

KUPREANOF LANDING

1. INTRODUCTION

Presently a State of Alaska asset, managed by the Alaska Department of Transportation and Public Facilities (ADOT&PF), Kupreanof Landing is a long approach, gangway and floating dock facility serving small transient watercraft. A well-used facility, Kupreanof Landing provides local residents and visitors, alike access to this area north of, and across the strait from the town of Petersburg, proper.

It is anticipated that this facility, and the underlying land will eventually become the property of the Petersburg Borough.

a. History

Originally constructed c.1961 by the State of Alaska Department of Public Works, Division of Water and Harbors, Kupreanof Landing was originally designated the West Petersburg Approach and Floats Project No. W6216.

In 1971, the Kupreanof Landing floats saw a significant repair effort, with several sill members and flotation billets being replaced in the process.

In 1980, Kupreanof Landing an even more comprehensive repair and upgrade effort was undertaken by the Division, this time under the West Petersburg Float Repair Project No. K30154. During this project the timber floats were again repaired, flotation units were replaced, and new steel internal pile collars and other appurtenances were installed. At the approach trestle, the decking was replaced with new 2x10 (nominal) material, new handrail, handrail posts and girts were installed, and new cross-bracing was installed between bents 3 and 4. Perhaps most significant of all, the existing bowstring type timber gangway was replaced with a new steel gangway.

In August 2011 an underwater and topside inspection was made of the existing piles, under ADOT&PF Project No. 80803/BR-NBIS (65) and Project No. 80801/BR-NBIS (64).

Some work appears to have been completed since the last repair project, but for which we do not presently have documentation. At the approach trestle, an additional continuous guard rail appears to have been added to each side. Also, at the floats at least two (2) timber guide piles have been replaced with steel pipe guide piles.

b. Description

The following paragraphs are intended to provide a general, overall description of the construction of the existing facility components observed at Kupreanof Landing.

Approach:

The approach to the Kupreanof Landing float is a timber trestle constructed of sixteen (16) – two- pile bents at 17' o.c., constructed of 10" (nominal) dia. timber pile, with 10x10 (nominal) timber pile caps, supporting two (2) 3x10 (nominal) interior timber stringers, and 6x10 (nominal) exterior stringers, overlain with a 6'-0" wide walking surface of 2x12 (nominal) timber decking.

Cross-bracing between bent piles is single tier 3x8 (nominal), with the last two bent spaces braced in the longitudinal direction of trestle, on each side, as well. 4x4 (nominal) posts, 4'-4" long (from bottom of stringer) at 8'-0" centers support a 2x4 (nominal) girt with a 2x6 (nominal) hand rail in the flat position. Two (2) - intermediate 2x6 (nominal) girt rails extend continuously on each side of the trestle. The top of the higher of these railings is approximately 16" below the bottom of the handrail girt. The lower girt is approximately centered between the middle girt and the decking below. No continuous toe or kicker plate, or wheel guard is present.

Gangway:

The gangway is an nominally 6' wide by 50' long steel open framed truss type, with 1-1/2" nom. dia. pipe top chord, a C6x10.5 channel bottom chord, and a 1-1/4" nom. dia. pipe web in a basic Howe configuration. Two (2) - 1x4 (nominal) timber girts extend continuous along each side, at roughly equal spacing between deck and top chord. The gangway is decked along half its width with welded steel grating with long, open, raised serrations perpendicular to the direction of travel. The decking is a single module wide. L3x3x3/16 tread angles laid corner up at 16" o.c. are attached to the welded grating. The other half of the gangway width is decked with 2x12 (nominal) lumber, secured with carriage bolts.

At the top end of the gangway, the bottom chord channel is hinged-connected to the end of the approach trestle with a link assembly. A hinged, radiused, smooth grating transition plate provides access from gangway to trestle deck. At the bottom end of the gangway, the bottom flange of the channel is filleted to a radius, and slides inside a pair of guide angles mounted to the float. A hinged, flat, smooth grating transition plate from gangway to float deck.

Float:

The main float is a nominal 10' wide by 95' long timber float with rows of four (4) - 10" thick x 20" wide x 9'-2" long polystyrene planks, grouped at approximately 12'-0" o.c. The planks support 6x6 (nominal) top sills at 6'-0" o.c. The top sills are bolted through the planks to 3x6 (nominal) bottom sills. The floatation planks are bounded on the outboard edges with 2x10 (nominal) siding.

The top sill framing supports two (2) - 4x6 (nominal) interior stringers and 6x8 (nominal) flatwise exterior stringers, which are overlain with 2x12 (nominal) decking. The outboard faces of the float framing are protected by 2x12 (nominal) bumper boards, and an 8x8 (nominal) tie-off rail on 3x8 (nominal) blocking is provided along all outboard edges of the float.

The gangway float is a nominal 10' wide by 47' long timber float, positioned perpendicular to, and approximately centered on the main float. It is of substantially similar construction.

The main float is held on station by four (3) - 12" (average) dia. timber guide piles and one (1) steel pipe pile along the shoreward edge of the float; two on either side of the gangway float. One of the outer guide piles is laterally supported from the top by two additional timber piles which batter toward shore. The inner guide piles and the other outer pile are laterally unsupported at the top.

The landward end of the gangway float is held on station by one timber guide pile and one steel pipe guide pile, both situated on the same side of the float, the prior in the seaward position, and the latter in the landward position. The top of these guide piles are laterally unsupported.

2. DETAILED ASSESSMENT

Approaches, Gangways:

The timber approach (Photo 2) is in fair condition, with several issues requiring attention. The deck is in good shape, and is reportedly power washed annually. The handrails appear to be newer construction, but show a fair amount of movement / deflection when leaned on. It is unlikely these handrails could safely support more than 1 or 2 people per post spacing. Cracks were noticed in the handrail posts at most connections to the stringer (Photo 4).

The stringers and pile caps appear to be in mostly good shape (Photo 3). Some of the pile caps have vertical cracks up to ¼" wide through their centers (Photo 6). The stringers are largely protected from the elements and appear to be in good condition. The 3rd pile bent from shore is leaning at approximately 10 degrees from vertical, towards the water.

The timber bearing piles appear to be in good condition at first, however multiple piles were found to have hollow areas near the MLLW (0') water line (Photo 5). Only several of these locations were inspected in detail due to tide levels. In 2 cases, over 50% of the cross section was void. A 2011 Underwater inspection report, commissioned by the State of Alaska, found 12 of the approach piles to have large splits, hollow areas, or softness in the intertidal zone. The above referenced underwater inspection report was prepared for ADOT&PF Bridge Section, Project # 80803/BR-NBIS(65) & 80801/BR-NBIS(64)

It is recommended that the soft and hollow piling be repaired or replaced. Given the age, condition, and location of the structure, a total in kind replacement may be a better long term solution than repairing only the damaged piling.

The steel gangway is in good condition (Photo 7), with only minor locations of coating loss and surface rust. The gangway is approximately 50' long, making it very steep at low tides, and not suitable for ADA access. It is recommended that the gangway be replaced with an 80' ADA accessible unit, as part of any significant rehabilitation to the approach structure or floating dock.

Timber Float:

The timber float is in fair to poor condition, and it appears to be nearing its useful life. The float lists on the order of 5" to the West (Photo 8). The decking is mostly in fair condition with many boards being weathered, but all appear sound. There is light vegetation between the boards, which should be pressure washed or mechanically removed.

The bullrail shows heavy wear and weathering (Photo 12), but appears mostly structurally sound. One location of significant structural rot and damage was observed where the main float intersects the gangway landing float, to the south (Photo 9). This section of bullrail should be replaced.

Corrosion in the form of surface rust is evident on many of the fasteners, though they appear to retain most of their sections. The hinge pins between the gangway float and the main float are heavily corroded and worn (Photo 10). They should be replaced. Failure of the hinge(s) will allow differential movement between the two float systems, but each float section is still secured in place with guide piling.

The flotation on the southeast corner of the float is heavily damaged. It appears outermost sill was split and the flotation is has been displaced (Photo 11). This type of damage can be anticipated at more locations, as some of the other sills appear rotted and split.

The existing timber and steel piling appear to be in good condition from the topside, though the southern – middle pile has a slight lean. A review of the 2011 underwater inspection report shows the guide piling are not in good shape, as observed from the topside. The underwater inspection report reveals heavy corrosion below the waterline on the steel piling, and no anodes. Two of the timber guide piling were found to be hollow near the mudline, and two of the piling had no damage noted. All of the guide piling should be replaced as part of a float replacement project.

It is recommended that the float be replaced with a heavy duty concrete, timber, or steel pontoon unit. The location is exposed, and heavy currents likely bring ice and other debris in contact with this float. The float does not appear to be on the verge of breaking loose, but it has reached its useful life. Without repair or replacement, it is not expected to be safely useable beyond the next 5 years. The float guide piling represent a serious issue if they continue to decay and corrode. These piling should be replaced.

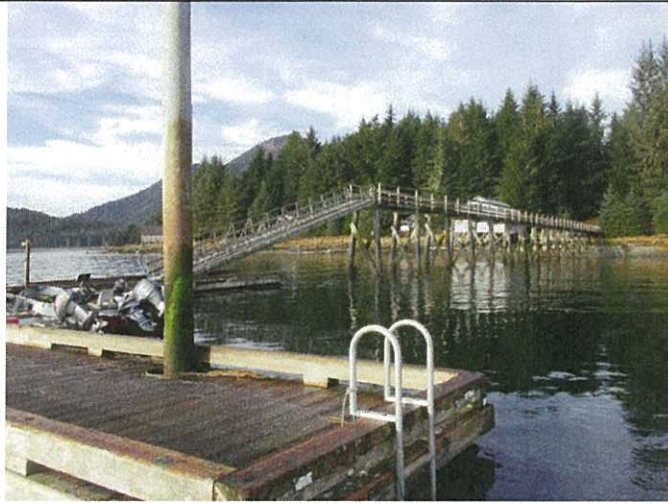
A renovation/replacement project at this location should include safety features such as life rings, fire extinguishers, and safety ladders, and an accessible gangway at a minimum.

The float reportedly grounds at negative tides. Soundings show the west end of the gangway float is at approximately -1' elevation (MLLW) and the NW and SW corners of the float are at -2 and -3 respectively. This shows that the more protected shoreward side of the float is not suitable for vessel mooring when the tide is expected to be low. If the float is replaced, it should be moved offshore to deeper water to increase its functionality. If the float was moved out approximately 30', and ADA compliant 80' gangway could be installed, without substantial modification to the approach geometry. Figure 6 indicates some soundings and freeboard values measured at the Kupreanof float.

KUPREANOF

Referenced Photos

Kupreanof Photos



1. Kupreanof Float and Approach



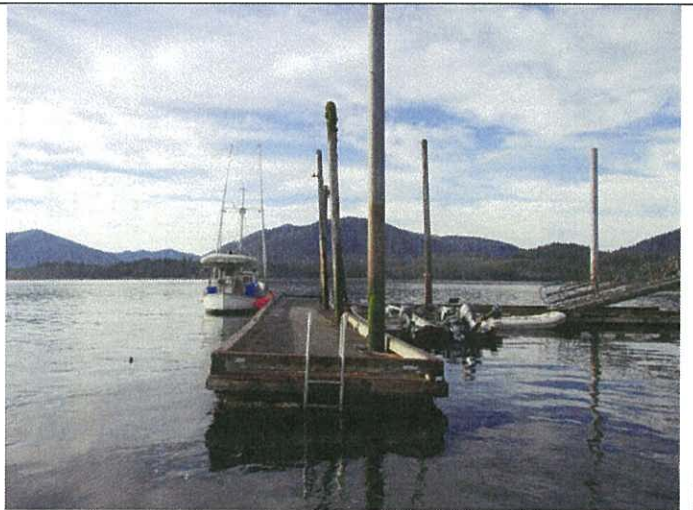
2. Approach Top Side



3. Approach Framing



4. Typical Crack at Handrail Post

**5. Hollow Approach Bearing Pile****6. Cracked Pile Cap****7. Float and Gangway****8. Listing Float, note crooked pile**



9. Damaged bullrail and lip at float intersection



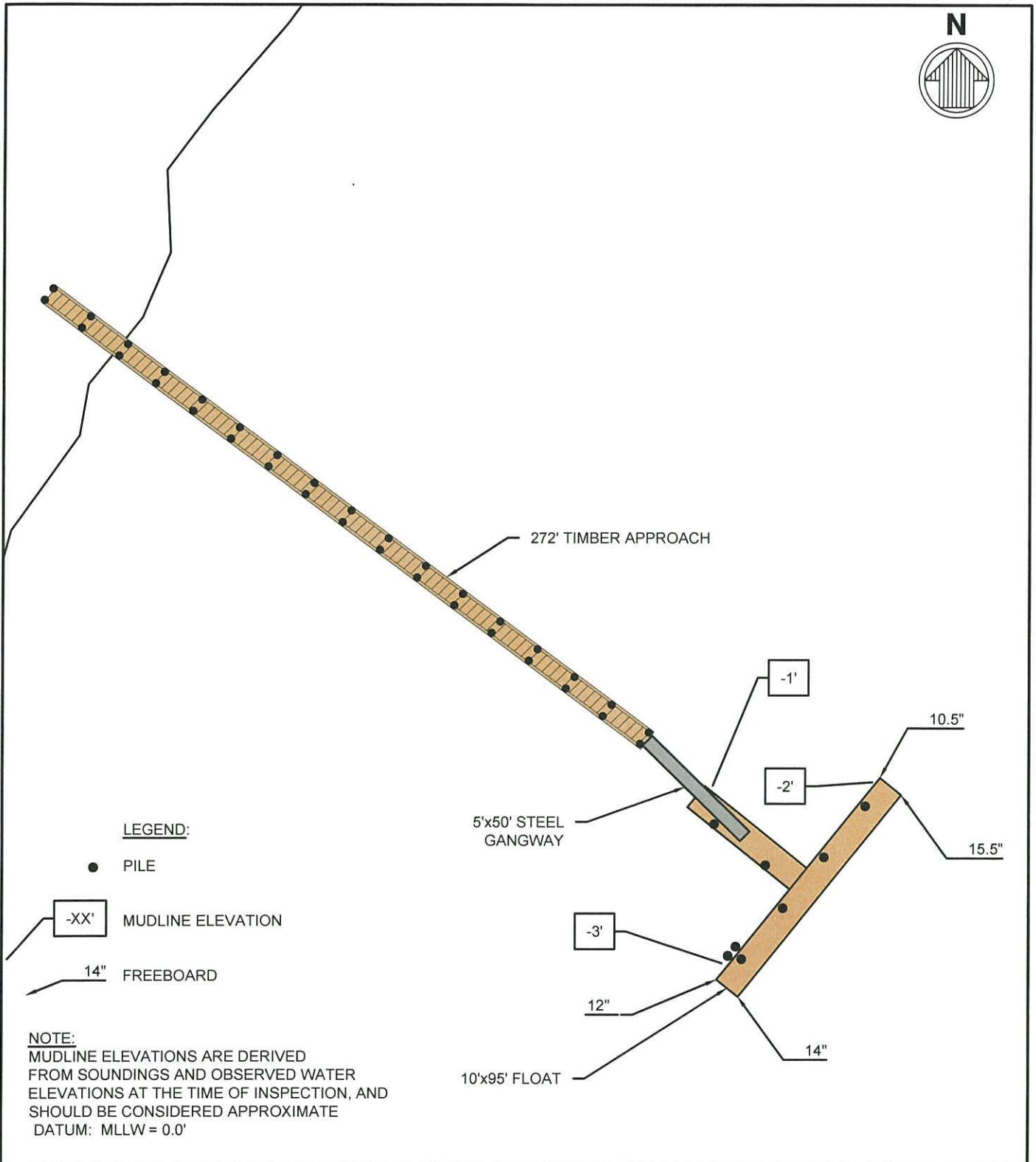
10. Worn and Corroded hinge components



11. Broken Sill, Note missing flotation



12. Worn Bullrail and Damaged Rub Board



KUPREANOF
Opinion of Probable
Construction Cost (OPCC)

Item No.	Description	Approx. Quantity	Unit	Unit Cost (\$)	Extended Cost (Rounded)
1	MOBILIZATION & DEMOBILIZATION		LS	\$ 250,000	\$ 250,000
2	CONSTRUCTION SURVEYING	1	LS	\$ 10,000	\$ 10,000
Float Replacement					
3	Demolish Existing Float and Gangway	1	LS	\$ 50,000	\$ 50,000
4	Install new 10'x100' Float	1	EA	\$ 150,000	\$ 150,000
5	Install Gangway Landing Float	1	EA	\$ 40,000	\$ 40,000
6	Install New 80' Gangway	1	LS	\$ 110,000	\$ 110,000
7	Install Steel Float Piling	8	EA	\$ 10,000	\$ 80,000
8	Install Life Rings, Fire Extinguishers and Safety Ladders	1	LS	\$ 20,000	\$ 20,000
Total Float Replacement:					\$ 450,000
APPROACH					
8	Demolish Existing Approach	1	LS	\$ 40,000	\$ 40,000
9	Install New Bearing Piles	16	EA	\$ 10,000	\$ 160,000
10	Install New Timber Framing	1	LS	\$ 40,000	\$ 40,000
11	Install New Abutment	1	LS	\$ 20,000	\$ 20,000
Total Approach					\$ 260,000
Estimated Construction Cost					\$ 970,000
Contingency				(25%)	\$ 243,000
Opinion of Probable Construction Cost					\$ 1,213,000
Planning, Permitting, Design and Bid Documents				(10%)	\$ 121,000
Contract Administration, Construction Inspection & Other Indirect Costs				(5%)	\$ 61,000
Estimated Project Cost					\$ 1,395,000
<u>Note:</u> All estimates are in 2015 USD and rounded to the nearest thousand dollars.					