S224.dwg Mar 11, 2025 - 7:21PM NG85190