sanitation

Javier D. Lojan Acting Commissioner

Anthony Bianco
Assistant Chief
SWM Operations

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Via Email

March 4, 2026

Denise Grattan
Div. of Environmental Permits
NYSDEC
47-40 21st Street
Long Island City, NY 11101

Re: NYSDEC Permit 2-6106-00002/00022 Ren 4 (Permit)
Southwest Brooklyn Marine Transfer Station (MTS)
New York City Department of Sanitation (DSNY)
2025 Marine Inspection Report

Dear Ms. Grattan:

On behalf of DSNY, this letter provides the 2025 Southwest Brooklyn Marine Routine Inspection report in compliance with Solid Waste Management Condition 24 of the above-mentioned Permit. The inspection report includes the King Pile, North, and East Bulkhead Fender Systems. As Required, the report will be posted on the DSNY website within 7 days.

Please contact me with any questions.

Sincerely,

Anthony Bianco

Enclosure (1) – 2025 Southwest Marine Inspection Report

C: J. McDonnell, J. Capo, J. Rossiello, K. Grunin, DSNY
P. Sierzenga, NYSDEC
J. Kaplan, A. Barna, Waste Management of New York, LLC

ROUTINE INSPECTION REPORT

MARINE FENDER SYSTEM
SOUTHWEST BROOKLYN MARINE TRANSFER STATION

400 Bay 41st Street
Brooklyn, New York

Prepared for:

Waste Management of NY, LLC
660 S. Front Street
Elizabeth, NJ 07202

Kraken Diving Services
1202 G Street
Millville, NJ 08332

Prepared by:

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Reston Va 20191-0000
NY PSC# 099050
Bowman File No.: 081596-01-001

Date: January 31, 2026

Andy Raichle, PE
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Bowman

Contents

APPENDICES:

1.0 EXECUTIVE SUMMARY

This report summarizes Bowman's evaluation of the Southwest Brooklyn Marine Transfer Station's (SWBMT) fender system, based upon above- and below-water "Routine" inspections performed on December 14 and December 18, 2025. Bowman performed the inspections in association with Kraken Diving (Kraken), who was retained by Waste Management of New York, LLC (WM) to perform the work.

The scope of the Routine Inspection included performing an above and below water visual and tactile inspection of the Facility's fender systems to review their current condition, evaluate the inspection findings, assign condition assessment rating, and recommend required maintenance repairs for each structure, based on visual observations during the inspection. Our key findings are summarized below.

- The fender systems and associated infrastructure are generally in Poor condition. The "Poor" condition definition, per applicable guidance documents, is defined as "Advanced deterioration or overstressing observed on widespread portions of the structure but does not significantly reduce the loadbearing capacity of the structure. Repairs may need to be carried out with moderate urgency." Bowman believes that the facilities are not in danger of failure and can accommodate the ongoing operations of the Facility. However, efforts to remedy the noted deficiencies are recommended.

- Bowman recommends a range of "Priority Repairs," as itemized below.

    - ✓ Tightening and/or replacement of all hardware connections for the North Fender System's timber fender panels.. This activity is a standard maintenance activity and failure to do this work in a timely manner has resulted in missing features (caps, fenders. etc.). Special attention should be given to a protruding bolt at Fender 11.
    - ✓ Implementation of "strap" improvements to the North Fender System's rubber fenders for the balance of fenders that were not improved in September 2025. This repair should include Fender #19, which was improved in September 2025.
    - ✓ Tighten all chains on the North Fender System.
    - ✓ Replace missing North Fender System timber caps.
    - ✓ Replace three severely damaged and/or missing East Fender System rubber fenders.
    - ✓ Provide rock scour protection at the base of the concrete cap of the East Fender System's End Fender.
    - ✓ Replace the bottom two corner fenders and associated timber supports for the East Fender System's End Fender.

- A comparison of the 2024 and 2025 inspections reveals modest changes. Key differences include the following:

    - Scour has occurred at the East Fender System's concrete cap, causing the steel H-Pile foundation to become exposed.
    - Concrete repairs have eliminated prior concerns with the North Fender System's Concrete Seawall.
    - The North Fender System's "strap" repairs have been successful. A sole exception exists at Fender #19. The failure in this location appears to have been related to bolt threading.
    - Corrosion of the East Fender System's sheetpile has accelerated and should be monitored.

- Routine maintenance, highlighted by regular tightening of hardware connections, is a key element of structure performance. Bowman recommends that all loose hardware connections be tightened annually.

- Bowman has recommended other improvements and maintenance activities that do not meet the threshold for "priority" improvements but should be implemented over time. Examples include mooring hardware evaluations and steel cleaning and recoating.

2.0 FACILITY DESCRIPTION

Southwest Brooklyn Marine Transfer Station (SWBMTS or Facility) is located approximately 2.5 Miles South of Verrazzano Narrows Bridge along the eastern shore of Gravesend Bay in Brooklyn, New York. The coordinates of this Facility are 40°35'20.10" N and 73°59'54" W. See Figures 1 and 2 for the Facility Location Map and Aerial View, respectively.

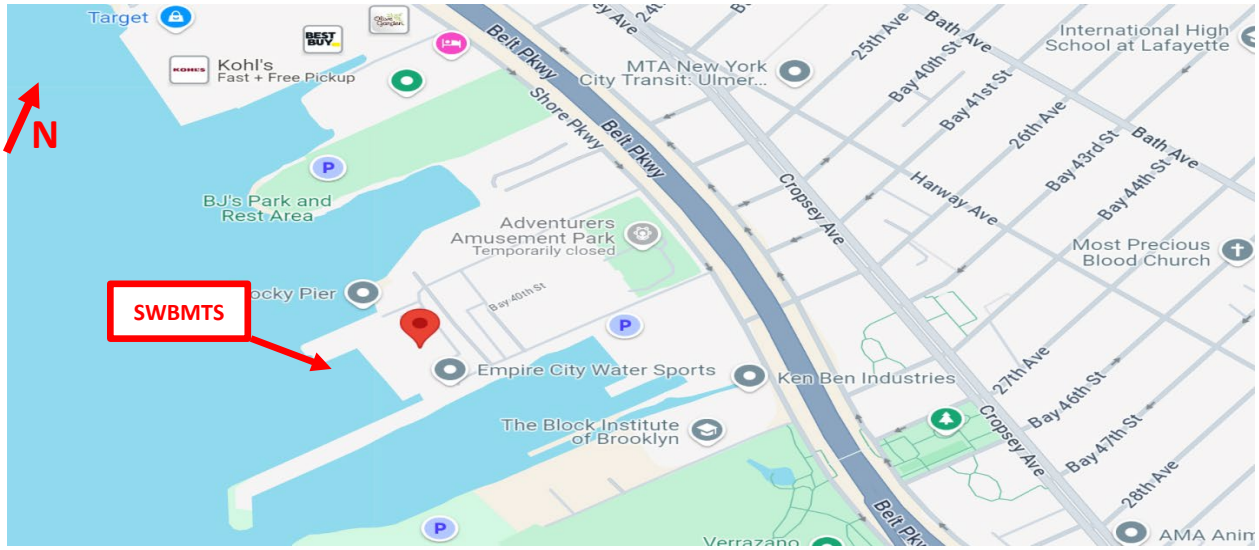


Figure 1: Location Map (via Google Maps).

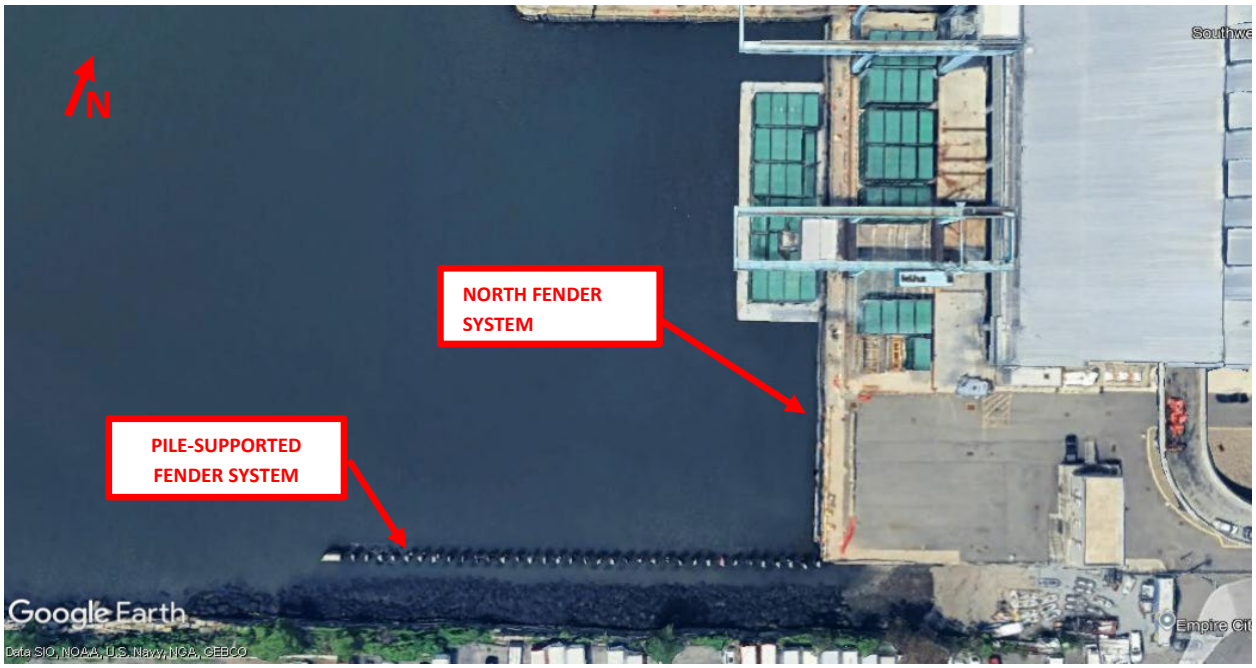


Figure 2: Aerial View & Layout of SWBMTS (Courtesy Google Earth).

The Facility's shoreline is composed of a 335 foot long wharf constructed of a steel sheet pile bulkhead with a concrete deck/cap. According to historical drawings, the top of concrete deck elevation is at approx. +10'-10" MLW (Local Mean Low Water). A concrete panel extends down approximately 12'-6" along the outshore face of sheet piles to form the visible face of bulkhead (referred to herein as the "Concrete Seawall") and serves as the mounting surface for the fender system (described below). Barge mooring hardware along the wharf includes bollards, cleats, winches, capstans, fairleads, and roller chocks. The wharf is protected by a fender system along its seaward face (the **"North Fender System"**). The Facility's marine infrastructure also includes a north-south oriented pile-supported fender system along its eastern boundary (the **"East Fender System"**). Descriptions of the fender systems are itemized below.

2.1. North Fender System

The North Fender System consists of 20 individual fender panels. In this report, and prior reports issued by Bowman, the westernmost fender panel is designated as "Fender #1" and the easternmost most fender panel is designated as "Fender #20" (see Figure 3). Each Fender Panel is constructed of a bolted frame, consisting of three horizontal members (Top, Middle, and Bottom Wales) of CTE coated W14 steel beams bolted to two vertically installed coal tar epoxy (CTE) coated HP12x84 steel "fender piles" that are driven into the seabed. The frame supports fifteen vertically mounted 10x12 timber fenders that are bolted to the outer face of the walers. Each panel is attached to and buffered from the bulkhead by two vertically oriented 300 mm x 1000 mm rubber arch fenders that are bolted to the inner flange of each fender pile. The inner flanges of each arch fender are bolted to a CTE coated mounting plate. The mounting plate is anchored to the concrete face of bulkhead using six galvanized threaded rods. The panels are also attached directly to the bulkhead via two galvanized shear chains along the top wale. Each chain is equipped with galvanized shackles and a chain tensioner.

2.2. East Fender System

The East Fender System extends 300 feet offshore from the eastern end of the wharf (see Figure 3). The East Fender System is free standing (not supported by an upland wharf). The system is composed of 36 pairs of CTE coated PSP900 steel "king" pilings that are installed directly adjacent to each other. The void between each installed pair is filled with concrete. Two vertically oriented 400 mm arch fenders are bolt-mounted to the west face of each king pile pair.

A pair of CTE coated steel sheet piles (PZC 26) are installed between the king pile pairs. The sheet piles are driven into the seabed and serve as a "toe" for the adjoining rock revetment. The sheet piles are attached to the king piles via a female interlock joint welded to the king

pile. The welded interlock extends to the top of the king piles, but the sheet piles are only installed below water as illustrated in Figure 3.

Two arch rubber fenders are mounted on the West face (basin side) of each king pile pair. The two rubber fenders are mounted vertically, in line. Two types (Type A and B) of King Pile Fenders exist. Type A fenders consist of two (2) – 400x2000 mm arch rubber fenders. Type B fenders consist of two (2) – 400x2500 mm arch rubber fenders and are taller as compared to Type – A fenders. Each rubber fender is connected to the king piles using eight galvanized bolts. The East Fender System has no mooring hardware, as it is used exclusively for breasting and turning movements.

For purposes of this report, and consistent with prior Bowman reports, the landward most king pile pair is designated as "King Pile Fender #1" and the seaward most pair is designated as "King Pile Fender #36". King Pile Fender #s 2, 4, and 6 are Type B fenders. All other fenders are Type A. See Appendix C for Photographs showing the current condition of East Fender System.

The end condition of the East Fender System extends offshore of King Pile Fender #36 and has a different configuration than the balance of the system. This "End Fender" consists of an approx. 7'-0" long x 4'-10" wide concrete cap supported on H-Piles (believed to be four piles, but uncomfirmed). The concrete cap extends vertically to about 3 feet below mean low water. In prior investigations, the bottom of the cap and the H-Piles were not visible; however, the seawardmost end of the seabed experienced scour in this most recent inspection, revealing the presence of an H-Pile foundation. The west side of this fender is protected by four corner arch rubber fenders mounted on timbers using galvanized bolts.

It is noted that the above-referenced descriptions are based upon design information provided to Bowman. In some instances, the actual construction varied from the design. Actual observed conditions are illustrated in Figures 4 and 5.

It is noted that the fender systems' original construction was c. 2015/2016. The End Fender was not installed until 2018. In 2025, a maintenance activity occurred, consisting of repairing the concrete seawall and repair of the North Fender System's panels #15-#20. The fender repairs included replacement of the rubber fenders' bolts and washers with new and a strap which extended from the top of the bulkhead backing plate to the bottom of the plate and was welded in place at those points. Additionally, it was welded to the head of the head of each bolt. This was done not only to replace the defective bolts and washers but to add the strap to distribute the pull on the fender. This appears to have provided relief to this issue.

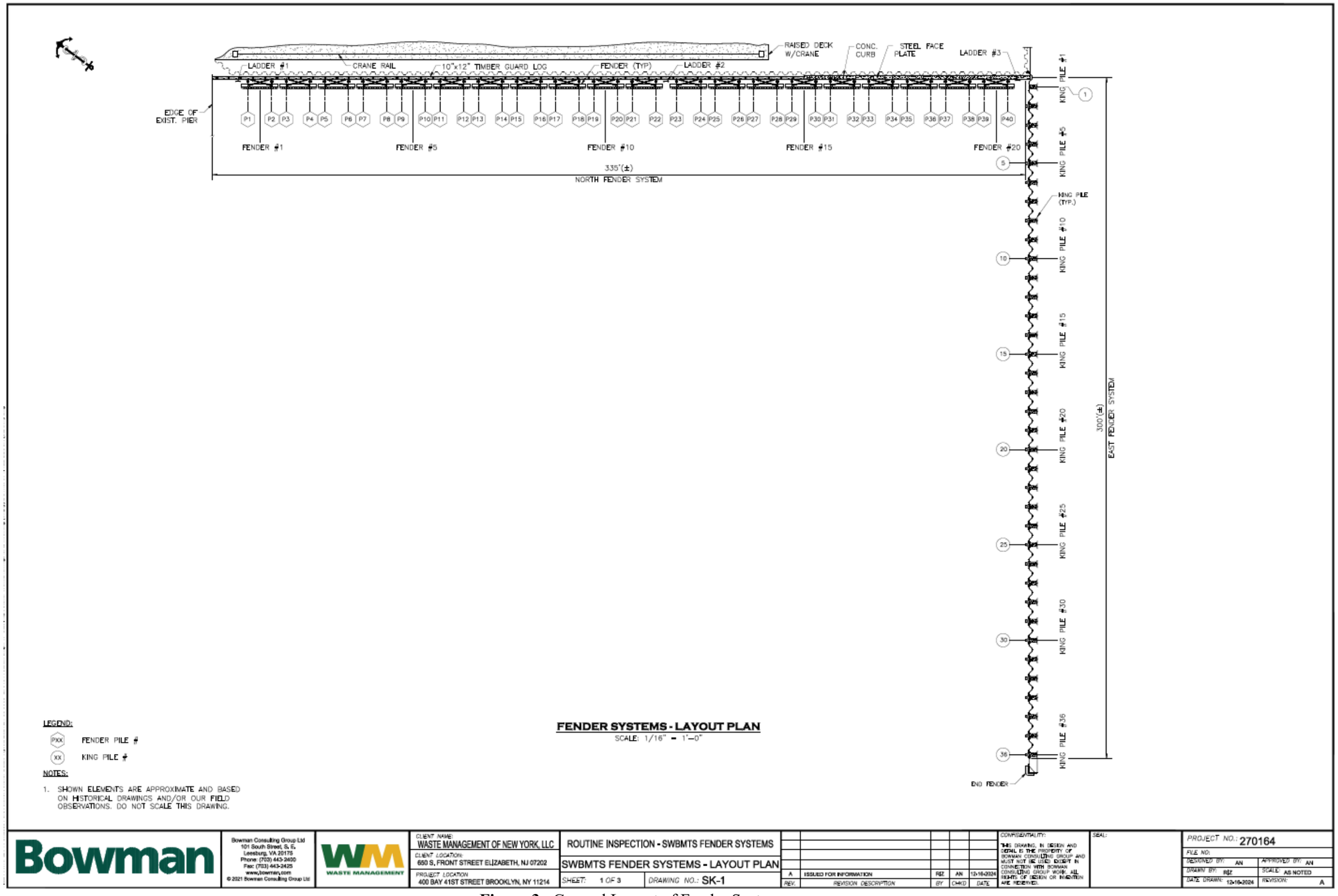


Figure 3 : General Layout of Fender Systems

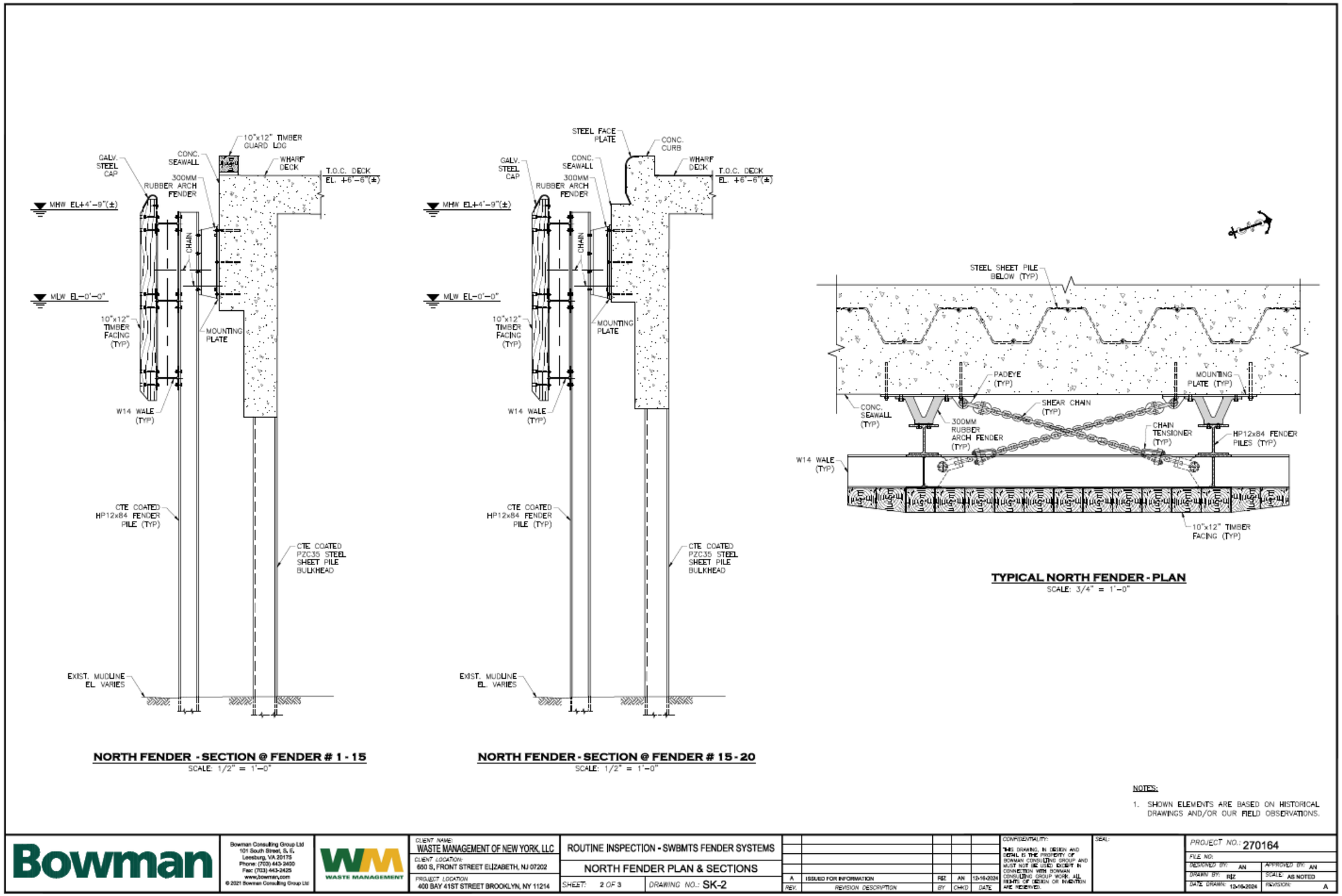
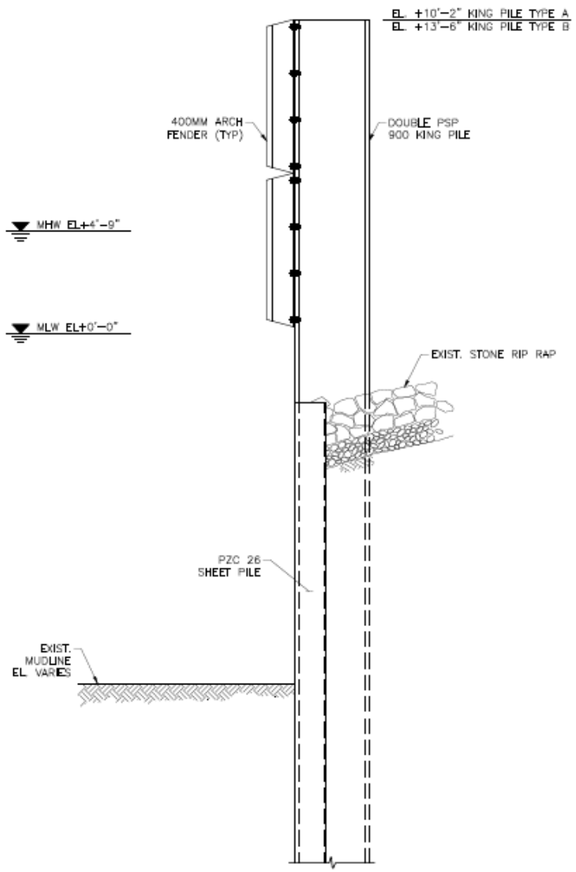
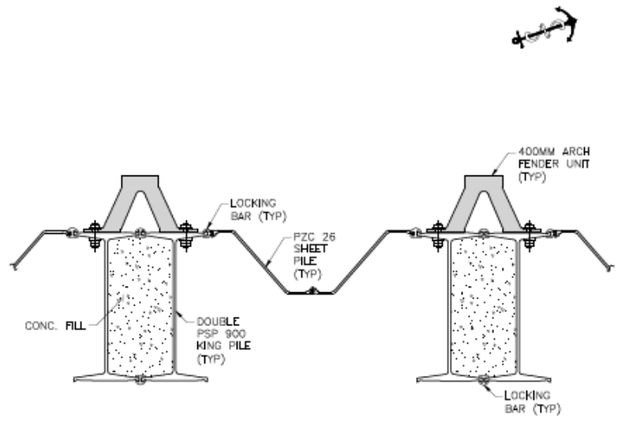


Figure 4 : North Fender Plan & Sections



KING PILE # 1 THRU 36 - ELEVATION
SCALE: 3/8" = 1'-0"
(LOOKING NORTH)



EAST KING PILE # 1 THRU 36 - PLAN
SCALE: 3/4" = 1'-0"

NOTES:
1. SHOWN ELEMENTS ARE BASED ON HISTORICAL DRAWINGS AND/OR OUR FIELD OBSERVATIONS.

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WM WASTE MANAGEMENT

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CLIENT LOCATION: 650 S. FRONT STREET ELIZABETH, NJ 07202
PROJECT LOCATION: 400 BAY 41ST STREET BROOKLYN, NY 11214

ROUTINE INSPECTION - SWBMTS FENDER SYSTEMS
EAST BULKHEAD FENDER SYSTEM - PLAN & SECTION
SHEET: 3 OF 3 DRAWING NO.: SK-3

REV.	REVISION DESCRIPTION	BY	CHKD	DATE
A	ISSUED FOR INFORMATION	RIZ	AN	12-16-2024

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DRAWN BY: RIZ | SCALE: AS NOTED
DATE DRAWN: 12-16-2024 | REVISION: A

Figure 5 : East Fender Plan & Sections

3.0 SCOPE OF WORK & LIMITATIONS

3.1. General Scope of Work

WM retained Kraken to perform a Routine Inspection of the SWBMTS fender systems. Routine Inspections are performed on a routine, cyclical basis, and therefore represent a proactive rather than reactive approach to maintenance. The primary purpose of a Routine Inspection is to assess the general overall condition of a waterfront structure, assign a condition assessment rating to the overall waterfront structure and recommend course of action for current and future maintenance work.

The Routine Inspection presented herein is performed in accordance with the general recommendations of ASCE Waterfront Facilities Inspection and Assessment Manual, Engineering Practice No. 130 (ASCE Manual). The ASCE Manual recommends performing three levels of inspection during a Routine Inspection. An ASCE Level I Inspection involves a swim by visual and tactile inspection of all underwater structural components of a marine structure, without the removal of marine growth, and is the methodology followed for this investigation. The scope of the SWBMT inspection involved some Level II and III elements at piles and sheet piles (e.g. removal of marine growth and steel thickness measurements (see below).

3.2. Site Specific Inspection Approach & Details

Kraken and Bowman (Inspection Team) conducted the underwater and topside inspections of SWBMTS fender systems on December 14 and December 18, 2025. The underwater inspection was performed using an OSHA compliant diving crew consisting of a diving captain, a diver, a standby diver, and a tender. Bowman's Marine Engineer was on site to oversee the inspection. The dive crew was equipped with a landside inspection station, surface supplied air, two-way audio equipment, video monitor and camera. The diver had an underwater camera & light attached to his helmet to allow the inspector to observe what the diver observed underwater.

Underwater inspection included the visual and tactile inspection of underwater structural elements. While the inspection focused on the fender systems of the SWBMTS facility, the existing bulkhead was also visually inspected at randomly selected locations and the findings are presented herein. The extent of deterioration, corrosion, section loss, signs of distress in structural members and their connections, were reviewed and recorded during the underwater inspection. Level I, II and III inspections were performed on randomly selected fender piles and sheet piles. Level III Inspection was performed using an Ultrasonic Thickness

Measurement (UTM) Gauge to measure the remaining steel thickness at the submerged portion of selected piles and sheet piles.

The diver was instructed to observe and report the observed loss of coating, extent and type of corrosion, delamination of steel, necking and knife edging of piles, evidence of section loss, holes, buckling, and visual plumbness of piles and sheet piles. Randomly selected piles were cleaned of marine growth and inspected to Level III using a UTM gauge, in addition to the visual inspection. Remaining steel thicknesses were recorded at the outer flange, inner flange, and the web of piles and sheet piles in selected locations. Thickness readings of the wharf's steel sheetpile were recorded below the concrete seawall and near mudline. Erosion of the mudline was also reviewed. The diver observed and reported the condition and tightness of accessible bolts connecting various members of fender systems.

Topside inspection included the visual inspection of visible portions of fender piles, wales, rubber fenders, connecting bolts, and shear chains. Existing mooring hardware, concrete deck, and safety ladders were also visually inspected. Still photographs of above water deficiencies were taken and selected photographs are included in Appendix – C of the report.

3.3. Limitations

Routine Inspections are performed to determine the general overall condition of waterfront structures. It should be noted that the entire underwater portion of a waterfront structure is not inspected during Routine Inspections. Visual and tactile inspection of *portions of* randomly selected structural members of each waterfront structure are inspected.

A Routine Inspection assumes that the condition of inspected sample of structural members represents the general condition of waterfront structure. During our inspection, all fender piles, rubber fenders, and connecting bolts were visually inspected. Randomly selected sheet piles were also inspected below concrete seawall and at mudline.

It should be noted that only the accessible, visible, and apparent damage and deterioration at the inspected portion of waterfront structure can be observed and recorded during underwater Routine Inspections. Additional damage and/or deterioration may exist at portions of the structure which are not visible, accessible and at portions that are not inspected. Therefore, a Routine Inspection only provides a general overview of the underwater condition of the inspected structure and overall waterfront facility. Also, underwater inspection represents the condition of the inspected structure on the day(s) of the inspection. The condition of waterfront structures may change with time and due to other events.

The structural assessment and evaluation under the scope of Routine Inspections is based on the field observed damage/deterioration of existing waterfront structures and their structural components. Performing structural analysis or calculations to evaluate the structural adequacy/capacity of existing waterfront structures or individual structural components constituting the waterfront structures, in their current or original condition, is not included under the scope of Routine Inspections. A detailed structural analysis under a separate contract must be undertaken if determining the structural adequacy/capacity of existing waterfront structures in their current, as new, or repaired condition is desired.

The recommendations provided in this report are general recommendations. These recommendations are not based on structural analysis/design and do not consider the calculated current structural capacity versus demands of existing structures and their individual structural members. These recommendations also do not delve into the site-specific limitations, which are considered during a preliminary or detailed structural design. As a minimum, a preliminary design must be performed to investigate the feasibility and economical ways to accomplish the required repairs prior to developing a budget for the repairs. A preliminary design is also necessary to develop a reliable Opinion of Probable Costs (OPC) of repairs, specific to the project.

Regulatory permitting, final structural analysis, final design, and detailing are necessary prior to proceeding with the construction of repairs recommended in this report.

4.0 INSPECTION FINDINGS

This section of Report summarizes the findings of our Routine Inspection of SWBMTS Fender Systems. While the inspection focused on fender systems, existing bulkhead was also inspected at random locations. General inspection findings of bulkhead inspection are also presented in this section.

Detailed inspection findings for each structure element are summarized in tabular format in Appendix D. Summaries of typical conditions for each system and element are presented below.

4.1. North Fender System

A description of the North Fender System is presented in Section 2 of this report and illustrated in Figure 4. This section presents typical inspection findings. Unless noted otherwise in the Appendix D tabulated results, the structural elements forming the North Fender System were found to be in the following "Typical Conditions" during our visual inspection.

Rubber Fenders

Typically, the rubber fenders are intact with no cuts or tears, except at Fenders #8 and #13 (torn). However, it is also true that the rubber fender has partially or fully separated from the mounting plate for their full or partial height in multiple locations. Likewise, it is typical for one or more bolt holes of rubber fender to be worn and enlarged and, in some instances, for the bolt head to be fully or partially pulled out of the bolt hole due to tensile stresses in the rubber fender.

Bolts connecting the rubber fender to fender pile typically exhibit Major coating loss and surface corrosion, but no significant section loss. Bolts and washers connecting rubber fenders to the mounting plate typically exhibit Minor to Moderate coating loss and surface corrosion with Minor section loss or damage. Bottom bolts and washers exhibit greater coating loss and corrosion. One or more washers of bolts connecting the rubber fender to the mounting plate are typically loose or missing. As noted above, heads of one or more bolts to the mounting plate have pulled out or are pulling out of the rubber fender bolt hole at a typical rubber fender. See Photos 1 and 2 for Typical Condition of rubber fender and their connecting bolts.

It is noted that Fender systems #15-#20 were repaired during September 2025. The bolts and washers were replaced with new. Additionally, a strap which extended from the top of the bulkhead backing plate to the bottom of the plate was welded in place at those points and to the head of the head of each bolt. This was done not only to replace the defective bolts and

washers but to add the strap to distribute the pull on the fender. This appears to have provided relief to this issue. Photo #3 illustrates a typical strap improvement.

A failure of the strap has occurred at Fender #19 where the bolts released from the backing plate and pulled the strap off. Upon examination it appears that the threads inside the bulkhead plate should be repaired with a) installing a larger bolt or b) welding studs in place. An illustration of the Fender #19 failure is presented in Photo 4.

Photo 1: Rubber fender separated from mounting plate w/ top 2 bolts pulling out of fender.

Photo 2: Rubber fender bolt connecting fender to mounting plate.

Photo 3: Typical strap repair.

Photo 4: Strap repair failure at Fender #19.

Fender Piles

The HP12 fender piles that support each fender frame typically exhibit moderate coating loss and surface corrosion along their top 18 to 24 inches of a typical fender pile, including coating "peeling" loss. Coating loss and surface corrosion of the piles' flanges extend further down these piles to the mid-wale location (i.e. through the intertidal splash zone); however, it is not accompanied with any concerning loss of steel thickness. See Photos 5 & 6 for the Typical Condition of fender piles. Coating is intact below water with heavy, soft marine growth. No visible section loss, no significant knife edging (thinning) of pile flanges or necking (reduction in width) of flanges was observed in fender piles under water.

Photo 5: Fender pile with heavy coating loss & moderate corrosion at top of pile. Corrosion of flange edges continues further down.

Notable exception to the pile conditions are at Fender #9 where the South Pile has deflected (see Photo 7) and Fender #12 where the North Fender exhibits a twist that is pulling on the south rubber fender face.

No scouring was observed at the bottom of the piles, where they meet the seabed. Ultrasonic thickness measurements of steel thicknesses were measured for select piles along the wharf. Measurements were made at the mudline and mid-depth. Steel thicknesses ranged from 0.69 to 0.76 inches. The original thickness of an HP 12X86 pile is 0.67 inches, suggesting that corrosion has been minor. The measurements that show thicknesses greater than the original are likely due to coatings and/or measurement inaccuracies.

Photo 6: Coating of fender pile below water is intact. Flange edges are square with no necking or knife edging.

Photo 7: Deflection of Fender 9 South Pile.

Mounting Plates

The coal tar epoxy coated steel mounting plates for the rubber fenders are anchored to the concrete seawall with six galvanized threaded rods arranged in 3 rows. The mounting plates has experienced Moderate coating loss and surface corrosion with no significant section loss. Mounting plates are in place and not rotated or separated from seawall. The top and bottom rows of threaded rods and nuts are intact with Moderate to Severe coating loss and surface corrosion. Nuts of threaded rods are generally tight. See Photo 8 for Typical Condition of the mounting plates.

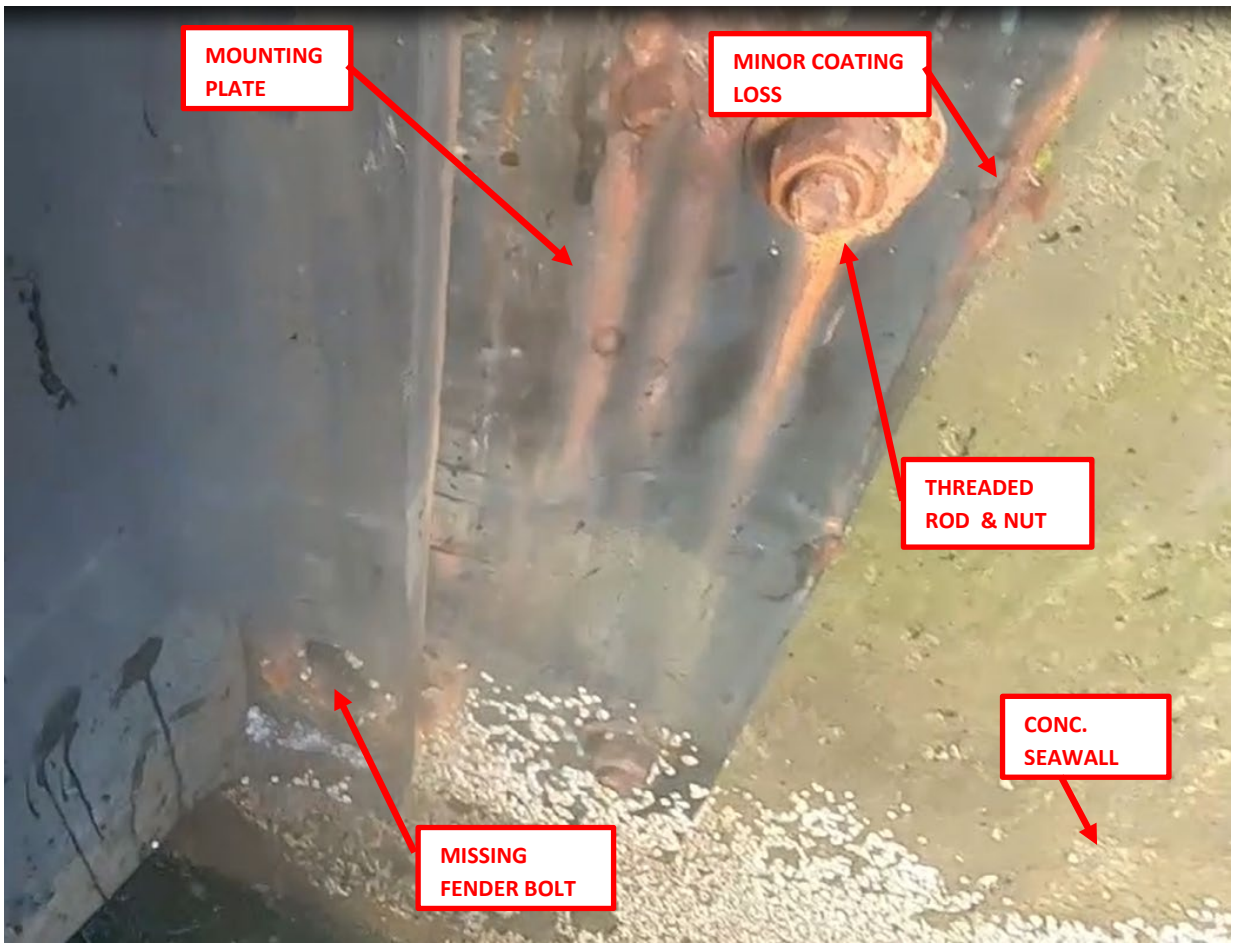

Photo 8: Typical Condition of mounting plate

Frame Wales and Cross Bracing

Three rows of coal tar epoxy coated W14 beams (wales) are attached to each panel's Fender Piles and support the fender timbers. The wales exhibit Minor coating loss and surface corrosion but no significant section loss. Coal tar epoxy coated steel pipe cross bracing exists between the two fender piles of each fender system. Top 3 to 4 inches of pipes exhibit coating

loss and surface corrosion but no significant section loss. Welds at the ends of bracing members are intact.

Four galvanized bolts connect each wale to each fender pile. Bolts connecting top wale to fender piles exhibit Minor to Moderate coating loss and surface corrosion, but no significant section loss. Bolts connecting the mid and lower wale exhibit greater coating loss and corrosion, but no significant section loss. Observation of select loose bolts was noted. See Photos 9 & 10 for Typical Condition of Wales.

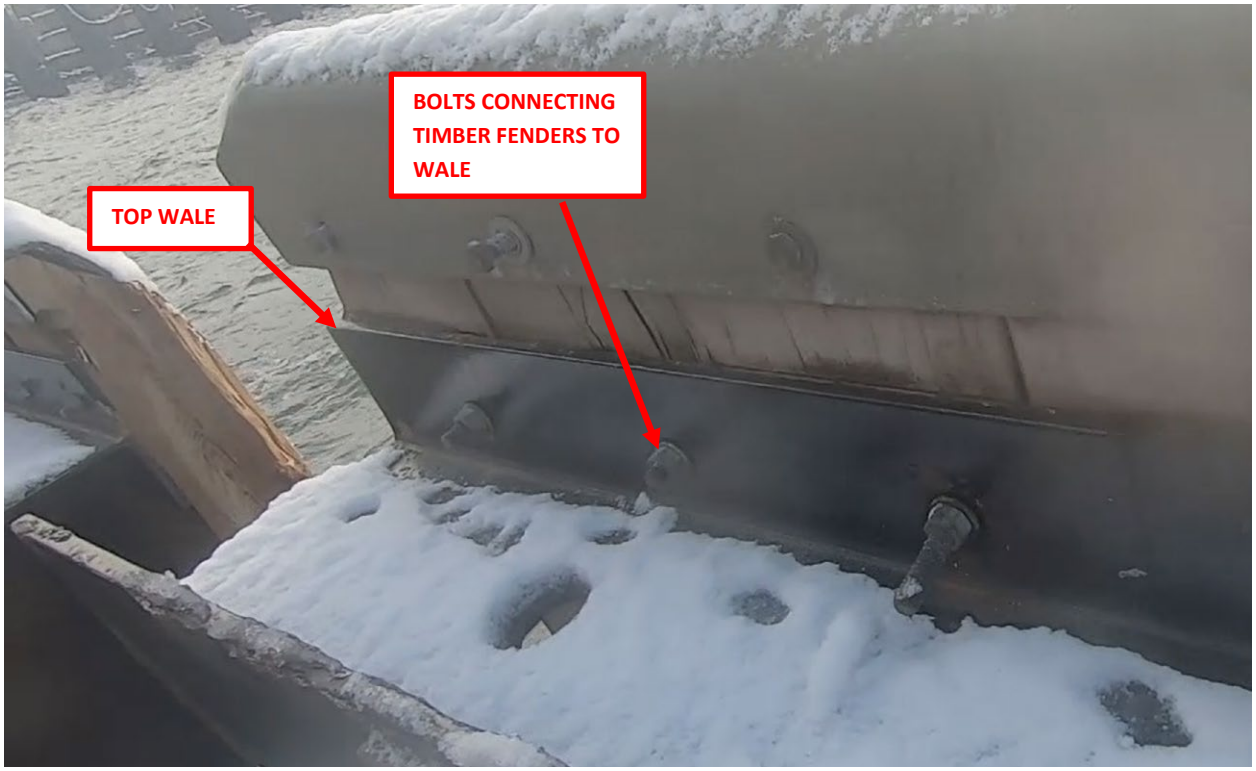

Photo 9: Typical Condition of top Wale.

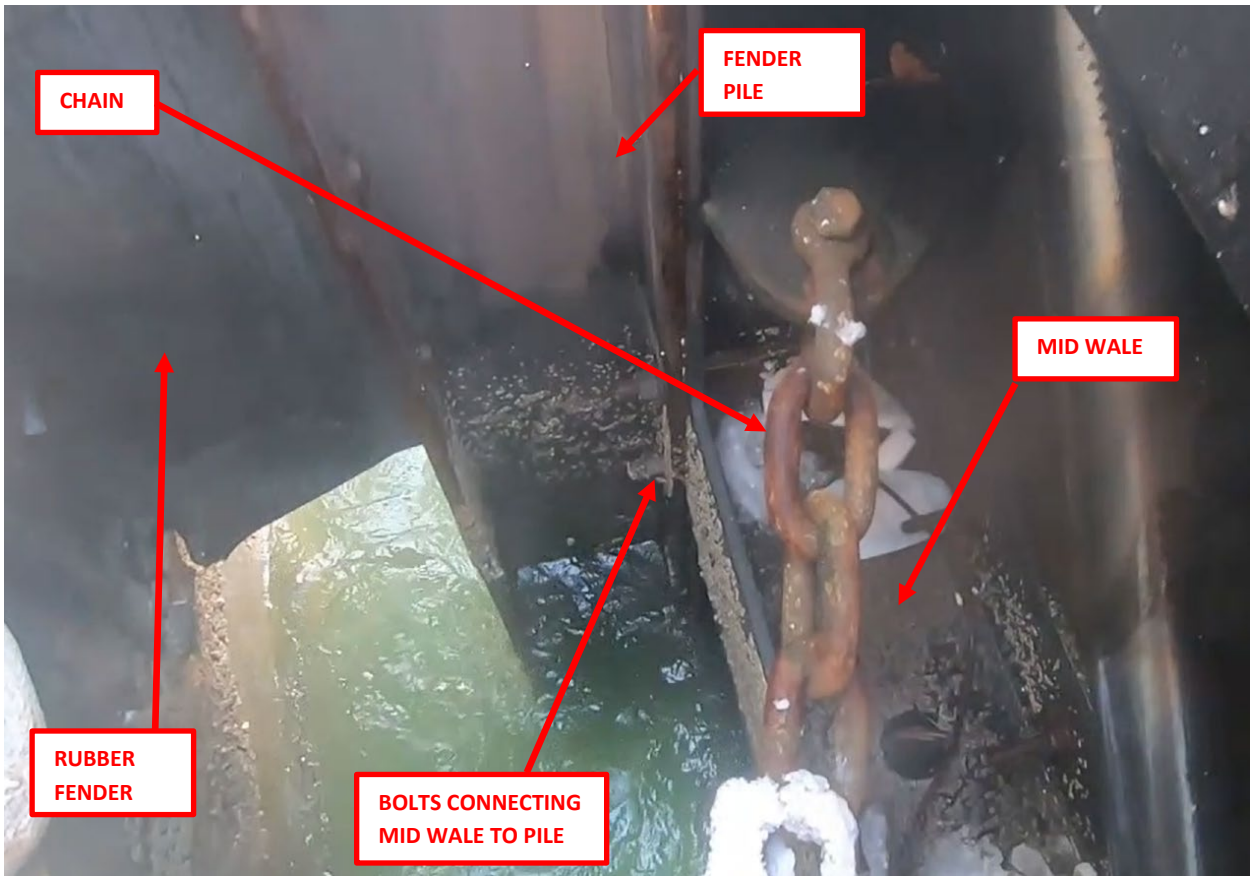

Photo 10: Typical Wale Construction

Fender Chain Assemblies

Two galvanized shear chains exist at each Fender. Each chain is equipped with galvanized shackles and a chain tensioner. Lower fender chain and hardware exhibit Moderate to Major coating loss and surface corrosion. The top fender chain and hardware exhibit Minor to Moderate coating loss and surface corrosion. All hardware including padeyes, shackles, and chain tensioner are intact. Lower chain is sagging while the upper chain is generally tight. Welds of padeyes are intact with Minor coating loss and surface corrosion. See Photos 10 & 11 for Typical Condition of fender chains.

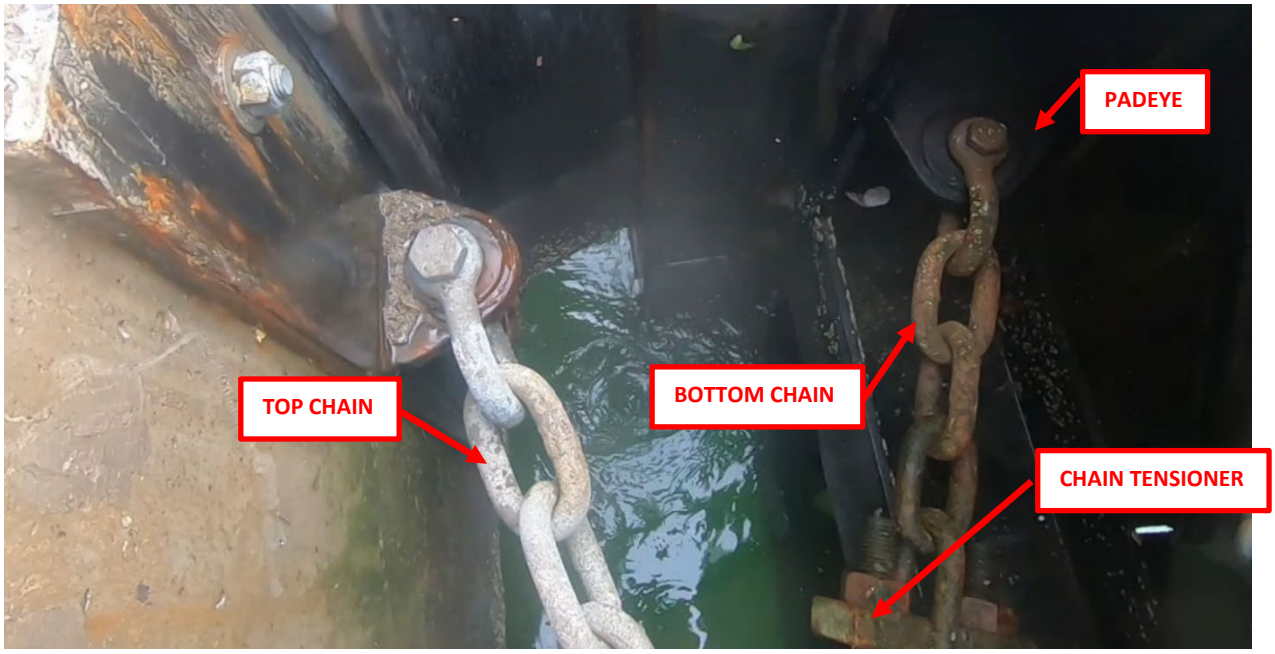

Photo 11: Typical Condition of chains.

Timber Fender Panels

The timbers that form the outer surface of the fender panels are intact and typically not broken or split. Timbers exhibit checks, some gouging, and normal abrasion due to vessel contact. Two galvanized bolts connect each timber to each wale. Bolts exhibit Minor to Moderate surface corrosion and coating loss but no significant section loss. Bolts and nuts are loose or missing throughout the system. Likewise, one timber face panel is missing at Panel 12.

A galvanized rolled steel cap exists on top of fender timbers at each fender panel. The coating of cap is intact with Minor corrosion or absence of corrosion. The cap is in place, except at Fenders 3, 4 and 7. Many of the fifteen bolts that connect each cap to timbers are loose, missing or have broken inside the timber. See Photos 12 & 13 for Typical Condition of fender timbers and cap.

Photo 12: Typical Condition of fender timbers from interior side.

Photo 13: Typical Condition of fender timbers from exterior side

Concrete Seawall

Above water, the concrete seawall is characterized by a 2025 repair of previously identified cracks and voids (see Figures 14 and 15).

An 18” wide x 12” tall concrete curb exists along the outer edge of seawall behind Fender #s 15 thru 20. A curved steel plate forms the top outer edge of curbs. The plate extends down approximately 30” to form the outer top face of seawall. The plate exhibits surface corrosion.

A 10x12 timber guard log exists along the outer edge of seawall behind Fender #s 1 through 15. Guard log timbers are checked with no section loss and are intact. See Photos 14 through 17 for typical condition of concrete seawall and curb.

Photo 14: Typical concrete seawall repairs.

Photo 15: Typical below water concrete repair (turbidity prevented clear imagery).

Photo 16: Typical Condition of concrete curb behind Fender #s 15 thru 20

Photo 17: Typical condition of timber curb behind Fenders #1 through #15.

4.2. East Fender System

A description of the East Fender System is presented in Section 2 of this report and illustrated in Figure 5. This section presents typical inspection findings. Unless noted otherwise in the Appendix D tabulated results, the structural elements forming the North Fender System were found to be in the following "Typical Conditions" during our visual inspection.

King Piles

Typically, the king piles are plumb with no impact damage. Below the approximate elevation of +8'-6" MLW, the king piles exhibit coating loss and surface corrosion along flange edges. The area of coating loss and corrosion extends into the face of flanges and web below the approx. elevation of +6'-0" MLW. The interlocks have moderate coating loss and surface corrosion above water. Below MLW, all components are covered with heavy marine growth. The king piles have approximately 20% coating loss, with no visible section loss. The interlocks between the king piles and between the king piles and sheet piles are tight and not separating.

Photo 18: Typical condition of King Pile.

Ultrasonic thickness measurements of steel thicknesses were measured at select king piles below water along the system. Steel thicknesses of the king piles were measured along the face of the flange and ranged from 0.48 to 0.87 inches, within a median measurement of approximately 0.65 inches. The original thickness of an PSP 900 pile varies along the face of

the flange, with a maximum thickness of 0.67 inches at the flange/web intersection. The thickness measurements suggest that substantial corrosion has not occurred; however, average readings suggest that, on average, less than 10% loss of steel thickness has occurred. Therefore, future monitoring should occur regularly. A single outlier measurement (0.48 inches) suggests a 30% corrosion of the steel thickness; however, that measurement is considered erroneous.

Steel Sheet Piles

The steel sheet piles installed between the king piles are not visible above water. Typical sheet pile is generally plumb with no bulge or lean. Up to 1" thick, soft marine growth exists with negligible coating loss and corrosion. Sheet pile penetrates mudline and the interlocks are intact with no tenting.

Photo 19: Typical condition of Sheet Pile (divers' hand is on interlock).

Ultrasonic thickness measurements of steel thicknesses were measured for select sheet piles. The steel sheetpile thickness measurements ranged from 0.47 inches to 0.67 inches in the web and 0.43 inches to 0.57 inches in the flange. The original thickness of a PZC 26 sheetpile pile is 0.60 inches at the flange and 0.53 inches at the web. The thickness measurements suggest that Moderate corrosion has occurred. Therefore, future monitoring should occur regularly.

Top Rubber Arch Fender

A Typical top rubber Arch fender is intact with no significant damage to the rubber. The bottom of top rubber fender has abrasion marks. The galvanized bolts connecting rubber fender to the king piles have negligible coating loss and are intact. A substantial number of bolts are loose

or missing as Itemized Inspection Findings Tables presented in Appendix D. Although lack of substantial damage to the Top Fender is typical, substantial damage has occurred as noted in Appendix D.

Bottom Rubber Arch Fender

Top of a Typical bottom rubber Arch fender has abrasion marks but no significant damage to the rubber. Galvanized bolts in the top two rows, connecting the rubber fender to the king piles, have negligible to minor coating loss and are intact. Bolts in the bottom two rows of lower Arch fender exhibit Minor to Moderate coating loss and surface corrosion, but no significant section loss. A substantial number of bolts are loose or missing as Itemized Inspection Findings Tables presented in Appendix D. Below MLW, the lower fender is covered in marine growth up to the second bolt from the bottom.

It was noted that each rubber fender is attached to king piles using 8 bolts and not 10, as shown in historical drawings. Twenty-seven (or 37.5%) of the existing 72 fenders were found to be damaged (predominantly the Bottom Fenders) during our inspection and one located on King Pile #6 is missing completely.

Photos of the upper and bottom Rubber Arch Fenders typical conditions are presented in Photos 20, 21 and 22.

Photo 20: Typical condition of Upper Rubber Arch Fender.

Photo 21: Typical condition of Bottom Rubber Arch Fender.

Photo 22: Typical fender damage (King Pile 13).

End Fender

The concrete cap of the end fender remains in Fair condition, some Moderate spalling and voids existing at the structure's lower seam. Scour has developed under the concrete cap, exposing one (or potentially more) of the steel H-Pile foundations. The lowest two corner arch fenders and timber supports are missing. The balance of fenders and timber supports are in place, and without substantial defects.

Photo 23: Exposed lag bolts at missing timber support / fender.

Photo 24: Above-water condition of End Fender.

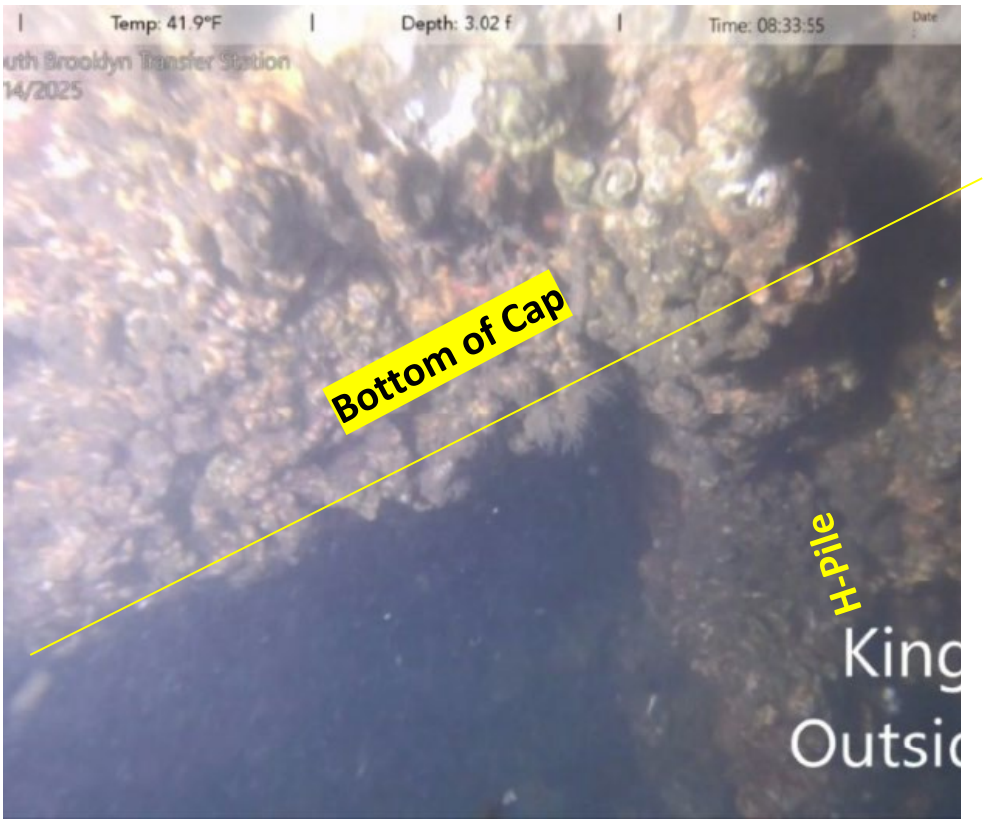

Photo 25: Exposed bottom of Concrete Cap.

5.0 EVALUATION

This section summarizes Bowman's evaluation of the components of the North and East Fender Systems and associated infrastructure.

5.1. North Fender System

5.1.1. Rubber Fenders

Of the North Fender System's 40 rubber arch fenders, 5 are severely damaged (torn, stretched, distorted) requiring removal and renewal (at Piles P5, P16, P18, P20, and P22). Twenty-eight additional rubber fenders (at Piles P2, P3, P4, P7, P8, P9, P10, P11, P13, P17, P21, P23, P24, P26, P27 & P28) are also damaged and separated from their mounting plates; however, they can likely be repaired. **Therefore, of the existing 40 rubber arch fenders, a total of thirty-three (33) or 82.5% rubber fenders are damaged.** The observed damage to rubber fenders may be due to the outward deflection/rotation of fender panels during eccentric barge impacts on fender panels. Rubber fenders are attached to mounting plates using four (4) bolts and not six (6), as indicated in historical drawings. Missing and loosening of existing bolts and washers connecting rubber fenders to mounting plates may also be due to the outward deflection/rotation of fender panels.

It is noted that a fender repair scope was implemented in September 2025 at Piles P29-40. As described earlier in this report, the repair included replacement of all fender bolts and washers and installation of a band over the end of the bolts to reduce the imparted stress. This solution has performed well to date, except for one location (P37), where the threads in the backing plate have failed and the new bolts were released. Bowman recommends that this solution be installed at all fender locations.

5.1.2. Fender Piles

Forty (40) fender piles support the North Fender System. Fender piles are generally in serviceable condition with coating loss and corrosion in top approx. 5 ft. **Four (4) (P5, P18, P15, and P20) of the existing 40 (or 10%) fender piles exhibit buckling of web and rotation of inner flange in top approx. 5 ft.** *(note – same conclusion as previous Bowman report).* This observed damage in fender piles may also be due to eccentric impact from barges on fender panels. Installation of a mechanism to minimize this deflection/rotation in fender panels may prevent damage to rubber fenders and their connections.

Our evaluation of corrosion in fender piles indicates that **less than 5% of pile steel section has been lost at midwater depth and at mudline due to corrosion. This section loss is classified as Minor in accordance with ASCE Manual.** See Table A below and Tables 3A, 12A, and details in Appendix D of this Report.

Table A: North Fender System Piles - Corrosion Evaluation.

	Percent Section Loss				
Pile	**P1**	**P9**	**P18**	**P20**	**Average**
Mid Water	<5%	<5%	<5%	<5%	**<5%**
Mudline	<5%	<5%	<5%	<5%	**<5%**

5.1.3. **Mounting Plates**

Mounting plates are in serviceable condition. Threaded rods anchoring mounting plate to the concrete wall exhibit varying degree of coating loss and surface corrosion. Significant section loss was generally not observed. Recoating with marine coating may prolong their life.

5.1.4. **Frame Wales**

Existing Wales are W14 steel beams and not W12, as shown in historical drawings. Wales are in serviceable condition. Cleaning and re-coating areas with coating loss and corrosion will prolong their life. Several bolts connecting Wales to fender piles are loose. The loosening of bolts may be due to repeat impact loads from barges. Installing lock nuts/washers may alleviate the loosening of bolts in future.

5.1.5. **Fender Chain Assemblies**

Chain assemblies are intact. Most lower fender chains were found to be sagging. The slack in fender chains may allow greater deflection in Fenders, resulting in damage to rubber fenders and piles.

5.1.6. **Timber Fender Panels**

Timbers of fender panels are in serviceable condition. Several timbers exhibit deep checks and may split in future, requiring removal and renewal. Multiple bolts connecting timber to the Wale were found to be loose, missing or broken inside the timber. At one location (Panel 11), a bolt was found to project beyond the face of timber panel. Projecting bolts

may cause damage to barge hull. The steel caps are in good condition; however, the caps for Fender #3, 4, and 7 are missing. Bolts connecting the cap to timbers are missing or loose throughout.

5.1.7. **Steel Sheetpile Bulkhead**

Sheet piles were found to be plumb with no noticeable lean, bulge, or tenting. Interlocks between sheet piles are intact, indicating no overstressing. Our evaluation of corrosion in sheetpiles indicates that **less than 5% of the sheetpile steel section has been lost at midwater depth and at mudline due to corrosion. This section loss is classified as Minor in accordance with ASCE Manual.** See Table B below and Tables 3A, 12A, and details in Appendix D of this Report.

Table A: North Fender System Sheetpiles - Corrosion Evaluation.

	Percent Section Loss				
Sheetpile	**P1**	**P9**	**P18**	**P20**	**Average**
	<5%	<5%	11%	<5%	**<5%**

5.1.8. **Mooring Hardware**

Visible portions of mooring hardware units (cleats, bollards, roller chocks, sheaves, winches, etc.) are intact with no signs of overstress in the form of damage, lean, or pulling out of anchor rods. However, mooring hardware appeared to be coated in paint recently and rust was visible below the paint, indicating significant corrosion in mooring hardware prior to the application of paint. Concrete around several mooring hardware was also stained in rust. Anchor rods of mooring hardware could not be inspected due to inaccessibility. A closer inspection of mooring hardware is recommended.

5.1.9. **Concrete Seawall**

The concrete seawall does not exhibit any substantial defects. Spalling, cracking and other issues noted in the years previous report have been addressed with satisfaction in September 2025.

Based on our findings and evaluations, **the North Fender System of SWBMTS is rated to be in "POOR" condition** in accordance with the ASCE Manual.

The **"POOR"** Condition in the ASCE Manual is defined as: "Advanced deterioration or overstressing observed on widespread portions of the structure but does not significantly

reduce the loadbearing capacity of the structure. Repairs may need to be carried out with moderate urgency."

5.2. East Fender System

5.2.1. King Piles

Visually, existing king piles appear plumb with no visible lean, indicating they are performing satisfactorily. While coating loss was observed in the tidal and splash zones, our evaluation of corrosion in king piles indicates that negligible section loss has occurred in king piles below water and near mudline due to corrosion. See Table C below and detailed information in Appendix D.

Table C: East Fender System King Piles - Corrosion Evaluation.

	Percent Section Loss				
King Pile	**2**	**10**	**22**	**31**	**Average**
Below Lower Fender	28% *	<5%	7%	8%	**12%**
Mudline	<5%	<5%	<5%	10%	**<5%**

* Likely erroneous measurement.

5.2.2. Steel Sheet Piles

Sheet piles below waterline were found to be plumb with no lean or bulge. Interlocks between sheet piles and between sheet piles and king piles are intact, indicating no overstressing. If the existing sheet piles are those specified in historical drawings, our evaluation of corrosion in sheet piles indicates that Moderate section loss due to corrosion has occurred below fenders in sheet piles. Monitoring should continue to ensure that the rate of corrosion does not further increase. See Table D below and Appendix D for more detailed measurements.

Table D: East Fender System Sheet Piles - Corrosion Evaluation.

	Percent Section Loss				
Steel Sheetpile	**2**	**10**	**22**	**31**	**Average**
Below Lower Fender	*<5%* (<5%)	*20%* (19%)	*22%* (13%)	*25%* (<5%)	***17%*** (10%)
Mudline	*<5%*	*22%*	*20%*	*27%*	***19%***

Italicized result is for the face of the sheet, value in parentheses ( ) is for the angle piece.

5.2.3. **Rubber Arch Fenders**

Seventy-two rubber arch fenders exist at the 36 King Pile Fenders of the East Fender System. Of this total, 27 (or 37.5%) of the existing 72 fenders were found to be damaged during our inspection. The bottom fender at King Pile 6 is completely missing.

It was observed during our presence on site that barge maneuvering operations at East Berth may be causing damage to the rubber fenders. Modifying the existing fender system may alleviate the observed damage to rubber fenders.

Noted damage has occurred at King Piles 6, 7, 8, 9, 10, 18, 24, 29 & 30. In all cases, the damaged fender is the bottom fender, except for Piles 18 and 24. Replacement should be considered for all these piles.

5.2.4. **End Fender**

The End Fender has exhibited substantial defects since the last inspection. Scour has developed under the concrete cap, exposing one (or potentially more) of the steel H-Pile foundations. Bowman recommends that this scoured area be armored with stone to prevent additional undermining of the foundation. Further, the lowest two corner arch fenders and timber supports are missing from the End Fender and must be replaced. The balance of fenders and timber supports are in place, and without substantial defects. Several bolts connecting Wales to fender piles remain loose and should be tightened. Installing lock nuts/washers may alleviate the loosening of bolts in future.

Based on our findings and evaluations, **the East Fender System of SWBMTS is rated to be in "POOR" condition** in accordance with the ASCE Manual.

The **"POOR"** Condition in the ASCE Manual is defined as: "Advanced deterioration or overstressing observed on widespread portions of the structure but does not significantly reduce the loadbearing capacity of the structure. Repairs may need to be carried out with moderate urgency."

6.0 RECOMMENDATIONS

Bowman's recommendations for the Fender System are summarized below. Priority recommendations are presented in **bold**.

6.1. North Fender System

6.1.1. Rubber Fenders

- Fender systems #15-#20 were repaired during September 2025 with a strap improvement. **Bowman recommends that this repair be implemented on the balance of the fenders. Where threads in back plate are damaged or worn, it is advised to weld a threaded stud into the hole and mount the fender and strap to that.**
- Fender #19, which was part of the September 2025 repair, failed when the bolts released from the backing plate and pulled the strap off the bulkhead plate. **This Fender should be repaired per the above methodology.**

6.1.2. Fender Piles

- Clean and recoat approx. top 5 ft. of all existing fender piles.
- Repair four damaged/rotated fender piles P5, P15, 18, and P20 at Fender #s 3, 8, 9 and 10, respectively.

6.1.3. Mounting Plates

- Clean and recoat mounting plate.
- Clean & recoat exposed portions of corroded threaded rods, nuts, and washers
- Renew threaded rods, nuts, and washers with greater than 15% section loss.
- **Tighten all loose nuts.**

6.1.4. Frame Wales

- Clean and recoat damaged coating of top and mid Wales.
- Install lock washer/nut on all bolts connecting Wale to fender piles.
- **Tighten all loose bolts connecting top, mid, and bottom Wales to fender piles.**

6.1.5. Fender Chain Assemblies

- **Reinstall missing nut of chain tensioner of Fender #16.**
- **Tighten lower chains of all fenders and few loose upper chains.**
- **Weld the crack in one chain link at Fender #2.**

6.1.6. **Timber Fender Panels**

- Install lock washer/nut on all bolts connecting timbers to top, mid, and bottom Wales.
- **Tighten all loose bolts connecting timbers to top, mid, and bottom Wales.**
- **Reinstall displaced steel caps at Fender #s 3, 4, and 7.**
- **Renew cap bolts where missing or broken.**
- **Remove and reinstall projecting bolt at Fender #11.**
- **Tighten loose cap bolts at all Fender**s.

6.1.7. **Steel Sheetpile Bulkhead**

- Continue to monitor steel sheetpile thickness.

6.1.8. **Concrete Seawall**

- No Action. Repairs made in 2025 have addressed outstanding defects.

6.1.9. **Mooring Hardware**

- Remove existing paint, remove rust and have a registered Engineer perform visual inspection of corroded mooring hardware and their anchor rods. Temporary removal of mooring hardware may be required for inspection, if determined by the Engineer.
- If mooring hardware and their anchor rods are in serviceable condition and do not exhibit section loss, clean and recoat mooring hardware. Renew anchor rods and mooring hardware if section loss is observed.

6.1.10. **Additional Recommendations**

1. Consider evaluation, design, and installation of supplementary engineered tension chains or an alternate engineered mechanism at each Fender to minimize outboard deflection/rotation of fender panels which may be causing the separation of rubber fenders from the mounting plates and damage to the rubber arch fenders. Damage to fender piles may also be mitigated by the installation of tension chains. Disconnecting the outer face of rubber fenders from fender piles should also be evaluated to minimize these damages.

6.2. East Fender System

6.2.1. King Piles

- Clean and install marine coating to repair damaged king pile coating in tidal and splash zones.

6.2.2. Steel Sheet Piles

- Continue to monitor sheetpile thickness. This inspection's results indicate average steel thickness loss of up to 25% of the original thickness.

6.2.3. Rubber Arch Fenders

- **Remove and renew in-kind, the three severely damaged bottom arch rubber fenders at King Pile Fender #s 6, 9, and 11 (#11 is missing).**
- **Renew missing bolts connecting the top rubber fender to king pile at King Pile Fender #s 9 and 32.**
- **Renew missing nuts and washers throughout.**
- **Tighten all loose bolts connecting rubber fender to king piles.**

6.2.4. End Fender

- **Provide rock scour protection around the base of the concrete cap.**
- **Tighten all loose fender connections.**
- Repair concrete spall and cracking.
- **Replace bottom two corner fenders and timber supports, which are missing.**

6.2.5. Additional Recommendations

- In addition to the 3 severely damaged and/or missing rubber fenders recommended to be renewed above, 24 other rubber fenders are damaged. Renewal of these fenders has not been recommended in this Report since the damage may have not reduced the energy absorption capacity of these fenders significantly. However, it is expected that damage to these rubber fenders will become worse in future, requiring removal and renewal.

- Consider evaluation, design, and installation of a continuous horizontal Wale system at the East Fender System to minimize damage to rubber fenders.

END OF REPORT

APPENDIX A

ASCE Waterfront Facilities Damage Rating System

Table 2-5. Damage Ratings for Steel Elements

Damage Rating		Existing Damage[a]	Exclusions [Defects Requiring Elevation to the Next Higher Damage Rating(s)]
NI	Not Inspected	• Not inspected, inaccessible, or passed by[b]	
ND	No Defects	• Protective coating or wrap intact • Light surface rust • No apparent loss of material	
MN	Minor	• Protective coating or wrap damaged and loss of thickness up to 15% of nominal at any location • Less than 50% of perimeter or circumference affected by corrosion at any elevation or cross section • Loss of thickness up to 15% of nominal at any location	Minor damage not appropriate if • Changes in straight line configuration or local buckling • Corrosion loss exceeding fabrication tolerances (at any location)
MD	Moderate	• Protective coating or wrap damaged and loss of thickness 15 to 30% of nominal at any location • More than 50% of perimeter or circumference affected by corrosion at any elevation or cross section • Loss of thickness 15 to 30% of nominal at any location	Moderate damage not appropriate if • Changes in straight line configuration or local buckling • Loss of thickness exceeding 30% of nominal at any location

(Continued)

Table 2-5. Damage Ratings for Steel Elements *(Continued)*

Damage Rating		Existing Damage[a]	Exclusions [Defects Requiring Elevation to the Next Higher Damage Rating(s)]
MJ	Major	• Protective coating or wrap damaged and loss of nominal thickness 30 to 50% at any location • Partial loss of flange edges or visible reduction of wall thickness on pipe piles • Loss of nominal thickness 30 to 50% at any location	Major damage not appropriate if • Changes in straight line configuration or local buckling • Perforations or loss of wall thickness exceeding 50% of nominal
SV	Severe	• Protective coating or wrap damaged and loss of wall thickness exceeding 50% of nominal at any location • Structural bends or buckling, breakage and displacement at supports, loose or lost connections • Loss of wall thickness exceeding 50% of nominal at any location	

[a]Any defect listed is sufficient to identify relevant damage grade.
[b]If not inspected due to inaccessibility or passed by, note as such.

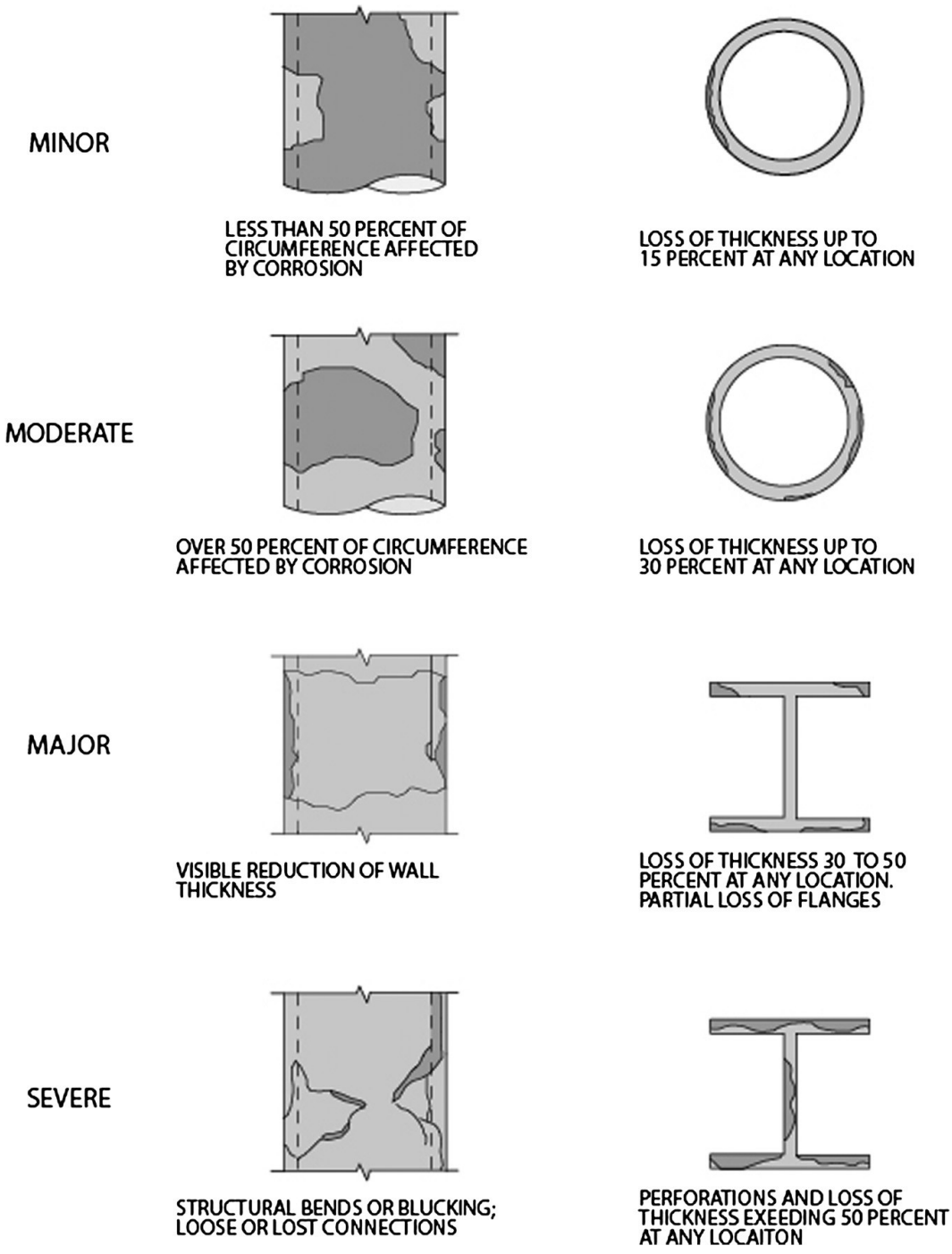

Fig. 2-3. Damage ratings for steel elements
Source: Courtesy of CH2M HILL, Inc. and COWI, Inc., reproduced with permission.

APPENDIX B

ASCE Waterfront Facilities Condition Assessment Rating System

Table 2-14. Condition Assessment Ratings

Rating		Description
6	Good	No visible damage or only minor damage noted. Structural elements may show very minor deterioration, but no overstressing observed. No repairs are required.
5	Satisfactory	Limited minor to moderate defects or deterioration observed but no overstressing observed. No repairs are required.
4	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.
3	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.
2	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.
1	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.

2.6.2 Condition Assessment Ratings

The Condition Assessment Rating should be assigned upon completion of the Routine Inspection and remain associated with the structural unit (as defined in Section 3.1.1) until the structure is rerated following a quantitative engineering evaluation and repairs, or upon completion of the next

APPENDIX C

Photographs

APPENDIX C

Photographs

Inspection videos and photographs are

available at the following link

https://www.dropbox.com/scl/fo/6jdbs25a9h36znrf2x9d8/AKjpF1egLOnbhwIsUDSJjT0?rlkey=ch1tu5uu1aaqj002gz6lhadz2&st=7nye1rei&dl=0

APPENDIX D

Tabulated Inspection Findings

TABLE - 1: Fender #1 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P2)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P1)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Poor	X		Coating loss & corrosion, replace bottom bolts
East Rubber Fender	Poor		X	Loose fender w/0.5" to 0.75" gap & damaged bolt holes
Bolts to East Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Corroded bolt, missing washer
East Bottom	Poor		X	Corroded bolt, missing washer
West Top	Poor		X	Corroded bolt, loose washer
West Bottom	Poor		X	Corroded bolt, missing washer
West Fender Mounting Plate	Fair			Minor coating loss & corrosion
Anchors to Seawall	Poor	X		Coating loss & some corrosion of threaded rods, nuts & washers
West Rubber Fender	Fair		X	Loose fender w/damaged bolt holes
Bolts to West Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Corroded bolt, loose
East Bottom	Fair	X		Corroded bolt, missing washer
West Top	Fair	X		Corroded bolt pulled through fender
West Bottom	Poor		X	Bolt loose & corroded, missing washer
Fender Chain Assembly				
Chains	Fair	X		Minor to moderate corrosion.
Padeyes	Fair	X		Minor coating loss & corrosion
Shackles & Tensioners	Fair			Minor to moderate corrosion.
Frame Wales				
Top Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Bottom Wale	Fair	X		Heavy marine growth. Loose bolts
Cross Bracing Members	Fair			Minor coating loss & corrosion at top
Timber Fender Panel				
Cap	Fair	X		In place, loose bolts
Face Timbers	Fair			Minor checking
Concrete Seawall				
Above Waterline	Fair	X		Area repaired 2025
Below Waterline	Fair			Area repaired 2025
Sheetpile Bulkhead	Fair			Heavy marine growth. No scouring at mudline

TABLE - 1A - CORROSION EVALUATION @ FENDER #1		
Item	**Current Thickness (Inch)**	**Corrosion Evaluation**
West Pile (P1) - Midwater		<5% section loss (Minor).
Outer Flange	0.723	
Web	0.719	
Inner Flange	0.701	
West Pile (P1) - Bottom		<5% section loss (Minor).
Outer Flange	0.700	
Web	0.700	
Inner Flange	0.685	
Sheetpile - Below Conc. Seawall		<5% section loss (Minor).
Outer Flange	0.593	
Web	0.506	
Inner Flange	0.582	

NOTES:

1. Existing piles are HP12x84 (Per historical drawings)
2. Section Properties of New HP12X84

   Flange thickness = 0.685"

   Web thickness = 0.685"
3. Existing sheet piles are PZ35 (Per historical drawings)
4. Section Properties of New PZ35 Sheet Pile:

   Flange thickness = 0.600"

   Web thickness = 0.500"

TABLE - 2: Fender #2 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P4)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P3)	Fair	X		Coating loss & corrosion at top 5 ft, light scouring
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Poor	X		Coating loss & corrosion, replace bottom bolts
East Rubber Fender	Fair		X	Loose fender w/0.5" gap and damaged bolts
Bolts to East Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Bolt corrosion, loose washer & bolt
East Bottom	Poor		X	Bolt corrosion, missing washer, pulling through fender
West Top	Poor		X	Bolt corrosion, loose washer & bolt
West Bottom	Poor		X	Bolt corrosion, loose washer & bolt
West Fender Mounting Plate	Fair			Minor coating loss & corrosion
Anchors to Seawall	Poor	X		Coating loss & corrosion, replace bottom bolts
West Rubber Fender	Fair		X	Loose fender w/0.5" gap at top
Bolts to West Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Bolt corrosion, pulling through fender
East Bottom	Fair		X	Bolt corrosion, missing washer
West Top	Fair		X	Bolt corrosion
West Bottom	Poor		X	Bolt corrosion, missing washer
Fender Chain Assembly				
Chains	Fair	X		Moderate corrosion. 1 link of lower chain has a crack
Padeyes	Fair	X		Minor coating loss & corrosion
Shackles & Tensioners	Fair	X		Minor to moderate corrosion. Tighten lower chain.
Frame Wales				
Top Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Bottom Wale	Fair	X		Heavy marine growth. Loose bolts
Cross Bracing Members	Fair			Minor coating loss & corrosion at top
Timber Fender Panel				
Cap	Fair	X		Loose & missing bolts
Face Timbers	Fair			Minor checking
Concrete Seawall				
Above Waterline	Fair			Repaired 2025
Below Waterline	Fair			Repaired 2025
Sheetpile Bulkhead	Fair			Heavy marine growth. No scouring at Mudline

TABLE - 3: Fender #3 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P6)	Typical	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P5)		X		Typical but pile web is buckled. Pile flange is distorted & rotated.
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Poor	X		Coating loss & corrosion, replace bottom bolts
East Rubber Fender	Poor			Fender loose w/0.125" to 0.5" gap. Stretched & damaged
Bolts to East Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Bolt & washer loose and corroded, pulling through fender
East Bottom	Poor		X	Bolt & washer loose and corroded, pulling through fender
West Top	Poor		X	Bolt & washer loose and corroded, pulling through fender
West Bottom	Poor		X	Bolt & washer corroded
West Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Poor	X		Coating loss & corrosion, replace bottom bolts
West Rubber Fender	Poor		X	Fender loose with damaged bolts
Bolts to West Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Bolt & washer corroded, washer dislocated.
East Bottom	Poor		X	Bolt & washer corroded, Bolt pulling through fender
West Top	Poor		X	Bolt & washer corroded. Washer dislocated
West Bottom	Poor		X	Bolt & washer corroded. Washer dislocated.
Fender Chain Assembly				
Chains	Poor	X		Moderate corrosion. Lower chain sagging
Padeyes	Fair	X		Minor coating loss & corrosion
Shackles & Tensioners	Fair	X		Minor to moderate corrosion, tighten chains
Frame Wales				
Top Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Fair	X		Light marine growth. Loose bolts
Bottom Wale	Fair	X		Heavy marine growth. Loose bolts
Cross Bracing Members	Fair	X		Minor coating loss & corrosion at top
Timber Fender Panel				
Cap	Poor		X	Missing
Face Timbers	Fair			Minor checking
Concrete Seawall				
Above Waterline	Fair			Repaired 2025
Below Waterline	Fair			Repaired 2025
Sheetpile Bulkhead	Fair			Heavy marine growth. No scouring at Mudline

TABLE - 4: Fender #4 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P8)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P7)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & some corrosion of threaded rods, nuts & washers
East Rubber Fender	Poor		X	Loose fender with 2" to 3" gap
Bolts to East Fender Pile	Poor		X	Coating loss and corrosion of bottom bolts
Bolts to Mounting Plate				
East Top	Poor		X	Corroded bolt, dislodged washer, pulled through fender
East Bottom	Poor		X	Corroded bolt, mislodged washer.
West Top	Poor		X	Corroded bolt, dislodged washer, pulled through fender
West Bottom	Poor		X	Corroded bot, mislodged bolt and washer
West Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss and corrosion of bottom bolts
West Rubber Fender	Poor	X		Loose fender with 2" to 3" gap
Bolts to West Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Corroded bolt, dislodged washer
East Bottom	Poor		X	Corroded bolt, missing washer, pullted through fender
West Top	Poor		X	Corroded bolt, mislodged washer, pulled through fender
West Bottom	Poor		X	Corroded bolt, pulling through fender
Fender Chain Assembly				
Chains	Poor		X	Moderate corrosion. Lower chain sagging
Padeyes	Fair	X		Minor coating loss & corrosion
Shackles & Tensioners	Fair			Minor to moderate corrosion.
Frame Wales				
Top Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Fair	X		Light marine growth. Loose bolts
Bottom Wale	Fair	X		Heavy marine growth. Loose bolts
Cross Bracing Members	Fair	X		Minor coating loss & corrosion at top
Timber Fender Panel				
Cap	Poor		X	Missing
Face Timbers	Fair			Minor checking
Concrete Seawall				
Above Waterline	Fair			2025 Repair
Below Waterline	Fair			2025 Repair
Sheetpile Bulkhead	Fair			Heavy marine growth. No scouring at Mudline

TABLE - 5: Fender #5 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P10)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P9)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Poor	X		Corrosion and loose bolts
East Rubber Fender	Poor		X	Fender loose from bulkhead
Bolts to East Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Corroded bolt, washer dislodged, pulling through fender
East Bottom	Poor		X	Corroded bolt, washer dislodged, pulling through fender
West Top	Poor		X	Corroded bolt, washer dislodged, pulling through fender
West Bottom	Poor		X	Corroded bolt, missing washer, pulling through fender
West Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion
West Rubber Fender	Poor		X	Loose fender w/damaged bolt holes
Bolts to West Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Corroded bolt, washer loose, pulling through fender
East Bottom	Poor		X	Corroded bolt, washer loose, pulling through fender
West Top	Poor		X	Corroded bolt, washer loose, pulling through fender
West Bottom	Poor		X	Corroded bolt, washer loose, pulling through fender
Fender Chain Assembly				
Chains	Fair	X		Moderate corrosion. Lower chain sagging
Padeyes	Fair	X		Minor coating loss & corrosion
Shackles & Tensioners	Fair			Minor to moderate corrosion
Frame Wales				
Top Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Fair	X		Light marine growth. Loose bolts
Bottom Wale	Fair	X		Heavy marine growth. Loose bolts
Cross Bracing Members	Fair	X		Minor coating loss & corrosion at top
Timber Fender Panel				
Cap	Fair	X		Loose Bolts
Face Timbers	Fair			Minor checking
Concrete Seawall				
Above Waterline	Fair			Repaired 2025
Below Waterline	Fair			Repaired 2025
Sheetpile Bulkhead	Fair			Heavy marine growth. No scouring at mudline

TABLE - 6: Fender #6 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P12)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P11)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion
East Rubber Fender	Poor	X		Fender looose from bulkhead
Bolts to East Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Corroded bolt.
East Bottom	Poor		X	Corroded bolt, dislodged washer, pulling through fender
West Top	Poor		X	Corroded bolt, loose washer
West Bottom	Poor		X	Corroded bolt, loose washer
West Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss with minor corrosion
West Rubber Fender	Poor	X		Loose fender w /damaged bolt holes
Bolts to West Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Corroded Bolt, loose washer, pulling through fender
East Bottom	Poor		X	Corroded Bolt, loose washer, pulling through fender
West Top	Poor		X	Corroded Bolt, loose washer, pulling through fender
West Bottom	Poor		X	Corroded Bolt, loose washer, pulling through fender
Fender Chain Assembly				
Chains	Fair	X		Moderate corrosion
Padeyes	Fair	X		Minor coating loss & corrosion
Shackles & Tensioners	Fair			Minor to moderate corrosion
Frame Wales				
Top Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Fair	X		Light marine growth. Loose bolts
Bottom Wale	Fair	X		Heavy marine growth. Loose bolts
Cross Bracing Members	Fair			Minor coating loss & corrosion at top
Timber Fender Panel				
Cap	Fair	X		Loose Bolts
Face Timbers	Fair			Minor checking
Concrete Seawall				
Above Waterline	Fair			Repaired 2025
Below Waterline	Fair			Repaired 2025
Sheetpile Bulkhead	Fair			Heavy marine growth. No scouring at Mudline

TABLE - 7: Fender #7 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P14)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P13)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Minor coating loss & corrosion
East Rubber Fender	Poor		X	Fender loose, 5" from bulkhead
Bolts to East Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Corroded botlt, loose, washer dislodged.
East Bottom	Poor		X	Corroded botlt, loose, washer dislodged.
West Top	Poor		X	Corroded bolt
West Bottom	Poor		X	Corroded bolt
West Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Minor coating loss & corrosion
West Rubber Fender	Poor		X	Loose fender, damaged bolt holes
Bolts to West Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Bolt corrosion & washer loose, pulling through fender
East Bottom	Poor		X	Bolt corrosion & washer missing, pulling through fender
West Top	Poor		X	Bolt corrosion & washer loose, pulling through fender
West Bottom	Poor		X	Bolt corrosion & washer loose, pulling through fender
Fender Chain Assembly				
Chains	Poor		X	Moderate corrosion. Upper chain sagging
Padeyes	Fair	X		Minor coating loss & corrosion
Shackles & Tensioners	Fair			Minor to moderate corrosion
Frame Wales				
Top Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Fair	X		Light marine growth. Loose bolts
Bottom Wale	Fair	X		Heavy marine growth. Loose bolts
Cross Bracing Members	Fair	X		Minor coating loss & corrosion at top
Timber Fender Panel				
Cap	Poor		X	Missing
Face Timbers	Fair			Minor checking
Concrete Seawall				
Above Waterline	Fair			Repaired in 2025
Below Waterline	Fair			Repaired in 2025
Sheetpile Bulkhead	Fair			Heavy marine growth. No scouring at Mudline

TABLE - 8: Fender #8 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P16)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P15)	Fair	X		Typical, but w/slight buckling of web
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion
East Rubber Fender	Poor		X	Fender loose, torn side
Bolts to East Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Bolt corroded, washer loose & bolt pulling through
East Bottom	Poor		X	Bolt corroded, washer loose & bolt pulling through
West Top	Poor		X	Bolt corroded, washer loose & bolt pulling through
West Bottom	Poor		X	Bolt corroded, washer dislodged & bolt pulling through
West Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion
West Rubber Fender	Poor		X	Fender loose, torn side
Bolts to West Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Bolt corroded, washer loose & bolt pulling through
East Bottom	Poor		X	Bolt corroded, washer loose & bolt pulling through
West Top	Poor		X	Bolt corroded, washer loose & bolt pulling through
West Bottom	Poor		X	Bolt corroded, washer dislodged & bolt pulling through
Fender Chain Assembly				
Chains	Poor	X		Moderate corrosion. Lower chain sagging
Padeyes	Fair	X		Minor coating loss & corrosion
Shackles & Tensioners	Fair			Minor to moderate corrosion
Frame Wales				
Top Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Fair	X		Minor coating loss & corrosion. Missing bolts
Bottom Wale	Fair	X		Heavy marine growth.Loose bolts
Cross Bracing Members	Fair	X		Minor coating loss & corrosion at top
Timber Fender Panel				
Cap	Fair	X		Loose Bolts
Face Timbers	Fair			Minor checking
Concrete Seawall				
Above Waterline	Fair			Repaired 2025
Below Waterline	Fair			Repaired 2025
Sheetpile Bulkhead	Fair			Heavy marine growth. No scouring at Mudline

TABLE - 9: Fender #9 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P18)	Poor	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P17)	Fair	X		Typical but pile web is buckled & inner flange is rotated.
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion at top 5 ft.
East Rubber Fender	Poor		X	Fender loose from bulkhead
Bolts to East Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Bolt corroded, washer loose, pulling through fender
East Bottom	Poor		X	Bolt corroded, missing washer, pulling through fender
West Top	Poor		X	Bolt corroded, washer loose, pulling through fender
West Bottom	Poor		X	Bolt corroded, dislodged washer, pulling through fender
West Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion
West Rubber Fender	Poor		X	Fender loose from bulkhead
Bolts to West Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Missing washer & bolt
East Bottom	Poor		X	Bolt corroded, washer dislodged, pulling through fender
West Top	Poor		X	Bolt corroded, washer loose, pulling through fender
West Bottom	Poor		X	Bolt corroded, washer dislodged, pulling through fender
Fender Chain Assembly				
Chains	Poor	X		Moderate corrosion. Lower chain is loose
Padeyes	Fair	X		Minor coating loss & corrosion
Shackles & Tensioners	Fair			Minor to moderate corrosion.
Frame Wales				
Top Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Bottom Wale	Fair	X		Heavy marine growth.Loose bolts
Cross Bracing Members	Fair	X		Minor coating loss & corrosion at top
Timber Fender Panel				
Cap	Fair	X		Loose bolts
Face Timbers	Fair			Minor checking
Concrete Seawall				
Above Waterline	Fair			Repaired in 2025
Below Waterline	Fair			Repaired in 2025
Sheetpile Bulkhead	Fair			Heavy marine growth. No scouring at mudline

TABLE - 9A - CORROSION EVALUATION @ FENDER #9		
Item	**Current Thickness (Inch)**	**Corrosion Evaluation**
West Pile (P18) - Midwater		<5% section loss (Minor).
Outer Flange	0.710	
Web	0.675	
Inner Flange	0.644	
West Pile (P18) - Bottom		<5% section loss (Minor).
Outer Flange	0.644	
Web	0.757	
Inner Flange	0.679	
Sheetpile - Below Conc. Seawall		<5% section loss (Minor).
Outer Flange	0.569	
Web	0.533	
Inner Flange	0.575	

NOTES:

1. Existing piles are HP12x84 (Per historical drawings)
2. Section Properties of New HP12X84

   Flange thickness = 0.685"

   Web thickness = 0.685"
3. Existing sheet piles are PZ35 (Per historical drawings)
4. Section Properties of New PZ35 Sheet Pile:

   Flange thickness = 0.600"

   Web thickness = 0.500"

TABLE - 10: Fender #10 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P20)	Fair	X		Typical but pile web is buckled & inner flange is rotated.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P19)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion
East Rubber Fender	Poor		X	Fender loose from bulkhead
Bolts to East Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Corroded bolt, dislodged washer & bolt pulling thru fender
East Bottom	Poor		X	Corroded bolt, missing & bolt pulling thru fender
West Top	Poor		X	Corroded bolt, missing & bolt pulling thru fender
West Bottom	Poor		X	Washer & bolt missing
West Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion
West Rubber Fender	Poor		X	Fender loose from bulkhead, damaged bolt holes
Bolts to West Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Corroded bolt, dislodged washer
East Bottom	Poor		X	Corroded bolt, dislodged washer & bolt pulling thru fender
West Top	Poor		X	Corroded bolt, dislodged washer
West Bottom	Poor		X	Corroded bolt, missing washer, bolt pulling through fender
Fender Chain Assembly				
Chains	Poor	X		Moderate corrosion. Lower chain sagging, loose bolts
Padeyes	Fair	X		Loose bolts
Shackles & Tensioners	Fair			Loose bolts
Frame Wales				
Top Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Fair	X		Minor coating loss & corrosion. Missing bolts
Bottom Wale	Fair	X		Heavy marine growth. Loose bolts
Cross Bracing Members	Fair	X		Minor coating loss & corrosion at top
Timber Fender Panel				
Cap	Fair	X		Loose Bolts
Face Timbers	Fair	X		3 bolts are broken inside timber
Concrete Seawall				
Above Waterline	Fair			2025 Repair
Below Waterline	Fair			2025 Repair
Sheetpile Bulkhead	Fair			Heavy marine growth. No scouring at Mudline

TABLE - 11: Fender #11 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P22)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P21)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion
East Rubber Fender			X	Loose fender at bottom and torn
Bolts to East Fender Pile	Fair		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Missing bolt & washer
East Bottom	Poor		X	Missing bolt & washer
West Top	Poor		X	Missing bolt & washer
West Bottom	Poor		X	Missing bolt & washer
West Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion
West Rubber Fender	Poor		X	Loose fender w/damaged bolts
Bolts to West Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Missing bolt & washer
East Bottom	Poor		X	Corrossion, washer loose, bolt pulling through fender
West Top	Poor		X	Corrosion, washer dislodged, bolt pulling through fender
West Bottom	Poor		X	Missing bolt & washer
Fender Chain Assembly				
Chains	Fair		X	Moderate corrosion. Lower chain sagging,
Padeyes	Fair	X		Minor coating loss & corrosion
Shackles & Tensioners	Fair			Minor to moderate corrosion, loose bolts
Frame Wales				
Top Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Fair	X		Minor coating loss & corrosion. Loose & missing bolts
Bottom Wale	Fair	X		Heavy marine growth. Loose bolts
Cross Bracing Members	Fair	X		Minor coating loss & corrosion at top
Timber Fender Panel				
Cap	Fair		X	Loose Bolts
Face Timbers	Fair		X	3 bolts broken inside timber, 1 extends beyond face
Concrete Seawall				
Above Waterline	Fair			2025 Repairs
Below Waterline	Fair			2025 Repairs
Sheetpile Bulkhead	Fair			Heavy marine growth. No scouring at Mudline

TABLE - 12: Fender #12 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P24)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P23)	Poor	X		Coating loss & corrosion at top 5 ft. Web of Piling twisted
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion
East Rubber Fender	Poor		X	Fender loose from bulkhead
Bolts to East Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Corroded bolt, loose & cracked washer
East Bottom	Poor		X	Corroded bolt, missing washer, pulled through
West Top	Poor		X	Missing bolt, washer dislodged
West Bottom	Poor		X	Corroded bolt, missing washer, pulled through
West Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion
West Rubber Fender	Poor		X	Fender loose and twisted
Bolts to West Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Corroded bolt, loose washer
East Bottom	Poor		X	Corroded bolt, missing washer, pulled through
West Top	Poor		X	Corroded bolt, loose washer
West Bottom	Poor		X	Corroded bolt, missing washer
Fender Chain Assembly				
Chains	Poor		X	Moderate corrosion. Both chains sagging
Padeyes	Fair	X		Minor coating loss & corrosion
Shackles & Tensioners	Fair	X		Minor to moderate corrosion
Frame Wales				
Top Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Fair	X		Minor coating loss & corrosion. Missing bolts
Bottom Wale	Fair	X		Heavy marine growth. Loose bolts
Cross Bracing Members	Fair	X		Minor coating loss & corrosion at top
Timber Fender Panel				
Cap	Fair	X		Loose Bolts
Face Timbers	Poor		X	One missing timber.
Concrete Seawall				
Above Waterline	Fair			2025 Repair
Below Waterline	Fair			2025 Repair
Sheetpile Bulkhead	Fair			Heavy marine growth. No scouring at Mudline

TABLE - 13: Fender #13 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P26)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P25)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion
East Rubber Fender	Poor	X		Loose fender
Bolts to East Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Corroded bolt, missing washer
East Bottom	Poor		X	Corroded bolt, missing washer
West Top	Poor		X	Corroded bolt, missing washer
West Bottom	Poor		X	Corroded bolt, missing washer
West Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion
West Rubber Fender	Poor			Torn & Loose fender.
Bolts to West Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Corroded bolt, loose washer
East Bottom	Poor		X	Corroded bolt, loose washer
West Top	Poor		X	Corroded bolt, loose washer
West Bottom	Poor		X	Corroded botl, missing washer
Fender Chain Assembly				
Chains	Fair	X		Moderate corrosion. Lower chain sagging
Padeyes	Fair	X		Minor coating loss & corrosion
Shackles & Tensioners	Fair			Minor to moderate corrosion.
Frame Wales				
Top Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Fair	X		Light marine growth. Loose bolts
Bottom Wale	Fair	X		Heavy marine growth. Loose bolts
Cross Bracing Members	Fair			Minor coating loss & corrosion at top
Timber Fender Panel				
Cap	Fair	X		Loose Bolts
Face Timbers	Fair			Minor checking
Concrete Seawall				
Above Waterline	Typical			2025 Repair
Below Waterline	Typical			2025 Repair
Sheetpile Bulkhead	Typical			Heavy marine growth. No scouring at Mudline

TABLE - 14: Fender #14 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P28)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P27)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss and corrosion
East Rubber Fender	Poor		X	Fender loose, 3" gap between bulkhead
Bolts to East Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Corroded bolt, missing washer
East Bottom	Poor		X	Corroded bolt, missing washer
West Top	Poor		X	Corroded bolt, missing washer
West Bottom	Poor		X	Corroded bolt, missing washer
West Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & some corrosion of threaded rods, nuts & washers
West Rubber Fender	Poor	X		Fender intact
Bolts to West Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Poor		X	Corroded bolt, loose washer
East Bottom	Poor		X	Corroded bolt, loose washer
West Top	Poor		X	Corroded bolt, loose washer
West Bottom	Poor		X	Corroded bolt, loose washer
Fender Chain Assembly				
Chains	Fair		X	Moderate corrosion. Lower chain sagging
Padeyes	Fair	X		Minor coating loss & corrosion
Shackles & Tensioners	Fair			Minor to moderate corrosion.
Frame Wales				
Top Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Bottom Wale	Fair	X		Heavy marine growth. Loose bolts
Cross Bracing Members	Fair	X		Minor coating loss & corrosion at top
Timber Fender Panel				
Cap	Fair	X		Loose Bolts & cap rotated in
Face Timbers	Fair			Minor checking
Concrete Seawall				
Above Waterline	Fair			2025 Repair
Below Waterline	Fair			2025 Repair
Sheetpile Bulkhead	Fair			Heavy marine growth. No scouring at Mudline

TABLE - 15: Fender #15 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P30)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P29)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion
East Rubber Fender	Fair	X		Loose from bulkhead
Bolts to East Fender Pile	Typical			Coating loss w/heavy corrosion
Bolts to Mounting Plate			X	
East Top	Typical			2025 strap repair
East Bottom	Typical			2025 strap repair
West Top	Typical			2025 strap repair
West Bottom	Typical			2025 strap repair
West Fender Mounting Plate	Typical	X		Minor coating loss & corrosion
Anchors to Seawall	Typical	X		Coating loss & corrosion
West Rubber Fender	Typical			
Bolts to West Fender Pile	Typical	X		Coating loss & corrosion
Bolts to Mounting Plate				
East Top	Typical			2025 strap repair
East Bottom	Typical			2025 strap repair
West Top	Typical			2025 strap repair
West Bottom	Typical			2025 strap repair
Fender Chain Assembly				
Chains	Typical		X	Moderate coating loss & corrosion. Lower chain sagging
Padeyes	Typical	X		Minor coating loss & corrosion
Shackles & Tensioners	Typical			Minor to moderate corrosion.
Frame Wales				
Top Wale	Typical	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Typical	X		Minor coating loss & corrosion. Loose bolts
Bottom Wale	Typical	X		Heavy marine growth. Loose bolts
Cross Bracing Members	Typical	X		Minor coating loss & corrosion. Loose bolts
Timber Fender Panel				
Cap	Typical	X		Loose & missing bolts
Face Timbers	Typical			Minor checking
Concrete Seawall				
Above Waterline	Typical			2025 Repair
Below Waterline	Typical			2025 Repair
Sheetpile Bulkhead	Typical			Heavy marine growth. No scouring at Mudline

TABLE - 16: Fender #16 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P32)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P31)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion
East Rubber Fender	Poor		X	Loose fender, 0.5" gap from bulkhead
Bolts to East Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Fair			2025 strap repair
East Bottom	Fair			2025 strap repair
West Top	Fair			2025 strap repair
West Bottom	Fair			2025 strap repair
West Fender Mounting Plate	Fair			Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss and corrosion
West Rubber Fender	Fair	X		
Bolts to West Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Fair	X		2025 strap repair
East Bottom	Fair	X		2025 strap repair
West Top	Fair	X		2025 strap repair
West Bottom	Fair	X	X	2025 strap repair
Fender Chain Assembly				
Chains	Poor		X	Moderate corrosion. Lower chain sagging
Padeyes	Fair	X		Minor coating loss & corrosion
Shackles & Tensioners	Poor		X	Minor to moderate corrosion. 1 nut of chain tensioner missing.
Frame Wales				
Top Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Bottom Wale	Fair	X		Heavy marine growth.Loose bolts
Cross Bracing Members	Fair	X		Minor coating loss & corrosion at top
Timber Fender Panel				
Cap	Fair	X		Loose Bolts
Face Timbers	Fair			Minor checking
Concrete Seawall				
Above Waterline	Fair			2025 Repair
Below Waterline	Fair			2025 Repair
Sheetpile Bulkhead	Fair			Heavy marine growth. No scouring at Mudline

TABLE - 17: Fender #17 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P34)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P33)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion
East Rubber Fender	Fair	X		
Bolts to East Fender Pile	Fair	X		Coating loss w/corrosion
Bolts to Mounting Plate				
East Top	Fair			2025 strap repair
East Bottom	Fair			2025 strap repair
West Top	Fair			2025 strap repair
West Bottom	Fair			2025 strap repair
West Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss and corrosion
West Rubber Fender	Fair			
Bolts to West Fender Pile	Fair	X		Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Fair			2025 strap repair
East Bottom	Fair			2025 strap repair
West Top	Fair			2025 strap repair
West Bottom	Fair			2025 strap repair
Fender Chain Assembly				
Chains	Fair	X		Moderate corrosion. Lower chain sagging
Padeyes	Fair	X		Minor coating loss & corrosion
Shackles & Tensioners	Fair	X		Minor to moderate corrosion.
Frame Wales				
Top Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Bottom Wale	Fair	X		Heavy marine growth. Loose bolts
Cross Bracing Members	Fair	X		Minor coating loss & corrosion at top
Timber Fender Panel				
Cap	Fair	X		Loose & missing bolts, rotated landward
Face Timbers	Fair			Minor checking
Concrete Seawall				
Above Waterline	Fair			2025 Repair
Below Waterline	Fair			2025 Repair
Sheetpile Bulkhead	Fair			Heavy marine growth. No scouring at Mudline

TABLE - 18: Fender #18 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P36)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P35)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & some corrosion of threaded rods, nuts & washers
East Rubber Fender	Fair			
Bolts to East Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Fair			2025 Strap repair
East Bottom	Fair			2025 Strap repair
West Top	Fair			2025 Strap repair
West Bottom	Fair			2025 Strap repair
West Fender Mounting Plate	Fair			Minor coating loss & corrosion
Anchors to Seawall	Fair			Coating loss w/heavy corrosion
West Rubber Fender	Fair			
Bolts to West Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Fair			2025 Strap repair
East Bottom	Fair			2025 Strap repair
West Top	Fair			2025 Strap repair
West Bottom	Fair			2025 Strap repair
Fender Chain Assembly				
Chains	Fair	X		Moderate corrosion. Lower chain sagging
Padeyes	Fair	X		Minor coating loss & corrosion
Shackles & Tensioners	Fair	X		Minor to moderate corrosion.
Frame Wales				
Top Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Bottom Wale	Fair	X		Heavy marine growth. Loose bolts
Cross Bracing Members	Fair	X		Minor coating loss & corrosion at top
Timber Fender Panel				
Cap	Fair			
Face Timbers	Fair			Minor checking
Concrete Seawall				
Above Waterline	Fair			2025 Repair
Below Waterline	Fair			2025 Repair
Sheetpile Bulkhead	Fair			Heavy marine growth. No scouring at Mudline

TABLE - 18A - CORROSION EVALUATION @ FENDER #18		
Item	**Current Thickness (Inch)**	**Corrosion Evaluation**
West Pile (P36) - Midwater		<5% section loss (Minor).
Outer Flange	0.699	
Web	0.674	
Inner Flange	0.672	
West Pile (P36) - Bottom		<5% section loss (Minor).
Outer Flange	0.688	
Web	0.672	
Inner Flange	0.688	
Sheetpile - Below Conc. Seawall		<5% section loss (Minor).
Outer Flange	0.532	
Web	0.537	
Inner Flange	0.566	

NOTES:

1. Existing piles are HP12x84 (Per historical drawings)
2. Section Properties of New HP12X84

   Flange thickness = 0.685"

   Web thickness = 0.685"
3. Existing sheet piles are PZ35 (Per historical drawings)
4. Section Properties of New PZ35 Sheet Pile:

   Flange thickness = 0.600"

   Web thickness = 0.500"

TABLE - 19: Fender #19 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P38)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P37)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion
East Rubber Fender	Fair			
Bolts to East Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Fair			2025 strap repair
East Bottom	Fair			2025 strap repair
West Top	Fair			2025 strap repair
West Bottom	Fair			2025 strap repair
West Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss
West Rubber Fender	Fair	X		Loose fender, 2" from bulkhead
Bolts to West Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Fair			2025 strap repair
East Bottom	Fair			2025 strap repair
West Top	Fair			2025 strap repair
West Bottom	Fair			2025 strap repair
Fender Chain Assembly				
Chains	Fair	X		Moderate corrosion. Lower chain sagging
Padeyes	Fair			Minor coating loss & corrosion
Shackles & Tensioners	Fair			Minor to moderate corrosion.
Frame Wales				
Top Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Bottom Wale	Fair	X		Heavy marine growth. Loose bolts
Cross Bracing Members	Fair	X		Minor coating loss & corrosion at top
Timber Fender Panel				
Cap	Fair	X		Loose & missing bolts
Face Timbers	Fair			Minor checking
Concrete Seawall				
Above Waterline	Fair			2025 repair
Below Waterline	Fair			2025 repair
Sheetpile Bulkhead	Fair			Heavy marine growth. No scouring at Mudline

TABLE - 20: Fender #20 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
East Fender Pile (P40)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
West Fender Pile (P39)	Fair	X		Coating loss & corrosion at top 5 ft.
Scouring at Mudline	No			
Marine Growth	Heavy			
East Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion
East Rubber Fender	Fair			
Bolts to East Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Fair			2025 Strap repair
East Bottom	Fair			2025 Strap repair
West Top	Fair			2025 Strap repair
West Bottom	Fair			2025 Strap repair
West Fender Mounting Plate	Fair	X		Minor coating loss & corrosion
Anchors to Seawall	Fair	X		Coating loss & corrosion
West Rubber Fender	Fair			
Bolts to West Fender Pile	Poor		X	Coating loss w/heavy corrosion
Bolts to Mounting Plate				
East Top	Fair			2025 Strap repair
East Bottom	Fair			2025 Strap repair
West Top	Fair			2025 Strap repair
West Bottom	Fair			2025 Strap repair
Fender Chain Assembly				
Chains	Fair	X		Moderate corrosion. Lower chain sagging. Tighten lower chain
Padeyes	Fair	X		Touch up coating loss
Shackles & Tensioners	Fair			Minor to moderate corrosion
Frame Wales				
Top Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Middle Wale	Fair	X		Minor coating loss & corrosion. Loose bolts
Bottom Wale	Fair	X		Heavy marine growth.Loose bolts
Cross Bracing Members	Fair	X		Touch up coating loss
Timber Fender Panel				
Cap	Fair			
Face Timbers	Fair			
Concrete Seawall				
Above Waterline	Fair			2025 Repair
Below Waterline	Fair			2025 Repair
Sheetpile Bulkhead	Fair			Heavy marine growth. No scouring at base

TABLE - 20A - CORROSION EVALUATION @ FENDER #20		
Item	**Current Thickness (Inch)**	**Corrosion Evaluation**
West Pile (P41) - Midwater		<5% section loss (Minor).
Outer Flange	0.791	
Web	0.783	
Inner Flange	0.765	
West Pile (P41) - Bottom		<5% section loss (Minor).
Outer Flange	0.656	
Web	0.677	
Inner Flange	0.695	
Sheetpile - Below Conc. Seawall		<5% section loss (Minor).
Outer Flange	0.645	
Web	0.676	
Inner Flange	0.669	
Sheetpile - Mudline		<5% section loss (Minor).
Outer Flange	0.674	
Web	0.676	
Inner Flange	0.660	

NOTES:

1. Existing piles are HP12x84 (Per historical drawings)
2. Section Properties of New HP12X84
   Flange thickness = 0.685"
   Web thickness = 0.685"
3. Existing sheet piles are PZ35 (Per historical drawings)
4. Section Properties of New PZ35 Sheet Pile:
   Flange thickness = 0.600"
   Web thickness = 0.500"

TABLE - 21: King Pile Fender #1 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair			
South Pile	Fair			
Top Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			Bottom Bolts corroded
Bottom Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			Majority of Bolts corroded
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 22: King Pile Fender #2 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Above water coating loss along edges
South Pile	Fair	X		Above water coating loss along edges
Top Fender				
Rubber Fender	Fair			Minor abrasion of outer face. Minor damage at bottom on North side
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Fair			Abrasion of outer face
Fender Bolts	Fair			Bottom two rows of bolts are corroded.
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 23: King Pile #3 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Coating loss
South Pile	Fair	X		Coating loss
Top Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			Majority of bolts corroded
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 24: King Pile Fender #4 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Coating loss
South Pile	Fair	X		Coating loss
Top Fender				
Rubber Fender	Fair			Minor abrasion & damage at the bottom of fender
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Fair			Abrasion & damage at top of fender
Fender Bolts	Fair			Majority of bolts are corroded
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 25: King Pile Fender #5 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair			Coating loss
South Pile	Fair			Coating loss
Top Fender				
Rubber Fender	Fair			Abrasions to bottom of fender
Fender Bolts	Fair			Washer of bottom South bolt is deteriorated
Bottom Fender				
Rubber Fender	Fair			Abrasions at top North corner of fender
Fender Bolts	Fair	X		Majority of bolts corroded. Loose washer & bolt (2nd down)
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 26: King Pile Fender #6 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Coating loss
South Pile	Fair	X		Coating loss, Impact damage to flange
Top Fender				
Rubber Fender	Poor		X	Damage to bottom, Outer face is separating
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Poor		X	Fender is split and torn, missing on bottom
Fender Bolts	Fair	X		~1/2 of bolts corroded, one loose washer and bolt
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 27: King Pile Fender #7 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Impact damage to flange
South Pile	Fair	X		Impact damage to flange
Top Fender				
Rubber Fender	Poor		X	Abrasion along North side of fender. Missing material at bottom 2"
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Poor		X	Abrasions along edge of fender
Fender Bolts	Poor	X		Majority of bolts are corroded and loose
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 28: King Pile Fender #8 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair			
South Pile	Fair			
Top Fender				
Rubber Fender	Fair			Damage at bottom edge
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Poor		X	Damage along side of fender
Fender Bolts	Fair			All bolts have corrosion
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 29: King Pile Fender #9 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Coating loss
South Pile	Fair	X		Coating loss
Top Fender				
Rubber Fender	Fair		X	Mini.damage
Fender Bolts	Poor			Top North bolt is missing
Bottom Fender				
Rubber Fender	Poor		X	Face is damaged
Fender Bolts	Poor		X	2nd bolt from bott. on N side is loose. All bolts have surface corrosion
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 30: King Pile Fender #10 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Missing coating
South Pile	Fair	X		Missing coating
Top Fender				
Rubber Fender	Fair			Minor abrasions
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Poor		X	Fact torn
Fender Bolts	Fair			All bolts have surface corrosion
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 31: King Pile Fender #11 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Coating Missing
South Pile	Fair	X		Coating Missing
Top Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			
Bottom Fender				Face abrated, but serviceable
Rubber Fender	Fair			
Fender Bolts	Fair			All bolts have surface corrosion
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 32: King Pile Fender #12 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair			
South Pile	Fair			
Top Fender				
Rubber Fender	Fair			Minor abrasion of fender
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender				Minor abrasions of fender
Fender Bolts	Fair			All bolts have surface corrosion
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 33: King Pile Fender #13 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair			
South Pile	Fair			
Top Fender				
Rubber Fender	Fair			Face damage to fender
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Fair			Face damage to fender
Fender Bolts	Fair			All bolts have surface corrosion
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 34: King Pile Fender #14 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair			
South Pile	Fair			
Top Fender				
Rubber Fender	Fair			Minor damage
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Fair			Tears in face of fender
Fender Bolts	Fair			All bolts have surface corrosion
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 35: King Pile Fender #15 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair			
South Pile	Fair			
Top Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender				
Fender Bolts	Fair			All bolts have surface corrosion
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 36: King Pile Fender #16 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair			
South Pile	Fair			
Top Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Fair			
Fender Bolts	Poor		X	Missing nut at both bottom bolts. All bolts have surface corrosion.
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 37: King Pile Fender #17 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Missing coating
South Pile	Fair	X		Missing coating
Top Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Fair			Minor damage
Fender Bolts	Poor		X	Missing nut at 2nd bolt from bott. on South side. Typical corrosion of bolts.
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 38: King Pile Fender #18 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Missing coating
South Pile	Fair	X		Missing coating
Top Fender				
Rubber Fender	Poor		X	Bottom edge material torn & loose
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Poor		X	Top edge of outer face separating and missing
Fender Bolts	Fair			All bolts have surface corrosion.
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 39: King Pile Fender #19 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Coating loss
South Pile	Fair	X		Coating loss
Top Fender				
Rubber Fender	Fair			Damage along bottom edge
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Fair			Damage along top edge
Fender Bolts	Fair			All bolts have surfacecorrosion
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 40: King Pile Fender #20 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair			Coating loss
South Pile	Fair			Coating loss
Top Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Fair			
Fender Bolts	Poor		X	Missing nut at bott. 2 bolts on N side. Typical corrosion of bolts.
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 41: King Pile Fender #21 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair			Coating loss
South Pile	Fair			Coating loss
Top Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Fair			Top edge minor damage
Fender Bolts	Poor		X	Missing nut at 2nd bolt from top on N side. Typical corrosion of bolts.
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 42: King Pile Fender #22 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Missing coating
South Pile	Fair	X		Missing coating
Top Fender				
Rubber Fender	Fair			Bottom 5" of fender damanged
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Fair			Outer face of fender is peeling along top edge
Fender Bolts	Poor		X	Missing nut at 2nd bolt from top on N side. Typical corrosion of bolts.
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 43: King Pile Fender #23 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Missing coating
South Pile	Fair	X		Missing coating
Top Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Fair			
Fender Bolts	Poor		X	Missing nut at 2nd bolt from top on N side. Typical corrosion of bolts.
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 44: King Pile Fender #24 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Missing coating
South Pile	Fair	X		Missing coating
Top Fender				
Rubber Fender	Poor		X	Fender torn between 2 bottom bolts and at bottom washer on South side
Fender Bolts	Poor		X	Missing washer at bottom bolt on S side
Bottom Fender				
Rubber Fender	Fair			Bottom edge abrasion damage
Fender Bolts	Poor			All bolts have surface corrosion.
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 45: King Pile Fender #25 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Missing coating
South Pile	Fair	X		Missing coating
Top Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Fair			Minor damage to top South corner of fender
Fender Bolts	Poor		X	All bolts have surface corrosion. One loose bolt
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 46: King Pile Fender #26 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Missing coating
South Pile	Fair	X		Missing coating
Top Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Fair			Minor abrasion of fender face
Fender Bolts	Fair			All bolts have surface corrosion
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 47: King Pile Fender #27 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Missing coating
South Pile	Fair	X		Missing coating
Top Fender				
Rubber Fender	Fair			Approx. 1"x1/2"x1/2" fender material missing at bottom
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender				
Fender Bolts	Fair			All bolts have surface corrosion
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 48: King Pile Fender #28 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Missing coating
South Pile	Fair	X		Missing coating
Top Fender				
Rubber Fender	Fair			Approx. 6"x6" damage/cut on outer face of fender
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			All bolts have surface corosion
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 49: King Pile Fender #29 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Typical	X		Missing coating
South Pile	Typical	X		Missing coating
Top Fender				
Rubber Fender	Typical			Face damage
Fender Bolts	Typical			
Bottom Fender				
Rubber Fender	Poor		X	Cuts in side of fender
Fender Bolts	Typical			All bolts have surface corosion
Steel Sheet Pile (SSP)				
North SSP	Typical			
South SSP	Typical			

TABLE - 50: King Pile Fender #30 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Missing coating
South Pile	Fair	X		Missing coating
Top Fender				
Rubber Fender	Fair			
Fender Bolts	Poor		X	2nd bolt from bottom on S side is missing
Bottom Fender				
Rubber Fender	Fair			Cuts in side of fender
Fender Bolts	Poor		X	Nut missing at 2nd bolt from top on S side. Bolts in Typical condition
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 51: King Pile Fender #31 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Missing coating
South Pile	Fair	X		Missing coating
Top Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Fair			
Fender Bolts	Poor		X	All bolts have surface corrosion, missing nut @3rd row
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 52: King Pile Fender #32 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Missing coating
South Pile	Fair	X		Missing coating
Top Fender				
Rubber Fender	Fair			
Fender Bolts	Poor		X	2nd nut from bott on N side & bott. nut on S side missing. Bott. nut loose on N side
Bottom Fender				
Rubber Fender	Fair			
Fender Bolts	Poor		X	Top & 2nd from top nut missing on S side. 2nd from top nut missing on N side
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 53: King Pile Fender #33 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Missing coating
South Pile	Fair	X		Missing coating
Top Fender				
Rubber Fender	Fair			
Fender Bolts	Poor		X	Both bottom row bolts missing nut.
Bottom Fender				
Rubber Fender	Fair			
Fender Bolts	Poor		X	Both 2nd row bolts from top missing nuts. Bottom bolts corroded
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 54: King Pile Fender #34 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Missing coating
South Pile	Fair	X		Missing coating
Top Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			All bolts have surface corrosion.
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 55: King Pile Fender #35 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair	X		Missing coating
South Pile	Fair	X		Missing coating
Top Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			All bolts have surface corrosion.
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 56: King Pile Fender #36 - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
King Piles				
North Pile	Fair			
South Pile	Fair	X		Missing coating
Top Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			
Bottom Fender				
Rubber Fender				
Fender Bolts	Fair			All bolts have surface corrosion.
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 55: King Pile End Cap - Inspection Findings				
Item	**Condition**	**Repair**	**Renew**	**Remarks**
Concrete Cap				
Concrete cap	Poor	X		Lower seam spalling, scouring underneath
Top Fender				
Rubber Fender	Fair			
Fender Bolts	Fair			
2nd Fender Down				
Rubber Fender	Fair			
Fender Bolts	Fair			
3rd Fender Down				
Rubber Fender	Fair			
Fender Bolts	Fair			
4th Fender Down				
Rubber Fender	Fair			
Fender Bolts	Fair			
5th Fender Down				
Rubber Fender	Poor		X	Missing
Fender Bolts	Fair		X	Missing
6th Fender Down (bottom)				
Rubber Fender	Fair		X	Missing
Fender Bolts	Fair		X	Missing
Steel Sheet Pile (SSP)				
North SSP	Fair			
South SSP	Fair			

TABLE - 57 - CORROSION EVALUATION @ KING PILE FENDER 2		
Item	**Current Thickness**	**Corrosion Evaluation**
North King Pile - Below Lower Fender		28% (Moderate)
Outer Flange	0.475	
North King Pile - Waterline		<5% (Minor)
Outer Flange	0.751	
Sheetpile - Below Lower Fender		<5% (Minor)
Flange	0.665	
Web	0.551	
Sheetpile - Mudline		<5% (Minor)
Flange	0.575	

NOTES:

1. Existing King Piles PSP 900 (Per historical drawings)
2. Section Properties of New PSP 900 King Pile

Flange thickness = 0.551" min; 0.673" Avg.

Web thickness = 0.551"

3. Existing sheet piles are PZC26 (Per historical drawings)
4. Section Properties of New PZC26 Sheet Pile:

Flange thickness = 0.600"

Web thickness = 0.525"

TABLE - 57 - CORROSION EVALUATION @ KING PILE FENDER 10		
Item	**Current Thickness**	**Corrosion Evaluation**
North King Pile - Below Lower Fender		<5% (Minor)
Outer Flange	0.663	
North King Pile - Waterline		<5% (Minor)
Outer Flange	0.874	
Sheetpile - Below Lower Fender		20% (Moderate)
Flange	0.482	
Web	0.425	
Sheetpile - Mudline		22% (Moderate)
Flange	0.466	

NOTES:

1. Existing King Piles PSP 900 (Per historical drawings)
2. Section Properties of New PSP 900 King Pile

Flange thickness = 0.551" min; 0.673" Avg.

Web thickness = 0.551"

3. Existing sheet piles are PZC26 (Per historical drawings)
4. Section Properties of New PZC26 Sheet Pile:

Flange thickness = 0.600"

Web thickness = 0.525"

TABLE - 57 - CORROSION EVALUATION @ KING PILE FENDER 10		
Item	**Current Thickness**	**Corrosion Evaluation**
North King Pile - Below Lower Fender		7% (Minor)
Outer Flange	0.625	
North King Pile - Waterline		<5% (Minor)
Outer Flange	0.659	
Sheetpile - Below Lower Fender		22% (Moderate)
Flange	0.472	
Web	0.454	
Sheetpile - Mudline		20% (Moderate)
Flange	0.488	

NOTES:

1. Existing King Piles PSP 900 (Per historical drawings)
2. Section Properties of New PSP 900 King Pile

Flange thickness = 0.551" min; 0.673" Avg.

Web thickness = 0.551"

3. Existing sheet piles are PZC26 (Per historical drawings)
4. Section Properties of New PZC26 Sheet Pile:

Flange thickness = 0.600"

Web thickness = 0.525"

TABLE - 57 - CORROSION EVALUATION @ KING PILE FENDER 31		
Item	**Current Thickness**	**Corrosion Evaluation**
North King Pile - Below Lower Fender		8% (Minor)
Outer Flange	0.615	
North King Pile - Mudline		10% (Minor)
Outer Flange	0.601	
Sheetpile - Below Lower Fender		25% (Moderate)
Flange	0.454	
Web	0.57	
Sheetpile - Mudline		27% (Moderate)
Flange	0.439	

NOTES:

1. Existing King Piles PSP 900 (Per historical drawings)
2. Section Properties of New PSP 900 King Pile

Flange thickness = 0.551" min; 0.673" Avg.

Web thickness = 0.551"

3. Existing sheet piles are PZC26 (Per historical drawings)
4. Section Properties of New PZC26 Sheet Pile:

Flange thickness = 0.600"

Web thickness = 0.525"