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SURVEY REPORT

Report No. 23101344

May 30, 2024

COVERING

ALLISION BETWEEN ASSIST TUG "OLYMPIC SCOUT"

94 GRT OF PORTLAND, OR, USA

AND THE "HYLEBOS RIVER BRIDGE WEST BASCULE FENDERING"

In accordance with instructions received via correspondence and dd. October 13, 2023, on behalf of Interested Parties concerned with the tug "OLYMPIC SCOUT", survey was held onboard the above-mentioned, steel-built harbor tug; for the purposes of ascertaining the cause, nature and extent of damage relating to an allision with the Hylebos Bridge's West Bascule Fendering System. Additional surveys were also conducted, both above and below water, to ascertain both current condition, and extent of damage, to said wooden fendering system.

Survey Requested by:

Mr. David Hanshaw
Marine Operations Manager
Centerline Logistics, 910 SW Spokane St., Seattle

Centerline Reference No.:

TBA

BACKGROUND INFORMATION

According to information provided telephonically by our Principals, we have been appointed, on behalf of Vessel Owners, to investigate the cause, nature, and extent of damage sustained to the tug "OLYMPIC SCOUT", as well as the extent of damage sustained to the protective fendering at the base of the Hylebos Bridge, due to an alleged allision.

The services of this Company are offered and this report or certificate is issued on the following condition:

That while the officers and the Board of Directors of Duncan Shoemaker & Associates, LLC, has used their best endeavors to select competent surveyors and to ensure that the functions of the Company are properly executed, neither the officers nor the Directors nor Duncan Shoemaker & Associates, LLC, are under any circumstances whatsoever to be held responsible for any error of judgment, default or negligence of any surveyor or other employee or representative of the Company or for any inaccuracy, omission, misrepresentation or misstatement in any report or certificate

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The “OLYMPIC SCOUT” was engaged as an assist tug to the tank barge “SODO” when, at approximately 2341hrs (LT), she made contact with the protective fender pile structure of the West Bascule Span sheer-wall.

We also refer to our Preliminary Survey Report dd. October 16, 2023, our 1st Update dd. November 02, 2023, and our 2nd Update, dd. April 17th, 2024.

PARTICULARS OF ATTENDANCE

During the course of our investigation, attendances were undertaken at the following locations:

Location	Date
Terminal 17, Berth A, Tacoma, WA	October 13, 2023
Hylebos Bridge	October 13, 2023
Hylebos Bridge – Dive Survey	October 26-27, 2023
Municipal Building Tacoma	February 01, 2024
Hylebos Bridge – Piling Removal	February 14-16, 2024

Tug “OLYMPIC SCOUT”

On October 13, 2023, we attended onboard the vessel whilst alongside and afloat, starboard side alongside a tank barge, at Terminal 7, Berth A, Tacoma, WA.

Our attending onboard was in the company of the following:

Attending	Representing
Mr. L. Gladsjo	Master – OLYMPIC SCOUT – Vessel Owners
Mr. N. Divelbiss	Vessel Engineer – OLYMPIC SCOUT – Vessel Owners
Mr. M Volholt	Director H&S – Vessel Owners

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Mr. B. Cunningham H&S Representative – Vessel Owners

Mr. [REDACTED] Marine Inspector – USCG

Mr. [REDACTED] Investigating Office – USCG

Location: Terminal 17, Berth A, Tacoma, WA

Survey Dates: October 13, 2023

Particulars Of Vessel [Photograph No. 01, Vessel Particulars]

Vessel Name: “OLYMPIC SCOUT”

Type: Towing Vessel

Flag/Port of Registry: Portland, OR, USA

IMO Number: N/A

Owners: Harley Marine Special Leasing LLC
910 SW Spokane Street, Seattle, WA

Operator’s Particulars: Centerline Logistics
910 SW Spokane Street, Seattle, WA

Length / Breadth / Draft: 91.8’ / 26.2’ / 11.5’

GRT / NRT: 94 GRT / 64 NRT

Built: Pacific Towboat & Salvage Co., Long
Beach, CA / 1976

Class: N/A

Main Engines: Two (2) x Caterpillar 399 Diesel Engines,
rated at 2,250HP.

During this attendance we found, ascertained, or were advised, as follows:

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Extent of Damage [Photograph Nos. [Photograph Nos. 02-16]

As inspected from the aft deck of the tug and the deck of the adjacent barge, no damage was observed to the starboard quarter of the “OLYMPIC SCOUT”. Small sections of wood were observed lodged under the rub rail and between the external rubber fendering.

No damage was sighted to the interior of the lazarette steering compartment, with no deformation of frames, gussets or other internals sighted. No cracking or splintering of the pain coating was observed.

Surveyor’s Notes

- The port and starboard main engine running hours were observed to be 8,004hrs each.
- No issues were reported with the engines prior to, or subsequent to, the incident, with no abnormal noises, vibration, or similar issues reported. No maintenance was being conducted on the engines at the time of transit.
- No issues were reported with the vessel’s steering either prior to, or subsequent to, the incident. No maintenance was being conducted on the steering gear at the time of transit. During our attendance, steering was tested, from both the bridge and the engine room, with the rudders being swung over to hard port and hard starboard. Testing did not indicate any deficiencies, noises, vibration or excessive play of the components. It is our considered opinion that the steering gear was functional throughout the transit.
- Mr. Gladsjo did verbally inform us that, although he had undertaken an assist voyage of this nature, in this area, on numerous occasions, this was his first time assisting the ATB MONTLAKE.
- Weather at the time of the incident was reportedly good, with no current, wind, or swell to affect vessel movement. Visibility was reported as good, with no rain.

HYLEBOS BRIDGE – INITIAL ATTENDANCE [Photograph Nos. 017-024]

Particulars Of Hylebos Bridge

The Hylebos bridge is located on East 11th Street in Tacoma, WA. The bridge is a Double Leaf Trunnion Bascule bridge consisting of concrete Approach Piers 2 and 3 on the Southwest, the Western Bascule Pier 4, the Eastern Bascule Pier 5, and Approach Pier 6 on the Northeast.

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The bridge, with a length of 947ft, was originally constructed in 1939 by the Washington State Department of Transportation and later transferred to the City of Tacoma. The bridge was originally designed for an H15 load rating, and the City of Tacoma Public Works Engineering maintains and operates the bridge. It was rebuilt in 2012.

A protective timber fender system is located along the channel side of each bascule pier. Stationing for the structure and numbering of the piers has been designated from West to East, consistent with design drawings and previous inspection reports.

Previous Inspection Reports (Attachment Nos. 1-2, 2017 Underwater Inspection Report~~2017-10-20, Tacoma_Bridge_Report_2022_Final_extracted_pages

2017 Inspection Report

An inspection of the bridge, undertaken by Civil/Marine Consulting Engineers ECHELON ENGINEERING, was commented on in their survey report, no. 17-2526, for an inspection dd. October 20, 2017.

We note the following extracts from the report, pertaining to the wooden fender pile system:

Extract from Executive Summary – Page 2 of 19

“...Investigation of the timber fender systems protecting Pier 4 and 5 found them to be in overall fair condition and noted evidence of minor to major damage due to marine borers in the intertidal and submerged zones. Observation on the above water portions of the timber fender systems noted localized areas of significant fungal damage. No general or localized scour patterns were identified within the channel or around the piers...”

Extract from Inspection Findings – Page 4 of 19

*“...Level 1 Investigation of the timber fender systems which protect the bascule piers found them to be in overall fair condition.
Both the eastern and western fender systems are constructed with a combination of older creosote treated members and newer Chemonite treated members.*

Inspection of the piling noted localized areas of minor to heavy marine borer damage identified in the intertidal and submerged zones of several piling, as well as heavy fungal decay noted above water in a number of piling. The majority of the significant damage, both above and below water was noted in the piling located within the timber dolphins. It was also noted that several of the older creosote piling are salvaged piles, as barnacle basal plates are visible on the piles above high water. Investigation of the horizontal lagging timbers noted minor marine borer attack in the lower elevation timbers along with localized area of minor impact damage most probably due to drift material. Inspection for the wire rope connections noted them to be in generally fair to good condition with minor to moderate corrosion...”

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2022 Inspection Report

An inspection of the bridge, undertaken by Civil/Marine Consulting Engineers ECHELON ENGINEERING, was commented on in their survey report, no. 22-2624, for an inspection dd. October 5, 2022.

We note the following extracts from the report, pertaining to the wooden fender pile system:

Extract from Executive Summary – Page 2 of 21

“...Investigation of the timber fender systems protecting Pier 4 and 5 found them to be in overall fair to good condition and noted evidence of minor to major damage to the piling as a result of marine borers in the intertidal and submerged zones. Observations on the above water portions of the timber fender systems noted localized areas of significant fungal damage to the piles and framing timbers. However, the horizontal timber lagging has been replaced and is in generally good condition...”

Extract from Inspection Findings – Page 4 of 21

“...Level I Investigation of the timber fender systems which protect the bascule piers found them to be in overall fair to good condition. Both the eastern and western fender systems are constructed with a combination of older creosote treated members and newer Chemonite treated members. Inspection of the piling noted localized areas of minor to heavy marine borer damage identified in the intertidal and submerged zones of several piling, as well as heavy fungal decay noted above water in a number of piling. The majority of the significant damage, both above and below water was found in the piling located within the timber dolphins. It was also noted that several of the older creosote piling are salvaged piles, as barnacle basal plates are visible on the piles above high water. Investigation of the horizontal lagging timbers found the majority have been replaced with newer Chemonite treated member which are in good condition. Inspection of the wire rope connections noted them to be in generally fair to good condition with minor to moderate corrosion...”

Comparison Study – Pages 4 and 5 of 21

“...Comparison of the current findings with those of the previous underwater inspection conducted by Echelon Engineering in November 2017 found that there has been little if any change in the condition of the submerged bridge components. Although minor spalling on both bascule piers and several localized areas of shallow unconsolidated concrete on Pier 4 were noted, no evidence of any significant damage or deterioration was found associated with the underwater portions of the Bascules or with the Approach Piers 2, 3 and 6. Inspection did find additional exposure of the top of the footing and seal on both Pier 4 and 5. This exposure is confined to the channel side of the bascule piers. Measurements of the vertical exposure found the maximum height of the exposed seal to be 12 inches. When compared to the findings of the previous inspection there has been additional degradation of the mudline and further exposure of the footing and seal on these piers.

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Comparison of the condition of the timber fender systems found apparent localized repairs. Additionally, there appears to have been a slight increase in the amount of localized fungal decay in the above water portion of the systems, but that the underwater condition remains similar with several piles noted to have sustained localized heavy marine borer damage. The majority of these heavily damaged piling were found within the dolphin clusters...”

2022 Inspection Report

The Annual Bridge Report 2022, from the City of Tacoma, of which pages 261-274 pertain to the Hylebos Bridge, notes the following pertaining to the condition of the wooden fender system:

From the report, we extract the following paragraph pertaining to the wooden fender pile system:

Extract from Executive Summary – Page 271

“FENDER SYSTEM/PIER PROTECTION:

Above waterline: Multiple piles deteriorated in dolphin clusters with localized areas of significant fungal damage: (NE end - 4 of 7 deteriorated, NE middle 1 of 7 deteriorated, SE middle 1 of 7 deteriorated, SE end OK. NW end - 3 of 7 deteriorated, NW middle OK, SW middle 2 of 7 deteriorated, SW end 6 of 7 deteriorated.

Below waterline:

Timber pile fender systems: 3 severely damaged piles, 3 significantly damaged piles (See photo 22) and 3 moderately damaged piles. Minor to major damage due to marine borers in the intertidal and submerged zones”

Particulars of Preliminary Attendance

An attendance was also made at the Hylebos Bridge to briefly ascertain, and comment, on the extent of damage observed.

Our attendance at the Hylebos Bridge was in the company of the following:

Attending

Mr. C. Rodriguez

Location:

Survey Dates:

Representing

Lead Bridge Tender – Hylebos Bridge

Hylebos Bridge, Tacoma, WA

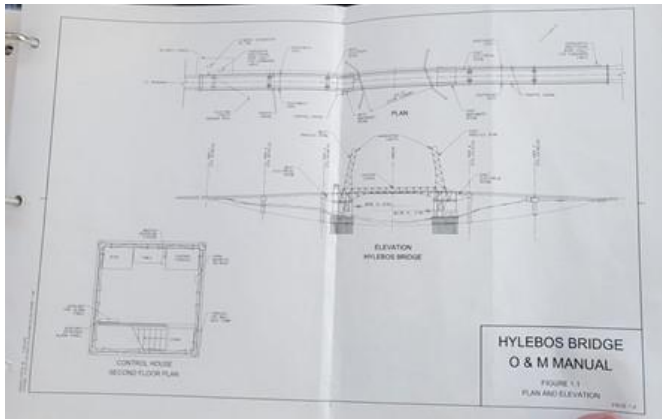
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During this attendance, we ascertained or were advised, as follows:

Particulars of Survey [Photograph Nos. 17-18]

The West Bascule Span is constructed of wooden fendering and measures approximately 142’ in total length. It is comprised of three (3) sections, the two (2) outer sections measuring approximately 35’ and 50’ respectively, and the centre section – under the bridge – measuring approximately 53’ in length. The termination, and joining areas, of the three (3) sections are tied to four (4) marine dolphin cluster piles comprising of wooden timber piles surrounded a timber pile core and secured by means of wire rope wraps. The reported length of the wooden piles is 200’.



17. Hylebos bridge schematic



18. Undamaged east fendering

The front of the timber piles are braced with horizontal wooden beams, measuring approximately 10” x 4”, of various lengths. At time of survey we sighted nine (9) wooden beams above the waterline comprising the front face of the sheer-wall. A wooden walkway of approximately three (3) feet in width, along with a wooden handrail, sits atop the fender piling over the full length of the sheer wall.

Extent of Damage [Photograph Nos. 19-24]

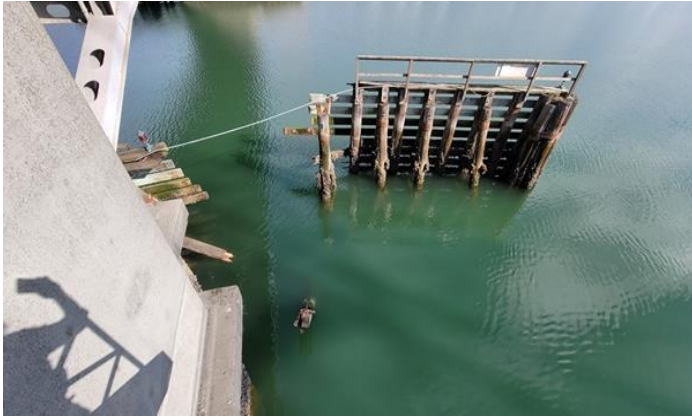
Damage was sighted to the centre and northern section of the sheer wall, with the center section being disconnected from the southern section and heavily pushed out of position, to the north, by approximately 45~50’. The supporting fender piles and batter piles for these sections have been pushed over at various angles of up to 30°~40°. The three (3) affected timber pile dolphins were also sighted as pushed over and moderately to heavily damaged.

At time of our initial attendance survey observation were made from above the waterline only and were unable to state whether the timber pile dolphins, fender piles, and batter piles had sheared at their respective bases, or had been pushed over in the silt bottom.

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The horizontal wooden beams comprising the face of the sheer-wall, where visible, were variously moderately to heavily damaged over the full length of the affected area.

There does not appear to be any damage to the bridge structure itself, nor was any reported to us during our attendance.



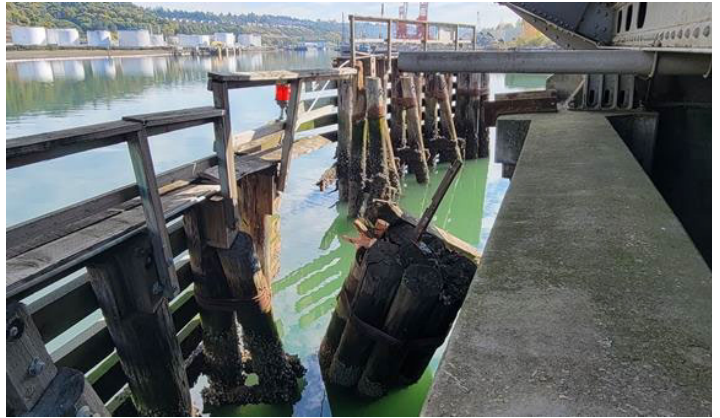
19. Damaged sheer wall



20. Damaged sheer wall

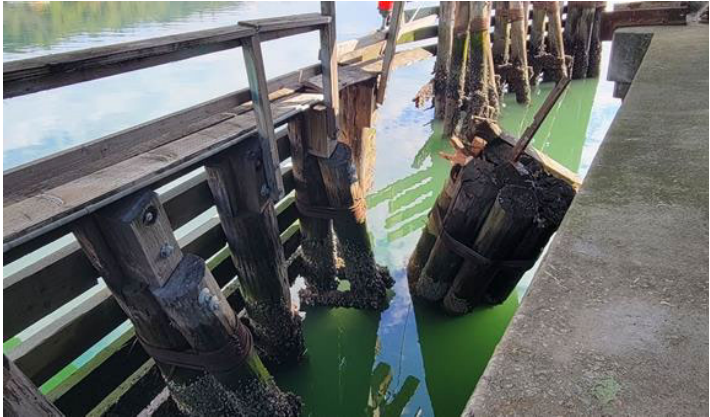


21. Damaged sheer wall



22. Damaged sheer wall

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23. Damaged sheer wall



24. Damaged sheer wall

Particulars of 2nd Attendance [Photograph Nos. 025-056]

We attended at the Hylebos bridge to witness an underwater dive survey of the wooden fenders and piles, in order to ascertain the general underwater condition of undamaged fendering at the Eastern Bascule (Pier 5) for comparison with the general underwater condition of the damaged fendering at the Western Bascule (Pier 4).

Our attendance was in the company of the following:

Attending

Mr. W. Bryan

Mr. J. Leato

Mr. D. Karl

Mr. D. Hanshaw

Location:

Survey Dates:

Representing

Dive Supervisor – AUS Diving – On Behalf of Centerline Logistics

Diver – AUS Diving – On Behalf of Centerline Logistics

Diver – AUS Diving – On Behalf of Centerline Logistics

Marine Operations Manager – Centerline Logistics

Hylebos Bridge, Tacoma, WA

October 26, 2023

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Particulars of Survey – Fendering System – East Bascule

Departure by dive boat was made from the Point Defiance Boat Launch at 0900hrs on Thursday, October 26, 2023, being on site at 0953hrs.

Diving operations commenced at 1025hrs, with an inspection of the fender piles, batter piles, mooring dolphins and horizontal battens of the East side (undamaged side) fendering system.

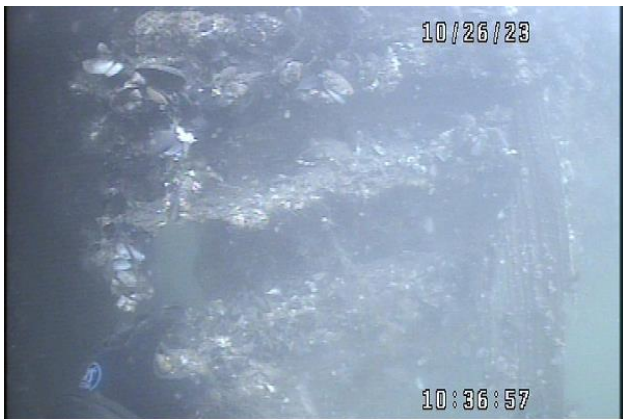
The initial dive was undertaken from North to South. The horizontal battens were initially inspected, followed by the mooring dolphins, fender piles and batter piles. Horizontal battens were numbered with the lower fender being No. 1.

Heavy marine growth was sighted on the lower three (3) horizontal battens. Comments pertaining to structural conditions and/or section loss was made by the attending diver and confirmed by the dive supervisor.

Of areas inspected by the dive team, we now report as follows:

Horizontal Battens [Photograph Nos. 025-034]

- No. 1 Batten – A end – end rot with approximately 90% loss over 6’.



25. No 1 Batten with end rot and loss



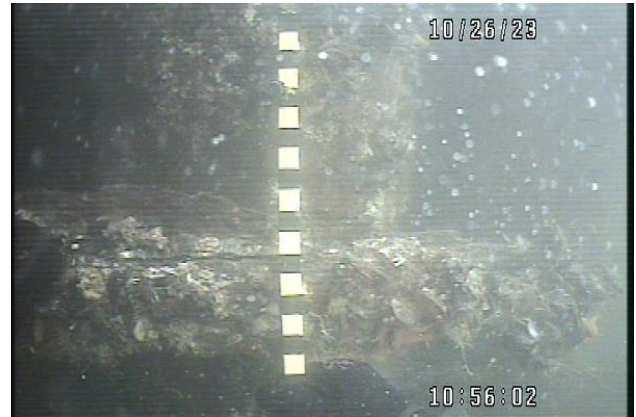
26. No 1 Batten with end rot and loss

- No. 1 Batten – B end – approximately 90% loss over 12’.

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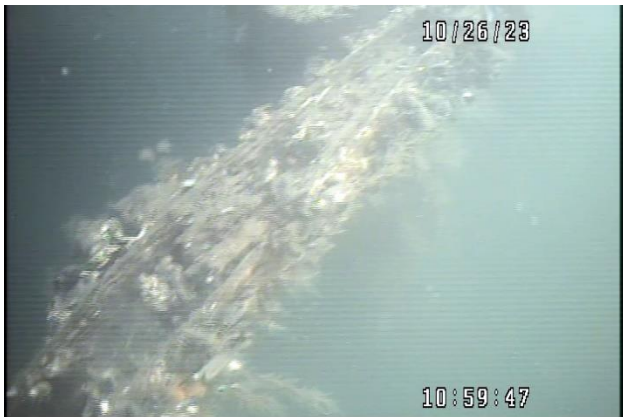


27. No 1 BC Interface - section missing



28. No 1 C batten failed over 20'

- No. 1 Batten – B to C interface – No C board section at interface.
- No. 1 Batten – C end – board completely failed over length of 20'. The South end in visually satisfactory condition.



29. No 1 C batten remains



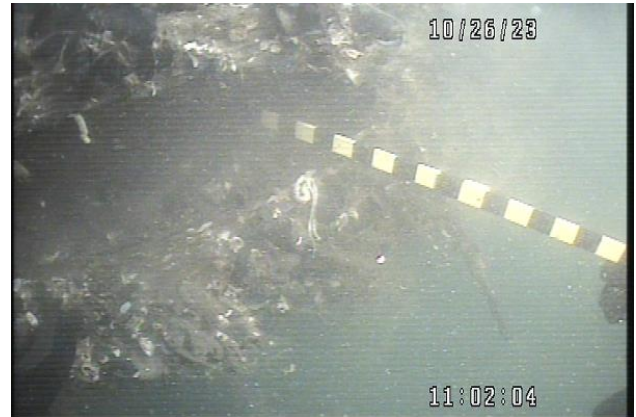
30. No 1 C batten remains

- No. 1 Batten – D end – approximately 60% of board loss over length with up to 90% loss at E end over 6'.

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31. No 1 D batten complete core loss

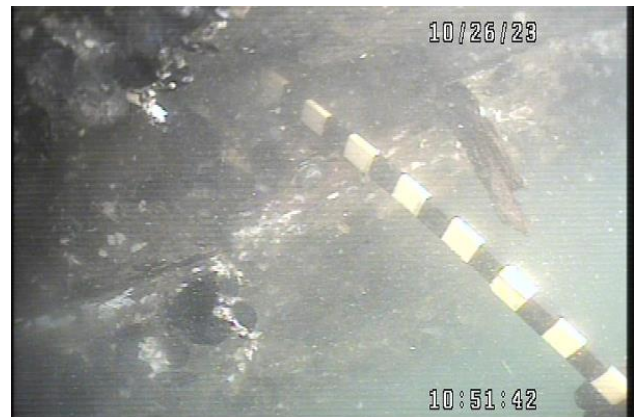


32. No 1 D batten complete core loss

- No. 1 Batten – E end – detached from pile. Loss of approximately 90% over 6’.
- No. 1 Batten – G to F – all visually satisfactory
- No. 2 Batten – A end – end rot with approximately 90% loss over 4’.
- No. 2 Batten – B end – end rot with exposed securing hardware. Up to 50% loss of carriage bolt head, no threads remaining. Approximately 90% section loss of batten over 6’.



33. No 2 Batten B end with end rot



34. No 2 Batten B end – carriage bolt loss

- No. 2 Batten – C end – board completely deteriorated approximately 90% over 6’.
- No. 2 Batten – D end – approximately 10% loss 6’.

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- No. 2 Batten – Section E to F at join – 5’ missing.
- No. 2 Batten – Start F end – end rot over 3’ depth.
- No. 2 Batten – G end – end rot over 18” depth.
- No. 3 Batten – A end – approximately 90% of core missing over 18”.
- No. 3 Batten – B end – core of board complete loss.
- No. 3 Batten – C end – end rot of approximately 50% over 5’.

Mooring Piles, Vertical Piles, Batter Piles [Photograph Nos. 035-056]

- Northern Mooring Pile – East Side: Fair condition visually. Moderate to heavy marine growth sighted on mooring pile. Less than 1/16” penetration during test.



35. N. Dolphin < 1/16” penetration



36. N. Dolphin at waterline



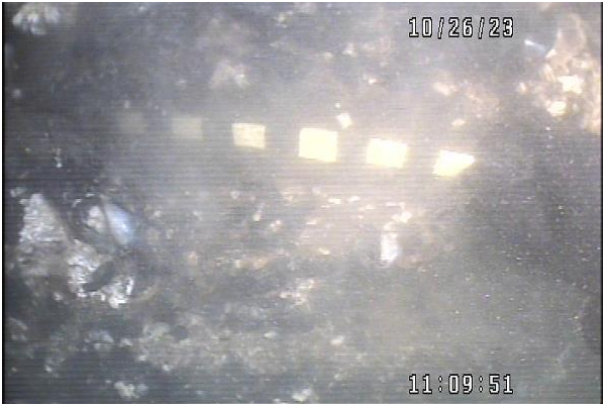
37. N. Dolphin – looking down



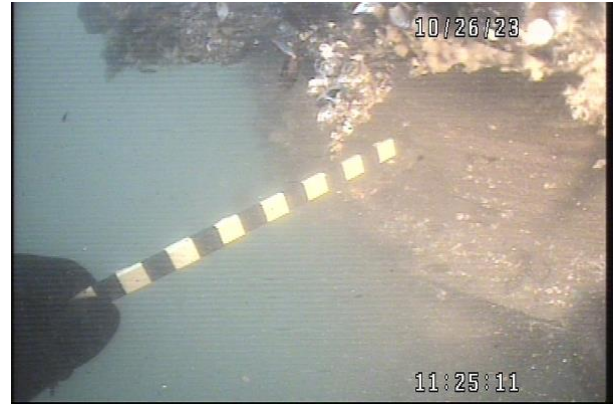
38. N. Dolphin – pile to mudline interface

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- No. 2 pile – Fender and batter pile visually satisfactory. Northern horizontal brace – 90% section loss over 4’ with hardware exposed. South horizontal brace – 50% section loss over complete length.



39. Horizontal brace section loss.



40. Securing hardware exposed.

- No. 3 pile – Fender pile visually satisfactory.
- No. 4 pile - Fender pile, batter pile and horizontal braces - visually satisfactory.
- No. 5 pile – Fender pile visually satisfactory.
- No. 6 pile – Fender pile and batter pile visually satisfactory. North horizontal support missing, securing hardware exposed. South horizontal – 60% section loss over length.



41. No 6 pile – south support



42. No 6 pile – heavy marine growth

- No. 7 pile – Fender pile visually satisfactory.

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- No. 8 pile – Fender pile visually satisfactory. Batter pile – 90% section loss commencing 6’ up from mudline and extending up over 4’, above this an additional 90% section loss over 1’. North horizontal support – 90% section loss over 50% of length. South horizontal support – 90% section loss over 1’. Heavy Teredo worm tracks sighted.



43. No 8 batter pile – bottom section loss

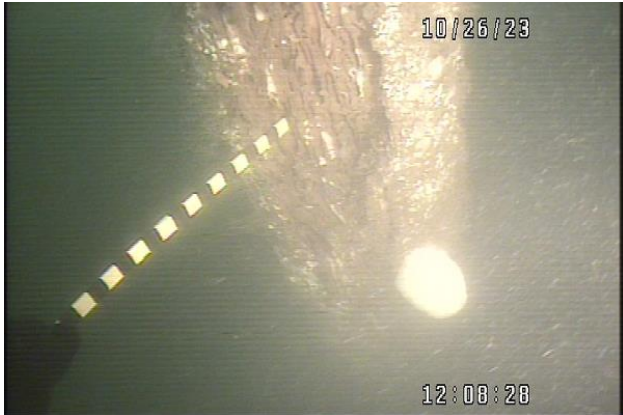


44. No 8 batter pile – worm tracks and rot

- No. 9 pile – Fender pile visually satisfactory.
- Fender cluster No. 2 – five (5) surrounding and one (1) center pile – all visually satisfactory.
- No. 10 pile – Fender pile visually satisfactory.
- No. 11 pile – Fender pile visually satisfactory.
- No. 12 pile – Fender pile and batter pile visually satisfactory. North horizontal support missing. South horizontal support completely failed over 90% of length.
- No. 13 pile – Fender pile visually satisfactory.
- No. 14 pile – Fender pile in visually satisfactory condition. Batter pile – 40% section loss from 4’ above mudline extending up over 3’ and approximately 10%~20% section loss over entire pile length. North horizontal support – 90% section loss over full length. South horizontal support – visually satisfactory condition.
- No. 15 pile – Fender pile in visually satisfactory condition.
- No. 16 pile – Fender pile in visually satisfactory condition. Batter pile – 60% section loss from mudline extending up over 15’.

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Extensive borer worm tracks sighted. North horizontal support – 50% section loss over 2'. South horizontal support – visually satisfactory condition.



45. No 16 batter pile – south support

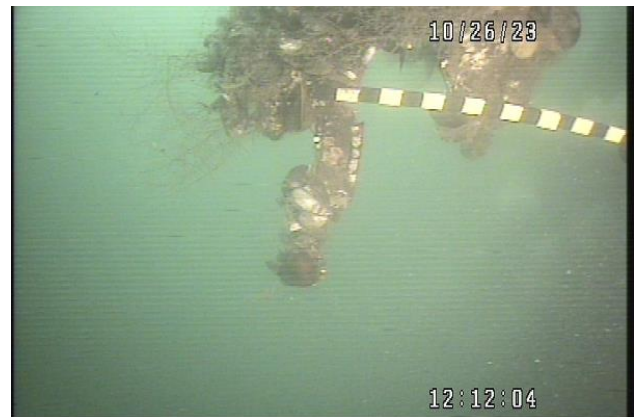


46. No 16 batter pile – worm tracks and rot

- No. 17 pile – Fender pile – lower 16' missing.



47. No 17 pile – lower section missing



48. No 17 pile – lower section missing

- No. 18 pile – Fender pile and batter pile visually satisfactory. North and south horizontal supports missing.
- No. 19 pile – Fender pile in visually satisfactory condition.

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- No. 20 pile – Fender pile and batter pile visually satisfactory. North horizontal support missing. South horizontal support – 90% section loss over full length.
- No. 21 pile – Fender pile in visually satisfactory condition.
- No. 22 pile – Fender pile and batter pile visually satisfactory. North and South horizontal braces failed and no longer connected. (Note: Starting at No. 22 pile – No. 23 pile – sistering timber fitted to support horizontal braces – sighted with 90% section loss over 3’ at north end.)
- No. 23 pile – Square pile fitted to support horizontal braces. North horizontal support in visually satisfactory condition. South horizontal support – 50% section loss over 1’. (Note: at No. 23 pile – round fender pile – loose section and not part of current structure sighted.)
- No. 24 pile – Square vertical pile – gap of 7” between pile and cap timber. Visually satisfactory condition.



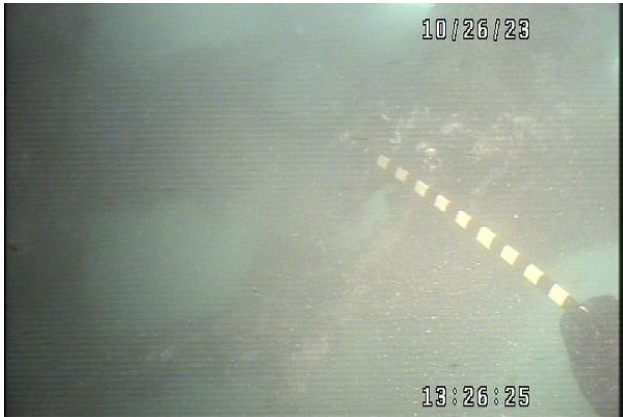
49. No 24 pile – gap between pile cap and timber



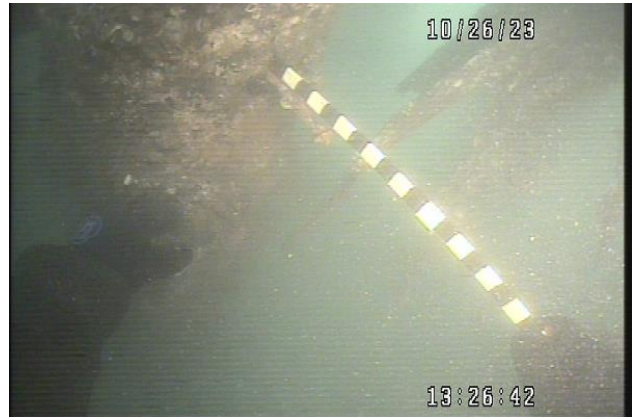
50. No 24 pile – gap between pile cap and timber

- No. 25 pile - Fender cluster No. 3 – seven (7) surrounding and one (1) center pile – pile closest to channel completely deteriorated with approximately 19’ lost.
- SE pile – approximately 70% section loss from mudline extending up over 10’. Remainder of piles visually satisfactory.

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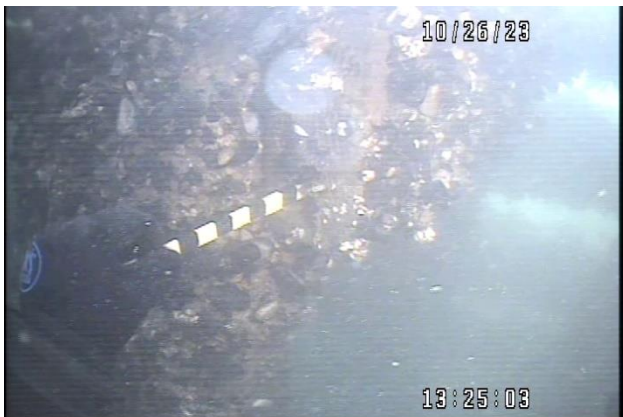


51. No 25 pile – pile deteriorated with bottom section loss

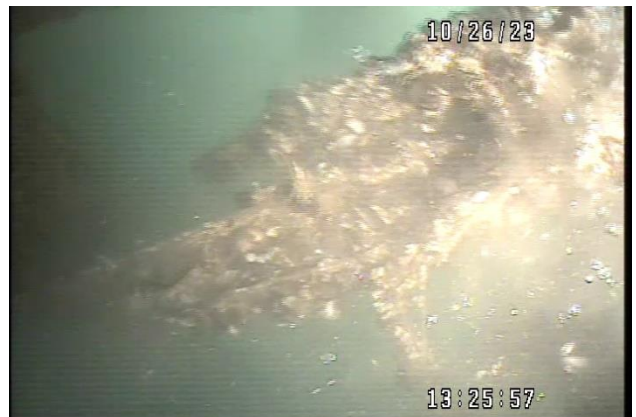


52. No 25 pile – pile deteriorated with bottom section loss

- No. 26 pile – Fender pile in visually satisfactory condition.
- No. 27 pile – Fender pile in visually satisfactory condition. Batter pile separated at 29' depth – no base. North horizontal support – end rot with wastage of approximately 50% over 12". Lower north and south horizontal supports – completely failed.



53. No 27 pile – north horizontal support end rot

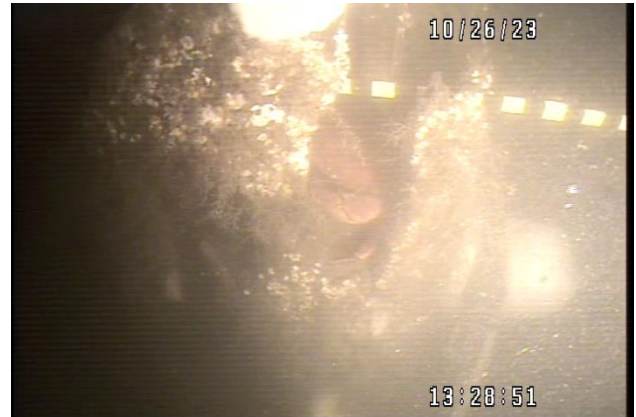


54. No 27 pile – north horizontal support end rot

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55. No 27 batter pile – fractured at mudline



56. No 27 batter pile – fractured at mudline

- No. 28 pile – Fender pile in visually satisfactory condition.
- No. 29 pile – Fender pile and batter pile in visually satisfactory condition. North horizontal support – not attached. South horizontal support – complete deterioration.
- No. 30 pile – Fender pile in visually satisfactory condition.
- No. 31 pile – Fender pile, batter pile, upper north and south horizontals in visually satisfactory condition. Lower north and south horizontals between fender pile and batter pile missing.
- No. 32 pile – Fender pile in visually satisfactory condition.
- No. 33 pile – Fender pile, batter pile, upper south horizontal in visually satisfactory condition. Lower north horizontal between fender pile and batter pile failed.
- No. 34 pile – Fender pile in visually satisfactory condition.
- No. 35 pile - Fender cluster No. 4 – six (6) surrounding and one (1) center pile – all in visually satisfactory condition.

Particulars of 3rd Attendance [Photograph Nos. 57-101]

We again attended at the Hylebos bridge to conduct an underwater dive survey of the wooden fenders and piles, in order to ascertain the general underwater condition of both the damaged fendering at the Western Bascule (Pier 4).

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Our attendance was in the company of the following:

Attending

Representing

Mr. W. Bryan

Dive Supervisor – AUS Diving – On Behalf of
Centerline Logistics

Mr. J. Leato

Diver – AUS Diving – On Behalf of Centerline
Logistics

Mr. D. Karl

Diver – AUS Diving – On Behalf of Centerline
Logistics

Mr. D. Hanshaw

Marine Operations Manager – Centerline
Logistics

Location:

Hylebos Bridge, Tacoma, WA

Survey Dates:

October 27, 2023

Particulars of Survey – Fendering System – West Bascule

Departure by dive boat was made from the Point Defiance Boat Launch at 0800hrs on Friday, October 27, 2023, with diving operations commencing at 0855hrs.

The second dive was undertaken from North to South. The horizontal battens were inspected at the same time as the fender and batter piles. Horizontal battens were numbered with the lower fender being No. 1.

Heavy marine growth was sighted on the lower three (3) horizontal battens. Comments pertaining to structural conditions and/or section loss was made by the attending diver and confirmed by the dive supervisor.

Of areas inspected by the dive team, we now report as follows:

Horizontal Battens [Photograph Nos. 057-060]

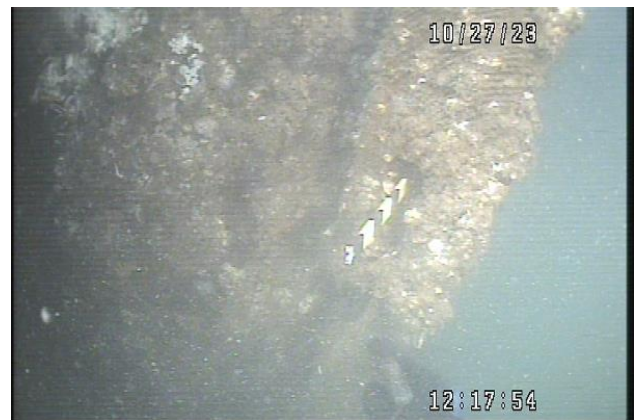
- Batten 1A – missing at fender.
- Batten 1B – C – displaced – standing proud a B end by 14”.

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- Batten 1C – end loose and continues offshore into channel.
- Batten 2A – free/loose at either end and attached only in middle.
- Batten 2C – sighted with what appears to be impact damage.
- Batten 2G – end rot sighted – 50% core loss over 2’.
- Batten 3A – missing.
- Batten 3 D-E section – apparent impact damage.
- Batten 4 – E section – disconnected from pile no. 23 and waterlogged with age.
- Batten 5 – E section - disconnected from pile no. 23 and waterlogged with age.
- Battens at section G to F displaying heavy end rot. South section of G missing.



57. Batten 2A – 90% section loss on end



58. Batten 2G – end rot sighted – 50% core loss over 2’.

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59. Batten 3 D-E section – apparent impact damage.



60. Batters at section G to F displaying heavy end rot. South section of G missing.

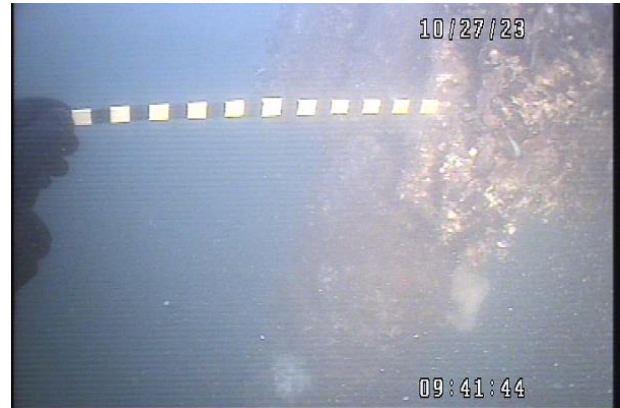
Mooring Piles, Vertical Piles, Batter Piles [Photograph Nos. 061-101]

- Northern Mooring Pile Cluster No. 1 – six (6) and one (1) center pile. Approximately 5% surface loss due to marine borers. Remainder of cluster visually in good condition.
- No. 1 pile – Fender pile in visually good condition
- No. 2 pile – Fender pile and batter pile in visually good condition. North horizontal support – approximately 50% loss over 12". South horizontal support – visually good condition.
- No. 3 pile – Fender pile in visually good condition.
- No. 4 pile - Fender pile in visually good condition. Batter pile – approximately ¼" wide checking over surface area. North horizontal support – visually good condition. South horizontal support – approximately 60% loss at end over 3'.

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61. No 4 pile – horional with core loss

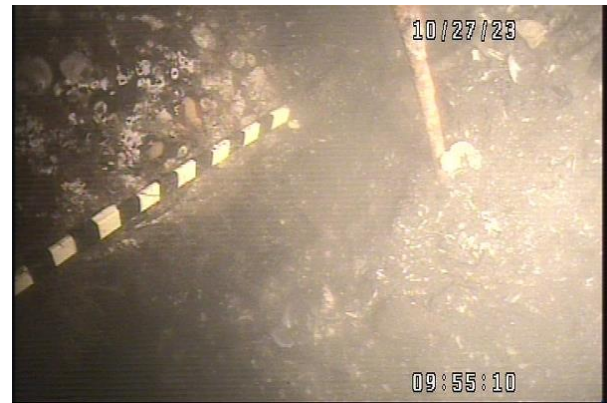


62. No 4 pile – horizontal core loss

- No. 5 pile – Fender pile visually in satisfactory condition but pushed over from vertical by approximately 30° - sighted displaced in mudline.



63. No. 6 pile – rotten above waterline

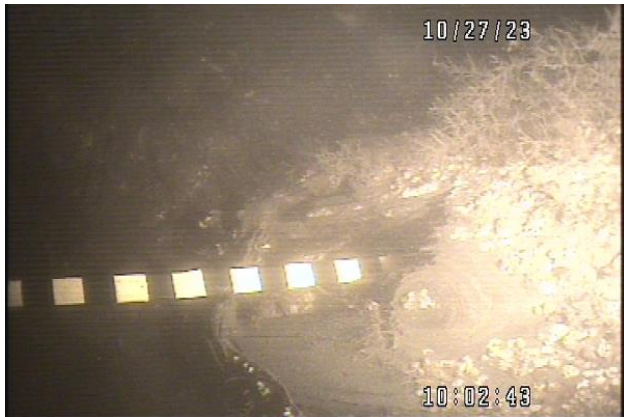


64. No. 6 batter pile – shifted in soil and erosion

- No. 6 pile – Fender pile sighted with noticeable rot of approximately 80%, extending upward by 6' from HW line. Fender is pushed over from vertical by approximately 30° - sighted displaced in mudline. Batter pile – visually satisfactory condition, sighted pushed over in mudline. North and south horizontal supports – approximately 60% loss over length of 4'.
- No. 7 pile – Fender pile observed with stress flowering at base of pile due to apparent internal degradation.
- No. 8 pile – Fender pile observed broken at base above mudline. Pile visually appears rotten over 70% of base.

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Batter pile sheared at base – pile visually appears internally rotten with heavy Teredo worm and bore worm spores. North and south horizontal supports – approximately 60% loss over length.

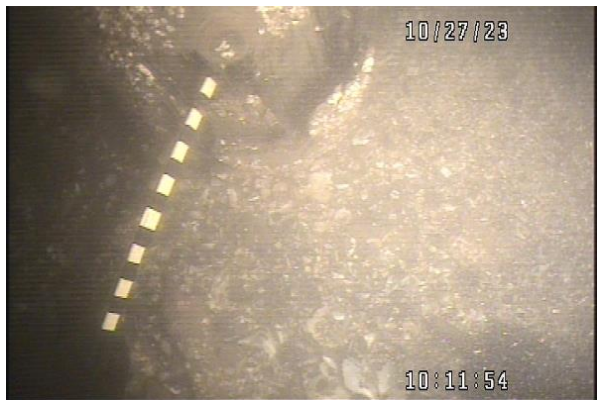


65. No. 8 batter pile – rotten at base



66. No. 8 batter pile – core rotten

- Fender cluster No. 2 – five (5) surrounding and one (1) center pile. NW pile – severed – core of bottom half of pile visually appears to be rotted out. S pile – Severed – top half visually displays heavy internal rot with Teredo worm tracks. No core strength retained in bottom section. SW pile – fractured – heavy core rot in bottom half – estimated 80% core loss in top half. SE pile – 3” deep checks on bottom along with stress pressure flowing due to internal core rot. Center pile fractured and shifted – lying on SE pile.

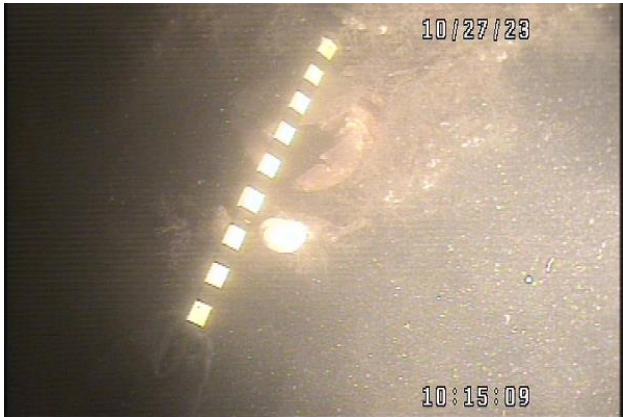


67. No. 2 pile cluster – N pile – rotted base

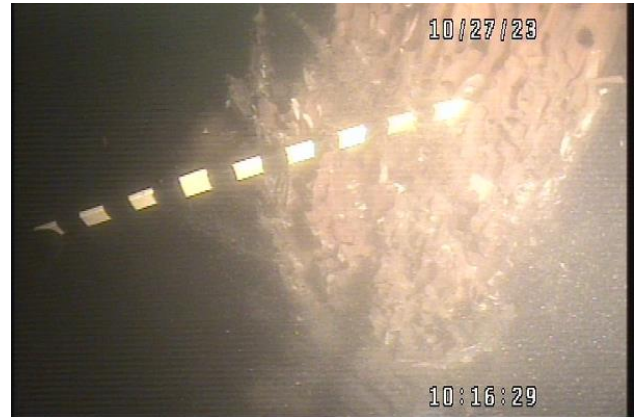


68. No. 2 pile cluster – NW pile – severed and with heavy worm tracks

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69. No. 2 pile cluster – SW pile - rotten



70. No. 2 pile cluster – SW pile rotten – looking down



71. No. 2 pile cluster – SE pile – rot with worm tracks



72. No. 2 pile cluster – SE pile – flowering at base

- No. 9 pile – Fender pile (square post) – visually satisfactory condition but pushed over from vertical by up to 45°.
- No. 10 pile – Fender pile sighted set over from vertical at a 60° angle to the North. Heavy core rot sighted above water. Heavy checking sighted below waterline with the mudline interface flowered out due to rotted center core.

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73. No. 10 pile – horizontal cap timber – heavy rot



74. No. 10 pile – securing hardware degraded and heavy core rot



75. No. 10 pile – heavy checking below waterline – possible internal core rot



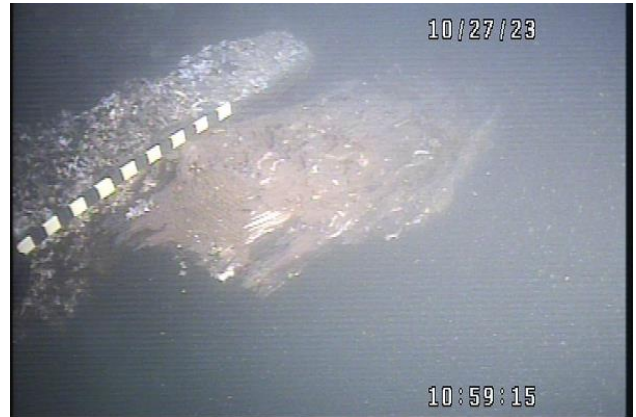
76. No. 10 pile – heavy core rot sighted above waterline

- No. 11 pile – Fender pile in visually satisfactory condition. Sighted displaced in mudline and set over, from vertical, to the north. Fender pile in visually satisfactory condition. Sighted displaced in mudline and set over, from vertical, to the north.
- No. 12 pile – Fender pile in visually satisfactory condition. Sighted displaced in mudline and set over, from vertical, to the north. A bracing timber – from pile to bridge displays heavy timber rot. Vertical timber fitted to bridge base also sighted with heavy rot and with timber core reduced.

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77. No. 12 pile – pier connected board rot

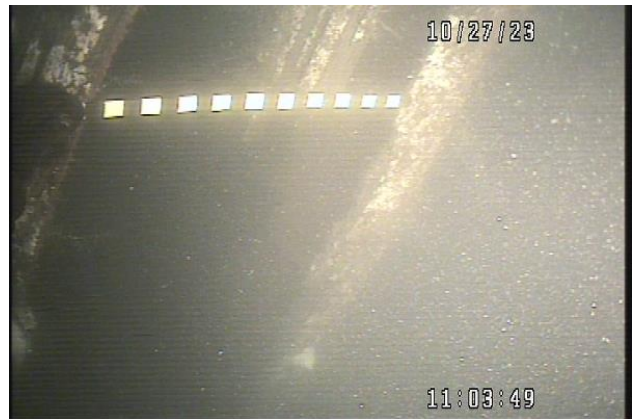


78. No. 12 pile – strut to pier connection
– end and core rot

- No. 13 pile – Fender pile in visually satisfactory condition. Sighted displaced in mudline and set over, from vertical, to the north.
- No. 14 pile – Fender pile, from mudline interface extending up over 15' – approximately 90% core loss. Pile completely severed with 19" separation between sections. Sections visually sighted as hollow with no core strength.



79. No. 14 pile – rot at 15' down with 90%
section loss



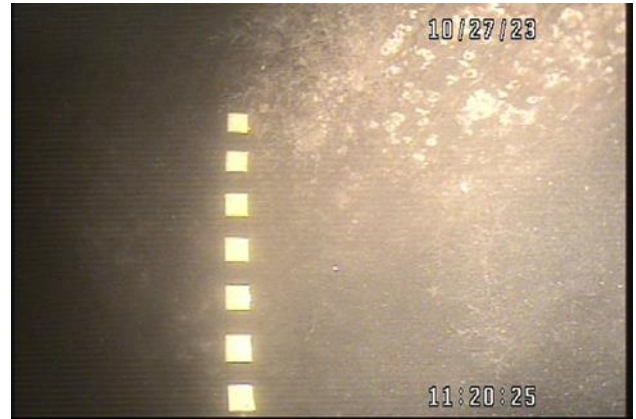
80. No. 14 pile – severed at 19' with 90%
section loss

- No. 15 pile – Fender pile broken and hollowed out at height of 15'.

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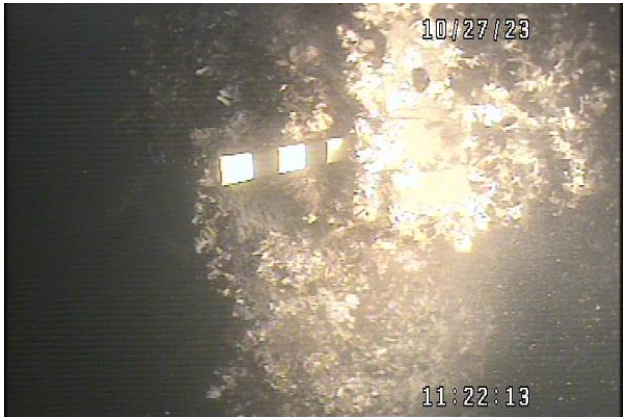
81. No. 15 pile – broken with over 90% core loss at 22’



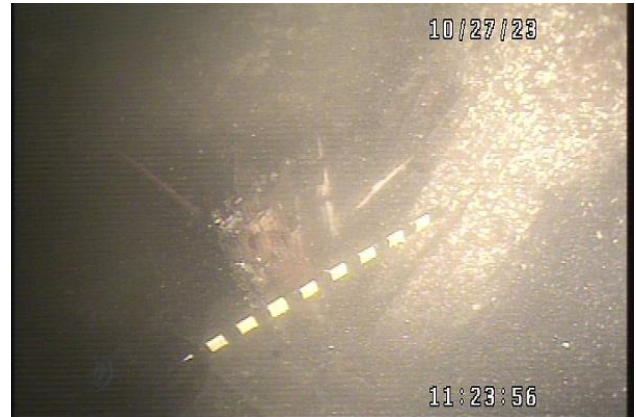
82. No. 19 pile – pressure flowering at mudline interface

- No. 16 pile – Fender pile in visually satisfactory condition. Sighted displaced in mudline and set over, from vertical, to the north.
- No. 17 pile – minor checking sighted along with pressure flowering at mudline interface.
- No. 18 pile – Fender pile in visually satisfactory condition. Batter pile sighted set over from vertical towards north. Pressure flowering sighted at mudline interface. North and south horizontal supports sighted with core and end rot of approximately for approximately 50% loss over full length.
- No. 19 pile – Fender pile in generally satisfactory condition, but set over from vertical to north. Pressure flowering sighted at mudline interface.
- No. 20 pile – Fender pile in generally satisfactory condition, but set over from vertical to north. Pressure flowering sighted at mudline interface. Batter pile completely separated at 27’ with heavy core rot observed. North horizontal support – minor surface rot. South horizontal support – approximately 60% loss over 4’.

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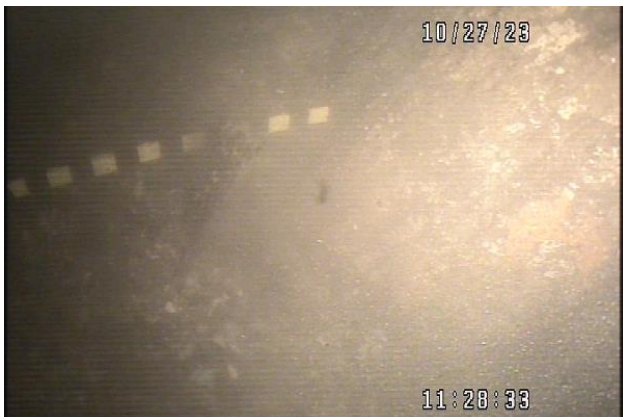


83. No. 20 pile – south horizontal support end rot with 60% core loss over 4’

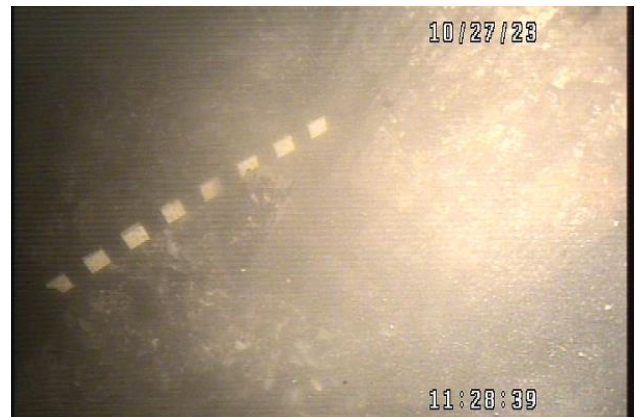


84. No. 20 batter pile – completely separated at 27’ with core rot observed.

- No. 21 pile – Fender pile fractured at mudline interface with checks and stress flowering sighted on surface.



85. No. 21 pile – fractured at mudline interface with checks and stress flowering sighted on surface.

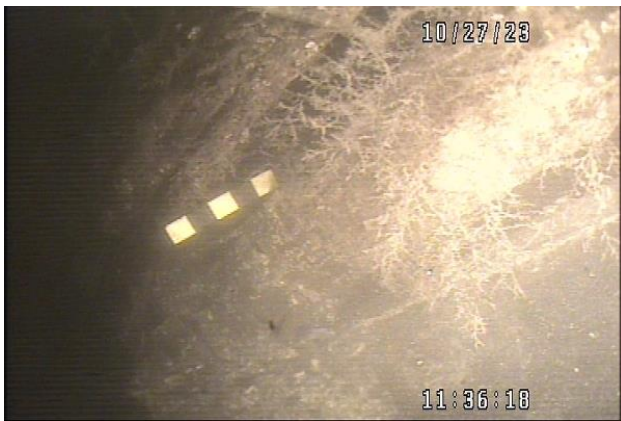


86. No. 21 pile – fractured at mudline interface with checks and stress flowering sighted on surface.

- No. 22 pile – Fender pile set over from vertical to the north and sighted with checking and stress flowering at mudline interface. Batter pile in visually satisfactory condition. North horizontal support – core rot over approximately 60% over full length. South horizontal support – strut disconnected from fender pile and displays core rot of approximately 60% over full length.

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- No. 23 pile – Fender pile sighted with approximately 10% surface loss due to borers over full length. Set over from vertical to the north. Stress flowering sighted at base at mudline interface.
- Fender cluster No. 3 – seven (7) surrounding and one (1) center pile – NE pile – sighted as broken and with hollow core. SE pile – sighted as broken with heavy rot and Teredo worm tracks. S pile – sighted as broken with heavy rot and Teredo worm tracks. SW pile – broken at midwater at 15' height. Wood sighted as rotten and with heavy Teredo worm tracks. Pile is also severed above mudline. Remainder of pile core hollowed out. W pile – set over from vertical to north. Sighted with checking and stress flowering at mudline interface. Remainder of pile cluster not accessible.



87. Fender Cluster 3 NE pile – broken at mudline interface



88. Fender Cluster 3 SE pile – broken with heavy rot



89. Fender Cluster 3 SE pile – broken with heavy rot



90. Fender Cluster 3 SW pile – wood sighted as rotten

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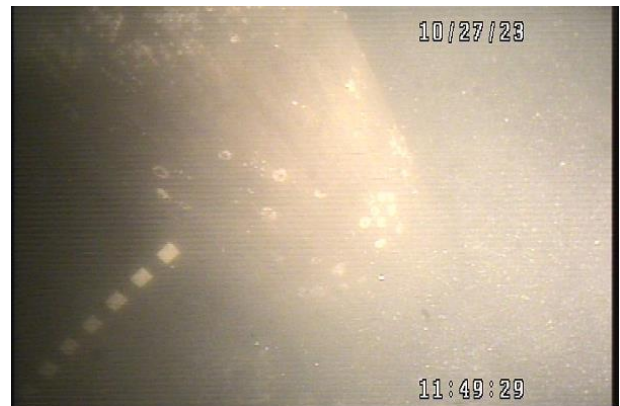
91. Fender cluster 3 SE pile – broken with heavy rot



92. Fender cluster 3 SW pile – severed above mudline and core hollowed out.



93. Fender cluster 3 – connecting fenders rotten and broken off



94. Fender cluster 3 W pile – pressure flowering at mudline

- No. 24 pile – Fender pile in visually satisfactory condition except very top of pile split open. Core, where sighted, appears to be without rot. Batter pile sighted displaced in mudline interface and in visually satisfactory condition. North and south horizontal supports missing.

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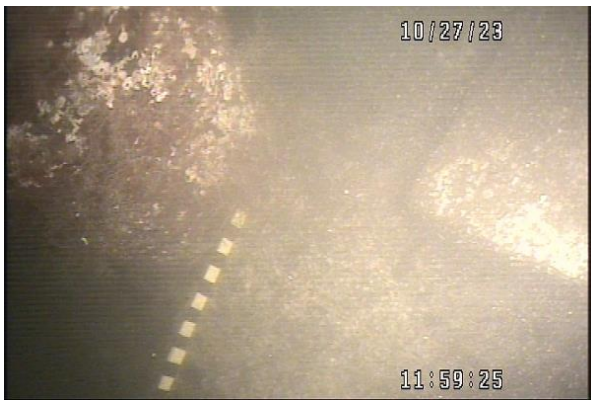


95. No. 24 pile – north and south horizontal supports missing

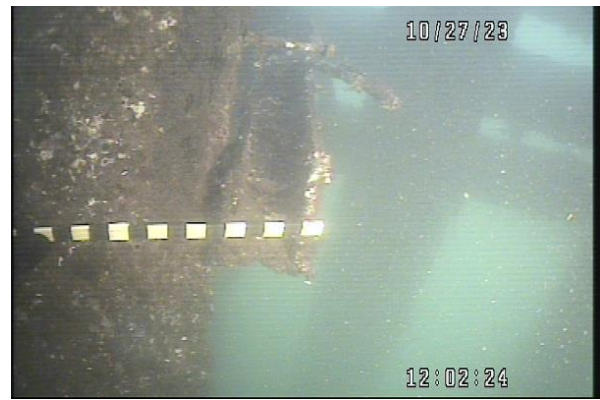


96. No. 24 pile – north and south horizontal supports missing

- No. 25 pile – Fender pile sighted with underwater surface section loss of approximately 10%. Surface checking and pressure flowering at mudline interface also observed.
- No. 26 pile – Fender pile and batter pile sighted with surface checking and pressure flowering at mudline interface. Batter pile also sighted with surface loss due to borers. North horizontal support – missing. South horizontal support – approximately 90% loss over full length.



97. No. 26 pile – surface checking and pressure flowering at mudline interface



98. No. 26 pile – south horizontal section loss of 90% over length

- No. 27 pile – Fender pile sighted with approximately 10% surface lost – remainder in visually satisfactory condition.

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- No. 28 pile – Fender pile sighted with checking and surface section loss. Batter pile – approximately 90% section loss and core hollowed out at mudline interface. North horizontal support – approximately 90% section loss over length. South horizontal support – missing.



99. No. 28 batter pile – approximately 90% section loss and core hollowed out at mudline interface.
- No. 29 pile – Fender pile in visually satisfactory condition with only light surface checking observed.
 - No. 30 pile – Fender pile sighted with approximately 15% surface section loss at mudline interface due to borers. Batter pile – approximately 10% surface section loss at mudline interface due to borers. North horizontal support – rotted and separated – full loss over length. South horizontal support – missing.
 - No. 31 pile – Fender pile sighted with pressure flowering at mudline interface. Remainder in visually satisfactory condition.
 - Fender cluster No. 4 – six (6) surrounding and one (1) center pile. NW pile – sighted with checking and pressure flowering at mudline interface. N pile – sighted with checking and pressure flowering at mudline interface, along with heavy worm tracks. NE pile – approximately 10% surface section loss. Center pile – sighted with checking and pressure flowing at mudline interface. S pile – at mid-pile height – tapping on pile indicates hollow section with potential full core rot and no remaining core strength. SW pile – approximately 15% surface section loss. Heavy worm tracks sighted at mudline interface.

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100. Fender cluster 4 – S pile – core rot measured at 11” at base with rot extending up to half of pile height



101. Fender cluster 4 – S pile – core rot measured at 11” at base with rot extending up to half of pile height

Pre-Construction Meeting – February 01, 2024 (Attachment Nos. 3-8, EMERG-Hylebos Bridge Fender System Replacement Pre-Con Agenda w Notes, 12-26-23 Concept, Submittal 005 Site Specific Safety Plan AC, Hylebos Bridge Fender System Replacement Pre-Con Agenda, Site Specific Safety Plan, Hylebos Bridge Fender System - Pre-Con Meeting Invite List)

Subsequent to the dive attendances on October 26-27, 2023, we also attended a meeting held with all relevant parties at the Municipal Building in Tacoma, WA, conference room no. 243, located at 747 Market Street, Tacoma, WA, on February 01, 2024.

During this meeting the main topics of discussion related to the following:

- A brief description of the work that would be undertaken.
- The compilation of a Site-specific Safety Plan.
- Traffic control for vehicles and marine traffic during construction.
- Site access for non-employees in the work zone.

The meeting commenced at 1000hrs and concluded at 1300hrs.

Particulars of 4th Attendance [Photograph Nos. 102-113]

On February 14, 2024, we attended at the premises of Quigg Brothers, located at 3701 Taylor Way, Tacoma, WA, prior to departure via construction barge to the Hylebos Bridge. This attendance was to witness the removal of the damage pilings, as well as the placement of temporary piles. In addition to the general barge crew, attending on behalf of Quigg Brothers, our attendance at the Hylebos Bridge was in the company of the following:

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 ASSIST TUG “OLYMPIC SCOUT”, 94 GRT OF PORTLAND, OR, USA
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Attending

Representing

Mr. Hans Brevik

Project Manager – Centerline Logistics

Mr. Randy Lamont

Project Supervisor – Centerline Logistics

Mr. Jim Patrick

Crane Drive / Foreman – Centerline Logistics

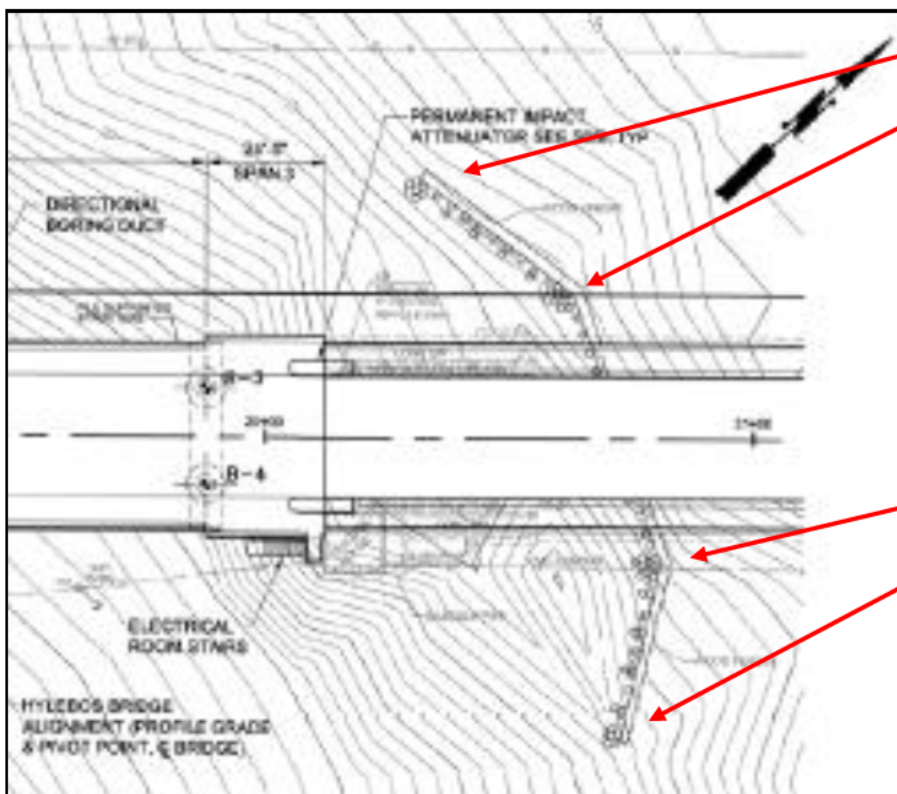
Location:

Hylebos Bridge, Tacoma, WA

Survey Dates:

February 14, 2024

The pilings are commented on in the order removed. As a safety precaution we did not access the barge during offloading and/or unhooking of the individual pilings or joined sections. As such, and in order not to delay removal of pilings, a visual inspection of each individual pile was not practicable, with newly removed sections often overlaying previously removed sections. Every effort was made, as far as practicable, and safe, to inspect individual piles.



1st Fender Cluster

2nd Fender Cluster

3rd Fender Cluster

4th Fender Cluster

Note: Piles are numbered from 01 to 31, starting from the North end at the 1st Fender Cluster.

Attachment No. 1: Hylebos Bridge Schematic – West Bascule, Tacoma Annual Bridge Report 2022, page 262

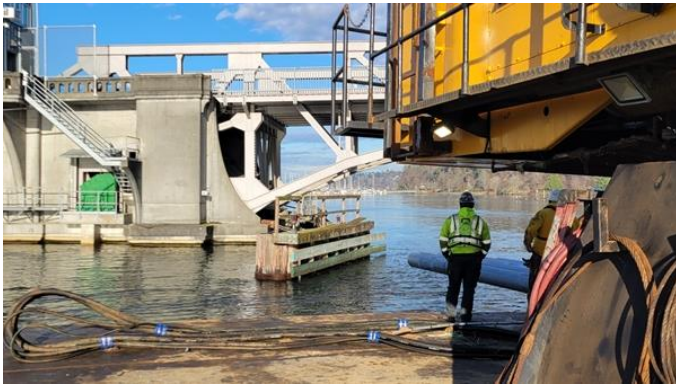
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We attended onboard the construction barge “SKOOKUM”, which was being assisted to site by the pusher tug “MIKE QUIGG”. Six (6) x 14” x 1/4” x 80ft steel piles were also loaded on the barge for temporary fitment in lieu of the wooden fendering removal, with the day proceeding according to the following timeline:

0810hrs – Depart Quigg Brothers with tug “MIKE QUIGG”.

0835hrs – On site – barge in position at South wing wall – deploy spuds.

0900hrs – Fitting of APE200 Vibro hammer to crane for driving of temporary piles. Prep initial piles.



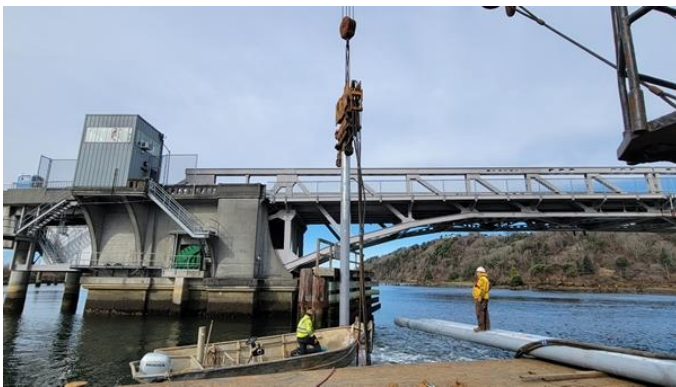
102. Barge on site



103. Fitting APE200 Vibro Hammer

1125hrs – Placing 1st pile at lower corner of South wing wall.

1137hrs – Commence driving 1st pile.



104. Commence driving 1st pile



105. Driving 2nd pile

1140hrs – 1st Pile complete.

1145hrs – Placing 2nd pile at upper corner of South wing wall.

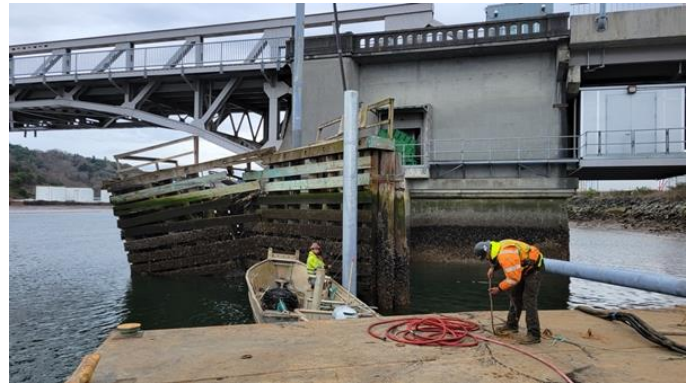
1155hrs – Commence driving 2nd pile.

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- 1205hrs – 2nd Pile complete.
- 1212hrs – Recovering spuds for barge repositioning.
- 1214hrs – Commence repositioning barge.
- 1225hrs – Barge in position at North end of North wing wall – deploy spuds.
- 1230hrs – 1300hrs – meal break.
- 1300hrs – Prep remaining piles for placement.
- 1310hrs – Placing 3rd pile at upper end of North wing wall.
- 1318hrs – Commence driving 3rd pile.
- 1320hrs – 3rd Pile complete.



106. 1st And 2nd piles in position



107. 3rd Pile in position

- 1322hrs – Placing 4th pile inboard of lower section of North wing wall.
- 1340hrs – Relocating 4th pile to outboard of lower section of North wing wall due to debris on inboard side.



108. 4th Pile in position



109. 5th Pile in position

- 1344hrs – Commence driving 4th pile.
- 1348hrs – 4th Pile complete.

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- 1408hrs – Placing 5th pile to North and inboard of upper section of North wing wall.
- 1411hrs – Commence driving 4th pile.
- 1413hrs – 5th Pile complete.
- 1417hrs – Recovering spuds for barge repositioning.
- 1421hrs – Barge in position underneath bridge – deploy spuds.
- 1422hrs – Place 6th pile at center of center wall.
- 1428hrs – Commence driving 6th pile.
- 1430hrs – 6th Pile complete.

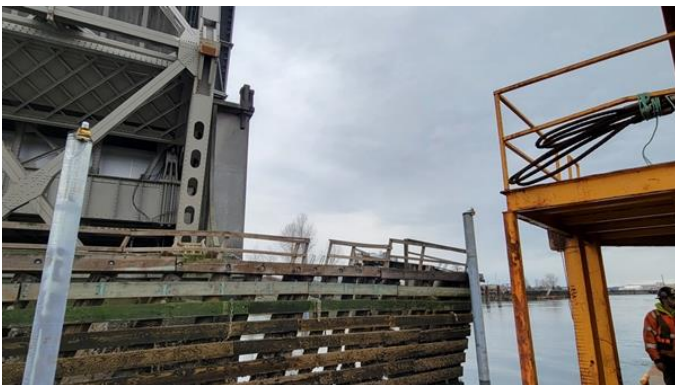


110. 6th Pile in position

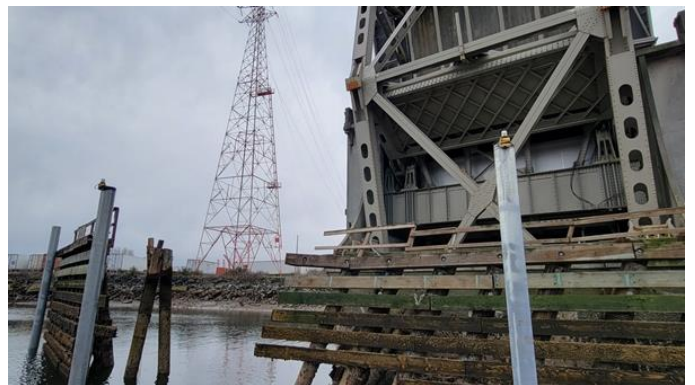


111. All temporary piles in position

- 1440hrs – Recover spuds – reposition barge for placement of wall hazards lights.
- 1500hrs – Commence fitting of hazard lights.
- 1500hrs – 1530hrs – Standby for marine traffic.
- 1545hrs – Fitting of hazard lights completed.
- 1600hrs – Return to Quigg Brothers dock.



112. Fitting of nav lights in progress



113. Fitting of nav lights completed

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5th Attendance – February 15, 2024 [Photograph Nos: 114-199]

On February 15, 2024, we again attended at the premises of Quigg Brothers to monitor the removal of the damaged wooden fender pilings from the Hylebos Bridge Western Bascule.

In addition to the general barge crew, attending on behalf of Quigg Brothers, we also met with the following:

Attending

Mr. Hans Brevik

Mr. Randy Lamont

Mr. Jim Patrick

Location:

Survey Dates:

Representing

Project Manager – Centerline Logistics

Project Supervisor – Centerline Logistics

Crane Drive / Foreman – Centerline Logistics

Hylebos Bridge, Tacoma, WA

February 15, 2024

We attended onboard the construction barge “SKOOKUM”, which was being assisted to site by the pusher tug “MIKE QUIGG”, and the day proceeded according to the following timeline:

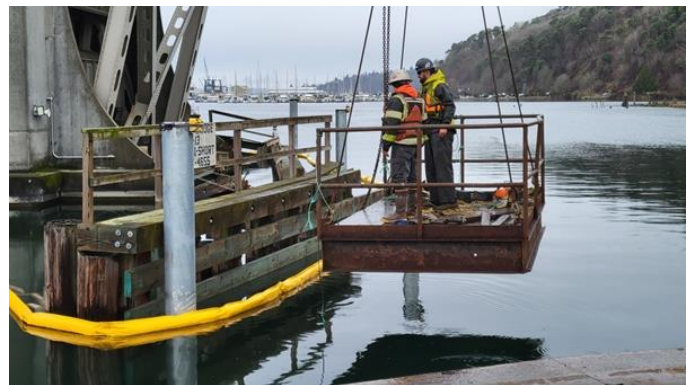
0730hrs – Depart Quigg Brothers with tug “MIKE QUIGG”.

0800hrs – On site – barge in position at South wing wall – deploy spuds.

0814hrs – Deploy anti-pollution boom.



114. Deploy anti-pollution boom



115. Inspecting catwalk prior to cropping

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116. Inspecting catwalk prior to cropping



117. Inspecting catwalk prior to cropping

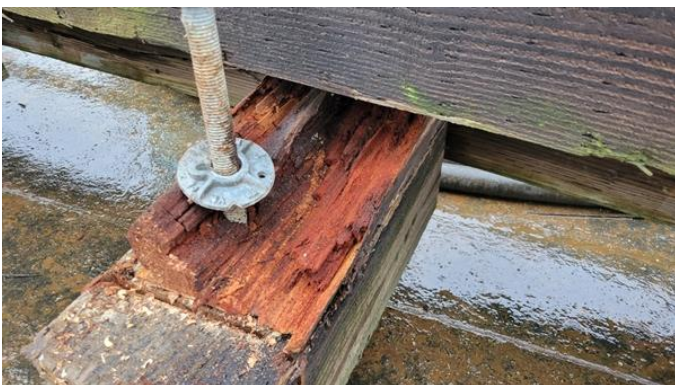
0850hrs – Commence cropping South wing wall catwalk supports.
0901hrs – Remove South wing wall catwalk.



118. Catwalk landed on barge



119. Catwalk condition of timber



120. Catwalk timber – soft and powdery



121. Catwalk timber soft and powdery

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0904hrs – Catwalk from South wing wall landed on barge.
0910hrs – Prep pile no. 25 for removal.
0917hrs – commence pulling pile.
0946hrs – Pile no. 25 free
0948hrs – Pile no. 25 landed on barge deck. Observed with approximately 10% section loss.
The underwater survey originally indicated surface section loss of approximately 10%. Surface checking and pressure flowering at mudline interface)



122. Pile No 25 on barge



123. Pile 25 – surface checking

0956hrs – Pile no. 27 connected for removal.
0957hrs – Commence lifting – top section of pile disintegrates due to weakened core.
1025hrs – Barge “HOQUIAM” alongside portside and fast.
1044hrs – Commence cropping top 5ft of piles in preparation of removal, thereby separating batter and dolphin piles and pile clusters into individual units.
1108hrs – Lifting removed section of South wing wall.
1110hrs – South wing wall section landed on barge.

- Top section pile 31 – good condition. The underwater survey originally indicated pressure flowering at mudline interface.
- Top section pile 30 – section loss observed over length – rotting in core. The underwater survey originally indicated approximately 15% surface section loss at mudline interface due to borers.
- Top section batter pile 30 – fair condition. The underwater survey originally indicated approximately 10% surface section loss at mudline interface due to borers. North horizontal support – rotted and separated – full loss over length. South horizontal support – missing.

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- Top section pile 29 – fair condition. The underwater survey originally indicated fender pile in visually satisfactory condition with only light surface checking.
- Top section pile 28 – core deterioration observed. The underwater survey originally indicated fender pile sighted with checking and surface section loss.
- Top section batter pile 28 – poor condition with rotten core. The underwater survey originally indicated batter pile with approximately 90% section loss and core hollowed out at mudline interface. North horizontal support – approximately 90% section loss over length. South horizontal support – missing.
- Top section pile 27 – poor condition, core rotten, very powdery. The underwater survey originally indicated fender pile sighted with approximately 10% surface lost – remainder in visually satisfactory condition.
- Top section Pile 26 – fair condition. The underwater survey originally indicated Fender pile and batter pile sighted with surface checking and pressure flowering at mudline interface.
- Top section batter pile 26 – fair condition with split at upper section. The underwater survey originally indicated batter pile also sighted with surface loss due to borers. North horizontal support – missing. South horizontal support – approximately 90% loss over full length.



124. Top of pile No 31 – visually satisfactory



125. Top of pile No 30 – rotting of core section

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126. Top of Pile No 29 – visually satisfactory



127. Top of Pile No 28 – core deterioration visually observed



128. Top of Pile No 27 – visually poor condition, core rotten, very powdery



129. Top of Pile No. 26 – visually fair condition

1113hrs – Prep number 4 pile cluster for lifting - South cluster South Wing Wall. Top 5 ft cropped for removal.
1205hrs – Commence pulling cluster.
1210hrs – Number 4 pile cluster top section landed on barge - tops of all seven (7) clusters visually observed with extensive core deterioration. Bottom section of three (3) of seven (7) clusters with rotting observed. The underwater survey originally indicated six (6) surrounding and one (1) center pile. NW pile – sighted with checking and pressure flowering at mudline interface. N pile – sighted with checking and pressure flowering at mudline interface, along with heavy worm tracks. NE pile – approximately 10% surface section loss. Center pile – sighted with checking and pressure flowering at mudline interface. S pile – at mid-pile height – tapping on pile indicated hollow section with potential full core rot and no remaining core strength.

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130. Top of No 4 cluster – general view



131. Top of No 4 cluster – extensive core deterioration observed



132. Top of No 4 cluster – extensive core deterioration observed



133. Top of No 4 cluster – extensive core deterioration observed

- 1215hrs – Lunch break.
- 1256hrs – Choke 1st pile 4th cluster - Commence pull.
- 1315hrs – Stop heaving – no success.
- 1320hrs – Inspecting Center wall for removal - lifting chains fitted.
- 1350hrs – Spuds raised - repositioning barge to work center wall.
- 1400hrs – Barge in position spuds down.
- 1410hrs – Crane rigged to center wall for lifting.
- 1417hrs – Cutting horizontal battens between no. 2 cluster and no. 9 pile.
- 1424hrs – Cropping battens complete - commence pull - trying to lift.
- 1427hrs – Stop lifting of center section - no success.
- 1432hrs – Cropping horizontal battens between piles 17 and 18.
- 1440hrs – Cropping complete, lift and remove rear section center wing wall.
- 1455hrs – Rear section Center Wing wall placed on barge.

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134. Rear section – center wing wall – being lifted



135. Rear section – center wing wall – being lifted



136. Pile No 18 – broken off below mudline



137. Pile No 18 – lower section – interior core wasted and soft to touch.



138. Pile 18 batter pile – broken off below mudline



139. Pile No 18 batter pile – lower section – interior core heavily wasted

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The underwater survey originally indicated No. 18 fender pile No. 18 in a visually satisfactory condition and No. 18 batter pile sighted set over from vertical towards north. Pressure flowering sighted at mudline interface. North and south horizontal supports sighted with core and end rot of approximately for approximately 50% loss over full length.



140. Pile No 18 lower horizontal support
– extensive core wastage noted.



141. Pile No 18 lower horizontal support
– extensive core wastage noted.



142. Pile No 19 – cracks observed over
length of pile



143. Pile No 19 – cracks observed over
length of pile

The underwater survey originally indicated No. 19 fender pile in generally satisfactory condition but set over from vertical to north. Pressure flowering sighted at mudline interface.

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144. Pile No 20 – broken off below mudline



145. Pile No. 20 – worm tracks observed

The underwater survey originally indicated No. 20 fender pile was in generally satisfactory condition but set over from vertical to north. Pressure flowering was sighted at mudline interface.

The batter pile was completely separated at 27' with heavy core rot observed. The north horizontal support displayed minor surface rot. The south horizontal support displayed approximately 60% loss over 4'.



146. Pile No 20 horizontal support with core loss.



147. Pile No 20 horizontal support with core loss.

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148. Pile No 20 batter pile – broken off at mudline – wastage of core and heavy worm tracks noted



149. Pile No 20 batter pile – broken off at mudline – wastage of core and heavy worm tracks noted



150. Pile No 21 – broken off below mudline



151. Pile No 21 – extensive wastage of core with worm tracks noted

The underwater survey originally indicated No. 21 fender pile fractured at the mudline interface with checks and stress flowering sighted on the pile surface.

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152. Pile No 22 – broken off at mudline –
wastage of core observed



153. Pile No 22 – broken off at mudline –
wastage of core observed



154. Pile No 22 – surface checking



155. Pile No 22 – surface checking



156. Pile No 22 batter pile – wastage of
core



157. Pile No 22 batter pile – wastage of
core and surface checking

The underwater survey originally indicated No. 22 batter pile was in visually satisfactory condition. North horizontal support – core rot over approximately 60% over full length.

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South horizontal support – strut disconnected from fender pile and displays core rot of approximately 60% over full length.



158. Pile No 23 – core loss due to borers



159. Pile No 23 – core loss due to borers

The underwater survey originally indicated No. 23 fender was observed with approximately 10% surface loss due to borers over full length and set over from vertical to the north. Stress flowering sighted at base at mudline interface.

- 1505hrs – Prep forward section of center wing wall for lifting.
- 1530hrs – Commence lifting forward section center wing wall.
- 1533hrs – Pause lifting to cut securing chain.
- 1543hrs – Continue lift and remove forward section center wing wall.
- 1545hrs – Forward section Center wing wall placed on barge.



160. Center wing wall removal



161. Center wing wall removal

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162. Pile No 9 – fender pile with core degradation



163. Pile No 9 – fender pile with core degradation

No. 9 fender pile was observed with extensive core degradation. The underwater survey originally indicated No. 9 fender pile (square post) was in visually satisfactory condition but pushed over from vertical by up to 45°.



164. Pile No 10 – fender pile with surface checking



165. Pile No 10 – fender pile with surface checking and core rot

The underwater survey originally indicated No. 10 fender pile was sighted set over from vertical at a 60° angle to the North. Heavy core rot was sighted above water. Heavy checking was sighted below the waterline with the mudline interface flowered out due to a rotted center core.

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166. No 11 fender pile – satisfactory



167. No 11 fender pile - satisfactory



168. No 12 fender pile – broken off below
mudline and with surface checking



169. No 12 fender pile – core degradation
due to borer worms

The underwater survey originally indicated No. 12 fender pile was in visually satisfactory condition. Sighted displaced in mudline and set over, from vertical, to the north.



170. No 13 fender pile – satisfactory



171. No 13 fender pile – satisfactory

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172. No 14 fender pile – surface degraded and with worm tracks



173. No 14 fender pile – surface degraded and with worm tracks



174. No 14 fender pile – hollow with no core strength



175. No 14 fender pile – hollow with no core strength

The underwater survey originally indicated No. 14 fender pile displayed approximately 90% core loss. Pile completely severed with 19” separation between sections. Sections visually sighted as hollow with no core strength.

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176. No 15 fender pile – broken with heavy core loss and worm tracks



177. No 15 fender pile – broken with heavy core loss and worm tracks

The underwater survey originally indicated No. 15 fender pile broken and hollowed out at height of 15’.



178. No 16 fender pile – satisfactory



179. No 16 fender pile – satisfactory



180. No 17 fender pile – surface checking and pressure flowering



181. No 17 fender pile – core degradation and worm tracks observed

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The underwater survey originally indicated No. 17 fender pile with minor checking and with pressure flowering at mudline interface.

1555hrs – Lift and remove no. 3 pile cluster



182. Remove No 3 pile cluster



183. Remove No 3 pile cluster



184. No 3 pile cluster



185. No 3 pile cluster – heavy degradation



186. No 3 pile cluster – worm tracks



187. No 3 pile cluster – worm tracks

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188. No 3 pile cluster – broken and with hollow cores



189. No 3 pile cluster – broken and with hollow cores

The underwater survey originally indicated No. 3 pile cluster consisted of seven (7) surrounding and one (1) center pile. NE pile – sighted as broken and with hollow core. SE pile – sighted as broken with heavy rot and Teredo worm tracks. S pile – sighted as broken with heavy rot and Teredo worm tracks. SW pile – broken at midwater at 15’ height. Wood sighted as rotten and with heavy Teredo worm tracks. Pile is also severed above mudline. Remainder of pile core hollowed out. W pile – set over from vertical to north. Sighted with checking and stress flowering at mudline interface. Remainder of pile cluster not accessible.

1610hrs – Lift and remove no. 2 pile cluster.



190. Lift and remove no. 2 pile cluster



191. Lift and remove no. 2 pile cluster

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192. No 2 pile cluster – fender board with internal core degradation



193. No 2 pile cluster – fender board with internal core degradation



194. No 2 pile cluster – core degradation and worm tracks



195. No 2 pile cluster – core degradation and worm tracks



196. No 2 pile cluster – core degradation and worm tracks



197. No 2 pile cluster – surface checks due to internal core rot

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198. No 2 pile cluster – core degradation and worm tracks



199. No 2 pile cluster – core degradation and worm tracks

The underwater survey originally indicated No. 2 pile cluster consisted of five (5) surrounding and one (1) center pile. NW pile – severed – core of bottom half of pile visually appears to be rotted out. S pile – Severed – top half visually displays heavy internal rot with Teredo worm tracks. No core strength retained in bottom section. SW pile – fractured – heavy core rot in bottom half – estimated 80% core loss in top half. SE pile – 3” deep checks on bottom along with stress pressure flowing due to internal core rot. Center pile fractured and shifted – lying on SE pile.

1620hrs – Prep remaining Wing Wall sections for removal.
1710hrs – Work complete lift spuds.
1713hrs – Returning to dock.

6th Attendance – February 16, 2024 [Photograph Nos: 200-245]

On February 16, 2024, we again attended at the premises of Quigg Brothers to monitor the removal of the damaged wooden fender pilings from the Hylebos Bridge Western Bascule.

In addition to the general barge crew, attending on behalf of Quigg Brothers, we also met with the following:

Attending

Mr. Randy Lamont

Mr. Jim Patrick

Representing

Project Supervisor – Centerline Logistics

Crane Drive / Foreman – Centerline Logistics

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Location: Hylebos Bridge, Tacoma, WA

Survey Dates: February 16, 2024

We attended onboard the construction barge “SKOOKUM”, which was being assisted to site by the pusher tug “MIKE QUIGG”, and the day proceeded according to the following timeline:

The day proceeded according to the following timeline:

0830hrs – Tug Skookum depart dock with tug Mike Quig.

0900hrs – Barge on site at North wing wall spuds down.

0925hrs – Crop top section North wing wall for removal.

0949hrs – Remove top section North wing wall.



200. North wing wall top section removal



201. North wing wall top section removal



202. Hollow core of top section



203. Degraded core of top section

0952hrs – Prep remaining North Wing Wall pilings for removal.

1026hrs – Prepping 1st pile cluster - North cluster - for removal.

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1053hrs – Top of 1st pile cluster - North cluster – removed.



204. Pile cluster No 1 top – timber deteriorated



205. Pile cluster No 1 top – timber deteriorated



206. Pile cluster No 1 top – timber deteriorated



207. Pile cluster No 1 top – timber deteriorated

The underwater survey originally indicated No. 1 pile cluster consisted of six (6) surrounding piles and one (1) center pile, with approximately 5% surface loss due to marine borers. The remainder of cluster visually in good condition. Upon removal the pile cores were observed as being heavily deteriorated.

1102hrs – Vibro hammer with wood clamp fitted to crane.

1111hrs – Commence removal pile no. 6.

1116hrs – Pulling no. 6 batter pile.

1119hrs – Pulling number no. 5 pile.

1121hrs – Pulling no. 4 pile.

1122hrs – Pulling no. 4 batter pile.

1123hrs – No. 4 batter pile removed.

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208. No 4 batter pile – checking over surface area



209. No 4 batter pile – checking over surface area and core deteriorated

- 1127hrs – Pulling no. 3 pile.
- 1129hrs – Pulling no. 2 pile.
- 1130hrs – Pulling no. 2 batter pile.
- 1132hrs – Pulling no. 1 pile.
- 1134hrs – Pulling 1st pile no. 1 cluster.
- 1136hrs – Pulling 2nd pile no. 1 cluster.
- 1139hrs – Putting center pile no. 1 cluster.
- 1140hrs – Pulling 3rd pile no. 1 cluster.
- 1142hrs – Pulling 4th pile no. 1 cluster.
- 1144hrs – Removing 4th pile to barge.
- 1148hrs – Pulling 5th pile no. 1 cluster.
- 1150hrs – Pulling 6th pile no. 1 cluster.
- 1200hrs to 1220hrs – Lunch.



210. No 1 cluster pile – core degradation and extensive worm tracks



211. No 1 cluster pile – core degradation and extensive worm tracks

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1220hrs – Removing piles from no. 1 cluster - Access to barge not available due to frequency of pile loading onboard - Unable to ascertain individual pile location.



212. No 1 cluster pile – core degradation and extensive worm tracks



213. No 1 cluster pile – core degradation and extensive worm tracks o 24 fender pile – visually generally satisfactory



214. No 1 cluster pile – core degradation and extensive worm tracks



215. No 1 cluster pile – hollow core

- 1236hrs – Remove no. 1 pile.
- 1239hrs – Remove no. 2 batter pile.
- 1242hrs – Remove no. 2 pile.
- 1244hrs – Remove no. 3 pile.
- 1251hrs – Remove no. 4 pile.
- 1255hrs – Remove no. 5 pile.
- 1257hrs – Remove no. 6 pile.
- 1301hrs – Remove no. 6 batter pile. Access to barge not available due to frequency of pile loading onboard - Unable to ascertain individual pile location.

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1306hrs – North Wing wall removal complete.
1326hrs – Recovering spuds repositioning barge.
1338hrs – Barge in position off South wing wall, dropping spuds.
1343hrs – Prepare remaining piles for removal.



216. Pile Nos. 1-6 loaded on barge



217. Pile Nos. 1-6 loaded on barge



218. Pile Nos 1-6 – general deterioration



219. Pile Nos 1-6 – general deterioration



220. Pile Nos 1-6 – general deterioration



221. Surface checking and worm tracks

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222. Heavily deteriorated core and worm tracks



223. Core hollowed out



224. Heavily deteriorated core and worm tracks



225. Horizontal support - core deterioration

The underwater survey originally noted the following conditions for pile Nos. 1-6:

- No. 1 pile - Fender pile in visually good condition
- No. 2 pile - Fender pile and batter pile in visually good condition. North horizontal support - approximately 50% loss over 12". South horizontal support - visually good condition.
- No. 3 pile - Fender pile in visually good condition.
- No. 4 pile - Fender pile in visually good condition. Batter pile - approximately 1/4" wide checking over surface area. North horizontal support - visually good condition. South horizontal support - approximately 60% loss at end over 3'.

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- No. 5 pile – Fender pile visually in satisfactory condition but pushed over from vertical by approximately 30° - sighted displaced in mudline.
- No. 6 pile – Fender pile sighted with noticeable rot of approximately 80%, extending upward by 6’ from HW line. Fender is pushed over from vertical by approximately 30° - sighted displaced in mudline. Batter pile – visually satisfactory condition, sighted pushed over in mudline. North and south horizontal supports – approximately 60% loss over length of 4’.

1357hrs – Pulling no. 24 batter pile.

1359hrs – Pulling no. 24 pile.

1491hrs – Pulling number 26 batter pile.

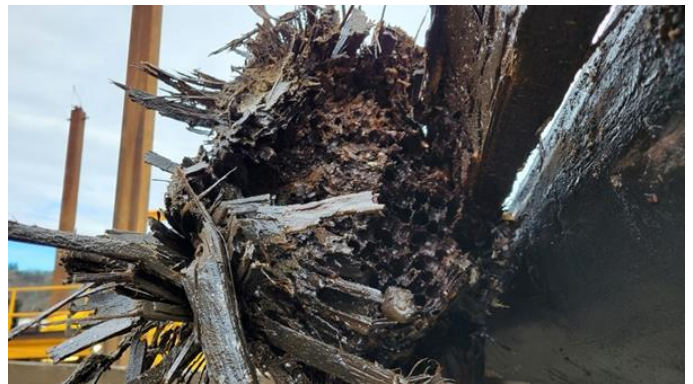
1403hrs – Pulling no. 26 pile.

1406hrs – Pulling no. 27 pile.

1407hrs - Pulling no. 28 batter pile - Removing number 28 batter pile.



226. No 28 batter pile – core hollowed out at mudline interface



227. No 28 batter pile – core degradation and worm tracks

1411hrs - Pulling no. 28 pile.

1414hrs – Pulling no. 29 pile.

1416hrs – Pulling no. 30 batter pile.

1417hrs – Pulling no. 30 pile.

1420hrs – Pulling no. 31 pile.

1423hrs – Pulling 1st pile no. 4 cluster.

1424hrs – Pulling 2nd pile of no. 4 cluster.

1426hrs – Pulling 3rd pile of no. four cluster.

1428hrs – Pulling 4th pile of no. four cluster.

14312hrs – 5th and center pile of no. 4 cluster broken loose.

1432hrs – Pulling 6th of no. 4 cluster.

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- 1444hrs – Removing broken 5th and center pile from no. 4 cluster.
- 1445hrs – Removing 4th pile from no. 4 cluster.
- 1448hrs – Removing 3rd pile from no. 4 cluster.
- 1451hrs – Removing 6th pile from no. 4 cluster.
- 1454hrs – Removing 2nd pile of no. 4 cluster.
- 1457hrs – Remove 1st pile of no. 4 cluster.



228. No 5 pile 4th cluster – checking on surface.



229. Center pile 4th cluster – heavy worm tracks



230. No 4 pile 4th cluster – hollow core



231. No 6 pile 4th cluster – heavy worm tracks

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232. No 3 pile 4th cluster – water leaking during lifting due to hollowed core



233. No 3 pile 4th cluster – hollow core

The underwater survey originally noted the following conditions for No. 4 cluster:

Fender cluster No. 4 – six (6) surrounding and one (1) center pile. NW pile – sighted with checking and pressure flowering at mudline interface. N pile – sighted with checking and pressure flowering at mudline interface, along with heavy worm tracks. NE pile – approximately 10% surface section loss. Center pile – sighted with checking and pressure flowering at mudline interface. S pile – at mid-pile height – tapping on pile indicates hollow section with potential full core rot and no remaining core strength. SW pile – approximately 15% surface section loss. Heavy worm tracks sighted at mudline interface.

1501hrs – Removing no. 31 pile.



234. No 31 fender pile – light surface checking



235. No 31 fender pile – pressure flowering at mudline interface

The underwater survey originally noted No. 31 fender pile was sighted with pressure flowering at the mudline interface with the remainder being in visually satisfactory condition.

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1504hrs – Removing no. 30 batter pile.

1507hrs – Removing no. 30 pile.



236. No 30 fender pile – leaking water from hollowed core



237. No 30 fender pile – section loss due to borers.

The underwater survey originally noted No. 30 fender pile was sighted with approximately 15% surface section loss at mudline interface due to borers.

1511hrs – Removing no. 29 pile.



238. No 29 fender pile – generally satisfactory with light surface checking



239. No 29 fender pile – generally satisfactory with light surface checking

1515hrs – Removing no. 28 pile.

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240. No 28 fender pile – generally satisfactory with light surface checking



241. No 28 fender pile – generally satisfactory with light surface checking

1522hrs – Removing no. 26 batter pile.

1525hrs – Removing. 27 pile.

1529hrs – Removing no. 26 pile.



242. No 26 fender pile – leaking water due to hollow sections in core



243. No 26 fender pile – visually generally satisfactory with light surface checking

The underwater survey originally noted No. 26 fender pile was sighted with with surface checking and pressure flowering at mudline interface. Batter pile also sighted with surface loss due to borers. North horizontal support – missing. South horizontal support – approximately 90% loss over full length.

1532hrs – Removing no. 24 batter pile.

1536hrs – Remove no. 24 pile.

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244. No 24 fender pile – visually generally satisfactory

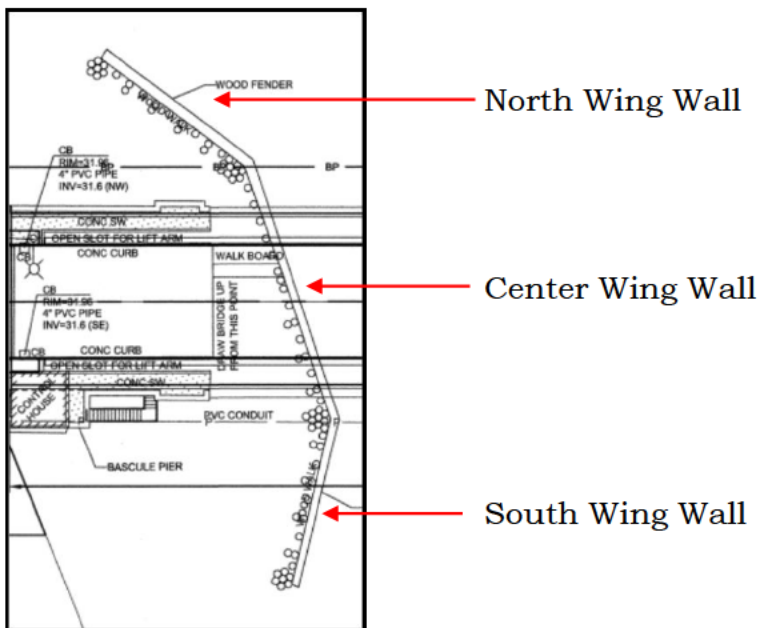


245. No 24 fender pile – visually generally satisfactory

The underwater survey originally noted No. 24 fender pile was in visually satisfactory condition except very top of pile split open.

1540hrs – West Bascule timber fendering removal completed - collecting various debris items.
 1600hrs – Removal complete, lifting spuds, returning to dock.

CONDITION SUMMARY:



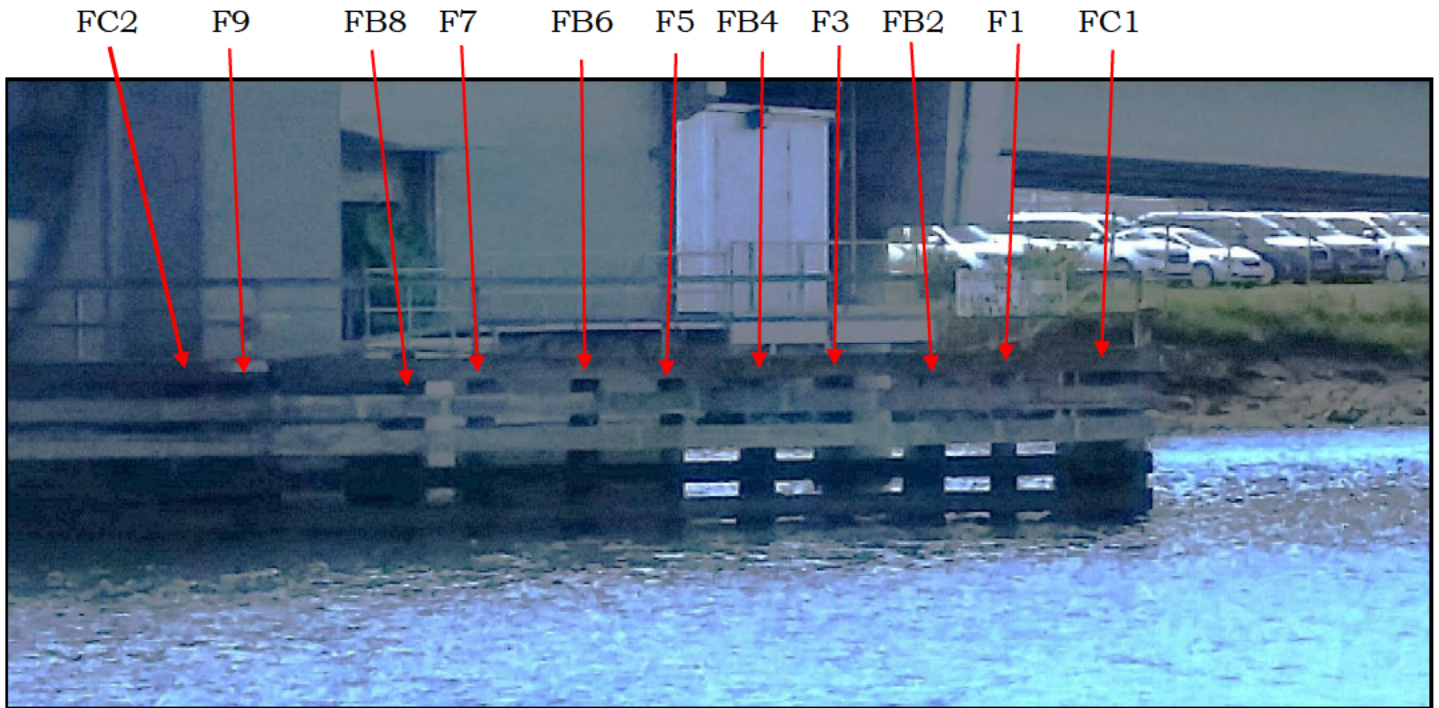
Picture 1: Western Bascule: Hylebos Creek Waterway. Paving, Signing And Striping Plan 2. PWK-00297 Sheet 10 of 194

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FC – Fender Cluster
F – Fender
FB – Fender and Batten

Estimated deterioration is based on visual observations at time of attendance for dive survey and removal of piles.

North Wing Wall



Picture 2: Representative Picture of North Wing Wall (Photograph Prior Incident)

Comments On General Observed Condition of North Wing Wall. Photographs subsequent to removal of piles are referenced, where available.

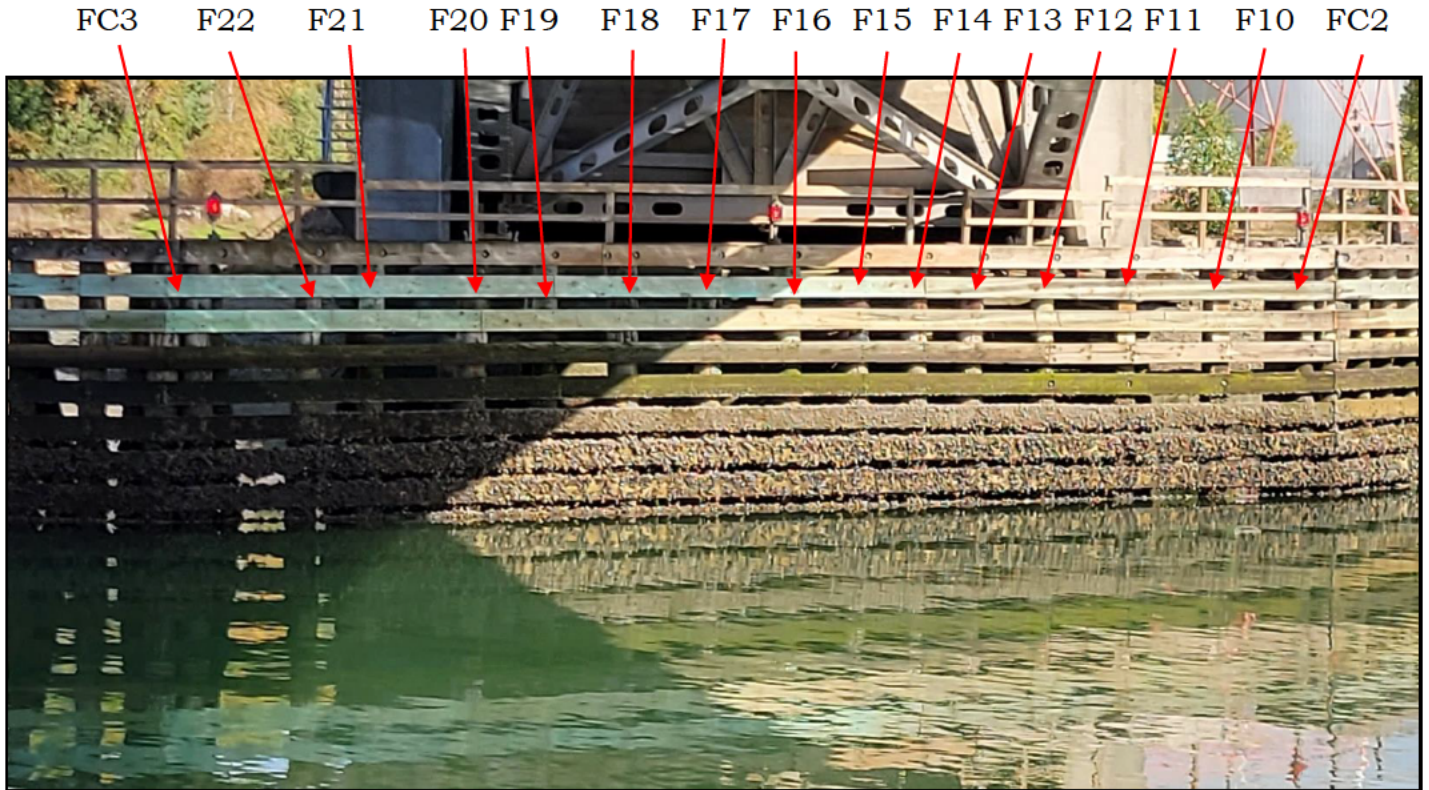
- Northern Mooring Pile Cluster No. 1 – six (6) and one (1) center pile. Subsequent to removal – estimated approximately 50% core strength loss due to core degradation and worm tracks [Photo Nos. 204-215]

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- Nos. 1-6 Fender Pile – Initially in generally satisfactory condition, except for Pile No. 6. Extensive core degradation of horizontal supports observed. Subsequent to removal, cores observed fractured, deteriorated, or hollowed out, with core loss variously estimated at 25%~50%. Fender pile No. 6 noted with core loss estimated at 80% due to rot, extending upward by 6’ from HW line. [Photograph Nos. 216-225]
- No. 7 Fender Pile – Fender pile observed with stress flowering at base of pile due to apparent internal degradation. Estimated 15% core strength loss.
- No. 8 Fender Pile – Fender pile observed broken at base above mudline. Pile visually appears rotten over 70% of base. Batter pile sheared at base – pile visually appears internally rotten with heavy Teredo worm and bore worm spores. Estimated 50% core strength loss.
- No. 9 Fender Pile – Observed with extensive core degradation. Estimated 50% ~ 75% core strength loss. [Photograph Nos. 162-165]
- Fender Cluster No. 2 – five (5) surrounding and one (1) center pile. NW pile – severed – core of bottom half of pile visually appears to be rotted out. S pile – Severed – top half visually displays heavy internal rot with Teredo worm tracks. No core strength retained in bottom section. SW pile – fractured – heavy core rot in bottom half – estimated 80% core loss in top half. SE pile – 3” deep checks on bottom along with stress pressure flowing due to internal core rot. Center pile fractured and shifted – lying on SE pile. Cluster overall estimated at up to 75% core strength loss. [Photograph Nos. 192-199]

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Center Wing Wall



Picture 3: Representative Picture of Center Wing Wall

Comments On General Observed Condition of Wing Wall. Photographs subsequent to removal of piles are referenced, where available.

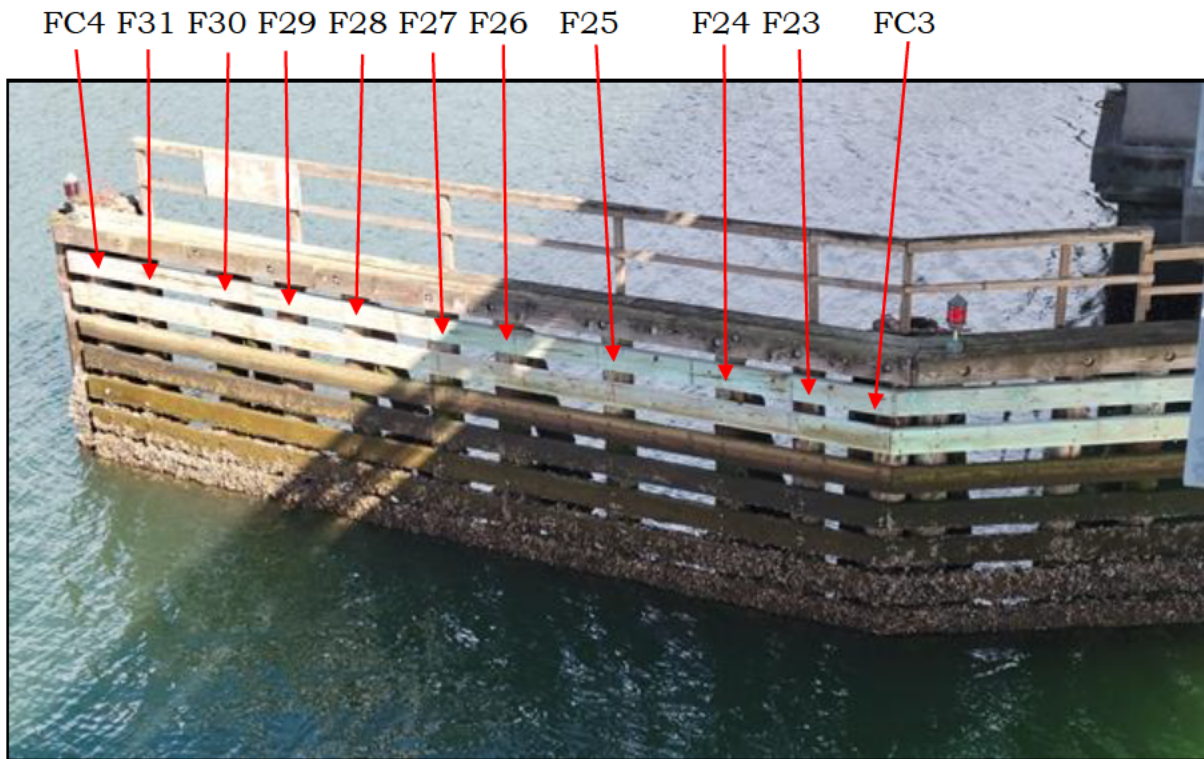
- No. 10 Fender Pile – heavy core rot was sighted above water. Heavy checking was sighted below the waterline with the mudline interface flowered out due to a rotted center core. Estimated 50% core strength loss. [Photograph Nos. 164-165]
- Nos. 11-13 Fender Piles – condition generally satisfactory. Estimated minimal core strength loss. [Photographs 166-171]
- No. 14 Fender Pile – pile severed with 19” separation between sections. Sections visually sighted as hollow with no core strength. [Photograph Nos. 172-175]

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- No. 15 Fender Pile - underwater survey originally indicated No. 15 fender pile broken and hollowed out at height of 15'. Estimated 50% ~ 75% core strength loss. [Photograph Nos. 176-177]
- Nos. 16 Fender Pile – condition generally satisfactory. Estimated minimal core strength loss. [Photographs 178-179]
- No. 17 Fender Pile – minor checking and pressure flowering. Estimate 25% core strength loss.
- No. 18 Fender Pile – generally satisfactory. Minimal core strength loss [Photograph Nos. 140-141]
- No. 19 Fender Pile – generally satisfactory, but pressure flowering observed. After removal, fracturing of surface observed. Estimate up to 25% core strength loss. [Photograph Nos. 142-143]
- No. 20 Fender Pile – set over from vertical due to fracturing below mud line. Pressure flowering observed during dive survey. Estimated up to 25% core strength loss. The batter pile completely separated at 27' with heavy core rot observed – no core strength remaining. Horizontal supports estimated up to 75% core strength loss. [Photograph Nos. 144-149]
- No. 21 Fender Pile – fractured at mudline with surface checks and stress flowering. Heavy worm tracks and interior degradation observed. Estimate 50%~75% core strength loss. [Photograph Nos. 150-151]
- No. 22 Fender Pile – sheared at mudline. Surface checking and wastage of core observed. Estimate 25% ~ 50% core strength loss. [Photograph Nos. 152-157]
- Fender Cluster No. 3 – seven (7) surrounding and one (1) center pile. NE pile – sighted as broken and with hollow core. SE pile – sighted as broken with heavy rot and Teredo worm tracks. S pile – sighted as broken with heavy rot and Teredo worm tracks. SW pile – broken at midwater at 15' height. Wood sighted as rotten and with heavy Teredo worm tracks. Pile is also severed above mudline. Remainder of pile core hollowed out. W pile – set over from vertical to north. Sighted with checking and stress flowering at mudline interface. Remainder of pile cluster not accessible. Cluster overall estimate at up to 75% core strength loss. [Photograph Nos. 182-189]

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South Wing Wall



Picture 4: Representative Picture of South Wing Wall

Comments On General Observed Condition of the South Wing Wall. Photographs subsequent to removal of piles are referenced, where available.

- No. 23 Fender Pile – initially observed with approximately 10% surface loss due to borers over full length and set over from vertical to the north. Stress flowering sighted at base at mudline interface. After removal core loss observed due to marine borers. Estimated 25%~50% core strength loss. [Photograph Nos. 158~159]
- No. 24 Fender Pile– condition generally satisfactory. Estimated minimal core strength loss. [Photograph Nos. 244-245]
- No. 25 Fender Pile – condition generally satisfactory. Observed with approximately 10% section loss. Estimated minimal core strength loss. [Photograph Nos. 122-123]

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- No. 26 Fender Pile – sighted with surface checking and pressure flowering at mudline interface. Observed leaking water on removal due to hollow sections in core. Estimated core strength loss up to 25%. [Photograph Nos. 242-243]
- No. 27. Fender Pile – top section of pile observed to be in poor condition, with the core rotten and powdery. The underwater survey originally indicated fender pile sighted with approximately 10% surface lost – remainder in visually satisfactory condition. Estimated core strength loss up to 25% [Photograph No. 128]
- No. 28 Fender Pile – condition generally satisfactory. Observed with approximately 10% section loss. Estimated minimal core strength loss. [Photograph Nos. 240-241]
- No. 29 Fender Pile – condition generally satisfactory. Observed with approximately 10% section loss. Estimated minimal core strength loss. [Photograph Nos. 238-239]
- No. 30 Fender Pile – sighted with approximately 15% surface loss due to borers. Observed leaking water on removal due to hollow sections in core. Estimated core strength loss up to 25%. [Photograph Nos. 236-237]
- No. 31 Fender Pile – condition generally satisfactory. Observed with approximately 10% section loss. Estimated minimal core strength loss. [Photograph Nos. 230-231]
- Fender Cluster No. 4 – removed in two (2) sections. Top section cut off and removed. Tops of all seven (7) clusters visually observed with extensive core deterioration. Bottom section of three (3) of seven (7) clusters with rotting observed. [Photograph Nos. 130-133]
- Bottom section – six (6) surrounding and one (1) center pile. NW pile – sighted with checking and pressure flowering at mudline interface. Estimated core strength loss up to 25%. N pile – sighted with checking and pressure flowering at mudline interface, along with heavy worm tracks. Estimated core strength loss up to 25%. NE pile – approximately 10% surface section loss. Estimated core strength loss up to 25%. Center pile – sighted with checking and pressure flowing at mudline interface. Estimated core strength loss up to 25%. S pile – at mid-pile height – tapping on pile indicates hollow section with potential full core rot and no remaining core strength. SW pile – approximately 15% surface section loss. Heavy worm tracks sighted at mudline interface. Estimated core strength loss up to 25%. Estimated core strength loss up to 35%. [Photograph Nos. 228-233]

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CONCLUSION

Based on the observations made during the recent dive survey, along with comments in the City of Tacoma’s independent survey reports of 2017 and 2022, we note the following:

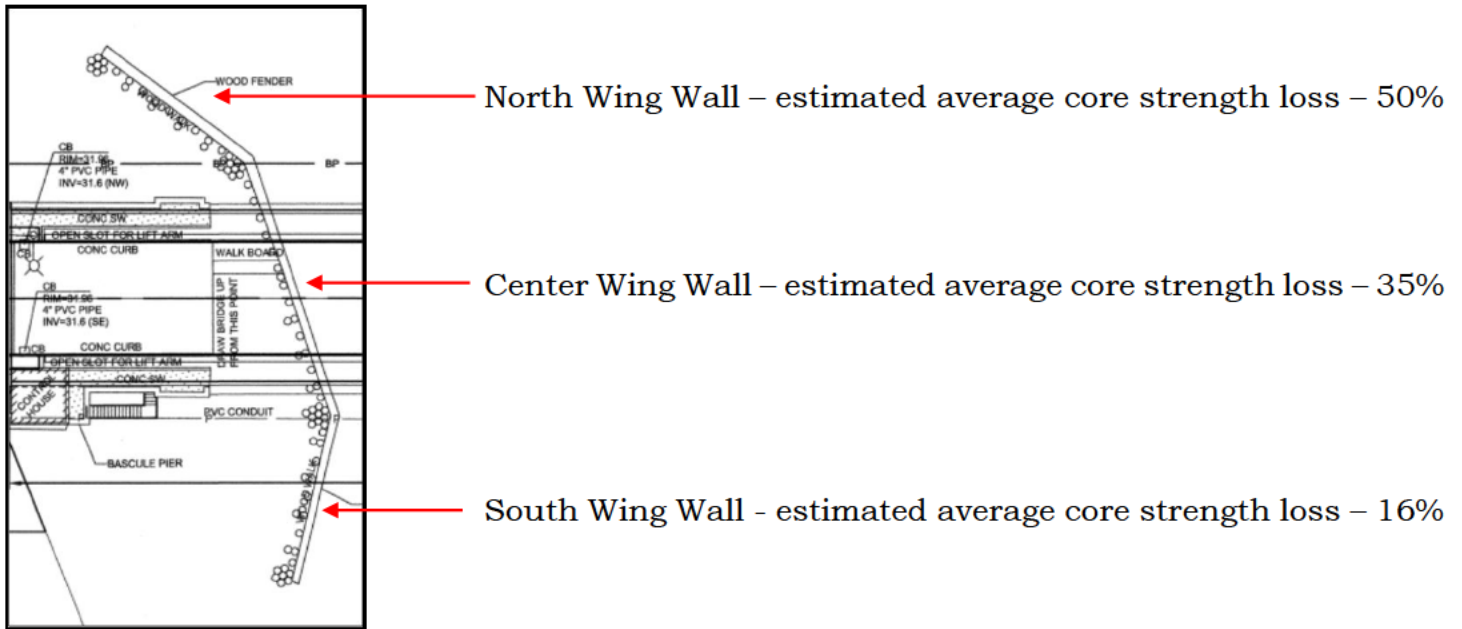
The eastern (undamaged) wood fendering, including the fender piles, batter piles, horizontal supports beams between the fender piles and the batter piles, as well as the horizontal fendering, displayed evidence of minor to major damage due to marine borer worms and general fungal degradation. Light to heavy marine growth was observed throughout the intertidal and submerged areas. Heavy degradation to various core timber sections was also observed, along with sections missing in entirety, such as lower section losses in pile Nos. 17, 25 and 27, resulting in reduced overall structural strength.

Although the fendering above the waterline can be considered as being in a generally fair condition, where sighted, the supporting structure below the waterline displays significant areas of wastage, rot, and marine worm and borer tracks.

The western (damaged) wood fendering, including the fender piles, batter piles, horizontal supports beams between the fender piles and the batter piles, as well as the horizontal fendering, also displayed evidence of minor to major damage due to marine borer worms and general fungal degradation. Light to heavy marine growth was observed throughout the intertidal and submerged areas. Heavy degradation to various core timber sections was also observed, along with sections fractured or broken in entirety, such as with pile Nos. 20, 21, and fender cluster 3 NE, SE, S and SW piles. Pressure flowering indicating loss of core strength due to internal rot, was also readily observed throughout, especially near the mudline interface. Loss of core strength is variously estimated from minimal loss; to complete loss where fender piles cores have been hollowed out in entirety, or where section had sheared prior to the incident under review.

Although the fendering above the waterline can be considered as being in a generally fair condition, where sighted, the supporting structure below the waterline displays significant areas of wastage, rot, and marine worm and borer tracks.

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Picture 2: Western Bascule: Hylebos Creek Waterway. Paving, Signing And Striping Plan 2. PWK-00297 Sheet 10 of 194

As such it is our considered opinion, based on our above comments and observations, that the timber fendering structures of both the east and west bascules are subject to an inherent loss of structural strength, and that the damage caused by the allision resulted in significantly more damage being sustained as would have been, had the fendering structure been of sufficient structural strength.

DOCUMENTS RETAINED ON FILE

Copies of the following documents are retained by us on file:

- Survey Notes
- Survey Photos
- Survey Photos Provided by Mr. David Hanshaw, Marine Operations Manager, Centerline Logistics
- Copies of Vessel Certificates
- Copy of Engine Room Logbook for date: October 12, 2023

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- Copy of Hylebos Bridge Schematic from Hylebos Bridge O&M Manual, Page 1-4, dd;. April 26, 2012
- Copy of ECDIS/Rosepoint Data For Time of Incident
- 60% Submittal - 11th Street Bridge_02-02-2024 Design sheets
- 2017 Underwater Inspection Report~~2017-10-20
- 2022 Underwater Inspection Report Echelon Engineering
- 2017 Underwater Inspection Report~~2017-10-20
- EMERG-Hylebos Bridge Fender System Replacement Pre-Con Agenda w Notes
- 12-26-23 Concept
- Submittal 005 Site Specific Safety Plan AC
- Hylebos Bridge Fender System Replacement Pre-Con Agenda
- Site Specific Safety Plan
- Hylebos Bridge Fender System - Pre-Con Meeting Invite List
- 1938 electrical
- 1938 plans shts 1-33 of 53
- 2008 shts 31-121 Structural
- 27. Hylebos Bascule Span load Rating 2010
- 2020_Hylebos_MechReport_Final
- 10670 Pacific Falcon touching Hylebos Bridge Preliminary Report
- 2012 WSDOT Underwater Inspection Report - Hylebos Bridge 13 Nov 2012~~

We trust our comments will assist.

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Field surveys were conducted by Mr. Jonathan M. Wanliss, Marine Surveyor.

We now certify that the above is correct to the best of our knowledge and belief. Survey made and report issued without prejudice.

DUNCAN SHOEMAKER & ASSOCIATES, LLC



David S. Shoemaker, Marine Surveyor



JMW/dss:

Enclosures: (245) Photographs

Attachments:

1. 2017 Underwater Inspection Report~~2017-10-20
2. Tacoma_Bridge_Report_2022_Final_extracted_pages
3. EMERG-Hylebos Bridge Fender System Replacement Pre-Con Agenda w Notes
4. 12-26-23 Concept
5. Submittal 005 Site Specific Safety Plan AC
6. Hylebos Bridge Fender System Replacement Pre-Con Agenda
7. Site Specific Safety Plan
8. Hylebos Bridge Fender System - Pre-Con Meeting Invite List