



# **Routine Thrice-yearly Inspection Report #8**

## **Keats Landing Keats Island, BC**

Date on Site: May 31st 2022  
Report Submitted: July 18, 2022

### **SUBMITTED TO:**

#### **Sunshine Coast Regional District**

1975 Field Road  
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### **SUBMITTED BY:**

#### **Summerhill Fine Homes Inc.**

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## **1. INTRODUCTION**

On May 31st, 2022 Summerhill Fine Homes (SFH) attended the Keats Landing Marine Facility located on Keats Island, B.C. to complete a thrice-yearly inspection and maintenance visit under General Service Contract #18 354 with the Sunshine Coast Regional District (SCRD). The inspectors were Jake Stanley & Charlie Durrant. The site was visually inspected for any signs of deficiency or apparent public safety risk. The observations, actions and recommendations documented in this report are intended for the use of SCR D staff to prioritize and plan future maintenance activities and capital upgrades.

### **1.1. Description of Structure**

The Keats Landing Marine Facility is located on Keats Island, in Howe Sound, B.C.

The facility consists of a timber approach and large wharfhead with timber decking extending in a western direction from shore. A metal service shed and derrick is located on the northwest corner of the wharfhead. From the northeast side of the wharfhead there is a gangway accessing a float that is retrained by mooring piles in pile wells.

### **1.2. Scope of Work**

The scope of the inspection included conducting a visual assessment of all the structural and non-structural components of the port above the waterline at the time of inspection. Additional work completed as documented in Section 3 of this report based on SCR D Change Directive and safety issues observed while on site.

### **1.3. Limitations**

Summerhill strives to ensure the completeness and accuracy of this report within the limitations of a visual inspection. This report is not however intended to provide assessment of the structural integrity or assurance of the public safety of the port location. Refer to engineering reports for further information regarding structural condition assessment.

## **2. REPORT**

### **2.1. Approach & Wharf Head**

#### **2.1.1. Railings**

The railings are comprised of dimensional painted wood railings and mid-level guards supported by painted 89x89 wood posts which are bolted through the outside stringers and curb rails.

Observations:

- The railing is generally in reasonable condition, although handrails are starting to show signs of wear.

### 2.1.2. Deck

The decking is comprised of treated wood decking and large 292x152 stringers supported by 272x305 pile caps, and timber bearing piles.

Observations: Generally in good condition. Deficiencies noted below:

- (from Previous Inspection) Some large gaps 1"+ between boards and uneven deck surface. (continue to monitor)



- The wharf head still requires pressure washing at the next opportunity when there are fewer cars on deck. Approved, deferred due to time limitations.
- Rains are continuing to bring sediment onto the approach, the temporary ditch was deepened to promote better drainage. All vegetation and a larger trench dug on the uphill side will extend the life of the wharf significantly. Recommend adding trench drain at the approach entry.



### 2.1.3. **Bullrails/Curb Rails**

The bullrails/curb rails are treated timber bolted through the timber decking installed on riser blocks.

Observations: Generally in good condition. Deficiencies noted below:

- (From previous inspection April 2019) Red and yellow caution paint requires touchups on Wharfhead curb rail. (Deferred)
- 2 Aluminum top caps were replaced during round 8



#### **2.1.4. Bents (Piles, Pile Caps, Stringers, Cross Braces)**

Timber bearing piles and one (1) concrete piles at Bent 1 Row A; Timber piles caps 272x305 bearing above timber piles and one (1) concrete pile.

Timber cross braces 152x203 generally bolted through the top and bottom of the timber piles in Row A & C and bolted through Piles in Row B at mid-span along the approach. 2 braces per Bent in opposing directions. Lateral braces bolted through adjacent Bents near the bottom of piles located between bents 4-7. Wharfhead corner braces installed at each corner in two directions.

Observations: Deficiencies noted below:

Several pile footings (see locations below) are showing significant wear and are undercut, should be reviewed by an engineer.

- **Bent 2** (From Previous inspection January 2021) is a small diameter pile and footings are getting undermined. Recommended to have Herold Engineering review
- **Bent 3** Pile 3A need new bolt on Cross brace
- **Bent 4** (From Previous Inspection May 2021) Piles 4B concrete footing is showing significant deterioration. Almost half missing. Also loose bolt on lateral brace.
  - Herold Engineering to review photo below and advise on remediation.
  - Tighten lateral brace bolts



- **Bent 5** (From previous inspection September 2019) Piles @ Bent 5 installed on concrete footings which are showing deterioration (30% failed on 5A) and possible movement. Loose bolt on Lateral Brace and cross brace similar to Bent 4
  - Herald Engineering to review photos and advise on remediation for footings
  - Tighten lateral brace bolts



- **Bent 6** Pile 6A rotting, multiple holes in Pile. Lower 6C needs new bolt. 30% of crossbrace has failed

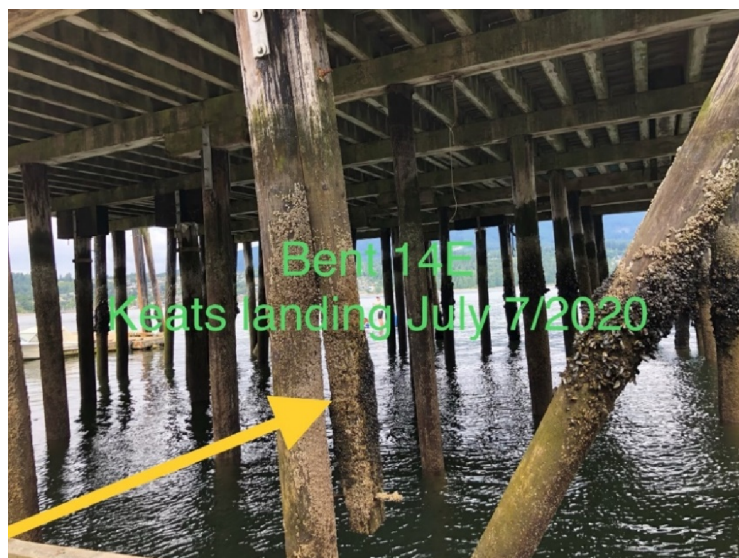


- **Bent 7** Needs New Bolt on crossbrace.

Spray paint applied on site to damage, indicates bolts that need replacing.



- **Bent 9** (From Previous Inspection May 2021) Pile 9B has a rusting bolt.
  - Monitor at future inspections
- **Bent 10** 10B Bolt rusting. Bolt on 10 B needs new bolt, 10A will need replacing soon also.
- **Bent 11** 11C lower cross brace bolt needs replacing
- **Bent 12. Lower Cross brace has failed (12A lower Bolt failed),** 12B mid cross brace bolt failed. 2' Tide needed when replacing bolts.
- **Bent 13** Appears to have broken cross brace or bolt
  - Inspect and create action plan during next inspection, low tide required
- **Bent 14** (From previous Inspection May 2021) Broken cross brace with slight damage to fender pile and rusted bolt. (Mid-low tide removal recommended)
  - Consult with Herold Engineering to confirm if brace is required.



- **Bent 15** Monitor rot in Pile 15D

- (From Previous Inspection) Wharfhead corner brace batter pile at Bent 15 between Row E & F appears to be loose at the bottom.
- Dive inspection recommended to determine underwater condition of batter piles. Engineer to review and advise on findings
- Cracks in upper Pile 15C. (Banded during round 7)



- **Bent 16** (From Previous Inspection May 2021) Pile 16d worn 2", monitor at future inspections.

#### **2.1.5. Lighting**

Three light posts, located at Bents 1,6 and 14

Observations: Deficiencies noted below:

- Recommend replacing light fixtures with LED as to be installed at Gambier
- Only 1/3 of light operational.

### **2.1.6. Shed**

Metal service shed located on northwest corner of the Wharf Head

Observations: Deficiencies noted below:

- (From previous inspection April 2019) Metal wall cladding and fascia trim showing some signs of wear and damage, but generally in serviceable condition.
- Graffiti on Shed. Recommend either pressure wash or repainting shed.

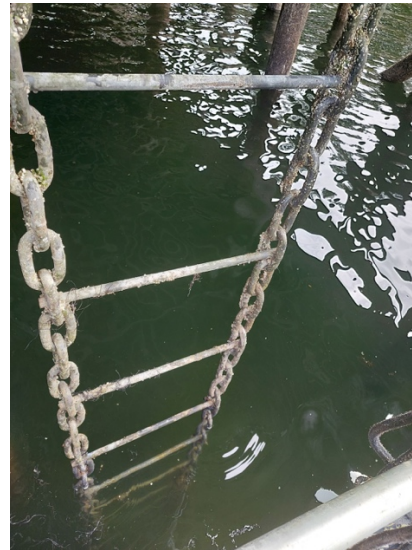


### **2.1.7. Ladder**

Metal ladder secured at the top and bottom located at the end of wharfhead and one on the end of the float.

Observations: Generally in acceptable condition.

- (From Previous Inspection May 2021) Eyebolts beginning to rust. (Monitor)
- Ladder was cleaned during inspection round 8



#### **2.1.8. Derrick**

Derrick crane locate in the northwest corner of the wharfhead

Observations: Generally in good condition.

- No derrick handle on site. Summerhill has replacement in our office, advise if it should be delivered to site or to the SCRD

#### **2.1.9. Signage**

Observations:

- Temporary moorage rules signage installed. Permanent signage required.
- Checklist for signage required from SCRD

### **2.2. Gangways**

The gangway accessing the concrete float is located at the southeast corner of the wharfhead and is aligned parallel to the approach

#### **2.2.1. Railings**

The gangway railings and frame are trusses comprised of welded steel angles and flat stock

Observations:

- (From Previous Inspection May 2021) Generally, in reasonable condition, photos show some rust below, possibly undermining structural integrity. Recommend consulting with Herold Engineering, and/or discuss upgrades soon.



#### **2.2.2. Deck**

The decking is comprised of timber planks installed to the metal gangway frame

Observations: Generally, in good condition

#### **2.2.3. Hinge and Wheels**

Steel hinge connection top, steel roller on bottom on timber float deck and retained by steel angle

Observations: Deficiencies noted below:

- Top Hinge to be inspected by engineer

### **2.3. Floats**

There is a float with a timber deck with 3 pile wells accessed by the gangway

#### **2.3.1. Deck Condition**

Deck boards are 38x305 and are generally worn and showing deterioration

Observations: Deck in acceptable condition, except for float sinking.

- (From Previous Inspection May 2021) Improvements to Float from dive remediation work completed in May. Freeboard went from 3" to 14". The float still requires close monitoring, and ideally replacement.

#### **2.3.2. Bullrail and Cleats**

Bullrails are 89x140 timber on risers bolted through to stringers

Observations: Deficiencies noted below:

- (From previous inspection April 2019) Bullrails are loose in numerous locations.
  - Monitor at future inspection

### **2.3.3. Pile Wells, Mooring Piles and Wear Strips**

3 pile wells on the float, each containing mooring pile groups tied together by steel wires at the top.

Observations: Deficiencies noted below:

- (From previous inspection April 2019) Pile well/pile plastic wear strips missing or significantly worn out in all 3 pile wells. Recommend replacement in numerous locations.
- South west corner missing 30"
  - Deferred, calm weather required. (Some Section's will require dive crew)
- Pile wear strips could be 3-4' longer

### **2.3.4. Flotation**

Observations: Deficiencies noted below:

- This float needs attention and or replacing. The float is sagging significantly in the middle towards north west side. We pumped all 3 billets in sagged location to discover the Western most billet has a significant hole in it and needs replacing. Deckboards that need to be removed to access billets were spraypainted for referencing.



West side of float, fiberglass billet failed. Not repairable



West side of float, fiberglass billet failed. Not repairable

#### **2.3.5. Anti-skid**

Observations:

- Generally, in fair condition.

#### **2.3.6. Signage**

Observations: Deficiencies noted below:

- (From Previous Inspection May 2021) Main signage is due for replacement, awaiting signs.
- Temporary signage functional.

#### **2.3.7. Ladder**

Float ladder was cleaned during Inspection Round 8



### 3. CONCLUSION

Based on our visual inspection approach and wharf head are generally in good condition with the exception of substructure which requires work in order to keep dock open. Eventual upgrades or replacement of the gangway is recommended (sandblast, paint as a minimum). The float has one billet that requires replacing and others that may have slow leaks.

Herold Engineering to review and advise on the existing condition of the pile footings at Bents 3,4 & 5 as noted in this report and the loose lateral cross brace located at pile 14E. Gangway condition is deteriorated, consider upgrade options. Pile well wear strips require attention, unless entire float is to be replaced.

#### 3.1 Work Update per Approved Change Orders:

<i>Work Item</i>	<i>Description</i>	<i>SCRD Contract Category</i>	<i>Status</i>
<b>Change Directive 01</b>			
K11	Replaced 2 Pile Caps on Wharfhead	Minor Repairs	Completed May 2022

#### 3.2 Additional work completed on site to be billed T&M:

<i>Work Item</i>	<i>Description</i>	<i>SCRD Contract Category</i>	<i>Status</i>
	Pumped out billets, discovered one broken billet.	Safety	Completed May 2022

#### 3.3 Recommended work for future visits:

<i>Work Item</i>	<i>Description</i>	<i>SCRD Contract Category</i>	<i>Status</i>
K13	Review Pile footing upgrade with engineer		
K14	Bolt replacement 10A&B, 12A, 13		
K15	Shed to be upgraded, or paint over graffiti.		
K16	Consider upgrade options for the gangway and hinges		
K17	Replace one fiberglass billet on float which has failed beyond repair		
K18	New transition ramp at the bottom of gangway		
K19	Consider drainage ditch at approach entry to reduce debris flow		

Note: New items highlighted in yellow