

Appendix D

Structures Inspection Results

Attachments

Attachment D-1	Phase II Detailed Inspection FCA Reports: Structures
Attachment D-2	Phase I Visual Inspection FCA Reports: Structures
Attachment D-3	Photographs of Outfalls Located in Phase II

1 Introduction

The results of the Lower Duwamish Waterway (LDW) middle reach structures field inspection, visual observation, and general evaluation are outlined in the facility condition assessment (FCA) reports included in this appendix. Types of structures that were inspected are identified in Table D2-1. The attached FCA reports include the following:

- Facility name and property information, where known
- Facility identification – ST (Structures)
- Waterway User Survey identification number (WUS#) (Integral et al. 2018)
- Location – river mile (RM), station, and side of river
- Relevant background information, photographs, and description of observed presence or absence of defects or deficiencies in individual elements of the structure
- Overall structure rating (for the purpose of remediation)
- Accessibility for field investigation, construction equipment, and remediation activities
- Observed hazards
- Basic material inspection checklist form and general element condition rating

Two rounds of inspections were completed in accordance with the LDW Pre-Design Investigation (PDI) Quality Assurance Project Plan (QAPP) and PDI QAPP Addendum Nos. 1 and 2 for Phase II (herein referred to as the Phase II QAPP Addenda) (Windward and Anchor QEA 2022; Anchor QEA and Windward 2024a, b), including the Phase I visual inspection and the Phase II “due diligence” inspection. During the Phase I visual inspection, structures and outfalls along the entire middle reach were identified and information was documented to the extent possible based on visual and access limitations.

The Phase II due diligence inspections added to the visual data collected during Phase I but focused on structures within or near Phase I RAL exceedance areas; the inspections involved performing an overall general conditions assessment for the purpose of remediation and general material surface conditions assessments. The results of these assessments are summarized in Table D2-1.¹ The due diligence survey of outfall structures will occur as part of PDI Phase III once the 30% remedial design is complete and the extent of potential impacts on those features is better known. Locations of structures and outfalls near areas with RAL exceedances are shown on Maps 2-9a through 2-9e. The inspections performed for each structure should not be considered “complete” or “detailed” to the extent that they provide recommendations for structural repairs, maintenance, upgrades, or load ratings. The inspection level of effort performed was to gather general information about each

¹ Table D2-1 summarizes findings from Phase I and Phase II inspections. Since the Phase I visual inspection did not involve detailed conditions assessments, the last two columns of the table are populated with “NA” (i.e., not applicable).

structure to understand remediation technology method impacts adjacent to structures in RAL exceedance areas.

FCA reports for structures inspected in both Phases I and II of the PDI are included in Attachment D-1. These reports note the separate inspection dates and present combined data from both inspections. FCA reports for structures only inspected during Phase I are included in Attachment D-2.

2 Conditions Descriptions and Results

The overall structure ratings provide a general assessment of the structures' conditions, not an assessment of their strength to support their intended design load or functional use. Overall ratings are based on the manual by Childs (2001), which provides the general framework and template for ratings. More recent reference documents are available (i.e., Waterfront Facility Inspection Committee (2025)) but were not used because the intent is not to provide a complete inspection or condition assessment for the purpose of structural repairs, maintenance, upgrades, load ratings, etc. The intent of the assessment was to assign a rating of how the structure may perform if remediation activities (e.g., dredging) were conducted adjacently.

Childs (2001) ratings are categorized as follows:

- **Good:** Structure has no significant problems, and only minor defects/deficiencies were noted.
- **Satisfactory:** Structure has minor to moderate defects/deficiencies.
- **Fair:** Structure has minor to moderate defects/deficiencies, but all primary structural elements remain in sound condition. Localized areas of moderate to major defects and/or deterioration may be present but do not significantly reduce the load-bearing capacity of the structure.
- **Poor:** Structure has major severe defects/deficiencies, and/or deterioration is observed on widespread portions of the structure.
- **Serious:** Structure has severe defects; deterioration, overstressing, and/or breakage is observed on primary structural elements. Localized failures are observed or possible to occur.
- **Critical:** Structure has severe defects/deficiencies, deterioration, overstressing, and/or breakage that has resulted in localized failures of primary structural elements. Widespread failures are possible or likely to occur.

In addition to overall general structure ratings, the FCA reports for structures include a preliminary material identification/conditions rating, which is a general assessment of the condition of materials observed/used for construction of a structure (e.g., timber, concrete, steel) and a preliminary condition rating based on visual observations only. The material conditions rating (opinion only)

indicates whether a structural element observed is damaged, or if it is damaged severely enough to prevent remediation efforts (e.g., dredging) adjacent to that area. Severe loss of material (i.e., loss of material cross section) that may change the capacity of a structural element may be at high risk of collapse if remediation efforts occur. Again, these ratings provide a general assessment of the structural element or component integrity and are not an indication of the structures' capacity to support their intended design load or current functional use. Materials condition ratings for each observed structure are categorized as follows:

- **Excellent:** New or near-new condition; no loss of material cross section
- **Good:** No significant issues or concerns; <5% loss of material cross section
- **Fair:** Some wear observed but no significant issues/concerns; 5% to 20% loss of material cross section
- **Poor:** Significant wear observed; 20% to 50% loss of cross section
- **Critical:** Extremely worn or damaged; 50% to 80% loss of cross section

Table D2-1 summarizes the list of structures identified during PDI Phases I and II. The overall general structure ratings and surface condition notes from the preliminary material visual inspection checklist are summarized for structures inspected during Phase II. Due to access limitations or safety considerations during the inspections, the following structures identified for inspection in the Phase II PDI QAPP Addenda (Anchor QEA and Windward 2024a, b) were not inspected or only partially inspected during Phase II:

- ST07 – Seattle Iron and Metals Wharves North (WUS#30)
- ST08 – Seattle Iron and Metals Wharves South (WUS#32)
- ST14 – Boyer Alaska Barge Line North Lay Berth (WUS#29)
- ST15 – Boyer Mooring Dolphins (WUS#28)

Table D2-1
Summary of Structure Conditions

Facility ID ¹	WUS#	Facility Name or Description	Inspection Phase	Asset Type	Condition Assessment ¹	Material Surface Condition ¹
ST01	23	Samson Tug	I, II	Piers	Satisfactory	Concrete: Good Wood: Fair Steel: Good
ST02	23	Duwamish Marine Center	I, II	Floating dock	Satisfactory	Concrete: Critical Wood: Fair Steel: Good
ST03	54	SDOT Duwamish River Boat Ramp	I, II	Concrete apron	Fair	Concrete: Fair

Facility ID ¹	WUS#	Facility Name or Description	Inspection Phase	Asset Type	Condition Assessment ¹	Material Surface Condition ¹
ST04	26	SeaTac Marine (Slip 3 South Side)	I, II	Wharf	Satisfactory	Concrete: Good Wood: Good Steel: Good
ST09	36	8th Avenue Terminal (Slip 4 North Side)	I, II	Wharf	Good	Concrete: Good Wood: Good Steel: Good
ST10	63	Historic Intake Structure Building	II	Water intake structure	Satisfactory	Concrete: Fair Wood: Fair Steel: Critical
ST11	35	Pacific Pile and Marine Wharf	I, II	Timber wharf	Poor	Concrete: Good Steel: Good Wood: Poor
ST12	33	Pacific Pile and Marine Mooring	II	Ramp structure	Satisfactory	Steel: Good
ST13	34	Pacific Pile and Marine Mooring	II	Timber pier	Satisfactory	Steel: Good Wood: Good
ST16	NA	Inlet at RM 2.2W	I, II	Inlet	Fair	Wood: Poor
ST17	25	Alaska Marine Yard No. 2	I, II	Concrete wharf	Fair	Concrete: Fair Steel: Good
ST18	54	WSDOT/SDOT	II	Bridge	Good	Concrete: Good Steel: Good
NA	18	CertainTeed	I	Wharf	NA	NA
NA	21	Glacier Northwest (Slip 2 North Side)	I	Wharf	NA	NA
NA	27	Muckleshoot Tribe Marina (Slip 3 North Side)	I	Wharf	NA	NA
ST07, ST08	30, 32	Seattle Iron & Metals	I	Wharf	NA	NA
NA	37	Silver Bay Logging (8th Avenue Wharf)	I	Wharf	NA	NA
ST14, ST15	28, 29, 31, 33	Boyer Towing, Inc	I	Dolphins, bulkhead	NA	NA
NA	24	Seafreeze	I	Wharf, dolphins, catwalk	NA	NA
NA	22	Northland South (Terminal 115)	I	Pier	NA	NA
NA	19	Northland North (Terminal 115)	I	Wharf, dolphins	NA	NA

Notes:

1. Structures not identified for inspection during Phase II were not given a site-specific facility ID. Additionally, overall general condition and preliminary material surface condition assessments were not completed until Phase II and are listed as "NA" for structures only inspected during Phase I.

NA: not applicable

RM: river mile

SDOT: Seattle Department of Transportation

WSDOT: Washington State Department of Transportation

A summary of the outfalls near RAL exceedance areas and indication of whether they were verified visually or through a desktop review of photographs are included in Table D2-2. Additionally, photographs of outfalls are included (when located) in Attachment D-3.

Table D2-2
Summary of Outfalls

Facility ID	Outfall ID	Outfall Name	Outfall Status	Inspection Status
OF01	DuwMetalFab	DuwMetalFab	Decommissioned	Potentially located during desktop review (pipes potentially indicative of outfall)
OF02	2502	S Michigan CSO	Active	Located during inspection
OF03	2501	2501	Active	Located during inspection
OF04	Georgetown WWTS	Georgetown WWTS	Active	Submarine outfall; not inspected
OF05	S River St SD	S River St SD	Active	Potentially located during desktop review (structure potentially indicative of outfall)
OF06	Seattle Dist Ctr	SDC	Active	Not located
OF07	2025	2025	No information	Potentially located during desktop review (pipes potentially indicative of outfall)
OF08	Dawn Foods	DWN	Active	Located during desktop review
OF09	SBW-B	SBW-B	Active	Located during desktop review
OF10	2028	2028	Active	Located during desktop review
OF11	2027	2027	Presumed inactive	Located during desktop review
OF12	2026	S Myrtle St SD	Active	Located during desktop review
OF13	2035	S Garden St SD	Active	Located during desktop review
OF14	2036	2036	Presumed inactive	Located during desktop review
OF15	2037	2037	Presumed inactive	Located during desktop review
OF16	2040	2040	Active	Located during desktop review
OF17	CleanScapes B	CS-B	Active	Potentially located during desktop review (pipes potentially indicative of outfall)
OF18	DuwReload	DRLD	Active	Located during desktop review
OF19	2042	2042	Inactive	Located during inspection

Facility ID	Outfall ID	Outfall Name	Outfall Status	Inspection Status
OF20	5008	5008	Inactive	Located during inspection
OF21	5009	5009	Inactive	Located during inspection
OF22	2107	8th Avenue CSO	Active	Located during desktop review
OF23	2112	7th Avenue S SD	Active	Located during desktop review
OF24	2115	2115	Active	Located during desktop review
OF25	Boyer-2	B2	Active	Located during desktop review
OF26	Boyer-1	B1	Active	Located during desktop review
OF27	2118	2nd Ave S SD	Active	Located during desktop review
OF28	2120	W Seattle Reservoir Overflow	Not an outfall	Located during desktop review
OF29	2508	2508	Active	Potentially located during desktop review
OF30	2506	West Michigan CSO	Active	Located during desktop review

Notes:

CSO: combined sewer overflow

SD: storm drain

WWTS: wet weather treatment station

3 References

Anchor QEA, Windward. 2024a. Pre-Design Investigation Quality Assurance Project Plan Addendum No. 1 for the Lower Duwamish Waterway Middle Reach - Phase II Sampling. Final. Anchor QEA and Windward Environmental LLC, Seattle, WA.

Anchor QEA, Windward. 2024b. Quality assurance project plan addendum No. 2 for the Lower Duwamish Waterway middle reach - Phase II sampling for the Inlet at RM 2.2W. Draft. Submitted to the US Environmental Protection Agency April 19, 2024. Anchor QEA and Windward Environmental LLC, Seattle, WA.

Childs KM. 2001. Underwater Investigations: Standard Practice Manual. American Society of Civil Engineers.

Integral, Moffat & Nichol, Windward. 2018. Waterway user survey and assessment of in-water structures - data report. Integral Consulting Inc., Moffan & Nichol, and Windward Environmental LLC, Seattle, WA.

Waterfront Facility Inspection Committee. 2025. Waterfront Facilities Inspection and Assessment. ASCE MOP 130-2025. Second ed., Heffron RE, ed. American Society of Civil Engineers, Reston, VA.

Windward, Anchor QEA. 2022. Pre-design investigation quality assurance project plan for the Lower Duwamish Waterway - Middle Reach. Final. Submitted to EPA November 21, 2022. Windward Environmental LLC and Anchor QEA, Seattle, WA.

FINAL

Attachment D-1

Phase II Detailed Inspection FCA Reports:
Structures

FACILITIES CONDITION ASSESSMENT REPORT, PHASE I/II

REVISION 02/21/2025

Sediment Cleanup of Middle Reach of Lower Duwamish Waterway

Facility Name: ST01
 Samson Tug (Slip 2 South Side)
 Parcel No. 5367204565

WUS#: 23

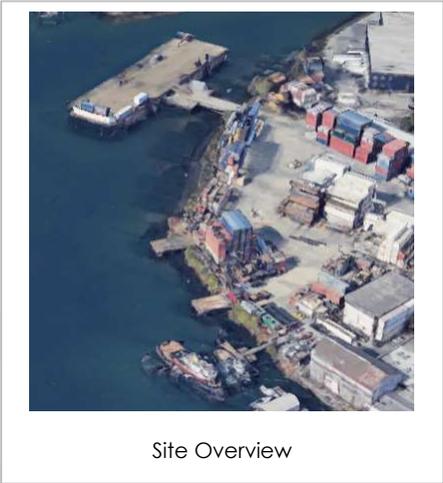
Facility Location: River Mile 1.8 to 1.9
 Direction (side) East

Asset Type: Piers

Use: Barge loading and unloading, and moorage

Inspection Date: August 8, 2022, July 9, 2024

Inspected By: Ade Bright and Stephanie Lor



Site Overview

General Condition and Evaluation:

Overall Condition Rating: Good Satisfactory Fair Poor Serious Critical

Inspection was conducted from the water side during high tide and from the water and land side during low tide.

The structure consists of:

- A 75-foot-wide T-head pier at the north end
- Two (2) 25-foot-wide single span piers at the center and south end
- Dolphins

T-Head Pier:

The pier consists of steel piles supported apron, steel and concrete pile caps, concrete deck, two deep steel plate girders 3-span approach bridge, and timber fender piles. (Photos 1 to 5)

- The steel piles and steel pile caps are in good condition. (Photos 3 to 5)
- It appears that the concrete pile caps and concrete deck are recently constructed and are in good condition. (Photos 4 to 6)
- The plate girders are supported on braced steel piers; the abutment material could not be observed. The web of the plate girders are severely corroded and exhibit a significant loss of material. (Photos 6 to 9)
- The fender piles appear to be in good condition.
- Straddling the pier are a 7-pipe pile steel dolphin to the east and a 4-pipe pile steel dolphin to the west. The piles are in good condition. (Photo 1)
- The bank is armored with a combination of concrete apron and brick rubbles. (Photo 9)

Center Pier:

The pier consists of one bent of vertical and battered octagonal precast concrete piles, concrete pile cap, 8(?) steel beams, timber decking, and timber fender piles. Only the north side could be observed because of a moored vessel.

- The concrete piles, pile cap, and steel beams appear to be in good condition.
- A number of the timber fender piles are broken or displaced.
- On the north side of the pier is a 14-pile timber dolphin, which appears to be in good condition. (Photo 10)
- The bank is armored with timber stub piles; wood debris; and a combination of concrete panels, concrete rubbles and stones. (Photo 10)

South Pier:

The pier consists of one bent of vertical and battered octagonal precast concrete piles, concrete pile cap, 8(?) steel beams, timber decking, and timber fender piles. Only the south side could be observed because of a moored vessel.

- The concrete piles, pile cap, and steel beams appear to be in good condition. (Photo 11)
- All timber fender piles are broken or displaced. (Photo 12)
- On the south side of the pier is a 14-pile timber dolphin, which appears to be in good condition. (Photos 13 to 15)
- The bank is armored with timber stub piles; wood debris; and a combination of concrete panels, concrete rubbles and stones.

Accessibility:

- Accessibility at the T-pier is limited by pile bay clearance in both directions and low headroom under the approach bridge.
- At the center and south piers, accessibility is limited by the bent, clearance under the pier, and the presence of large concrete debris and stub timber piles.

Potential Hazards:

- Presence of stub timber piles invisible during high tides at the center and south piers.

PHOTOGRAPHS



Photo ST01-01: T-Pier south elevation

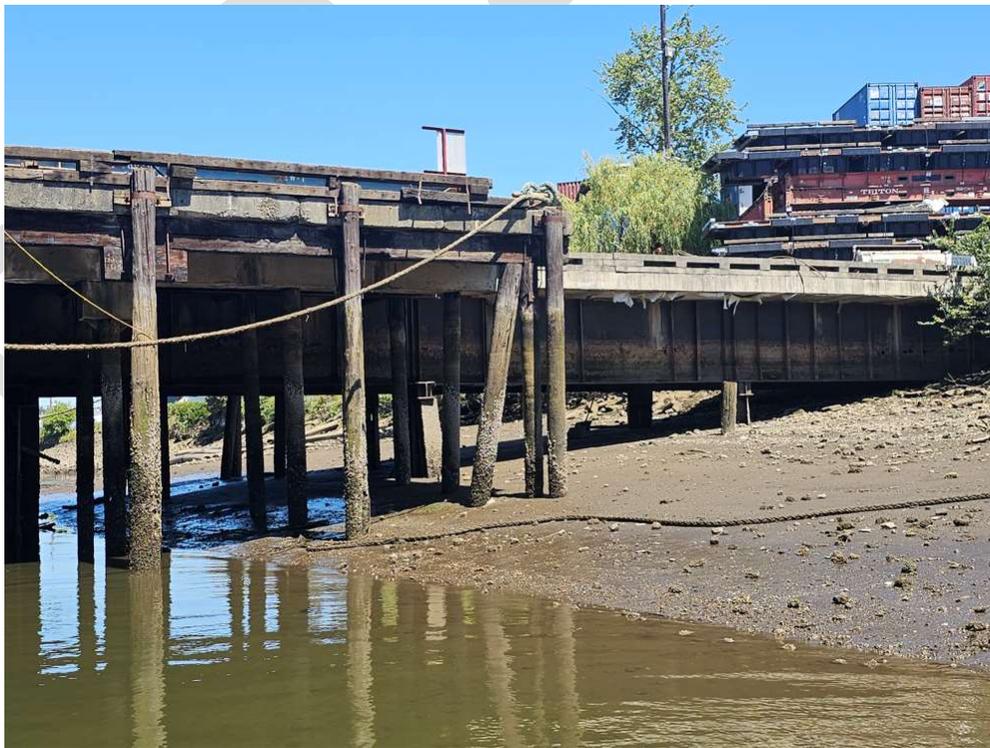


Photo ST01-02: Approach bridge

PHOTOGRAPHS



Photo ST01-03: T-Pier south side looking northwest

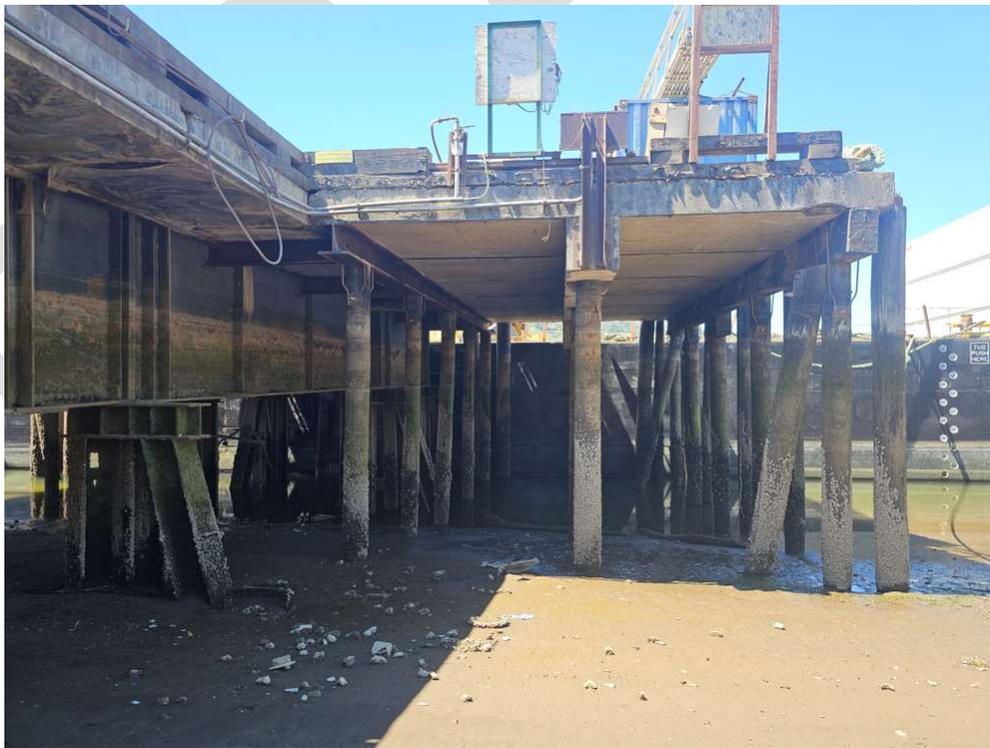


Photo ST01-04: T-Pier north side looking northeast

PHOTOGRAPHS



Photo ST01-05: T-Pier looking north



Photo ST01-06: T-Pier south plate girder

PHOTOGRAPHS



Photo ST01-07: T-Pier south plate girder



Photo ST01-08: T-Pier looking west between plate girders

PHOTOGRAPHS



Photo ST01-09: T-Pier approach bridge abutment



Photo ST01-10: Center pier looking south

PHOTOGRAPHS



Photo ST01-11: South pier looking northeast



Photo ST01-12: South pier looking north

PHOTOGRAPHS



Photo ST01-13: South end of south pier looking east



Photo ST01-14: South end of south pier looking south

PHOTOGRAPHS



Photo ST01-15: South end of south pier looking east

DRY

CONCRETE MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A – Exposure		1B – Drainage		1C – Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Flashing		Expansive soil
		Freezing and thawing		Joint sealants		Compressive soil (settlement)
	X	Wetting and drying		Weepholes		Evidence of pumping
		Drying under dry atmosphere		Contour		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Elevation of drains		Steep or unstable slope/revetment
	X	Abrasion, erosion, cavitation, impact				
	Heat from adjacent sources					

2. DISTRESS INDICATORS	
X	Cracking or Breakage
X	Staining
X	Surface deposits and exudations
	Leaking

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure							
	X	Settlement	X	Deflection/Leaning		Expansion		Contraction
	3B – Surface Condition							
	General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.				
		Good	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.				
		Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.				
		Poor		Worn from use: Between 20% - 50% loss of cross section.				
		Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.				
	Formed and finished surfaces – slippery, uneven, or misaligned		X					
	Cracking		X					
	Scaling		X					
	Spalls, pop outs, and delamination		X					
	Stains, Efflorescence		X					
	Exposed Reinforcement: Corrosion		X					
	Damage or distress		X					
	Missing or broken members		X					
	Collapse, partial collapse or structure off foundation							
	Damage or decay of chimney, parapet or other overhead falling hazard							
	Ground or slope movement present							
	Unstable supports – gaps or holes, excessive rotation, loss of bearing							
Curling and warping								
Erosion								
Previous Patching or Other Repair:		X						
Surface Coatings, Protective Systems, Linings, Toppings								
Penetrating Sealers								
Signs of Past Overflow on Rungs and Walls								
Debris Buildup		X						
Exposed Aggregate		X						
Leaks through Walls								
Structural Defects		X						
Moss		X						

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A – Exposure		1B – Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
		Freezing and thawing		Compressive soil (settlement)
	X	Wetting and drying		Evidence of pumping
		Drying under dry atmosphere		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
	X	Abrasion, erosion, impact		
	Heat from adjacent sources			

2. DISTRESS INDICATORS	X	Cracking or breakage
	X	Rot and decay
	X	Surface deposits
		Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure							
		Settlement	X	Deflection/Leaning		Expansion		Contraction
	3B – Surface Condition							
	General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.				
		Good		Good condition: no reported issues or concerns. Less than 5% loss of cross section.				
		Fair	X	Average wear; not new but no issues to report. Between 5% - 20% cross section.				
		Poor		Worn from use: Between 20% - 50% loss of cross section.				
		Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.				
	Finished surfaces – slippery, uneven, or misaligned			X				
	Cracking			X				
	Loss of Material			X				
	Missing or broken members			X				
	Damage or distress			X				
	Collapse, partial collapse or structure off foundation							
	Damage or decay of chimney, parapet or other overhead falling hazard							
	Ground or slope movement present							
	Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot			X				
Fasteners: Corrosion			X					
Soft timber and decay			X					
Abrasion			X					
Previous Repair			X					
Surface Coatings, Protective Systems			X					
Debris Buildup			X					
Structural Defects			X					
Moss			X					

STEEL MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A – Exposure		1B – Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
		Freezing and thawing		Compressive soil (settlement)
	X	Wetting and drying		Evidence of pumping
		Drying under dry atmosphere		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
	X	Abrasion, impact		
	Heat from adjacent sources			

2. DISTRESS INDICATORS	X	Member cracking or breakage
	X	Staining, corrosion
	X	Surface deposits
		Weld cracking or breakage

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure			
		Settlement	X	Deflection/Leaning
	3B – Surface Condition			
	General Condition	<u>Excellent</u>		New or near-new condition: no issues to report. No loss of cross section.
		<u>Good</u>	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.
		<u>Fair</u>		Average wear; not new but no issues to report. Between 5% - 20% cross section.
		<u>Poor</u>		Worn from use: Between 20% - 50% loss of cross section.
		<u>Critical</u>		Extremely worn or damaged: Between 50% - 80% loss of cross section.
		Finished surfaces – slippery, uneven, or misaligned		
		Cracking		
		Rust and scale		X
		Loss of Material		X
		Missing or broken members		
		Damage or distress		X
		Collapse, partial collapse or structure off foundation		
		Damage or decay of chimney, parapet or other overhead falling hazard		
		Ground or slope movement present		
		Unstable supports – gaps or holes, excessive rotation, loss of bearing		
		Stains		X
		Corrosion		X
	Abrasion			
	Previous Repair			
	Surface Coatings			
	Debris Buildup		X	
	Structural Defects		X	
	Moss		X	

FACILITIES CONDITION ASSESSMENT REPORT, PHASE I/II

REVISION 02/21/2025

Sediment Cleanup of Middle Reach of Lower Duwamish Waterway

Facility Name: ST02 – Duwamish Marine Center
Parcel No. 5367204565

WUS#: 23

Facility Location: River Mile 1.8

Direction (side) East

Asset Type: Floating Dock

Use: Mooring/Boat Houses

Inspection Date: August 8, 2022, July 9, 2024,
October 15, 2024

Inspected By: Ade Bright and Stephanie Lor



Site Overview

General Condition and Evaluation:

Overall Condition Rating: Good Satisfactory Fair Poor Serious Critical

General

Structure consists of floating docks, guide piles, gangway, and boat houses (one recently burned down).

Shoreline structures consist of:

- Series of timber pile field, and timber dolphins at the north end. It appears that the series of piles were soldier piles with timber lagging bulkhead supporting the embankment and the building upland. Practically all the lagging have fallen off because of severe bank erosion. (Photos 1 to 10)
- Concrete slab/apron east of the building is undermined and has sagged. (Photos 8 and 9)
- There is severe soil erosion under the aluminum gangway abutment. The gangway leads to the boathouses. (Photo 11)
- Timber pile and timber lagging in front (west) of the King County outfall appears to be stable and in good condition. However, the bank north and south of the outfall structure is eroded. (Photos 12 and 13)
- The south bank is armored with concrete rubbles and quarry spalls. (Photo 14)
- Nearshore structures consist of timber guide piles along almost the entire shoreline, supporting floating docks and boathouses. (Photos 2 to 6)
- The guide piles appear to be in good condition.

Accessibility:

- Accessibility to the shoreline is restricted by the boathouses, floating docks, and guide piles along the nearshore.

Potential Hazards:

- *To be completed...*

DRAFT

PHOTOGRAPHS



Photo ST02-01: North end of boathouses



Photo ST02-02: Floating boat houses

PHOTOGRAPHS



Photo ST02-03: Mid section of boathouses



Photo ST02-04: North end of boathouses

PHOTOGRAPHS



Photo ST02-05: Boathouses



Photo ST02-06: South end of boathouses

PHOTOGRAPHS



Photo ST02-07: North end bank

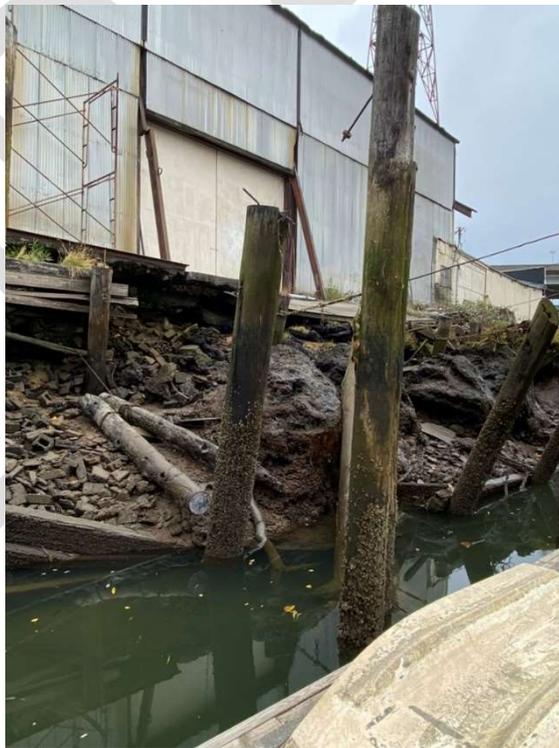


Photo ST02-08: Middle of bank

PHOTOGRAPHS



Photo ST02-09: Middle of bank



Photo ST02-10: South end of shoreline

PHOTOGRAPHS



Photo ST02-11: Bank at gangway



Photo ST02-12: Bank at KC outfall

PHOTOGRAPHS



Photo ST02-13: South end of shoreline

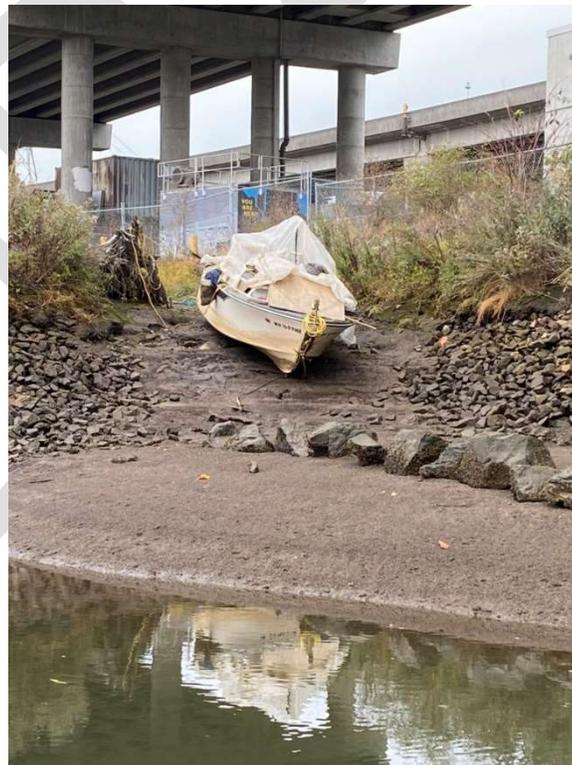


Photo ST02-14: South end under 1st Ave Bridge

CONCRETE MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A – Exposure		1B – Drainage		1C – Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Flashing		Expansive soil
		Freezing and thawing		Joint sealants		Compressive soil (settlement)
	X	Wetting and drying		Weepholes		Evidence of pumping
		Drying under dry atmosphere		Contour		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Elevation of drains	X	Steep or unstable slope/revetment
	X	Abrasion, erosion, cavitation, impact				
	Heat from adjacent sources					

2. DISTRESS INDICATORS	
X	Cracking or Breakage
X	Staining
X	Surface deposits and exudations
	Leaking

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure							
	X	Settlement	X	Deflection/Leaning		Expansion		Contraction
	3B – Surface Condition							
	General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.				
		Good		Good condition: no reported issues or concerns. Less than 5% loss of cross section.				
		Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.				
		Poor		Worn from use: Between 20% - 50% loss of cross section.				
		Critical	X	Extremely worn or damaged: Between 50% - 80% loss of cross section.				
	Formed and finished surfaces – slippery, uneven, or misaligned						X	
	Cracking						X	
	Scaling							
	Spalls, pop outs, and delamination							
	Stains, Efflorescence						X	
	Exposed Reinforcement: Corrosion							
	Damage or distress						X	
	Missing or broken members							
	Collapse, partial collapse or structure off foundation							
	Damage or decay of chimney, parapet or other overhead falling hazard							
	Ground or slope movement present						X	
	Unstable supports – gaps or holes, excessive rotation, loss of bearing						X	
Curling and warping								
Erosion						X		
Previous Patching or Other Repair:						X		
Surface Coatings, Protective Systems, Linings, Toppings								
Penetrating Sealers								
Signs of Past Overflow on Rungs and Walls								
Debris Buildup								
Exposed Aggregate								
Leaks through Walls								
Structural Defects						X		
Moss								

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A – Exposure		1B – Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
		Freezing and thawing		Compressive soil (settlement)
	X	Wetting and drying		Evidence of pumping
		Drying under dry atmosphere		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)	X	Steep or unstable slope/revetment
	X	Abrasion, erosion, impact		
	Heat from adjacent sources			

2. DISTRESS INDICATORS	X	Cracking or breakage
	X	Rot and decay
	X	Surface deposits
		Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure					
	Settlement	X	Deflection/Leaning	Expansion	Contraction	
	3B – Surface Condition					
	General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.		
		Good		Good condition: no reported issues or concerns. Less than 5% loss of cross section.		
		Fair	X	Average wear; not new but no issues to report. Between 5% - 20% cross section.		
		Poor		Worn from use: Between 20% - 50% loss of cross section.		
		Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.		
	Finished surfaces – slippery, uneven, or misaligned		X			
	Cracking		X			
	Loss of Material		X			
	Missing or broken members		X			
	Damage or distress		X			
	Collapse, partial collapse or structure off foundation					
	Damage or decay of chimney, parapet or other overhead falling hazard					
	Ground or slope movement present		X			
	Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot		X			
	Fasteners: Corrosion					
	Soft timber and decay		X			
	Abrasion		X			
Previous Repair						
Surface Coatings, Protective Systems		X				
Debris Buildup		X				
Structural Defects		X				
Moss		X				

STEEL MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A – Exposure		1B – Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
		Freezing and thawing		Compressive soil (settlement)
	X	Wetting and drying		Evidence of pumping
		Drying under dry atmosphere		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)	X	Steep or unstable slope/revetment
	X	Abrasion, impact		
	Heat from adjacent sources			

2. DISTRESS INDICATORS	X	Member cracking or breakage
	X	Staining, corrosion
	X	Surface deposits
		Weld cracking or breakage

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure				
		Settlement	X	Deflection/Leaning	
	3B – Surface Condition				
	General Condition	<u>Excellent</u>		New or near-new condition: no issues to report. No loss of cross section.	
		<u>Good</u>	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.	
		<u>Fair</u>		Average wear; not new but no issues to report. Between 5% - 20% cross section.	
		<u>Poor</u>		Worn from use: Between 20% - 50% loss of cross section.	
		<u>Critical</u>		Extremely worn or damaged: Between 50% - 80% loss of cross section.	
		Finished surfaces – slippery, uneven, or misaligned			
		Cracking			
		Rust and scale			
		Loss of Material			
		Missing or broken members			
		Damage or distress			
		Collapse, partial collapse or structure off foundation		X	
		Damage or decay of chimney, parapet or other overhead falling hazard			
		Ground or slope movement present		X	
		Unstable supports – gaps or holes, excessive rotation, loss of bearing		X	
		Stains			
		Corrosion			
	Abrasion				
	Previous Repair				
	Surface Coatings				
	Debris Buildup				
	Structural Defects				
	Moss				

FACILITIES CONDITION ASSESSMENT REPORT, PHASE I/II

REVISION 02/21/2025

Sediment Cleanup of Middle Reach of Lower Duwamish Waterway

Facility Name: ST03 – Seattle Dept. of Transportation (SDOT) Duwamish River Boat Ramp
Parcel No. 2

WUS#: 54

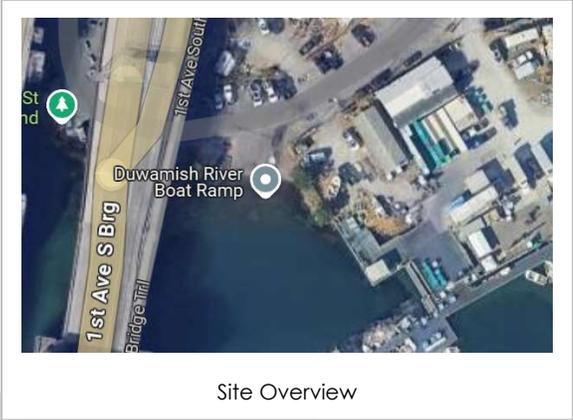
Facility Location: River Mile 2.05
Direction (side) East

Asset Type: Concrete Apron

Use: Boat Launch

Inspection Date: July 9, 2024

Inspected By: Ade Bright and Stephanie Lor



Site Overview

General Condition and Evaluation:

Overall Condition Rating: Good Satisfactory Fair Poor Serious Critical

Structure consists of asphalt concrete approach pavement (off River Road) at the head of the concrete ramp, five 10-foot-wide concrete ramp panels, and riprap armor at the toe and sides of the concrete ramp. (Photos 1 and 2)

The structure consists of:

- The concrete surface of the ramp is worn and exhibits evidence of mortar loss. (Photos 3 to 6)
- There are several wide transverse and longitudinal cracks on all panels. (Photos 4 to 6)
- Several concrete spalls were observed on the panels. (Photo 4)

Accessibility:

- There are no obstructions on the land side.
- Access from the water side depends on draft and tide level.

Potential Hazards:

- The surface of the concrete ramp is slippery, especially towards the toe.

PHOTOGRAPHS



Photo ST03-01: Boat ramp (looking east)



Photo ST03-02: ACP approach ramp (looking west)

PHOTOGRAPHS

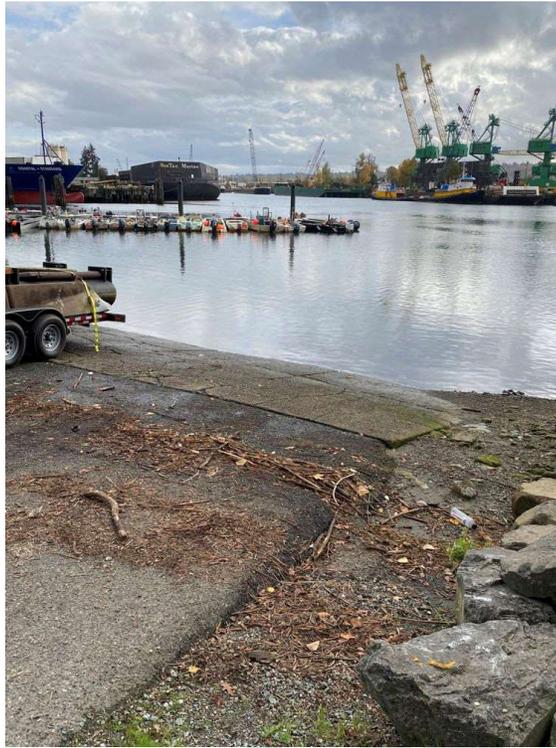


Photo ST03-03: Concrete ramp (looking west)



Photo ST03-04: Top of concrete ramp (looking south)

PHOTOGRAPHS



Photo ST03-05: Toe of concrete ramp (looking south)



Photo ST03-06: Concrete ramp (looking north)

CONCRETE MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A – Exposure		1B – Drainage		1C – Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Flashing		Expansive soil
		Freezing and thawing		Joint sealants		Compressive soil (settlement)
	X	Wetting and drying		Weepholes		Evidence of pumping
		Drying under dry atmosphere		Contour		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Elevation of drains	X	Steep or unstable slope/revetment
	X	Abrasion, erosion, cavitation, impact				
	Heat from adjacent sources					

2. DISTRESS INDICATORS	X	Cracking or Breakage
	X	Staining
		Surface deposits and exudations
		Leaking

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure							
	X	Settlement	X	Deflection/Leaning		Expansion		Contraction
	3B – Surface Condition							
	General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.				
		Good		Good condition: no reported issues or concerns. Less than 5% loss of cross section.				
		Fair	X	Average wear; not new but no issues to report. Between 5% - 20% cross section.				
		Poor		Worn from use: Between 20% - 50% loss of cross section.				
		Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.				
	Formed and finished surfaces – slippery, uneven, or misaligned				X			
	Cracking				X			
	Scaling							
	Spalls, pop outs, and delamination				X			
	Stains, Efflorescence							
	Exposed Reinforcement: Corrosion							
	Damage or distress				X			
	Missing or broken members				X			
	Collapse, partial collapse or structure off foundation							
	Damage or decay of chimney, parapet or other overhead falling hazard							
	Ground or slope movement present				X			
	Unstable supports – gaps or holes, excessive rotation, loss of bearing							
Curling and warping								
Erosion				X				
Previous Patching or Other Repair:								
Surface Coatings, Protective Systems, Linings, Toppings								
Penetrating Sealers								
Signs of Past Overflow on Rungs and Walls								
Debris Buildup								
Exposed Aggregate				X				
Leaks through Walls								
Structural Defects				X				
Moss				X				

FACILITIES CONDITION ASSESSMENT REPORT, PHASE I/II

REVISION 02/21/2025

Sediment Cleanup of Middle Reach of Lower Duwamish Waterway

Facility Name: ST04
 SeaTac Marine (Slip 3 South Side)
 Parcel Nos. 0001800104, 0001800128

WUS#: 26

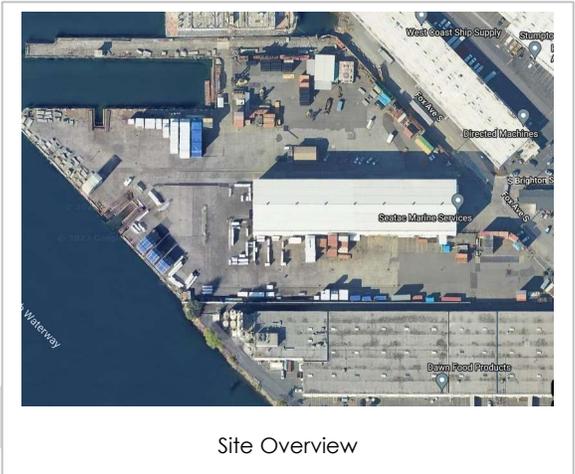
Facility Location: River Mile 2.1 to 2.2
 Direction (side) East
 STA 283+50 to STA 308+00

Asset Type: Wharf

Use: Cargo Handling

Inspection Date: August 8, 2022, July 9, 2024

Inspected By: Ade Bright and Stephanie Lor



General Condition and Evaluation:

Overall Condition Rating: Good Satisfactory Fair Poor Serious Critical

The facility is on the south shoreline of Slip 3, extending south. It comprises of a wharf on the south end running southeast to northwest, a vessel slip to the north running east to west formed by a finger pier to the north. A floating dock at the east end of the slip is accessible by a gangway at the east end of the finger pier. (Photos 1 to 4)

Inspection of the in-water structure was conducted from the waterside during low and high tides. Observations and field measurements are limited to boat accessible areas.

The wharf consists of:

- Pier decks
- Pier caps
- Piles
- Fender piles
- Bulkheads along the east shoreline

Pier Decks:

Pier decks consist mainly of precast concrete, timber in some sections, and occasional steel fill-in.

- Precast Concrete Pier Decks (Photos 5 to 18, 21 to 24):
 - Observation is limited to the soffit of the haunched decks, and topping material is not known.
 - The concrete surface of the deck soffit appears to be in good condition, except for occasional small spalls in the interior decks and at the top and bottom corners of the exterior decks.
 - Exposed reinforcing is observed on a few exterior decks.
 - A number of pipes/conduits and a cable tray are supported by the far side decks.

- Timber Decks:
 - The timber decking was observed along the north side of the finger pier. Close observation of the soffit was not possible. (Photo 27)
- Steel Decks:
 - The steel decks were observed at various sections and they appear to be fill-ins between pier bents, and around timber dolphins along the finger pier. The surface of the soffit appears to be in good condition. (Photos 14, 24, 28, and 29)

Pier Caps:

The pier caps consist mainly of concrete sections, except for timber along the north side of the finger pier.

- Spalls, cracks, and exposed reinforcing bars are observed on the outboard (berthing) face of several concrete pier caps. (Photos 15, 22, 23 and 28)
- Severe rots and loss of material was observed on several timber pier caps.

Piles:

- The majority of the piles are octagonal precast concrete piles, several square precast piles along the wharf, and rectangular precast concrete piles and timber piles along the north side of the finger pier.
- Piles in accessible areas appear to be in good condition, except for a jacketed concrete pile along the wharf. The condition of the pile inside the jacket is not known. (Photo 24)

Fender Piles:

- Fender piles consist of timber and steel pipe piles.
- A large number of the piles are damaged and several timber piles are broken.
- The surfaces of the piles appear to be in good condition, except for rust on the steel piles.

Bulkheads along the east shoreline (Photos 5 to 34):

- The bulkhead along the south end of the wharf consists of steel plate skirts with concrete cap and riprap along the toe. The steel plates are not embedded. The plates appear to be in good condition. (Photo 3)
- The bulkhead along the wharf, up to the north end of Slip 3, consists of steel sheet piles with riprap armoring at the toe and a slipped-line outfall. The sheet piles appear to be in good condition.
- North of Slip 3, the bulkhead consists of timber piles and lagging supplement with a steel wall with riprap armoring along the toe. The timber piles and lagging are deteriorated. (Photo 34)
- A number of pipes/conduits appear to be supported on the bulkhead.

Accessibility:

- On several bays, access to the under deck is restricted by the fender piles.
- Clearance under the decks is limited by the vessel size, height, draft, and tide level.
- Access to the south end bulkhead of the wharf is limited by the pile of riprap.

Potential Hazards:

- TBD

PHOTOGRAPHS



Photo ST04-01: Overall view of wharf (south)



Photo ST04-02: Bank at south end

PHOTOGRAPHS



Photo ST04-03: South end



Photo ST04-04: South end of wharf

PHOTOGRAPHS



Photo ST04-05: Enlargement of Photo ST04-02 showing debris and riprap



Photo ST04-06: Exterior view of typical continuous deck bay

PHOTOGRAPHS



Photo ST04-07: Interior view of typical bay

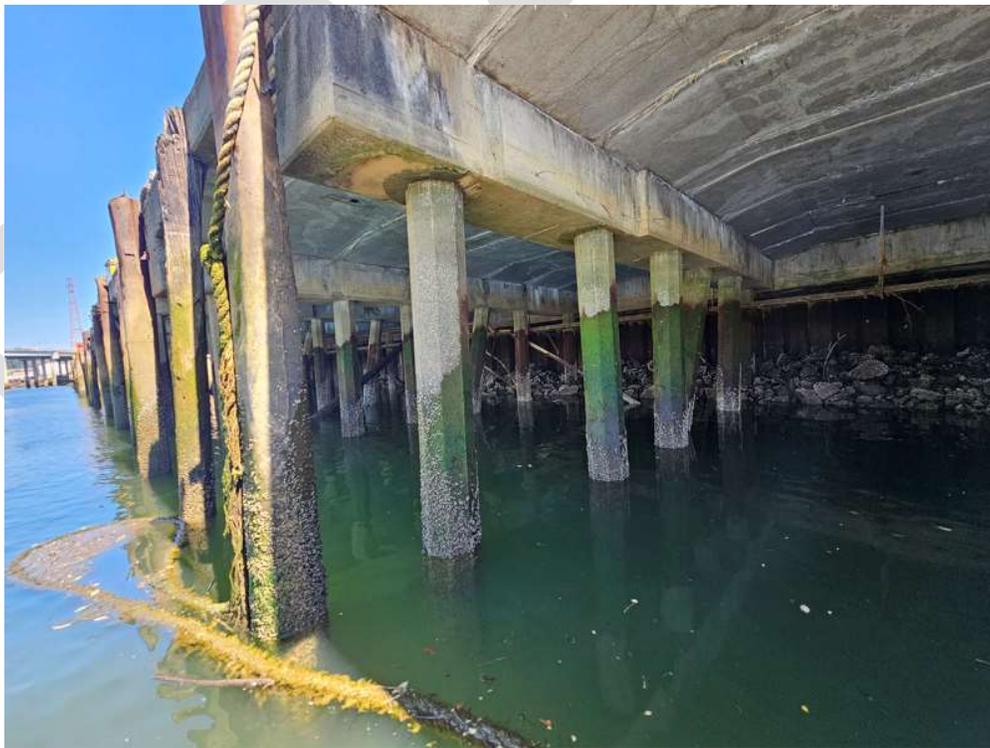


Photo ST04-08: Bulkhead and pile bents

PHOTOGRAPHS



Photo ST04-09: Bulkhead and pile bents

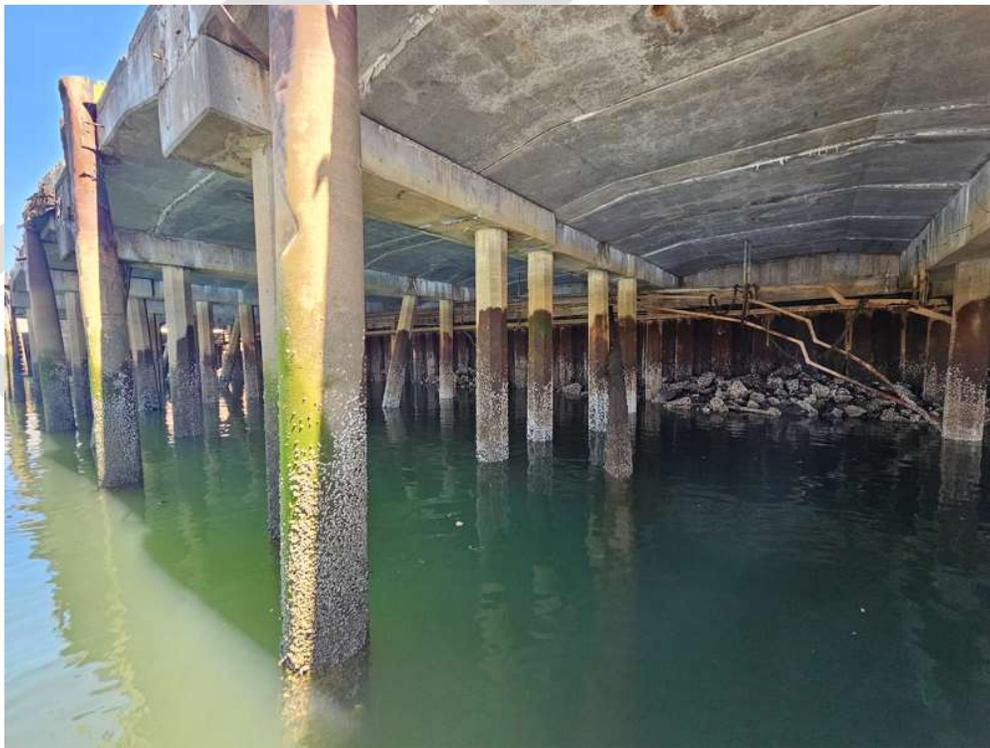


Photo ST04-10: Bulkhead and pile bents

PHOTOGRAPHS



Photo ST04-11: Typical pile cap



Photo ST04-12: Pile cap damage at south end of wharf

PHOTOGRAPHS



Photo ST04-13: Overall view of wharf (north)



Photo ST04-14: Exterior view of typical single span deck bay (north wharf)

PHOTOGRAPHS



Photo ST04-15: Pile cap damage (north end of wharf)



Photo ST04-16: North end of wharf

PHOTOGRAPHS



Photo ST04-17: North end of wharf

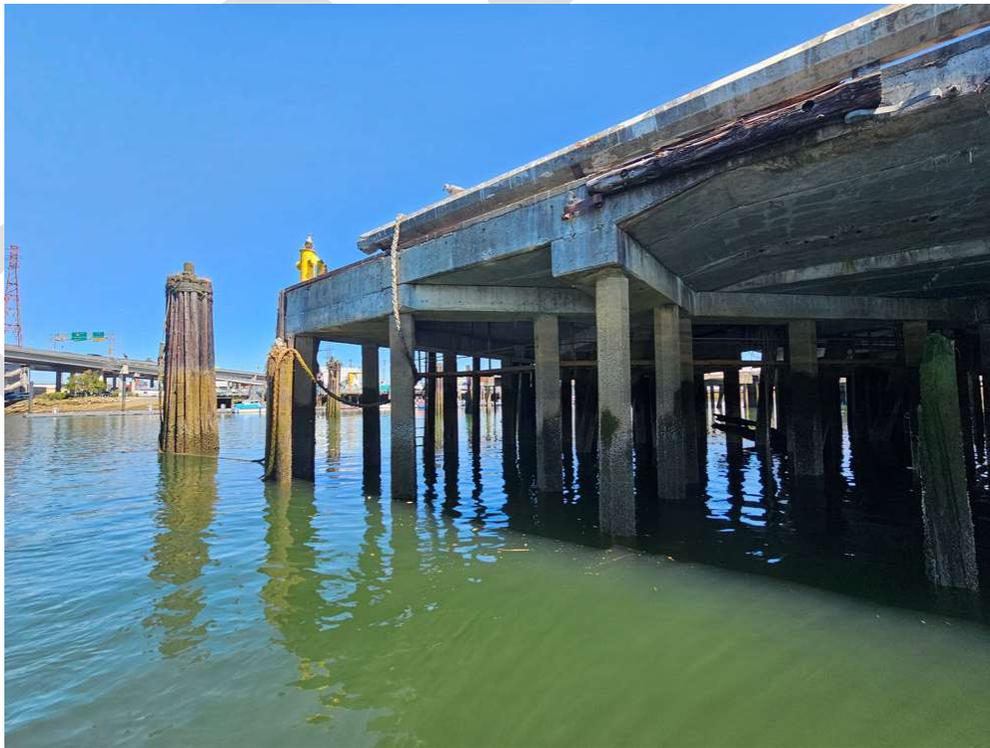


Photo ST04-18: Northwest corner of north end wharf

PHOTOGRAPHS



Photo ST04-19: Approach to Slip 3



Photo ST04-20: North end of north wharf

PHOTOGRAPHS



Photo ST04-21: Slip 3 (looking east)



Photo ST04-22: Pile cap damage (north end of wharf)

PHOTOGRAPHS



Photo ST04-23: Pile cap damage at wharf south side of Slip 3



Photo ST04-24: Wharf at south side of Slip 3

PHOTOGRAPHS



Photo ST04-25: Slip 3 (looking east)

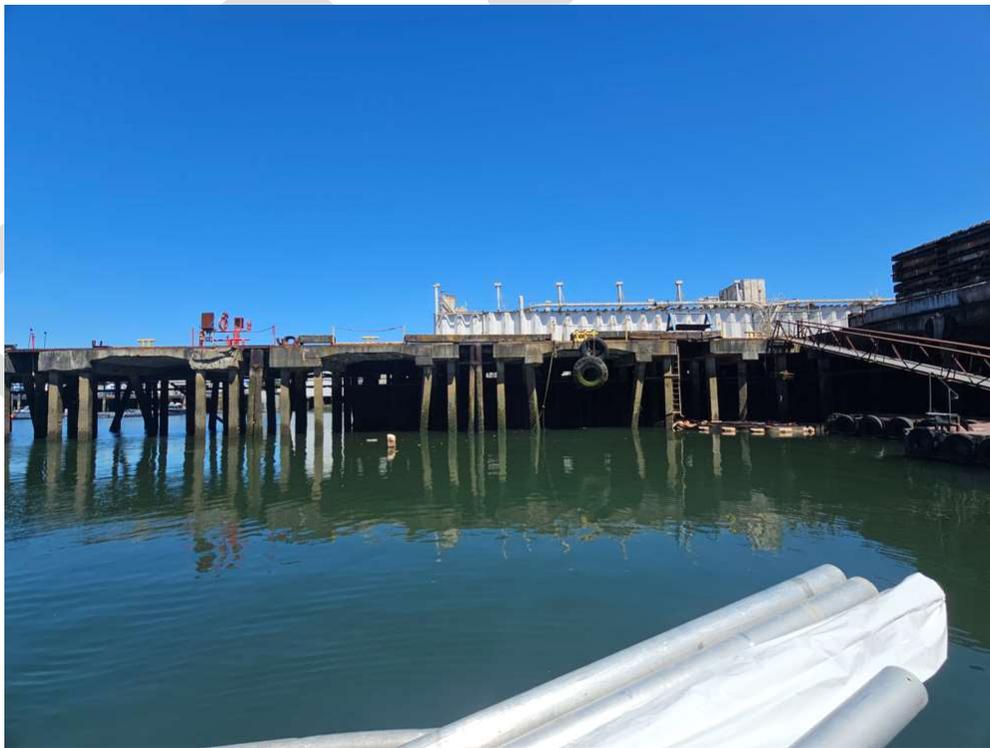


Photo ST04-26: Finger pier at Slip 3 (looking north)

PHOTOGRAPHS



Photo ST04-27: Finger pier north side of Slip 3 (looking north)

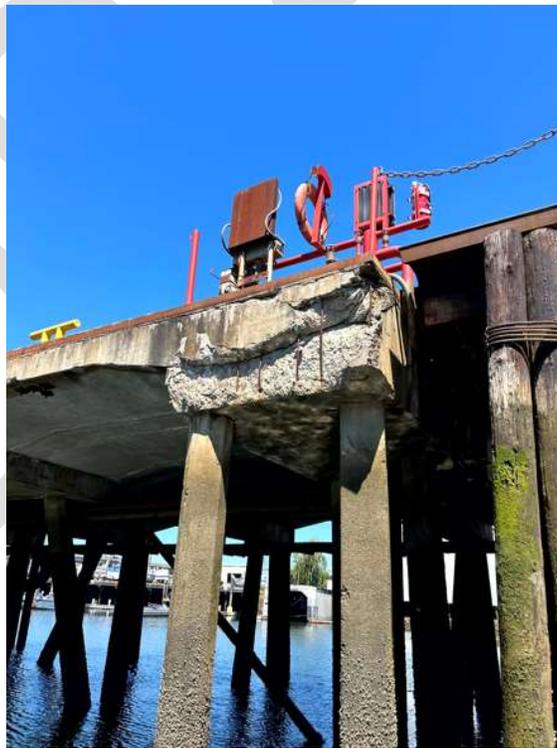


Photo ST04-28: Pile cap damage at south side of finger pier

PHOTOGRAPHS



Photo ST04-29: North end of finger pier

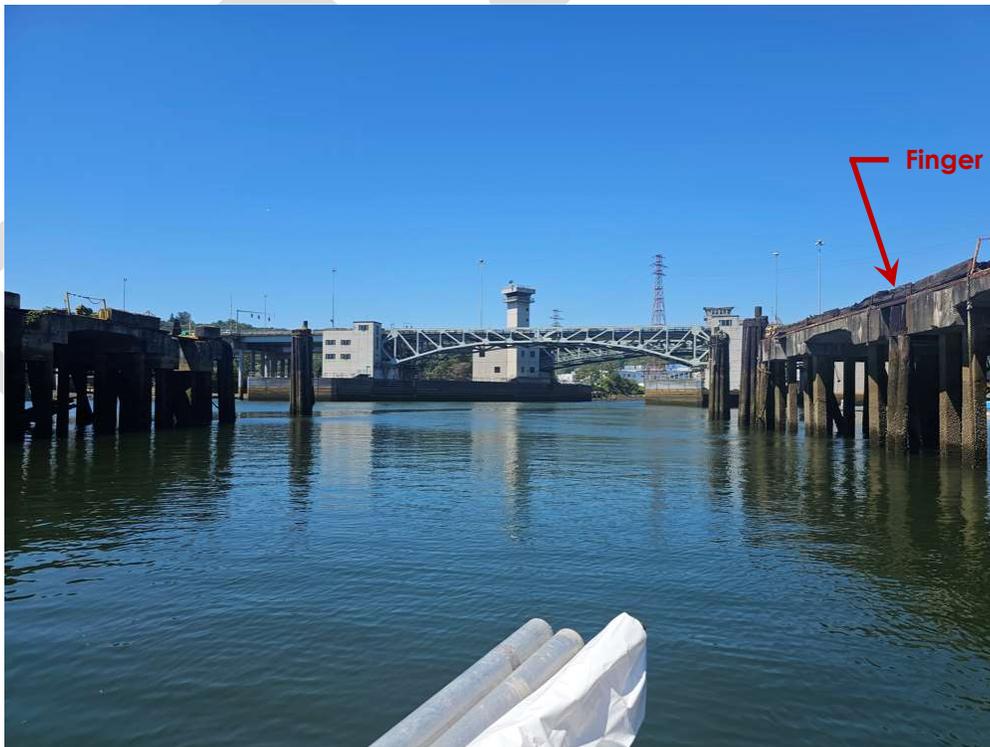


Photo ST04-30: Finger pier (looking north)

PHOTOGRAPHS



Photo ST04-31: Southwest corner of finger pier

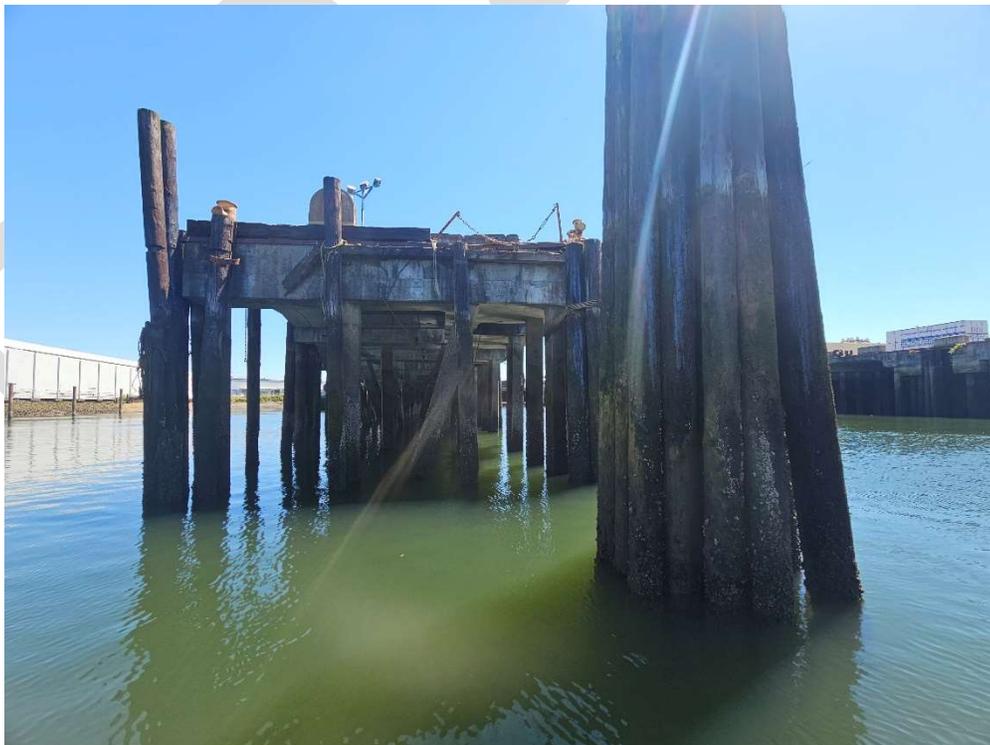


Photo ST04-32: Finger pier (looking south)

PHOTOGRAPHS



Photo ST04-33: Northwest corner of finger pier



Photo ST04-34: Bulkhead north of Slip 3 (looking south)

CONCRETE MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A – Exposure		1B – Drainage		1C – Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Flashing		Expansive soil
		Freezing and thawing		Joint sealants		Compressive soil (settlement)
	X	Wetting and drying		Weepholes		Evidence of pumping
		Drying under dry atmosphere		Contour		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Elevation of drains		Steep or unstable slope/revetment
	X	Abrasion, erosion, cavitation, impact				
		Heat from adjacent sources				

2. DISTRESS INDICATORS	
X	Cracking or Breakage
X	Staining
X	Surface deposits and exudations
	Leaking

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure			
		Settlement	X	Deflection/Leaning
				Expansion
				Contraction
	3B – Surface Condition			
	General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
		Good	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.
		Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
		Poor		Worn from use: Between 20% - 50% loss of cross section.
		Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.
		Formed and finished surfaces – slippery, uneven, or misaligned		
		Cracking	X	
		Scaling		
		Spalls, pop outs, and delamination	X	
		Stains, Efflorescence	X	
		Exposed Reinforcement: Corrosion	X	
		Damage or distress	X	
		Missing or broken members		
		Collapse, partial collapse or structure off foundation		
		Damage or decay of chimney, parapet or other overhead falling hazard		
	Ground or slope movement present			
	Unstable supports – gaps or holes, excessive rotation, loss of bearing			
	Curling and warping			
	Erosion			
	Previous Patching or Other Repair:	X		
	Surface Coatings, Protective Systems, Linings, Toppings			
	Penetrating Sealers			
	Signs of Past Overflow on Rungs and Walls			
	Debris Buildup	X		
	Exposed Aggregate	X		
	Leaks through Walls			
	Structural Defects	X		
	Moss	X		

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A – Exposure		1B – Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
		Freezing and thawing		Compressive soil (settlement)
	X	Wetting and drying		Evidence of pumping
		Drying under dry atmosphere		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
	X	Abrasion, erosion, impact		
	Heat from adjacent sources			

2. DISTRESS INDICATORS	X	Cracking or breakage
	X	Rot and decay
	X	Surface deposits
		Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure					
	Settlement	X	Deflection/Leaning	Expansion	Contraction	
	3B – Surface Condition					
	General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.		
		Good	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.		
		Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.		
		Poor		Worn from use: Between 20% - 50% loss of cross section.		
		Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.		
	Finished surfaces – slippery, uneven, or misaligned		X			
	Cracking		X			
	Loss of Material		X			
	Missing or broken members		X			
	Damage or distress		X			
	Collapse, partial collapse or structure off foundation					
	Damage or decay of chimney, parapet or other overhead falling hazard					
	Ground or slope movement present					
	Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot					
	Fasteners: Corrosion			X		
	Soft timber and decay			X		
	Abrasion			X		
Previous Repair						
Surface Coatings, Protective Systems			X			
Debris Buildup			X			
Structural Defects			X			
Moss			X			

STEEL MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A – Exposure		1B – Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
		Freezing and thawing		Compressive soil (settlement)
	X	Wetting and drying		Evidence of pumping
		Drying under dry atmosphere		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
	X	Abrasion, impact		
	Heat from adjacent sources			

2. DISTRESS INDICATORS	X	Member cracking or breakage
	X	Staining, corrosion
	X	Surface deposits
	X	Weld cracking or breakage

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure			
		Settlement	X	Deflection/Leaning
	3B – Surface Condition			
	General Condition	<u>Excellent</u>		New or near-new condition: no issues to report. No loss of cross section.
		<u>Good</u>	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.
		<u>Fair</u>		Average wear; not new but no issues to report. Between 5% - 20% cross section.
		<u>Poor</u>		Worn from use: Between 20% - 50% loss of cross section.
		<u>Critical</u>		Extremely worn or damaged: Between 50% - 80% loss of cross section.
		Finished surfaces – slippery, uneven, or misaligned	X	
		Cracking	X	
		Rust and scale	X	
		Loss of Material	X	
		Missing or broken members	X	
		Damage or distress	X	
		Collapse, partial collapse or structure off foundation	X	
		Damage or decay of chimney, parapet or other overhead falling hazard		
		Ground or slope movement present	X	
		Unstable supports – gaps or holes, excessive rotation, loss of bearing	X	
		Stains	X	
		Corrosion	X	
	Abrasion	X		
	Previous Repair	X		
	Surface Coatings	X		
	Debris Buildup	X		
	Structural Defects	X		
	Moss	X		

FACILITIES CONDITION ASSESSMENT REPORT, PHASE I/II

REVISION 02/21/2025

Sediment Cleanup of Middle Reach of Lower Duwamish Waterway

Facility Name: ST09
 8th Avenue Terminal (Slip 4 North Side)
 Parcel Nos. 2136200641

WUS#: 36

Facility Location: River Mile 2.8
 Direction (side) East

Asset Type: Wharf

Use: Cargo Handling

Inspection Date: August 8, 2022, July 8, 2024

Inspected By: Ade Bright and Stephanie Lor



General Condition and Evaluation:

Overall Condition Rating: Good Satisfactory Fair Poor Serious Critical

Inspection was conducted from the water side during high and low tides. Observations are limited to boat accessible areas and no measurements were taken.

The wharf is along the south bank of Slip 4 with two kinks—NW to SE leg, W-E leg, and SW-NE leg. Along the NE-SE leg, E-W leg, and between the E-W and SW-NE legs are large notches/slots in the deck for steel transfer spans. At the east end of the SW-NE wharf are timber debris deflection logs.

The structure consists of:

- Haunched concrete deck panels: The soffit surface of the deck panels appear to be in good condition. Deck topping material was not observed. A number of pipes and conduits are supported under the deck. (Photos 5 to 16)
- Concrete pile caps: The caps appear to be in good condition. (Photos 5 and 10 to 16)
- Octagonal prestressed piles: The piles appear to be in good condition. (Photos 5 to 16)
- Steel sheet pile bulkhead:
 - The sheet piles are tied-back. Some rust was observed on the surface of the sheets and walers. (Photos 9 and 15 to 21)
 - The condition of the tieback and trumpet is not known.
 - Sheet piles extend along the bank beyond the SW-NE leg of the wharf/cove. (Photos 15 to 19)
 - There are several outfalls or discharge pipes projecting through the bulkhead. (Photos 8, 9, and 21)
- Bank protection: Bank protection along the shoreline and the toe of the bulkhead consists of quarry spalls, timber stub piles, concrete panels and concrete rubble. (Photos 1 to 5, 9, and 15 to 21)

- Dolphins: There are several dolphins consisting of:
 - At the west approach—single steel pipe pile, 4-steel pile cluster with rubber fenders and a 14-timber cluster. (Photos 1 to 4)
 - Along the berthing face—7 (?) large diameter steel monopiles with ring-shaped fender around waterline (Photos 7, 10, 13, and 14)
 - All fenders appear to be in good condition.
- Fender piles: Fendering system consists of timber piles, HDPE jacketed steel pipe piles. The steel and timber piles appear to be in good condition, but some timber piles are damaged or broken. (Photos 4 to 7, 11, and 14 to 16)

Accessibility:

- Access to some bays is restricted by the fender piles or dolphins.
- Clearance under the deck is limited by vessel size, height, draft, and tide level.
- Access to the bulkhead along the wharf is limited by stub piles and bank protection.

Potential Hazards:

- *To be completed*

PHOTOGRAPHS



Photo ST09-01: North approach

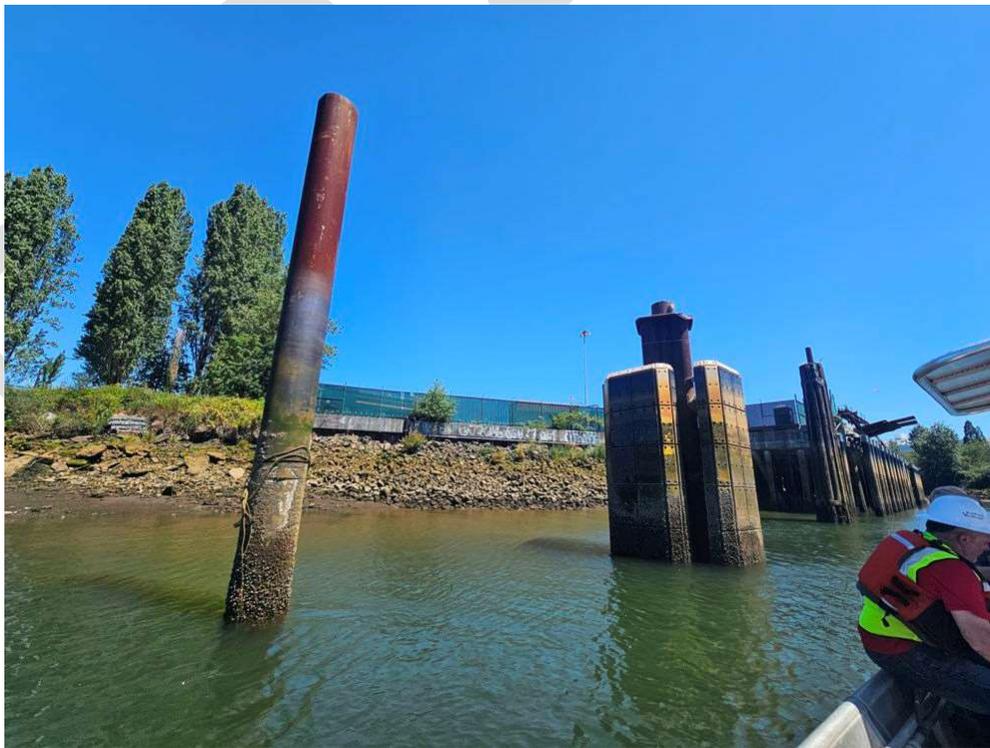


Photo ST09-02: North approach

PHOTOGRAPHS



Photo ST09-03: Dolphins at west end

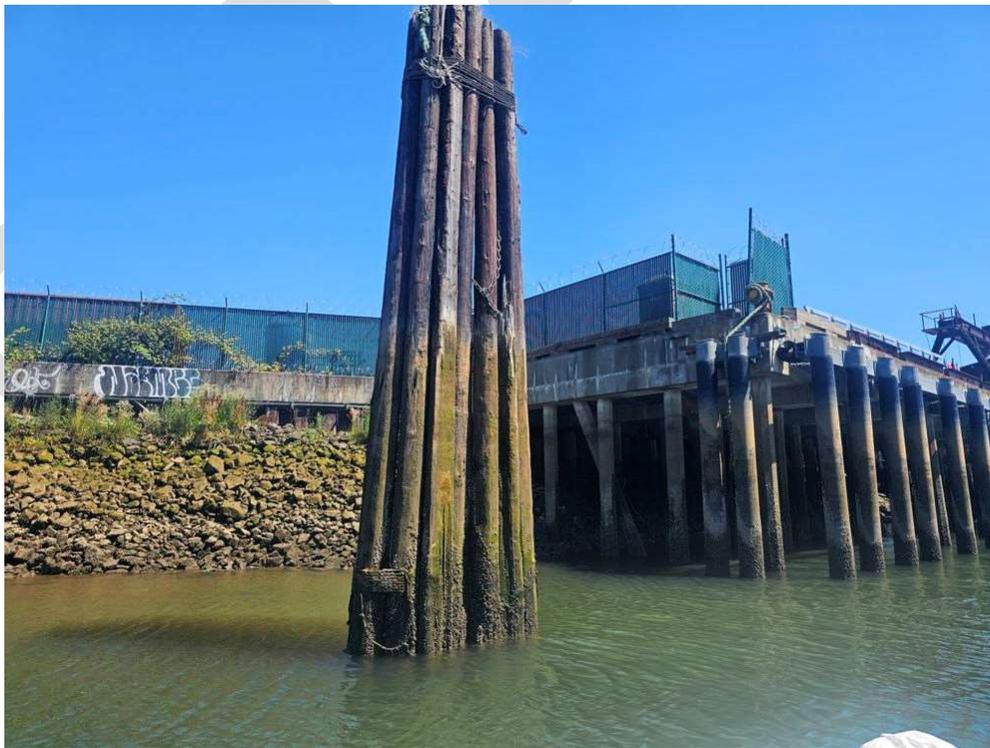


Photo ST09-04: North end of NW-SE leg

PHOTOGRAPHS



Photo ST09-05: NW-SE leg



Photo ST09-06: Notch at the NW-SE leg

PHOTOGRAPHS



Photo ST09-07: South end of NW-SE leg



Photo ST09-08: East End of NW-SE leg

PHOTOGRAPHS

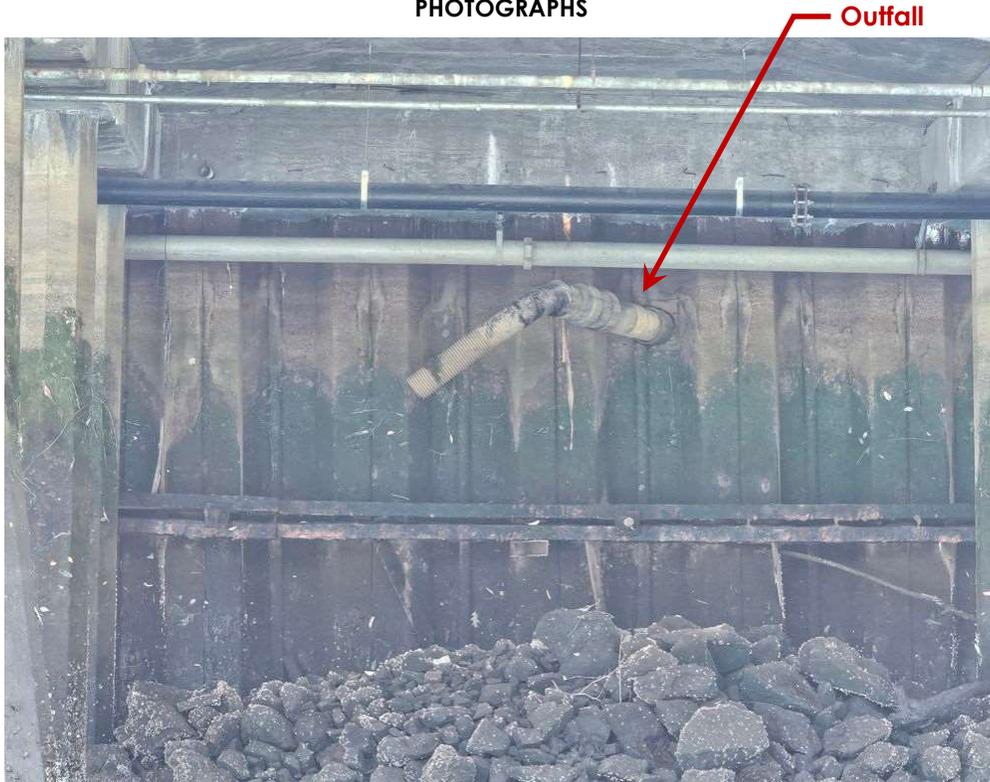


Photo ST09-09: Enlarged outfall



Photo ST09-10: E-W leg of wharf

PHOTOGRAPHS

Transfer Span

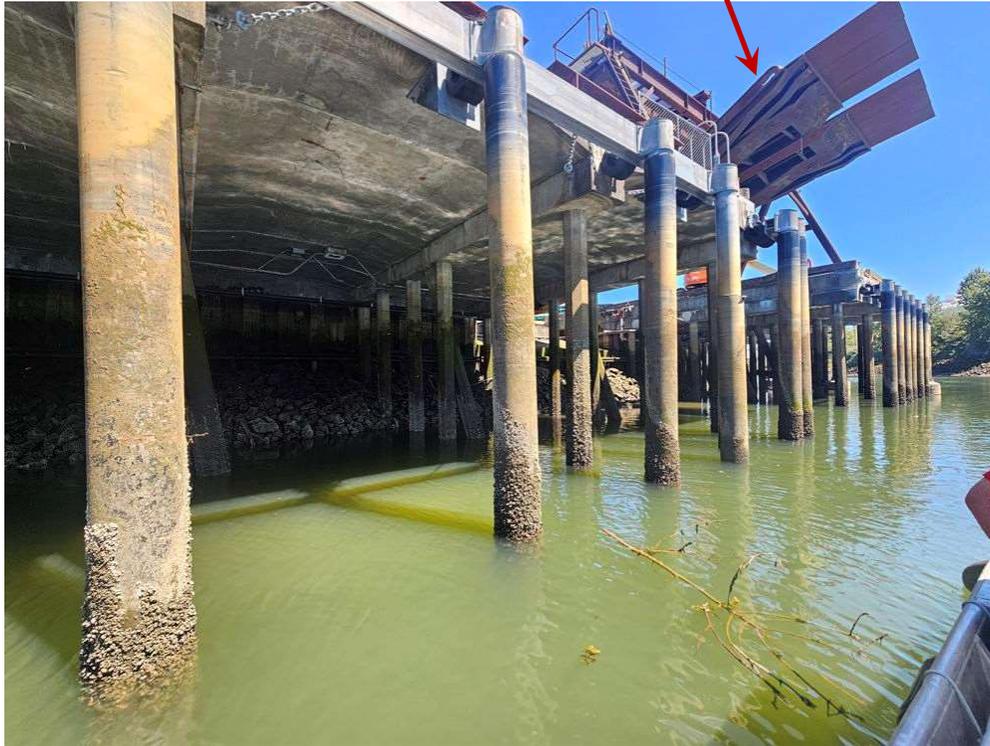


Photo ST09-11: E-W and SW-NE legs

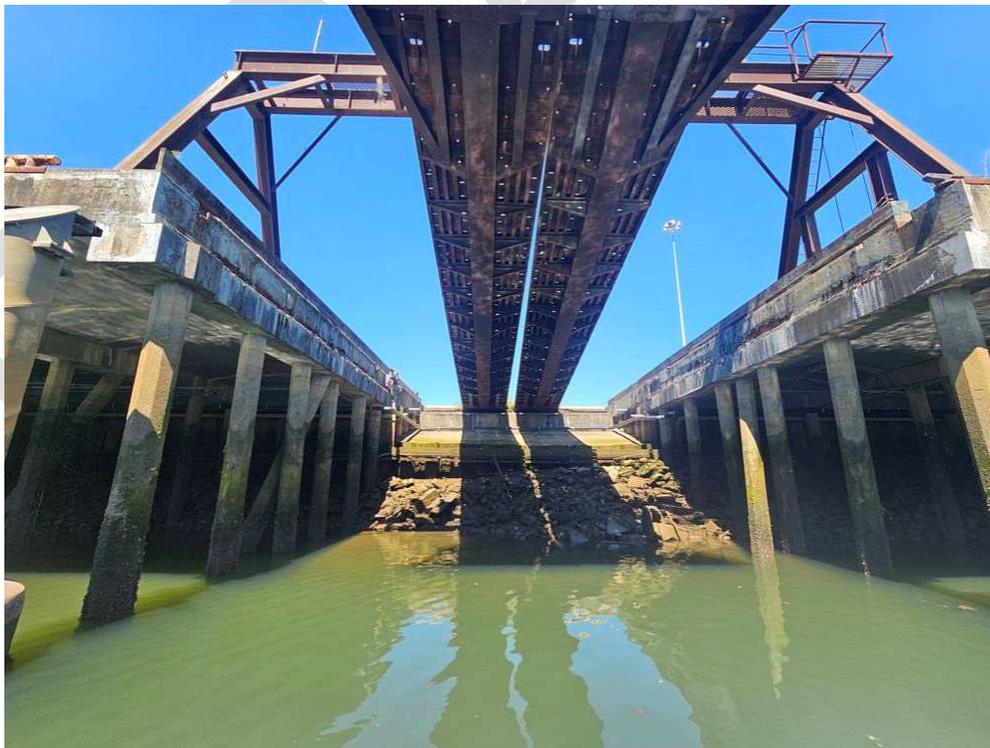


Photo ST09-12: Transfer span between E-W and SW-NE legs

PHOTOGRAPHS



Photo ST09-13: SW-NE wharf leg

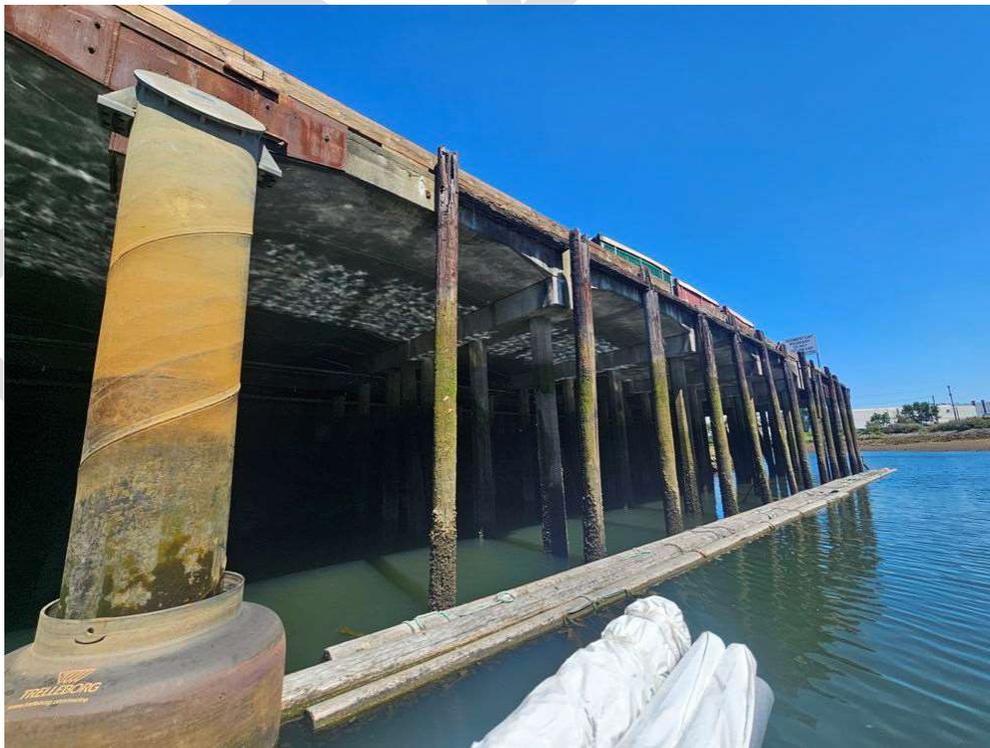


Photo ST09-14: East end of SW-NE leg

PHOTOGRAPHS

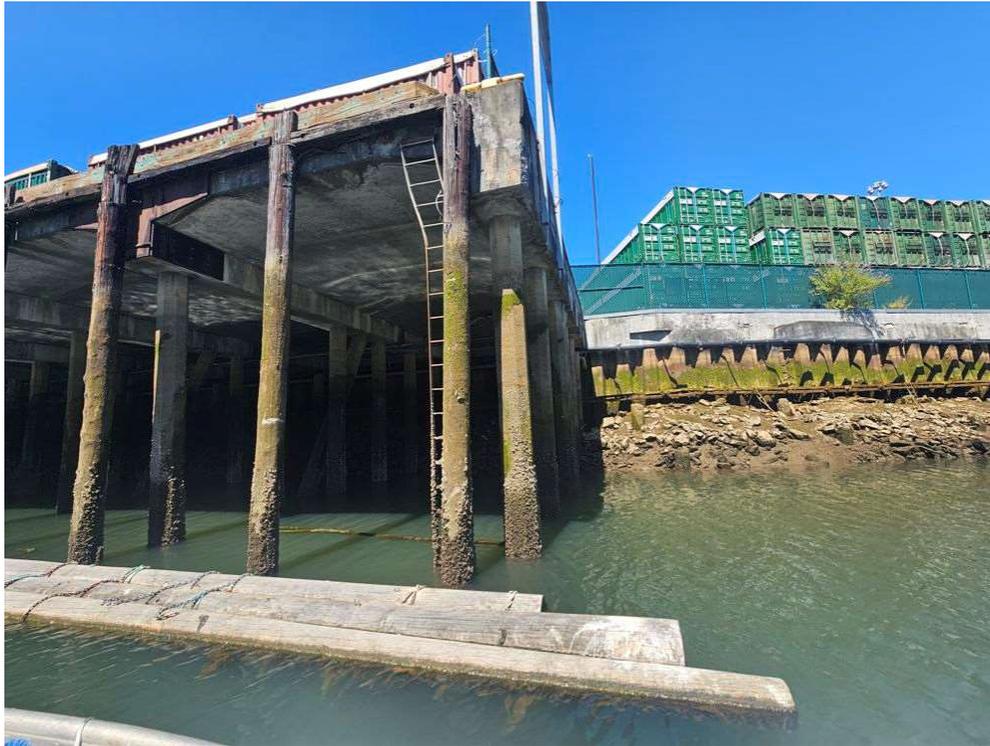


Photo ST09-15: East end of SW-NE leg

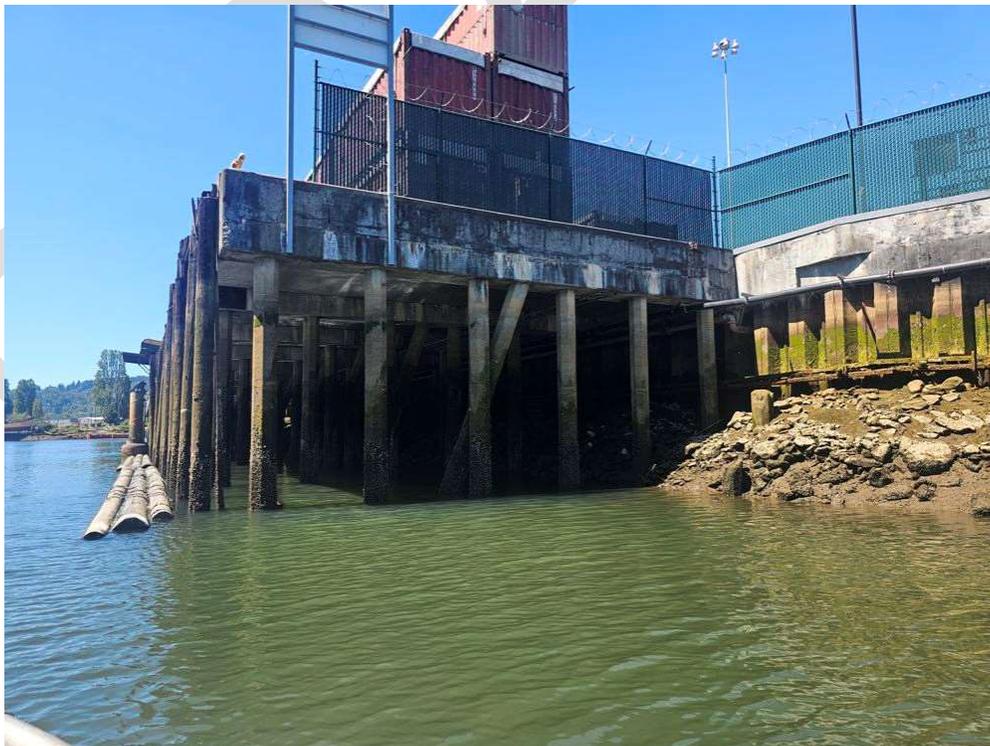


Photo ST09-16: East face of SW-NE wharf

PHOTOGRAPHS



Photo ST09-17: Bulkhead along cove



Photo ST09-18: Bulkhead along the cove

PHOTOGRAPHS



Photo ST09-19: East end of bulkhead



Photo ST09-20: Typical bank protection

PHOTOGRAPHS



Photo ST09-21: Outfall

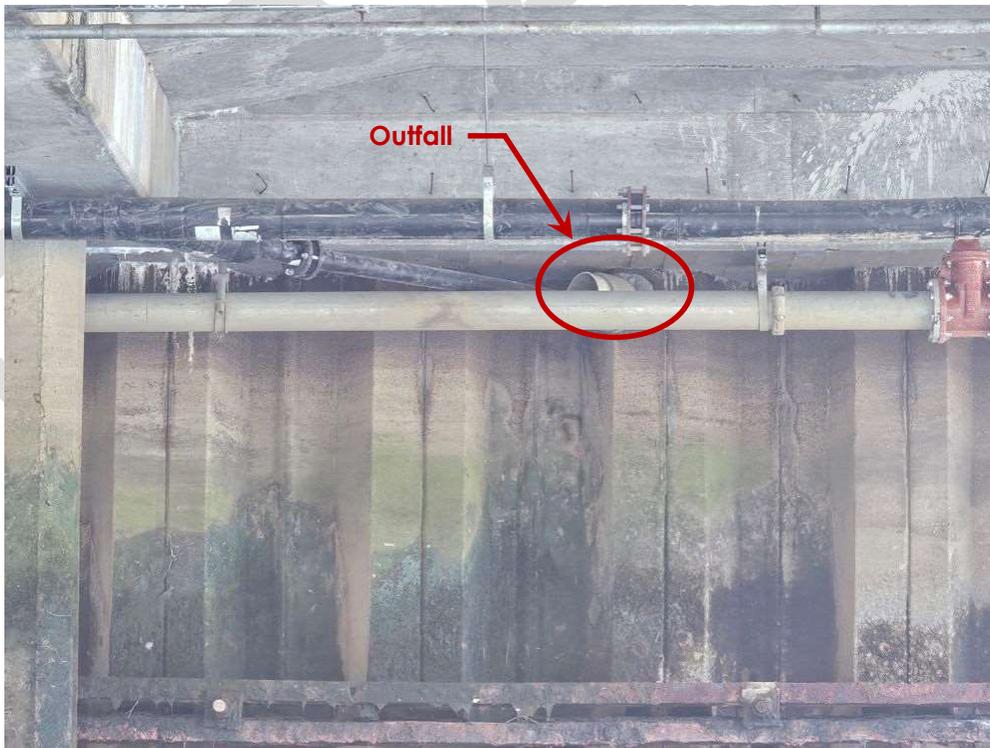


Photo ST09-22: Outfall

PHOTOGRAPHS



Photo ST09-23: Outfall



Photo ST09-24: Enlarged Outfall

CONCRETE MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A – Exposure		1B – Drainage		1C – Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Flashing		Expansive soil
		Freezing and thawing		Joint sealants		Compressive soil (settlement)
	X	Wetting and drying		Weepholes		Evidence of pumping
		Drying under dry atmosphere		Contour		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Elevation of drains		Steep or unstable slope/revetment
	X	Abrasion, erosion, cavitation, impact				
		Heat from adjacent sources				

2. DISTRESS INDICATORS	
X	Cracking or Breakage
X	Staining
X	Surface deposits and exudations
	Leaking

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure						
		Settlement	X	Deflection/Leaning		Expansion	Contraction
	3B – Surface Condition						
	General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.			
		Good	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.			
		Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.			
		Poor		Worn from use: Between 20% - 50% loss of cross section.			
		Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.			
		Formed and finished surfaces – slippery, uneven, or misaligned					
		Cracking					
		Scaling					
		Spalls, pop outs, and delamination					
		Stains, Efflorescence					
		Exposed Reinforcement: Corrosion					
		Damage or distress					
		Missing or broken members					
		Collapse, partial collapse or structure off foundation					
		Damage or decay of chimney, parapet or other overhead falling hazard					
		Ground or slope movement present					
		Unstable supports – gaps or holes, excessive rotation, loss of bearing					
	Curling and warping						
	Erosion						
	Previous Patching or Other Repair:						
	Surface Coatings, Protective Systems, Linings, Toppings						
	Penetrating Sealers						
	Signs of Past Overflow on Rungs and Walls						
	Debris Buildup		X				
	Exposed Aggregate						
	Leaks through Walls						
	Structural Defects						
	Moss			X			

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A – Exposure		1B – Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
		Freezing and thawing		Compressive soil (settlement)
	X	Wetting and drying		Evidence of pumping
		Drying under dry atmosphere		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
	X	Abrasion, erosion, impact		
X	Heat from adjacent sources			

2. DISTRESS INDICATORS	X	Cracking or breakage
	X	Rot and decay
	X	Surface deposits
	X	Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A – Overall Apparent Alignment of Structure						
		Settlement	X	Deflection/Leaning		Expansion	Contraction
	3B – Surface Condition						
	General Condition	<u>Excellent</u>		New or near-new condition: no issues to report. No loss of cross section.			
		<u>Good</u>	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.			
		<u>Fair</u>		Average wear; not new but no issues to report. Between 5% - 20% cross section.			
		<u>Poor</u>		Worn from use: Between 20% - 50% loss of cross section.			
		<u>Critical</u>		Extremely worn or damaged: Between 50% - 80% loss of cross section.			
	Finished surfaces – slippery, uneven, or misaligned		X				
	Cracking		X				
	Loss of Material		X				
	Missing or broken members		X				
	Damage or distress		X				
	Collapse, partial collapse or structure off foundation						
	Damage or decay of chimney, parapet or other overhead falling hazard						
	Ground or slope movement present						
	Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot						
Fasteners: Corrosion			X				
Soft timber and decay							
Abrasion			X				
Previous Repair							
Surface Coatings, Protective Systems			X				
Debris Buildup			X				
Structural Defects							
Moss			X				

STEEL MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A – Exposure		1B – Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
		Freezing and thawing		Compressive soil
	X	Wetting and drying		Evidence of pumping
		Drying under dry atmosphere		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
	X	Abrasion, impact		
	Heat from adjacent sources			

2. DISTRESS INDICATORS	X	Member cracking or breakage
	X	Staining, corrosion
	X	Surface deposits
		Weld cracking or breakage

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure				
		Settlement		Deflection/Leaning	
	3B – Surface Condition				
	General Condition	<u>Excellent</u>		New or near-new condition: no issues to report. No loss of cross section.	
		<u>Good</u>	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.	
		<u>Fair</u>		Average wear; not new but no issues to report. Between 5% - 20% cross section.	
		<u>Poor</u>		Worn from use: Between 20% - 50% loss of cross section.	
		<u>Critical</u>		Extremely worn or damaged: Between 50% - 80% loss of cross section.	
		Finished surfaces – slippery, uneven, or misaligned			
		Cracking			
		Rust and scale		X	
		Loss of Material			
		Missing or broken members		X	
		Damage or distress			
		Collapse, partial collapse or structure off foundation			
		Damage or decay of chimney, parapet or other overhead falling hazard			
		Ground or slope movement present			
		Unstable supports – gaps or holes, excessive rotation, loss of bearing			
		Stains		X	
		Corrosion		X	
	Abrasion				
	Previous Repair				
	Surface Coatings		X		
	Debris Buildup		X		
	Structural Defects				
	Moss		X		

FACILITIES CONDITION ASSESSMENT REPORT, PHASE I/II

REVISION 02/21/2025

Sediment Cleanup of Middle Reach of Lower Duwamish Waterway

Facility Name: ST10 – Historic Intake Structure Building
Parcel Nos. 2136200670

WUS#: 63

Facility Location: River Mile 2.7

Direction (side) East

Asset Type: Water Intake Structure

Use: Inactive

Inspection Date: July 8, 2024, October 15, 2024

Inspected By: Ade Bright and Stephanie Lor



Site Overview

General Condition and Evaluation:

Overall Condition Rating: Good Satisfactory Fair Poor Serious Critical

This is an historic building and no modification of the building is permitted. Inspection of the in-water structure was conducted from the water side during low and high tides, and bank inspection during low tide. Inspection is limited to exterior parts of the building and wing walls. (Photos 1 to 4)

This facility consists of:

- Intake building
- Timber wing walls and bulkheads
- Riprap banks

Intake Building

- This is classified as an historic concrete building and may not be modified.
- Inspection was limited to the south side of the building, which is accessible by land side and along the bank at low tide. The interior of the building was not inspected.
- The concrete surface of the structure exhibits some wear, weathering, and loss of concrete mortar in the tidal zone, but appears to be in good condition. (Photos 11 , 12, 17, and 25)
- The metal screen at the two intakes are worn, especially at the bottom sections. (Photo 17)

Timber Wing Walls

The bank consists of derelict timber piles at the north end; a cove with a concrete retaining wall nearshore and concrete rubble armor on the shoreline; a timber bulkhead and a timber fendering wing wall system north of the intake structure; the intake structure; another timber bulkhead wall and timber fendering wing wall system south of the intake structure; and a concrete rubble armored bank to the south. (Photos 1, and 4 to 8)

- The fendering system consists of: 12" diameter timber piles in line with soldier piles, offset 4 feet. The piles show wear in the tidal zone, up to 1" of loss of material and 1/8" spike penetration, but are in good condition. (Photos 9, 10, 13, 16, 18 to 22, and 26)

- An 8x12 longitudinal timber beam connects the fender piles near their top. The beams are in good condition. (Photos 20 and 21)
- Timber connections consist of Rosette Head fasteners. The fasteners are in good condition. (Photo 21)
- The top of the soldier piles are cross-connected to the longitudinal beam with a pair of 6x16 timber beams, with blocking. The cross beams are in good condition. (Photos 21, 22, and 26)
- Along the path behind the bulkhead are several timber piles. The function of these piles are unknown. (Photos 23 to 27)

Accessibility:

- Access to the bank north and south of the building is limited by the bulkheads and fendering wing walls.

Potential Hazards:

-

DRAFT

PHOTOGRAPHS



Photo ST10-01: Structure looking southeast



Photo ST10-02: Structure looking northeast

PHOTOGRAPHS



Photo ST10-03: Structure looking east



Photo ST10-04: North end of bank looking east

PHOTOGRAPHS



Photo ST10-05: Cove looking east



Photo ST10-06: North bank looking northeast

PHOTOGRAPHS



Photo ST10-07: North end of bulkhead



Photo ST10-08: North end of fendering system

PHOTOGRAPHS



Photo ST10-09: North fendering system



Photo ST10-10: South end of north fendering system

PHOTOGRAPHS



Photo 11: Intake structure



Photo ST10-12: South fendering system

PHOTOGRAPHS



Photo ST10-13: South end of south fendering system



Photo ST10-14: South end of shoreline

PHOTOGRAPHS



Photo ST10-15: South end of bank



Photo ST10-16: Enlargement of south bulkhead and fendering system

PHOTOGRAPHS



Photo ST10-17: Intake Screen

Decommissioned outfall

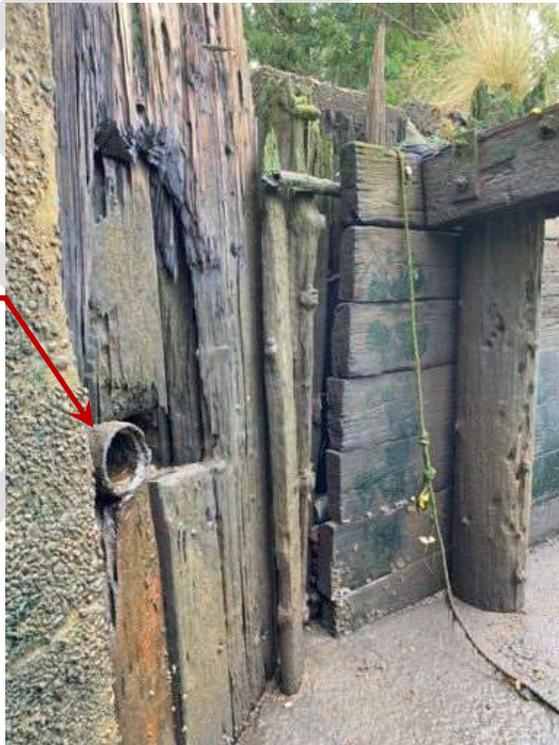


Photo ST10-18: Build to south bulkhead interface

PHOTOGRAPHS

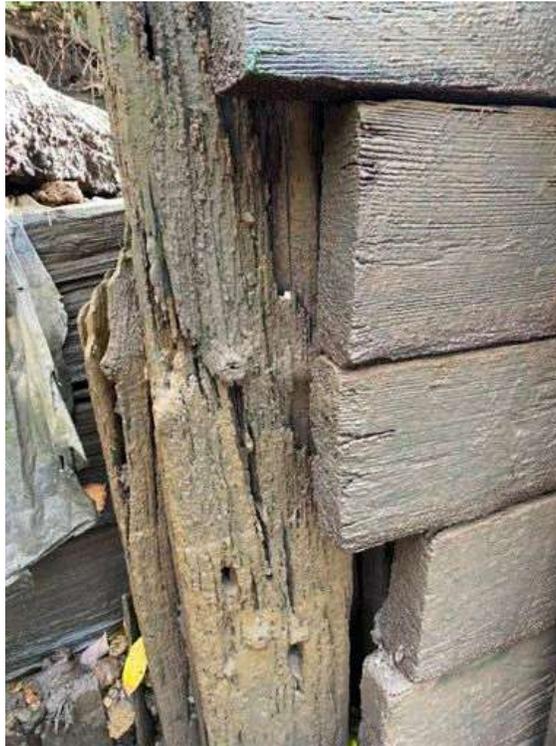


Photo ST10-19: Bulkhead assembly

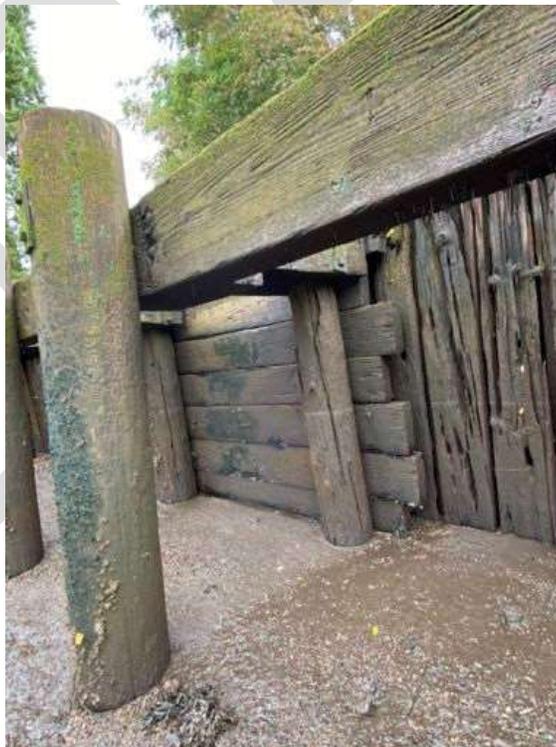


Photo ST10-20: Bulkhead and fendering system

PHOTOGRAPHS



Photo ST10-21: Fender and soldier pile looking north



Photo ST10-22: Fender pile to soldier pile connection

PHOTOGRAPHS



Photo ST10-23: Path looking north



Photo ST10-24: Path looking north

PHOTOGRAPHS



Photo ST10-25: Path looking north



Photo ST10-26: Path looking south

PHOTOGRAPHS



Photo ST10-27: Path looking southwest

CONCRETE MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A – Exposure		1B – Drainage		1C – Soils (Foundation Conditions)		
	X	Environment (Marine, Freshwater, Industrial, etc.)		Flashing		Expansive soil	
		Freezing and thawing		Joint sealants		Compressive soil (settlement)	
	X	Wetting and drying		Weepholes		Evidence of pumping	
		Drying under dry atmosphere		Contour		Scour	
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Elevation of drains		Steep or unstable slope/revetment	
	X	Abrasion, erosion, cavitation, impact					
		Heat from adjacent sources					

2. DISTRESS INDICATORS	
X	Cracking or Breakage
X	Staining
X	Surface deposits and exudations
	Leaking

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure							
	X	Settlement	X	Deflection/Leaning		Expansion		Contraction
	3B – Surface Condition							
	General Condition	<u>Excellent</u>		New or near-new condition: no issues to report. No loss of cross section.				
		<u>Good</u>		Good condition: no reported issues or concerns. Less than 5% loss of cross section.				
		<u>Fair</u>	X	Average wear; not new but no issues to report. Between 5% - 20% cross section.				
		<u>Poor</u>		Worn from use: Between 20% - 50% loss of cross section.				
		<u>Critical</u>		Extremely worn or damaged: Between 50% - 80% loss of cross section.				
		Formed and finished surfaces – slippery, uneven, or misaligned						
		Cracking						
		Scaling						
		Spalls, pop outs, and delamination						
		Stains, Efflorescence						
		Exposed Reinforcement: Corrosion						
		Damage or distress						
		Missing or broken members						
		Collapse, partial collapse or structure off foundation						
		Damage or decay of chimney, parapet or other overhead falling hazard						
		Ground or slope movement present						
		Unstable supports – gaps or holes, excessive rotation, loss of bearing						
	Curling and warping							
	Erosion							
	Previous Patching or Other Repair:							
	Surface Coatings, Protective Systems, Linings, Toppings							
	Penetrating Sealers							
	Signs of Past Overflow on Rungs and Walls							
	Debris Buildup							X
	Exposed Aggregate							
	Leaks through Walls							
	Structural Defects							
	Moss							X

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A – Exposure		1B – Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
		Freezing and thawing		Compressive soil (settlement)
	X	Wetting and drying		Evidence of pumping
		Drying under dry atmosphere		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
	X	Abrasion, erosion, impact		
		Heat from adjacent sources		

2. DISTRESS INDICATORS	X	Cracking or breakage
	X	Rot and decay
	X	Surface deposits
	X	Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure					
	Settlement	X	Deflection/Leaning	Expansion	Contraction	
	3B – Surface Condition					
	General Condition	<u>Excellent</u>		New or near-new condition: no issues to report. No loss of cross section.		
		<u>Good</u>		Good condition: no reported issues or concerns. Less than 5% loss of cross section.		
		<u>Fair</u>	X	Average wear; not new but no issues to report. Between 5% - 20% cross section.		
		<u>Poor</u>		Worn from use: Between 20% - 50% loss of cross section.		
		<u>Critical</u>		Extremely worn or damaged: Between 50% - 80% loss of cross section.		
	Finished surfaces – slippery, uneven, or misaligned	X				
	Cracking	X				
	Loss of Material	X				
	Missing or broken members	X				
	Damage or distress	X				
	Collapse, partial collapse or structure off foundation					
	Damage or decay of chimney, parapet or other overhead falling hazard					
	Ground or slope movement present					
	Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot					
	Fasteners: Corrosion	X				
Soft timber and decay	X					
Abrasion						
Previous Repair						
Surface Coatings, Protective Systems	X					
Debris Buildup	X					
Structural Defects	X					
Moss	X					

STEEL MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A – Exposure		1B – Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
		Freezing and thawing		Compressive soil (settlement)
	X	Wetting and drying		Evidence of pumping
		Drying under dry atmosphere		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
	X	Abrasion, impact		
	Heat from adjacent sources			

2. DISTRESS INDICATORS	X	Member cracking or breakage
	X	Staining, corrosion
	X	Surface deposits
		Weld cracking or breakage

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure				
		Settlement	X	Deflection/Leaning	
	3B – Surface Condition				
	General Condition	<u>Excellent</u>		New or near-new condition: no issues to report. No loss of cross section.	
		<u>Good</u>		Good condition: no reported issues or concerns. Less than 5% loss of cross section.	
		<u>Fair</u>		Average wear; not new but no issues to report. Between 5% - 20% cross section.	
		<u>Poor</u>		Worn from use: Between 20% - 50% loss of cross section.	
		<u>Critical</u>	X	Extremely worn or damaged: Between 50% - 80% loss of cross section.	
		Finished surfaces – slippery, uneven, or misaligned		X	
		Cracking		X	
		Rust and scale		X	
		Loss of Material		X	
		Missing or broken members		X	
		Damage or distress		X	
		Collapse, partial collapse or structure off foundation			
		Damage or decay of chimney, parapet or other overhead falling hazard			
		Ground or slope movement present			
		Unstable supports – gaps or holes, excessive rotation, loss of bearing			
		Stains		X	
		Corrosion		X	
	Abrasion				
	Previous Repair				
	Surface Coatings				
	Debris Buildup		X		
	Structural Defects		X		
	Moss		X		

FIELD CONDITION ASSESSMENT REPORT

Sediment Cleanup of Middle Reach of Lower Duwamish Waterway

Facility Name: ST11 Pacific Pile and Marine Wharf
Parcel No. _____

WUS#: 35

Facility Location: River Mile 2.75

Direction (side) West

Asset Type: Timber Wharf

Use: Boat loading and unloading

Inspection Date: July 8 and 9, 2024

Inspected By: Aaron Emoto and Trevor Baumgartner



General Condition and Evaluation:

Overall Condition Rating: Good Satisfactory Fair Poor Serious Critical

Inspection of in-water structures was conducted from the water side during low tide. Observations are limited to boat accessible areas and field measurements were taken.

The wharf consists of:

- Timber stringers
- Timber floor planks
- Steel stringers
- Timber cross beams
- Steel cross beams
- Timber piles
- Concrete pedestal
- Debris

Timber Stringers and Floor Planks

- Multiple bays of the wharf use discontinuous timber stringers with timber floor plank decking (Photos 4-6).
- Several stringers show signs of growth and discoloration.
- Stringers and deck do not show obvious signs of section loss.

Steel Stringers

- Multiple bays in the center section of the wharf use continuous steel I section stringers.

- Stringers do not show signs of damage.

Timber Cross Beams

- Cross beams in timber spans use timber cross beams (Photos 2, 5, and 6).
- Multiple cross beams show signs of significant rot and section loss.
- Multiple cross beams have been either supported by added piles or by a concrete pedestal.
- Multiple cross beams have timber or steel supports bolted to the section (Photos 5 and 10).
- Multiple cross beams have large rot and section losses visible at the ends (Photos 2, 11, and 12).

Steel Cross Beams

- Cross beams in steel spans use steel I section beams (Photos 8 and 9).
- Steel cross beams do not show signs of damage.

Timber Piles

- All cross beams are supported by round timber piles (Photos 2, 6, and 8).
- Many piles show signs of algal growth and discoloration.
- No piles show signs of rot or section loss.
- Tops of some piles are below the bottom of the cross beams, and spacer blocks were placed on top to form a connection (Photos 5 and 6).

Concrete Pedestal

- One concrete pedestal was installed to support a section of timber cross beam (Photo 3).
- Concrete shows signs of algal growth.
- Concrete does not show signs of deterioration or damage.

Debris

- There is scattered debris under the wharf, strewn on top of the gravel (Photo 4).

Accessibility:

- Due to the tight spacing of the piles, many added reinforcements, and debris under the wharf, accessibility is very limited.

Potential Hazards:

- Many repairs and timber spacer blocks could have potentially changed the load path.
- Many timber cross beams have signs of rot and section loss. Extent of rot is not detectable by visual inspection and requires further testing.
- Many piles do not reach up to the cross beams, and timber blocks have been placed in the space between. This could impact the connection between the pile and cross beam, and place additional loads on the other piles.

PHOTOGRAPHS



Photo 1: Wharf looking north



Photo 2: Timber cross beam section loss

PHOTOGRAPHS



Photo 3: Concrete support pedestal



Photo 4: Debris

PHOTOGRAPHS



Photo 5: Timber cross beam reinforcement



Photo 6: Additional cross beam support

PHOTOGRAPHS



Photo 7: Typical bay



Photo 8: Transition from timber to steel span

PHOTOGRAPHS



Photo 9: Transition from steel to timber span



Photo 10: Added reinforcement in cross beam

PHOTOGRAPHS



Photo 11: Section loss in cross beam



Photo 12: Section loss in cross beam



CONCRETE MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A - Exposure		1B - Drainage		1C - Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Flashing		Expansive soil
		Freezing and thawing		Joint sealants		Compressive soil (settlement)
	X	Wetting and drying		Weepholes		Evidence of pumping
		Drying under dry atmosphere		Contour		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Elevation of drains		Steep or unstable slope/revetment
	X	Abrasion, erosion, cavitation, impact				
	Heat from adjacent sources					

2. DISTRESS INDICATORS	Cracking or Breakage
	Staining
	Surface deposits and exudations
	Leaking

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure							
		Settlement		Deflection/Leaning		Expansion		Contraction
	3B - Surface Condition							
	General Condition	<u>Excellent</u>		New or near-new condition: no issues to report. No loss of cross section.				
		<u>Good</u>	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.				
		<u>Fair</u>		Average wear; not new but no issues to report. Between 5% - 20% cross section.				
		<u>Poor</u>		Worn from use: Between 20% - 50% loss of cross section.				
		<u>Critical</u>		Extremely worn or damaged: Between 50% - 80% loss of cross section.				
		Formed and finished surfaces - slippery, uneven, or misaligned						
		Cracking						
		Scaling						
		Spalls, pop outs, and delamination						
		Stains, Efflorescence						
		Exposed Reinforcement: Corrosion						
		Damage or distress						
		Missing or broken members						
		Collapse, partial collapse or structure off foundation						
		Damage or decay of chimney, parapet or other overhead falling hazard						
		Ground or slope movement present						
		Unstable supports - gaps or holes, excessive rotation, loss of bearing						
		Curling and warping						
		Erosion						
		Previous Patching or Other Repair:						
		Surface Coatings, Protective Systems, Linings, Toppings						
	Penetrating Sealers							
	Signs of Past Overflow on Rungs and Walls							
	Debris Buildup							
	Exposed Aggregate							
	Leaks through Walls							
	Structural Defects							
	Moss						X	



STEEL MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A - Exposure		1B - Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
		Freezing and thawing		Compressive soil (settlement)
	X	Wetting and drying		Evidence of pumping
		Drying under dry atmosphere		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
	X	Abrasion, impact		
	Heat from adjacent sources			

2. DISTRESS INDICATORS		Member cracking or breakage
		Staining, corrosion
		Surface deposits
		Weld cracking or breakage

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure			
		Settlement		Deflection/Leaning
	3B - Surface Condition			
	General Condition	<u>Excellent</u>		New or near-new condition: no issues to report. No loss of cross section.
		<u>Good</u>	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.
		<u>Fair</u>		Average wear; not new but no issues to report. Between 5% - 20% cross section.
		<u>Poor</u>		Worn from use: Between 20% - 50% loss of cross section.
		<u>Critical</u>		Extremely worn or damaged: Between 50% - 80% loss of cross section.
		Finished surfaces - slippery, uneven, or misaligned		
		Cracking		
		Rust and scale		
		Loss of Material		
		Missing or broken members		
		Damage or distress		
		Collapse, partial collapse or structure off foundation		
		Damage or decay of chimney, parapet or other overhead falling hazard		
		Ground or slope movement present		
		Unstable supports - gaps or holes, excessive rotation, loss of bearing		
		Stains	X	
		Corrosion		
	Abrasion			
	Previous Repair			
	Surface Coatings			
	Debris Buildup			
	Structural Defects			
	Moss			



WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A - Exposure		1B - Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
		Freezing and thawing		Compressive soil (settlement)
	X	Wetting and drying		Evidence of pumping
		Drying under dry atmosphere		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
	X	Abrasion, erosion, impact		
	Heat from adjacent sources			

2. DISTRESS INDICATORS	X	Cracking or breakage
	X	Rot and decay
	X	Surface deposits
		Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure							
		Settlement		Deflection/Leaning		Expansion		Contraction
	3B - Surface Condition							
	General Condition	<u>Excellent</u>		New or near-new condition: no issues to report. No loss of cross section.				
		<u>Good</u>		Good condition: no reported issues or concerns. Less than 5% loss of cross section.				
		<u>Fair</u>		Average wear; not new but no issues to report. Between 5% - 20% cross section.				
		<u>Poor</u>	X	Worn from use: Between 20% - 50% loss of cross section.				
		<u>Critical</u>		Extremely worn or damaged: Between 50% - 80% loss of cross section.				
		Finished surfaces - slippery, uneven, or misaligned						
		Cracking						X
		Loss of Material						X
		Missing or broken members						
		Damage or distress						
		Collapse, partial collapse or structure off foundation						
		Damage or decay of chimney, parapet or other overhead falling hazard						
		Ground or slope movement present						
		Unstable supports - gaps or holes, excessive rotation, loss of bearing, rot						
	Fasteners: Corrosion							
	Soft timber and decay						X	
	Abrasion							
	Previous Repair						X	
	Surface Coatings, Protective Systems							
	Debris Buildup							
	Structural Defects							
	Moss							

FIELD CONDITION ASSESSMENT REPORT

Sediment Cleanup of Middle Reach of Lower Duwamish Waterway

Facility Name: ST12 Pacific Pile and Marine Mooring
Parcel No. _____

WUS#: 33

Facility Location: River Mile 2.6

Direction (side) West

Asset Type: Ramp Structure

Use:

Inspection Date: July 8, 2024

Inspected By: Aaron Emoto and Trevor Baumgartner



General Condition and Evaluation:

Overall Condition Rating: Good Satisfactory Fair Poor Serious Critical

Inspection of in-water structures was conducted from the water side during low tide. Observations are limited to boat accessible areas and field measurements were taken.

The ramp structure consists of:

- Soil embankment
- Steel ramp structure
- Boat structure support
- Debris

Soil Embankment

- One end of the structure is supported by a short soil embankment (Photos 1 and 4).
- There is vegetation growing on the soil, with some vegetation covering the support of the structure.

Steel Ramp Structure

- The structure consists of two truss systems, transverse floor beams, lateral bracing, and a steel sheet floor.
- The truss elements consist of steel angle shapes and steel gusset plates.
- Truss lateral bracing consists of steel angle shapes making a X shaped cross brace.
- Steel floor beams are I shapes and connected via bolted gusset plates.

- Transverse bracing for the floor beams are I shapes that are placed diagonally between floor beams.
- Steel flooring consists of corrugated steel sheets.
- There is slight rusting on the bottom flanges of the floor beams and at some seams of the truss (Photos 4 and 5).

Boat Structure Support

- The boat support consists of a boat permanently welded to the ramp structure and a dolphin pile to keep the boat in place (Photos 2 and 6).
- The ramp structure is welded on the bottom face to the top of the boat structure.
- The boat structure is connected to the dolphin pile via a large I shape steel beam that has been welded to both the boat and the pile.
- The boat is heavily rusted on the outer shell.

Debris

- There is rocky and concrete debris scattered along the shore, under the ramp structure.

Accessibility:

- The structure is accessible via the shore, with sufficient vertical clearance to perform work under the structure.

Potential Hazards:

- It is unclear if the soil is reinforced or has a potential of failure.
- Welds were unable to be inspected, so the condition of the connection between the ramp and the boat structure is unclear.
- We were unable to access the top of the boat support, so the exact mechanism of connection to the ramp structure is unclear.

PHOTOGRAPHS



Photo 1: Steel Ramp Structure and Bank Support

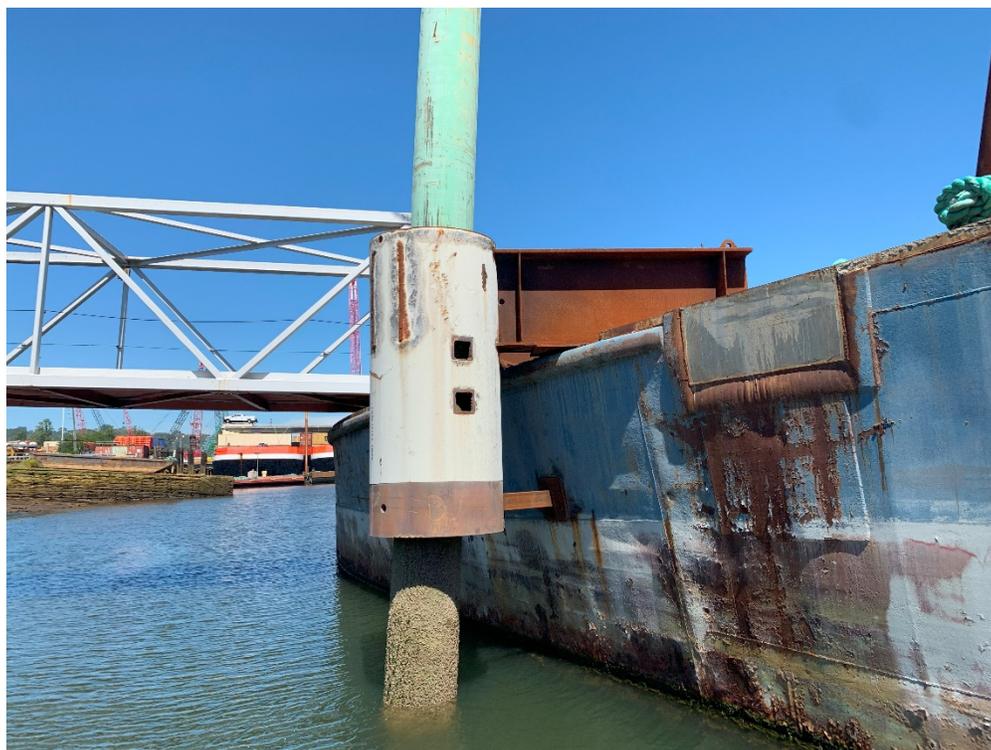


Photo 2: Ramp Structure Supported by Boat Structure

PHOTOGRAPHS



Photo 3: Structure Looking South



Photo 4: South Face of Ramp Structure and Bank Support

PHOTOGRAPHS

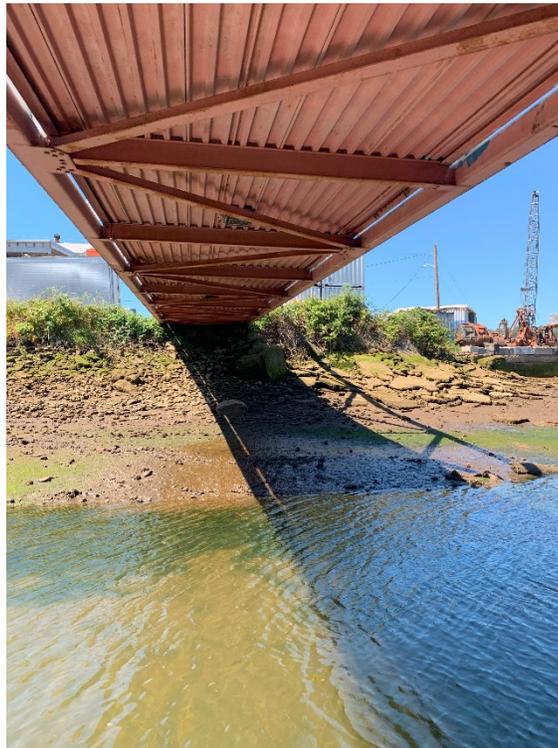


Photo 5: Underside of Ramp Structure



Photo 6: North Face of Structure and Boat Support



STEEL MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A - Exposure		1B - Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
		Freezing and thawing		Compressive soil (settlement)
		Wetting and drying		Evidence of pumping
		Drying under dry atmosphere		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
	X	Abrasion, impact		
	Heat from adjacent sources			

2. DISTRESS INDICATORS		Member cracking or breakage
	X	Staining, corrosion
		Surface deposits
		Weld cracking or breakage

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure			
		Settlement		Deflection/Leaning
	3B - Surface Condition			
	General Condition	<u>Excellent</u>		New or near-new condition: no issues to report. No loss of cross section.
		<u>Good</u>	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.
		<u>Fair</u>		Average wear; not new but no issues to report. Between 5% - 20% cross section.
		<u>Poor</u>		Worn from use: Between 20% - 50% loss of cross section.
		<u>Critical</u>		Extremely worn or damaged: Between 50% - 80% loss of cross section.
		Finished surfaces - slippery, uneven, or misaligned		
		Cracking		
		Rust and scale	X	
		Loss of Material		
		Missing or broken members		
		Damage or distress		
		Collapse, partial collapse or structure off foundation		
		Damage or decay of chimney, parapet or other overhead falling hazard		
		Ground or slope movement present		
		Unstable supports - gaps or holes, excessive rotation, loss of bearing		
	Stains			
	Corrosion			
	Abrasion			
	Previous Repair			
	Surface Coatings			
	Debris Buildup			
	Structural Defects			
	Moss			

FIELD CONDITION ASSESSMENT REPORT

Sediment Cleanup of Middle Reach of Lower Duwamish Waterway

Facility Name: ST13 Pacific Pile and Marine Mooring
Parcel No. _____

WUS#: 34

Facility Location: River Mile 2.6

Direction (side) West

Asset Type: Timber Pier

Use: Boat loading and unloading

Inspection Date: July 8, 2024

Inspected By: Aaron Emoto and Trevor Baumgartner



General Condition and Evaluation:

Overall Condition Rating: Good Satisfactory Fair Poor Serious Critical

Inspection of in-water structures was conducted from the water side during low tide. Observations are limited to boat accessible areas and field measurements were taken.

The pier consists of:

- Timber Superstructure
- Steel Superstructure
- Timber piles
- Timber cross beams

Timber Superstructure

- The timber superstructure consists of timber stringers and timber floor planks (Photos 3 and 4).
- There is some discoloration and buildup on the timber stringers.
- The stringers appear to not be continuous over adjacent spans.

Steel Superstructure

- The steel superstructure consists of one span of steel stringers and timber floor planks (Photo 5).
- There is some streaking on the steel and discoloration and buildup on the timber planks.

Timber Piles

- Each timber cross beam has four round timber piles (Photos 1 and 3).

- The piles have algal buildup and discoloration
- Piles have timber cross bracing and sway bracing.

Timber Cross Beams

- Each support has a timber cross beam (Photos 2, 3, and 8).
- Cross beams have algal buildup and discoloration with no signs of section loss.
- The cross beam at the transition between the steel and timber spans has a timber support section bolted on to the original section.

Accessibility:

- Access in the water is available between timber supports, in the clear spans.
- There is limited access on the shore due to the timber cross bracing and sway bracing.

Potential Hazards:

- Signs of previous repair could show an area of concern at the timber cross beam where the steel span transitions to timber spans.
- Algal buildup and discoloration of the timber sections do not show signs of rot.

PHOTOGRAPHS

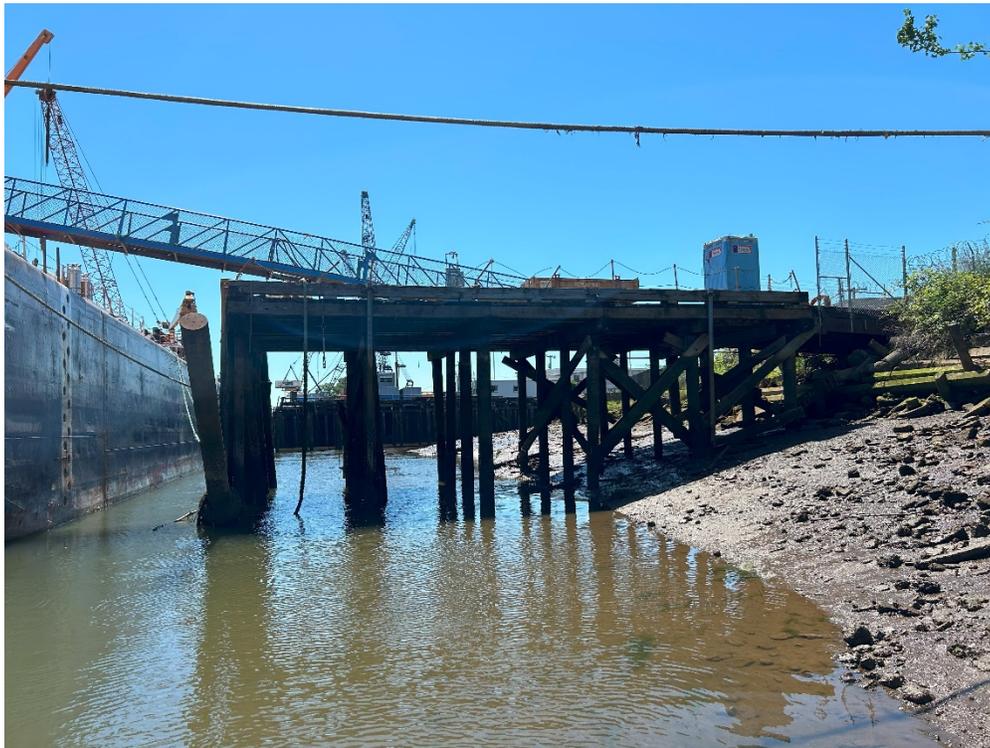


Photo 1: North Elevation of Pier



Photo 2: Timber Cross Beams and Piles

PHOTOGRAPHS



Photo 3: Timber Deck, Crossbeams, and Piles



Photo 4: Timber Stringers and Substructure

PHOTOGRAPHS



Photo 5: Steel Approach Span



Photo 6: Timber Stringers

PHOTOGRAPHS



Photo 7: Transition Between Steel and Timber



Photo 8: Timber Substructure and Bracing



STEEL MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A - Exposure		1B - Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
		Freezing and thawing		Compressive soil (settlement)
	X	Wetting and drying		Evidence of pumping
		Drying under dry atmosphere		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
		Abrasion, impact		
	Heat from adjacent sources			

2. DISTRESS INDICATORS		Member cracking or breakage
	X	Staining, corrosion
		Surface deposits
		Weld cracking or breakage

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure			
		Settlement		Deflection/Leaning
	3B - Surface Condition			
	General Condition	<u>Excellent</u>		New or near-new condition: no issues to report. No loss of cross section.
		<u>Good</u>	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.
		<u>Fair</u>		Average wear; not new but no issues to report. Between 5% - 20% cross section.
		<u>Poor</u>		Worn from use: Between 20% - 50% loss of cross section.
		<u>Critical</u>		Extremely worn or damaged: Between 50% - 80% loss of cross section.
		Finished surfaces - slippery, uneven, or misaligned		
		Cracking		
		Rust and scale	X	
		Loss of Material		
		Missing or broken members		
		Damage or distress		
		Collapse, partial collapse or structure off foundation		
		Damage or decay of chimney, parapet or other overhead falling hazard		
		Ground or slope movement present		
	Unstable supports - gaps or holes, excessive rotation, loss of bearing			
	Stains			
	Corrosion			
	Abrasion			
	Previous Repair			
	Surface Coatings			
	Debris Buildup			
	Structural Defects			
	Moss			



WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A - Exposure		1B - Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
		Freezing and thawing		Compressive soil (settlement)
	X	Wetting and drying		Evidence of pumping
		Drying under dry atmosphere		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
	X	Abrasion, erosion, impact		
	Heat from adjacent sources			

2. DISTRESS INDICATORS		Cracking or breakage
		Rot and decay
	X	Surface deposits
		Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure								
		Settlement		Deflection/Leaning		Expansion		Contraction	
	3B - Surface Condition								
	General Condition	<u>Excellent</u>		New or near-new condition: no issues to report. No loss of cross section.					
		<u>Good</u>	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.					
		<u>Fair</u>		Average wear; not new but no issues to report. Between 5% - 20% cross section.					
		<u>Poor</u>		Worn from use: Between 20% - 50% loss of cross section.					
		<u>Critical</u>		Extremely worn or damaged: Between 50% - 80% loss of cross section.					
		Finished surfaces - slippery, uneven, or misaligned							
		Cracking							
		Loss of Material							
		Missing or broken members							
		Damage or distress							
		Collapse, partial collapse or structure off foundation							
		Damage or decay of chimney, parapet or other overhead falling hazard							
		Ground or slope movement present							
		Unstable supports - gaps or holes, excessive rotation, loss of bearing, rot							
	Fasteners: Corrosion								
	Soft timber and decay								
	Abrasion								
	Previous Repair								
	Surface Coatings, Protective Systems								
	Debris Buildup								
	Structural Defects								
	Moss								

FACILITIES CONDITION ASSESSMENT REPORT, PHASE I/II

REVISION 02/21/2025

Sediment Cleanup of Middle Reach of Lower Duwamish Waterway

Facility Name: ST16 – Inlet
 Parcel No. _____

WUS#: N/A

Facility Location: River Mile 2.2
 Direction (side) West

Asset Type: Inlet

Use: Retaining Walls

Inspection Date: July 8, 2024

Inspected By: Ade Bright and Stephanie Lor



General Condition and Evaluation:

Overall Condition Rating: Good Satisfactory Fair Poor Serious Critical

Inspection of in-water structures was conducted from the water side during low tide. Observations are limited to boat accessible areas and no field measurements were taken.

The inlet consists of:

- Tiered timber training walls/bulkhead
- Ecology block bulkhead
- Concrete wall bulkhead
- Timber piles
- Timber cross beams
- Debris piles

Training Walls

- The bank along the northern section of the inlet consists of three tiers of timber (terraced) training wall/bulkhead comprising of timber piles and timber lagging (Photos 1 to 8).
- Several panels of the lagging are missing, resulting in erosion of the terrace behind the walls. (Photos 5 to 9)
- The training walls returns at west and east ends. (Photos 2 and 12)
- Backfill behind lower two tiers consists of soil and concrete rubbles. Some of the rubbles have toppled into the inlet. (Photos 5 and 8)

Ecology Block Bulkhead

- *To be completed...*

Concrete Wall Bulkhead

- *To be completed...*

Timber Piles

- Along the north bank, west of the training wall are several rows of evenly-spaced timber piles along the north bank and into approximately the middle of the inlet. (Photos 9, 10, and 12 to 14)
- These piles appear not to be presently serving any particular purpose.

Timber Cross Beams

- Across the base of the inlet are a series of evenly-spaced single timber cross beams. (Photos 12 to 14)
- These beams appear to coincide with the timber piles.

Debris

- Along the north and south banks and in the inlet are numerous debris consisting of concrete rubbles, metal, logs, and branches. (Photos 10 and 11)

South Bank

- *Bulkhead composition to be completed.*

Accessibility:

- The north and south banks of the inlet are accessible at the east end of the outlet, up to about the west end of the training walls.
- Access to the center and west end of the inlet is limited because of the rows of piles that extend from north bank into the middle of the inlet.

Potential Hazards:

- *To be completed...*

PHOTOGRAPHS



Photo ST16-01: East return wall at NE corner of Inlet

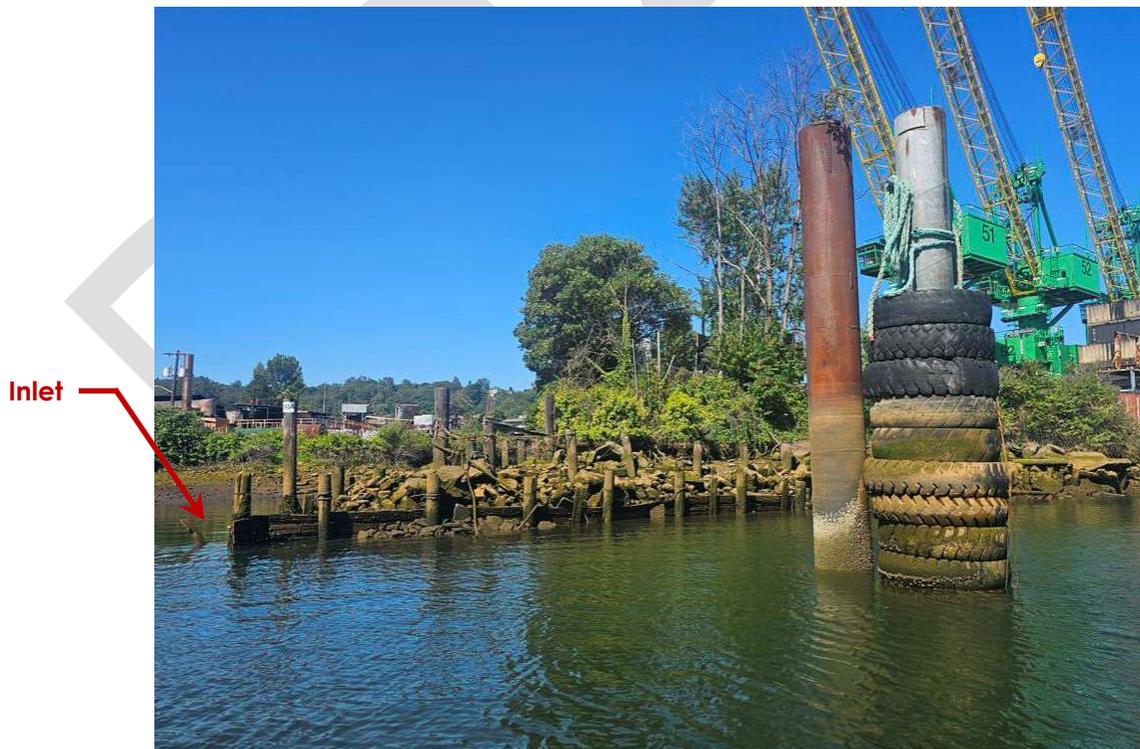


Photo ST16-02: Northeast corner of Inlet

PHOTOGRAPHS



Photo ST16-03: Inlet looking west



Photo ST16-04: Inlet looking southwest

PHOTOGRAPHS



Photo ST16-05: Training walls looking northeast



Photo ST16-06: Training walls looking north

PHOTOGRAPHS



Photo ST16-07: Training wall looking northeast



Photo ST16-08: West end of training walls

PHOTOGRAPHS



Photo ST16-09: North bank looking northwest



Photo ST16-10: South bank looking west

PHOTOGRAPHS



Photo ST16-11: South bank looking southwest



Photo ST16-12: West end of Inlet looking west

PHOTOGRAPHS



Photo ST16-13: Piles and cross beams looking west



Photo ST16-14: Piles and cross beams looking west

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A – Exposure		1B – Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
		Freezing and thawing		Compressive soil (settlement)
	X	Wetting and drying		Evidence of pumping
		Drying under dry atmosphere		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)	X	Steep or unstable slope/revetment
	X	Abrasion, erosion, impact		
	Heat from adjacent sources			

2. DISTRESS INDICATORS	X	Cracking or breakage
	X	Rot and decay
	X	Surface deposits
	X	Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure							
		Settlement	X	Deflection/Leaning		Expansion		Contraction
	3B – Surface Condition							
	General Condition	<u>Excellent</u>		New or near-new condition: no issues to report. No loss of cross section.				
		<u>Good</u>		Good condition: no reported issues or concerns. Less than 5% loss of cross section.				
		<u>Fair</u>		Average wear; not new but no issues to report. Between 5% - 20% cross section.				
		<u>Poor</u>	X	Worn from use: Between 20% - 50% loss of cross section.				
		<u>Critical</u>		Extremely worn or damaged: Between 50% - 80% loss of cross section.				
	Finished surfaces – slippery, uneven, or misaligned							X
	Cracking							X
	Loss of Material							X
	Missing or broken members							X
	Damage or distress							X
	Collapse, partial collapse or structure off foundation							
	Damage or decay of chimney, parapet or other overhead falling hazard							
	Ground or slope movement present							
	Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot							X
Fasteners: Corrosion								
Soft timber and decay							X	
Abrasion								
Previous Repair								
Surface Coatings, Protective Systems							X	
Debris Buildup							X	
Structural Defects							X	
Moss							X	

FIELD CONDITION ASSESSMENT REPORT

Sediment Cleanup of Middle Reach of Lower Duwamish Waterway

Facility Name: ST17 Alaska Marine Yards No. 2
Parcel No. _____

WUS#: 25

Facility Location: River Mile 2.1

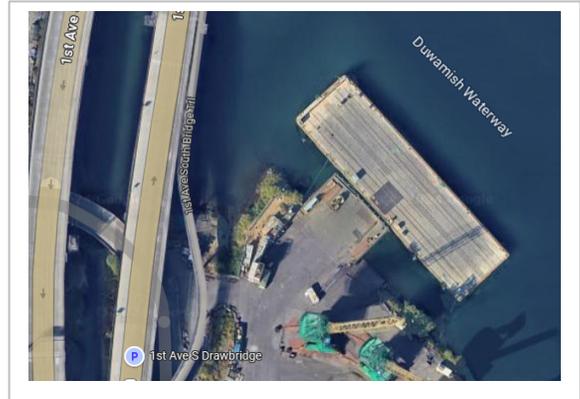
Direction (side) West

Asset Type: Concrete Wharf

Use: Wharf used by Alaska Marine

Inspection Date: July 8, 2024

Inspected By: Aaron Emoto and Trevor Baumgartner



General Condition and Evaluation:

Overall Condition Rating: Good Satisfactory Fair Poor Serious Critical

Inspection of in-water structures was conducted from the water side during low tide. Observations are limited to boat accessible areas and field measurements were taken.

The wharf consists of:

- Steel sheet retaining wall
- Reinforced concrete piles
- Reinforced concrete cross beams
- Reinforced concrete deck

Steel Sheet Retaining Wall

- The back of the wharf consists of a steel sheet pile retaining wall with rocky debris in front (Photo 6).
- All panels are intact with little to no damage.
- The depth at which the wall is driven is unclear due to murky water.

Reinforced Concrete Piles

- There are eight reinforced concrete piles at each pier, with one pile being battered (Photos 4 and 5).

- There is some algae growth starting at high water level, typical of each pile.

Reinforced Concrete Cross Beams

- Each pier consists of an integral reinforced concrete crossbeam.
- There is consistent spalling on each cross beam, with exposed rebar in extreme cases (Photo 5).

Reinforced Concrete Deck

- The wharf has a continuous concrete deck spanning all bays.
- Concrete deck thickens toward each pier (Photo 6).
- Deck soffit has spall with some exposed rebar (Photo 3)

Accessibility:

- The clear spans between each bay are accessible with sufficient clear height.

Potential Hazards:

- Concrete spall and exposed rebar could potentially reduce strength in the deck.
- Extent of spall could not be tested visually, and further spalling is possible.
- Structural analysis is required to determine the strength of affected sections.

PHOTOGRAPHS



Photo 1: Concrete Deck



Photo 2: Concrete Cross Beam and Steel Fender

PHOTOGRAPHS



Photo 3: Spall on Deck Soffit with Exposed Rebar



Photo 4: Reinforced Concrete Piles at North End

PHOTOGRAPHS



Photo 5: Spall on Cross Beam with Exposed Rebar



Photo 6: Single Bay with Steel Retaining Wall in Back



CONCRETE MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A - Exposure		1B - Drainage		1C - Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Flashing		Expansive soil
		Freezing and thawing		Joint sealants		Compressive soil (settlement)
	X	Wetting and drying		Weepholes		Evidence of pumping
		Drying under dry atmosphere		Contour		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Elevation of drains		Steep or unstable slope/revetment
	X	Abrasion, erosion, cavitation, impact				
	Heat from adjacent sources					

2. DISTRESS INDICATORS	X	Cracking or Breakage
	X	Staining
		Surface deposits and exudations
		Leaking

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure							
		Settlement		Deflection/Leaning		Expansion		Contraction
	3B - Surface Condition							
	General Condition	<u>Excellent</u>		New or near-new condition: no issues to report. No loss of cross section.				
		<u>Good</u>		Good condition: no reported issues or concerns. Less than 5% loss of cross section.				
		<u>Fair</u>	X	Average wear; not new but no issues to report. Between 5% - 20% cross section.				
		<u>Poor</u>		Worn from use: Between 20% - 50% loss of cross section.				
		<u>Critical</u>		Extremely worn or damaged: Between 50% - 80% loss of cross section.				
		Formed and finished surfaces – slippery, uneven, or misaligned						
		Cracking						X
		Scaling						
		Spalls, pop outs, and delamination						X
		Stains, Efflorescence						X
		Exposed Reinforcement: Corrosion						X
		Damage or distress						
		Missing or broken members						
		Collapse, partial collapse or structure off foundation						
		Damage or decay of chimney, parapet or other overhead falling hazard						
		Ground or slope movement present						
		Unstable supports – gaps or holes, excessive rotation, loss of bearing						
	Curling and warping							
	Erosion							
	Previous Patching or Other Repair:							
	Surface Coatings, Protective Systems, Linings, Toppings							
	Penetrating Sealers							
	Signs of Past Overflow on Rungs and Walls							
	Debris Buildup							
	Exposed Aggregate							
	Leaks through Walls							
	Structural Defects							
	Moss						X	



STEEL MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A - Exposure		1B - Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
		Freezing and thawing		Compressive soil (settlement)
	X	Wetting and drying		Evidence of pumping
		Drying under dry atmosphere		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
	X	Abrasion, impact		
	Heat from adjacent sources			

2. DISTRESS INDICATORS		Member cracking or breakage
	X	Staining, corrosion
		Surface deposits
		Weld cracking or breakage

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure			
		Settlement		Deflection/Leaning
	3B - Surface Condition			
	General Condition	<u>Excellent</u>		New or near-new condition: no issues to report. No loss of cross section.
		<u>Good</u>	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.
		<u>Fair</u>		Average wear; not new but no issues to report. Between 5% - 20% cross section.
		<u>Poor</u>		Worn from use: Between 20% - 50% loss of cross section.
		<u>Critical</u>		Extremely worn or damaged: Between 50% - 80% loss of cross section.
		Finished surfaces - slippery, uneven, or misaligned		
		Cracking		
		Rust and scale		
		Loss of Material		
		Missing or broken members		
		Damage or distress		
		Collapse, partial collapse or structure off foundation		
		Damage or decay of chimney, parapet or other overhead falling hazard		
		Ground or slope movement present		
	Unstable supports - gaps or holes, excessive rotation, loss of bearing			
	Stains			
	Corrosion			
	Abrasion			
	Previous Repair			
	Surface Coatings			
	Debris Buildup			
	Structural Defects			
	Moss			

FIELD CONDITION ASSESSMENT REPORT

Sediment Cleanup of Middle Reach of Lower Duwamish Waterway

Facility Name: ST18 State of Washington/Seattle DOT
Parcel No. _____

WUS#: 54

Facility Location: River Mile 2.05

Direction (side) West

Asset Type: Bridge

Use: Vehicle crossing

Inspection Date: July 9, 2024

Inspected By: Aaron Emoto and Trevor Baumgartner



General Condition and Evaluation:

Overall Condition Rating: Good Satisfactory Fair Poor Serious Critical

Inspection of in-water structures was conducted from the water side during low tide. Observations are limited to boat accessible areas and field measurements were taken.

The bridge consists of:

- Steel superstructure
- Concrete walls
- Concrete pile cap
- Concrete piles
- Steel piles

Steel Superstructure

- The bridge has a steel superstructure that consists of steel trusses, steel girders, steel diaphragms, and steel cross bracing (Photos 6, 8-10).
- The steel members do not show signs of deterioration and appear in good condition.

Concrete Walls

- Concrete walls create a channel for boats to travel through (Photos 1-4).
- The concrete walls protect the steel piles and allow for water to flow through to even levels on either side of the walls.
- There are signs of algal growth, but no signs of deterioration on the walls.

Concrete Pile Cap

- A thick concrete slab acts as a pile cap for the steel piles, and is attached to the concrete walls (Photo 5).
- There is a concrete cross beam at two interior piers of the bridge that supports steel girders (Photo 7).
- There are no signs of deterioration on the pile cap or cross beam.

Concrete Piles

- At two interior piers, there are 4 round concrete piles (Photo 7).
- These piles have signs of discoloration at high water levels, but show no other signs of deterioration.

Steel Piles

- There are two rows of round steel concrete piles at the two concrete walls (Photo 5).
- There are growths on the surface of the piles, however the piles do not show signs of deterioration.

Accessibility:

- There is a wide channel and high vertical clearance, so accessibility should not be an issue.

Potential Hazards:

- Water was too murky to see through, so any potential hazards underwater were unable to be identified.

PHOTOGRAPHS



Photo 1: Concrete wall on east side



Photo 2: Concrete wall on west side

PHOTOGRAPHS

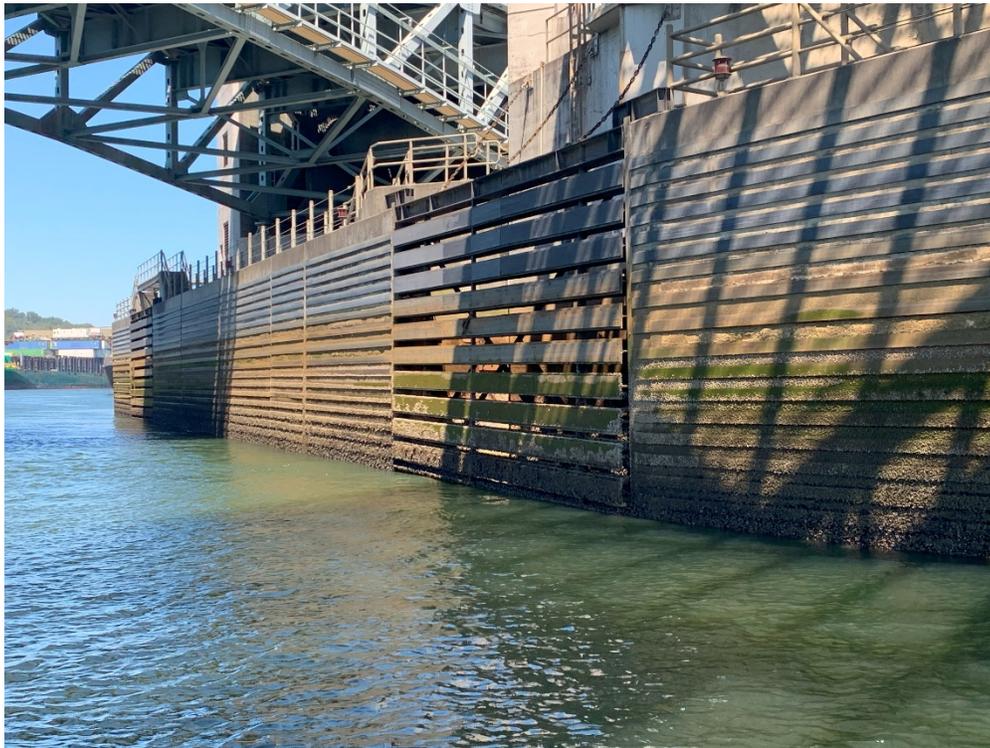


Photo 3: Section of wall on east side



Photo 4: Section of wall on west side

PHOTOGRAPHS



Photo 5: Round steel piles with concrete cap



Photo 6: 48 ft Clearance M.I.W.

PHOTOGRAPHS



Photo 7: Concrete cap beam with concrete piles

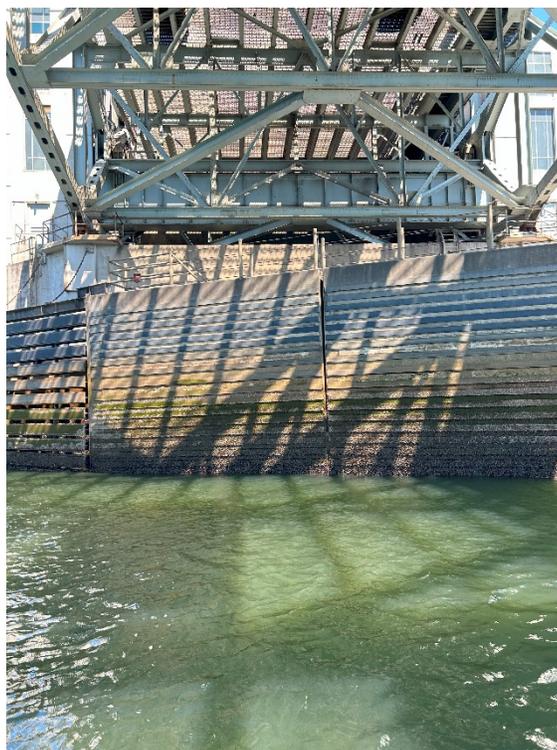


Photo 8: Steel truss structure

PHOTOGRAPHS

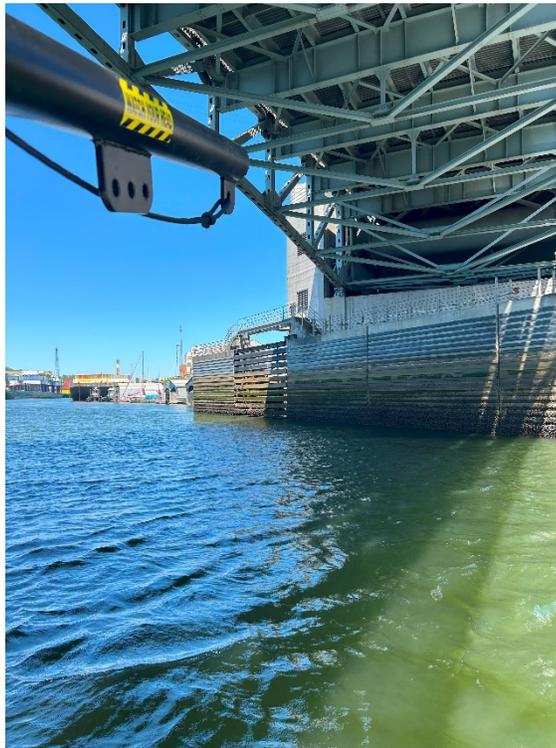


Photo 9: Steel truss cross bracing

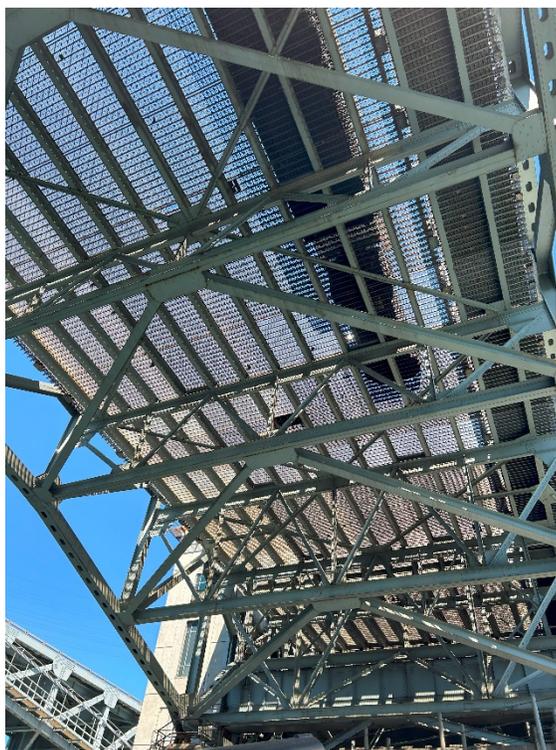


Photo 10: Steel truss cross bracing



CONCRETE MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A - Exposure		1B - Drainage		1C - Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Flashing		Expansive soil
		Freezing and thawing		Joint sealants		Compressive soil (settlement)
	X	Wetting and drying		Weepholes		Evidence of pumping
		Drying under dry atmosphere		Contour		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Elevation of drains		Steep or unstable slope/revetment
	X	Abrasion, erosion, cavitation, impact				
	Heat from adjacent sources					

2. DISTRESS INDICATORS	Cracking or Breakage
	Staining
	Surface deposits and exudations
	Leaking

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure							
		Settlement		Deflection/Leaning		Expansion		Contraction
	3B - Surface Condition							
	General Condition	<u>Excellent</u>		New or near-new condition: no issues to report. No loss of cross section.				
		<u>Good</u>	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.				
		<u>Fair</u>		Average wear; not new but no issues to report. Between 5% - 20% cross section.				
		<u>Poor</u>		Worn from use: Between 20% - 50% loss of cross section.				
		<u>Critical</u>		Extremely worn or damaged: Between 50% - 80% loss of cross section.				
		Formed and finished surfaces - slippery, uneven, or misaligned						
		Cracking						
		Scaling						
		Spalls, pop outs, and delamination						
		Stains, Efflorescence						
		Exposed Reinforcement: Corrosion						
		Damage or distress						
		Missing or broken members						
		Collapse, partial collapse or structure off foundation						
		Damage or decay of chimney, parapet or other overhead falling hazard						
		Ground or slope movement present						
		Unstable supports - gaps or holes, excessive rotation, loss of bearing						
		Curling and warping						
		Erosion						
		Previous Patching or Other Repair:						
		Surface Coatings, Protective Systems, Linings, Toppings						
	Penetrating Sealers							
	Signs of Past Overflow on Rungs and Walls							
	Debris Buildup							
	Exposed Aggregate							
	Leaks through Walls							
	Structural Defects							
	Moss							



STEEL MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION	1A - Exposure		1B - Soils (Foundation Conditions)	
	X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
		Freezing and thawing		Compressive soil (settlement)
	X	Wetting and drying		Evidence of pumping
		Drying under dry atmosphere		Scour
		Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
	X	Abrasion, impact		
		Heat from adjacent sources		

2. DISTRESS INDICATORS		Member cracking or breakage
		Staining, corrosion
		Surface deposits
		Weld cracking or breakage

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)	3A - Overall Apparent Alignment of Structure			
		Settlement		Deflection/Leaning
	3B - Surface Condition			
	General Condition	<u>Excellent</u>		New or near-new condition: no issues to report. No loss of cross section.
		<u>Good</u>	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.
		<u>Fair</u>		Average wear; not new but no issues to report. Between 5% - 20% cross section.
		<u>Poor</u>		Worn from use: Between 20% - 50% loss of cross section.
		<u>Critical</u>		Extremely worn or damaged: Between 50% - 80% loss of cross section.
		Finished surfaces - slippery, uneven, or misaligned		
		Cracking		
		Rust and scale		
		Loss of Material		
		Missing or broken members		
		Damage or distress		
		Collapse, partial collapse or structure off foundation		
		Damage or decay of chimney, parapet or other overhead falling hazard		
		Ground or slope movement present		
	Unstable supports - gaps or holes, excessive rotation, loss of bearing			
	Stains			
	Corrosion			
	Abrasion			
	Previous Repair			
	Surface Coatings			
	Debris Buildup			
	Structural Defects			
	Moss			

FINAL

Attachment D-2

Phase I Visual Inspection FCA Reports:
Structures

FACILITIES CONDITION ASSESSMENT REPORT

Sediment Cleanup of Middle Reach of Lower Duwamish Waterway

Facility Name: Certainteed
Parcel No. 1924049092

WUS#: 18

Facility Location: River Mile 1.6

Direction (side) East

Asset Type: Wharf

Use: Bulk Cement and Gypson Rock unloading

Inspection Date: August 8, 2022

Inspected By: Ade Bright and Stephanie Lor



Site Overview

General Conditions, Evaluations and Recommendations:

- Dock
- Steel Dolphins North and South
- Timber Dock
- Many rotten piles – lots of barnacles
- Shoreline rocks with splash of concrete
- Timber fender piles and steel piles
 - Outboard timber
 - Inboard steel
- Horizontal bracing

Attachment D-3
Photographs of Located Outfalls Located
in Phase II

PHOTOGRAPHS



Photo 1



Photo 2

PHOTOGRAPHS



Photo 3



Photo 4

FACILITIES CONDITION ASSESSMENT REPORT

Sediment Cleanup of Middle Reach of Lower Duwamish Waterway

Facility Name: Glacier Northwest (Slip 2 North Side)
Parcel No. 1924049075

WUS#: 21

Facility Location: River Mile 1.7

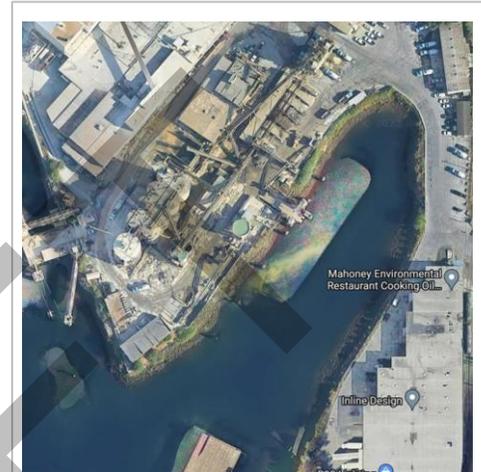
Direction (side) East

Asset Type: Wharf

Use: Sand and gravel unloading

Inspection Date: August 8, 2022

Inspected By: Ade Bright and Stephanie Lor



Site Overview

General Conditions, Evaluations and Recommendations:

- Steel dolphins with tire fender (3 ?)
- Pier
- Catwalk

PHOTOGRAPHS



Photo 1

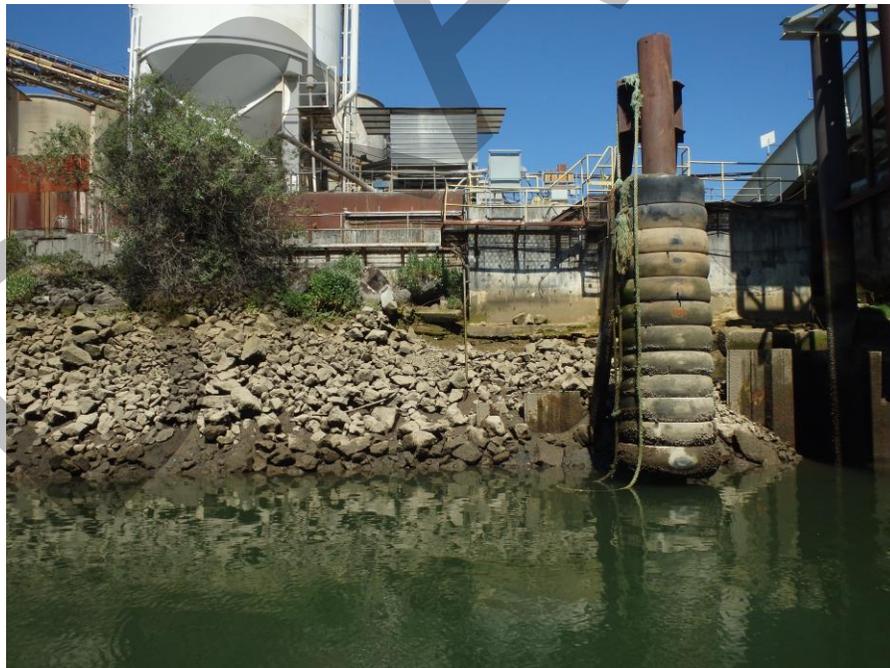


Photo 2

PHOTOGRAPHS



Photo 3



Photo 4

PHOTOGRAPHS



Photo 5

DRAFT

FACILITIES CONDITION ASSESSMENT REPORT

Sediment Cleanup of Middle Reach of Lower Duwamish Waterway

Facility Name: Muckleshoot Tribe Marina (Slip 3 North Side)
Parcel No. 5367204200, 5367204160,
5367204100

WUS# 27

Facility Location: River Mile 2.1

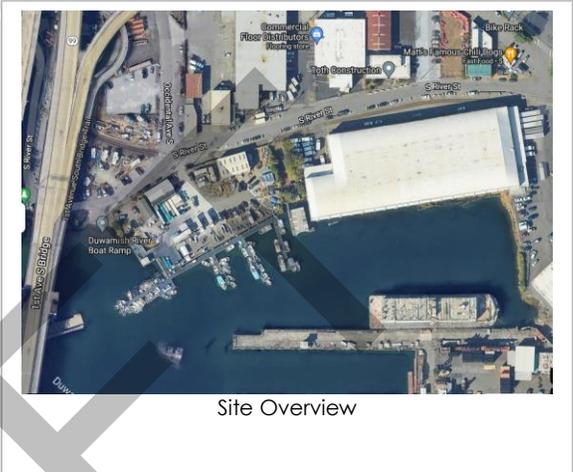
Direction (side) East

Asset Type: Wharf

Use: Floating dock and boat house,
barge mooring

Inspection Date: August 8, 2022

Inspected By: Ade Bright and Stephanie Lor



General Conditions, Evaluations and Recommendations:

- 4 steel guide piles on each of finger piers
- Decking is composite

PHOTOGRAPHS



Photo 1



Photo 2

PHOTOGRAPHS



Photo 3

DRAFT

PHOTOGRAPHS



Photo 1



Photo 2

PHOTOGRAPHS



Photo 3

DRAFT

FACILITIES CONDITION ASSESSMENT REPORT

Sediment Cleanup of Middle Reach of Lower Duwamish Waterway

Facility Name: Silver Bay Logging (8th Avenue Wharf)
Parcel No. 7327903645

WUS# 37

Facility Location: River Mile 2.9

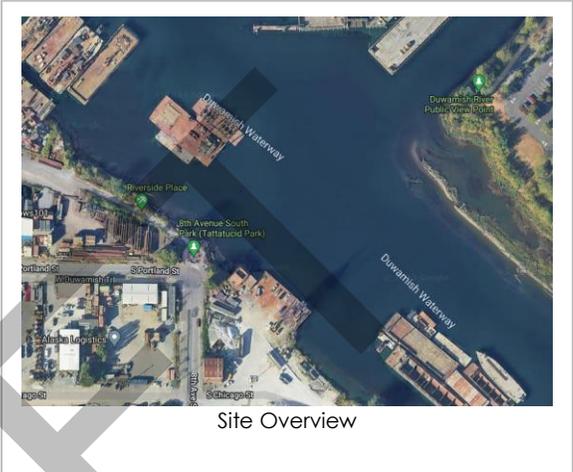
Direction (side) West

Asset Type: Wharf

Use: Lumber barge unloading

Inspection Date: August 8, 2022

Inspected By: Ade Bright and Stephanie Lor



General Conditions, Evaluations and Recommendations:

- South Side structure is gone
- Steel piles
- Steel cap beam
- Timber fender piles
- Bank is protected with quarry spalls
- Dolphin with Fishing Pole No. 76

PHOTOGRAPHS



Photo 1

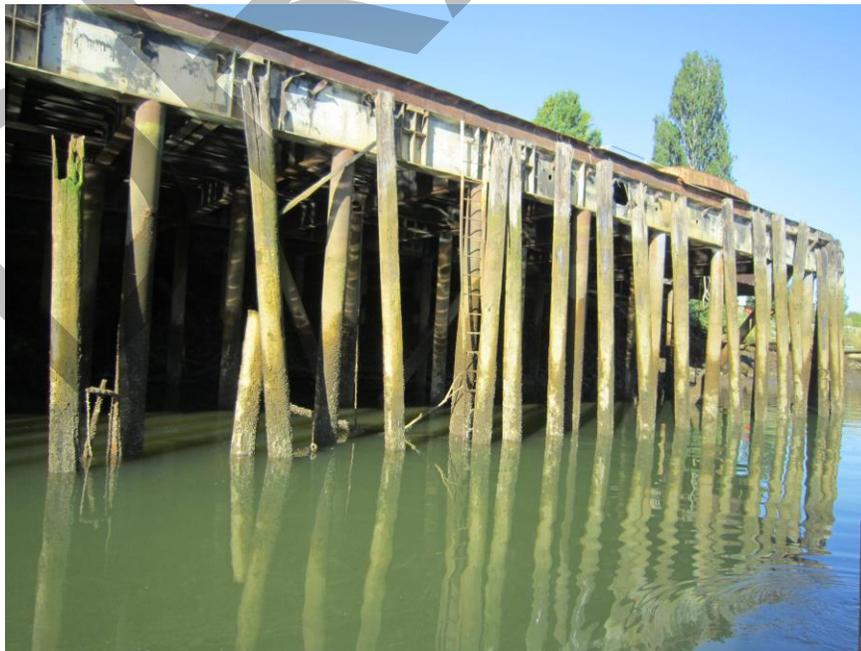


Photo 2

PHOTOGRAPHS



Photo 3



Photo 4

PHOTOGRAPHS



Photo 1



Photo 2

PHOTOGRAPHS



Photo 3



Photo 4

PHOTOGRAPHS



Photo 5

FACILITIES CONDITION ASSESSMENT REPORT

Sediment Cleanup of Middle Reach of Lower Duwamish Waterway

Facility Name: Seafreeze
Parcel No. 5367202505

WUS# 24

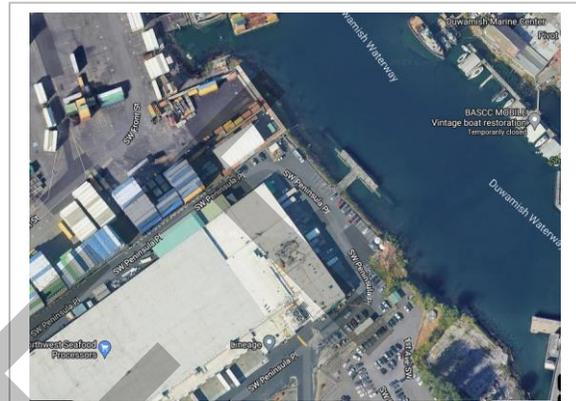
Facility Location: River Mile 1.9
Direction (side) West

Asset Type: Wharf, Dolphins, Catwalks

Use: Fish and Seafood unloading

Inspection Date: August 8, 2022

Inspected By: Ade Bright and Stephanie Lor



Site Overview

General Conditions, Evaluations and Recommendations:

- Pre-stressed concrete octagonal piles
- Concrete cap
- Flat slab decking (pre-cast)
- Walkway/Gangway on North and South ends
- 8 dolphins (Steel and Timber) to the North

PHOTOGRAPHS



Photo 1



Photo 2

FACILITIES CONDITION ASSESSMENT REPORT

Sediment Cleanup of Middle Reach of Lower Duwamish Waterway

Facility Name: Northland South (T 115)
Parcel No. 5367202505

WUS# 22

Facility Location: River Mile 1.8

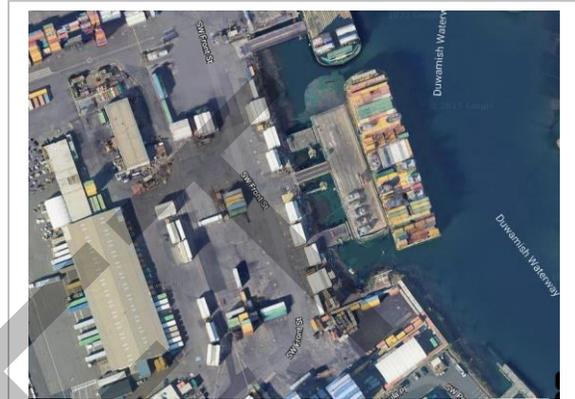
Direction (side) West

Asset Type: Pier

Use: Cargo and Container handling

Inspection Date: August 8, 2022

Inspected By: Ade Bright and Stephanie Lor



Site Overview

General Conditions, Evaluations and Recommendations:

- Pier

PHOTOGRAPHS



Photo 1



Photo 2

PHOTOGRAPHS



Photo 3

FACILITIES CONDITION ASSESSMENT REPORT

Sediment Cleanup of Middle Reach of Lower Duwamish Waterway

Facility Name: Northland North (T 115)
Parcel No. 5367202505

WUS# 19

Facility Location: River Mile 1.5 to 1.9

Direction (side) West

Asset Type: Wharf, Dolphins

Use: Barge loading and unloading

Inspection Date: August 8, 2022

Inspected By: Ade Bright and Stephanie Lor



Site Overview

General Conditions, Evaluations and Recommendations:

- Steel girder bridge on South side
- Outfall (concrete pipe) underneath bridge embankment
- Wharf with octagonal precast piles
- Timber fenders
- Rectangular cap beams
- Concrete pier decks
- Wharf has been reinforced near ramps, but not in middle

PHOTOGRAPHS



Photo 1



Photo 2

Attachment D-3
Photographs of Located Outfalls Located in LDW PDI Phase II

Facility ID	Outfall ID	Photograph or Note
OF01	DuwMetalFab	
OF02	2502	

Facility ID	Outfall ID	Photograph or Note
OF03	2501	
OF04	Georgetown WWTS	Submarine outfall; not inspected
OF05	S River St SD	
OF06	Seattle Dist Ctr	Not located

Facility ID	Outfall ID	Photograph or Note
OF07	2025	
OF08	Dawn Foods	

Facility ID	Outfall ID	Photograph or Note
OF09	SBW-B	
OF10	2028	

Facility ID	Outfall ID	Photograph or Note
OF11	2027	 A photograph showing a structure in a rocky stream. The structure consists of two vertical wooden posts and a horizontal beam. A red arrow points to a pipe or structure on the left side of the structure.
OF12	2026	 A photograph showing a structure in a rocky stream, similar to the one above. A red arrow points to a pipe or structure on the right side of the structure.

Facility ID	Outfall ID	Photograph or Note
OF13	2035	
OF14	2036	

Facility ID	Outfall ID	Photograph or Note
OF15	2037	
OF16	2040	

Facility ID	Outfall ID	Photograph or Note
OF17	CleanScapes B	 <p>A photograph showing a concrete structure with a pipe extending from it. A red arrow points to the pipe. The structure is situated near a body of water, and there is a fence and some vegetation in the background.</p>
OF18	DuwReload	 <p>A photograph showing a concrete structure with a pipe extending from it. A red arrow points to the pipe. The structure is situated near a rocky area, and there is a fence and some vegetation in the background.</p>

Facility ID	Outfall ID	Photograph or Note
OF19	2042	
OF20	5008	
OF21	5009	

Facility ID	Outfall ID	Photograph or Note
		 A photograph showing the interior of a large industrial facility, likely a wastewater treatment plant. The ceiling is high and made of concrete, with several large pipes running across it. A red arrow points to a specific pipe in the middle ground.
OF22	2107	 A photograph of an outfall pipe discharging into a river. The pipe is a large, dark, circular opening in a concrete structure on a rocky bank. A red arrow points to the pipe. The water in the river is a murky, brownish-green color. In the background, there are trees and a building.

Facility ID	Outfall ID	Photograph or Note
OF23	2112	 <p>A photograph showing a concrete-lined channel or outfall. A red arrow points to a pipe structure extending across the channel. In the background, there are industrial buildings and a worker in a yellow safety vest on a wooden platform.</p>
OF24	2115	 <p>A photograph showing a rocky area, likely a stream bed or outfall. A red arrow points to a pipe structure extending across the rocks. In the background, there are blue and white shipping containers and a building.</p>

Facility ID	Outfall ID	Photograph or Note
OF25	Boyer-2	 <p>A photograph showing a rocky stream bed. In the background, there are blue and white shipping containers and a blue metal structure. A red arrow points to a pipe opening in the rocky stream bed.</p>
OF26	Boyer-1	 <p>A photograph showing a rocky stream bed. In the background, there is a blue metal structure and a concrete tank. A red arrow points to a pipe opening in the rocky stream bed.</p>

Facility ID	Outfall ID	Photograph or Note
OF27	2118	
OF28	2120	

Facility ID	Outfall ID	Photograph or Note
OF29	2508	 <p>A photograph showing an industrial facility with green cranes and a concrete bridge structure. In the foreground, there is a concrete structure with a red arrow pointing to a crack in the concrete.</p>
OF30	2506	 <p>A photograph showing two large concrete pipes in a rocky stream bed. A red arrow points to a pipe opening in the water.</p>