



**STRUCTURE CONDITION ASSESSMENT REPORT
REVISION 0**

**REMEDIAL DESIGN SERVICES
SWAN ISLAND BASIN PROJECT AREA
CERCLA Docket No. 10-2021-001**

**PORTLAND HARBOR SUPERFUND SITE
PORTLAND, MULTNOMAH COUNTY, OREGON**

Contract Number: DT2002

Prepared for:

Swan Island Basin Remedial Design Group

Prepared by:



**11107 Sunset Hills Road, Suite 400
Reston, Virginia 20190**

With assistance from:



November 2023

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November 2023

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LIST OF ACRONYMS AND ABBREVIATIONS

AME	Appledore Marine Engineering, LLC
ASCE	American Society of Civil Engineers
BODR	Basis of Design Report
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	U.S. Environmental Protection Agency
HGL	HydroGeoLogic, Inc.
ID	identification
LiDAR	Light Detection and Ranging
MM	Mott MacDonald
PDI	Pre-Design Investigation
RD	Remedial Design
SIB	Swan Island Basin
SCC	Shipyard Commerce Center
USCG	U.S. Coast Guard

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STRUCTURE CONDITION ASSESSMENT REPORT SWAN ISLAND BASIN PROJECT AREA PORTLAND HARBOR SUPERFUND SITE PORTLAND, MULTNOMAH COUNTY, OREGON

1.0 INTRODUCTION

This report summarizes the results of structural inspections and condition assessments completed for shoreline and overwater structures inspected in the Swan Island Basin (SIB) Project Area of the Portland Harbor Superfund Site in Portland, Multnomah County, Oregon. Mott MacDonald (MM) and Collins Engineers performed the work in response to a request from HydroGeoLogic, Inc. (HGL) and on behalf of the SIB Remedial Design (RD) Group based on the requirements of the Portland Harbor Superfund Site Record of Decision (EPA, 2017) and the Administrative Settlement Agreement and Order on Consent (EPA, 2021). The work was performed in accordance with the final Pre-Design Investigation (PDI) Work Plan, which the U.S. Environmental Protection Agency (EPA) approved in May 2022 (HGL, 2022a). The goal of the structural inspections and condition assessments was to address data gaps identified in Section 3.7 of the PDI Work Plan, that are not addressed through other activities, such as the Facility Owner/Operator Survey and the Facility Future Use and Remedial Action Impacts Evaluation.

1.1 OBJECTIVES AND SCOPE

Condition assessments for shoreline and overwater structures were conducted to support functional structure determinations and Remedial Action impact analysis as part of RD development. The data gap analysis in the PDI Work Plan indicated that structural information, including as-built data and current structural member conditions, was needed to conduct structural assessments. Assessments were informed by screening-level structural inspections of readily accessible main structural system components to assess the physical condition of the structure relative to the structure's as-built condition. The following activities support completion of structure condition assessments:

- Conducted topside structure visual and tactile inspection of main structural system components;
- Conducted under-structure visual and tactile inspection of main structural system components;
- Conducted visual and tactile dive inspection of selected/representative portions of underwater main structural system components;
- Performed Mobile Terrestrial Light Detection and Ranging (LiDAR) Survey to document locations of marine structures; and
- Requested as-built documents, past repair history, and recent condition assessments from property owners/operators.

Condition assessments are not intended to reflect the structures' ability to withstand the remedial activities that may occur based on RD choices detailed in the Basis of Design Report (BODR).

Table 1-1 presents a crosswalk of data gaps identified in the PDI Work Plan and the activities to address data gaps. Activities include the Facility Owner/Operator Survey, Structure Condition Assessment, Functional Structure Determinations, and Remedial Action Impacts Evaluations. Functional Structure Determinations and evaluation of potential remedial action impacts on the structures, including likely capacity and design loads, will be developed in the BODR.

1.2 PROJECT AREA

The SIB Project Area is the active cleanup area between approximately River Mile 8.1 and River Mile 9.2 on the northeast side of the Willamette River; a major tributary of the Columbia River in Oregon. Condition assessments were completed for 24 permanent structures¹, including 5 outfalls, within the SIB Project Area boundary. Figure 1-1 shows the facilities included in the condition assessment.

1.3 DOCUMENT ORGANIZATION

The report is organized into the following sections:

- Section 1.0 presents an introduction, including the objectives and scope of the condition assessments;
- Section 2.0 describes the assessment activities and methodology;
- Section 3.0 summarizes the assessment results and conclusions; and
- Section 4.0 presents the references cited in this report.

¹ Floating structures that could be moved during remedial action and are not permanently attached to the basin sediments were not assessed as a part of this activity.

2.0 ASSESSMENT ACTIVITIES

2.1 STRUCTURE ASSESSMENT METHODOLOGY

Topside, above-water, and underwater inspections were conducted to determine the physical condition of the primary structural components of the substructure and superstructure at each shoreline/overwater structure. Structural element inspection included both visual and tactile methods, as described in the Field Sampling Plan (HGL, 2022b). Inspections and condition assessments followed the American Society of Civil Engineers (ASCE) guidance for the inspection and assessment of waterfront facilities (ASCE, 2015).

The inspections were conducted in two phases in accordance with the PDI Work Plan (HGL, 2022a). The first phase was a topside and above-water screening-level visual and tactile inspection of readily accessible, main structural systems components and fender piles by foot and by boat. The second phase was an underwater dive inspection of all facilities. Photographs and notes were taken of the observed structure conditions, indicating the type, severity, and location of damage and deterioration. Damage ratings were assigned to each inspected element. Element-level damage ratings (e.g., not inspected, no defects, minor, moderate, major, and severe) are standardized to provide a qualitative description of an element's condition based on a quantified level of damage (ASCE, 2015). Attachment A includes a glossary of terms, observations, measurements, and photographs from the two phases of inspections.

2.1.1 Structure Inspections

2.1.1.1 Topside and Above Water Structure Inspections

During the first phase inspection, the topside and above-water screening-level inspections were conducted by up to three two-person teams between April 25 and May 27, 2022. The screening inspections were used to make further inspection recommendations including focus areas for the dive inspection. The inspections were conducted above the deck of each structure, first on foot (topside), then by boat to observe the above-water components beneath the deck.

During the topside and above-water screening-level inspections, physical methods including sounding, drilling core measurements, pitting measurements, drilling resistance measurements, and steel thickness measurements were used to help inform estimates on remaining structural capacity.

A sounding test was performed using a hammer to determine interior deterioration and hollow or loose material for concrete and timber structures. Drilling core measurements were used to estimate section loss for timber structures. Pitting and ultrasonic thickness measurements were used to estimate section loss for steel structures. Pitting measurements used a pitting depth gage to measure localized areas of corrosion in steel elements. Steel thickness measurements were taken of selected steel components to determine the average amount of section loss due to corrosion. Resistance drill measurements were performed to estimate density and cross-sectional loss of timber piles. Resistance drill measurements used a needle that was pushed into the timber elements and recorded a plot of resistance correlating to the density of the wood.

Access for the topside and above-water teams to most facilities was unrestricted; however, access to the topside of the U.S. Navy Pier was not granted. Topside conditions for the U.S. Navy Pier were referenced from Waterfront Facilities Inspections and Assessments at Navy Operation Support Center Portland (Appledore Marine Engineering, LLC [AME], 2019).

2.1.1.2 Dive Inspection of In-water and Overwater Structures

During the second phase, in-water and overwater structures were inspected by a dive team accessing the water by boat. A four-person team performed the inspection using surface-supplied air diving equipment and techniques, with the diver having continuous wired communications with the topside. Inspections were carried out between July 17 and July 28, 2022.

During the dive inspections, a 100-percent visual/tactile inspection (Level I) was conducted on all structures. Sampling (Level II) and nondestructive testing or partially destructive testing (Level III) inspections were performed on the sheet pile cells at Quay Wall and the south side of the cells at Pier A (Figure 1-1). A Level III inspection using underwater resistance drilling equipment was performed on portions of the timber substructure elements. Water depth soundings were taken off the face of each structure. The diver-inspector's observations were transmitted to the topside personnel and recorded by the note taker. Attachment A includes observations, measurements, and photographs from the second phase inspection.

Access for the dive team to most facilities was unrestricted. Access to the Project Fleet Owner LLC (Shipyard Commerce Center [SCC]) structures, particularly the Quay Wall and the south side of Pier A near the dry dock (Figure 1-1), required prior notification to the owner in accordance with overwater/shoreline structure security requirements. The north side of Pier A (Figure 1-1) received minimal inspection because of the presence of a moored vessel with similar security and stand-off requirements.

2.1.1.3 Mobile Terrestrial Light Detection and Ranging Survey

Mobile Terrestrial LiDAR elevation data was collected on April 7, 2022, from a vessel-mounted laser scanner to estimate locations of emergent debris and marine structures and measure riverbank elevations. The survey collected location/elevation data using methods described in Sections 2.5 and 2.6 in Appendix A of the Survey and Quality Control Plan (MM, 2022). The Debris and Utility Identification and Survey Report contains additional information about the mobile LiDAR survey (HGL, 2023a).

2.1.2 Condition Assessment

Condition assessments were conducted for the primary structural system components of each overwater structure. The assessments, based on the inspection results from inspections described in Section 2.1.1, follow ASCE guidelines for the inspection and assessment of waterfront facilities (ASCE, 2015). Generally, the assessed condition of each component is based on a rating assigned to it using the following factors:

- Scope of damage (total number of defects);
- Severity of damage (type and size of defects);

- Distribution of damage (approximate area affected, local vs. general);
- Types of components affected (their structural “sensitivity”);
- Location of defect on component (relative to point of maximum moment/shear); and
- Serviceability.

Condition assessment ratings are as follows (ASCE, 2015):

- Good,
- Satisfactory,
- Fair,
- Poor,
- Serious, and
- Critical.

Definitions of the ratings are included in Table 2-1. After components were assessed, an overall condition assessment rating was assigned to each structure following the same methodology.

2.2 FACILITY OWNER/OPERATOR INFORMATION

A survey of property owners and operators for facilities located along the SIB shoreline was conducted. Applicable information (e.g., past repair history, past inspections, and as-built drawings) to the condition assessment for each facility, if available, is noted in Attachment A-0. The Facility Owner/Operator Information Summary Report contains additional information about the survey (HGL, 2023b). Interviews, questionnaires, past inspection reports, and as-built data, if available, provided by property owners and operators were used to supplement the field inspections. The facility owner/operator information will be evaluated for potential RD constraints or opportunities, including the application of remedial technologies. Coordination information is provided in Table 3-1 of the Facility Owner/Operator Information Summary Report.

Responses to the owner/operator survey were gathered from all 10 identified shoreline property owners and operators (HGL, 2023b). Information collected during this effort is summarized in Attachment A-0. The 10 property owners/operators are as follows:

- Project Fleet Owner LLC/SCC
- Port of Portland
- Freightliner
- Anchor Park, LLC
- City of Portland
- Swan Island Dock Company
- ATC Leasing Co.
- Marine Consortium Inc./NRC Environmental Services
- U.S. Navy
- U.S. Coast Guard (USCG)

Two survey respondents provided past structure condition assessments or structure inspections (Port of Portland [Berth 308] and U.S. Navy pier). Berth 308 and the U.S. Navy pier are no longer

in operation. Two of the survey respondents (Project Fleet Owner LLC/SCC [Pier D, Pier C, Berths 306 and 307, and Pier A] and the U.S. Navy provided as-built information for their facilities.

The only shoreline/overwater structure anticipating structural maintenance projects is the U.S. Navy pier. The U.S. Navy indicated that it is investigating the removal of its pier structure but has yet to identify a timeline for removal (HGL, 2023b).

Available as-built information, past repair history, and recent inspection report documents received to date for each shoreline and overwater structure are in Attachment A.

3.0 ASSESSMENT RESULTS SUMMARY

This section summarizes the inspection findings and conclusions of the structure condition assessments organized by structure, based on the inspection findings and factors described in Section 2.1. Structures are listed in counterclockwise order around the basin with outfalls grouped together. The assessed condition of each overwater/shoreline structure is depicted in Figure 3-1.

The results of the inspection and measurements recorded in the field are summarized in the first sub-section, with a reference to related inspection observations summary tables. The second sub-section provides a condition assessment of the main force resisting system's structural components at each overwater/shoreline structure and the overall overwater/shoreline structure condition rating based on the inspection findings and guidelines in ASCE Manual of Practice 130.² This assessment is based on conditions observed at the time of the data collection using the ratings indicated in Table 2-1.

The condition assessment rating is a qualitative judgement using engineering principles of the following (ASCE, 2015).

- Scope of damage (total number of defects);
- Severity of damage (type and size of defects);
- Distribution of damage (approximate area affected, local vs. general);
- Types of components affected (their structural “sensitivity”);
- Location of defect on component (relative to point of maximum moment/shear); and
- Serviceability.

Attachment A includes a glossary of terms as well the following supporting information, organized by structure:

- The general location, description, structure type, owner/operator, and function of structures, excluding city outfalls
- The general layout of the structure and as-built information, if available, obtained during the overwater/shoreline structure owner/operator surveys discussed in Section 2.2;
- Above-water inspection photographs, including location and description of associated field observations;
- Moata geospatial field data forms, including specific observations and measurements obtained during the inspection. Each input contains a unique identification (ID), information about the associated location (including bent and pile ID); and structure description, including structure name, element designation (e.g., substructure or superstructure), structure type (e.g., deck, pile, sheet pile, etc.), material (e.g., reinforced concrete, steel, etc.), defect level (e.g., not inspected, no defects, minor, moderate, major, and severe), and comments related to each input.

² The main force-resisting system of a structure includes elements that are critical for stability and carrying the intended loads from the bearing surface through the foundation to the ground below.

- Dive inspection photographs, including location and description of associated field observations; and
- Thickness measurements obtained using resistance drilling equipment or ultrasonic thickness gages, if available.

Figure 3-1 summarizes the overall condition ratings for each overwater/shoreline structure. The focus of the inspections was documenting damage and deterioration of the main force-resisting system components; therefore, damage to those components directly affects the capacity and stability of the structure. The magnitude of the diminished capacity and a determination regarding the structure's capacity to support design loads will be documented in the BODR.

3.1 BERTH 312 - PIER D (PROJECT FLEET OWNER LLC)

3.1.1 Structure Inspection Findings

As summarized in Table 3-1-1, the Pier D structure comprises prestressed concrete deck panels on concrete pile caps, supported by concrete and steel piles. Concrete spalls and severe cracks were observed in approximately 15 percent of the bullrail surface area. No damage was observed on the underside of the concrete deck panels. Several fender piles were missing or broken. The pile caps at some bents of the pier had rust stains and some locations had impact or corrosion-induced spalls. Concrete piles had spalls with rebar exposed at some locations. Steel piles had widespread corrosion and coating loss. The steel piles in general exhibited pitting 1/16 inch to 1/8 inch deep.

Attachment A-1 includes observed conditions of the above-water inspection and photographs of typical conditions observed during the dive inspection.

3.1.2 Structure Condition Assessment

The overall condition assessment rating of Pier D is **Fair** considering the main force-resisting system components were in fair condition. A summary of the condition assessment for each structural component and the overall condition assessment of Pier D are shown in Table 3-1-2.

3.2 EAST PIER (PROJECT FLEET OWNER LLC)

3.2.1 Structure Inspection Findings

As summarized in Table 3-2-1, the East Pier structure comprises steel grating and concrete girders supported by concrete and steel piles. Minor corrosion and coating loss were observed throughout the grating. Approximately less than 1 percent of the surface of the concrete pile caps had open spalls with rebar exposed. The concrete piles had abrasion damage and the steel piles had minor corrosion on over 50 percent of their surface area.

Attachment A-2 includes annotated plan layouts, representative photographs of typical conditions, tables of observed conditions for the East Pier from the above-water inspection, and photographs of typical conditions observed during the dive inspection.

3.2.2 Structure Condition Assessment

The overall condition assessment rating of the East Pier is **Fair** considering the condition of the piles. A summary of the condition assessment of the East Pier is shown in Table 3-2-2.

3.3 WEST PIER (PROJECT FLEET OWNER LLC)

3.3.1 Structure Inspection Findings

As summarized in Table 3-3-1, the West Pier structure comprises a concrete deck and concrete girders supported by concrete and steel piles. Minor cracks were observed throughout the surface area of the concrete deck. The handrail along West Pier was bent at one location. Approximately 4 percent of the surface of the concrete girders had open spalls caused by corrosion. No damage was observed on the pile caps. The concrete piles had abrasion damage, while steel piles had minor corrosion on over 50 percent of their surface area.

Attachment A-3 includes annotated plan layouts, representative photographs of typical conditions, tables of observed conditions for the West Pier from the above-water inspection, and photographs of typical conditions observed during the dive inspection.

3.3.2 Structure Condition Assessment

The overall condition assessment rating of the West Pier is **Poor** due to the condition of concrete girders. A summary of the condition assessment of the West Pier is shown in Table 3-3-2.

3.4 DEMO PIER (PROJECT FLEET OWNER LLC)

3.4.1 Structure Inspection Findings

As summarized in Table 3-4-1, the Demo Pier structure comprises timber panels, steel girders, prestressed concrete pile caps, and steel piles. Splits/checks less than 1/2 inch wide were observed on the timber panels (decking). Steel girders had coating loss with minor corrosion on less than 50 percent of the surface area. Prestressed concrete pile caps had spalls on approximately 12 percent of their surface area. Steel piles in general exhibited pitting 1/16 inch to 1/8 inch deep on 50 percent of the pile surface area.

Attachment A-4 includes annotated plan layouts, representative photographs of typical conditions, tables of observed conditions for the Demo Pier from the above-water inspection, and photographs of typical conditions observed during the dive inspection.

3.4.2 Structure Condition Assessment

The overall condition assessment rating of the Demo Pier is **Fair** considering the condition of the steel piles. A summary of the condition assessment is shown in Table 3-4-2.

3.5 SCC FLOATING DOCK (PROJECT FLEET OWNER LLC)

3.5.1 Structure Inspection Findings

As summarized in Table 3-5-1, the structure comprises a timber floating dock, a floating dock with steel grating on the top, and steel guide piles. Splits/checks less than 1/2 inch wide were observed throughout the surface of the timber floating deck and the bullrail. The steel grating and above-water sections of the steel guide piles had minor corrosion. The steel guide piles typically exhibited pitting 1/16 inch deep on 50 percent of the observed surface area below water.

Attachment A-5 includes observed conditions from the above-water inspection and photographs of typical conditions from the dive inspection.

3.5.2 Structure Condition Assessment

The overall condition rating of the SCC Floating Dock is **Satisfactory** considering the condition of the main force-resisting system. A summary of the condition assessment of the SCC Floating Dock is shown in Table 3-5-2.

3.6 BERTH 309 AND 310 – PIER C (PROJECT FLEET OWNER LLC)

3.6.1 Structure Inspection Findings

As summarized in Table 3-6-1, the Pier C structure comprises a reinforced concrete deck, reinforced concrete girders and pile caps, and steel piles. Localized open spalls with exposed rebar were observed on the topside of the concrete deck and the underside of the deck near the drainage holes. Concrete bullrail had localized open spalls with rebar exposed and/or utility pipes exposed. Some mooring hardware was missing. Chocks were partially or completely broken at some locations. Reinforced concrete girders had discrete open spalls with exposed rebar. Pile caps had open/closed spalls at some locations. Steel piles exhibited coating failure and pitting 1/16 inch to 1/8 inch deep on 60 percent of the observed surface area.

Attachment A-6 includes annotated plan layouts, representative photographs of typical conditions, tables of observed conditions for Pier C from the above-water inspection, and photographs of typical conditions and thickness measurements from the dive inspection.

3.6.2 Structure Condition Assessment

The overall condition assessment rating of Pier C is **Fair** considering the condition of the main force-resisting system components. A summary of the condition assessment of Pier C is shown in Table 3-6-2.

3.7 BERTH 301 – PIER A (PROJECT FLEET OWNER LLC)

3.7.1 Structure Inspection Findings

As summarized in Table 3-7-1, the Pier A structure comprises an asphalt overlay, concrete moment slab with bullrail, and steel sheet pile cells. The asphalt overlay had alligator cracking throughout

the surface area. The bullrail had open spalls at several locations. The handrail was bent at one location. Mooring hardware had coating loss and moderate surface corrosion. Several fender piles were missing. Minor corrosion and deformation were observed on the steel waler. The steel sheet pile had widespread corrosion and coating loss. Sheet piles exhibited pitting up to 1/8 inch deep on 60 percent of the area and 1/4 inch deep on 40 percent of the area near mean lower low water. Some steel sheet piles had cross-section loss of approximately 10 percent to 20 percent.

Attachment A-7 includes annotated plan layouts, representative photographs of typical conditions, tables of observed conditions for Pier A from the above-water inspection, and photographs of typical conditions and thickness measurements from the dive inspection.

3.7.2 Structure Condition Assessment

The overall condition rating of Pier A is **Serious** considering the condition of the steel sheet pile cells. A summary of the condition assessment of Pier A is shown in Table 3-7-2.

3.8 QUAY WALL (PROJECT FLEET OWNER LLC)

3.8.1 Structure Inspection Findings

As summarized in Table 3-8-1, the Quay Wall structure comprises steel sheet pile cells, concrete pile caps, and concrete beams. Only the portions of the concrete beam and pile caps accessible from the topside surface were inspected; portions of the concrete beams and pile caps were not readily accessible due to the height of the components. Concrete beams and pile caps showed cracks that have been potentially caused by settlement, as shown in Attachment A-8. The steel sheet pile had widespread corrosion and coating loss. Sheet piles exhibited pitting up to 1/8 inch deep on 50 percent of the area and 1/4 inch deep on 40 percent of the area near mean lower low water. Some steel sheet pile had cross-section loss of approximately 10 percent to over 50 percent.

Attachment A-8 also includes annotated plan layouts, representative photographs of typical conditions, tables of observed conditions from the above-water inspection, and photographs of typical conditions and thickness measurements from the dive inspection.

3.8.2 Structure Condition Assessment

The overall condition rating of the Quay Wall is **Serious** considering the condition of the steel sheet pile cells. A summary of the condition assessment of the Quay Wall is shown in Table 3-8-2.

3.9 BERTH 302-305 – LAGOON WHARF (PROJECT FLEET OWNER LLC)

3.9.1 Structure Inspection Findings

As summarized in Table 3-9-1, the Lagoon Wharf structure comprises a deck, timber girders, timber pile caps, timber piles, steel toe wall, and steel bulkhead sheet piles (including a waler tie-back system). The deck had alligator cracking throughout the water edge to the crane rail. Approximately 10 percent of the bullrail had splits/checks wider than 1/2 inch and a section loss of over 50 percent. Approximately 10 percent of the handrail had local buckling and breakage. Splits/checks up to 1/2 inch wide were observed on the approximately 10 percent surface of timber

girders. Pile caps at some locations had displacement and were crushed. Approximately 2 percent of cross bracing was broken. The steel toe wall had rust lamination 1/4 inch thick on 100 percent of the surface area and pitting 1/32 inch to 1/16 inch deep on 50 percent of the observed surface area. The steel waler that forms a portion of the bulkhead tie-back system was corroded and had a moderate level of deterioration. The flanges of the steel bulkhead sheet piles exhibited pitting 3/50 inch to 1/5 inch deep on observed surfaces and some flanges had cross-section loss of around 1 percent to 6 percent. The web of steel bulkhead sheet piles at several locations had a cross-section loss of around 1 percent to 9 percent. Timber piles had splits/checks up to 1/4 inch to 1/2 inch wide. Sounding tests were performed on 325 piles during the above-water inspection and 12 percent of the sampled piles exhibited internal core deterioration. Resistance drill measurements were taken on 72 piles during the dive inspection and 5 percent of the sampled piles had internal core deterioration.

Attachment A-9 includes annotated plan layouts, representative photographs of typical conditions, tables of observed conditions from the above-water inspection, and photographs of typical conditions and resistance drill measurements from the dive inspection.

3.9.2 Structure Condition Assessment

The overall condition rating of the Lagoon Wharf is **Poor** considering the condition of piles and bulkhead sheet piles. A summary of the condition assessment of the Lagoon Wharf is shown in Table 3-9-2.

3.10 BERTH 306 (PROJECT FLEET OWNER LLC)

3.10.1 Structure Inspection Findings

As summarized in Table 3-10-1, the Berth 306 structure comprises 1 berth, 2 timber walkways, and 10 timber dolphins. The berth consists of a concrete deck supported by timber piles. Broken cross-bracing and timber panels (decking of walkways) were observed on the timber walkways. Approximately 80 percent of the piles of dolphins had damage, including section loss of up to 75 percent, pile partial/complete breakage, and splits/checks over 1/2 inch wide. The concrete deck of the berth had minor cracks and surface delamination throughout the surface area. Pile caps and the piles of the berth had minor to moderate splits/checks at several locations.

Attachment A-10 includes annotated plan layouts, representative photographs of typical conditions, tables of observed conditions from the above-water inspection, and photographs of typical conditions and resistance drill measurements from the dive inspection.

3.10.2 Structure Condition Assessment

The overall condition rating of the Berth 306 walkways and dolphins is between **Poor** to **Serious** due to the condition of the dolphins. The overall condition rating of the main pier is **Fair** because of the condition of the piles. A summary of the condition assessment of Berth 306 is shown in Table 3-10-2.

3.11 BERTH 307 (PROJECT FLEET OWNER LLC)

3.11.1 Structure Inspection Findings

As summarized in Table 3-11-1, the Berth 307 structure comprises a berth, a timber walkway, and four timber dolphins. The berth consists of a concrete deck supported by timber piles. Approximately 80 percent of the piles for each dolphin showed damage including pile section loss, pile partial/complete breakage, pile cap missing, and splits/checks up to a 1/2 inch wide. Minor to moderate splits/checks were observed on the piles supporting the walkway. One bridging connection between the walkway and dolphin was missing. The concrete deck of the berth had localized open spalls with exposed rebar. The concrete cover had moderate deterioration. Bullrail had minor cracks and the handrail had minor corrosion. No damage was observed on the pile caps of the berth. Timber cross-bracing of the berth was broken at some locations. Piles of berth had minor to moderate splits/checks at several locations and two piles had internal core deterioration.

Attachment A-11 includes annotated plan layouts, representative photographs of typical conditions, tables of observed conditions from the above-water inspection, and photographs of typical conditions and resistance drill measurements from the dive inspection.

3.11.2 Structure Condition Assessment

The overall condition rating of the Berth 307 walkway and dolphins is **Serious**. The overall condition rating of the main pier is **Poor** considering the condition of the piles. A summary of the condition assessment of Berth 307 is shown in Table 3-11-2.

3.12 BERTH 308 (PORT OF PORTLAND)

3.12.1 Structure Inspection Findings

As summarized in Table 3-12-1, the Berth 308 structure comprises a berth and three timber dolphins. The berth consists of a concrete deck supported by timber piles. Several piles at the dolphins were fractured and had section loss of up to 100 percent. The concrete deck of the berth had minor to moderate cracks. The concrete cover of the deck had severe deterioration. Two open spalls with rebar exposed were observed on the deck. Bullrail had minor cracks and the handrail had minor corrosion. No damage was observed on the pile caps of the Berth. Piles of berth had minor to moderate splits/checks at several locations and seven piles had internal core deterioration.

Attachment A-12 includes annotated plan layouts, representative photographs of typical conditions, tables of observed conditions from the above-water inspection, and photographs of typical conditions and resistance drill measurements from the dive inspection.

3.12.2 Structure Condition Assessment

The overall condition rating of the Berth 308 dolphins is **Poor**. The overall condition rating of the main pier is **Poor** considering the condition of the piles and deck. A summary of the condition assessment of Berth 308 is shown in Table 3-12-2.

3.13 WIND TUNNEL (FRIEGHTLINER)

3.13.1 Structure Inspection Findings

As summarized in Table 3-13-1, the Wind Tunnel foundation comprises three steel pile bents and a retaining wall. The retaining wall consists of wide flange steel king piles with concrete lagging. Minor corrosion and coating loss were observed on steel framing and piles. No damage was observed on the retaining wall.

Attachment A-13 includes annotated plan layouts, representative photographs of typical conditions, tables of observed conditions from the above-water inspection, and photographs of typical conditions observed during the dive inspection.

3.13.2 Structure Condition Assessment

The overall condition rating of the Wind Tunnel is **Satisfactory** considering the condition of the piles. A summary of the condition assessment of the Wind Tunnel is shown in Table 3-13-2.

3.14 SWAN ISLAND BOAT RAMP (CITY OF PORTLAND)

3.14.1 Structure Inspection Findings

As summarized in Table 3-14-1, the Swan Island Boat Ramp structure comprises a timber floating dock supported by five timber piles. The floating dock had widespread minor splits/checks. The bullrail was broken at the end of the floating dock near the waterside. Splits/checks up to 1/2 inch wide were observed throughout the surface of the bullrail. Several piles had splits/checks up to 1 inch wide, and one pile had a section loss of up to 25 percent. One pile guide was submerged due to an apparent loss of floatation.

Attachment A-14 includes annotated plan layouts, representative photographs of typical conditions, tables of observed conditions from the above-water inspection, and photographs of typical conditions and resistance drill measurements from the dive inspection.

3.14.2 Structure Condition Assessment

The overall condition rating of Swan Island Boat Ramp is **Fair** considering the condition of the main force resisting system. A summary of the condition assessment of the Swan Island Boat Ramp is shown in Table 3-14-2.

3.15 BERTH 311 (SWAN ISLAND DOCK COMPANY)

3.15.1 Structure Inspection Findings

As summarized in Table 3-15-1, the Berth 311 structure comprises two timber dolphins, two timber walkways, and a timber wharf. The berth comprises a U-type wharf with two access trestles. One dolphin timber pile was broken and a steel tie between the pile and pile cap was loose. Another dolphin was missing a timber pile and a steel tie between a pile and the pile cap was broken. Timber panels (decking) of walkways had splits/checks of up to 1/2 inch wide throughout the surface area.

Thirteen percent of the west trestle piles sounded hollow and one pile had splits/checks up to 3/4 inch wide. Eight percent of the east trestle piles sounded hollow and one pile had a section loss of over 75 percent. The timber girders of the wharf had minor splits/checks throughout the surface. The two crane beams had minor corrosion over approximately 50 percent of their surface area. The pile caps typically had horizontal splits/checks along the whole length. One pile cap was partially broken and misaligned about 1 inch, while another pile cap had a section loss of approximately 50 percent. Sounding tests were performed on 180 piles during the above-water inspection, and approximately 13 percent of the piles sounded hollow.

During the dive inspection, sounding tests were performed on 391 piles and approximately 20 percent of sampled piles sounded hollow. Within the piles that sounded hollow, 12 piles showed visible signs of damage. The damage included section loss ranging from 25 percent to over 50 percent, partial/complete breakage, and displacements.

Attachment A-15 includes annotated plan layouts, representative photographs of typical conditions, tables of observed conditions from the above-water inspection, and photographs of typical conditions and resistance drill measurements from the dive inspection.

3.15.2 Structure Condition Assessment

The overall condition rating of the Berth 311 dolphins and walkways is Fair. The overall condition rating of the Berth 311 wharf is **Serious** considering the condition of pile caps, trestles, and piles. A summary of the condition assessment of Berth 311 is shown in Table 3-15-2.

3.16 DREDGE BASE (PORT OF PORTLAND)

3.16.1 Structure Inspection Findings

As summarized in Table 3-16-1, the Dredge Base structure comprises a concrete deck supported by timber and steel piles. The concrete deck panels had minor longitudinal and transverse cracks at expansion joints. The timber bullrail had full section splits/checks up to 1/2 inch wide at the end of the member. No damage was observed on the cross-bracing. Timber pile caps had minor splits/checks throughout the surface. Steel pile caps had minor corrosion. Timber piles typically exhibited splits/checks up to 1/4 inch wide and 40 percent of the timber piles had internal core decay. Steel piles typically exhibited minor corrosion and had pitting up to 1/16 deep on 75 percent of their surface area.

Attachment A-16 includes annotated plan layouts, representative photographs of typical conditions, tables of observed conditions from the above-water inspection, and photographs of typical conditions and resistance drill measurements from the dive inspection.

3.16.2 Structure Condition Assessment

The overall condition rating of the Dredge Base is **Serious** considering the condition of pile caps and piles. A summary of the condition assessment of the Dredge Base is shown in Table 3-16-2.

3.17 MARINE CONSORTIUM PIER (THE MARINE CONSORTIUM, INC.)

3.17.1 Structure Inspection Findings

As summarized in Table 3-17-1, the Marine Consortium Pier structure comprises steel dolphins, a timber T-pier, and timber floating docks supported by steel piles. The timber pier has timber panels (decking) supported by timber piles. No damage was observed on the timber panels. The mooring hardware (cleats) had minor pitting on the surface. The fender system walers/chocks had 25 percent section loss and several fender piles had moderate splits/checks. Pile caps had splits/checks up to 1/2 inch wide at one location. The timber piles typically had splits/checks up to 1/4 inch wide. Nine percent of the piles had internal core deterioration. The boat house was not inspected because it is not a fixed overwater structure.

The steel dolphins had minor corrosion and coating loss. The timber decking on the floating docks sounded soft in some locations. The floating docks were leaning toward the landside for the entire landside edge. Steel guide piles for the floating docks typically had minor corrosion and pitting 1/16 inch to 1/8 inch deep on 50 percent of the surface area.

Attachment A-17 includes annotated plan layouts, representative photographs of typical conditions, tables of observed conditions from the above-water inspection, and photographs of typical conditions and resistance drill measurements from the dive inspection.

3.17.2 Structure Condition Assessment

The overall condition rating of the Marine Consortium Pier dock is **Fair** because of the condition of floating docks. The overall condition rating of the T Pier is **Fair** considering the condition of piles and pile caps. The overall condition rating of the dolphins is **Satisfactory** given the condition of the piles. A summary of the condition assessment of the Marine Consortium Pier is shown in Table 3-17-2.

3.18 U.S. NAVY PIER (UNITED STATES OF AMERICA)

3.18.1 Structure Inspection Findings

As summarized in Table 3-18-1, the U.S. Navy Pier comprises timber dolphins, asphalt overlay, timber decking, timber beams, timber pile caps, and timber piles. Only a dive inspection was performed on the U.S. Navy Pier because above-water inspection access was not granted by the owner. AME³ conducted a topside inspection in 2019. AME's inspection report was used to assess topside structural elements. Alligator cracks were observed on the asphalt overlay. The steel handrail had widespread corrosion and coating loss and had failed in two locations. The timber bullrail had widespread moderate checks/splits and cross-section loss due to internal decay. Beams had minor splits/checks and light fungal decay. Pile caps had split/checks and severe end-grain

³ AME, under contract with U.S. Navy, conducted condition assessment in 2019. U.S. Navy provided this prior condition assessment for their structure as a part of the Facility Owner/Operator Information request.

fungal decay. Approximately 30 percent of the timber chocks had severe end-grain fungal decay. All the dolphin piles and blocks on the dolphin had severe fungal decay (AME, 2019).

The dive inspection noted that the timber piles typically exhibited splits/checks up to 1/4 inch wide. One batter pile had a 50 percent section loss. Resistance drill measurements were taken at 20 piles (279 piles in total) and 5 of the piles had internal core deterioration. Several fender piles showed lateral deflection and impact damage.

Attachment A-18 includes photographs of typical conditions and resistance drill measurements from the dive inspection.

3.18.2 Structure Condition Assessment

The overall condition rating of the U.S. Navy Pier is **Fair** considering the condition of the main force-resisting system components. A summary of the condition assessment of the U.S. Navy Pier is shown in Table 3-18-2.

3.19 U.S. COAST GUARD DOCK AND PIER (UNITED STATES OF AMERICA)

3.19.1 Structure Inspection Findings

As summarized in Table 3-19-1, the USCG Dock and Pier structure comprises two separate structures: a timber pier and a floating dock. The timber pier had a main pier with three timber mooring/breasting dolphins. No damage was observed on the main pier timber panels (decking). The bullrail had splits/checks ranging from 1/4 inch to 1/2 inch wide throughout the surface. The cross section of the bullrail had splits/checks running through the full section depth. Pile caps were misaligned from the top of the pile at Bent 2. Several cross-bracings were damaged. Damage to the cross-bracings included splits/checks on the surface, partial breakage, and section loss ranging from approximately 25 percent to 50 percent. Timber piles typically had splits/checks up to 1/4 inch wide. Several piles had impact gouges. Sounding tests were performed on 58 piles of the main pier (70 piles in total). Four percent of the sampled piles of the main pier had internal core deterioration with section loss ranging from 40 percent to 50 percent. Nearly fifty percent of the dolphin piles had internal core deterioration with a section loss of approximately 50 percent.

The USCG floating dock is supported by eight dolphins. Each dolphin comprises one steel guide pile and two timber piles forming an A-frame to support the steel guide pile. No damage was observed on the floating dock. The steel piles had minor corrosion and pitting 1/16 inch to 1/8 inch deep on 50 percent of the observed area. One timber pile had a gouge. Approximately 69 percent of the dolphin timber piles had internal core deterioration with section loss approximately greater than 50 percent.

Attachment A-19 includes annotated plan layouts, representative photographs of typical conditions, tables of observed conditions from the above-water inspection, and photographs of typical conditions and resistance drill measurements from the dive inspection.

3.19.2 Structure Condition Assessment

The overall condition rating of the USCG main pier is **Fair** considering the condition of the piles and mooring/breasting dolphins. The overall condition rating of the floating dock is **Fair** considering the condition of the dolphins and guide piles. A summary of the condition assessment of the USCG Dock and Pier is shown in Table 3-19-2.

3.20 CITY STORMWATER OUTFALLS

The following section summarizes inspection findings for city outfalls S1, S2, M1, M2, and M3 at SIB. As indicated in Section 1.2, the condition assessment was performed for structures that were considered large permanent structures, including city outfalls listed above, and not all SIB outfalls.

3.20.1 City Outfall S1

3.20.1.1 Structure Inspection Findings

As summarized in Table 3-20-1, outfall S1 comprises a steel sheet pile headwall and corrugated metal pipe. The embankment behind and adjacent to the headwall has significantly eroded, exposing the corrugated metal pipe. The pipe was undermined outboard of the headwall and was broken approximately 10 feet away from the headwall. Attachment A-20 includes photographs of typical conditions observed during the riverbank and above-water inspections.

3.20.1.2 Structure Condition Assessment

The overall condition rating of outfall S1 is **Serious** considering the condition of the head wall and corrugated metal pipe. A summary of the condition assessment is shown in Table 3-20-2.

3.20.2 City Outfall S2

3.20.2.1 Structure Inspection Findings

As summarized in Table 3-20-1, outfall S2 comprises a concrete headwall, concrete wingwalls, and a concrete apron. The outfall structure was undermined with a hole approximately 2 feet wide and 3 feet to 4 feet deep immediately in front and under the structure. The top of the headwall had a 2-inch crack. Edges of the wingwalls were spalled up to 4 inches deep. The apron exhibited abrasion up to 1/2 inch deep. Attachment A-20 includes photographs of conditions observed during the inspection.

3.20.2.2 Structure Condition Assessment

The overall condition rating of outfall S2 is **Poor** considering the condition of the head wall. A summary of the condition assessment is shown in Table 3-20-2.

3.20.3 City Outfall M1

3.20.3.1 Structure Inspection Findings

As summarized in Table 3-20-1, outfall M1 comprises a concrete headwall, concrete wingwalls, and a concrete apron. The concrete structures typically exhibited abrasion up to 1/2 inch deep. The west wingwall was fractured 7 feet from the headwall with exposed rebar. The exposed rebar had surface corrosion with no measurable section loss. Attachment A-20 includes photographs of conditions observed during the inspection.

3.20.3.2 Structure Condition Assessment

The overall condition rating of outfall M1 is **Satisfactory** considering the condition of the main force-resisting system. A summary of the condition assessment is shown in Table 3-20-2.

3.20.4 City Outfall M2

3.20.4.1 Structure Inspection Findings

As summarized in Table 3-20-1, outfall M2 comprises a concrete headwall, concrete wingwalls, and a concrete apron. The concrete structures typically exhibited abrasion up to 1/2 inch deep. There was a spall 7 inches wide by 1 foot long by 2 inches deep on the north wingwall. A build-up of material at the base of the outfall was observed. Attachment A-20 includes photographs of conditions observed during the inspection.

3.20.4.2 Structure Condition Assessment

The overall condition rating of outfall M2 is **Satisfactory** considering the condition of the main force-resistance system. A summary of the condition assessment is shown in Table 3-20-2.

3.20.5 City Outfall M3

3.20.5.1 Structure Inspection Findings

As summarized in Table 3-20-1, outfall M3 comprises a concrete headwall, concrete wingwalls, and a concrete apron. The dive inspection noted that no significant defects were observed. Attachment A-20 includes photographs of conditions observed during the inspection.

3.20.5.2 Structure Condition Assessment

The overall condition rating of outfall M3 is **Good** due to the condition of the main force-resistance system. A summary of the condition assessment is shown in Table 3-20-2.

3.21 CONCLUSIONS

The objective of the inspections and condition assessments of the shoreline and overwater structures within the SIB Project Area was to fill specific data gaps identified in the PDI Work Plan. The inspection data and assessment findings will support functional structure determinations and development of the RD by evaluating the general condition of shoreline and overwater structures and estimating their present structural capacity.

Inspection data demonstrates that the condition of SIB Project Area shoreline and overwater structures (including the city outfalls) ranges from **Satisfactory** to **Serious**. Six structures and one outfall are rated in **Serious** condition, five structures and one outfall are rated in **Poor** condition, twelve structures are rated in **Fair** condition, three structures and two outfalls are rated in **Satisfactory** condition, and one outfall is rated in **Good** condition. None of the observed structures were rated in **Critical** condition. A summary of the condition ratings for all overwater structures is shown in Table 3-21.

The structures rated in **Fair** to **Serious** condition have reduced structural capacity due to deterioration or physical damage. The reduced capacity is attributed to widespread major-to-severe deterioration on the deck, pile caps, or piles. Structures rated in **Poor** or **Serious** condition might have a higher probability of being affected by Remedial Action. The magnitude of the reduction in the capacity of these structures will be determined as part of the BODR.

As-built information was not available for all structures. In the absence of as-built drawings, RD engineers will develop assumptions regarding pile depths and other structural characteristics based on the structure age, structure type, adjacent structures, and additional data collected during PDI⁴. These assumptions will be accompanied by sensitivity analyses and to inform Remedial Action impacts and will be incorporated into the BODR.

⁴ Additional information may include repair activities completed since this assessment, such as plans to repair and stabilize the Berth 305 slope and outfall that are currently being developed and anticipated to be completed in Summer 2023.

4.0 REFERENCES

- American Society of Civil Engineers (ASCE), 2015. *ASCE Manual of Practice 130, Waterfront Facilities Inspection and Assessment Manual of Practice*.
- Appledore Marine Engineering, LLC. (AME), 2019. *Waterfront Facilities Inspections and Assessments at NOSC Portland*, CR-NAVFAC EXWC-CIOFP-1919. Prepared for NAVFAC EXWC, Washington Navy Yard, Washington, DC. August.
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- HGL, 2022b. *Field Sampling Plan*, Revision 3, CERCLA Docket No. 10-2021-00. Prepared for the Swan Island Remedial Design Group, Overland Park, Kansas. May.
- HGL, 2023a. *Debris and Utility Identification and Survey Report, Revision 0*. Prepared for the Swan Island Remedial Design Group, Overland Park, Kansas. February.
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- Mott MacDonald (MM), 2022. Revised (Version 4) *Survey and Quality Control Plan*. Technical Memorandum. Prepared for the Swan Island Remedial Design Group, Overland Park, Kansas. March.
- U.S. Environmental Protection Agency (EPA), 2017. *Record of Decision*, Portland Harbor Superfund Site, Portland Oregon. United States. Environmental Protection Agency Region 10, Seattle, Washington.
- EPA, 2021. *Administrative Settlement Agreement and Order on Consent for Remedial Design, Swan Island Basin Project Area*, CERCLA Docket No. 10-2021-001 – 7, Region 10. January 20.

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TABLES

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Table 1-1
Data Gap Analysis Crosswalk Table – Shoreline and Overwater Structures

Data Requirement	Existing Data Summary	PDI-WP Data Gap to be Filled		Completed Activity	Remaining Activities
Existing structure layout, structural system component sizes and strengths, and original structure design criteria	<ul style="list-style-type: none">Some as-built design plans are available for various fixed structures within the shipyard.	<ul style="list-style-type: none">Structural information for all potentially affected shoreline and over-water structures, including piers, wharves, dolphins, floating docks, retaining walls/bulkheads, boat launch, dry docks, and other structures. Information to be compiled includes as-built structure dimensions and layout, material types, material strengths, design loads, environmental loads, pile embedment depths and capacities, and fill material used in cellular structures.	→	<ul style="list-style-type: none">Structure Condition Assessment	<ul style="list-style-type: none">Facility Future Use and Remedial Action Impacts Evaluation
		<ul style="list-style-type: none">Mobile Terrestrial Light Detection and Ranging (LiDAR) Survey (laser scan) data to document the locations and elevations of existing structures.		<ul style="list-style-type: none">Mobile Terrestrial LiDAR Survey	<ul style="list-style-type: none">None
		<ul style="list-style-type: none">Land- and water-based inspections of marine structures, to be photo-documented and geo-referenced.		<ul style="list-style-type: none">Structure Condition Assessment activity photo-documented and georeferenced primary elements of overwater structures.	<ul style="list-style-type: none">None
Current and future use and design criteria	<ul style="list-style-type: none">None	<ul style="list-style-type: none">Data on vehicles, equipment, vessels, and other loads that the structures need to support and are planning to support in the future (if different than the original design).	→	<ul style="list-style-type: none">Facility Owner/Operator Survey captured current and future use of overwater structures	<ul style="list-style-type: none">Facility Future Use and Remedial Action Impacts Evaluation
		<ul style="list-style-type: none">Interviews with owners/operators to understand facility operations and current/future use.		<ul style="list-style-type: none">Facility Owner/Operator Survey captured current and future use of overwater structures	<ul style="list-style-type: none">None
History of past repairs	<ul style="list-style-type: none">As-built design plans are available for various fixed structures within the shipyard.	<ul style="list-style-type: none">As-built plans of repairs or remodels for all affected shoreline and over-water structures, including design criteria.	→	<ul style="list-style-type: none">None	<ul style="list-style-type: none">Facility Future Use and Remedial Action Impacts Evaluation
Current above- and below-water structural member condition	<ul style="list-style-type: none">The latest condition assessment report available is from 2014 and covers Berths 301-305, 309-310, 312-314, associated finger pier, and sheet piles cell walls of Pier A.	<ul style="list-style-type: none">Current condition inspections and assessments (within 3 years) of all over-water facilities affected. Condition assessments will include pile and sheet pile foundations, decks, and other support structure members.	→	<ul style="list-style-type: none">Structure Condition Assessment completed on all overwater structures.Facility/Owner-Operator Survey obtained 2019 condition assessment of U.S. Navy structure	<ul style="list-style-type: none">None
Functional structures evaluation	<ul style="list-style-type: none">Some as-built design plans are available for various fixed structures within the shipyard, but no remaining service life information is available	<ul style="list-style-type: none">Current condition assessments of shoreline and over-water structures, and structural evaluation to estimate remaining service life.	→	<ul style="list-style-type: none">Structure Condition Assessment completed on overwater structures.	<ul style="list-style-type: none">Facility Future Use and Remedial Action Impacts Evaluation
Impacts of Remedial Action on structures	<ul style="list-style-type: none">Information is available on impacts of berth deepening on the sheet pile walls of Pier A.	<ul style="list-style-type: none">Structural analysis to confirm impacts of the remedial action on a given structure.	→	<ul style="list-style-type: none">None	<ul style="list-style-type: none">Facility Future Use and Remedial Action Impacts Evaluation
		<ul style="list-style-type: none">Previous navigation channel studies, dredging studies, or berth deepening studies for all affected structures.		<ul style="list-style-type: none">None	<ul style="list-style-type: none">Facility Future Use and Remedial Action Impacts Evaluation

Table 2-1
Condition Assessment Ratings

Rating	Description
Good	No visible damage or only minor damage noted. Structural elements may show very minor deterioration, but no overstressing observed. No repairs are required.
Satisfactory	Limited minor to moderate defects or deterioration observed but no overstressing observed. No repairs are required.
Fair	All primary structural elements are sound but minor to moderate defects or deterioration observed. Localized areas of moderate to advanced deterioration may be present but do not significantly reduce the load-bearing capacity of the structure. Repairs are recommended, but the priority of the recommended repairs is low.
Poor	Advanced deterioration or overstressing observed on widespread portions of the structure but does not significantly reduce the load-bearing capacity of the structure. Repairs may need to be carried out with moderate urgency.
Serious	Advanced deterioration, overstressing, or breakage may have significantly affected the load-bearing capacity of primary structural components. Local failures are possible and loading restrictions may be necessary. Repairs may need to be carried out on a high-priority basis with urgency.
Critical	Very advanced deterioration, overstressing, or breakage has resulted in localized failure(s) of primary structural components. More widespread failures are possible or likely to occur, and load restrictions should be implemented as necessary. Repairs may need to be carried out on a very high-priority basis with strong urgency.

Source: Table 2-14 of American Society of Civil Engineers (ASCE), 2015. *ASCE Manual of Practice 130*, Waterfront Facilities Inspection and Assessment Manual of Practice.

Table 3-1-1
Inspection Observations Summary – Berth 312 - Pier D

Pier D		Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected			Notes	
Main Force-Resisting System Components								
Deck Topping		Concrete	Moderate – Major	Area affected	< 5%		Open and closed spalls were along the crane rail	
Deck Panel		Concrete	No damage		N/A		N/A	
Beam / Joist / Stringer / Girder		Concrete	Moderate – Major		< 1		Occasional corrosion stains	
Pile Caps		Concrete	Moderate – Severe		1.4%		Open and close spalls	
Piles		Steel and Concrete	Minor – Severe	% of piles affected	Above Water	Below Water	Above Water	Below Water
				In total	100%	100%	1. Minor corrosion 2. Pile K at Bent 1 was broken	3. Rust lamination 1/2 on 100% of the pile surface area 4. Pitting 1/16 to 1/8 inch deep on 50% of the observed area
Ancillary Components								
Guardrail / Handrail / Bullrail		Concrete	Moderate – Severe	Area affected	15.1%		Impact open spalls with exposed rebar	
Mooring Hardware		Steel	No damage observed	% of Mooring Affected	N/A		N/A	
Fender System	Fender Piles	Timber, Steel, and Concrete	Major – Severe	Number of Piles Affected	25		1. Fender piles were missing 2. Fender piles had section loss 3. No information about the total number of fender piles	
	Waler	Steel	No damage observed	% of Waler Affected	N/A		N/A	

Notes: Refer to Attachment A-1 for detailed observations, measurements, and typical condition photos.

N/A = not applicable

Table 3-1-2
Condition Assessment Summary – Berth 312 - Pier D

Main Force-Resisting System Components		Condition Rating	Comments
Concrete Deck Panel		Satisfactory	<ol style="list-style-type: none"> 1. No spalls were observed on the underside of the deck panels 2. The cover of the deck panel was intact, and the underside of the deck panel looked new 3. There was evidence of water leaking from the topping of the deck
Concrete Pile Caps		Fair	<ol style="list-style-type: none"> 1. Pile caps exhibited a discoloration 2. The connection between the pile and pile cap at Bent 9 Pile K had spalls due to potential high shear loading
Piles	Concrete Piles	Fair	<ol style="list-style-type: none"> 1. Minor spalls were observed on approximately 2% of the total piles 2. Bent 1 Pile K was completely broken at the top
	Steel Piles	Poor	<ol style="list-style-type: none"> 1. 1/2-inch rust lamination 2. Widespread deterioration 3. 30% reduction of the flange thickness
Overall Condition Rating			
Pier D		Fair	

Table 3-2-1
Inspection Observations Summary – East Pier

East Pier	Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected			Notes	
Main Force-Resisting System Components							
Grating	Steel	Minor	Area affected	100%		Minor corrosion and coating loss	
Pile Caps	Concrete	Major		< 1%		Open spalls with rebar exposed	
Piles			% of Piles Affected	Above Water	Below Water	Above Water	Below Water
	Concrete	Minor	In total	100%	100%	Mechanical Abrasion	Mechanical Abrasion
	Steel	Minor		100%	100%	Less than 50% of the perimeter had minor corrosion and coating loss was observed	1. Rust lamination 1/4 to 1/2 thick on 100% of the surface area 2. Pitting 1/16 to 1/8 inch deep on 50% of the observed area
Ancillary Components							
Guardrail / Handrail / Bullrail	Steel	Minor	Area affected	50%		Less than 50% of the perimeter had minor corrosion and coating loss was observed	

Notes: Refer to Attachment A-2 for detailed observations, measurements, and typical condition photos.

Table 3-2-2
Condition Assessment Summary – East Pier

Main Force-Resisting System Components		Condition Rating	Comments
Steel Grating		Satisfactory	Minor corrosion and coating loss
Concrete Pile Caps		Fair	The surface area had localized open spalls with rebar exposed, less than 1% of the surface area
Piles	Concrete Piles	Fair	Mechanical abrasion
	Steel Piles	Fair	1. Minor corrosion 2. Coating loss
Overall Condition Rating			
East Pier		Fair	

Table 3-3-1
Inspection Observations Summary – West Pier

West Pier	Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected			Notes	
Main Force-Resisting System Components							
Deck	Concrete	Minor	Area affected	100%		Minor cracks throughout the deck surface	
Beam / Joist / Stringer Girder	Concrete	Severe		3.6%		Opens spalls with exposed rebar and corrosion	
Pile Caps	Concrete	Minor		< 5%		Occasional corrosion stains	
Piles			% of Piles Affected	Above Water	Below Water	Above Water	Below Water
	Concrete	Minor	In total	100%	100%	Mechanical Abrasion	Mechanical Abrasion
	Steel	Minor		100%	100%	1. Less than 50% of the perimeter had minor corrosion and coating loss was observed	1. Rust lamination 1/4 to 1/2 thick on 100% of the surface area 2. Pitting 1/16 to 1/8 inch deep on 50% of the observed area
Ancillary Components							
Guardrail / Handrail / Bullrail	Steel	Severe	Area affected	1%		Structure bent at one location	

Notes: Refer to Attachment A-3 for detailed observations, measurements, and typical condition photos.

Table 3-3-2
Condition Assessment Summary – West Pier

Main Force-Resisting System Components		Condition Rating	Comments
Concrete Deck		Satisfactory	Minor cracks
Concrete Girders		Poor	<ol style="list-style-type: none"> 1. Open spalls with rebar exposed 2. Advanced spalls were at the expansion joints 3. Chemical degradation was observed on the surface
Concrete Pile Caps		Satisfactory	Occasional corrosion stains
Piles	Concrete Piles	Fair	<ol style="list-style-type: none"> 1. Mechanical abrasion 2. Minor cracks
	Steel Piles	Fair	<ol style="list-style-type: none"> 1. Minor corrosion 2. Coating loss
Overall Condition Rating			
West Pier		Poor	

Table 3-4-1
Inspection Observations Summary – Demo Pier

Demo Pier	Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected			Notes	
Main Force-Resisting System Components							
Timber Panels	Timber	Minor	Area affected	100%		Minor splits/checks throughout the deck	
Beam / Joist / Stringer Girder	Steel	Minor		50%		Less than 50% of the perimeter had minor corrosion and coating loss was observed	
Pile Caps	Concrete	Minor to Moderate		11.6%		Open and closed impact spalls	
Piles	Steel	Minor	% of piles affected	Above Water	Below Water	Above Water	Below Water
			In total	100%	100%	1. Less than 50% of the perimeter had minor corrosion and coating loss was observed	1. Rust lamination 1/4 to 1/2 thick on 100% of the surface area 2. Pitting up to 1/16 inch deep on 50% of the observed area
Ancillary Components							
Guardrail / Handrail / Bullrail	Steel	Minor	Area affected	100%		Minor corrosion	

Notes: Refer to Attachment A-4 for detailed observations, measurements, and typical condition photos.

Table 3-4-2
Condition Assessment Summary – Demo Pier

Main Force-Resisting System Components	Condition Rating	Comments
Timber Deck Panel	Satisfactory	Minor checks/splits
Steel Girders	Satisfactory	Minor corrosion
Concrete Pile Caps	Satisfactory/Fair	Pile caps had impact open and closed spalls
Steel Piles	Fair	1. Piles had light surface corrosion 2. Pitting was under 1/16 inch
Overall Condition Rating		
Demo Pier	Fair	

Table 3-5-1
Inspection Observations Summary – SCC Floating Dock

SCC Floating Dock	Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected			Notes	
Main Force-Resisting System Components							
Floating Dock	Timber	Minor	Area affected	100%		Splits/checks less than 1/2 inch wide throughout the surface	
Steel Grating	Steel	Minor	Area affected	100%		Minor corrosion	
Guide piles	Steel	Minor	% of Piles Affected	Above Water	Below Water	Above Water	Below Water
			In total	100%	100%	Minor corrosion and coating loss	Pitting 1/16 inch deep on 50% of the surface area
Ancillary Components							
Guardrail / Handrail / Bullrail	Timber	Moderate - Severe	Area affected	100%		Bullrail: Splits/checks less than 1/2 inch wide throughout the surface	

Notes: Refer to Attachment A-5 for detailed observations, measurements, and typical condition photos

Table 3-5-2
Condition Assessment Summary – SCC Floating Dock

Main Force-Resisting System Components	Condition Rating	Comments
Timber Floating Dock	Satisfactory	Minor splits/checks throughout the surface of the floating dock
Steel Grating	Satisfactory	Minor corrosion
Steel Piles	Satisfactory	Pitting 1/16 inch deep on 50% of the surface area
Overall Condition Rating		
SCC Floating Dock	Satisfactory	

Table 3-6-1
Inspection Observations Summary – Berth 309 and 310 – Pier C

Pier C (Berths 309 and 310)		Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected			Notes	
Main Force-Resisting System Components								
Deck		Reinforced Concrete	Moderate - Major	Area affected	100%		1. Cracks throughout the deck surface 2. Approximately 2.4% of the surface area had open spalls	
Beam / Joist / Stringer / Girder		Reinforced Concrete	Moderate - Major		1.5%		Transverse cracks and partially open and open spalls	
Pile Caps		Reinforced Concrete	Moderate - Severe		3.3%		Open spalls with rebar exposed and closed spalls	
Piles		Steel pipe and battered steel H-piles	Minor - Moderate	% of Piles Affected	Above Water	Below Water	Above Water	Below Water
				In total	100%	100%	Over 50% area of steel piles had rust and coating loss	1. 60% of the surface area had pitting 1/16 to 1/8 inch deep 2. 10% had rust nodules up to 1.5 inches
Ancillary Components								
Guardrail / Handrail / Bullrail		Concrete	Major - Severe	Area affected	10%		Bullrail had open spalls with exposed rebar and/or utility pipes	
Mooring Hardware		Steel	Severe	% of Mooring affected	3		3 mooring hardware were missing	
Fender System	Fender Piles	Timber, Steel, and Concrete	Severe	Number of piles affected	Only 4 fender piles were left from Bents 56 to 39		1. Several fender piles were missing 2. No information about the total number of fender piles	
	Waler	Steel	Major - Severe	Number of walers affected	4		1. Timber chocks were partially or completely broken 2. No information about the total number of walers	

Notes: Refer to Attachment A-6 for detailed observations, measurements, and typical condition photos.

Table 3-6-2
Condition Assessment Summary – Berth 309 and 310 - Pier C

Main Force-Resisting System Components	Condition Rating	Comments
Concrete Deck	Fair	Localized area with moderate to severe deterioration (open spalls with rebar exposed)
Concrete Girders	Fair	<ol style="list-style-type: none"> Three locations with major to severe damage including possible flexural cracking, exposed reinforcement, and efflorescence Severe damage is limited to two bents in the full pier
Concrete Pile Caps	Fair	<ol style="list-style-type: none"> The pile cap had a diagonal crack, but the damage was localized Five locations with impact spalls with exposed reinforcement Damage observed on pile caps was localized
Steel Piles	Fair	Steel pipe had coating failure and moderate corrosion
Overall Condition Rating		
Pier C	Fair	

Table 3-7-1
Inspection Observations Summary – Berth 301 - Pier A

Pier A (Berth 301)		Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected			Notes	
Main Force- Resisting System Components								
Piles		Steel sheet piles	Moderate	% of Piles Affected	Above Water	Below Water	Above Water	Below Water
				In total	100%	100%	1. Moderate to major corrosion on 60% of the area 2. Pitting typically from 1/25 inch to 2/25 inch deep near the waterline for 40% of the area	1. 60% of the surface area had pitting 1/16 to 1/8 inch deep 2. Some sheet piles had cross-section loss of around 10% to 30%
Ancillary Components								
Overlay		Asphalt	Moderate	Area affected	50%	Alligator cracking		
Guardrail / Handrail / Bullrail		Reinforced Concrete	Severe	Area affected	40%	Bullrail had open spalls with exposed rebar at several locations		
Mooring Hardware		Steel	Severe	% of Mooring Affected	Unable to determine	1. Coating loss and surface corrosion on less than 50% of the area. 2. One bollard foundation has a large open spall with exposed connections.		
Fender System	Fender Piles	Timber, Steel, and Concrete	Severe	Number of Piles Affected	10	Fender piles missing		
	Waler	Steel	Minor	% of Waler Affected	Unable to determine	1. Minor corrosion and deformation of steel waler 2. Timber chocks had splits/checks less than 1/2 inch wide 3. No information about the total number of walers		

Notes: Refer to Attachment A-7 for detailed observations, measurements, and typical condition photos.

Table 3-7-2
Condition Assessment Summary – Pier A

Main Force-Resisting System Components	Condition Rating	Comments
Steel Sheet Pile	Serious	<ol style="list-style-type: none">1. Substantial reduction of load-carrying capacity due to loss of section by approximately 10 to 30%2. The location of the loss of section near the middle of the cell is critical. The location of minimum thickness is near the maximum moment. Demand would increase with dredging3. There is no visible overstressing yet, but there is a substantial reduction in the physical properties used for estimating the carrying capacity of the system
Overall Condition Rating		
Pier A	Serious	

Table 3-8-1
Inspection Observations Summary – Quay Wall

Quay Wall	Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected			Notes	
Main Force-Resisting System Components							
Pile Caps and Deck Beam	Reinforced Concrete	Moderate	Area affected	Unable to determine		Moderate cracks both on the deck beam and pile caps	
Piles	Steel sheet piles	Moderate	% of Piles Affected	Above Water	Below Water	Above Water	Below Water
			In total	100%	100%	1. Widespread corrosion with coating loss 2. Pitting up to 1/4 deep on 40% of the area near the water	1. 60% of the surface area had pitting 1/8 inch deep 2. Some sheet piles had cross-section loss of around 10% to 30%
Ancillary Components							
N/A			Area affected				

Notes: Refer to Attachment A-8 for detailed observations, measurements, and typical condition photos.

N/A = not applicable

Table 3-8-2
Condition Assessment Summary – Quay Wall

Main Force-Resisting System Components	Condition Rating	Comments
Concrete Deck Beam	Satisfactory/Fair	1. Cracks on deck beams and pile caps do not appear to be caused by overstressing. 2. This damage should be considered when analyzing the location for possible dredging. Risk of additional settlement damage to the structure.
Concrete Pile Caps	Satisfactory/Fair	As above, evaluated as a structural group
Steel Sheet Pile	Serious	1. Substantial reduction of load-carrying capacity due to loss of section by approximately 40%. 2. The location of the loss of section near the middle of the cell is critical. The location of minimum thickness is near the maximum moment. Demand would increase with dredging. 3. There is no visible overstressing yet, but there is a substantial reduction in the physical properties used for estimating the carrying capacity of the system.
Overall Condition Rating		
Quay Wall	Serious	

Table 3-9-1
Inspection Observations Summary – Berth 302-305 - Lagoon Wharf

Berth 302-305 - Lagoon Wharf	Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected			Notes	
Main Force-Resisting System Components							
Deck	Timber with an asphalt overlay	Moderate - Severe	Area affected	50%		1. Alligator cracking throughout the water edge to crane rail 2. One location had open spalls with rebar exposed	
Beam / Joist / Stringer / Girder	Timber	Moderate - Major		10%		Splits/checks were up to 1/2 inch wide	
Pile Caps	Timber	Major - Severe		2%		1. Pile caps at some locations had misalignment from the top of the piles 2. Pile caps at some locations were crushed	
Cross-bracing	Timber	Severe	Area affected	2%		Cross-bracings had partially or completed breakage at some bents	
Piles	Timber	Minor - Severe	% of Piles Affected	Above Water	Below Water	Above Water	Below Water
			In total	100%	100%	1. 3% of the piles had splits/ checks up to 1/2 inch wide 2. 12% (39 out of 325) of sampled piles had internal core deterioration 3. Bent 135 Pile A had complete breakage	1. Splits/checks up to 1/4 inch wide 2. 5% of the sampled pile (72 sampled piles) had internal core deterioration 3. Piles at Bent 0 had 65% internal core decay

Table 3-9-1 (continued)
Inspection Observations Summary – Berth 302-305 - Lagoon Wharf

Berth 302-305 - Lagoon Wharf		Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected	Notes	Berth 302-305 - Lagoon Wharf
Steel Bulkhead Sheet Piles (including waler tie back system)		Steel	Minor - Severe	Area affected	100%	4. The flange had pitting 3/50 to 1/5 inch deep on the observed surface area 5. Several flanges had cross-section loss of around 1 to 6% 6. The web had a cross-section loss of around 1 to 9% 7. Waler had section loss potentially reducing the capacity 8. The bulkhead sheet pile had breakage at Bent 100
Steel Toe Wall		Steel	Moderate	Area affected	100%	1. Pitting 1/32 to 1/16 inch deep on 50% of the observed surface area 2. Rust lamination 1/4inch thickness on 100% of the surface area
Ancillary Components						
Guardrail / Handrail / Bullrail		Bullrail: timber Handrail: steel	Moderate - Severe	Area affected	10%	Bullrail; 1. Splits/checks over 1/2 inch wide 2. Some sections with over 50% section loss Handrail: Local bucking and breakage
Mooring Hardware		Steel	No damage observed	% of Mooring Affected	N/A	N/A
Fender System	Fender Piles	Timber, Steel, and Concrete	Major - Severe	Number of Piles Affected	9	1. 9 fender piles missing 2. 3 fender piles were broken, or approximately 50% section lost
	Waler	Timber	Major - Severe	% of Waler Affected	<5%	1. Missing or broken 2. Some chocks had displacements or misalignments
	Chocks	Timber	Minor - Severe	% of Chocks Affected	<10%	Walers in the tidal zone had decay at member ends

Notes: Refer to Attachment A-9 for detailed observations, measurements, and typical condition photos.

Table 3-9-2
Condition Assessment Summary – Berth 302-305 - Lagoon Wharf

Main Force-Resisting System Components	Condition Rating	Comments
Timber Girders	Satisfactory	Splits/checks were up to 1/2 inch wide
Timber Cross-bracing	Poor	Several cross-bracing was partially or completely broken
Timber Pile Caps	Fair	1. Pile caps at some locations were not aligned with a pile 2. Pile caps at some locations were crushed
Timber Piles	Poor	1. Splits/checks up to 1/4 inch wide 2. 12% of the sampled piles had internal core deterioration (above-water inspection) 3. 5% of the sampled piles had internal core deterioration (dive inspection) 4. Piles at Bent 0 had 65% core deterioration
Steel Bulkhead Sheet Pile	Fair/Poor	1. Pitting on the flange up to 1/5 inch deep 2. Cross-section loss of several flanges was around 1 to 6% 3. Cross-section loss of the web at several locations was around 1 to 9% 4. Waler had section loss potentially reducing the capacity of the sheet pile 5. One location of bulkhead had a breakage
Steel Toe Wall	Fair	1. Moderate corrosion 2. Pitting 1/32 to 1/16
Overall Condition Rating		
Berth 302-305 – Lagoon Wharf	Poor	

Table 3-10-1
Inspection Observations Summary –Berth 306

Berth 306	Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected			Notes	
Main Force-Resisting System Components							
Walkways	Timber	Major - Severe	% of walkways affected	100%		1. Several cross-bracings and timber panels were partially or completely broken 2. One timber pile sounds hollow	
Dolphins	Timber	Major - Severe	% of dolphins affected	50% (5 of 10)		1. Minor to moderate splits/checks on the piles 2. Section loss observed on several piles 3. Several piles were broken 4. Almost 80% of piles of Dolphins D1 to D5 had damage	
Lay Berth							
Deck	Reinforced Concrete	Minor - Moderate	Area affected	100%		Minor cracks were observed throughout the surface	
Pile Caps	Timber	Moderate	Area affected	2.6%		Moderate cracks were observed in one location	
Cross-bracing	Timber	Moderate to Severe	Area affected	< 5%		Full-length splits/checks up to 1/8 inch wide The cross-bracing connection was fractured between Piles A and B	
Piles	Timber	Minor	% of Piles Affected	Above Water	Below Water	Above Water	Below Water
			In total	100%	100%	Minor splits/checks less than 1/8 inch wide	1. Splits/checks up to 1/4 inch wide
Ancillary Components							
Guardrail / Handrail / Bullrail	Reinforced Concrete and Steel	Severe	Area affected	100%		Bullrail: minor cracks Handrail: minor corrosion	

Notes: Refer to Attachment A-10 for detailed observations, measurements, and typical condition photos.

Table 3-10-2
Condition Assessment Summary – Berth 306

Main Force-Resisting System Components	Condition Rating	Comments
Timber Walkways	Serious	1. Walkways had broken timber panels and cross-bracing 2. Several piles had internal core deterioration
Timber Dolphins	Poor/Serious	1. Fractured piles 2. Section loss of piles was observed at each dolphin
Berth		
Concrete Deck	Fair	1. Minor to moderate cracks throughout the surface 2. Surface delamination
Timber Pile Caps	Satisfactory	1. Moderate splits/checks were observed at one location
Timber Cross-bracing	Poor/Serious	1. Cross-bracings or connections broken at 5 discrete locations
Timber Piles	Fair	1. Splits/checks less than 1/4 inch wide
Overall Condition Rating		
Walkways and Dolphins	Poor/Serious	
Berth	Fair	

Table 3-11-1
Inspection Observations Summary – Berth 307

Berth 307	Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected			Notes	
Main Force-Resisting System Components							
Walkway	Timber	Serious	% of walkways affected	100%		1. Piles of the walkway had minor to moderate splits/checks 2. The connection between the walkway and Dolphin D10 was missing	
Dolphins	Timber	Major - Severe	% of dolphins affected	100%		1. Minor to moderate splits/checks on the piles 2. Section loss observed on several piles 3. Several piles were broken for each dolphin	
Berth							
Deck	Reinforced Concrete	Moderate - Severe	Area affected	100%		1. Open spall with exposed rebar observed at one location 2. The concrete cover had moderate deterioration	
Pile Caps	Timber	No damage observed	Area affected	N/A		N/A	
Cross-bracing	Timber	Moderate to Severe	% of cross-bracing affected	5%		One cross-bracing was completely broken	
Piles	Timber	Major	% of Piles Affected	Above Water	Below Water	Above Water	Below Water
			In total	4.2%	100%	1. Minor splits/ checks less than 1/8 inch wide 2. 2 piles had internal core deterioration	1. Splits/checks up to 1/4 inch wide 2. 1 pile had approximately 15% cross-section deterioration
Ancillary Components							
Guardrail / Handrail / Bullrail	Reinforced Concrete and Steel	Minor	Area affected	Unable to determine		Bullrail: minor cracks Handrail: minor corrosion	

Notes: Refer to Attachment A-11 for detailed observations, measurements, and typical condition photos.

N/A = not applicable

Table 3-11-2
Condition Assessment Summary – Berth 307

Main Force-Resisting System Components	Condition Rating	Comments
Timber Walkway	Serious	1. Piles of the walkway had minor to moderate splits/checks 2. The connection between the walkway and Dolphin D10 was missing
Timber Dolphins	Serious	1. Fractured piles were observed at each dolphin
Berth		
Concrete Deck	Poor	1. Open spalls with exposed rebar 2. Severe deterioration on the deck cover
Timber Pile Caps	Satisfactory	No damage observed
Timber Cross-bracing	Serious	1. Cross-bracings and connection broken
Timber Piles	Poor	2. Splits/checks less than 1/4 inch wide 3. Three piles had internal core deterioration
Overall Condition Rating		
Walkway and Dolphins	Serious	
Berth	Poor	

Table 3-12-1
Inspection Observations Summary – Berth 308

Berth 308	Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected			Notes	
Main Force-Resisting System Components							
Dolphins	Timber	Major - Severe	% of dolphins affected	67%		1. Minor to moderate splits/checks on the piles 2. Some piles had section loss of up to 100% 3. Several piles were broken for each dolphin	
Berth							
Deck	Reinforced Concrete	Moderate - Severe	Area affected	100%		1. Minor to moderate cracks were observed throughout the surface area 2. Two open spalls with exposed rebar observed 3. The concrete topping had severe deterioration	
Pile Caps	Timber	No damage observed	Area affected	N/A		N/A	
Cross-bracing	Timber	No damage observed	% of cross-bracing affected	N/A		N/A	
Piles	Timber	Major	% of Piles Affected	Above Water	Below Water	Above Water	Below Water
			In total	17%	100%	1. Splits/checks greater than 1/2 inch wide on one pile 2. 6 piles had internal core deterioration	1. Splits/checks up to 1/4 inch wide 2. 30% of walers were broken along the line of Pile A and had section loss of up to 100%
Ancillary Components							
Guardrail / Handrail / Bullrail	Reinforced Concrete and Steel	Minor	Area affected	100%		Bullrail: minor cracks Handrail: minor corrosion	

Notes: Refer to Attachment A-12 for detailed observations, measurements, and typical condition photos.

N/A = not applicable

Table 3-12-2
Condition Assessment Summary – Berth 308

Main Force-Resisting System Components	Condition Rating	Comments
Timber Dolphins	Poor	1. Fractured piles were observed at each dolphin 2. Some piles had section loss of up to 100% 3. Effects on the capacity of dolphins were limited
Berth		
Concrete Deck	Poor	1. Open spalls with exposed rebar 2. Severe deterioration on the deck cover
Timber Pile Caps	Satisfactory	No damage was observed. Some areas were not inspected due to access limitations
Timber Piles	Poor	1. Splits/checks less than 1/2 inch wide 2. Six piles had internal core deterioration 3. Damage was widespread but was similar to Berth 307
Overall Condition Rating		
Dolphins	Poor	
Lay Berth	Poor	

Table 3-13-1
Inspection Observations Summary – Wind Tunnel

Wind Tunnel	Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected			Notes	
Main Force-Resisting System Components							
Retaining Wall	Reinforced Concrete	No damage observed	Area affected	N/A		N/A	
Steel Framing	Steel	Minor	Area affected	< 50%		Minor corrosion and coating loss	
Piles	Steel	Minor	% of Piles Affected	Above Water	Below Water	Above Water	Below Water
			In total	100%	100%	1. Widespread corrosion with coating loss 2. Pitting up to 1/32 deep on 30% of the area in the tidal zone	1. 50% of the surface area had pitting 1/16 inch deep
Ancillary Components							
N/A			Area affected				

Notes: Refer to Attachment A-13 for detailed observations, measurements, and typical condition photos.

N/A = not applicable

Table 3-13-2
Condition Assessment Summary – Wind Tunnel

Main Force-Resisting System Components	Condition Rating	Comments
Concrete Retaining Wall	Good	No damage observed
Steel Framing	Good	Minor corrosion and coating loss
Steel Piles	Satisfactory	Widespread minor corrosion and coating loss
Overall Condition Rating		
Wind Tunnel	Satisfactory	

Table 3-14-1
Inspection Observations Summary – Swan Island Boat Ramp

Swan Island Boat Ramp	Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected			Notes	
Main Force-Resisting System Components							
Floating Dock	Timber	Minor	Area affected	100%		1. Minor splits/checks observed throughout the surface of the floating dock 2. The connection between Floating Docks 3 and 4 was loose	
Piles	Timber	Minor	% of piles affected	Above Water	Below Water	Above Water	Below Water
			In total	80%	100%	1. Splits/checks up to 1 inch wide for all the piles 2. Pile 3 had a section loss of up to 25% 3. Pile 5 had a section loss	1. Splits/checks up to 1/2 inch wide
Ancillary Components							
Guardrail / Handrail / Bullrail	Timber	Moderate - Severe	Area affected	13%		1. Bullrail was broken at the end of the floating dock 2. Bullrail had splits/checks up to 1/2 inch wide between Floating Docks 3 and 4	
Pile guides	Steel	Moderate	% of pile guide affected	20%		1. The pile guide of Pile 5 was submerged in the water	

Notes: Refer to Attachment A-14 for detailed observations, measurements, and typical condition photos.

Table 3-14-2
Condition Assessment Summary – Swan Island Boat Ramp

Main Force-Resisting System Components	Condition Rating	Comments
Timber Floating Dock	Fair	Minor splits/checks throughout the surface of the floating dock
Timber Piles	Fair	1. Splits/checks up to 1 inch wide 2. Two piles had section loss
Overall Condition Rating		
Swan Island Boat Ramp	Fair	

Table 3-15-1
Inspection Observations Summary – Berth 311

Berth 311	Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected		Notes
Main Force-Resisting System Components					
Dolphins	Timber	Major - Severe	% of dolphins affected	100%	1. Steel ties between the pile and pile cap for both dolphins were broken 2. Dolphin A had one pile partially broken 3. One pile of Dolphin B was missing
Walkways	Timber	Moderate	% of walkways affected	100%	Splits/checks were up to 1/2 inch wide throughout the surface area of both walkways
Main Pier					
Trestles	Reinforced concrete and timber	Moderate	Area affected	N/A	1. The concrete deck had moderate cracks throughout the surface 2. West Trestle: 13% (7 out of 55) of piles sounded hollow and 1 pile had spilt/check up to 3/4 inch between Bent 6 and Bent 10 3. East Trestle: 8% (4 out of 50) of piles sounded hollow and 1 pile had a section loss of over 75% between Bent 6 and Bent 10
Deck	Reinforced concrete	Moderate - Major	Area affected	100%	1. The concrete deck had moderate cracks throughout the surface 2. Several locations had open spalls
Pile Caps	Timber	Moderate - Severe	Area affected	100%	1. Splits/checks less than 1/2 inch wide throughout the surface 2. Pile cap at Bent 23 between Piles I and K was partially broken and was displaced approximately 1 inch 3. Pile caps at Bent 2 between Piles A and B had section loss of approximately 50% 4. The pile cap was bending at one location
Cross-bracing	Timber	Minor - Severe	% of cross-bracing affected	100%	1. Splits/checks less than 1/2 inch wide 2. 1 cross-bracing was completely broken under a platform between Bent 25 and Bent 26

Table 3-15-1 (continued)
Inspection Observations Summary – Berth 311

Berth 311		Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected			Notes	
Piles		Timber	Moderate to Severe	% of piles affected	Above Water	Below Water	Above Water	Below Water
				In total	15%	20%	1. Sounds hollow 2. Section loss from 25% to over 50% 3. Partially or completely broken 4. Displacement	
Ancillary Components								
Mooring Hardware		Steel	Minor	% of mooring hardware affected	100%		Minor corrosion	
Guardrail / Handrail / Bullrail		Timber	Minor - Severe	Area affected	100%		1. Bullrail: Some locations were partially broken and minor to moderate splits/checks throughout the surface 2. Handrail: Minor splits/checks throughout the surface	
Fender System	Fender Piles	Timber, Steel, and Concrete	Severe	Number of piles affected	24		1. Fender piles were missing	
	Waler	Timber	Minor	% of Waler Affected	Unable to determine		1. Minor splits/checks throughout the surface 2. No information about the total number of walers	

Notes: Refer to Attachment A-15 for detailed observations, measurements, and typical condition photos.

N/A = not applicable

Table 3-15-2
Condition Assessment Summary – Berth 311

Main Force-Resisting System Components	Condition Rating	Comments
Timber Dolphins	Fair	Some piles were partially broken and the steel tie between the pile and pile cap was loose/broken
Timber Walkways	Fair	Several timber panels had splits/checks over 1/2 inch
Berth		
Trestles	Serious	1. 7 out of 55 (13%) timber piles sounded hollow and hollow-sounding piles were concentrated in Bent 6 to Bent 9 (Each bent has 5 piles). Bent 6 to Bent 9 have reduced capacity.
Concrete Deck	Satisfactory	1. Open spalls at some locations 2. Minor cracks
Timber Girders	Satisfactory	1. Splits/checks less than 1/2 inch 2. The steel crane beam had minor corrosion on approximately 50% of the surface area
Timber Pile Caps	Serious/Poor	1. Horizontal splits/checks throughout the surface 2. The pile cap was broken at one location 3. The pile cap was bending and displaced at one location
Timber Piles	Poor	1. Some piles sounded hollow 2. Some piles had section loss from 25% to over 50% 3. Some piles had partially or completely broken 4. Some piles were displaced
Overall Condition Rating		
Dolphins	Fair	
Walkways	Fair	
Berth	Serious	

Table 3-16-1
Inspection Observations Summary – Dredge Base

Dredge Base	Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected			Notes	
Main Force-Resisting System Components							
Deck	Concrete	Minor	Area affected	100%		Minor longitudinal and transverse cracks throughout the deck surface	
Pile Caps	Timber	Minor		100%		Minor Splits/checks throughout the surface area	
	Steel	Minor		100%		Minor corrosion and coating loss	
Piles			% of Piles Affected	Above Water	Below Water	Above Water	Below Water
	Timber	Severe	In total	40%	100%	1. Splits/checks up to 1/4 inch wide 2. 8 out of 20 timber piles had internal core deterioration	1. Splits/checks up to 1/4 inch
	Steel	Minor		100%	100%	1. Minor corrosion on 10% of the pile surface area 2. Pitting up to 1/16 inch deep	
Ancillary Components							
Guardrail / Handrail / Bullrail	Timber	Severe	Area affected	5%		1. Bullrail: Splits/checks up to 1/2 inch wide through the cross-section at the end of the bullrail 2. Timber handrail: Minor splits/checks throughout the surface area 3. Steel handrail: Minor corrosion	

Notes: Refer to Attachment A-16 for detailed observations, measurements, and typical condition photos

Table 3-16-2
Condition Assessment Summary – Dredge Base

Main Force-Resisting System Components	Condition Rating	Comments
Concrete Deck	Satisfactory	Minor cracks at the expansion joint
Pile Cap (Timber and Steel)	Fair	1. Timber: minor splits/checks 2. Steel: minor corrosion and coating loss
Piles (Timber and Steel)	Serious	1. Timber: 40% of timber piles had internal core deterioration (8 out of 20) 2. Steel: pitting up to 1/16 inch wide on 75% of the area
Overall Condition Rating		
Dredge Base	Serious	

Table 3-17-1
Inspection Observations Summary – Marine Consortium Pier

Marine Consortium Pier	Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected			Notes	
Main Force Resisting System Components							
Dolphins	Steel	Minor	Area affected	100%		Minor corrosion and coating loss	
Floating Docks	Timber	Major		Unable to determine		1. Timber panels sounded hollow at some locations 2. No information about the total number of timber panels 3. Floating docks leaning toward the landside	
Timber Pier							
Deck	Timber	No damage observed	Area affected	N/A		N/A	
Pile Caps	Timber	Moderate		1%		Splits/checks up to 1/2 inch wide	
Piles			% of Piles Affected	Above Water	Below Water	Above Water	Below Water
	Timber	Major	In total	100%		1. Splits/checks up to 1/4 inch wide 2. 5 out of 54 piles had internal core deterioration	
	Steel (floating dock)	Minor		100%		1. Pitting up to 1/16 to 1/8 inch on 50% of the surface	
Ancillary Components							
Guardrail / Handrail / Bullrail	Timber	Severe	Area affected	1%		Bullrail: Section loss of up to 25% at some locations	
Ladder	Steel	Severe	Area affected	100%		Steel ladder bent	
Walkways	Steel	Minor	Area affected	100%		Minor corrosion and coating loss	

Notes: Refer to Attachment A-17 for detailed observations, measurements, and typical condition photos.

Table 3-17-2
Condition Assessment Summary – Marine Consortium Pier

Main Force Resisting System Components	Condition Rating	Comments
Steel Floating Docks	Fair	1. The floating docks were leaning to one side 2. Some timber panels sounded soft
Steel Piles (Floating docks)	Satisfactory	Pitting up to 1/16 to 1/8 on 50% of the surface area
Steel Dolphins	Satisfactory	Minor corrosion and coating loss
T-Pier		
Timber Deck	Satisfactory	Minor splits/checks on the surface
Timber Girders	Satisfactory	Minor splits/checks on the surface
Timber Cross-bracing	Satisfactory	Minor splits/checks on the surface
Timber Pile Caps	Fair	Splits/checks up to 0.5 inches wide at one location
Timber Piles	Fair	1. 5 Piles had inner core deterioration 2. Splits/checks up to 1/4 inch wide
Overall Condition Rating		
Floating Docks	Fair	
Dolphins	Satisfactory	
T Pier	Fair	

Table 3-18-1
Inspection Observations Summary – U.S. Navy Pier

U.S. Navy Pier	Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected				Notes	
Main Force-Resisting System Components								
Dolphins	Timber	Moderate - Severe	Area affected	100%		1. Walers on dolphins had moderate to severe core deterioration 2. Dolphin Pile 2 had approximately 20% cross-section deterioration 3. All dolphin piles had severe fungal decay at the end		
Pier								
Deck	Timber	Minor	Area affected	Unable to determine		1. Light fungal decay at the underside of the deck		
Beams	Timber	Minor	Area affected	100%		1. Minor splits/checks 2. Light fungal decay		
Pile cap	Timber	Minor - Severe	Area Affected	100%		1. Minor splits/checks 2. Severe end-grain fungal decay		
Piles			% of Piles Affected	Above Water	Below Water	Above Water	Below Water	
	Timber	Moderate - Major	In total	N/A	100%	N/A	1. Splits/checks up to 1/4 inch wide 2. 4 piles had section loss ranging from 20% to 40%	

Table 3-18-1 (continued)
Inspection Observations Summary – U.S. Navy Pier

U.S. Navy Pier		Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected		Notes
Ancillary Components						
Guardrail / Handrail / Bullrail		Timber	Moderate - Severe	Area affected	100%	Bullrail: 1. Widespread moderate splits/checks 2. Cross-section loss due to internal decay Handrail: 1. Widespread corrosion and coating loss 2. Two locations were failed
Fender System	Piles	Timber and Steel	Severe	% of fender piles affected	100%	1. Minor surface corrosion 2. 3 piles had deflection and impact damage
	Chocks	Timber	Severe	% of chocks affected	30%	Severe end-grain fungal decay

Notes: Refer to Attachment A-18 for detailed observations, measurements, and typical condition photos.

Table 3-18-2
Condition Assessment Summary – U.S. Navy Pier

Main Force-Resisting System Components	Condition Rating	Comments
Timber Deck	Fair	Light fungal decay
Timber Beams	Fair	1. Minor splits/checks 2. Light fungal decay
Timber Pile Cap	Fair	1. Splits/checks 2. Two piles had severe end-grain fungal decay
Timber Piles	Fair	1. Splits/checks up to 1/4 inch wide 2. Four piles had section loss ranging from 20% to 40%
Timber Dolphin	Fair	1. Walers on dolphins had moderate to severe core decay 2. Dolphin Pile 2 had a 20% section loss 3. All the dolphin piles had severe fungal decay
Overall Condition Rating		
U.S. Navy Pier	Fair	

Table 3-19-1
Inspection Observations Summary – U.S. Coast Guard Dock and Pier

U.S. Coast Guard Dock and Pier	Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected			Notes	
Main Force-Resisting System Components							
Main Pier							
Dolphins	Timber	Minor-Major	% of dolphins affected	100%		1. 48% of piles had internal core deterioration 2. Section loss of approximately 50%	
Deck	Timber	No damage observed	Area affected	N/A		N/A	
Girders	Timber	No damage observed	Area affected	N/A		N/A	
Cross-bracing	Timber	Major-Severe	Area affected	1%		1. Cross-bracing at Bent 9 between Piles D and F was broken 2. Cross-bracing at Bent 17 Pile B had splits/checks along the full depth 3. Cross-bracing at Bent 9 Piles C and D had section loss of up to 50%	
Pile Caps	Timber	Major	Area affected	5.8%		4. Pile caps were offset from the top of the piles at Bent 2	
Piles			% of Piles Affected	Above Water	Below Water	Above Water	Below Water
	Timber	Minor-Major	In total	100%		1. Piles typically exhibit splits/checks up to 1/4 inch wide throughout the surface 2. Bent C Pile 9 and Bent 6 Pile D had gouges 3. 4% of piles have at least 50% internal core deterioration	

Table 3-19-1 (continued)
Inspection Observations Summary – U.S. Coast Guard Dock and Pier

U.S. Coast Guard Dock and Pier	Type of Material	Range of Deterioration Level	Approximate % of Area/Piles Affected			Notes	
USCG Floating Dock							
Floating Dock	Timber	No damage observed	Area affected	N/A		N/A	
Piles (Dolphins)			% of piles affected	Above Water	Below Water	Above Water	Below Water
	Timber	Minor-Major	In total	100%		1. Splits/checks up to 1/4 inch wide throughout the surface 2. 11 out of 16 piles have at least 50% internal core deterioration	
	Steel	Minor		100%		1. Pitting up to 1/16 to 1/8 inch deep on 50% of the surface	
Ancillary Components							
Guardrail / Handrail / Bullrail	Timber	Moderate - Major	Area affected	100%		Bullrail (Main Pier): 1. Splits/checks 1/4 to 1/2 inch wide throughout the surface 2. Some splits/checks run the full depth of the cross-section	

Notes: Refer to Attachment A-19 for detailed observations, measurements, and typical condition photos.

N/A = not applicable

Table 3-19-2
Condition Assessment Summary – U.S. Coast Guard Dock and Pier

Main Force-Resisting System Components		Condition Rating	Comments
Main Pier			
Timber Deck		Satisfactory	No damage observed
Timber Girders		Satisfactory	No damage observed
Timber Pile Caps		Fair	The pile cap had offset at one bent of the main pier
Timber Cross-bracing		Fair	Damage includes broken members, splits/checks on the surface, and section loss of up to 50%
Timber Piles		Fair	1. Splits/checks up to 1/4 inch wide 2. 4% of the piles had internal core deterioration 3. Several piles had gouges
Timber Mooring/berthing Dolphins		Fair/Poor	48% of the piles have at least 50% internal core deterioration
USCG Floating Dock			
Floats	Timber	Satisfactory	No damage observed
Dolphin Guide Piles	Timber Piles	Fair/Poor	69% of sampled piles have at least 50% internal core deterioration
	Steel Piles	Satisfactory	Minor corrosion
Overall Condition Rating			
Main Pier		Fair	
USCG Floating Dock		Fair	

Table 3-20-1-1
Inspection Observations Summary – City Stormwater Outfalls

City Outfall S1	Type of Material	Range of Deterioration Level	Approximate % of Area Affected		Notes
Headwall and Pipe	Steel	Major	Area affected	Unable to determine	Erosion around headwall observed from walkway; outfall pipe broken
City Outfall S2					
Headwall	Concrete	Major	Area affected	Unable to determine	A 2-inch-wide crack at the top of the headwall
Wingwall	Concrete	Major	Area affected	Unable to determine	Edges of the wingwalls spalled up to 4 inches deep
Apron	Concrete	Minor	Area affected	Unable to determine	Abrasion up to 1/2 inch deep
City Outfall M1					
Headwall	Concrete	Minor	Area affected	Unable to determine	Abrasion up to 1/2 inch deep
Wingwall	Concrete	Severe	Area affected	Unable to determine	1. Abrasion up to 1/2 inch deep 1. The west wingwall was fractured 7 feet from the headwall with exposed rebar. The exposed rebar had surface corrosion with no measurable section loss.
Apron	Concrete	Minor	Area affected	Unable to determine	Abrasion up to 1/2 inch deep
City Outfall M2					
Headwall	Concrete	Minor	Area affected	Unable to determine	Abrasion up to 1/2 inch deep
Wingwall	Concrete	Major	Area affected	Unable to determine	1. Abrasion up to 1/2 inch deep 2. A spall on the north wingwall 7 inches wide by 1 foot long by 2 inches deep
Apron	Concrete	Minor	Area affected	Unable to determine	Abrasion up to 1/2 inch deep
City Outfall M3					
Headwall	Concrete	No Defects	Area affected	0%	No significant defects were observed
Wingwall	Concrete	No Defects	Area affected	0%	No significant defects were observed
Apron	Concrete	No Defects	Area affected	0%	No significant defects were observed

Notes: Refer to Attachment A-20 for detailed observations, measurements, and typical condition photos.

Table 3-20-1-2
Condition Assessment Summary – City Stormwater Outfalls

System Components	Condition Rating	Comments
City Outfall S1		
Outfall S1	Serious	Erosion of embankment around headwall and corrugated metal pipe; pipe broken outboard of headwall
City Outfall S2		
Concrete Headwall	Poor	A 2-inch-wide crack was on the top of the headwall, indicating a potential reduction of structural integrity
Concrete Wingwalls	Satisfactory	Spalls up to 4 inches deep at the edges of the wingwalls
Concrete Apron	Satisfactory	Abrasion up to 1/2 inch deep
Overall Condition Rating		
Outfall S2	Poor	
City Outfall M1		
Concrete Headwall	Satisfactory	Abrasion up to 1/2 inch deep
Concrete Wingwalls	Satisfactory	1. Abrasion up to 1/2 inch deep. 2. The west wingwall was fractured 7 feet from the headwall with exposed rebar. The exposed rebar had surface corrosion with no measurable section loss.
Concrete Apron	Satisfactory	Abrasion up to 1/2 inch deep
Overall Condition Rating		
Outfall M1	Satisfactory	
City Outfall M2		
Concrete Headwall	Satisfactory	Abrasion up to 1/2 inch deep
Concrete Wingwalls	Satisfactory	1. Abrasion up to 1/2 inch deep 2. A spall on the north wingwall 7 inches wide by 1 foot long by 2 inches deep
Concrete Apron	Satisfactory	Abrasion up to 1/2 inch deep
Overall Condition Rating		
Outfall M2	Satisfactory	
City Outfall M3		
Concrete Headwall	Good	No significant defects were observed
Concrete Wingwalls	Good	No significant defects were observed
Concrete Apron	Good	No significant defects were observed
Overall Condition Rating		
Outfall M3	Good	

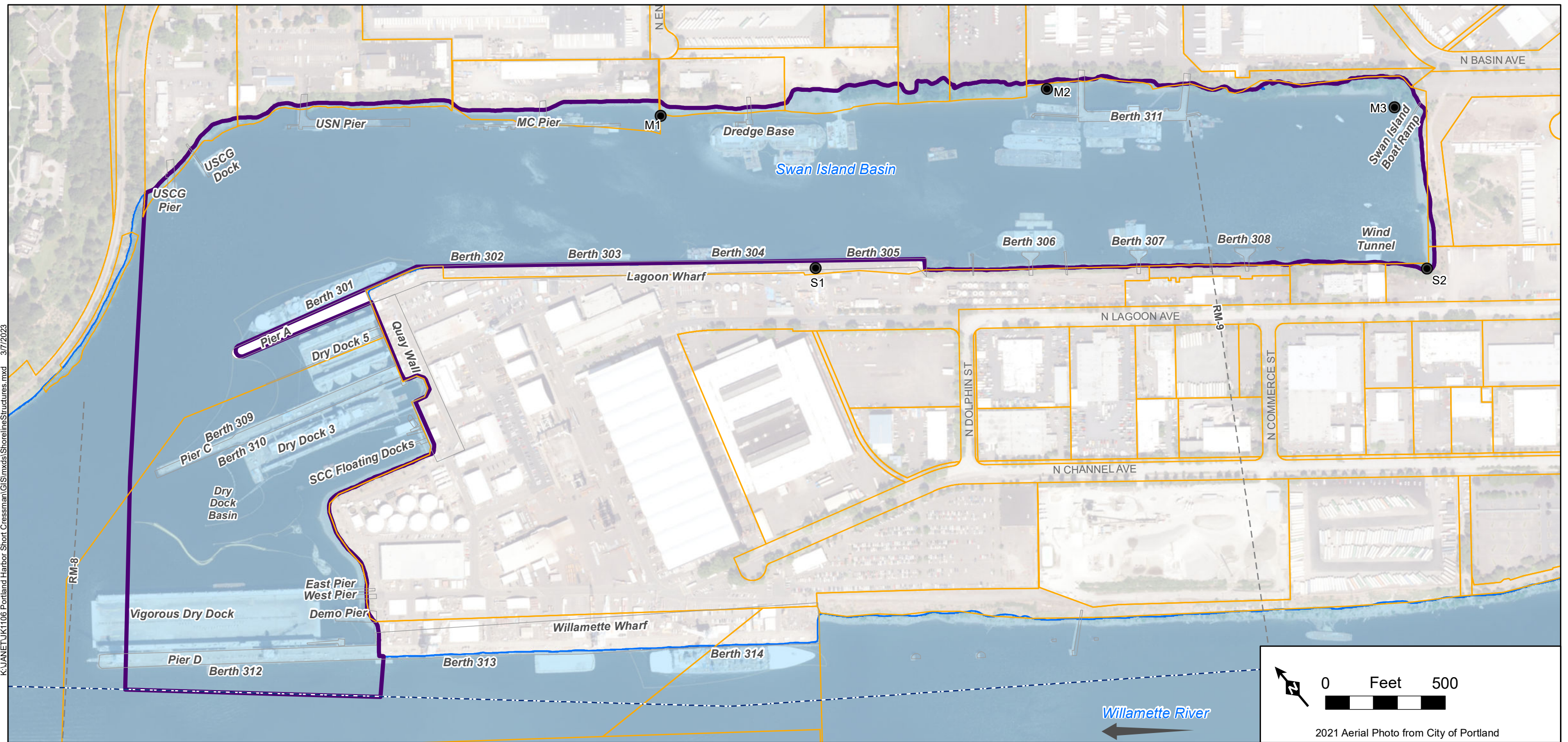
Table 3-21
Condition Rating for Swan Island Overwater Facilities

Facility Name		Condition Rating
Berth 312 – Pier D		Fair
East Pier		Fair
West Pier		Poor
Demo Pier		Fair
SCC Floating Dock		Satisfactory
Berth 309 and 310 - Pier C		Fair
Berth 301 - Pier A		Serious
Quay Wall		Serious
Berth 302-305 - Lagoon Wharf		Poor
Berth 306	Walkways and Dolphins	Poor/Serious
	Pier	Fair
Berth 307	Walkways and Dolphins	Serious
	Pier	Poor
Berth 308	Dolphins	Poor
	Pier	Poor
Wind Tunnel		Satisfactory
Swan Island Boat Ramp		Fair
Berth 311	Walkways and Dolphins	Fair
	Wharf	Serious
Dredge Base		Serious
Marine Consortium Pier	T-Pier	Fair
	Floating Dock	Fair
	Dolphins	Satisfactory
U.S. Navy Pier		Fair
USCG Dock and Pier	USCG Floating Dock	Fair
	Pier	Fair
City Outfall S1		Serious
City Outfall S2		Poor
City Outfall M1		Satisfactory
City Outfall M2		Satisfactory
City Outfall M3		Good

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FIGURES

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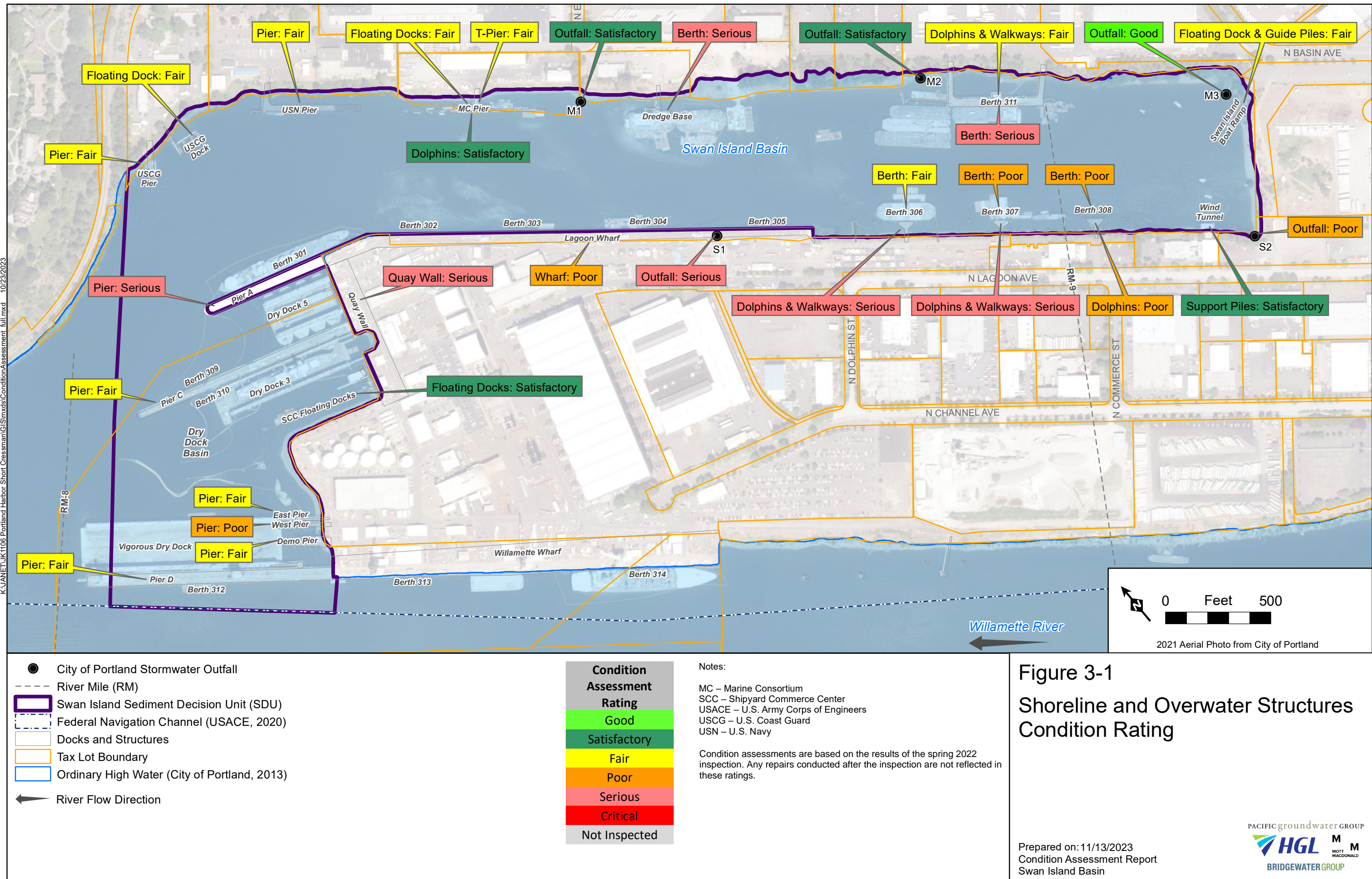
Notes:

MC – Marine Consortium
SCC – Shipyard Commerce Center
USACE – U.S. Army Corps of Engineers
USCG – U.S. Coast Guard
USN – U.S. Navy

Figure 1-1
Shoreline and Overwater Structures

Prepared on: 3/7/2023
Condition Assessment Report
Swan Island Basin

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ATTACHMENT A
STRUCTURE INSPECTION
REPORTS AND PHOTOGRAPHS

GLOSSARY

Bent	Transverse row of piles fastened together by a pile cap.
Berth	A place where a boat may be secured to a fixed or floating structure and left unattended.
Bulkhead	A structure used in waterfront construction to retain earth fill.
Bullrail	Wide curb along the outboard edge of a pier or wharf. It may be concrete, steel, or timber; fixed or removable; mooring hardware is often mounted on top.
Check	Separation in the grain of the wood, the separation occurring across the annual rings.
Chock	Piece of wood fitted between two piles to prevent the piles from rolling upon impact.
Corrosion	Destruction of a metal by a chemical or electrochemical reaction with its environment.
Dolphin	Free-standing, pile-supported or solid filled structure used for mooring and berthing vessels.
Efflorescence	A surface encrustation caused by the evaporation of solutions seeping out onto the surface of rock or concrete.
Element	A discrete portion of a structure or facility, such as a pile, beam, pile cap, etc.
Fenders	Energy-absorbing devices used on the face of a pier, wharf, or dolphin to protect the ship and shore facility from damage due to contact between the two during berthing and mooring.
Fender Pile	An energy-absorbing element on the exterior face of a pier, wharf, or dolphin to protect the ship and shore the facility from damage due to contact between the two during berthing and mooring.
Girder	Large-sized beam used as a main structural member, normally for the support of other beams.
Layberth	A designated area for the purpose of carrying out maintenance, repairs, other work, or removing a vessel from active service.
Pier	A structure that projects from the shore, oriented perpendicular, or at an angle to the shore.
Pile Cap	Beam member connecting pile heads and through which deck loads are transmitted to the piles.
Pitting	Form of extremely localized corrosion that leads to the creation of small pits and/or holes in the metal.

GLOSSARY (continued)

Sounding	A method used to determine interior deterioration in wood and concrete; a method used to determine the depth of water.
Spall	A portion of a concrete surface that is chipped or fragmented.
Split	A lengthwise separation of the wood extending completely through the piece from one surface to another.
Sheet pile wall	A bulkhead composed of driven vertical or near vertical steel sheet sections interlocked to form a continuous wall, sometimes tied back to anchor.
Ultrasonic thickness measurements	A measurement made from one side of a material using ultrasonic wave transmission and return to determine thickness.
Wale (and Waler)	Horizontal structural member, usually wood or steel, used for bracing.
Wharf	A structure oriented approximately parallel to the shore, where ships can be moored at the offshore face.

Attachment A-0

Summary of Received Owner/Operator Information

Property ID	Owner/Operator	Facility Name		Information Received
R543777 and R506872	Project Fleet Owner LLC/Shipyard Commerce Center	Pier D		<ul style="list-style-type: none">• Cross section drawings for Pier D• 2014 inspection of shipyard berths by Global Diving & Salvage
		Demo Pier		<ul style="list-style-type: none">• 2014 inspection of shipyard berths by Global Diving & Salvage
		West Pier		
		East Pier		
		Shipyard Commerce Center Floating Dock		N/A
		Pier C		<ul style="list-style-type: none">• General Plan and Pile Plan drawing for Pier C• “As built” driven pile information• 2014 inspection of shipyard berths by Global Diving & Salvage
		Pier A		<ul style="list-style-type: none">• 1945 Kaiser Company construction drawings for Pier A and the quay wall• 2014 inspection of shipyard berths by Global Diving & Salvage
		Quay Wall		
		Lagoon Wharf		<ul style="list-style-type: none">• Cross-section, elevation, and metal thickness drawings• 1981 Facility Condition Study of berths 302-305• 2014 inspection of shipyard berths by Global Diving & Salvage
		Berth 306	Walkways and Dolphins	N/A
			Berth	<ul style="list-style-type: none">• Typical Plan and cross-section drawing
Berth 307	Walkways and Dolphins	N/A		
	Berth	<ul style="list-style-type: none">• Typical Plan and cross-section drawing		
R543792 and R632314	Port of Portland	Berth 308	Dolphins	N/A
R543792 and R632314			Berth	<ul style="list-style-type: none">• Typical Plan and cross-section drawing
		Navigation Base		N/A
R315949	Freightliner	Wind Tunnel		N/A
R592200	City of Portland	Swan Island Boat Ramp		N/A
R673573	Swan Island Dock Company	Berth 311	Dolphins	N/A
			Walkways	N/A
			Berth	N/A
R315704	The Marine Consortium Inc.	Marine Consortium Pier	T-Pier	N/A
			Floating Dock	N/A
			Dolphins	N/A
R315697	United States of America/Department of the Navy	U.S. Navy Pier		<ul style="list-style-type: none">• 2019 U.S. Navy Pier inspection by Appledore Marine Engineering
R315695	United States of America/United States Coast Guard	USCG Docks and Pier	USCG Floating Dock	N/A
			Main Pier	N/A

Attachment A-0
Summary of Received Owner/Operator Information
Table - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Attachment A-1

Berth 312 - Pier D

Facility Information

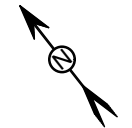
Owner	Shipyard Commerce Center, LLC		
Asset Name(s)	Pier D (Berth 312)		
Construction Year	1979 (From Cascade General Memorandum)		
Owner/Operator Notes	Facility operational - Ship repair and building, as-builts provided		
Previous Inspection Year	2014		
Previous Inspection Assessment Rating/Notes	2014 Substructure Assessment Rating: Good		
Repair History	No information received		
Structure Components	Superstructure	<ul style="list-style-type: none">Reinforced Concrete DeckReinforced Concrete Girder	
	Substructure	<ul style="list-style-type: none">Reinforced Concrete and Steel PilesReinforced Concrete Pile CapsReinforced Concrete and Steel Batter Piles	
Other information	Facility Length/ Depth/ Design Depth	1178 feet/ Not provided/ Not provided	
	Fender System	<ul style="list-style-type: none">Steel WalerTimber ChockSteel and Timber Fender Piles	
	Mooring Hardware	<ul style="list-style-type: none">Steel Bollard Mooring	
	Dolphin System	Not applicable	
	Other System	Not applicable	

General Location



Asset Photo





Not to scale

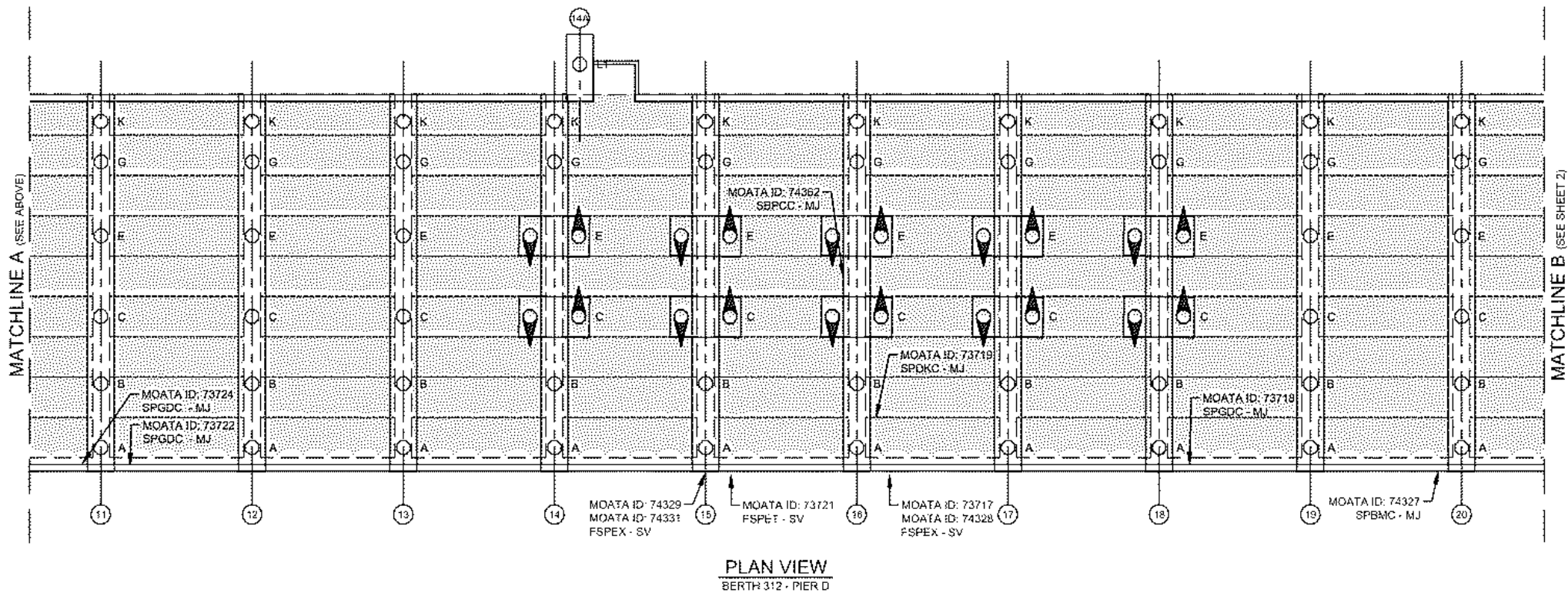
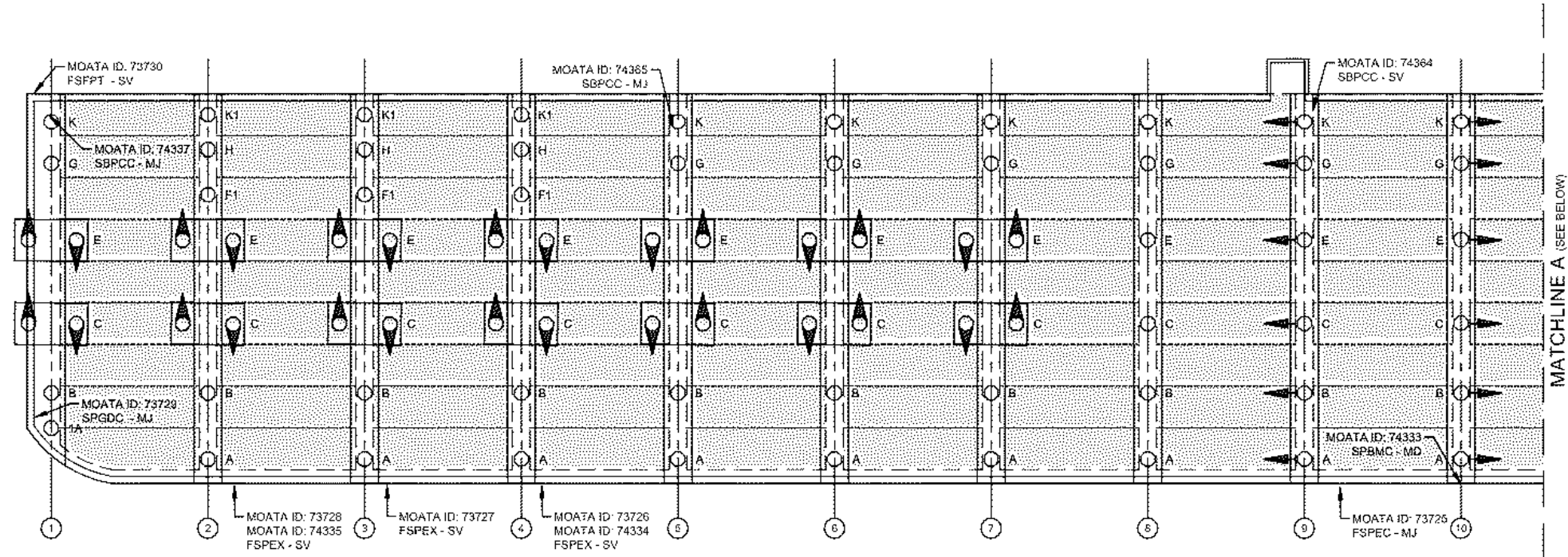
Attachment A-1
Berth 312 - Pier D
Structure Layout - Sheet 1 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



LEGEND:

- BATTER PILE
- PILE
- CONCRETE PANEL DECK
- CONCRETE PILE CAP
- BULL RAIL



Not to scale

[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

ELEMENT TYPE:
GD = GUARDRAIL/HANDRAIL/BULLRAIL
PE = PILE/SHEET PILE
BM = BEAM/JOIST/STRINGER/GIRDER
PC = PILE CAP

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

GENERAL NOTES:

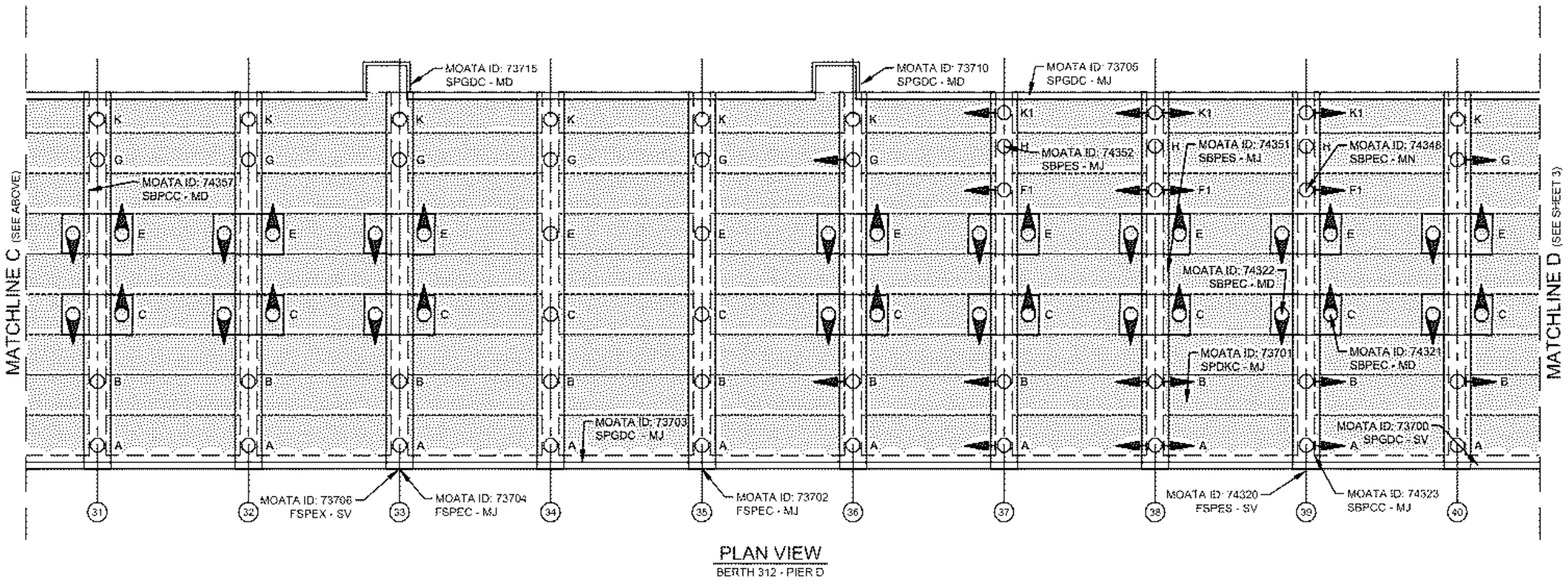
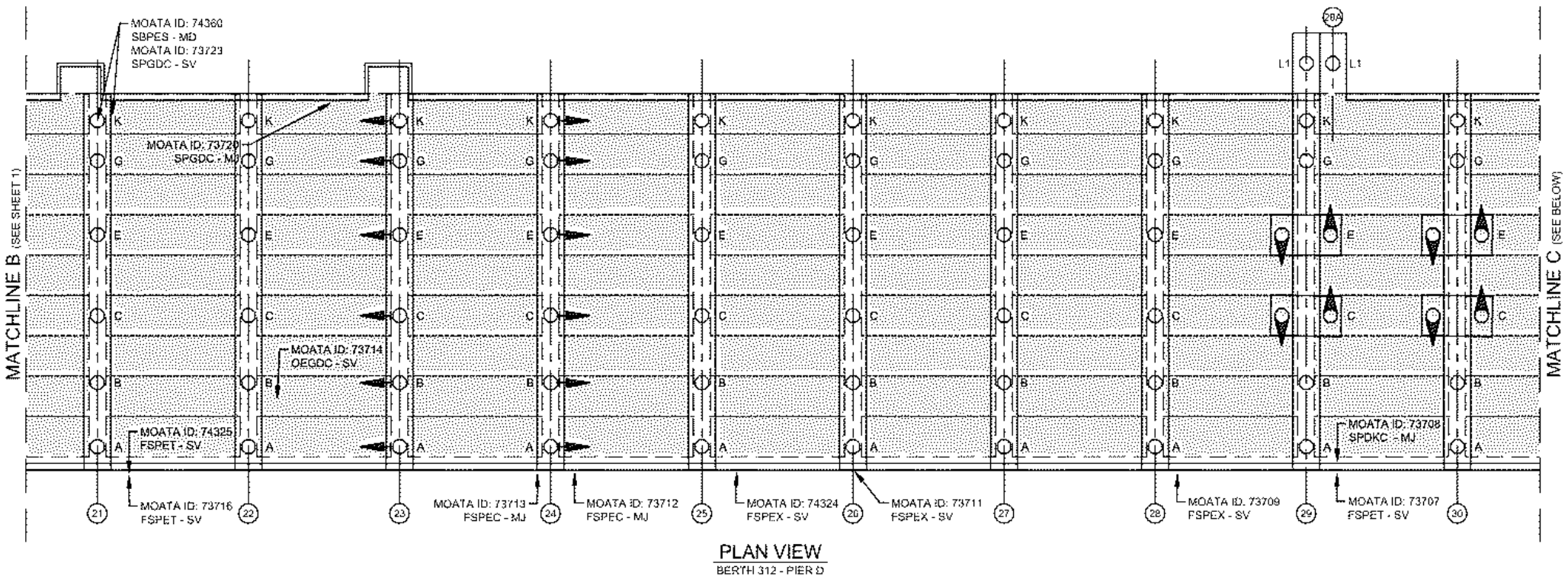
- The additional steel H piles were observed in the field but are not shown in the plan.
- Drawings are not to scale and are intended to generally locate structural members to note inspection observations.
- If any of the system elements or materials are unknown use X to represent them.

Attachment A-1
Berth 312 - Pier D
Structure Layout - Sheet 2 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

LEGEND:

- BATTER PILE
○ PILE
■ CONCRETE PANEL DECK
--- CONCRETE PILE CAP
|| BULL RAIL



[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SP = SUPERSTRUCTURE
FS = FENDER SYSTEM
OE = OTHER ELEMENT
SB = SUBSTRUCTURE

ELEMENT TYPE:
GD = GUARDRAIL/HANDRAIL/BULLRAIL
PE = PILE/SHEET PILE
BM = BEAM/JOIST/STRINGER/GIRDER
PC = PILE CAP

MATERIAL TYPE:
C = REINFORCED CONCRETE
S = STEEL
T = TIMBER

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE


GENERAL NOTES:


1. The additional steel H piles were observed in the field but are not shown in the plan.
2. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.
3. If any of the system elements or materials are unknown use X to represent them.


Attachment A-1
Berth 312 - Pier D
Structure Layout - Sheet 3 of 5


Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin


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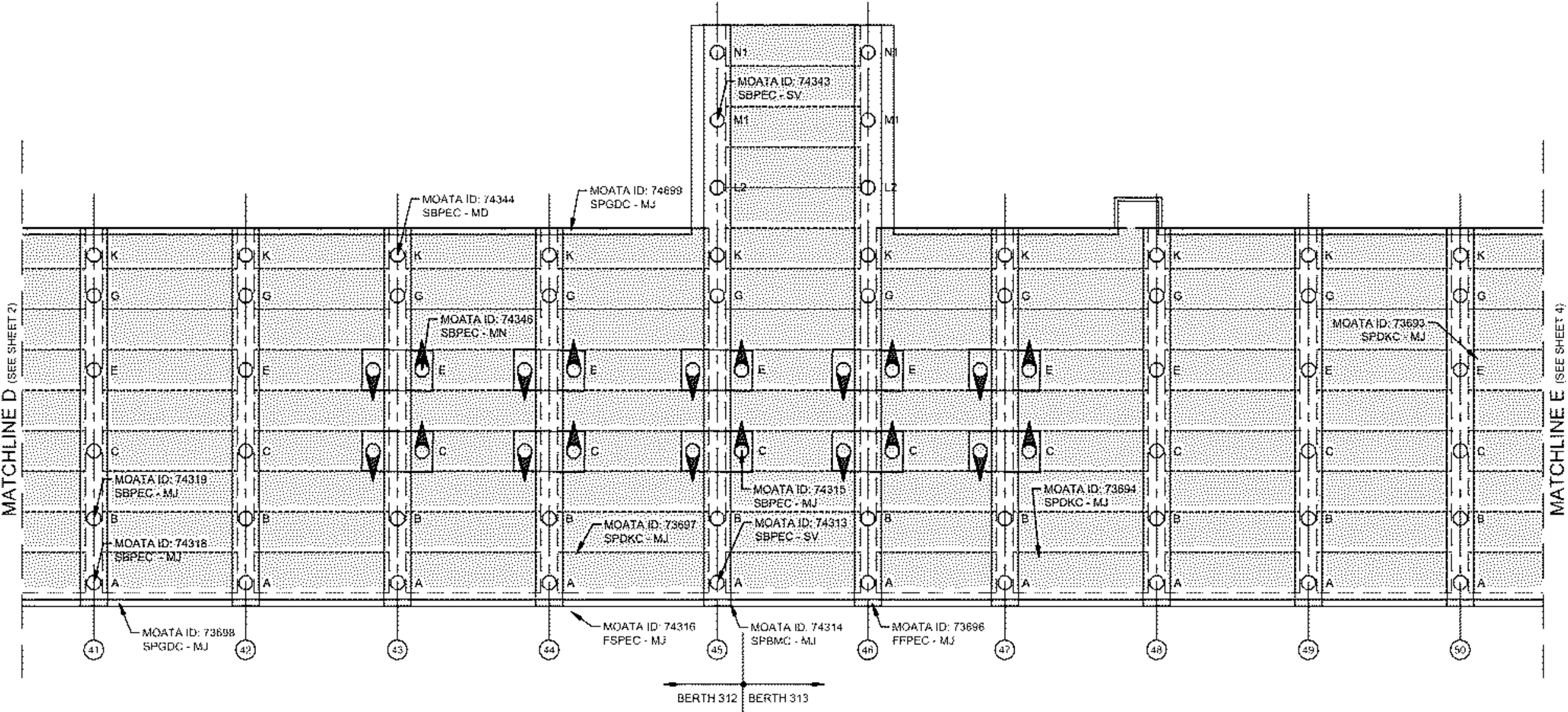
 BATTER PILE

 PILE

 CONCRETE PANEL DECK

 CONCRETE PILE CAP

 BULL RAIL



Not to scale

[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
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MATERIAL TYPE:
C = REINFORCED CONCRETE
S = STEEL
T = TIMBER

DEFECT LEVEL:
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MD = MODERATE
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SV = SEVERE

- GENERAL NOTES:**
1. The additional steel H piles were observed in the field but are not shown in the plan.
 2. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.
 3. If any of the system elements or materials are unknown use X to represent them.







Attachment A-1

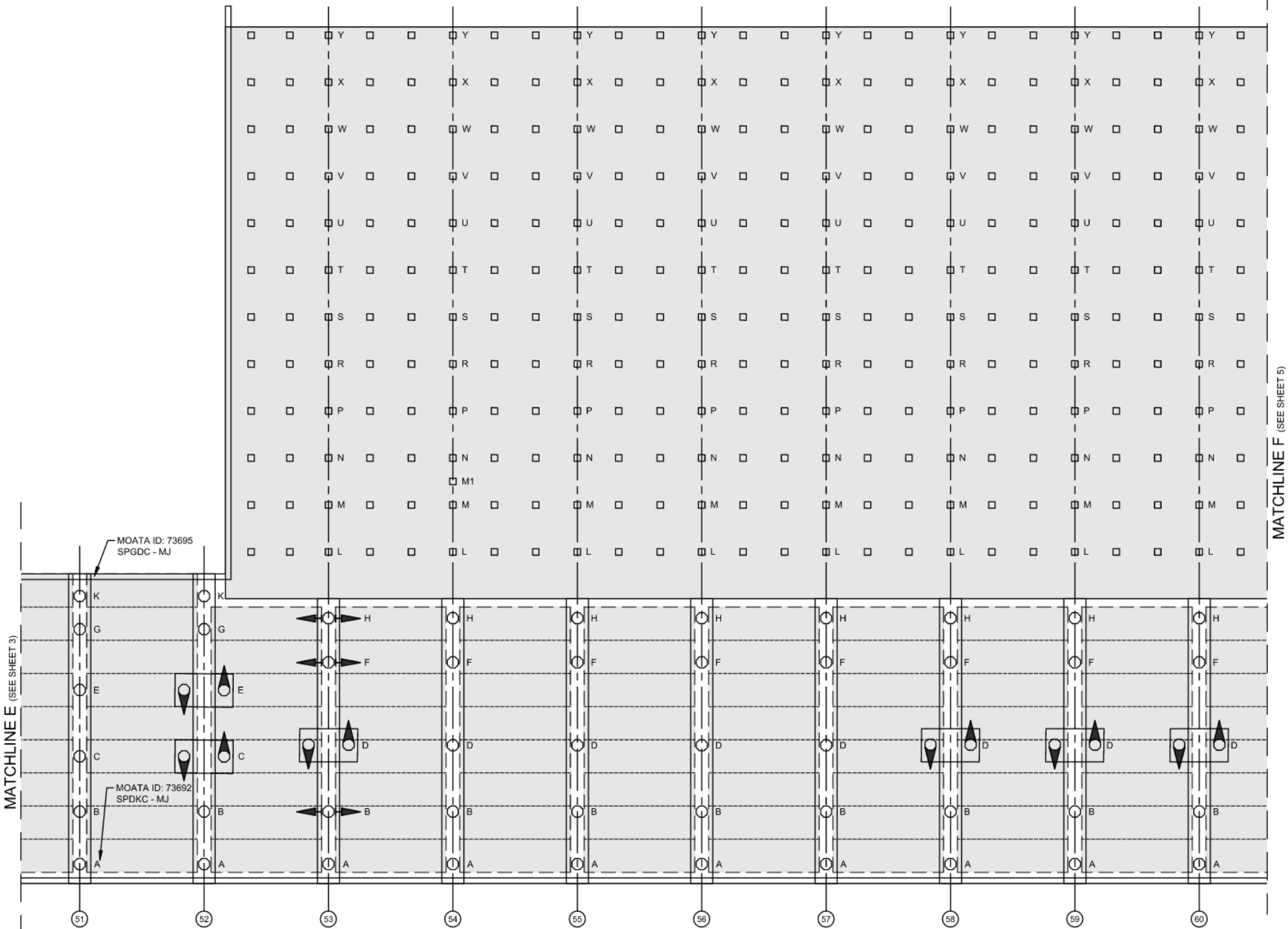
Berth 312 - Pier D

Structure Layout - Sheet 4 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

LEGEND:

-  BATTER PILE
-  PILE
-  CONCRETE PANEL DECK
-  CONCRETE PILE CAP
-  BULL RAIL
-  PILE



Not to scale

[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

ELEMENT TYPE:
GD = GUARDRAIL/HANDRAIL/BULLRAIL
PE = PILE/SHEET PILE
BM = BEAM/JOIST/STRINGER/GIRDER
PC = PILE CAP

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

GENERAL NOTES:
1. The additional steel H piles were observed in the field but are not shown in the plan.
2. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.
3. If any of the system elements or materials are unknown use X to represent them.

Attachment A-1 Berth 312 - Pier D Structure Layout - Sheet 5 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Pier D Overview
Pier D, looking from waterside
Moata ID: Not Applicable



Photo 02: Pier D Superstructure
Bent 50 between Piles E and G
Concrete spalls around crane rail
Moata ID: 73693



Photo 03: Pier D Superstructure
Bullrail between Bents 22 and 23
Concrete spall exposing reinforcement
Moata ID: 73720



Photo 04: Pier D Substructure
Substructure between Bents 13 and 14
Typical condition of substructure above water
Moata ID: Not Applicable



Photo 05: Pier D Substructure
Pile K at Bent 43
Concrete spall around full diameter of the pile
Moata ID: 74344

Attachment A-1 Berth 312 - Pier D

Above-Water Inspection Photos - Sheet 1 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 06: Pier D Substructure
Pile K at Bent 21
Typical condition of steel piles above water
Moata ID: 74360



Photo 07: Pier D Substructure
Pile K at Bent 1
Complete breakage at the top of Pile K
Moata ID: Not Applicable

Attachment A-1 Berth 312 - Pier D

Above-Water Inspection Photos - Sheet 2 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	PY., SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Unknown
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Other Element
Facility:	Pier D			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
Moata ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73692	51	N/A	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Major (MJ)	Concrete deck topping has multiple cracks and open spalls at the mooring hardware.
73693	50 to 1	N/A	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Major (MJ)	Concrete topping has both open and closed spalls along the rail.
73694	48 to 47	N/A	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Moderate (MD)	Concrete spalling and mechanical impact damages are observed along the river side crane rail.
73695	51	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Reinforced Concrete	Major (MJ)	The guardrail has partially open corrosion spalls and a roughly 10 feet long crack. Some possible rust stains are observed along the cracks. Spall location seems to have some moisture coming out. Damage is observed to adjacent handrail post connection.
73696	46	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Reinforced Concrete	Major (MJ)	Concrete pile has open spalls with exposed rebar at the top.
73697	45	N/A	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Major (MJ)	Concrete topping has spalls along the edge of the rail at the deck expansion joint and crack is wider than 1/4 inch.
73698	42 to 41	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Reinforced Concrete	Severe (SV)	Concrete bull rail has open spalls with exposed rebar.

Attachment A-1

Berth 312 - Pier D

Moata Forms - Sheet 1 of 10

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	PY., SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Unknown
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Other Element
Facility:	Pier D			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
Moata ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73699	45	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Reinforced Concrete	Major (MJ)	The concrete bull rail has open spalls at the handrail connection.
73700	41 to 40	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Reinforced Concrete	Severe (SV)	Concrete bull rail has open spalls with exposed rebar.
73701	38	N/A	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Major (MJ)	Concrete deck has an open spalls with a depth of less than 1/2 inch.
73702	35	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Reinforced Concrete	Major (MJ)	Concrete fender pile has open spalls at the topside.
73703	34	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Reinforced Concrete	Major (MJ)	Concrete bull rail has an open spall.
73704	33	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Reinforced Concrete	Major (MJ)	Concrete fender pile has open spalls.
73705	37	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Reinforced Concrete	Major (MJ)	Spalls are at light pole foundation. Rust stains are possibly from light pole. Impact damage is observed on the pole. Spall location is near light pole connection.

Attachment A-1
Berth 312 - Pier D
Moata Forms - Sheet 2 of 10

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	PY., SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Unknown
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Other Element
Facility:	Pier D			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
Moata ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73706	33	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Unknown	Severe (SV)	The fender pile is broken.
73707	30 to 29	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	The timber fender pile has cross-section area loss more than 50% at the top.
73708	29	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Reinforced Concrete	Major (MJ)	Concrete bull rail has open spall.
73709	29 to 28	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Unknown	Severe (SV)	Fender pile is missing.
73710	36	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Reinforced Concrete	Moderate (MD)	Cracks on both sides of the handrail connection in cantilevered portion of deck. No visible cracks at connection from topside.
73711	26	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Unknown	Severe (SV)	Two fender piles are missing and steel waler has loss of connection and/or fully nonbearing condition.
73712	25 to 24	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Reinforced Concrete	Major (MJ)	Reinforced concrete fender pile has open spalls on the top and side of the pile.

Attachment A-1
Berth 312 - Pier D
Moata Forms - Sheet 3 of 10

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	PY., SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Unknown
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Other Element
Facility:	Pier D			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
Moata ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73713	24	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Reinforced Concrete	Severe (SV)	Concrete fender pile has open spalls with exposed rebar at the top.
73714	23 to 22	N/A	Pier / Wharf	Other Element	Guardrail / Handrail / Bullrail	Reinforced Concrete	Severe (SV)	Concrete bull rail has open spalls with exposed rebar.
73715	33	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Reinforced Concrete	Moderate (MD)	Cracks, roughly 0.06 inch to 0.14 inch width, run along the bull rail at the start of the cantilevered concrete deck portion. Some visible efflorescence is on outside corner edge.
73716	22 to 21	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	The timber fender pile has cross-section area loss exceeding 50% at the top of the pile and a transverse deep check 6 inches from the top.
73717	17	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Unknown	Severe (SV)	Two fender piles are missing.
73718	18	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Reinforced Concrete	Major (MJ)	Concrete bull rail has a structural crack wider than 1/4 inch on the top side and open spalls.
73719	16	N/A	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Major (MJ)	Concrete topping slab along the rail has impact spalls greater than 1 inch in depth.

Attachment A-1
Berth 312 - Pier D
Moata Forms - Sheet 4 of 10

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
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Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Other Element
Facility:	Pier D			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
Moata ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73720	23 to 22	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Reinforced Concrete	Severe (SV)	Concrete bull rail has roughly 52 inch open spall with exposed reinforcement. Reinforcement is exposed for roughly 20 inches.
73721	16 to 15	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	Timber fender pile has cross-section area loss exceeding 50% at the top of the pile.
73722	12 to 11	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Reinforced Concrete	Severe (SV)	Concrete bull rail has an open spall with exposed rebar.
73723	22 to 21	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Reinforced Concrete	Severe (SV)	Bull rail has a large open spall, roughly 70 inches in length, likely due to impact. Reinforcement is exposed for 15 inches.
73724	11 to 10	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Reinforced Concrete	Major (MJ)	Concrete bull rail has an open spall. The depth of spall is more than 1 inch.
73725	10 to 9	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Reinforced Concrete	Major (MJ)	The fender pile has a concrete spall at the top of the fender pile with cross section loss not exceeding 30%.
73726	5 to 4	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Unknown	Severe (SV)	Fender pile is missing.

Attachment A-1
Berth 312 - Pier D
Moata Forms - Sheet 5 of 10

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
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Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Other Element
Facility:	Pier D			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
Moata ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73727	4 to 3	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Unknown	Severe (SV)	Fender pile is missing.
73728	3 to 2	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Unknown	Severe (SV)	Fender pile is missing.
73729	1	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Reinforced Concrete	Major (MJ)	Concrete bull rail has an open spall. The depth of spall is more than 1 inch.
73730	1	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	The timber fender pile has cross-section area loss more than 50% with splits and checks wider than 1/2 inch.
74313	45	A	Pier / Wharf	Substructure	Pile / Sheet Pile	Reinforced Concrete	Severe (SV)	The concrete pile has a closed spall, with some section loss, roughly 2 feet from the top of the pile cap. Reinforcement is possibly exposed.
74314	45	N/A	Pier / Wharf	Superstructure	Beam / Joist / Stringer / Girder	Reinforced Concrete	Major (MJ)	Leaking at joint. The outside beam shows spall/crack over 1/2 inch at the support.
74315	45	C	Pier / Wharf	Substructure	Pile / Sheet Pile	Reinforced Concrete	Major (MJ)	The pile has an open spall at the waterline, which appears 3 inch x 2 inch wide and roughly 1 inch deep.

Attachment A-1
Berth 312 - Pier D

Moata Forms - Sheet 6 of 10

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
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Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Other Element
Facility:	Pier D			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
Moata ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74316	44 to 45	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Reinforced Concrete	Major (MJ)	Impact spalls are on the fender pile. Rub strip is damaged and connection is damaged at the impact location.
74318	41	A	Pier / Wharf	Substructure	Pile / Sheet Pile	Reinforced Concrete	Major (MJ)	The pile has an open spall which appears 3 to 5 inches wide wrapping around the pile.
74319	41	B	Pier / Wharf	Substructure	Pile / Sheet Pile	Reinforced Concrete	Major (MJ)	Exposed rebar is at 1/3 of height of the pile from the top of pile.
74321	39	C	Pier / Wharf	Substructure	Pile / Sheet Pile	Reinforced Concrete	Severe (SV)	Concrete spalls with exposed rebar 2 feet below the bottom of the pile cap.
74322	39	C	Pier / Wharf	Substructure	Pile / Sheet Pile	Reinforced Concrete	Moderate (MD)	The crack is around the rebar luring point and wider than 1/16 inch, running from the waterline up roughly 3 feet. A crack appears again around the midway point of the pile.
74323	39	A	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	Concrete spalls are over 1/2 inch deep at bottom of the pile cap near the Pile A.
74324	26 to 25	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Unknown	Severe (SV)	One fender pile is missing and one pile is settled. The chock assembly is tilting towards the water and has large checks.

Attachment A-1

Berth 312 - Pier D

Moata Forms - Sheet 7 of 10

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	PY., SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Unknown
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Other Element
Facility:	Pier D			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
Moata ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74325	22 to 21	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	The timber pile is soft with checks and splits and moves freely at base.
74327	20 to 19	N/A	Pier / Wharf	Superstructure	Beam / Joist / Stringer / Girder	Reinforced Concrete	Major (MJ)	Outside beam has an open spall over 1 inch deep but no exposed rebar.
74328	17 to 16	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Unknown	Severe (SV)	Two fender piles are missing.
74329	15	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Unknown	Severe (SV)	Fender piles is missing.
74331	15	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Unknown	Severe (SV)	Fender pile is missing.
74333	10	N/A	Pier / Wharf	Superstructure	Beam / Joist / Stringer / Girder	Reinforced Concrete	Moderate (MD)	Concrete beam has corrosion crack with rust staining and efflorescence.
74334	5 to 4	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Unknown	Severe (SV)	Fender pile is missing. Fender assembly still looks straight.

Attachment A-1
Berth 312 - Pier D

Moata Forms - Sheet 8 of 10

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	PY., SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Unknown
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Other Element
Facility:	Pier D			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
Moata ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74335	2	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Unknown	Severe (SV)	Fender pile is missing. Fender assembly still looks straight.
74337	1	K	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	The corner of the pile cap has an open spall over 1 inch deep.
74343	45	M1	Pier / Wharf	Substructure	Pile / Sheet Pile	Reinforced Concrete	Severe (SV)	Pile has open spalls with rusted exposed rebar at mid height of the pile.
74344	43	K	Pier / Wharf	Substructure	Pile / Sheet Pile	Reinforced Concrete	Major (MJ)	Spall is around full diameter. The pile appears bent and out of alignment at the top. No visible reinforcement is observed.
74346	43	E	Pier / Wharf	Substructure	Pile / Sheet Pile	Reinforced Concrete	Minor (MN)	Pile has severe delamination just above the waterline.
74348	39	F1	Pier / Wharf	Substructure	Pile / Sheet Pile	Reinforced Concrete	Minor (MN)	Pile has some delamination but no open spalls.
74351	38	E to C	Pier / Wharf	Substructure	Pile / Sheet Pile	Steel	Severe (SV)	The flange of steel pile bends. Another steel pile is directly adjacent.

Attachment A-1
Berth 312 - Pier D
Moata Forms - Sheet 9 of 10

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	PY., SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Unknown
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Other Element
Facility:	Pier D			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
Moata ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74352	37	H	Pier / Wharf	Substructure	Pile / Sheet Pile	Reinforced Concrete	Major (MJ)	Pile has open spalls.
74357	31	G to E	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Moderate (MD)	Pile cap has rust staining on north facing side. Staining and moss growth are extensive.
74360	21	K	Pier / Wharf	Substructure	Pile / Sheet Pile	Steel	Moderate (MD)	Pile has minor pitting covering roughly 40% of the surface area. Rust is throughout the surface of the pile.
74362	16	E and C	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	Rust stains are extensive. Spall is on river facing top of the pile cap, over 1 inch deep. Some locations appear to have nearly 3 inch deep cross-section area loss.
74364	9	K	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Severe (SV)	Pile cap has a large, roughly 4 feet long, partially open spall with exposed reinforcement. Cracks are on top of the pile.
74320	39	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Steel	Severe (SV)	Fender pile is missing.
74365	5	K	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	Closed spall is at top of the pile cap, roughly 1 foot long.

Attachment A-1
Berth 312 - Pier D
Moata Forms - Sheet 10 of 10

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Pier D overview,
Pier D, looking North



Photo 02: Pier D Substructure
Typical condition of concrete piles at waterline

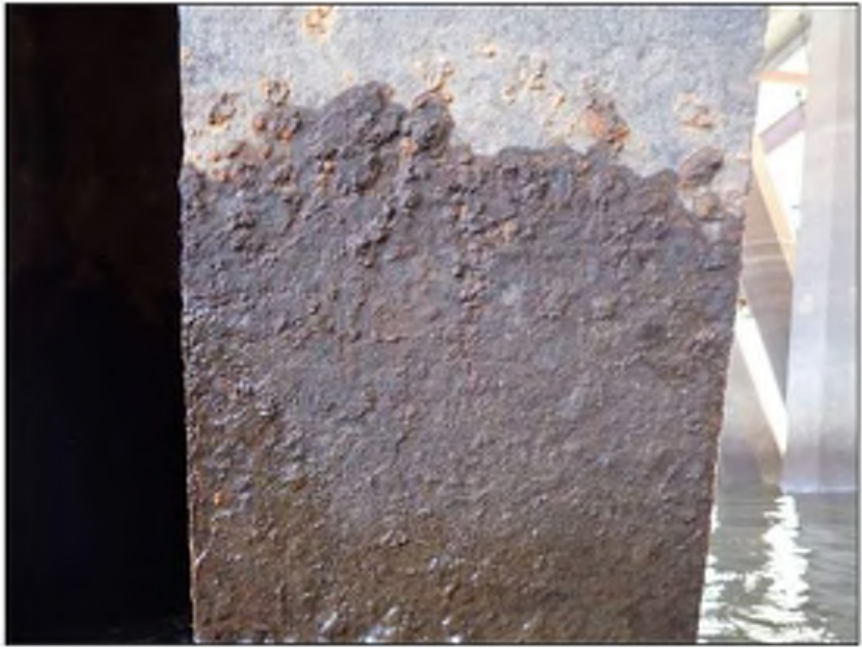


Photo 03: Pier D Substructure
Typical condition of steel batter piles in splash zone



Photo 04: Pier D Substructure
Typical condition of steel batter piles flange below waterline



Photo 05: Pier D Substructure
Cleaned concrete piles at mid-depth

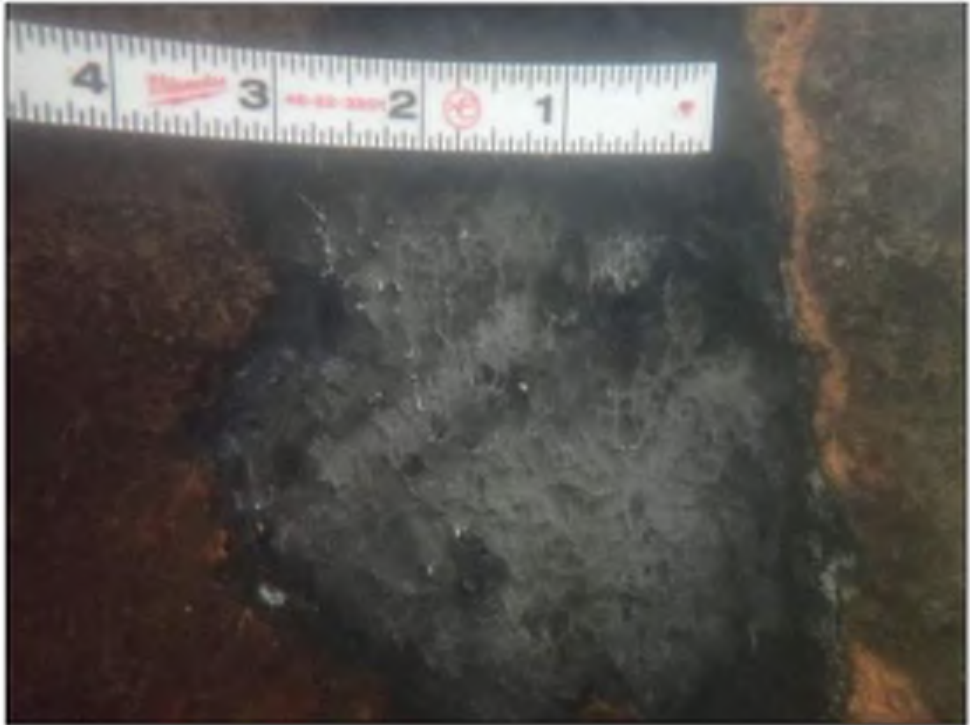


Photo 06: Pier D Substructure
Cleaned surface of steel Batter piles at mid-depth

Attachment A-1
Berth 312 - Pier D

Dive Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Attachment A-2

East Pier

Facility Information

Owner	Shipyard Commerce Center, LLC	
Asset Name(s)	West, East, and Demo Pier	
Construction Year	Around World War II (From the staff of Vigor)	
Owner/Operator Notes	Operational - Transporting necessary materials to Vigorous Dry Dock	
Previous Inspection Year	2014	
Previous Inspection Assessment Rating/Notes	Substructure Assessment Notes: Piers were structurally sound and in good shape	
Repair History	No information received	
Structure Components	Superstructure	<ul style="list-style-type: none">• Prefab Concrete Deck• Timber Deck• Steel Grate• Reinforced Concrete and Steel Girders
	Substructure	<ul style="list-style-type: none">• Reinforced Concrete and Steel Piles• Prestressed Concrete Pile Caps
Other information	Facility Length/ Depth/ Design Depth	No information received
	Fender System	No information received
	Mooring System	No information received
	Dolphin System	No information received
	Other System	No information received

General Location



Asset Photo

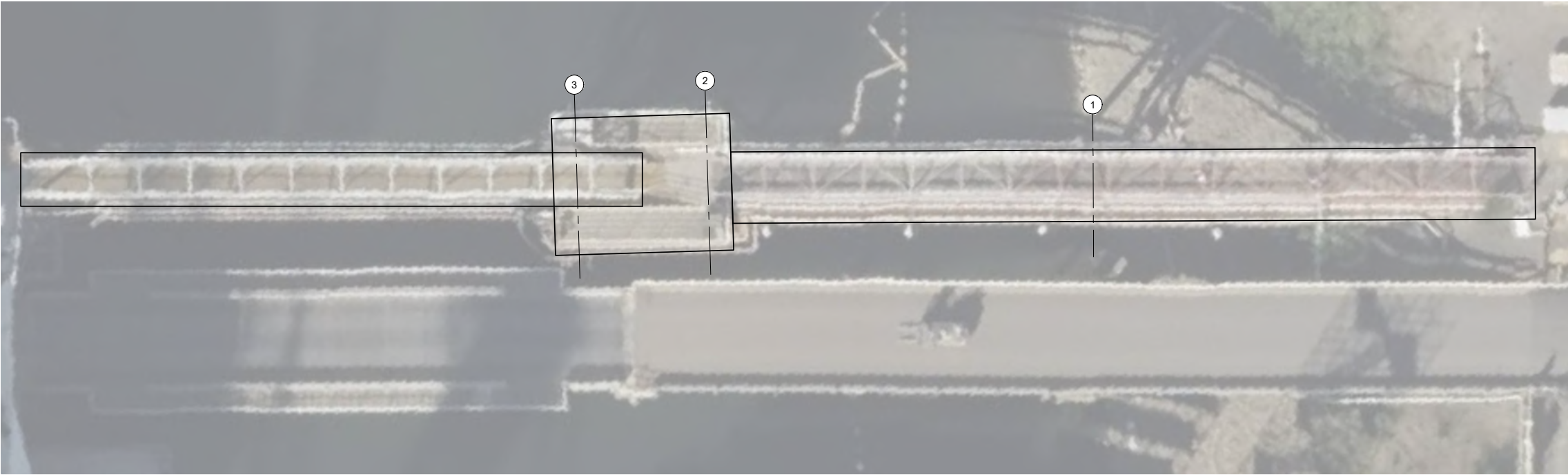


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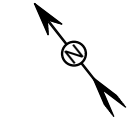
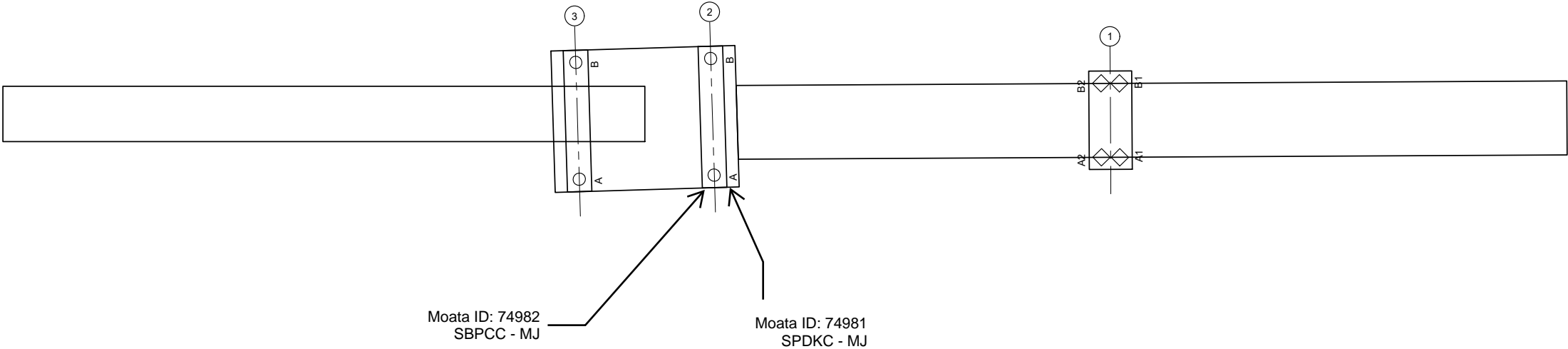
STEEL PILE

CONCRETE PILE CAP

CONCRETE PILE



TOPSIDE PLAN
East Pier



Not to scale

ABOVE WATER PLAN
East Pier

[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SP = SUPERSTRUCTURE
SB = SUBSTRUCTURE

ELEMENT TYPE:
AT = ABUTMENT
PC = PILE CAP
DK = DECK

MATERIAL TYPE:
C = REINFORCED CONCRETE

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

GENERAL NOTES:
1. Drawings are not to scale and are intended to
generally locate structural members to note inspection
observations.

Attachment A-2 East Pier Structure Layout - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: East Pier Substructure
Substructure between Bent 1 and Bent 2
Typical configuration of substructure
Moata ID: Not Applicable



Photo 02: East Pier Superstructure
Deck between Bents 2 and 3
Concrete spall exposing reinforcement
Moata ID: 74981



Photo 03: East Pier Superstructure
Steel Grate Between Pier End to Bent 1
Typical condition of steel grate (minor corrosion)
Moata ID: Not Applicable



Photo 04: East Pier Superstructure
Pile Cap between Bents 2 and 3
Concrete spall on the bottom of the pile cap
Moata ID: 74982

Attachment A-2 East Pier

Above-Water Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., HW.		Materials:	Reinforced Concrete
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure
Facility:	East, West, and Demo Piers			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74974	1	N/A	Pier / Wharf	Substructure	Abutment	Reinforced Concrete	Minor (MN)	South half of the pile cap has light surface corrosion and soil eroded on south half of pile cap.
74975	2	G and H1	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	The pile cap has poor consolidation and a closed spall.
74976	3	F and G	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Minor (MN)	Bottom of the pile cap has poor consolidation.
74977	4	C1 and E	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Minor (MN)	Pile cap has hairline cracks.
74978	5	C1 and A	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	The top of pile cap of Pile C1 has an open spall with 12 inch long x 8 inch wide x 3 inch deep. The top of the pile cap of Pile A1 has an open spall with 14 inch long x 5 inch wide x 2 inch deep.
74979	7	C1, H1 and J	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	Pile cap of Pile C1 has open spall. Pile cap of Pile H1 has cracks on the bottom. Pile cap of Pile K has open spall.
74980	3 and 4	All	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Major (MJ)	Deck has an open spall.

Attachment A-2
East, West, and Demo Piers
Moata Forms - Sheet 1 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., HW.		Materials:	Reinforced Concrete
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure
Facility:	East, West, and Demo Piers			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
74981	2	A	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Severe (SV)	Deck has an open spall with exposed rebar.
74982	2	A	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	Pile cap has a closed spall.

Attachment A-2
East, West, and Demo Piers
Moata Forms - Sheet 2 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: East, West, and Demo Piers Substructure
Typical condition of concrete bearing piles at waterline

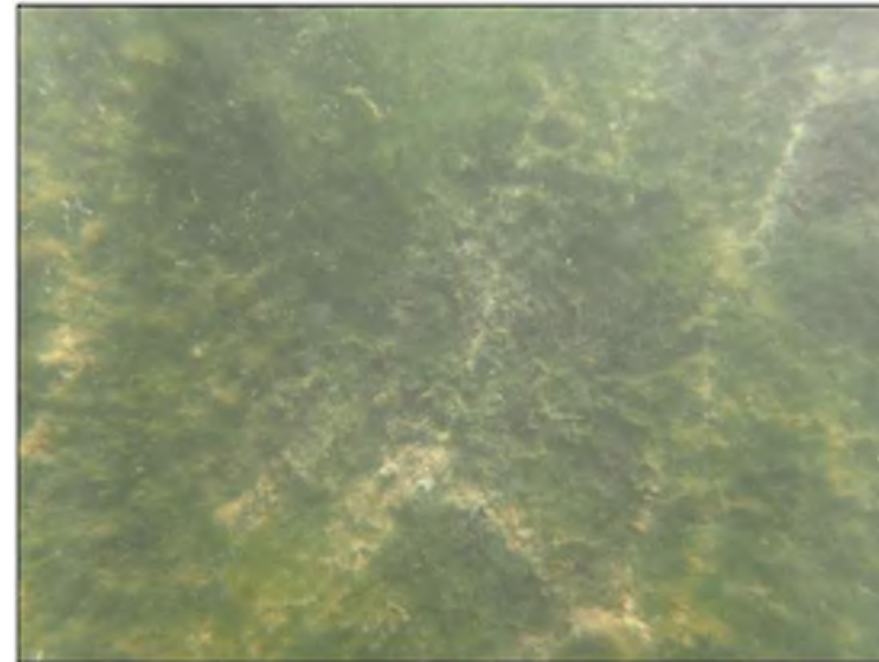


Photo 02: East, West, and Demo Piers Substructure
Typical condition of concrete bearing piles below waterline



Photo 03: East, West, and Demo Piers Substructure
Typical cleaned surface of steel piles at mid-depth



Photo 04: East, West, and Demo Piers Substructure
Typical condition of steel piles at mid-depth

Attachment A-2 East, West, and Demo Piers Dive Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Attachment A-3

West Pier

Facility Information

Owner	Shipyard Commerce Center, LLC	
Asset Name(s)	West, East, and Demo Pier	
Construction Year	Around World War II (From the staff of Vigor)	
Owner/Operator Notes	Operational - Transporting necessary materials to Vigorous Dry Dock	
Previous Inspection Year	2014	
Previous Inspection Assessment Rating/Notes	Substructure Assessment Notes: Piers were structurally sound and in good shape	
Repair History	No information received	
Structure Components	Superstructure	<ul style="list-style-type: none">• Prefab Concrete Deck• Timber Deck• Steel Grate• Reinforced Concrete and Steel Girders
	Substructure	<ul style="list-style-type: none">• Reinforced Concrete and Steel Piles• Prestressed Concrete Pile Caps
Other information	Facility Length/ Depth/ Design Depth	No information received
	Fender System	No information received
	Mooring System	No information received
	Dolphin System	No information received
	Other System	No information received

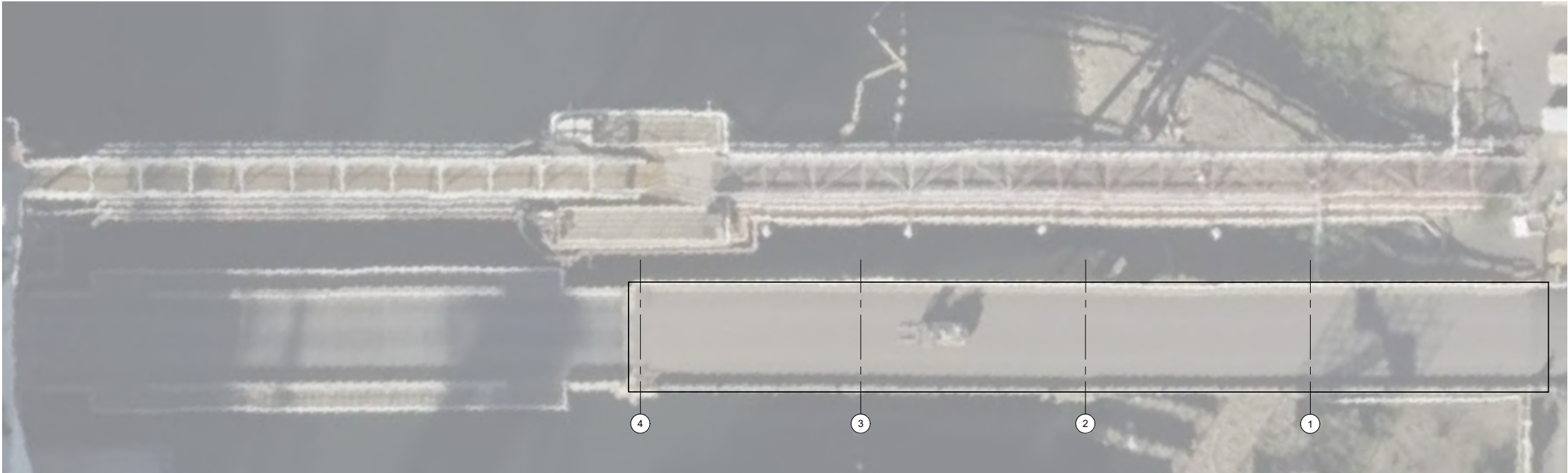
General Location



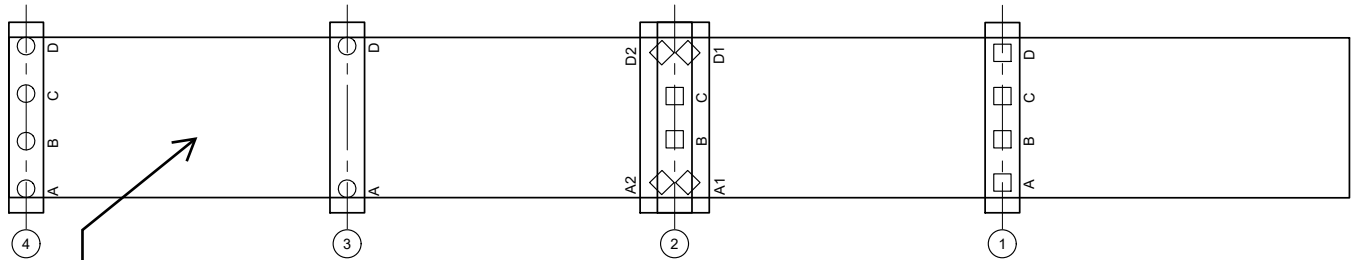
Asset Photo



- LEGEND:
- STEEL PILE
 - ||| CONCRETE PILE CAP
 - CONCRETE PILE



TOPSIDE PLAN
West Pier



Moata ID: 74980
SPDKC - MJ



Not to scale

ABOVE WATER PLAN
West Pier

[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SP = SUPERSTRUCTURE
SB = SUBSTRUCTURE

ELEMENT TYPE:
AT = ABUTMENT
PC = PILE CAP
DK = DECK

MATERIAL TYPE:
C = REINFORCED CONCRETE

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

GENERAL NOTES:
1. Drawings are not to scale and are intended to
generally locate structural members to note inspection
observations.

Attachment A-3 West Pier Structure Layout - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: West Pier Overview
West Pier, Looking East
Typical configuration of West Pier
Moata ID: Not Applicable



Photo 02: West Pier Superstructure
Overview of the Concrete Deck
Typical condition of the concrete deck
Moata ID: Not Applicable



Photo 03: West Pier Substructure
Concrete Girders between Bent 3 to Bent 4
Concrete spalls exposing reinforcement due to corrosion
Moata ID: 74980



Photo 04: West Pier Substructure
Concrete Girders between Bent 3 to Bent 4
Concrete spalls exposing reinforcement due to corrosion
Moata ID: 74980

Attachment A-3 West Pier

Above-Water Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., HW.		Materials:	Reinforced Concrete
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure
Facility:	East, West, and Demo Piers			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74974	1	N/A	Pier / Wharf	Substructure	Abutment	Reinforced Concrete	Minor (MN)	South half of the pile cap has light surface corrosion and soil eroded on south half of pile cap.
74975	2	G and H1	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	The pile cap has poor consolidation and a closed spall.
74976	3	F and G	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Minor (MN)	Bottom of the pile cap has poor consolidation.
74977	4	C1 and E	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Minor (MN)	Pile cap has hairline cracks.
74978	5	C1 and A	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	The top of pile cap of Pile C1 has an open spall with 12 inch long x 8 inch wide x 3 inch deep. The top of the pile cap of Pile A1 has an open spall with 14 inch long x 5 inch wide x 2 inch deep.
74979	7	C1, H1 and J	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	Pile cap of Pile C1 has open spall. Pile cap of Pile H1 has cracks on the bottom. Pile cap of Pile K has open spall.
74980	3 and 4	All	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Major (MJ)	Deck has an open spall.

Attachment A-3
East, West, and Demo Piers
Moata Forms - Sheet 1 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., HW.		Materials:	Reinforced Concrete
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure
Facility:	East, West, and Demo Piers			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
74981	2	A	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Severe (SV)	Deck has an open spall with exposed rebar.
74982	2	A	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	Pile cap has a closed spall.

Attachment A-3
East, West, and Demo Piers
Moata Forms - Sheet 2 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: East, West, and Demo Piers Substructure
Typical condition of concrete bearing piles at waterline

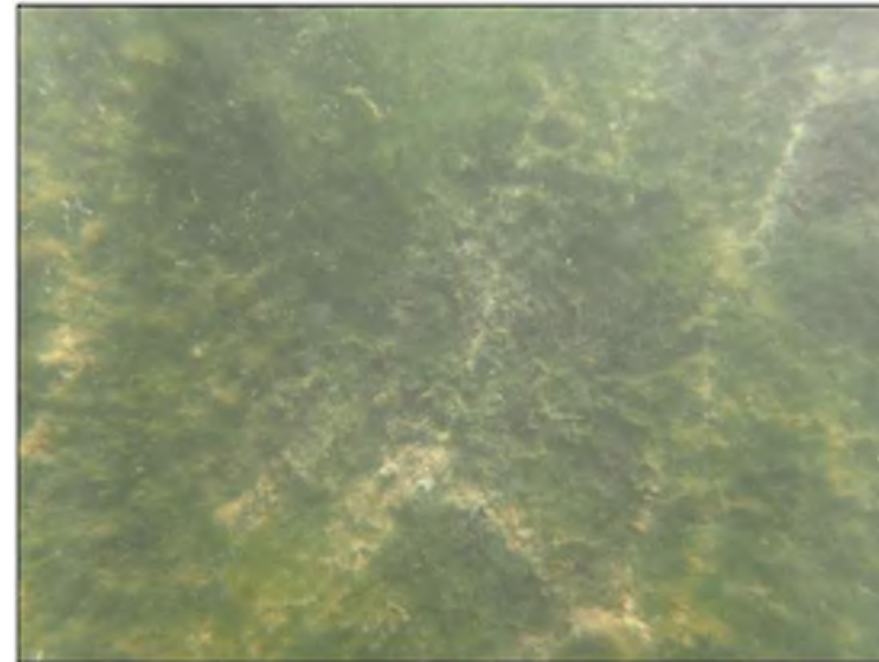


Photo 02: East, West, and Demo Piers Substructure
Typical condition of concrete bearing piles below waterline



Photo 03: East, West, and Demo Piers Substructure
Typical cleaned surface of steel piles at mid-depth



Photo 04: East, West, and Demo Piers Substructure
Typical condition of steel piles at mid-depth

Attachment A-3 East, West, and Demo Piers Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Attachment A-4

Demo Pier

Facility Information

Owner	Shipyard Commerce Center, LLC	
Asset Name(s)	West, East, and Demo Pier	
Construction Year	Around World War II (From the staff of Vigor)	
Owner/Operator Notes	Operational - Transporting necessary materials to Vigorous Dry Dock	
Previous Inspection Year	2014	
Previous Inspection Assessment Rating/Notes	Substructure Assessment Notes: Piers were structurally sound and in good shape	
Repair History	No information received	
Structure Components	Superstructure	<ul style="list-style-type: none">• Prefab Concrete Deck• Timber Deck• Steel Grate• Reinforced Concrete and Steel Girders
	Substructure	<ul style="list-style-type: none">• Reinforced Concrete and Steel Piles• Prestressed Concrete Pile Caps
Other information	Facility Length/ Depth/ Design Depth	No information received
	Fender System	No information received
	Mooring System	No information received
	Dolphin System	No information received
	Other System	No information received


General Location





Asset Photo

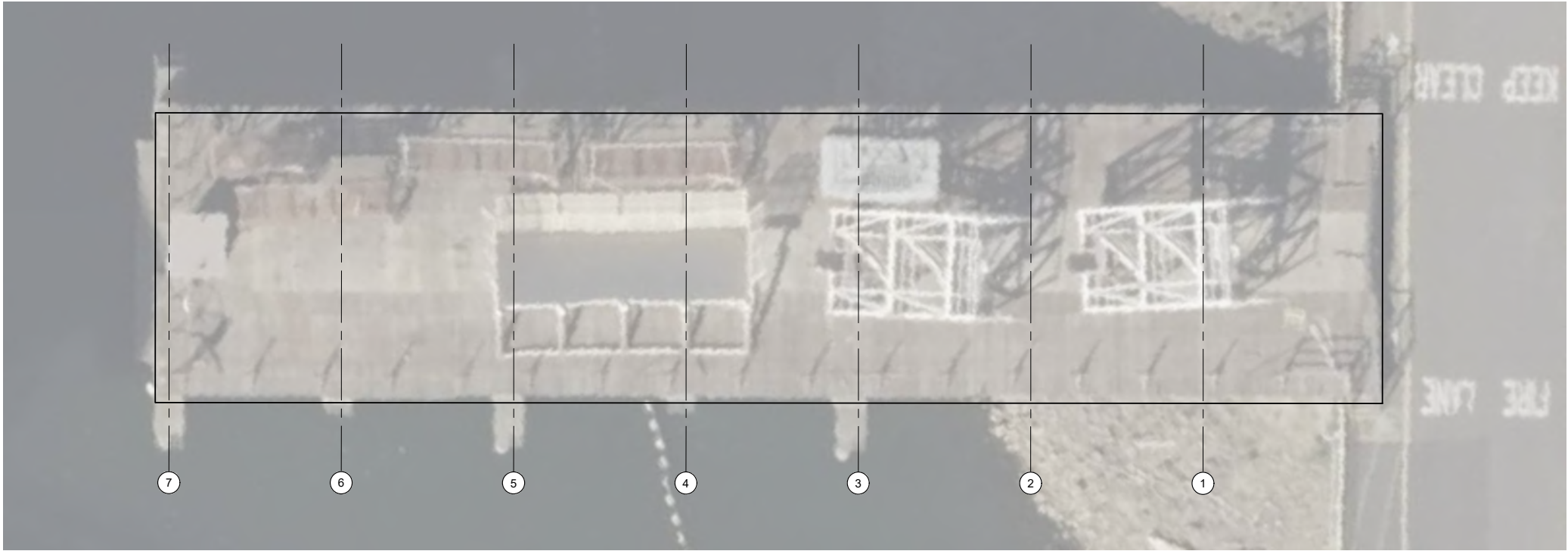


LEGEND:

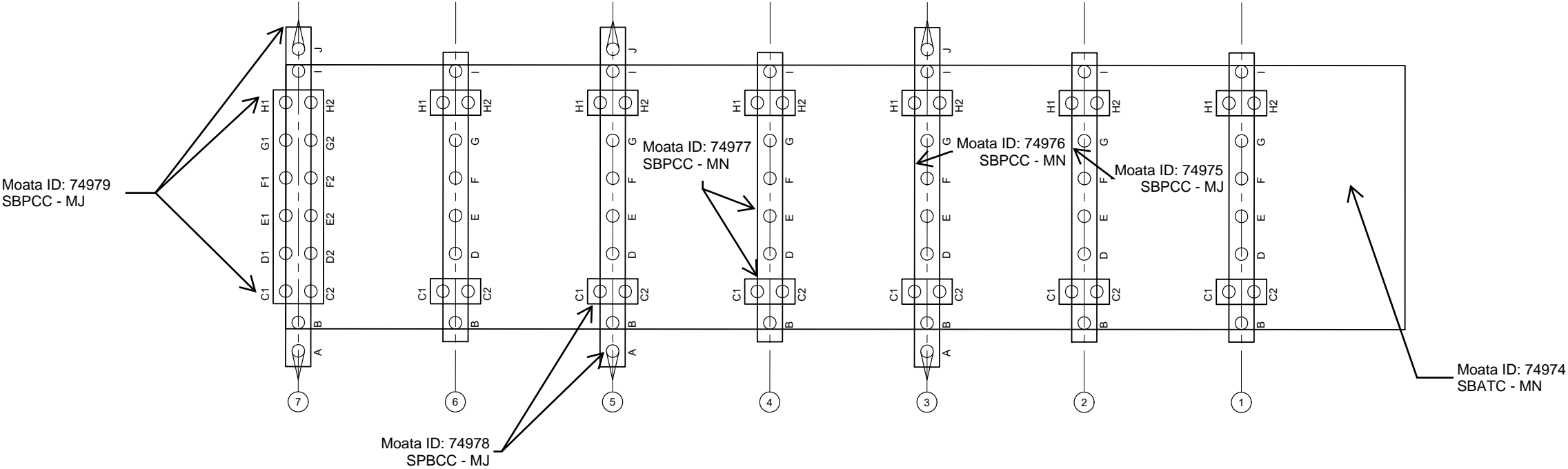
 STEEL BATTER PILE


 STEEL PILE

 CONCRETE PILE CAP



TOPSIDE PLAN
DEMO PIER




Not to scale

[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SP = SUPERSTRUCTURE
SB = SUBSTRUCTURE

ELEMENT TYPE:
AT = ABUTMENT
PC = PILE CAP
DK = DECK

MATERIAL TYPE:
C = REINFORCED CONCRETE

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

GENERAL NOTES:
1. Drawings are not to scale and are intended to
generally locate structural members to note inspection
observations.

Attachment A-4
Demo Pier
Structure Layout - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

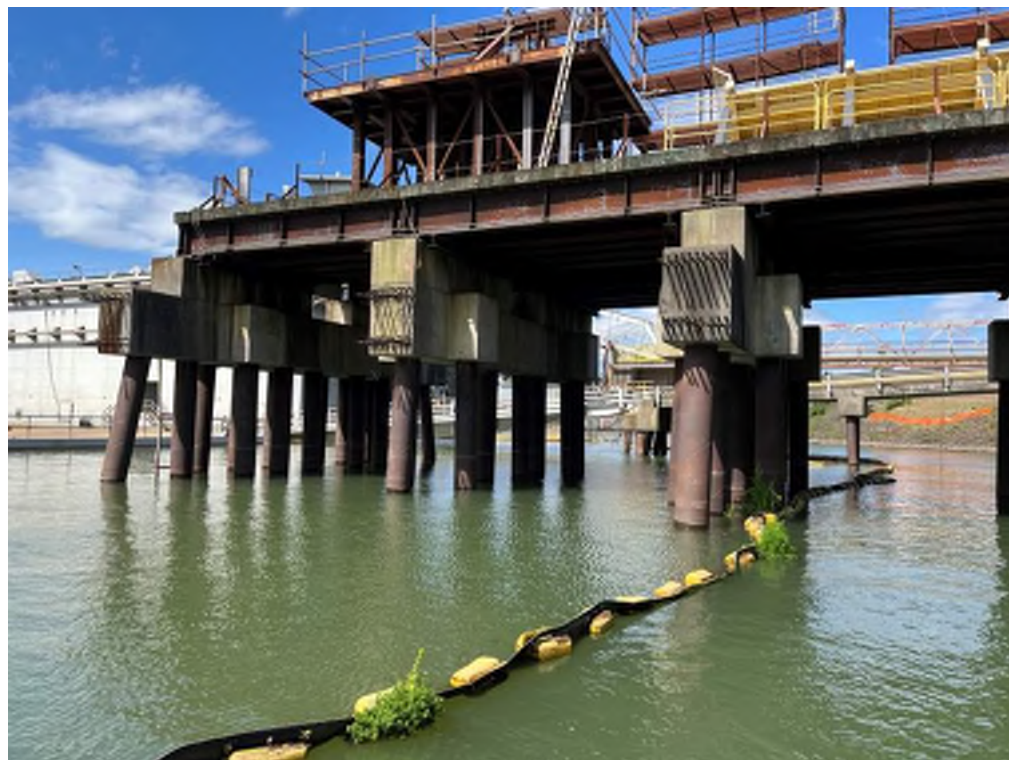


Photo 01: Demo Pier Overview
Demo Pier (Between Bents 7 and 4) , Looking North
Typical configuration of West Pier
Moata ID: Not Applicable

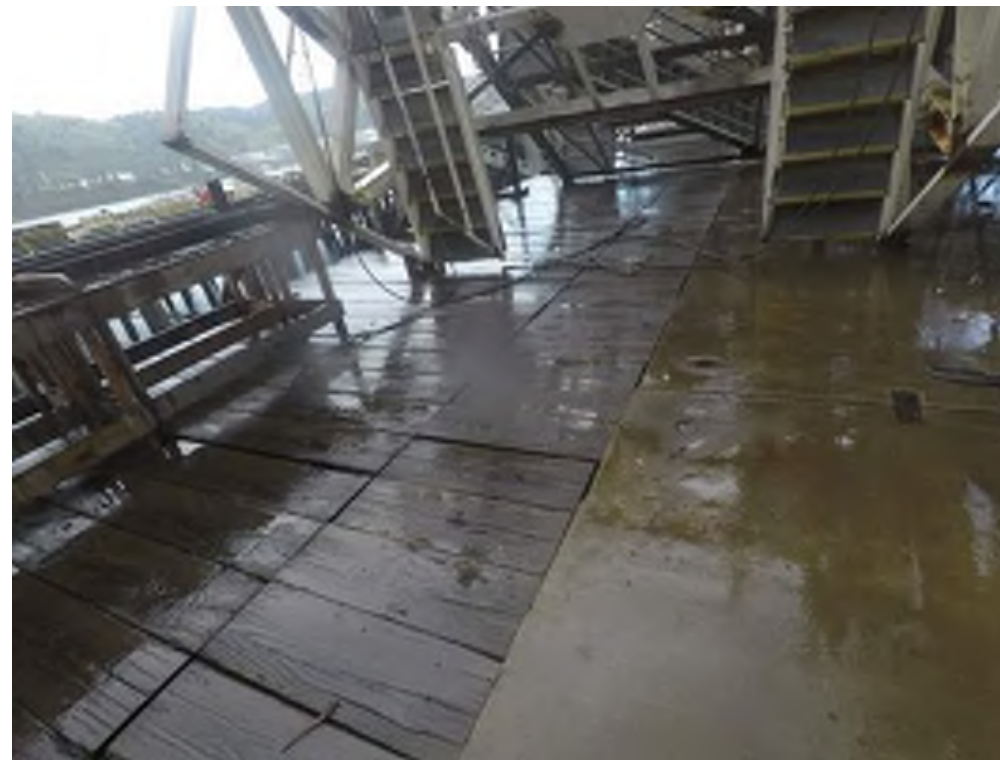


Photo 02: Demo Pier Superstructure
Timber Deck Between Bents 1 and 2
Typical condition of timber deck
Moata ID: Not Applicable



Photo 03: Demo Pier Substructure
Pile Cap at Bents 7 Pile J
Impact spalls at corner of the pile cap
Moata ID: 74979



Photo 04: Demo Pier Substructure
Pile Cap at Bents 7 Pile C1
Closed spall at corner of the pile cap
Moata ID: 74979

Attachment A-4 Demo Pier

Above-Water Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., HW.		Materials:	Reinforced Concrete
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure
Facility:	East, West, and Demo Piers			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74974	1	N/A	Pier / Wharf	Substructure	Abutment	Reinforced Concrete	Minor (MN)	South half of the pile cap has light surface corrosion and soil eroded on south half of pile cap.
74975	2	G and H1	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	The pile cap has poor consolidation and a closed spall.
74976	3	F and G	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Minor (MN)	Bottom of the pile cap has poor consolidation.
74977	4	C1 and E	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Minor (MN)	Pile cap has hairline cracks.
74978	5	C1 and A	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	The top of pile cap of Pile C1 has an open spall with 12 inch long x 8 inch wide x 3 inch deep. The top of the pile cap of Pile A1 has an open spall with 14 inch long x 5 inch wide x 2 inch deep.
74979	7	C1, H1 and J	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	Pile cap of Pile C1 has open spall. Pile cap of Pile H1 has cracks on the bottom. Pile cap of Pile K has open spall.
74980	3 and 4	All	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Major (MJ)	Deck has an open spall.

Attachment A-4
East, West, and Demo Piers
Moata Forms - Sheet 1 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., HW.		Materials:	Reinforced Concrete
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure
Facility:	East, West, and Demo Piers			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
74981	2	A	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Severe (SV)	Deck has an open spall with exposed rebar.
74982	2	A	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	Pile cap has a closed spall.

Attachment A-4
East, West, and Demo Piers
Moata Forms - Sheet 2 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Attachment A-5

Shipyard Commerce Center (SCC) Floating
Dock

Facility Information

Owner	Shipyard Commerce Center, LLC	
Asset Name(s)	Shipyard Commerce Center (SCC) Floating Dock (South of Dry Dock 3)	
Construction Year	No information received	
Owner/Operator Notes	Operational - No Information on function provided	
Previous Inspection Year	No information received	
Previous Inspection Assessment Rating/Notes	No information received	
Repair History	No information received	
Structure Components	Superstructure	<ul style="list-style-type: none">• Timber Floating Dock• Steel Grate
	Substructure	<ul style="list-style-type: none">• Steel guide piles
Other information	Facility Length/ Depth/ Design Depth	No information received
	Fender System	No information received
	Mooring System	No information received
	Dolphin System	Not applicable
	Other System	Not applicable

General Location



Asset Photo



LEGEND:

○

STEEL PILE

■

TIMBER FLOAT

□

STEEL GRATING



Not to scale

[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
FS = FLOATING STRUCTURE

ELEMENT TYPE:
PE = PILE/SHEET PILE

MATERIAL TYPE:
S = STEEL

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

GENERAL NOTES:
1. Drawings are not to scale and are intended to
generally locate structural members to note
inspection observations.

Attachment A-5
SCC Floating Dock
Structure Layout - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Ship Commerce Center Floating Dock Overview
Ship Commerce Center Floating Dock, Looking East
Moata ID: Not Applicable



Photo 02: Ship Commerce Center Floating Dock Floats
Float docking
Typical condition of the float docking
Moata ID: Not Applicable



Photo 03: Ship Commerce Center Floating Dock Floats
Steel Grate
Typical condition of steel grating
Moata ID: Not Applicable

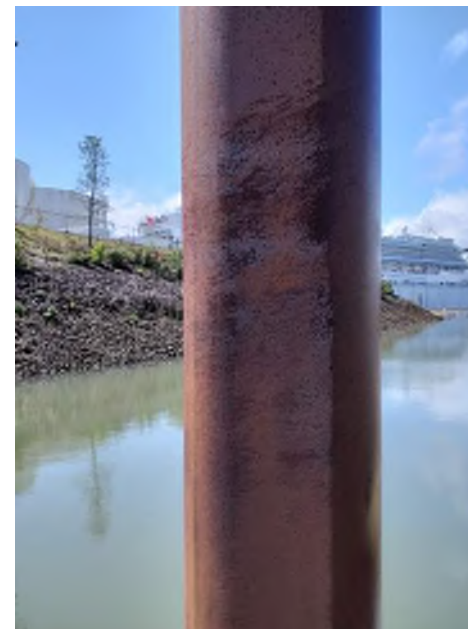


Photo 04: Ship Commerce Center Floating Dock Piles
Pile P6
Typical condition of guide piles
Moata ID: 73672

Attachment A-5 SCC Floating Dock

Above-Water Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., HW.		Materials:	Steel
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Floating Structure
Facility:	SCC Floating Dock			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73672	N/A	All	Floating Dock	Floating Structure	Pile / Sheet Pile	Steel	Minor (MN)	General condition: Splits/checks less than 1/2 inch wide on timber floats. Minor corrosion on steel piles and steel grating.

Attachment A-5
SCC Floating Dock
Moata Forms - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Ship Commerce Center Floating Dock Overview
Ship Commerce Center Floating Dock, looking east

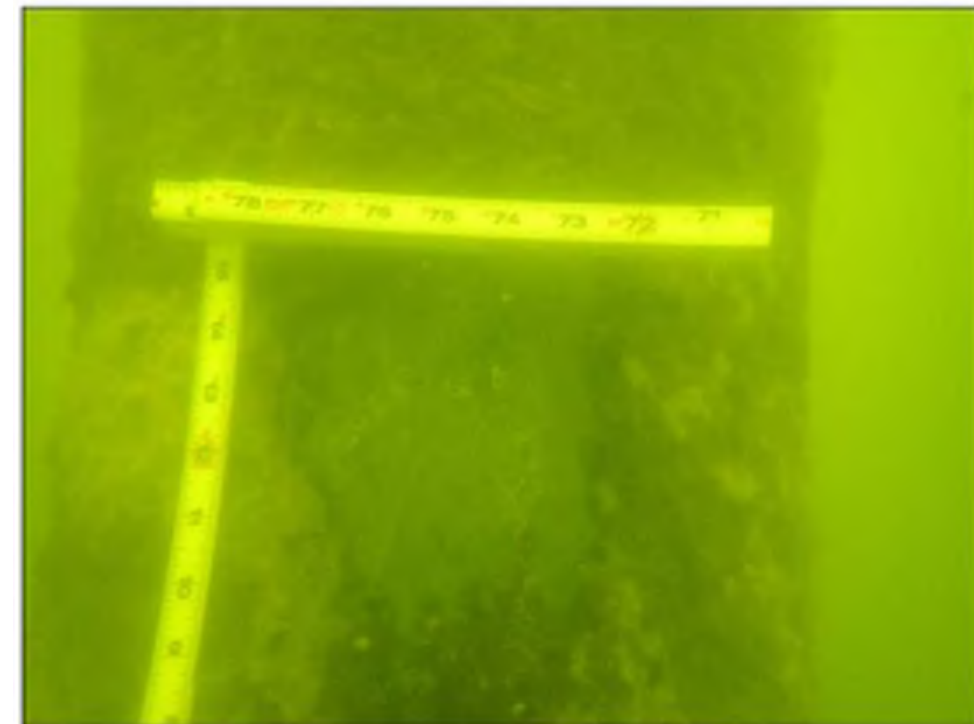


Photo 02: Ship Commerce Center Floating Dock Floating Structure
Typical cleaned surface of steel piles below waterline

Attachment A-5
SCC Floating Dock
Dive Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Attachment A-6
Berth 309 and 310 - Pier C

Facility Information

Owner	Shipyard Commerce Center, LLC	
Asset Name(s)	Shipyard Commerce Center (SCC) Pier C (Berths 309 and 310)	
Construction Year	1962	
Owner/Operator Notes	Operational - No information on function provided	
Previous Inspection Year	2014	
Previous Inspection Assessment Rating/Notes	<ul style="list-style-type: none">• All bents of Pier C were in good condition and structurally sound• There were a total of 78 fender piles of Pier C consisting of concrete steel and timber piles. 60 were rated at 50% or less and/or missing.	
Repair History	No information received	
Structure Components	Superstructure	<ul style="list-style-type: none">• Prefabricated concrete deck• Reinforced Concrete pile caps
	Substructure	<ul style="list-style-type: none">• 56 Reinforced Concrete bents• Steel pipe piles• 78 fender piles (concrete, timber and steel)• Steel batter piles in narrow section
Other information	Facility Length/ Depth/ Design Depth	1100 ft x 55 ft pier
	Fender System	78 fender piles (concrete, timber and steel), timber chocks and steel walers
	Mooring System	Steel appurtenances
	Dolphin System	Not applicable
	Other System	Not applicable

General Location



Asset Photo



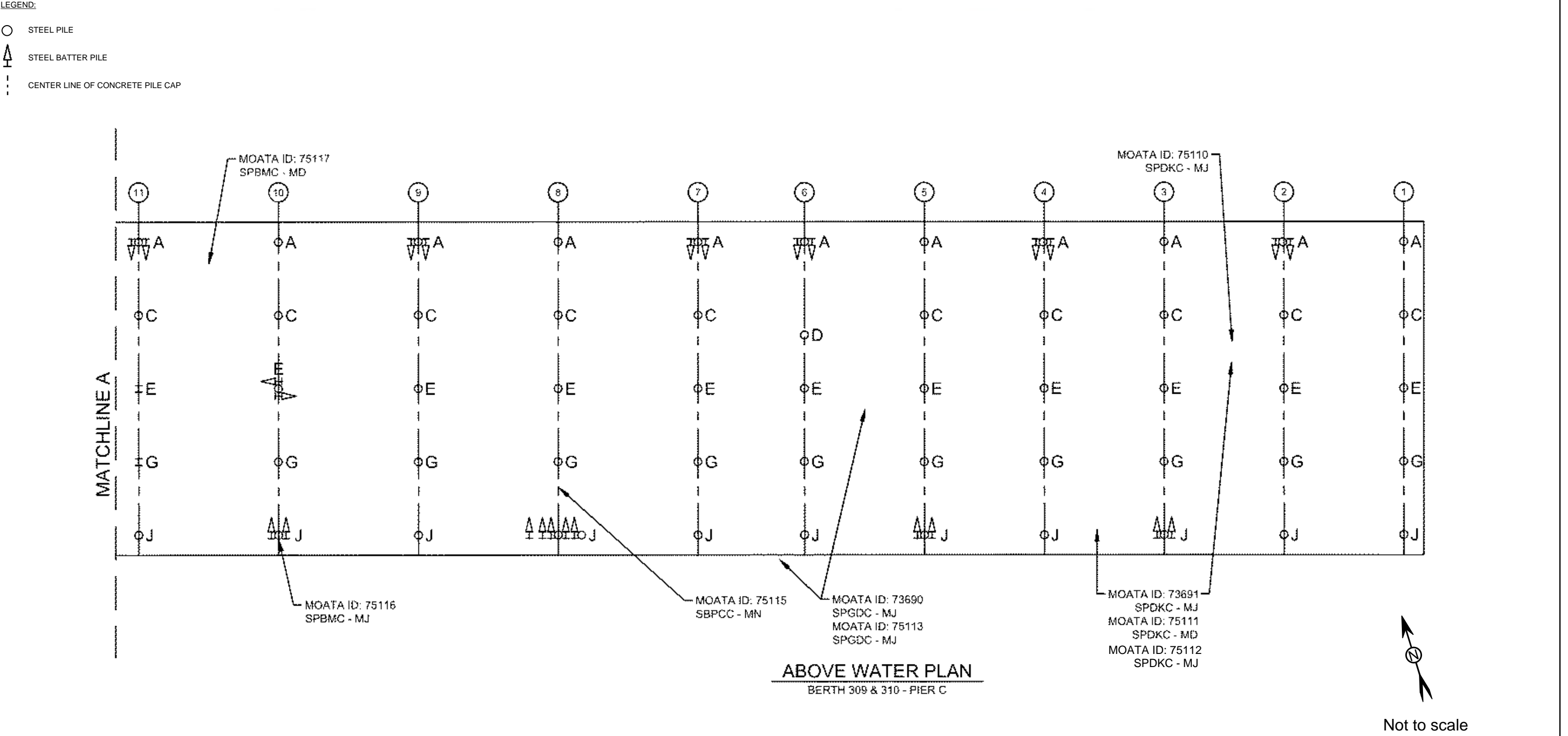
View of south side of Pier C looking north



Not to scale

Attachment A-6
Berth 309 and 310 - Pier C
Structure Layout - Sheet 1 of 6

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SP = SUPERSTRUCTURE
FS = FENDER SYSTEM
MR = MOORING
SB = SUBSTRUCTURE

ELEMENT TYPE:
GD = GUARDRAIL/HANDRAIL/BULLRAIL
CT = CLEAT/BOLLARD
BM = BEAM/JOIST/STRINGER/GIRDER
PC = PILE CAP
CK = CHOCK
DK = DECK

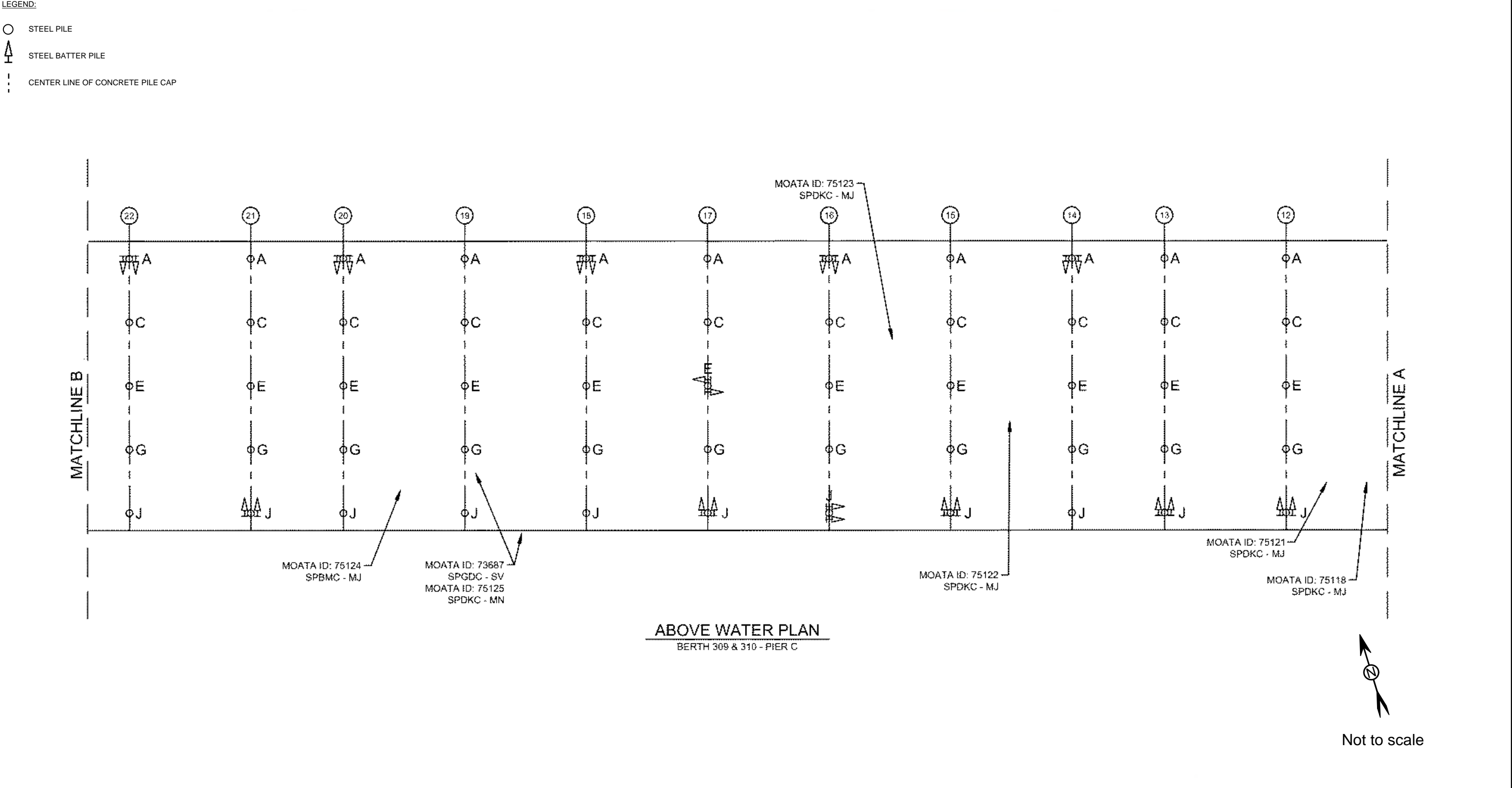
MATERIAL TYPE:
C = REINFORCED CONCRETE
S = STEEL
T = TIMBER

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

GENERAL NOTES:
1. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.

Attachment A-6
Berth 309 and 310 - Pier C
Structure Layout - Sheet 2 of 6

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SP = SUPERSTRUCTURE
FS = FENDER SYSTEM
MR = MOORING
SB = SUBSTRUCTURE

ELEMENT TYPE:
GD = GUARDRAIL/HANDRAIL/BULLRAIL
CT = CLEAT/BOLLARD
BM = BEAM/JOIST/STRINGER/GIRDER
PC = PILE CAP
CK = CHOCK
DK = DECK

MATERIAL TYPE:
C = REINFORCED CONCRETE
S = STEEL
T = TIMBER

DEFECT LEVEL:
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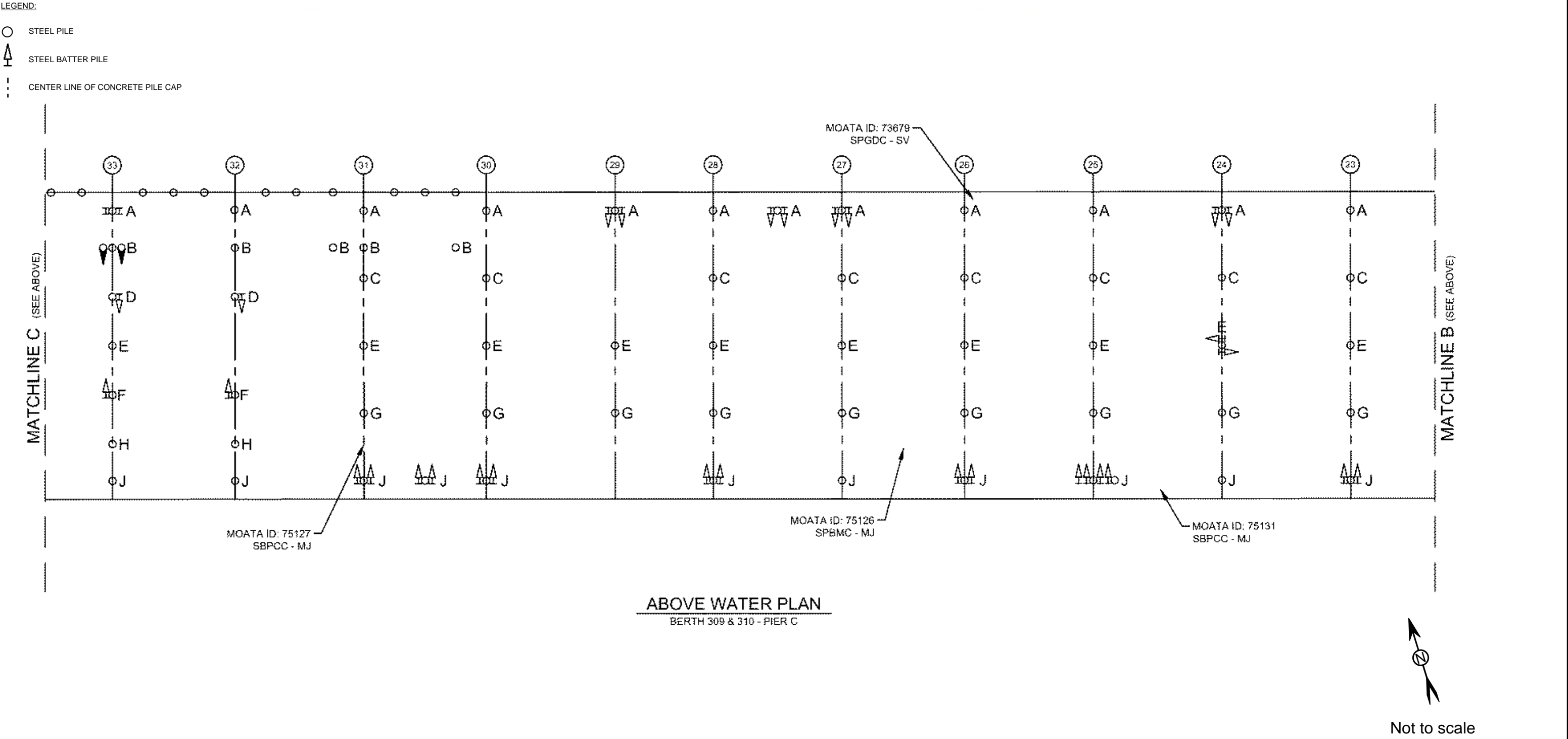
GENERAL NOTES:
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observations.

Attachment A-6

Berth 309 and 310 - Pier C

Structure Layout - Sheet 3 of 6

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



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Attachment A-6

Berth 309 and 310 - Pier C


Structure Layout - Sheet 4 of 6

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin


LEGEND:



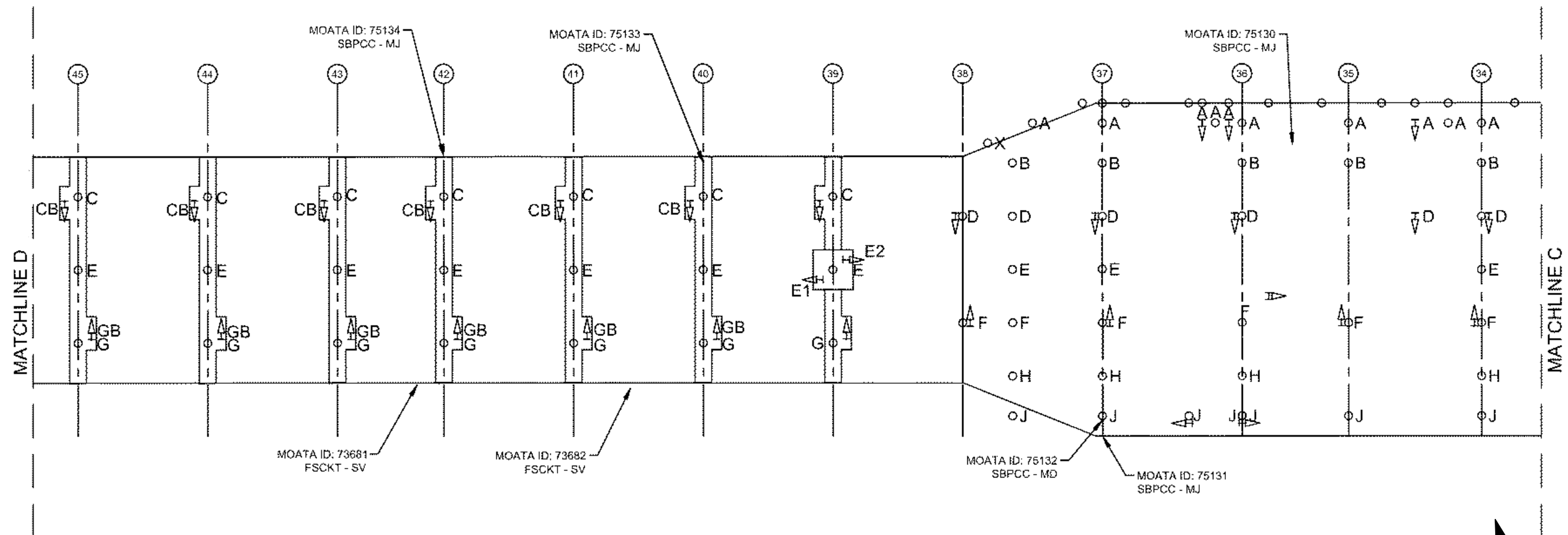
STEEL PILE



STEEL BATTER PILE



CONCRETE PILE CAP



ABOVE WATER PLAN
BERTH 309 & 310 - PIER C

Not to scale

[MOATA ID XXXXX]
[WWYYZ - ##]

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Attachment A-6

Berth 309 and 310 - Pier C

Structure Layout - Sheet 5 of 6

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

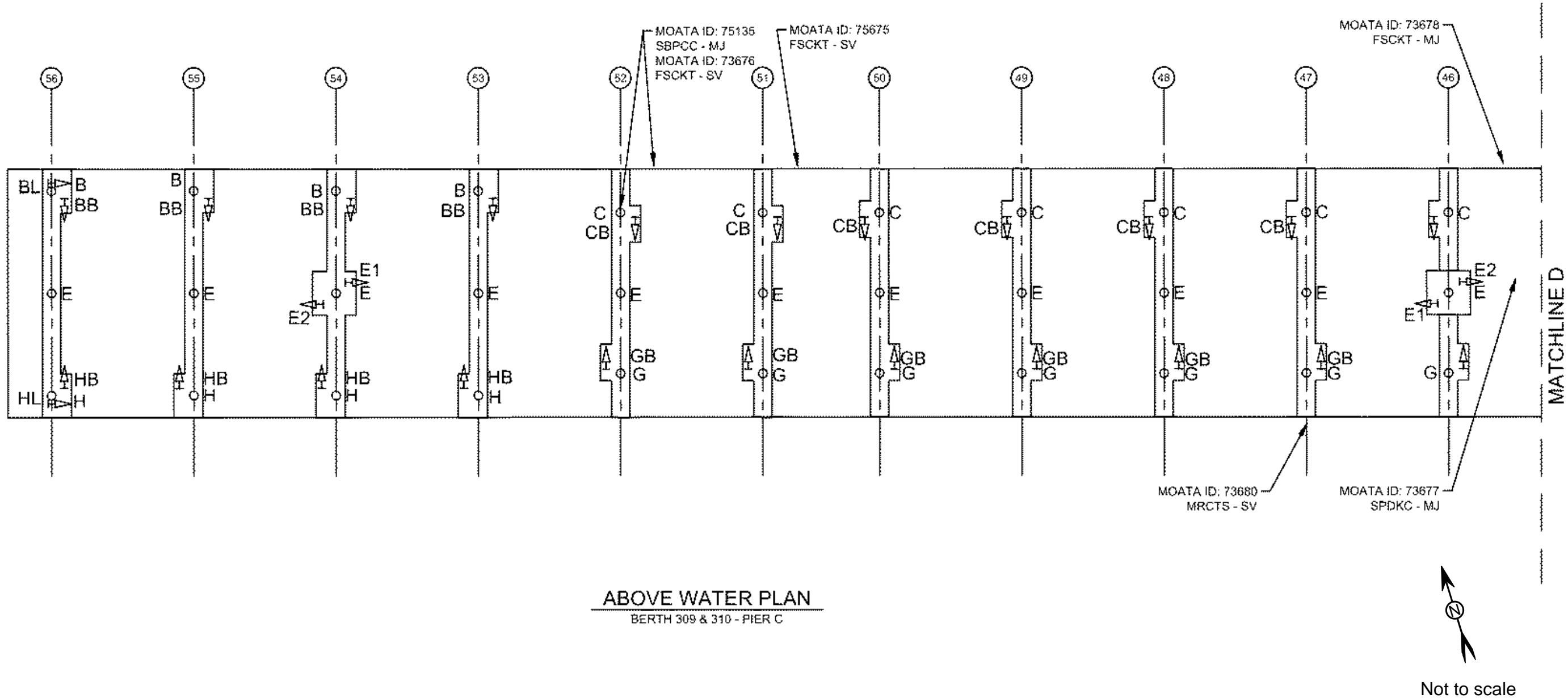


LEGEND:

STEEL PILE

STEEL BATTER PILE

CONCRETE PILE CAP



[MOATA ID XXXXX]
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GENERAL NOTES:
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observations.

Attachment A-6

Berth 309 and 310 - Pier C

Structure Layout - Sheet 6 of 6

Prepared on: 3/10/2023

Structure Condition Assessment Report

Swan Island Basin

HGL

Hydrographic & Geologic Ltd.

M

MOTT

MACDONALD



Photo 01: Pier C Superstructure
Concrete Deck Between Bents 45 and 46
Concrete closed spall on the top of the deck
Moata ID: 73677



Photo 02: Pier C Superstructure
Concrete Bullrail Between Bents 25 and 26
Concrete open spall exposing reinforcement
Moata ID: 73679

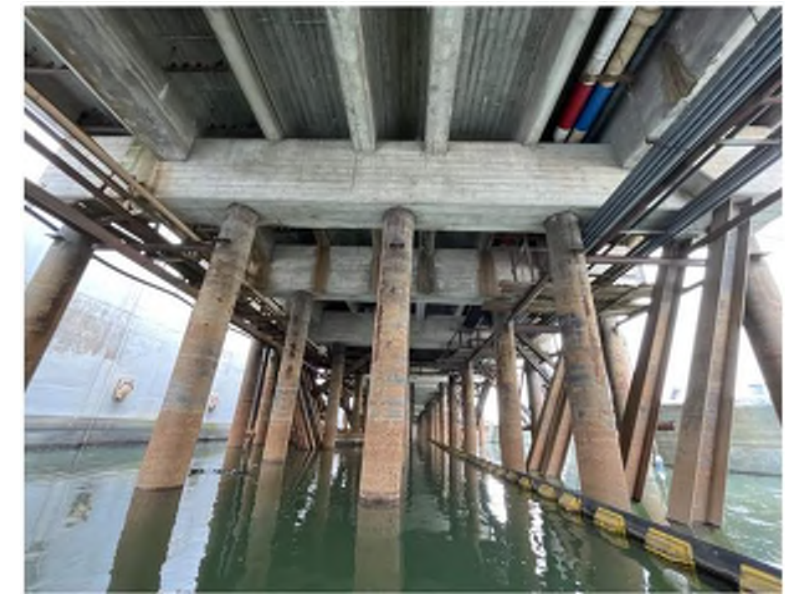


Photo 03: Pier C Substructure
Substructure between Bents 4 and 5
Typical configuration of Pier C substructure
Moata ID: Not Applicable



Photo 04: Pier C Superstructure
Underside of Concrete Deck Between Bents 4 and 5
Concrete open spall exposing reinforcement
Moata ID: 75112



Photo 05: Pier C Superstructure
Concrete Pile Cap at Pile C Bent 40
Concrete closed spall on the bottom of the pile cap
Moata ID: 75133

Attachment A-6 Berth 309 and 310 - Pier C

Above-Water Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	PY., SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Mooring
Facility:	Pier C (Berth 309 and 310)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73675	50 to 51	N/A	Pier / Wharf	Fender System	Chock	Timber	Severe (SV)	Timber chock is partially broken.
73676	51 to 52	N/A	Pier / Wharf	Fender System	Chock	Timber	Severe (SV)	Timber chock is partially broken.
73678	45 to 46	N/A	Pier / Wharf	Fender System	Chock	Timber	Major (MJ)	Chock has cross-section area loss of between 25% to 50%.
73681	42 to 43	N/A	Pier / Wharf	Fender System	Chock	Timber	Severe (SV)	Chock is completely broken.
73680	47	N/A	Pier / Wharf	Mooring	Cleat / Bollard	Steel	Severe (SV)	One of the mooring hardware is missing.
73682	40 to 41	N/A	Pier / Wharf	Mooring	Cleat / Bollard	Steel	Severe (SV)	One of the mooring hardware is missing.
73683	40 to 41	N/A	Pier / Wharf	Mooring	Cleat / Bollard	Steel	Severe (SV)	Same as 73682
75133	40	C	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	Pile cap of Pile C has 48" long x 24" wide closed spall with cracks on the bottom of the pile cap.

Attachment A-6
Berth 309 and 310 - Pier C
Moata Forms - Sheet 1 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
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Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Mooring
Facility:	Pier C (Berth 309 and 310)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75134	41	C	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	Pile cap has open spalls with exposed rebar on the bottom of the pile cap.
75135	52	C	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	Pile cap of Pile C has 24" long x24" wide close spall with structural cracks up to 0.5".
73677	44 to 45	N/A	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Major (MJ)	Concrete deck has open spalls and crack.
73679	25 to 26	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Reinforced Concrete	Severe (SV)	Bull rail has a roughly 84" long spall with exposed reinforcement. Section of bull rail is gone beneath the life ring. Reinforcement is bent and exposed. Steam actively comes out of openings.
73687	All	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Reinforced Concrete	Severe (SV)	General Condition: Concrete bull rail has open spalls with exposed rebar. At the pull box location, the concrete bull rail has spalls with abandoned utility pipes exposed. Concrete pavement has spalls with multiple cracks.
73689	All	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Reinforced Concrete	Severe (SV)	Same as 73687
73690	6 to 7	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Reinforced Concrete	Major (MJ)	Concrete bull rail has open spalls.
73691	2 to 3	N/A	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Major (MJ)	The concrete deck has an open spall on the lane with a spalling depth of more than 0.5".

Attachment A-6
Berth 309 and 310 - Pier C
Moata Forms - Sheet 2 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	PY., SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Mooring
Facility:	Pier C (Berth 309 and 310)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75110	2 to 3	All	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Major (MJ)	Deck has transverse cracks with efflorescence and possible rust stains are in the soffit. Deck has open spalls approximately 1' dia around 2 of the 3 drains.
75111	3 to 4	All	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Moderate (MD)	Deck has transverse cracks with efflorescence
75112	4 to 5	All	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Major (MJ)	Deck has transverse cracks with efflorescence and open spalls around drains.
75113	5 to 6	All	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Major (MJ)	Deck has transverse cracks with efflorescence and open spalls around drains.
75115	7 to 8	All	Pier / Wharf	Superstructure	Pile Cap	Reinforced Concrete	Minor (MN)	Poor consolidation of concrete is under bent 8 near pile G.
75116	10	J	Pier / Wharf	Superstructure	Beam / Joist / Stringer / Girder	Reinforced Concrete	Major (MJ)	Open spall with exposed rebar on bottom of the south girder.
75117	10 to 11	A to C	Pier / Wharf	Superstructure	Beam / Joist / Stringer / Girder	Reinforced Concrete	Moderate (MD)	Girder has possible flexure cracks with efflorescence.
75118	11 to 12	G to J	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Major (MJ)	Open spall with exposed rebar is on bottom of deck.

Attachment A-6
Berth 309 and 310 - Pier C
Moata Forms - Sheet 3 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	PY., SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Mooring
Facility:	Pier C (Berth 309 and 310)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75121	11 to 12	G to J	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Major (MJ)	Open spalls with exposed rebar are on bottom of deck around the drains.
75122	14 to 15	E to G	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Major (MJ)	Open spall with exposed rebar is on bottom of deck.
75123	15 to16	C to E	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Major (MJ)	Open spall with exposed rebar is on bottom of deck.
75124	19 to 20	G to J	Pier / Wharf	Superstructure	Beam / Joist / Stringer / Girder	Reinforced Concrete	Major (MJ)	A partially open spall with exposed rebar on the bottom of the girder.
75125	18 to 19	G to J	Pier / Wharf	Superstructure	Beam / Joist / Stringer / Girder	Reinforced Concrete	Minor (MN)	Girder has possible flexure cracks with efflorescence.
75126	26 to 27	G to J	Pier / Wharf	Superstructure	Beam / Joist / Stringer / Girder	Reinforced Concrete	Major (MJ)	Girder has open spalls with exposed rebar.
75127	31	G to J	Pier / Wharf	Superstructure	Pile Cap	Reinforced Concrete	Major (MJ)	Pile cap has open spalls with exposed rebar on the bottom of the pile cap.
75130	35 to 36	A to B	Pier / Wharf	Superstructure	Pile Cap	Reinforced Concrete	Major (MJ)	Pile cap has open spalls with exposed rebar on the bottom of the pile cap.

Attachment A-6
Berth 309 and 310 - Pier C
Moata Forms - Sheet 4 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

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Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Mooring
Facility:	Pier C (Berth 309 and 310)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75131	37	J	Pier / Wharf	Superstructure	Pile Cap	Reinforced Concrete	Major (MJ)	Pile cap has open spalls with exposed rebar on the bottom of the pile cap.
75132	37	J	Pier / Wharf	Superstructure	Pile Cap	Reinforced Concrete	Moderate (MD)	Cracks are on the bottom of the pile cap.

Attachment A-6
Berth 309 and 310 - Pier C
Moata Forms - Sheet 5 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin





Photo 01: Pier C Overview,
Pier C, looking north

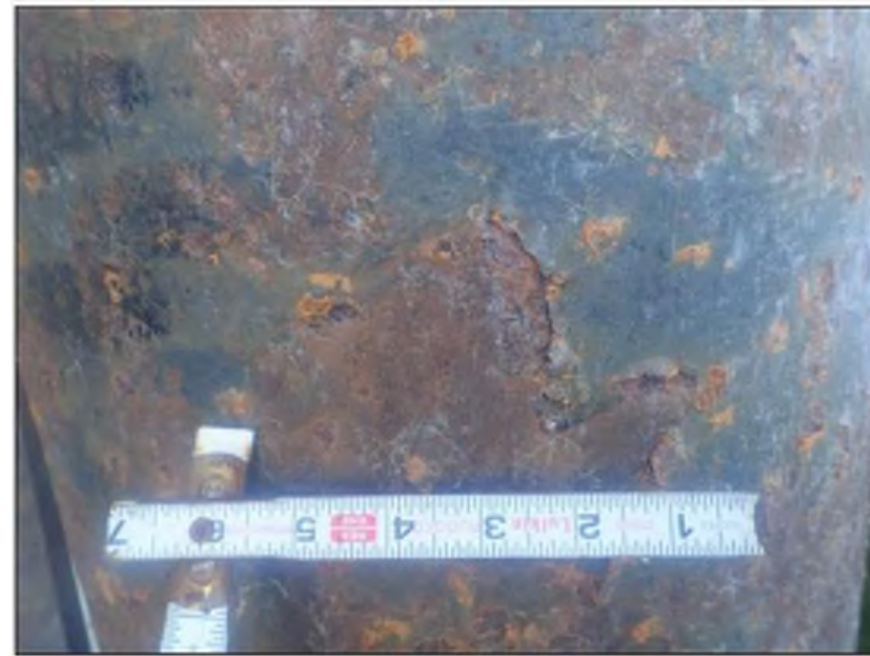


Photo 02: Pier C Substructure
Typical steel pile coating loss and corrosion in splash zone



Photo 03: Pier C Substructure
Typical cleaned surface of steel piles below waterline

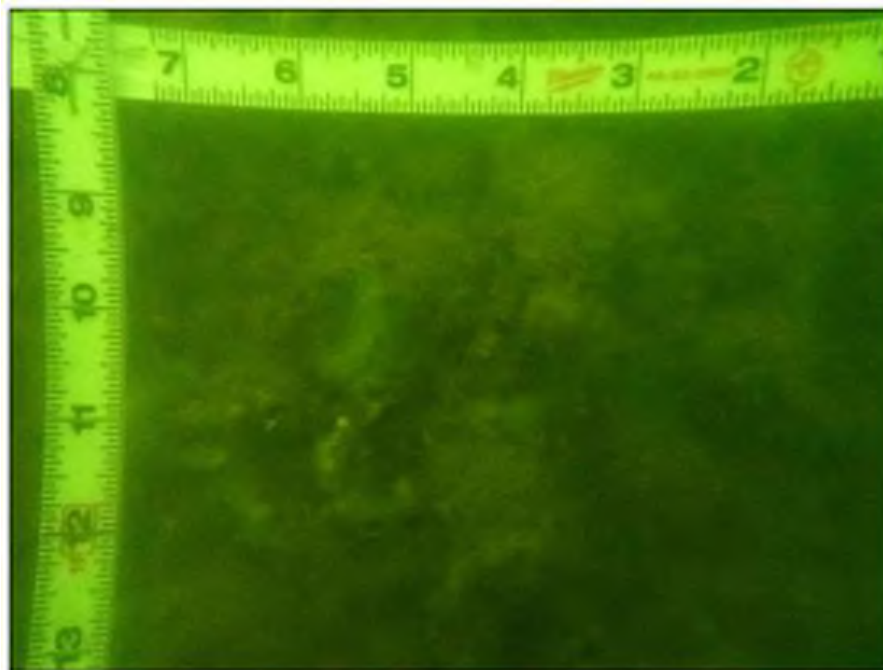


Photo 04: Pier C Substructure
Typical condition of steel piles at mid-depth

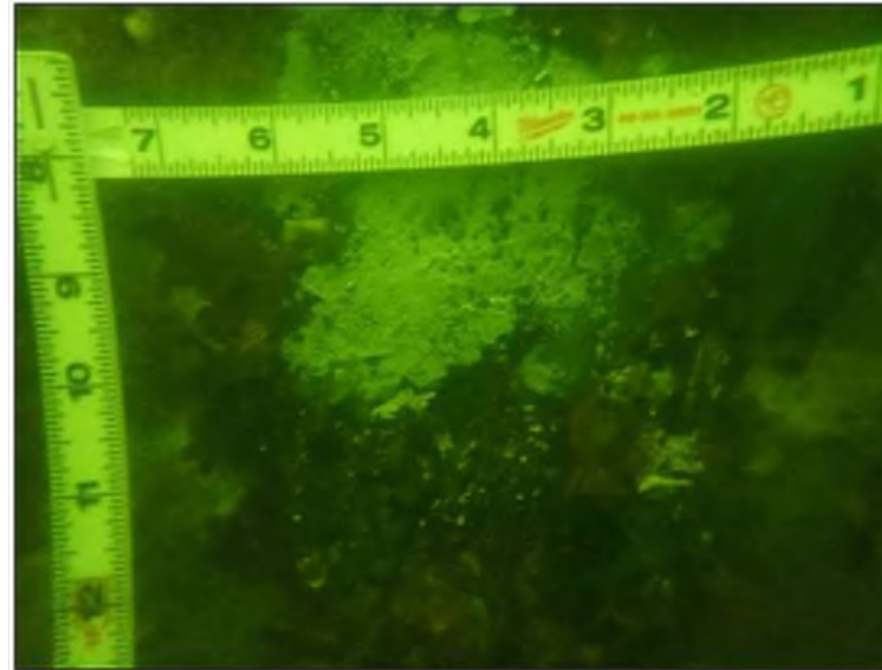


Photo 05: Pier C Substructure
Typical cleaned surface of steel piles at mid-depth

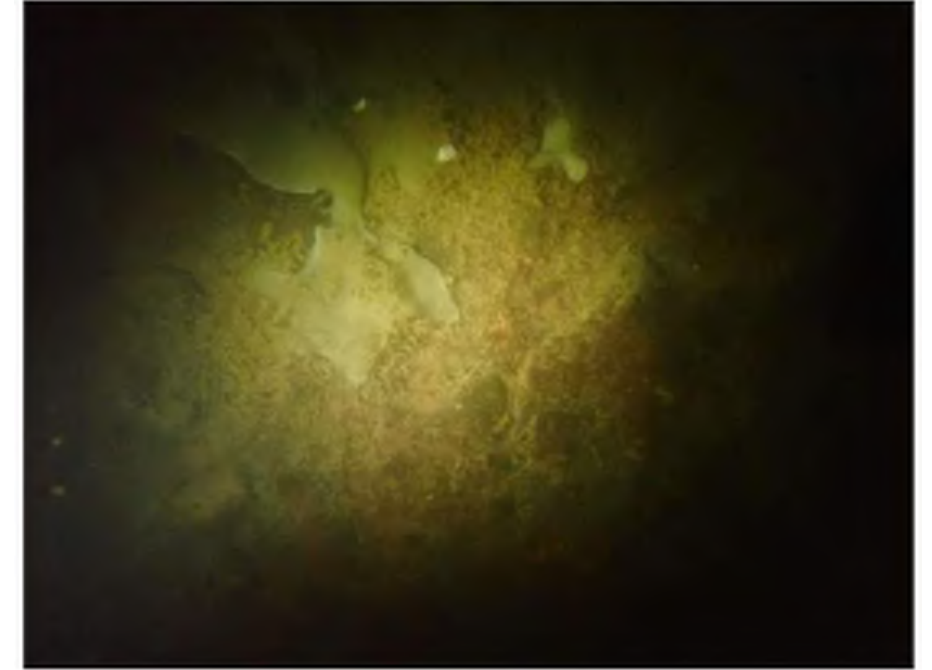


Photo 06: Pier C Substructure
Typical condition of steel H piles near channel bottom

Attachment A-6
Berth 309 and 310 - Pier C
Dive Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Ultrasonic Thickness Measurements						
Swan Island Basin	Location: Portland, OR		Company: <i>Collins Engineers, Inc.</i>		Divers: Pinkston, Moss, Malone, Sukow	
Facility: Various	Auditor: Jordan Furlan		Inspection Date: 07/19/2022 - 07/28/2022			
Time of Day: N/A	Tide: +0-3 ft. MLLW		Pile Type (Bearing, Batter, Sheet, Guide): Sheet, Bearing, Batter		Component Material: Steel	
Property	Location	Depth	Estimated Nominal Thickness	Measured Thickness	Estimated Loss of Section	Notes
Berth 309 & 310 - Pier C	Bent 36 Pile F	Mid-depth	0.500	0.500	0.0%	Pipe Pile
	Bent 36 Pile F	Channel bottom	0.500	0.500	0.0%	Pipe Pile
	Bent 35 Pile F	Mid-depth	0.500	0.540	0.0%	H-Pile Flange
	Bent 35 Pile F	Mid-depth	0.500	0.360	28.0%	H-Pile Web
	Bent 35 Pile F	Channel bottom	0.500	0.370	26.0%	H-Pile Flange
	Bent 35 Pile F	Channel bottom	0.500	0.530	0.0%	H-Pile Web
	Bent 15 Pile J	10' below waterline	0.500	0.500	0.0%	H-Pile Flange

Attachment A-6
Berth 309 and 310 - Pier C
Dive Ultrasonic Thickness Measurements - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



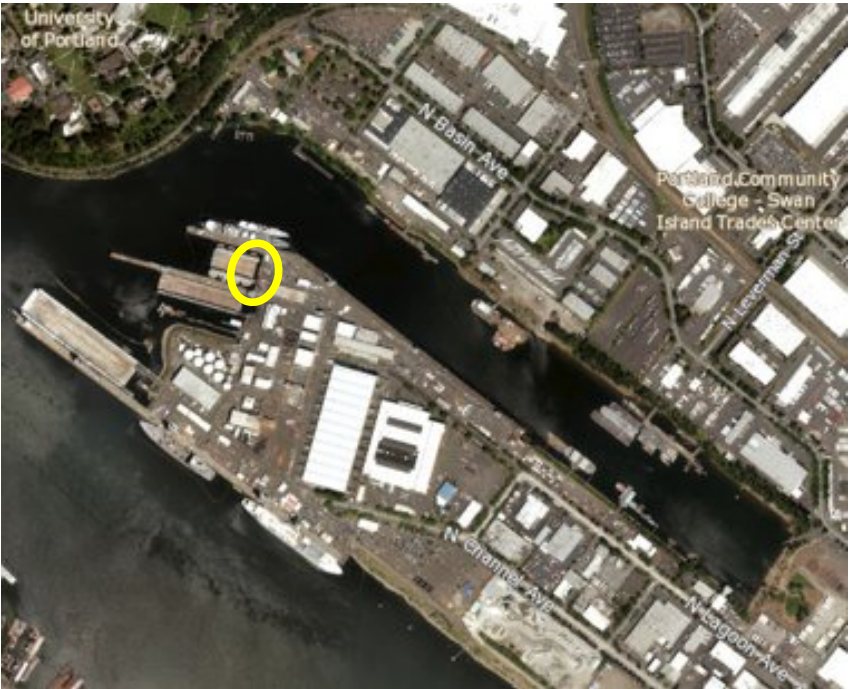
Attachment A-7

Berth 301 - Pier A

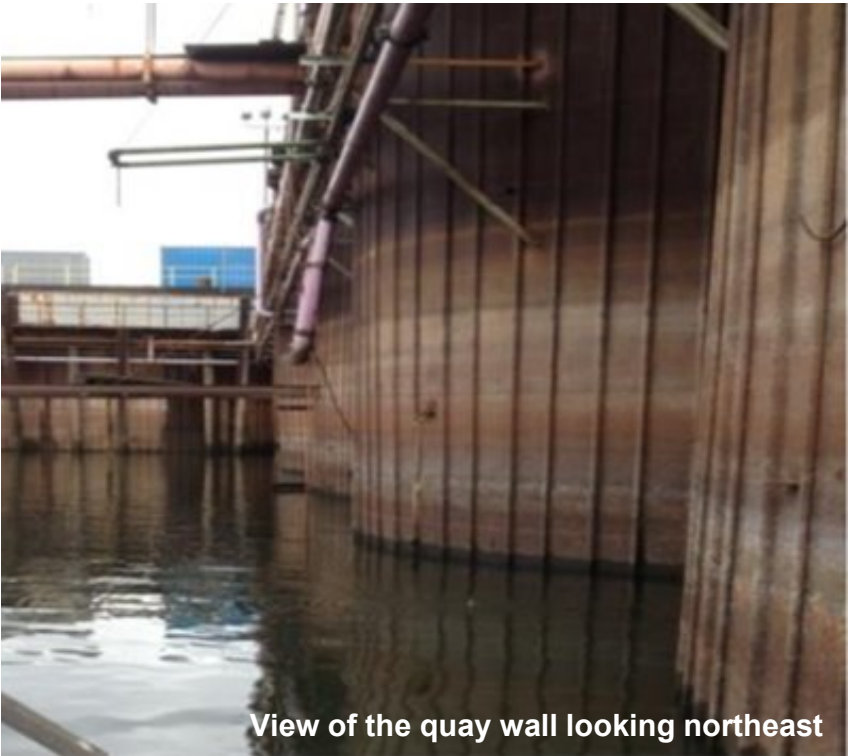
Facility Information

Owner	Shipyards Commerce Center, LLC	
Asset Name(s)	Shipyards Commerce Center (SCC) Quay Wall	
Construction Year	(Sometime after Pier A was constructed, >= 1940s)	
Owner/Operator Notes	Operational	
Previous Inspection Year	2014	
Previous Inspection Assessment Rating/Notes	There were 60 sheet pile Cells. Only one deficiency was found; a 1 ½” vertical gap on the butt joint between two sheets on Berth 301, Cell #36, sheet 14 (starting from the north side). All others had no noted damage and were structurally sound.	
Repair History	No information received	
Structure Components	<div>Quay Wall<ul style="list-style-type: none">(1) 280 ft x 71 ft quay wallInterlocked steel sheet piles filled with soil topped with asphalt pavementA circular sheet pile bulkhead with the main cells, designated #83(C-C), #85(D-D), #87(E-E), and #88(F-F), located between Pier A and Pier C</div>	
Other information	Facility Length/ Depth/ Design Depth	280 ft x 71 ft quay wall
	Fender System	Not applicable
	Mooring System	Not applicable
	Dolphin System	Not applicable
	Other System	Not applicable

General Location



Asset Photo



View of the quay wall looking northeast

LEGEND:

STEEL SHEET PILE

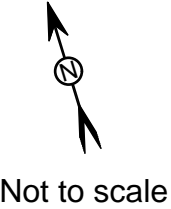
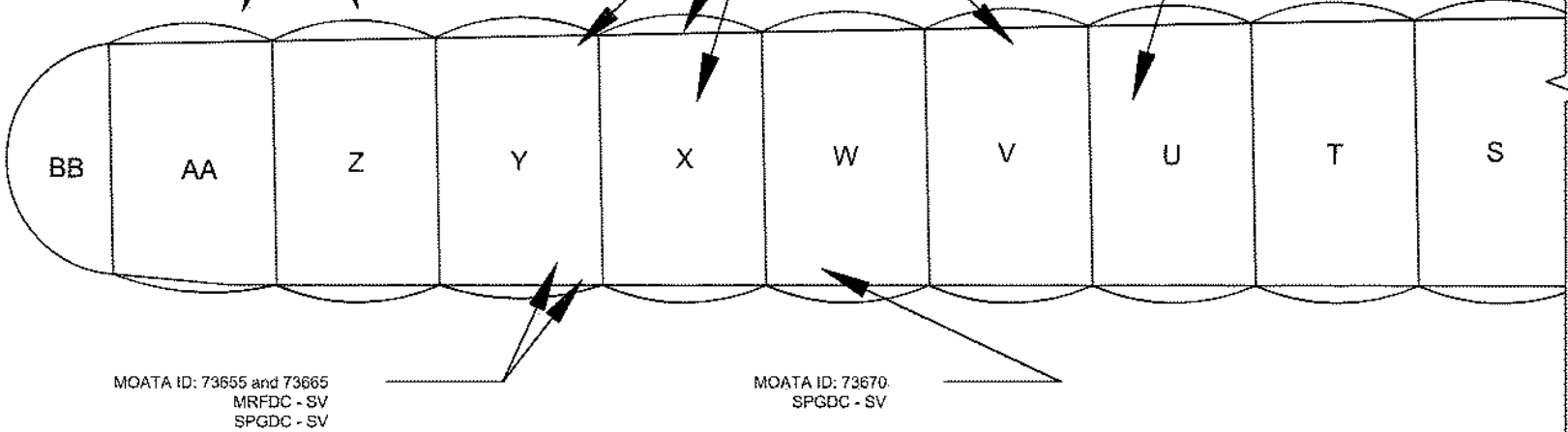
ASPHALT OVERLAY



MOATA ID: 73646 to 73648
FSPEX - SV
MOATA ID: 73653 to 73654
FSPEX - SV

MOATA ID: 73659
SPDKA - MD
MOATA ID: 73662
MRCTS - MD
MOATA ID: 78984
FSPET - SV

MOATA ID: 73666 to 73668
FSPET - SV
MOATA ID: 73689
MRCTS - MD



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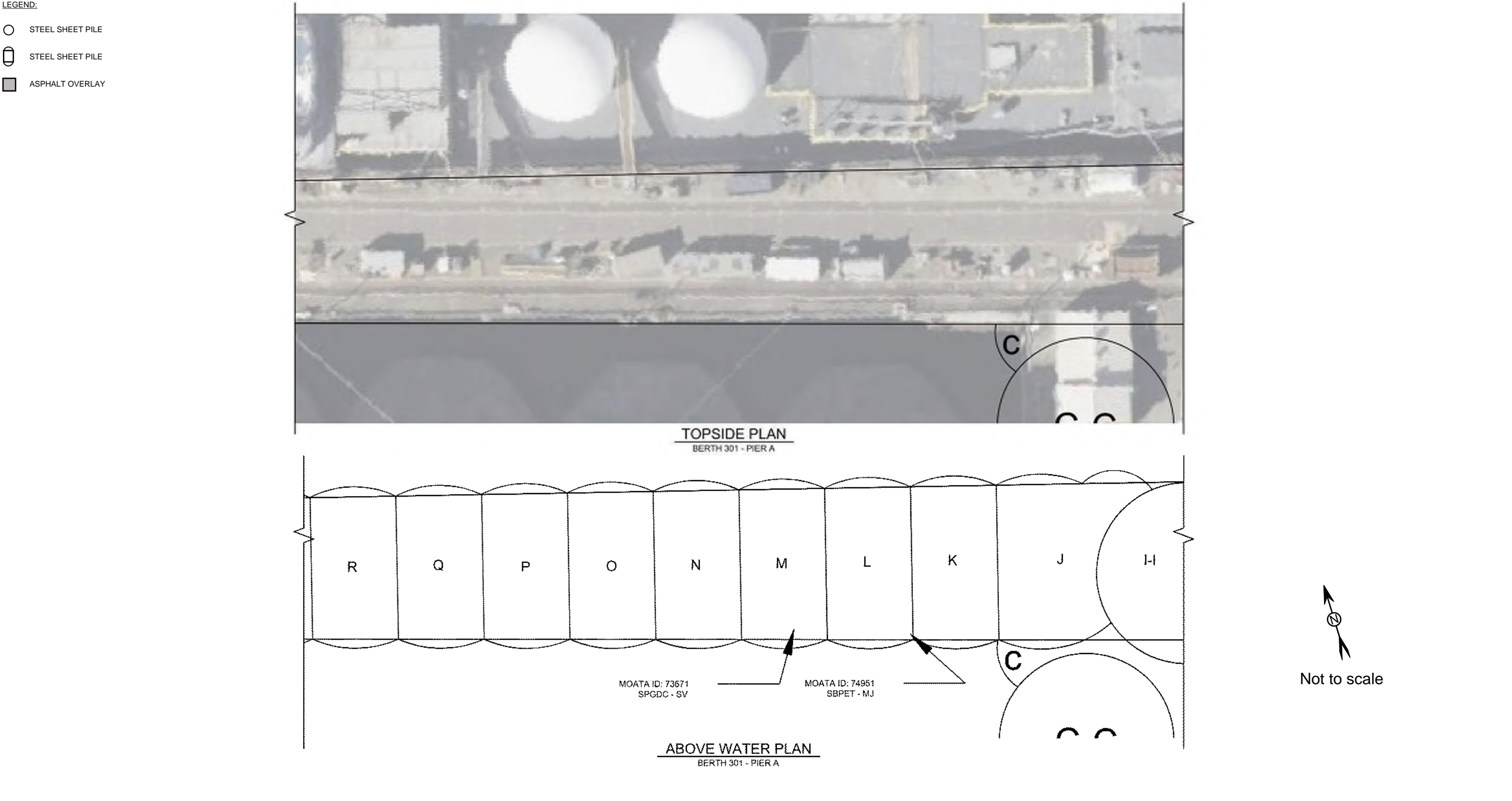
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GENERAL NOTES:
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Attachment A-7
Berth 301 - Pier A
Structure Layout - Sheet 1 of 3

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



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GENERAL NOTES:

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Attachment A-7
Berth 301 - Pier A
Structure Layout - Sheet 2 of 3

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

HGL

Hydrographic

M

MOTT

MACDONALD

LEGEND:

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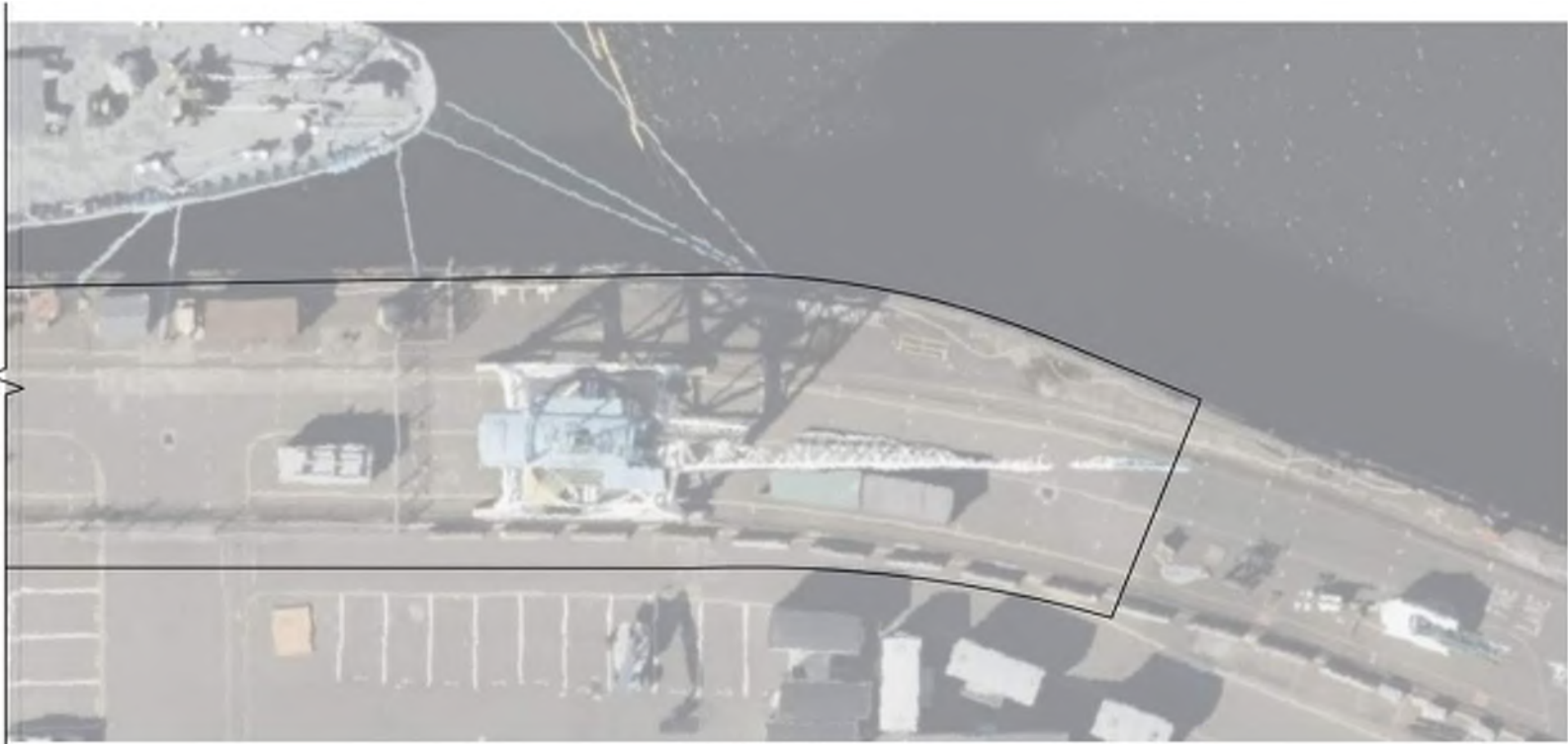
STEEL SHEET PILE

◻

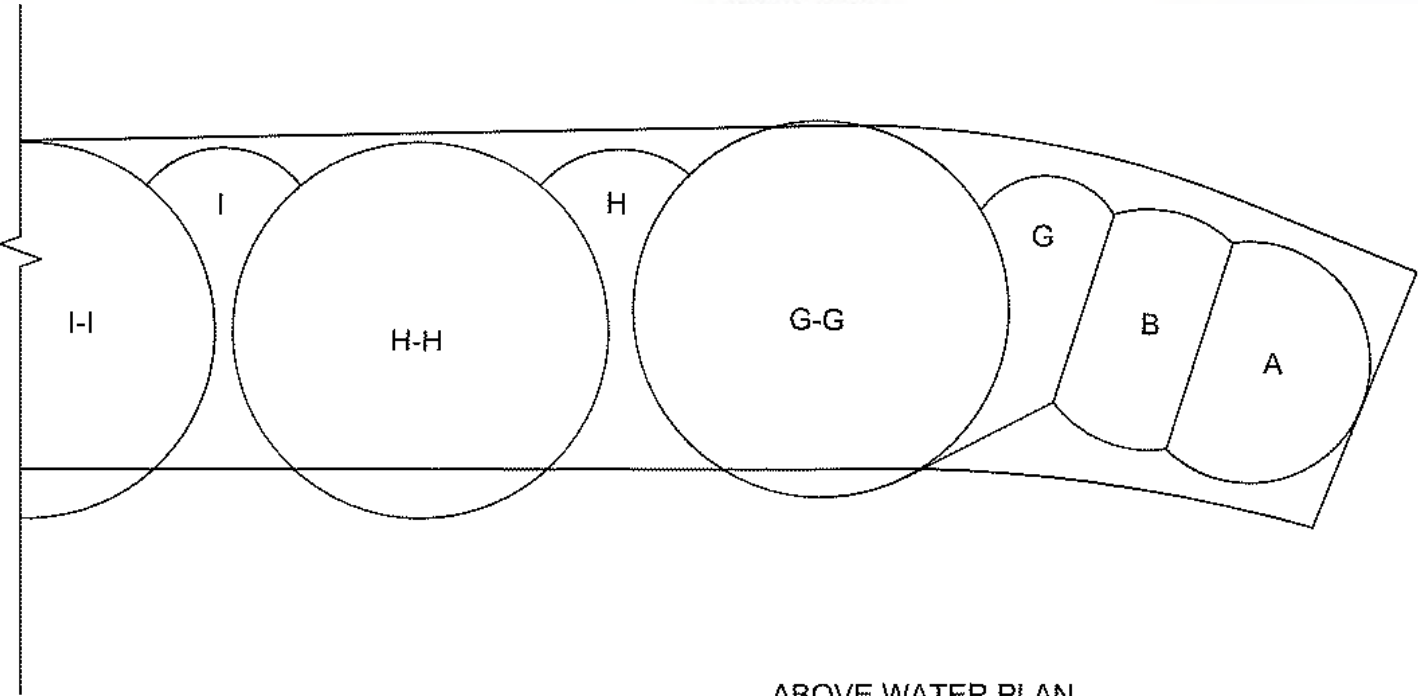
STEEL SHEET PILE

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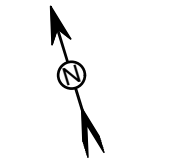
ASPHALT OVERLAY



TOPSIDE PLAN
BERTH 301 - PIER A



ABOVE WATER PLAN
BERTH 301 - PIER A



Not to scale

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GENERAL NOTES:
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Attachment A-7
Berth 301 - Pier A
Structure Layout - Sheet 3 of 3

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

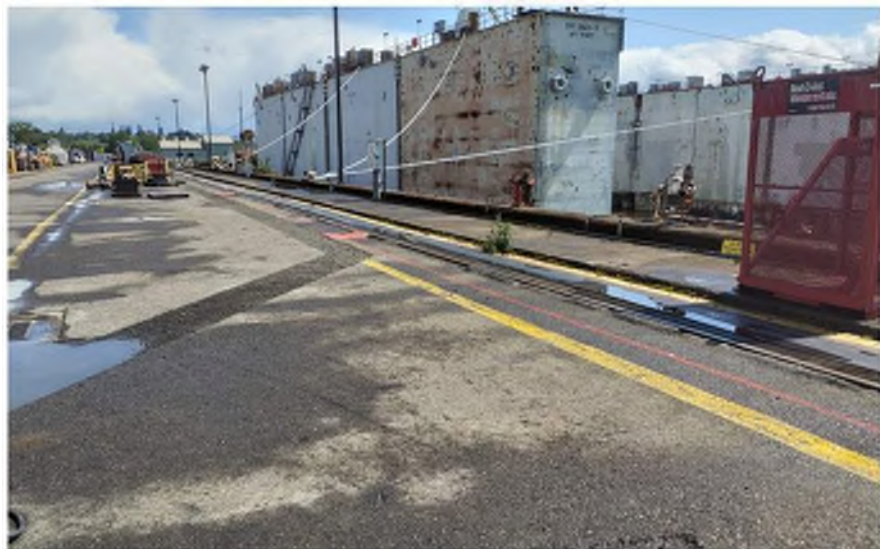


Photo 01: Pier A Superstructure
Asphalt Overlay at Sheet Pile K
Typical condition of Asphalt Overlay
Moata ID: Not Applicable

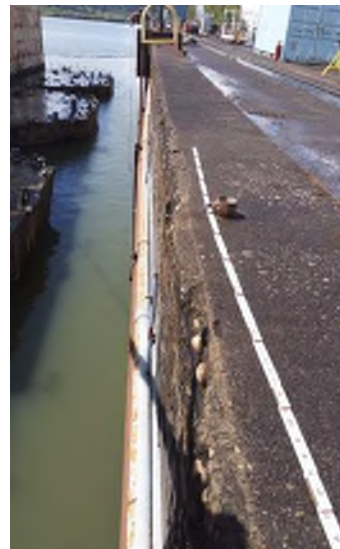


Photo 02: Pier A Superstructure
Bullrail at Sheet Pile M
Open spall exposing reinforcement
Moata ID: 73671

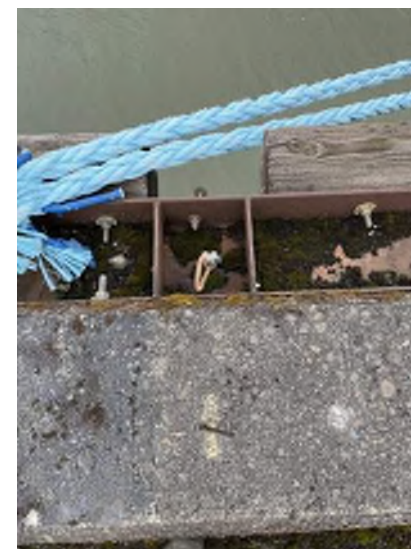


Photo 03: Pier A Fender System
Fender Pile at Sheet Pile AA
Missing fender pile
Moata ID: 73646

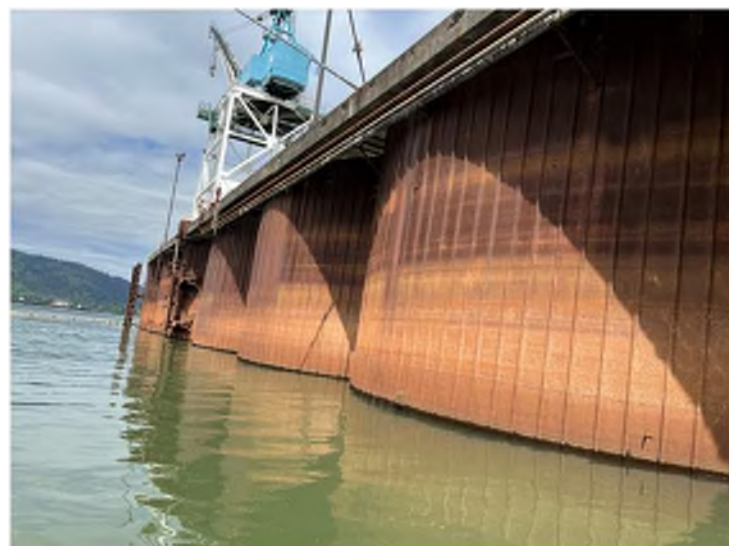


Photo 04: Pier A Substructure
Pier A Substructure, Looking West
Typical configuration of sheet piles
Moata ID: Not Applicable

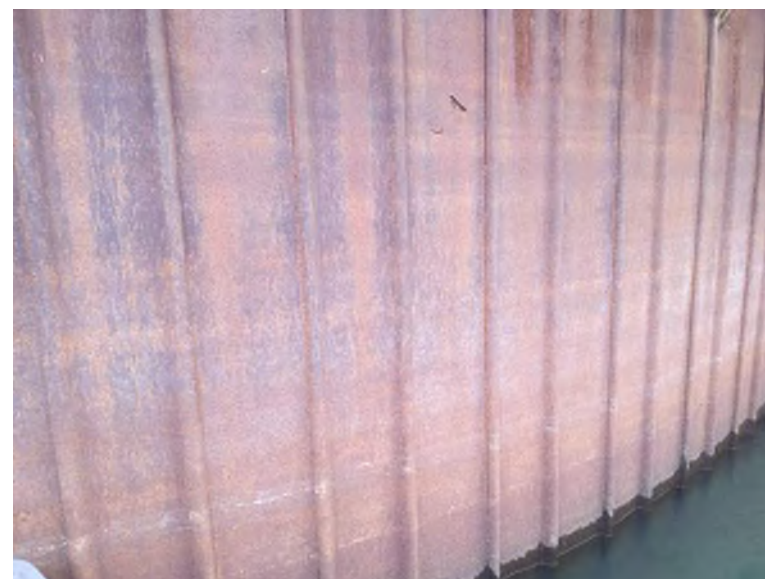


Photo 05: Pier A Substructure
Sheet Pile AA
Typical condition of sheet piles of Pier A above water
Moata ID: Not Applicable

Attachment A-7 Berth 301 - Pier A

Above-Water Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	PY., SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Asphalt
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Mooring
Facility:	Pier A (Berth 301) and Quay Wall			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Cell Number	Pile	Structure	Element	Type	Material	Defect Level	Comments
73650	All	N/A	Pier / Wharf	Fender System	Walers	Steel	Minor (MN)	General Condition: Steel walers exhibit minor corrosion and deformation in the areas where the piles are in contact. Many missing timber fender piles. Timber chocks exhibit minor defects with splits and checks less than 1/2 inch wide.
73646	AA	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	Fender pile is missing.
73647	AA	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	Fender pile is missing.
73648	AA	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	Fender pile is missing.
73653	Z	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	Fender pile is missing.
73654	Z	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	Fender pile is missing.
73655	Y	N/A	Pier / Wharf	Mooring	Foundation	Reinforced Concrete	Severe (SV)	Double bit bollard foundation has large spall (23 inch x 11 inch) with exposed connection steel. Spall at joint between mooring foundation and bull rail has exposed reinforcing and goes from 10 inch deep to full depth through the bull rail.
73659	X	N/A	Pier / Wharf	Superstructure	Deck	Asphalt	Moderate (MD)	Transverse crack across the north drive lane.

Attachment A-7
Quay Wall and Berth 301 - Pier A
Moata Forms - Sheet 1 of 3

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	PY., SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Asphalt
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Mooring
Facility:	Pier A (Berth 301) and Quay Wall			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Cell Number	Pile	Structure	Element	Type	Material	Defect Level	Comments
73662	Y	N/A	Pier / Wharf	Mooring	Cleat / Bollard	Steel	Moderate (MD)	Mooring hardware has loss of coating and surface corrosion less than 50% of area. No pitting or scaling is observed.
73665	Y	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Reinforced Concrete	Severe (SV)	The bull rail has large spalls over 1 foot in length with exposed reinforcement. Spalls are both on the internal and external sides of the bull rail. The long section of exposed vertical reinforcement on the outside face of the bull rail.
73666	V	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	Fender pile is missing.
73667	V	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	Fender pile is missing.
73668	U	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	Fender pile is missing.
73669	U	N/A	Pier / Wharf	Mooring	Cleat / Bollard	Steel	Moderate (MD)	Mooring hardware has loss of coating and surface corrosion less than 50% of area. No pitting or scaling is observed.
73670	W	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Reinforced Concrete	Severe (SV)	General condition: Spalls fully punching through to outside face of bull rail are roughly 6 inch wide at inside face of bull rail. Reinforcing bars are coming out of outside face.
73671	M	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Reinforced Concrete	Severe (SV)	Spalls with exposed reinforcement are along top outer corner edge of bull rail. Reinforcement is exposed for approximately 182 inch length.

Attachment A-7
Quay Wall and Berth 301 - Pier A
Moata Forms - Sheet 2 of 3

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	PY., SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Asphalt
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Mooring
Facility:	Pier A (Berth 301) and Quay Wall			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Cell Number	Pile	Structure	Element	Type	Material	Defect Level	Comments
74941	F-F and E-E	N/A	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	Horizontal Cracks and shear Cracks are on the top of the cap. Spall is observed between the cap and deck. Erosion is below the outfall pipe.
74951	K and L	N/A	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Some piles supporting the walk way are disconnected. Splits and checks are up to 1/4 inch and run the full height of the pile.
78983	All	N/A	Pier / Wharf	Substructure	Pile / Sheet Pile	Steel	Moderate (MD)	General condition: Sheet pile walls of Pier A and Quay wall typically have moderate to major surface corrosion on 60% of the observed area. Pitting is typically from 1/2 inch to 1 inch on 40% of the surface area near the waterline.
78984	X	N/A	Pier / Wharf	Fender system	Pile / Sheet Pile	Timber	Severe (SV)	Two fender piles are missing.

Attachment A-7
Quay Wall and Berth 301 - Pier A
Moata Forms - Sheet 3 of 3

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Ultrasonic Thickness (UT) Measurements and Pitting Measurement									
Swan Island Basin Remedial Design		Location: Portland, OR			Company: Mott MacDonald				
Facility: Quay Wall and Berth 301 - Pier A		Inspector: PY, HW			Inspection Date: 5/23/2022				
Time of Day: Multiple Times		Tide: Varies			Pile Type (Bearing, Batter, Sheet, Guide): Steel Sheet Pile			Component Material: Steel	
Sheet Pile Number	Side	UT Measurements (in)					Pitting Measurements (in)	Loss of Section (Estimated Nominal Thickness = 0.390 in)	
		Thickness 1 ft above waterline			Thickness 6 ft above waterline			1 ft above waterline	6 ft above waterline
J-J	Northwest	0.345	/	/	0.375	0.365	/	11.5%	5.1%
F-F	Northwest	0.325	/	/	0.385	0.385	0.050	16.7%	1.3%
E-E	Northwest	0.190	/	/	0.370	0.380	0.080	51.3%	3.8%
E	Northwest	0.365	0.360	0.370	/	/	0.080	6.4%	/
D-D	Northwest	0.360	0.365	/	/	/	0.070	7.1%	/
D	Northwest	0.355	0.360	0.355	/	/	0.060	8.5%	/
C-C	Northwest	0.360	0.355	0.355	/	/	0.040	8.5%	/
C	Northwest	0.310	0.325	0.320	/	/	0.050	18.4%	/
K	Southwest	0.355	0.360	0.360	/	/	0.070	8.1%	/
L	Southwest	0.375	0.380	0.380	/	/	0.040	3.0%	/
M	Southwest	0.385	0.385	0.385	/	/	0.080	1.3%	/
N	Southwest	0.375	0.380	0.375	/	/	0.070	3.4%	/
O	Southwest	0.350	0.380	0.380	/	/	0.040	5.1%	/
P	Southwest	0.375	0.370	0.380	/	/	0.050	3.8%	/
Q	Southwest	0.370	0.375	0.375	/	/	0.020	4.3%	/
R	Southwest	0.380	0.375	0.380	/	/	0.070	3.0%	/
S	Southwest	0.390	0.385	0.385	/	/	0.070	0.9%	/
T	Southwest	0.375	0.370	0.370	/	/	0.020	4.7%	/
U	Southwest	0.400	0.395	0.405	/	/	0.040	0.0%	/
V	Southwest	0.375	0.380	0.380	/	/	0.020	3.0%	/
W	Southwest	0.400	0.405	0.400	/	/	0.040	0.0%	/
X	Southwest	0.380	0.370	0.380	/	/	0.060	3.4%	/
Y	Southwest	/	/	/	0.385	/	/	/	1.3%

Attachment A-7
Quay Wall and Berth 301 - Pier A
MM Ultrasonic Thickness Measurements - Sheet 1 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Ultrasonic Thickness (UT) Measurements and Pitting Measurement									
Swan Island Basin Remedial Design		Location: Portland, OR			Company: Mott MacDonald				
Facility: Quay Wall and Berth 301 - Pier A		Inspector: PY, HW			Inspection Date: 5/23/2022				
Time of Day: Multiple Times		Tide: Varies			Pile Type (Bearing, Batter, Sheet, Guide): Steel Sheet Pile			Component Material: Steel	
Sheet Pile Number	Side	UT Measurements (in)					Pitting Measurements (in)	Loss of Section (Estimated Nominal Thickness = 0.390 in)	
		Thickness 1 ft above waterline			Thickness 6 ft above waterline			1 ft above waterline	6 ft above waterline
Z	Southwest	0.380	0.385	0.385	/	/	0.080	1.7%	/
AA	Southwest	0.375	0.380	0.370	/	/	0.050	3.8%	/
AA	Northeast	0.370	0.385	0.375	0.375	/	0.080	3.4%	3.8%
BB	Southwest	0.380	0.385	0.380	/	/	0.050	2.1%	/
BB	Northeast	0.390	0.385	0.385	0.375	/	0.070	0.9%	3.8%
A	Northeast	0.395	0.390	0.390	0.400	/	0.010	0.0%	0.0%
B	Northeast	0.385	0.390	0.385	0.380	/	0.010	0.9%	2.6%
G	Northeast	0.390	0.390	0.385	0.400	/	0.030	0.4%	0.0%
G-G	Northeast	0.375	0.360	0.360	0.380	/	0.020	6.4%	2.6%
H	Northeast	0.370	0.380	0.375	0.380	/	0.010	3.8%	2.6%

Attachment A-7
Quay Wall and Berth 301 - Pier A
MM Ultrasonic Thickness Measurements - Sheet 2 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Plumbness Measurements				
Swan Island Basin Remedial Design		Location: Portland, OR	Company: Mott MacDonald	
Facility: Quay Wall and Berth 301 - Pier A		Inspector: PY, SH, HW	Inspection Date: 5/23/2022	
Time of Day: Multiple Times		Tide: Varies	Pile Type (Bearing, Batter, Sheet, Guide): Steel Sheet Pile	Component Material: Steel
Sheet Pile Number	Side	Plumbness Measurements (in)		Tangent (level length = 4 ft), Unit: in/ft
		Top	Bottom	
J-J	Northwest	/	0.500	0.125
F-F	Northwest	1.500	/	0.031
E-E	Northwest	/	1.000	0.021
E	Northwest	/	0.750	0.016
D-D	Northwest	0.750	/	0.016
D	Northwest	/	1.000	0.036
C-C	Northwest	1.250	/	0.026
C	Northwest	/	1.750	0.036
K	Southwest	2.250	/	0.047
L	Southwest	1.750	/	0.036
M	Southwest	2.000	/	0.042
N	Southwest	0.750	/	0.016
O	Southwest	1.000	/	0.021
P	Southwest	1.000	/	0.021
Q	Southwest	2.000	/	0.042
R	Southwest	2.750	/	0.057
S	Southwest	2.000	/	0.042
T	Southwest	0.500	/	0.010
U	Southwest	2.500	/	0.052
V	Southwest	0.750	/	0.016
W	Southwest	0.500	/	0.010
X	Southwest	1.750	/	0.036
Y	Southwest	1.000	/	0.021
Z	Southwest	0.750	/	0.016

Attachment A-7
Quay Wall and Berth 301 - Pier A
MM Plumbness Measurements - Sheet 1 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Plumbness Measurements				
Swan Island Basin Remedial Design		Location: Portland, OR	Company: Mott MacDonald	
Facility: Quay Wall and Berth 301 - Pier A		Inspector: PY, SH, HW	Inspection Date: 5/23/2022	
Time of Day: Multiple Times		Tide: Varies	Pile Type (Bearing, Batter, Sheet, Guide): Steel Sheet Pile	Component Material: Steel
Sheet Pile Number	Side	Plumbness Measurements (in)		Tangent (level length = 4 ft), Unit: in/ft
		Top	Bottom	
AA	Southwest	1.250	/	0.026
AA	Northeast	1.000	/	0.021
BB	Southwest	0.000	/	0.000
BB	Northeast	0.500	/	0.010
A	Northeast	3.000	/	0.063
B	Northeast	/	1.063	0.022
G	Northeast	/	2.000	0.042
G-G	Northeast	1.750	/	0.036
H	Northeast	/	1.000	0.021

Attachment A-7
 Quay Wall and Berth 301 - Pier A
 MM Plumbness Measurements - Sheet 2 of 2

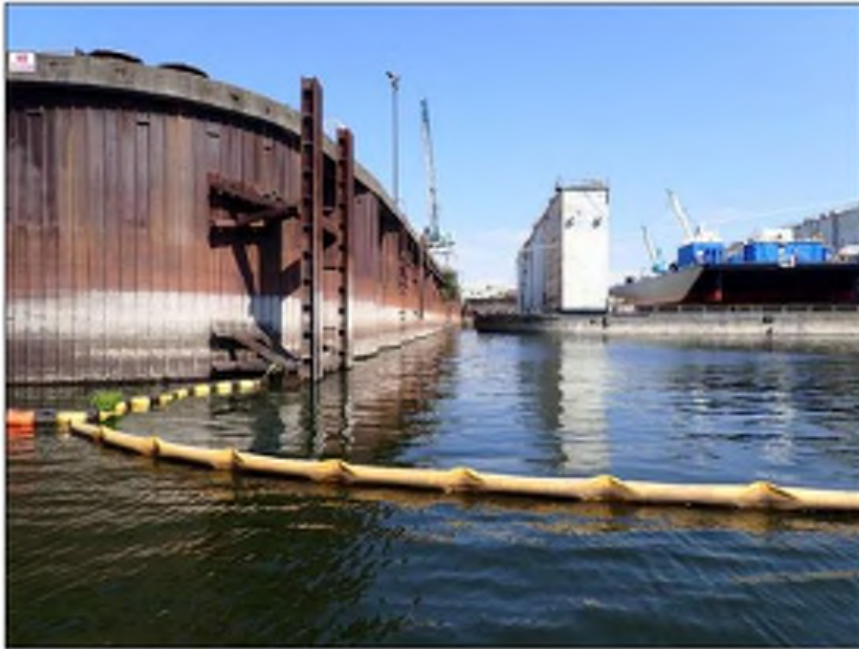


Photo 01: Pier A Overview
Pier A, looking east



Photo 02: Pier A Substructure
Typical pitting on sheet pile cells at waterline

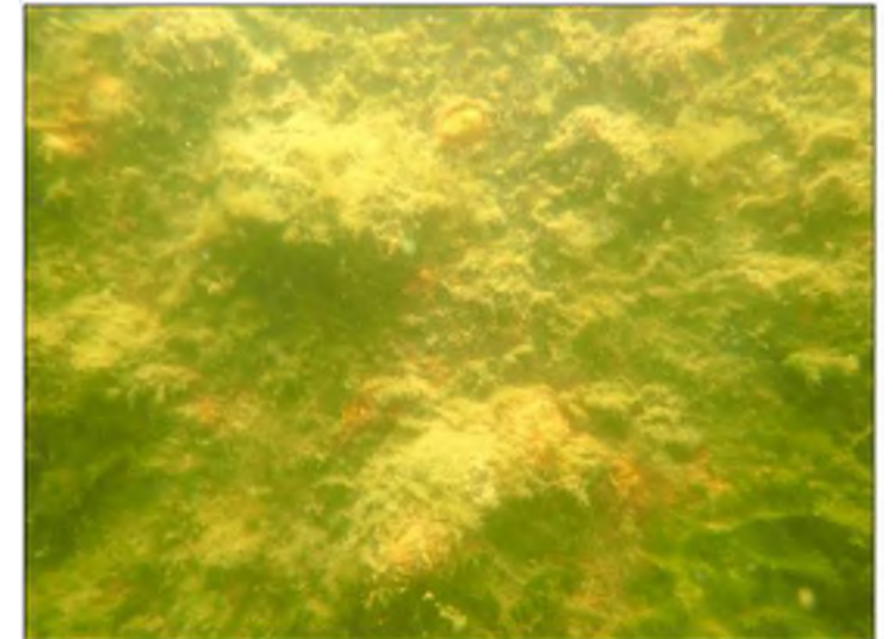


Photo 03: Pier A Substructure
Typical condition of steel sheet pile cells below waterline



Photo 04: Pier A Substructure
Typical cleaned steel below waterline

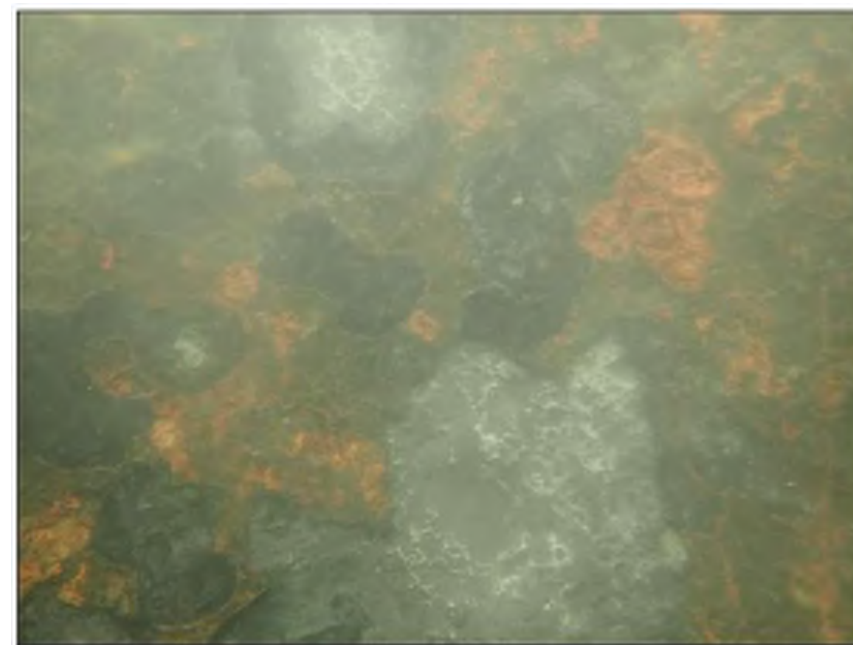


Photo 05: Pier A Substructure
Typical cleaned surface on steel sheet pile cells at 10 feet below waterline

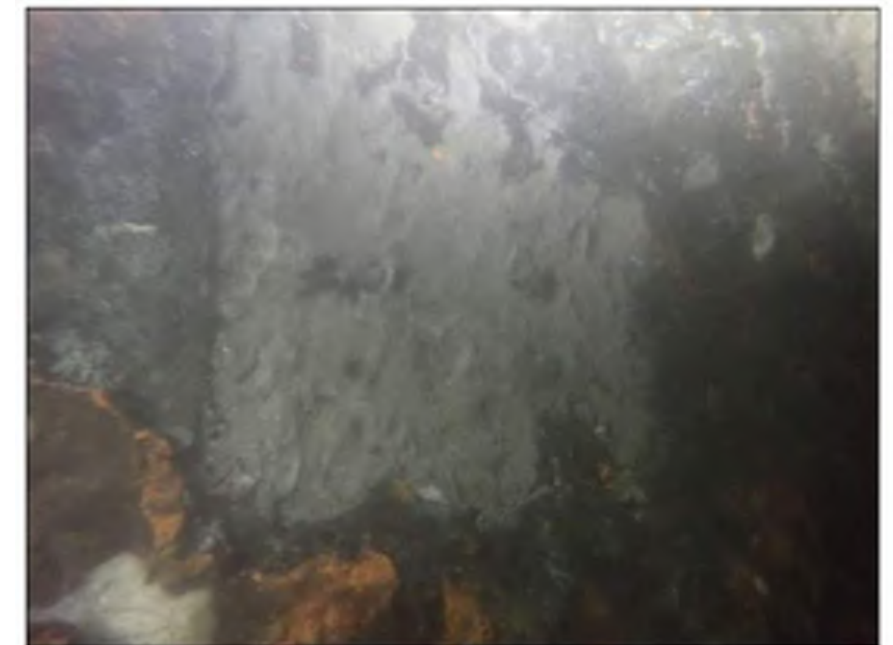


Photo 06: Pier A Substructure
Typical cleaned surface on steel sheet pile cells at channel bottom

Attachment A-7 Berth 301 - Pier A

Dive Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Ultrasonic Thickness Measurements						
Swan Island Basin	Location: Portland, OR		Company: <i>Collins Engineers, Inc.</i>		Divers: Pinkston, Moss, Malone, Sukow	
Facility: Various	Auditor: Jordan Furlan		Inspection Date: 07/19/2022 - 07/28/2022			
Time of Day: N/A	Tide: +0-3 ft. MLLW		Pile Type (Bearing, Batter, Sheet, Guide): Sheet, Bearing, Batter		Component Material: Steel	
Property	Location	Depth	Estimated Nominal Thickness	Measured Thickness	Estimated Loss of Section	Notes
Quay Wall	Cell C-C	Waterline	0.390	0.265	32.1%	Sheet Pile
	Cell C-C	10' below waterline	0.390	0.230	41.0%	Sheet Pile
	Cell C-C	30' below waterline	0.390	0.265	32.1%	Sheet Pile
	Cell F-F	6' above waterline	0.390	0.360	7.7%	Sheet Pile
	Cell F-F	2' above waterline	0.390	0.160	59.0%	Sheet Pile
Berth 301-Pier A	Cell O	Mid-depth	0.390	0.335	14.1%	Sheet Pile
	Cell O	Channel bottom	0.390	0.300	23.1%	Sheet Pile
	Cell R	Mid-depth	0.390	0.330	15.4%	Sheet Pile
	Cell R	Channel bottom	0.390	0.290	25.6%	Sheet Pile
	Cell S	Mid-depth	0.390	0.315	19.2%	Sheet Pile
	Cell U	Channel bottom	0.390	0.300	23.1%	Sheet Pile
	Cell Z	Mid-depth	0.390	0.265	32.1%	Sheet Pile

Note: Thickness measurements were taken at the centerline of steel cells.

Attachment A-7
Quay Wall and Berth 301 - Pier A
Ultrasonic Thickness Measurements - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Attachment A-8

Quay Wall

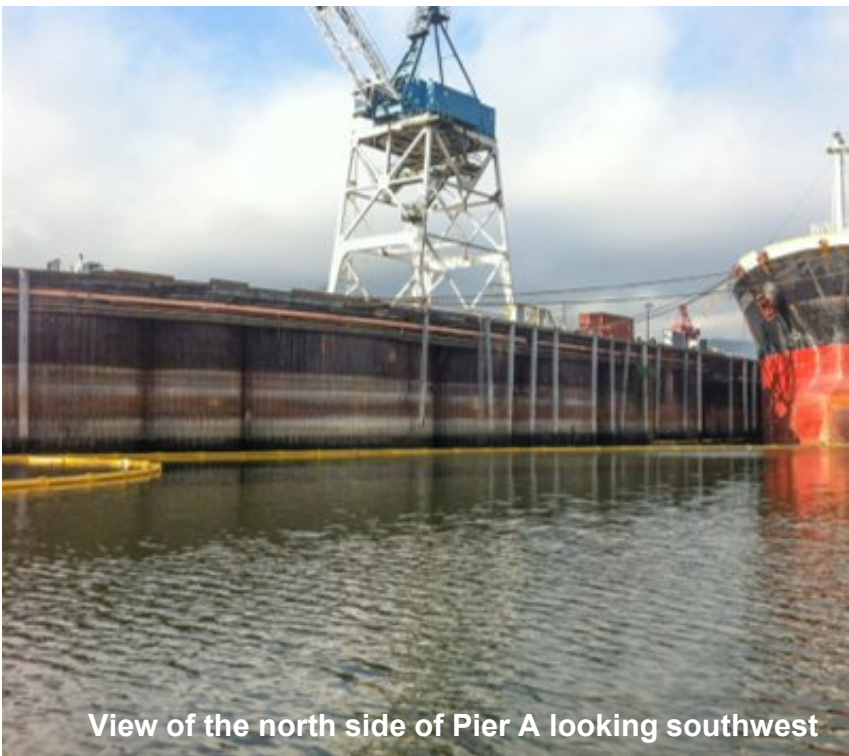
Facility Information

Owner	Shipyard Commerce Center, LLC	
Asset Name(s)	Shipyard Commerce Center (SCC) Pier A (Berth 301)	
Construction Year	~1940s	
Owner/Operator Notes	Operational	
Previous Inspection Year	2014	
Previous Inspection Assessment Rating/Notes	• All together with Lagoon Wharf there were 199 concrete (16x16), steel (16.5" diameter), and timber (16.5" diameter) fender piles. 101 were rated at 50% or less and/or missing.	
Repair History	No information received	
Structure Components	<div>Pier<ul style="list-style-type: none">(1) 780 ft x 47.7 ft (max) pier27 Interlocked steel sheet piles filled with soil topped with asphalt pavementMix of concrete, steel and timber fender piles (documented in Cascade General Memo – Attachment C)Steel fender piles</div>	
Other information	Facility Length/ Depth/ Design Depth	780 ft x 47.7 ft (max) pier
	Fender System	Mix of concrete, steel and timber fender piles, Steel waler and timber chocks
	Mooring System	Steel appurtenances
	Dolphin System	Not applicable
	Other System	Not applicable

General Location



Asset Photo



View of the north side of Pier A looking southwest

LEGEND:

○

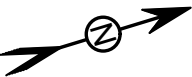
STEEL SHEET PILE

◻

STEEL SHEET PILE

■

ASPHALT OVERLAY



Not to scale

[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SP = SUPERSTRUCTURE
FS = FENDER SYSTEM
WR = WALERS
MR = MOORING
SB = SUBSTRUCTURE

ELEMENT TYPE:
CT = CLEAT/BOLLARD
GD = GUARDRAIL/HANDRAIL/BULLRAIL
PE = PILE/SHEET PILE
PC = PILE CAP

MATERIAL TYPE:
C = REINFORCED CONCRETE
S = STEEL
T = TIMBER

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

GENERAL NOTES:
1. Drawings are not to scale and are intended to
generally locate structural members to note
inspection observations.

Attachment A-8
Quay Wall and Berth 301 - Pier A - Quay Wall
Structure Layout - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



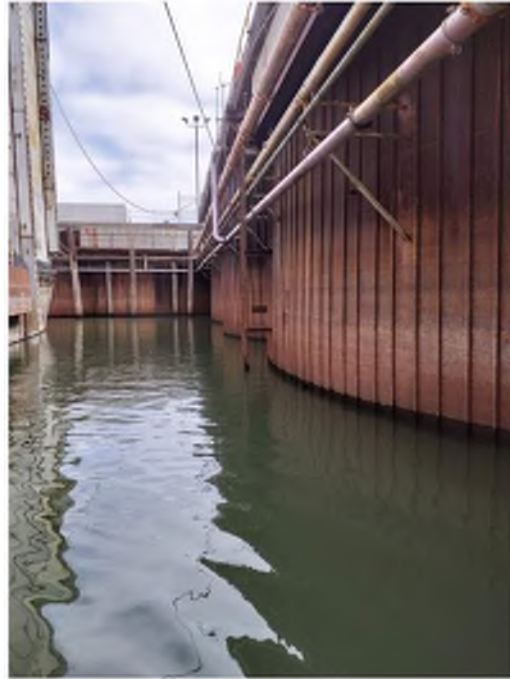


Photo 01: Quay Wall Overview
Quay Wall, looking North
Moata ID: Not Applicable



Photo 02: Quay Wall Substructure
Concrete Pile Cap between Sheet Piles F-F and E-E
Crack on the bottom of the concrete beam
Moata ID: 74941



Photo 03: Quay Wall Substructure
Concrete Pile Cap between Sheet Piles F-F and E-E
Closed spall on the bottom of the concrete pile cap
Moata ID: 74941



Photo 04: Quay Wall Substructure
Sheet Pile C-C
Typical condition of sheet piles above water
Moata ID: Not Applicable



Photo 05: Quay Wall Substructure
Sheet Pile C-C
Typical condition of sheet piles above water
Moata ID: Not Applicable

Attachment A-8 Quay Wall

Above-Water Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	PY., SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Asphalt
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Mooring
Facility:	Pier A (Berth 301) and Quay Wall			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Cell Number	Pile	Structure	Element	Type	Material	Defect Level	Comments
73650	All	N/A	Pier / Wharf	Fender System	Walers	Steel	Minor (MN)	General Condition: Steel walers exhibit minor corrosion and deformation in the areas where the piles are in contact. Many missing timber fender piles. Timber chocks exhibit minor defects with splits and checks less than 1/2 inch wide.
73646	AA	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	Fender pile is missing.
73647	AA	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	Fender pile is missing.
73648	AA	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	Fender pile is missing.
73653	Z	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	Fender pile is missing.
73654	Z	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	Fender pile is missing.
73655	Y	N/A	Pier / Wharf	Mooring	Foundation	Reinforced Concrete	Severe (SV)	Double bit bollard foundation has large spall (23 inch x 11 inch) with exposed connection steel. Spall at joint between mooring foundation and bull rail has exposed reinforcing and goes from 10 inch deep to full depth through the bull rail.
73659	X	N/A	Pier / Wharf	Superstructure	Deck	Asphalt	Moderate (MD)	Transverse crack across the north drive lane.

Attachment A-8
Quay Wall and Berth 301 - Pier A
Moata Forms - Sheet 1 of 3

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	PY., SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Asphalt
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Mooring
Facility:	Pier A (Berth 301) and Quay Wall			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Cell Number	Pile	Structure	Element	Type	Material	Defect Level	Comments
73662	Y	N/A	Pier / Wharf	Mooring	Cleat / Bollard	Steel	Moderate (MD)	Mooring hardware has loss of coating and surface corrosion less than 50% of area. No pitting or scaling is observed.
73665	Y	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Reinforced Concrete	Severe (SV)	The bull rail has large spalls over 1 foot in length with exposed reinforcement. Spalls are both on the internal and external sides of the bull rail. The long section of exposed vertical reinforcement on the outside face of the bull rail.
73666	V	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	Fender pile is missing.
73667	V	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	Fender pile is missing.
73668	U	N/A	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	Fender pile is missing.
73669	U	N/A	Pier / Wharf	Mooring	Cleat / Bollard	Steel	Moderate (MD)	Mooring hardware has loss of coating and surface corrosion less than 50% of area. No pitting or scaling is observed.
73670	W	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Reinforced Concrete	Severe (SV)	General condition: Spalls fully punching through to outside face of bull rail are roughly 6 inch wide at inside face of bull rail. Reinforcing bars are coming out of outside face.
73671	M	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Reinforced Concrete	Severe (SV)	Spalls with exposed reinforcement are along top outer corner edge of bull rail. Reinforcement is exposed for approximately 182 inch length.

Attachment A-8
Quay Wall and Berth 301 - Pier A
Moata Forms - Sheet 2 of 3

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	PY., SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Asphalt
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Mooring
Facility:	Pier A (Berth 301) and Quay Wall			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Cell Number	Pile	Structure	Element	Type	Material	Defect Level	Comments
74941	F-F and E-E	N/A	Pier / Wharf	Substructure	Pile Cap	Reinforced Concrete	Major (MJ)	Horizontal Cracks and shear Cracks are on the top of the cap. Spall is observed between the cap and deck. Erosion is below the outfall pipe.
74951	K and L	N/A	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Some piles supporting the walk way are disconnected. Splits and checks are up to 1/4 inch and run the full height of the pile.
78983	All	N/A	Pier / Wharf	Substructure	Pile / Sheet Pile	Steel	Moderate (MD)	General condition: Sheet pile walls of Pier A and Quay wall typically have moderate to major surface corrosion on 60% of the observed area. Pitting is typically from 1/2 inch to 1 inch on 40% of the surface area near the waterline.
78984	X	N/A	Pier / Wharf	Fender system	Pile / Sheet Pile	Timber	Severe (SV)	Two fender piles are missing.

Attachment A-8
Quay Wall and Berth 301 - Pier A
Moata Forms - Sheet 3 of 3

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Ultrasonic Thickness (UT) Measurements and Pitting Measurement									
Swan Island Basin Remedial Design		Location: Portland, OR			Company: Mott MacDonald				
Facility: Quay Wall and Berth 301 - Pier A		Inspector: PY, HW			Inspection Date: 5/23/2022				
Time of Day: Multiple Times		Tide: Varies			Pile Type (Bearing, Batter, Sheet, Guide): Steel Sheet Pile			Component Material: Steel	
Sheet Pile Number	Side	UT Measurements (in)					Pitting Measurements (in)	Loss of Section (Estimated Nominal Thickness = 0.390 in)	
		Thickness 1 ft above waterline			Thickness 6 ft above waterline			1 ft above waterline	6 ft above waterline
J-J	Northwest	0.345	/	/	0.375	0.365	/	11.5%	5.1%
F-F	Northwest	0.325	/	/	0.385	0.385	0.050	16.7%	1.3%
E-E	Northwest	0.190	/	/	0.370	0.380	0.080	51.3%	3.8%
E	Northwest	0.365	0.360	0.370	/	/	0.080	6.4%	/
D-D	Northwest	0.360	0.365	/	/	/	0.070	7.1%	/
D	Northwest	0.355	0.360	0.355	/	/	0.060	8.5%	/
C-C	Northwest	0.360	0.355	0.355	/	/	0.040	8.5%	/
C	Northwest	0.310	0.325	0.320	/	/	0.050	18.4%	/
K	Southwest	0.355	0.360	0.360	/	/	0.070	8.1%	/
L	Southwest	0.375	0.380	0.380	/	/	0.040	3.0%	/
M	Southwest	0.385	0.385	0.385	/	/	0.080	1.3%	/
N	Southwest	0.375	0.380	0.375	/	/	0.070	3.4%	/
O	Southwest	0.350	0.380	0.380	/	/	0.040	5.1%	/
P	Southwest	0.375	0.370	0.380	/	/	0.050	3.8%	/
Q	Southwest	0.370	0.375	0.375	/	/	0.020	4.3%	/
R	Southwest	0.380	0.375	0.380	/	/	0.070	3.0%	/
S	Southwest	0.390	0.385	0.385	/	/	0.070	0.9%	/
T	Southwest	0.375	0.370	0.370	/	/	0.020	4.7%	/
U	Southwest	0.400	0.395	0.405	/	/	0.040	0.0%	/
V	Southwest	0.375	0.380	0.380	/	/	0.020	3.0%	/
W	Southwest	0.400	0.405	0.400	/	/	0.040	0.0%	/
X	Southwest	0.380	0.370	0.380	/	/	0.060	3.4%	/
Y	Southwest	/	/	/	0.385	/	/	/	1.3%

Attachment A-8
Quay Wall and Berth 301 - Pier A
MM Ultrasonic Thickness Measurements - Sheet 1 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Ultrasonic Thickness (UT) Measurements and Pitting Measurement									
Swan Island Basin Remedial Design		Location: Portland, OR			Company: Mott MacDonald				
Facility: Quay Wall and Berth 301 - Pier A		Inspector: PY, HW			Inspection Date: 5/23/2022				
Time of Day: Multiple Times		Tide: Varies			Pile Type (Bearing, Batter, Sheet, Guide): Steel Sheet Pile			Component Material: Steel	
Sheet Pile Number	Side	UT Measurements (in)					Pitting Measurements (in)	Loss of Section (Estimated Nominal Thickness = 0.390 in)	
		Thickness 1 ft above waterline			Thickness 6 ft above waterline			1 ft above waterline	6 ft above waterline
Z	Southwest	0.380	0.385	0.385	/	/	0.080	1.7%	/
AA	Southwest	0.375	0.380	0.370	/	/	0.050	3.8%	/
AA	Northeast	0.370	0.385	0.375	0.375	/	0.080	3.4%	3.8%
BB	Southwest	0.380	0.385	0.380	/	/	0.050	2.1%	/
BB	Northeast	0.390	0.385	0.385	0.375	/	0.070	0.9%	3.8%
A	Northeast	0.395	0.390	0.390	0.400	/	0.010	0.0%	0.0%
B	Northeast	0.385	0.390	0.385	0.380	/	0.010	0.9%	2.6%
G	Northeast	0.390	0.390	0.385	0.400	/	0.030	0.4%	0.0%
G-G	Northeast	0.375	0.360	0.360	0.380	/	0.020	6.4%	2.6%
H	Northeast	0.370	0.380	0.375	0.380	/	0.010	3.8%	2.6%

Attachment A-8
Quay Wall and Berth 301 - Pier A
MM Ultrasonic Thickness Measurements - Sheet 2 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Plumbness Measurements				
Swan Island Basin Remedial Design		Location: Portland, OR	Company: Mott MacDonald	
Facility: Quay Wall and Berth 301 - Pier A		Inspector: PY, SH, HW	Inspection Date: 5/23/2022	
Time of Day: Multiple Times		Tide: Varies	Pile Type (Bearing, Batter, Sheet, Guide): Steel Sheet Pile	Component Material: Steel
Sheet Pile Number	Side	Plumbness Measurements (in)		Tangent (level length = 4 ft), Unit: in/ft
		Top	Bottom	
J-J	Northwest	/	0.500	0.125
F-F	Northwest	1.500	/	0.031
E-E	Northwest	/	1.000	0.021
E	Northwest	/	0.750	0.016
D-D	Northwest	0.750	/	0.016
D	Northwest	/	1.000	0.036
C-C	Northwest	1.250	/	0.026
C	Northwest	/	1.750	0.036
K	Southwest	2.250	/	0.047
L	Southwest	1.750	/	0.036
M	Southwest	2.000	/	0.042
N	Southwest	0.750	/	0.016
O	Southwest	1.000	/	0.021
P	Southwest	1.000	/	0.021
Q	Southwest	2.000	/	0.042
R	Southwest	2.750	/	0.057
S	Southwest	2.000	/	0.042
T	Southwest	0.500	/	0.010
U	Southwest	2.500	/	0.052
V	Southwest	0.750	/	0.016
W	Southwest	0.500	/	0.010
X	Southwest	1.750	/	0.036
Y	Southwest	1.000	/	0.021
Z	Southwest	0.750	/	0.016

Attachment A-8
Quay Wall and Berth 301 - Pier A
MM Plumbness Measurements - Sheet 1 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Plumbness Measurements				
Swan Island Basin Remedial Design		Location: Portland, OR	Company: Mott MacDonald	
Facility: Quay Wall and Berth 301 - Pier A		Inspector: PY, SH, HW	Inspection Date: 5/23/2022	
Time of Day: Multiple Times		Tide: Varies	Pile Type (Bearing, Batter, Sheet, Guide): Steel Sheet Pile	Component Material: Steel
Sheet Pile Number	Side	Plumbness Measurements (in)		Tangent (level length = 4 ft), Unit: in/ft
		Top	Bottom	
AA	Southwest	1.250	/	0.026
AA	Northeast	1.000	/	0.021
BB	Southwest	0.000	/	0.000
BB	Northeast	0.500	/	0.010
A	Northeast	3.000	/	0.063
B	Northeast	/	1.063	0.022
G	Northeast	/	2.000	0.042
G-G	Northeast	1.750	/	0.036
H	Northeast	/	1.000	0.021

Attachment A-8
 Quay Wall and Berth 301 - Pier A
 MM Plumbness Measurements - Sheet 2 of 2



Photo 01: Quay Wall Overview
Quay Wall, looking south

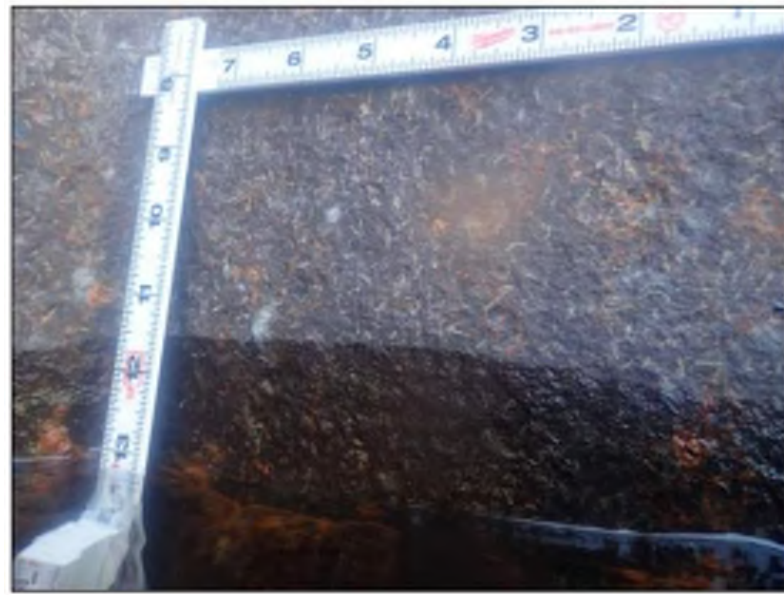


Photo 02: Quay Wall Substructure
Typical condition of steel sheet pile cells at waterline



Photo 03: Quay Wall Substructure
Typical pitting on steel sheet pile cells at waterline

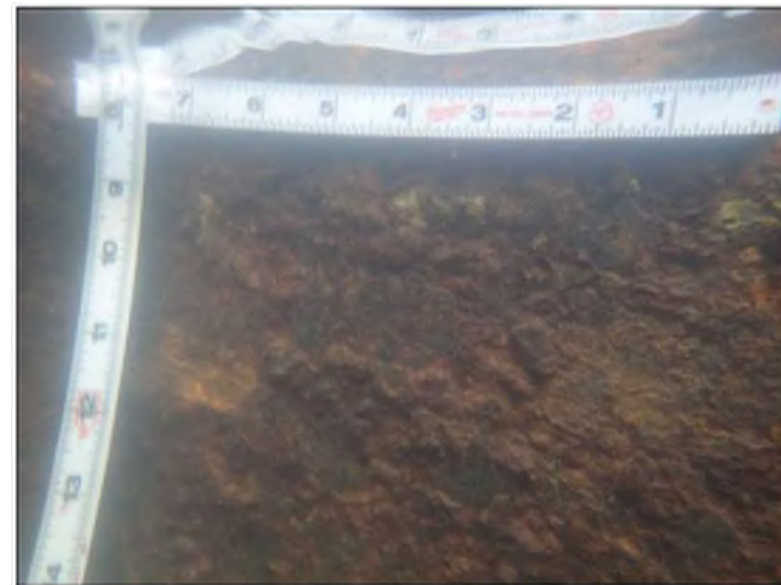


Photo 04: Quay Wall Substructure
Typical corrosion on steel sheet pile cells below waterline



Photo 05: Quay Wall Substructure
Typical condition of steel sheet pile cells at mid-depth



Photo 06: Quay Wall Substructure
Typical condition of steel sheet pile cells at channel bottom

Attachment A-8 Quay Wall

Dive Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Ultrasonic Thickness Measurements						
Swan Island Basin	Location: Portland, OR		Company: <i>Collins Engineers, Inc.</i>		Divers: Pinkston, Moss, Malone, Sukow	
Facility: Various	Auditor: Jordan Furlan		Inspection Date: 07/19/2022 - 07/28/2022			
Time of Day: N/A	Tide: +0-3 ft. MLLW		Pile Type (Bearing, Batter, Sheet, Guide): Sheet, Bearing, Batter		Component Material: Steel	
Property	Location	Depth	Estimated Nominal Thickness	Measured Thickness	Estimated Loss of Section	Notes
Quay Wall	Cell C-C	Waterline	0.390	0.265	32.1%	Sheet Pile
	Cell C-C	10' below waterline	0.390	0.230	41.0%	Sheet Pile
	Cell C-C	30' below waterline	0.390	0.265	32.1%	Sheet Pile
	Cell F-F	6' above waterline	0.390	0.360	7.7%	Sheet Pile
	Cell F-F	2' above waterline	0.390	0.160	59.0%	Sheet Pile
Berth 301-Pier A	Cell O	Mid-depth	0.390	0.335	14.1%	Sheet Pile
	Cell O	Channel bottom	0.390	0.300	23.1%	Sheet Pile
	Cell R	Mid-depth	0.390	0.330	15.4%	Sheet Pile
	Cell R	Channel bottom	0.390	0.290	25.6%	Sheet Pile
	Cell S	Mid-depth	0.390	0.315	19.2%	Sheet Pile
	Cell U	Channel bottom	0.390	0.300	23.1%	Sheet Pile
	Cell Z	Mid-depth	0.390	0.265	32.1%	Sheet Pile

Note: Thickness measurements were taken at the centerline of steel cells.

Attachment A-9
Berth 302 -305 - Lagoon Wharf

Facility Information

Owner	Shipyards Commerce Center, LLC	
Asset Name(s)	Shipyards Commerce Center (SCC) Lagoon Wharf (Berth 302, 303, 304, 305)	
Construction Year	Mid-1950's	
Owner/Operator Notes	Berths are 60% - 85% utilized	
Previous Inspection Year	2014	
Previous Inspection Assessment Rating/Notes	<ul style="list-style-type: none">There were 135 bents from Berth 301 to 305. All bents were in good condition with only 1 pile in bent 135 Pile "A" showing damage (major splitting).199 concrete, and timber (16.5" diameter) fender piles. 101 were rated at 50% or less and/or missing.There were 13 fire walls. 12 of the fire walls were missing up to 40% of their timber generally at their lower sections	
Repair History	No information received	
Structure Components	Superstructure	<ul style="list-style-type: none">(4) 530' x 58' WharvesTimber deck with asphalt cover
	Substructure	<ul style="list-style-type: none">Timber piles, framing, bracing, and fire wallsFender piles (concrete, steel and timber)
Other information	Facility Length/ Depth/ Design Depth	(4) 530' x 58' Wharves
	Fender System	199 concrete(16x16), steel(16.5" diameter), and timber(16.5" diameter) fender piles.
	Mooring System	Steel
	Dolphin System	Not applicable

General Location



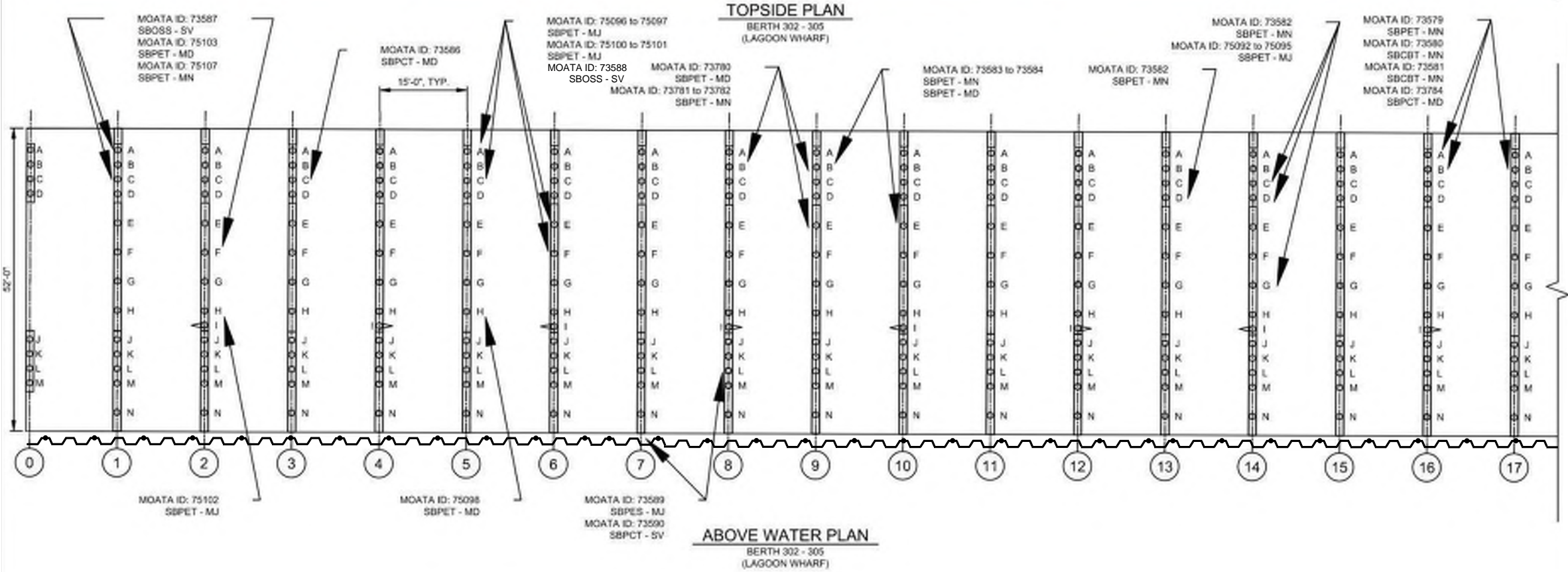
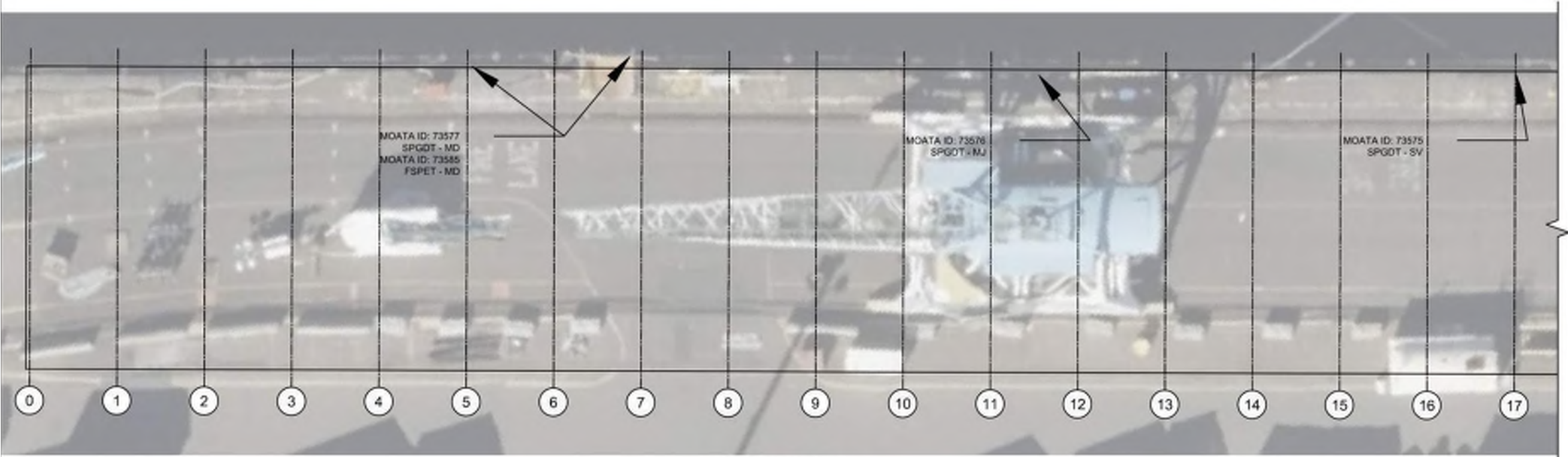
Asset Photo



View of north side of Lagoon Wharf looking southwest

LEGEND:

- TIMBER PILE
- TIMBER BATTER PILE
- TIMBER PILE CAP
- ASPHALT OVERLAY ON TIMBER DECK
- BULKHEAD (STEEL SHEET PILE)



[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SP = SUPERSTRUCTURE
FS = FENDER SYSTEM
OE = OTHER ELEMENT
SB = SUBSTRUCTURE
MC = MISCELLANEOUS

ELEMENT TYPE:
GD = GUARDRAIL/HANDRAIL/BULLRAIL
PE = PILE/SHEET PILE
BM = BEAM/JOIST/STRINGER/GIRDER
PC = PILE CAP
OS = OTHER STRUCTURE
WR = WALER
CB = CROSS-BRACING
CR = CRANE RAIL
CP = CONNECTION PLATE
CK = CHOCK
DK = DECK

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

MATERIAL TYPE:
A = ASPHALT
C = REINFORCED CONCRETE
S = STEEL
T = TIMBER

GENERAL NOTES:
1. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.
2. If any of the system elements or materials are unknown use X to represent them.

Attachment A-9 Berth 302 - 305 - Lagoon Wharf Structure Layout - Sheet 1 of 8

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

LEGEND:

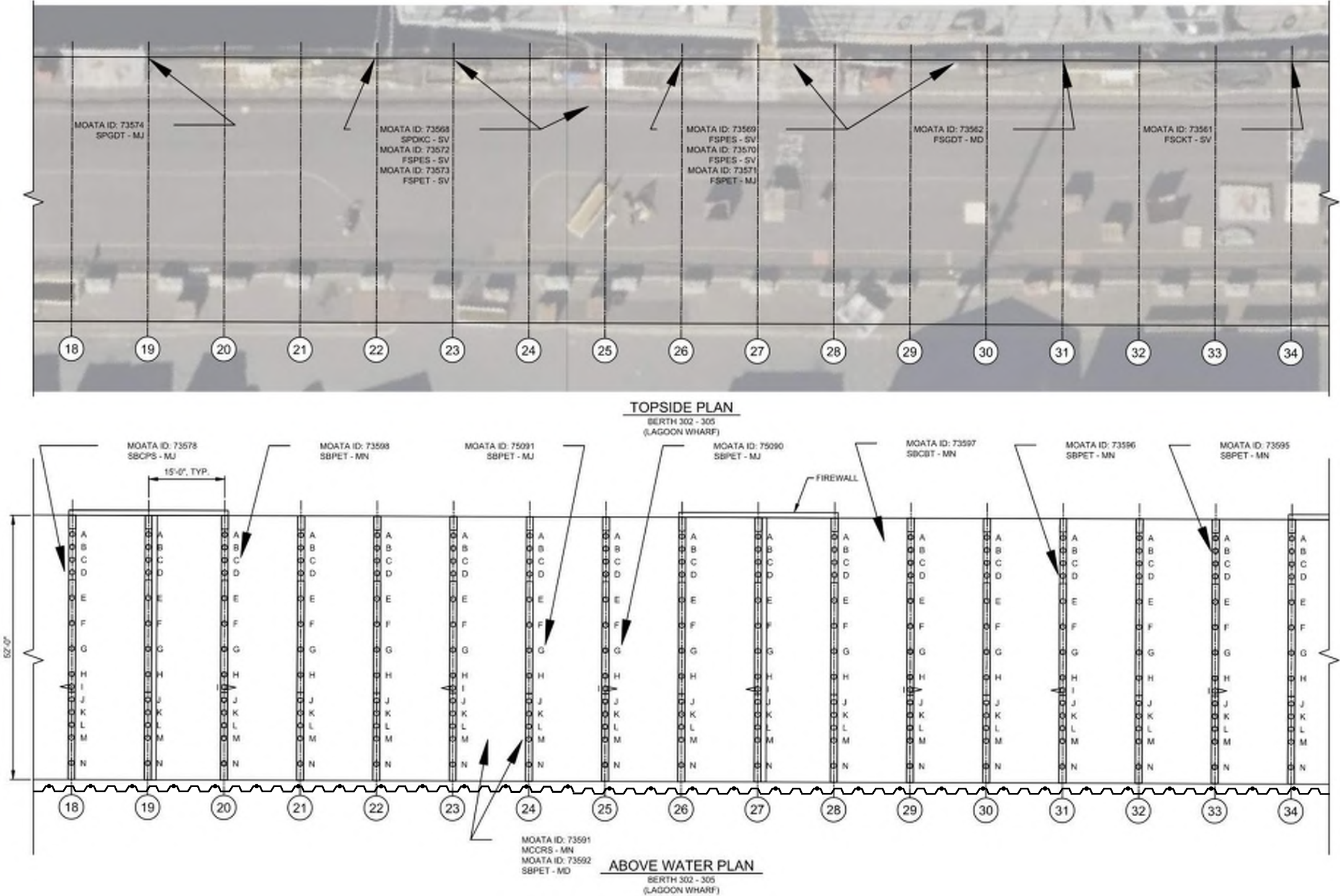
TIMBER PILE

TIMBER BATTER PILE

TIMBER PILE CAP

ASPHALT OVERLAY ON TIMBER DECK

BULKHEAD (STEEL SHEET PILE)



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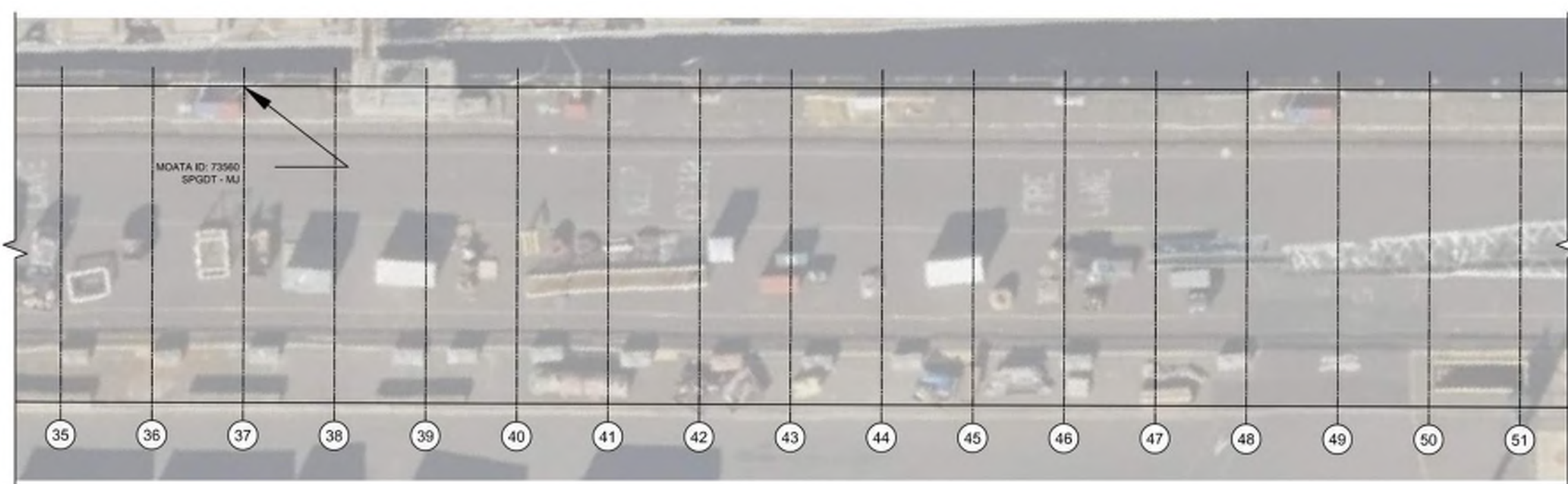
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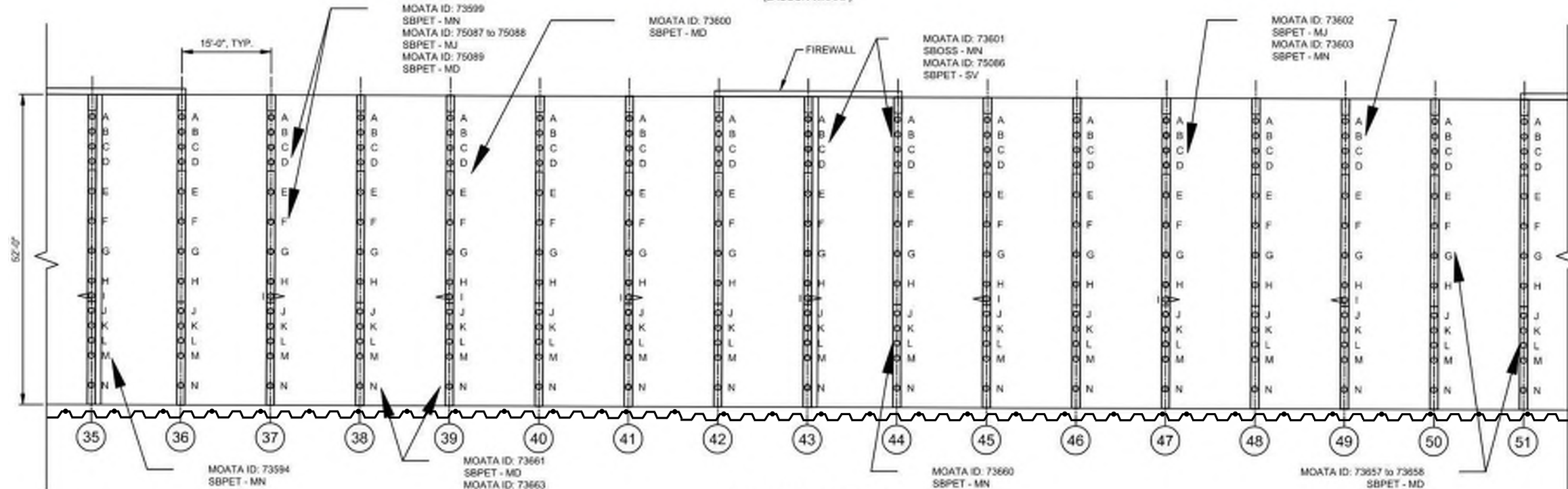
Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Structure Layout - Sheet 2 of 8

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

- LEGEND:
- TIMBER PILE
 - TIMBER BATTER PILE
 - TIMBER PILE CAP
 - ASPHALT OVERLAY ON TIMBER DECK
 - BULKHEAD (STEEL SHEET PILE)



TOPSIDE PLAN
BERTH 302 - 305
(LAGOON WHARF)



ABOVE WATER PLAN
BERTH 302 - 305
(LAGOON WHARF)

Not to scale

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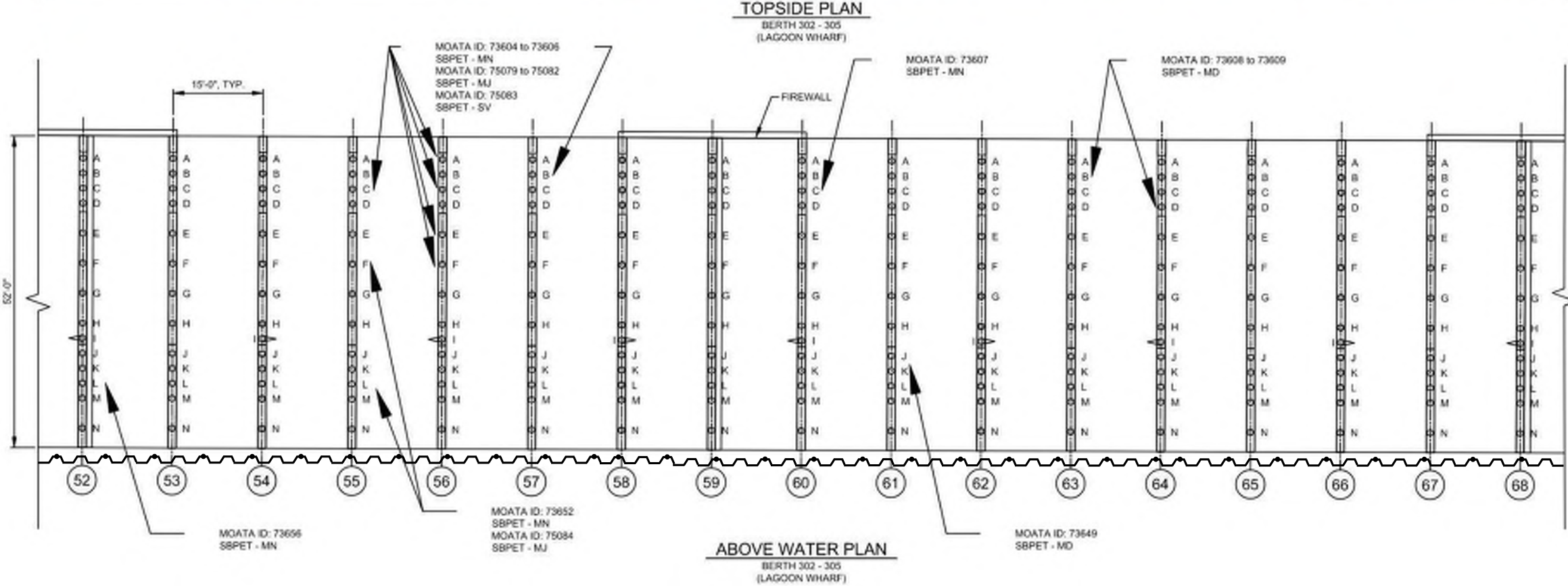
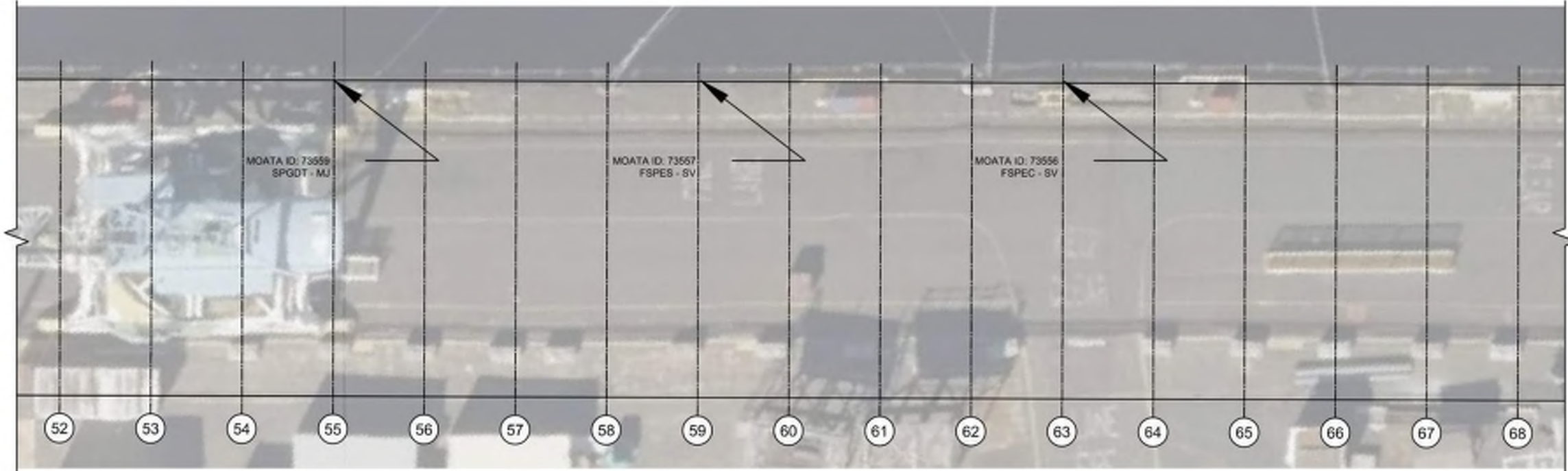
GENERAL NOTES:
1. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.
2. If any of the system elements or materials are unknown use X to represent them.

Attachment A-9 Berth 302 - 305 - Lagoon Wharf Structure Layout - Sheet 3 of 8

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

LEGEND:

- TIMBER PILE
- TIMBER BATTER PILE
- TIMBER PILE CAP
- ASPHALT OVERLAY ON TIMBER DECK
- BULKHEAD (STEEL SHEET PILE)



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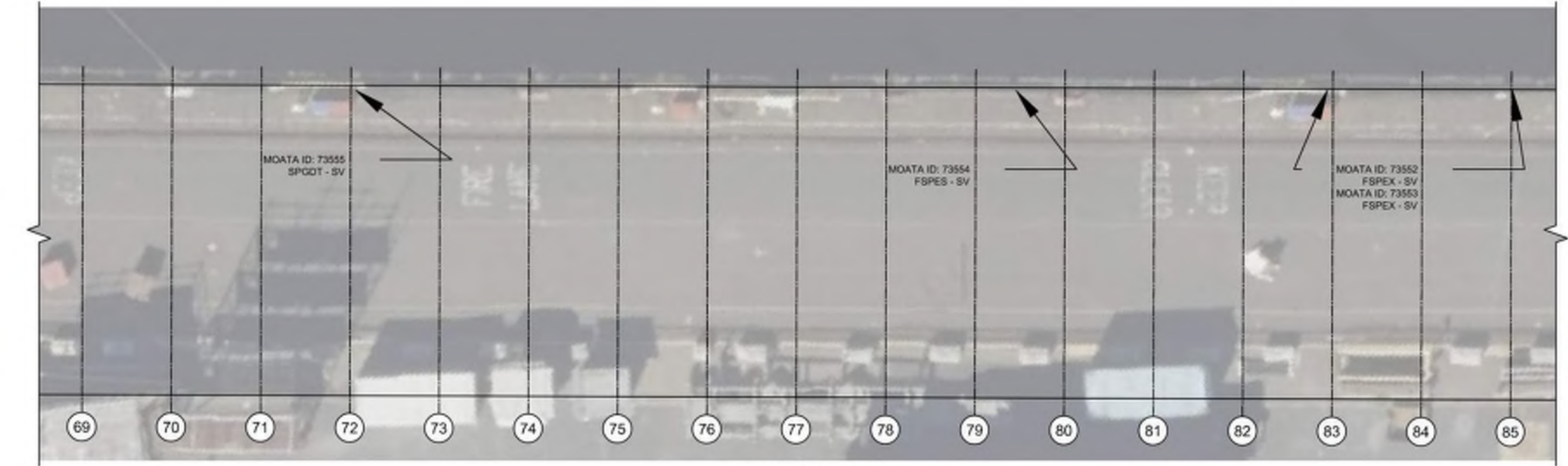
GENERAL NOTES:
1. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.
2. If any of the system elements or materials are unknown use X to represent them.

Attachment A-9 Berth 302 - 305 - Lagoon Wharf Structure Layout - Sheet 4 of 8

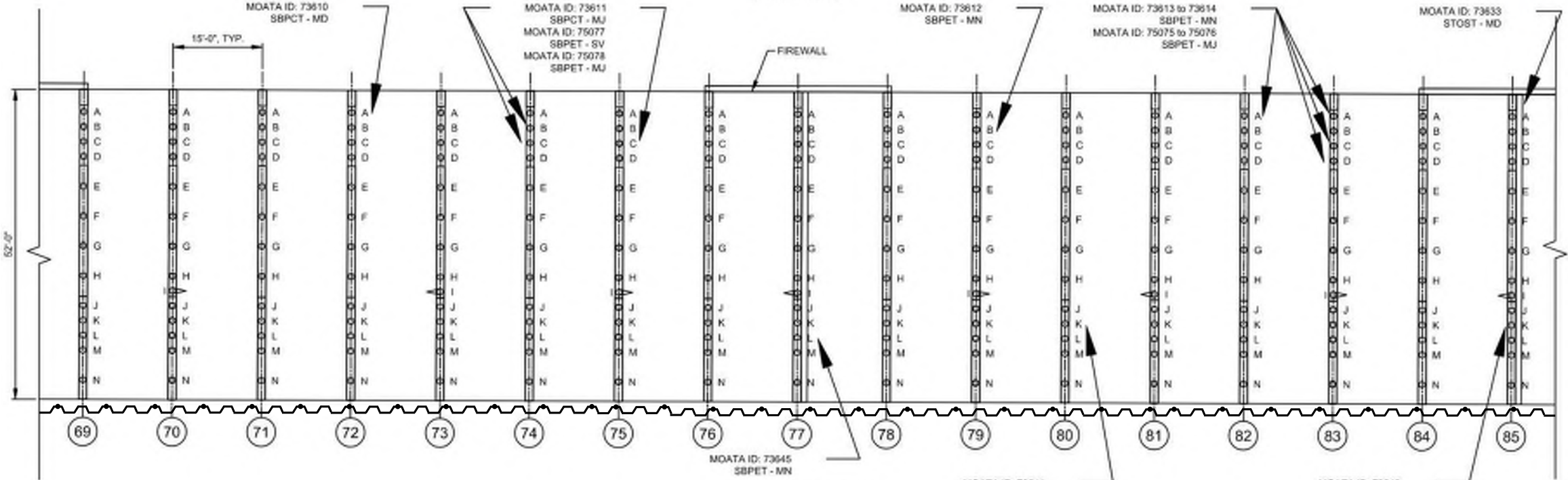
Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

LEGEND:

- TIMBER PILE
- TIMBER BATTER PILE
- TIMBER PILE CAP
- ASPHALT OVERLAY ON TIMBER DECK
- BULKHEAD (STEEL SHEET PILE)



TOPSIDE PLAN
BERTH 302 - 305
(LAGOON WHARF)



ABOVE WATER PLAN
BERTH 302 - 305
(LAGOON WHARF)

Not to scale

[MOATA ID XXXXX]
[WWYYZ - ##]

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GENERAL NOTES:
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Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Structure Layout - Sheet 5 of 8

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

LEGEND:

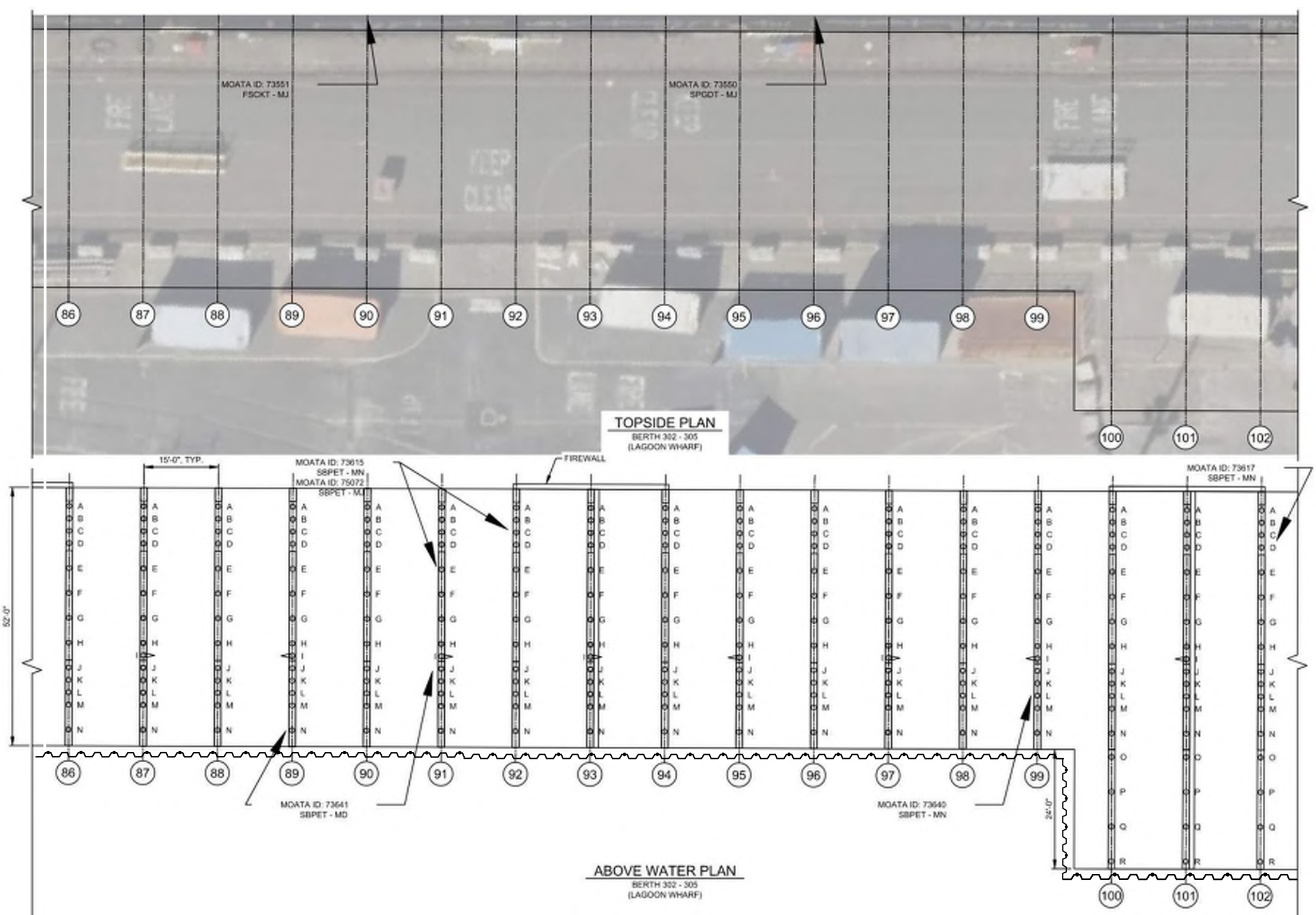
TIMBER PILE

TIMBER BATTER PILE

TIMBER PILE CAP

ASPHALT OVERLAY ON TIMBER DECK

BULKHEAD (STEEL SHEET PILE)



[MOATA ID XXXXX]
[WWYYZ - ##]

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YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SP = SUPERSTRUCTURE
FS = FENDER SYSTEM
OE = OTHER ELEMENT
SB = SUBSTRUCTURE
MC = MISCELLANEOUS

ELEMENT TYPE:
GD = GUARDRAIL/HANDRAIL/BULLRAIL
PE = PILE/SHEET PILE
BM = BEAM/JOIST/STRINGER/GIRDER
PC = PILE CAP
OS = OTHER STRUCTURE
WR = WALER
CB = CROSS-BRACING
CR = CRANE RAIL
CP = CONNECTION PLATE
CK = CHOCK
DK = DECK

MATERIAL TYPE:
A = ASPHALT
C = REINFORCED CONCRETE
S = STEEL
T = TIMBER

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

GENERAL NOTES:
1. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.
2. If any of the system elements or materials are unknown use X to represent them.

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Structure Layout - Sheet 6 of 8

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

LEGEND:

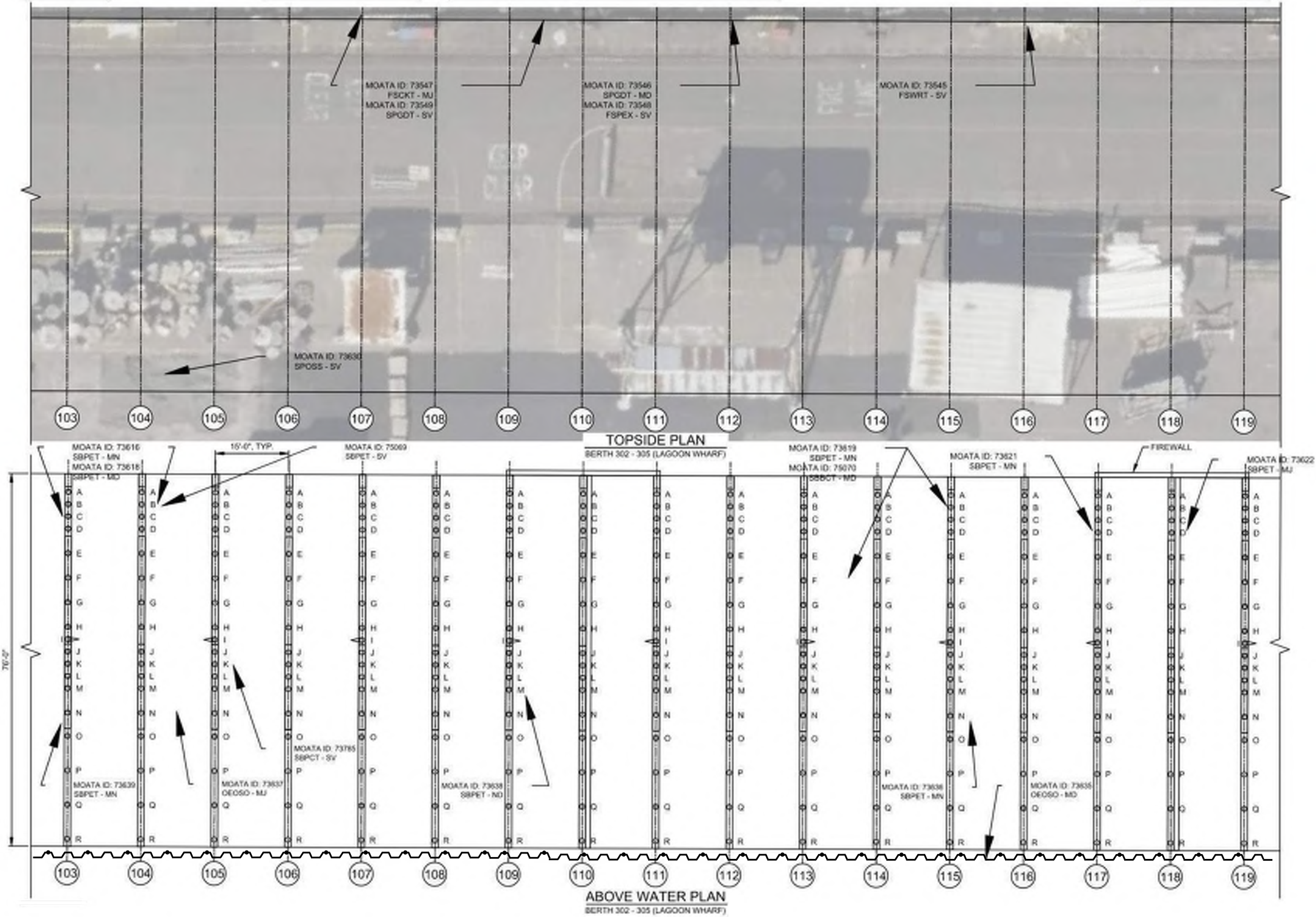
TIMBER PILE

TIMBER BATTER PILE

TIMBER PILE CAP

ASPHALT OVERLAY ON TIMBER DECK

BULKHEAD (STEEL SHEET PILE)



[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SP = SUPERSTRUCTURE
FS = FENDER SYSTEM
OE = OTHER ELEMENT
SB = SUBSTRUCTURE
MC = MISCELLANEOUS

ELEMENT TYPE:
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PC = PILE CAP
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DK = DECK

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MD = MODERATE
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S = STEEL
T = TIMBER

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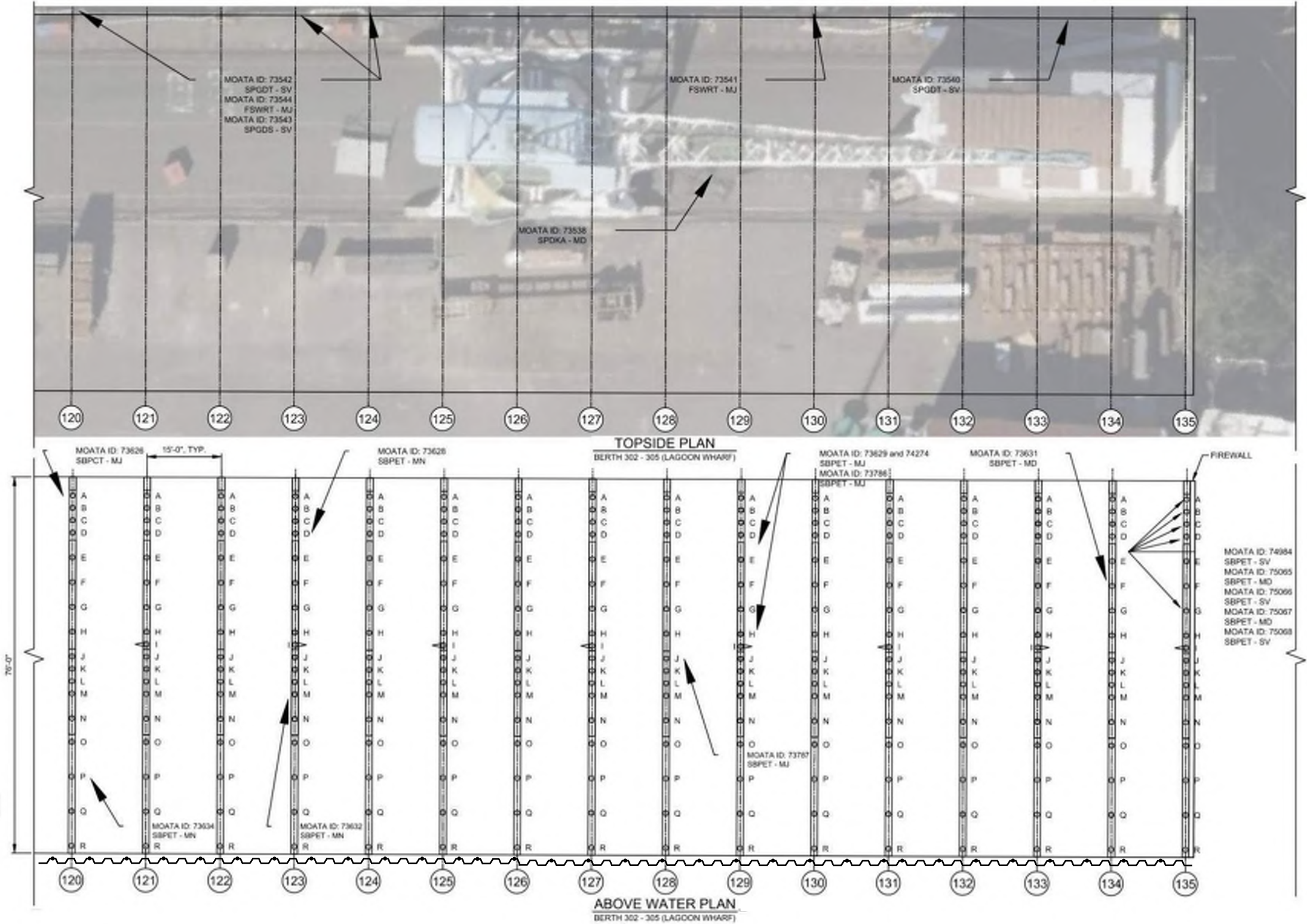
Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Structure Layout - Sheet 7 of 8

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Not to scale

LEGEND:

- TIMBER PILE
- TIMBER BATTER PILE
- TIMBER PILE CAP
- ASPHALT OVERLAY ON TIMBER DECK
- BULKHEAD (STEEL SHEET PILE)



[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
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DK = DECK

DEFECT LEVEL:
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MJ = MAJOR
SV = SEVERE

MATERIAL TYPE:
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C = REINFORCED CONCRETE
S = STEEL
T = TIMBER

GENERAL NOTES:
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2. If any of the system elements or materials are unknown use X to represent them.

Attachment A-9 Berth 302 - 305 - Lagoon Wharf Structure Layout - Sheet 8 of 8

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Lagoon Wharf Superstructure
Timber Bullrail between Bents 133 and 134
Loss of section on bullrail
Moata ID: 73540



Photo 02: Lagoon Wharf Superstructure
Asphalt Pavement Overview
Typical condition of asphalt pavement
Moata ID: Not Applicable



Photo 03: Lagoon Wharf Fender System
Adjacent to Bent 85
Missing fender pile
Moata ID: 73552



Photo 04: Lagoon Wharf Substructure
Adjacent to Bent 3
Typical condition of pile caps
Moata ID: 73586

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Above-Water Inspection Photos - Sheet 1 of 5

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Photo 05: Lagoon Wharf Substructure
Adjacent to Bent 3
Bearing plate severely corroded
Moata ID: 73587



Photo 06: Lagoon Wharf Substructure
Typical condition of crane rail
Moata ID: 73587



Photo 07: Lagoon Wharf Substructure
Adjacent to Bent 72
Split on the pile cap
Moata ID: 73610



Photo 08: Lagoon Wharf Substructure
Adjacent to Bent 16
Split on the pile cap
Moata ID: 73784

Attachment A-9 Berth 302 - 305 - Lagoon Wharf Above-Water Inspection Photos - Sheet 2 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

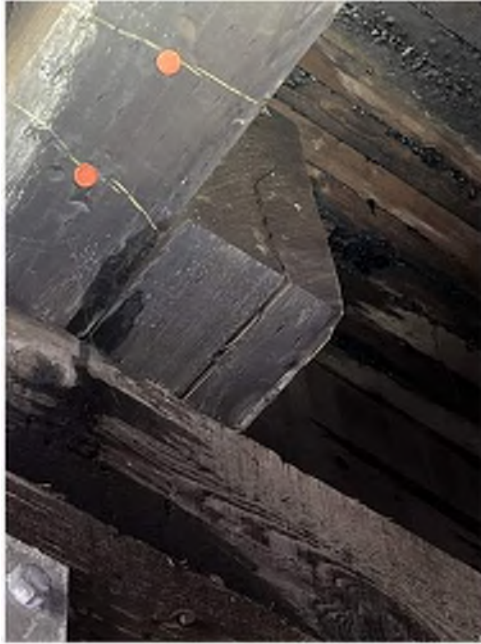


Photo 09: Lagoon Wharf Substructure
Adjacent to Bent 38
Split on the bottom of the beams
Moata ID: 74273



Photo 10: Lagoon Wharf Substructure
Typical condition of the deck underside
Moata ID: Not Applicable



Photo 11: Lagoon Wharf Substructure
Adjacent to Bent 13
Typical condition of the piles
Moata ID: 73582



Photo 12: Lagoon Wharf Substructure
Adjacent to Bent 129
Pile fully non-bearing
Moata ID: 74274



Photo 13: Lagoon Wharf Substructure
Adjacent to Bent 16
Split on the timber cross-bracing
Moata ID: 73580

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Above-Water Inspection Photos - Sheet 3 of 5

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Photo 14: Lagoon Wharf Substructure
Steel Sheet Piles between Bents 59 and 67
Corroded steel sheet piles
Moata ID: Not Applicable



Photo 15: Lagoon Wharf Substructure
Steel Sheet Piles between Bents 52 and 58
Typical condition of at bottom of steel sheet piles
Moata ID: Not Applicable



Photo 16: Lagoon Wharf Substructure
Steel Sheet Piles between Bents 85 and 92
Typical condition of walers
Moata ID: Not Applicable



Photo 17: Lagoon Wharf Substructure
Steel Sheet Piles between Bents 77 and 84
Corroded steel waler
Moata ID: Not Applicable

Attachment A-9 Berth 302 - 305 - Lagoon Wharf Above-Water Inspection Photos - Sheet 4 of 5

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Structure Condition Assessment Report
Swan Island Basin



Photo 18: Lagoon Wharf Substructure
Adjacent to Bent 13
Typical condition of piles
Moata ID: 73582



Photo 19: Lagoon Wharf Substructure
Adjacent to Bent 17
Split on the timber pile
Moata ID: 73579

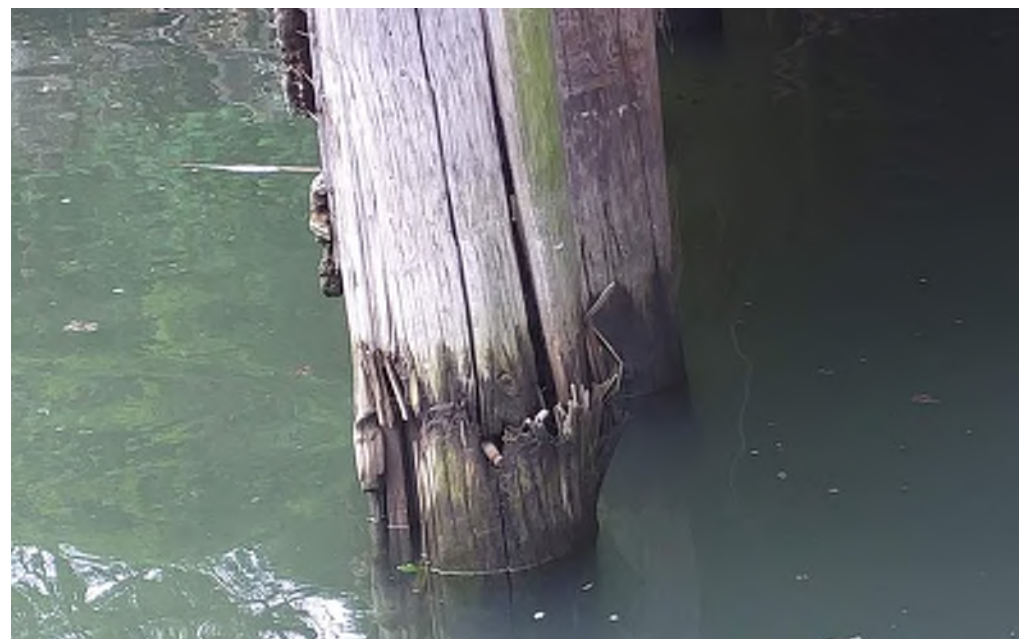


Photo 20: Lagoon Wharf Substructure
Adjacent to Pile A Bent 135
Split on the timber pile
Moata ID: 74984



Photo 21: Lagoon Wharf Substructure
Adjacent to Pile A Bent 135
Split on the timber pile
Moata ID: 74984

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Above-Water Inspection Photos - Sheet 5 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SM., PY. SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Asphalt, Other Material, Unknown
Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73538	All	All	Pier / Wharf	Superstructure	Deck	Asphalt	Moderate (MD)	General note: Alligator cracking in pavement throughout the outside, waterside, of the crane rail. Pavement between crane rail in adequate condition.
73540	133-134	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Timber	Severe (SV)	Bull rail has cross-section area loss over 50%. Splits run along bull rail through its length and width.
73541	130	N/A	Pier / Wharf	Fender System	Waler	Timber	Major (MJ)	Timber chocks and walers have splits and checks up to 1/2 inch wide. Top of fender piles appear tilted toward water, possible pile settlement (displacements).
73542	124	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Timber	Severe (SV)	Bull rail has partial breakage with bolts exposed. Handrail connection is likely compromised.
73544	123	N/A	Pier / Wharf	Fender System	Waler	Timber	Major (MJ)	Chock and waler have noticeable rotation (displacements).
73546	112	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Timber	Moderate (MD)	Split and checks wider than 1/2 inch wide down the full length of bull rail.

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Moata Forms - Sheet 1 of 25

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
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Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73547	109-110	N/A	Pier / Wharf	Fender System	Chock	Timber	Major (MJ)	Chocks have over 1 inch of displacement. The connection is likely damaged.
73548	112	N/A	Pier / Wharf	Fender System	Pile/Sheet Pile	Unknown	Severe (SV)	Fender pile is missing.
73549	107	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Timber	Severe (SV)	Bull rail has section loss over 50%. The damaged bull rail may compromise the connected handrail.
73550	96	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Timber	Major (MJ)	Checks at connection cause visible displacement of connection, splits run throughout length of bull rail section.
73551	90	N/A	Pier / Wharf	Fender System	Chock	Timber	Major (MJ)	Chock has visible rotation/displacements observed at connections.
73552	85	N/A	Pier / Wharf	Fender System	Pile/Sheet Pile	Unknown	Severe (SV)	Fender pile is missing.

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Moata Forms - Sheet 2 of 25

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SM., PY. SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Asphalt, Other Material, Unknown
Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73553	83	N/A	Pier / Wharf	Fender System	Pile/Sheet Pile	Unknown	Severe (SV)	Fender pile is missing.
73554	79-80	N/A	Pier / Wharf	Fender System	Pile/Sheet Pile	Steel	Severe (SV)	Fender pile is missing, material assumed due to adjacent piles.
73556	63	N/A	Pier / Wharf	Fender System	Pile/Sheet Pile	Reinforced Concrete	Severe (SV)	Fender pile is missing, material assumed due to adjacent piles.
73557	59	N/A	Pier / Wharf	Fender System	Pile/Sheet Pile	Steel	Severe (SV)	Fender pile is missing, material assumed due to adjacent piles.
73559	55	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Timber	Major (MJ)	Bull rail has cross-section area loss up to 50% due to rot.
73560	37	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Timber	Major (MJ)	Bull rail has cross-section area loss of 25%. Checks, splits and gouges run through the full depth of cross section. Splits run through the cross section.

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Moata Forms - Sheet 3 of 25

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
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Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73561	34	N/A	Pier / Wharf	Fender System	Chock	Timber	Severe (SV)	Chock is completely broken and hanging from connection.
73562	31	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Timber	Moderate (MD)	Bull rail has large splits and checks over 1/2 inch wide and is rotted. cross-section area loss less than 25%.
73568	24-25	N/A	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Severe (SV)	Deck has concrete spalling with exposed reinforcement.
73569	29-30	N/A	Pier / Wharf	Fender System	Pile/Sheet Pile	Steel	Severe (SV)	Fender pile is missing, material assumed due to adjacent piles.
73570	27-28	N/A	Pier / Wharf	Fender System	Pile/Sheet Pile	Steel	Severe (SV)	Fender pile is missing, material assumed due to adjacent piles.
73571	26	N/A	Pier / Wharf	Fender System	Pile/Sheet Pile	Timber	Major (MJ)	Fender pile has 50% cross-section area loss and the connection at top of the pile is compromised.

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Moata Forms - Sheet 4 of 25

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
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Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73572	23	N/A	Pier / Wharf	Fender System	Pile/Sheet Pile	Steel	Severe (SV)	Fender pile is missing, material assumed due to adjacent piles.
73573	22	N/A	Pier / Wharf	Fender System	Pile/Sheet Pile	Timber	Severe (SV)	Top of pile is damaged from chain. Fender pile has over 50% cross-section area loss. Connection is loose but may be redundant.
73574	19	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Timber	Major (MJ)	Section is rotted through with checks and splits running through full depth of cross section. Displacements/misalignment is observed at connections.
73575	17	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Timber	Severe (SV)	Bull rail has over 50% cross-section area loss near leaking box which has likely contributed to the damage.
73576	11-12	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Timber	Major (MJ)	Bull rail has up to 50% cross-section area loss near leaking box which has likely contributed to the damage.
73577	5	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Timber	Moderate (MD)	Bull rail has large split over 1/2 inch wide running down full length of timber.

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Moata Forms - Sheet 5 of 25

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
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Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73578	18	D	Pier / Wharf	Substructure	Connection Plate	Steel	Major (MJ)	The connection plate has cross-section area loss up to 30% and partial loss of flanges. Crane rail drain water or fire protection water is leaking onto steel plate.
73579	17	B	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	The split is approximately 6 feet long from the top of the pile, split width is undetermined but is likely near 1/2 inch.
73580	16	A	Pier / Wharf	Substructure	Cross-bracing	Timber	Minor (MN)	Split is at connection and not wider than 1/2 inch.
73581	16	A	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits are less than 1/2 inch wide and from the top of the pile down half-height of the pile.
73582	13	D	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits are less than 1/2 inch wide and from the top of the pile down approximately 12 feet.
73583	9	E	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Pile J: Checks and splits are less than 1/2 inch wide from the top of the pile down to the waterline.

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Moata Forms - Sheet 6 of 25

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
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Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73584	8	A and B	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Moderate (MD)	Pile N: Checks and splits are less than 1/2 inch wide and from the top of the pile down approximately 2 feet. Pile M: Checks and splits are 1/2 inch wide and from the top of the pile down approximately 6.5 feet.
73585	7	N/A	Pier / Wharf	Fender System	Pile/Sheet Pile	Timber	Moderate (MD)	Large split runs down to waterline and is FSPET wider than 1/2 inch, fender pile sounds soft at some locations.
73586	3	C	Pier / Wharf	Substructure	Pile Cap	Timber	Moderate (MD)	Flexural horizontal cracking is on the beam beneath the crane rail, the bearing plate under the crane rail is severely corroded, the bearing plate possibly slides longitudinally, and is damaged more severe than the beam.
73587	1	C	Pier / Wharf	Substructure	Other Structure	Steel	Severe (SV)	Bearing plate is severely corroded, connection plate is almost fully disconnected but appears redundant.
73588	6	C	Pier / Wharf	Substructure	Other Substructure	Steel	Severe (SV)	Bearing plate and connection are corroded and damaged. Broken connection appears redundant.
73589	7	N/A	Pier / Wharf	Substructure	Pile/Sheet Pile	Steel	Major (MJ)	General condition- thick rust flaking is at the base of sheet piles. Unable to determine the cross-section area loss without information on original thickness.

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Moata Forms - Sheet 7 of 25

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

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Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73590	8	L	Pier / Wharf	Substructure	Pile Cap	Timber	Severe (SV)	Pile cap has cracking less than 1/2 inch. Connection under crane rail is broken. Possible shifting/uplift causes cracking and connection damage.
73591	24	M	Pier / Wharf	Miscellaneous	Crane Rail	Steel	Minor (MN)	General condition: Crane rail has moderate corrosion with some pitting.
73592	24	M	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Moderate (MD)	Checks and splits 1/2 inch wide and from the top of the pile down to the mud line.
73594	35	M	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide and from the top of the pile down 1 foot.
73595	33	B	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Splits are less than 1/2 inch wide running down roughly 5 feet from top of pile.
73596	31	D	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide and from the top of the pile down 6.5 feet.

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Moata Forms - Sheet 8 of 25

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

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Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73597	28-29	A	Pier / Wharf	Substructure	Cross-bracing	Timber	Major (MJ)	Cross-brace sounds hollow, 2 inch wide and 4 inch thick wood board attached on the top of the cross-brace and has cross-section area loss up to 25%, likely damaged by water.
73598	20	C	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide from the top of the pile down 3 feet.
73599	37	C and D	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Pile L: Checks and splits less than 1/2 inch wide and from the top of the pile down approximately 12 feet. Pile K: Checks and splits less than 1/2 inch and from the top of the pile down to the waterline.
73600	39	C, E and F	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Moderate (MD)	Cracks are observed in piles and pile caps with maximum cracks over 1/2 inch.
73601	43	B and C	Pier / Wharf	Substructure	Other Substructure	Steel	Minor (MN)	Steel bearing has minor surface rust.
73602	47	A to D	Pier / Wharf	Substructure	Pile Cap	Timber	Major (MJ)	Multiple horizontal checks and splits less than 1/2 inch wide with a length of 1 feet. Pile K and pile cap have 1 inch gap.

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Moata Forms - Sheet 9 of 25

Prepared on: 3/10/2023
Structure Condition Assessment Report
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Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73603	49	B	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Check and split less than 1/2 inch and from the top of the pile down approximately 6 feet.
73604	55	C	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Multiple checks and splits less than 1/2 inch wide from the top of the pile down 10 feet.
73605	56	C	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide at 1/3 height from the top of the pile down approximately 10 feet.
73606	57	B	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide from the top of the pile down 1/3 height of the pile.
73607	60	C	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide from the top of the pile down approximately 6 feet.
73608	63	B	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Moderate (MD)	Checks and splits approximately 3/4 inch wide and from the top of the pile down approximately 10 feet.

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Moata Forms - Sheet 10 of 25

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SM., PY. SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Asphalt, Other Material, Unknown
Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73609	64	D	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Moderate (MD)	Checks and splits wider than 1/2 inch from the top of the pile down approximately 12 feet.
73610	72	A	Pier / Wharf	Substructure	Pile Cap	Timber	Moderate (MD)	Checks and splits wider than 1/2" from the bottom of the pile cap up half-height of the pile cap cross-section.
73611	74	B	Pier / Wharf	Substructure	Pile Cap	Timber	Major (MJ)	Pile and pile cap have 1 inch gap.
73612	79	B	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Moderate (MD)	Checks and splits wider than 1/2 inch from the top of the pile down 7 feet.
73613	82	A	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 3/8 inch wide from the top of the pile down 7 feet.
73614	83	A	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide from the top of the pile down approximately 10 feet.

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Moata Forms - Sheet 11 of 25

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SM., PY. SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Asphalt, Other Material, Unknown
Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73615	92	C	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide from the top of the pile down approximately 6 feet.
73616	103	C	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide from the top of the pile down approximately 14 feet.
73617	102	C and D	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Pile C and D: checks and splits less than 1/4 inch wide from the top of the pile down approximately 20 feet to the waterline.
73618	104	B	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Moderate (MD)	The most significant check and splits is 9/16 inch wide from the top of the pile down approximately 8 feet. Multiple checks and splits less than 1/4 inch wide from the top of the pile down approximately 20 feet to the waterline.
73619	115	B	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/4 inch wide from the top of the pile down 8 feet.
73621	117	D	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide at 3 feet from the top of the pile down 7 feet.

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Moata Forms - Sheet 12 of 25

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SM., PY. SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Asphalt, Other Material, Unknown
Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73622	118	D	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Major (MJ)	Pile and pile cap have 1 inch gap with dowel exposed.
73626	120	A	Pier / Wharf	Substructure	Pile Cap	Timber	Major (MJ)	Checks and splits less than 1/2 inch wide over the full cross-section of the pile cap.
73628	123	D	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide from the top of the pile down 8 feet.
73629	129	B, D and E	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Major (MJ)	Pile B: Pile and cross beam have a 1 inch gap with the dowel exposed. Pile D: Check is from the top of the pile to the bottom of the pile with maximum width over 1/2 inch. Pile E: Checks and split wider than 1/2 inch from the top of the pile down approximately 15 feet.
73630	104-105	N/A	Pier / Wharf	Substructure	Pile/Sheet Pile	Steel	Severe (SV)	Large saw cut rectangle where there is a sinkhole through sheet pile.
73631	134	D, F and G	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Moderate (MD)	Pile D: Checks and splits less than 1/2 inch from the top of the pile down approximately 1 foot. Pile F: Checks and splits less than 1/2 inch wide from the top of the pile down approximately 2 feet. Pile G: Checks and splits wider than 1/2 inch from the top of the pile down approximately 1 foot.

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Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SM., PY. SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Asphalt, Other Material, Unknown
Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73632	123	M	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide from the top of the pile down approximately 6 inches.
73633	85	N/A	Pier / Wharf	Safety	Other Structure	Timber	Moderate (MD)	Fire door locking mechanism is broken.
73634	120	P	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide from the top of the pile down 6 feet.
73635	116 to 115	N/A	Other Structure	Other Element	Other Structure	Other Material	Moderate (MD)	Scoring of soil between is bent 116 and 115.
73636	115	N	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide from the top of the pile down approximately 12 feet to the mud line.
73637	104-105	N/A	Other Structure	Other Element	Other Structure	Other Material	Major (MJ)	Sinkhole location, no openings are visible, soils are washed out of large section.

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Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SM., PY. SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Asphalt, Other Material, Unknown
Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73638	109	M	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	No Defects (ND)	The old piles were broken and were replaced by two timber piles. The replaced piles are in good condition without any defects.
73639	103	N and O	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Pile N: Checks and splits less than 1/4 inch wide from the top of the pile down 3 feet. Pile O: Checks and splits less than 1/4 inch wide from the top of the pile down 10 feet.
73640	99	L	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/4 inch wide from the top of the pile down 3 feet.
73641	91	J	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Moderate (MD)	Check at the top of the pile has a length of 6 inches and maximum width of 1/2 inch. cross-section area loss up to 15% and the drift pin is exposed.
73642	89	N	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide from the top of the pile down 8 feet to the ground line.
73643	85	K	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide from the ground line up approximately 1 foot.

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Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SM., PY. SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Asphalt, Other Material, Unknown
Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73644	80	K	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Severe (SV)	Check at top of the pile has maximum width of 1/2 inch and length of 1 foot. Nut/chunk is missing at the top of the pile.
73645	77	L	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide from the top of the pile down 5 feet.
73649	61	K and J	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Moderate (MD)	Pile K: Checks and splits wider than 1/2 inch from the top of the pile down approximately 8 feet to the mud line. Pile J: Check and split less than 1/4 inch wide at 2 feet from the top of the pile down 8 feet.
73652	55	L	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide from the top of the pile down approximately 1.5 feet.
73656	52	L	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide from the top of the pile down 1 foot.
73657	51	L	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Moderate (MD)	Checks and splits less than 1/2 inch wide from the top of the pile down approximately 2 feet. cross-section area loss up to 15% at the center of the pile.

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Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Project Information								
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Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73658	50	G	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Moderate (MD)	The pile has full length crack with maximum width 1/2 inch.
73660	44	L	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than1/2 inch wide from the top of the pile down approximately 4 feet.
73661	39	N	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Moderate (MD)	Checks and splits 13/16 inch wide by 4 inch deep the full length.
73663	38	N	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than1/2 inch wide from the top of the pile down approximately 6 feet.
73780	8	A and B	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Moderate (MD)	Checks and splits 1/2 inch wide from the top of the pile down 6.5 feet.
73781	9	C	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide from the top of the pile down 20 feet' to the waterline.

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Moata Forms - Sheet 17 of 25

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Project Information								
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Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73782	9	E	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Minor (MN)	Checks and splits less than 1/2 inch wide from the top of the pile down 20 feet to the waterline.
73784	16	A	Pier / Wharf	Substructure	Pile Cap	Timber	Moderate (MD)	Checks and splits wider than 1/2 inch over the cross-section of the pile cap.
73785	105	K	Pier / Wharf	Substructure	Pile Cap	Timber	Severe (SV)	Crushing is observed at end of the cap over Pile K.
73786	129	H	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Major (MJ)	Pile H sounds hollow at base and up roughly 2 to 4 feet, the inner core is likely not intact.
73787	128	J	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Major (MJ)	Pile sounds hollow at the base and up roughly 1 to 2 feet from the base, the inner core is likely not intact.
74273	38	N	Pier / Wharf	Superstructure	Beam / Joist / Stringer / Girder	Timber	Minor (MN)	Checks and splits up to 1/2 inch wide 3 feet from end.

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Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SM., PY. SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Asphalt, Other Material, Unknown
Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74274	129	B	Pier / Wharf	Substructure	Pile/Sheet Pile	Timber	Major (MJ)	Pile and pile cap have 1 inch gap with dowel exposed, the same as MOATA Form: 73629.
73543	120	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Steel	Severe (SV)	Handrail bent, buckling and is breaking.
73545	116	N/A	Pier / Wharf	Fender System	Waler	Timber	Severe (SV)	Timber waler has partial breakage and section loss more than 50%.
73555	72	N/A	Pier / Wharf	Superstructure	Guardrail / Handrail / bull rail	Timber	Severe (SV)	Connection is rotted, bent and cross-section area loss over 50% at end.
74984	135	A	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Timber pile is near complete breakage at the waterline.
75065	135	G	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Moderate (MD)	The first 1 inch from the outside surface to the inner core is soft, and diameter loss is 8%.

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
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Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



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Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75066	135	D	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	The pile has a 1-3/4 inch outer shell at 4 feet above the waterline. The cross section area loss is over 50%.
75067	135	C	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Moderate (MD)	Checks and splits wider than 1/2 inch from the waterline up 6 feet.
75068	135	B	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	The pile is soft 6 inches on one side and soft 1-1/2 inches on the opposite side at 1 foot above the waterline.
75069	104	B	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	The pile is soft 6 inches from the outer surface to the inner core at 4 feet above the waterline. cross-section area loss over 50%.
75070	113/114	F	Pier / Wharf	Substructure	Cross-bracing	Timber	Moderate (MD)	Checks and splits over 1/2 inch wide and run the full length of the member.
75072	91	E	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 2 inches from the outer surface to the inner core at 2 feet above the waterline. The diameter loss is 16%.

Attachment A-9
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Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



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Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75075	83	D	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 2 inches from the outer surface to the inner core at 2 feet above the waterline. The diameter loss is 16%.
75076	83	C	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 2 inches from the outer surface to the inner core at 2 feet above the waterline. The diameter loss is 16%.
75077	75	C	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	The pile is soft 5 inches from the outer surface to the inner core at 1 foot above the waterline. The diameter loss is 42%.
75078	74	C	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 3 inches from the outer surface to the inner core at 2 feet above the waterline. The diameter loss is 25%.
75079	56	F	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 2-/12 inches from the outer surface to the inner core at 2 feet above the waterline. The diameter loss is 21%.
75081	56	E	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 2 inches from the outer surface to the inner core at 2 feet above the waterline. The diameter loss is 16%.

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Berth 302 - 305 - Lagoon Wharf
Moata Forms - Sheet 21 of 25

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



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Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75082	56	C	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 2 inches from the outer surface to the inner core at 1 foot above the waterline. The diameter loss is 16%.
75083	56	A	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	The pile is soft 6 inches from the outer surface to the inner core at 3 feet above the waterline. The diameter loss is 50%.
75084	55	F	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 2 inches from the outer surface to the inner core at 1 foot above the waterline. The diameter loss is 16%.
75086	44	B	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 3 inches from the outer surface to the inner core at 2 feet above the waterline. The diameter loss is 25%.
75087	37	F	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 5 inches from the outer surface to the inner core at 2 feet above the waterline. The diameter loss is 42%.
75088	37	D	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 2 inches from the outer surface to the inner core at 1 foot above the waterline. The diameter loss is 16%.

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Moata Forms - Sheet 22 of 25

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



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Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75089	37	C and D	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Moderate (MD)	Checks and splits wider than 1/2 inch from top of pile down to waterline.
75090	25	G	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 5 inches from the outer surface to the inner core at 2 feet above the waterline. The diameter loss is 42%.
75091	24	G	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 2 inches from the outer surface to the inner core at 1 foot above the waterline. The diameter loss is 16%.
75092	14	G	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 3 inches from the outer surface to the inner core at 2 feet above the waterline. The diameter loss is 25%.
75093	14	D	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 2 inches from the outer surface to the inner core at 1 foot above the waterline. The diameter loss is 16%.
75095	14	C	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 2 inches from the outer surface to the inner core at 1 foot above the waterline. The diameter loss is 16%.

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Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Project Information								
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Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75096	6	F	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 2 inches from the outer surface to the inner core at 1 foot above the waterline. The diameter loss is 16%.
75097	6	E	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 2 inches from the outer surface to the inner core at 1 foot above the waterline. The diameter loss is 21%.
75098	5	H	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Moderate (MD)	The first 1 inch from the outside surface to the inner core is soft and diameter loss is 8%.
75100	5	C	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 2 inches from the outer surface to the inner core at 1 foot above the waterline. The diameter loss is 16%.
75101	5	A	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 2 inches from the outer surface to the inner core at 1 foot above the waterline. The diameter loss is 16%.
75102	2	H	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile is soft 2-1/2 inches from the outer surface to the inner core at 2 foot above the waterline. The diameter loss is 21%.

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Moata Forms - Sheet 24 of 25

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SM., PY. SH., AE., HW.		Materials:	Steel, Reinforced Concrete, Timber, Asphalt, Other Material, Unknown
Location:	Portland, OR			Above Water:	PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Miscellaneous, Safety, Other Element
Facility:	Lagoon Wharf (Berths 302, 303, 304, and 305)			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75103	1	A	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Moderate (MD)	The first 1 inch from the outside surface to the inner core is soft and diameter loss is 8%.
75107	2	F	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Minor (MN)	Checks and splits less than1/2 inch wide.

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Moata Forms - Sheet 25 of 25

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Ultrasonic Thickness (UT) Measurements and Pitting Measurements							
Swan Island Basin Remedial Design		Location: Portland, OR		Company: Mott MacDonald			
Facility: Berth 302 -305 - Lagoon Wharf		Inspector: ES, ATE		Inspection Date: 5/23/2022			
Time of Day: Multiple Times		Tide: Varies		Pile Type (Bearing, Batter, Sheet, Guide): Bulkhead		Component Material: Steel	
Component	Component Section	Bent Number	Pile Number	Measurements (in)			Loss of Section (Estimated Nominal Thickness = 0.5 in)
				UT	Pitting	Location	
Bulkhead	Outside Flange	129	/	0.512	≤1/8	Mudline	0.0%
	Outside Flange	129	/	0.510	/	Top of Cell	0.0%
	Web			0.359	≤1/8	Center	28.2%
				0.368	/	Top of Cell	26.4%
	Inside Flange			/	0.530	/	Center
		0.510	Top of Cell		0.0%		
	Inside Flange	102	/	0.480	/	Mudline	4.0%
	Web			0.350		Mudline	30.0%
	Outside Flange			0.474		Mudline	5.2%
				0.454		Top of Cell	9.2%
	Web			0.350		Top of Cell	30.0%
	Inside Flange			0.474		Top of Cell	5.2%
	Wale	100	/	0.490	/	Top Flange	2.0%
	Outside Flange	95	/	0.500	/	4ft Above Catwalk Deck	0.0%
	Wale			N/A	0.05	Top Flange	/
	Wale			0.480	/	Bottom Flange	4.0%
	Outside Flange	91	/	0.496	/	4ft Above Catwalk Deck	0.8%
	Web			0.380		4ft Above Catwalk Deck	24.0%
	Inside Flange	91	/	0.497	/	4ft Above Catwalk Deck	0.6%
	Outside Flange			0.470	0.06	Mudline	6.0%
	Outside Flange	86	/	0.528	/	4ft Above Catwalk Deck	0.0%

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
MM Ultrasonic Thickness Measurements - Sheet 1 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Ultrasonic Thickness (UT) Measurements and Pitting Measurements							
Swan Island Basin Remedial Design		Location: Portland, OR		Company: Mott MacDonald			
Facility: Berth 302 -305 - Lagoon Wharf		Inspector: ES, ATE		Inspection Date: 5/23/2022			
Time of Day: Multiple Times		Tide: Varies		Pile Type (Bearing, Batter, Sheet, Guide): Bulkhead		Component Material: Steel	
Component	Component Section	Bent Number	Pile Number	Measurements (in)			Loss of Section (Estimated Nominal Thickness = 0.5 in)
				UT	Pitting	Location	
Bulkhead	Web	86	/	0.380	/	4ft Above Catwalk Deck	24.0%
	Inside Flange			0.520		4ft Above Catwalk Deck	0.0%
	Outside Flange			0.480		Mudline	4.0%
	Outside Flange	81	/	0.510	/	4ft Above Catwalk Deck	0.0%
	Web			0.370		4ft Above Catwalk Deck	26.0%
	Inside Flange			0.530		4ft Above Catwalk Deck	0.0%
	Outside Flange			0.520	0.18	Mudline	0.0%
	Web			0.370	/	Mudline	26.0%
	Inside Flange			0.520		Mudline	0.0%
	Outside Flange	76	/	0.516	/	4ft Above Catwalk Deck	0.0%
	Web			0.362		4ft Above Catwalk Deck	27.6%
	Inside Flange			0.512		4ft Above Catwalk Deck	0.0%
	Outside Flange			0.510		Mudline	0.0%
	Web	76	/	0.370	/	Mudline	26.0%
	Inside Flange			0.508		Mudline	0.0%
	Outside Flange	71	/	0.504	/	4ft Above Catwalk Deck	0.0%
	Web			0.362		4ft Above Catwalk Deck	27.6%
	Inside Flange			0.516		4ft Above Catwalk Deck	0.0%
	Outside Flange			0.510		Mudline	0.0%
	Web			0.360		Mudline	28.0%
	Inside Flange			0.512		Mudline	0.0%
	Outside Flange	66		0.480		4ft Above Catwalk Deck	4.0%

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
MM Ultrasonic Thickness Measurements - Sheet 2 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Ultrasonic Thickness (UT) Measurements and Pitting Measurements							
Swan Island Basin Remedial Design		Location: Portland, OR		Company: Mott MacDonald			
Facility: Berth 302 -305 - Lagoon Wharf		Inspector: ES, ATE		Inspection Date: 5/23/2022			
Time of Day: Multiple Times		Tide: Varies		Pile Type (Bearing, Batter, Sheet, Guide): Bulkhead		Component Material: Steel	
Component	Component Section	Bent Number	Pile Number	Measurements (in)			Loss of Section (Estimated Nominal Thickness = 0.5 in)
				UT	Pitting	Location	
Bulkhead	Web	66	/	0.380	/	4ft Above Catwalk Deck	24.0%
	Inside Flange			0.500		4ft Above Catwalk Deck	0.0%
	Outside Flange			0.480		Mudline	4.0%
	Web			0.380		Mudline	24.0%
	Inside Flange			0.490		Mudline	2.0%
	Outside Flange	61	/	0.480	/	4ft Above Catwalk Deck	4.0%
	Web			0.360		4ft Above Catwalk Deck	28.0%
	Inside Flange			0.490		4ft Above Catwalk Deck	2.0%
	Outside Flange			0.480		Mudline	4.0%
	Web	61	/	0.350	/	Mudline	30.0%
	Inside Flange			0.490		Mudline	2.0%
	Outside Flange	56	/	0.470	/	4ft Above Catwalk Deck	6.0%
	Web			0.390		4ft Above Catwalk Deck	22.0%
	Inside Flange	56	/	0.480	/	4ft Above Catwalk Deck	4.0%
	Outside Flange			0.480		Mudline	4.0%
	Web			0.370		Mudline	26.0%
	Inside Flange			0.490		Mudline	2.0%
	Outside Flange	37	/	0.530	/	4ft Above Catwalk Deck	0.0%
	Web			0.360		4ft Above Catwalk Deck	28.0%
	Inside Flange			0.510		4ft Above Catwalk Deck	0.0%
	Outside Flange			0.500		Mudline	0.0%
	Web			0.340		Mudline	32.0%

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
MM Ultrasonic Thickness Measurements - Sheet 3 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Ultrasonic Thickness (UT) Measurements and Pitting Measurements							
Swan Island Basin Remedial Design		Location: Portland, OR		Company: Mott MacDonald			
Facility: Berth 302 -305 - Lagoon Wharf		Inspector: ES, ATE		Inspection Date: 5/23/2022			
Time of Day: Multiple Times		Tide: Varies		Pile Type (Bearing, Batter, Sheet, Guide): Bulkhead		Component Material: Steel	
Component	Component Section	Bent Number	Pile Number	Measurements (in)			Loss of Section (Estimated Nominal Thickness = 0.5 in)
				UT	Pitting	Location	
Bulkhead	Inside Flange	37	/	0.500	/	Mudline	0.0%
	Outside Flange	17	/	0.510	/	Mudline	0.0%
	Web			0.360		Mudline	28.0%
	Inside Flange			0.500		Mudline	0.0%
	Outside Flange			0.510		Mudline	0.0%
	Web			0.360		Mudline	28.0%
	Inside Flange			0.500		Mudline	0.0%
	Outside Flange	3	/	0.510	/	4ft Above Catwalk Deck	0.0%
	Web			0.380		4ft Above Catwalk Deck	24.0%
	Inside Flange	3	/	0.500	0.17-0.2	4ft Above Catwalk Deck	0.0%
	Outside Flange			0.480		Mudline	4.0%
	Web			0.380		Mudline	24.0%
	Inside Flange			0.490	/	Mudline	2.0%

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
MM Ultrasonic Thickness Measurements - Sheet 4 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Plumbness Measurements						
Swan Island Basin Remedial Design		Location: Portland, OR		Company: Mott MacDonald		
Facility: Berth 302 -305 - Lagoon Wharf		Inspector: ES, ATE		Inspection Date: 5/23/2022		
Time of Day: Multiple Times		Tide: Varies		Pile Type (Bearing, Batter, Sheet, Guide): Fender pile, Bulkhead		Component Material: Steel
Component	Component Section	Bent Number	Pile Number	Plumbness Measurements (in)		Tangent (level length = 2 ft), Unit: in/ft
				Top	Bottom	
Bulkhead	Inside Flange	129	/	/	1.500	0.750
	Outside Flange	91	/	/	0.500	0.250
	Outside Flange	86	/	/	0.500	0.250
	Outside Flange	61	/	/	1.250	0.625
	Outside Flange	37	/	/	0.750	0.375
	Outside Flange	3	/	/	0.750	0.375

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
MM Plumbness Measurements - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin





Photo 01: Lagoon Wharf overview
Lagoon Wharf, looking east

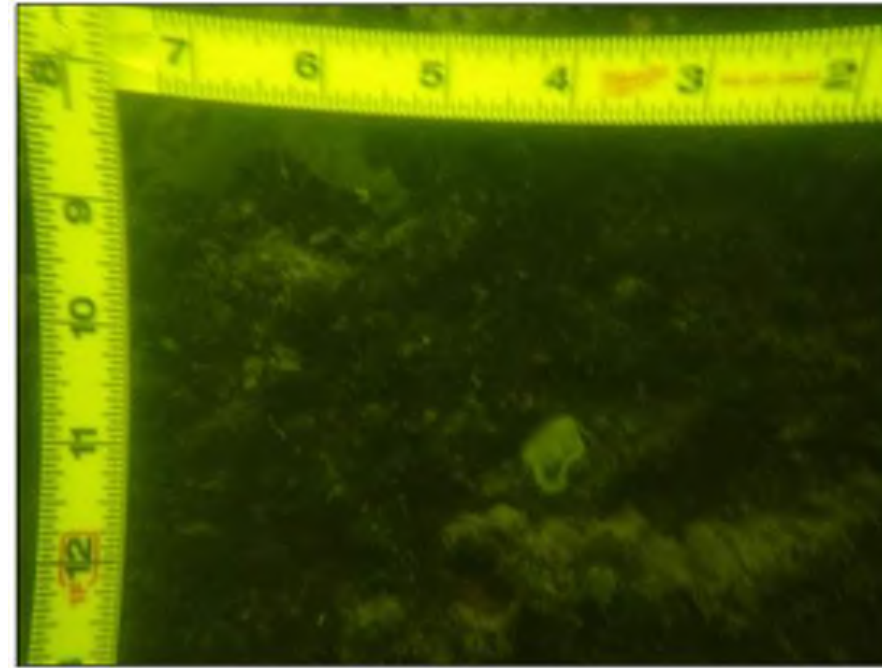


Photo 02: Lagoon Wharf Substructure
Typical condition of steel sheet pile below waterline

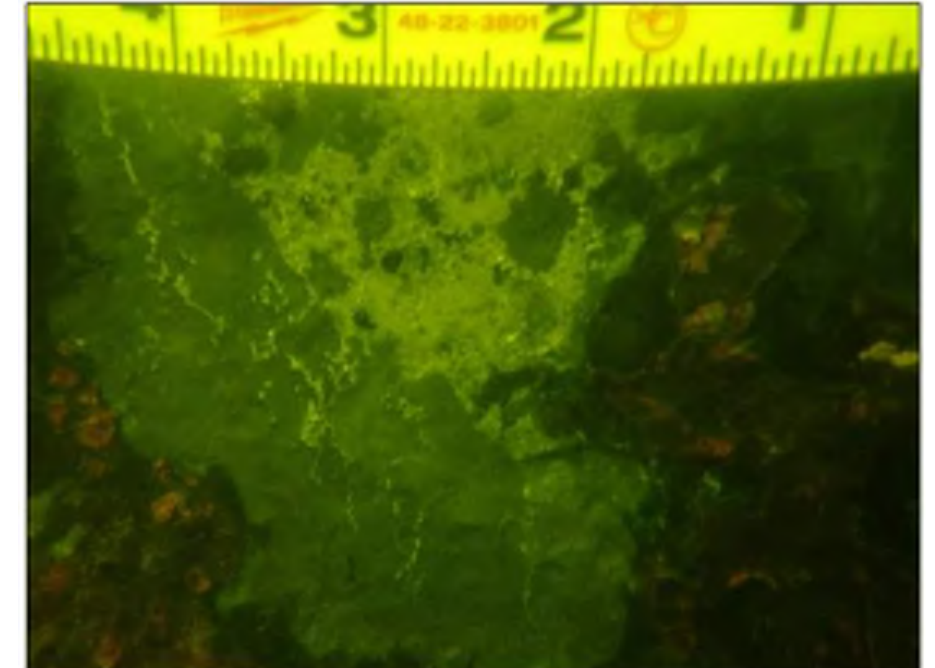


Photo 03: Lagoon Wharf Substructure
Typical cleaned surface of steel sheet pile below waterline

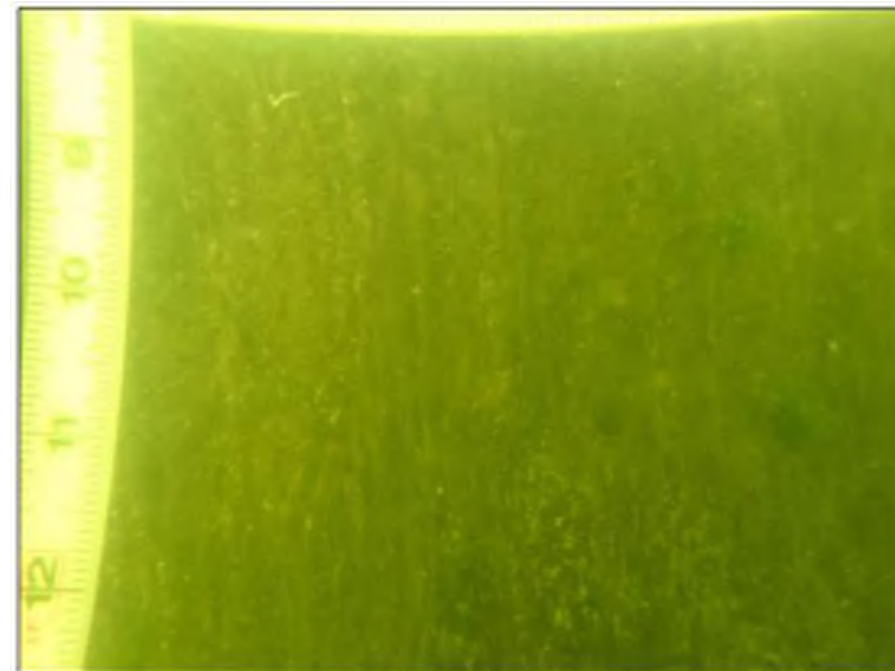


Photo 04: Lagoon Wharf Substructure
Typical condition of timber piles below waterline



Photo 05: Lagoon Wharf Substructure
Typical condition of timber piles near channel bottom



Photo 06: Lagoon Wharf Substructure
Typical damaged cross-bracing

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Dive Inspection Photos - Sheet 1 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 07: Lagoon Wharf Substructure
Core decay in water support square piles at bent 0



Photo 08: Lagoon Wharf Substructure
Typical timber decay in walers and cross-bracing

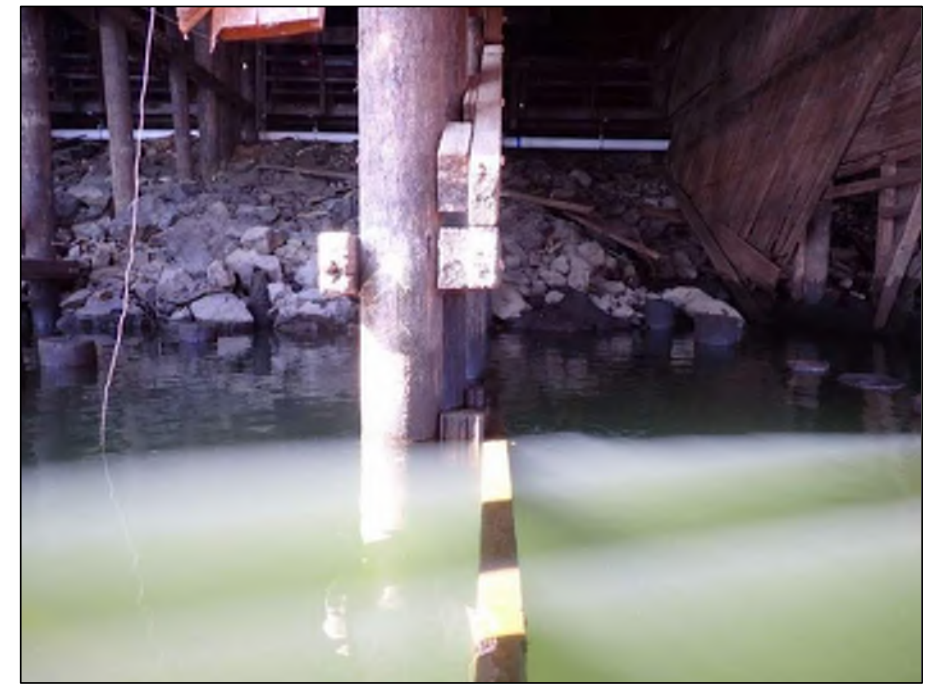


Photo 09: Lagoon Wharf Substructure
Typical timber decay in walers and cross-bracing

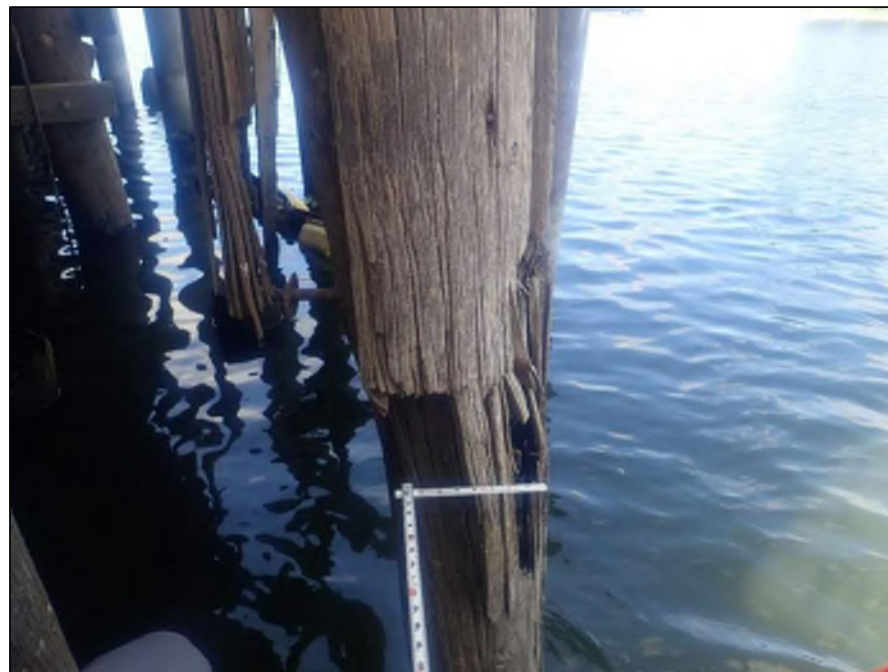


Photo 10: Lagoon Wharf Substructure
Bent 135, Pile A
Broken pile



Photo 11: Lagoon Wharf Embankment
Typical condition of embankment

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Dive Inspection Photos - Sheet 2 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Resistance Drill Measurements							
Swan Island Basin	Location: Portland, OR		Company: <i>Collins Engineers, Inc.</i>			Divers: Pinkston, Moss, Malone, Sukow	
Facility: Various	Auditor: Jordan Furlan		Inspection Date: 07/19/2022 - 07/28/2022				
Time of Day: N/A	Tide: +0-3 ft. MLLW		Pile Type (Bearing, Batter, Sheet, Guide): Bearing, Batter			Component Material: Timber	
Measurement	Property	Bent	Pile	Depth	Length of decay	Estimated cross-section loss	Notes
1	Berth 302 - 305 - Lagoon Wharf	0	A	2-3' above waterline	6.5	50%	
2		0	B	2-3' above waterline	0		
3		10	A	2-3' above waterline	0		
4		10	C	2-3' above waterline	0		
5		10	D	2-3' above waterline	0		
6		20	B	2-3' above waterline	1	10%	
7		23	C	2-3' above waterline	0		
8		23	E	2-3' above waterline	0		
9		24	C	2-3' above waterline	0		
10		24	F	2-3' above waterline	0		
11		32	A	2-3' above waterline	0		
12		32	B	2-3' above waterline	0		
13		40	B	2-3' above waterline	0		
14		40	C	2-3' above waterline	0		
15		49	A	2-3' above waterline	0		
16		62	C	2-3' above waterline	0		
17		62	D	2-3' above waterline	0		
18		63	B	2-3' above waterline	0		
19		63	A	2-3' above waterline	0		
20		70	A	2-3' above waterline	0		
21		80	A	2-3' above waterline	0		
22		80	B	2-3' above waterline	0		
23		**	**	2-3' above waterline	0		Bad reading
24		90	A	2-3' above waterline	0		
25		90	C	2-3' above waterline	0		
26		99	A	2-3' above waterline	0		
27		112	A	2-3' above waterline	0		

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Resistance Drill Measurements - Sheet 1 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Resistance Drill Measurements							
Swan Island Basin	Location: Portland, OR		Company: <i>Collins Engineers, Inc.</i>		Divers: Pinkston, Moss, Malone, Sukow		
Facility: Various	Auditor: Jordan Furlan		Inspection Date: 07/19/2022 - 07/28/2022				
Time of Day: N/A	Tide: +0-3 ft. MLLW		Pile Type (Bearing, Batter, Sheet, Guide): Bearing, Batter		Component Material: Timber		
Measurement	Property	Bent	Pile	Depth	Length of decay	Estimated cross-section loss	Notes
28	Berth 302 - 305 - Lagoon Wharf	112	B	2-3' above waterline	1.5	15%	
29		**	**	2-3' above waterline	0		Bad reading
30		**	**	2-3' above waterline	0		Bad reading
31		123	A	2-3' above waterline	0		
32		130	A	2-3' above waterline	0		
33		135	D	2-3' above waterline	8	45%	
34		135	D	2-3' above waterline	7	45%	
35		135	E	2-3' above waterline	0		
36		13	A	5' below waterline	0		
37		13	A	Channel bottom	0		
38		13	B	Channel bottom	0		
39		13	C	Channel bottom	0		
40		13	D	Channel bottom	0		
41		13	E	Channel bottom	0		
42		13	E	5' below waterline	0		
43		13	D	5' below waterline	0		Bad reading
44		13	D	5' below waterline	0		
45		13	C	5' below waterline	0		
46		13	B	5' below waterline	0		Bad reading
47		13	B	5' below waterline	0		
48		47	A	Channel bottom	0		
49		47	B	Channel bottom	0		
50		47	C	Channel bottom	0		
51		47	D	Channel bottom	0		
52		47	E	Channel bottom	0		
53		47	E	5' below waterline	0		Bad reading
54		47	D	5' below waterline	0		

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Resistance Drill Measurements - Sheet 2 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Resistance Drill Measurements								
Swan Island Basin	Location: Portland, OR		Company: Collins Engineers, Inc.		Divers: Pinkston, Moss, Malone, Sukow			
Facility: Various	Auditor: Jordan Furlan		Inspection Date: 07/19/2022 - 07/28/2022					
Time of Day: N/A	Tide: +0-3 ft. MLLW		Pile Type (Bearing, Batter, Sheet, Guide): Bearing, Batter		Component Material: Timber			
Measurement	Property	Bent	Pile	Depth	Length of decay	Estimated cross-section loss	Notes	
55	Berth 302 - 305 - Lagoon Wharf	47	C	5' below waterline	0			
56		47	B	5' below waterline	0			
57		47	A	5' below waterline	0			
58		50	A	Channel bottom	0			
59		50	B	Channel bottom	0			
60		50	C	Channel bottom	0			
61		50	D	Channel bottom	0			
62		50	E	Channel bottom	0			
63		50	E	5' below waterline	0			
64		50	D	5' below waterline	0			
65		50	C	5' below waterline	0			
66		50	B	5' below waterline	0			
67		50	A	5' below waterline	0			
68		78	A	5' below waterline	0			
69		78	A	Channel bottom	0			Bad reading
70		78	A	Channel bottom	0			
71		78	C	Channel bottom	0			
72		78	C	5' below waterline	0			
73		78	D	Channel bottom	0			
74		78	D	5' below waterline	0			
75		81	A	5' below waterline	0			
76		81	A	Channel bottom	0			
77		81	C	Channel bottom	0			Bad reading
78		81	C	Channel bottom	0			
79		81	C	5' below waterline	0			
80		81	E	5' below waterline	0			Bad reading
81		81	E	5' below waterline	0			Bad reading

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Resistance Drill Measurements - Sheet 3 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Resistance Drill Measurements							
Swan Island Basin	Location: Portland, OR		Company: <i>Collins Engineers, Inc.</i>		Divers: Pinkston, Moss, Malone, Sukow		
Facility: Various	Auditor: Jordan Furlan		Inspection Date: 07/19/2022 - 07/28/2022				
Time of Day: N/A	Tide: +0-3 ft. MLLW		Pile Type (Bearing, Batter, Sheet, Guide): Bearing, Batter		Component Material: Timber		
Measurement	Property	Bent	Pile	Depth	Length of decay	Estimated cross-section loss	Notes
82	Berth 302 - 305 - Lagoon Wharf	81	E	5' below waterline	0		Bad reading
83		81	E	5' below waterline	0		Bad reading
84		81	E	Waterline	0		

Attachment A-9
Berth 302 - 305 - Lagoon Wharf
Resistance Drill Measurements - Sheet 4 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Attachment A-10

Berth 306

Facility Information

Owner	Shipyard Commerce Center, LLC	
Asset Name(s)	Shipyard Commerce Center (SCC) Lay Berths 306 & 307	
Construction Year	No information received	
Owner/Operator Notes	Berth 306 is utilized for storing floating equipment Berth 307 is utilized for storing a historic vessel and museum	
Previous Inspection Year	No information received	
Previous Inspection Assessment Rating/Notes	No information received	
Repair History	No information received	
Structure Components	Berth 306 & 307	<ul style="list-style-type: none">• (2) 98' x 72' (max) lay berths• Concrete deck• Timber piles• Timber bracing
	Dolphins	<ul style="list-style-type: none">• (15) Timber Dolphins
Other information	Facility Length/ Depth/ Design Depth	(2) 98' x 72'
	Fender System	Breasting dolphins
	Mooring System	Upland - steel appurtenances
	Dolphin System	Timber dolphins
	Other System	Not applicable

General Location

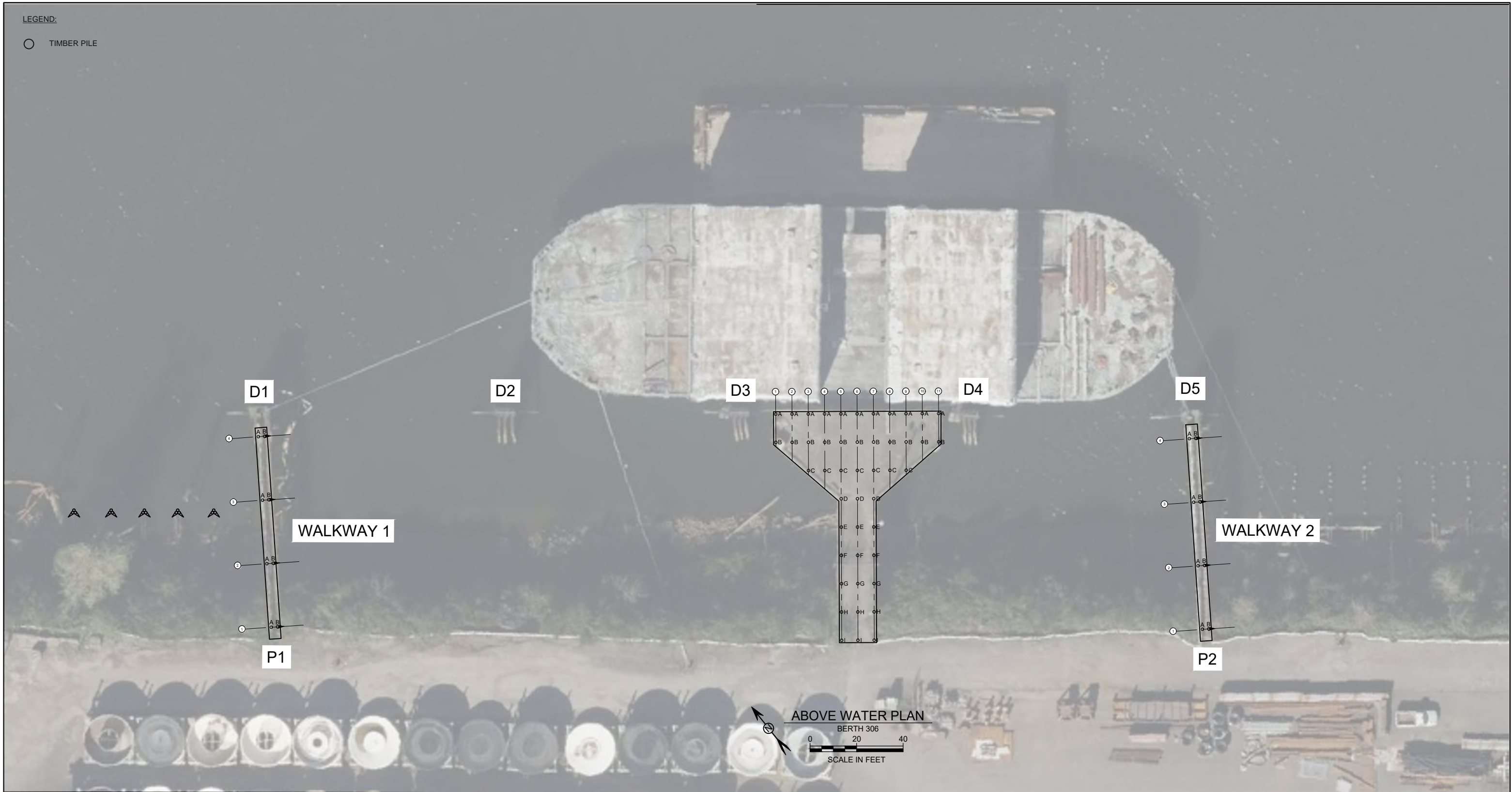


Asset Photo



LEGEND:

○ TIMBER PILE



[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SB = SUBSTRUCTURE

ELEMENT TYPE:
CB = CROSS-BRACING

MATERIAL TYPE:
T = TIMBER

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

Attachment A-10

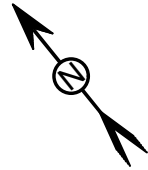
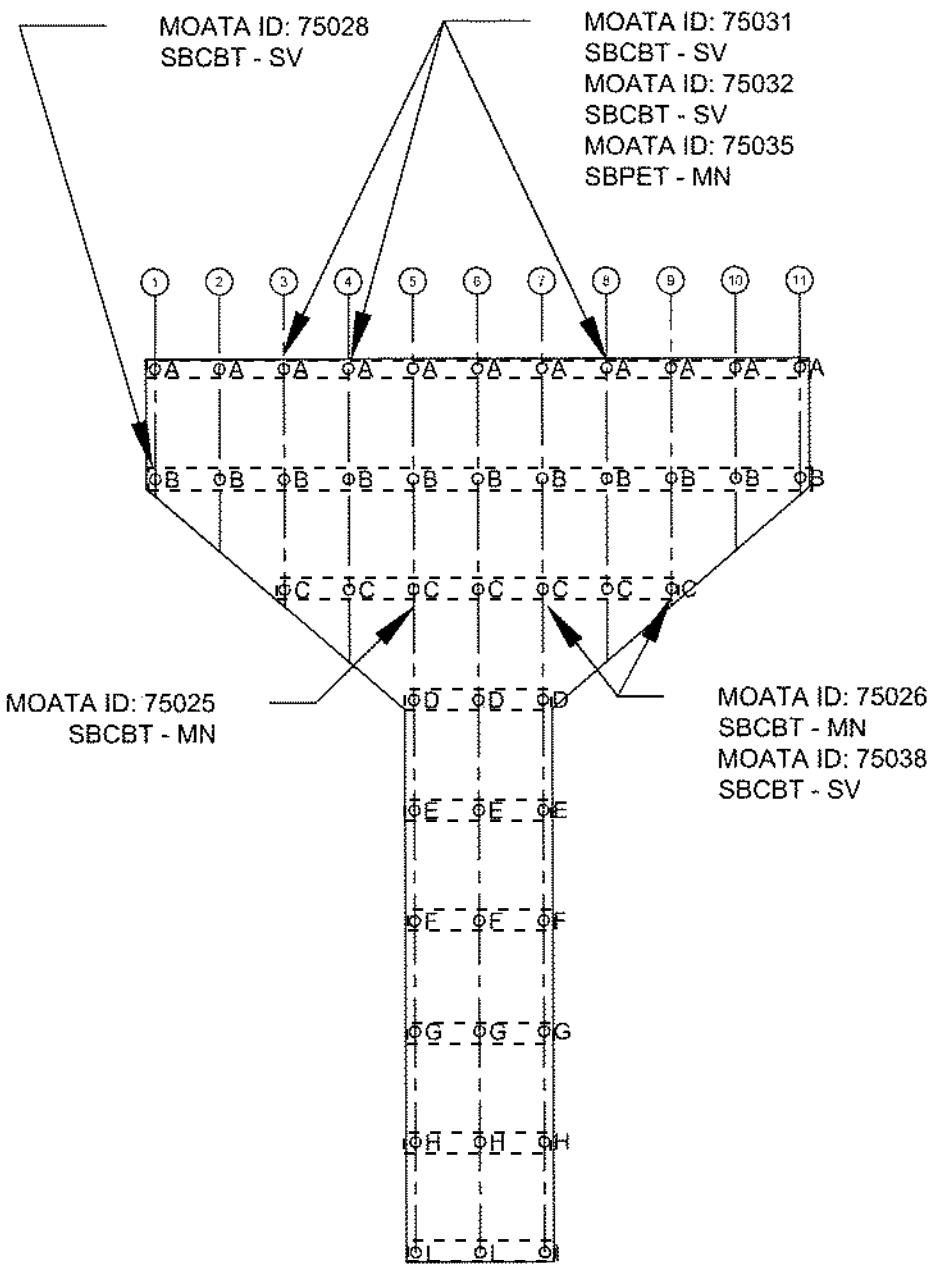
Berth 306

Structure Layout - Sheet 1 of 3

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

LEGEND:

- TIMBER PILE
- ⌵ ⌵ ⌵ TIMBER PILE CAP
- CONCRETE DECK



Not to scale

ABOVE WATER PLAN
BERTH 306

[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SB = SUBSTRUCTURE

ELEMENT TYPE:
CB = CROSS-BRACING
PE = PILE/SHEET PILE

MATERIAL TYPE:
C = REINFORCED CONCRETE
S = STEEL
T = TIMBER

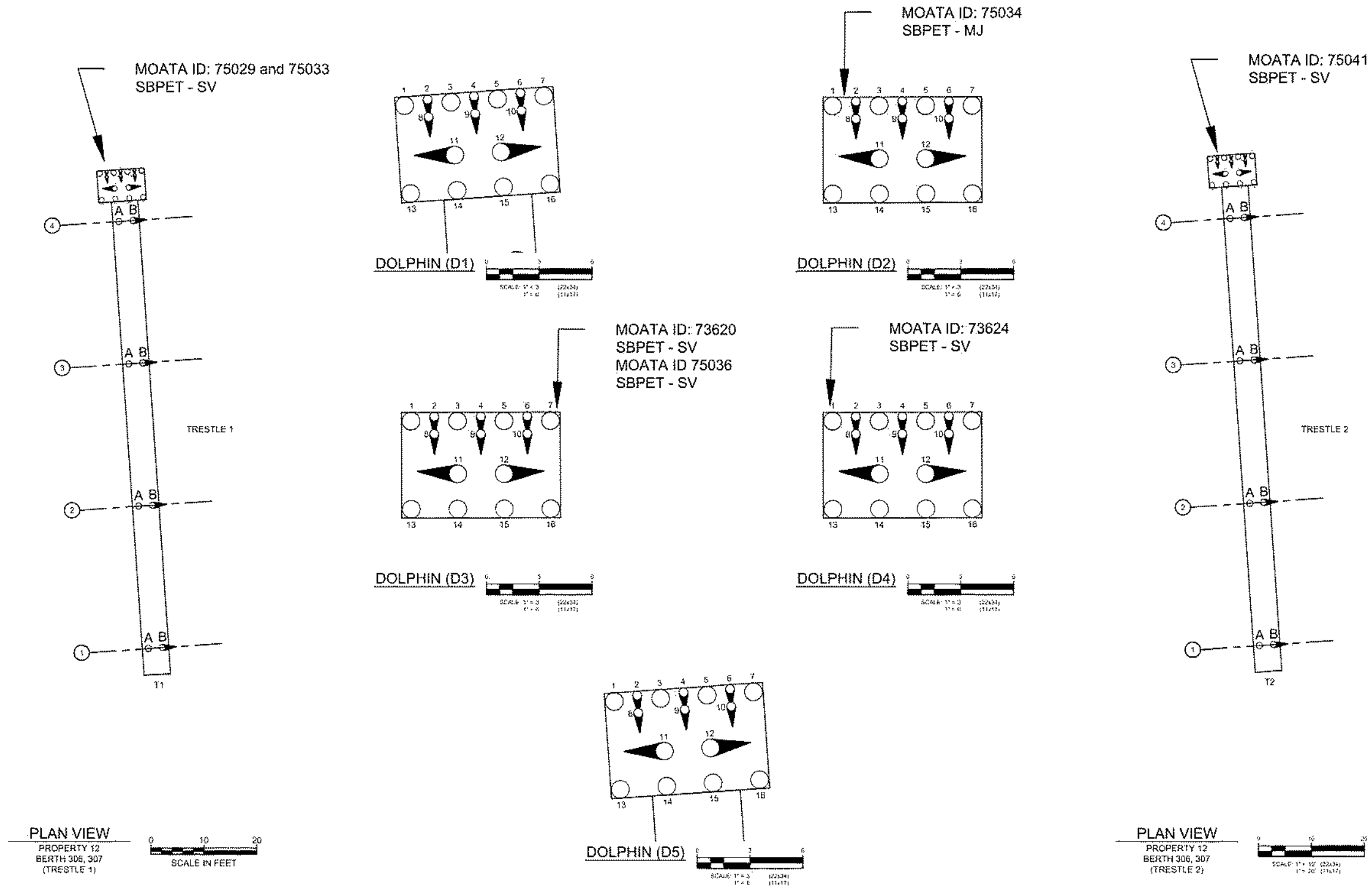
DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

GENERAL NOTES:
1. Drawings are not to scale and are intended to
generally locate structural members to note
inspection observations.

Attachment A-10 Berth 306 Structure Layout - Sheet 2 of 3

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

LEGEND:
TIMBER BATTER PILE
TIMBER PILE



[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SB = SUBSTRUCTURE

ELEMENT TYPE:
CB = CROSS-BRACING
PE = PILE/SHEET PILE

MATERIAL TYPE:
C = REINFORCED CONCRETE
S = STEEL
T = TIMBER

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

Attachment A-10 Berth 306 Structure Layout - Sheet 3 of 3

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Lay Berth 306 Superstructure
Overview of Concrete Deck
Typical condition of concrete deck
Moata ID: Not Applicable



Photo 02: Lay Berth 306 Superstructure
Underside of Concrete Deck Overview
Typical condition of underside of concrete deck
Moata ID: Not Applicable



Photo 03: Lay Berth 306 Dolphin
Dolphin D1 Overview
Typical configuration of dolphin
Moata ID: 75029



Photo 04: Lay Berth 306 Dolphin
Dolphin D1
Partially broken pile
Moata ID: 75029



Photo 05: Lay Berth 306 Dolphin
Dolphin D3
Partially broken pile
Moata ID: 75036

Attachment A-10 Berth 306

Above-Water Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., AE., HW.		Materials:	Timber
Location:	Portland, OR			Above Water:	ES., PY., SH., HW.		Elements:	Substructure
Facility:	Lay Berths 306 and 307			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73620	N/A	7	Dolphin (Breasting dolphin)	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Dolphin 3: Pile 7 is shattered and has cross-section area loss over 50%, splits going down roughly 15 feet from top of the pile-connections and is compromised/broken at several locations.
73624	N/A	All	Dolphin (Breasting dolphin)	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Dolphin 4: cross-section area loss is visible on all piles with pile 1 having cross-section area loss over 75%. Cracks greater than 1/2 inch on various piles. Pile 1 is severed.
75025	5	C	Pier / Wharf	Substructure	Cross-bracing	Timber	Minor (MN)	Berth 306: Splits on the cross-bracing are less than 1/2 inch wide from the connection to the end of cross-bracing.
75026	7	C	Pier / Wharf	Substructure	Cross-bracing	Timber	Minor (MN)	Berth 306: Splits on the cross-bracing are less than 0.25" wide from connection to the end of cross-bracing.
75028	1	B	Pier / Wharf	Substructure	Cross-bracing	Timber	Severe (SV)	Berth 306: Cross-bracing has loss of connection.
75029	N/A	11, 13, 1 and 10	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Trestle 1: Pile 10 and 11 are broken. Pile 13 sounds hollow. Pile 1 has splits full length.
75031	3	A	Pier / Wharf	Substructure	Cross-bracing	Timber	Severe (SV)	Berth 306: Cross-bracing is broken.

Attachment A-10
Berths 306 and 307
Moata Forms - Sheet 1 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., AE., HW.		Materials:	Timber
Location:	Portland, OR			Above Water:	ES., PY., SH., HW.		Elements:	Substructure
Facility:	Lay Berths 306 and 307			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75032	4	A	Pier / Wharf	Substructure	Cross-bracing	Timber	Severe (SV)	Berth 306: 3 broken members are at waterline.
75033	All	All	Trestle	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	General condition of Trestle 1 piles: Bent 4 pile 1 sounds hollow, the inner core is likely is not intact. Several bracing members are broken. Piles are weathered with minor splits and checks.
75034	N/A	8, 12 and 13	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Dolphin 2: All piles were observed with minor splits and checks. Pile 8, 12 and 13 sound hollow, the inner core is likely not intact.
75035	8	A	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Minor (MN)	Splits and checks are less than 1/8 inch, going through the full length of the pile.
75036	N/A	1,12 and 2	Dolphin	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Dolphin 3: Pile 1 is broken. Pile 12 is broken. Pile 2 sounds hollow and the inner core likely is not intact. Other structural components have the similar condition as Dolphin 1.
75038	9	C	Pier / Wharf	Substructure	Cross-bracing	Timber	Minor (MN)	Cross-bracing has a partial split with 1/4 inch wide by 3 feet in length and going through the connection.
75041	2 and 4	A	Trestle	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Trestle 2: Bent 4 pile A has a large spilt and sounds hollow, the inner core is likely not intact. The pile is wagging. 3 braces are broken. Bent 2 Pile A has large checks and splits.

Attachment A-10
Berths 306 and 307

Moata Forms - Sheet 2 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., AE., HW.		Materials:	Timber
Location:	Portland, OR			Above Water:	ES., PY., SH., HW.		Elements:	Substructure
Facility:	Lay Berths 306 and 307			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75042	1	A	Pier / Wharf	Substructure	Cross-bracing	Timber	Severe (SV)	Berth 307: Cross-bracing is broken near the waterline.
75043	N/A	1,2,3,7,8 10 and 11	Dolphin	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Dolphin 6: Piles 1,2,3,7,8,10 and 11 are broken. Pile 7 has large splits and check. One of the pile caps is missing.
75044	4	A	Pier / Wharf	Substructure	Cross-bracing	Timber	Severe (SV)	Berth 307: Cross-bracing is broken near the waterline.
75045	5	A	Pier / Wharf	Substructure	Cross-bracing	Timber	Severe (SV)	Berth 307: Cross-bracing is broken near the waterline.
75046	N/A	1, 3, 4, 5, 6, 7 and 10	Dolphin	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Dolphin 7: Pile cap is missing. Pile 1 has section loss. Piles 1,3,5, and 7 have splits and checks up to 1/2 inch. Piles 4, 6 and 10 are broken at the top.
75048	N/A	2, 4, 6, 8, 9 and 10	Dolphin	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Dolphin 8: Piles 2, 4, 6, 8, 9 and 10 are broken.
75049	9 to 10	A	Pier / Wharf	Substructure	Cross-bracing	Timber	Severe (SV)	Berth 307: Cross-bracing is broken at mid-height.

Attachment A-10
Berths 306 and 307

Moata Forms - Sheet 3 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., AE., HW.		Materials:	Timber
Location:	Portland, OR			Above Water:	ES., PY., SH., HW.		Elements:	Substructure
Facility:	Lay Berths 306 and 307			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75050	N/A	1, 2, 4, 6, 8, 9, 10 and 11	Dolphin	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Dolphin 9: Piles 1, 2, 4, 6, 8, 9, 10 and 11 are broken.
75053	N/A	1, 2, 4, 6, 7, 8, 9 and 10	Dolphin	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Dolphin 10: Piles 1, 2, 4, 6, 7, 8, 9, and 10 are broken.
75054	2	B	Trestle	Substructure	Pile / Sheet Pile	Timber	Minor (MN)	Trestle 3 Pile 2B: Splits and checks up to 1/2 inch.
75055	2	A	Trestle	Substructure	Pile / Sheet Pile	Timber	Moderate (MD)	Trestle 3 Pile 2A: Splits and checks greater than 1/2 inch.
75063	1	B	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Berth 307: Bent 1 pile B has 2-1/2 inch outer shell and 50% cross-section area loss 5 feet above the waterline. Pile is soft and saturated 1 foot above the waterline. Diagonal bracing is broken at the downstream direction.
75064	3	C	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Berth 307: Bent 3 pile C is soft for first 2 inches. The diameter loss is 16% .

Attachment A-10
Berths 306 and 307

Moata Forms - Sheet 4 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Lay Berths 306 & 307 Substructure
Typical substructure configuration

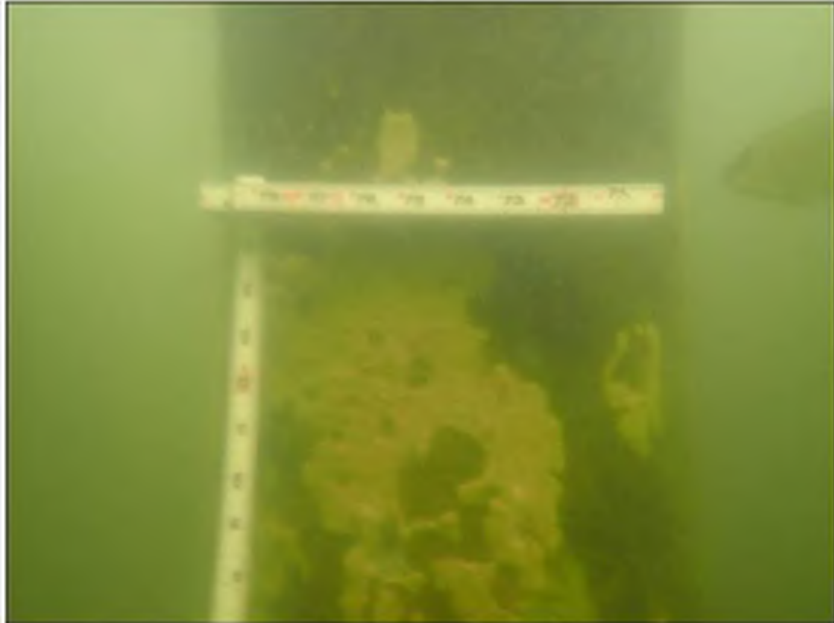


Photo 02: Lay Berths 306 & 307 Substructure
Typical condition of timber piles below waterline

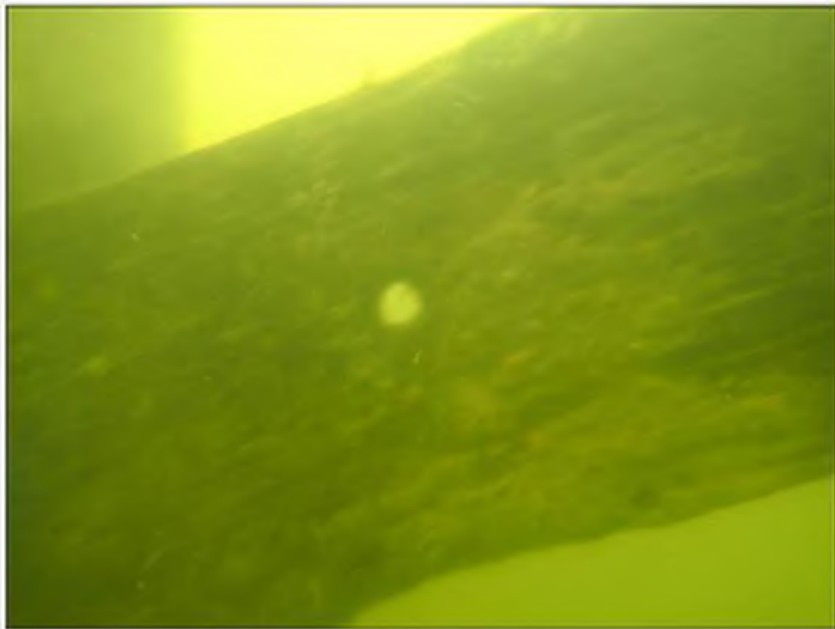


Photo 03: Lay Berth 306 & 307 Substructure
Berth 306 Bent 1
Unsecured water

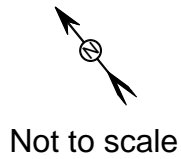


Photo 04: Lay Berths 306 & 307 Dolphins
Dolphin D4 pile 6
Internal decay in pile

Attachment A-10
Berths 306
Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Resistance Drill Measurements							
Swan Island Basin	Location: Portland, OR		Company: <i>Collins Engineers, Inc.</i>			Divers: Pinkston, Moss, Malone, Sukow	
Facility: Various	Auditor: Jordan Furlan		Inspection Date: 07/19/2022 - 07/28/2022				
Time of Day: N/A	Tide: +0-3 ft. MLLW		Pile Type (Bearing, Batter, Sheet, Guide): Bearing, Batter			Component Material: Timber	
Measurement	Property	Bent	Pile	Depth	Length of decay	Estimated cross-section loss	Notes
132	Lay Berth 306 & 307	Dolphin 10	12	2-3' above waterline	0		Bad reading
133		Dolphin 6	5	2-3' above waterline	0		
134		Dolphin 5	3	2-3' above waterline	0		
135		Dolphin 5	1	2-3' above waterline	0		
136		Dolphin 4	10	2-3' above waterline	0		
137		Dolphin 4	6	2-3' above waterline	9	60%	
138		Dolphin 4	16	2-3' above waterline	0		
139		9	C	2-3' above waterline	0		
140		9	B	2-3' above waterline	0		
141		9	B	2-3' above waterline	0		
142		Dolphin 1	8	2-3' above waterline	0		
143		Dolphin 1	2	2-3' above waterline	0		Bad reading
144		Dolphin 1	2	2-3' above waterline	0		
145		Dolphin 2	10	2-3' above waterline	0		
146		Dolphin 2	16	2-3' above waterline	0		
147		3	C	2-3' above waterline	0		
148		3	B	2-3' above waterline	1	15%	
149		2	B	2-3' above waterline	0		
150		Dolphin 3	8	2-3' above waterline	0.5	<5%	
151		Dolphin 3	2	2-3' above waterline	0		



Attachment A-11

Berth 307

Facility Information

Owner	Shipyard Commerce Center, LLC	
Asset Name(s)	Shipyard Commerce Center (SCC) Lay Berths 306 & 307	
Construction Year	No information received	
Owner/Operator Notes	Berth 306 is utilized for storing floating equipment Berth 307 is utilized for storing a historic vessel and museum	
Previous Inspection Year	No information received	
Previous Inspection Assessment Rating/Notes	No information received	
Repair History	No information received	
Structure Components	Berth 306 & 307	<ul style="list-style-type: none">• (2) 98' x 72' (max) lay berths• Concrete deck• Timber piles• Timber bracing
	Dolphins	<ul style="list-style-type: none">• (15) Timber Dolphins
Other information	Facility Length/ Depth/ Design Depth	(2) 98' x 72'
	Fender System	Breasting dolphins
	Mooring System	Upland - steel appurtenances
	Dolphin System	Timber dolphins
	Other System	Not applicable

General Location



Asset Photo



LEGEND:

○ TIMBER PILE



[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SB = SUBSTRUCTURE

ELEMENT TYPE:
CB = CROSS-BRACING
PE = PILE/SHEET PILE

MATERIAL TYPE:
C = REINFORCED CONCRETE
S = STEEL
T = TIMBER

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

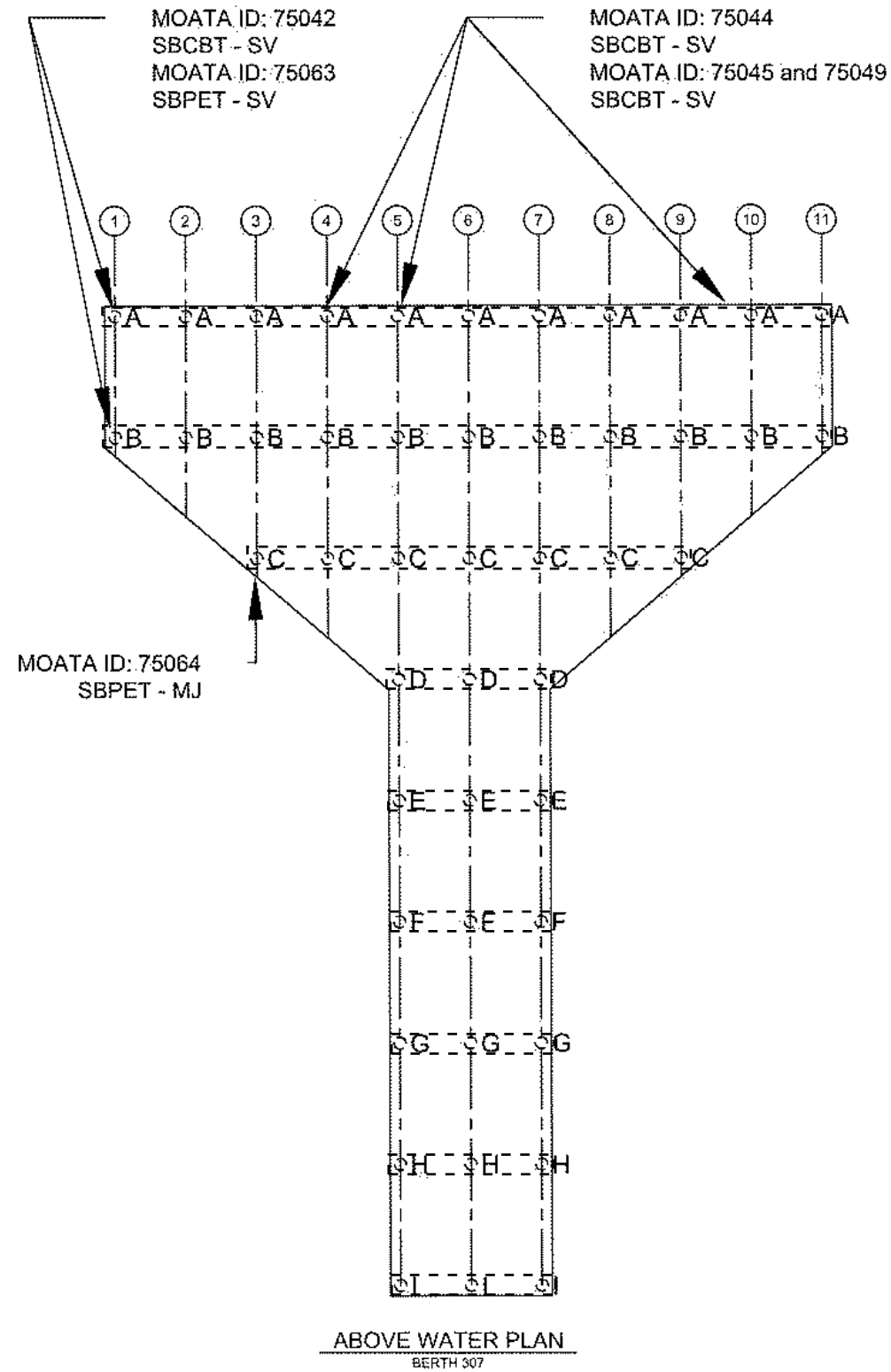
GENERAL NOTES:
1. Drawings are not to scale and are intended to
generally locate structural members to note
inspection observations.

Attachment A-11 Berth 307 Structure Layout - Sheet 1 of 3

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

LEGEND:

- TIMBER PILE
- TIMBER PILE CAP
- CONCRETE DECK



[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SB = SUBSTRUCTURE

ELEMENT TYPE:
CB = CROSS-BRACING
PE = PILE/SHEET PILE

MATERIAL TYPE:
C = REINFORCED CONCRETE
S = STEEL
T = TIMBER

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

GENERAL NOTES:



1. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.

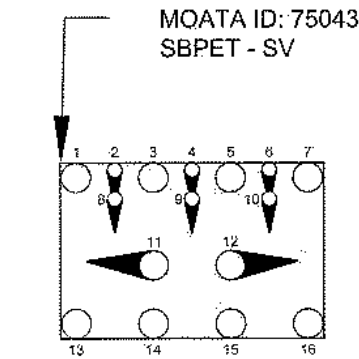
**Attachment A-11
Berth 307**

Structure Layout - Sheet 2 of 3

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

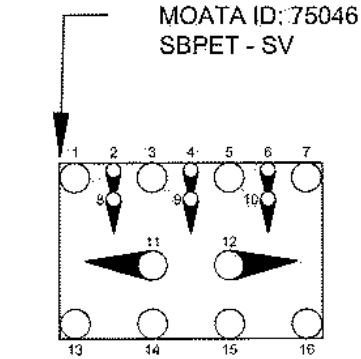
LEGEND:

-  TIMBER BATTER PILE
-  TIMBER PILE



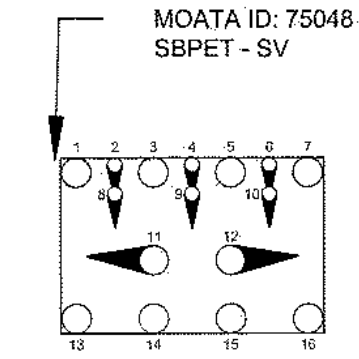
DOLPHIN (D6)

SCALE: 1" = 3' (22x34)
1" = 6' (11x17)



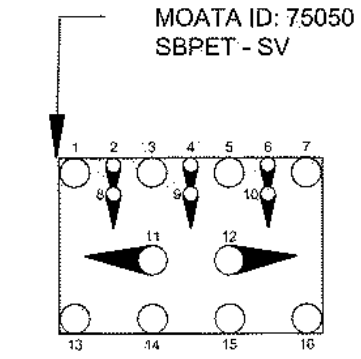
DOLPHIN (D7)

SCALE: 1" = 3' (22x34)
1" = 6' (11x17)



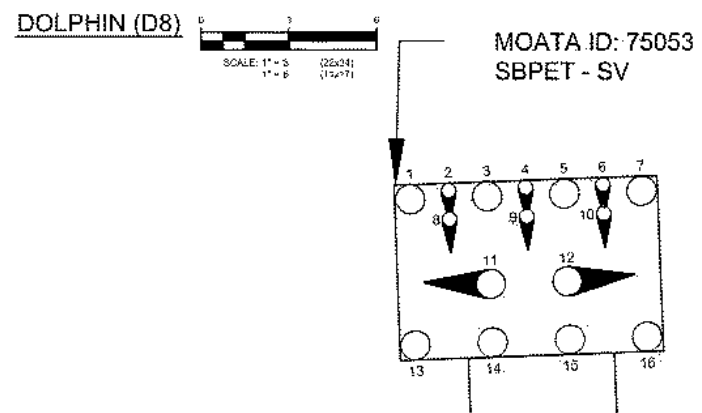
DOLPHIN (D8)

SCALE: 1" = 3' (22x34)
1" = 6' (11x17)



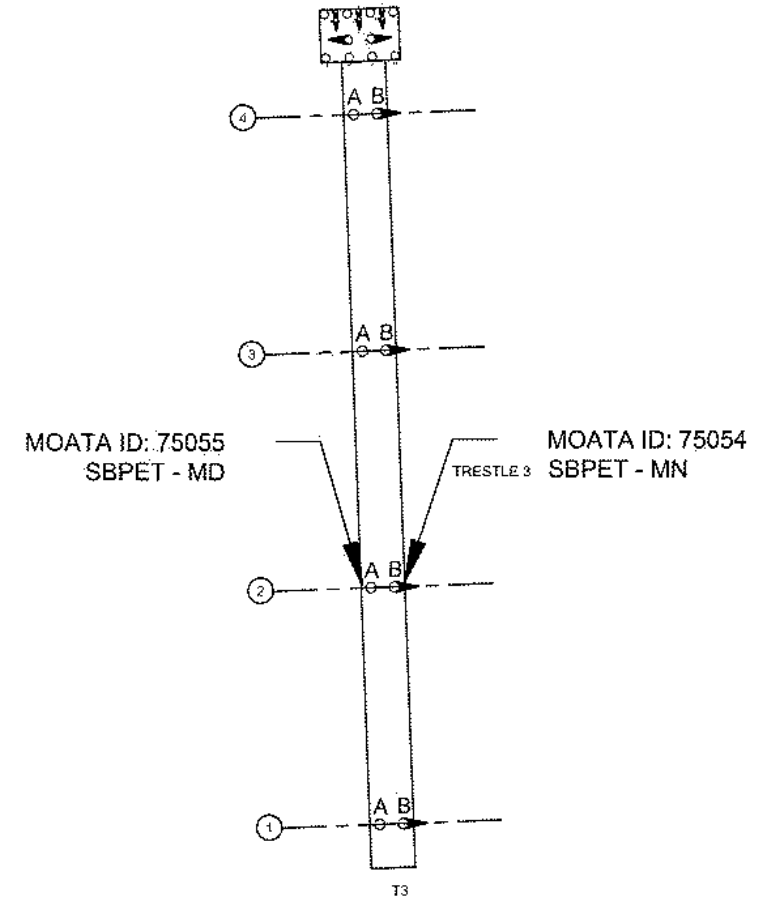
DOLPHIN (D9)

SCALE: 1" = 3' (22x34)
1" = 6' (11x17)



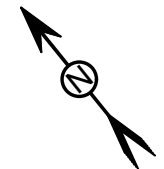
DOLPHIN (D10)

SCALE: 1" = 3' (22x34)
1" = 6' (11x17)



PLAN VIEW
PROPERTY: 12
BERTH 306, 307
(TRESTLE 3)

SCALE: 1" = 10' (22x34)
1" = 20' (11x17)



Scales shown
in the figure

[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SB = SUBSTRUCTURE

ELEMENT TYPE:
CB = CROSS-BRACING
PE = PILE/SHEET PILE

MATERIAL TYPE:
C = REINFORCED CONCRETE
S = STEEL
T = TIMBER

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

Attachment A-11 Berth 307 Structure Layout - Sheet 3 of 3

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Lay Berth 307 Superstructure
 Overview of Concrete Deck
 Typical condition of concrete deck
 Moata ID: Not Applicable



Photo 02: Lay Berth 307 Superstructure
 Underside of Concrete Deck Overview
 Typical condition of underside of concrete deck
 Moata ID: Not Applicable



Photo 03: Lay Berth 307 Substructure
 Cross-Bracing at Bent 1
 Broken cross-bracing
 Moata ID: 75042



Photo 04: Lay Berth 307 Substructure
 Pile B Bent 1
 Typical condition of piles
 Moata ID: 75063



Photo 05: Lay Berth 307 Dolphin
 Dolphin D6
 Broken piles
 Moata ID: 75063

Attachment A-11
 Berth 307
 Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
 Structure Condition Assessment Report
 Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., AE., HW.		Materials:	Timber
Location:	Portland, OR			Above Water:	ES., PY., SH., HW.		Elements:	Substructure
Facility:	Lay Berths 306 and 307			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
73620	N/A	7	Dolphin (Breasting dolphin)	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Dolphin 3: Pile 7 is shattered and has cross-section area loss over 50%, splits going down roughly 15 feet from top of the pile-connections and is compromised/broken at several locations.
73624	N/A	All	Dolphin (Breasting dolphin)	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Dolphin 4: cross-section area loss is visible on all piles with pile 1 having cross-section area loss over 75%. Cracks greater than 1/2 inch on various piles. Pile 1 is severed.
75025	5	C	Pier / Wharf	Substructure	Cross-bracing	Timber	Minor (MN)	Berth 306: Splits on the cross-bracing are less than 1/2 inch wide from the connection to the end of cross-bracing.
75026	7	C	Pier / Wharf	Substructure	Cross-bracing	Timber	Minor (MN)	Berth 306: Splits on the cross-bracing are less than 0.25" wide from connection to the end of cross-bracing.
75028	1	B	Pier / Wharf	Substructure	Cross-bracing	Timber	Severe (SV)	Berth 306: Cross-bracing has loss of connection.
75029	N/A	11, 13, 1 and 10	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Trestle 1: Pile 10 and 11 are broken. Pile 13 sounds hollow. Pile 1 has splits full length.
75031	3	A	Pier / Wharf	Substructure	Cross-bracing	Timber	Severe (SV)	Berth 306: Cross-bracing is broken.

Attachment A-11
Berths 306 and 307
Moata Forms - Sheet 1 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., AE., HW.		Materials:	Timber
Location:	Portland, OR			Above Water:	ES., PY., SH., HW.		Elements:	Substructure
Facility:	Lay Berths 306 and 307			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75032	4	A	Pier / Wharf	Substructure	Cross-bracing	Timber	Severe (SV)	Berth 306: 3 broken members are at waterline.
75033	All	All	Trestle	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	General condition of Trestle 1 piles: Bent 4 pile 1 sounds hollow, the inner core is likely is not intact. Several bracing members are broken. Piles are weathered with minor splits and checks.
75034	N/A	8, 12 and 13	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Dolphin 2: All piles were observed with minor splits and checks. Pile 8, 12 and 13 sound hollow, the inner core is likely not intact.
75035	8	A	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Minor (MN)	Splits and checks are less than 1/8 inch, going through the full length of the pile.
75036	N/A	1,12 and 2	Dolphin	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Dolphin 3: Pile 1 is broken. Pile 12 is broken. Pile 2 sounds hollow and the inner core likely is not intact. Other structural components have the similar condition as Dolphin 1.
75038	9	C	Pier / Wharf	Substructure	Cross-bracing	Timber	Minor (MN)	Cross-bracing has a partial split with 1/4 inch wide by 3 feet in length and going through the connection.
75041	2 and 4	A	Trestle	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Trestle 2: Bent 4 pile A has a large spilt and sounds hollow, the inner core is likely not intact. The pile is wagging. 3 braces are broken. Bent 2 Pile A has large checks and splits.

Attachment A-11
Berths 306 and 307

Moata Forms - Sheet 2 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., AE., HW.		Materials:	Timber
Location:	Portland, OR			Above Water:	ES., PY., SH., HW.		Elements:	Substructure
Facility:	Lay Berths 306 and 307			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75042	1	A	Pier / Wharf	Substructure	Cross-bracing	Timber	Severe (SV)	Berth 307: Cross-bracing is broken near the waterline.
75043	N/A	1,2,3,7,8 10 and 11	Dolphin	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Dolphin 6: Piles 1,2,3,7,8,10 and 11 are broken. Pile 7 has large splits and check. One of the pile caps is missing.
75044	4	A	Pier / Wharf	Substructure	Cross-bracing	Timber	Severe (SV)	Berth 307: Cross-bracing is broken near the waterline.
75045	5	A	Pier / Wharf	Substructure	Cross-bracing	Timber	Severe (SV)	Berth 307: Cross-bracing is broken near the waterline.
75046	N/A	1, 3, 4, 5, 6, 7 and 10	Dolphin	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Dolphin 7: Pile cap is missing. Pile 1 has section loss. Piles 1,3,5, and 7 have splits and checks up to 1/2 inch. Piles 4, 6 and 10 are broken at the top.
75048	N/A	2, 4, 6, 8, 9 and 10	Dolphin	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Dolphin 8: Piles 2, 4, 6, 8, 9 and 10 are broken.
75049	9 to 10	A	Pier / Wharf	Substructure	Cross-bracing	Timber	Severe (SV)	Berth 307: Cross-bracing is broken at mid-height.

Attachment A-11
Berths 306 and 307
Moata Forms - Sheet 3 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., AE., HW.		Materials:	Timber
Location:	Portland, OR			Above Water:	ES., PY., SH., HW.		Elements:	Substructure
Facility:	Lay Berths 306 and 307			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75050	N/A	1, 2, 4, 6, 8, 9, 10 and 11	Dolphin	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Dolphin 9: Piles 1, 2, 4, 6, 8, 9, 10 and 11 are broken.
75053	N/A	1, 2, 4, 6, 7, 8, 9 and 10	Dolphin	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Dolphin 10: Piles 1, 2, 4, 6, 7, 8, 9, and 10 are broken.
75054	2	B	Trestle	Substructure	Pile / Sheet Pile	Timber	Minor (MN)	Trestle 3 Pile 2B: Splits and checks up to 1/2 inch.
75055	2	A	Trestle	Substructure	Pile / Sheet Pile	Timber	Moderate (MD)	Trestle 3 Pile 2A: Splits and checks greater than 1/2 inch.
75063	1	B	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Berth 307: Bent 1 pile B has 2-1/2 inch outer shell and 50% cross-section area loss 5 feet above the waterline. Pile is soft and saturated 1 foot above the waterline. Diagonal bracing is broken at the downstream direction.
75064	3	C	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Berth 307: Bent 3 pile C is soft for first 2 inches. The diameter loss is 16% .

Attachment A-11
Berths 306 and 307

Moata Forms - Sheet 4 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Lay Berths 306 & 307 Substructure
Typical substructure configuration

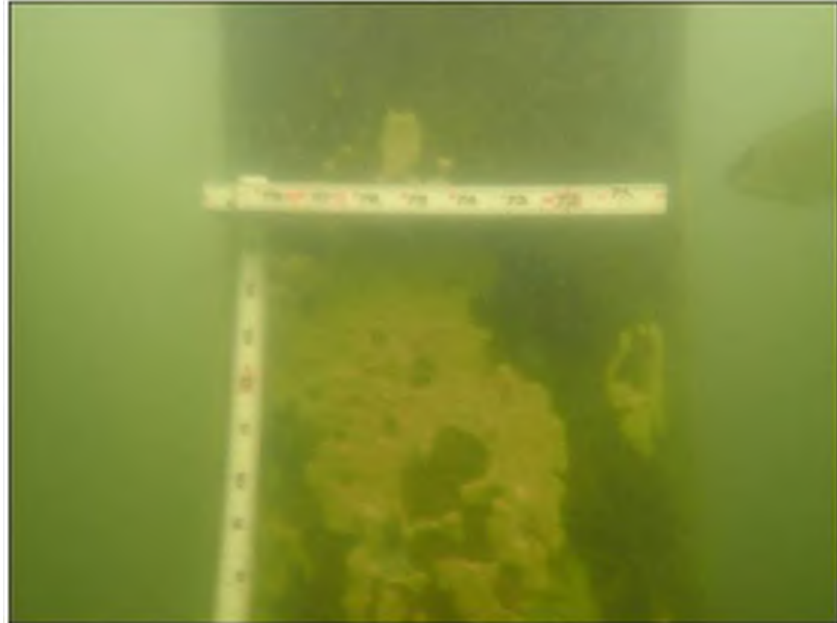


Photo 02: Lay Berths 306 & 307 Substructure
Typical condition of timber piles below waterline

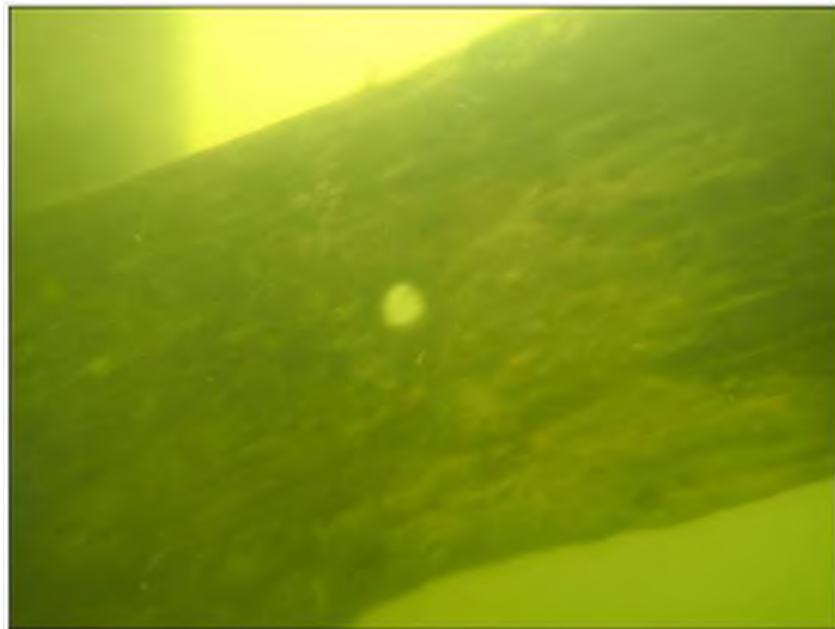


Photo 03: Lay Berth 306 & 307 Substructure
Berth 306 Bent 1
Unsecured water

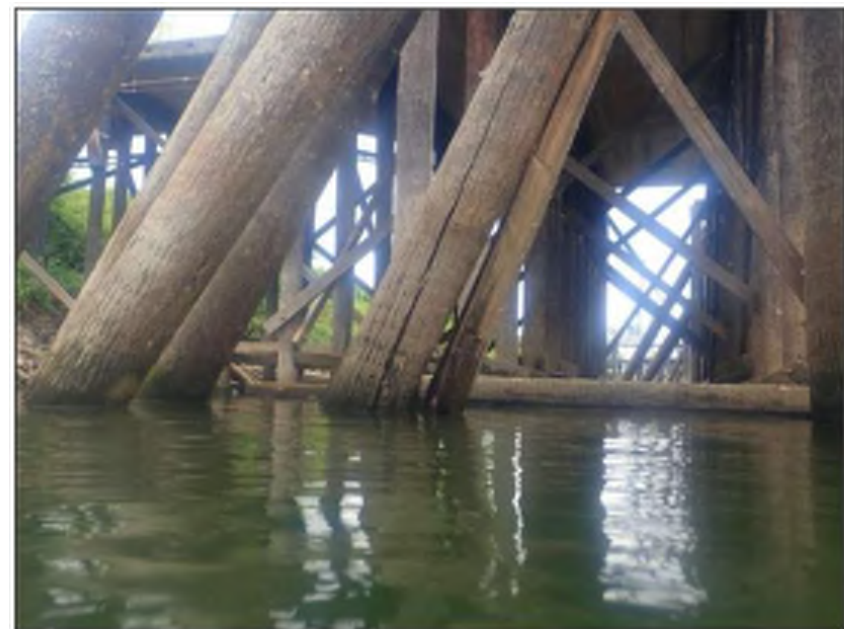


Photo 04: Lay Berths 306 & 307 Dolphins
Dolphin D8
Split timber pile

Resistance Drill Measurements							
Swan Island Basin	Location: Portland, OR		Company: <i>Collins Engineers, Inc.</i>			Divers: Pinkston, Moss, Malone, Sukow	
Facility: Various	Auditor: Jordan Furlan		Inspection Date: 07/19/2022 - 07/28/2022				
Time of Day: N/A	Tide: +0-3 ft. MLLW		Pile Type (Bearing, Batter, Sheet, Guide): Bearing, Batter			Component Material: Timber	
Measurement	Property	Bent	Pile	Depth	Length of decay	Estimated cross-section loss	Notes
132	Lay Berth 306 & 307	Dolphin 10	12	2-3' above waterline	0		Bad reading
133		Dolphin 6	5	2-3' above waterline	0		
134		Dolphin 5	3	2-3' above waterline	0		
135		Dolphin 5	1	2-3' above waterline	0		
136		Dolphin 4	10	2-3' above waterline	0		
137		Dolphin 4	6	2-3' above waterline	9	60%	
138		Dolphin 4	16	2-3' above waterline	0		
139		9	C	2-3' above waterline	0		
140		9	B	2-3' above waterline	0		
141		9	B	2-3' above waterline	0		
142		Dolphin 1	8	2-3' above waterline	0		
143		Dolphin 1	2	2-3' above waterline	0		Bad reading
144		Dolphin 1	2	2-3' above waterline	0		
145		Dolphin 2	10	2-3' above waterline	0		
146		Dolphin 2	16	2-3' above waterline	0		
147		3	C	2-3' above waterline	0		
148		3	B	2-3' above waterline	1	15%	
149		2	B	2-3' above waterline	0		
150		Dolphin 3	8	2-3' above waterline	0.5	<5%	
151		Dolphin 3	2	2-3' above waterline	0		

Attachment A-11
Berths 306 and 307

Resistance Drill Measurements - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

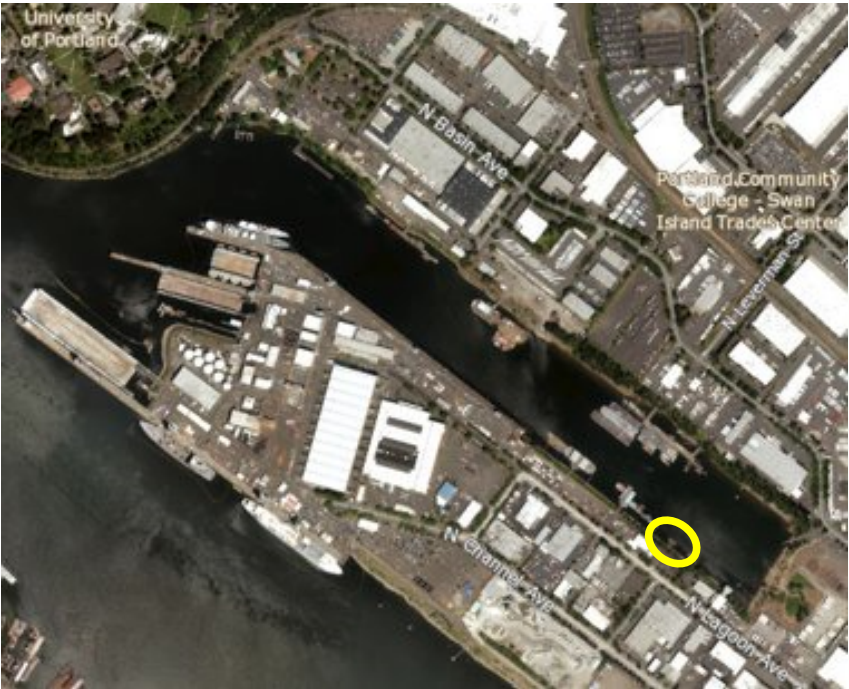
Attachment A-12

Berth 308

Facility Information

Owner	Port of Portland	
Asset Name(s)	Port of Portland Lay Berth 308	
Construction Year	No information received	
Owner/Operator Notes	Berth currently inactive	
Previous Inspection Year	No information received	
Previous Inspection Assessment Rating/Notes	No information received	
Repair History	Unknown	
Structure Components	Berth 308	<ul style="list-style-type: none">• (1) 98' x 72' (max) pier• Timber piles• Reinforced concrete deck• Timber bracing• Timber fender piles
	Dolphins	<ul style="list-style-type: none">• (4) Timber Berthing Dolphins
Other information	Facility Length/ Depth/ Design Depth	98' x 72' (max) pier
	Fender System	Breasting dolphins
	Mooring System	Upland - steel appurtenances
	Dolphin System	Timber dolphins
	Other System	Not applicable

General Location



Asset Photo

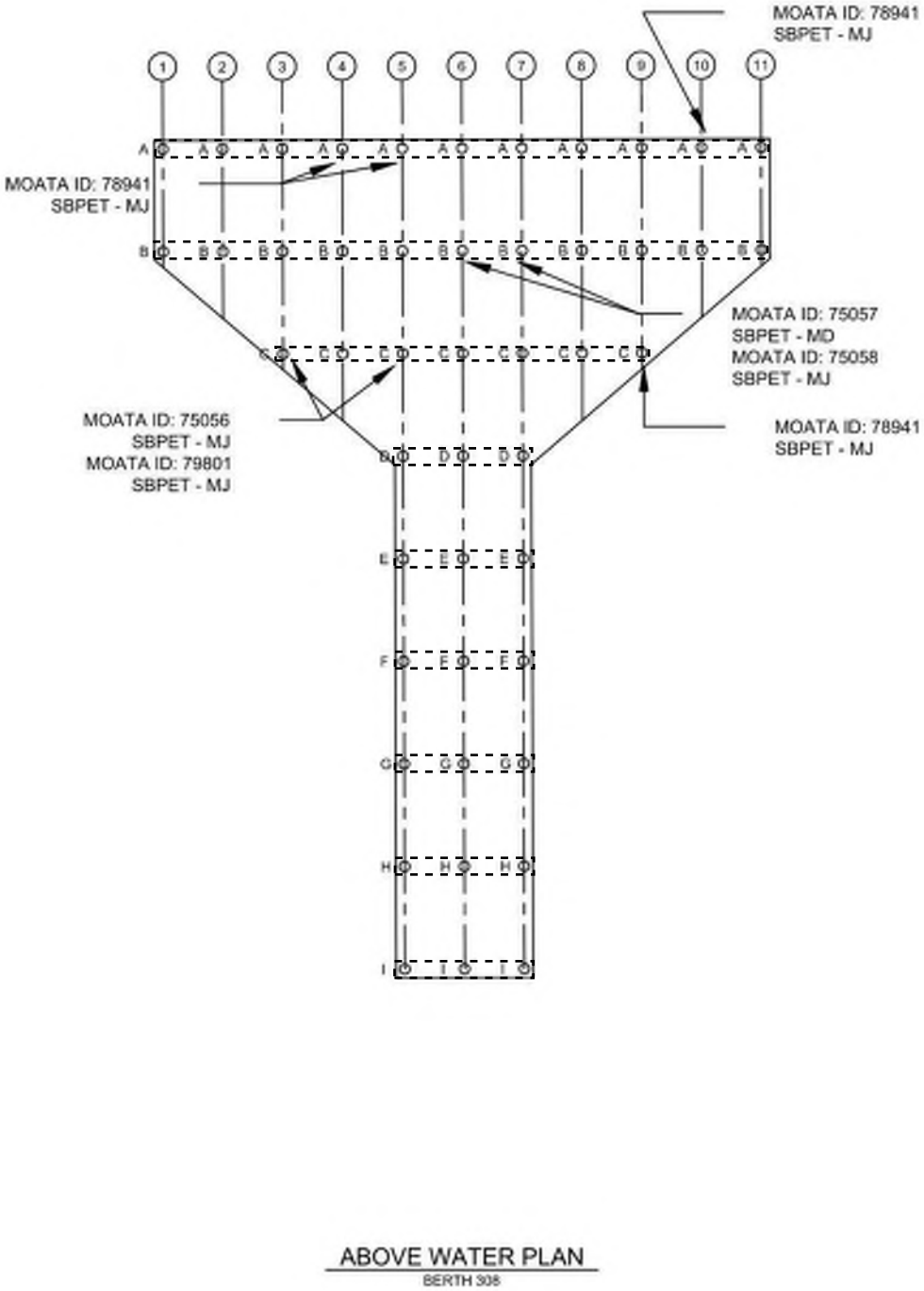
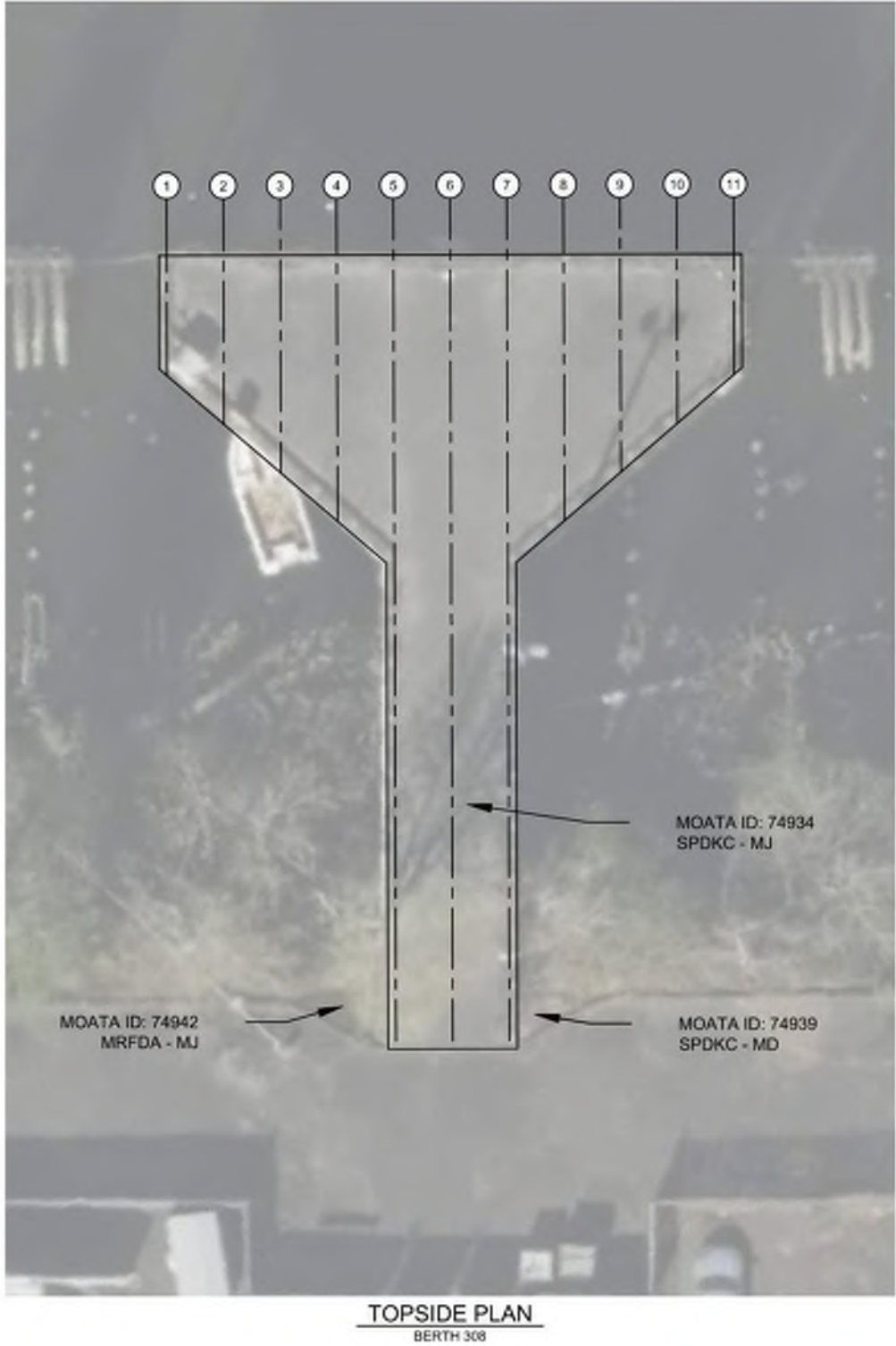


LEGEND:

TIMBER PILE

TIMBER PILE CAP

CONCRETE DECK



Not to scale

[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SP = SUPERSTRUCTURE
FS = FENDER SYSTEM
SB = SUBSTRUCTURE
MR = MOORING

ELEMENT TYPE:
PE = PILE/SHEET PILE
DK = DECK
FD = FOUNDATION

MATERIAL TYPE:
A = ASPHALT
C = REINFORCED CONCRETE
T = TIMBER


DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE


GENERAL NOTES:
1. Drawings are not to scale and are intended to
generally locate structural members to note
inspection observations.

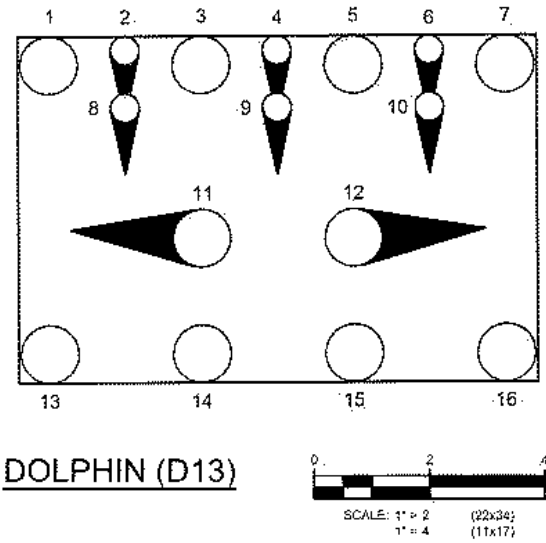
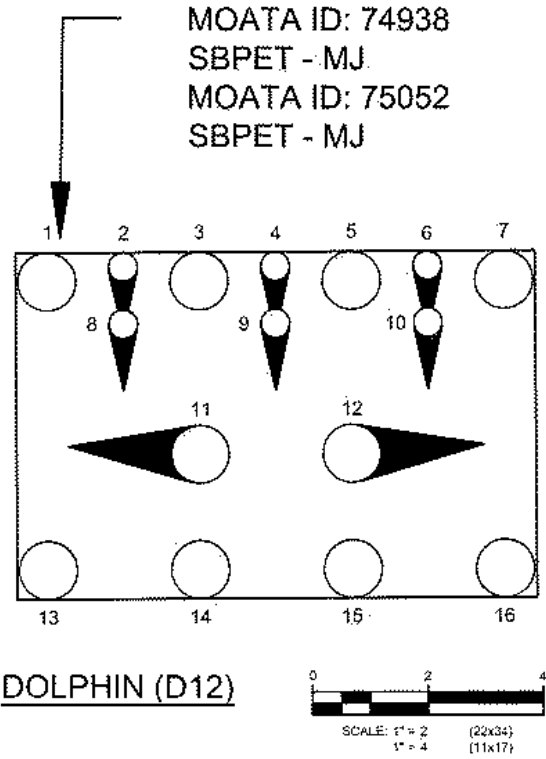
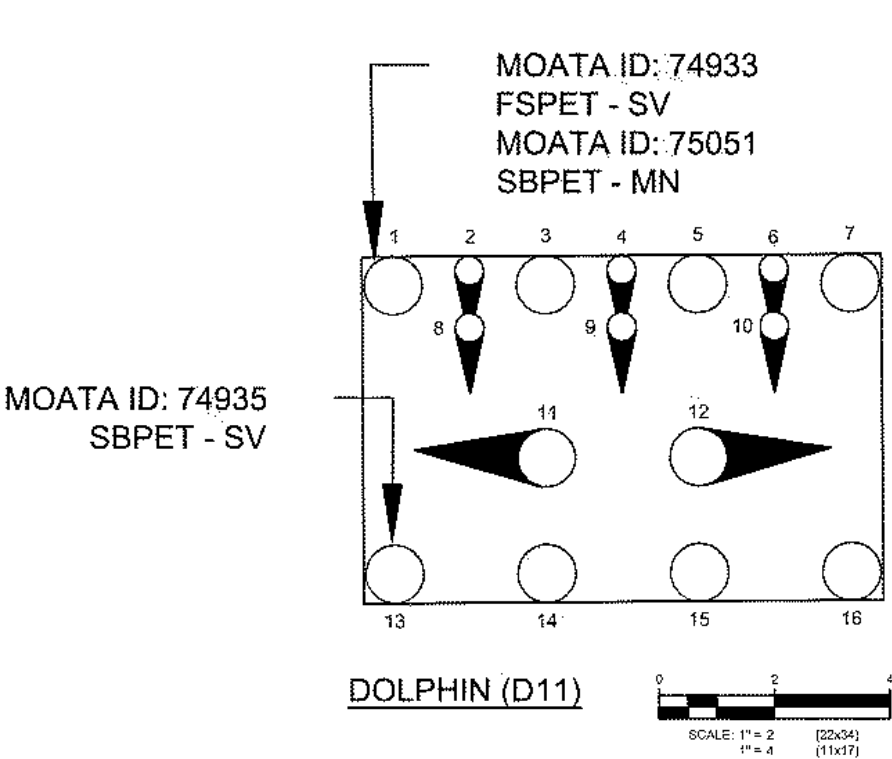
Attachment A-12
Berth 308
Structure Layout - Sheet 1 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

LEGEND:

TIMBER BATTER PILE

TIMBER PILE



Scale shown in the figure

[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SP = SUPERSTRUCTURE
FS = FENDER SYSTEM
SB = SUBSTRUCTURE
MR = MOORING

ELEMENT TYPE:
PE = PILE/SHEET PILE
DK = DECK
FD = FOUNDATION

MATERIAL TYPE:
A = ASPHALT
C = REINFORCED CONCRETE
T = TIMBER

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

GENERAL NOTES:
1. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.

Attachment A-12
Berth 308
Structure Layout - Sheet 2 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Lay Berth 308 Superstructure
Overview of Concrete Deck
Typical condition of concrete deck
Moata ID: 74934



Photo 02: Lay Berth 308 Substructure
Bent 7 Pile B
Typical condition of piles
Moata ID: 75057



Photo 03: Lay Berth 308 Dolphin
Dolphin D11
Broken piles at Dolphin D11
Moata ID: Not Applicable



Photo 04: Lay Berth 308 Substructure
Bent 7 Pile B
Split on the timber pile
Moata ID: 75057

Attachment A-12 Berth 308

Above-Water Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	PY., SH., AE., HW.		Materials:	Reinforced Concrete, Timber, Asphalt
Location:	Portland, OR			Above Water:	ES., PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Mooring
Facility:	Lay Berth 308			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74933	N/A	N/A	Dolphin	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	Two fender piles are missing, and one remaining fender pile has over 75% cross-section area loss at top of pile with checks and splits running down full length. Fender system has fallen and is non-functional. cross-section area loss on waler behind rubber elements.
74934	All	All	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Major (MJ)	General condition for deck: Concrete deck has furnace delaminating with exposed rusted rebar.
74935	N/A	7, 13 and 16	Dolphin	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Cross-section area loss from 25% to 75% on piles 7, 13 and 16 of Dolphin 11 was observed at the top of the pile. Checks and splits on all piles. One visible connection is not fully engaged.
74938	N/A	1,3,5 and 7	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Cross-section area loss 25% to 50% observed on pile 1, 3, 5 and 7 of Dolphin 12.
74939	N/A	N/A	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Moderate (MD)	Signs of settlement on the upstream side of riverbank. Asphalt cracked and sunken near structure. Similar signs of sliding and sloughing are on several sections of upland pavement.
74942	N/A	N/A	Other Structure	Mooring	Foundation	Asphalt	Major (MJ)	Foundation of bollard appears uplifted with severe cracking at asphalt base. Evidence of sliding and sloughing at top of bank.

Attachment A-12
Berth 308
Moata Forms - Sheet 1 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	PY., SH., AE., HW.		Materials:	Reinforced Concrete, Timber, Asphalt
Location:	Portland, OR			Above Water:	ES., PY., SH., HW.		Elements:	Superstructure, Substructure, Fender System, Mooring
Facility:	Lay Berth 308			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75051	N/A	4,5,6 and 11	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Two fender piles of Dolphin 11 are missing and one fender pile of Dolphin 11 is broken. Walers have failed. Pile cap of Dolphin 11 is missing. Pile 11 of Dolphin 11 has 100% cross-section area loss and is hollow all the way through. Pile 4 of Dolphin 11 has large splits checks. Pile 5 and 6 of Dolphin 11 sound hollow, the inner core is likely not intact.
75052	N/A	1, 2, 8, 10 and 12	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Piles 1, 2, 8, 10 and 12 of Dolphin 12 sound hollow, the inner core is likely not intact.
75056	5	C	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile has a soft and saturated outer 2 inch shell. After the shell, the core is intact. The diameter loss is about 16%.
75057	7	B	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Moderate (MD)	The pile has splits and checks wider than 1/2 inch and runs full length of the pile.
75058	6	B	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile has a soft and saturated outer 2 inch shell. After the shell, the core is intact. The diameter loss is about 16%.

Attachment A-12
Berth 308
Moata Forms - Sheet 2 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Lay Berth 308 Overview
Berth 308, looking east



Photo 02: Lay Berth 308 Substructure
Typical condition of walers at waterline

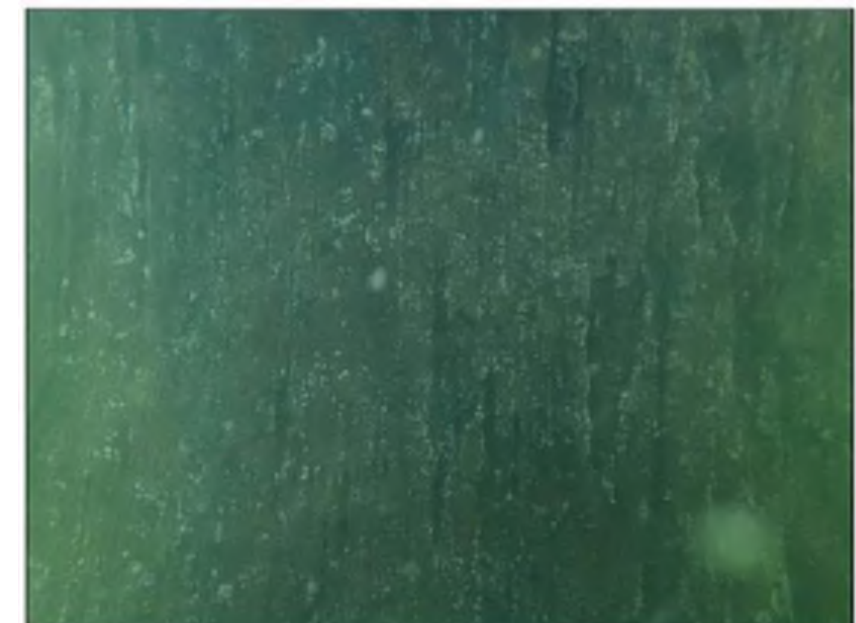


Photo 03: Lay Berth 308 Substructure
Typical cleaned surface timber piles below waterline

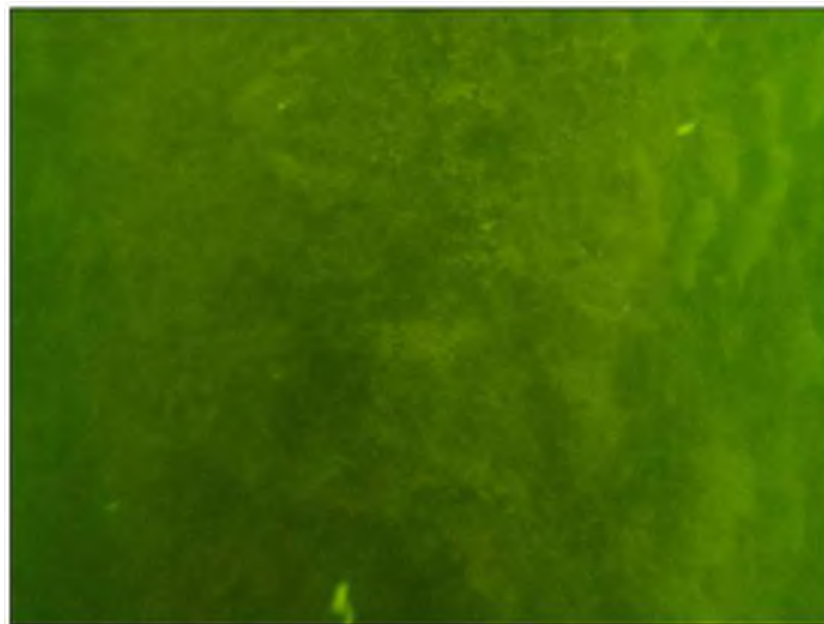


Photo 04: Lay Berth 308 Substructure
Typical marine growth on timber piles below waterline



Photo 05: Lay Berth 308 Dolphins
Dolphin D11, Pile 11
Timber pile decay

Attachment A-12

Berth 308

Dive Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Resistance Drill Measurements							
Swan Island Basin	Location: Portland, OR		Company: <i>Collins Engineers, Inc.</i>			Divers: Pinkston, Moss, Malone, Sukow	
Facility: Various	Auditor: Jordan Furlan		Inspection Date: 07/19/2022 - 07/28/2022				
Time of Day: N/A	Tide: +0-3 ft. MLLW		Pile Type (Bearing, Batter, Sheet, Guide): Bearing, Batter			Component Material: Timber	
Measurement	Property	Bent	Pile	Depth	Length of decay	Estimated cross-section loss	Notes
126	Lay Berth 308	7	A	2-3' above waterline	0		Bad reading
127		7	A	2-3' above waterline	0		
128		5	A	2-3' above waterline	4	25%	
129		2	A	2-3' above waterline	0		
130		Dolphin 11	7	2-3' above waterline	0		
131		Dolphin 11	16	2-3' above waterline	0		

Attachment A-12

Berth 308

Resistance Drill Measurements - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Attachment A-13

Wind Tunnel

Facility Information

Owner	Freightliner	
Asset Name(s)	Wind Tunnel Dock	
Construction Year	Timber bulkhead ~1960's, Steel piles supporting intake ~2002	
Owner/Operator Notes	Operational – wind tunnel for vehicle development testing. Air enters the wind tunnel from the basin and requires unobstructed flow for full functionality.	
Previous Inspection Year	No information received	
Previous Inspection Assessment Rating/Notes	No information received	
Repair History	No information received	
Structure Components	Superstructure	<ul style="list-style-type: none">• Steel wind tunnel
	Substructure	<ul style="list-style-type: none">• (3) Steel pile bents• Bents 1-2 consist of (4) piles each• Bent 3 consists of (2) piles
Other information	Facility Length/ Depth/ Design Depth	Approximately 55' x 30'
	Fender System	Not applicable
	Mooring System	Not applicable
	Dolphin System	Not applicable
	Other System	Not applicable

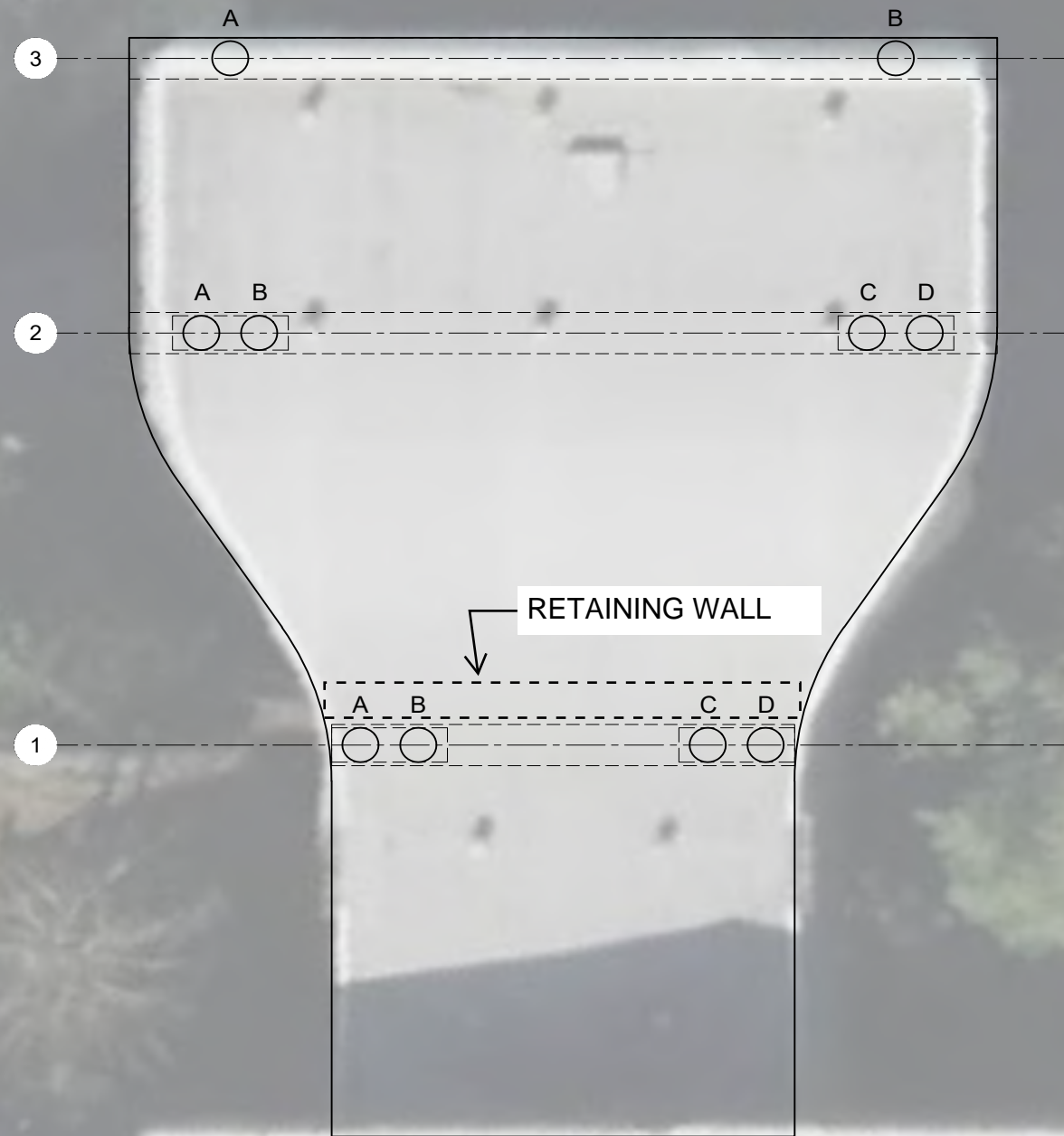
General Location



Asset Photo



LEGEND:
○ STEEL PILE
- - - STEEL PILE CAP



ABOVE WATER PLAN
WIND TUNNEL DOCK
0 6 12
SCALE: 1" = 6' (22x34)
1" = 12' (11x17)

Attachment A-13
Wind Tunnel
Structure Layout - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Wind Tunnel Overview
Wind Tunnel Overview, Looking South
Moata ID: Not Applicable

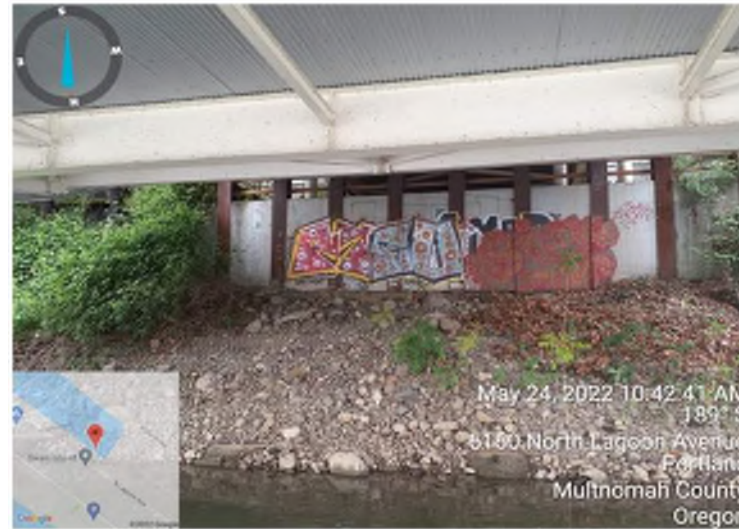


Photo 02: Wind Tunnel Retaining Wall
Typical condition of Retaining Wall
Moata ID: Not Applicable



Photo 03: Wind Tunnel Substructure
Typical condition of substructure above water
Moata ID: Not Applicable



Photo 04: Wind Tunnel Substructure
Piles A and B, Bent 1
Typical condition of piles above water
Moata ID: Not Applicable

Attachment A-13 Wind Tunnel

Above-Water Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Ultrasonic Thickness Measurements					
Swan Island Basin Remedial Design		Location: Portland, OR		Company: Mott MacDonald	
Facility: Wind Tunnel		Inspector: PY, ATE		Inspection Date: 5/17/2022	
Time of Day: Multiple Times		Tide: Varies		Pile Type (Bearing, Batter, Sheet, Guide): Steel Pile	Component Material: Steel
Bent Number	Pile Number	Measurements (in)		Loss of Section (Estimated Nominal Thickness = 0.250 in)	
		Thickness (in) Waterline	Thickness (in) 6 ft above waterline	Waterline	6 ft above waterline
2	D	0.245	/	2.0%	/
2	D	/	0.245	/	2.0%
2	C	0.245	/	2.0%	/
2	C	/	0.245	/	2.0%
1	B	0.250	/	0.0%	/
1	B	/	0.250	/	0.0%
1	A	0.246	/	1.6%	/
1	A	/	0.246	/	1.6%
2	B	0.248	/	0.8%	/
2	B	/	0.248	/	0.8%
2	A	0.244	/	2.4%	/
2	A	/	0.246	/	1.6%

Attachment A-13

Wind Tunnel

MM Ultrasonic Thickness Measurements - Sheet 1 of 1

Prepared on: 3/10/2023
 Structure Condition Assessment Report
 Swan Island Basin





Photo 01: Wind Tunnel Overview
Wind Tunnel, looking east



Photo 02: Wind Tunnel Substructure
Typical condition of steel piles at waterline

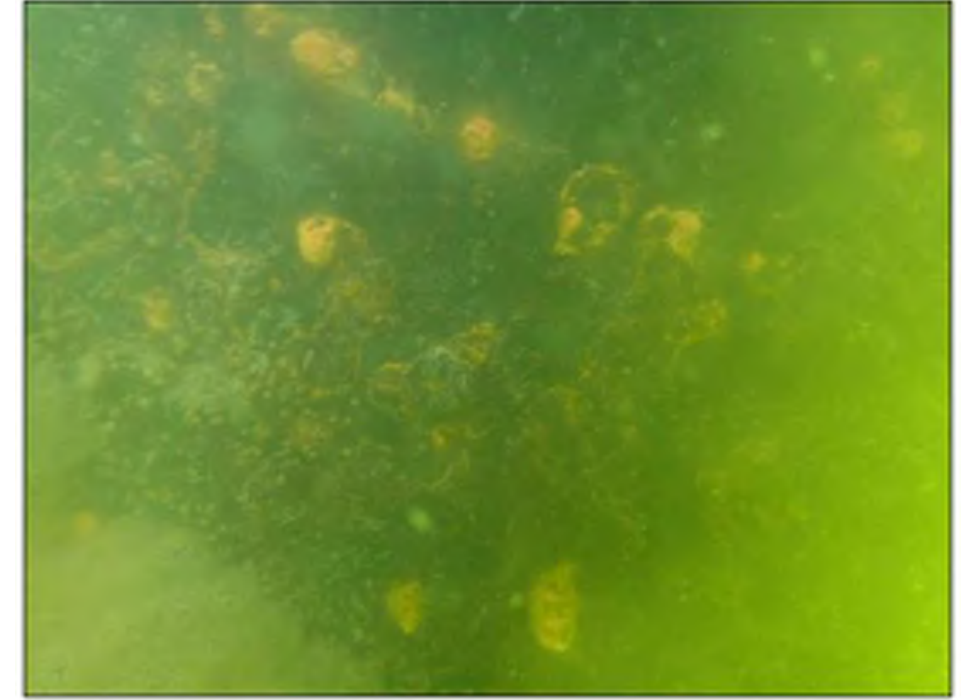


Photo 03: Wind Tunnel Substructure
Typical condition of steel piles below waterline

Attachment A-13

Wind Tunnel

Dive Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Attachment A-14

Swan Island Boat Ramp

Facility Information

Owner	City of Portland	
Asset Name(s)	Swan Island Boat Ramp	
Construction Year	~1987	
Owner/Operator Notes	Operational - Used by recreational small motorized and unmotorized boats, as well as for fishing.	
Previous Inspection Year	No information received	
Previous Inspection Assessment Rating/Notes	No information received	
Repair History	No information received	
Structure Components	Floating Dock	<ul style="list-style-type: none">• (1) 120' x 6' Floating Dock• Timber floating deck, bull rail, and (5) timber guide piles• (1) 20' x 6' Abutment
	Substructure	<ul style="list-style-type: none">• (1) 60' x 20' Boat Ramp
Other information	Facility Length/ Depth/ Design Depth	120' x 6' Floating Dock 60' x 20' Boat Ramp
	Fender System	Not applicable
	Mooring System	Not applicable
	Dolphin System	Not applicable
	Other System	Not applicable

General Location



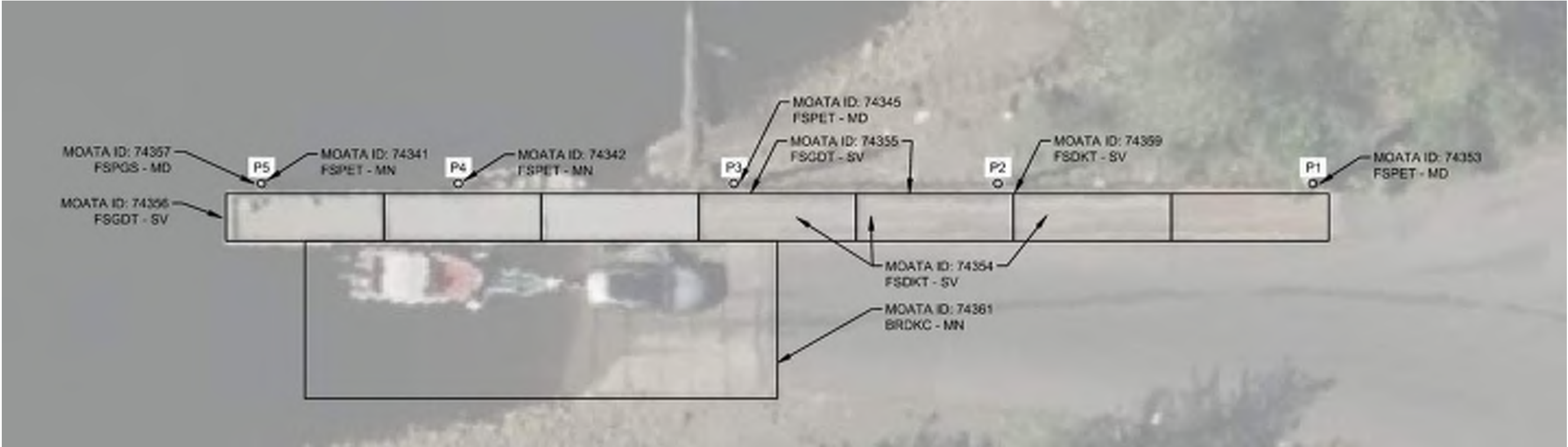
Asset Photo



LEGEND:

TIMBER PILE

TIMBER FLOAT



Not to scale

[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
BR = BOAT RAMP
FS = FLOATING STRUCTURE

ELEMENT TYPE:
GD = GUARDRAIL/HANDRAIL/BULLRAIL
DK = DECK
PE = PILE/SHEET PILE

MATERIAL TYPE:
C = REINFORCED CONCRETE
S = STEEL
T = TIMBER

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

GENERAL NOTES:
1. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.

Attachment A-14
Swan Island Boat Ramp
Structure Layout - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Swan Island Boat Ramp Overview
 Swan Island Boat Ramp, Looking from Waterside
 Moata ID: Not Applicable

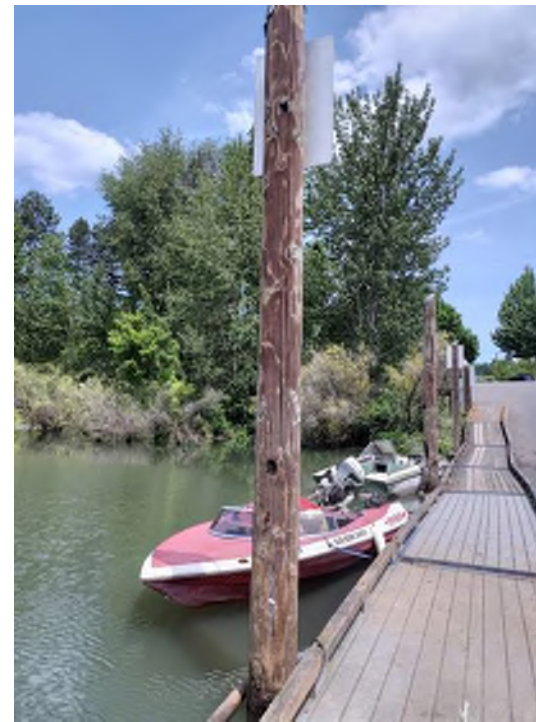


Photo 02: Swan Island Boat Ramp Piles
 Pile 4
 Splits on the timber pile
 Moata ID: 74342



Photo 03: Swan Island Boat Ramp Piles
 Pile 3
 Loss of section on pile
 Moata ID: 74345

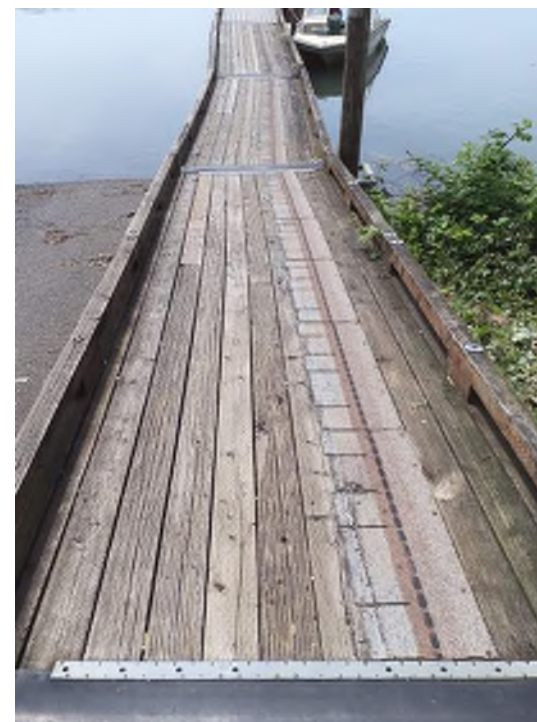


Photo 04: Swan Island Boat Ramp Floating Docks
 Floats
 Typical condition of floats
 Moata ID: 74354

Attachment A-14
 Swan Island Boat Ramp
 Above-Water Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
 Structure Condition Assessment Report
 Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	PY., HW.		Materials:	Steel, Reinforced Concrete, Timber
Location:	Portland, OR			Above Water:	N/A		Elements:	Floating Structure, Boat Ramp
Facility:	Swan Island Boat Ramp			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74341	N/A	P5	Floating Dock	Floating Structure	Pile/ Sheet Pile	Timber	Minor (MN)	Checks and splits are less than 1/2 inch wide from the top of the pile down to the waterline.
74342	N/A	P4	Floating Dock	Floating Structure	Pile/ Sheet Pile	Timber	Minor (MN)	Checks and splits are less than 1/2 inch wide from the top of the pile down to the waterline.
74345	N/A	P3	Floating Dock	Floating Structure	Pile/ Sheet Pile	Timber	Moderate (MD)	Checks and splits are up to 1 inch wide from the top of the pile down to the waterline. cross-section area loss up to 25%.
74353	N/A	P1	Floating Dock	Floating Structure	Pile/ Sheet Pile	Timber	Moderate (MD)	Checks/splits are up to 3/4 inch wide from the top of the pile down to the groundline.
74354	N/A	N/A	Floating Dock	Floating Structure	Deck	Timber	Severe (SV)	Decking on floats 2, 3 and 4 has connection loss and checks and splits are 1/4 inch wide.
74355	N/A	N/A	Floating Dock	Floating Structure	Guardrail / Handrail / Bullrail	Timber	Severe (SV)	Checks and splits are up to 1/2 inch wide and bull rail at floating dock 3 and 4 has connection loss.
74356	N/A	N/A	Floating Dock	Floating Structure	Guardrail / Handrail / Bullrail	Timber	Severe (SV)	Bull rail at the end of floating 7 is broken.
74357	N/A	P5	Floating Dock	Floating Structure	Pile Guide	Steel	Moderate (MD)	Pile guide is submerged due to loss of floatation.
74359	N/A	P3 and P2	Floating Dock	Floating Structure	Deck	Timber	Severe (SV)	Floating dock has loss of connection (non structural).
74361	N/A	N/A	Boat Ramp	Boat Ramp	Deck	Reinforced Concrete	Minor (MN)	General notes: Minor longitudinal and transverse cracks are from middle of the ramp down to the water.

Attachment A-14
Swan Island Boat Ramp
Moata Forms - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Swan Island Boat Ramp Overview
Swan Island Boat Ramp, looking north

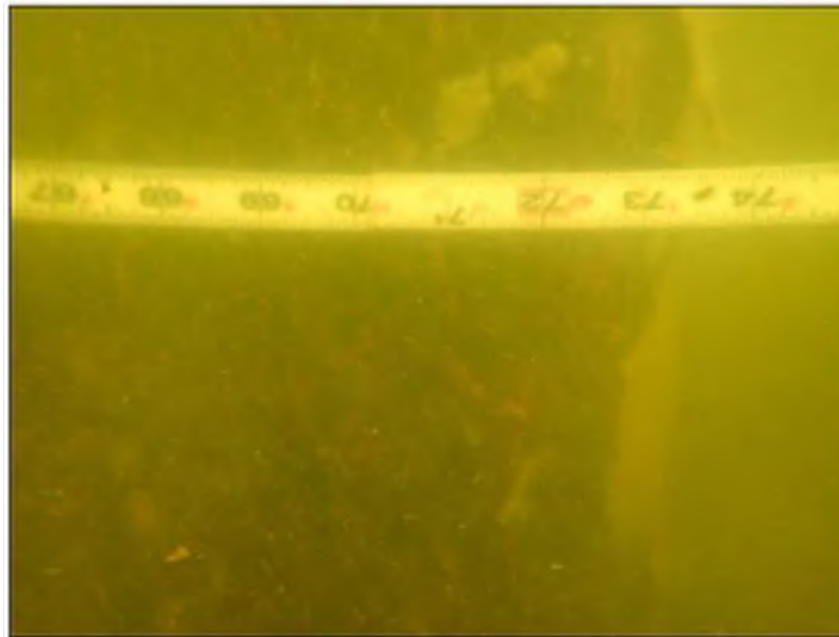


Photo 02: Swan Island Boat Ramp Piles
Typical condition of timber piles below waterline



Photo 03: Swan Island Boat Ramp Piles
Typical checking on timber piles



Photo 04: Swan Island Boat Ramp Piles
Pile 5
Loss of section

Attachment A-14
Swan Island Boat Ramp
Dive Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Resistance Drill Measurements							
Swan Island Basin	Location: Portland, OR		Company: <i>Collins Engineers, Inc.</i>		Divers: Pinkston, Moss, Malone, Sukow		
Facility: Various	Auditor: Jordan Furlan		Inspection Date: 07/19/2022 - 07/28/2022				
Time of Day: N/A	Tide: +0-3 ft. MLLW		Pile Type (Bearing, Batter, Sheet, Guide): Bearing, Batter		Component Material: Timber		
Measurement	Property	Bent	Pile	Depth	Length of decay	Estimated cross-section loss	Notes
120	Swan Island Boat Ramp	4	5	2-3' above waterline	0		
121		4	4	2-3' above waterline	0		

Attachment A-14
Swan Island Boat Ramp
Resistance Drill Measurements - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Attachment A-15

Berth 311

Facility Information

Owner	Swan Island Dock Company	
Asset Name(s)	Swan Island Dock Company – Berth 311	
Construction Year	No information received	
Owner/Operator Notes	Operational - Breakbulk cargo shipped on 100’ x 400’ deck barges. Liquid cargo business expected to pick up in 2023.	
Previous Inspection Year	No information received	
Previous Inspection Assessment Rating/Notes	No information received	
Repair History	No information received	
Structure Components	Superstructure	<ul style="list-style-type: none">(1) 450’ x 45’ Pier
	Substructure	<ul style="list-style-type: none">(31) timber bents with (11) timber piles(2) intermediate bents with (2) pairs of piles in between each main bent
	Timber trestles	<ul style="list-style-type: none">(2) 160’ x 24’ Access TrestlesAccess Trestles have (11) or (10) bents, each bent has (5) timber piles
Other information	Facility Length/ Depth/ Design Depth	<ul style="list-style-type: none">(1) 450’ x 45’ Pier
	Fender System	No information received
	Mooring System	No information received
	Dolphin System	No information received
	Other System	Not applicable

General Location



Asset Photo



LEGEND:

GUARDRAIL/HANDRAIL

DECK



[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SP = SUPERSTRUCTURE
FS = FENDER SYSTEM
MR = MOORING
SB = SUBSTRUCTURE

ELEMENT TYPE:
GD = GUARDRAIL/HANDRAIL/BULLRAIL
PE = PILE/SHEET PILE
BM = BEAM/JOIST/STRINGER/GIRDER
PC = PILE CAP
DK = DECK
CT = CLEAT/BOLLARD
CB = CROSS-BRACING

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

MATERIAL TYPE:
C = REINFORCED CONCRETE
S = STEEL
T = TIMBER

GENERAL NOTES:
1. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.

Attachment A-15
Berth 311

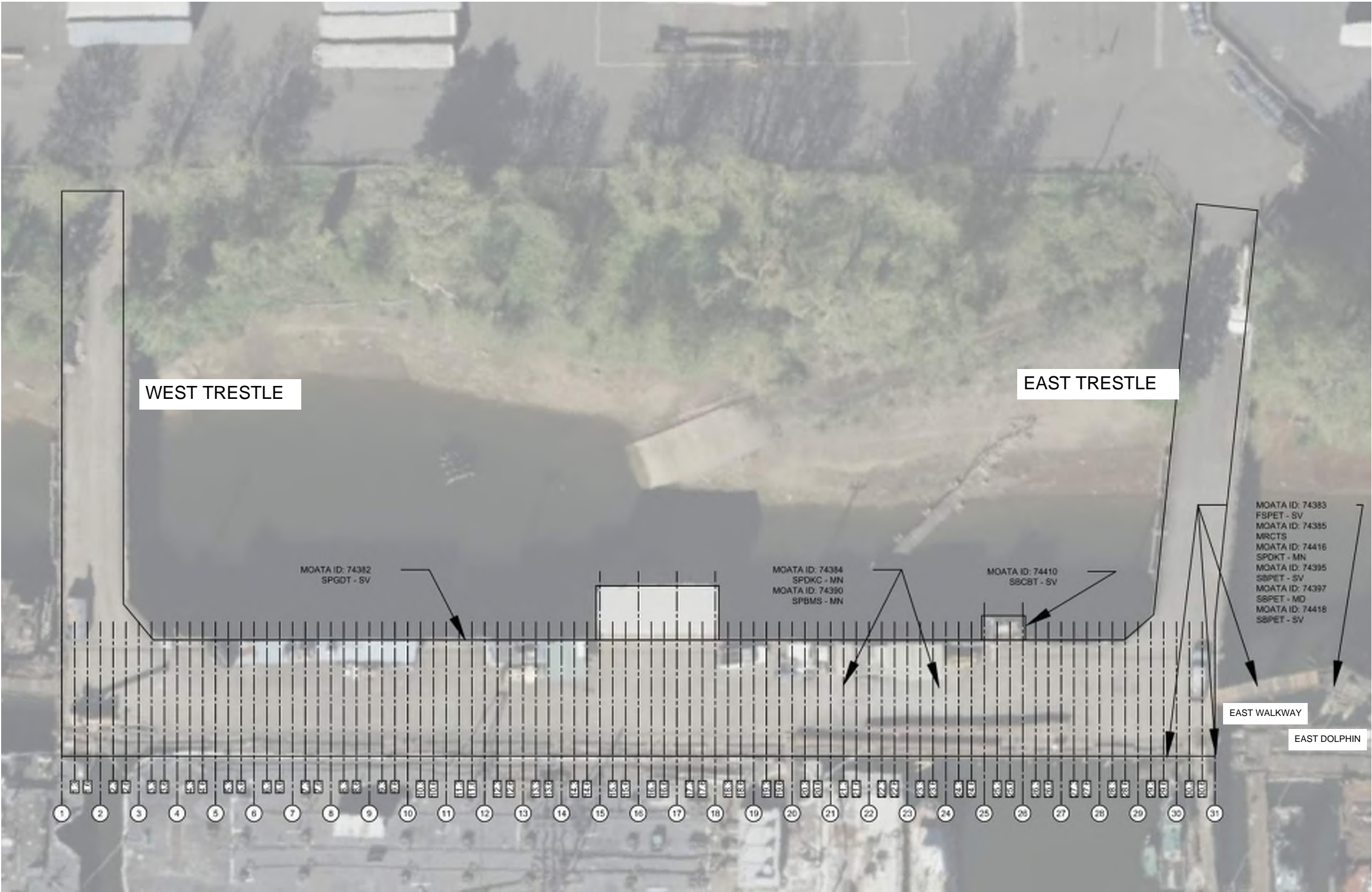
Structure Layout - Sheet 1 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

LEGEND:

GUARDRAIL/HANDRAIL

DECK



[MOATA ID XXXXX]
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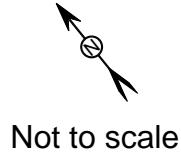
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GENERAL NOTES:
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Attachment A-15
Berth 311
Structure Layout - Sheet 2 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



LEGEND:

○

TIMBER PILE

⚓

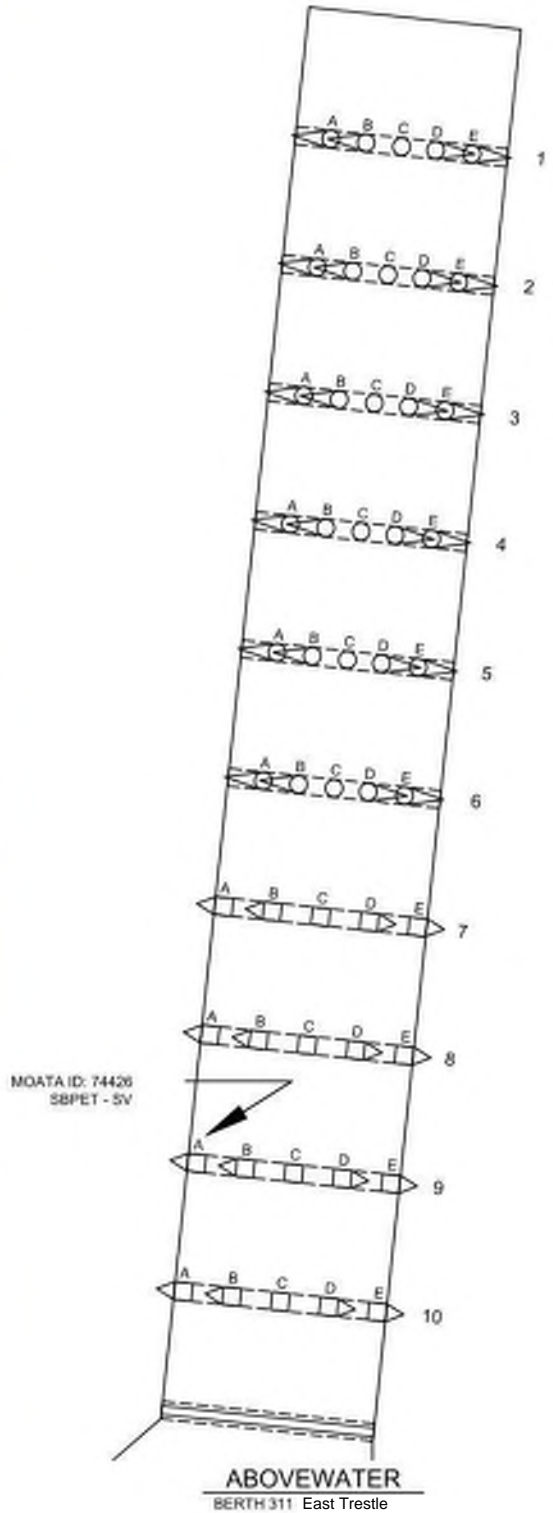
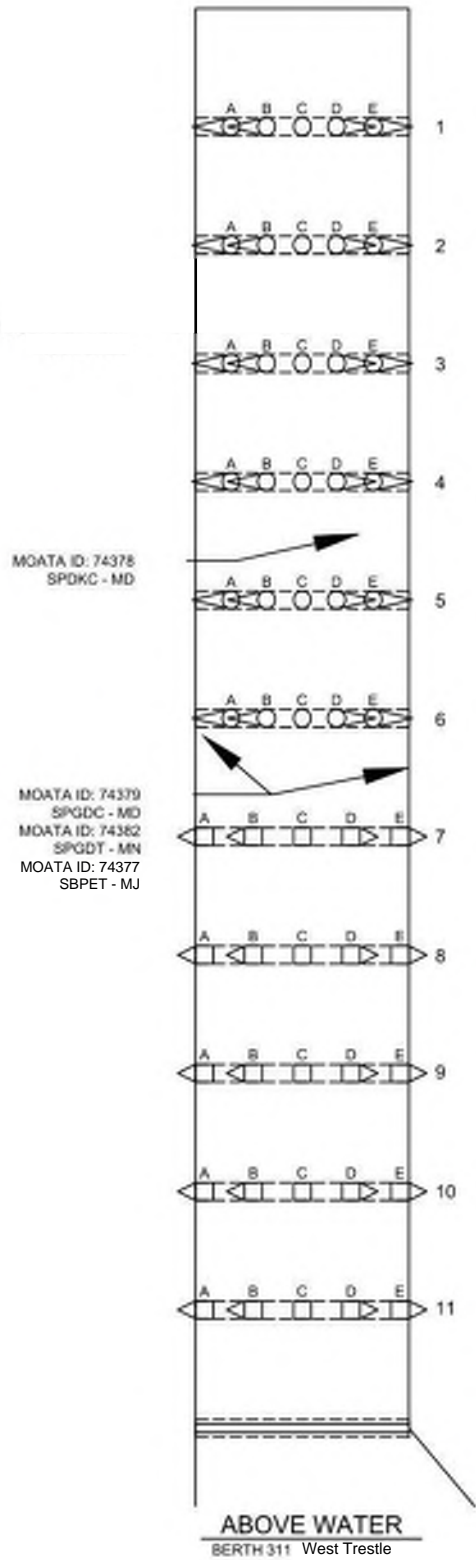
TIMBER BATTER PILE

⋯

TIMBER PILE CAP

■

CONCRETE DECK



Not to scale

[MOATA ID XXXXX]
[WWYYZ - ##]

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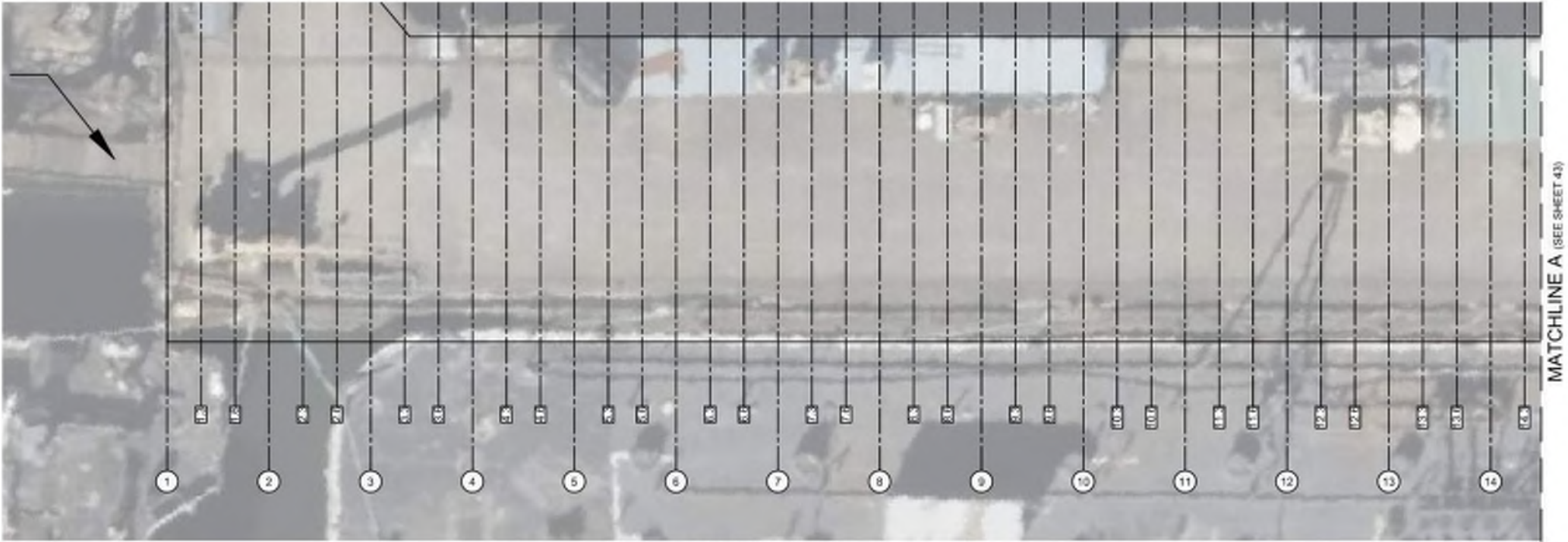
GENERAL NOTES:
1. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.

Attachment A-15 Berth 311 Structure Layout - Sheet 3 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

- LEGEND:
- TIMBER PILE
 - TIMBER PILE CAP
 - CONCRETE DECK

MOATA ID: 74419
SPDKT - MD

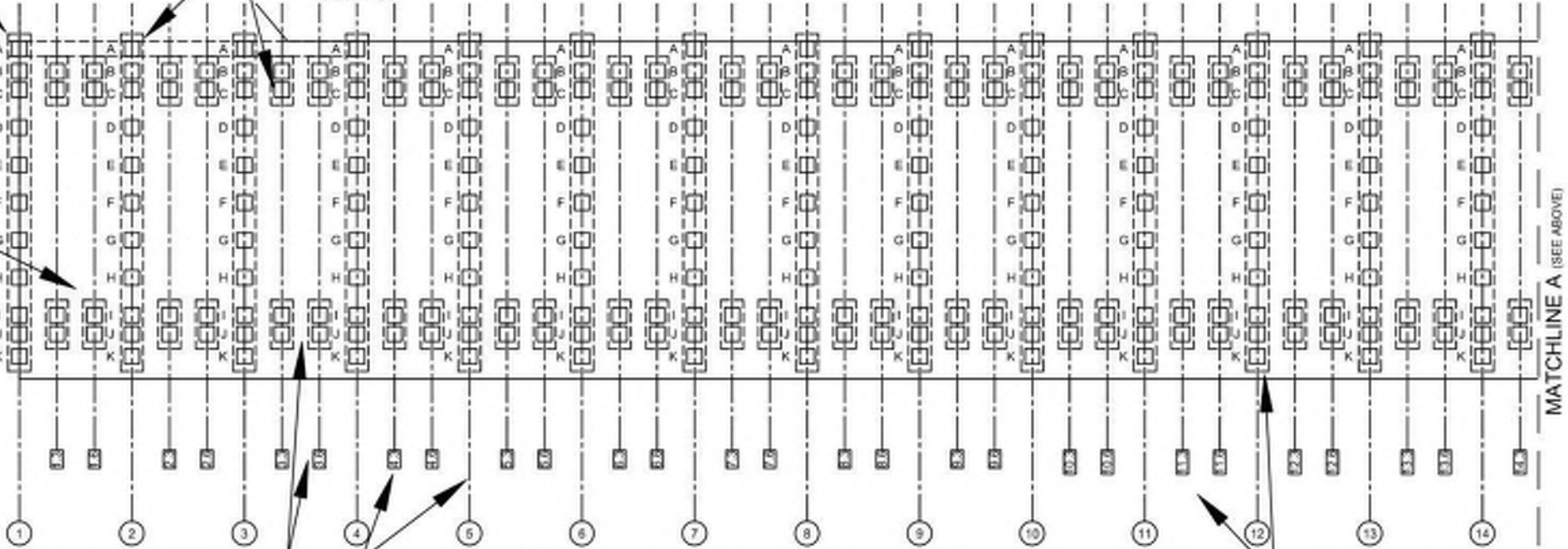


TOPSIDE PLAN
BERTH 311

MOATA ID: 74393
SBPCT - MD
MOATA ID: 74396
SBPCT - MJ

MOATA ID: 74406
SBPCT - SV
MOATA ID: 74424
SBPCT - MD

MOATA ID: 74419
SPDKT - MD



ABOVE WATER PLAN
BERTH 311

MOATA ID: 74425
FSPET - MD
MOATA ID: 79074
SBPCT - MJ
MOATA ID: 79075
FSPET - MJ

MOATA ID: 79076
FSPET - MD
MOATA ID: 79077
FSPET - SV

MOATA ID: 74408 and 74423
SBPCT - SV
MOATA ID: 79073
SBPCT - MJ

Not to scale

[MOATA ID XXXXX]
[WWYYZ - ##]

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Z = MATERIAL TYPE
= DEFECT LEVEL

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MR = MOORING
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ELEMENT TYPE:
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DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

MATERIAL TYPE:
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T = TIMBER

GENERAL NOTES:
1. Drawings are not to scale and are intended to
generally locate structural members to note
inspection observations.

Attachment A-15 Berth 311 Structure Layout - Sheet 4 of 5

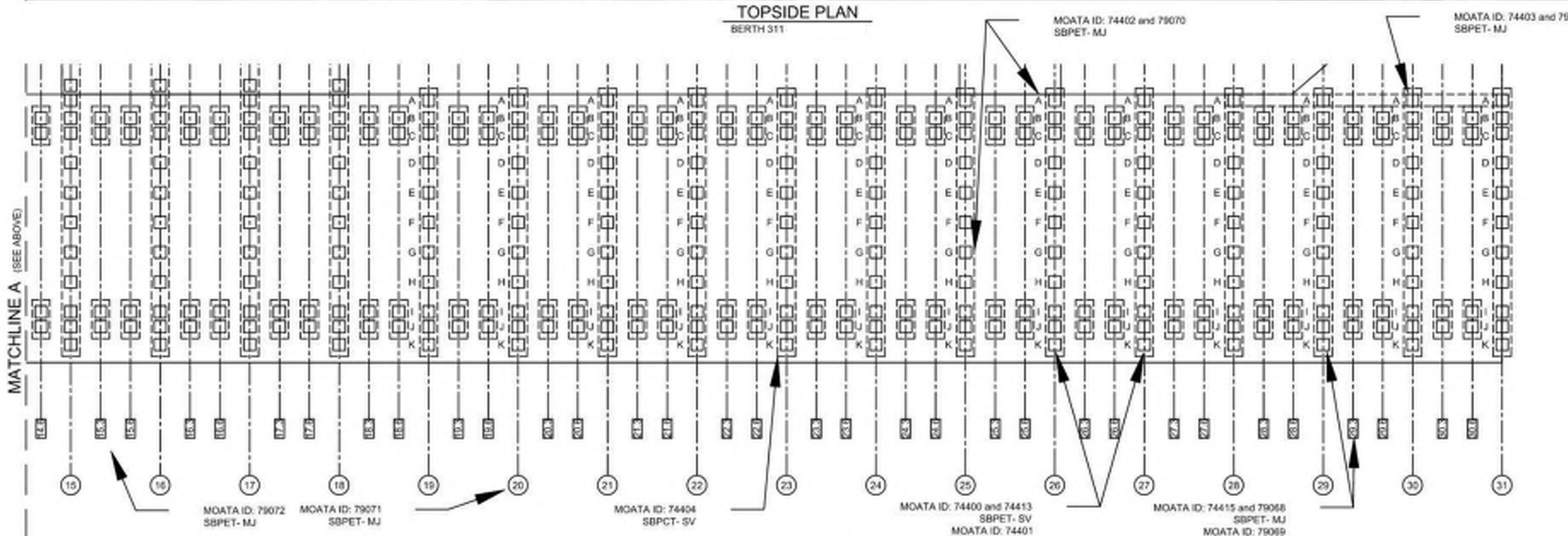
Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

LEGEND:

- TIMBER PILE
- TIMBER PILE CAP
- CONCRETE DECK



TOPSIDE PLAN
BERTH 311



↗
Not to scale

[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

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FS = FENDER SYSTEM
MR = MOORING
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ELEMENT TYPE:
GD = GUARDRAIL/HANDRAIL/BULLRAIL
PE = PILE/SHEET PILE
BM = BEAM/JOIST/STRINGER/GIRDER
PC = PILE CAP
DK = DECK
CT = CLEAT/BOLLARD
CB = CROSS-BRACING

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

MATERIAL TYPE:
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S = STEEL
T = TIMBER

GENERAL NOTES:
1. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.

Attachment A-15
Berth 311
Structure Layout - Sheet 5 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Berth 311 Dolphin
East Dolphin
Loss of connection between batter pile and deck
Moata ID: 74395



Photo 02: Berth 311 Dolphin
West Dolphin
Typical condition of piles
Moata ID: 74374



Photo 03: Berth 311 Trestle
West Trestle
Cracks on the concrete deck
Moata ID: 74378



Photo 04: Berth 311 Trestle
West Trestle
Typical condition of piles
Moata ID: Not Applicable



Photo 05: Berth 311 Trestle
West Trestle
Broken cross-bracing
Moata ID: Not Applicable

Attachment A-15 Berth 311

Above-Water Inspection Photos - Sheet 1 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 06: Berth 311 Main Pier
Concrete Deck of Main Pier
Typical condition of concrete deck
Moata ID: 74384

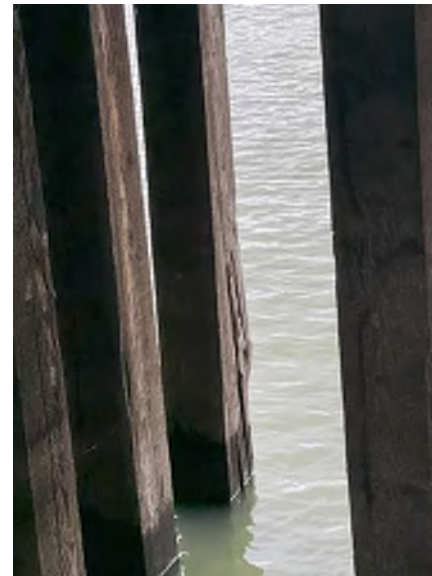


Photo 07: Berth 311 Main Pier
Pile K Bent 27
Broken pile
Moata ID: 74400



Photo 08: Berth 311 Main Pier
Pile Cap at Bent 2
Loss of section on pile cap
Moata ID: 74406

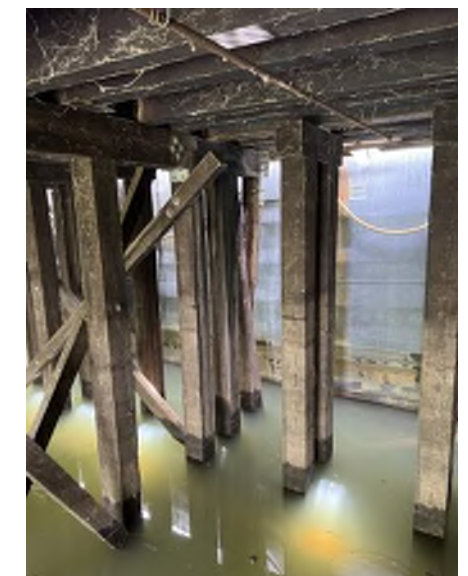


Photo 09: Berth 311 Main Pier
Pile K Bent 12
Broken pile
Moata ID: 74408



Photo 10: Berth 311 Main Pier
Cross-Bracing at Bent 26
Broken cross-bracing
Moata ID: 74410



Photo 11: Berth 311 Main Pier
Pile Cap at Bent 23
Bent pile cap
Moata ID: 74404

Attachment A-15 Berth 311

Above-Water Inspection Photos - Sheet 2 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SM.,ES., SH.		Materials:	Steel, Reinforced Concrete, Timber
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Mooring
Facility:	Berth 311			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74372	All	All	Gangway / Walkway / Catwalk	Substructure	Pile / Sheet Pile	Timber	Minor (MN)	Checks and splits are up to 1/4 inch and from the top of the pile down to the waterline. Piles and cross-bracing of bent number sound solid. Piles have minor deterioration.
74374	N/A	N/A	Dolphin	Substructure	Pile / Sheet Pile	Timber	Moderate (MD)	One of the piles has splits and checks up to 1/8 inch and cross-section area loss up to 15%.
74375	N/A	N/A	Dolphin	Substructure	Pile / Sheet Pile	Timber	Moderate (MD)	One of the batter piles has cross-section area loss up to 15%.
74377	All	All	Trestle / Ramp	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	West trestle: Pile 6A, 7A, 7D, 9C, 9A, 10C and 10E sound hollow. The inner cores are likely not intact. 6E has checks and splits 3/4 inch wide and running full length of the pile.
74378	All	All	Trestle / Ramp	Superstructure	Deck	Reinforced Concrete	Moderate (MD)	Transverse cracks are observed on the deck up to 1/4 inch wide.
74379	All	All	Trestle / Ramp	Superstructure	Guardrail / Handrail / Bullrail	Timber	Severe (SV)	Generally: Timber guard rail is observed with facial shake, separation, minor cracks and missing sections.
74380	All	All	Trestle / Ramp	Superstructure	Guardrail / Handrail / Bullrail	Timber	Minor (MN)	Generally: Bull rail is weathered but intact with no missing segments.

Attachment A-15
Berth 311
Moata Forms - Sheet 1 of 6

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SM.,ES., SH.		Materials:	Steel, Reinforced Concrete, Timber
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Mooring
Facility:	Berth 311			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74382	All	All	Trestle / Ramp	Superstructure	Guardrail / Handrail / Bullrail	Timber	Severe (SV)	Generally: Bull rail on the dock sounds hollow and has section losses. Some sections are crushed and have missing pieces.
74383	All	All	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Severe (SV)	General condition of the fender system: 24 fenders piles are missing. Top of the standing piles have section loss. The walers are in good condition.
74384	All	All	Pier / Wharf	Superstructure	Deck	Reinforced Concrete	Minor (MN)	General condition of the pier deck is similar to the trestle deck. Some transverse cracks are observed.
74385	All	All	Pier / Wharf	Mooring	Cleat / Bollard	Steel	Moderate (MD)	The general condition of mooring bollards: Mooring bollards have surface rust, and attachment has minor to no deterioration. Cleats have loss of protective coating and surface rust.
74390	All	All	Pier / Wharf	Superstructure	Beam / Joist / Stringer / Girder	Steel	Minor (MN)	Crane beam: Less than 50% of the surface is affected by corrosion.
74393	All	All	Pier / Wharf	Substructure	Pile Cap	Timber	Minor (MN)	General condition of pile caps: Pile cap stringers range from no damage to minor deterioration, checks and splits are less than 1/2 inch wide.
74395	N/A	N/A	Dolphin	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	One of the batter piles has loss of connection and is broken.

Attachment A-15
Berth 311
Moata Forms - Sheet 2 of 6

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SM.,ES., SH.		Materials:	Steel, Reinforced Concrete, Timber
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Mooring
Facility:	Berth 311			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74397	N/A	N/A	Dolphin	Substructure	Pile / Sheet Pile	Timber	Moderate (MD)	One of the piles has checks and splits over 1/2 inch wide and run the full length of the pile.
74398	All	All	Pier / Wharf	Substructure	Pile Cap	Timber	Major (MJ)	Every location on the pile cap is wet due to the leaking.
74400	27	K	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Cross-section area loss over 50% is observed just above the waterline. Checks and splits are at several locations along the pile up to 1/2 inch wide.
74401	26	K	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Cross-section area loss up to 50% and splits over 1 inch wide observed.
74402	25	G and H	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Both piles are twisted.
74403	30	A	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Pile sounds hollow, the inner core is likely not intact.
74404	23	I J K	Pier / Wharf	Substructure	Pile Cap	Timber	Severe (SV)	The pile cap is broken and displaced about 1 feet toward the downstream. Pile I, J and K are displaced accordingly.
74406	2	A and B	Pier / Wharf	Substructure	Pile Cap	Timber	Severe (SV)	Pile cap is decaying with cross-section area loss about 50%.

Attachment A-15
Berth 311
Moata Forms - Sheet 3 of 6

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SM.,ES., SH.		Materials:	Steel, Reinforced Concrete, Timber
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Mooring
Facility:	Berth 311			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74408	12	K	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Pile is displaced and no longer bearing pile cap.
74410	26	N/A	Pier / Wharf	Substructure	Cross-bracing	Timber	Severe (SV)	Outside support for the top platform is completely broken.
74413	27	K	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Same as MOATA form 74400
74415	29	K	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Checks and splits are 4 inches wide and run the full length of the pile.
74418	N/A	N/A	Dolphin	Superstructure	Deck	Timber	Severe (SV)	One side of bull rail is missing.
74419	All	All	Gangway / Walkway / Catwalk	Superstructure	Deck	Timber	Moderate (MD)	Catwalk Deck has typical cross-section area loss about 1/2 inch deep.
74423	12	K	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	Pile is partially broken.
74424	3.3	C	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Moderate (MD)	Gouge is 1-3/4 inch wide by 1 inch depth and cross-section area loss up to 25%.
74425	3.6	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Major (MJ)	Fender pile has cross-section area loss up 50%.

Attachment A-15
Berth 311
Moata Forms - Sheet 4 of 6

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SM.,ES., SH.		Materials:	Steel, Reinforced Concrete, Timber
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Mooring
Facility:	Berth 311			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74426	All	All	Trestle / Ramp	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	East trestle: 6E, 6B, 7D and 9C sound hollow. Pile 8E has a section loss greater than 75%. Cross-bracing between piles 8A and 9A are broken.
74416	All	All	Gangway / Walkway / Catwalk	Superstructure	Deck	Timber	Minor (MN)	Timber deck is weathered and has not been replaced. Minor deterioration is observed on the deck, bull rail and guardrail.
79067	30	A, J and K	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Piles sound hollow, the inner cores are likely not intact.
79068	29	J and K	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Piles sound hollow, the inner cores are likely not intact.
79069	29.3	A and J	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Piles sound hollow, the inner cores are likely not intact.
79070	26 and 25.6	J and A	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Pile 26J and 25.6A sound hollow, the inner core is likely not intact.
79071	20	D	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Pile sounds hollow, the inner core is likely not intact.
79072	15, 15.6 and 16	C, I and J	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Pile 16C, 15.6I, 15C, 15I and 15J sound hollow, the inner core is likely not intact.
79073	11.3, 11.6 and 12	B, C and H	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Pile 12H, 11.6C and 11.3B sound hollow, the inner core is likely not intact.

Attachment A-15
Berth 311
Moata Forms - Sheet 5 of 6

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SM.,ES., SH.		Materials:	Steel, Reinforced Concrete, Timber
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System, Mooring
Facility:	Berth 311			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
79074	3 and 4	G, I, J and K	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Pile 4I, 3G, 3I, 3J and 3K sound hollow, the inner cores are likely not intact.
79075	3.6	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Major (MJ)	Fender pile cross-section area loss up 25% due to marine borers.
79076	4.3	Fender	Pier / Wharf	Fender System	Pile / Sheet Pile	Timber	Moderate (MD)	Fender pile cross-section area loss less than 10% due to marine borers.

Attachment A-15
Berth 311
Moata Forms - Sheet 6 of 6

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Berth 311 Substructure
Typical substructure configuration, looking west



Photo 02: Berth 311 Substructure
Typical condition of timber piles below waterline



Photo 03: Berth 311 Substructure
Pile 4 Bent 31
Pile non-bearing



Photo 04: Berth 311 Substructure
Piles I and J Bent 23
Broken piles

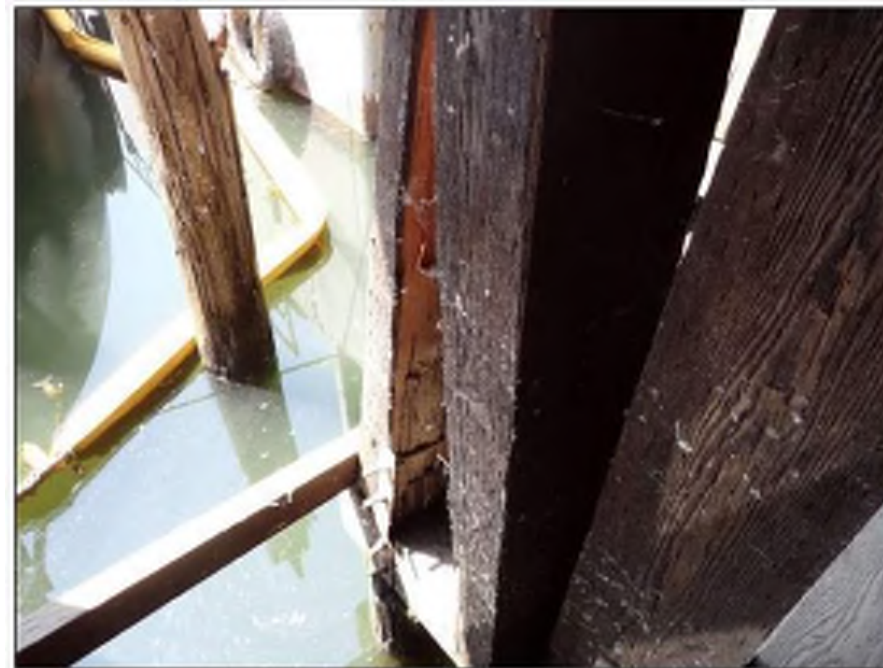


Photo 05: Berth 311 Substructure
Pile K Bent 24
Broken pile



Photo 06: Berth 311 Trestles
East Trestle
Broken cross-bracing

Attachment A-15

Berth 311

Dive Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Resistance Drill Measurements							
Swan Island Basin	Location: Portland, OR		Company: <i>Collins Engineers, Inc.</i>		Divers: Pinkston, Moss, Malone, Sukow		
Facility: Various	Auditor: Jordan Furlan		Inspection Date: 07/19/2022 - 07/28/2022				
Time of Day: N/A	Tide: +0-3 ft. MLLW		Pile Type (Bearing, Batter, Sheet, Guide): Bearing, Batter		Component Material: Timber		
Measurement	Property	Bent	Pile	Depth	Length of decay	Estimated cross-section loss	Notes
152	Berth 311 16	W Dolphin		2-3' above waterline	0.5	<5%	
153	16	2.6	J	1' above waterline	0		Circular pile
154	16	2.6	J	2-3' above waterline	2	5%	Square Column
155	16	2.3	J	1' above waterline	0		Circular pile
156	16	2.3	J	2-3' above waterline	0		Square Column
157	16	28.6	J	1' above waterline	0		Circular pile
158	16	28.6	J	2-3' above waterline	0		Square Column
159	16	26.3	J	1' above waterline	0		Circular pile
160	16	26.3	J	2-3' above waterline	9	50%	Square Column
161	16	31	A	2-3' above waterline	10	70%	Square Column
162	16	31	A	1' above waterline	0		Circular pile
163	16	E Trestle Pier Wall	E	2-3' above waterline	0		
164	16	E Trestle Bent 2	E	2-3' above waterline	0		
165	16	31	G	Channel bottom	0		
166	16	31	G	Mid-depth	0		
167	16	30	G	Channel bottom	0		
168	16	30	G	Mid-depth	0		
169	16	30	F	Channel bottom	0		

Attachment A-15

Berth 311

Resistance Drill Measurements - Sheet 1 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Resistance Drill Measurements							
Swan Island Basin	Location: Portland, OR		Company: <i>Collins Engineers, Inc.</i>			Divers: Pinkston, Moss, Malone, Sukow	
Facility: Various	Auditor: Jordan Furlan		Inspection Date: 07/19/2022 - 07/28/2022				
Time of Day: N/A	Tide: +0-3 ft. MLLW		Pile Type (Bearing, Batter, Sheet, Guide): Bearing, Batter			Component Material: Timber	
Measurement	Property	Bent	Pile	Depth	Length of decay	Estimated cross-section loss	Notes
170	Berth 311	30	F	Mid-depth	0		
171		31	B	Channel bottom	0		
172		31	B	Mid-depth	0		
185		4	D	Channel bottom	0		
186		4	D	Waterline	0		
187		4	F	Waterline	0		Bad reading
188		4	F	Waterline	0		
189		4	F	Waterline	0		
190		4	L	Channel bottom	0		
191		4	L	Waterline	0		
192		3	J	Channel bottom	0		
193		3	J	Waterline	0		
194		3	L	Waterline	0		
195		3	L	Waterline	0		
196		3	L	Channel bottom	0		

Attachment A-15

Berth 311

Resistance Drill Measurements - Sheet 2 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Attachment A-16

Dredge Base

Facility Information

Owner	Port of Portland	
Asset Name(s)	Dredge Base	
Construction Year	1970's – Timber dock. Steel piles added in 2019 repairs	
Owner/Operator Notes	Operational - Facility serves as mooring point for the vessels of Dredge Oregon and other support equipment. Floating dock used as metal fabrication shop.	
Previous Inspection Year	2022 – Floating Hulls	
Previous Inspection Assessment Rating/Notes	Unknown	
Repair History	Unknown	
Structure Components	Superstructure	<ul style="list-style-type: none"> • (1) 96' x 18' timber trestle • (2) 101' x 240'-6" steel floating hulls • (1) 40' x 4' steel Gangway
	Substructure	<ul style="list-style-type: none"> • Trestle – timber piles and cross bracing

General Location



Asset Photo

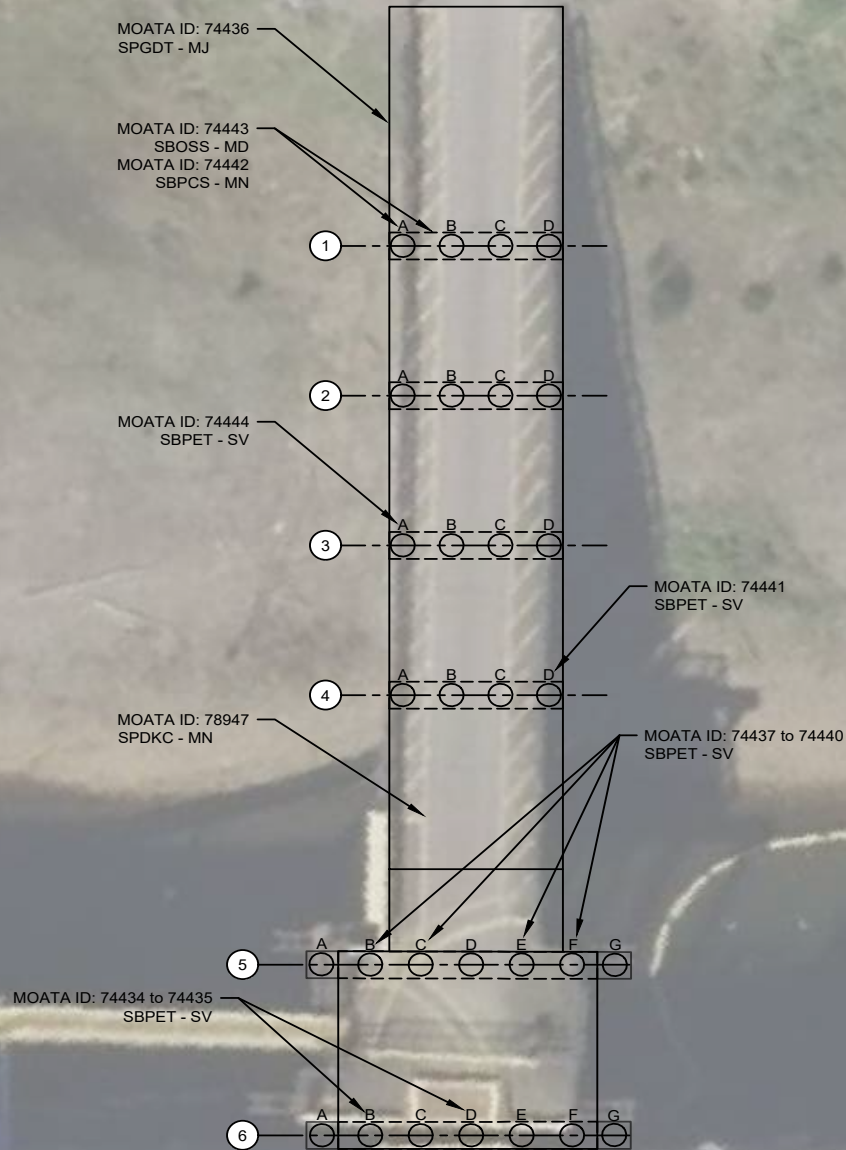


View of south side of Nav Base looking north

LEGEND

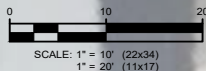
○ PILE

--- PILE CAP



ABOVEWATER PLAN

PROPERTY 17
NAVIGATION BASE



[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SP = SUPERSTRUCTURE
SB = SUBSTRUCTURE

ELEMENT TYPE:
GD = GUARDRAIL/HANDRAIL/BULLRAIL
PE = PILE/SHEET PILE
DK = DECKING
OS = OTHER STRUCTURE
PC = Pile Cap

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

MATERIAL TYPE:
C = REINFORCED CONCRETE
S = STEEL
T = TIMBER

Attachment A-16
Dredge Base

Structure Layout - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Dredge Base Superstructure
End of Bullrail
Split on the bullrail
Moata ID: 74436



Photo 02: Dredge Base Superstructure
Concrete Deck, Looking South
Typical condition of concrete deck
Moata ID: Not Applicable



Photo 03: Dredge Base Substructure
Piles at Bent 6
Typical condition of piles
Moata ID: 74435



Photo 04: Dredge Base Substructure
Bents 5 and 6
Typical condition of substructure
Moata ID: Not Applicable



Photo 05: Dredge Base Substructure
Pile Cap at Bents 5
Typical condition of pile cap
Moata ID: Not Applicable

Attachment A-16 Dredge Base Above-Water Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., AE.		Materials:	Steel, Reinforced Concrete, Timber
Location:	Portland, OR			Above Water:	ES., HW.		Elements:	Superstructure, Substructure
Facility:	Navigation Base			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74434	6	B	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	The pile sounds hollow and has a 2 inch outer shell. More than 50% cross-section area loss.
74435	6	D	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	The pile sounds hollow and has a 1 inch outer shell. More than 50% cross-section area loss.
74436	All	All	Trestle / Ramp	Superstructure	Guardrail / Handrail / Bullrail	Timber	Major (MJ)	Bull rail has full cross section splits, up to 1 inch width.
74437	5	E	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	The pile sounds hollow and has a 2 inch shell. More than 50% cross-section area loss.
74438	5	C	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	The pile sounds hollow and has a 2 inch shell. More than 50% cross-section area loss.
74439	5	B	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	The pile sounds hollow and has a 3 inch shell. More than 50% cross-section area loss.
74440	5	F	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	The pile sounds hollow and has a 3 inch shell. More than 50% cross-section area loss.
74441	4	D	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	The pile sounds hollow and has a 2 inch shell. More than 50% cross-section area loss.
74442	1	All	Pier / Wharf	Substructure	Pile Cap	Steel	Minor (MN)	Checks and splits less than 1/2 inch wide.
74443	1	A	Pier / Wharf	Substructure	Other Structure	Steel	Moderate (MD)	Connection plate from deck to pile is corroded on all exposed areas. Connection is not engaged.
74444	3	A	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	The pile sounds hollow and has a 2 inch shell. More than 50% cross-section area loss.
78947	N/A	N/A	Trestle / Ramp	Superstructure	Deck	Reinforced Concrete	Minor (MN)	Deck has minor longitudinal and transverse cracks at the expansion joint.

Attachment A-16
Dredge Base
Moata Forms - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Dredge Base Overview
Navigation Base, looking east



Photo 02: Dredge Base Overview
Typical condition of timber piles at waterline



Photo 03: Dredge Base Overview
Typical condition of steel piles at waterline

Attachment A-16 Dredge Base

Dive Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Resistance Drill Measurements							
Swan Island Basin	Location: Portland, OR		Company: <i>Collins Engineers, Inc.</i>			Divers: Pinkston, Moss, Malone, Sukow	
Facility: Various	Auditor: Jordan Furlan		Inspection Date: 07/19/2022 - 07/28/2022				
Time of Day: N/A	Tide: +0-3 ft. MLLW		Pile Type (Bearing, Batter, Sheet, Guide): Bearing, Batter			Component Material: Timber	
Measurement	Property	Bent	Pile	Depth	Length of decay	Estimated cross-section loss	Notes
116	Navigation Base	6	A	2-3' above waterline	0		
117		5	C	2-3' above waterline	0		Bad reading
118		5	B	2-3' above waterline	0		Bad reading
119		5	C	2-3' above waterline	0.5		

Attachment A-16
Dredge Base
Resistance Drill Measurements - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Attachment A-17

Marine Consortium Pier

Facility Information

Owner	The Marine Salvage Consortium Inc.	
Asset Name(s)	MSC Pier	
Construction Year	No information received	
Owner/Operator Notes	Operational – spill response operations from waterway. Boats docked at facility.	
Previous Inspection Year	No information received	
Previous Inspection Assessment Rating/Notes	No information received	
Repair History	No information received	
Structure Components	T-Pier	<ul style="list-style-type: none">• 80' x 24' (N-S section)• 130' x 30' (E-W)
	Docks	<ul style="list-style-type: none">• West: 200' x 6'• East: 260' x (varies)
	Dolphins	<ul style="list-style-type: none">• 3 total
Other information	Facility Length/ Depth/ Design Depth	Approximtely 650' long', no information on depth
	Fender System	Timber and steel fender piles
	Mooring System	Steel appurtenances
	Dolphin System	3 timber dolphins

General Location

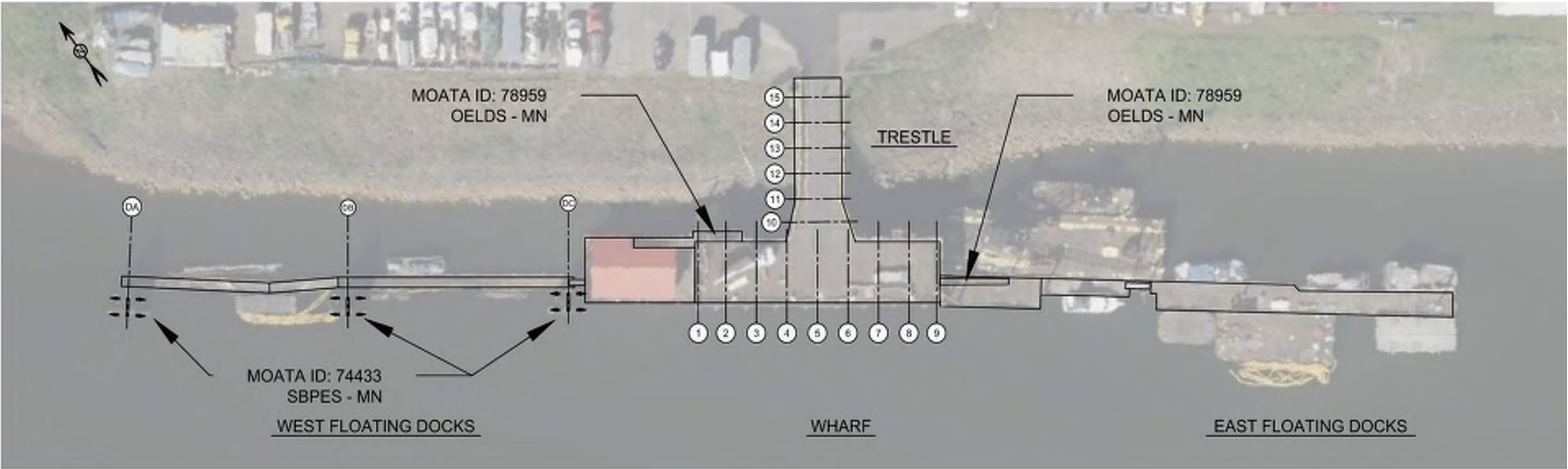


Asset Photo

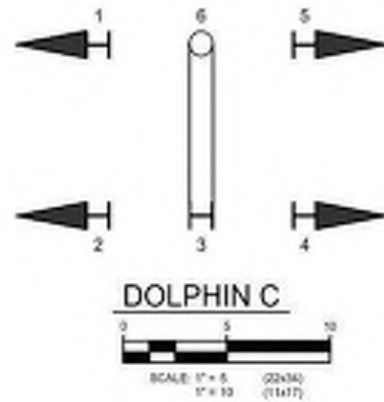
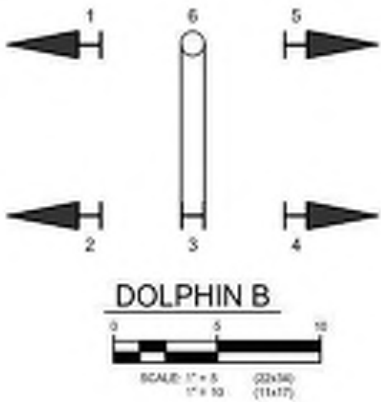
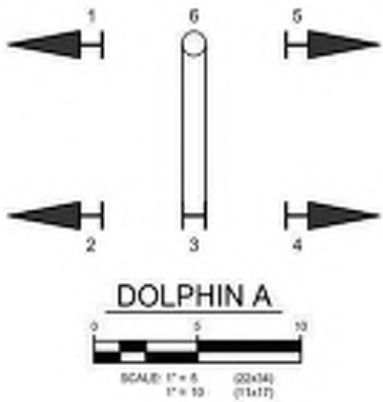


View of the MSC pier looking north

LEGEND:
STEEL BATTER PILE



PLAN VIEW
Marine Salvage Consortium Pier



[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
FS = FENDER SYSTEM
FL = FLOATING STRUCTURE
OE = OTHER ELEMENT
SB = SUBSTRUCTURE
MR = MOORING

ELEMENT TYPE:
PE = PILE/SHEET PILE
PC = PILE CAP
PG = PILE GUIDE
DK = DECKING
CT = CLEAT/BOLLARD
CB = CROSS-BRACING
WR = WALER
LD = LADDER

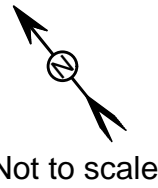
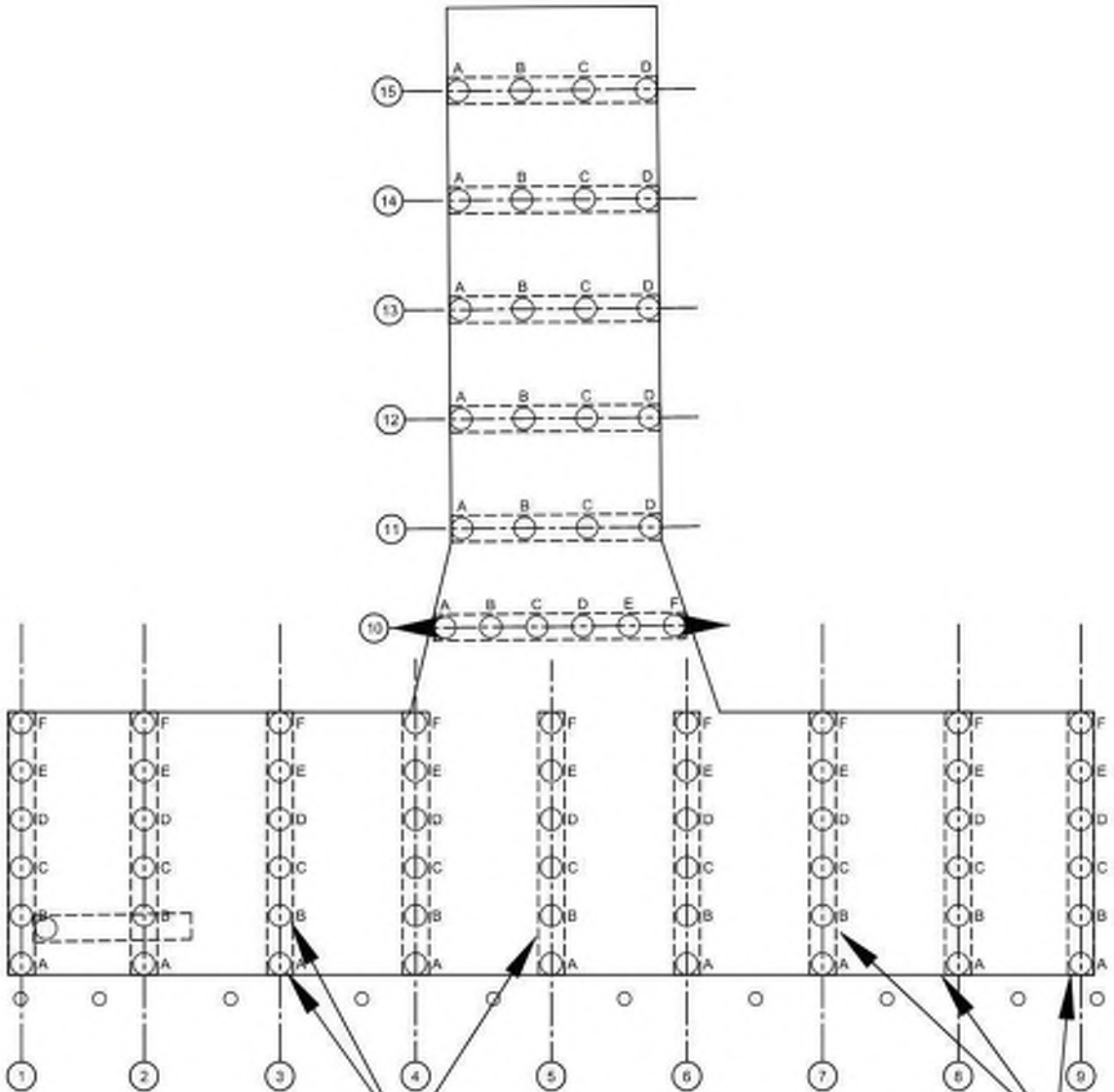
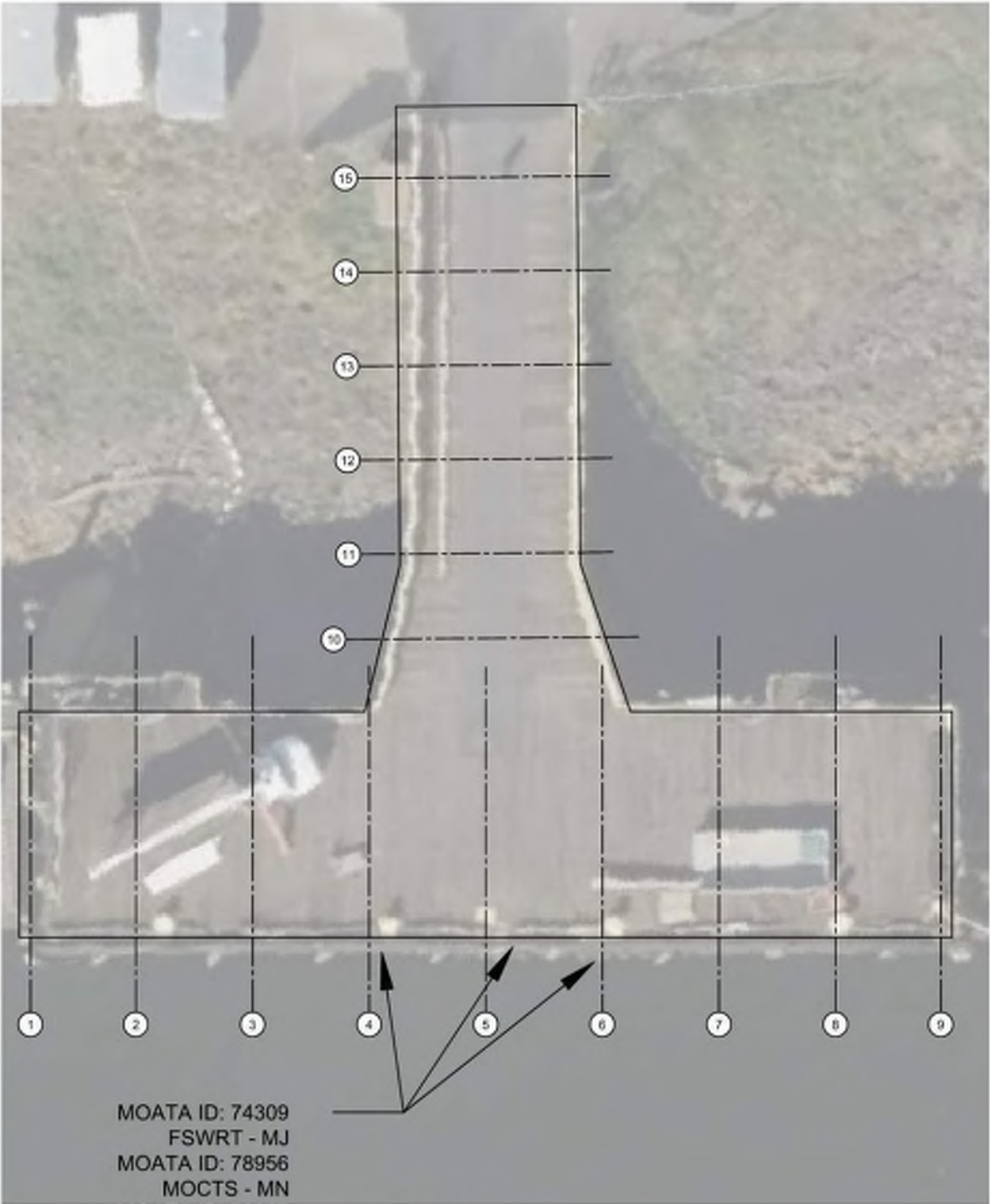
DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

MATERIAL TYPE:
C = REINFORCED CONCRETE
S = STEEL
T = TIMBER
R = Rubber

Attachment A-17 Marine Consortium Pier Structure Layout - Sheet 1 of 3

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

- LEGEND:
- TIMBER PILE
 - TIMBER PILE CAP
 - TIMBER DECK
 - TIMBER BATTER PILE



Not to scale

[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
FS = FENDER SYSTEM
FL = FLOATING STRUCTURE
OE = OTHER ELEMENT
SB = SUBSTRUCTURE
MR = MOORING

ELEMENT TYPE:
PE = PILE/SHEET PILE
PC = PILE CAP
PG = PILE GUIDE
DK = DECKING
CT = CLEAT/BOLLARD
CB = CROSS-BRACING
WR = WALER
LD = LADDER

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE



MATERIAL TYPE:
C = REINFORCED CONCRETE
S = STEEL
T = TIMBER
R = Rubber

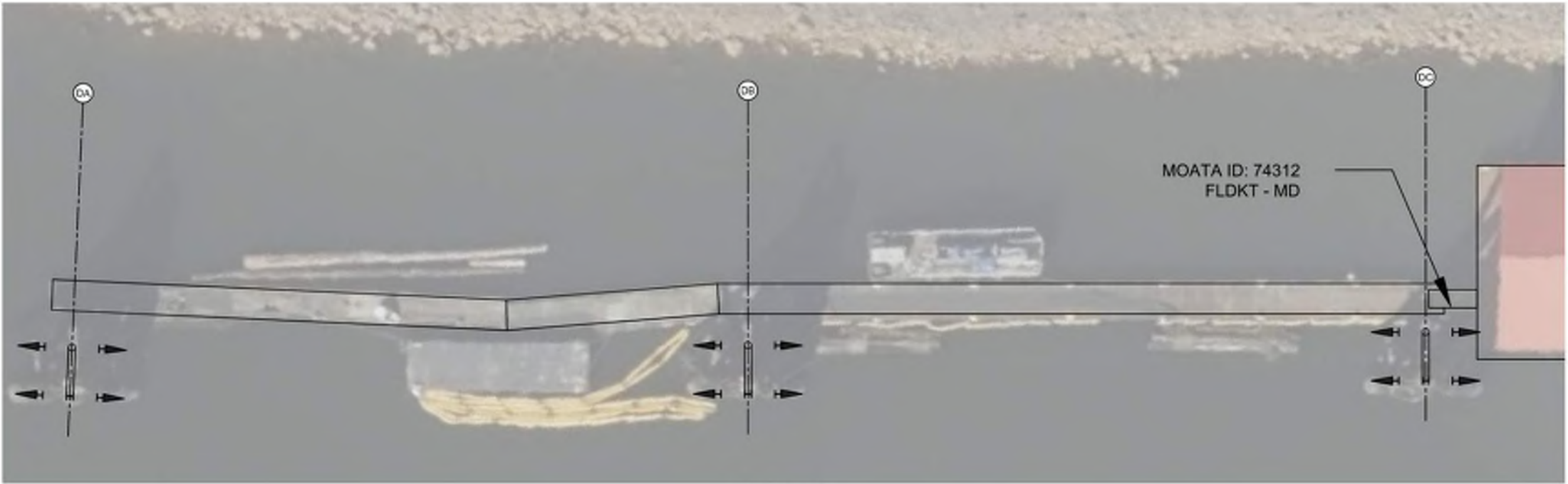
GENERAL NOTES:
1. Drawings are not to scale and are intended to
generally locate structural members to note
inspection observations.

Attachment A-17 Marine Consortium Pier Structure Layout - Sheet 2 of 3

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

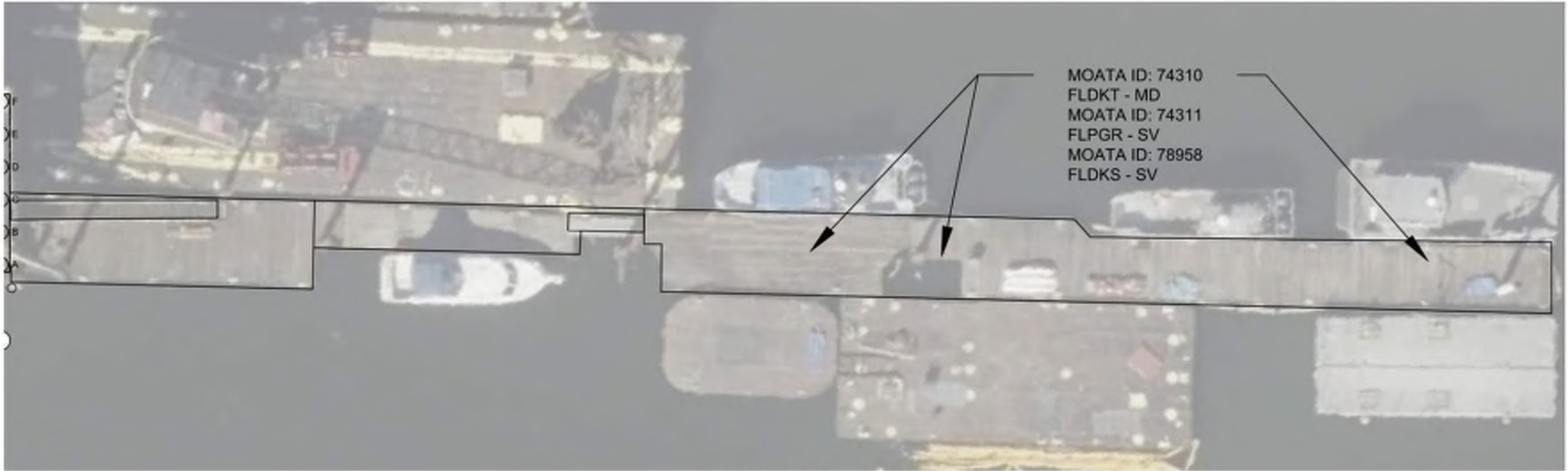
LEGEND:

-  STEEL BATTER PILE
-  TIMBER DECK



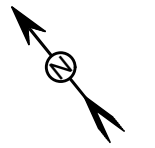
PLAN VIEW

Marine Salvage Consortium Pier



PLAN VIEW

Marine Salvage Consortium Pier



Not to scale

[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
FS = FENDER SYSTEM
FL = FLOATING STRUCTURE
OE = OTHER ELEMENT
SB = SUBSTRUCTURE
MR = MOORING

ELEMENT TYPE:
PE = PILE/SHEET PILE
PC = PILE CAP
PG = PILE GUIDE
DK = DECKING
CT = CLEAT/BOLLARD
CB = CROSS-BRACING
WR = WALER
LD = LADDER

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

MATERIAL TYPE:
C = REINFORCED CONCRETE
S = STEEL
T = TIMBER
R = Rubber

GENERAL NOTES:

1. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.

Attachment A-17
Marine Consortium Pier
Structure Layout - Sheet 3 of 3

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Marine Consortium Pier Overview
Marine Consortium Pier, Looking North
Moata ID: Not Applicable



Photo 02: Marine Consortium Pier Substructure
Marine Consortium Pier Substructure Overview
Typical configuration of MC Pier substructure
Moata ID: Not Applicable



Photo 03: MC Pier Substructure
Marine Consortium Pier Pile Cap
Typical condition of pile caps
Moata ID: Not Applicable



Photo 04: Marine Consortium Pier Floats
West Float
Typical condition of the float
Moata ID: Not Applicable



Photo 05: Marine Consortium Dolphin
Dolphin C
Typical configuration of dolphins
Moata ID: 74433

Attachment A-17 Marine Consortium Pier Above-Water Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., AE.		Materials:	Steel, Timber, Rubber
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Substructure, Floating Structure, Fender System, Mooring, Other Element
Facility:	MC Pier			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74312	N/A	N/A	Floating Dock	Floating Structure	Decking	Timber	Moderate (MD)	The floating dock is listing toward the landside. 12 inches high from the waterline at the landside and 18 inches high from the waterline at the waterside over 6 feet (length of the floating dock). Floating timbers are likely soft in some locations.
74429	9	A	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Severe (SV)	The first 1/2 inch from the outer surface to the inside core is hollow over 1/3 of the perimeter of the cross section at the waterline. The diameter loss is up to 15% and the loss of cross section is over 50%.
74431	3	A	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile has a 2 inch shell and 50% cross-section area loss at 3 feet above the waterline.
74432	3	B	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Moderate (MD)	The first 1/2 inch from the outer surface to the inside core is hollow over 1/3 of the perimeter of the cross section at the waterline. The diameter loss is up to 15% and the cross-section area loss is over 50%.
74306	7	A to C	Pier / Wharf	Substructure	Pile Cap	Timber	Moderate (MD)	The pile cap has splits/checks, continuous from pile A to pile C. The split is nearly 1/2 inch at the widest section of pile cap.
74307	8	A	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Moderate (MD)	Pile sounds soft at pile cap connection.

Attachment A-17
Marine Consortium Pier
Moata Forms - Sheet 1 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., AE.		Materials:	Steel, Timber, Rubber
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Substructure, Floating Structure, Fender System, Mooring, Other Element
Facility:	MC Pier			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74308	5	A to B	Pier / Wharf	Substructure	Cross-bracing	Timber	Major (MJ)	Bracing between piles A and B, supporting catwalk, has splits at connection.
74309	6	N/A	Pier / Wharf	Fender System	Waler	Timber	Major (MJ)	Fender assembly waler/chock system has 25% cross-section area loss. Fender piles have long splits. Rubber fender elements are generally in good condition.
74310	N/A	N/A	Floating Dock	Floating Structure	Decking	Timber	Moderate (MD)	The floating dock is listing 5 inches toward the landside. 8 inches high from the waterline at the landside and 13 inches high from the waterline at the waterside over 13.33 feet (length of the floating dock).
74311	N/A	N/A	Floating Dock	Floating Structure	Pile Guide	Rubber	Severe (SV)	Rub strip at the mid center is 5/8 of its cross section area. Rub strip shows signs of cracking. Missing nut hardware on the southern side.

Attachment A-17
Marine Consortium Pier
Moata Forms - Sheet 2 of 2

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: Marine Consortium Pier Overview
Marine Consortium Pier, looking north

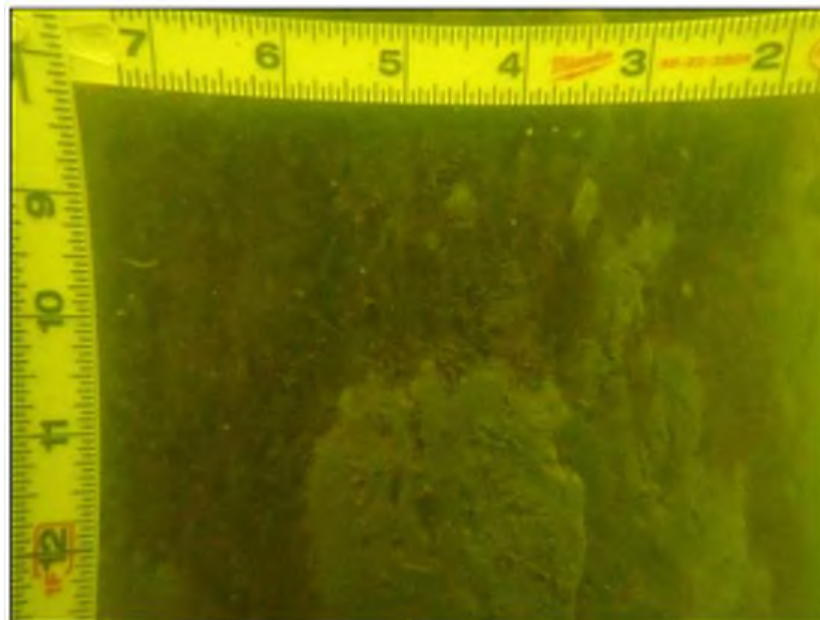


Photo 02: Marine Consortium Pier Substructure
Typical condition of timber piles near channel bottom

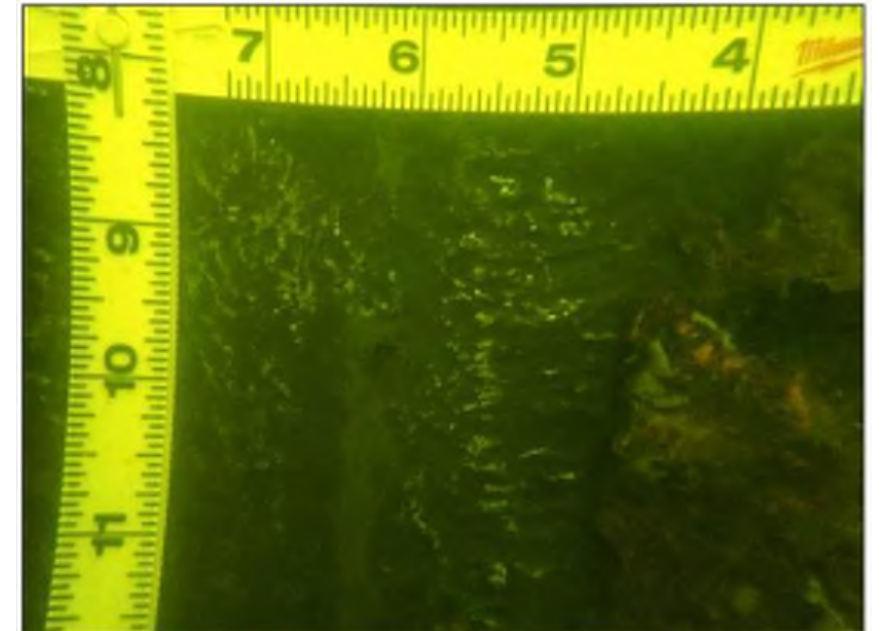


Photo 03: Marine Consortium Pier Dolphins
Typical cleaned surface on steel H piles on Dolphins near channel bottom

Attachment A-17
Marine Consortium Pier
Dive Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Resistance Drill Measurements							
Swan Island Basin	Location: Portland, OR		Company: <i>Collins Engineers, Inc.</i>			Divers: Pinkston, Moss, Malone, Sukow	
Facility: Various	Auditor: Jordan Furlan		Inspection Date: 07/19/2022 - 07/28/2022				
Time of Day: N/A	Tide: +0-3 ft. MLLW		Pile Type (Bearing, Batter, Sheet, Guide): Bearing, Batter			Component Material: Timber	
Measurement	Property	Bent	Pile	Depth	Length of decay	Estimated cross-section loss	Notes
111	Marine Consortium Pier	3	A	2-3' above waterline	6	40%	
112		4	A	2-3' above waterline	1.5	15%	
113		7	A	2-3' above waterline	0		
114		7	B	2-3' above waterline	0		
115		9	A	2-3' above waterline	0		

Attachment A-17
Marine Consortium Pier
Resistance Drill Measurements - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Attachment A-18

U.S. Navy Pier

Facility Information

Owner	United States of America Department of the Navy	
Asset Name(s)	USN Pier	
Construction Year	1973	
Owner/Operator Notes	Not currently operational	
Previous Inspection Year	No information received	
Previous Inspection Assessment Rating/Notes	No information received	
Repair History	No information received	
Structure Components	Superstructure	<ul style="list-style-type: none">• (1) 425' x 30' Pier• (1) 80' x 6' Gangway• (1) 36' x 10' Floating Dock
	Substructure	<ul style="list-style-type: none">• Timber piles and cross bracing
Other information	Facility Length/ Depth/ Design Depth	No information received
	Fender System	No information received
	Mooring System	No information received
	Dolphin System	No information received
	Other System	Not applicable

General Location



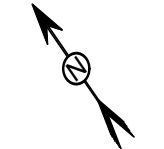
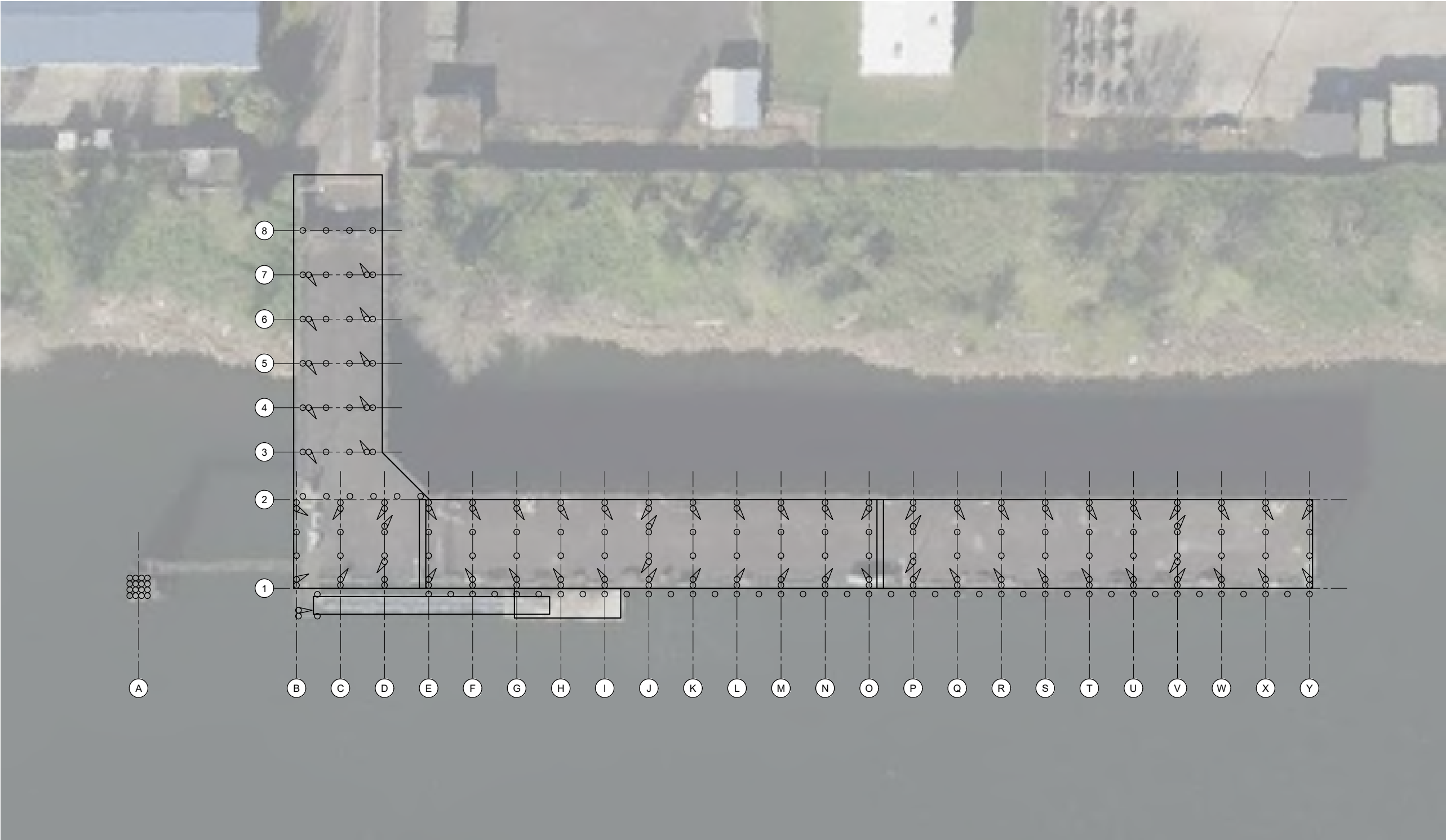
Asset Photo



View of west side of the USN pier looking east

LEGEND:

- TIMBER PILE
- TIMBER BATTER PILE
- TIMBER DECK



Not to scale

GENERAL NOTES:

1. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.

Attachment A-18
U.S. Navy Pier
Structure Layout - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin





Photo 01: U.S. Navy Pier Overview
U.S. Navy Pier, looking north
Source: AME 2019 Report



Photo 02: U.S. Navy Pier Substructure
Typical condition of timber pile cap
Source: AME 2019 Report



Photo 03: U.S. Navy Pier Substructure
Timber pile cap with severe end grain fungal decay
Source: AME 2019 Report



Photo 04: U.S. Navy Pier Dolphins
Typical condition of timber batter pile
Source: AME 2019 Report



Photo 05: U.S. Navy Pier Substructure
Typical condition of timber pile
Source: AME 2019 Report

Attachment A-18 U.S. Navy Pier

Above-Water Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: U.S. Navy Pier Overview
U.S. Navy Pier, looking east

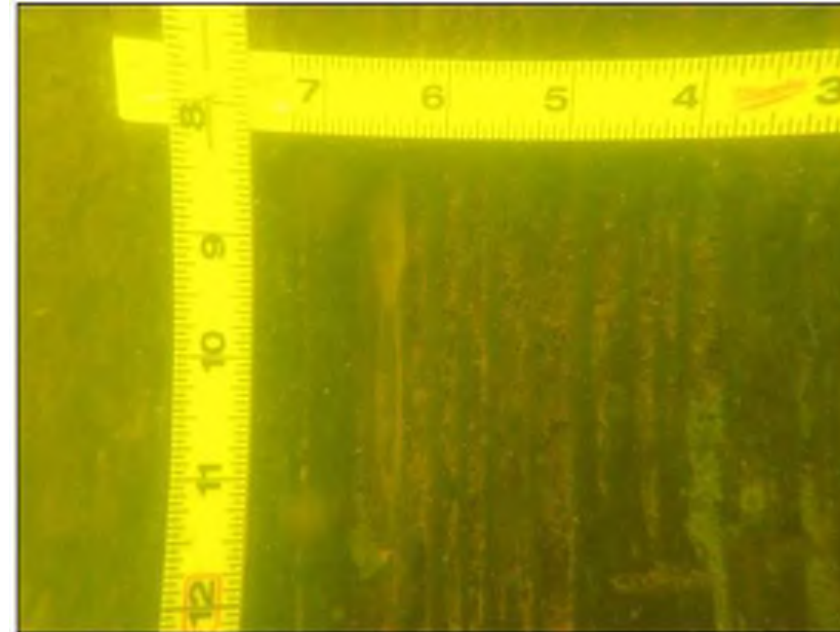


Photo 02: U.S. Navy Pier Substructure
Typical condition of timber piles at mid-depth

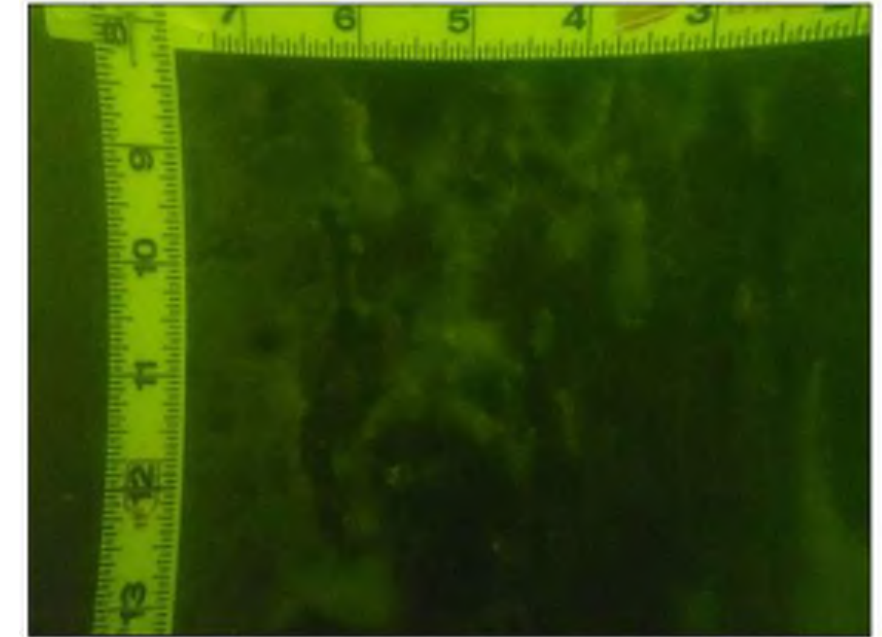


Photo 03: U.S. Navy Pier Substructure
Typical marine growth on timber piles



Photo 04: U.S. Navy Pier Dolphins
West Dolphin
Core decay in walers

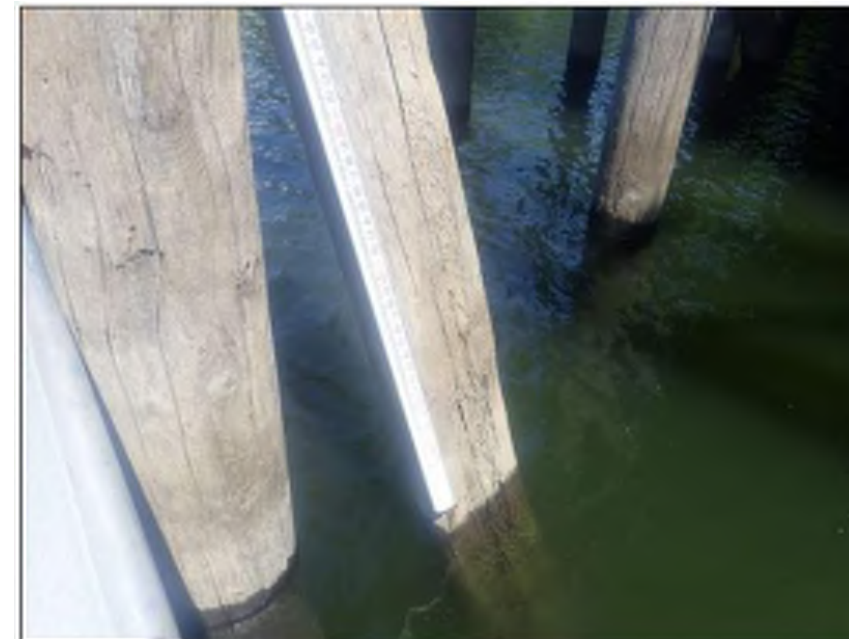


Photo 05: U.S. Navy Pier Substructure
Batter Piles
Loss of section

Attachment A-18 U.S. Navy Pier

Dive Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Resistance Drill Measurements							
Swan Island Basin	Location: Portland, OR		Company: <i>Collins Engineers, Inc.</i>		Divers: Pinkston, Moss, Malone, Sukow		
Facility: Various	Auditor: Jordan Furlan		Inspection Date: 07/19/2022 - 07/28/2022				
Time of Day: N/A	Tide: +0-3 ft. MLLW		Pile Type (Bearing, Batter, Sheet, Guide): Bearing, Batter		Component Material: Timber		
Measurement	Property	Bent	Pile	Depth	Length of decay	Estimated cross-section loss	Notes
97	U.S. Navy Pier	24	C	2-3' above waterline	4.5	40%	
98		16	D	2-3' above waterline	4.5	20%	
99		14	C	2-3' above waterline	0		
100		14	C	2-3' above waterline	0		
101		13	D	2-3' above waterline	0		
102		9	C	2-3' above waterline	0		
103		8	D	2-3' above waterline	0		
104		1	A	2-3' above waterline	0		Bad reading
105		1	A	2-3' above waterline	0		Bad reading
106		1	A	2-3' above waterline	7.5	30%	
107		1	B	2-3' above waterline	3.5	30%	
108		1	C	2-3' above waterline	0		
109		Dolphin	1	2-3' above waterline	0		Bad reading
110		Dolphin	2	2-3' above waterline	5	20%	
173		7	A	Channel bottom	0		
174		7	A	Mid-depth	0		
175		8	B	Channel bottom	0		
176		8	B	Mid-depth	0		
177		8	B	Mid-depth	0		
178		9	B	Channel bottom	0		
179		9	B	Channel bottom	0		
180		9	B	Mid-depth	0		
181		1	A	Channel bottom	0		
182		1	A	Mid-depth	0		
183		1	B	Channel bottom	0		
184		1	B	Mid-depth	0		

Attachment A-18
U.S. Navy Pier
Resistance Drill Measurements - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Attachment A-19
U.S. Coast Guard Dock and Pier

Facility Information

Owner	United States of America United States Coast Guard	
Asset Name(s)	USCG Docks and Pier	
Construction Year	1974	
Owner/Operator Notes	Operational	
Previous Inspection Year	No information received	
Previous Inspection Assessment Rating/Notes	No information received	
Repair History	No information received	
Structure Components	Pier	<ul style="list-style-type: none">• (1) 140' x 30' Trestle• (2) 50' x 8' Finger Piers
	Dock	<ul style="list-style-type: none">• (4) 48' x 10' Finger Docks• (1) 125' x 10' Access Dock
Other information	Facility Length/ Depth/ Design Depth	No information received
	Fender System	No information received
	Mooring System	No information received
	Dolphin System	No information received
	Other System	Not applicable

General Location



Asset Photo



LEGEND:

- PILE
- TIMBER BATTER PILE
- TIMBER BATTER PILE
- TIMBER DECK



Not to scale

[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SP = SUPERSTRUCTURE
FS = FENDER SYSTEM
SB = SUBSTRUCTURE

ELEMENT TYPE:
CB = CROSS-BRACING
GD = GUARDRAIL/HANDRAIL/BULLRAIL
WR = WALER
PE = PILE/SHEET PILE
PC = PILE CAP
GT = GRATE

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

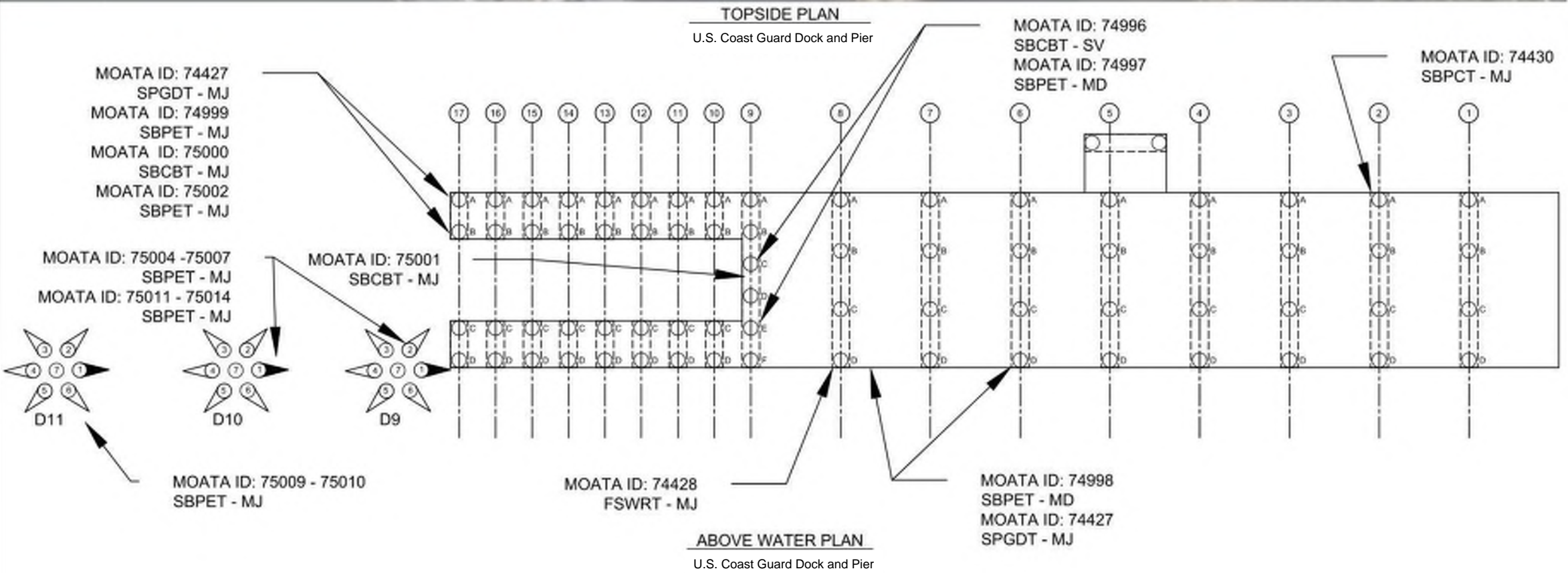
MATERIAL TYPE:
S = STEEL
T = TIMBER

GENERAL NOTES:
1. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.

Attachment A-19
U.S. Coast Guard Dock and Pier
Structure Layout - Sheet 1 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

- LEGEND:
- TIMBER PILE
 - TIMBER BATTER PILE
 - TIMBER BATTER PILE
 - TIMBER PILE CAP
 - TIMBER DECK



[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SP = SUPERSTRUCTURE
FS = FENDER SYSTEM
SB = SUBSTRUCTURE

ELEMENT TYPE:
CB = CROSS-BRACING
GD = GUARDRAIL/HADNRail/BULLRAIL
WR = WALER
PE = PILE/SHEET PILE
PC = PILE CAP
GT = GRATE

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

MATERIAL TYPE:
S = STEEL
T = TIMBER

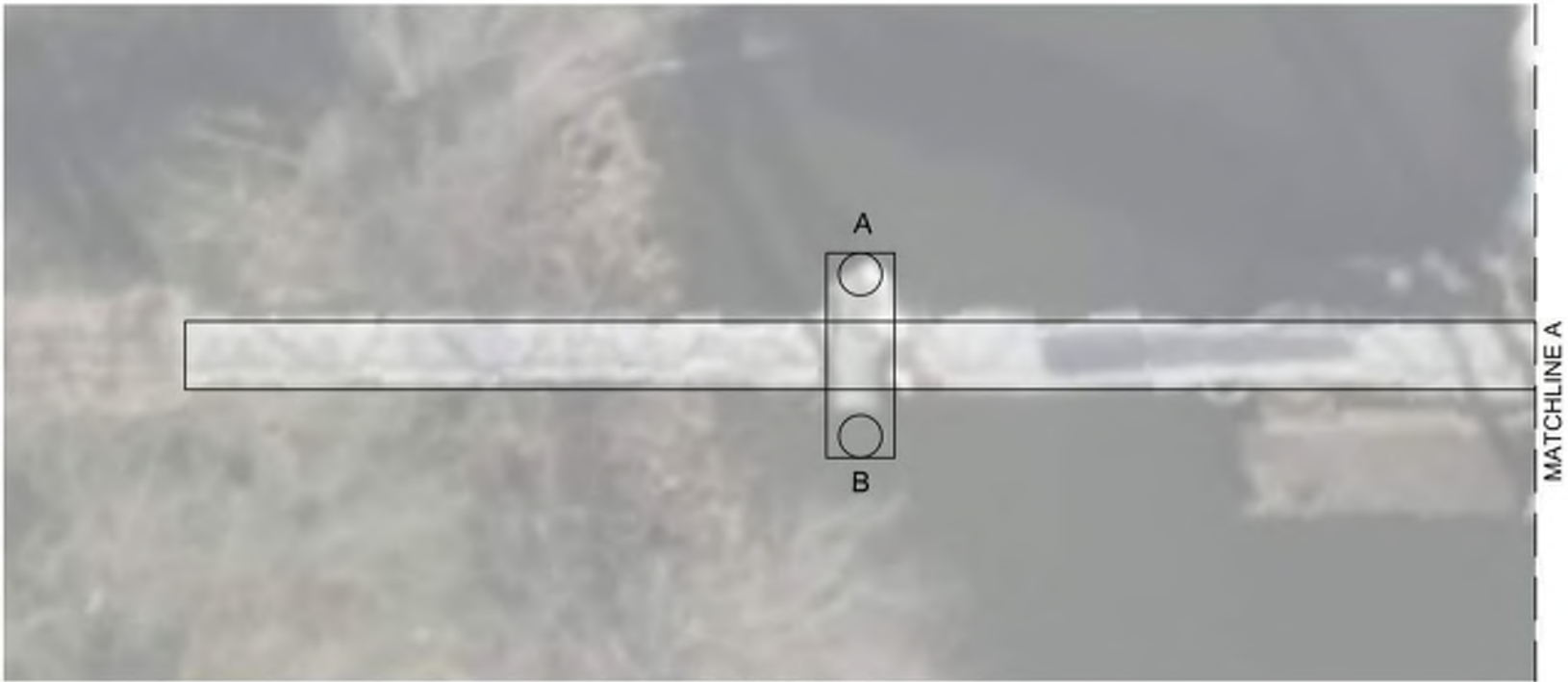
GENERAL NOTES:
1. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.

Attachment A-19 U.S. Coast Guard Dock and Pier Structure Layout - Sheet 2 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

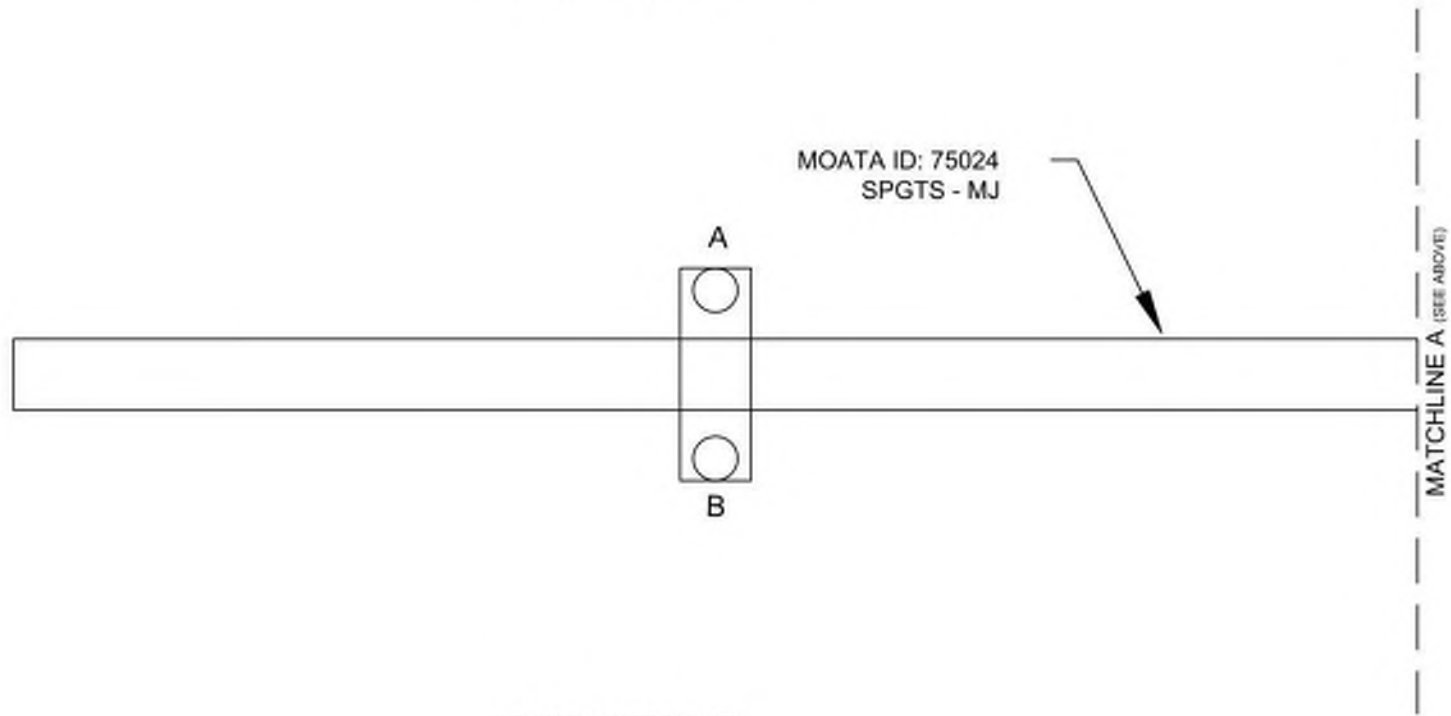
LEGEND:

- STEEL PILE
- STEEL DECK



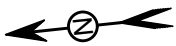
TOPSIDE PLAN

U.S. Coast Guard Dock and Pier



ABOVE WATER PLAN

U.S. Coast Guard Dock and Pier



Not to scale

[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SP = SUPERSTRUCTURE
FS = FENDER SYSTEM
SB = SUBSTRUCTURE

ELEMENT TYPE:
CB = CROSS-BRACING
GD = GUARDRAIL/HANDRAIL/BULLRAIL
WR = WALER
PE = PILE/SHEET PILE
PC = PILE CAP
GT = GRATE

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

MATERIAL TYPE:
S = STEEL
T = TIMBER

GENERAL NOTES:

1. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.

Attachment A-19
U.S. Coast Guard Dock and Pier
Structure Layout - Sheet 3 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

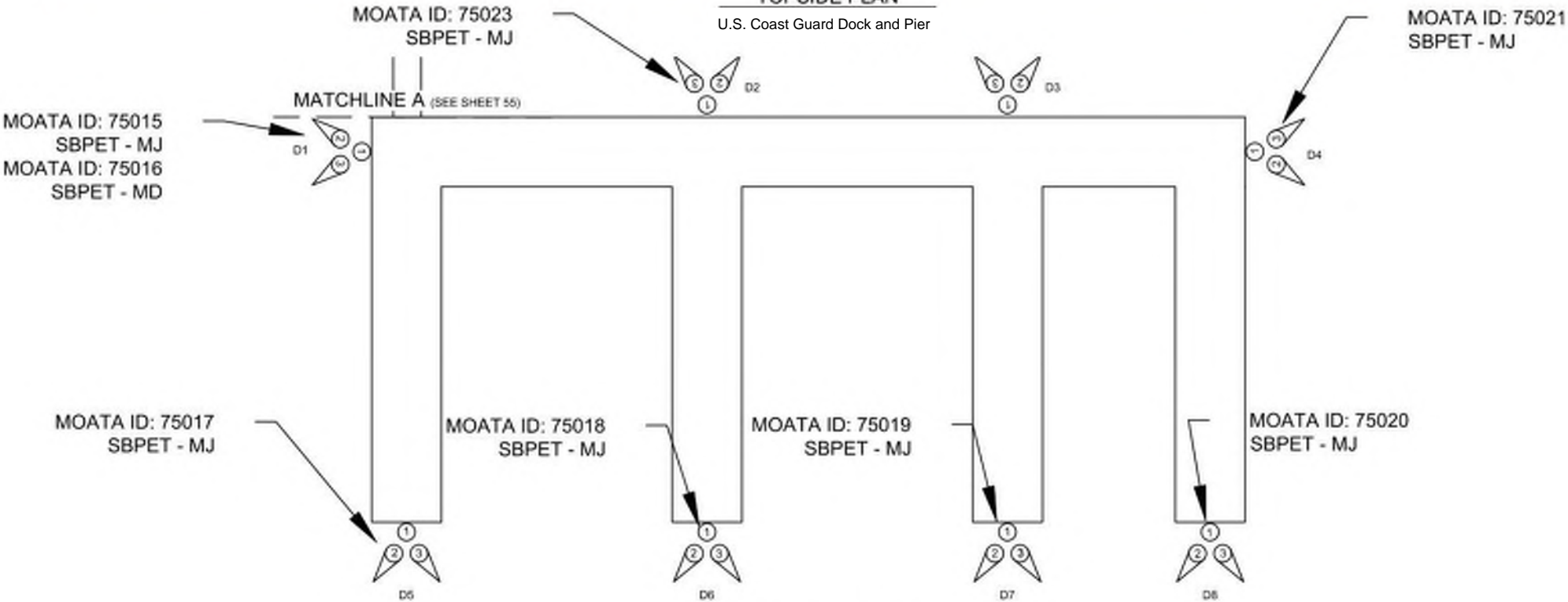
LEGEND:

- STEEL PILE
△ TIMBER BATTER PILE
■ TIMBER FLOAT



TOPSIDE PLAN

U.S. Coast Guard Dock and Pier



ABOVE WATER PLAN

U.S. Coast Guard Dock and Pier

[MOATA ID XXXXX]
[WWYYZ - ##]

DEFECT CALLOUT
MOATA ID XXXXX = MOATA FORM
ID NUMBER
WW = SYSTEM TYPE
YY = ELEMENT TYPE
Z = MATERIAL TYPE
= DEFECT LEVEL

SYSTEM TYPE:
SP = SUPERSTRUCTURE
FS = FENDER SYSTEM
SB = SUBSTRUCTURE

ELEMENT TYPE:
CB = CROSS-BRACING
GD = GUARDRAIL/HANDRAIL/BULLRAIL
WR = WALER
PE = PILE/SHEET PILE
PC = PILE CAP
GT = GRATE

DEFECT LEVEL:
MN = MINOR
MD = MODERATE
MJ = MAJOR
SV = SEVERE

MATERIAL TYPE:
S = STEEL
T = TIMBER

GENERAL NOTES:

1. Drawings are not to scale and are intended to generally locate structural members to note inspection observations.

Attachment A-19
U.S. Coast Guard Dock and Pier
Structure Layout - Sheet 4 of 4

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

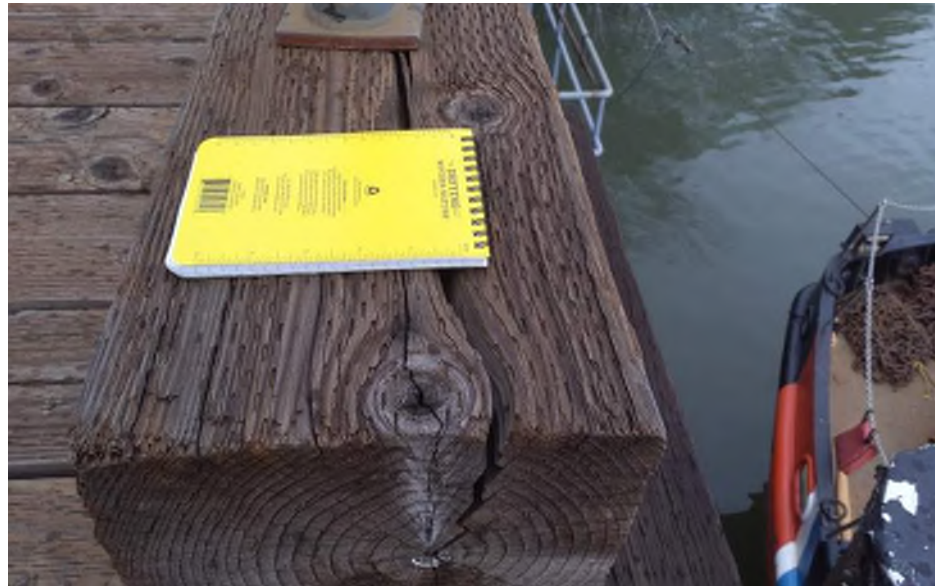


Photo 01: U.S. Coast Guard Dock and Pier Superstructure
Bullrail at Bent 17
Split on the bullrail
Moata ID: 74427



Photo 02: U.S. Coast Guard Dock and Pier Substructure
Cross-bracing Between Piles D and F at Bent 9
Broken cross-bracing
Moata ID: 74996

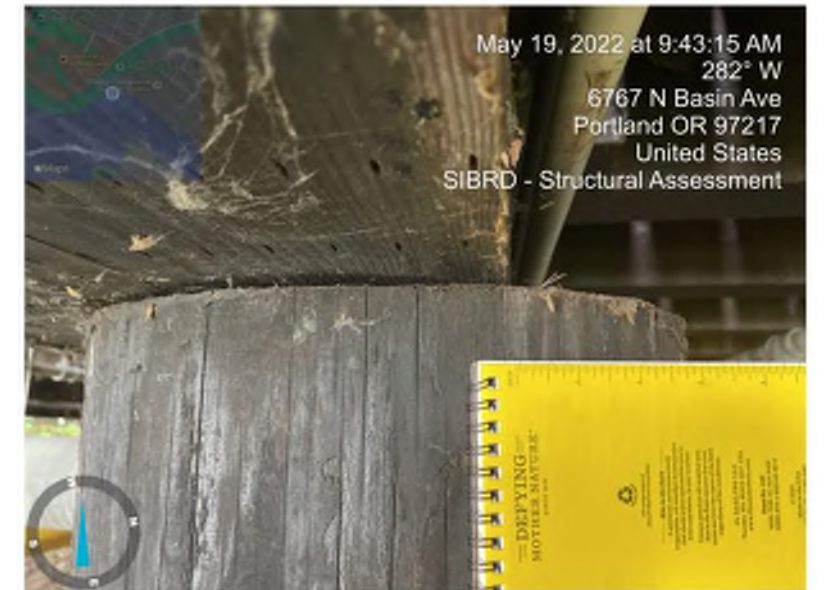


Photo 03: U.S. Coast Guard Dock and Pier Substructure
Pile Cap at Bent 2
Displacement of pile cap
Moata ID: 74430



Photo 04: U.S. Coast Guard Dock and Pier Substructure
Pile D Bent 6
Loss of section on the pile
Moata ID: 74998



Photo 05: U.S. Coast Guard Dock and Pier Dolphin
Dolphin D11
Typical condition of Dolphins (Main Pier)
Moata ID: 75009

Attachment A-19 U.S. Coast Guard Dock and Pier Above-Water Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., AE.		Materials:	Steel, Timber
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System
Facility:	USCG Dock and Pier			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74427	All	All	Pier / Wharf	Superstructure	Guardrail / Handrail / Bullrail	Timber	Major (MJ)	Split, 1/4 to 1/2 inch width, runs down full length of bull rail. Cross section shows checks and splits running nearly through full cross section. Attached handrail post connections are sturdy but bolts are not fully engaged at two locations.
74428	8	D	Pier / Wharf	Fender System	Waler	Timber	Major (MJ)	Bolted connection on waler is not engaged.
74430	2	A and B	Pier / Wharf	Substructure	Pile Cap	Timber	Major (MJ)	Pile cap is offset from the top of piles, with about a 3" section of pile not supporting the cap. All of the piles in bent show some offset distance.
74996	9	D and F	Pier / Wharf	Substructure	Cross-bracing	Timber	Severe (SV)	Transverse bracing is broken.
74997	9	C	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Moderate (MD)	The pile has gouge with 2" wide, 2.5" high and 1"depth at 1.5 feet above the waterline.
74998	6	D	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Moderate (MD)	The pile has gouge with 10 inch wide 3.5 inch high and 1.5 feet above the waterline.

Attachment A-19
U.S. Coast Guard Dock and Pier
Moata Forms - Sheet 1 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., AE.		Materials:	Steel, Timber
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System
Facility:	USCG Dock and Pier			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
74999	17	B	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile has 3 inch shell and 50% cross-section area loss at 3 feet above the waterline.
75000	17	B	Pier / Wharf	Substructure	Cross-bracing	Timber	Major (MJ)	Cross-bracing has splits along the full depth of its cross section.
75001	9	C to D	Pier / Wharf	Substructure	Cross-bracing	Timber	Major (MJ)	Bracing cross-section area loss of 25% to 50%.
75002	17	A	Pier / Wharf	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	The pile has 3 inch shell and 50% cross-section area loss at 3 feet above the waterline.
75004	N/A	3	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Dolphin 10: Pile 3 has a 3 inch outer shell and 50% cross-section area loss at 6 feet above the waterline.
75005	N/A	4	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Dolphin 10: Pile 4 has a 2.5 inch outer shell and 50% cross-section area loss at 5 feet above the waterline.

Attachment A-19
U.S. Coast Guard Dock and Pier
Moata Forms - Sheet 2 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., AE.		Materials:	Steel, Timber
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System
Facility:	USCG Dock and Pier			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75006	N/A	5	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Dolphin 10: Pile 5 has a 3 inch outer shell and 50% cross-section area loss at 4 feet above the waterline.
75007	N/A	1	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Dolphin 10: Pile 1 has a 3 inch outer shell and 50% cross-section area loss at 4 feet above the waterline.
75009	N/A	4	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Dolphin 11: Pile 4 has a 2.5 inch outer shell and 50% cross-section area loss at 4 feet above the waterline.
75010	N/A	3	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Dolphin 11: Pile 3 has a 3 inch outer shell and 50% cross-section area loss at 4 feet above the waterline.
75011	N/A	5	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Dolphin 9: Pile 5 has a 3.5 inch outer shell and 50% cross-section area loss at 4 feet above the waterline.
75012	N/A	3	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Dolphin 9: Pile 3 has a 2.5 inch outer shell and 50% cross-section area loss at 4 feet above the waterline.

Attachment A-19
U.S. Coast Guard Dock and Pier
Moata Forms - Sheet 3 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., AE.		Materials:	Steel, Timber
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System
Facility:	USCG Dock and Pier			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75013	N/A	4	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Dolphin 9: Pile 4 has a 2.5 inch outer shell and 50% cross-section area loss at 4 feet above the waterline.
75014	N/A	6	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Dolphin 9: Pile 6 sounds hollow, the inner core is likely not intact.
75015	N/A	3	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Dolphin 1: Pile 3 sounds hollow, the inner core is likely not intact.
75016	N/A	2	Dolphin	Substructure	Pile / Sheet Pile	Timber	Moderate (MD)	Dolphin 1: Pile 2 has a gouge with 7 inch wide and 3 inch high, at 6 feet above the waterline.
75017	N/A	2 and 3	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Dolphin 5: Pile 2 and 3 sound hollow, the inner cores are likely not intact.
75018	N/A	3	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Dolphin 6: Pile 3 sounds hollow, the inner core is likely not intact. Pile 3 has a gouge with 3 inch wide and 5 inch high at 3 feet above the waterline.

Attachment A-19
U.S. Coast Guard Dock and Pier
Moata Forms - Sheet 4 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Project Information								
Name:	Swan Island Basin Remedial Design			Topside:	SH., AE.		Materials:	Steel, Timber
Location:	Portland, OR			Above Water:	PY., HW.		Elements:	Superstructure, Substructure, Fender System
Facility:	USCG Dock and Pier			Date/Time:	Varies		Water Level:	Varies
Tabulated Field Data								
MOATA ID	Bent	Pile	Structure	Element	Type	Material	Defect Level	Comments
75019	N/A	3	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Dolphin 7: Pile 3 sounds hollow, the inner core is likely not intact.
75020	N/A	2 and 3	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Dolphin 8: Pile 2 and 3 sound hollow, the inner cores are likely not intact.
75021	N/A	2 and 3	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Dolphin 4: Pile 2 and 3 sound hollow, the inner cores are likely not intact.
75023	N/A	2 and 3	Dolphin	Substructure	Pile / Sheet Pile	Timber	Major (MJ)	Dolphin 2: Pile 2 and 3 sound hollow, the inner cores are likely not intact.
75024	All	All	Gangway / Walkway / Catwalk	Superstructure	Grating	Steel	Minor (MN)	Steel grating has minor surface rust.

Attachment A-19
U.S. Coast Guard Dock and Pier
Moata Forms - Sheet 5 of 5

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Photo 01: U.S. Coast Guard Dock and Pier Overview
U.S. Coast Dock and Pier, looking north

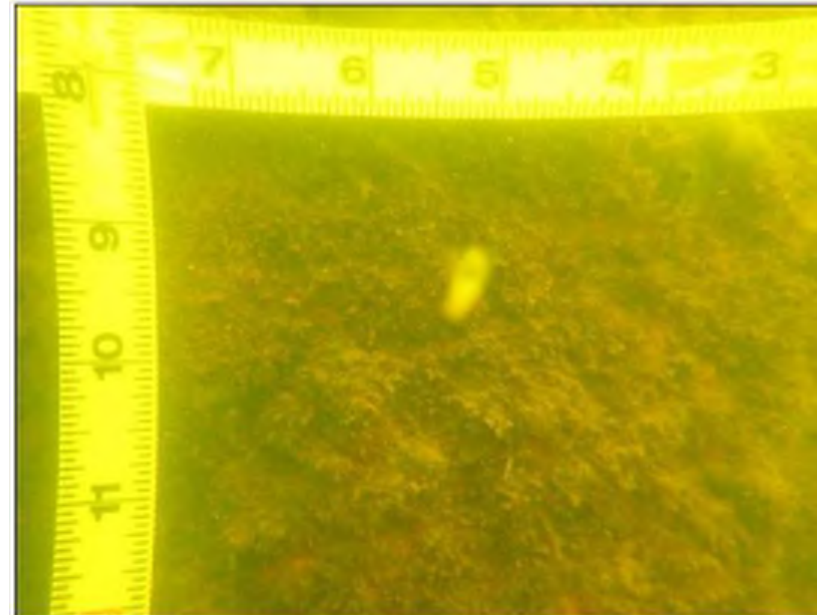


Photo 02: U.S. Coast Guard Dock and Pier Dolphins
Typical condition of steel pile on floating dock dolphins
near channel bottom

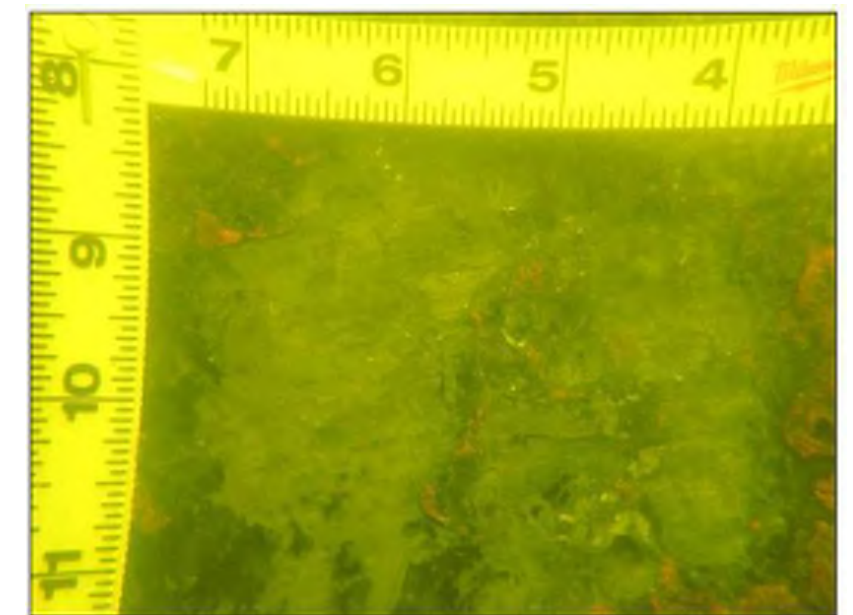


Photo 03: U.S. Coast Guard Dock and Pier Dolphins
Typical marine growth on timber batter piles at floating
dock dolphin

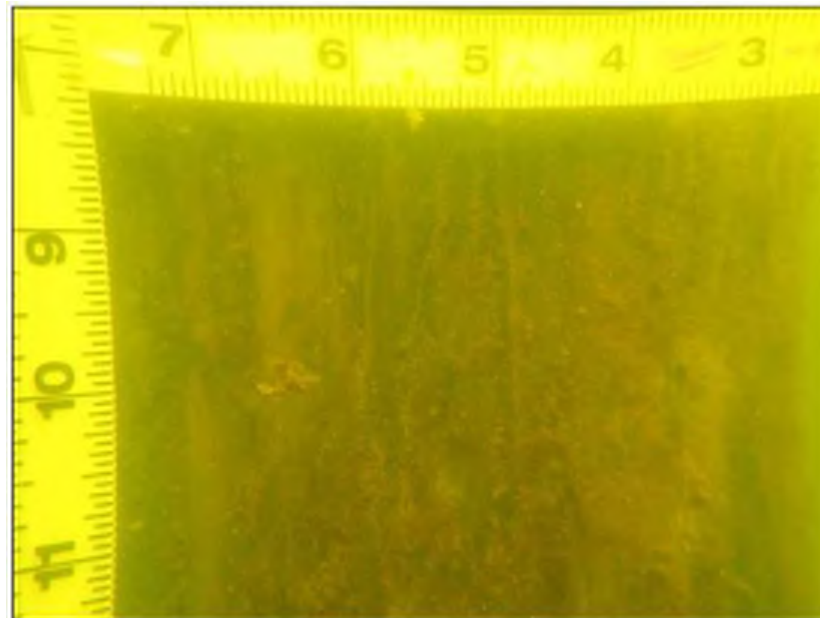


Photo 04: U.S. Coast Guard Dock and Pier Dolphins
Typical cleaned surface of timber batter piles at floating
dock dolphins

Attachment A-19
U.S. Coast Guard Dock and Pier
Dive Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Resistance Drill Measurements							
Swan Island Basin	Location: Portland, OR		Company: <i>Collins Engineers, Inc.</i>		Divers: Pinkston, Moss, Malone, Sukow		
Facility: Various	Auditor: Jordan Furlan		Inspection Date: 07/19/2022 - 07/28/2022				
Time of Day: N/A	Tide: +0-3 ft. MLLW		Pile Type (Bearing, Batter, Sheet, Guide): Bearing, Batter		Component Material: Timber		
Measurement	Property	Bent	Pile	Depth	Length of decay	Estimated cross-section loss	Notes
85	20	11	B	2-3' above waterline	0		
86	20	10	B	2-3' above waterline	1		
87	20	15	C	2-3' above waterline	0		
88	20	16	C	2-3' above waterline	5	30%	
89	20	9	D	2-3' above waterline	1	<5%	
90	20	9	E	2-3' above waterline	0		
91	20	9	A	2-3' above waterline	0		
92	20	9	A	2-3' above waterline	0		
93	20	Dolphin 4	2	2-3' above waterline	5	40%	
94	20	Dolphin 4	2	2-3' above waterline	7	40%	
95	20	Dolphin 8	**	2-3' above waterline	0		Bad reading
96	20	Dolphin 8	**	2-3' above waterline	0		Bad reading

Attachment A-19
U.S. Coast Guard Dock and Pier
Resistance Drill Measurements - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin



Attachment A-20

City Stormwater Outfalls

Attachment A-20.1
City Stormwater Outfall S1

Facility Information

Owner	City of Portland	
Asset Name(s)	City Stormwater Outfall S1	
Construction Year	1964	
Owner/Operator Notes	Operational – repair project underway	
Previous Inspection Year	N/A	
Previous Inspection Assessment Rating/Notes	N/A	
Repair History	No information received	
Structure Components	Outfall <ul style="list-style-type: none">Corrugated metal outfall and sheet pile headwall	
Other information	Facility Length/ Depth/ Design Depth	Not applicable
	Fender System	Not applicable
	Mooring System	Not applicable
	Dolphin System	Not applicable
	Other System	Not applicable

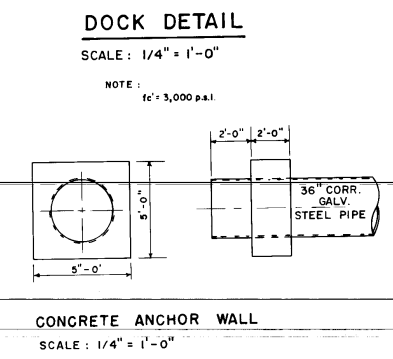
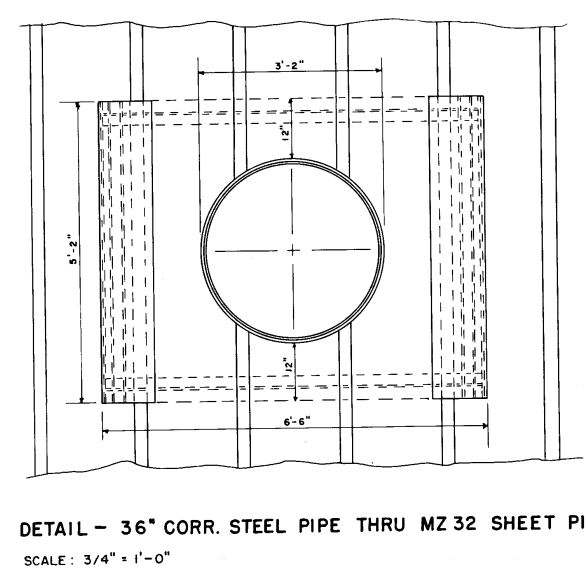
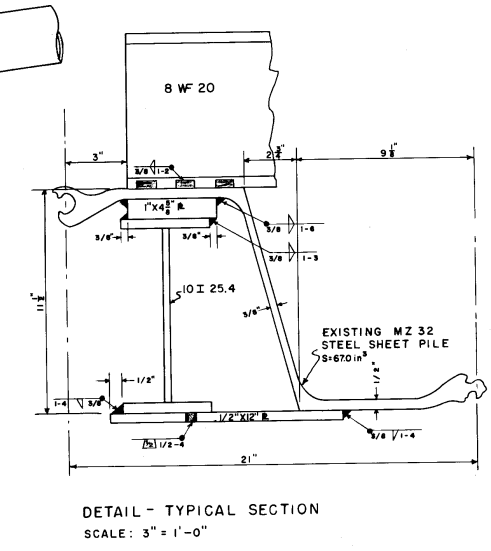
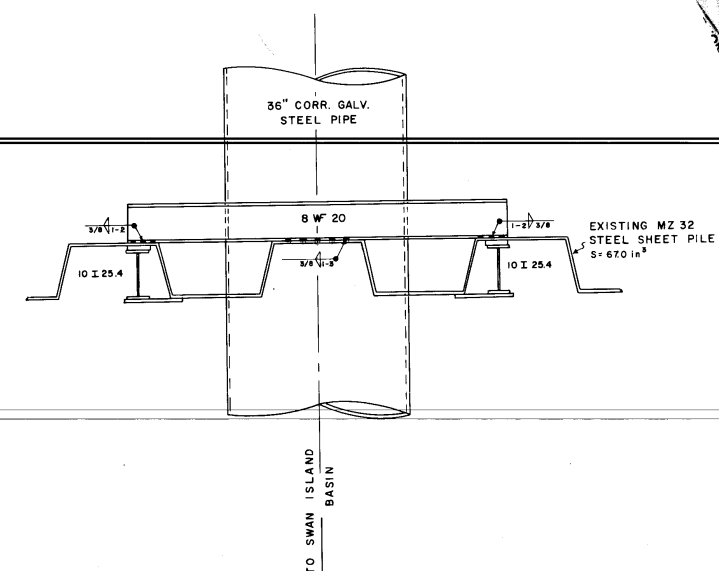
General Location



Asset Photo



Concrete anchor wall was not visible during inspection



FINAL MAP

sewer Constructed by C. J. MONTAG & SONS, INC.
sewer Completed 10/14/64
kind of Pipe _____
Map Corrected by W.A.K. Checked by E.S.T.
Data Entered on 3 Sec. Map by _____ Checked by _____
Data Entered on Dist. Map by _____ Checked by _____

FILE NO. L-67

CITY OF PORTLAND OREGON
DEPARTMENT OF PUBLIC WORKS
W.M.A. BOWEN COMMISSIONER
L.H. ROSENTHAL CITY ENGINEER

N. CHANNEL AVE., N. LAGOON AVE.,
B PRIVATE PROPERTY
STORM & SANITARY SEWER SYSTEM

DETAIL - DOCK

APPROVED: *[Signature]* 5-12-64
CITY ENGINEER REG. PROF. ENGR. NO. 1887

APPROVED: *[Signature]* 5-12-64
CHIEF REG. BUREAU NO. 8675
BUREAU OF DESIGN

JOB NO. 2639 REG. NO. _____ DRAWN BY W.A.K.
PCT. NO. _____ 1/8" SCS. SHEET 4 OF 6

UNDERGROUND CHECKED BY _____ CHECKED BY E. S. T.

Drawings obtained using City's GIS and facility records on PortlandMaps.com

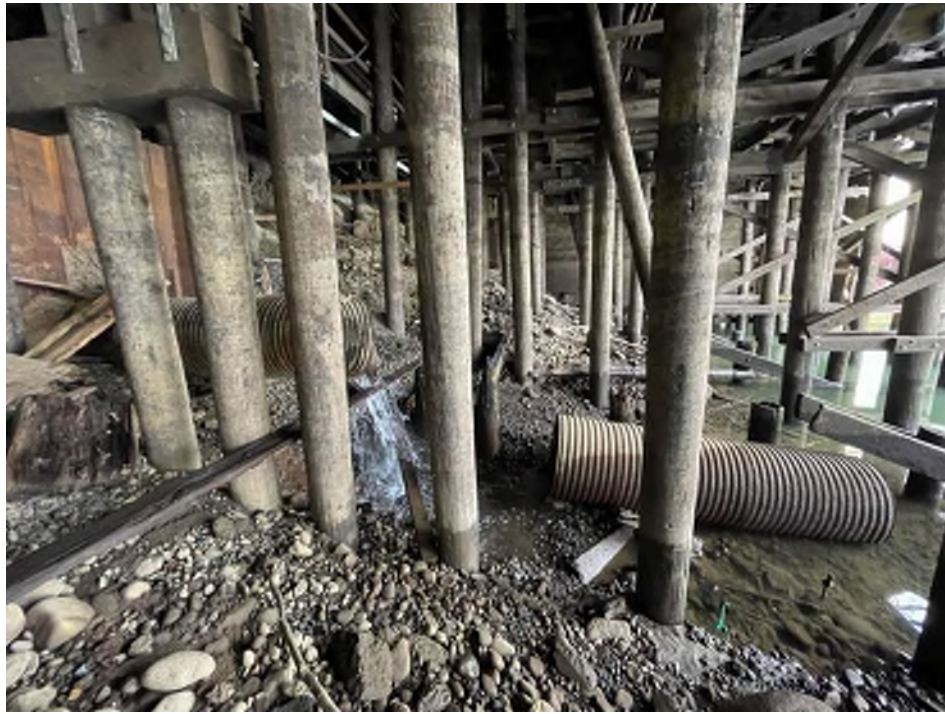


Photo 01: City Stormwater Outfall S1 Overview
City Stormwater Outfall S1, Looking West



Photo 02: City Stormwater Outfall S1 Overview
City Stormwater Outfall S1, Looking East



Photo 03: City Stormwater Outfall S1
Embankment erosion behind and adjacent to headwall



Photo 04: City Stormwater Outfall S1
Embankment erosion behind and adjacent to headwall

Attachment A-20.1 City Stormwater Outfall S1 Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Attachment A-20.2
City Stormwater Outfall S2

Facility Information

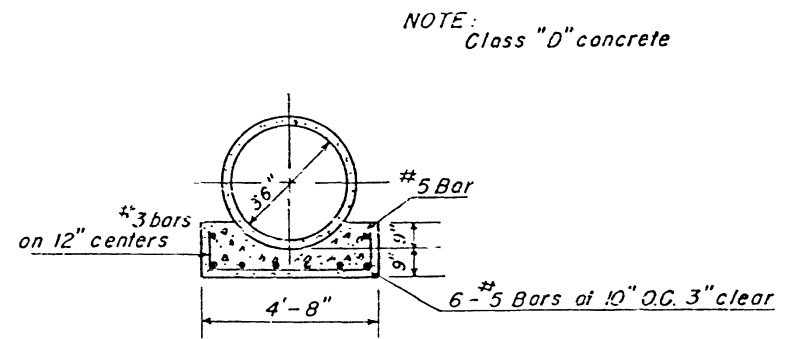
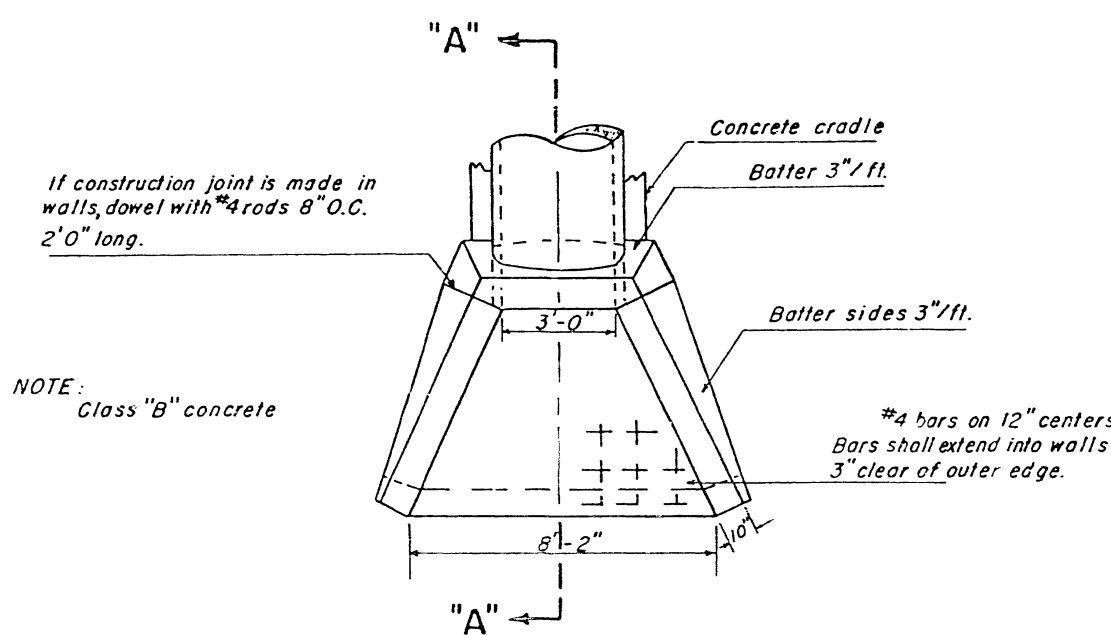
Owner	City of Portland	
Asset Name(s)	City Stormwater Outfall S2	
Construction Year	1963	
Owner/Operator Notes	Operational	
Previous Inspection Year	N/A	
Previous Inspection Assessment Rating/Notes	N/A	
Repair History	No information received	
Structure Components	Outfall <ul style="list-style-type: none">Reinforced concrete headwall, wingwalls, and cradle	
Other information	Facility Length/ Depth/ Design Depth	Not applicable
	Fender System	Not applicable
	Mooring System	Not applicable
	Dolphin System	Not applicable
	Other System	Not applicable

General Location

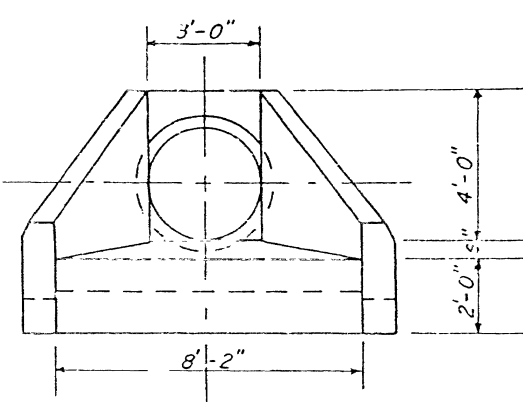


Asset Photo

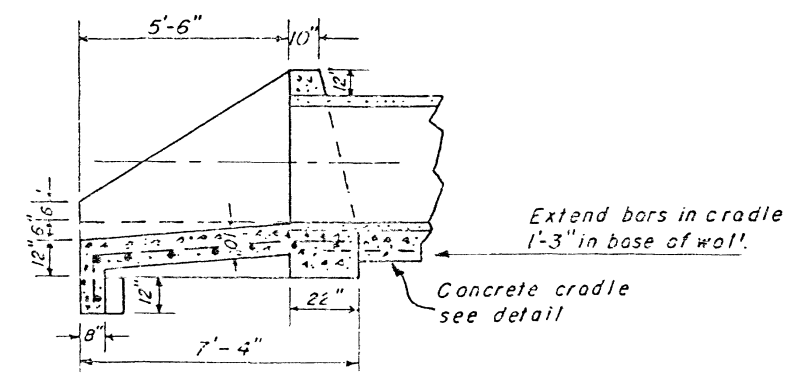




CRADLE DETAIL
SCALE: 1/4" = 1'-0"



HEADWALL FOR 36" OUTFALL
SCALE: 1/4" = 1'-0"



SECTION "A"-"A"

FINAL MAP

Drawn Constructed by JAMES G. ROBERTSON

Sewer Completed 4/11/63

Kind of Pipe CONCRETE

Map Corrected by W.A.K. Checked by D.F.D.

Data Entered on 1/2 Sec. Map by Checked by

Date Entered on Dist. Map by Checked by

FILE #K67

CITY OF PORTLAND OREGON
DEPARTMENT OF PUBLIC WORKS
WM. A. BOWES COMMISSIONER
L.H. ROSENTHAL CITY ENGINEER

N. LAGOON AVE., N. ANCHOR ST.,
N. BALLAST ST., & N. COMMERCE ST.
STORM & SANITARY SEWER SYSTEM

HEADWALL & CRADLE DETAILS

APPROVED: [Signature] 9-18-62
CITY ENGINEER REG. PROF. ENGR. NO. 1337

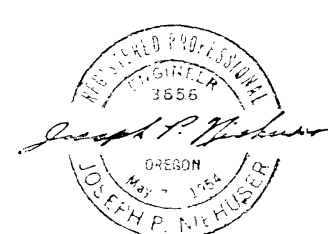
APPROVED: [Signature] 9-18-62
CHIEF: REG. PROF. ENGR. NO. 3271

BUREAU OF DESIGN

JOB NO. 2572 RES. NO. DRAWN BY W.A.K.

PET. NO. 1/4 SEC. 2526 SHEET 4 OF 5

UNDERGROUND CHECKED BY CHECKED BY Z.S.T.



BES #02572
Sheet 4 of 5

Drawings obtained using City's GIS and facility records on PortlandMaps.com



Photo 01: City Stormwater Outfall S2 Overview
City Outfall S2, looking west



Photo 02: City Stormwater Outfall S2 Headwall
Crack in top of head wall

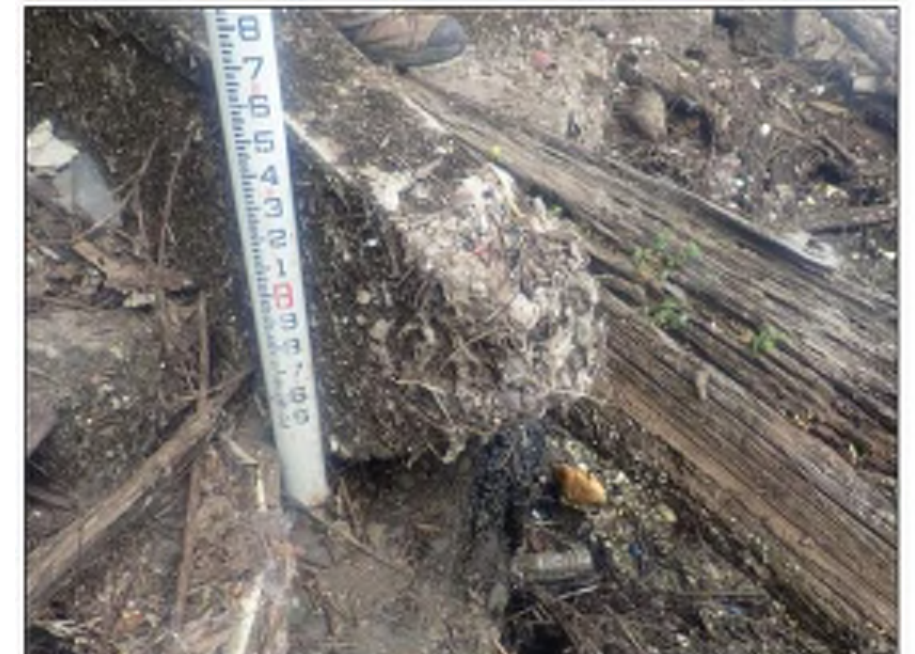


Photo 03: City Stormwater Outfall S2 Wingwalls
Typical spalling at edge of wingwalls



Photo 04: City Stormwater Outfall S2 Outfall Base
Abrasion on outfall surface



Photo 05: City Stormwater Outfall S2 Base
Undermining at outfall

Attachment A-20.2 City Stormwater Outfall S2 Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Attachment A-20.3
City Stormwater Outfall M1

Facility Information

Owner	City of Portland	
Asset Name(s)	City Stormwater Outfall M1	
Construction Year	1965	
Owner/Operator Notes	Operational	
Previous Inspection Year	N/A	
Previous Inspection Assessment Rating/Notes	N/A	
Repair History	No information received	
Structure Components	Outfall <ul style="list-style-type: none">Reinforced concrete headwall, wingwalls, and cradle	
Other information	Facility Length/ Depth/ Design Depth	Not applicable
	Fender System	Not applicable
	Mooring System	Not applicable
	Dolphin System	Not applicable
	Other System	Not applicable

General Location



Asset Photo



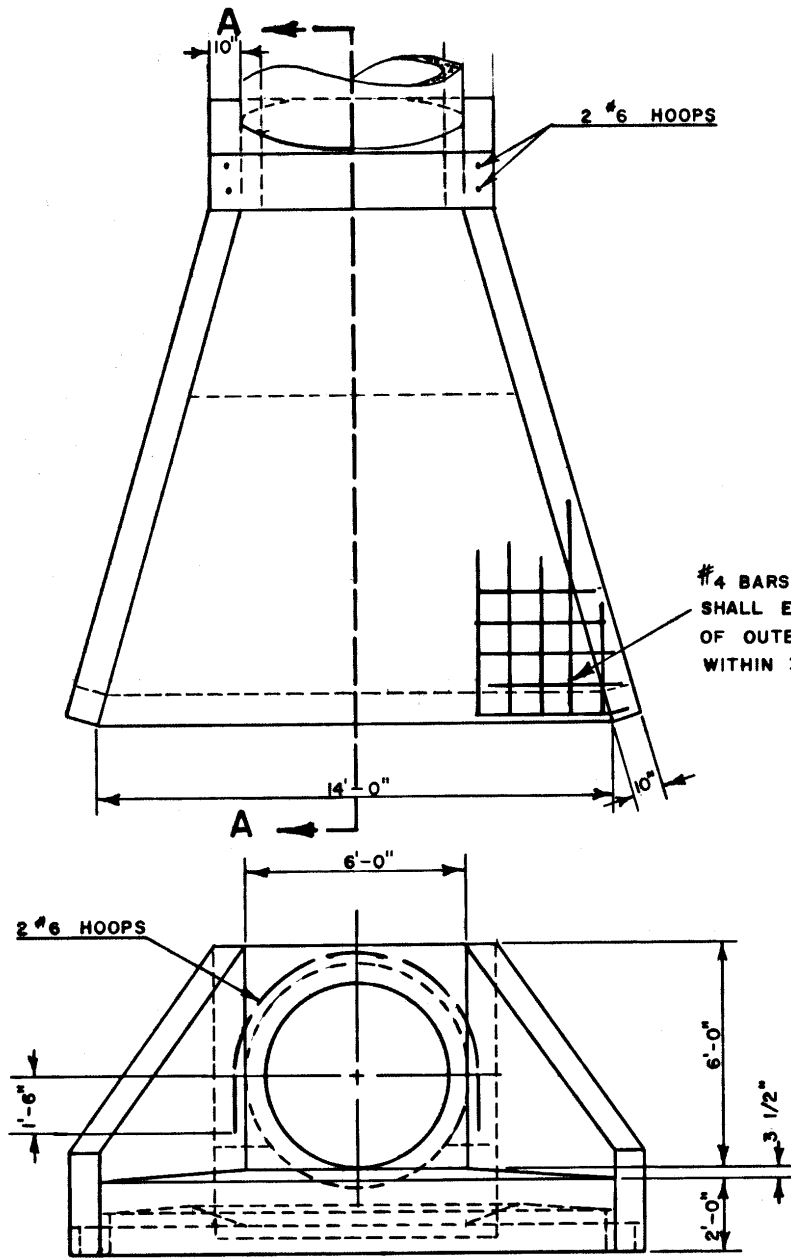
BES #02679
Sheet 4 of 6

NOTE:

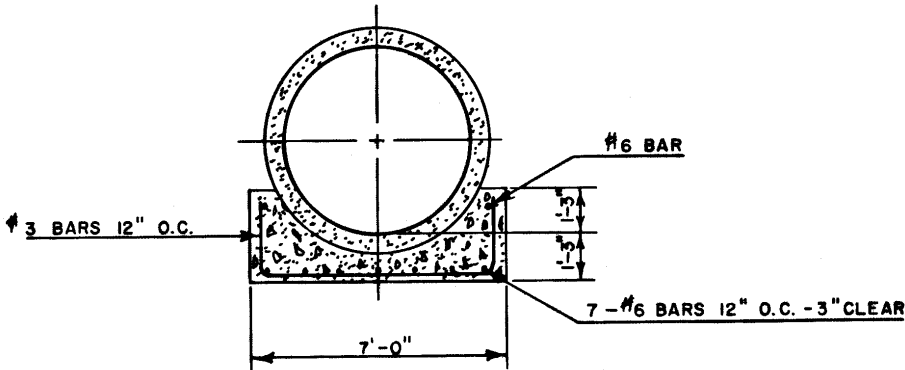
$f_c = 3,000$ P.S.I.
 $f_s = 20,000$ P.S.I.

FINAL MAP
Sewer Constructed by GEORGE W. LIND JR.
Sewer Completed 10-20-65
Kind of Pipe CONCRETE
Map Corrected by _____ Checked by _____
Data Entered on $\frac{1}{4}$ Sec. Map by _____ Checked by _____
Data Entered on Dist. Map by _____ Checked by _____

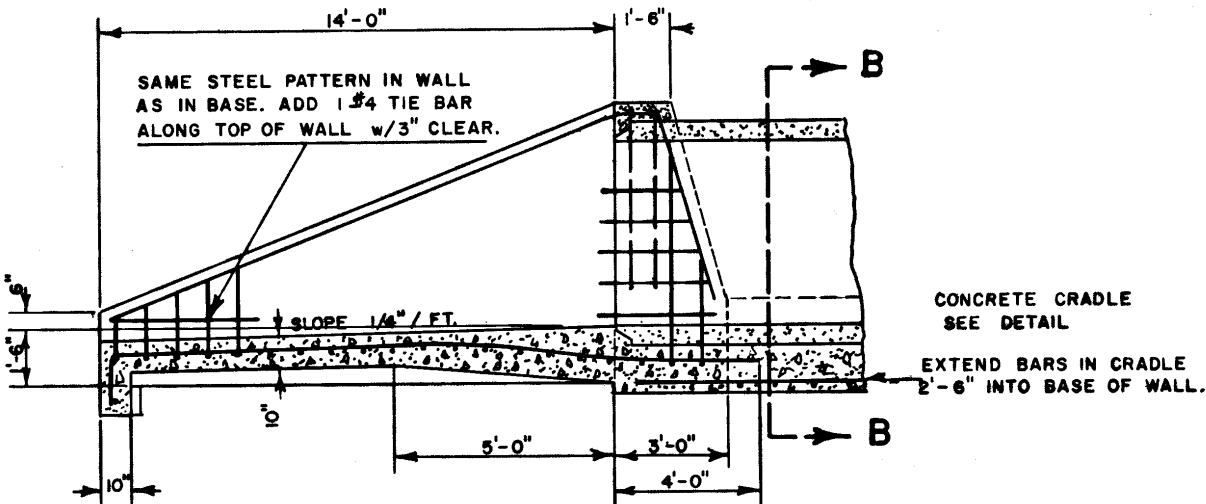
FILE NO. F-37



HEADWALL FOR 60" OUTFALL



SECTION B-B
CRADLE DETAIL



SECTION A-A

SCALE: $\frac{1}{4}'' = 1'-0''$

CITY OF PORTLAND OREGON
DEPARTMENT OF PUBLIC WORKS
WM. A. BOWES COMMISSIONER
L.H. ROSENTHAL CITY ENGINEER

N. BASIN AVE.
& PRIVATE PROPERTY
STORM AND SANITARY
SEWER SYSTEM
DETAIL - HEADWALL AND CRADLE

APPROVED: Ray H. Brownson 3-26-65
CITY ENGINEER
REG. PROF. ENGR. NO. 1397

APPROVED: Ray H. Brownson 3-26-65
CHIEF: Ray H. Brownson
BUREAU OF DESIGN
REG. PROF. ENGR. NO. 2016

JOB NO. 02679 RES. NO. _____ DRAWN BY BEL
P.T. No. _____ $\frac{1}{4}$ SEC. _____ SHEET 4 OF 6
UNDERGROUND CHECKED BY _____ CHECKED BY _____

Drawings obtained using City's GIS and
facility records on PortlandMaps.com



Photo 01: City Stormwater Outfall M1
Typical abrasion on concrete



Photo 02: City Stormwater Outfall M1 Wingwalls
West Wingwall
Fractured west wingwall

Attachment A-20.3
City Stormwater Outfall M1
Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

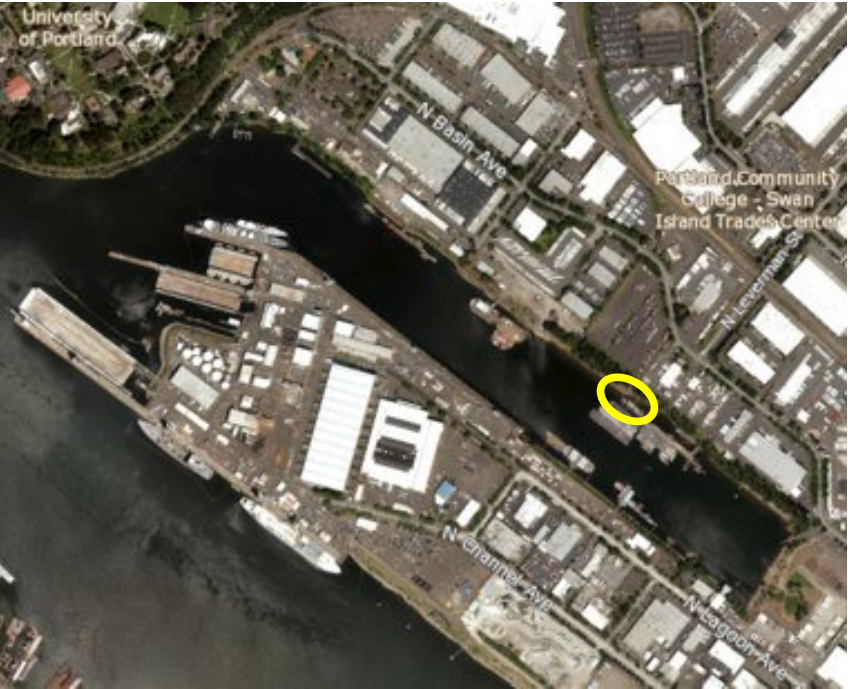
Attachment A-20.4

City Stormwater Outfall M2

Facility Information

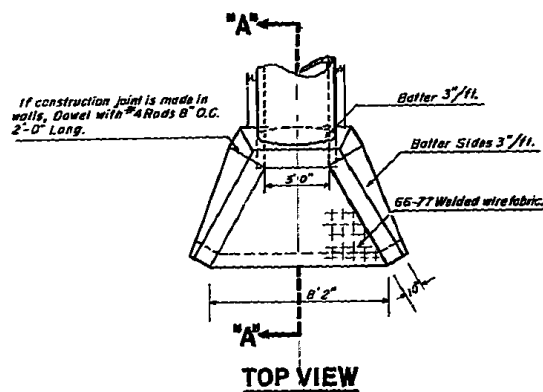
Owner	City of Portland	
Asset Name(s)	City Stormwater Outfall M2	
Construction Year	1960	
Owner/Operator Notes	Operational	
Previous Inspection Year	N/A	
Previous Inspection Assessment Rating/Notes	N/A	
Repair History	No information received	
Structure Components	Outfall <ul style="list-style-type: none">Reinforced concrete headwall, wingwalls, and cradle	
Other information	Facility Length/ Depth/ Design Depth	Not applicable
	Fender System	Not applicable
	Mooring System	Not applicable
	Dolphin System	Not applicable
	Other System	Not applicable

General Location

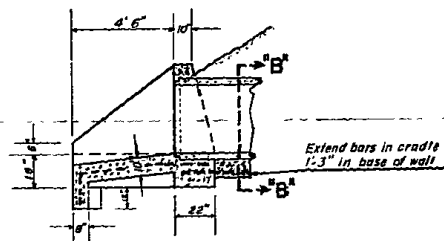
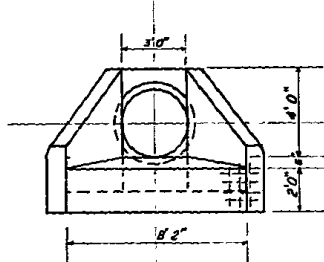
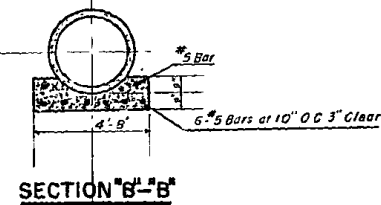


Asset Photo





NOTE:
 1- Complete removal of existing outfall structure required.
 2- If construction joint is made between wall and slab; Dowel with #4 bars @ 12" O.C. 2 ft. long otherwise extend wire mesh into base of walls, 3" clear of edge.

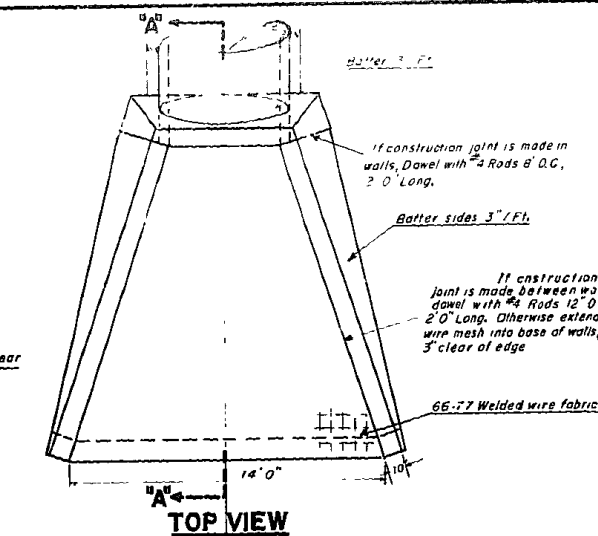


FRONT VIEW

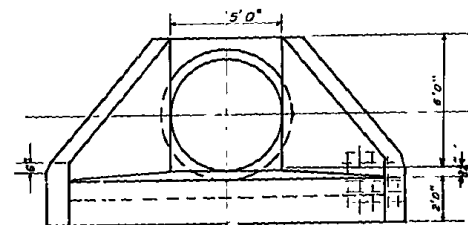
SECTION "A-A"

HEADWALL FOR 36" OUTFALL

Scale: $\frac{1}{4}" = 1\text{ Ft.}$



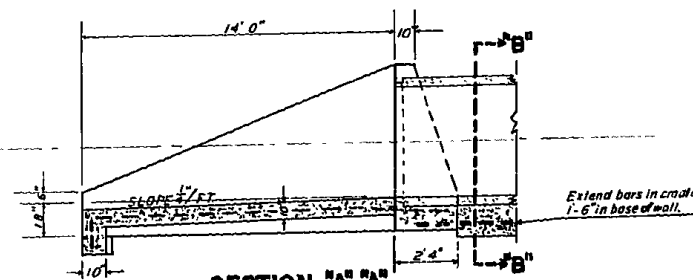
TOP VIEW



FRONT VIEW

HEADWALL FOR 60" OUTFALL

Scale: $\frac{1}{4}" = 1\text{ Ft.}$



SECTION "A-A"

SECTION "B-B"

Note:
 All concrete including cradles and encasement to be 2500 P.S.I. in 28 days.

FINAL MAP
 MONTAG & SONS
 FEB 23, 1960
 CONCRETE & CORR. IRON
 EST. BY R.C.S.
 A.E.M. & E.W.N.
 EST. BY E.G.S.

CITY OF PORTLAND OREGON
 DEPARTMENT OF PUBLIC WORKS
 WIL. A. BOWEN COMMISSIONER
 L.H. ROSENTHAL CITY ENGINEER
 N. BASIN AVE. & MOCK'S
 BOTTOM SANITARY
 & STORM SEWER SYSTEM

APPROVED: *[Signature]* 9-8-59
 CITY ENGINEER



APPROVED: *[Signature]* 9-8-59
 CHIEF, BUREAU
 SURVEY & DRAINAGE

JOB NO. 2432 SHEET 5 OF 5
 DATE 9-8-59
 PROJECT NO. 9526-7

Drawings obtained using City's GIS and facility records on PortlandMaps.com



Photo 01: City Stormwater Outfall M2 Wingwalls
Typical condition of concrete at waterline



Photo 02: City Stormwater Outfall M2 Wingwalls
North Wingwall
Spall on north waingwall



Photo 03: City Stormwater Outfall M2 Base
Material build-up at base of outfall

Attachment A-20.4
City Stormwater Outfall M2
Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin

Attachment A-20.5

City Stormwater Outfall M3

Facility Information

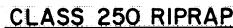
Owner	City of Portland	
Asset Name(s)	City Stormwater Outfall M3	
Construction Year	1989	
Owner/Operator Notes	Operational	
Previous Inspection Year	N/A	
Previous Inspection Assessment Rating/Notes	N/A	
Repair History	No information received	
Structure Components	Outfall <ul style="list-style-type: none">Reinforced concrete anchor wall and closure collars	
Other information	Facility Length/ Depth/ Design Depth	Not applicable
	Fender System	Not applicable
	Mooring System	Not applicable
	Dolphin System	Not applicable
	Other System	Not applicable

General Location

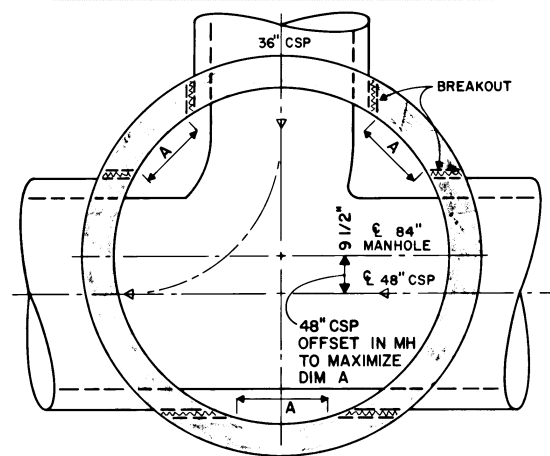
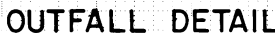
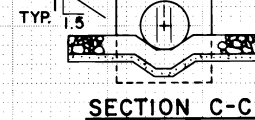


Asset Photo

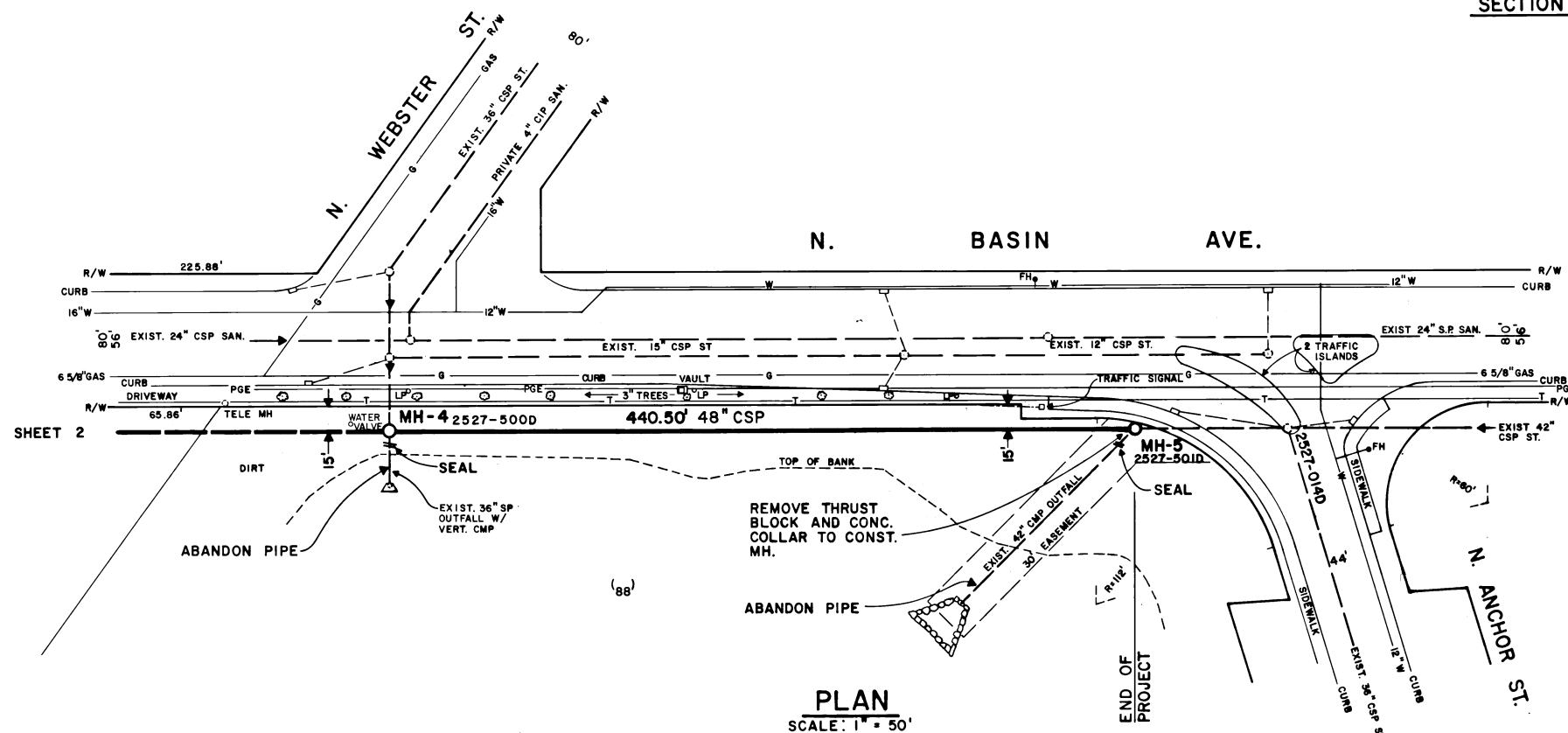




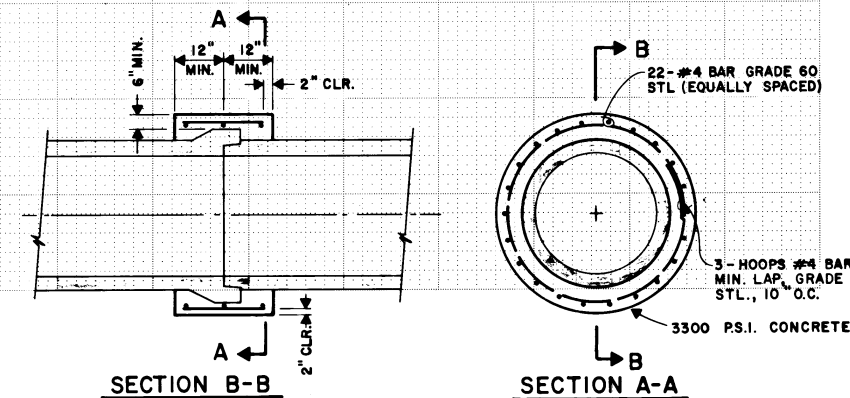
SIZE OF STONE (LB)	% BY WEIGHT
250 - 200	20
200 - 100	30
100 - 10	40
LESS THAN 10	10



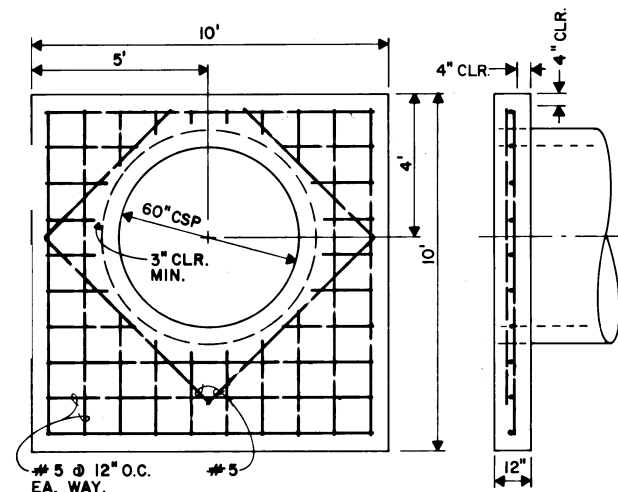
MH-4
SCALE: 1/2" = 1'-0"








PLAN
SCALE: 1" = 50'



CLOSURE COLLAR
N.T.S.



ANCHOR WALL
SCALE: 3/8" = 1'-0"

		CONSTRUCTED BY TRI-STATE CONSTRUCTION		DESIGNED BY M.A.B. N.A.N.		DATE APPROVED 7-19-88		CITY OF PORTLAND, OREGON		DEPARTMENT OF PUBLIC UTILITIES				N. BASIN AVE.		1/4 SECTION 2527	
		PROJECT COMPLETED OCTOBER 15, 1989		DRAWN BY T.A.R. 4		DIV. ENGINEER RGS								8		JOB NO 4420	
		MAP CORRECTED BY DON TROXELL CHECKED BY NAN		CHECKED BY L.G.F.		RESOLUTION NO				BOB KOCH COMM		<div style="border: 2px solid red; padding: 5px; color: red; font-weight: bold;"> Drawings obtained using City's GIS and facility records on PortlandMaps.com </div>					
		DATA ENTERED ON 1/4 SEC. MAP BY _____ CHECKED BY _____		FILE NO		UNDERGROUND S.Mc.				R.O. SCHMIDT, P.E. CITY E							
NO DATE		DESCRIPTION		APPRO.													
		REVISION		FINAL MAP DATA													

Drawings obtained using City's GIS and facility records on PortlandMaps.com



Photo 01: City Stormwater Outfall M3 Wingwalls
Typical condition of concrete at waterline



Photo 02: City Stormwater Outfall M3 Headwall
Top of concrete headwall

Attachment A-20.5
City Stormwater Outfall M3
Inspection Photos - Sheet 1 of 1

Prepared on: 3/10/2023
Structure Condition Assessment Report
Swan Island Basin