CONDITION INSPECTION OF THE SUNSHINE COAST REGIONAL DISTRICT KEATS LANDING MARINE FACILITY LOCATED AT KEATS ISLAND, BC

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Pelagic Project No. 1646

Prepared for:

Sunshine Coast Regional District

1975 Field Road
Sechelt, BC
V0N 3A1

Prepared by:

PELAGIC TECHNOLOGIES INC.

P.O. Box 2049, Sechelt, B.C.
V0N 3A0

604.885.3552 *Tel*
604.885.4333 *Fax*
info@pelagic.ca

1. INTRODUCTION

Through the week of December 14th and 21st Pelagic Technologies Inc. field technicians and WCB certified Scuba divers conducted an inspection at the Sunshine Coast Regional District's facility located at Keats Landing, on Keats Island, British Columbia as per Pelagic Proposal C-1646. Components inspected included bearing, batter and fender piles, stringers, caps, cross braces, whalers and fender chocks of the approach and wharfhead structures while mooring piles, flanges, cross ties, flotation and connection hardware were inspected as part of the timber landing float. The results are summarized in this report referencing data tables 1 through 5 attached as Appendix A.

1.1 Description of Structure

The Keats Landing Marine Facility is located on the north-west side of Keats Island facing Gibsons, BC.

The facility consists of a timber approach and Wharfhead extending in a northerly direction from shore. The south side of the Wharfhead has a steel trussed timber decked gangway accessing a single small craft float that is moored with float anchor piles.

The approach and Wharfhead are a timber-decked structure supported by timber piles, batter piles, diagonal and horizontal bracing. The approach measures 4.85m wide by 62.6m long, extending from Bent 0 (abutment) to Bent 13, and the Wharfhead measures 15.25m wide by 16.65m long, extending from Bent 14 to Bent 20.

1.2 Scope of Work

The scope of the inspection was to conduct a condition assessment of the structural components existing below the decking. This included:

- Above-water and underwater visual inspection of timber piles, diagonal and horizontal bracing.
- Visual, sounding and coring/drilling inspection of pile tops, corbels, pile caps, and stringer timbers.
- Underwater visual inspection of submerged structural float components, including flanges, flange connection blocks and hardware and flotation.

2. REPORT

Throughout this report the terms light, moderate and heavy have been used to denote cross-section losses. Light damage denotes a cross-section loss of 1% to 10%, moderate damage denotes a cross-section loss of 11% - 50% and heavy damage indicates a cross-section loss of greater than 50%.

Piles have been identified by bents, labelled sequentially from the shore (Bents 1 to 20), and rows labelled sequentially from the west (Rows A, B and C). The concrete abutment at the south end of the approach has been labelled Bent O.

There are batter piles in the Wharfhead and they have been labelled from their direction driven and then the side of the pile where they are attached. They are given the designation of "btr" within the tables. For example 20-F Wbtr S is located at Bent 20 Row F, is driven into the mudline in a westerly direction and is attached on the south side of the main bearing pile.

Diagonal bracing has been labelled by bent and row as well the compass direction designating the side of the pile they are attached to. The order they are written in designates their direction from top to bottom. For example "Cross-brace 3 C to A North" is located at Bent 3, attached at the top of Pile B and the bottom of Pile A and is on the north side of the piles.

Horizontal Bracing (whalers) has been labelled by bent and row as well as the compass direction designating the side of the pile they are attached to.

The float has four (4) flanges numbered sequentially from east to west. All layout notes and damage remarks are referenced with "0.0m" located at the north end.

3. COMPONENTS AND DIMENSIONS

3.1 Approach and Wharfhead

The decking is supported by salt-treated timber stringers and creosote-treated timber caps, diagonal bracing and bearing piles. The structure also has a concrete abutment located at the shore labeled as Bent 0.

The component dimensions are as follows (height x width):

- **Edge stringers**: ----- 285mm x 145mm
- **Stringers**: ---------- 285mm x 145mm
- **Pile caps**: ---------- 270mm x 300mm
- **Diagonal bracing**: -- 200mm x 150mm
- **Decking**:---------- 95mm x 300mm

3.2 Float

The float is positioned in a south to north alignment measuring 4.27m wide and 15.0m long. The structure consists of timber decking supported by creosote-treated timber stringers, joists, cross-ties, and flanges. The flange joins are secured with upper flange splice timbers. The flotation consists of a combination of fiberglass pontoons. There are timber risers and bull rails above the decking.

The component dimensions are as follows (height x width):

- **Bull rail:** ---------- 100mm x 155mm
- **Riser:**---------- 100mm x 155mm
- **Decking:** ---------- 38m x 292mm
- **Edge Stringer:** ---------- 190mm x 140mm
- **Cross Tie:** ---------- 292mm x 140mm
- **Joist:** ---------- 140mm x 89mm
- **Flange:** ---------- 330mm x 152mm
- **Upper Block:** ---------- 178mm x 152mm
- **Fascia:**---------- 51mm x 254mm
- **Fiberglass Pontoon:** --------- 1220mm x 2440mm x 760mm

4. RESULTS & RECOMMENDATIONS

This section contains a condition assessment of each component. Each condition assessment includes a list or reference to a table itemizing damaged components and the recommended repairs.

4.1 Approach and Wharfhead

The approach support system is generally in good condition exhibiting general low levels of weathering and abrasion throughout. A few instances of marine borer activity were identified in piles underwater but overall underwater timber bearing pile condition was good. Majority of the stringers and cap timbers were covered in lichen and algal growth with only a few localized areas of fungal damage identified in the above water components including the timber caps.

4.1.1 Stringers

The stringers were found to be in good condition with only light levels of weathering and surface algae growth. The only minor damage noted was exposed mechanical damage in the north end of a stringer at the northwest corner of the wharfhead between rows E and F.

It is recommended that a re-inspection be carried out in three (3) to five (5) years.

4.1.2 Pile Caps

The pile caps were found to be in fair condition exhibiting general low levels of weathering, abrasion and light fungal damage. Two (2) caps at Bents 1 and 6 were identified with a moderate level of fungal damage. Light mechanical damage was witnessed in the form of impact markings as a result of stray log activity. Checking was common through cap timbers, and although not critical to the structure, this feature can be used to help predict where fungal activity could become more prevalent in the future. See Table 1 for details on the pile cap condition inspection.

It is recommended to treat light fungal damage with a diffusible fungicide and replace cap timbers with moderate fungal damage within 1 to 2 years. A re-inspection should be conducted in three (3) to five (5) years.

4.1.3 Timber Piles

Timber piles include bearing, batter and fender piles. The batter piles exist at the four corners of the wharfhead while the fender piles line the east, north and west sides. Results and details of the timber pile inspection can be seen in Tables 2 (Bearing & Batter piles) and Table 4 (Fender piles).

The timber bearing piles are generally in good condition; two (2) piles were identified with heavy damage ratings while eight (8) piles exhibited moderate damage ratings. The remainder either had no damage detected and 100% ratings or light levels of marine borer activity and/or abrasion. The batter pile located at 20A (A E Btr S) was in sound condition, but the connection point to the main bearing pile at 20A had failed.

The fender piles are generally in poor condition but given that they are sacrificial timbers, they are still in serviceable condition. There are eight (8) fender piles identified with heavy damage ranging from heavy fungal decay in pile tops to extensive underwater marine borer cavities which have removed more than 50% of their cross sectional structure.

The two piles with major cavities identified should be replaced. The loose batter pile should be re-attached while other instances of marine borer activity should be monitored.

It is recommended that the piles be re-inspected in two (2) to four (4) years. However if no repairs are undertaken it is recommended the piles be re-inspected in one (1) to two (2) years.

4.1.4 Diagonal Bracing, Whalers and Fender Chocks

The diagonal bracing starts at Bent 2 and continues to Bent 13. The whalers start at Bent 1 and continue to Bent 8. See Table 5 for inspection result details with regards to diagonal bracing, whalers and fender chocks.

The cross bracing is generally in fair condition; six (6) braces were identified to replace, two (2) to re-install, and two (2) to monitor their condition. No issue was identified with the whalers.

Fender chocks were generally in fair condition exhibiting an overall moderate level of weathering and surface abrasion. Three (3) chocks were identified with moderate to heavy fungal damage and are recommended to be replaced. The remainder showed a consistent level of light fungal decay and should be monitored for continued degradation.

Fender chocks should be replaced within one year. The diagonal bracing should be replaced within one to two years and re-inspected in three (3) to five (5) years. However if no repairs are undertaken it is recommended the diagonal bracing be re-inspected, along with all components listed in section 4.1.4 within one (1) to two (2) years.

4.1.5 Davit Support Timbers

The wharfhead davit, located at the northwest corner of the wharfhead, is secured by a series of bolting timbers which are pinned to the underside of the wharfhead stringers. The deficiency and recommendation is highlighted in Table 5.

It is recommended to repair the davit securing hardware within one year.

4.2 Float

4.2.1 Edge Stringers

No damage was detected to the edge stringers.

It is recommended the edge stringers are re-inspected in two (2) to four (4) years.

4.2.2 Joists

No damage was detected to the joists. It should be noted there was limited access to the joists. Further inspection was not possible without the removal of the decking.

It is recommend that the joists be re-inspected in three (3) to five (5) years. In addition, the tops of the joists should be inspected for fungal decay during routine deck plank replacement.

4.2.3 Cross-ties

Majority of the cross ties were in good condition but it should be noted that access to the cross ties is limited without removing the decking. Cross ties which border the pile wells were the main locations where mechanical damage can influence their structure. 20% cross sectional loss was observed in cross ties at pile well A. Appropriate abrasion protection and/or pile well guards should be installed to prevent additional loss at these locations.

It is recommended the cross-ties be re-inspected in three (3) to five (5) years.

4.2.4 Flange Timbers

The float is comprised of 4 flange timbers which are generally in good condition exhibiting only light damage as a result of abrasion and marine activity. Flange 3, at 0.0m to 0.8m, has 25% cross sectional loss as a result of abrasion with mooring piles of well A.

All flange timbers should be re-inspected in three (3) to five (5) years.

4.2.5 Flange Blocks and Connection Hardware

The flange bocks are generally in fair condition with lower blocks exhibiting a higher level of damage than the upper blocks. Connection hardware has failed in a couple locations and exhibits a general condition ranging from light to moderate levels of corrosion. On Flange 2 and 3 at 9.5m, 2 of 4 connection bolts have failed and need to be replaced. The flange block of Flange 2 at 9.5m, has been gouged by the loose connection hardware.

It is recommended to replace float hardware and simultaneously add new lower connection blocks within one year. The entire structure should be monitored as the loose to failed hardware means the flange timbers are subject to serious impact from winter weather systems.

4.2.6 Flotation

The flotation is in good condition with no damage detected, and consists of nine (9) fiberglass pontoons.

It is recommended the flotation be re-inspected three (3) to five (5) years or with the next flange inspection cycle.

4.2.7 Mooring System

The float is moored ay three (3) float anchor pile dolphins, consisting of ten (10) piles in total. The piles are in good condition as five (5) new piles were recently installed. The remaining old piles exhibited general abrasion in the intertidal zone as a result of contact with the float pile well guard timbers. It should be noted that the piles have abrasion strips drilled directly into the piles and these should be monitored consistently for attachment condition.

It should also be noted that all the pile wells have rub strips with the exception of the north side of Pile Well A. At this location there is a 20% cross-section loss on the cross-tie. There are no abrasion strips installed on any of the piles.

5. RESIDUAL LIFE ESTIMATES

Residual life estimates of all components of the facility are included in this section. This is essential for planning an adequate maintenance program. These estimates are based on the following factors:

1. Creosote-treated timber components above-water can be expected to have a service life of :

    - No damage detected - six (6) to years (10).
    - Light damage - four (4) to years six (6).
    - Moderate damage – two (2) to three (3) years.
    - Heavy damage – one (1) year.

2. Creosote-treated timber components below-water can be expected to have a service life of:

    - No damage detected - four (4) to years six (6).
    - Light to moderate damage - three (3) to five (5) years.
    - Moderate damage – one (1) to two (2) years.
    - Heavy damage – replaced immediately.

3. “Salt treated” (ACZA) timber components above-water can be expected to have a service life of:

    - No damage detected - three (3) to five (5) years.
    - Light to moderate damage - two (2) to four (4) years.
    - Heavy damage – one (1) year.

4. “Salt treated” (ACZA) timber components below-water (e.g. fascia) can be expected to have a service life of:

    - No damage detected – two (2) to three (3) years.
    - Light to moderate damage - one (1) year.
    - Heavy damage – replace immediately.

NOTE: Residual life estimates are approximate as the speed and severity of fungal decay and marine borer attack can vary greatly depending on the environmental and biological conditions.

TABLE 1

RESULTS OF THE ABOVE AND BELOW-WATER INSPECTION OF THE TIMBER CAPS AT THE SUNSHINE COAST REGIONAL DISTRICT'S APPROACH AND WHARFHEAD LOCATED AT KEATS LANDING, B.C.

Timber Identification		Rating	Remarks	Recommendations
Bent	Row			
0	A to C	N/A	Concrete sill - No Damage Detected	None
1	**West to A.2**	**70%**	**Moderate fungal damage**	**Replace**
1	A.2 to C	90%	Light fungal damage	Install diffusable fungicide
2	East	90%	Light fungal damage	Install diffusable fungicide
3	A and C	90%	Light fungal damage	Install diffusable fungicide
4	A and C	90%	Light fungal damage	Install diffusable fungicide
6 Lower	**A to C**	**70%**	**Moderate fungal damage A.5 to B.7, light fungal damage on remainder of cap**	**Replace**
7	A to C	100%	Checked, No Damage Deteceted	None
8	A to C	100%	Checked, No Damage Deteceted	None
9	A to C	100%	Checked A to A.5, No Damage Deteceted	None
10	A to C	100%	Checked and wet west to A, No Damage Deteceted	None
11	West to A	90%	Light fungal damage, checked and wet	Install diffusable fungicide
11	C to East	90%	Light fungal damage	Install diffusable fungicide
17	E.9 to East	90%	Light fungal damage	Install diffusable fungicide
20	West to A	75%	Light fungal damage and 15% Cross section loss	Install diffusable fungicide

TABLE 2
RESULTS OF THE ABOVE AND BELOW-WATER INSPECTION OF THE TIMBER BEARING PILES AT THE SUNSHINE COAST REGIONAL DISTRICT'S APPROACH AND WHARFHEAD LOCATED AT KEATS LANDING, KEATS ISLAND, B.C.

Pile Identification		Rating	Remarks	Recommendations
Bent	Row			
1	A.2	100%	Concrete pile. NDD	None
1	A.9	100%	No Damage Detected	None
1	C	100%	Checked top 1.0m	None
2	A	100%	Checked top 0.9	None
2	B	100%	No Damage Detected	None
2	C	100%	No Damage Detected	None
3	A	100%	No Damage Detected	None
3	B	70%	Moderate fungal damage top 0.3m, light fungal damage from 0.3m to 0.7m	Install corbel
3	C	100%	Checked top 1.2m, pile banded at top	None
4	A	100%	No Damage Detected	None
4	B	70%	20% marine borer cavity and 10% marine borer cavity in open bolt hole at footing, Moderate fungal damage top 0.9m	Replace
4	C	95%	5% mechanical abrasion at 6.1m and 3 open bolt holes at 6.0m	Monitor
5	A	100%	No Damage Detected	None
5	B	90%	10% marine borer cavity at 6.0m	Monitor
5	C	90%	Light fungal damage at 0.3m, 2 open bolt hole at 6.0m	Monitor
6	**A**	**40%**	**60% marine borer cavity at 5.0m**	**Replace**
6	B	80%	20% abrasion top 4.0m	Monitor
6	C	100%	Open bolt hole at 6.0m	None
7	A	100%	No Damage Detected	None
	B	100%	No Damage Detected	None
	C	100%	No Damage Detected	None
8	A	100%	No Damage Detected	None
	B	100%	No Damage Detected	None
	C	100%	No Damage Detected	None
9	A	100%	No Damage Detected	None
	B	100%	No Damage Detected	None
	C	100%	No Damage Detected	None

TABLE 2
RESULTS OF THE ABOVE AND BELOW-WATER INSPECTION OF THE TIMBER BEARING PILES AT THE SUNSHINE COAST REGIONAL DISTRICT'S APPROACH AND WHARFHEAD LOCATED AT KEATS LANDING, KEATS ISLAND, B.C.

Pile Identification		Rating	Remarks	Recommendations
Bent	Row			
10	A	100%	No Damage Detected	None
	B	100%	No Damage Detected	None
	C	100%	No Damage Detected	None
11	A	100%	No Damage Detected	None
11	B	100%	No Damage Detected	None
11	C	100%	No Damage Detected	None
12	A	100%	No Damage Detected	None
12	B	100%	No Damage Detected	None
12	C	100%	No Damage Detected	None
13	A	100%	No Damage Detected	None
13	B	100%	No Damage Detected	None
13	C	100%	.open bolt hole at 4.6m	None
14	A	90%	10% abrasion in intertidal zone	Monitor
14	A EBtr N	100%	No Damage Detected	None
14	A NBtr E	100%	Missing aluminum hat	None
14	**B**	**45%**	**45% marine borer cavity in 10% abrasion at 1.8m to 3.6m**	**Replace**
14	C	100%	No Damage Detected	None
14	D	100%	Checked top 0.6m	None
14	E	100%	No Damage Detected	None
14	F	95%	5% marine borer cavity at mudline, 2 open bolt holes at 3.5m	Monitor
14	F WBtr N	100%	No Damage Detected	None
14	F N Btr W	100%	No Damage Detected	None
15	A	95%	Bankia attack in knots from 7.0m to mudline	Monitor
15	A.9	95%	5% Marine borer cavity from 6.0m to 4.9m, Bankia attack from 7.3m to 8.2m	Monitor
15	B	88%	Bankia attack in knots from 5.8m to mudline, chainsaw cut at top	Monitor
15	C	95%	Bankia attack in knots at mudline, Checked top 1.8m	Monitor
15	D	75%	25% marine borer cavity at 4.2m, 5% marine borer cavity at 5.5m	Install pile wrap
15	D.9	75%	25% marine borer cavity at 4.2m, 5% marine borer cavity at 5.5m	Monitor
15	E	0%	Derelict bearing pile used for diagonal bracing (15F to EN, 14E to 15E west)	None

TABLE 2
RESULTS OF THE ABOVE AND BELOW-WATER INSPECTION OF THE TIMBER BEARING PILES AT THE SUNSHINE COAST REGIONAL DISTRICT'S APPROACH AND WHARFHEAD LOCATED AT KEATS LANDING, KEATS ISLAND, B.C.

Pile Identification		Rating	Remarks	Recommendations
Bent	Row			
15	F	95%	5% marine borer cavity at 6.3m	Install pile wrap
16	A	100%	No Damage Detected	None
16	B	95%	5% Limnoria attack from 3.0m to mudline	Monitor
16	C	97%	Multiple 3% marine borer cavities from 1.8m to mudline, 10% shake repaired with collar	Monitor
16	D	90%	10% abrasion top 4.0m	Monitor
16	E	90%	10% marine borer cavity at 8.0m	Install pile wrap
16	F	100%	No Damage Detected	None
17	A	100%	No Damage Detected	None
17	B	100%	No Damage Detected	None
17	C	95%	Multiple 3% marine borer cavities from 8.2m to mudline	Monitor
17	D	100%	No Damage Detected	None
17	E	95%	Multiple 3% marine borer cavities from 7.6m to mudline, 2% shake top 0.3m	Monitor
17	F	75%	25% marine borer cavity at 9.3m, Bankia attack in 10% marine borer cavity at mudline	Install pile wrap
18	A.2	90%	Bankia attack in knots from 9.7 to mudline	Monitor
18	B	100%	No Damage Detected	None
18	C	100%	No Damage Detected	None
18	D	95%	5% abrasion intertidal zone	Monitor
18	E	100%	No Damage Detected	None
18	F	100%	No Damage Detected	None
19	A	85%	5% Limnoria from 7.6m to mudline, multiple 5% Bankia attack from 3.4m to mudline	Monitor
19	A.9	90%	Bankia attack in knots from 8.2m to mudline	Monitor
19	B.9	95%	Multiple 3% marine borer cavities from 7.0m to mudline, Bankia attack in knots at mudline	Monitor
19	D	100%	No Damage Detected	None
19	E	95%	5% marine borer cavity at mudline, 5% marine borer cavity at 5.9m	Monitor

TABLE 2
RESULTS OF THE ABOVE AND BELOW-WATER INSPECTION OF THE TIMBER BEARING PILES AT THE SUNSHINE COAST REGIONAL DISTRICT'S APPROACH AND WHARFHEAD LOCATED AT KEATS LANDING, KEATS ISLAND, B.C.

Pile Identification		Rating	Remarks	Recommendations
Bent	Row			
19	F	95%	Bankia attack in knots at mudline. Partially bearing 40%	Install shim
20	A	100%	No Damage Detected	None
20	A SBtr E	97%	3% Limnoria at mudline	
20	**A E Btr S**	**97%**	**Pile not attached at A, 3% Limnoria at mudline, 2% abrasion top 0.6m**	**Reattach**
20	A.9	100%	No Damage Detected	None
20	C	100%	No Damage Detected	None
20	D	97%	3% limnoria attack from 11.2m to mudline	
20	E	100%	No Damage Detected	None
20	F	100%	No Damage Detected	None
20	F SBtr W	100%	No Damage Detected	None
20	F WBtr S	100%	Missing aluminum hat	None

TABLE 3

RESULTS OF THE ABOVE AND BELOW-WATER INSPECTION OF THE FLOAT ANCHOR PILES AT THE SUNSHINE COAST REGIONAL DISTRICT'S MARINE FACILITY AT KEATS LANDING, B.C.

Pile Identification		Rating	Remarks	Recommendations
Group	Number			
A	1	85%	15% abrasion in intertidal zone	None
A	2	90%	10% abrasion in intertidal zone	None
A	3	100%	No abrasion protection present. No Damage Detected	None
B	1	90%	10% abrasion in intertidal zone. No abrasion protection present	None
B	2	88%	12% abrasion in intertidal zone	None
B	3	100%	No Damage Detected to pile. South well liner timber loose.	Tighten Guard
C	1	100%	No Damage Detected	None
C	2	100%	No Damage Detected	None
C	3	95%	5% abrasion in intertidal zone	None
C	4	90%	10% abrasion in intertidal zone. UHMW abrasion protection loose on west side of pile well	Reattach UHMW Strip

TABLE 4

RESULTS OF THE ABOVE AND BELOW-WATER INSPECTION OF THE FENDER PILES AT THE SUNSHINE COAST REGIONAL DISTRICT'S WHARFHEAD LOCATED AT KEATS LANDING, B.C.

Pile Identification		Rating	Remarks	Recommendations
Bent	Row			
14	**A**	**50%**	**Heavy fungal damage top 0.7m**	**Replace when failed**
14	F	90%	10% shake top 1.2m	Monitor
15	**A**	**50%**	**Heavy fungal damage top 0.6m**	**Replace when failed**
15	**F**	**50%**	**Heavy fungal damage top 1.8m**	**Replace when failed**
16	A	80%	Split top 1.0m with 20% cross section loss	Monitor
16	**F**	**50%**	**Heavy fungal damage top 0.9m**	**Replace when failed**
17	A	90%	Light fungal damage top 0.5m	Monitor
17	**F**	**50%**	**Heavy fungal damage top 1.5m**	**Replace when failed**
18	A	70%	Moderate fungal damage top 0.6m	
18	F	100%	No damage detected	Monitor
19	A	100%	No damage detected	Monitor
19	F	70%	Moderate fungal damage top 0.6m	**Replace when failed**
20	A west	100%	No damage detected	Monitor
20	**A north**	**50%**	**Heavy fungal damage top 2.0m**	**Replace when failed**
20	B	95%	No damage detected	Monitor
20	C	90%	Split top 2.4m	Monitor
20	D	85%	15% abrasion in intertidal zone	Monitor
20	**E**	**20%**	**80% Marine borer cavity from 1.5 to 6.1m, heavy fungal damage top 1.6m**	**Replace**
20	**F north**	**50%**	**Heavy fungal damage top 1.5m**	**Replace when failed**
20	F east	100%	No damage detected	Monitor

TABLE 5

LIST OF DAMAGED CROSS BRACING, WALERS, FENDER CHOCKS AND DAVIT ANCHOR TIMBERS AT THE SUNSHINE COAST REGIONAL DISTRICT'S KEATS LANDING, B.C.

Note: Only damaged timbers are mentioned in table below.
Note: Cross bracing follows same pattern from Bent 2 to Bent 13 (A - C north, C - A south).

Identification			Diagonal Bracing	
Bent/Row to Bent/Row		Side	Remarks	Recommendations
6A	6C	NORTH	Heavy marine borer damage at C	**Replace**
8C	8A	SOUTH	Heavy marine borer damage at A	**Replace**
9A	9C	NORTH	Light marine borer damage at C	Monitor
11A	11C	NORTH	Moderate marine borer damage at C	**Replace**
11C	11A	SOUTH	Heavy marine borer damage at A	**Replace**
12A	12C	NORTH	Light marine borer damage at C	Monitor
12C	12A	SOUTH	Heavy marine borer damage at A	**Replace**
13A	13C	NORTH	Missing	**Replace**
14E	15E	EAST	Attached to derelict pile, move to bearing pile 15 D.9	**Reinstall**
15E	15F	NORTH	Attached to derelict pile, move to bearing pile 15 D.9	**Reinstall**

Note: All walers are in good condition

Identification			Fender Chocks	
Bent/Row to Bent/Row		Side	Remarks	Recommendations
14	15	WEST	Light fungal damage	Monitor
15	16	WEST	Moderate fungal damage	**Replace**
17	18	WEST	Moderate fungal damage	**Replace**
17	18	EAST	Light fungal damage	Monitor
19	20	EAST	Light fungal damage	Monitor
20 A	20 B	NORTH	Light fungal damage and 20% shake	Monitor
20 B	20 C	NORTH	Light fungal damage	Monitor
20 C	20 D	NORTH	Light fungal damage	Monitor
20 D	20 E	NORTH	Light fungal damage	Monitor
20 E	20 F	NORTH	Heavy fungal damage	**Replace**

Identification	Side	Davit Anchor Timbers Remarks	Recommendations
North anchor timbers	North	6" x 6" timber has 20% shake and timber is loose	Replace timber and re-bolt davit