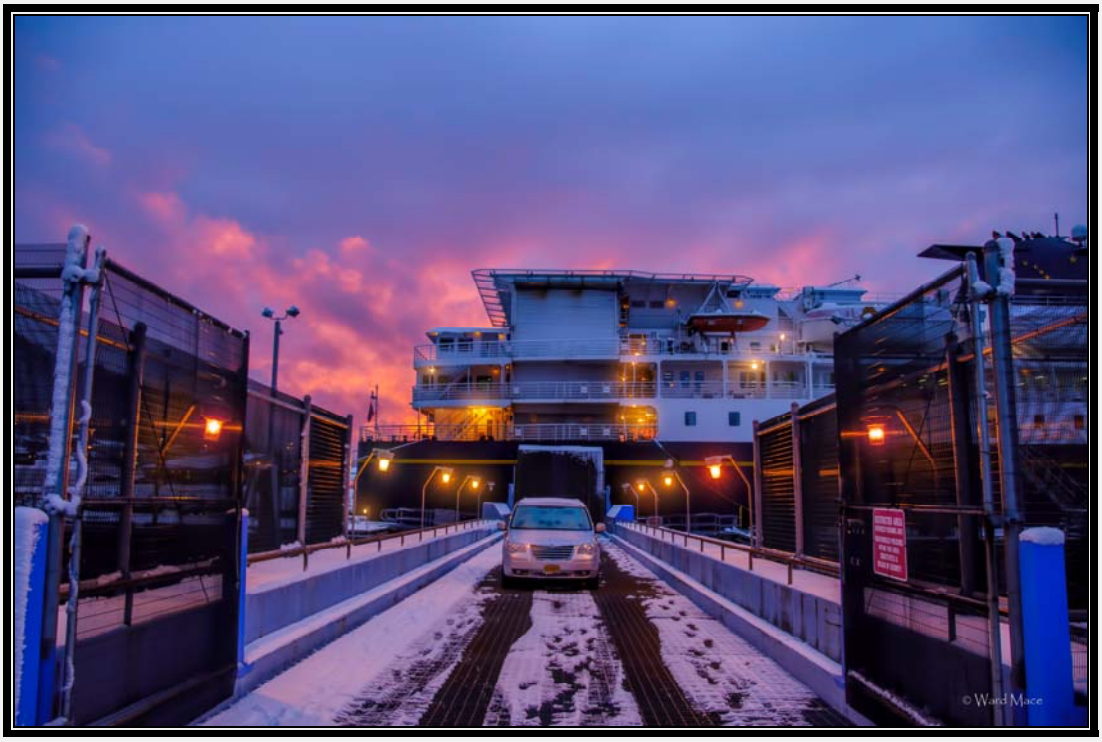
STATE OF ALASKA
Department of Transportation
and Public Facilities

2018

Alaska Marine Highway System

SHORE FACILITIES CONDITION SURVEY REPORT



Prepared by

Southcoast Region
Marine Engineering Section

Cover photograph: Ketchikan Ferry Terminal - Berth II, M/V Kennicott
January, 2017

2018 Shore Condition Survey Report
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INTRODUCTION

This report documents the condition of the ferry terminals and marine facilities used by the Alaska Marine Highway System (AMHS) in all of its ports of call. The primary purpose of this survey is to provide an overview of the present condition of the terminals to ensure the safety of the structures, aid planners in programming for future development, assist maintenance personnel with upkeep, and alert AMHS managers of operational constraints.

AMHS vessels currently visit thirty-seven coastal communities (43 port facilities). The ownership and configuration of the facilities vary widely; they include state and foreign owned ferry terminals, city owned freight wharves, and privately owned fish processing docks. The above water components of each facility are inspected biennially (SE on odd years, SC & SW on even years) and underwater inspections are performed on a five-year cycle. Table 1 below lists the facilities, their owners, and the dates of the most recent inspections.

Route		Facility Location	ON/OFF SYSTEM	Bridge #	Owner	Inspection Date		
						Condition Survey	Underwater Inspection	FC Bridge Inspection
Southeast AK	1	Angoon	ON	181	State	Jul-17	Aug-16	-
	2	Auke Bay East	ON	1474	State	Aug-17	Aug-16	Aug-18
	3	Auke Bay West	ON	191	State	Aug-17	Aug-16	Aug-18
	4	Auke Bay Stern	ON	803	State	Aug-17	Aug-16	Aug-18
	5	Bellingham	-	-	Port Authority	Sep-17	-	-
	6	Clark Bay (Hollis)	ON	182	State (IFA)	Jul-17	-	-
	7	Coffman Cove	ON	193	City of Coffman Cove (IFA)	Jul-17	Aug-16	Aug-18
	8	Gustavus	ON	1417	State	Jun-17	Aug-16	-
	9	Haines	ON	804	State	Aug-17	Aug-16	Aug-18
	10	Hoonah	ON	179	State	Aug-17	Aug-16	-
	11	Kake	ON	177	State	Jun-17	Aug-16	-
	12	Ketchikan Berth 1	ON	800	State	Jul-17	Aug-16	Aug-18
	13	Ketchikan Berth 2	ON	1823	State	Jul-17	Aug-16	Aug-18
	14	Ketchikan Berth 3	ON	190	State	Jul-17	Aug-16	Aug-18
	15	Metlakatla (Port Chester)	ON	178	State	Jul-17	Aug-16	Aug-16
	16	Metlakatla (Annette Bay)	ON	194	State	Jul-17	Jul-18	-
	17	Pelican	ON	1426	City of Pelican	Oct-17	Aug-18	-
	18	Petersburg	ON	802	State	Jun-17	Aug-16	Aug-18
	19	(Petersburg) South Mitkof	ON	192	State (IFA)	Jun-17	Aug-16	Aug-18
	20	Prince Rupert	-	-	Port Authority	Oct-17	-	-
	21	Sitka	ON	806	State	Aug-17	Aug-16	Aug-18
	22	Skagway	ON	805	State/City of Skagway	Aug-17	Aug-16	Aug-18
	23	Tenakee	ON	1451	State	Jun-17	Aug-16	Aug-18
	24	Wrangell	ON	801	State	Jun-17	Aug-16	Aug-18
	25	Yakutat	OFF	2094	City of Yakutat	Sep-17	Aug-16	Sep-12
Southcentral AK	25	Chenega	ON	184	NPR Housing Authority	Aug-18	Aug-18	Aug-18
	26	Cordova	ON	180	State	Aug-18	Aug-16	Aug-18
	27	Homer	OFF	1415	City of Homer	Aug-18	Sep-18	Sep-12
	28	Seldovia	ON	1423	City of Seldovia	Aug-18	Sep-18	Sep-12
	29	Tatitlek/Ellamar	ON	183	NPR Housing Authority	Aug-18	Aug-16	Aug-18
	30	Valdez	ON	1429	State	Aug-18	Aug-17	Aug-18
	31	Whittier	OFF	1424	State	Aug-18	Aug-18	Aug-18
Southwest AK	32	Akutan	ON	1946	City of Akutan	Sep-18	Jul-14	Sep-12
	33	Chignik	-	-	City of Chignik	Sep-18	-	-
	34	Cold Bay	ON	1755	City of Cold Bay	Sep-18	Aug-18	Aug-18
	35	False Pass	ON	1945	City of False Pass	Sep-18	Aug-18	Aug-18
	36	King Cove	-	-	City of King Cove	Sep-18	Jul-14	-
	37	Kodiak City Dock (Pier 1)	OFF	1425	City of Kodiak	Aug-18	Jul-14	Sep-12
	38	Kodiak Pier 2	ON	2095	City of Kodiak	Aug-18	Jul-14	Sep-12
	39	Old Harbor Dock	OFF	186	City of Old Harbor	Aug-18	Aug-18	Aug-18
	40	Ouzinkie City Dock	-	-	City of Ouzinkie	Aug-18	-	-
	41	Port Lions	-	-	City of Port Lions	Aug-18	Jul-14	-
	42	Sand Point	ON	1756	City of Sand Point	Sep-18	Jul-14	Sep-12
	43	Unalaska (Dutch Harbor)	ON	1824	City of Unalaska	Sep-18	Jul-14	-

Table 1 - Ferry Terminal Inspection Dates

CONDITION RATINGS

Inspectors rate the condition of each facility component as new, good, fair, poor or failed. The ratings reflect the component in-place condition as compared to its as-built condition.

Condition Rating	Description
NEW	No problems.
GOOD	Some minor problems.
FAIR	All primary structural elements are sound but may have minor section loss, cracking, spalling, or corrosion.
POOR	Loss of section, advanced deterioration, spalling that has affected primary structural components. Local failures are possible. Unless closely monitored the facility will have to be closed until corrective action is taken.
FAILED	Out of service, beyond corrective action.

Three major categories of work are presented in the Inspection Summary in an attempt to assist prioritization of the effort necessary at the terminals.

Category	Definition
SAFETY	End of useful life replacements, which if not done will lead to terminal closure, structural collapse or failure, possibly during use by the public.
REHABILITATION	Useful life extensions on existing facilities (or replacement of marginally functional items), which if not done will lead to structural damage or loss of useful life.
UPGRADE	Enhancements to the operational characteristics of existing facilities, which if not done, will limit the systems ability to adequately serve the public.

TERMINOLOGY

Terminology used for the major components of a typical facility are:

All-Tide – A facility with floating fenders/mooring floats for home-port and/or overnight layup of vessels.

Approach - A structure that provides access for vehicles and passengers to the transfer bridge or dock, usually an embankment or pile supported structure with open steel grid, concrete deck or a timber deck.

Buildings - These are the terminal, generator, purser and warehouse structures located at facilities.

Catwalk - A walkway, with fixed ends, that provides access to mooring dolphins for shoreside personnel tying up the vessel.

Dock - A structure that provides a landing pier for vessels to moor and transfer vehicles and passengers. Usually a steel pile supported structure with a concrete deck or all timber structure.

Fender - Protective structure attached to the face of the dolphin, dock or mooring float. May be a row of timber piles, a steel pile supported timber structure, or a steel panel with high-density plastic facing.

Gangway - A catwalk in which one end moves vertically with tidal fluctuations.

Mooring Dolphins - Steel or timber structures used to attach mooring lines for the vessel.

Mooring Float - Steel framed structure with working deck, float support and fender panels used for berthing and mooring of vessels in lay-up or home port capacities as part of an all-tide facility.

Staging Area - Area where vehicles are assembled prior to boarding the vessel. May include short and long term vehicle parking.

Transfer Bridge - Transfer structure used to convey vehicles and passengers between the shore and vessel.

Transfer Bridge Support Structure - A steel or concrete floating pontoon or pile supported lift structure supporting the seaward end of the transfer bridge.

Utilities - Electrical power, water, telephone, TV cable and sewer services for the terminal facility and in some cases the vessels.

DOCUMENT ORGANIZATION

This document is divided into four sections.

Section I contains the condition report for each AMHS terminal. Information collected during site visits, underwater and fracture critical inspections, and drawn from terminal project histories and maintenance records is distilled into a tabular report. Following the report is an "Action Required" list of items identified in the inspection requiring action by the facility owner or AMHS.

Section II contains a prioritization of capital improvements required at AMHS facilities based on rankings by SE Region Marine Engineering.

Section III contains a list of capital improvements required at all AMHS facilities, listed by individual terminal.

Section IV lists the characteristics of the eleven AMHS vessels.

This report was prepared by reviewing historical records of the AMHS, interviewing vessel personnel, maintenance crews, and terminal operators. This report is a compilation of the findings of the bridge, underwater and above water inspection programs.

COMMENTS AND FEEDBACK

This document is updated annually using information from the most recent condition surveys. Questions and comments are appreciated and welcomed. All comments and questions should be mailed, faxed, e-mailed, or phoned to the following address:

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Department of Transportation & Public Facilities
Statewide Design & Engineering Services
6860 Glacier Highway
Juneau, Alaska 99801-7999
Attn: Joel Osburn, Shore Facilities Inspection Manager

Phone: (907) 465-4409

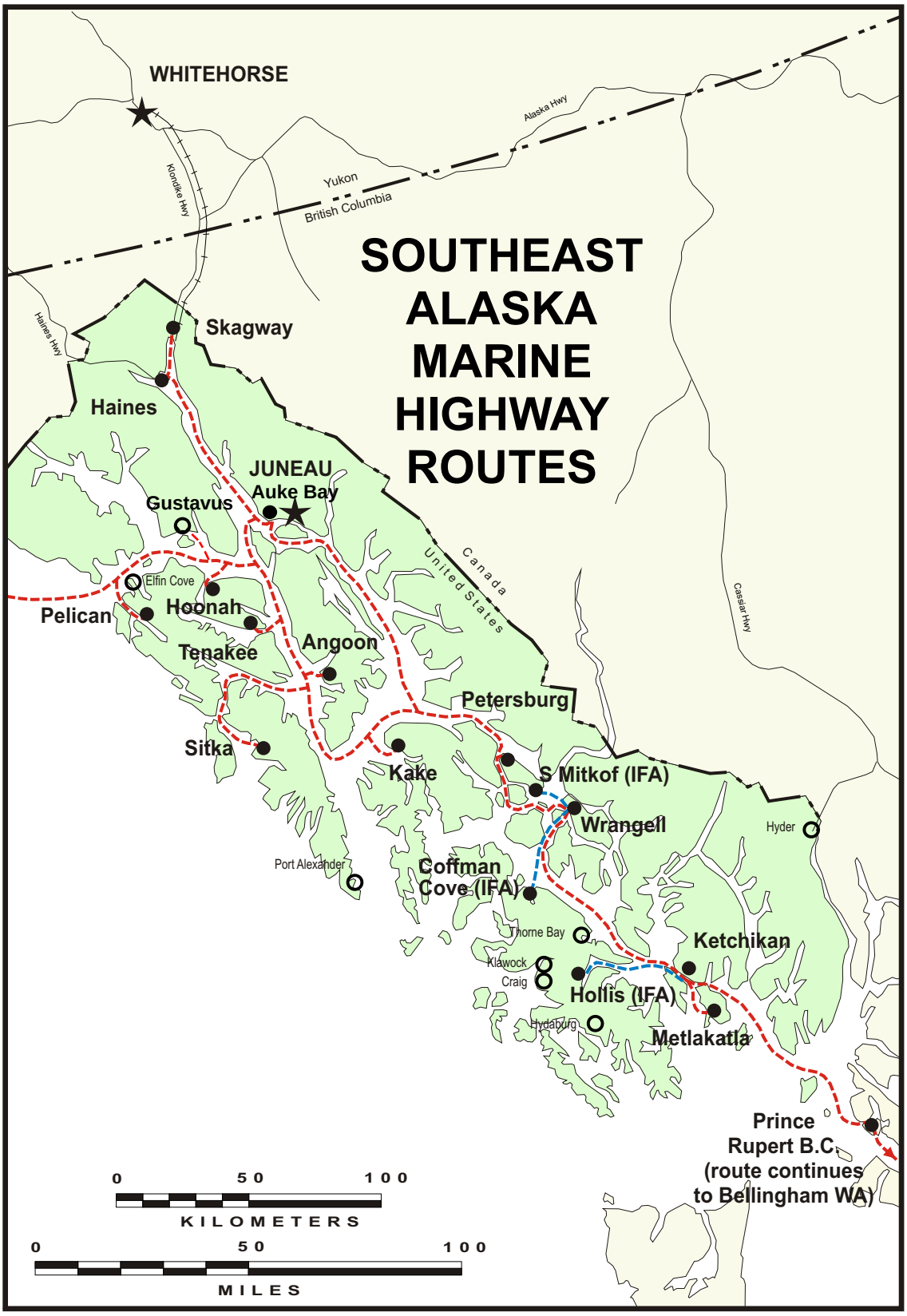
Fax: (907) 465-4414

E-mail: joel.osburn@alaska.gov

REQUEST FOR HARD COPY

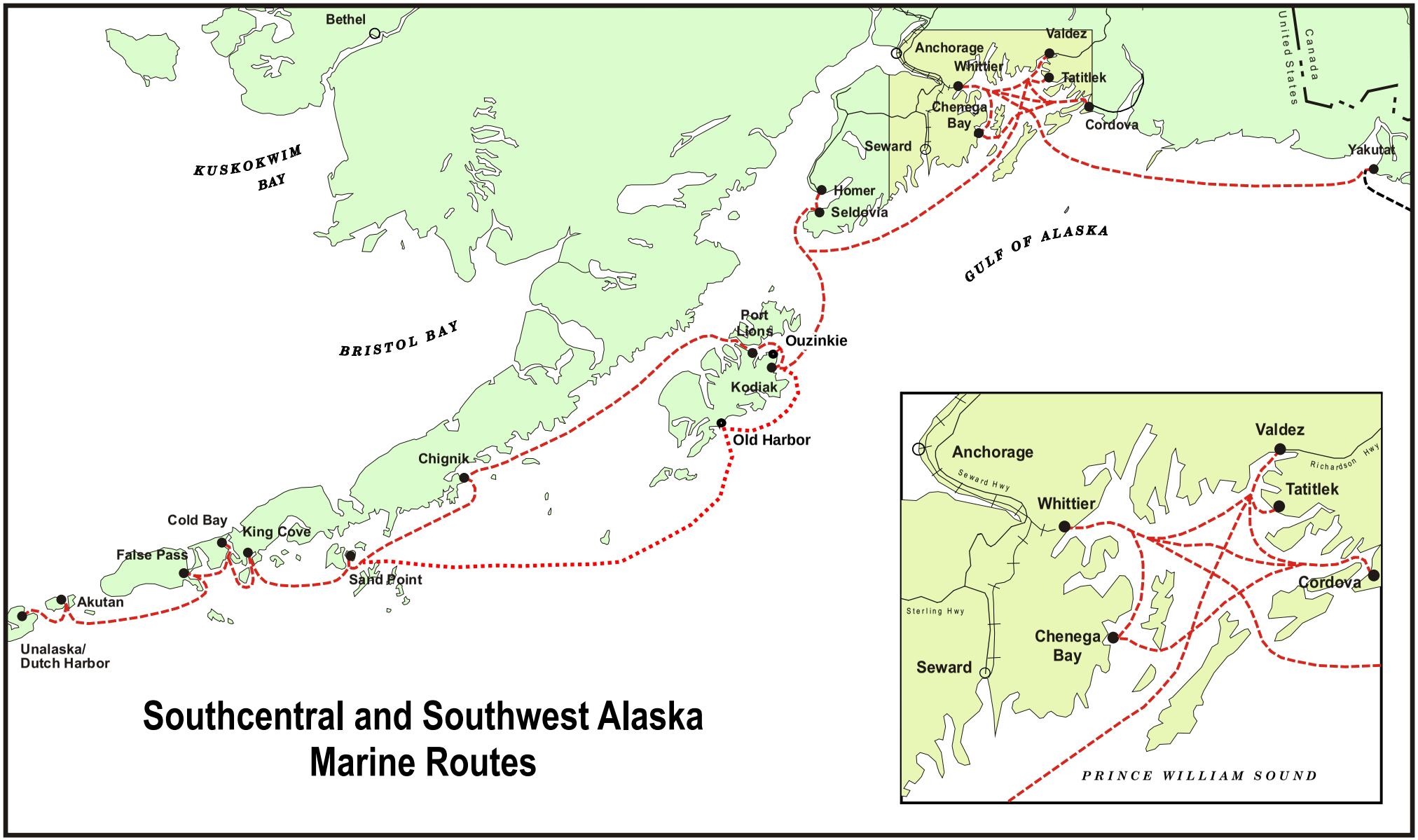
The "2018 Shore Facilities Condition Survey Report" is distributed in an electronic format and can be downloaded from the following URL: http://dot.alaska.gov/project_info/AMHS_Shore_Fac_Report.shtml .

If a hard copy of individual sections or of the entire report is desired, send your request with an address to the contact above. The materials will be mailed to you.



LEGEND

- AMHS or IFA PORT
- AMHS MARINE ROUTE
- IFA MARINE ROUTE
- RAILROADS
- ROADS



Southcentral and Southwest Alaska Marine Routes

LEGEND

- AMHS PORT
- MARINE ROUTE
- RAILROADS
- ROADS

0 50 100
KILOMETERS

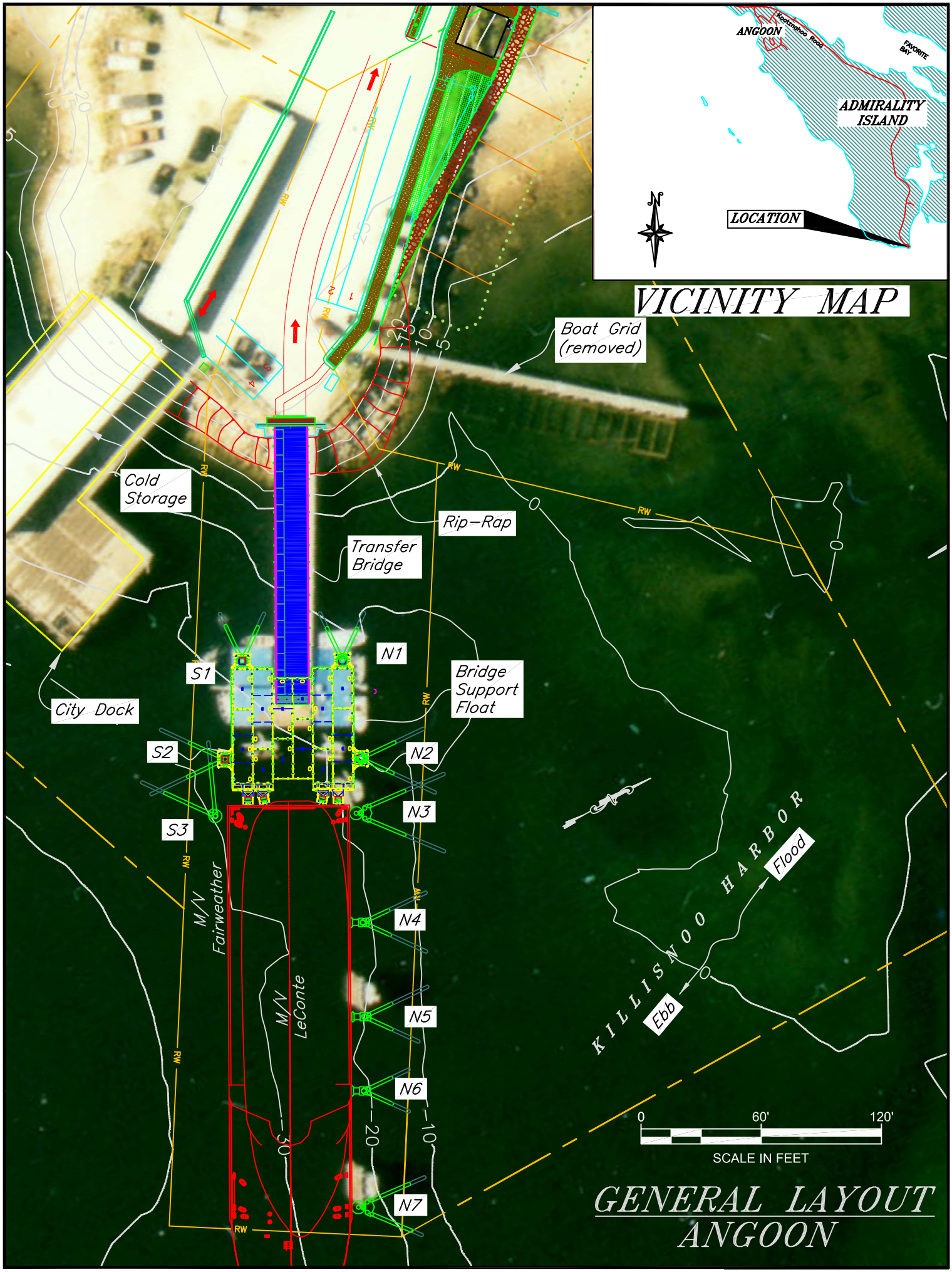
0 50 100
MILES

ALASKA DOT&PF
GIS MAPPING SECTION

SECTION I

FACILITIES CONDITION REPORTS

Southeast Alaska Marine Route


ANGOON
Kootznahoo Road
FAVORITE BAY
ADMIRALITY ISLAND
LOCATION
VICINITY MAP
Boat Grid (removed)
Cold Storage
Rip–Rap
Transfer Bridge
N1
S1
Bridge Support Float
City Dock
S2
N2
S3
N3
M/V Fairweather
M/V LeConte
N4
N5
N6
N7
KILLISNOO HARBOR
Flood
Ebb
RW
0
60'
120'
SCALE IN FEET
GENERAL LAYOUT
ANGOON

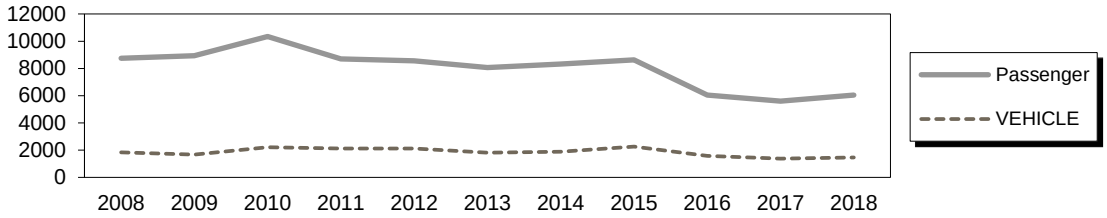
Angoon Ferry Terminal

2.5 Mile Killisnoo Road

Owner: State of Alaska

Contact: Simon Bradley, AMHS Terminal Ops Manager (Ketchikan) – 907-228-7290

Terminal Description: The Angoon Ferry Terminal is a stern-loading facility that was originally constructed in 1976 and completely removed and reconstructed in 2011 for the LeConte class & FVF vessels. The terminal consists of a steel transfer bridge, adjustable intermediate ramp & apron, steel support float and five steel pile fender dolphins. FVF service to Angoon started in May, 2012. Angoon's past 10 years of total passenger and vehicle traffic is shown below.



The most recent above water survey was completed on July 7, 2017. The most recent underwater inspection occurred on August 8, 2016.

Vessels	
Name	Berthing Alignment
LeConte/FVF	Stern
N/A	Port
N/A	Stbd

Tidal Data (MLLW 0.0 feet)	
EHW	19.0
MHHW	14.1
MHW	13.2
ELW	-5.5

Terminal Building	
Year Built:	2016
Square Footage:	342 s.f.
Heating System:	Heat Pump & Baseboard
Fuel Storage:	N/A; Electric
Fire Protection:	N/A
Condition:	New

Generator & Building	
N/A	
Building / Generator:	
Square Footage:	
Heating System:	
Fuel Storage:	
Fire Protection:	
Condition:	

Utilities	
Telephone:	No
Electrical:	Yes

Uplands	
Short-Term Parking:	10 cars
Long-Term Parking:	10 cars
Staging Area	65 lineal feet
Driving Surface:	Asphalt

Vehicle Transfer Bridge - #0181	
Type:	16' x 132'; 4 Girders
Year Built:	2011
Shoreward support:	Concrete Abutment ('77)
Seaward support:	Steel Support Float
Coating:	Spray Metallizing
Pedestrian Access:	On Bridge
Lighting:	3 overhead light posts
Condition:	New
Load Posting Sign:	N/A
Original Design Load:	HL93

Bridge Support Float	
Type:	60x60x5' Flexifloat
Year Built:	2011
Ballasted:	Yes
Ramp & Apron:	Electric Actuators
Anodes:	Yes
Condition:	New

Dolphins							
Dolphins	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Notes**
S2	2B, 1V	-	-	Yes	2011	New	Ladder ring
S1	2B, 1V	-	-	Yes	2011	New	
N1	2B, 1V	-	-	Yes	2011	New	
N2	2B, 1V	-	-	Yes	2011	New	Ladder ring
N3	2B, 3V	Floating	Plastic	Yes	2011	New	
N4	2B, 1V	Hanging	UHMW	Yes	2011	New	
N5	2B, 1V	Hanging	UHMW	Yes	2011	New	
N6	2B, 1V	Hanging	UHMW	Yes	2011	New	
N7	2B, 3V	Floating	Plastic	Yes	2011	New	Nav Light

LEGEND
N1 = North Mooring Dolphin
B = Battered Steel Pipe Piles
V = Vertical Steel Pipe Piles

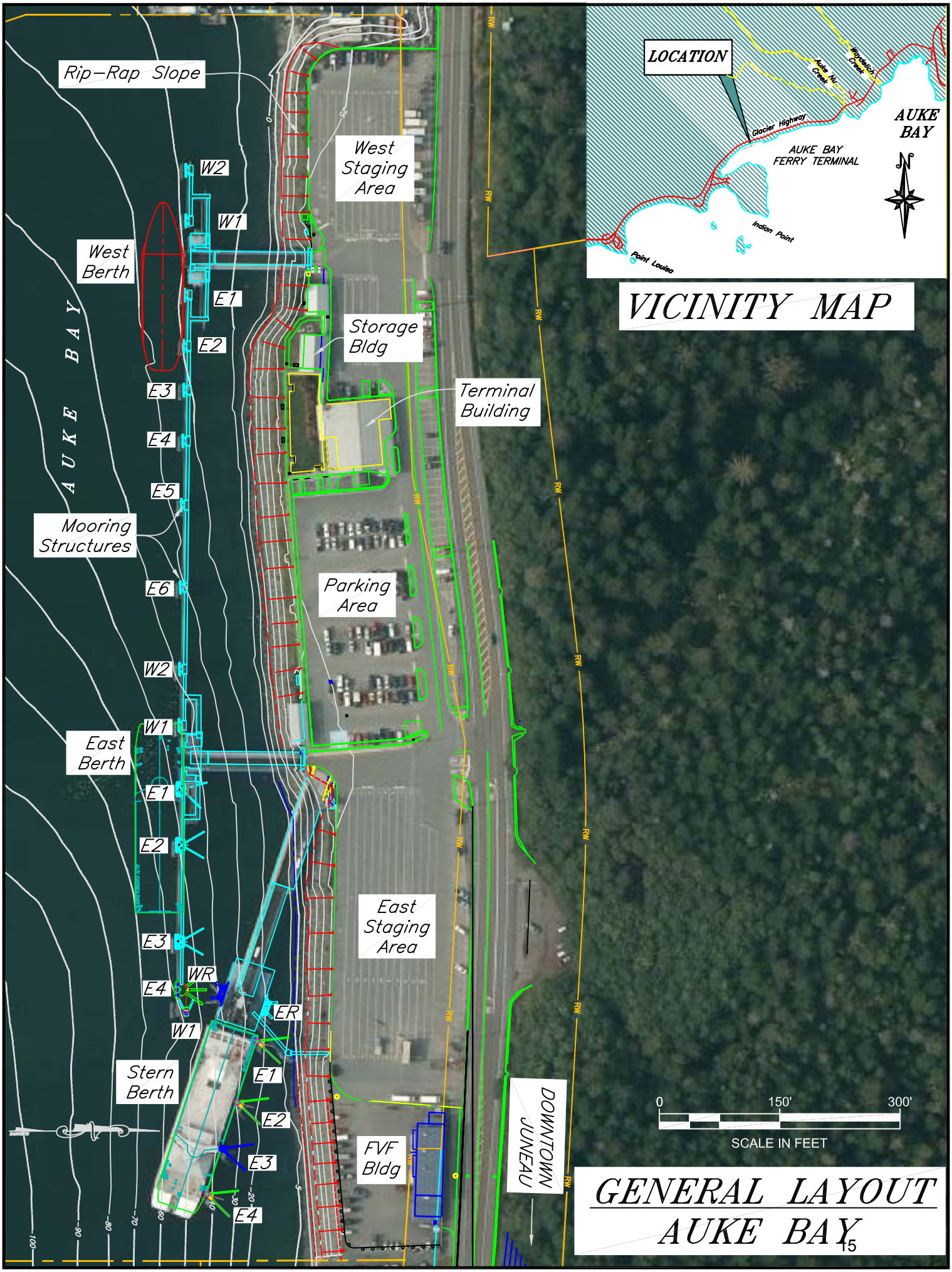
Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1977	RS-0998(1)	Ferry Terminal Facilities at Angoon	Construction of new terminal structures. Uplands fill from end of the road to the abutment.
1984	X30006	Angoon FT Basin Dredge	The floor of the basin was excavated beneath the float and beneath the docking footprint.
1988	RS-005(78) 74665	Southeast Secondary Upgrade	The bridge was over-coated with spray metallizing and the bridge support float was replaced with the existing barge from Clark Bay.
1990	75122	Angoon Ferry Terminal Basin Dredge	The floor of the basin was excavated beneath the north corner of the float.
2011	68502	Angoon Ferry Terminal Improvements	This project replaced the marine berthing and transfer structures with new all-tide mooring dolphins and transfer bridge. The new design accommodates the Fast-Vehicle Ferries (FVF) M/V Fairweather & M/V Chenega, as well as LeConte class vessels.
2016	69440	Angoon Ferry Terminal Passenger Facility	This project expanded the uplands approximately 40' seaward along the northeast edge of the embankment, adding 16 parking spaces, staging lanes for 15 vehicles, curb and sidewalk, and area lighting. Also constructed was a new 21' x 21' Waiting Building, Pursers Shelter and Pit Toilet. The bridge abutment backwall, apron and transition plate were replaced with new structures that provide better clearance to vehicles at low tide. An access platform was built on dolphin S1 for vessel personnel to aid line handling.

Observations

1. Marine structures seaward of the bridge abutment were new as of fall of 2011. Uplands parking/staging area & waiting building are new as of Fall of 2016.
2. An adjacent stream has, in past years, deposited sediment in the moorage basin. The basin was dredged in 1984 and again in 1992 to remove the sediment and maintain acceptable basin depth. A diversion dike was installed in 1992 to remedy the problem. A bathymetric survey performed in 2003 determined the basin depth within the vicinity of the terminal is adequate.
3. There is an above-ground 1-1/2" Ø PVC pipe running along the RT ditchline of Killisnoo Road. The City would like to use this pipe to provide City water to Whalers Cove Lodge across the Bay, but haven't been able to complete the DEC permitting process.
4. A privately owned fuel storage facility was constructed adjacent to the ferry terminal in 2010.
5. The external housing for the bridge lift cylinders are corroding near their base (above the accordion cylinder cover).
6. The most recent underwater inspection found that 30-50% of all anodes are depleted on the mooring dolphins.
7. On October 1, 2016 the apron lift system was damaged as the M/V Aurora was preparing to dock. The apron is normally stowed in a vertical up position but must be rotated into the water prior to berthing of 235 class vessels. As the M/V Aurora approached the berth the apron was being lowered when the lift system controller (PLC) detected a fault and halted the operation. Vessel personnel went ashore and attempted to correct the fault but damaged both actuators while adjusting the system manually. Emergency repairs were completed the next day to lower the apron and the damaged actuators were removed. The actuators have been refurbished and are stored in Ketchikan awaiting re-installation.

   The apron lift system is currently inoperable with the apron stowed in the down position. The apron is not required for 235 class vessels and they continue to serve the Angoon terminal. The apron is required for FVFs; therefore, they cannot use the terminal until operation of the apron lift system is restored.
8. Depth to mudline elevations, taken with leadline readings at the front edges of the bridge float in 2015, range from -13' to -20' MLLW. The highest ground occurs 10-feet away from the edge of the vessel berthing surface; the minimum bottom elevation at the vessel should approximate the deeper of the two readings.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Nothing required.		
Category II - Rehabiliation Work		
Dolphin anodes	1	Replace anodes on all mooring dolphins
Bridge apron	2	Install actuators on apron lift system prior to FVF sailings.
Category III - Upgrades Needed		
Nothing required.		


Rip–Rap Slope
West Staging Area
W2
W1
West Berth
E1
E2
E3
E4
E5
Mooring Structures
E6
AUKE BAY
Storage Bldg
Terminal Building
Parking Area
W2
W1
East Berth
E1
E2
E3
WR
E4
ER
W1
Stern Berth
E1
E2
E3
E4
East Staging Area
FVF Bldg
DOWNTOWN JUNEAU
RW
LOCATION
Auke Nu Creek
Mendenhall Creek
Glacier Highway
AUKE BAY
AUKE BAY FERRY TERMINAL
Indian Point
Point Louisa
VICINITY MAP
0
150'
300'
SCALE IN FEET
GENERAL LAYOUT
AUKE BAY

Auke Bay East Berth

13.8 Mile Glacier Highway

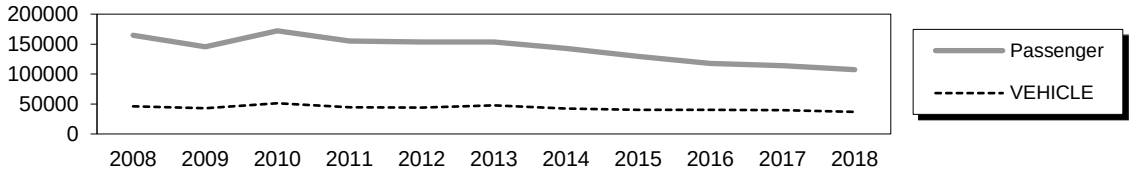
Owner: State of Alaska

Terminal Manager: Lisa Moore – 907-465-8853

Terminal Description: The Juneau Auke Bay terminal has three active berths and has the highest traffic volumes of all AMHS facilities. This terminal often accommodates three vessels simultaneously.

Auke Bay East Berth is a side-loading facility consisting of a transfer bridge, steel support float, six steel pile dolphins and catwalks/gangways for line-handling access. This facility was constructed in 1982 to handle mainline vessels.

Auke Bay's past 10 years of total passenger and vehicle traffic for all berths is shown below.



The most recent above water survey was completed on August 22, 2017. The most recent fracture critical & underwater inspections occurred on August 3, 2016.

Vessels	
Name	Berthing, Alignment
All Vessels	Port/Starboard

Tidal Data (MLLW 0.0 feet)	
EHW	22.0
MHHW	15.9
MHW	15.0
ELW	-6.0

Terminal Building	
Year Built:	1982
Square Footage:	4879 s.f.
Heating System:	Boiler
Fuel Storage:	UST
Fire Protection:	Remote Alarm
Condition:	Good

Generator & Building	
Building / Generator:	1988
Square Footage:	1118 s.f.
Heating System:	Electric
Fuel Storage:	N/A
Fire Protection:	Remote Alarm
Condition:	Good

Uplands	
Short-Term Parking:	151 cars, 6 HCP
Long-Term Parking:	30
Staging Area	3770 lineal feet
Paint Striping:	Yes
Driving Surface:	Asphalt

Utilities		
	@ terminal	@ ramp
Electrical:	Yes, city & backup power	
Water:	Yes	Yes
Sewer:	Yes (City)	No
Telephone:	Yes	Yes
Cable TV:	No	No
Fuel:	UST	Yes
Wireless Bridge:	Yes	Yes

Bridge Support Float	
Type:	24'x60' Steel Pontoon
Year Built:	1995
Ballasted:	Yes
Ramp lift:	Hydraulic/Block & Cable
Apron lift:	Hydraulic/Block & Cable
Anodes:	Yes
Condition:	Fair

Vehicle Transfer Bridge - #1474	
Type:	16' x 140' twin box beam
Year Built:	1982
Shoreward support:	Steel Beam/ Driven Piling
Seaward support:	Steel Support Float
Coating:	Wasser Paint
Pedestrian Access:	Concrete 4' wide on bridge
Lighting:	Jelly Jars on bent posts, both girders
Condition:	Fair
Load Posting Sign:	N/A
Original Design Load:	HS 20-44

Dolphins							
Dolphins	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Notes**
W2	2B, 1V	4V	Sitka Spruce	Yes	1982	Fair	Added anodes all dolphins '15
W1	2B, 1V	4V	Sitka Spruce	Yes	1982	Fair	
E1	2B, 1V	4V	Sitka Spruce	Yes	1982	Fair	
E2	2B, 1V	4V	Sitka Spruce	Yes	1982	Fair	
E3	2B, 1V	4V	Sitka Spruce	Yes	1982	Fair	
E4	3B, 3V	Chains	UHMW	Yes	2015	New	Light Pole & Nav Light
EG	1B, 1V	-	-	Yes	1995	Good	
WG	1B, 1V	-	-	Yes	1995	Good	
WR	2B, 2V	-	-	Yes	1982	Fair	
ER	2B, 2V	-	-	Yes	1982	Fair	

LEGEND
ER = East Bridge Support Float Restraint Dolphin
V = Vertical Steel Pipe Piling
G1 = Gangway
WG = West Gangway Support Dolphin
B = Battered Steel Pipe Piling
EFP = East Float Platform

Catwalks / Gangways								
#	**From Struc.**	**To Struc.**	**Lenth / Style / Main Members**	**Built**	**Safety Chains?**	**Cond.**	**Lighting**	**Notes**
C1	E4	E3	49' / Catwalk / 10"x10" Tube Girders	1982	Yes	Good	Jelly Jars	Shortened '15
C2	E3	E2	108' / Catwalk / 10"x10" Tube Girders	1982	Yes	Good	Jelly Jars	
C3	E2	E1	58' / Catwalk / 10"x10" Tube Girders	1982	Yes	Good	Jelly Jars	
C4	C3	EG	15' / Catwalk / Single 16x8 Tuber Girder	1982	No	Good	Jelly Jars	
G1	EG	EFP	50' / Gangway / C 6x10.5 Bottom Chord	1982	Yes	Good	No	Safety chain is poorly welded.
G2	WFP	WG	50' / Gangway / C 6x10.5 Bottom Chord	1982	Yes	Good	No	Safety chain is poorly welded.
C5	WG	C6	15' / Catwalk / Single 16x8 Tuber Girder	1982	No	Good	Jelly Jars	
C6	W1	W2	64' / Catwalk / 10"x10" Tuber Girders	1982	Yes	Good	Jelly Jars	

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1982	F-093-2(2)	Auke Bay Ft Modifications	Construction of new terminal structures. Uplands consisted of existed fill between East and West berths.
1982	H-78002	Auke Bay Marine Terminal Building	Construction of new terminal building.
1995	75265	Auke Bay FT Pontoon Upgrade	Replaced bridge support float and restraint dolphins, recoated the transfer bridge, intermediate ramp and catwalks, relocated gangways and 15' catwalks.
1998	75227	Auke Bay Staging Area	Uplands extension consisting of staging area for East berth, extended between berths, and West berth staging area. Also constructed: employee parking area across the street; storage building; mods to electrical building; waiting shelter; upgrades to all electrical utilities; waterline & sewer extension; East ramp waterline improvements; improvements to Glacier Highway in front of facility.
2004	68021	Auke Bay East Stern Berth	Construction of new transfer bridge, bridge support float, floating fenders, gangway, catwalk, and approach with a covered walkway.
2005	68318	Auke Bay East Stern Berth Fender Modifications	Modified existing floating rubber fenders at Auke Bay East stern berth.
2008	73651	Auke Bay East & West Terminal Repairs	This project rehabilited the fender support piles at all mooring dolphins on East Berth. Work also included repairs to the seaward bridge bearing plates on East and West Berths, installation of anodes on all East Berth pipe pile groups, and installation of UHMW line guards on dolphin E1 at both East and West berths.
2015	67463	Auke Bay Ferry Terminal Improvements	Removed dolphin E4, disconnected from dolphin W1 on Stern Berth. Built new 6-pile dolphin E4, installed new piles on dolphin W1

Observations

1. The terminal building is adequately sized for current terminal operations. ADA compliance modifications were completed in 1997. Water and sewer modifications were completed in the 1998 upgrade project. A new sewer septic system was installed, the public address system was replaced and the building was re-keyed. The terminal building roof needs to be replaced as roof penetrations have leaked, and the roof condition needs to be inspected annually. The fire alarm system was replaced in 2004 by Alcan Electric. The terminal building heating system controls were replaced in 2007 with Direct Digital Controls (DDC). The existing boiler needs replacement. The interior of the building is in fair condition. The carpet was replaced in 2008. The restrooms & ticket counters are in need of being renovated.
2. The terminal facility uplands were modified in 1998 to improve traffic flow, signage, and site illumination. The eastern waiting shelter was reconstructed and the size of onsite warehousing was increased. The parking areas were modified to create distinctly separate eastern and western staging areas, short term, long term, commercial and employee parking areas.

   Traffic flow out of the terminal staging area remains a concern for AMHS operations even after the 1998 upgrade. Exit visibility is limited looking west due to road alignment and tractor-trailers must cross into westbound lanes of Glacier Highway when exiting the eastern staging area.
3. The pipe hinges at the shoreward bridge transition plate have up to 50% section loss from corrosion & wear. The transfer bridge box girders were recoated with Wasser Moisture Cure Paints in 1994. The paint top coat is peeling on 75% of the underside of the transfer bridge; spot corrosion appears along the edges of beams and stringers near the abutment. There is a clanging sound with the apron in the

Observations (continued)

upward, stowed position. Steel grating on the in-filled pedestrian walkway is exposed and is freely corroding. There is minor damage to the expanded metal grating on the apron. Corners of the concrete abutment backwall are deteriorated.

Stringers 1 and 5 have surface and laminating corrosion on the top flanges with up to 1/16-inch section loss. Generally, stringer 1 is worse than 5, due to location beneath the pedestrian walkway and application of deicing salts.

The exterior webs of both girders are bowing out-of-plumb in the area of Floorbeam 7. At the LT Girder, bowing was measured laterally up to 3/8" out-of-plumb over the height of the web. At the outboard web of the RT Girder at Floorbeam 7 a bow measured laterally of up to 11/16" was recorded.

The most recent Fracture Critical inspection found cracks in utility bracket stitch welds in the interior of girder 1, outboard web. Cracks do not propagate into the base metal at this time. There are weld crack indications at corners of the Stringer 1 to Floorbeam 16 connection.

4. The bridge pontoon was replaced in 1995. This pontoon is an internally reinforced steel pontoon structure that can be supported by chains from the restraint dolphins for maintenance and cleaning. The float was recoated with Wasser 'Marine Blue' Paint by AMHS Maintenance in 2017.

   Each of the seaward hinge bearings are worn between hinge plates; 1/4" section loss on RT side; 1/8" section loss on LT side. Cause of wear appears to be a result of float bearing on LT restraint pile, hinge plates shifted over to LT side of bearing – leaving a gap on the RT side of the hinge plates.

5. Two fender piles on dolphin E4 were cracked just below the lowest fender wale, where a single gusset plate distributes the loads to the pile in a point load. Of the four fender piles, only the two inner piles have this feature. All other dolphins at East Berth had similar fatigue damage and were repaired on the 2008 fender pile repair project.

   The coating has failed on all steel pipe piles and the base metal is bright red, with approximately 1/16" scale and 1/8" deep pitting and less than 10% loss of section from high-water to mudline. Anodes were installed on all piles on the '15 project. Depth to mudline elevations, taken with leadline readings at locations along the fender line, range from -42' to -56' MLLW.

   The steel cap on the fender panel of dolphin E1 was pried off by a vessel's sponson leaving several fastening nails on the face protruding. The steel caps were replaced with UHMW sheets. Restraint chain connections on the fender cap of dolphin E1 have been bent upwards, due to collision with fender crown during vessel impact, and are corroding.

6. There is damage to the handrail from the hawse rail extension near E3. There are broken conduit connections on Dolphin W1. The video camera has failed at the top of the light pole at Dolphin E4. The light poles (2005) are undergoing rapid coating failure and surface corrosion.

7. There is a 15'x15' void at the toe of the riprap slope near the shoreward end of the Stern berth Flexifloat pontoon.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
None noted.		
Category II - Rehabiliation Work		
Bridge	1	Program project for bridge paint recoat. Remove & replace the shoreward transition plate pipe hinge. Replace the failed hinge assembly at bridge transition plate between the apron and intermediate ramp. Replace the minor damage to the bridge apron metal grating. Repair the field coating on bridge stringers 1 and 5. Repair the failed welds between Stringer 1 and Floorbeam 16.
Dolphins	2	Monitor condition of dolphin structures for structural integrity. Program future project(s) for eventual replacement of aged structures.
Catwalks	3	The catwalk retaining bolts, mounted on the dolphins at each end, should be checked and replaced as needed. Several are in need of replacement.
Catwalk Access Platform/Gangways	4	Replace damaged grating on east platform.
Gangways	5	Replace the worn UHMW pads beneath the dolphin access gangway skids.
Uplands	6	Fill in voids in armor rock at toe of riprap slope near the stern berth.
Category III - Upgrades Needed		
None noted.		

Auke Bay Stern Berth

13.8 Mile Glacier Highway

Owner: State of Alaska

Terminal Manager: Lisa Moore – 907-465-8853

Terminal Description: Auke Bay Stern Berth is an all-tide stern-loading facility consisting of an approach, transfer bridge, steel support float, employee access gangways, four floating rubber fender dolphins and one fixed fender panel dolphin.

The facility is the homeport for the Fast Vehicle Ferry (FVF) M/V Fairweather. See West Berth report for passenger and vehicle traffic counts. The most recent above water survey was completed on August 22, 2017. The most recent fracture critical & underwater inspections occurred on August 3, 2016.

Vessels	
Name	Berthing, Alignment
FVF / LeConte	Stern

Terminal Building
Main terminal building data in East Berth report

Generator & Building
Main generator data in East Berth report

Approach Trestle	
Type:	29' x 142' Pile-Supported Steel Frame
Shoreward support:	Steel Beam/Driven Piling
Seaward support:	Steel beam/Driven Piling
Pedestrian Walkway:	Covered and separated from vehicles by guardrail.
Anodes on piles:	Yes
Condition:	New

Bridge Support Float	
Type:	50' x 80' Flexifloat Pontoon
Year Built:	2004
Ballasted:	Yes
Ramp lift:	Hydraulic tower
Apron lift:	Hydraulic
Anodes:	Yes
Condition:	New

Uplands
Uplands is shared between West, East and Stern berths. See East berth report for data.

Vehicle Transfer Bridge - #0191	
Type:	18' x 142' twin box beam
Year Built:	2004
Shoreward support:	Steel Beam/ Driven Piling
Seaward support:	Steel Support Float
Coating:	Wasser Paint
Pedestrian Access:	Covered and separated from vehicles by guardrail.
Lighting:	Light posts, left girder
Condition:	New
Load Posting Sign:	N/A
Original Design Load:	HS 20-44

Utilities at Ramp	
Electrical:	Yes, city & backup power
Water:	Yes
Sewer:	No
Telephone:	Yes
Cable TV:	No
Fuel:	No
Wireless Bridge:	Yes

Catwalks / Gangways							
#	From Struc.	To Struc.	Lenth / Style / Main Members	Built	Safety Chains?	Cond.	Notes
G1	SFP	A1	62'8" / Gangway / 2.5"x2.5" Bottom Chord	2004	No	New	
G2	A1	Shore	49' / Gangway / W18x40 Girders	2004	No	New	

Dolphins								
Dolphins	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Mooring Crown?**	**Notes**
W1	2B, 3V	Floating	Rubber Fender	Yes	2015	New	No	Modified in '15
E1	2B, 3V	Floating	Rubber Fender	Yes	2004	Good	Yes	
E2	2B, 3V	Floating	Rubber Fender	Yes	2004	Good	No	
E3	2B, 2V	1V	UHMW	Yes	2004	Good	No	
E4	2B, 3V	Floating	Rubber Fender	Yes	2004	Good	Yes	Windsock mounted
WR	2B, 2V	-	-	Yes	2004	Good	-	
ER	2B, 2V	-	-	Yes	2004	Good	-	
A1	4V	-	-	Yes	2004	Good	-	

LEGEND
V = Vertical Steel Pipe Piling B = Battered Steel Pipe Piling A1 = Gangway Access Dolphins
SFP = Shoreward Float Platform ER = East Bridge Support Float Restraint Dolphin

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
2004	68021	JNU Auke Bay East Stern Berth	Original construction of facility.
2005	68318	JNU Auke Bay East Stern Berth Modifications	Modifications to floating fender dolphins.
2009	67763	JNU AMHS - Auke Bay FVF Support Facility	New 50'x125' building concstruction, uplands fill and site work, sanitary sewer line from vessel to new on site holding tank.
2015	67463	Auke Bay Ferry Terminal Improvements	Removed dolphin E4, disconnected from dolphin W1 on Stern Berth. Built new 6-pile dolphin E4 on East berth, installed new piles on dolphin W1 Stern berth.

Observations

1. The Concrete apron at the approach trestle abutment has settled 1 inch.
2. The anchor bolts of all stringer bearings at Bent 5 are damaged. Access to the piers and bridge abutment is difficult but the bolts appear bent and may have possibly failed.
3. The right side shoreward hinge bearings for the transfer bridge are inaccessible due to the enclosed pedestrian walkway overhang.
4. A bolt is missing on the base plate of the right seaward roller bearing.
5. There is a minor paint failure in the seaward-side weld between the LT most hinge plate & bearing beam on the shoreward LT hinge bearing.
6. In summer of 2011, an inspection of the ends of the seaward bridge roller bearings found that the bronze bushings had failed. AMHS Maintenance pulled the failed cast bronze bushings and replaced these with new higher-strength sintered bronze bushings. The new bushing renewed the proper clearance between the roller and the stiffener of ~1".
7. The blue urethane paint topcoat on the Flexifloat pontoons has only 30% remaining. Rust staining is apparent on 10% of the seaward faces of the floats. The field weld coating has failed at most pontoon-to-frame connection tabs, and the steel in these areas is freely corroding. AMHS Maintenance crews made coating repairs to the float surface in 2017.
8. The hydraulic rams are exposed while the apron is stowed in the 'up' position, exhibiting minor surface corrosion.

Observations (continued)

9. Rubber fenders between the restraint dolphin & Flexifloat have been crushed & replaced at least once since the project was completed. Thinner UHMW bearing pads have been used to better bend under load; thicker pads were cracking under load. The 2017 inspection found deformed, but functional, UHMW pads.
10. There is a waterline leak around the gate valve at the bridge-vessel connection. Precipitation/humidity has filled the ballast compartment in the bridge lights with water.
11. Several of the mounting studs for fender panel UHMW facing have sheared off.
12. The ocean floor is within 10' of the bottom of the northwest corner of the Flexifloat pontoon at extreme low tide.
13. Looking forward at the steel grating deck adjacent to the pontoon at the forward end of the structure, there are a few broken and distorted deck bars.
14. There is a 1 3/4-inch weld indication between the girder web and tee stiffener on the interior of Girder 1, at Floorbeam 0.
15. There are weld indications at the lower corners of Floorbeam 9 to both LT & RT Girders.
16. There is a broken conduit connection at the junction box under the right side of the shared pier of the approach trestle and bridge.
17. The anodes are 50-75% consumed on the mooring dolphins. Cathodic protection readings on dolphins E4-5 and approach trestle bent 4 are below -0.8V, which means the steel isn't adequately protected.
18. Depth to mudline elevations, taken with leadline readings at the front edges of the bridge float in 2015, range from -23' to -36' MLLW.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
None required.		
Category II - Rehabiliation Work		
Approach Trestle	1	Monitor the condition of the bent girder bearing bolts at the shared bridge pier.
Fenders	2	Remove UHMW facing, re-mount studs, increase size of bore hole and counter-boring and remount.
Bridge	3	Inspect with NDT methods and repair (as necessary) weld indications at FB 9 to both Girders. Install a ladder/catwalk to access the underside of the RT shoreward bridge bearing at the shared approach pier. Repair broken conduit in this location.
Dolphins & Trestle piles	4	Replace anodes on all pipe piles and the bridge support float.
All welds	5	Remove surface corrosion, perform touch-up repairs to field weld coating.
Pontoon Float	6	Repaint the polyurethane topcoat.
Gangways	7	Install safety cables.
Apron & Ramp	8	Repair the chrome treatment on the ramp's hydraulic lift rams and cover with a rubber boot. Replace rubber fender units on the apron lift arms. Weld repair the broken grating. Re-coat the apron with non-skid.
Category III - Upgrades Needed		
Nothing Needed		

Auke Bay West Berth

13.8 Mile Glacier Highway

Owner: State of Alaska

Terminal Manager: Lisa Moore – 907-465-8853

Terminal Description: Auke Bay West Berth is side-loading facility consisting of a transfer bridge, steel support float, eight steel pile dolphins and catwalks/gangways for linehandling access. The facility was built in 1989 to serve both mainline & feeder vessels, and is the homeport for the M/V LeConte. See East Berth report for passenger and vehicle traffic counts. The most recent above water survey was completed on August 23, 2017. The most recent fracture critical & underwater inspections occurred on August 3, 2016.

Vessels	
Name	Berthing, Alignment
Kennicott/Tustumena	Port
All other Vessels	Port/Starboard

Terminal Building
Main terminal building data in East Berth report

Generator & Building
Main generator data in East Berth report

Bridge Support Float	
Type:	24' x 60 ' Steel Pontoon
Year Built:	1989
Ballasted:	Yes
Ramp lift:	Hydraulic/Block & Cable
Apron lift:	Hydraulic/Block & Cable
Anodes:	Yes, but inadequate reading.
Condition:	Fair

Uplands
Uplands is shared between West, East and Stern berths. See East berth report for data.

Utilities at Ramp	
Electrical:	Yes, city & backup power
Water:	Yes
Sewer:	No
Telephone:	Yes
Cable TV:	No
Fuel:	Yes
Wireless Bridge:	N/A

Vehicle Transfer Bridge - #0803	
Type:	16' x 140' twin box beam
Year Built:	1988
Shoreward support:	Concrete abutment
Seaward support:	Steel Support Float
Coating:	Wasser Paint
Pedestrian Access:	Concrete 4' wide on bridge
Lighting:	Jelly Jars on bent posts, both girders
Condition:	Good
Load Posting Sign:	N/A
Original Design Load:	HS 20-44

Dolphins								
Dolphins	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Hawse Extension**	**Notes**
W2	2B, 1V	4V	Ekki Timber	No	1989	Good	No	
W1	2B, 1V	4V	Ekki Timber	No	1989	Good	No	
E1	2B, 1V	4V	Ekki Timber	No	1989	Good	No	
E2	2B, 1V	4V	Ekki Timber	No	1989	Good	Yes	
E3	2B, 1V	4V	Ekki Timber	No	1989	Good	No	Light Pole
E4	1B, 1V	4V	Ekki Timber	No	1989	Good	Yes	
E5	1B, 1V	4V	Ekki Timber	No	1989	Good	Yes	
E6	1B, 1V	4V	Ekki Timber	No	1989	Good	Yes	Light Pole
EG	1B, 1V	-	-	No	1989	Good	-	
WG	1B,1V	-	-	No	1989	Good	-	
WR	2B, 2V	-	-	No	1989	Good	-	Light Pole
ER	2B, 2V	-	-	No	1989	Good	-	Light Pole

LEGEND

ER = East Bridge Support Float Restraint Dolphin
V = Vertical Steel Pipe Piling
G1 = Gangway
EBW2 = East Berth, Dolphin W2
WG = West Gangway Support Dolphin
B = Battered Steel Pipe Piling
EFP = East Float Platform

Catwalks / Gangways							
#	**From Struc.**	**To Struc.**	**Lenth / Style / Main Members**	**Built**	**Safety Cables?**	**Cond.**	**Lighting**
C1	EBW2	E6	91' / Catwalk / 12" x 12" Tube Girders	1989	Yes	Good	Jelly Jars
C2	E6	E5	91' / Catwalk / 12" x 12" Tube Girders	1989	Yes	Good	Jelly Jars
C3	E5	E4	69' / Catwalk / 12" x 12" Tube Girders	1989	Yes	Good	Jelly Jars
C4	E4	E3	53' / Catwalk / 12" x 12' Tube Girders	1989	Yes	Good	Jelly Jars
C5	E3	E2	44' / Catwalk / 12" x 12' Tube Girders	1989	Yes	Good	Jelly Jars
C6	E2	E1	53' / Catwalk / 12" x 12' Tube Girders	1989	Yes	Good	Jelly Jars
C7	C6	EG	22' / Catwalk / 5" x 7" Tube Girders	1989	No	Good	Jelly Jars
G1	EG	EFP	57' / Gangway / Tube & Pipe Thru Truss	1989	Yes	Good	Jelly Jars
G2	WFP	WG	57' / Gangway / Tube & Pipe Thru Truss	1989	Yes	Good	Jelly Jars
C8	WG	C9	22' / Catwalk / 5" x 7" Tube Girders	1989	No	Good	Jelly Jars
C9	W1	W2	53' / Catwalk / 12" x 12' Tube Girders	1989	Yes	Good	Jelly Jars

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1963	F-095-8(1)	Southeast Alaska Ferry System Terminal Facility at Juneau, Alaska	Original construction of timber Side Berth in Auke Bay (present site of West Berth)
1968	N/A	N/A	Original construction of timber Stern Berth
1970	N/A	Auke Bay FT Dredging	Dredging at original timber Stern Berth.
1982	F-093-2(2)	Auke Bay FT Modifications	Original East Berth construction. Work included demolition of existing timber Stern Berth.
1982	F-093-3(2) H-78002 74268 A38282	Auke Bay FT Modifications	Construction of terminal building.
1989	F-095-4(16) / 74626	Auke Bay Western Terminal Modification	Demolition of existing structures, construction of new steel terminal structures. Also includes construction of generator/storage building, purser station, atrium/covered pedestrian walkway, and miscellaneous electrical and lighting enhancements.
1989	F-095-4(16) A70041 74618	Auke Bay FT Rehabilitation / Relocation	Associated with 74626.
1989	3711-SE(2)	Auke Bay FT Passenger Shelter	Associated with 74626.
1989	74914	Auke Bay FT Water Service	Associated with 74626.
1991	75134 MT 763	Auke Bay FT Floor Covering Replacement	Modified flooring of terminal building.
1995	75265	Auke Bay FT Pontoon Upgrade	Recoated the bridge support float.
1998	75227	Auke Bay Staging Area	Uplands extension of West berth staging area.
2006	HHE-093-3(29) 68975	JNU- Ferry Terminal Sight Distance Improvements	Modified main roadway vehicle entrance.
2008	N/A	Auke Bay Delta - Wye Conversion	This work replaces existing transformer at the Auke Bay Ferry Terminal with a new WYE-Configured Secondary, 480Y/277, 3-phase, 500KVA transformer.
2008	73003(4)	Auke Bay FT Carpet Replacement	Replaced carpet in the terminal building modular carpet panels.
2008	259S030	Auke Bay FT Heat Trace	This project replaced all existing heat trace and controls on West Berth, East Berth, and East Stern Berth.
2008	73003(1)	Auke Bay FT Heating Control System Upgrade	This project replaced existing pneumatic HVAC constrols with a new HVAC control system consisting of a Direct Digital Control (DDC) Building Automation System (BAS). The new system allows network capability for interface through the internet for monitoring & manipulation of the Heating System.

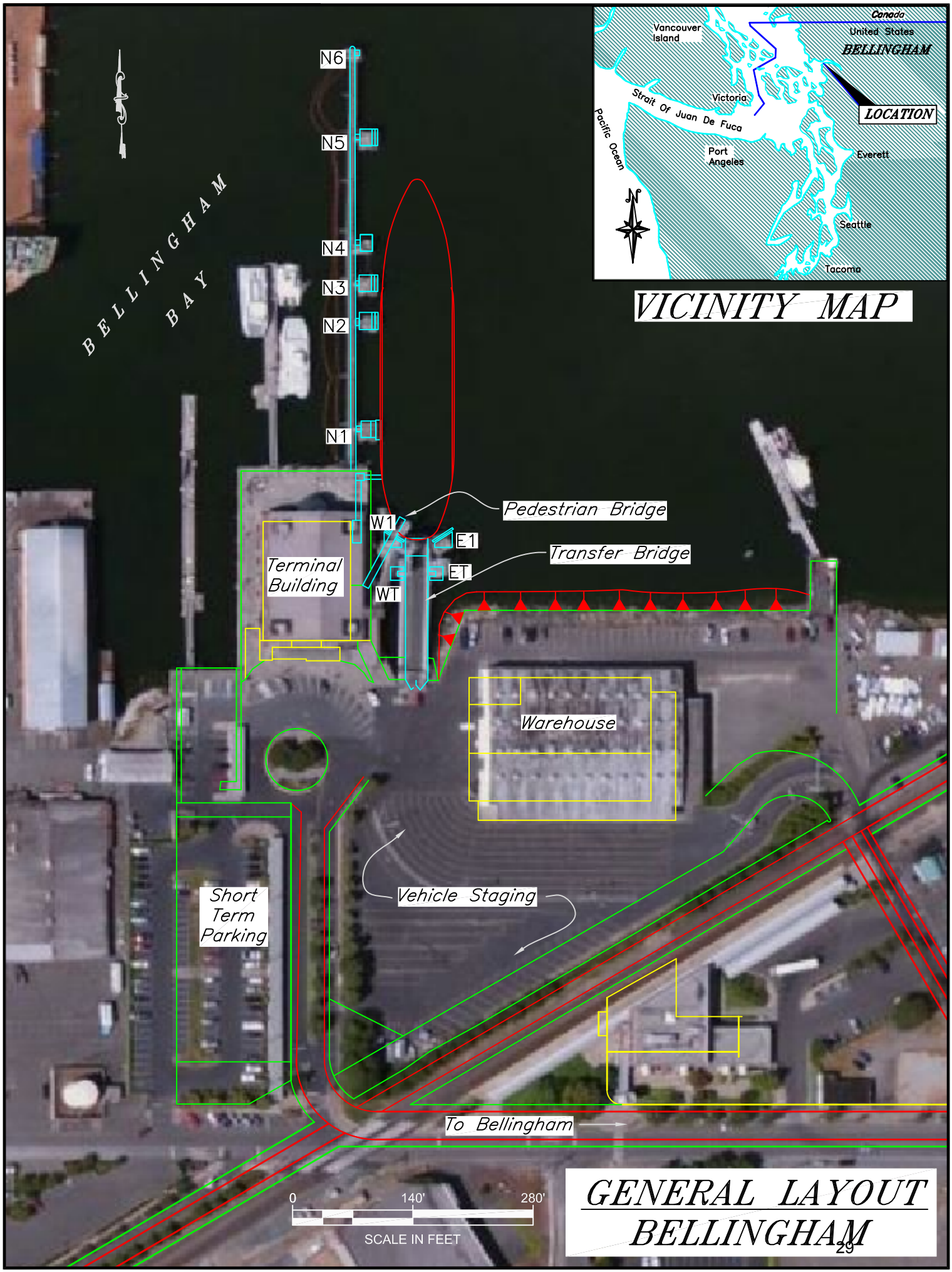
Terminal Projects (continued)			
Year	**Project #**	**Project Name**	**Description**
2008	73651	Auke Bay East & West Terminal Repairs	This project rehabilitated the fender support piles at all mooring dolphins on East Berth. Work also included repairs to the seaward bridge bearing plates on East and West Berths, installation of naoes on all East Berth pipe pile groups, and installation of UHMW line guards on dolphin E1 at both East and West berths.
2008	67763	Auke Bay FVF Support Facility	This project constructed tidelands fill adjacent to East berth parking lot, paved, installed underground utilities, constructed the FVF Support Building and installed an underground septic holding tank for pumping out vessel wastewater.

Observations

1. The most recent Fracture Critical inspection found a 3” long weld crack, and 1-1/4” long spur into the Girder web, at the top flange-shoreward corner of FB 1 to LT Girder (no propagation since last inspection) and a 7 3/8” long weld crack (2-3/4” horizontal and 4-5/8” vertical) between the top flange-shoreward corner of FB 1 to RT Girder (no propagation since last inspection).
2. The 2014 FC inspection found cracks in the welded connection between the top of FB 16 and the bottoms of Stringers 1 & 5. The crack on Stringer 1 is 3-3/8 inches long. The crack on Stringer 5 is 2-3/4 inches long. Neither of the cracks have propagated since the last inspection.
3. There is 100% section loss to the steel soffit form pans underneath concrete in-filled pedestrian walkway, over Stringer 1. Additionally, there is laminar corrosion and up to 1/16” section loss along the top flange of Stringer 1. The corrosion is most likely due to corrosive ice-melt solutions applied to the concrete in-filled walkway.
4. On the underside of the transfer bridge, the paint coating shows brown bleed-through corrosion or algae on the vertical surfaces of the framing.
5. There is an approximate 1/4” gap between the bottom of the seaward end of the steel base plate of the RT girder bearing & the top of the concrete abutment.
6. The pontoon float was listing roughly 10” to the north and the anodes had less than half their life remaining. The float was recoated by AMHS Maintenance in 2017.
7. A 2’x7’ area of expanded metal is missing on the apron.
8. Several utility lines beneath the bridge are loosely hanging or laying near the ground. There is a broken conduit connection, with exposed wiring, near exterior of LT girder @ FB 13.
9. The pipe truss hand rails on the gangways have split in several locations due to accumulated condensation that froze, and expanded. The handrail frames are primary structural members of the gangway through truss, so any failure in the rails could lead to failure of the structure.
10. Many of the hanger/retainer bolts at the gangway & platform catwalk end connections are wearing down. In addition, cotter pins retaining the bolts are loose and inadequately sized for the pin holes. The ‘wander limit’ plate welded to the Hillman rollers on the western gangway is cutting into the support tube below. The LT little gangway RT UHMW skid was worn & replaced by Hillman Rollers.

    The lower Hillman Roller bearing for the LT gangway was replaced with a UHMW skid, to reduce the possibility of the bearing jumping the track. The upper gangway pin-hanger bearings were replaced with new pins & hangers in 2011 by AMHS Maintenance.
11. There is a cracked truss tube in the LT gangway, 6’ from the upper bearing. There are failing pipe hinges at the LT access ramp.
12. Cathodic potential (CP) readings for all mooring dolphins are all above -0.8V except dolphin E6, after the most recent project installed new anodes. Depth to mudline elevations, taken with leadline readings at locations along the fender line in 2015, range from -17’ to -31’ MLLW.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Nothing recommended.		
Category II - Rehabilitation Work		
Transfer Bridge	1	Program a project to repair weld crack in the first floor beam-to-girder connections & the cracks at Stringers 1 & 5 near FB 16.
Gangways / Catwalks	2	Weld repair the splits in pipe handrails. Drill drain holes near the bottom of each pipe. Check all hanger/retainer bolts - replace as needed. Install washers that match the O.D. of the bolts on the outside of connections before installing new cotter pins. Replace the retaining plate on the western access platform gangway with UHMW pad and backing plate.
Bridge Support Float	3	Investigate cause for seaward list in bridge float, re-ballast float if required. Maintain anode replacement as needed. Program the float for paint re-coating. Replace the anode cables and mounting studs as needed.
Bridge Apron	4	Replace expanded metal grating.
Utilities	5	Reinstall supports for hanging conduit and repair the conduit breaks.
UHMW Skids	6	Replace the worn UHMW skids on LT little gangway.
Bridge	7	Monitor the gap between the bottom of the RT hinge baseplate and the top of the concrete abutment. Inspect entire bridge for potential paint recoat. Floor stringer 1 is in noticable need for abrasive blast cleaning and recoat.
Category III - Upgrades Needed		
Nothing recommended.		


N6
N5
N4
N3
N2
N1
W1
E1
ET
WT
BELLINGHAM BAY
Pedestrian Bridge
Transfer Bridge
Terminal Building
Warehouse
Short Term Parking
Vehicle Staging
To Bellingham
0
140'
280'
SCALE IN FEET
Canada
United States
BELLINGHAM
LOCATION
Vancouver Island
Victoria
Strait Of Juan De Fuca
Pacific Ocean
Port Angeles
Everett
Seattle
Tacoma
N
VICINITY MAP
GENERAL LAYOUT
BELLINGHAM

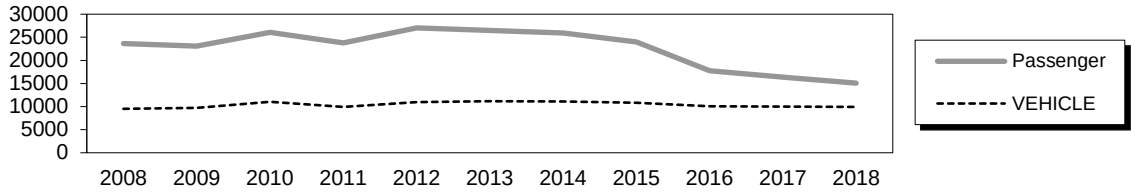
Bellingham Ferry Terminal

335 Harris Ave. – Ste. 101

Owner: Port of Bellingham

Terminal Manager: Dave Warter – 360-676-2500

Terminal Description: Bellingham Ferry Terminal, built in 1989, is the southern terminus for the Alaska Marine Highway System (AMHS). Bellingham is a stern-loading facility consisting of a steel transfer bridge, supported by a steel framed lift tower and counterweight system at the seaward end, with two stern dolphins and five breasting dolphins connected by timber catwalks. The terminal building differs from AMHS owned facilities in that it is a multiple use facility. The terminal building lies on a concrete dock supported by steel pipe piles. The dock extends around the northern, eastern, and western faces of the terminal building. The staging area has separate long and short term parking areas. Bellingham's past 10 years of total passenger and vehicle traffic are shown below.



The most recent above water survey was completed on September 29, 2017.

Vessels	
Name	Berthing, Alignment
Mat/Mal/Ken/Col	Stern

Tidal Data (MLLW 0.0 feet)	
EHW	11.5
MHHW	8.6
MHW	7.8
ELW	-4.5

Terminal Building	
Year Built:	1989
Square Footage:	22,509 s.f.
Heating System:	Boiler
Fuel Storage:	UST
Fire Protection:	Yes
Condition:	Good

Generator & Building
The vessel's generator powers the vehicle ramp during shorepower outages.

Uplands	
Short-Term Parking:	12 cars, 1 HCP
Long-Term Parking:	80 cars
Staging Area:	3200 lineal feet - cars; 800 lineal feet - trucks;
Paint Striping:	Yes
Driving Surface:	Asphalt

Utilities		
	at Terminal	at Ramp
Electrical:	Yes	Yes
Water:	Yes	Yes
Sewer:	Yes	Yes
Telephone:	Yes	Yes
Cable TV:	Yes	No
Fuel:	UST	Yes
Wireless Bridge:	Yes	-

Pedestrian Bridge	
Type:	8' x 77' Steel Truss
Year Built:	1989
Shoreward support:	Hinge bearings
Seaward support:	Cable hoist support on steel lift towers
Apron lift:	Hydraulic
Coating:	Sherwin Williams Paint
Lighting:	Overhead fixtures
Condition:	Good

Vehicle Transfer Bridge	
Type:	22' x 120' twin steel girder
Year Built:	1989
Shoreward support:	Hinge bearings
Seaward support:	Counterweighted cable
Coating:	Hydraulic
Pedestrian Access:	Sherwin Williams Paint
Lighting:	Lights on Lift Towers
Condition:	Good
Load Posting Sign:	10 Tons Max Axle Load
Original Design Load:	AASHTO HS 20-44

Dolphins

Dolphins	Dolphin Piles	Fender Support	Fender Face	Anodes	Built	Cond.	Notes
N6	1BC, 3VC	-	-	-	1989	Good	Red Nav Light & Windsock
N5	3BC, 5VC	4V	Sitka Spruce	Yes	1989	Good	
N4	2T	-	-	-	1989	Good	
N3	3BC, 5VC	4V	Sitka Spruce	Yes	1989	Good	
N2	2BS, 2VS	Chains	UHMW	Yes	1997	Good	
N1	3BC, 5VC	4V	Sitka Spruce	Yes	1989	Good	
W1	12BH, 20VH	-	Sitka Spruce	Yes	1989	Fair	
E1	10BC	4V	Sitka Spruce	Yes	1989	Good	
WT	7BC, 4VC	-	-	-	1989	Good	
ET	7BC, 4VC	-	-	-	1989	Good	

LEGEND
WT = West Bridge Lift Tower Dolphin
VC = Vertical Concrete Piling
C1 = Catwalk
BH = Battered Steel H-Piling
BS = Battered Steel Pipe Piling

Catwalks / Gangways

#	From Struc.	To Struc.	Lenth / Style / Main Members	Built	Safety Chaines?	Cond.	Lighting	Notes
C1	Dock	N6	380' / Catwalk / Timber stringers on piles spaced 50' (roughly) apart	1989	No	Good	Lightpoles	

Observations

Terminal Projects

Year	Project #	Project Name	Description
1989	N/A	Bellingham Ferry Terminal	Construction of new terminal structures. Uplands fill, vehicle parking/staging, landscaping, fencing and new terminal building.
1997	75562	Ocean Class Vessel Dock Modifications	Constructed new breasting dolphin N2, mondified bridge apron for the Kennicott and installed new hydraulic lift for apron.
1999	N/A	Fairhaven Terminal Passenger Ramp Apron Modifications	Replaced the existing apron with a new retractable apron.

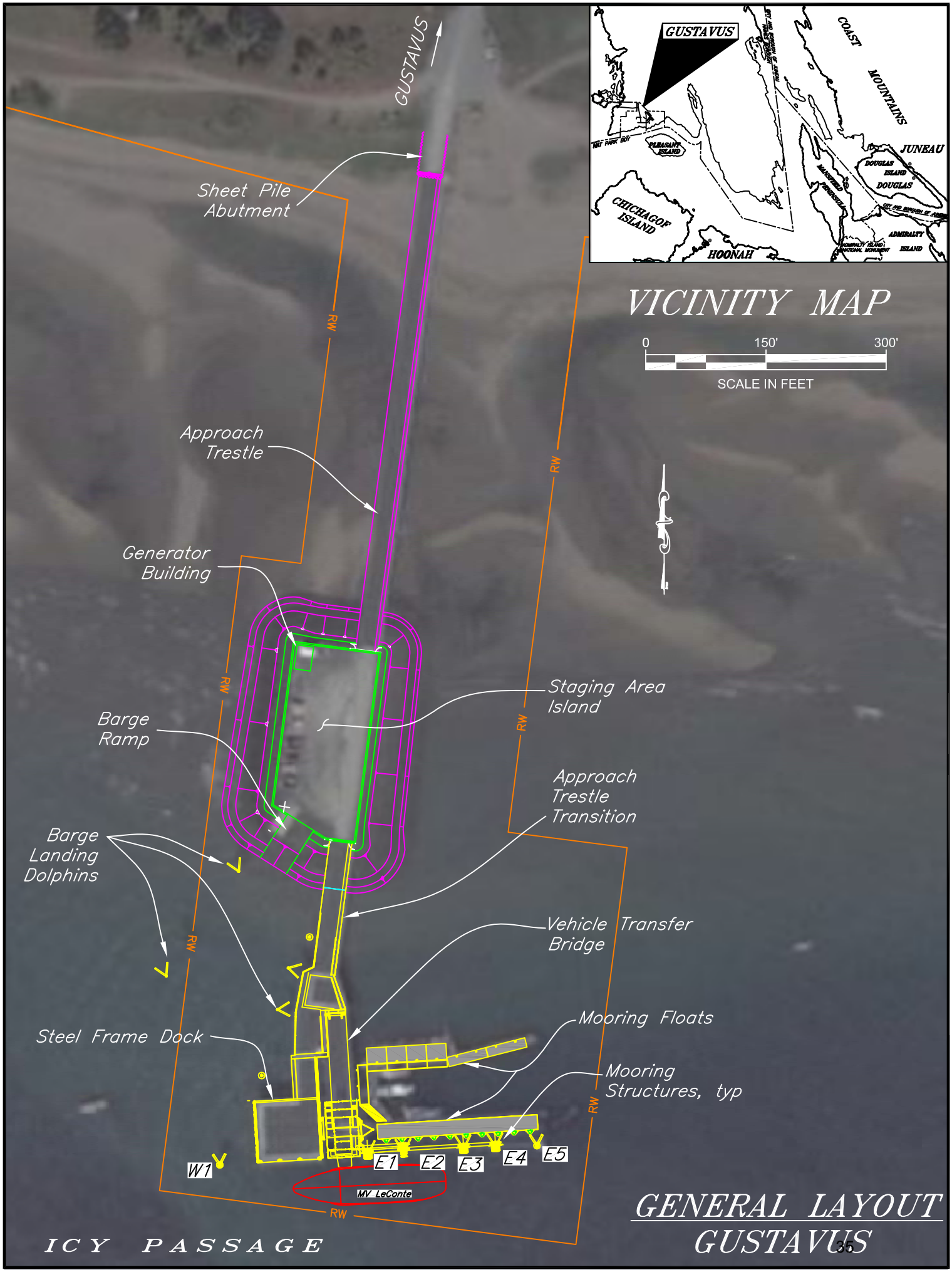
1. AMHS rents part of a warehouse facility located directly adjacent to the vehicle loading bridge and Port of Bellingham terminal facility. The warehouse provides phone and fax services to the crew while the vessel is in port. The warehouse provides storage for vessel equipment, spare parts, and receiving items.

   The paint storage area in the warehouse is out of compliance. There are many propeller blades are stored in the warehouse. Storage racks in the warehouse are unrestrained at the post bases, which is a seismic concern.
2. The terrazzo floor has cracked between the roof truss supports. The microcracks are small and don't present a tripping hazard.
3. The northern-most mooring structure (N6) and approximately sixty feet of access catwalk were damaged in 1992 by an AMHS vessel collision. The vessel was approaching the facility during high winds. The vessel stern was blown against the northwest corner of this dolphin, which has no fender protection. The Port replaced the damaged mooring structure, navigation light, windsock, and catwalk in 1994. AMHS vessel masters have requested that this structure be replaced with a wraparound turning dolphin similar to those located at the ends of the mooring structures in Ketchikan to aid vessel landing during high wind conditions. With the potential cost of this upgrade approaching one million dollars, this project has not been placed on the Port's priority list. The state will need to coordinate funding of this project with the Port of Bellingham. This dolphin has a red nav light and windsock mounted on the cap.

   In 1997, AMHS added a new dolphin (N2) with a steel fender system. This dolphin was added to accommodate the M/V Kennicott. The new dolphin is a galvanized steel cap structure supporting a steel suspended fender system. The fender face is an ultra-high-molecular-weight (UHMW) black plastic. Cylindrical rubber bumpers installed between the fender system and dolphin provides vessel energy absorption. CP measurement in 2017 for dolphin N2 was below -0.8V, which indicate that the steel is unprotected from corrosion.

   Several of the timbers are broken on the fender panels of dolphins N1 & N3. The energy-absorbing units of these fender dolphins are "buckling column" rubber units. These have very good energy capacity but require a large initial force to cause buckling. Most broken timbers are located in the corners of the panels where the vessel sponson contacts a single timber when berthing obliquely. It is very likely the timbers fail because the fender units are stiff and the large initial reaction causes failure of the timber prior to buckling of the rubber unit. Recommend an analysis of the fender assembly by marine engineering to ensure compatibility among the timbers, wales, rubber elements and back-up structure. If the timbers are the limiting element, a possible solution is substituting the damaged timbers with stronger members such as steel beams faced with UHMW.
4. Condition of all dolphins are relatively identical to the previous inspection: coal tar epoxy coating is failing on all immersed steel structures, some fender timbers are still broken, timber catwalks have no safety chain/cable installed. Overall, dolphins are in good/fair condition.
5. The horizontal fender chains, mounted on the sides of the caps and fenders of dolphins N1, N3 & N5 are corroding. U-bolt chain connections to the fender and caps are undersized and corroding.
6. The towers, bridge and pedestrian ramp coatings were replaced in 2002 and remain in good condition. The non-skid coating on the pedestrian ramp-walking surface was replaced in 2002 and appears durable. The cables of the lift system and upper sheaves are inspected annually by Port staff.
7. The pedestrian gangway collapsed suddenly during service in 2012, and was not used again until January of 2016. There was litigation involved, which affected the timeline for making the repairs. During the shutdown period, pedestrians would walk down the transfer bridge car deck to load on the vessel, similar to standard AMHS port facilities.
8. The short timber catwalks between the main catwalk and the dolphin caps are fastened rigidly to their supports and do not have safety chains installed.
9. Improvements to the sewer pumpout utility lines were completed in January of 2011.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Nothing recommended.		
Category II - Rehabilitation Work		
Dolphins	1	Replace the end dolphin N6 with a wrap-around turning dolphin. Analyze the timber fender system for capacity. Replace broken fender rubbing timbers as necessary. Replace the U-bolt chain connections on the fender and caps with properly sized pad eyes, with concrete anchor bolts for the caps. Replace the chain connecting links on the dolphin cross chains. Monitor the coating loss on the dolphin fender support piles.
Catwalks	2	Install safety chains/cables at the supports of the short timber catwalks between the main catwalk and the dolphin caps.
Terminal Building	3	Monitor the cracks in the terrazzo floor.
Storage Building	4	Fasten the post bases of the storage racks to the Warehouse floor, to brace in the event of seismic loading. Bring paint storage area into compliance.
Category III - Upgrades Needed		
Nothing recommended.		


GUSTAVUS
Sheet Pile Abutment
Approach Trestle
Generator Building
Staging Area Island
Barge Ramp
Approach Trestle Transition
Barge Landing Dolphins
Vehicle Transfer Bridge
Steel Frame Dock
Mooring Floats
Mooring Structures, typ
RW
W1
E1
E2
E3
E4
E5
MV LeConte
ICY PASSAGE
GUSTAVUS
COAST MOUNTAINS
JUNEAU
DOUGLAS ISLAND
DOUGLAS
PLEASANT ISLAND
CHICHAGOF ISLAND
HOONAH
ADMIRALTY ISLAND
VICINITY MAP
0
150'
300'
SCALE IN FEET
GENERAL LAYOUT
GUSTAVUS

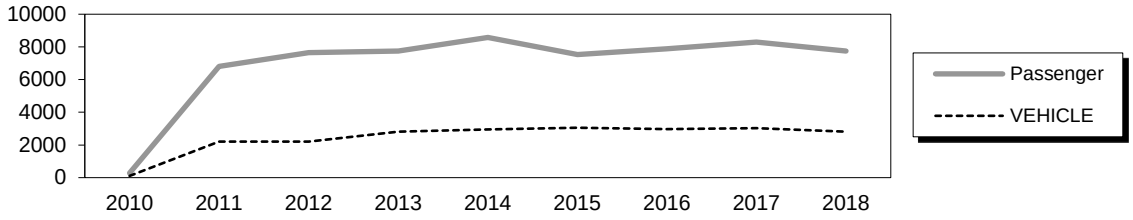
Gustavus Ferry Terminal

State Dock Road

Owner: State of Alaska

Contact: Gregory Patz, M&O Superintendent, SE Region – 907-465-1784

Terminal Description: The Gustavus Ferry Terminal is a side-berth loading facility consisting of a 600' long trestle, 0.75 acre staging/parking island, 175' long approach trestle with a 75'x75' dock and sheet pile wave barrier, pontoon-supported transfer bridge with adjustable ramp and apron, six steel pile dolphins and catwalks/gangways for linehandling access. This facility was recently constructed in 2011 as a multi-purpose community dock and for use as a ferry terminal by AMHS. This facility is presently operated and maintained by DOT&PF, SE Region – not AMHS. Gustavus's total passenger and vehicle traffic are shown below.



The most recent above water survey was completed on June 21, 2017. The most recent underwater inspection was completed on August 2, 2016.

Vessels	
Name	Berthing Alignment
LeConte, Aurora	Port/Starboard
FVF	Port/Starboard

Tidal Data (MLLW 0.0 feet)	
EHW	20.0
MHHW	14.8
MHW	13.7
ELW	-5.0

Terminal Building
This facilty does not have a terminal building.

Generator & Building	
Year Built:	2011
Square Footage:	336 s.f
Heating System:	Oil Furnace
Fuel Storage:	500 gal Tank
Fire Protection:	N/A
Condition:	New

Utilities		
	at dock	at ramp
Electrical:	Yes	Yes
Water:	No	No
Sewer:	No	No
Fuel:	Yes	No

Uplands	
Parking:	14 cars
Staging Area:	240 ft
Paint Striping:	No
Driving Surface:	Gravel

Vehicle Transfer Bridge - #1417	
Type:	21'x125' steel multi girder
Year Built:	2011
Shoreward support:	Steel Beam/ Driven Piling
Seaward support:	Steel Support Float
Coating:	Wasser Paint
Pedestrian Access:	On Bridge
Lighting:	Overhead Fixtures
Condition:	New
Load Posting Sign:	N/A
Original Design Load:	HS 20-44/Cat 972 Forklift & Lift Truck

Bridge Support Float	
Type:	40'x70'x7' Flexifloat
Year Built:	2011
Ballasted:	Yes
Ramp & Apron:	Hydraulic
Anodes:	Yes
Condition:	New

Dolphins							
Dolphins	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Notes**
W1	1V, 2B	-	Rubber Tires	No	2011	New	
E1	1V, 2B	Hanging	UHMW	No	2011	New	
E2	1V, 2B	Hanging	UHMW	No	2011	New	
E3	1V, 2B	Hanging	UHMW	No	2011	New	
E4	1V, 2B	Hanging	UHMW	No	2011	New	
E5	1V, 2B	-	Rubber Tires	No	2011	New	

LEGEND

E1 = East Mooring Dolphin
V = Vertical Steel Pipe Piles
B = Battered Steel Pipe Piles

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
2011	67599/ BR-0003(53)	Gustavus Causeway Replacement	The replacement of the old structures with new structures, the construction of a new dock and approach, and the relocation of the existing floats.
2011	N/A	GST Emergency Bridge Repairs	The replacement of bridge support roller bushings and repairs to the damaged bridge support rollers.
2013	67599	Gustavus Causeway Replacement	A new access gangway was installed between mooring structures E4 to E5 to allow use of E5 as a mooring line attachment for the MV Kennicott. Other miscelleneous modifications were made to the bullrails on the fixed dock and the existing dolphin caps to minimize line abrasion.

Observations

1. There is no purser shelter or designated pedestrian waiting areas. Vehicle staging for an incoming ferry occurs on the paved island, in painted staging lanes.
2. The transfer bridge has a hydraulically operated intermediate ramp and apron. The hinge bearings for the shoreward bridge support pier are not easily accessible, but a remote greasing station was installed for maintenance.
3. The intermediate ramp is short and is too high for the primary vessel (LeConte). Limitations on vehicle length and trailer type are required in order to traverse the grade breaks from ship to the intermediate ramp and bridge.
4. The apron hinges were recently greased. The bolted end of the tension rods on the hydraulic cylinders for the apron lift system are corroding. The interior of the hydraulic cabinet is in good condition.
5. AMHS employs shore-based personnel to assist with vessel mooring lines. Self-retrieval of mooring lines by the vessels is no longer required. SER removed all fixed mooring lines and pendant masts from this facility and made other minor line handling improvements to the top of the dolphin caps for ease of vessel tie-up.
6. Cathodic potential (CP) readings for all mooring dolphins, and all but one trestle bent (16) are below -0.8V, which means the steel is freely corroding. CP readings for the main dock piles are all above -0.8V. Depth to mudline elevations, taken with leadline readings at locations along the fender line in 2015, range from -30’ to -38’ MLLW.
7. Portions of the galvanized coatings exhibit failure on dolphin W1 & E5 access ladders.

Observations (continued)

8. Damage to the seaward bridge bearings from a winter storm was discovered on December 6, 2011. Additional inspection by SER marine design inspection crew on Feb 8, 2012 revealed vertical support bearing failure again on two girders on the eastern side. AMHS Maintenance replaced the damaged bushings with synthetic high-impact strength bushings.

   In October of 2013 a project replaced girder roller bearings with higher strength, larger diameter barrels and synthetic bushings. Also installed were additional lateral roller bearing restraints. The most recent inspection found them operating normally.

9. On September 28, 2011 a barge, hauling embankment materials for an ADOT airport project, impacted the edge of the approach transition structure and the barge landing lead-in dolphin. Damage to the transition structure was minor, consisting of a crushed stiffener plate & utility hanger and deformation of the bottom flange of the exterior trestle girder. The dolphin was damaged more significantly:

   - Two dents and a substantial deformation of the upper 40-feet of the west batter pile (18" diameter).
   - A large dent and deformation of the front face of the vertical king pile located about 3-feet above the rubber tire fender (24" diameter).
   - Deformation of the bottom plate of the pile cap structure.

   The approach transition & dock are protected by 3 dolphins, but the impact occurred where the gap between dolphins is ~150' wide.

10. During embankment hauling operations heavy truck traffic traversed the approach trestle, which induced a vibration that caused the bolts of the deck hold-down clamps to loosen in September, 2011.The Contractor re-fastened all of the bolts on the dock. These bolts reportedly loosen with regular traffic. The local DOT maintenance crew inspects and re-tightens when needed.

    Re-fastening all deck hold-down bolts is a difficult process to coordinate, requiring 2 men and a skiff during high tide. By turning the bolts around, so that the nut end is up, and tack welding the bolt head down to the clamp plate, these bolts could be tightened by one maintenance worker from top-side.

    Inspection in October, 2013 found 52 loose deck hold-down clamps out of 800. The girder anchor bolts are missing or have loose nuts at various locations along the approach trestle.

11. The steel transition fingers at the leading edge of the apron clear the top of the LeConte door opening by a few inches. Vessel personnel typically fold the fingers back to allow more clearance when lowering the apron into the vessel. But the existing steel apron fingers are heavy and, when left in the folded down position, fill with water & freeze in the winter – which increases their weight.

12. Local boaters have anchored a dense group of mooring buoys offshore within proximity of the dock over the past years. The location of the buoys creates navigational concerns for ferry traffic and maneuvering capabilities on approach to the dock - especially during winter storms.

    The M/V Kennicott made a trial berthing in late April, 2012 and desires to utilize the terminal for regular traffic stops on its cross-gulf voyages. They indicated a need for a method of attaching mooring line to dolphin structure E5. A catwalk is preferred. The Kennicott was routinely stopping at GUS monthly as part of its cross gulf voyage, but not in 2018 as reduction of service from budget cuts. A new access catwalk was added in 2015 from E4 to E5 to allow line handlers to access structure E5.

13. The dolphin access gangway has been struck by the breakwater guide pile. There is a significant dent in the shoreward bottom chord. Additionally, the angle guide at bottom of gangway sheared off from one side and fiberglass conical cap on pile adjacent to gangway has been completely destroyed. Clearance between bottom chord and nearest surface of pile is 24 in.

14. Bridge pontoon - Seaward freeboard is estimated at about 12 inches and shoreward freeboard is 26". Slight decrease in freeboard from previous measurements. Extruded delta fenders of all pile guides show some damage such as loose bolts, bent UHMW backing plates, and cracks in rubber fender. AMHS Maintenance has made coating repairs to the area above the waterline on the seaward edge of the float.

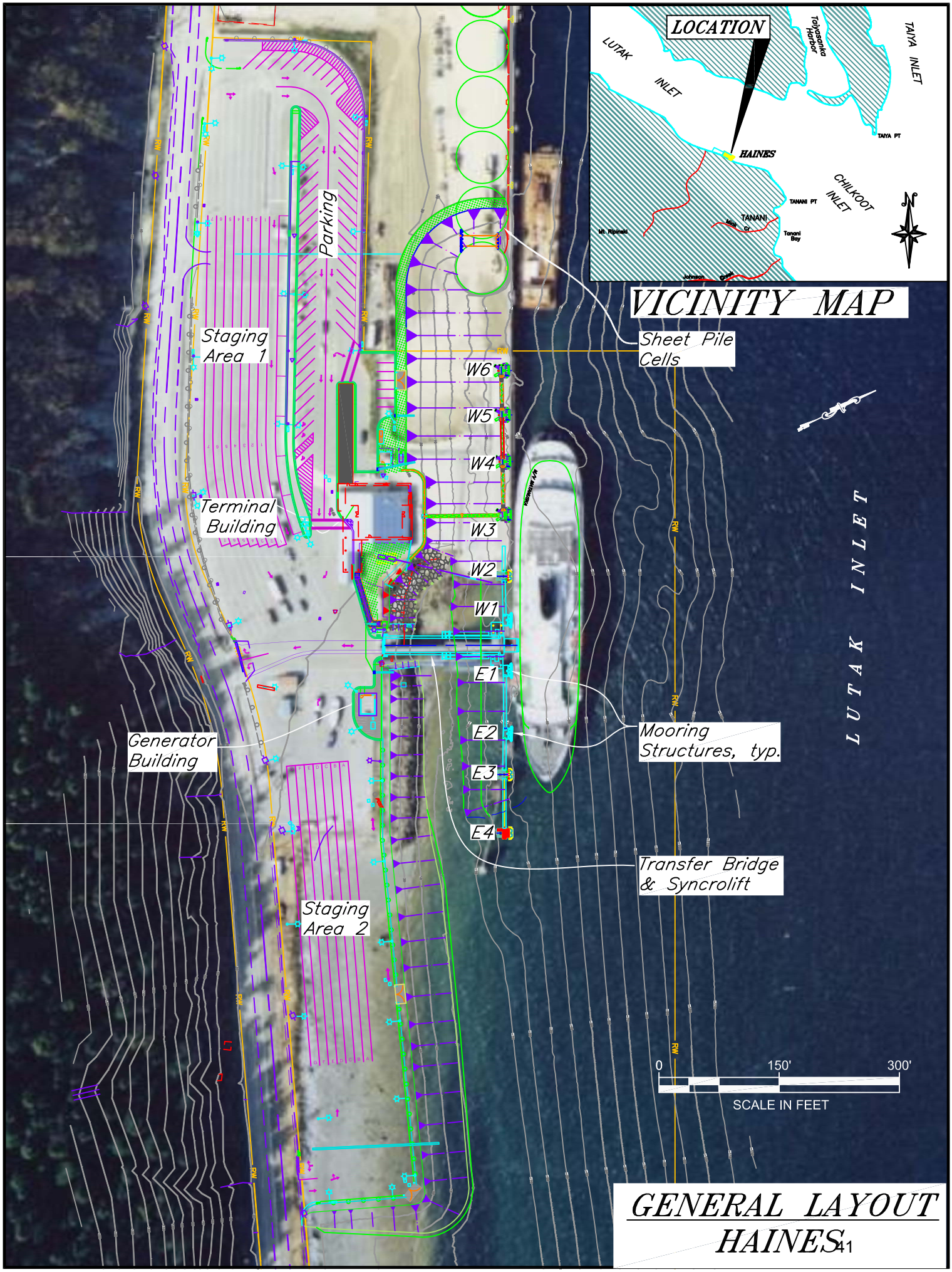
15. The aluminum pedestrian access gangway was modified during construction by raising the seaward end. A white polyethylene half-round was added to the original skids to increase underside clearance between the gangway and platform. Additional piece rotating out of alignment. Gangway skids extend beyond the angle guide at high tide and the skid appendage is at risk of being sheared from the gangway.

16. There are various damages to the timber harbor floats, most concerning are missing bolts & nuts at the removable pile guides. If the guides fail, the harbor floats may float towards the vicinity of a moored vessel.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Marine	1	Construct additional offshore dolphin to protect exterior girder from future vessel impacts while utilizing the barge landing ramp.
Private Mooring Buoys	2	Determine the appropriate approach and departure channels to the dock and then discuss establishment of formal navigation areas with the USCG and local residents. Buoys or other obstacles to safe navigation should be removed.
Trestle Deck	3	Monitor the bolts of the deck hold-down clamps. Program a project to modify the clamps so that the bolts can be tightened by one maintenance worker from topsides.
Harbor floats	4	Add bolts/nuts where missing to the removable pile guide brackets.
Category II - Rehabiliation Work		
Bridge	5	Provide fence/gate improvements at seaward end of transfer bridge to prevent pedestrian access to vessel from the adjacent small boat harbor.
Trestle & Barge Landing Dolphin	6	Replace damaged stiffener plate & utility hanger on exterior girder on outer trestle approach. Repair/replace damaged barge landing dolphin.
Bridge Float	7	Remove the anode and cable on the southeast corner of the pontoon. Retrofit or replace the damaged rubber restraint fender units. Monitor the condition of the paint coating along the seaward edge & at the lock assemblies. Monitor the skiff moorage on the shoreward edge of the pontoon.
Ramp and Apron	8	Remove & replace existing steel fingers on the apron with aluminum fingers. Wrap corroding zinc hydraulic fittings with corrosion-proof wax tape. Prep and paint the hydraulic pump coupling. Drill drain holes in the bottom of the hydraulic cabinet.
Bridge	9	Provide an access platform and ladder for access to the shoreward bridge hinge bearings.
Dolphins	10	Repair the failed galvanized coating on the dolphin W1 & E5 access ladders. For 3-pile structures, install a ladder between the deck platform & the cap/lower mooring lines.
Pedestrian Rail	11	Install pedestrian rail and fence to east side of dock along wave barrier. Pedestrians accidentally falling from dock will strike wave barrier framing and likelihood of injury before entering the water is high.
Category III - Upgrades Needed		
Uplands	12	There is an active design project underway to investigate elimination of bridge float system and replace with lift bridge in future. Existing wave environment is too severe for the current float system. Also investigate/fund separate access to the boat harbor so that ferry and harbor use does not conflict.

Project #68128 – AMHS Gustavus Ferry Terminal Improvements:

This project is currently under design. The proposed scope is to install new pile supported lift towers with an associated bridge lift system, expand the existing dock to provide a new bridge abutment, more favorable vehicle alignment and separated transient harbor access, and relocate and reinstall the existing gangway and electrical. Advertisement is planned for Spring 2018, with construction expected to occur in 2018-19.


LOCATION
LUTAK
INLET
Taiyasanka Harbor
TAIYA INLET
TAIYA PT
HAINES
CHILKOOT INLET
TANANI PT
TANANI
Mosquito Cr
Mt. Ripinski
Tanani Bay
Johnson Creek
VICINITY MAP
Parking
Staging Area 1
Terminal Building
Generator Building
Staging Area 2
Sheet Pile Cells
W6
W5
W4
W3
W2
W1
E1
E2
E3
E4
Mooring Structures, typ.
Transfer Bridge & Syncrolift
LUTAK INLET
RW
0
150'
300'
SCALE IN FEET
GENERAL LAYOUT
HAINES

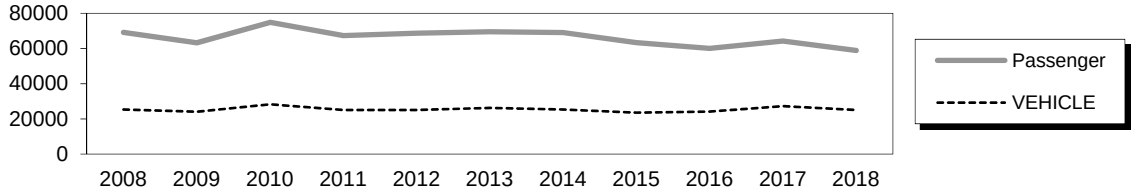
Haines Ferry Terminal

4 Mile Lutak Road

Owner: State of Alaska

Terminal Manager: Edith von Stauffenberg – 907-766-2862

Terminal Description: Haines is a side-loading facility consisting of a transfer bridge, twin lift tower syncrolift, three steel pile and two timber dolphins, sheet pile cell structure with timber fenders and catwalks/gangways for line-handling access. The terminal structures were originally constructed in 1980 and it is the second busiest facility in the AMHS system; only Juneau surpasses it for combined passenger and vehicle traffic. Haines past 10 years of total passenger and vehicle traffic is shown below.



The most recent above water survey was completed on August 3, 2017. The most recent fracture critical & underwater inspections occurred on August 12, 2016.

Vessels	
Name	Berthing, Alignment
Kennecott/Tustumena	Port
All Other Vessels	Starboard

Tidal Data (MLLW 0.0 feet)	
EHW	22.5
MHHW	16.8
MHW	15.8
ELW	-6.0

Terminal Building	
Year Built:	1980
Square Footage:	4352 s.f.
Heating System:	Forced Air
Fuel Storage:	UST
Fire Protection:	Fire Alarm
Condition:	Good

Generator & Building	
Year Built:	1984
Square Footage:	360 s.f.
Heating System:	Electric
Fuel Storage:	N/A
Fire Protection:	Halon
Condition:	Good

Uplands	
Short-Term Parking:	12 cars, 1 HCP
Long-Term Parking:	80 cars
Staging Area:	3200 lineal feet - cars; 800 lineal feet - trucks;
Paint Striping:	Yes
Driving Surface:	Asphalt

Utilities		
	at Terminal	at Ramp
Electrical:	Yes, city & backup power	
Water:	Yes	No
Sewer:	Yes (Septic)	No
Telephone:	Yes	Yes
Cable TV:	No	No
Fuel:	UST	Yes
Wireless Bridge:	Yes	-

Vehicle Transfer Bridge - #0804	
Type:	16' x 140' twin box beam
Year Built:	1985
Shoreward support:	Concrete abutment
Seaward support:	Steel Lift Beam-Syncrolift
Coating:	Wasser Paint
Pedestrian Access:	Concrete 4' wide on bridge
Lighting:	Tubular lights on railing
Condition:	Good
Load Posting Sign:	N/A
Original Design Load:	HS 20-44

Dolphins								
Dolphins	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Hawse Extensions**	**Notes**
W6	2B, 2V	Hanging	UHMW	Yes	2015	New	Yes	
W5	2B, 2V	Hanging	UHMW	Yes	2015	New	Yes	
W4	2B, 2V	Hanging	UHMW	Yes	2015	New	Yes	No mooring
W3	2B, 2V	Hanging	UHMW	Yes	2015	New	Yes	
W2	4V	Hanging	UHMW	Yes	2008	Good	Yes	
W1	2B, 1V	4V	Ekki Timber	No	1984	Fair	No	
E1	2B, 1V	4V	Ekki Timber	No	1984	Fair	No	
E2	2B, 1V	4V	Ekki Timber	No	1984	Fair	No	
E3	4V	Hanging	UHMW	Yes	2008	Good	Yes	
E4	4V	Hanging	UHMW	Yes	2008	Good	Yes	Windsock
ET	4V	-	-	No	1984	Good	-	Light Pole & Nav Light
WT	4V	-	-	No	1984	Good	-	Light Pole

LEGEND
ET = East Lift Tower V = Vertical Steel Pipe Piling B = Battered Steel Pipe Piling
G1 = Gangway EBP = East Bridge Platform

Catwalks / Gangways								
#	**From Struc.**	**To Struc.**	**Lenth / Style / Main Members**	**Built**	**Safety Restraints**	**Cond.**	**Lighting**	**Notes**
C1	E4	E3	61' / Catwalk / 10"x10" Tube Girders	1984	Yes	Fair	Jelly Jars	
C2	E3	E2	39' / Catwalk / 10"x10" Tube Girders	1984	Yes	Fair	Tubuloid	
C3	E2	E1	68' / Catwalk 10"x10" Tube Girders	1984	Yes	Fair	Tubuloid	
G1	ET	EBP	53' / Gangway / S 4x9.5 Bottom Chord	1984	Yes	Fair	Tubuloid	
G2	WT	WBP	53' / Gangway / S 4x9.5 Bottom Chord	1984	No	Fair	Tubuloid	
C4	W1	W2	44' / Catwalk / 16"x4" Tube Girders	2008	Yes	Good	Tubuloid	
C5	W2	W3	57' / Catwalk / 16"x4" Tube Girders	2015	Yes	New	Jelly Jars	
C6	W3	W4	57' / Catwalk / 16"x4" Tube Girders	2015	Yes	New	Jelly Jars	
C7	W4	W5	57' / Catwalk / 16"x4" Tube Girders	2015	Yes	New	Jelly Jars	
C8	W5	W6	44' / Catwalk / 16"x4" Tube Girders	2015	Yes	New	Jelly Jars	
C9	W3	Shore	97' / Catwalk / Under truss	2015	Yes	New	Jelly Jars	

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1952	N/A	Haines Sheet Pile Dock	Construction of new sheet pile dock. Includes concrete retaining wall and timber piles bolted to concrete face.
1962	F-095-10(1)	Southeast Alaska Ferry Terminal	Placement of fill, guardrail, septic tank, oil tank, lighting, and hypochlorinator.
1963	N/A	Haines Ferry Terminal	Construction of timber transfer bridge, timber lift towers and counterweight system, and timber mooring dock. Also constructed new waiting shelter.
1968	MT 95	38 Pile Dolphin Haines Ferry Terminal	Construction of timber mooring dolphins, in-line with existing mooring dock fenders.

Terminal Projects (continued)			
Year	**Project #**	**Project Name**	**Description**
1972	DB 13-0870	Haines Ferry Terminal Building	Construct Haines waiting shelter.
1978	75210-MT-739	Haines Ferry Terminal Upgrades	Replaced the existing timber fender piles on the sheet pile dock with new timber pile modules that include rubber energy-absorbing donuts.
1980	N/A	Haines Ferry Terminal Building	Replaced the existing waiting shelter with new terminal and generator buildings.
1984	A38512-F-095-5(5)	Haines Ferry Terminal Modifications	Replaced the existing timber bridge, lift towers, and mooring dock with steel transfer bridge, lift towers and three steel mooring dolphins.
1992	75034 / RS-0991(3)	Haines Ferry Terminal Upland Improvements	Expand uplands parking & staging areas.
1995	75475-NH-095-5(7)	Haines Mooring Improvements Phase A	Adds an access gangway & platform between west side of transfer bridge and west lift tower; upgrades syncrolift winch gear & motors; miscellaneous electrical and bridge control upgrades.
2007	75249	Haines Mooring Improvements	Replaced a Duncan Type timber dolphin (E3) and a concrete apped timber pile cluster (E4) with new steel mooring/breasting dolphins. A new dolphin, W2, was also installed west of the transfer bridge. Additional work included replacing a timber catwalk between E3 and E4 with a steel catwalk, installing a new gangway between W2 and the sheet pile dock, removing an existing timber fender module on the dock, and shoring for an existing concrete retaining wall above partially fail sheetpile cell #4.
2008	N/A	N/A	The AMHS Maintenance crews removed a timber fender module on sheet pile cell #3 that was leaning out tude to scour undermining the base of the fender panel. Maintenance also replaced the timber fender mounting bolts for the lower two wales on each of the three existing mooring dolphins.
2008	73003(4)	Haines FT Carpet Replacement	Replaced carpet in the terminal buliding with out standard style: Lees Carpet - Vitral Pattern, Modular 24" x 24" No. 428 Mountain Beauty.
2008	69050 / SHAK-0005-(575)	Haines - Ferry Dock Hoist Upgrade	Replaced the existing relay-based control panel for the transfer bridge lift system with a PLC-based control panel.
2015	68433	Haines FT Improvements	Removed the cellular sheet pile bulkhead, installed a retaining wall seaward of the terminal building, constructed three new mooring dolphins, four catwalks, two pedestrian walkways, new generator & storage buildings, reconfigured the uplands parking and staging areas, placed excavated fill from bulkhead along tidelands to construct new staging area west of the terminal building.

Observations

1. The terminal building has received several improvements over the years including: the installation of a new roof, insulation and vapor barrier upgrades, increase in ventilation capacity, and modifications to comply with ADA requirements. New carpet was installed throughout in 2008. The bathrooms need an upgrade and the water system is currently under review by DEC.

Observations (continued)

2. A small dam and creek impoundment located one mile west of the facility provides water to the terminal building. The water supply system between the dam and building is approximately 40 years old. A water treatment system was installed in 1990 to comply with regulatory requirements for treatment of water obtained from surface water sources. A fall storm in 2005 destroyed the dam, temporarily disrupting the water supply. Repairs were made and the water supply restored. In 2009 the sand filter was removed and replaced with two bag filters.
3. The bridge and lift system were constructed in 1984. The bridge was top coated in 1993 and is in fair condition. New Synchrolift motors and cables were installed in 1996. Motors and motor wiring were upgraded, Synchrolift controls were modified, and the lift gearboxes were upgraded to increase the bridge lifting rate. The lift system is in good condition. There have been numerous faults with the syncrolift controls over the years. In 1999, the controls were reset as directed by Synchrolift. An AMHS Maintenance project provided a permanent improvement to the faults by replacing the steady-state controls with PLC automated controls in 2008. The lift system has stabilized, but if/when faults do occur, they can be monitored on the internet.

   The lift cables were replaced in 2011. The leveling grout pad has several microcracks beneath the support frame for the East syncrolift hoist. There is also a sheared anchor bolt in the frame.
4. There is surface corrosion on the lifting beam covering ~30 s.f. of the middle & top of the web, underside of the top flange for the middle 15', on each side. No measureable section loss. The bridge lifting beam is out of plumb in section view, a sign that the bridge hinges may have seized. The lift beam access platform is damaged from impact with the lift tower piling, and access is difficult without a ladder from the bridge deck.
5. Sections of the open-grid decking are bent near the shoreward transition plate. Laminating corrosion exists along the full length of stringer #1, located beneath the left pedestrian walkway. Deicing chemicals are most likely the cause. The interior of the box girders were prime coated, but not top coated. They currently have widespread surface corrosion on the lower flange. The most severe corrosion is at the shoreward girder entrance door. A fuel hose approaching the bridge fuel line connection on shore is old, weathered and cracked.

   A steel pipe lever on the right side of the bridge, used to retract the locking pin from the hanger bar, is sheared in half. The lever has been lashed to adjacent framing to prevent it from falling into the water. Operations personnel haven't adjusted the ramp for years.
6. The hinge pin of the apron transition plate has no retaining nut or cotter. The apron hinges are reported to be worn; there is excessive play between the bridge and the apron.
7. Surface corrosion is bleeding through the paint on the top of the girders on Catwalk C3. Hanger bolts of the catwalk leading to the left lift tower are loose.
8. The most recent Fracture Critical inspection found a 13-5/8" crack between the RT girder web & bottom flange (1-7/8'' vertical (shoreward) + 10'' (bottom flange) + 1-3/4'' vertical (seaward)). Also a 9 ¾" long crack between the RT girder web and bottom flange weld under the floorbeam. None of these appear to be propagations, (brown rust coating the welds) rather most accurately inspected.
9. The most recent Fracture Critical inspection found cracks between the LT girder (G1) & floorbeam 1 at corners – shoreward bottom, 3-5/8"; seaward bottom, 3-7/8". There is also a 9-3/4" long crack between the web plate & bottom flange girder weld.
10. Weld indications exist at the lower corners of the intermediate ramp lift beam to Stringer 1 connection.
11. There is heavy surface corrosion & 1/8" section loss on interior of seaward end of bridge, and lower 4" of bottom flange plates. Laminar corrosion exists on interior of shoreward end of bridge, lower 2" of stiffener plates & bottom flange of girder. Section loss is less than 1/8".
12. The diagonal braces between lift tower piling have failed galvanized coating in splash zone. The field coating has failed at welds between gusset plates & piles.
13. Cathodic potential (CP) readings for mooring dolphins W1-2 are above -0.8V, which indicates the steel is adequately protected against corrosion. CP readings for dolphins E1-4 are below -0.8V, which indicates the steel is freely corroding. Depth to mudline elevations, taken with leadline readings at locations along the fender line in 2015, range from -26.5' to -31' MLLW.

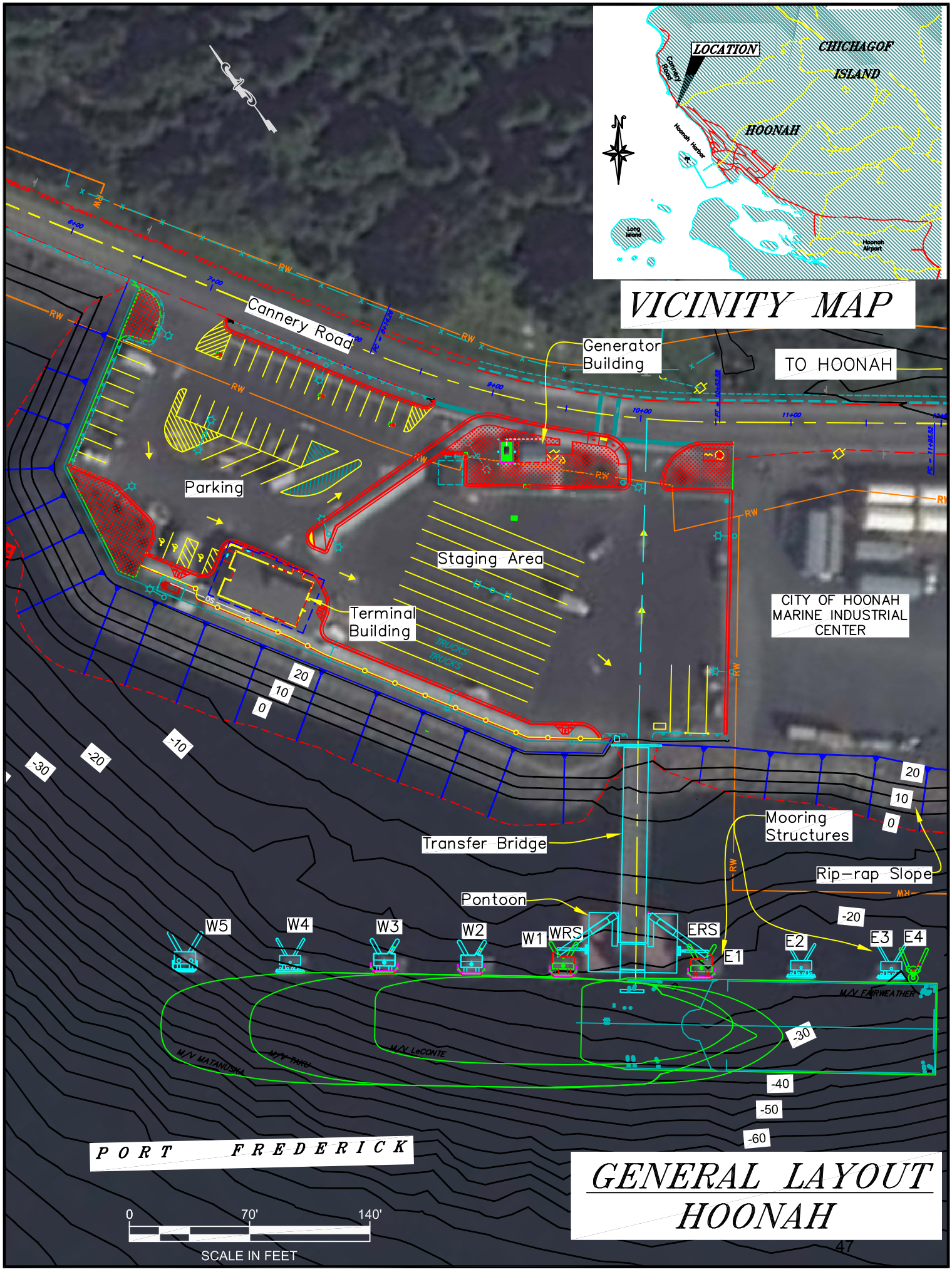
Observations (continued)

14. There are several broken concrete curb sections in the re-built west side of the parking lot.
15. Construction staff allowed a power/light pole to be built with two diagonal guy wire anchors in the new staging area, which conflicts with staging lane ‘G’. Had Contractor place heavy concrete blocks with carsonite posts around the guy anchors. Needed to install sidewalk guys, with intermediate brace on pole and vertical anchors.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Transfer Bridge	1	Replace the bridge lift beam. Construct a wider inspection platform on the lift beam, with access ladder from the bridge deck.
Category II - Rehabilitation Work		
Transfer Bridge	2	Install neoprene gasket in the girder entrance door and secure the door with bolts. Monitor corrosion within the interior of the girders. Replace the cracked fuel line. Monitor the cracks in the corner and bottom welds of the floorbeam connection to webs of both box girders and repair if/when required. Recoat floor stringer 1 below concrete in-filled pedestrian walkaway. Investigate need for new paint recoat of entire bridge in future.
Transfer Bridge Lift Towers	3	Monitor the condition of the grout pad and replace the anchor bolt on the East lift tower frame. Replace the lift beam access platforms with a design like the Valdez platforms. Repair the field coating on welds of the cross bracing of tower piles.
Terminal Building	4	Consider future project to replace and/or retrofit existing terminal building as may be needed.
Power pole guy anchor	5	At the existing power pole guy anchor conflict with staging lane 'G', remove & replace diagonal with vertical braced sidewalk guy anchors to utilize full width of lane 'G'.
Bridge Apron	6	Replace apron hinges. Install retaining nut/cotter on the end of the hinge pin for the apron transition plate.
Bridge Ramp	7	Determine extent of damage to bridge ramp lock pin/hanger bar and program repairs so that lift functions are restored.
Catwalks	8	Inspect/replace hanger bolts, tighten existing jam nuts to prevent failure of catwalk.
Concrete curbs	9	Cutout & replace damaged sections of concrete curb.
Dolphins	10	Replace the existing UHMW caps on the fender panels with steel caps securely fastened to the timbers. Install anodes on existing steel piles.
Catwalk C3	11	Inspect and evaluate catwalk for a paint re-coat.
Category III - Upgrades Needed		
No upgrades necessary		

Project #68464 – Haines Ferry Terminal End Berth Facility:

The proposed scope of this project is to construct offshore and uplands improvements necessary for accommodating end loading of AMHS ferry vessels. These improvements are required for the safe and efficient berthing, mooring, and vehicle and pedestrian transfer operations of existing and proposed new ferry vessels. Preliminary design is complete, awaiting construction funding.


LOCATION
CHICHAGOF ISLAND
HOONAH
Cannery Road
Hoonah Harbor
Hoonah Airport
VICINITY MAP
Cannery Road
Generator Building
TO HOONAH
Parking
Staging Area
Terminal Building
CITY OF HOONAH MARINE INDUSTRIAL CENTER
TRUCKS
Transfer Bridge
Mooring Structures
Rip–rap Slope
Pontoon
W5
W4
W3
W2
W1
WRS
ERS
E1
E2
E3
E4
M/V FAIRWEATHER
M/V LeCONTE
M/V TAKU
M/V MATANUSKA
PORT FREDERICK
GENERAL LAYOUT
HOONAH
0
70'
140'
SCALE IN FEET
47

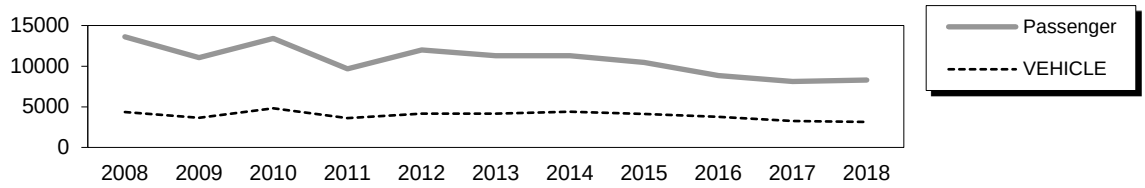
Hoonah Ferry Terminal

1 Mile Cannery Road

Owner: State of Alaska

Terminal Manager: Lyna Johanson – 907-945-3543

Terminal Description: Hoonah Ferry Terminal was originally constructed in 1974. The current facility is a side-berth facility consisting of a transfer bridge, steel support float, and eight steel mooring dolphins. The uplands and terminal building was reconstructed in 2010/11. The transfer bridge, float system and five new mooring dolphins were constructed in 2011. This terminal is now capable of servicing all AMHS vessels including the FVF. Uplands include terminal and generator buildings, paved parking and overhead lighting. Hoonah's past 10 years of total passenger and vehicle traffic counts are shown below.



The most recent above water survey was completed on August 14, 2017. The underwater inspection occurred on August 10, 2016.

Vessels	
Name	Berthing, Alignment
Mat / Mal / Taku/ Leconte	Port
FVF	Starboard

Tidal Data (MLLW 0.0 feet)	
EHW	20.0
MHHW	14.8
MHW	13.9
ELW	-5.1

Generator & Building	
Year Built:	1992 (exterior siding - 2010)
Square Footage:	360 s.f.
Heating System:	Electric
Fuel Storage:	UST
Fire Protection:	N/A
Condition:	Good

Vehicle Transfer Bridge - #0179	
Type:	16' x 130' steel multi-girder
Year Built:	2011
Shoreward support:	Concrete abutment (1973)
Seaward support:	Steel Support Float
Coating:	Spray metallized w/topcoat
Pedestrian Access:	Concrete 4' wide on bridge
Lighting:	(3) Overhead Light Posts
Condition:	New
Load Posting Sign:	N/A
Original Design Load:	HL93

Uplands	
Short-Term Parking:	22 cars
Long-Term Parking:	0
Staging Area:	610 lineal feet, 4 lanes
Paint Striping:	Yes
Driving Surface:	Asphalt

Terminal Building	
Year Built:	2011
Square Footage:	1472 s.f.
Heating System:	Monitor
Fuel Storage:	500 gal UST
Fire Protection:	None
Condition:	New

Bridge Support Float	
Type:	40' x 60' Steel Flexi-float
Year Built:	2011 (Intermediate Ramp & Apron reused).
Ballasted:	No
Ramp lift:	Hydraulic/Cable (1994)
Apron lift:	Hydraulic/Cable (1994)
Anodes:	Yes
Float Condition:	New

Utilities		
	at Terminal	at Ramp
Electrical:	Yes, city & backup power	
Water:	Yes	No
Sewer:	Yes (City)	No
Telephone:	Yes	No
Cable TV:	Yes	No
Fuel:	Yes	No
Wireless Bridge:	Yes	N/A

Dolphins							
Dolphins	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Notes**
W5	2B, 2V	Hanging	UHMW	-	2006	Good	Windsock & Red navlight
W4	2B, 1V	4V	Ekki Timber	-	1993	Fair	
W3	2B, 2V	Hanging	UHMW	Yes	2010	New	
W2	2B, 2V	Hanging	UHMW	Yes	2010	New	
W1	2B, 2V	Hanging	UHMW	Yes	2010	New	
E1	2B, 2V	Hanging	UHMW	Yes	2010	New	
E2	2B, 1V	4V	Ekki Timber	-	1993	Fair	
E3	2B, 1V	4V	Ekki Timber	-	1993	Fair	
E4	2B, 3V	Floating	Rubber	Yes	2010	New	White nav light
ERS	1B, 1V	-	-	-	1993	Fair	
WRS	1B, 1V	-	-	-	1993	Fair	

LEGEND
ERS = East Float Restraint Structure
V = Vertical Steel Pipe Piles
B = Battered Steel Pipe Piles
H = Vertical Steel H-Piles

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1973	S-0918(1)	HNH Ferry Terminal Construction	Original fill onto tidelands, with Shelter and separate vault toilet on uplands; built transfer bridge, flexifloat seaward support (w/ concrete anchors), ramp lift system and four concrete capped, steel pile mooring dolphins (E1, W1-3).
1975	??	HNH Ferry Terminal Building	Construct the terminal building.
1986	X-70006	HNH Ferry Terminal North Dolphin Repair	Remove existing and install new fender panel from dolphin W3; Loosen existing concrete cap from existing dolphin piles and level.
1987	RS-0005(78)	Southeast Secondary Upgrade	Recoated and installed new zincs on flexi-floats; Recoated ramp, apron, transfer bridge; Replaced expanded metal mesh on bridge; Upgrade to dolphin fenders.
1992	74905 -RS-0918 (5)	HNH Ferry Terminal	Expanded the staging and parking areas, along with grading, paving, lighting and drainage improvements.
1993	75130 - RS0989	HNH Ferry Terminal Mooring	Installed new mooring structures W4 & E2-3; Replaced fender on W1; Installed new barge fenders and restraint structures.
1996	75455 - STP-0918 (6)	HNH Ferry Terminal Ramp & Apron Upgrade	Replace ramp and apron with newer hydraulically controlled units.
2006	67488	Kake & Hoonah Ferry Terminal Dolphins	Install new lead-in dolphin W5.

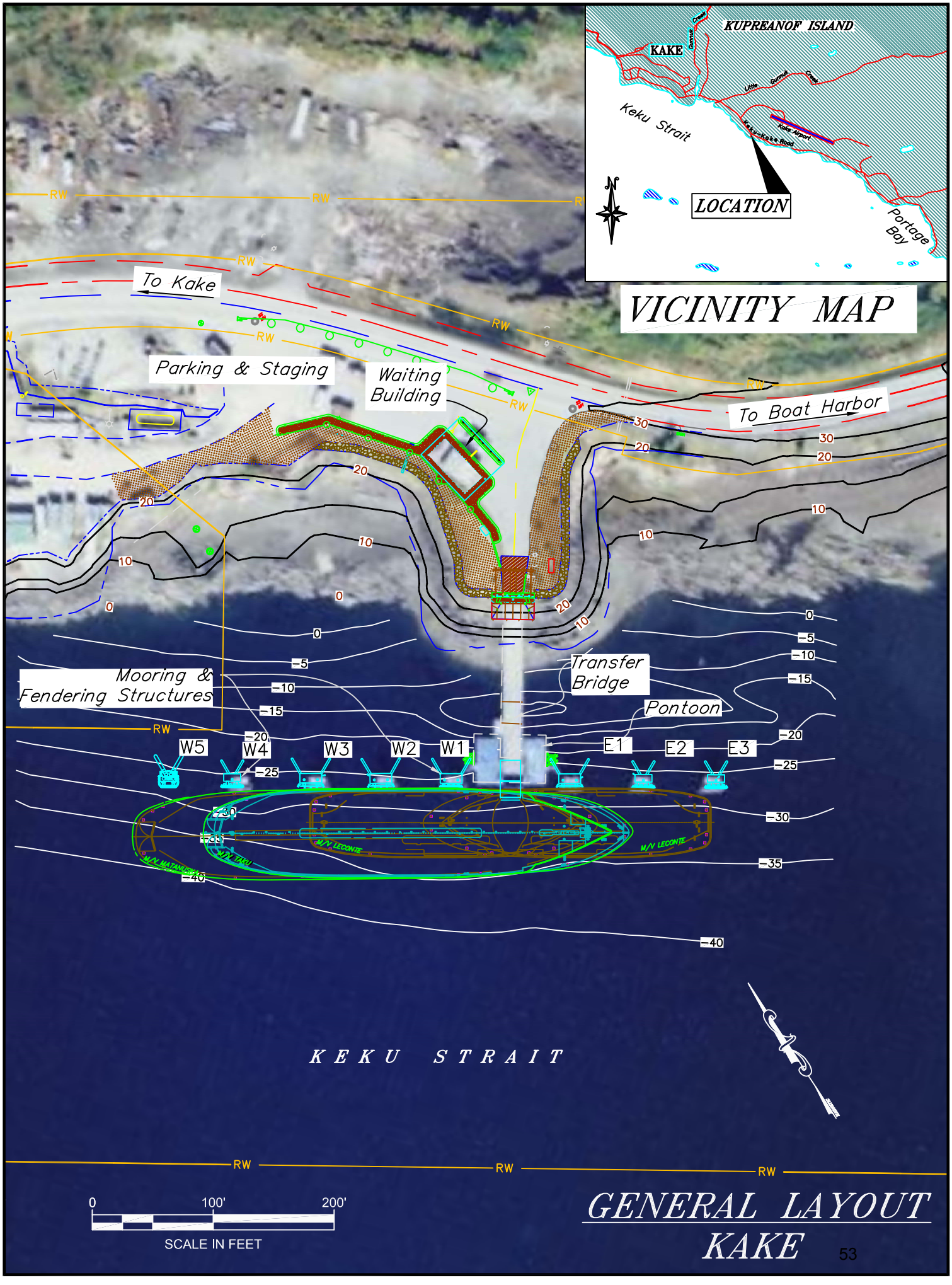
Terminal Projects (continued)			
Year	**Project #**	**Project Name**	**Description**
2010	67813	HNH Ferry Terminal Improvements	Expanded the staging & parking areas, constructed new terminal building, connected building to City sewer system.
2011	69311	HNH FT Marine Structures	Replaced the vehicle transfer bridge, float system, mooring dolphins E1 & W1, W2 and W3, installed new gangways & platforms to access dolphins E1 & W1 for line handling. Installed new dolphin E4 for all-tide mooring of the FVF.

Observations

1. The uplands, terminal building and most marine structures were reconstructed in 2010-11. Most components are in good condition.
2. The generator shed has a hole in the roof that was not properly sealed from water intrusion. A dark spot is a sign of decay in the timber roof panel.
3. The terminal manager commented that parking space becomes insufficient on holidays, special event days and at funerals.
4. Several roofing screws were found on the ground adjacent to the covered walkway. Settlement at the walkway foundation has resulted in a height variation of over 1-inch between it and the adjacent sidewalk.
5. At low tide conditions the shoreward transition plate between the transfer bridge & uplands becomes a break over issue. In combination with the down grade to the pavement, this causes clearance issues for some AML vehicles.
6. The connection bolts between the concrete backwall and the steel support beam have been severed. Likely occurred during the 2011 improvement project.
7. The intermediate bridge ramp and apron were replaced in 1996. The ramp & apron were re-used on the 2011 Marine Structures project and are currently in service. They are in good condition. The hydraulic cylinder cap for the apron lift system is actively corroding. There is a weld indication at the connection between the RT lift beam for the intermediate ramp and the Girder.

   Paint is peeling on the side of the hydraulic power unit, which needs a containment pan for potential oil leaks.
8. The bridge floats were replaced on the ’11 project. Algae/mold growing on the floats produces a slippery walking surface.
9. Mooring is provided by five (5) recently built steel-capped structures with hanging fender panels (E1, W1-W3 and W5), a new floating fender dolphin (E4) and three older steel capped structures with 4-pile supported fender panels (W4 and E2-E3). Gangways provide access to W1 and E1 for assistance in line handing.
10. The galvanized coatings on the older dolphins have approximately 40% remaining. No anodes are installed on the older mooring structures (except for W5). The cathodic protection readings on dolphins W4, E2 – E3 are below -0.8V, which means the steel is actively corroding. Depth to mudline elevations, taken with leadline readings at locations along the fender line in 2015, range from -19’ to -22’ MLLW.
11. All exposed steel and concrete surfaces are stained green/brown from algae on the uplands and marine structures. Recommend power wash the facility on a regular basis.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Nothing required.		
Category II - Rehabilitation Work		
Abutment	1	Re-establish structural connection between concrete backwall and steel support beam.
Covered Walkway	2	Monitor the ground around the walkway for roofing screws. Fill in the sunken concrete pads at the post foundations with grout.
Hydraulics	3	Repaint hydraulic power unit where coating has failed and install containment pan.
Dolphin anodes	4	Replace anodes on dolphins W4, and E2 - 3.
Staging Area	5	Monitor break-over issue at the shoreward bridge abutment transition plate.
Category III - Upgrades Needed		
Nothing required.		


KUPREANOF ISLAND
KAKE
Gamuk Creek
Little Gamuk Creek
Keku Strait
Kake Airport
Kake-Keku Road
LOCATION
Portage Bay
VICINITY MAP
To Kake
Parking & Staging
Waiting Building
To Boat Harbor
Mooring & Fendering Structures
Transfer Bridge
Pontoon
W5
W4
W3
W2
W1
E1
E2
E3
M/V LECONTE
M/V TAKU
M/V MATANUSKA
RW
KEKU STRAIT
0
100'
200'
SCALE IN FEET
GENERAL LAYOUT
KAKE

`

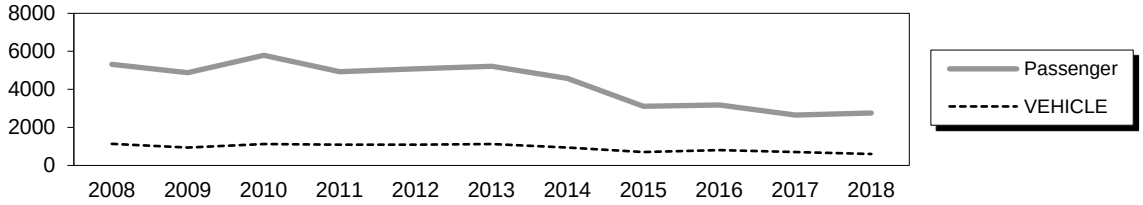
Kake Ferry Terminal

264 Keku Road

Owner: State of Alaska

Contact: Simon Bradley, AMHS Terminal Ops Manager (Ketchikan) – 907-228-7290

Terminal Description: Kake Ferry Terminal was originally constructed in 1974 to provide service to the communities of Kupreanof Island via the LeCONTE Class vessels. A new mooring dolphin (W5) was added in 2006 to allow service by the larger AMHS vessels. The M/V LeConte no longer visits Kake. Kake is a side-berth facility consisting of a transfer bridge, steel support float, and eight steel mooring dolphins. This terminal is capable of berthing all AMHS vessels. Uplands include an open waiting shelter, paved parking and overhead lighting. Kake's past 10 years of total passenger and vehicle traffic counts are shown below.



The most recent above water survey was completed on June 29, 2017. The underwater inspection occurred on August 17, 2016.

Vessels	
Name	Berthing, Alignment
Malaspina / Matanuska	Port
Taku	Port
LeConte / Aurora	Port

Uplands	
Short-Term Parking:	8 cars
Long-Term Parking:	0
Staging Area:	200 lineal feet, 1 lane
Paint Striping:	No
Driving Surface:	Asphalt

Tidal Data (MLLW 0.0 feet)	
EHW	18.1
MHHW	14.0
MHW	13.2
ELW	-4.6

Terminal Building	
Year Built:	2016
Square Footage:	933 s.f.
Heating System:	Heat Pump & Baseboard
Utilities:	Water, sewer, electric
Fire Protection:	N/A
Condition:	New

Vehicle Transfer Bridge - #0177	
Type:	16' x 132' steel multi-girder open deck
Year Built:	2015
Shoreward support:	Spread footing with tiebacks
Seaward support:	Steel Support Float
Coating:	Wasser Paint
Pedestrian Access:	Concrete 4' wide on bridge
Lighting:	3 light poles
Condition:	New

Bridge Support Float	
Type:	40' x 60' Steel Flexi-float
Year Built:	2015
Ballasted:	Yes
Ramp lift:	Hydraulic/Cable
Apron lift:	Hydraulic/Cable
Anodes:	Yes
Condition:	New
Load Posting Sign:	N/A
Original Design Load:	HS 20-44

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Dolphins							
Dolphins	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Notes**
W5	2B, 2V	Hanging	UHMW	Yes	2006	New	Red navlight
W4	2B, 1V	4V	Ekki Timber	Yes	1993	Good	
W3	2B, 1V	4V	Ekki Timber	No	1998	Good	
W2	2B, 1V	4V	Ekki Timber	Yes	1998	Good	
W1	2B, 1V	4V	Ekki Timber	Yes	1998	Good	
E1	2B, 1V	4V	Ekki Timber	Yes	1998	Good	
E2	2B, 1V	4V	Ekki Timber	Yes	1993	Good	Windsock
E3	2B, 1V	4V	Ekki Timber	Yes	1993	Good	Red navlight
ERS	2B, 1V	-	-	Yes	1993	Good	
WRS	2B, 1V	-	-	Yes	1993	Good	

LEGEND
ERS = East Float Restraint Structure
B = Battered Steel Pipe Piles
V = Vertical Steel Pipe Piles

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1973	S-0915(1)	Kake Ferry Terminal Construction	Original fill onto tidelands, with Shelter and separate vault toilet on uplands; built transfer bridge, flexifloat seaward support (w/ concrete anchors), ramp lift system and four concrete capped, steel pile mooring dolphins (E1, W1-3).
1987	RS-0005(78)	Southeast Secondary Upgrade	Recoated and installed new zincs on flexi-floats; Recoated ramp, apron, transfer bridge; Replaced expanded metal mesh on bridge; Upgrade to dolphin fenders.
1993	75186-RS-0915(3)	Kake Ferry Terminal Mooring Improvements	Installed new mooring structures W4 & E2-3; replaced fender on W1; installed new barge fenders and restraint structures - released chains to concrete anchors and abandoned in place; inspected and replaced ribs on transfer bridge; installed electrical power upgrades.
1994	75377 - STP-0930(5)	Kake Ferry Terminal Ramp & Apron Upgrade	Replaced ramp and apron with newer hydraulically controlled units; installed electrical power upgrades.
1998	75525-STP-0939(6)	Kake Dolphin Replacement & Bridge Rehabilitation	Replaced mooring dolphins W1-3 & E1; re-coated bridge; replaced elastomeric bearing under shoreward swivel beam; replaced west hinge pin on swivel beam; inspected & repaired ribs in 5 seaward bays between floor beams.
2006	67488	Kake & Hoonah Ferry Terminal Dolphins	Install new lead-in dolphin W5.

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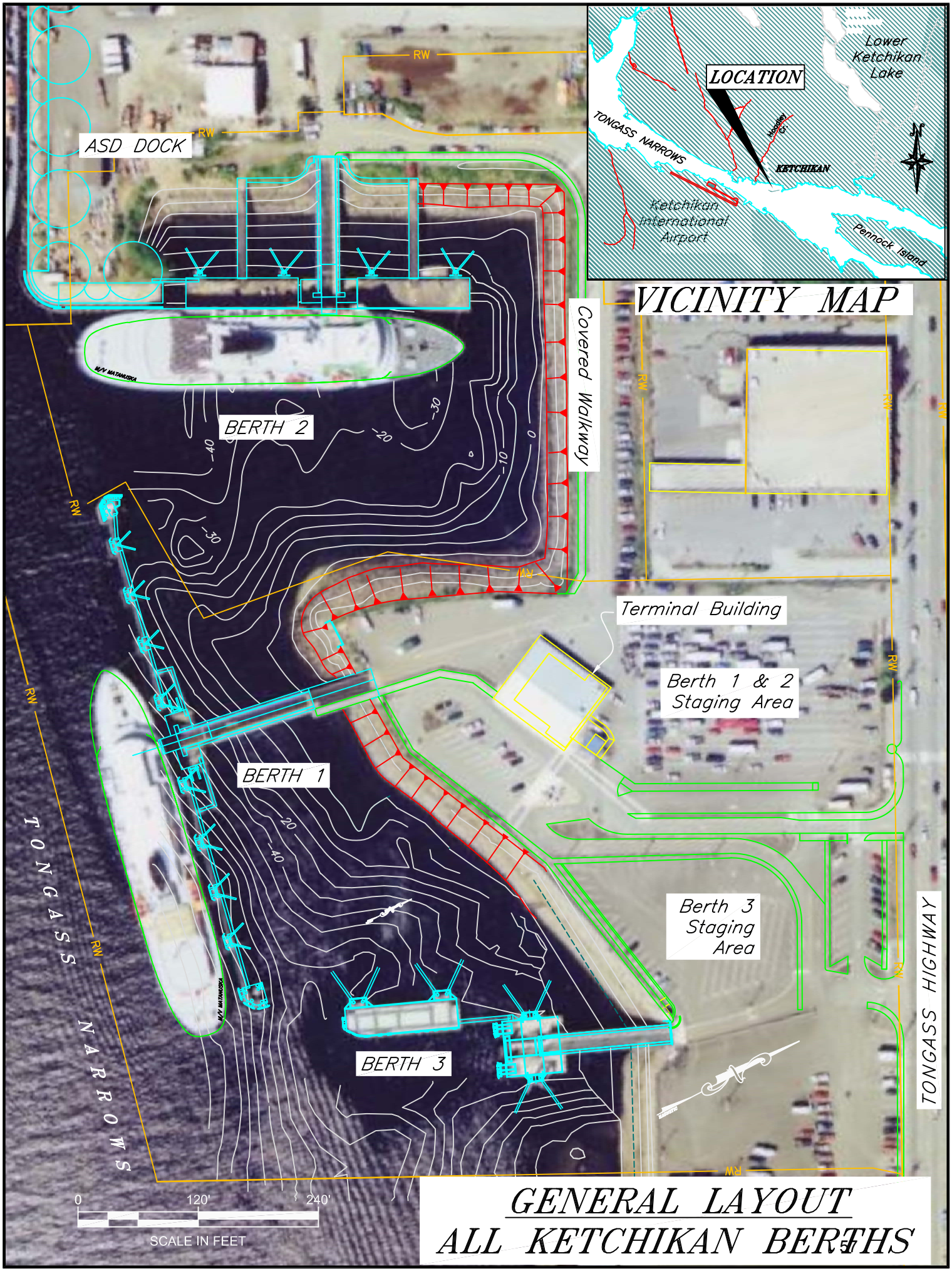
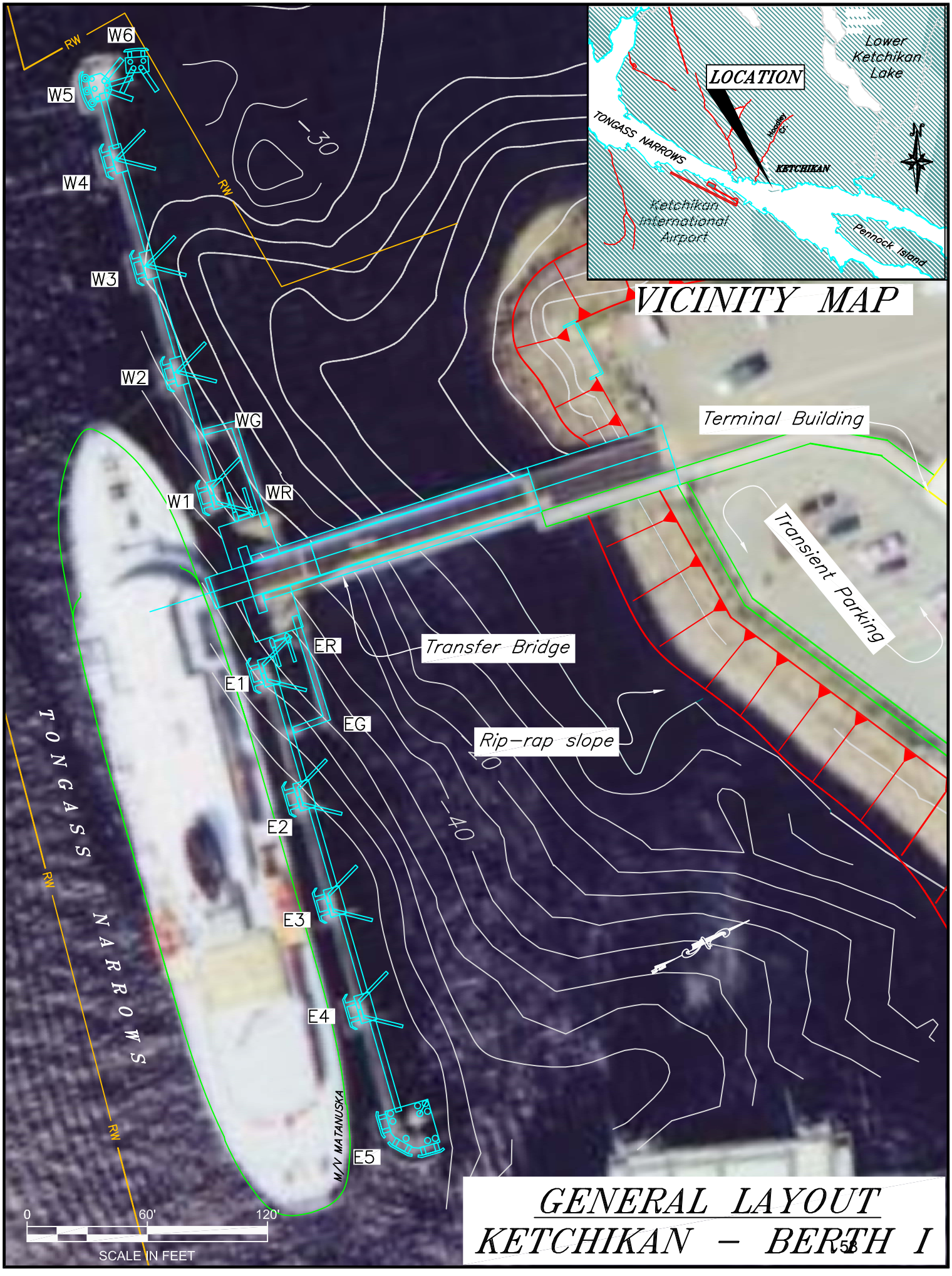
Terminal Projects (cont'd.)			
Year	**Project #**	**Project Name**	**Description**
2015	68238	Kake Ferry Terminal Improvements	Replaced the older orthotropic bridge and corroding seaward floats with new multi-girder bridge and flexifloats. Replaced the abutment with new spread footing with tiebacks.
2015	SAMHS0002	Kake Ferry Terminal Passenger Facility	Removed dilapidated shelter. Constructed new 20.5' x 45.5' waiting building with indoor plumbing (mens and womens bathrooms), connections to city water and sewer utiliities, curb and sidewalk, safety handrail and area lighting.

Observations

1. The transfer bridge & support float was replaced in 2015. The apron, ramp, and lift system were originally built in 1994. A new waiting building and pursers shelter were constructed in 2016.
2. There is a loose nut that connects the transition plate to the top of the bridge.
3. Three additional mooring dolphins (W4, E2 & E3) were installed to allow Taku Class vessels to moor at this facility in 1993. A new fender system was installed on dolphin W1. The original dolphins (W1-W3 and E1) and remaining fender systems were replaced with new dolphins and fenders in a 1998 Dolphin Replacement and Bridge Rehabilitation Project. Dolphin W5 was constructed in 2007 to provide mainline vessel (Matanuska/Malaspina/Columbia) berthing capacity. The shore-powered dolphin navlights were removed and replaced with solar-powered lights in 2009.
4. The sacrificial zinc anodes are depleted on all but dolphin W1. Several UHMW mounting bolts have sheared off the fender panel of dolphin W5.
5. AMHS has mounted a pendant in an SS box below the intermediate ramp, for emergency cases when the ship personnel are without a pendant. AMHS maintenance installed a containment pan beneath the hydraulic power unit in '17. Electrical conduit connectors are freely corroding where mounted on the intermediate ramp. Apron fingers do not move freely and require maintenance.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Nothing required		
Category II - Rehabilitation Work		
Dolphin anodes	1	Replace/add anodes to all in-water piles.
Bridge transition plate	2	Install a stop-nut (second nut) or cross drill and install cotter pin on the transition plate hinge pin at the top of the bridge.
Ramp electrical	3	Replace corroded electrical conduit clamps at intermediate ramp.
Dolphin fender panels		Monitor the UHMW fender panel attachment studs and nuts. A plan to refurbish the UHMW fender panels should be made in the next 5 years. The refurbishment shall include welding new studs to the front face of the steel fender panels in the tidal zone and re-securing the associated UHMW panels to the studs with new nuts.
Apron		Replace hinges on apron fingers.
Category III - Upgrades Needed		
Nothing required		


VICINITY MAP
LOCATION
Lower Ketchikan Lake
TONGASS NARROWS
Hoadley Cr.
KETCHIKAN
Ketchikan International Airport
Pennock Island
ASD DOCK
RW
M/V MATANUSKA
BERTH 2
Covered Walkway
Terminal Building
Berth 1 & 2 Staging Area
BERTH 1
Berth 3 Staging Area
BERTH 3
TONGASS HIGHWAY
TONGASS NARROWS
0
120'
240'
SCALE IN FEET
GENERAL LAYOUT
ALL KETCHIKAN BERTHS


W6
W5
W4
W3
W2
WG
W1
WR
ER
E1
EG
E2
E3
E4
E5
RW
-30
-40
Terminal Building
Transient Parking
Transfer Bridge
Rip-rap slope
TONGASS NARROWS
M/V MATANUSKA
0
60'
120'
SCALE IN FEET
LOCATION
Lower Ketchikan Lake
TONGASS NARROWS
Ketchikan International Airport
KETCHIKAN
Pennock Island
VICINITY MAP
GENERAL LAYOUT
KETCHIKAN – BERTH I

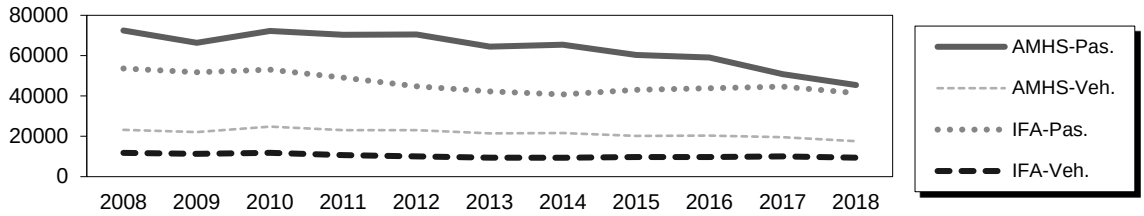
Ketchikan Ferry Terminal, Berth I

3501 Tongass Avenue

Owner: State of Alaska

Terminal Manager: Susan Schenk – 907-228-6854

Terminal Description: Ketchikan Main Berth is a side-berth facility consisting of a transfer bridge, steel support float, with steel catwalks that provide access to 10 steel mooring dolphins. Ketchikan is one of the primary service terminals along the AMHS Route, providing northbound connections for mainline service to Wrangell, Petersburg, Sitka, Juneau, Haines and Skagway; southbound connections to Prince Rupert and Bellingham; and hub service to Prince of Wales communities, and Metlakatla. The majority of vessel services and crew changes occur at the Ketchikan terminal. Ketchikan's past 10 years of total passenger and vehicle traffic counts are shown below.



The most recent above water survey was completed on July 26, 2017. The most recent fracture critical & underwater inspections occurred on August 2, 2016.

Vessels	
Name	Berthing, Alignment
All but FVF	Port/ Starboard

Tidal Data (MLLW 0.0 feet)	
EHW	21.3
MHHW	15.4
MHW	14.5
ELW	-5.1

Terminal Building	
Year Built:	1993
Square Footage:	4848 s.f.
Heating System:	Boiler
Fuel Storage:	2,500 gal. Ust
Fire Protection:	Simplex Alarm
Condition:	Fair

Vehicle Transfer Bridge - #0800	
Type:	16' x 140' twin box beam
Year Built:	1988
Shoreward support:	Steel Beam/ Driven Piling
Seaward support:	Steel Support Float
Coating:	Wasser Paint
Pedestrian Access:	Yes, next to vehicles
Lighting:	Jelly Jars on bent posts,
Condition:	Good
Load Posting Sign:	N/A
Original Design Load:	HS 20-44

Uplands	
Short-Term Parking:	20 cars, 2 HCP
Long-Term Parking:	0
Staging Area	2200 lineal feet, 7 lanes
Paint Striping:	Yes
Driving Surface:	Asphalt

Generator & Building	
Building / Generator:	1988
Square Footage:	252 s.f.
Heating System:	Elecric
Fuel Storage:	500 gal
Fire Protection:	Halon
Condition:	Fair

Bridge Support Float	
Type:	24'x60' Steel Pontoon
Year Built:	1988
Coating:	Epoxy
Ramp lift:	Hydraulic/Cable
Apron lift:	Hydraulic/Cable
Anodes:	Yes, but inadequate reading.
Condition:	Fair

Approach Trestle	
Type:	27' x 67' Pile Supported Steel Frame
Year Built:	1994
Shoreward support:	Steel Beam/Driven Piling
Seaward support:	Steel Beam/Driven Piling
Pedestrian Access:	Covered walkway, guardrail seperation
Anodes on piles:	No
Condition:	Good

Utilities		
	at terminal	at ramp
Electrical:	Yes, city & backup power	
Water:	Yes	Yes
Sewer:	Yes (City)	No
Telephone:	Yes	Yes
Cable TV:	No	No
Fuel:	No	No
Wireless Bridge:	Yes	No

~~LEGEND~~

Dolphins

Dolphins	Dolphin Piles	Fender Support	Fender Face	Anodes	Built	Cond.	Hawse Extensions	Notes
W6	2B, 2V	Hanging	UHMW	Yes	2016	New	Yes	Retrieval mast
W5	3B, 3V	Hanging	UHMW	Yes	2016	New	Yes	Marker Light
W4	2B, 1V	4V	Ekki Timber	Yes	1994	Fair	Yes	
W3	2B, 1V	4V	Ekki Timber	Yes	1994	Fair	Yes	Light Pole mounted
W2	2B, 1V	4V	Ekki Timber	Yes	1994	Fair	Yes	
W1	2B, 2V	Hanging	UHMW	Yes	1994	Fair	Yes	Light Pole & Windsock mounted
E1	2B, 2V	Hanging	UHMW	Yes	1994	Fair	Yes	Light Pole mounted
E2	2B, 2V	Hanging	UHMW	Yes	1994	Fair	Yes	
E3	2B, 2V	Hanging	UHMW	Yes	1994	Fair	Yes	Light Pole mounted
E4	2B, 2V	Hanging	UHMW	Yes	1988	Fair	Yes	
E5	4B, 4V	Hanging	UHMW	Yes	1994	Fair	Yes	Red Nav Light mounted
ER	2B, 2V	-	-	Yes	1988	Fair	-	
WR	2B, 2V	-	-	Yes	1988	Fair	-	
EG	1B, 1V	-	-	Yes	1988	Fair	-	
WG	1B, 1V	-	-	Yes	1988	Fair	-	

ER = East Float Restraint Dolphin
B = Battered Steel Pipe Piling
WP1 = Upper West Float Platform
WG = West Gangway Support Dolphin
V = Vertical Steel Pipe Piling
WP2 = Lower West Float Platform

Catwalks / Gangways

#	From Struc.	To Struc.	Lenth / Style / Main Members	Built	Safety Chains?	Cond.	Lighting
C1	W5	W4	28' / Catwalk / 10" x 10" Tube Girders	1994	Yes	Fair	Jelly Jars
C2	W4	W3	44' / Catwalk / 10" x 10" Tube Girders	1994	Yes	Fair	Jelly Jars
C3	W3	W2	44' / Catwalk / 10" x 10" Tube Girders	1994	Yes	Fair	Jelly Jars
C4	W2	W1	53' / Catwalk / 12" x 12" Tube Girders	1994	Yes	Fair	Jelly Jars
C5	E1	E2	53' / Catwalk / 12" x 12" Tube Girders	1988	Yes	Fair	Jelly Jars
C6	E2	E3	44' / Catwalk / 10" x 10" Tube Girders	1994	Yes	Fair	Jelly Jars
C7	E3	E4	44' / Catwalk / 10" x 10" Tube Girders	1994	Yes	Fair	Jelly Jars
C8	E4	E5	52' / Catwalk / 12" x 12" Tube Girders	1998	Yes	Fair	Jelly Jars
C9	C4	WG	22' / Catwalk / Tube Floor Truss	1998	Yes	Fair	Jelly Jars
G1	WG	WP1	57' / Gangway / Tube Thru Truss	1998	Yes	Fair	-
G2	WP1	WP2	12' / Gangway / Tube Thru Truss	1998	Yes	Fair	-
G3	EP1	EP2	12' / Gangway / Tube Thru Truss	1998	Yes	Fair	-
G4	EG	EP1	57' / Gangway / Tube Thru Truss	1998	Yes	Fair	-
C10	C5	EG	22' / Catwalk / Tube Floor Truss	1998	Yes	Fair	-

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1969	F-095-2-5	KTN Ferry Terminal Grading, Drainage, Paving & Slope Protection	Widened existing uplands parking and staging area, paved top surface, installed guardrail and added armor rock to seaside slopes.
1976	6-75153	KTN Ferry Terminal Reconstruction	Repaired timber dolphin, dock and catwalk elements; replaced timber lift towers with concrete capped/steel piling.
1978	F-M-0902-8	KTN Ferry Terminal Facility	Replaced timber dolphins with concrete capped/steel piling, timber dock with concrete and steel piling.
1988	74826	KTN Ferry Terminal	Replace existing timber bridge and lift towers with steel bridge, steel support float, hydraulically operated ramp and apron, steel access gangways and platforms, and steel approach dock.
1991	75010	KTN Ferry Terminal Building	New terminal building.
1991	75113	KTN Staging Area Expansion	Dredged areas adjacent to current Berths II & III and filled uplands next to terminal building. Adds 28 parking spaces and larger staing area. Also removes the berth for airport shuttle and M/V Chilkat.
1994	75120	KTN Ferry Terminal Mooring Realignment	Removed existing concrete dock, all dolphins (but W5). Held dolphin W5 and installed new dolphins along a rotated fender face that is parallel to the north pierhead line to allow both port and strbd side mooring. New bridge approach and dolphin catwalks.
2008	73003(2)	Ketchikan FT Carpet Replacement	Replaced carpet in the terminal building with our standard style: Lees Carpet - Vitral Pattern, Modular 24" x 24" No. 428 Mountain Beauty.
2009	7303(3)	KTN Berth I Waterline Modifications	Replaced the bridge waterline with a new arctic pipe, heat trace and 'Hot Box' for valve connections.
2016	SAMHS00015	KTN Ferry Terminal Improvements	Replaced wrap-around end dolphin W5 with two dolphins, W5 and W6 at Berth 1, modified the catwalk leading to that dolphin, built new dolphin S1 at Berth 3, installed new sewer and waterlines with heat trace at Berth 3 transfer bridge, built new covered walkway between Berth 3 and the terminal building.

Observations

1. The main staging area was expanded in 1992 and provides adequate staging and parking for current Ketchikan Berth I operations. The staging area was again expanded in 2001 to accommodate Berth III. Berth I and III uplands are paved, staging area illumination is fair and staging area paint striping is in good condition. There is no dedicated vehicle staging area for the Berth II transfer facility. Berth II traffic uses the main parking area, while vehicle staging backs up on Ferry Way prior to vessel loading.

   In 1993, two covered walkways were constructed, one serving passengers between the terminal building and Berths I & II. The acrylic panels on the vertical sides of the enclosures are severely fogged and crazed; however, the curved roof panels are clear. The flat panels were manufactured with an abrasion resistant coating that has turned opaque, the curved panels were not. The panels have exceeded their warranty and there is no recourse with the panel manufacturer.

Observations (continued)

A diesel generator housed next to the terminal building provides standby emergency power to Berths I, II, III, and the terminal building.

A temporary terminal building, used during construction of the main terminal building, was relocated for use as personnel, supply, and shore maintenance shop. This building is in good condition. The shop side of the building needs to be expanded to accommodate the shore maintenance boom truck.

2. The galvanized coating is depleted with red corrosion on all 90's-era steel pipe piles in the tidal zone. Steel fender panels have roughly 40% galvanized coating remaining, with widespread rust staining. Coating has also failed on steel handrails for catwalks and has 50% remaining on catwalk beams.
3. Dolphin W2 is sloping towards the bridge and the fender panel is displaced to the west, due to a hard tug by a departing vessel with spring line still attached. A section of plastic UHMW has detached from the face of the fender panel of Dolphin W1. These are 1st generation plastic panels, and thermal expansion has been shearing off mounting studs.
4. Cathodic potential (CP) readings, taken in 2015, for all mooring dolphins were below -0.8V. The most recent 2016 project replaced anodes on all the dolphins, so CP readings will be improved. Depth to mudline elevations, taken with leadline readings at locations along the fender line in 2015, range from -26' to -100' MLLW (going west to east).
5. The most recent inspection found that the intermediate ramp hinges have ~1/2" of play between the pin & sleeve.

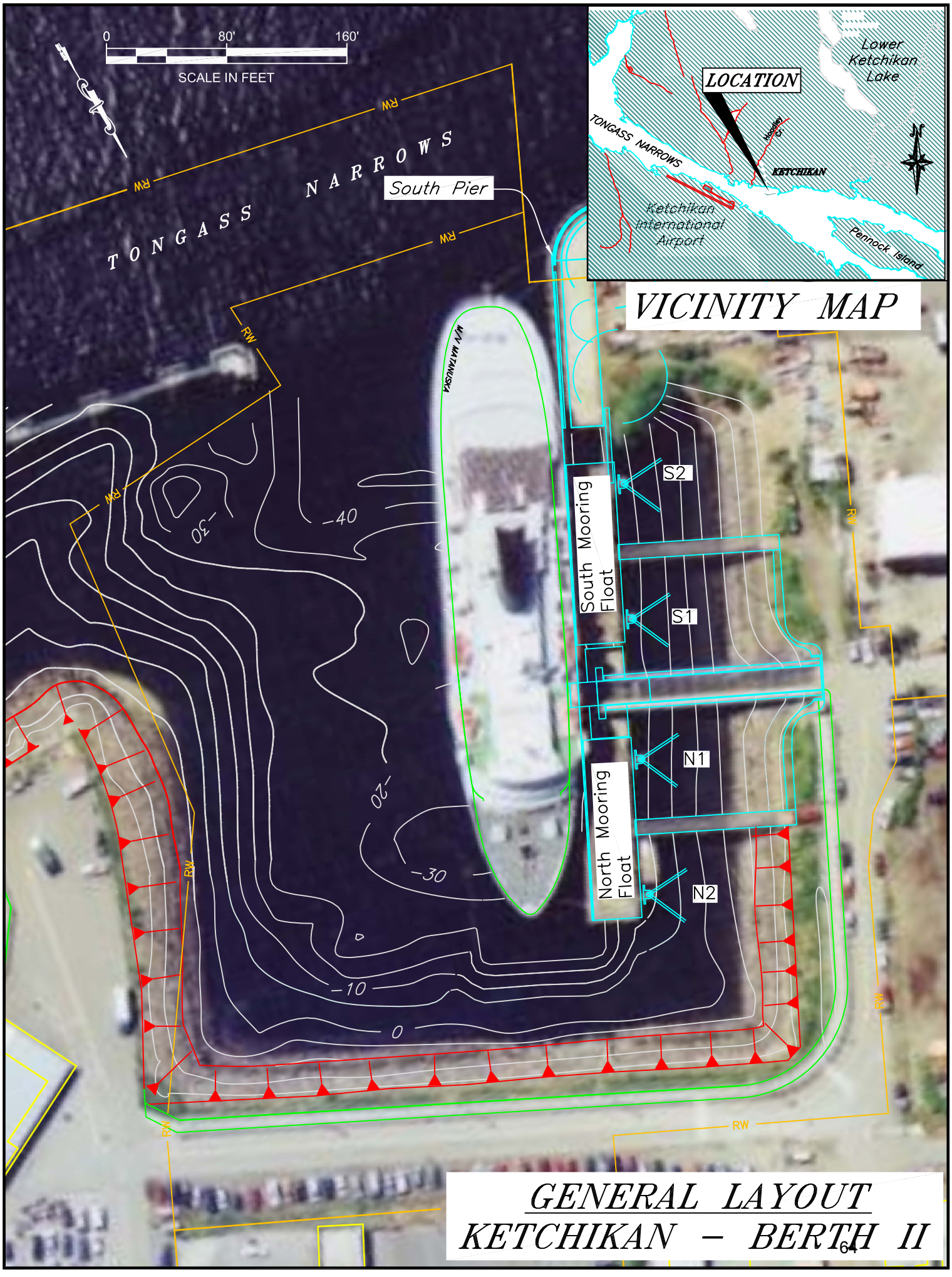
   The transfer bridge coating is chalked & faded on the top surfaces, with 75% remaining. The underside of the bridge has 40% coating remaining with miscellaneous areas of coating failure & surface corrosion, most notably along Stringer 1 beneath the concrete walkway. The coating has failed along the full-length of the top flange of Stringer 1 with laminating corrosion & up to 1/16" section loss. The open-deck grating hold down clips also exhibit 30% section loss along Stringer 1.
6. The most recent Fracture Critical inspection found two weld failures between Stringers and the lifting beam.
   a. A 3-1/2" long crack exists in the bottom flange of Stringer 1 at the lifting beam welded connection on the pontoon.
   b. A 3" long crack exists in the bottom flange of Stringer 5 at the lifting beam welded connection on the pontoon.
7. The most recent Fracture Critical inspection found the cracks in Girder 1 at the Floorbeam 12 stiffening diaphragms have not changed in length since the 2012 inspection. Also, the cracks in Girder 2 at the Floorbeam 12 stiffening diaphragms have not changed in length since the 2008 inspection.
8. There is a 1/2" long crack in Girder 2 at the Floorbeam 9, Shoreward Side, stiffening diaphragm-to-top flange welded connection. The crack has extended through the throat of the weld.
9. There is heavy laminating corrosion and up to 1/16" pitting, typical, on the lower web plate of the Girders under the floorbeam bottom flange connections.
10. The deck clamp bolts are heavily corroded beneath stringer 1 and the pedestrian walkway.
11. A flex conduit connection is damaged at a utility cabinet mounted on the (seaward) bridge bearing strut, Left side.
12. There are many scratches in the protective coating on the pontoon, especially at the vertical edges. The coating is in fair condition, but requires repainting at edges and corners. Structure-to-seawater potentials varied from –0.8 to –0.82 indicating the steel is only marginally protected. Anodes have 5% remaining. Recommend cleaning and tightening all anode cable connections and using larger or doubled anodes when the anodes are next maintained. The fender on the western side of the float has a ½" saddle worn from rubbing against restraint piling.
13. There is 100% section loss to most utility attachments welded to the underside of the floorbeams. The vertical support tubes for the east pontoon platform have been bent seaward, most likely due to vessel impact. The dolphin access catwalk and platform on the west side of the pontoon is damaged.

    Maintenance installed channel skids to the gangway, an excellent repair. The east side catwalk and platform are unmodified.

Observations (continued)

14. Pins are worn in hanger connections for platform gangways and safety chains aren't installed. If the platform is jostled, it may be dislodged from its hangers and collapse. The hanger pins in the top bearing of the RT dolphin access gangway are especially in need of replacement, as there is <50% section remaining.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Nothing required		
Category II - Rehabilitation Work		
Transfer Bridge	1	Repair the failed welds between Stringers 1 & 5 and the lift beam. Program project for bridge re-coat. Monitor the cracks in the diaphragm welds at floorbeam No. 12 inside both box girders. Replace bridge deck hold-down clips with advanced section loss on RT side of bridge.
Bridge Platform	2	Straighten support tubes for the eastern platform and re-weld connections.
Terminal Building & Uplands	3	Bring the UST into compliance with current ADEC regulations.
Dolphin W2	4	The dolphin may have been overloaded. Monitor the performance under load, then make repairs if necessary.
Dolphins	5	Monitor the condition of the pipe piles, maintain the cathodic protection anodes. Monitor the condition of the UHMW plastic facing on the fender panels.
Apron	6	Replace small sections of the expanded metal grating on the apron.
Category III - Upgrades Needed		
Nothing required		


0
80'
160'
SCALE IN FEET
TONGASS NARROWS
South Pier
RW
M/V MATANUSKA
South Mooring Float
North Mooring Float
S1
S2
N1
N2
-40
-30
-20
-10
0
LOCATION
Lower Ketchikan Lake
TONGASS NARROWS
Ketchikan International Airport
KETCHIKAN
Pennock Island
VICINITY MAP
GENERAL LAYOUT
KETCHIKAN – BERTH II

Ketchikan Ferry Terminal, Berth II

3501 Tongass Avenue

Owner: State of Alaska

Terminal Manager: Susan Schenk – 907-228-6854

Terminal Description: Ketchikan Berth II is an all-tide side-berth facility consisting of a transfer bridge, steel support float, with two mooring floats and access bridges. A sheet pile wharf south of the bridge provides fixed moorage, in-line with the mooring float fenders. This berth is often used as a layup berth for off-system AMHS vessels. See Berth I report for passenger and vehicle traffic counts. The most recent above water survey was completed on July 26, 2017. The most recent fracture critical & underwater inspections occurred on August 4, 2016.

Vessels	
Name	Berthing, Alignment
All Vessels	Port/ Starboard

Terminal Building
Main terminal building data is in Berth I report

Generator & Building
Main generator data is in Berth I report.

Vehicle Transfer Bridge - #1823	
Type:	16' x 140' twin box beam
Year Built:	1986
Shoreward support:	Steel Beam/ Driven Piling
Seaward support:	Steel Support Float
Coating:	Wasser Paint
Pedestrian Access:	Yes, next to vehicles
Lighting:	Jelly Jars on bent posts, both girders
Condition:	Good/Fair
Load Posting Sign:	N/A
Original Design Load:	HS 20-44/200 psf

Uplands	
Short-Term Parking:	Shared with Berth I
Long-Term Parking:	0
Staging Area:	600 ft, 1 lane; i.e. along Marine Way
Paint Striping:	Yes
Driving Surface:	Asphalt

Bridge Support Float	
Type:	24'x60' Steel Pontoon
Year Built:	1986
Coating:	Epoxy
Ramp lift:	Hydraulic/block & Cable
Apron lift:	Hydraulic/block & Cable
Anodes:	Yes
Condition:	Fair

Utilities at Mooring Float	
Electrical:	Yes, city & backup power
Water:	Yes
Sewer:	Yes
Telephone:	Yes
Cable TV:	Yes
Fuel:	No
Wireless Bridge:	No

Mooring Float Restraint Dolphins

Dolphins	Dolphin Piles	Anodes	Built	Cond.	Notes
N1	2B, 1V	80% left	1986	Fair	30% of the galvanized coating remains intact: Precipitation ponds along the top of the pile collars; Light poles mounted on dolphins N1 and S1.
N2	2B, 1V	80% left	1986	Fair	
S1	2B, 1V	80% left	1986	Fair	
S2	2B, 1V	80% left	1986	Fair	

Mooring Floats

Platform	Size	Fender Face	Anodes	Built	Decking	Cond.	Notes
NMF	32' x 120'	Ekki Timber	80% left	1986	Glulam	Fair	Traction is poor on deck, rolled roofing has been installed but needs repair.
SMF	32' x 120'	Ekki Timber	80% left	1986	Glulam	Fair	

South Pier								
Cells	**Type**	**Coating**	**Fender**	**Cell Cap**	**Anodes**	**Built**	**Cond.**	**Notes**
1	Closed	Epoxy	Timber Pile	Reinforced Concrete	None	80 & '86	Fair	
2	Closed	Epoxy	Timber Pile	Reinforced Concrete	None	80 & '86	Fair	

Catwalks / Gangways							
#	**From Struc.**	**To Struc.**	**Lenth / Style / Main Members**	**Built**	**Safety Chains?**	**Cond.**	**Notes**
G1	Shore	NMF	100' / Catwalk / 4" x 4" Bottom Chord	1986	No	Fair	Check pins in shoreward hangar connections.
G2	Shore	SMF	100' / Catwalk / 4" x 4" Bottom Chord	1986	No	Fair	
C1	Bridge	NMF	16.5' / Catwalk / W6x9 Girders	1986	_	Fair	
C2	Bridge	SMF	16.5' / Catwalk / W6x9 Girders	1986	_	Fair	A support post has split due to internal freezing (i.e. no drain hole.)
G3	NMF	Platform	44' / Gangway / 2.5"x2.5' Bottom Chord	1992	No	No	
G4	Platform	SP	44' / Gangway / 2.5"x2.5' Bottom Chord	1992	No	No	

LEGEND

N1 = North Mooring Float Restraint Dolphin
B = Battered Steel Pipe Piling
C1 = Catwalk
G1 = Gangway
V = Vertical Steel Pipe Piling
NMF = North Mooring Float
SP = South Pier

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1980	K61216	KTN Vessel Maintenance Facility	Beginning of ASD facility, including cells for South Pier of Berth II.
1986	X70010	KTN Vessel Maintennace Facility South Berth	Dredged basin, built all structural elements of the existing facility, installed cap and fenders on 2 corner sheet pile cells of exisitng wharf.
1991	F-091-1(4) / 75113	KTN Staging Area Expansion	Constructed new access road to Berth II.
1994	F-095-2(16) / 75120/75285	KTN Ferry Terminal Mooring	Built access gangway between the South mooring float and South Pier.

Observations

1. Berth II once included a parts warehouse, personnel, supply, and shore maintenance buildings, and the Port Engineers office. The Ketchikan Shipyard acquired Berth II and the buildings in a swap with property in Ward Cove, but the complete handover will not occur until a layup facility is constructed in Ward Cove. The Shipyard has installed security gates on the facility including a drive gate at the property line, man gates at the vehicle and pedestrian gangways and drive gate at the head of the bridge. There are also work floats moored behind the transfer bridge pontoon, large vessel fenders and orange emergency life boats tied up behind the mooring floats.

Observations (continued)

2. The facility was originally constructed in 1986 for lay-up and maintenance of vessels but was converted to a transfer berth in 1992. There are two mooring/work floats, one on each side of the transfer bridge. These floats consist of two circular steel pontoons connected by a steel superstructure and covered with a glulam deck. Two dolphins restrain the mooring floats and each float is accessed with a vehicular gangway. The adjacent sheet pile cell dock of the shipyard is also accessed with a gangway.
3. Traction on the glulam deck of the mooring floats is poor. Maintenance has installed rolled-roofing, but that surface is in disrepair. The transition panels and roller bearings of the mooring float access gangways (G1 & G2) have worn ½" to ¾" ruts in the 3" thick glulam decking. The transition panels for the bridge access catwalks (C1 & C2) also have formed ruts where water ponds. The outer edges of the float pontoons exhibit light corrosion and isolated paint cracking, most likely due to impact from flotsam. The framing members along the outside have roughly 75% coating loss. The floats are each rated for a maximum load of 180 kips distributed over the deck (20 kip maximum axle load).
4. The grease plates were removed from the end blocks of the seaward roller bearings on the mooring float vehicular gangways. The bronze bushing is worn around the shaft, and the roller is rubbing against the bearing block mount plate. The shoreward pin-hanger bearings have been in service for nearly thirty years, rust staining covers the exterior plates, and there is no room for inspecting the remaining pin thickness. The gangways are rated for light vehicle loading (40 kip maximum gross vehicle weight) and only have a 7'-9" clear width.
5. The coating of the transfer bridge is in fair condition. There is extensive chalking of the finish on the girders and floor beams. The most recent Fracture Critical report noted that there is severe laminar corrosion over 1 SF at the near end of Stringer 2 in the ramp structure, directly beneath the concrete pedestrian walkway. Years of applying sodium-based deicing chemicals to the concrete walkway are the source of the corrosion.

   There are several transverse lines of coating failure on the bottom plate of both bridge girders. They are typical at 7 locations on each girder. The 2010 FC inspection team determined that the coating damage does not occur at welded splices, and that damage was likely caused during shipping of the bridge to the site in 1986.

   There is typical surface rust, with up to 1/16" section loss, on interior bottom flanges of box girders. Unistrut utility hangers under the RT side of the bridge all have up to 100% section loss. An unsealed bolted utility connection, near Floorbeam 9, is admitting moisture to girder interiors with associated corrosion around web plate. There is a 36" long x 1" wide area of isolated surface rust at the exterior bottom plate to web weld of RT girder near FB 5. The RT pin retention nut for the seaward bearing of the LT girder has backed off ½". The hinges are missing for the RT girder access hatch cover.

   The bearing surface of the shoreward abutment hinge plate is not flush mounted to the concrete abutment. The east (seaward) end is roughly 1/8" above the surface. The shoreward transition plate is cutting into the asphalt behind the backwall.

   The bottom flange of stringers & floorbeams near the shoreward end have spot areas of paint removal, but are covered with a layer of epoxy. Strain gages were mounted at these locations during bridge instrumentation in 2010.
6. The most recent Fracture Critical inspection found two weld failures between Stringers and the lifting beam.
   a. A 2-3/4" long crack exists in the bottom flange of Stringer 1 at the lifting beam welded connection on the pontoon (the crack hasn't propagated since '14).
   b. A 2-5/8" long crack exists in the bottom flange of Stringer 5 at the lifting beam welded connection on the pontoon (the crack has propagated 1/4-inch since '14).
7. The coating on the bridge pontoon top surface is in fair condition, with some areas requiring touch up paint. The seaward edge of the pontoon has 25% coating remaining, with minor surface corrosion showing through the remaining coating. The CP readings taken in 2015 were -0.93V on average, which means the immersed steel is adequately protected by anodes. Float freeboard measurements were 34-inches on average.

Observations (continued)

8. Two hundred feet of the southern end of the Ketchikan Vessel Maintenance Facility (shipyard) wharf is reserved for vessels transiting Berth II. An access gangway was installed from the southwest corner of Berth II float to the adjacent corner of the wharf as part of the 1993 mooring realignment project. This gangway remains in good condition. The mooring basin is approximately minus forty feet MLLW, and large enough for the largest AMHS vessel. The basin allows the 235' class vessels to berth starboard to, with their stern towards the shore.

   The sheet pile cell wharf and fender system, which extends from ASD into the Berth II basin, appears to be in good condition. The protective coatings applied during manufacture were failing. Previous inspections noted that the steel in the splash zone had 100% coating loss with $1/16^{th}$ – $1/8^{th}$ inch scale, and minor section loss from pitting. The coating failures were limited to the sheet pile interlocks, however the coating is now peeling from the piling surfaces. The base metal was covered with a light oxidation layer and did not display any surface pitting when the piling surfaces were brushed clean. The Shipyard hired a paint contractor in 2013 to abrasively blast & paint the seaward face of the sheet pile bulkhead above extreme low waterline. Cathodic protection needs to be installed to protect the structure against further base steel section loss. This structure is not maintained by AMHS, however due to the importance to AMHS Operations in Ketchikan, continued inspection is justified.

   The most recent underwater inspection found that ~30% of the timber fender chocks within the tidal zone had 80% section loss. Coatings failure is estimated at 40% for the fender and dock support system.

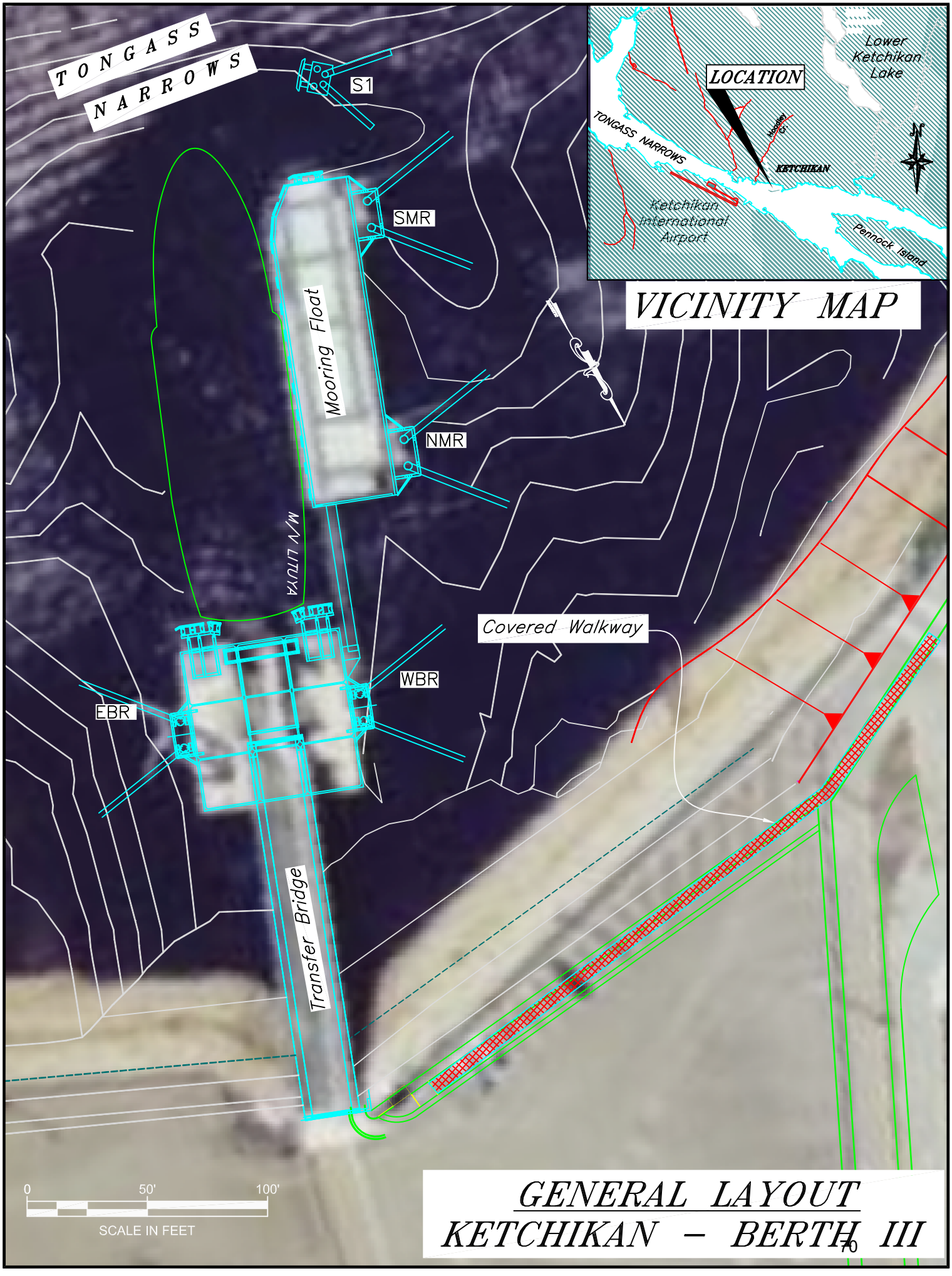
9. None of the gangways have safety cables or chains installed. Pins in shoreward hangar connections were not revealed enough to be inspected. Gangways G1 & G2 have roughly 60% galvanized coating loss. Existing deck panels between the mooring float access catwalk (C1 or C2) and the bridge ramp are staggered and present a tripping hazard. A vertical support tube for the South Mooring Float access catwalk (C2) has cracked along a vertical edge due to expansion of frozen trapped moisture.

10. Electrical utilities out to the South Mooring Float control cabinet were replaced in 2009. The existing cabinet remained and is in poor condition. There is a broken flex conduit connection at a junction box on the South Mooring Float.

    The sewer/fuel utilities on this float are abandoned. ASD upgraded the water utilities at the facility in 2013.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Bridge Pontoon	1	Weld the cracked vertical edge of the South access catwalk post. Install a drain hole 6-inches above the base of the post.
Bridge	2	Fasten down the RT pin retention nut at the seaward bearing of the LT girder.
Transfer Bridge	3	Repair the failed welds between Stringers 1 & 5 and the lift beam.
Category II - Rehabilitation Work		
South Pier	4	Install cathodic protection system on the steel sheet pile cells and the steel support piling. Program a project to replace the deteriorated timber chocks on the wharf's timber fender system.
Mooring Float	5	Refit the deck with rolled-roofing or more functional traction improvement.
Bridge	6	Paint the transfer bridge. Cancel the use of corrosive de-icing chemicals on the road. Implement the use of a non-chloride based de-icing chemical such as NC-3000. Seal the open bolted utility connection near Floorbeam 9.
Mooring Float	7	Repair the ruts in the glulam deck, at the end of the gangway rollers, and install a skid plate that is flush with the deck and long enough for tidal movement.
	8	Monitor the condition of the edges of the float, program a re-coating project for the floats and frame. Determine cathodic protection needs & install anodes.
	9	Overhaul both seaward & shoreward bearings on the float access gangways.

Inspection Summary (continued)		
Structure	Priority	Recommendations
Category II - Rehabilitation Work		
Catwalks/Gangways	10	Install safety chains/cables. Check pins in shoreward hangar connections. The coatings have 50% remaining. Program a re-coating project.
Transfer Bridge	11	Clean and paint exterior and prime interior bridge box beams. Monitor the elevation of the shoreward hinge bottom plate relative to the abutment. Install a concrete/steel skid plate beneath the shoreward transition plate. Remove laminar corrosion & repair the failed coating near end of Stringer 2 of the intermediate ramp.
Bridge Pontoon	12	Repair the damaged coating on the seaward edge, and touch up the topsides.
Catwalks/Gangways	13	Monitor the coating loss of G1 & G2. Plan a project for re-coating structural steel.
Mooring Float	14	Remove the old utility fixtures mounted on the south dock and patch the holes in the deck. Replace the electrical cabinet mounted on the south floating dock with a utility shed with twopitch roof.
Intermediate Ramp	15	Design/install a hinged transtion panel that spans the gap between the catwalk and the bridge ramp deck panel.
Mooring Float	16	Replace the control cabinet on South mooring float with a walk-in shed with two-pitch roof. Remove abandoned utilities and patch holes on deck.
Category III - Upgrades Needed		
Nothing required.		


TONGASS NARROWS
S1
SMR
Mooring Float
NMR
M/V LITUYA
EBR
WBR
Covered Walkway
Transfer Bridge
0
50'
100'
SCALE IN FEET
LOCATION
Lower Ketchikan Lake
TONGASS NARROWS
Ketchikan International Airport
KETCHIKAN
Pennock Island
VICINITY MAP
GENERAL LAYOUT
KETCHIKAN – BERTH III

Ketchikan Ferry Terminal, Berth III 3501 Tongass Avenue

Owner: State of Alaska

Terminal Manager: Susan Schenk – 907-228-6854

Terminal Description: Ketchikan Berth III is an all-tide stern-loading facility consisting of a transfer bridge, steel support float, with mooring float and access gangway. Constructed in 2001, the berth is primarily used by IFA ferry and the M/V Lituya. See Berth I report for passenger and vehicle traffic counts. The most recent above water survey was completed on July 26, 2017. The most recent fracture critical & underwater inspections occurred on August 4, 2016.

Vessels	
Name	Berthing, Alignment
Lituya / FVF / Prince of Wales (IFA)	Port/ Starboard

Terminal Building
Main terminal building data is in Berth I report

Generator & Building
Main generator data is in Berth I report.

Vehicle Transfer Bridge - #0190	
Type:	13'6" x 142' twin box beam
Year Built:	2001
Shoreward support:	Steel Beam/ Driven Piling
Seaward support:	Steel Support Float
Coating:	Wasser Paint
Pedestrian Access:	Covered and separated from vehicles by grdrail.
Lighting:	Light posts, left girder
Condition:	Good
Load Posting Sign:	N/A
Original Design Load:	HS 20-44

Uplands	
Short-Term Parking:	11
Long-Term Parking:	24
Staging Area:	790 ft
Paint Striping:	Yes
Driving Surface:	Asphalt

Bridge Support Float	
Type:	60' x 60' Concrete Pontoon
Year Built:	2001
Ballasted:	Yes
Ramp lift:	hydraulic tower
Apron lift:	Hydraulic
Condition:	Fair

Utilities at Mooring Float	
Electrical:	Yes, city & backup power
Water:	Yes
Sewer:	Yes
Telephone:	Yes
Cable TV:	No
Fuel:	No
Wireless Bridge:	No

Dolphins

Dolphins	Dolphin Piles	Anodes	Built	Cond.	Notes
EBR	2B, 2V	Yes	2001	Good	Restraint fenders on seawardside are crushed.
WBR				Good	
NMR				Good	
SMR				Good	
S1	2B, 2V	Yes	2016	New	

LEGEND

EBR = East Bridge Support Float Restraint Dolphin
V = Vertical Steel Pipe Piling
G1 = Gangway
NMR = North Mooring Float Restraint Dolphin
B = Battered Steel Pipe Piling

Mooring Float							
Platform	**Size**	**Fender Face**	**Float**	**Built**	**Decking**	**Cond.**	**Notes**
MF	30' x 120'	UHMW	Concrete	2001	Glulam	Fair	Structural damage to frame behind fender panels.

Catwalks / Gangways							
#	**From Struc.**	**To Struc.**	**Lenth / Style / Main Members**	**Built**	**Safety Chains?**	**Cond.**	**Notes**
G1	SF	MF	57'4" / Gangway / 2.5"x2.5" Bottom Chord	2001	No	Fair	

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
2001	67857	KTN Transfer Facility - Phase I	Construction of uplands & all structures.
2016	SAMHS00015	KTN Ferry Terminal Improvements	Replaced wrap-around end dolphin W5 with two dolphins, W5 and W6 at Berth 1, modified the catwalk leading to that dolphin, built new dolphin S1 at Berth 3, installed new sewer and waterlines with heat trace at Berth 3 transfer bridge, built new covered walkway between Berth 3 and the terminal building.

Observations

1. The bridge is supported at the shoreward end by hinge bearings on a swivel beam fastened to a concrete abutment. The abutment and riprap slope is littered with woody debris. The bottom of the fixed hinge bearings are underwater at extreme high tides. Debris washes up and can interfere with the vertical motion of the bridge. Terminal personnel should be vigilant and look under the bridge for large debris that may restrict bridge movement following extreme high tides.

   An electrical junction box fastened to the concrete back wall is located in the splash zone. This box should be inspected periodically to ensure there is no water entering the box. If water is found, the junction box should be relocated. There is ¼" standing water at the seaward end of Girder 2.

   A portion of the steel grid bridge deck at the lower end of the bridge is filled with concrete for a pedestrian path. The concrete was placed in the field and is weathering prematurely. No action is required at this time but the concrete should be replaced if the grid becomes a tripping hazard.

   Heat trace was called for in the original plans, for both water & sewer utility lines, but they were never installed during construction. The sewer line has frozen three times in recent years, and a hose is left running in winter to prevent the water line from freezing. The recent 2016 project replaced the water and sewer with insulated heat trace lines.
2. The intermediate ramp is operated with hydraulic cylinders directly coupled to the lift assembly. In normal operation, the ram is extended and exposed to weather. There is corrosion on the surface of the rams of both left and right cylinders. The rams should be coated with grease and covered with a weather-tight boot to prevent further damage to the protective coating. The non-skid coating on the apron is worn.
3. The bridge support float has roller bearings mounted to support the seaward end of the transfer bridge. The float is listing seaward 11-inches.
4. The mooring float fender structure has been damaged in three separate incidents. A portion of the back-up framework for the southern fenders has been crushed. An extremely hard blow bent the steel fender panels, lower wales, and vertical supports. The connection of the steel frame to the concrete float was unaffected. Further impacts to the backup frame may severely damage the concrete float and/or the fender system.

Observations (continued)

In a separate occurrence, the M/V Prince of Wales damaged the wear surface on the corner fender panel. The UHMW facing was torn away and several mounting studs were sheared off. A scar on the flare of the starboard door of the IFA vessel matches the elevation of the damage on the fender. In 2009, the M/V Lituya collided with the float, which ultimately resulted in a panel (@ middle of fender face) being knocked into Tongass Narrows. AMHS Maintenance raised the panels and re-connected them to the fender float in 2012.

The mooring float is listing towards the restraint piles, roughly 20". The float was designed with the list to provide for the added weight of raised fender panels for the FVF, to be added in the future.

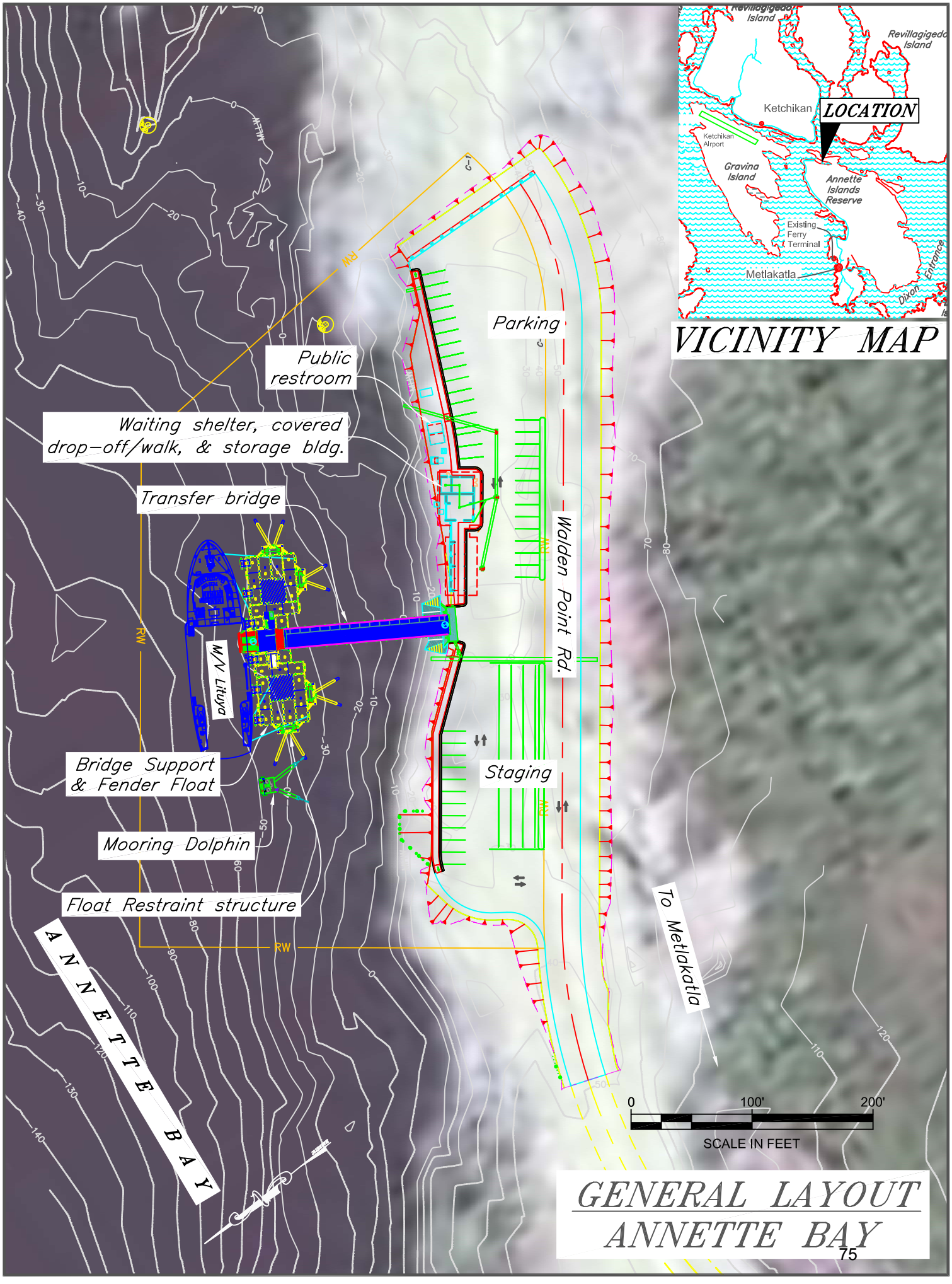
There is a vertical crack along the edge of a vertical HSS post on the mooring float frame. This was likely caused by expansion of frozen water trapped inside. A mooring line mast is bent near the southeast corner of the float.

5. Cathodic potential (CP) readings for the restraint dolphins are all below -0.8V, which indicates the steel is freely corroding.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Mooring Float	1	Repairs should be made to the backup frame of the mooring float platform as soon as possible. Further impacts to the backup frame may severely damage the concrete float and/or the fender system, effectively shutting down the terminal until emergency repairs are performed. Consideration should be given to relocating the energy absorption system closer to the impact (fender panel) surface. Also construct a bollard to tie a transverse stern line for holding the IFA vessel in place during a SErly blow (predominant wind direction).
Category II - Rehabilitation Work		
Bridge	2	Relocate the j-box outside of the splash zone. Install rubber gasket between girder access hatches on shoreward end to prevent seawater ingress during high tides. Re-grout the concrete in-filled walkway that was damaged in the wheel-path on the transfer bridge.
Bridge Apron	3	Replace the non-skid coating.
Bridge Ramp	4	Coat hydraulic rams with grease and cover with a weather-tight boot/bellows.
Restraint Dolphins	5	Install anodes on all submerged steel pipe piles.
Pontoon float	6	Repair the weld at the diagonal brace connection at the bridge float restraint.
Category III - Upgrades Needed		
Mooring Float	7	A project is programmed to refurbish the fender & platform components (damaged support frame, missing fender panel, listing float).

Project SAMHS0015 – KTN Ferry Terminal Improvements:

The first phase of this project was completed Summer, 2016. The second phase involves refurbishment of fendering and platform components at the Berth 3 float. The project has been permitted and is awaiting availability of internal resources to conduct the design work

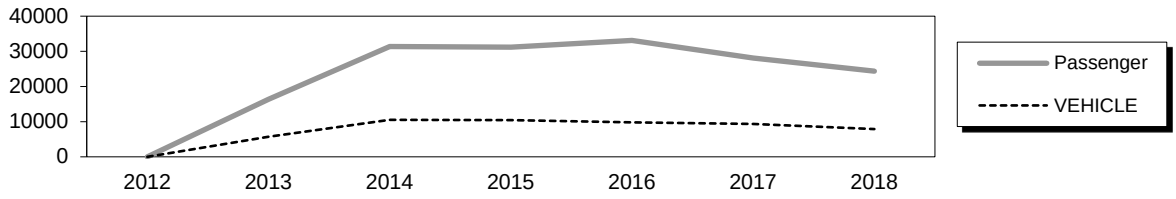

Revillagigedo Island
Revillagigedo Island
Ketchikan
LOCATION
Ketchikan Airport
Gravina Island
Annette Islands Reserve
Existing Ferry Terminal
Metlakatla
Dixon Entrance
VICINITY MAP
Parking
Public restroom
Waiting shelter, covered drop-off/walk, & storage bldg.
Transfer bridge
Walden Point Rd.
M/V Lituya
Bridge Support & Fender Float
Staging
Mooring Dolphin
Float Restraint structure
To Metlakatla
ANNETTE BAY
MLLW
RW
0
100'
200'
SCALE IN FEET
GENERAL LAYOUT
ANNETTE BAY

Annette Bay Ferry Terminal (Metlakatla)

Owner: State of Alaska

Contact: Simon Bradley, AMHS Terminal Ops Manager (Ketchikan) – 907-228-7290

Terminal Description: The Annette Bay Ferry Terminal, built in 2013, is the primary port of call for the M/V Lituya. Annette Bay is a side-berth loading facility. The vehicle transfer bridge and breasting fender panels are supported on a series of Flexifloats. Uplands are paved & striped for parking & staging areas with overhead lighting. There is an open-air waiting shelter, public pit toilets and generator building. There is no terminal building, nor terminal staff, so we didn't get any feedback from operations on the facility.



The most recent topside inspection was conducted on July 24, 2017.

Vessels	
Name	Berthing, Alignment
Lituya/LeConte/IFA	Starboard

Tidal Data (MLLW 0.0 feet)	
EHW	19.5
MHHW	15.4
MHW	14.4
ELW	-4.5

Waiting Shelter	
Year Built:	2013
Square Footage:	483 s.f.
Heating System:	Electric
Condition:	New

Vehicle Transfer Bridge - #0194	
Type:	16' x 138' Multi-girder
Year Built:	2013
Shoreward support:	Abutment / Bearing Beam
Seaward support:	Flexifloat / Roller Bearings
Coating:	Epoxy/Polyurethane
Pedestrian Access:	Concrete 4' wide on bridge
Lighting:	(4) Light poles, left side
Condition:	New
Load Posting Sign:	No
Original Design Load:	HS 20-44

Uplands	
Short-Term Parking:	15
Long-Term Parking:	24
Staging Area:	450 ft
Paint Striping:	Yes
Driving Surface:	Asphalt Concrete

Standby Generator	
Year Built:	2013
Fuel Storage:	Daytank & 250 Gal AST
Other:	Surrounded by security fence

Utilities
The waiting shelter, apron hydraulics and lighting are powered by Metlakatla Power & Light. There is no potable water or sanitary sewer service.

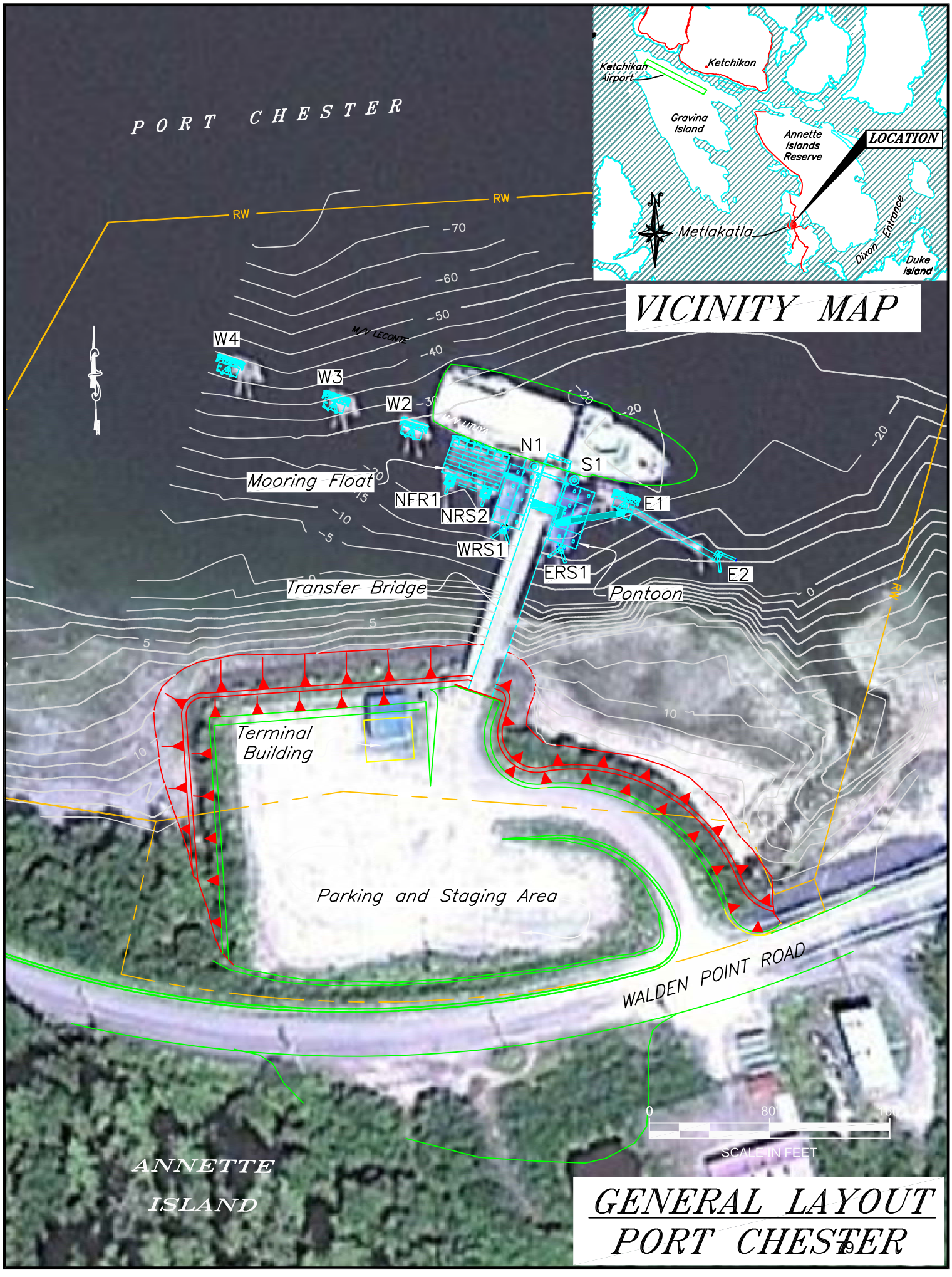
Bridge Support Float	
Type:	Steel Flexi-float units (5,000 s.f.)
Year Built:	2013
Ballasted:	Yes
Ramp lift:	None
Apron lift:	Hydraulic
Condition:	New

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
2013	69200 / AK-03-0075-01	Annette Bay Ferry Terminal	Construction of new marine & uplands facilities at the end of Walden Point Road.
2015	68135	Annette Bay FT Improvements	Installation of a 4-pile mooring dolphin to the east of the existing marine structures, boarding ladder mounted on steel bridge float, envelope improvements to the existing storage room.

Observations

1. There is an anchor bolt missing on one of the shoreward girder hinge bearing plates.
2. A come-along is attached to the westernmost fender frame on the seaward bridge float. No apparent reason for its use.
3. Cathodic potential (CP) readings for the bridge float average -0.91V, which indicates the steel is adequately protected against corrosion. The float restraint dolphins are just below -0.8V, which is the cutoff for adequate protection. So the steel piles are freely corroding. Depth to mudline elevations, taken with leadline readings at locations along the fender line in 2015, range from -42’ to -48’ MLLW.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
No repairs necessary.		
Category II - Rehabilitation Work		
Bridge	1	Install an anchor bolt on the shoreward hinge bearing plate.
Fender frame	2	Remove the come-along attached to the fender frame.
Float Restraints	3	Install new anodes on the steel pipe piles.
Category III - Upgrades Needed		
No repairs necessary.		


PORT CHESTER
RW
RW
-70
-60
-50
-40
-30
-20
-20
-20
-20
-10
-5
0
5
5
10
10
15
20
W4
W3
W2
M/V LECONTE
M/V LITUYA
N1
S1
E1
E2
NFR1
NRS2
WRS1
ERS1
Mooring Float
Transfer Bridge
Pontoon
Terminal Building
Parking and Staging Area
WALDEN POINT ROAD
ANNETTE ISLAND
0
80
160
SCALE IN FEET
Ketchikan Airport
Ketchikan
Gravina Island
Annette Islands Reserve
LOCATION
Metlakatla
Dixon Entrance
Duke Island
VICINITY MAP
GENERAL LAYOUT
PORT CHESTER

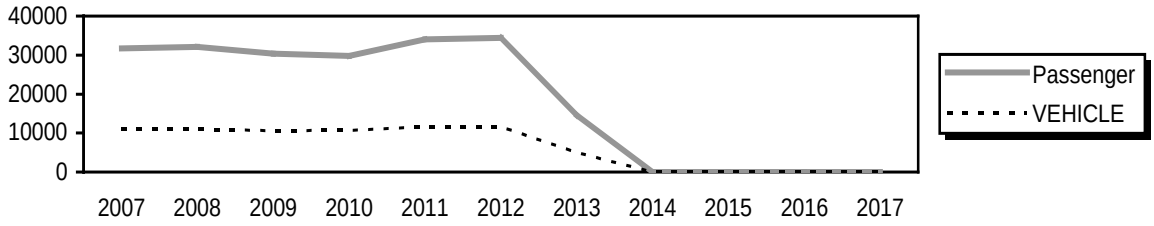
Port Chester Ferry Terminal (Metlakatla)

Mile 3 Walden Point Road

Owner: State of Alaska

Contact: Simon Bradley, AMHS Terminal Ops Manager (Ketchikan) – 907-228-7290

Terminal Description: The Port Chester terminal was constructed in 1987 and is approximately two miles from town. The facility is a side berth designed for LeConte class vessels, and consists of an orthotropic steel deck bridge, seven steel pipe pile dolphins (six breasting and one mooring), an HDPE mooring float, and a steel bridge pontoon. In 2003, the terminal was modified to serve as a homeport for the M/V Lituya, a shuttle ferry operating between Metlakatla and Ketchikan. The past 10 years of total passenger and vehicle traffic for Port Chester is shown below.



A new ferry terminal in Annette Bay has been completed, and ferry operations have moved there; however, the Port Chester facility remains in active operation status. The most recent topside inspection was conducted July 24, 2017. The most recent fracture critical & underwater inspections occurred on August 4, 2016.

Vessels	
Name	Berthing, Alignment
Lituya / LeConte	Starboard

Tidal Data (MLLW 0.0 feet)	
EHW	19.5
MHHW	15.4
MHW	14.4
ELW	-4.5

Terminal Building	
Year Built:	1987
Square Footage:	576 s.f.
Heating System:	Electric
Condition:	Poor, out of service

Vehicle Transfer Bridge - #0178	
Type:	16' x 132' steel orthotropic deck
Year Built:	1973
Shoreward support:	Steel Beam/Driven Piling
Seaward support:	Steel Support Float
Coating:	Spray Metallizing
Pedestrian Access:	Concrete 4' wide on bridge
Lighting:	Jelly Jars, left guardrail
Condition:	Poor
Load Posting Sign:	N/A
Original Design Load:	HS 20-44

Uplands	
Short-Term Parking:	8
Long-Term Parking:	30
Staging Area:	150 ft
Paint Striping:	No
Driving Surface:	Chip seal

Generator & Building
This facility does not have a generator.

Utilities
The terminal building and bridge ramp have city Electric.

Bridge Support Float	
Type:	40' x 60' Steel Flexi-float
Year Built:	1996
Ballasted:	Yes
Ramp lift:	Hydraulic/Cable
Apron lift:	Hydraulic/Cable
Condition:	Fair

Dolphins							
Dolphins	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Notes**
W4	2B, 1V	4V	Ekki Timber	No	1987	Fair	Red Navlight
W3	2B, 1V	4V	Ekki Timber	No	1987	Fair	
W2	2B, 1V	4V	Ekki Timber	No	1987	Fair	
MFR2	1B, 1V	See Mooring Float		No	2003	Good	
MRF1	1B, 1V			No	2003	Good	
WRS1	2B, 1V	See Bridge Support Float		No	2003	Good	
N1	1V	Floating Fender		No	2003	Good	
S1	1V	Floating Fender		No	2003	Good	
ERS1	2B, 1V	See Bridge Support Float		No	2003	Good	
E1	2B, 1V	4V	Ekki Timber	No	1987	Fair	
E2	2B, 1V	-	-	No	2003	Good	Windsock & Red Navlight

LEGEND

ERS1 = East Bridge Support Float Restraint Dolphin
V = Vertical Steel Pipe Piling
MFR1 = Mooring Float Restraint Dolphin
B = Battered Steel Pipe Piling

Mooring Float							
Platform	**Size**	**Fender Face**	**Float**	**Built**	**Decking**	**Cond.**	**Notes**
MF	40' x 25'	UHMW	Steel Pontoon	2003	Fiberglass	Good	

Catwalks / Gangways / Platforms							
#	**From**	**To**	**Length / Style / Main Members**	**Built**	**Safety Chains?**	**Cond.**	**Notes**
P1	Bridge Float		22' / Platform	2003	_	Good	
G1	P1	E1	57'4" / Gangway / 2.5"x2.5" Bottom Chord	2003	No	Good	
C1	E1	E2	40' / Catwalk / 10"x10" Tube Girders	2003	Yes	Good	

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1974	S-0927(1)	Ferry Terminal Facilities at Metlakatla	Original construction of terminal uplands, vehicle transfer and mooring structures.
1987	A70002	Metlakala Ferry Terminal	Relocated the terminal roughly 1/2 mile to the east. Removed existing timber dolphins; reinstalled steel transfer bridge and support float. Constructed new float platform, apron & lift system, and five steel mooring dolphins. Installed new electrical & lighting systems.
1996	75269 / STP-0927 (4)	Metlakatla Ferry Terminal Pontoon Upgrade	Removed and replaced the original bridge support float. Installed a re-designed bridge-barge connection weldment and new hinge to seaward end of the bridge.
2004	68208 / STP-0927 (6)	Metlakatla Ferry Termial Modifications	Removed dolphin W1 and the bridge support float restraint dolphins. Installed new restraint dolphins for the bridge float on south ends. Constructed new mooring float east of the bridge and two floating fender dolphins on either side of the bridge for all-tide mooring. Installing access gangway & catwalk to east dolphins. Upgraded the electrical power utilities on the bridge.

Observations

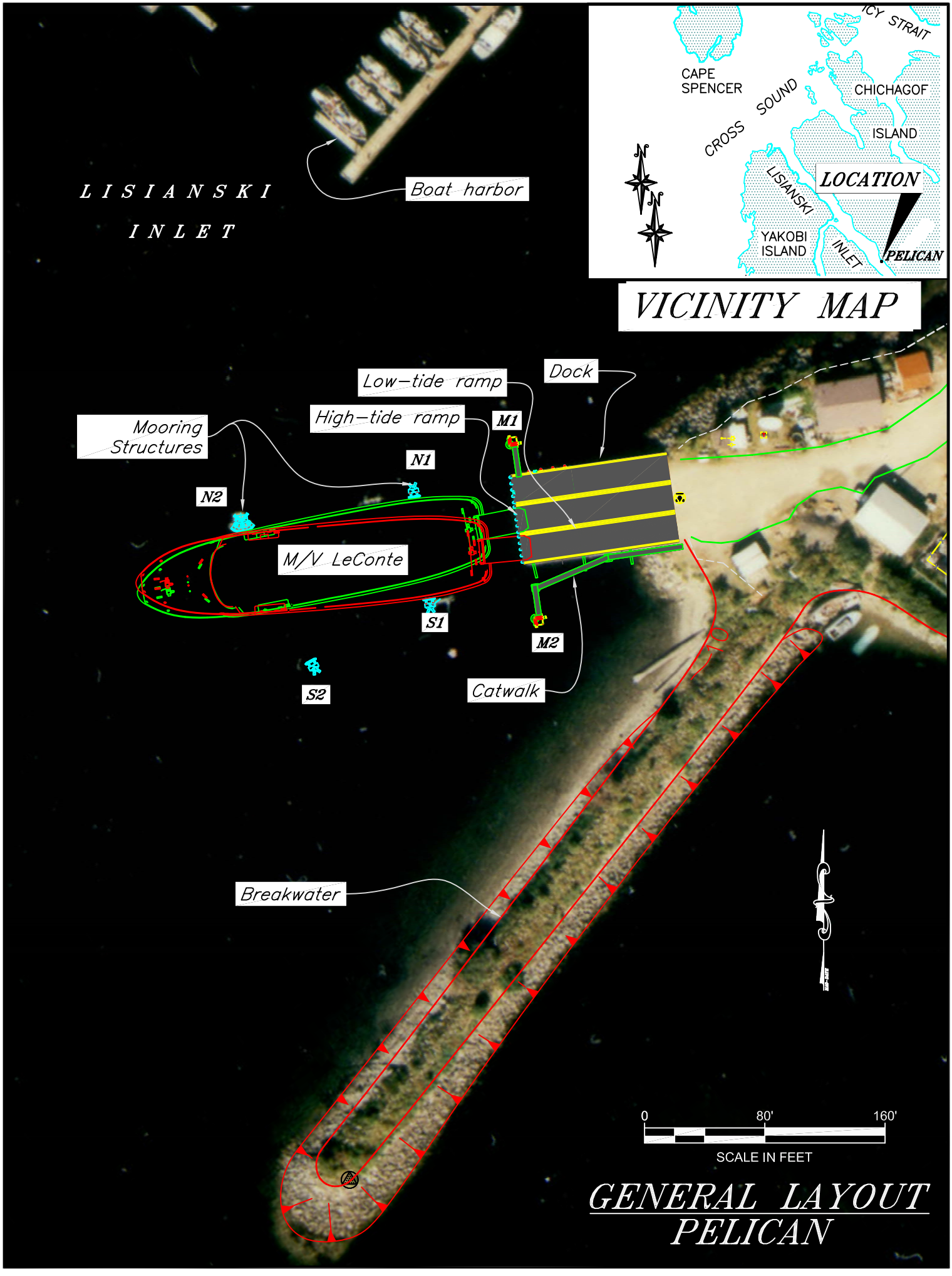
1. The chip seal surface on the staging area placed in 1994 has failed and has numerous large potholes. The roadway requires additional aggregate surface course and should be graded to drain.
2. A modular terminal building was installed in 1985 but the facility sits unused. The building has been vandalized and is in need of maintenance. There are many deficiencies such as, rotting siding and door framing, broken windows, no stairs and ramp at the entrance, and failed exterior finish. Water and sewer services are needed and the building should be modified to comply with ADA requirements, if the terminal building is to be used in the future. No operating agreement exists between AMHS and the community covering operation, maintenance, or security, so the building remains unused.
3. The transfer bridge was built in 1974 and used in an earlier terminal located closer to town. The bridge was salvaged, re-coated with spray metalizing in 1996, and relocated to the present site. The bridge appears to have reverse camber along its length. Currently, 85% of the coating is covered in white rust and 25% bare corroded patches, while the remaining surface is freely corroding. The bridge abutment is a tied-back spread footing that supports the approach bearings. The shoreward bridge bearing beam swivels around a pin, which has corroded and worn a jagged and elongated hole on the top flange of the beam. Looking shoreward, the right box girder bearing at the abutment has 1/4-inch wear into the bearing pin with minor surface corrosion. There are sections of expanded metal on the deck that are loose, while some sections are torn. The bridge alignment cables are slack.
4. The seaward bridge bearings, intermediate ramp, and apron are supported by a Flexifloat pontoon system. The pontoon is guided by two 3-pile restraint dolphins and the bridge bears on rollers mounted to the float. The bearings and restraints are in good condition. Touch-up paint coatings have failed on the topside of the Flexifloats, and rust covers 25% of the surface area. Rubbing from the UHMW skids of the mooring float gangway have worn away the coating of the float in this area.
5. The deck of the mooring float appears to be in good condition. The hawse mast on deck is bent, may have been too high & impacted the ship while berthing. The 2011 underwater report found that bolts for hanger strops are loose on mooring float pontoons, and the most recent above water inspection found the majority of the hanger strap bolts covered in a light surface rust.
6. All mooring structures are in good condition. Previous inspections noted the dolphin caps were spray metallized in the past and they now show signs of light surface rust. All the piling are brown in color due to bleed-through corrosion and failure of the galvanized coating. There are extra/old mooring cables that are lying on the caps of dolphin E1. There is no hawse mast on dolphin W2. Masts are bent on dolphin W3.

   Cathodic potential (CP) readings for the mooring & restraint structures average -0.68V. The cutoff for adequate protection is -0.8V, so the steel piles are freely corroding. Depth to mudline elevations, taken with leadline readings at locations along the fender line in 2015, range from -22' to -29' MLLW.
7. Gangway lights were turned on during daylight hours during our inspection.
8. The M/V Lituya broke loose from her moorings while tied up overnight at this terminal on January 30, 2009 and went aground on Scrub Island nearby. She was safely re-floated and taken to ASD shipyard for repairs later on that day.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Mooring Float	1	Tighten the bolts to the hanger strops on the mooring float pontoons.
Category II - Rehabilitation Work		
Dolphins	2	Install and maintain anodes on all submerged steel.
Transfer Bridge	3	Re-paint bridge, repair shoreside bearing beam, and replace the shoreward hinge pins and plates. Tighten the bridge alignment cables at the seaward bridge bearing. Rehab the non-skid coating on the transition plate between the bridge and apron. Replace damaged sections of expanded metal on the apron. Repair broken conduit leading from the apron to the ramp. Discourage recreational skiffs from tying up to the float and tapping in to the catwalk lighting circuit.
Waiting Shelter	4	Refurbish/replace or remove existing waiting shelter. Existing building structure is not being utilized.

Inspection Summary (continued)		
Structure	Priority	Recommendations
Category II - Rehabilitation Work		
Bridge Pontoon	5	Replace the surface paint coating on all Flexifloat units. Install channel skids beneath the mooring float gangway.
Dolphin E1	6	Remove the extra/old mooring cables.
Mooring Float	7	Straighten/replace bent & damaged hawse masts.
Category III - Upgrades Needed		
All Facilities	8	The new Annette Bay facility is the home-port location for the M/V Lituya. IFA is currently berthing at Port Chester, until modifications at Annette Bay are made for the IFA vessels. Eventually the Port Chester facility will no longer be needed. Existing structures could be removed/relocated or facility may be abandoned in near future. Deficiencies noted will be obsolete if this terminal is removed.

NOTE: This facility has not been in operation since the Annette Bay terminal came online in 2013, and is not being maintained for operational readiness by AMHS. The Department has removed from our inspection program, but is including past data in the report as 'informational only'.

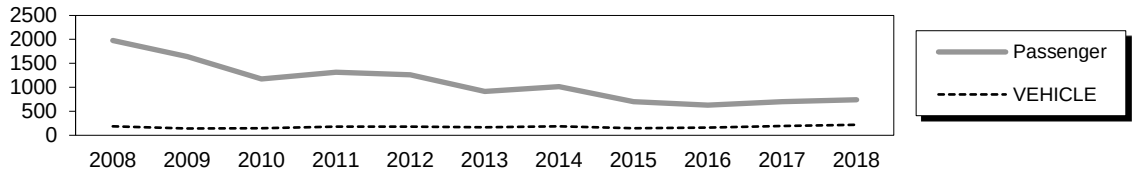

LISIANSKI INLET
Boat harbor
ICY STRAIT
CAPE SPENCER
CROSS SOUND
CHICHAGOF ISLAND
LISIANSKI INLET
YAKOBI ISLAND
LOCATION
PELICAN
VICINITY MAP
Low-tide ramp
Dock
High-tide ramp
M1
Mooring Structures
N1
N2
M/V LeConte
S1
M2
S2
Catwalk
Breakwater
0
80'
160'
SCALE IN FEET
GENERAL LAYOUT
PELICAN

Pelican Ferry Terminal

Owner: City of Pelican

Contact: Simon Bradley, AMHS Terminal Ops Manager (Ketchikan) – 907-228-7290

Terminal Description: This ferry terminal facility is a multi-use tidal ramp and fixed dock facility that accommodates LeConte class vessels, barges, and landing crafts. The original facility was built in 1976, expanded in 1980 and completely removed and replaced in 2012. The ferry terminal is located at the southeast end of the Pelican boat harbor and consists of a fixed platform dock, two tidal ramps, and four mooring structures. The facility is a stern-berth for use by ferries with a stern apron. A rubble mound breakwater to the south provides protection for the berth and adjacent harbor. This facility has neither a terminal building nor a staging area. The City of Pelican owns this facility and the adjacent uplands; however, ADOT has provided primary construction funding and other maintenance related upgrades over the years. AMHS does not have exclusive use of the terminal or control of maintenance at this facility. The terminal is not staffed. City personnel meet the vessel and assist with vessel tie-up. The past 10 years of total passenger and vehicle traffic for Pelican is shown below.



The most recent above water survey was completed on October 10, 2017.

Vessels	
Name	Berthing, Alignment
LeConte	Stern

Tidal Data (MLLW 0.0 feet)	
EHW	14.5
MHHW	10.4
MHW	9.5
ELW	-4.0

Terminal Building
NA

Generator & Building
NA

Utilities @ Dock
NA

Uplands	
Short-Term Parking:	N/A
Long-Term Parking:	N/A
Staging Area:	N/A

Dock & Tidal Ramps - #1426	
Type:	3200 s.f. Concrete & Open-grate Steel Panel Dock; 20' x 42' high tide ramp; 20' x 100' low tide ramp
Year Built:	2012
Support:	Vertical & Battered Steel Piles
Steel Coating:	Galvanizing
Fender System:	Timber Pin Piles bolted to steel wale
Anodes:	Yes
Lighting:	None
Condition:	New
Notes:	No navlights
Load Posting Sign:	N/A
Original Design Load:	HL93

Dolphins							
Dolphins	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Notes**
N2	2B, 1V	4V	Timber	No	1980	Fair	
N1	2B, 1V	Hanging	UHMW	No	2008	Good	
S1	2B, 1V	Hanging	UHMW	No	2008	Good	
S2	2B, 1V	Hanging	UHMW	No	2008	Good	
M1	2B, 1V	-	Rubber Tires	Yes	2012	New	
M2	2B, 1V	-	Rubber Tires	Yes	2012	New	

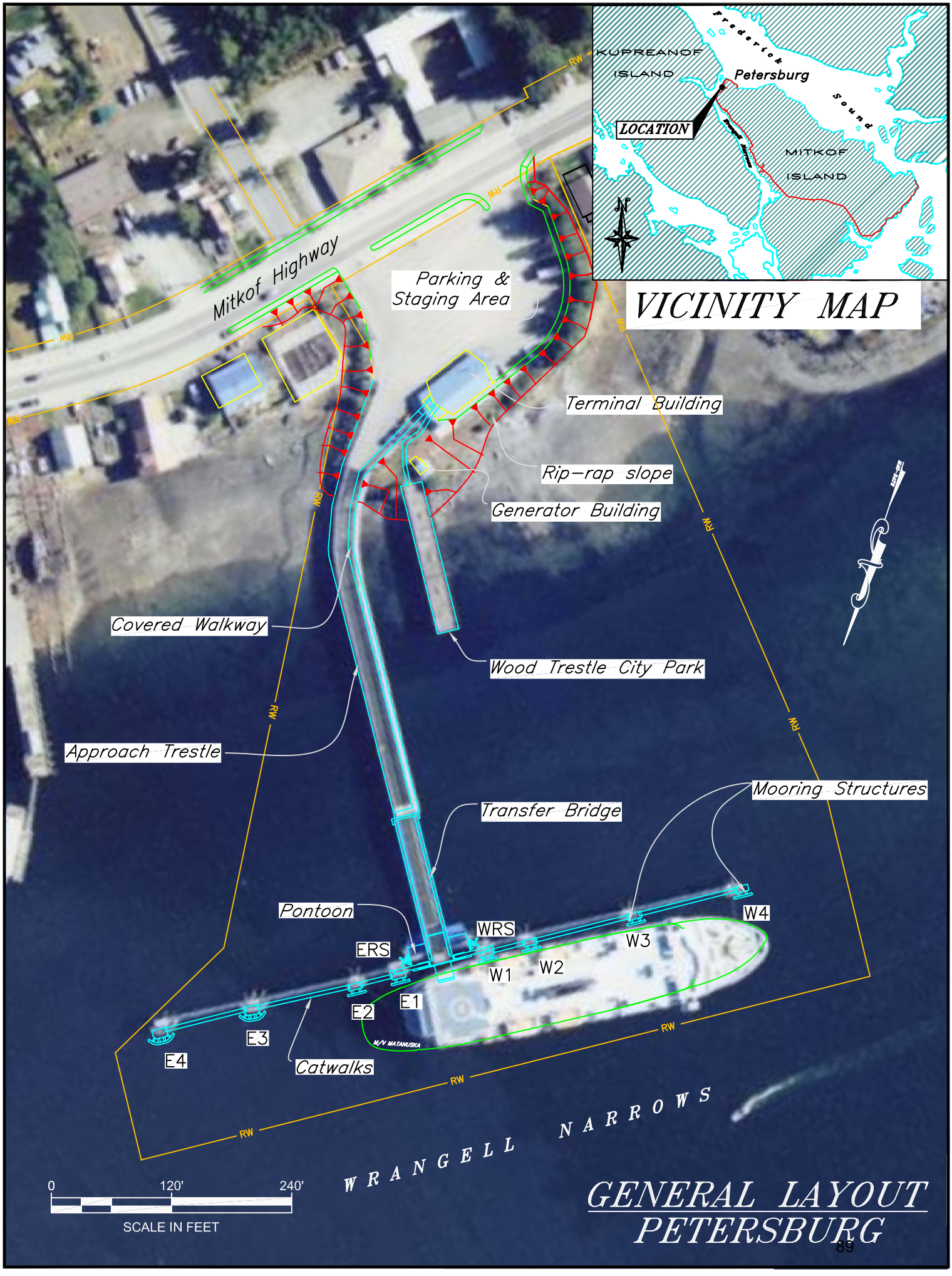
LEGEND
V = Vertical Steel Pipe Piling B = Battered Steel Pipe Piling

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1975	533002	City of Pelican - Pelican Dock	Placed in-water fill for uplands extension from shore; constructed original high and low tide ramps (concrete panels supported by steel piles and caps); installed timber breasting and mooring dolphins; installed mooring deadman south of low-tide ramp.
1980	X30097	Pelican Dock Facilities	Extended the length of hihg & low tide ramps seaward; constructed main dock (north of the original high tide ramp); installed fendering system along dock face; relocated mooring deadman; relocated stern breasting dolphins; constructed new steel pipe pile turning dolphin N2.
1993	75287	Pelican Ferry Terminal	Repaired the existing timber breasting dolphins N1 & S1.
2005	73741-06	Pelican City Dock Rehab. Project	Installed a timber overlay structure on the lower tidal ramp to permit vehicles to transit across the ramp's failing concrete panels.
2008	68731	Pelican Ferry Terminal	Removed the existing timber breasting dolphins and installed two steel pipe pile mooring dolphins and one safety dolphin.
2012	69433	Pelican Ferry Terminal Renovation	Removed and replaced the dock. Also installed two new stern mooring dolphins with access catwalks.

Observations

1. The steel angle that protects the timber abutment backwall is missing screws in several locations.
2. An HSS spacer tube between panels D and E is loose and rocks side to side on the low tide ramp. Further inspection found three out of five bolts that attach the HSS spacer to the stringers below have been pried-off. Also, there is marine growth on the seaward-most concrete deck panels, which creates a slick walking surface. Drag marks from trailer hitches can be seen in the concrete overlay of the low tide ramp deck, but there is no apparent damage.
3. The underside of the deck panels reveal minor efflorescence and water staining, indicating leaks through the grouted keyways.
4. Cathodic potential (CP) readings for the dock support piles & nearby mooring structure average -0.95V, which indicates the steel piles are adequately protected against corrosion (more negative than -0.8V).

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Issues		
N/A		
Category II - Rehabilitation Work		
Low Tide Ramp	1	Replace missing/loose bolts on HSS tube steel spacer between deck panels D and E on the low tide ramp. Remove marine growth as necessary on concrete deck panels D and E.
Abutment	2	Replace missing screws in the steel angle that protects the timber abutment backwall.
Category III - Upgrades Needed		
N/A		


KUPREANOF ISLAND
Petersburg
Frederick Sound
LOCATION
Wrangell Narrows
MITKOF ISLAND
N
VICINITY MAP
Mitkof Highway
Parking & Staging Area
Terminal Building
Rip-rap slope
Generator Building
Covered Walkway
Wood Trestle City Park
Approach Trestle
Transfer Bridge
Mooring Structures
Pontoon
WRS
ERS
W1
W2
W3
W4
E1
E2
E3
E4
Catwalks
M/V MATANUSKA
RW
0
120'
240'
SCALE IN FEET
WRANGELL NARROWS
GENERAL LAYOUT
PETERSBURG

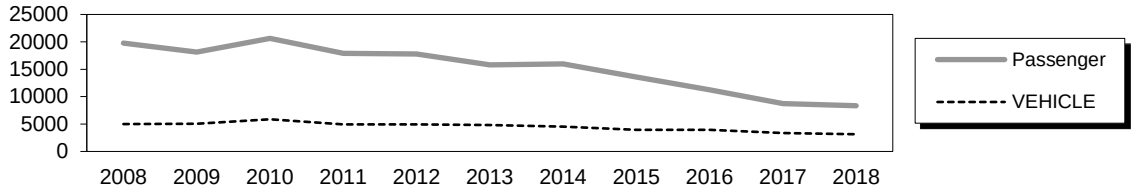
Petersburg Ferry Terminal

1100 South Nordic Road

Owner: State of Alaska

Terminal Manager: Richard Patteson – 907-772-3855

Terminal Description: The Petersburg Ferry Terminal is a side-berth facility and consists of staging and parking areas, terminal building, emergency generator facilities, approach span, transfer bridge, covered walkways, and eight steel mooring structures. The Petersburg facility is located in the Wrangell Narrows, about ½ mile south of town. The past 10 years of total passenger and vehicle traffic for Petersburg is shown below.



The most recent above water survey was completed on June 28, 2017. The most recent fracture critical inspection occurred on August 12, 2018. The most recent underwater inspection occurred on August 5, 2016.

Vessels	
Name	Berthing, Alignment
Taku / LeConte / Mat / Mal / Columbia	Port/ Starboard
Kennicott	Port
FVF	Starboard

Tidal Data (MLLW 0.0 feet)	
EHW	20.5
MHHW	16.4
MHW	14.8
ELW	-4.5

Terminal Building	
Year Built:	1982 (rebuilt and expanded in 2000)
Square Footage:	2078 s.f.
Heating System:	Furnace
Fuel Storage:	UST
Fire Protection:	Sprinkler / Alarm
Condition:	Good

Generator & Building	
Building / Generator:	1986
Square Footage:	120 s.f.
Heating System:	Electric
Fuel Storage:	UST
Fire Protection:	Halon
Condition:	Good

Uplands	
Short-Term Parking:	15 cars
Long-Term Parking:	N/A
Staging Area:	1375 lineal feet, 10 lanes
Paint Striping:	Yes
Driving Surface:	Asphalt

Vehicle Transfer Bridge - #0802	
Type:	16' x 140' twin box beam
Year Built:	1985
Shoreward support:	Steel approach bent
Seaward support:	Steel Support Float
Coating:	Wasser Paint
Pedestrian Access:	Concrete 4' wide on bridge
Lighting:	None
Condition:	Good
Load Posting Sign:	N/A
Original Design Load:	HS 20-44

Bridge Approach Trestle	
Type:	25' x 360' Pile-supported, Open grate deck
Year Built:	1986
Shoreward support:	Steel Beam/Driven Piling
Seaward support:	Steel Beam/Driven Piling
Pedestrian Access:	Covered walkway, guardrail separation
Anodes on piles:	No
Condition	Good

Bridge Support Float	
Type:	24' x 50' Steel Pontoon
Year Built:	1986
Ballasted:	Yes
Ramp lift:	Hydraulic/Block & Cable
Apron lift:	Hydraulic/Block & Cable
Anodes:	Yes, but poor reading
Condition:	Good

Utilities		
	at terminal	at ramp
Electrical:	Yes, city & backup power	
Water:	Yes	No
Sewer:	Yes	No
Telephone:	Yes	Yes
Cable TV:	No	No
Fuel:	Yes	No
Wireless Bridge:	Yes	_

Dolphins							
Dolphins	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Notes**
W4	3B, 3V	Hanging	UHMW	Yes	2013	New	
W3	2B, 2V	Hanging	UHMW	Yes	2013	New	Light Pole
W2	2B, 1V	4V	Ekki Timber	Yes	1986	Fair	
W1	2B, 1V	4V	Ekki Timber	Yes	1986	Fair	Windsock & light pole
WRS	2B, 2V	-	-	Yes	1986	Fair	
ERS	2B, 2V	-	-	Yes	1986	Fair	
E1	2B, 1V	4V	Ekki Timber	Yes	1986	Fair	Light pole
E2	2B, 1V	4V	Ekki Timber	Yes	1986	Fair	
E3	2B, 2V	Hanging	UHMW	Yes	2013	New	Light pole
E4	3B, 3V	Hanging	UHMW	Yes	2013	New	Red navlight

LEGEND
V = Vertical Steel Pipe Piling
H = Vertical Steel H-Piling
ERS = East Bridge Float Support Restraint Structure
EFP = East Float Platform

Catwalks / Gangways							
#	**From Struct.**	**To Struct.**	**Length / Style / Main Members**	**Built**	**Safety Chains?**	**Cond.**	**Lighting**
C1	W4	W3	100' / Catwalk / 10"x10" Tube Girders	1986	Yes	Good	Jelly Jars
C2	W3	W2	79' / Catwalk / 10"x10" Tube Girders	1986/ 2013	Yes	Good	Jelly Jars
C3	W2	W1	33' / Catwalk / 10"x10" Tube Girders	1986	Yes	Good	Jelly Jars
G1	W1	WFP	35' / Gangway / Pony truss	1986	Yes	Good	Jelly Jars
G2	EFP	E1	35' / Gangway / Pony truss	1986	Yes	Good	Jelly Jars
C4	E1	E2	33' / Catwalk / 10"x10" Tube Girders	1986	Yes	Good	Jelly Jars
C5	E2	E3	79' / catwalk / 10'x10" Tube Girders	1986/ 2013	Yes	Good	Jelly Jars
C6	E3	E4	83' / Catwalk / 10"x10" Tube Girders	1986	Yes	Good	Jelly Jars

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1963	F-095-6(1)	Petersburg Ferry Terminal	Original ferry terminal construction consisting of uplands fill for parking & staging area; waiting shelter; electrical and lighting; timber trestle approach span.
1963	N/A	Petersburg Ferry Terminal	Constructed timber transfer bridge, mooring dolphins and dock.
1976	6-75157	Petersburg Ferry Terminal Dolphins	Constructed two steel pile mooring dolphins and two steel catwalks.
1986	F-095-4(15)	Petersburg Ferry Terminal	This project re-aligned the mooring and vehicle transfer marine structures, including the replacement of all timber structures and the existing dock with a new steel approach trestle, steel transfer bridge & steel pontoon, steel mooring structures and steel catwalks.
2000	75382 & 75273	Petersburg Terminal Building Expansion & Uplands Improvements	Replaced the roof, expanded the footprint by 45% and made several other upgrades to the terminal building. Re-paved the uplands and installed new concrete curb & gutter and sidewalk.
2013	69422	Petersburg Ferry Terminal Improvements	Replaced the end dolphins, W3-4 & E3-4, modified catwalks, replaced catwalk lighting, installed anodes on all pile-supported structures.

Observations

1. The staging area is paved and illuminated. Neighboring development has crowded the AMHS facility to the point that the staging area can now only be expanded by purchasing additional property and by building onto the existing wetlands adjacent to the terminal. The Terminal Manager reports that additional parking space is required. The staging area and illumination were upgraded as part of the terminal building expansion project completed in 2000.
2. The original 1,432 square foot terminal building was constructed in 1982 and expanded to 2078 square feet in 2000. The terminal building is in good condition. The interior and exterior of the terminal building were completely redone as part of the building expansion. The facility now meets ADA requirements. The restrooms and office area were expanded. The heating system and fuel storage tank replaced. A fire alarm and sprinkler system were installed. A new roof was put on the structure. New sidewalks were installed around the building. New electrical, water and sewer utilities were installed. The terminal has a separate generator building and storage building for equipment. The generator and storage buildings are in good condition.

   An area drain, in pavement near the beginning of the approach trestle is undermined. Pavement is eroded around the frame, along with several other potholes which present a driving hazard.
3. A 360'-long approach trestle connects the transfer bridge to shore. Overall, the trestle is in fair condition. At Pier 7, an anchor bolt is bent and corroding, concrete has spalled around the surface of the pier cap & anchor bolt on the eastern-most girder. The timber backwall is deteriorating at the shoreside transition. The galvanized coating has 50% remaining on the steel wheel guard, along the topside deck. The steel form pan for the concrete in-fill walkway is corroding, along with steel utility conduit hanging below.
4. The transfer bridge, built in 1986, has a hydraulically operated intermediate ramp and apron. A new paint coating was applied in 1997. A crack (approximately four inches long) in the bridge's wheel guard located near mid-span on the bridge has been repaired. Corrosion from the steel pan stay-in-place form for the concrete in-filled walkway, on the underside of the bridge deck, has leaked onto the

top flange of Stringer 1. The coating has failed, laminating corrosion & minor section loss covers the top flange of Stringer 1.

Observations (continued)

5. The shore end of the bridge is supported on a concrete cap on steel pipe piles. The steel piling has minor corrosion near the underside of the concrete cap, which has minor spalling in some areas around the pile/cap surface. The bridge bearings appear to be in good condition. The expanded metal grating on the bridge apron has been damaged and several areas are missing. The girder access hatches are missing bolts, and need a neoprene gasket to seal off precipitation.

   The underside of the bridge reveals widespread coating failures, with an estimated 40% painted surface remaining. The coating has failed within the wheel path of the open-grate decking. Similar to the approach trestle, the utility conduit hanging below the concrete in-fill decking is corroding. Stringer 1 and the girder web in this area has 100% coating failure with heavy laminating corrosion on the top flange of the stringer. There is miscellaneous paint failure on the seaward bridge support strut, likely accelerated from regular power washing.
6. A roller bearing on the east gangway support platform has damaged bar grating, due to improper orientation of the grating bear bars.
7. Dolphins W3-4 and E3-4 were replaced in 2013. W4 & E4 are large lead-in dolphins with curved fender panels to accept ship berthing contact from various angles to the fenderline.

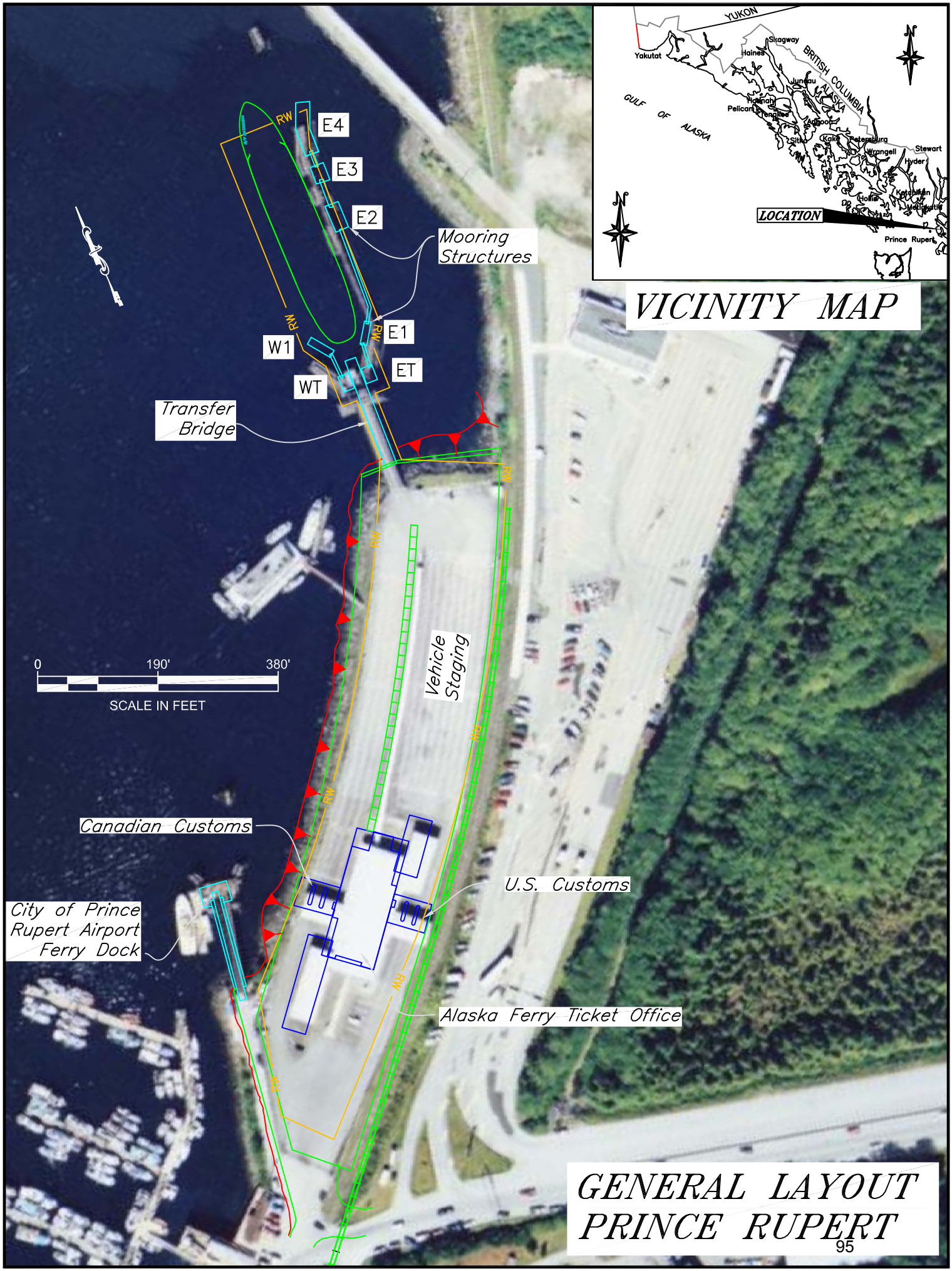
   Dolphins E3 and W3 receive heavy mooring (line) loads because of the tidal currents in Wrangell Narrows. In addition, during the fishing season many fishing vessels anchor off the ends of the facility and the ferries must approach the berth at a steep angle.
8. Steel pipe hawse rail extensions have impacted and bent the middle rail of several of the catwalks. The most recent underwater inspection report revealed that all 1986-era mooring dolphin pipe piling have lost 80-90% of their galvanized coating. Overall these pipe piling have only experienced a minor loss of section, but this will accelerate once the coating is fully depleted. The master links are corroding on the horizontal chains between fender and dolphin caps. New 100# bar anodes were installed on all pile-supported structures in 2013, but cathodic protection readings are below -0.8V on existing dolphins (E1-2, W1-2) and only -0.8V on average for new dolphins (E3-4, W3-4). This is likely because new bar anodes are hanging from cables and laying covered in mud on the shore bottom. When the surface of an anode is not exposed to seawater, it is not electrically active.

   Depth to shore bottom leadline measurements taken along the dolphin fenderline on the most recent above water survey ranged from 21 to 28 feet below MLLW.

   The mooring structures are roosts for a large seabird population. Bird debris is deposited on the top of the pile caps, walkways, pontoon, and bridge. Expanded metal grating has been installed on the pile caps between dolphins in an attempt to improve traction, but this also provides a sanctuary for moss to grow. The combination of bird guano and moss causes the pile caps to become slippery.
9. We could not visually inspect the gangway hanger brackets/pins due to lack of clearance between pin & plate.
10. There is a 1.5” long crack in the northwest corner of the bridge pontoon deck. The paint coating is failing on the sides of the pontoon float. The top of the pontoon float requires a power washing. The galvanized coating on the restraint dolphins is failing in the splash/tidal zone.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Nothing required.		
Category II - Rehabilitation Work		
Transfer Bridge	1	Program a project to re-paint the entire bridge.
Bridge float	2	Patch the hole in the deck of the bridge support float.
Approach	3	Replace broken anchor bolt on West trestle girder at bridge abutment.
Gangways	4	Replace the gangway hanger pins.
Dolphin anodes	5	Adjust the length of cable supporting anodes so they are hanging vertically in the water.
Apron	6	Repair and replace the missing sections of expanded metal grating on the apron.

Inspection Summary (cont'd.)		
Structure	Priority	Recommendations
Category II - Rehabilitation Work		
Miscellaneous	7	Cut the hawse rail extensions back, or bend them, to avoid impacting the catwalk railing. Replace the master links on the horizontal chains between fender and dolphin caps. Pressure wash the dolphin caps more frequently.
Uplands	8	Adjust the elevation of the area drain at the head of the approach trestle.
Gangways	9	Reinstall bar grating that supports East gangway to provide proper orientation of bearing bars with relation to the gangway roller.
Category III - Upgrades Needed		
Uplands	10	Bring UST into compliance with current ADEC regulations. Review the need for additional parking.


E4
E3
E2
E1
ET
W1
WT
RW
Mooring Structures
Transfer Bridge
Vehicle Staging
Canadian Customs
U.S. Customs
City of Prince Rupert Airport Ferry Dock
Alaska Ferry Ticket Office
0
190'
380'
SCALE IN FEET
YUKON
Yakutat
Skagway
Haines
BRITISH COLUMBIA
ALASKA
Juneau
Pelican
Sitka
Petersburg
Wrangell
Stewart
Hyder
Ketchikan
Prince Rupert
GULF OF ALASKA
LOCATION
VICINITY MAP
GENERAL LAYOUT
PRINCE RUPERT

Prince Rupert Ferry Terminal

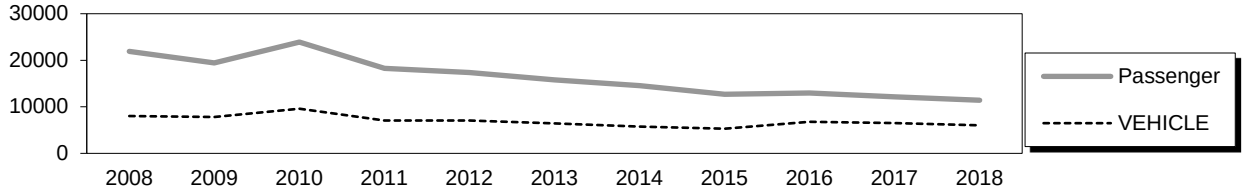
2100 Park Avenue

Owner: City of Prince Rupert / Prince Rupert Port Authority

Terminal Manager: Cathy Basdeo – 250-627-6523

Terminal Description: Prince Rupert Ferry Terminal is a stern-loading facility consisting of a timber transfer bridge, supported by a timber framed lift tower and counterweight system at the seaward end, with two timber stern dolphins, and three timber breasting dolphins connected by timber catwalks. Uplands include a terminal building built in 1992, with US & Canadian customs stations, paved parking and overhead lighting. The facility was originally constructed in 1963 to service AMHS vessels. Terminal is owned by the Prince Rupert Port Authority (PRPA). The City of Prince Rupert also had interest in the terminal building. As of April, 2013, AMHS now leases the entire facility under a fifty-year term for exclusive AMHS operations. AMHS is now responsible for all operation and maintenance of the marine and upland structures.

The past 10 years of total passenger and vehicle traffic counts for Prince Rupert are shown below.



The most recent above water survey was completed on October 5, 2017.

Vessels	
Name	Berthing, Alignment
All AMHS Vessels	Stern

Tidal Data
No data available at time of printing.

Utilities		
	at terminal	at ramp
Electrical:	Yes	Yes
Water:	Yes	Yes
Sewer:	Septic	No
Telephone:	Yes	No
Cable TV:	No	No
Fuel:	Yes	No
Wireless Bridge:	No	No

Generator & building
This facility does not have a generator.

Bridge Lift System	
Type:	Timber framed lift tower and counterweight system.
Year Built:	1963
Lift Towers:	15 timber piles with cross bracing (each side)
Lift Beams:	(2)-20.5'x44" glulams
Bridge lift:	Cable supported counterweights (2:1) w/ electric motor hoist (6:1)
Apron lift:	Hydraulic
Condition:	Poor

Uplands	
Short-Term Parking:	5 cars
Long-Term Parking:	0
Staging Area:	1000 lineal feet, 3 lanes; 10,000 lineal feet of pre-staging
Paint Striping:	Yes
Driving Surface:	Asphalt

Terminal Building	
Year Built:	1992
Square Footage:	8500 s.f.
Heating System:	Furnace (Natural Gas)
Fuel Storage	City Supply (Natural Gas)
Fire Protection:	Alarm
Condition:	Good

Vehicle Transfer Bridge	
Type:	18' x 140' Glue-Laminated Twin I-beam
Year Built:	1963
Shoreward Support:	Rocker bearing on piles
Seaward Support:	Counterweighted cable support
Pedestrian Access:	Separate 4' wide on bridge
Lighting:	Light on overhead beam
Condition:	Poor
Load Posting Sign:	N/A
Original Design Load:	H20 - Rated in 2008 to 70,000 lb max vehicle load.

Dolphins							
Dolphins	**Rubbing Piles**	**Fender Piles**	**Dolphin Piles**	**Anchor Piles**	**Built**	**Cond.**	**Notes**
W1	24V	31V	18B, 28V	18V	1963	Poor	Green navlight (Rubbing 7 Fender piles replaced - 2007)
E1	22V	29V	18B, 28V	18V	1963	Poor	Crushed.
E2	18V	24V	18B, 28V	18V	1963	Poor	
E3	9V	12V	10B, 12V	12V	1963	Poor	Three anchor piles share with E4.
E4	30V	40V	28B, 45V	18V	1963	Poor	Red navlight

LEGEND
B = Battered Timber Piles V = Vertical Timber Piles

Catwalks / Gangways								
#	**From Struct.**	**To Struct.**	**Lenth / Style / Main Members**	**Built**	**Safety Chains?**	**Cond.**	**Lighting**	**Notes**
C1	Bridge	E4	200' / Catwalk / Timber stringers on piles spaced 10' (roughly) apart	1963	No	Good	Jelly Jars	Sringers, metal grating and handrails were replaced in 2007
C2	Brige	W1	200' / Catwalk / Timber stringers on piles spaced 10' (roughly) apart	1963	No	Good	Jelly Jars	

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1963	N/A	Prince Rupert Ferry Terminal Construction	Original fill onto tidelands; built transfer bridge and lift system and six timber mooring dolphins (W1, E1-5).
1998	N/A	Prince Rupert Ferry Terminal Apron Replacement & Miscellaneous Repairs	Replaced original 15; timber apron with steel 15; apron and 10; articulating extension to fit Kennicott. Steel was added to counterweight boxes due to increased weight of new apron. Replaced old apron cable, lift gears and motors; replaced shoreward bridge bearings; replaced rotten bridge decking; relocated electrical bridge controls.
2002	N/A	Prince Rupert FT Repairs	Catwalk repairs: new stringers, expanded metal decking and aluminum railings.
2003	N/A	Prince Rupert FT Maintenance	Replaced bridge hoist cables, shackles and blocks after the existing shackle broke.
2008	N/A	Prince Rupert Ferry Terminal Rehabilitation	Replaced main lifting beams, replaced main lifting cables and connection lugs, equalizer plates, etc., removed asphalt from transfer bridge (approx 58,000 lb) and replaced it with a lighter timber wear deck, removed 3 ft sidewalk on east side of transfer bridge between lifting beams and shore, reinforced counterweight boxes, removed approx 11,000 lb from counterweights, drove 2 new steel piles on west headframe tower, replaced hanging bar assemblies both sides of ramp, replaced sections of laminated deck over top of lifting beam and at abutment, replaced deteriorated bracing on headframe towers, replaced timber bearing surfaces at abutment with steel bearing plates

Observations

1. A combined terminal and customs building was completed in 1992. This facility is approximately 8,500 square feet and houses passenger waiting areas, restrooms, ticket offices, terminal operator offices, customs agent offices, and a customs clearance room. In 2002, AMHS helped fund a secure room for Canada Immigrations to house the computer used by Canadian Police Information Center (CPIC).

   Cracks in the concrete sidewalk surrounding the building reveal likely foundation settlement. Settlement of the main support beam on the arched roof has caused the steel beam to bear on the window wall and deflect the header above the double doors. The weather seal between the double pane windows have failed in several locations. Carpets are stained and smell of mold.

   Paint coatings are failing on the steel roof over the Canadian Customs vehicle inspection area and there is minor surface rust along the gable edges and on structural members exposed to the elements beneath. The paint coating has only 30% remaining on the steel frame for the covered walkway between the terminal building and the bridge, with corrosion on exposed steel.

   Several sheet-metal sheds in the uplands are in need of replacement, with large corrosion holes in the roofs requiring equipment within to be covered by tarps. There is a light pole missing off its concrete base at the edge of the covered walkway, which is a hazard to vehicles and pedestrians. There are numerous potholes in the asphalt surface of the staging area.

2. The transfer bridge was built in 1964 and consists of twin glue laminated I-shaped girders, and a nailed laminated deck. The 5-foot wide cantilevered pedestrian walkway was cutoff the RT side of the transfer bridge in 2008 to reduce dead load. The bridge is supported at the shore abutment on pin & rocker bearings and at the seaward end by a steel cross girder. The original glue laminated cross girder was replaced in 2008 with a welded steel girder. The cross girder is attached to a cable on counter-weight lift system. New bearing pads and rockers were installed on the bridge abutment in 2008.

   In 1997 the timber deck was overlaid with an asphalt topping lift, 2-1/2" thick in the driving lane and 1" thick in the walkway. The asphalt was removed in 2008 to decrease weight on the aging bridge. Timber deck boards show signs of deterioration & decay.

3. A new steel, hydraulically operated apron was installed in 1998 to accommodate the Kennicott. The primary apron is 15 ft. long, with an articulating 10 ft. secondary apron extension for the Kennicott mounted below. The new structure weighs considerably more than the original 15 ft. timber apron. All of the UHMW wear strips on the underside of the extension have come off and the tube girders have been bearing and rubbing against the vessel sponson. The wear has removed the galvanized coating and the steel is freely corroding. The east hinge pin cover plate is missing a bolt and has rotated out of position.

   A 2016 structural inspection notes that the secondary apron should be removed to reduce the cantilevered dead load on the aging timber transfer bridge, since the Kennicott does not dock at Prince Rupert anymore.

4. The lift towers consist of 15 timber piles with cross bracing, with two steel support piles installed in 2008 on the outboard end of the towers. The original structural timber support piles from 43 years ago are covered in barnacles up to the mean high water line. The through-bolts that connect the diagonal braces to the timber piles should be checked for corrosion throughout both towers, and the bolt holes checked for marine borer infestation.

5. The overhead beams are 7-1/4" x 30" creosote-treated glue-laminated (glulam) timber and support the cable sheaves for the counterweight-lift system. Two of the beams span the distance between the two towers, while the short middle beam spans between the pile caps on each tower. Combined, the three beams on each tower support the weight of a counterweight box and a quarter of the weight of the vehicle transfer bridge. Work on the 2008 project removed the lichen/moss buildup and added a new coat of paint to the overhead beams.

6. The only light source along the bridge is a high-pressure sodium fixture bolted midspan beneath the overhead beams.

7. Two steel lifting beams support the seaward end of the bridge. The beams support half the bridge weight & up to 100% of the vehicle loads. Cables tied to the counterweight system support the bridge lift beams at each end. We were not able to inspect the underside of the lift beams as access requires a skiff. Lift cables were replaced by a Contractor under an AMHS contract in 2017.

Observations (continued)

8. The counterweight boxes are made of 3/8" steel plate with a bulkhead/stiffener that divides the box into quarters. The boxes were filled with steel ingots and topped with concrete. 2 tons of steel were added in 1998 after the installation of the new apron. Loose chain was piled on top, most likely due to the increase in weight of the asphalt topping lift, higher moisture content of structural timber, etc. All that remains is loose rebar after they reduced the bridge weight in 2008. The block and wire ropes to the counterweight boxes were replaced in 2008.

   Critical welds between the hangar plate and the box, as well as the cable attachment to the hangar plate, could not be checked by visual inspection due to the items within the box. The hangar plate was re-painted in 2008, but we're not sure if the welds to the counterweight box were inspected during the project.

9. The stern dolphins W1 and E1 center the vessel on the bridge, to allow transfer of vehicles and crew. They are skewed at roughly a 45^{o} angle to the centerline of the bridge to fit the rounded sterns of AMHS vessels. The stern dolphins are built of creosote-treated timber piles and consist of 24 fender piles, 28 vertical piles, and 18 anchor piles. Two smaller 7 & 9-pile dolphins were built on either end of each stern dolphin, although the 7-pile dolphin is missing on the seaward side of dolphin W1.

   In summer of 2007 a project was completed that included replacing fender piles for dolphin W1 and capping the tops of vertical piles with aluminum flashing. The same work was performed on dolphin E1 in 2008.

10. There are four breasting dolphins on the East side of the berth. Their construction is similar to the stern dolphins. Several front fender piles are missing; dolphin E2: 10 of 18 remain; dolphin E3: 7 of 9 remain; dolphin E4: 5 of 12 remain. This facility was originally designed to handle 79-foot wide vessels (MALASPINA, MATANUSKA, and TAKU) which fit the three eastern dolphin groups. This properly aligns the stern with the transfer bridge. The facility is too narrow for the 85-foot wide Kennicott to use all of the breasting dolphins and allow proper alignment of the stern opening and the transfer bridge. When moored, the Kennicott is skewed so that the stern is centered correctly against the stern dolphins and then made snug against the first eastern starboard breasting dolphin. All lateral loading is applied to the first group of breasting dolphins E1. During gusty or high wind conditions it is possible for the vessel to damage this dolphin group.

11. On March 28, 2007, the terminal was closed for structural repairs to dolphin W1 and elsewhere noted. During shutdown, the M/V Taku was able to dock in the BC Ferries' Prince Rupert Ferry Terminal, next door to the AMHS terminal. In order to keep the apron centered on the Taku car deck, the ship was tied off skew from the fender line, and only rested on the two stern fenders and the nearest dolphin on the west side of the bridge.

Summary: Elements of the mooring structures, transfer bridge, and lift system have remained in service since 1963 and are showing signs of years of use and degradation from the marine environment. Several inspection reports from AMHS and consulting engineering firms in recent years have recommended that elements of these timber structures be replaced or repaired. The repair work performed in 2008 was to stabilize the major structural elements. Complete replacement of all marine structures is needed (and currently under design by AMHS with construction funding established for FY15).

The following list of recommendations include those provided by consulting engineers reports and are focused on repair/replacement of existing structural elements. They are numbered starting with the highest priority. These issues will no longer be of concern once the facility is replaced.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Apron	1	Remove the fold-down apron from the end of the bridge, as this is a significant dead load on the aging timber structure that is not necessary since the Kennicott is the only vessel that uses the apron, and doesn't stop at Prince Rupert.
Counterweight lift tower	2	Replace the timber headframe structure and overhead beams that show significant deterioration. Coast Isle Engineering recommends these be replaced by 2018 at the latest.
Timber Transfer Bridge	3	Horizontal cracks in the top flange of the glulam bridge girders should be treated, sealed and monitored. Horizontal tie-rods between bridge girders should be replaced where they are not long enough to be fully threaded onto the nuts. Replace tie-rods where corrosion is severe. Repair the galvanized coating of the wear area on the underside of the apron and reinstall the UHMW wear strips with larger diameter mounting studs.
Maintenance & Annual Inspections	4	Institute a routine detailed inspection cycle and more frequent maintenance schedule for greasing cables, blocks and fittings on lift system parts. Perform annual/biennial inspections of primary structural elements of the facility and provide a report/loading limitations (if any) to the owner and AMHS.
Category II - Rehabilitation Work		
Timber Mooring Dolphins	5	Replace damaged and deteriorated front fender piles and mounting hardware as necessary. These structures have been in use for 43 years.
Terminal Building & Uplands	6	Hire engineer/architecture firm to analyze foundation settlement and associated damages to the windows & doors, including associated moisture in floor system. Re-paint the gable edges and underneath the rood over the Canadian Customs vehicle inspection area. Re-paint the vertical and horizontal tube supports for the covered walkway between the terminal building and the bridge. Other miscellenous items also on file with terminal manager.
Category III - Upgrades Needed		
Marine	7	Replace all marine facilities with new, modern structures to service current and future AMHS service. This project is under active planning and design (Project 68531) with construction obligation scheduled for August, 2015.

REFERENCES:

Coast Isle Engineering Ltd. (November, 2003). *Prince Rupert Port Authority, Alaska Ferry Terminal 2003 Condition Review*. Prince Rupert, B.C., Canada.

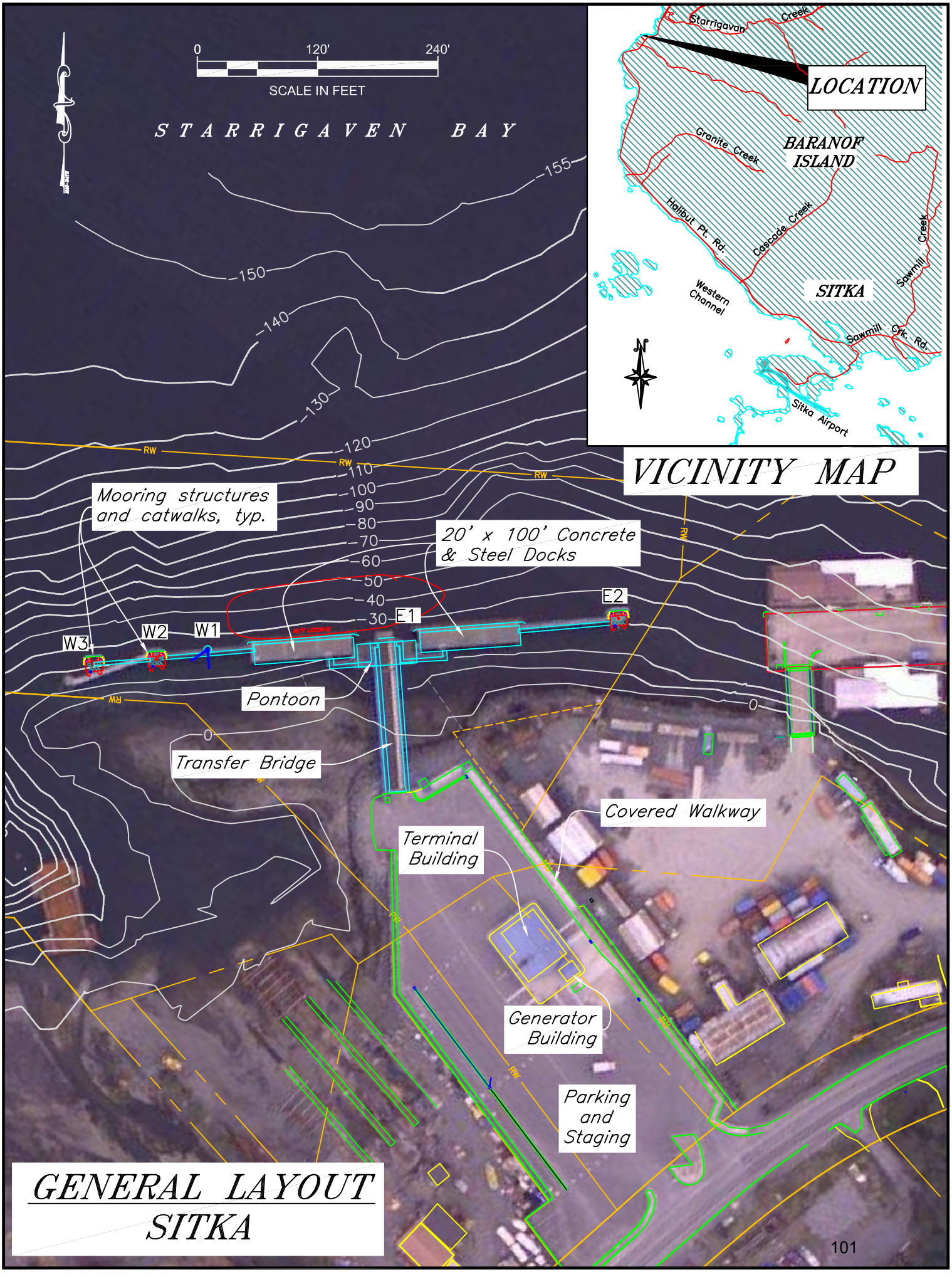
Coast Isle Engineering Ltd. (February, 2004). *Alaska Ferry Terminal, Prince Rupert; Interim report II: follow-up of Marine Structures Inspection.* Prince Rupert, B.C., Canada

Coast Isle Engineering Ltd. (June, 2004). *Alaska Ferry Terminal, Prince Rupert; Further Investigation into condition of components.* Prince Rupert, B.C., Canada

Appendix A: Foreshore Technologies Inc. (June 2004) *Alaska Ferry Terminal, Headframe Towers Pile Inspection Report.* North Vancouver, B.C., Canada

Appendix B: Equilibrium Consulting Inc. (May 2004) *Alaska Ferry Terminal, Prince Rupert, B.C.; Superstructure Assessment.* Vancouver, B.C., Canada

Project #68531 – Prince Rupert Ferry Terminal Replacement:
The final design is complete for a project to remove and replace the entire marine facilities with new structures to provide a new stern berth. Project was advertised once, and bid documents were pulled due to Buy America issues. The project is on hold until a resolution is found.


0
120'
240'
SCALE IN FEET
STARRIGAVEN BAY
155
150
140
130
120
110
100
90
80
70
60
50
40
30
0
RW
W3
W2
W1
E1
E2
Mooring structures and catwalks, typ.
20' x 100' Concrete & Steel Docks
Pontoon
Transfer Bridge
Covered Walkway
Terminal Building
Generator Building
Parking and Staging
Starrigavan Creek
LOCATION
BARANOF ISLAND
Granite Creek
Halibut Pt. Rd.
Cascade Creek
Sawmill Creek
Western Channel
SITKA
Sawmill Crk. Rd.
Sitka Airport
N
VICINITY MAP
GENERAL LAYOUT
SITKA

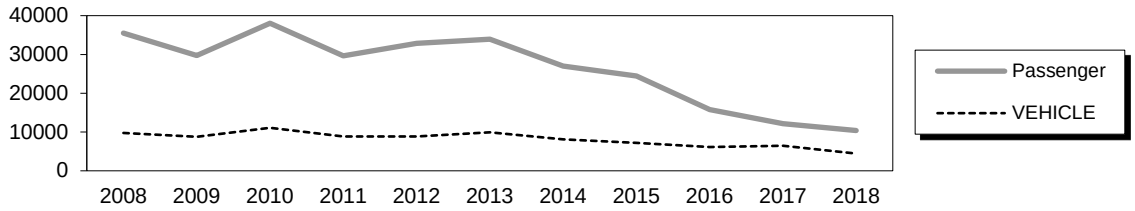
Sitka Ferry Terminal

5307 Halibut Point Road

Owner: State of Alaska

Terminal Manager: Andy LaPean – 907-747-5760

Terminal Description: The Sitka Terminal is located on Starrigavan Bay, approximately seven miles from the city center on Halibut Point Road. The inside waters of Southeast Alaska are reached via Olga/Neva Straits and Sergius Narrows. The mainline ferries must traverse the narrows at slack water. The Sitka Ferry Terminal is a side-berth facility consisting of staging and parking areas, terminal building, emergency generator facilities, transfer bridge, covered walkways, and five steel mooring structures connected by catwalks. The past 10 years of total passenger and vehicle traffic at Sitka is shown below.



The most recent above water survey was completed on August 3, 2017. The underwater inspection occurred on August 13, 2016 and the fracture critical inspection was on August 11, 2018.

Vessels	
Name	Berthing, Alignment
Taku / LeConte / Mat / Mal / Columbia	Port / Starboard
Kennicott	Port
FVF	Starboard

Tidal Data (MLLW 0.0 feet)	
EHW	14.7
MHHW	9.9
MHW	9.1
ELW	-3.8

Terminal Building	
Year Built:	1983
Square Footage:	2361 s.f.
Heating System:	furnace
Fuel Storage:	UST
Fire Protection:	Alarm
Condition:	Good

Bridge Support Float	
Type:	24' x 60' Steel Pontoon
Year Built:	1989
Ballasted:	Yes
Ramp lift:	Hydraulic/Block & Cable
Apron lift:	Hydraulic/Block & Cable
Anodes:	Yes
Condition:	Good

Uplands	
Short-Term Parking:	33 cars; 2 HCP
Long-Term Parking:	6 cars
Staging Area:	1875 lineal feet; 360 lineal feet-buses/trucks
Driving Surface:	Asphalt

Generator & Building	
Building / Generator:	1989
Square Footage:	224 s.f.
Heating System:	Electric
Fuel Storage:	–
Fire Protection:	N/A
Condition:	Good

Vehicle Transfer Bridge - #0806	
Type:	16' x 140' twin box beam
Year Built:	1989
Shoreward support:	Concrete abutment
Seaward support:	Steel Support Float
Coating:	Wasser Paint
Pedestrian Access:	Concrete 4' wide on bridge
Lighting:	Jelly Jars on bent posts, both girders
Condition:	Fair
Load Posting Sign:	N/A
Original Design Load:	HS 20-44

Docks (2)	
Type:	20' x 100' Concrete Dy-Core Panel Dock
Year Built:	1981
Support:	(4) Piers, consisting of cap & two steel piles, with batters at seaward corners.
Steel Coating:	Galvanizing
Fender System:	Timber Piles with W12x65 wales (3), donut fenders to dock with restraint chains
Anodes:	115# bar lower wale; bonding strap to upper 2 wales
Lighting:	(2) light poles
Condition:	Fair
Notes:	Raised fender panels added in 2004 for FVF.

Utilities		
	at terminal	at ramp
Electrical:	Yes, city & backup power	
Water:	Yes	Yes
Sewer:	Yes (Septic)	No
Telephone:	Yes	Yes
Cable TV:	No	No
Fuel:	No	No
Wireless Bridge:	Yes	-

Dolphins

Dolphins	Dolphin Piles	Fender Support	Fender Face	Anodes	Built	Cond.	Notes
W3	2B, 2V	Hanging	UHMW	Yes	2008	Good	Red navlight
W2	2B, 2V	Hanging	UHMW	Yes	2008	Good	Light pole
W1	2B, 1V	-	Floating Fender	Yes	2004	Good	
E1	2B, 1V	-	Floating Fender	Yes	2004	Good	
E2	2B, 2V	Hanging	UHMW	Yes	2008	Good	Red navlight & light pole
WG	1V	-	-	No	1989	Good	
ERS	2B, 2V	-	-	No	1989	Good	
WRS	2B, 2V	-	-	No	1989	Good	
EG	1V	-	-	No	1989	Good	

LEGEND

V = Vertical Pipe Piling
B = Battered Pipe Piling
ERS = East Bridge Float Support Restraint Structure
EFP = East Float Platform
WG = West Gangway Support Dolphin
WIRP = West Intermediate Ramp Platform

Catwalks / Gangways

#	From Struct.	To Struct.	Length / Style / Main Members	Built	Safety Chains?	Cond.	Lighting	Notes
C1	W3	W2	80' / Catwalk / Aluminum pony-truss	2001	No	Fair	Jelly Jars	
C2	W2	Dock	93' / Catwalk / 10"x10" Tube Girders	1982	No	Good	Jelly Jars	
C3	Dock	WG	10' / Catwalk / 4"x10" Bottom Chord	1989	No	Good	None	
G1	WG	WFP	37' / Gangway 2.5"x2.5" Bottom Chord	1989	Yes	Good	None	
G2	WFP	WIRP	12' / Gangway 2.5"x2.5" Bottom Chord	1989	No	Good	None	
G3	EIRP	EFP	12' / Gangway 2.5"x2.5" Bottom Chord	1989	No	Good	None	
G4	EFP	EG	37' / Gangway 2.5"x2.5" Bottom Chord	1989	Yes	Good	None	
C4	EG	Dock	10' / Catwalk / 4"x10" Bottom Chord	1989	No	Good	None	
C5	Dock	E2	93' / Catwalk / 10"x10" Tube Girders	1983	No	Good	Jelly Jars	

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1963	F-099-3(1)	Sitka Ferry Terminal	Original ferry terminal construction, consisting of uplands fill for small staging area, waiting shelter, approach road, timber transfer and mooring structures.
1969	MT 105	Safety Ferry Terminal Dolphin Addition	Constructed new concrete-capped duncan mooring dolphin off fender line.
1982	B59992	Sitka Ferry Terminal Modifications	Replaced existing timber docks with new concrete dock structures each side of the transfer bridge; replaced two existing timber dolphin and timber catwalks with steel dolphin E2 and steel catwalk.
1983	R-91013	Sitka Dolphin	Replaced timber dolphin W2 and catwalk with steel structures.
1983	N/A	Sitka Ferry Terminal Building	Constructed new terminal building.
1989	RS-BR-M-0935 (9)	Sitka Ferry Terminal Improvements	Replaced the original timber bridge and lift system with new steel bridge and steel support float with hydraulic/cable lift system. Also installed new steel dock access catwalks, new generator building, replaced bridge and catwalk lights/wiring, replaced telephone wiring to bridge.
1996	75050 / FM-0935	Sitka Ferry Terminal Staging Area	Widened existing staging and parking areas involving earthwork, paving and retaining wall (on south side); constructed a newe covered pedestrian walkway north of terminal building; installed a sewer treatment system.
2004	68792 / ACSTP-099-3(15)	Sitka All-Tide Mooring Improvements	Constructed two floating fender dolphins and installed raised fender panels on the dock for all-tide mooring of the FVF.
2008	67931 / NHS-MGE-099-1(1)	Sitka Ferry Terminal Mooring Improvements	Replaced steel mooring/breasting dolphins W2-3 &E2, as well as catwalk C1; re-painted catwalk C5; installed steel deck extensions to assist line-handlers at outside corners of the dock, and replaced the catwalk lights, cable and conduit.
2008	73003(3)	Sitka FT Carpet Replacement	Replaced carpet in the terminal building.

Observations

1. Overall, the terminal building is in good condition. The ferry terminal building, generator building, storage shed, purser shelters, and walkway corner structures exterior were repainted by AMHS maintenance staff in 2007. The building interior is in good condition. The carpet was replaced in 2008. The onsite sewer treatment system consistently fails ADEC inspections. The acrylic glazing on the covered pedestrian walkways is secured to the galvanized steel frame with steel self-drilling screws and aluminum flat bar. The steel screws are corroding where the dissimilar metals contact. Existing screws should be replaced with stainless fasteners. The bases of the metal doors to the generator building are corroding.

   The uplands staging & parking area are paved with asphalt & in good condition. Staging lane & parking striping is in good condition. A shoal continues to increase in size west of the edge of the riprap embankment.

2. There is earthen rock & debris scattered around the shoreward bridge bearings. A conduit connection is broken at a flex-to-rigid coupling where rigid conduit exits the front (seaward) face of the bridge abutment backwall. No discernable cracks were seen at the joint of the shoreward floor beam and box girders.

   The bridge is in good condition. The topsides of the bridge were repainted in the summer of 2010 by AMHS maintenance. The underside of the girders and floor beams have numerous, small areas of

corrosion; the coating has failed over approximately 10 to 20 percent of the underside of the bridge members. The entire top flange of Stringer 5 exhibits 100% coating failure, with laminar corrosion & minor section loss, due to deicing salts leaking from the concrete walkway above.

Two galvanized steel struts support the bridge at the pontoon. The welds between the top of the struts and the underside of the box girders are freely corroding. Stringer 5 has moderate/severe corrosion on all surfaces due to dripping deicing chemicals from concrete walkway above.

A potable water line is suspended under the transfer bridge. The backflow preventer should be replaced with a double check valve type. The water line is wrapped with heat trace and insulation, with approx.. 2-feet of insulation missing near the shoreward abutment (2017).

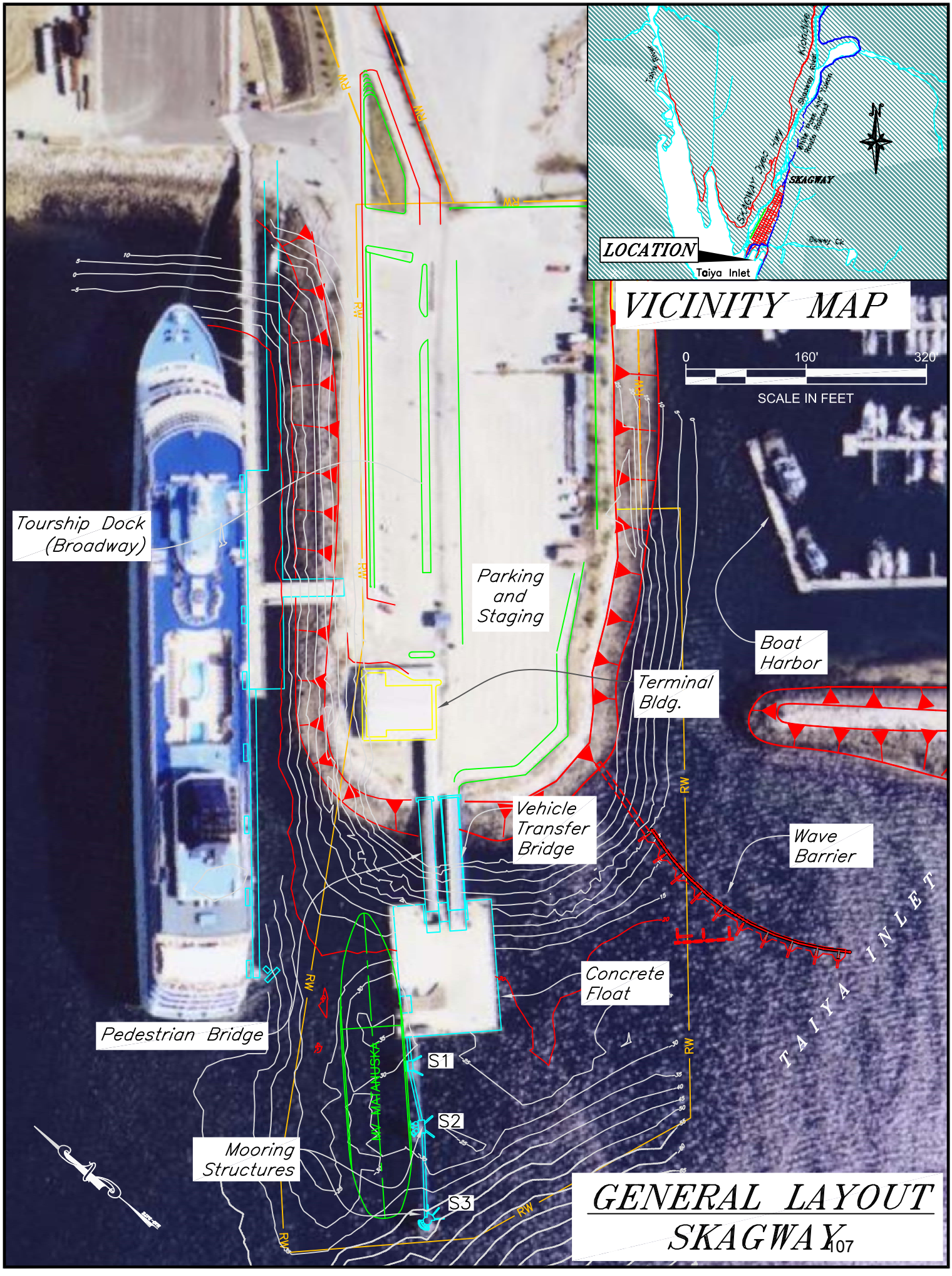
3. There are no safety access ladders on the bridge pontoon. Freeboard measurements indicate the pontoon is almost level. The pontoon is coated with a green-brown finish. The coating has performed well but there is the beginning of light, uniform corrosion on the upper pontoon steel surfaces. The pontoon coating received a touch-up paint coating on the topsides in the summer of 2009. (8) 8-pound anodes were installed on the float in August, 2009. They were already rapidly corroding. Seawater/ structure potentials for the pontoon average -0.95V (above -0.8V), so the steel is adequately protected.
4. The pontoon bears on the northwest restraining pile only. There is no UHMW sacrificial wear pad on the rubber restraint fender and the face of the fender is crescent shaped, worn approximately 1½" deep. The average CP reading for the restraint piles were -0.66, which indicates that the anodes are insufficient to protect against corrosion and the steel is freely corroding.
5. The docks are reached from the transfer bridge by a series of catwalks. The catwalks are hinged at one end and slide on steel skids at the opposite end as the pontoon elevation changes. The slides are either steel-on-steel or Hilman rollers-on-steel skids. These slides and rollers are satisfactory at present but should eventually be replaced with UHMW-PE slides.

   The short, transition catwalks are supported at one end by hinges and the hinge segments are welded to the grating and not the catwalk frame. A single bearing bar transfers the hinge reactions to the catwalk stringers. The hinge reaction should be transferred directly to the stringers by welding the hinge segments to a steel angle that is fastened to the ends of the stringers. The access ladder to the pontoon that is mounted on the East Float Platform (EFP) is difficult to access. In order to access, one needs to climb over the gangway/platform railing.
6. The docks are constructed of prestressed concrete panels that are in fair condition. There is a safety ladder at the end of both docks. The ladders reach below a –2.2 tide but the lower rungs are fouled with barnacles and mussels. Concrete is spalling beneath the West dock, near the light pole base bolts. Also, when the mooring lines are thrown from the vessels, they sometimes drop in the gap between the fender piles and the dock face and get snagged on bolts.

   The timber fender piles are in good condition. The northern most rubber cylinder on the west dock looks as if it was heavily loaded. The inboard flange of the wale was bent when the rubber cylinder was completely flattened; however, the function of the fender is unaffected. The fender extensions that were installed for berthing the fast vehicle ferries hinder the line handlers in pulling the vessel spring lines.

   The galvanized coating on the dock batter piles has failed at the circumferential welds above the water and on the pile surface above the splash zone. The average CP reading for the dock piles were -0.92, so the anodes are adequately protecting against corrosion. Bolts that connect the lower steel wales to the timber fenders are corroded and the nuts are missing in most locations.
7. In 2004, two floating donut fenders with mooring points were installed in anticipation of using the Sitka terminal as the homeport for the first fast vehicle ferry. Floating donut W1 is located between W2 and the west dock and donut E1 is immediately adjacent to the east side of the transfer apron. No ferries currently homeport in Sitka. The fenders and mooring points appear to move freely; no problems are reported with the fender system. All the dolphins have cathodic protection readings below -0.8V, which means the anodes are depleted and the steel is freely corroding.
8. Cathodic potential (CP) readings for the mooring & restraint structures average -0.69V. The cutoff for adequate protection is -0.8V, so the steel piles are freely corroding. The bridge support float CP readings are -0.94, which indicates adequate protected steel. Depth to mudline elevations, taken with leadline readings at locations along the fender line in 2015, range from -21' to -28' MLLW.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Nothing required.		
Category II - Rehabilitation Work		
Dock Fenders	1	Replace the corroded bolts that connect the timbers to the steel wales.
Transfer Bridge	2	Program a project to repaint the bridge. Also, monitor the corrosion in the floorbeam-to-stringer welded connections. Cancel the use of corrosive de-icing chemicals at the facility. Implement the use of non-chloride based de-icing chemical such as NC-3000. Touch-up the weld coating failures with zinc solder or Galv-Con. Clean the debris around the shoreward bridge bearings. Repair the broken conduit connection at the RT bridge backwall.
Intermediate Ramp Platform & Gangways	3	Repair the transition plate hinges by welding an angle or flatbar to the hinge that spans between the outside angles. On the platform, a bar welded to the floor beam needs to be installed. Install UHMW pads on the bottom of the steel skids. Also, replace the Hillman Rollers at the bottom of the upper gangways. Replace gangway skid plates with inverted channels.
Uplands	4	Replace the terminal building heating oil UST with an above ground tank (AST) or a leak-proof UST. Perform Engineering Study on replacement options for sewage treatment system in order to meet ADEC regulations. Replace the corroding metal doors to the generator building.
Mooring Dock	5	Install a safety netting to catch the mooring lines when thrown between the mooring cleats in this gap. Cutback excess bolt threads on upper wale of the dock fender system. Wrap ends of nuts with packing tape to allow mooring lines to slip over rather than snag. Repair the various areas of spalling damage beneath the west dock. Also top-treat existing creosote piling to prevent rot. Re-seal grouted joints to prevent drainage from leaking thru.
Miscellaneous	6	The apron lift cables need greasing. It's doubtful that the water line heat trace works. Flex conduit and heat trace cable are stretched and have failed at the abutment end of the bridge. Refasten the pipe hawser rail at the west end of the East dock to prevent hawsers from snagging on the pipe.
Bridge Support Float	7	Recommend increasing anode size. Also recommend using anodes with integral steel strap or core. Install a wearing surface on both bridge float restraint fenders. Also, touch up the paint coating where it's failing.
Dolphins	8	Program a project to install new anodes on all dolphins.
Covered Walkway	9	Program a project to replace all the frame fasteners and re-fasten the straps to the frame.
Purser Shelter	10	Re-fasten FRP wainscot on the shelter at the corner of ped access walkway.
Intermediate Ramp Platform & Gangways	11	At the float access ladder, remove railing from the transition plate in front and replace with two chains with clasps at the ends that fasten to rings welded on middle platform railing. Reinforce the transition plate floor beam on the side that the railing was removed.
Category III - Upgrades Needed		
Nothing recommended.		


LOCATION
Taiya Inlet
SKAGWAY
VICINITY MAP
0
160'
320'
SCALE IN FEET
Tourship Dock (Broadway)
Parking and Staging
Boat Harbor
Terminal Bldg.
Vehicle Transfer Bridge
Wave Barrier
Concrete Float
Pedestrian Bridge
Mooring Structures
S1
S2
S3
RW
SKAGWAY
TAIYA INLET
GENERAL LAYOUT
SKAGWAY
107

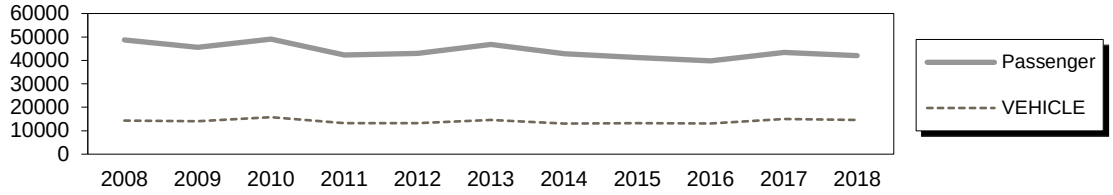
Skagway Ferry Terminal

Mile 0 Klondike Highway

Owner: State of Alaska

Terminal Manager: Tiffanie Potter – 907-983-2944

Terminal Description: The Skagway facility consists of a floating side berth, terminal building, staging and parking areas, three mooring dolphins, concrete mooring float, and separate vehicle and passenger transfer bridges. The Skagway facility is the northernmost terminal on the Southeast Alaska Marine Highway Route. The past 10 years of total passenger and vehicle traffic at Skagway is shown below.



The most recent above water survey was completed on August 3, 2017. The underwater inspection occurred on August 13, 2016 and the fracture critical inspection was on August 10, 2018.

Vessels	
Name	Berthing, Alignment
Mal / Columbia / FVF	Starboard
Kennicott	Port

Tidal Data (MLLW 0.0 feet)	
EHW	25.7
MHHW	16.7
MHW	15.7
ELW	-6

Terminal Building	
Year Built:	1982
Square Footage:	5344 s.f.
Heating System:	Boiler
Fuel Storage:	UST
Fire Protection:	Alarm
Condition:	Good

Generator & Building	
Building / Generator:	2002
Square Footage:	224 s.f.
Heating System:	Electric
Fuel Storage:	–
Fire Protection:	Halon
Condition:	Good

Uplands	
Short-Term Parking:	40 cars; 1 HCP
Long-Term Parking:	
Staging Area:	2400 lineal feet, 8 lanes
Paint Striping:	Yes
Driving Surface:	Asphalt

Vehicle Transfer Bridge - #0805	
Type:	17' x 140' Orthotropic deck, twin box girder
Year Built:	1980?
Shoreward support:	Concrete abutment
Seaward support:	Concrete Support Float
Coating:	Wasser Paint
Lighting:	Parking-lot light poles and Float light poles
Condition:	Fair
Load Posting Sign:	N/A
Original Design Load:	Original Design Drawings not on file

Utilities	at terminal	at ramp
Electrical:	Yes, city & backup power	
Water:	Yes	Yes
Sewer:	Yes (City)	No
Telephone:	Yes	Yes
Cable TV:	No	No
Fuel:	Yes	Yes
Wireless Bridge:	Yes	-

Bridge Support Float	
Type:	120' x 160' Concrete Mooring Float
Year Built:	1980
Ballasted:	No, but has flooding compartments
Ramp lift:	Hydraulic/Block & Cable
Apron lift:	Hydraulic/Block & Cable
Anodes:	-
Condition:	Fair

Pedestrian Bridge - #1626	
Type:	8' x 138' Through Truss
Year Built:	1995
Shoreward support:	Concrete abutment
Seaward support:	Concrete Support Float
Coating:	Wasser Paint
Lighting:	Roof mounted fixtures
Condition:	Fair

Dolphins

Dolphins	Dolphin Piles	Fender Support	Fender Face	Anodes	Built	Cond.	Notes
S3	6B, 1V	Hanging	UHMW	No	74-'98	Fair	Red navlight
S2	2B, 1V	4V	Ekki Timber	No	1980	Fair	
S1	2B, 2V	4V	Ekki Timber	No	1996	Fair	

LEGEND
V = Vertical Steel Pipe Piling B = Battered Steel Pipe Piling

Catwalks / Gangways

#	From Struct.	To Struct.	Length / Style / Main Members	Built	Safety Chains?	Cond.	Lighting	Notes
C1	S3	S2	60' / Catwalk / 10'x10" Tube Girders	1982	No	Good	Jelly Jars	
C2	S2	S1	108' / Catwalk / 10"x10" Tube Girders	1982	No	Good	Jelly Jars	
G1	S1	Dock	50' / Gangway / Thru Truss	1965	No			

Terminal Projects

Year	Project #	Project Name	Description
1963	S-0999(4)	Skagway Ferry Terminal	Original construction of terminal facility, consists of uplands fill and timber transfer & mooring/fendering structures.
1980	F-097-2(2)	Skagway FT Facility	Removed original timber structures and replaced with steel transfer and mooring/fendering structures. Extended uplands fill for future staging and terminal building.
1981	R10263	Skagway FT Pedestrian Transfer Bridge	Constructed the steel pedestrian bridge.
1982	N/A	Skagway Ferry Terminal Building	Constructed the current ferry terminal building.
1992	75092	Barge Tendon Rehabilitation	Tendon repair/overlay and tendon anchor head repair.
1993	75277 / F-097-1 (2)	Skagway FT Slope Stabilization	Added riprap armory rock to the seaward slopes beneath the terminal building.
1995	75468 / ER-0069 (1)	Skagway FT Reconstruction	Repaired and corrosion proofed existing transfer and mooring structures that were damaged from a slope failure across the Inlet.
1999	67543 / NH-097-1 (4)	Skagway FT Improvements	Installed new fender panels and hawse rails on dolphin S3.

Terminal Projects (continued)			
Year	**Project #**	**Project Name**	**Description**
2007	N/A	N/A	Maintenance hired a Contractor to construct shoreward bearing improvements to the Pedestrian Bridge.
2008	73003(5)	Skagway FT Building Interior Renovations & Door Replacement	The work consists of replacement of all exterior doors, frames, and hardware: construction of new ticket counters and staff work stations; and new finishes and toilet partitions at existing restrooms; and replaces all carpet in the facility.
2014	70196	AMHS Skagway Dock Emergency Repairs	The work consists of salvaging the sunken concrete float off the ocean bottom, structural analysis of the float's condition, raising and placement of the vehicle & pedestrian bridges, salvaging/repairing the timber vehicle ramp, repairing the intermediate ramp hydraulic system, replacing utility (fuel/water) services to the dock face.
2016	N/A	Backflow preventer re-location	DEC required project to re-locate the backflow preventer from the concrete float to shore.

Observations

1. The concrete float supports a hydraulically adjusted transfer ramp and apron structure used for side loading vehicles and passengers onto the ferry at the car deck level. The concrete float supports both a vehicle transfer bridge and a pedestrian bridge. The City owns the vehicle transfer bridge and the State owns the pedestrian bridge. The float and transfer bridge are a joint use facility between the City and the State. The City utilizes the southeast side of the float for tourism vessel moorage under a mutual-use agreement.
2. The pedestrian transfer bridge is in fair condition, the underside of the frame coating is failing. The shoreward end of the bridge sits on a steel bent frame that transfers bridge loads to the concrete abutment through an eccentric connection on the bent cap. The bridge has fallen off its shoreward bearings several times over the years and all lateral loads are transferred to shore via chains, which have been in use for years and are openly corroding. The seaward bearing, a synthetic skid bearing pad, transfers high friction loads to the shoreward bearing.
3. The vehicle transfer bridge is in fair condition but needs to be repainted. The shoreward end of the bridge is supported on a swivel beam. The collar around the retaining pin is cracked in several locations and more than half the weld between the collar and beam has failed. Access holes were cut in both girders, outside webs, 2 ea girder, to provide access for interior corrosion proofing on the 1995 repair project. The holes were sealed with a matched plate & weld. Therefore, there is no access to the girder interiors. The transition plate on the west side of the bridge at the abutment end is bent concave upward.

   The apron is supported from the seaward end of the bridge by a twin pin-hanger connection. This connection was retrofitted in 1991 by adding a restraint cable. The apron and transition pins have required frequent repairs, and the rubber fender is currently crushed and in need of replacement.

   Hillman brand rollers support both ends of the transfer bridge; these were refurbished during the 1994 slide damage repairs. On the float end, the rollers rub against the guide channels causing both the channels and the side plates to wear. The rollers at the abutment end are enveloped in sand and grit, which is blown into the abutment area by street sanding vehicles. The rollers and abutment should be cleaned thoroughly.
4. Roughly ten years after the concrete float was built, in 1991, a repair was made to the deck surface that involved removing contaminated surface concrete, down to the prestressing tendons in some cases, sealing the deck with Silane sealer, and installing a 1-1/2” concrete overlay along the south (seaward) end of the barge. The overlay repair has now almost fully delaminated from the superstructure below,

and there is spider-web cracking and spalling at the construction joint next to the original concrete deck.

Observations (continued)

Between 2009 & 2011, new damage consisted of minor spalling & widespread delamination in the concrete deck above post-tensioning strands in the vehicle lane between the timber cribbing & the vehicle transfer bridge (i.e. the main vehicular traffic area). There is a 42" long exposed section of post tensioning strand in the wheel path within 5-feet of the timber cribbing & intermediate ramp.

The float is held in position by a chain anchor system. The float moves due to wind, wave, and mooring loads, especially at low tide levels. The float may have rotated clockwise, in plan view, and the bridges and catwalks no longer track in their guides. The 2016 Underwater Inspection noted that the majority of anchor chains showed significant section loss in an area between 5-20 feet below the bottom of the float. The divers could not locate chain #8, and figure it must have parted & fallen to the seafloor.

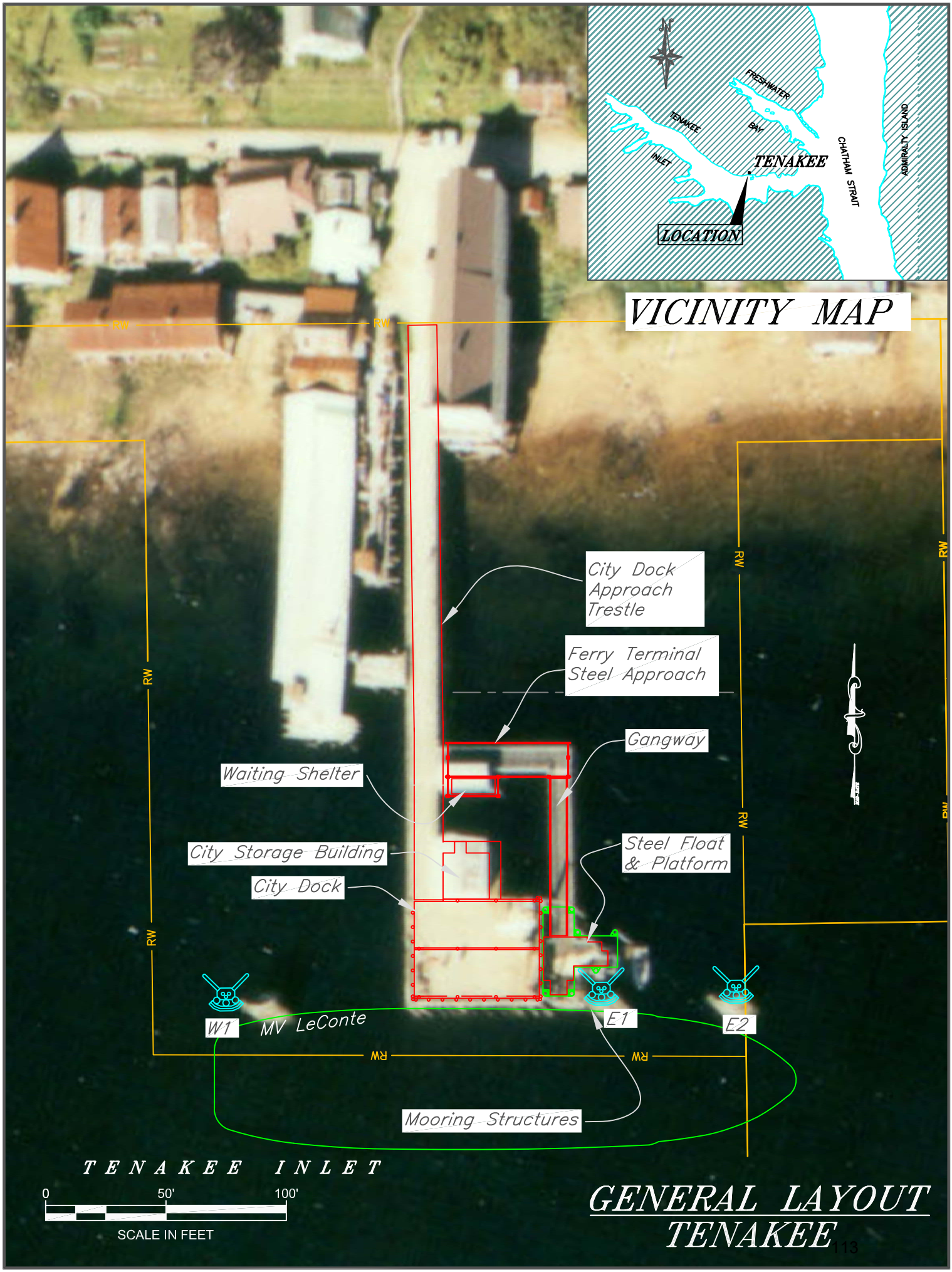
The shore lines are galvanized wire rope fastened to bollards at the float corners and bollards or padeyes on shore. Galvanizing of the lower portion of rope is exhausted. The FVF damaged the edge of the seaward fender panel mounted on the dock at low tide. The dock fenders stick out beyond the dolphin fenderline during low tidal stages. The terminal manager reports that they pump all cells dry each winter.

5. A wooden crib ramp structure provides access from the float deck to the hydraulically adjusted steel apron. The apron must be actively raised or lowered during transfer of low-clearance vehicles to prevent damage to vehicle undercarriages. This structure is in fair condition, but wear is evident at the toe of the incline and several 4x12 timbers need to be replaced.

   The bottom flange and a portion of the lower web of the stringers have been removed near the seaward end of the apron. The cut is uneven, indicating this was performed in the field. This is not noted on the as-builts of the apron replacement project in 1988. Both hydraulic actuators are corroding and section loss is evident at the bolted connections.
6. Snow removal operators damaged bull rails on south and west sides of the float. Two bull rails were pushed over the side on the south side and a single bull rail was damaged on the west side. The breach should be blocked with jersey barriers until repairs are made.
7. An electrical distribution panel and embedded copper conduit are severely corroded. Conduit buried in the concrete deck has corroded, causing spalling of concrete. Conductors are exposed in one location.
8. The gangway from the float to the dolphins is guided by a single angle. The gangway periodically migrates to the left and must be lifted and repositioned with a forklift.
9. The fender system northeast of the transfer ramp on the float has sustained damage from the KENNICOTT sponson wing. The sponson of the FAIRWEATHER can override the fenders on the float. Spruce timber units on the north fender panel have disconnected from the lower wale. Sitka spruce timbers on the north panel were replaced with Ekki wood in 1999.
10. Cathodic potential (CP) readings for mooring structures S1 and S2 average -0.65V. The cutoff for adequate protection is -0.8V, so the steel piles are freely corroding. The hawser rail of S2 collides with the toe plate and top cord of catwalk C2.
11. The mooring basin depth is limited by the elevation of the top of the barge anchor pin piling located at approximately –25.0 MLLW. Operations reported that the basin is more like a –19.0 MLLW and they are scheduling vessels to avoid the terminal at lower tides.
12. The concrete float sustained extensive damage, as the result of a broken waterline connection within the float, and sank on April 24th, 2014. Skagway was without service until construction crews were mobilized in and able to successfully pump out & raise the float, bridge and repair the timber ramp and hydraulic system. Service resumed on May 11th. The interior of the bridge girders filled with seawater and had to be drained. It is unknown whether corrosion protection grease was sprayed inside the girders during the repair project.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Concrete Float	1	Monitor ongoing deterioration of concrete top slab. Provide temporary spot repairs if needed until permanent repairs can be identified. Replace sub-surface mounted electrical utilities between terminal building and barge mounted distribution panel. Replace damaged/missing bullrails. Install guide for roller bearing of the dolphin access gangway on the barge. Monitor the wire rope shore line for broken strands. Inspect anchor system to determine needed adjustment to chains. Provide chafing gear for two lines on left side of bridge. Wire rope bears on armor rock of the beach.
Pedestrian Transfer Bridge	2	Program a project to replace the bridge bearings; the shoreward bearing is in critical condition and directly affected by the high friction seaward bearing.
Vehicular Transfer Bridge	3	The shoreward swivel beam should be replaced using a thicker collar and the top of the retaining pin should be tied into the backwall. Install Orkot skids to provide bearing surface and lift the seaward bottom flange above the float deck. Replace transition plates or bend leading edge downward.
Ramp/Apron	4	Load-rate the seaward end of the apron, where the stringers have been cut.
Dolphins	5	Cut hawser rail of S2 back to prevent damage to catwalk top cord when fender panel is compressed. Failure of top cord could cause collapse of catwalk.
Dock Fender System	6	Program to replace the fender system northeast of the ramp on the float to adequately provide fendering for the Kennicott sponson wing and geometrically capable of fendering the FVF.
Mooring Basin	7	Program a project to dredge the basin near shore to -30' MLLW.
Category II - Rehabiliation Work		
Intermediate Ramp	8	Replace several 4x12 timbers from the cribbing near the toe of the ramp.
Dolphins	9	Install anodes and bonding straps on all three dolphins.
Terminal Building & Uplands	10	The stain coating of the terminal building requires touch up at trim and building should be repainted within 2 years. All six exterior steel doors require replacement. Bottom panels are severely corroded. Install over-fill alarms on above ground fuel tanks to comply with ADEC regulations.
Pedestrian Transfer Bridge	11	Program a project to re-paint the bridge.
Transfer Bridge	12	Place riprap at the toe of the concrete bridge abutment backwall.
Category III - Upgrades Needed		
Concrete Float	13	Investigate and determine permanent repairs for concrete top slab and potentially the future replacement of the float if deemed required. Replace all chains and anchors. Design work for this work is presently ongoing under Project #69624.
Transfer Bridge	14	The bridge has been immersed in salt water twice due to the concrete float sinking. Consider replacement of the existing fracture-critical orthotropic solid-deck bridge with a new multi-girder open-deck bridge.

Project #69624 – Skagway Ferry Terminal Modifications:
Berger-ABAM has completed preliminary design, alternatives and project cost estimates have been developed. The project will consist of major restoration & refurbishment of the existing concrete float and anchor system and other miscellaneous items. Construction funding established for FY18.


N
FRESHWATER
BAY
TENAKEE
INLET
TENAKEE
CHATHAM STRAIT
ADMIRALTY ISLAND
LOCATION
VICINITY MAP
RW
City Dock
Approach
Trestle
Ferry Terminal
Steel Approach
Gangway
Waiting Shelter
City Storage Building
City Dock
Steel Float
& Platform
W1
MV LeConte
E1
E2
Mooring Structures
TENAKEE INLET
0
50'
100'
SCALE IN FEET
GENERAL LAYOUT
TENAKEE

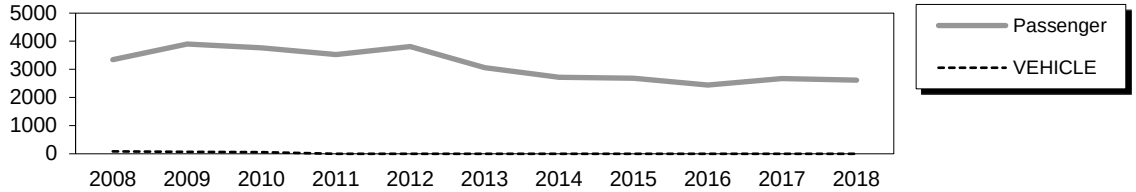
Tenakee Ferry Terminal

Owner: State of Alaska

Contact: Simon Bradley, AMHS Terminal Ops Manager (Ketchikan) – 907-228-7290

Terminal Description: The Tenakee Springs city dock was constructed in 1978 to provide passenger and light freight service to Tenakee Springs. The dock facility is a 40'x 52' main dock section with a 12'x 240' approach span to shore and consists of concrete panels supported by steel pipe piles. Three, steel pile mooring dolphins with timber fenders are used by AMHS for port side mooring. By City ordinance, *Transfer of vehicles at Tenakee Springs is limited to motorcycles, all terrain vehicles and other small motorized vehicles under 10'-0" in length and under the maximum weight limit of 1000 pounds.* The City Dock also supports a fuel and freight operations, a small city storage building and a jib crane that is located on the southeast corner of the dock. The AMHS ferry terminal is accessed from the City Dock by a pile supported steel platform structure and steel gangway. This platform structure was widened by ADOT in 2011.

The passenger transfer facility was built in 1984 to service LeConte class vessels. An open steel grate approach extends to the east, perpendicular to the City Dock. At the end of the approach is a gangway down to a floating platform supported by a custom steel pontoon. A counter weighted, pull-down apron connected to the platform provides access to the ferry side deck. An 8'x 20' waiting shelter was constructed at the juncture of the City Dock and the ferry terminal approach. The past 10 years of total passenger and vehicle traffic at Tenakee is shown below.



The most recent above water survey was completed on June 15, 2017. The most recent fracture critical inspection occurred on August 20, 2018. The most recent underwater inspection occurred on August 8, 2016.

Vessels	
Name	Berthing, Alignment
LeConte	Port

Tidal Data (MLLW 0.0 feet)	
EHW	21.6
MHHW	14.7
MHW	13.7
ELW	-5.0

Terminal Building
This facility does not have a terminal building.

Generator & Building
This facility does not have a generator on-site.

Utilities @ Dock	
Electrical:	Yes
Fuel:	Yes

Uplands	
Short-Term Parking:	N/A
Long-Term Parking:	N/A
Staging Area:	N/A

City Dock & Approach - #1451	
Type:	40'x 52' concrete panel dock with 12' x 240' approach span
Year Built:	1985
Support:	Vertical & Battered Steel Piles
Steel Coating:	Galvanizing
Fender System:	Timber Pin Piles bolted to steel wale with rubber (donut) energy absorbing units
Anodes:	No
Lighting:	Two lights mounted on fuel shed.
Condition:	Poor
Notes:	
Load Posting Sign:	Single Axle 4 Tons

Platform Pontoon	
Type:	715 s.f. steel barge
Year Built:	1984
Ballasted:	Yes
Ramp lift:	counterweight
Anodes:	Yes
Condition:	Fair

Dolphins							
Dolphins	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Notes**
W1	2B, 1V	4H	Sitka Spruce	No	1977	Fair	
E1	2B, 1V	4H	Sitka Spruce	No	1977	Fair	
E2	2B, 1V	4H	Sitka Spruce	No	1977	Fair	
EG	4V	-	-	No	1984	Fair	
ER	7V	-	-	No	1984	Fair	

LEGEND
V = Vertical steel pipe piling B = Battered steel pipe piling H = Vertical steel h-piling
ER = East gangway support float restraint piles EG = East gangway support piles

Catwalks / Gangways								
#	**From Struc.**	**To Struc.**	**Length / Style / Main Members**	**Built**	**Safety Chains?**	**Cond.**	**Lighting**	**Notes**
C1	Dock	EG	50' / Catwalk / W14x30 Stringers	1984	No	Good	None	
G1	EG	Float	65' / Gangway / MC 6x12 Stringers	1984	No	Good	None	
G2	Float	-	15' / Gangway / Pony Truss	1984	No	Good	None	

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1977	6-77126	Tenakee Dock	Constructed approach and main dock, fender system and mooring structures.
1984	K-83207	Tenakee Ferry Passenger Facility	Constructed steel catwalk, gangways, and barge with steel platform to provide access between vessel and fixed dock for transferring passengers.
1994	N/A	Tenakee Dock Structural Reinforcement (City Funded)	Installed new steel beams between the pile caps along both lines of exterior support piles of the approach and dock. However, these beams are not effective in strengthening vertical load capacity of dock.
2011	69444 / DC01321-00	Tenakee Springs FT Improvements	New 6'x52' steel approach expansion at upper pedestrian access platform, replaced the gangway support wheel, and replaced all float pile guides with removeable style.

Observations

1. The platform gangway support float is an L-shaped custom steel float installed in 1985. The paint system is epoxy coating and the float is cathodically protected with pendant anodes. The pontoon supports a steel galvanized platform welded to the top of the pontoon. The exposed coatings have failed and all surfaces exhibit large blisters and delamination. The steel is bare over much of the exposed steel surfaces. There is significant surface corrosion at almost all of the platform base plates, anode cable studs, and pile collars. The steel float needs to be inspected, re-coated or ideally replaced. Corrosion measurements indicate that anodes are not adequate. The pile guide brackets on the float have no galvanized coating remaining and are freely corroding. The 2011 project replaced all pile guides with new UHMW-faced units. Debris and materials are often deposited or stored on the float by non-AMHS users of the facility.
2. The pull-down ramp is decked with fiberglass grating secured with stainless steel fasteners. Several of the fasteners are damaged and they need to be replaced. The handrail has broken, on both sides, at the seaward end where the 2" pipe necks down to a 1" section.
3. The three offshore mooring structures are in very poor condition. These structures are beyond cost effective rehabilitation and should be completely replaced. The lower bolted connections on the Steel H fender piles have many corroded and missing bolts. As such, the fenders are structurally loose and have excessive movement. Some of these bolts were replaced by the contractor as part of the 2011 project. Anodes were installed in 1993 and need to be replaced. AMHS Maintenance has reported that anode consumption is higher in Tenakee than at other AMHS facilities. The steel H-piles for the fender system have 50% coating remaining within 5-feet of the low-water mark, with up to 1/8-in. pitting. The eccentrically bolted connection attaching the fender system to the piling is a high-stress region, and several bolts are missing or loose-fitting, due to poor installation. Twenty-percent (20%) of the timber fender boards have 100% section loss within the bottom 8-feet, due to rot in the saltwater environment. This affects the LeConte class vessels when mooring at low-tide.

   The fender timbers within the tidal zone are heavily deteriorated with >40% section loss on all dolphins. Dolphin E1 has the worst deteriorated fender timbers with a section loss of ~60%.
4. Several of the precast concrete ("Dy-Core" style) panels along the dock and approach have filled with water, subsequently frozen, and then cracked. The outside edges of the panels are in poor condition with substantial spalling. The east edge cell of the concrete dock panel nearest to shore has largely broken off beneath the timber bullrail leaving the bullrail hanging on the shoreward end.

   The top surface of the deck has numerous surface spalls and wide areas of delamination. There are longitudinal cracks beneath the bullrails, several holes in the underside of the panels, and moderate efflorescence between the panel joints. There is a sizeable 2"x 5" hole in the top surface of a concrete dock panel near the fuel/maintenance shop. A separate, but larger, hole is located at about the mid-point of the dock, on the underside of the panel. The size is estimated to be 4"x 24".

   The 2014 Fracture Critical inspection found small spalls on the underside of the deck panels with widespread delamination over more than 25% of the area of the dock. There are exposed and corroding prestressing strands with up to 30% section loss at the edges of the steel bent caps. Overall, the deck is rated as a 3 out of 10, correlating to a 'serious' FHWA condition rating; the bent caps are rated a 6, or 'satisfactory'.

   Steel backing plates beneath the crane on the bottom side of the dock do not bear on the pile cap. A timber fender pile on the face of the dock is broken 7-feet above the channel bottom.
5. The most shoreward bent has an odd pile/cap connection between the bent cap and support pile. Two W-sections are welded flange to flange to extend the bearing surface of the cap. The connection induces bending in the piles.

   There is a broken electrical conduit, with exposed wiring, on the RT side of approach trestle span #1. A J-box has pulled away from the RT edge of span #5.
6. In 1994, the municipality awarded a contract to reinforce the approach structure. The project included installation of new steel beams underneath the precast concrete panels. These beams were welded to pile caps between bents on both LT & RT edges. Unfortunately, no leveling grout was placed between the top flanges and the bottom of the dock panels. Therefore the beams carry no vertical load.
7. The City and AMHS installed anodes to the dock and pontoon in 1992, but most are exhausted. The steel bents are bonded with SS cables that run length of dock. The 2006 Underwater Inspection found that all steel support piles have complete coating loss within the high-water splash zone.

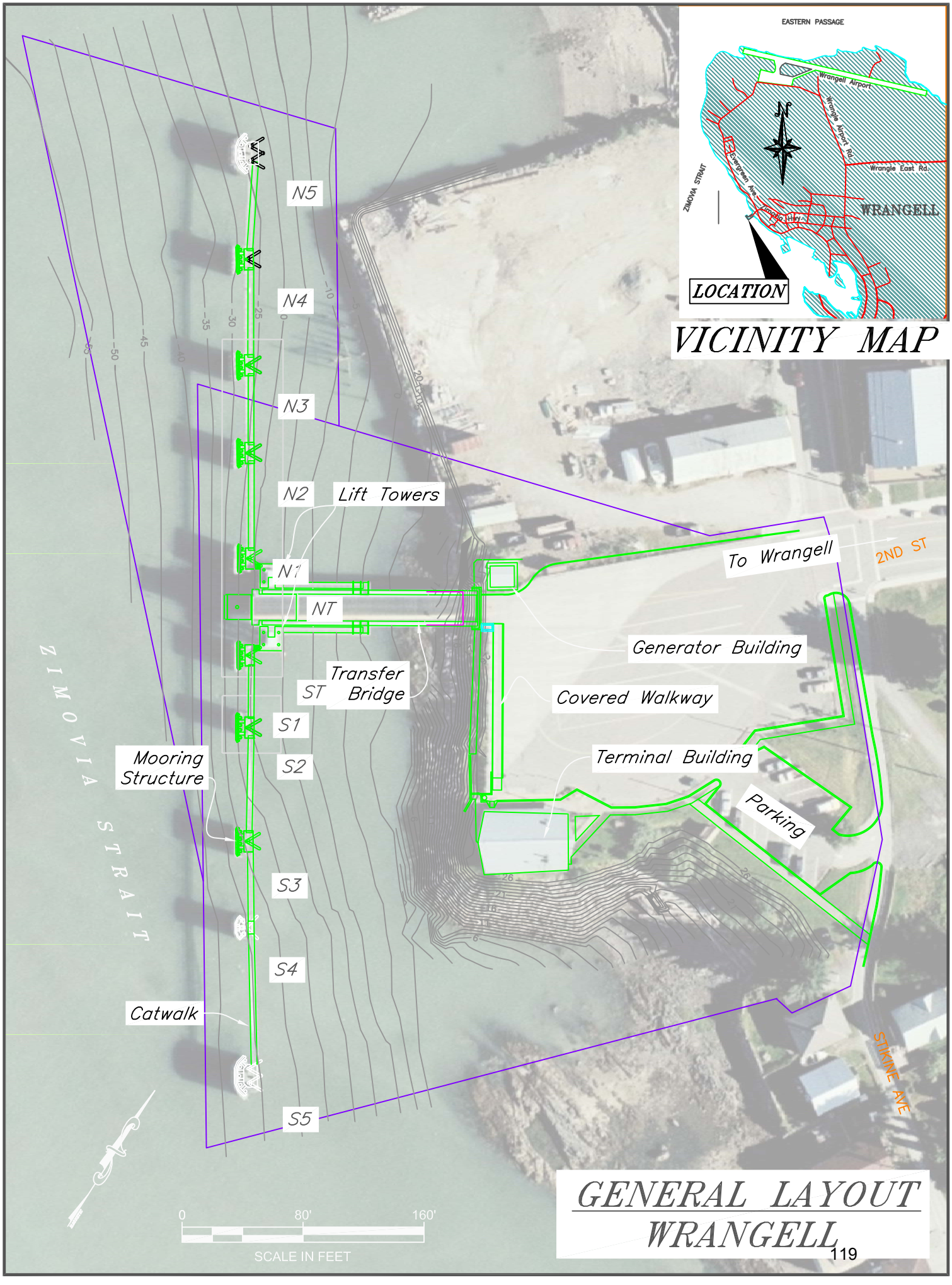
Observations (continued)

8. The timber support structure (beneath the City's storage building on the dock) was not closely inspected. A cursory inspection found that a 12"x12" pier cap exhibited open decay holes along the grain of the wood in the bottom face at the highest moment region, mid-span. Two of the support piles are missing cross-bracing.
9. The City dock is also used for fuel barge and freight deliveries via Alaska Marine Lines (AML) and other commercial carriers. The AML barge is extremely large and berths against the dock and ferry terminal mooring dolphins. The existing dock fender piles and mooring dolphins are largely inadequate for moorage of this type of vessel. Freight is transferred mostly by hand from inside containers that are lifted by AML from the barge to the dock surface. Freight is temporarily stored on the dock and then the City utilizes a small forklift to move items to shore. The dock was load rated in 2014 and is posted for a 4-ton max. axle weight.
10. The 2011 project (funded by the Denali Commission) installed a 6'x 52' addition to the existing steel approach, allowing increased room for ATV turning movements at the top of the gangway. The transition apron at the base of the access gangway still needs repairs.
11. Cathodic potential (CP) readings for the dock support piles average -0.59V. The cutoff for adequate protection is -0.8V, so the steel piles are freely corroding. Depth to mudline elevations, taken with leadline readings at locations along the fender line in 2015, range from -18' to -20' MLLW.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Dock & Approach span	1	A load restriction sign has been posted at both ends of the dock. Failure of the City dock will result in closure of AMHS ferry service since access to the existing ferry terminal is on the City Dock. A deck panel refurbishment design was completed by Denali Commission/USACE, but there is no construction funding. The State's project (described below) will replace the aging dock with a new facility.
Storage Building	2	Inspect/replace the timber center support beam beneath the storage building if required.
Category II - Rehabilitation Work		
Gangway Transition Apron	3	Remove and replace the small pipe skid at the end of the transition apron. Bolt 1/4" thick UHMW skids to the grating on the platform.
Anodes	4	Program a project to install/replace anodes on all submerged steel structures.
Platform Pontoon	5	Re-coat the platform pontoon and replace the gangway roller skids.
Dolphins	6	Replace the timber fender boards and mounting hardware on the three mooring structures. The new State project will replace the existing mooring structures.
Pull-down ramp	7	Replace damaged grating fasteners, and weld repair the pipe handrails.
Timber Bullrails	8	Timber bullrails should be re-mounted, possibly to a steel bracket welded to the stringers below the concrete deck.
Gangway	9	Replace the pins in the hanger connections for the gangway.
Category III - Upgrades Needed		
Marine	10	Replace the aging dock with a new facility (see project description below).

Project #68145 – Tenakee Ferry Terminal Modifications:

This project will construct improvements at the existing ferry terminal to provide improved vessel mooring facilities, pedestrian and vehicle access, public safety and security. Work includes the installation of new and/or renovation of existing shoreside facilities and marine structures to accommodate cargo and baggage handling, vessel mooring and passenger and vehicle access gangways. Preliminary design is underway with advertisement planned in Fall 2018. Construction funding established for FY18.


EASTERN PASSAGE
Wrangell Airport
Wrangle Airport Rd.
Wrangle East Rd.
Evergreen Ave.
Zimovia Hwy
ZIMOVIA STRAIT
WRANGELL
LOCATION
VICINITY MAP
N5
N4
N3
N2
Lift Towers
N1
NT
ST
Transfer Bridge
S1
S2
S3
S4
S5
Mooring Structure
Catwalk
To Wrangell
2ND ST
Generator Building
Covered Walkway
Terminal Building
Parking
STIKINE AVE
ZIMOVIA STRAIT
0
80'
160'
SCALE IN FEET
GENERAL LAYOUT
WRANGELL

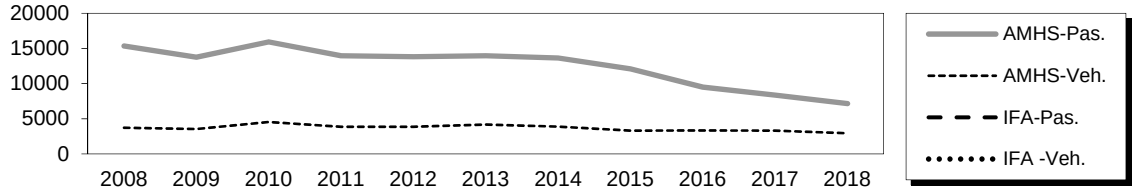
Wrangell Ferry Terminal

1/4 mile Stikine Ave.

Owner: State of Alaska

Terminal Manager: Pamela McCloskey – 907-305-0280

Terminal Description: The Wrangell Ferry Terminal is located at the north end of town, along Stikine Avenue. Wrangell is a side-loading facility consisting of a transfer bridge, cable supported bridge lift (Syncrolift), 10 steel pile dolphins and associated catwalks/gangways for line-handling access. Wrangell was also used by the IFA ferry from Coffman Cove and South Mitkof terminals but has not operated this route since 2008. The past 10 years of total passenger and vehicle traffic at Wrangell is shown below.



The most recent above water survey was completed on June 28, 2017. The most recent fracture critical inspection occurred on 8/15/18. The most recent underwater inspection occurred on 8/1/16.

Vessels	
Name	Berthing, Alignment
All AMHS/IFA Vessels	Port/Starboard
FVF	Starboard

Tidal Data (MLLW 0.0 feet)	
EHW	22.0
MHHW	15.7
MHW	14.8
ELW	-5.5

Terminal Building	
Year Built:	1984
Square Footage:	1408 s.f.
Heating System:	Furnace
Fuel Storage:	UST
Fire Protection:	Alarm Pyrotronics
Condition:	Good

Generator & Building	
Building / Generator:	1987
Square Footage:	224 s.f.
Heating System:	Electric
Fuel Storage:	UST
Fire Protection:	Halon
Condition:	Fair

Uplands	
Short-Term Parking:	5
Long-Term Parking:	15
Staging Area:	640 lineal feet; 60 lineal feet-buses/trucks
Paint Striping:	Yes
Driving Surface:	Asphalt

Vehicle Transfer Bridge - #0801	
Type:	16'x140' twin box beam
Year Built:	1987
Shoreward support:	Concrete abutment
Seaward support:	Steel Lift Beam-Syncrolift
Coating:	Wasser Paint
Pedestrian Access:	Concrete 4' wide on bridge
Lighting:	None
Condition:	Good
Load Posting Sign:	N/A
Original Design Load:	HS 20-44

Utilities		
	at Terminal	at Ramp
Electrical:	Yes, city & backup power	
Water:	Yes	Yes
Sewer:	Yes (Septic)	Yes
Telephone:	Yes	Yes
Cable TV:	No	No
Fuel:	Yes, UST	No
Wireless Bridge:	Yes	-

Dolphins							
Dolphins	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Notes**
N5	4B, 2V	5V	Ekki Timber	Yes	1994	Fair	Nav Light
N4	2B, 1V	4V	Ekki Timber	Yes	1994	Fair	
N3	2B, 1V	2V	Ekki Timber	Yes	1994/2013	Fair	
N2	2B, 1V	2V	Ekki Timber	Yes	1994/2013	Fair	
N1	2B, 1V	2V	Ekki Timber	Yes	1987/2013	Poor	
S1	2B, 1V	2V	Ekki Timber	Yes	1987/2013	Fair	
S2	2B, 1V	2V	Ekki Timber	Yes	2013	New	
S3	2B, 1V	4V	Ekki Timber	Yes	1987	Fair	Bent Ladder
S4	2B, 1V	4V	Ekki Timber	Yes	1978	Fair	
S5	4B, 2V	5V	Ekki Timber	Yes	1987	Fair	Nav Light
ST	4V	-	-	Yes	1987	Fair	Light Pole & Windsock
NT	4V	-	-	Yes	1987	Fair	Light Pole

LEGEND
ET = East Lift Tower V = Vertical Steel Pipe Piling B = Battered Steel Pipe Piling
G1 = Gangway EBP = East Bridge Platform

Catwalks / Gangways								
#	**From Struc.**	**To Struc.**	**Length / Style / Main Members**	**Built**	**Safety Chains?**	**Cond.**	**Lighting**	**Notes**
C1	N5	N4	59' / Catwalk / 12"x12" Tube Girders	1994	Yes	Good	Jelly Jars	
C2	N4	N3	59' / Catwalk / 12"x12" Tube Girders	1994	Yes	Good	Jelly Jars	
C3	N3	N2	47' / Catwalk / 12"x12" Tube Girders	1994	Yes	Good	Jelly Jars	
C4	N2	N1	59' / Catwalk / 12"x12" Tube Girders	1994	Yes	Good	Jelly Jars	
G1	ET	EBP	53' / Gangway / S 4x9.5 Bottom Chord	1984	Yes	Good	Jelly Jars	
G2	WT	WBP	53' / Gangway / S 4x9.5 Bottom Chord	1984	Yes	Good	Jelly Jars	
C5	S2	S1	36' / Catwalk / 10"x10" Tube Girders	1987	Yes	Good	Jelly Jars	
C3	S3	S2	65' / Catwalk / 10"x10" Tube Girders	1987/2013	Yes	Good	Jelly Jars	
C2	S4	S3	48' / Catwalk / 10"x10" Tube Girders	1987	Yes	Good	Jelly Jars	
C1	S5	S4	91' / Catwalk / 10"x10" Tube Girders	1987	Yes	Good	Jelly Jars	

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1963	N/A	WRG Ferry Terminal	Original construction of the terminal structures: timber vehicle bridge, timber lift towers & counterweight system, timber dock & timber mooring dolphins.
1978	RS-0943(14)	Ferry Terminal Facilities at Wrangell	Replace two timber dolphins with steel dolphins, retrofit the dock, install new catwalk.
1984	H78017	WRG Marine Terminal Building	Extension of uplands, construction of the current terminal building.
1987	A70022/F-095-3 (1)	WRG Ferry Terminal	Removed all timber structures and replaced with steel: new vehicle bridge, new lift towers and syncrolift system, new dolphins and catwalks.

Terminal Projects (continued)			
Year	**Project #**	**Project Name**	**Description**
1994	75279 / STP-095-3 (2)	WRG Ferry Terminal Fendering & Mooring Improvements	Installed steel dolphins, and catwalks, extending the north fender line and providing port/starboard mooring. Retrofit and upgraded southern mooring dolphin fender panels and batter piles. Improved the rock armor shore protection.
2006	67927 / CA-0003 (69)	WRG Ferry Terminal Modifications	Connected the transfer bridge to City sewer and water and installed hawse masts for the IFA vessel use. Installed fender panel extensions to dolphins S1-S3 for FVF vessels.
2008	73003(3)	Wrangell FT Carpet Replacement	Replaced carpet in the terminal building.
2008	69050 / SHAK - 0005 (575)	Wrangell - Ferry Dock Hoist Upgrade	Replaced the existing relay-based control panel for the transfer bridge lift system with a PLC-based control panel.
2008	73741(4)	WRG Ferry Terminal Transfer Bridge Repairs	Repaired failed welds between the first floor beam and girders of the Transfer Bridge. Work completed under a maintenance contract in October, '08.
2013	69432 / SHAK-MGE-STP-0943(25)	WRG Ferry Terminal Transfer Bridge Repairs	Replaced fender panels on dolphins N1-3, S1; replaced dolphin S2; refurbished transfer bridge lift beam; replaced the pursers shelter; installed a security gate at the head of bridge; installed anodes on all dolphins, shortened the catwalk to dolphin S3; reconstructed the catwalk lighting system.

Observations

1. The Wrangell staging area was expanded, paved, and illuminated in 1987; it is adequately sized for current AMHS operations. The terminal has a covered walkway from the terminal building to the head of the transfer bridge. This facility does not comply with all requirements of the Americans with Disabilities Act (ADA). Parking striping needs to be modified to provide required ADA complying parking spaces and the curbs and sidewalks need to be modified to provide ADA compliant access to the terminal building.

   A generator building and small storage building was constructed to the north of the bridge approach in 1987. The generator building fire suppression system is halon. The interior/exterior were given a new paint coating and the roof was replaced in 2016. The underground emergency generator fuel storage tank was replaced in 2000 to meet current regulations.

2. The 1,408 square foot terminal building was constructed in 1984. The terminal building waiting area is small and at times passengers are forced to congregate outside in the parking area. The office area is undersized and ventilation is poor. Some of the fixed seating in the waiting area is unstable and tips over easily. An expansion or refurbishment of the building may be due. Otherwise the building appears to be in good condition. New overhead lights are needed in the bathrooms and waiting area. With the completion of the Swan-Tyee intertie, Wrangell now has reasonably priced power, so future building improvements should also investigate switching to electric heat pump heating system.

3. The bridge has an adjustable intermediate ramp that also supports the apron. Sections of the expanded metal on the apron are missing and need to be replaced. The bridge is supported on the seaward end by a Syncrolift system. The shore side end is supported by hinge bearings on a concrete abutment. The solid-state controls for the lift system were replaced with digital PLC controls in 2008. Vehicles bottom out on the steel transition plate while the bridge is at its steepest incline during extreme low tide. Maintenance has chipped away concrete on the top of the abutment to drop the transition plate down, but only made an incremental change.

   The bridge was re-coated in 1994 and remains in good condition. There is some spot rust and slight pitting on the underside of the girders. Laminating corrosion with minor section loss exists along the full length of stringer #1, located beneath the left pedestrian walkway. Deicing chemicals are most likely the cause.

The interior of the box girders were prime coated, but not top coated. They currently have widespread surface corrosion on the lower flange. The most severe corrosion is at the shoreward girder entrance door and at a rapidly corroding conduit fitting in Girder 2, Floorbeam 0.

The most recent Fracture Critical (FC) bridge inspection found the following:

- Isolated areas of advancing surface corrosion on the pedestrian walkway form soffit between floorbeam locations, and on bottom and top flanges of Stringer 1.
- Several of the utility clamps, fastened to the bottom of the floorbeams, are corroded with section loss or missing.
- Up to ¼" laminar corrosion and 1/16" section loss and pitting on the bottom flange and lower web of Floorbeam 12

The expanded metal is installed backwards and a section is missing in the middle of the apron. There is a light switch on the north lift system that sits in standing water and has duct tape around the housing.

4. The galvanized coating on dolphin S4 has failed. Dolphin S4 is used for the spring line of the MV Kennicott, though the ship does not dock here often, it appears to be pushed up and inward. The donuts are ~25% compressed.

   The vertical piles at dolphin S5 are also scoured, but less than 6-in. and entirely on the seaward side. The fender donuts are compressed and the restraint chains are tight on the dolphins. There are strong currents and heavy winds at times and vessels have made high impact landings. The donuts on dolphin S5 have cracks along the exterior, its donut brackets are bent but intact. This is a turning-style dolphin that receives heavy impact and turning loads, but is hardly used for mooring.

   There are two old concrete-filled steel batter piles cutoff below extreme low water (ELW) behind dolphin N1. AMHS maintenance performed weld repairs to damaged fender restraint brackets on dolphins N1-N3 in February, 2012. The 2013 project installed anodes on all steel pipe piles.

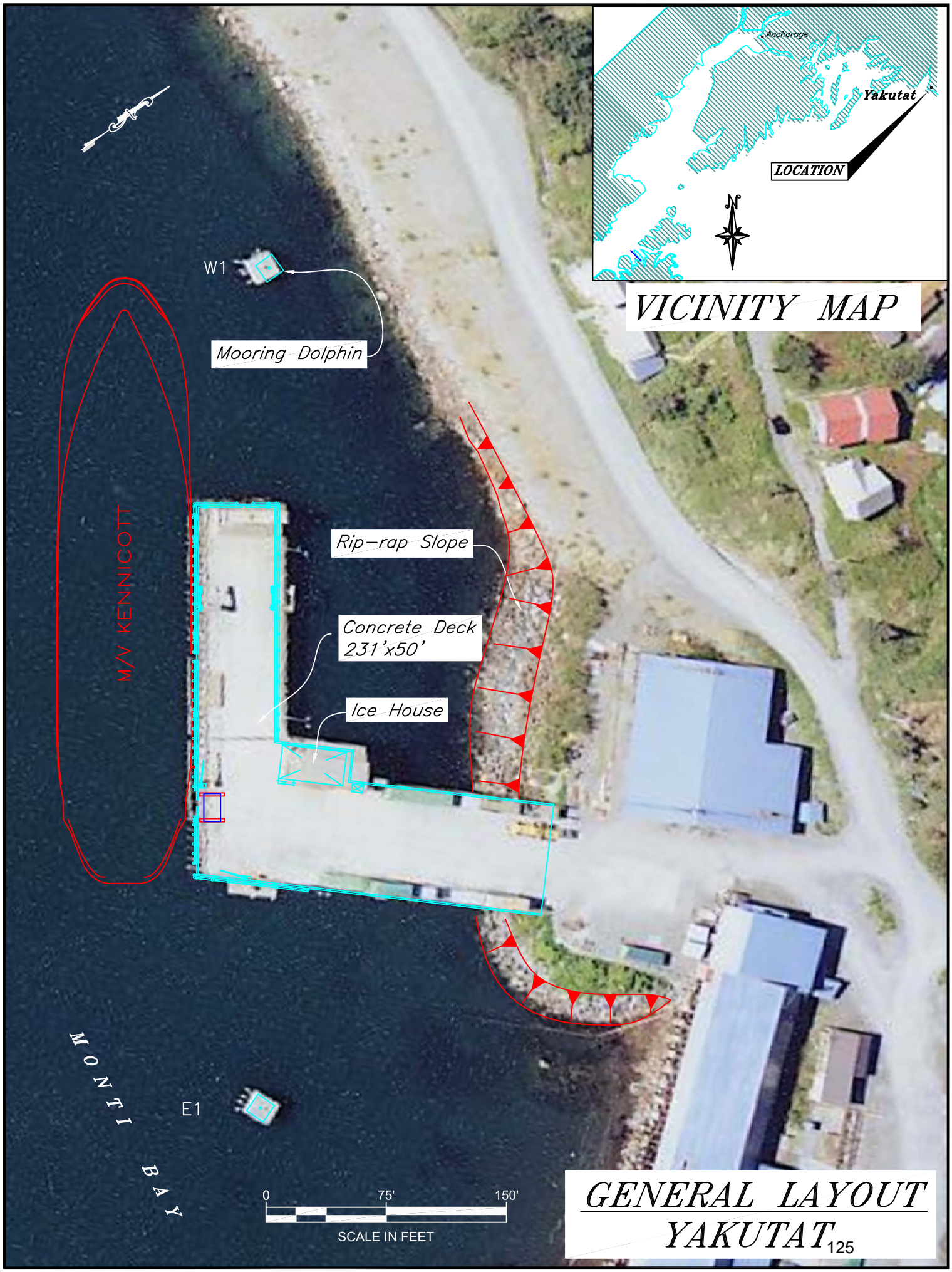
   Galvanizing on submerged steel piles on older dolphin components have been consumed below mean tide. Cathodic potential (CP) readings for all mooring structures average -1.00V. The cutoff for adequate protection is -0.8V, so CP readings less negative indicate the steel piles are freely corroding. Depth to mudline elevations, taken with leadline readings at locations along the fender line in 2015, range from -23' to -39' MLLW (north to south).

5. There is a gap in the railing on the small stairways between the lift towers and dolphins N1/S1. The lowest stair has a large gap behind it and is not connected to the upper stair assembly. Some handrail pipes are split due to expansion off ice from trapped condensation. Hinge pins on the lift tower gangway supports are loose.

7. IFA hasn't operated their northern route, including Wrangell, since 2008.

8. The kick-plate angle on the catwalk between dolphin N1 and N2 has been damaged by the hawse rail after a hard vessel impact. Catwalk posts are not freely draining. Base of posts are damaged from the freezing of trapped water.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Nothing required.		
Category II - Rehabilitation Work		
Transfer Bridge	1	Install neoprene gasket in the girder entrance door and secure the door with bolts. Monitor corrosion within the interior of the girders. Replace the sodium-based deicing chemicals with an inert product. Replace unistrut brackets & conduit supports where they're corroding beneath the bridge. Monitor the gap between the bottom of the shoreward hinge bearing plate and the top of the abutment. Re-coat the bridge. Re-grade the approach slab and install a flat transition plate.
Dolphins	2	Replace the cracked rubber donuts & bent brackets, install navlight and windcone on Dolphin S5. Repair the bent ladder posts on Dolphin S3.
Lift tower access stairway	3	Install an extension to the pipe railing on the stairway and connect the lower stair to the upper stair assembly with chains or cables and an angle kick plate in the back. Drill weep holes at the bottom of all pipe railing. Tighten hinge pins on lift tower gangway supports.
Bridge Apron	4	Remove and reinstall damaged and incorrectly installed expanded metal grating in correct orientation to reduce slippage during low tide events.
Catwalks/Gangways	5	Railing posts should be drilled for weep holes and those that are split should be weld repaired. Check hinge pins for gangways and replace as necessary. Clean catwalks and dolphin caps; repair catwalk guide bolts.
Lift Towers	6	Move the light switch to a fixed location above the standing water.
Generator Bldg	7	Refurbish the fire suppression system. Paint the exterior and replace the roof.
Category III - Upgrades Needed		
Terminal Building	8	Investigate terminal building expansion/refurbishment.

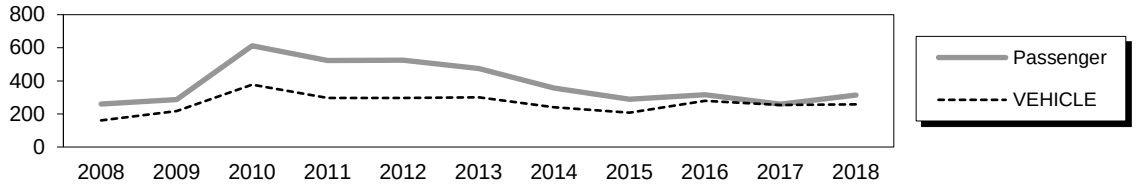

Anchorage
Yakutat
LOCATION
N
VICINITY MAP
W1
Mooring Dolphin
M/V KENNICOTT
Rip-rap Slope
Concrete Deck
231'x50'
Ice House
E1
MONTI BAY
0
75'
150'
SCALE IN FEET
GENERAL LAYOUT
YAKUTAT 125

Yakutat City Dock

Owner: City of Yakutat

Contact: Simon Bradley, AMHS Terminal Ops Manager (Ketchikan) – 907-228-7290

Terminal Description: The M/V KENNICOTT calls in Yakutat during its cross-gulf trips. The dock is L-shape in plan with a face 237 feet long by 50 feet wide and an approach 70 feet wide by 169 feet long. The dock is constructed of precast concrete deck panels atop cast-in-place concrete caps and steel support piles. Two mooring dolphins are located at each end of the dock and lie off-line from the dock face.
The facility is a multi-purpose dock and could be in use by other vessels when the ferry arrives. AMHS is not in control of the operation or maintenance of this facility. The past 10 years of total passenger and vehicle traffic at Yakutat is shown below. The KENNICOTT began its service in 1998.



The most recent above water survey was completed on September 13, 2017. The most recent underwater inspection occurred on August 25, 2016. The most recent fracture critical inspection occurred on September 17, 2012.

Vessels	
Name	Berthing, Alignment
Kennicott	Starboard

Tidal Data (MLLW 0.0 feet)	
EHW	16.3
MHHW	10.1
MHW	9.2
ELW	-4.0

Terminal Building
This facility does not have a terminal building.

Generator & Building
This facility does not have a generator on-site.

Utilities @ Dock	
Water:	Yes
Electric:	Yes

Uplands	
Short-Term Parking:	N/A
Long-Term Parking:	N/A
Staging Area:	N/A

L-Shaped Dock - #2094	
Type:	L-Shaped 237'x50' concrete panel dock & 169'x70' concrete panel approach
Year Built:	1984
Dock Support:	Steel piles & concrete pile caps
Pile Coating:	Epoxy paint
Fender:	Timber creosote piling bolted to steel wale with 'V' style energy absorbing unit.
Anodes:	Cables hanging from end of angle (welded to pile near low-water line)
Lighting:	Light poles mounted at dock corners
Condition:	Good
Load Posting Sign:	N/A
Original Design Load:	HS 20-44/60 Ton Mobile Crane/25 Ton Forklift/600 psf

Dolphins							
Dolphins	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Notes**
E1	8B, 5V	Mooring Only		No	1984	Fair	
W1	8B, 5V	Mooring Only		No	1984	Fair	

LEGEND
V = Vertical Steel Pipe Piling B = Battered Steel Pipe Piling

Observations

1. The dock is used for fish processing and the transfer of freight. There is an icehouse on the inside corner of the dock, a fish processing plant at the head of the approach, and the office of Alaska Marine Lines is nearby. The KENNICOTT ties up starboard-to, with bow and stern lines to the dolphins and spring line to the dock. This mooring configuration is marginal for the M/V KENNICOTT. There are no catwalks from the dock to the dolphins; a contract agent runs the bow & stern lines to each dolphin by skiff one at a time. In the winter, when the wind blows off the dock and snow/ice builds on the dolphin caps, the situation becomes dangerous when the KENNICOTT drifts while the linehandler is motoring over to disconnect the bow/stern line.
2. The steel support piling are epoxy-coated. The shoreward piling exhibit 75% coating loss with some laminating corrosion. Section loss is not known. Seaward piling are in fair condition, with 20% coating loss. The City installed new anodes on the piling recently, however a few of the anode cables have broken off at the support angles. Cathodic potential (CP) readings from the ’16 underwater report for the dock support piles average -0.95V. The cutoff for adequate protection is -0.8V, so the steel piles are protected against corrosion. Depth to mudline elevations, taken with leadline readings at locations along the fender line in 2015, range from -33’ to -36’ MLLW.
3. Kennicott ship personnel are required to block the ship’s vehicle transfer ramp up with wood in order to clear a cleat on the southern dock face. This results in excessively steep grades between the ship and the dock and requires additional work by ship’s personnel.

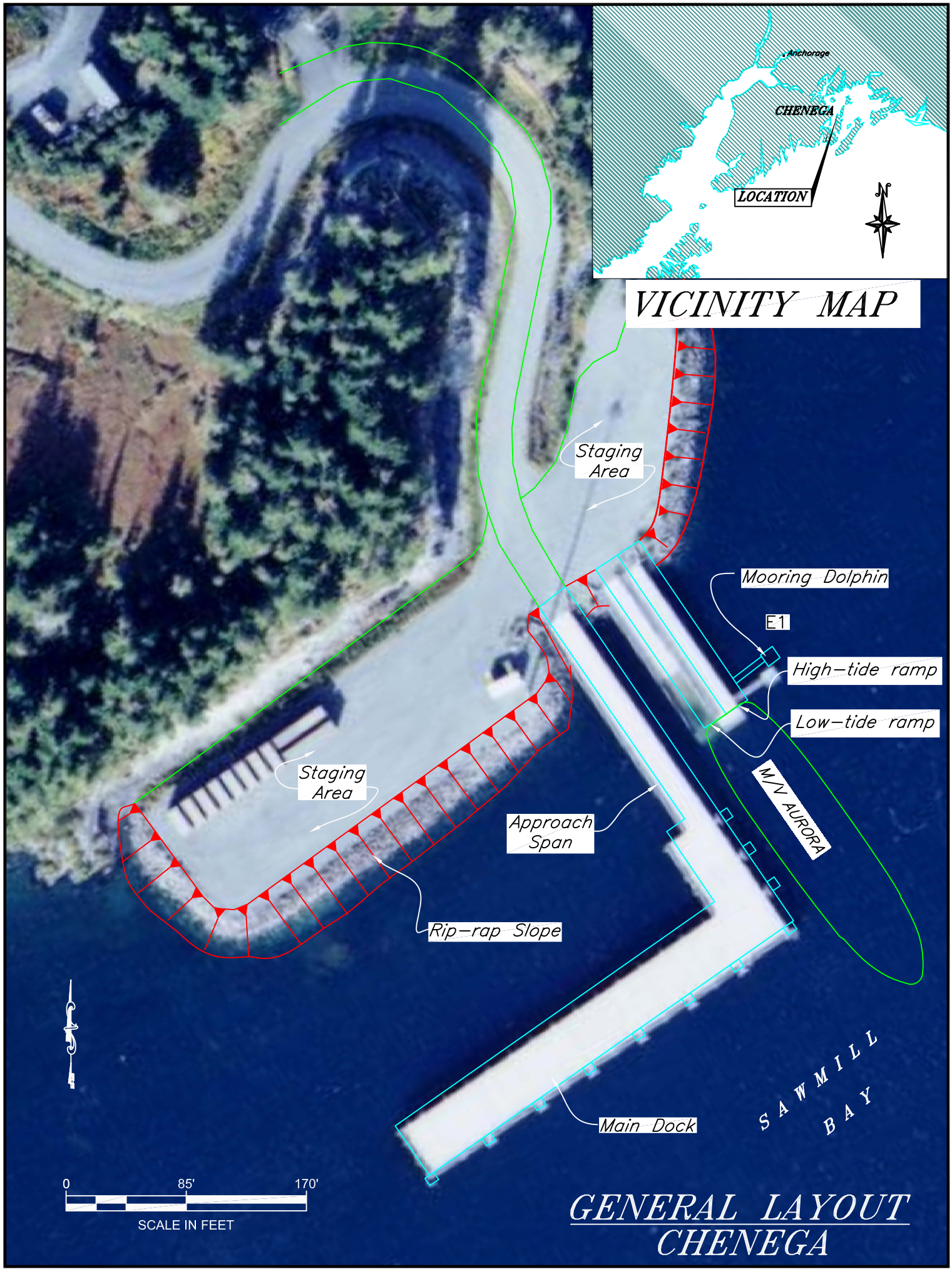
   There are several cranes fixed to the dock that are original vintage & all are not operational. One of the cranes on the north dock is in the way of the preferred landing for the Kennicott’s vehicle ramp.
4. The most recent underwater inspection (August 2016) found the timber piles at the east end of the dock from Bents 11 to 13 exhibit significant abrasion and decay from the low water mark to the high water mark. In two locations along the berthing face (Bents 20 to 23 and 15 Pile C to 15 Pile D) the timber fender walers were broken and dislodged. Additionally, two timber fender piles at Bent 15 Pile A and Bent 15 C were broken due to impact damage.

   All damaged timber fender piles, walers & chocks were replaced in October/November, 2016 on a City of Yakutat project. The timber fender system is still substandard for taking AMHS vessel & heavy barge berthing loads.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Mooring Arrangement	1	Install catwalks between the mooring dolphins & shore, to provide linehandler access. Consider installing a breasting dolphin in-line and west of the dock fenderline.
Category II - Rehabilitation Work		
Dock support piling	2	Sandblast and repair the coating on steel pile surfaces above the tidal splash zone.
Mooring Cleats	3	Determine alternative location for conflicting mooring cleat and if one of the cranes along the south face of the dock could be removed for better accessibility by the Cross-Gulf ferry; replace missing grout beneath existing mooring cleats.

Inspection Summary (continued)		
Structure	Priority	Recommendations
Category III - Upgrades Needed		
Dock Fenders	4	The timber pile fenders are inadequate for the Kennicott. Program a project to replace with steel fender units to provide a higher berthing capacity.
AMHS Coordination	5	Freight handling & fish processing activities occur simultaneously with AMHS vessel landings. Coordinate with dock use activities with City of Yakutat to avoid operational conflicts and safety hazards.

Southcentral Alaska Marine Route


Anchorage
CHENEGA
LOCATION
N
VICINITY MAP
Staging Area
Mooring Dolphin
E1
High–tide ramp
Low–tide ramp
M/V AURORA
Staging Area
Approach Span
Rip–rap Slope
Main Dock
SAWMILL BAY
0
85'
170'
SCALE IN FEET
GENERAL LAYOUT
CHENEGA

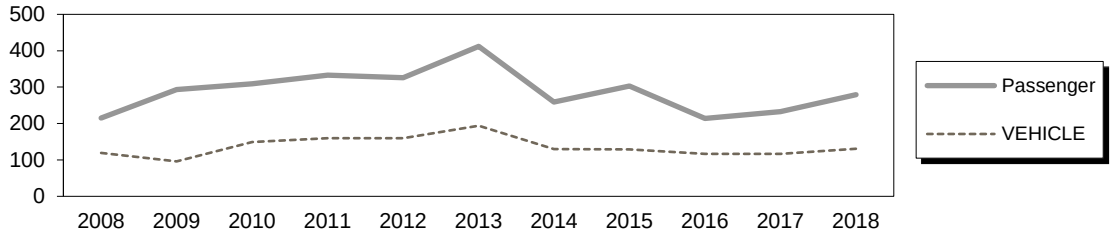
Chenega Dock

Owner: North Pacific Rim Housing Authority

Contact Person: Pete Kompkoff, 907-573-5132

Terminal Description: The Chenega dock and tidal ramps were originally constructed in 1995 to provide a terminal for the BARTLETT. The State of Alaska transferred ownership to the North Pacific Rim Housing Authority (NPRHA) in October, 1998. The Chenega facility consists of an approach, dock and two tidal ramps constructed of prestressed concrete panels welded to bridge beams supported by steel pipe piles socketed to the underlying bedrock. The M/V Tustumena has used the east face of this dock for moorage, while the M/V AURORA uses the tidal ramps located along the north face of the dock for stern loading.

The past 10 years of total passenger and vehicle traffic at Chenega is shown below.



The most recent above water survey and fracture critical inspection occurred on August 22 & 17, 2018, respectively. The most recent underwater inspection occurred on August 4, 2018.

Vessels	
Name	Berthing, Alignment
Kennicott	Port/Starboard
Aurora	Stern

Tidal Data (MLLW 0.0 feet)	
EHW	15.1
MHHW	12.6
MHW	11.8
ELW	-4.0

Generator & Building
This facility does not have a generator.

Utilities @ Dock
This facility does not have utilites at the dock.

Tidal Ramp	
Dimensions:	22' wide x ' 230' long
Year Built:	1995
Shoreward support:	Concrete abutment
Seaward support:	Steel pipe piling
Pile Coating:	Galvanizing
Anodes:	No
Lighting:	N/A
Condition:	Good
Load Posting Sign:	20 Ton Axle/45 Ton Max
Original Design Load:	HS-25

Uplands	
Short-Term Parking:	N/A
Long-Term Parking:	N/A
Staging Area:	N/A
Paint Striping:	No
Driving Surface:	Gravel

Terminal Building
This facility does not have a terminal building.

Dock - #'s 184 & 185	
Type:	40' x 300' Concrete Panel Dock; (2) - 18' x 130' tidal ramps
Year Built:	1995
Support:	Vertical & Battered Steel Pipe Piles
Steel Coating:	Galvanizing
Fender Support:	Steel Pin Piles
Fender Face:	12" x 12" Douglas Fir
Anodes:	No
Lighting:	Tall Mast Light in parking lot
Condition:	Good
Notes:	Red navlight, southeast corner
Load Posting Sign:	30 Ton Axle/45 Ton Max
Original Design Load:	AASHTO HS-25/30 Ton Forklift Axle load/250 psf Uniform Load/40 Ton Mobile Crane w/ Crane Mats Centered on Girders

Dolphins							
Dolphins	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Notes**
E1	2B, 1V	-	-	No	1995	Fair	

Catwalks / Gangways								
#	**From Struct.**	**To Struct.**	**Length / Style / Main Members**	**Built**	**Safety Chains?**	**Cond.**	**Lighting**	**Notes**
C1	TR	E1	25' / Catwalk / Pony Truss	1995	No	Good	None	

LEGEND
V = Vertical Steel Pipe Piling B = Battered Steel Pipe Piling TR = Tidal Ramps

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1995	N/A	Chenega Dock & Tidal Ramps	Original construction of the dock and tidal ramps, uplands, lighting and electrical installations

Observations

1. The dock is currently in fair condition. The dock driving surface is prestressed concrete panels, with a rough traffic surface, welded to the bridge superstructure. The ends of the pre-stressed strands in the deck are exposed and beginning to corrode. The deck closure pour at the end of the high tide ramp is cracked and spalled with heavy scaling at the west edge.

   The red navigation light on the Southeast corner of the dock is broken and should be replaced or repaired. There is damage to the bullrails and some are missing bolts on the post base plate on the dock.

2. The bridge girders are continuous span, welded box beams. The bents are composed of pipe piles driven and socketed to the underlying bedrock, with welded box pier caps.

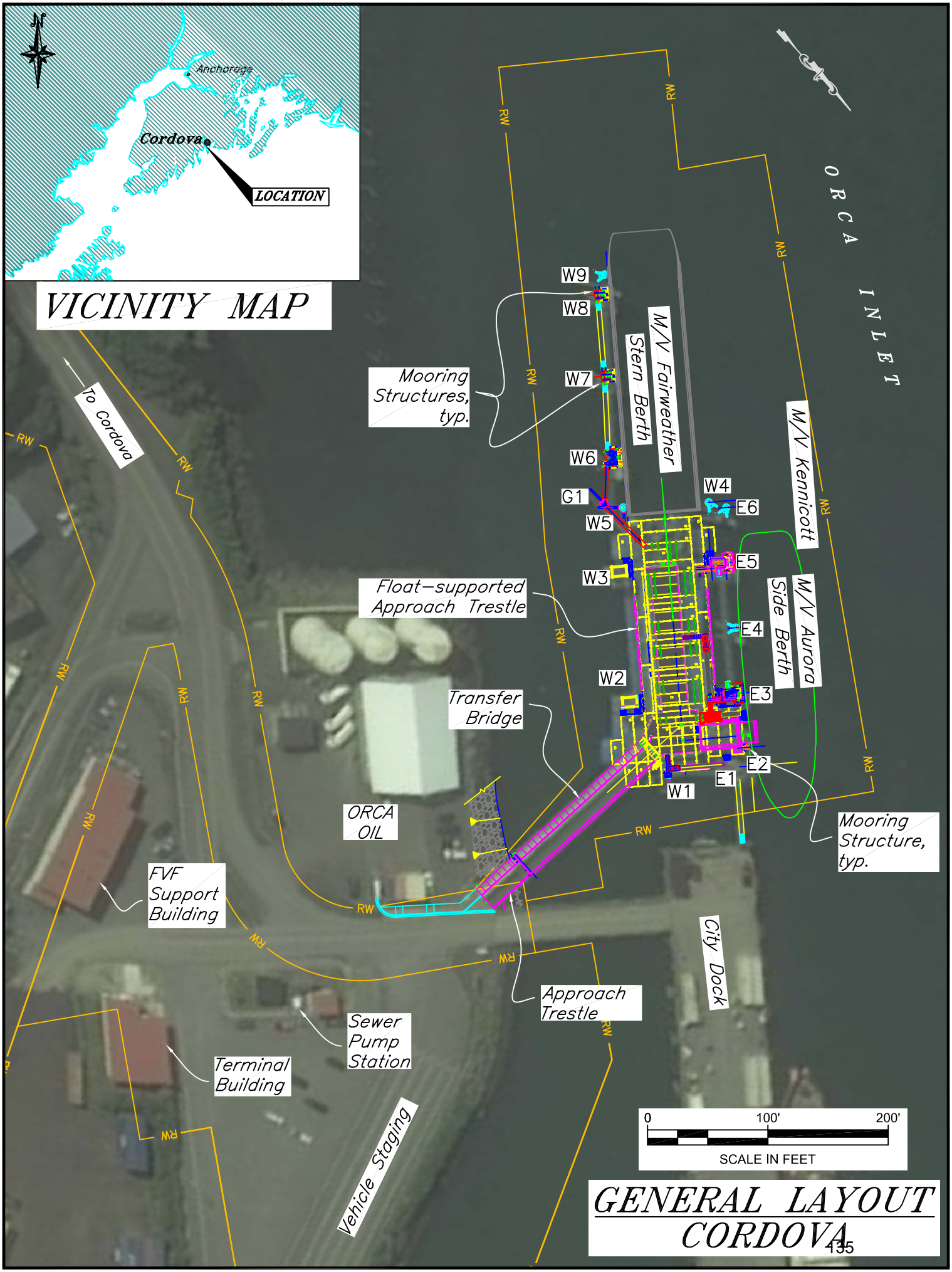
   White rust coats 100% of the spray metallized coating on the steel pile caps and girders. The coating on roughly 50% of the field welds have failed and are corroding. The December 2003 underwater inspection reported minor corrosion of the galvanized piles at the field splices, field connections, and at isolated locations of mechanical damage. The 2006 fracture critical bridge inspection noted that the box beam girders are sealed and cannot be inspected. There is no cathodic protection system for the piling, however the galvanized coating appears to be adequate.

   According to the most recent fracture critical inspection report, the girders exhibit several isolated areas of surface corrosion which vary in size from an inch to three square feet in diameter. The corrosion was identified mostly on the undersides of the box girders and bent caps, and at the bottom flange to cap welds.

3. The ends of the lower tidal ramp are very slippery due to marine growth. The marine growth needs to be removed periodically for safe loading off the AURORA's stern ramp. The fender is substandard for vessel loading as well.
4. The swinging bullrail on the dock, opening for the TUSTUMENA vehicle ramp, is operational and user-friendly.
5. The concrete panel joints on the high tide ramp and on the dock are delaminating and deteriorating.
6. The most recent underwater report noted that all of the vertical, battered and fender pipe piles exhibit 100% loss of galvanizing and are discolored from approx.. 2-feet above HTL to sea level, with 100% coverage of surface corrosion. These areas of corrosion did not exhibit any pitting or measureable section loss. From sea level to the channel bottom, the galvanizing was mainly intact with isolated areas affecting less than 5% of the surface area.

   There were no sacrificial anodes or cathodic protection observed on the entire structure.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Nothing required		
Category II - Rahabilitation Work		
Concrete dock panels	1	Clean and seal exposed steel on ends of precast concrete panels. Repair damaged closure pour on high tide ramp.
Steel superstructure	2	Install anodes on all piling and repair the coating on field welds using Galvcon or similar products to extend the pile life. Drill and tap the inspection port holes in the box beam end caps.
Miscellaneous	3	The marine growth needs to be removed periodically on the tidal ramps.
Conrete Panels	4	Monitor the concrete panel joints or delaminating and deterioration.
Support Piles	5	Monitor the rate of corrosion in the support piles, PT strand end terminals (tidal ramp concrete decks) and fender mounting bolts.
Electrical Conduits	6	Repair the broken electrical conduit beneath the LT side of the high tide ramp.
Mooring Bollard	7	Repair the base plate on the mooring bollard.
Navigation Light	8	Repair the red navigation light on the dock.
Ramp & Dock Abutment	9	Monitor the ramp and dock abutment backwalls for erosion.
Bullrails	10	Make repairs to the bullrails throughout the facility.
Category III - Upgrades Needed		
AMHS Coordination	11	AMHS has a 5-year MOA for prioritized use of the dock for normal ferry operations. Continue to maintain an agreement with the NPRHA.
Fender Panel	12	Program a future project to install a fender panel in front of the tidal ramps. The Aurora has a narrow tidal window to safely bear on the substandard rubber D-fender mounted to the leading edge of the tidal ramps.


Anchorage
Cordova
LOCATION
VICINITY MAP
ORCA INLET
W9
W8
W7
W6
G1
W5
W4
E6
E5
W3
E4
W2
E3
E2
E1
W1
M/V Fairweather
Stern Berth
M/V Kennicott
M/V Aurora
Side Berth
Mooring Structures, typ.
Float-supported Approach Trestle
Transfer Bridge
ORCA OIL
FVF Support Building
Mooring Structure, typ.
City Dock
Approach Trestle
Sewer Pump Station
Terminal Building
Vehicle Staging
To Cordova
RW
0
100'
200'
SCALE IN FEET
GENERAL LAYOUT
CORDOVA

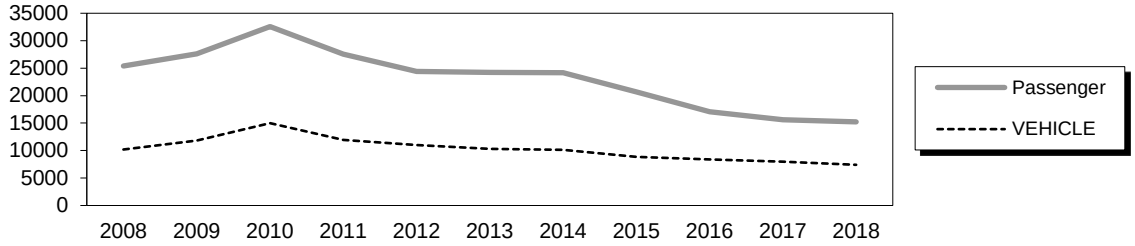
Cordova Ferry Terminal

201 Orca Avenue

Owner: State of Alaska

Terminal Manager: Toni Bocci – 907-424-7333

Terminal Description: Cordova has two berths, each connected to shore by a 40' approach, 140' transfer bridge and 60' x 210' flexifloat steel float system. The side-loading facility consists of an intermediate ramp & lift system, 6 steel pile dolphins and catwalks/gangways for line-handling access. The stern-loading facility consists of an intermediate ramp & lift system, 6 mooring dolphins and catwalks/gangways for line-handling access. The stern-berth is homeport of the Fast Vehicle Ferry (FVF) M/V Chenega. The past 10 years of total passenger and vehicle traffic at Cordova is shown below.



The most recent above water survey was completed on August 23, 2018. The most recent fracture critical inspection occurred on August 8, 2018. The most recent underwater inspection occurred on August 23, 2016.

Vessels	
Name	Berthing, Alignment
Tustumena/Kennicott	Port/Starboard/Stern
FVF	Stern/Starboard

Tidal Data (MLLW 0.0 feet)	
EHW	16.8
MHHW	12.4
MHW	11.5
ELW	-4.6

Terminal Building	
Year Built:	1998
Square Footage:	2200 s.f.
Heating System:	Furnace
Fuel Storage:	AST
Fire Protection:	Alarm Pyrotronics
Condition:	Good

Generator & Building	
Year Built:	1998
Square Footage:	252 s.f.
Heating System:	electric
Fuel Storage:	Daytank
Fire Protection:	Halon
Condition:	New

Uplands	
Short-Term Parking:	18 cars, 5 trucks, 4hcp
Long-Term Parking:	15
Staging Area:	1150 lineal feet; 230 lineal feet-buses/trucks
Paint Striping:	Yes
Driving Surface:	Asphalt
Utilities	
	at Terminal
Electrical:	Yes, city & backup power
Water:	Yes
Sewer:	Yes (City)
Telephone:	Yes
Fuel:	Yes, AST
Wireless Bridge:	Yes
Vehicle Transfer Bridge - #0180	
Type:	16'x140' twin box beam
Year Built:	2006
Shoreward support:	Steel approach
Seaward support:	Flexifloat pontoon
Coating:	Wasser Paint
Pedestrian Access:	Covered walkway, concrete deck, separated by guardrail
Lighting:	Tubuloid fixtures on rail
Condition:	New
Load Posting Sign:	N/A
Original Design Load:	HS 20-44

Catwalks / Gangways								
#	From Struct.	To Struct.	Length / Style / Main Members	Built	Safety Chains?	Cond.	Lighting	Notes
G1	W1	E1	46' / Gangway / 2.5"x2.5' Bottom Chord	2005	Yes	Good	Tubuloid	
C1	E1	CD	61' / Catwalk / 10"x10" Tube Girders	2005	Yes	Good	None	
G2	EGP1	-	15' / Gangway / 2.5"x2.5" Bottom Chord	2005	Yes	Good	None	
G3	EGP2	E3	46' / Gangway / 2.5"x2.5' Bottom Chord	2005	Yes	Good	Tubuloid	
G4	EGP2	E5	46' / Gangway / 2.5"x2.5' Bottom Chord	2005	Yes	Good	Tubuloid	
C2	E3	E5	102' / Catwalk / 12"x12" Tube Girders	2005	Yes	Good	Tubuloid	
G5	WGP1	G1	46' / Gangway / 2.5"x2.5' Bottom Chord	2005	Yes	Good	Tubuloid	
C3	G1	W6	31' / Catwalk / 2.5"x2.5" Bottom Chord	2005	Yes	Good	Tubuloid	
C4	W6	W7	57' / Catwalk / 10"x10" Tube Girders	2005	Yes	Good	Tubuloid	
C5	W7	W8	57' / Catwalk / 10"x10" Tube Girders	2005	Yes	Good	Tubuloid	

LEGEND

ET = East Lift Tower
G1 = Gangway
V = Vertical Steel Pipe Piling
EGP = East Gangway Platform
B = Battered Steel Pipe Piling
CD = City Dock

Dolphins								
Dolphins	Dolphin Piles	Fender Support	Fender Face	Anodes	Built	Cond.	Hawse Extentions	Notes
E1	4V	Hanging	UHMW	Yes	2005	New	Yes	
E2	1V	Floating	Rubber Fender	Yes	2005	New	-	
E3	4V	Hanging	UHMW	Yes	2005	New	Yes	
E4	2B, 1V	Floating	Rubber Fender	Yes	2005	New	-	
E5	4V	Hanging	UHMW	Yes	2005	New	Yes	
E6	2B, 1V	Floating	Rubber Fender	Yes	2005	New	-	
W9	2B, 1V	Floating	Rubber Fender	Yes	2005	New	-	
W8	2B, 1V	Hanging	UHMW	Yes	2005	New	Yes	
W7	2B, 1V	Hanging	UHMW	Yes	2005	New	Yes	
W6	2B, 2V	Hanging	UHMW	Yes	2005	New	Yes	
W5	2B, 1V	Floating	Rubber Fender	Yes	2005	New	-	
W4	2B,1V	Floating	Rubber Fender	Yes	2005	New	-	
W3	4V	-	-	Yes	2005	New	-	
W2	4V	-	-	Yes	2005	New	-	
W1	2B, 1V	-	-	Yes	2005	New	-	
G1	1B, 1V	-	-	Yes	2005	New	-	

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1968	MT 107	Cordova Ferry Terminal	Original stern-loading terminal construction consisted of orthotropic steel transfer bridge, (2) counterweight lift towers, (4) mooring dolphins, (2) stern dolphins, (5) steel catwalks, passenger waiting room building, and utilities. The shoreward bearing was built on the edge of the Cordova City Dock.
1988	RS-0851(42)	FT Fender Modifications	Replaced the stern dolphins, replaced the mooring dolphin fendering systems.
1988	RS-0851(44)	FT Recoating Project	Work included re-painting the steel transfer bridge, lift tower enclosures, and other miscellaneous coatings.
1993	RS-0851(46) 75128	FT Bridge Replacement	Replaced the solid plate deck bridge with an open-grate deck multi-girder structure. Modified existing steel lift towers for new lift system.
1993	STP-0851 (53) / 75339	Cordova Staging Area Phase "A"	Placed uplands fill adjacent to the dock approach road to expand the staging area.
1997	RS-0851(45) 75336	Cordova Staging Area Phase "B"	Work included paving, striping, curb & gutter, utilities, etc.
1998	N/A	Cordova Terminal Building	Construction of the terminal building.
2005	AK-03-0040 / 68447	Prince William Sound FVF Support Facility	Construction of the support facility for FVF Chenega
2006	MGS-0851(63)-68263	Cordova FT Modifications	Removed existing marine structures with new side and stern berths.
2010	73741(5)	AMHS Cordova FT Heat Trace Modifications	Replaced the faulty heat trace originally installed on Proj 68263 for water & sewer lines on dock.
2011	69617	Cordova FT Float Repairs	Emergency project to repair weld the cracks @ the locks within several Flexifloat units & install new structural steel frames to strengthen the floats.

Observations

1. The Cordova transfer facility allows the M/V CHENEGA to stern and side load. The M/V AURORA mainly uses the side-berth, but may also use the stern berth with some restrictions.
2. The Cordova upland facilities were refurbished in 1998. Major improvements included a new paved staging and long term parking areas, a new 2,200 square foot terminal building and a standby power generator facility. The uplands and building facilities are in good condition. The curb near the generator shed and guardrail in the back of the staging area have been damaged by snowplow activities.

   A 90'x34' vessel storage & maintenance building was constructed in the parking area southwest of the existing terminal building in 2005. The building is used as a shop and storage area for the AMHS fast vehicle ferry. The structure was completed in the Spring of 2005 and is in good condition. The building is constructed with steel frames, metal siding and metal roofing.

   There is a heated concrete floor, two garage spaces and a mezzanine area for storage. Area drainage and lighting appeared to be adequate. The second floor in the garage of the maintenance shop has a removable railing that should be re-designed as a swing gate instead of a lift gate, as it is heavy and difficult to use.

Observations (continued)

3. The stern load transfer facility off the southern end of the Cordova City Dock was removed and replaced in 2006 with a stern/side floating berth for all-tide mooring the MV CHENEGA while also providing moorage for the AURORA/KENNICOTT on the side-berth. The older bridge and lift system (installed in 1992) were salvaged and transported to Ketchikan. A 40 foot steel approach trestle and a 140 foot steel transfer bridge access a 60'x210' Flexifloat pontoon system with a raised steel platform and open grate deck. There is an intermediate ramp and apron on the southwest end of the float for a stern berth, and a ramp and apron on the northwest side for a side berth. Refer to the layout for identification of the various dolphin and restraint structures.
4. In 2011 routine maintenance revealed the level of ballast water could not be maintained in four modules near the middle of the float assembly. An inspection of the module interiors revealed the hull plate surrounding the lock castings of the end wall locks had cracked and the float modules were leaking seawater.

   A subsequent analysis showed that design loads such as unbalanced ballast water or environmental loading exceeded the capacity of the end locks. An emergency repair was underway to remedy the leaks and strengthen the float assembly when a severe storm occurred. The end wall locks of the weakened modules were damaged further; completely separating the locks from the hull and deck (8). The float assembly developed a concave downward profile (hump back) and gaps opened up between the individual trestle spans of the stern berth approach. The leaking modules were repaired and ballasted (Project 69617), and the gaps between the spans returned to their normal width. To strengthen the float assembly plate girders were installed to the exterior face of the float modules and tubular trusses were installed in the moon pools between the float modules. The top and bottom components of the end wall locks were enclosed with steel plate on the interior of the module to isolate the damage and make the module watertight.

   On the most recent above water survey, ballast water levels were checked in float modules 09, 10, 11, 29, 30, and 31 (repaired in 2011) and levels were lower than recorded in 2015 – which indicates the modules remain watertight. Freeboard measurements are much similar to values recorded in 2015. No cracks or rust staining was seen at any of the truss to float connections, which indicates the female lock castings have not been overloaded.
5. Divers found that several of the UHMW plastic facing panels for the float fender units are missing mounting bolts & studs. Restraint chains for the fender units, located at water line, are beginning to show brown corrosion – sign that the galvanizing has worn off.
6. Inspectors on the 2016 Fracture Critical Inspection found indications of weld cracks between floorbeams (FB) and girders (G):

   (A) Between FB 9 & G2, 18-1/4" long indication along bottom flange of FB & wraps around seaward and shoreward corners (first reported in '12; crack has not propagated since '14)

   (B) Between FB 9 & G1, 15-3/4" long indication along bottom flange of FB & wraps around seaward and shoreward corners (first reported in '14)

   (C) Between FB 0 & G2, 1-5/8" long indication along weld on shoreward bottom corner of FB (first reported in '14)

   Additionally, inspectors found 12-5/16" & 24-1/2" long weld indications between shoreward and seaward angle stiffeners, respectively, and the G2 interior web plate @ FB 9. Further visual inspection also found evidence of deformation and corrosion around the welded connection between the girders and end plates.

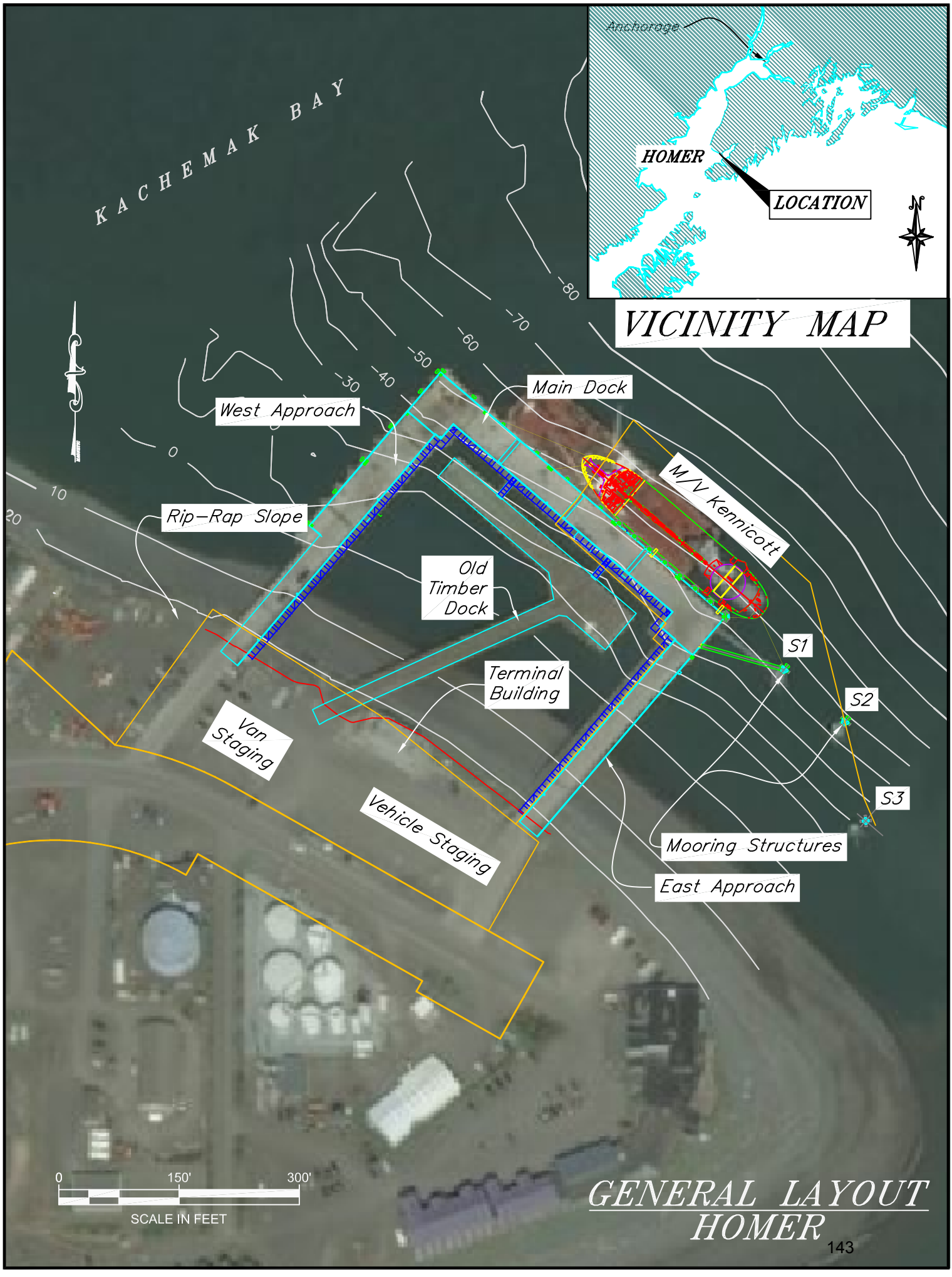
   The 2018 FC inspection found that none of the above cracks had propagated in length.
7. Vehicles have inadequate space in making the turn when offloading from the side-berth approach dock to the transfer bridge. Container vans are currently limited to 34-feet in length to avoid conflict.
8. Access hatches to the girders of the transfer bridge have never been bolted shut, leaving them open to potential rain and saltwater intrusion.
9. All piling at this facility are galvanized. The adjacent City Dock has an impressed current system.
10. The most recent underwater inspection (UW) indicated that the piles anodes are either missing or buried in the channel bottom, and the few piles that do have anodes attached to them have a remaining 50% or less. Cathodic protection readings taken during the most recent above water inspection were -1.05V and -0.67V for the flexifloats and piles, respectively. This indicates the floats are protected from corrosion, while the piles are not.

Observations (continued)

11. The plastic panels that comprise the walking surface in the covered pedestrian walkway on the bridge have warped.
12. Many welds have failed field coating repairs & are corroding on the surface within the heat-affected zone. There is a common area of corrosion on the seaward end of the bridge, between the bottom of the girder and the roller bearing plate. This area isn't welded, so condensation and moisture weep out between these surfaces showing up as rust on the edge and the beam below. This is the case on both bridge girders.
13. The facility requires power-washing regularly due to accumulating guano from shorebirds visiting the nearby fish processor waste discharge outlet as well as the algae growth.
14. Tubular bridge-rail mounted light fixtures all leak, and should be replaced with 'jelly-jars' as they burn out.
15. At the angle point in the approach dock, where the car deck is paved over with concrete for peds, there is a steel support cap (that ties into the column below) and concrete is spalled in a 6" diameter (roughly). The spalling is on the surface, above the cardeck, and is not structural.
16. The surface of the side-load transfer apron is thoroughly scraped up and roughly 60% of non-skid coating remains.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Flexi-floats	1	Monitor the condition of the float lock assemblies & inspect the ballast water levels.
Category II - Rehabilitation Work		
Transfer Bridge	2	Hire a QA firm to perform NDT on the weld crack indications. Inspect the floor beam indications every year until either (1) cracks are not propagating or (2) weld cracks are repaired.
Dolphin Fender Panels	3	Several of the fender panel UHMW mounting studs have sheared off due to lack of extra space in the bore hole for thermal expansion. Program a project to remove the fender panel UHMW wearing surface, re-bore holes 1/4" larger and re-weld studs where they've sheared off. Monitor the condition of the UHMW plastic on fender panels during the next inspection cycle.
Shorebird guano	4	The facility requires regular power-washing due to severe shorebird guano (from nearby seafood processor slimeline discharge) and algae growth. Continue to regularly power wash the terminal marine structures and analyze the effectiveness of a seasonal bird deterrent system.
Catwalk Lighting	5	Tubular bridge-rail mounted light fixtures all leak, and should be replaced with 'jelly-jars' as they burn out. They will not be used on future designs.
Weld coating repairs	6	Many welds are corroding on the surface due to failures in the field-applied weld coatings. A project should be programmed to make hot-stick repairs to welds and other damaged areas on galvanized steel.
Stern & Side Berth	7	Repair the damaged coating on the apron. Replace the old, decaying mooring lines on the floating fenders.
Transfer Bridge	8	Monitor the corrosion on the seaward end of the transfer bridge, between the bottom girder and roller bearing plate. Program a project to install watertight gaskets and bolt down both girders access hatches. Repair and monitor the broken conduits where damage is observed. Patch or otherwise repair the leaking waterline near the seawrd end of the bridge. Monitor the condition of the plastic floor panels in the bridge's covered pedestrian walkway.

Inspection Summary (continued)		
Structure	Priority	Recommendations
Category II - Rehabilitation Work		
Pedestrian Walkway	9	Monitor the damage in the pedestrian walkway panels that were caused by the vehicles at the intersection between the side berth loading and the stern berth loading bridges.
Anodes	10	Program a project to install anodes on all steel pipe piling.
Category III - Upgrades Needed		
Side Berth Approach	11	A project to increase the turning radius between the side-berth approach dock and the transfer bridge is currently under investigation.


KACHEMAK BAY
Anchorage
HOMER
LOCATION
N
VICINITY MAP
-80
-70
-60
-50
-40
-30
0
10
20
West Approach
Main Dock
M/V Kennicott
Rip-Rap Slope
Old Timber Dock
S1
Terminal Building
S2
Van Staging
S3
Vehicle Staging
Mooring Structures
East Approach
0
150'
300'
SCALE IN FEET
GENERAL LAYOUT
HOMER

Homer City Dock

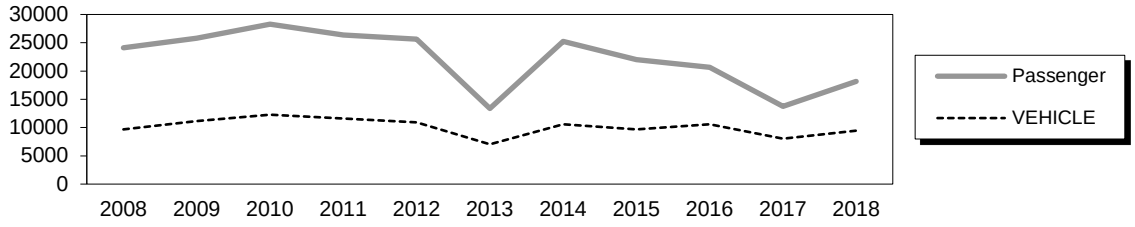
4690 Homer Spit Road

Owner: City of Homer

Terminal Manager: Ron Van Sickle – 907-235-8449

Terminal Description: Homer is a modern U-shaped concrete dock, built around the original timber city dock in 2001. It is owned and maintained by the City of Homer. The facility consists of terminal building and uplands staging area, east and west approach trestles connected to the main dock, two breasting dolphins and one mooring dolphin with one access catwalk. Vehicle and passenger transfer takes place on the city dock. The Coast Guard (USCG) uses the north end of the dock as a berth for their buoy tender. The presence of nearby Homer Harbor traffic has produced docking conflicts in the past. The State provided a portion of construction funding, has priority use and does not pay a docking fee per the MOA with the City.

The past 10 years of total passenger and vehicle traffic at Homer is shown below. The M/V Tustumena was out of service most of 2013, causing a steep dropoff in traffic at the terminal.



The most recent above water survey was completed on August 24, 2018, while the most recent underwater inspection was on September 25, 2018. The most recent Fracture Critical inspection was completed on September 28, 2012.

Vessels	
Name	Berthing, Alignment
FVF	Starboard
Aurora / Kennicot / Tustumena	Stern/Starboard

Tidal Data (MLLW 0.0 feet)	
EHW	24.8
MHHW	18.1
MHW	17.3
ELW	-6.1

Terminal Building	
Year Built:	1999
Square Footage:	2335 s.f.
Heating System:	Furnace
Fuel Storage:	AST
Fire Protection:	Alarm Pyrotronics
Condition:	Good

Generator & Building
This facility does not have a generator.

Uplands	
Short-Term Parking:	5 cars, 2 hcp
Long-Term Parking:	N/A
Staging Area:	2000 lineal feet; 250 lineal feet-buses/trucks
Paint Striping:	Yes
Driving Surface:	Asphalt

Approach Trestle (East Side)	
Dimensions:	30' wide x 300' long
Year Built:	2002
Shoreward support:	Concrete abutment
Seaward support:	30" diameter steel pipe piling
Pile Coating:	Epoxy-based paint
Cathodic Protection:	Anodes hang from cables
Lighting:	Overhead tall-mast lights
Condition:	Good
Load Posting Sign:	N/A
Original Design Load:	Uniform Load 500 psf/AASHTO HS25-44/45 Ton Forklift/140 Ton Truck Crane

Utilities		
	at Terminal	at Ramp
Electrical:	Yes, city & backup power	
Water:	Yes	Yes
Sewer:	Yes (City)	Yes
Telephone:	Yes	Yes
Cable TV:	No	No
Fuel:	Yes, AST	No
Wireless Bridge:	Yes	-

Dolphins							
Dolphins	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Notes**
S1	4B, 1V	2V	UHMW	No	2002	Good	Red navlight & weather station
S2	4B, 1V	2V	UHMW	No	2002	Good	Red navlight
S3	4B, 1V	-	-	No	2002	Good	Red navlight

LEGEND
V = Vertical Steel Pipe Piling B = Battered Steel Pipe Piling

Catwalks / Gangways								
#	**From Struc.**	**To Struc.**	**Length / Style / Main Members**	**Built**	**Safety Chains?**	**Cond.**	**Lighting**	**Notes**
C1	N5	N4	98' / Catwalk / 12"x12" Tube Girders	2007	Yes	New	None	

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1961	W6215	Homer Approach & Dock	Dismantled and re-assembled the existing timber city dock with new superstructure.
1993	N/A	Homer Ferry Terminal Staging Area	Constructed paved parking and staging area large enough to provide adequate service for the M/V Tustumena's sailings to Seldovia, Kodiak, and ports on the Southwest AMHS Route.,
1999	753 / STP-021 (43)	Homer Ferry Terminal	Constructed the new terminal building.
2002	N/A	Homer City Dock	Constructed the new concrete U-shaped dock around the existing timber structure. Also built two breasting dolphins and a mooring dolphin.
2007	69062 / SHAK - 021-1 (53)	Homer FT Dock Modifications	Removed existing aluminum catwalk, replaced with new steel catwalk. Installed new swinging bullrails to provide opening for the M/V Tustumena side and aft brow gangways. Installed new pipe bollard for forward spring line.
2011	69054 / SHAK 0003(119)	AMHS Southwest Warehouse	Improved uplands (paving, drainage, utilities, site work) & built a pre-engineering metal warehouse building on Gravel Access Road, within 1/4 mile of the Homer City Dock & AMHS terminal building. Work also included installation of security camera system, fire alarm controls, & new wireless bridge system.
2015	68223	Homer Ferry Terminal Improvements	Replaced 4 fender panels along the dock face, built 5 new fender panels between the existing units, built a wrap-around fender at the east corner, relocated the existing 98' catwalk, refurbished the fender panels on dolphins S1 & S2, built a covered walkway between the parking lot and the main dock.

Observations

1. This dock is a concrete deck structure with driven steel pile supports. The structure is designed for freight and ferry operations (HS 25-44) and is adequate for ferry traffic loads. The deck consists of precast concrete panels supported on precast concrete bents. There are 12x12 inch treated timber bullrails and mooring bits mounted on the deck structure. The substructure consists of 30" diameter vertical steel piling and batter piling.

   There are hairline cracks mid-span along the outer concrete deck panels that run up the exposed side (facing outward). This is a typical condition. The top surface of deck panels also exhibit transverse cracking.

   The epoxy coating on the support piling has roughly 25% remaining in the tidal zone. The pile coating is failing most severely near mudline due to high scour and sediment transport along the Homer Spit. There are numerous locations on the pipe piles where coating failure has occurred above the tidal zone with diameters of up to one foot. There is also minor surface rust forming at the pile top plate boundaries at the embedment locations to the cap soffits. There are 230 pound anodes installed on fender piles as part of the new construction; the dock support piles are bonded via thermite welds and heavy wire. The 2018 Underwater Inspection found only minor section loss (4-5%) typical for all piles.

   AMHS has no control of the dock or its operations. AMHS is not responsible for dock maintenance. Problems caused by others (such as overload damage or closure due to non-maintenance of critical items) would impact AMHS operations.

2. The fender system was replaced completely in 2015 and five (5) new pin-pile supported fender panels were installed between the existing panels, to improve the berthing capacity of the dock face for AMHS vessels, freight/fuel barges. Fender panels on dolphins S1 & S2 were also replaced on the 2015 project. A pulley is chained to the handrail on dolphin S1 to aid in line-handling.

3. There are several cracks in the catwalk handrail to S1. These likely formed as micro cracks while in the galvanizing tank during production, and progressively grew in size with repeated freeze-thaw cycles in the field.

   The City of Homer installed a small bollard for use in tying off mid-ship lines, but the bollard is too small for handling lines from AMHS vessels.

4. Utilities run along the west side of the East approach. Several security cameras were installed around the terminal as part of the Homeland Security upgrades in 2005. Dock lighting is from tall mast lights mounted at each corner. High mast lights mounted on the dock don't come on until it's very dark, i.e. the photo cell sensor isn't adjusted correctly. It also appears that seabirds have built nests on the central top cap of the luminaire mast arms. The dock and approach carry fueling lines.

5. There is no luggage cart or pallet-jack at the terminal. The Tustumena must unload its truck onto the dock to move AMHS freight to storage and vice-versa. All freight is hand-loaded. In 2015 a 3-sided structure was built above the existing pedestrian walkway on the approach trestle to protect walk-on passengers from the elements while loading.

6. The terminal building exterior is weathered and has algae growth. The siding above the eaves is heavily warped, which provides an entrance for moisture to enter the roof overhang. Exterior vent openings are freely corroding. An exterior door on the west side of the terminal building has a broken latch mechanism in the door frame. The terminal manager plans on building an internal wall to separate the ticket counter from the office space, which is currently one open space. The electronic notice board mounted on the wall next to the ticket counter is a nice feature for communicating general information to the customer, especially during peak hours. Flourescent lights inside terminal building are not functioning properly. Some lights do not work at all while others are very dim. The urinal in the men's bathroom was positioned too low, and results in splash issues. The ceiling fan is unbalanced.

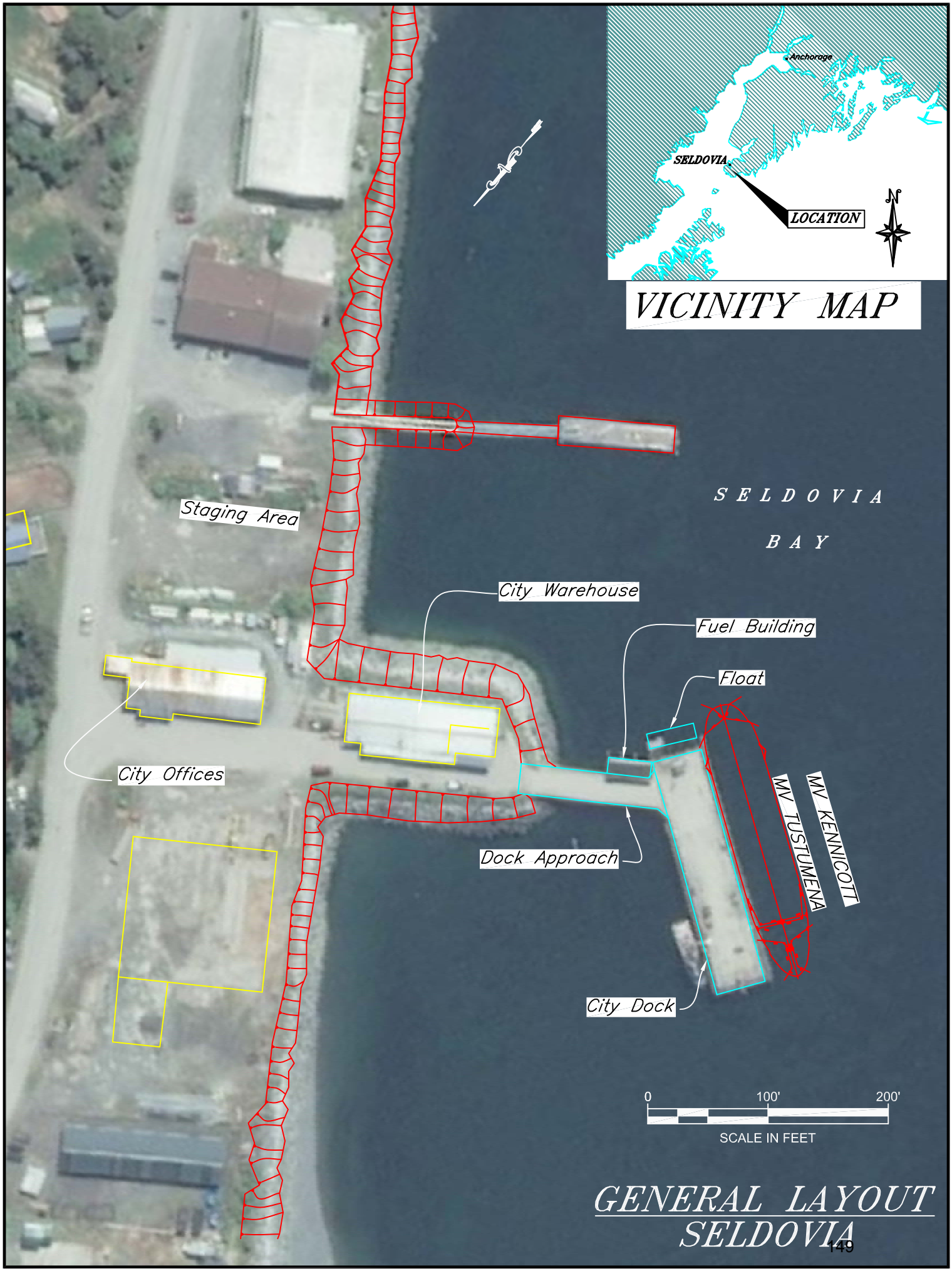
7. The pursers shelter, located at the beginning of the approach trestle on shore, has a rusting door and the siding is rotting.

8. The ferry terminal parking lot is reportedly low on ADOT priority list for snow plowing in winter. The City plows the dock regularly. Plows have damaged the corner of the curb near the east side of the terminal building. There are intermittent drainage problems in the parking lot. Half the drainage is directed to one of two field inlets, and the cross-slope is nearly flat. The outlet pipes may be tidally influenced and there may be winter freeze-up problems, which both lead to standing water in the parking lot.

Observations (continued)

9. A 36’ x 60’ storage warehouse was built off-site in 2011. Water puddles in the pavement near the north corner. This corner was struck by a delivery truck and needs to be repaired. There is grass growing out of the gutter near a downspout.
10. The existing timber dock is deteriorating rapidly and should be demolished and removed as soon as possible. It is no longer safe for human occupancy and has become a nesting site for seabirds.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
None noted.		
Category II - Rehabilitation Work		
Dock Support Piling	1	Monitor the piles for coating loss, corrosion and/or structural section loss. Program a project to wrap the pipes in the tidal zone with plastic sheathing.
Catwalk	2	Monitor the cracks in the handrail posts. Program a repair project in future.
High-mast lights	3	Program a project to adjust the sensitivity settings of the high mast lights on the dock to turn on before dusk and turn off after dawn.
Parking Lot	4	Monitor the condition of the parking lot pavement and shoulders, and look for other signs of drainange/overflow damage.
Terminal Building	5	Program a project to replace siding and re-coat the exterior of the terminal building. The project will also include repairs to the broken latch in the terminal building exterior door, replace fluorescent ceiling light fixtures with more modern/durable LED's, balance the ceiling fan, raise the urinal in the men's bathroom.
Category III - Upgrades Needed		
None noted.		


Anchorage
SELDOVIA
LOCATION
VICINITY MAP
Staging Area
SELDOVIA
BAY
City Warehouse
Fuel Building
Float
City Offices
MV KENNICOTT
MV TUSTUMENA
Dock Approach
City Dock
0
100'
200'
SCALE IN FEET
GENERAL LAYOUT
SELDOVIA

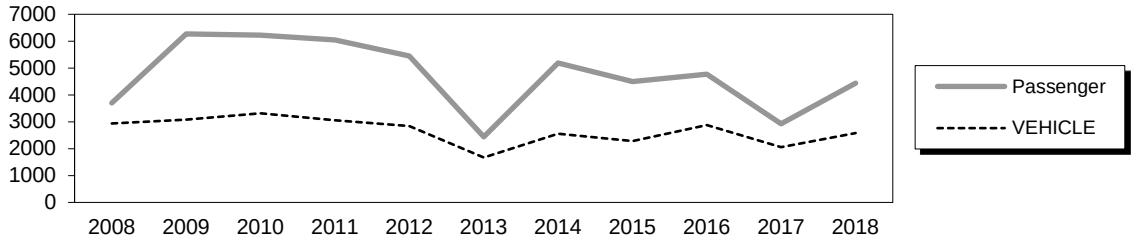
Seldovia City Dock

Dock Street

Owner: City of Seldovia

Terminal Manager: Layla Pedersen, Harbormaster, 907-234-7886

Terminal Description: Seldovia City Dock is a multi-purpose dock owned and operated by the City of Seldovia. The City & AMHS have an agreement for docking use. The dock is supported on steel pipe piling and has a steel and concrete superstructure with a steel wale, timber faced fender system. Vehicle access is via Dock Street and across a steel approach structure. There is a designated AMHS vehicle staging area (on City owned property), but no terminal building or other upland ferry terminal related facilities. This staging area does not appear to be utilized by ferry traffic. The dock and approach area has a fueling station, fuel storage facilities and serves as a freight wharf. The past 10 years of total passenger and vehicle traffic at Seldovia is shown below. The M/V Tustumena was out of service most of 2013, causing a steep dropoff in traffic at the terminal.



The most recent above water survey was completed on August 24, 2018. The underwater inspection occurred on September 26, 2018 and the fracture critical inspection was on September 27, 2012.

Vessels	
Name	Berthing, Alignment
Tustumena/Kennicott	Starboard

Tidal Data (MLLW 0.0 feet)	
EHW	25.1
MHHW	18
MHW	17.2
ELW	-7.0

Utilities @ Dock	
Electrical:	Yes
Water:	Yes, 1-1/2" PVC within insulated 5" PVC
Fuel:	Yes, three 4 1'2" diameter

Dock Approach - #1423	
Type:	21.5' x 120' composite girder
Year Built:	1967
Shoreward support:	Concrete Abutment
Seaward support:	Concrete capped, steel pile
Coating:	Spray metallizing
Lighting:	Light pole on shore side
Condition:	Fair

Terminal Building
N/A

Uplands	
Short-Term Parking:	10 cars (in lot next to the City office building).
Long-Term Parking:	10 cars
Staging Area:	420 lineal feet
Paint Striping:	No
Driving Surface:	Asphalt/Gravel

Generator & Building
N/A

City Dock	
Type:	44' x 208' Concrete Panels
Year Built:	1967
Support:	14" & 16" dia Steel Pipe Piles
Coating:	Covered with dielectric grease and plastic sheathing in 1991.
Fender Support:	HP 14x73, 10' apart
Fender Face:	12"x12" Douglas Fir
Anodes:	Yes- last checked 2004
Lighting:	Light poles, east and west ends of dock.
Condition:	Fair
Notes:	Red navlights - east light pole.
Load Posting Sign:	N/A
Original Design Load:	HS20-44

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1967	E.D.A Proj # 07-1-00030	City of Seldovia City Dock	Original construction of the City Dock, Dock Approach and Utilities.
1991	74610 / F-013-1(2)	Seldovia Ferry Terminal	Installed the fender system along the north face of the dock. Also rehabilitated the existing dock support piles by filling batter piles with concrete, installing pile sockets, and coating & wrapping all existing steel pipe piles with dielectic grease and plastic sheating. Installed fence, signs, light poles and wiring to the uplands parking area.

Observations

1. The original dock was constructed in 1967 and is basically sound. By 1988 most of the epoxy coating on the dock support piles had failed and they were freely corroding. Later that year, underwater video and UT inspection was performed to identify the extent of pile corrosion and was used as the basis for determining rehabilitation of the structure. In 1991 the piles were structurally repaired and corrosion protection was installed to minimize further section loss. Repair consisted of filling the piles with 5000 psi concrete, cleaning and coating the piles with dielectric grease, and installing a protective plastic wrap over the gel coating. The plastic wrap was secured in place with stainless steel straps and aluminum alloy anodes were installed at elevation -10.0 ft. to provide cathodic protection.

   The 1993 underwater inspection (UW) indicated that the anodes appeared to be functioning as designed, however the stainless steel straps located nearest the mudline exhibited some corrosion. At least two of the bands had broken. The 1997 UW inspection showed that many of the stainless steel bands had failed and that the plastic protective jackets were coming loose. The May 2004 UW inspection again noted that a large number of the stainless bands had failed and the remaining bands were corroded. Approximately 35 piling had jackets missing or loose. In 2006, the City Public Works replaced the corroding stainless steel bands with plastic bands. The anodes were reported to be in good condition at that time. Due to the nature of the plastic pile jackets, there is no way to take UT measurements or Cathodic Protection readings (need an exposed piece of steel pile). The portion of the piling right beneath the concrete caps is not covered by plastic sleeves, but most appear to still have some epoxy coating remaining in this area. It is unknown the condition/extent of sacrificial anodes on the piles.

   The 2018 Underwater Inspection report found several areas of loose pile wrap at the following locations:

   • Pile C3: 10 ft from the channel bottom for a height of 5 ft. The overlapping wrap section below the loose section is still in place and protecting the pile.
   • Pile D2: the top corner of the wrap is loose approximately 5 ft from the waterline. The overlapping wrap section below the loose section is still in place and protecting the pile.
   • Pile F3: A 10 ft long section from the mudline upward edge is loose. The overlapping wrap section below the loose section is still in place and protecting the pile.

   All of the cathodic protection system anodes have a remaining section of less than 20%. There are two sizes of anodes 4 ft long by 3 in by 3 in on Bents A to D and 4 ft long x 2 in by 2 in on Bents E to M. Isolated anodes are partially buried throughout the structure.

2. The approach span consists of steel plate girders with a cast-in-place concrete slab, curb, and guardrail. The shore end bears on bearing plates, while the seaward end is cantilevered and is supported by a concrete pile cap. The steel girders were cleaned and spray metalized in 1991, but some metalizing did not bond. The surface of the steel beams exhibit moderate-to-heavy surface corrosion on the lower flange and web, extending roughly 20-feet from the shoreward abutment. This is likely due to saltwater-spray at high-tide coming off the rock riprap during storms. Above the brown rust is white rust from the oxidization of the spray-metalized coating.

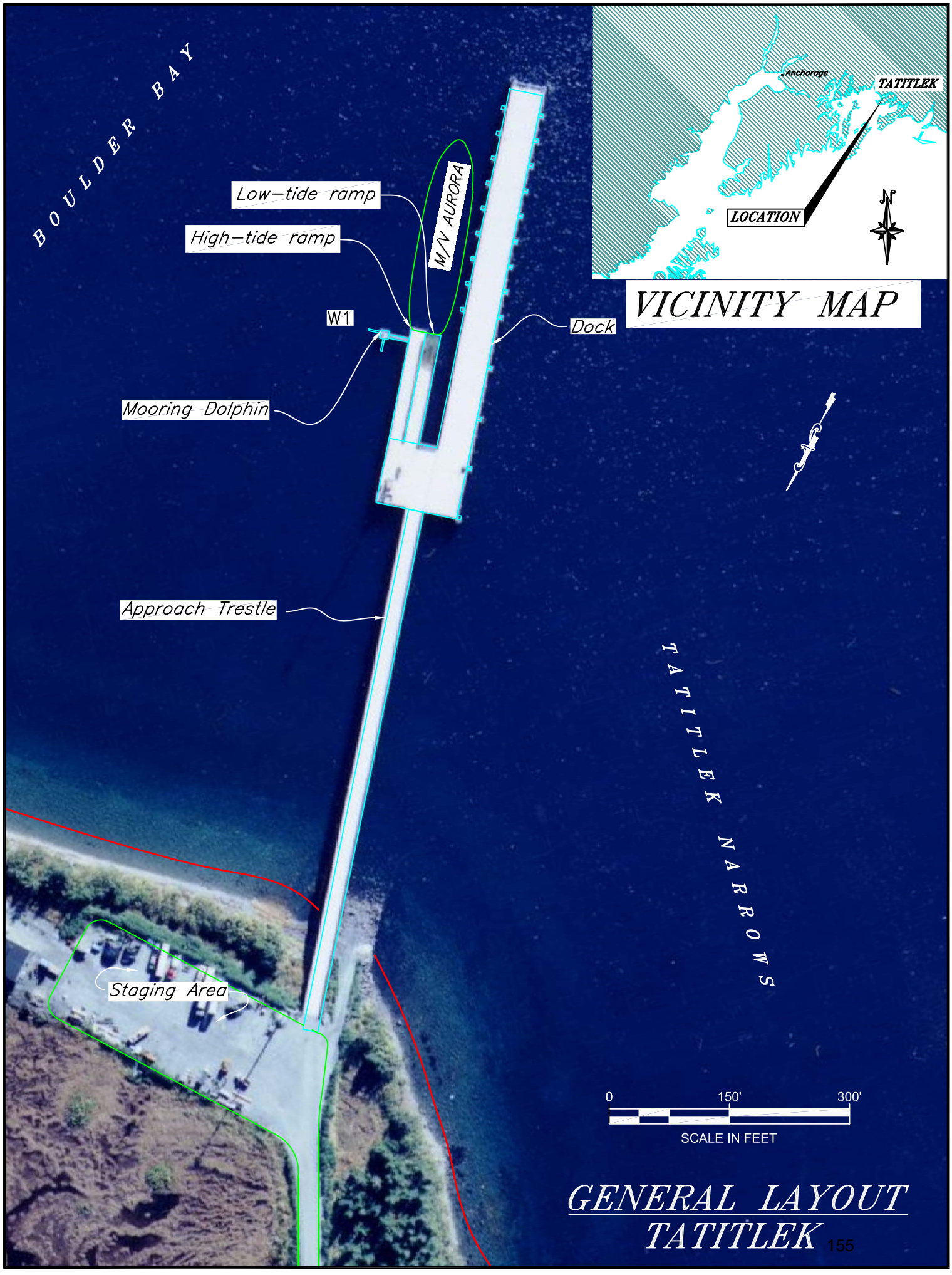
   The sliding plate bearings at the shore abutment are in need of repair. The interior bearing material is neoprene with an internal sandwich of steel shims. The top plates are worn on the seaward end and should be replaced. The south bearings have corrosion over 90% of their exposed surfaces.

The north bearings are most likely exposed to less sea spray, which is why they only have 30% surface corrosion. All bearings should be re-coated.

3. There is a concrete backwall at the abutment that retains fill and supports a small approach slab. A corrugated metal pipe is supported under the bridge and the pipe penetrates the back wall. A crack runs horizontally through the pipe penetration and across the backwall. The approach slab is cracked and has settled slightly because soil behind the backwall and beneath the slab is gone, and the slab is acting like a bridge.
4. The guardrail transition posts at the approach abutment have been undermined due to erosion around the abutment sidewalls. The end guardrail sections are loosely chained to the bridge rail. The height and post spacing of both left and right guardrail transition sections, leading into the bridge railing, is substandard. Handrail along the bridge does not meet safety standards.
5. A fence located along the south property line of the designated staging area has been damaged.
6. There is a broken flex conduit coupling at the right side abutment. Conduit at the base of the light standard, in the same area, is broken and wires are exposed.Several utility appurtenances are covered by weeds and wild grasses about 10-feet back from the right bridge abutment. The guardrail has also come unbolted from the backup post in this area.
7. A fuel building, supported separately from the dock on two rows of creosote-treated timber piling, is located next to the southeast corner of the dock. The piling look in fair condition above the waterline, but it is unknown the integrity of the timber below this level. We weren't able to look inside the fuel building, but the exterior is in fair condition. The City had notified DOT that the fuel building suffered damage after an earthquake in January of 2016. The City stated the timber pile-supported structure was swaying back-and-forth several inches with wind and tidal action. The City tied one corner of the timber structure to the existing dock. This was accomplished by wrapping a steel chain between two piles on the adjacent structures. During the site visit, the inspection team could not detect any movement in the structure.
8. The dock is comprised of several precast, prestressed concrete deck panels spanning between concrete cast-in-place pile caps supported by steel piling. During the 2006 inspection cycle holes in the deck were filled with grout, three new 4 ½" dia. fuel lines were installed between the Chevron building and the Dock, and holes were patched in the surface of the Dock. The 2012 Fracture Critical inspection report found numerous hairline cracks with rust staining and small-diameter spalls on the lower portions of the seaward end of Bent Cap M, directly above a support pile.
9. There are random, intermittent shorts in the dock lighting electrical circuit and City maintenance believes the source to be the main circuit breaker box, mounted on the side of the south corner of the dock. The breaker panel is old and weathered from constant exposure to salt spray and weather.
10. A small jib crane located on the seaward side of the dock is used to load and offload smaller boats using the facility. The crane location conflicts with the passenger loading ramp on the Tustumena. It may be necessary to relocate the crane in the future.

    A waterline runs along the right side of the bridge and approach. It ends at an insulated tee-connection with 2 valves at the intersection of the approach and dock. One valve is fitted with a short section of waterline hose to continuously run during winter months. The M/V Tustumena takes on water in Seldovia. The water source in Seldovia is reportedly very high quality.
11. The fender panels are timber-faced with steel w-beam vertical and horizontal wales, steel h-pile supports with horizontal chains connecting the upper wales with the concrete dock, and dampened by rubber energy-absorbing fenders at the upper wale. Maintenance has installed netting in the gap between the top wale and the edge of the dock to catch mooring lines thrown from vessels (6-inch openings). The netting has torn on the south corner. Upper fender wales do not have drain holes so the webs are retaining precipitation and corrosion is forming on the surface. The fender timbers are a mix of Ekki and Douglas Fir. The Ekki timbers are in very good condition, while the Doug fir shows checking/gouging near the upper bolt holes.
12. Grout is crumbling around the baseplates of the bollards. It appears that there were removable bull-rails along the front of the dock, but only short sections (with torn away connection plates) remain.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Approach Slab & Backwall	1	Fill void between the approach slab and the backwall, grout repair the crack in the backwall and/or remove the existing culvert. Stabilize the soil/riprap around the outer sidewalls.
Approach Guardrail and Handrail	2	Replace the substandard guardrail transition at the entrance to the approach structure with standard thrie-beam guardrail, and re-fasten the bolts of the guardrail on the right side. Replace the broken conduit couplings. Trim the weeds back to utility boxes.
Fuel Building	3	The City should continue to monitor condition of the support piles, especially looking for displacement during severe storms.
Category II - Rehabilitation Work		
Dock Piles /Fender Piles	4	Grind off the welds on Row 2 piles, Main Dock; coat remaining steel surface with dielectric grease & cover with plastic sleeves. Maintain anodes.
Approach Span	5	Investigate recoat of approach girders.
Dock - Moveable Curb	6	Repair/replace the moveable curb.
Shoreward & Seaward Abutments	7	Replace the top plate and re-coat the remainder of the sliding plate bearings on both the shoreward and seaward ends.
Bull-rail	8	Replace the removable bull-rail that was torn out. DOT paid for first install, check with City for matching funds on the second install.
Approach Girders	9	Program the girders of the approach structure for a re-coat, especially the shore side ends.
Lighting	10	Electrical inspection to investigate the circuit breaker problems with the dock lighting circuit.
Fender Wales	11	Drill drain holes in upper fender wales.
Category III - Upgrades Needed		
None noted.		



GENERAL LAYOUT
TATITLEK

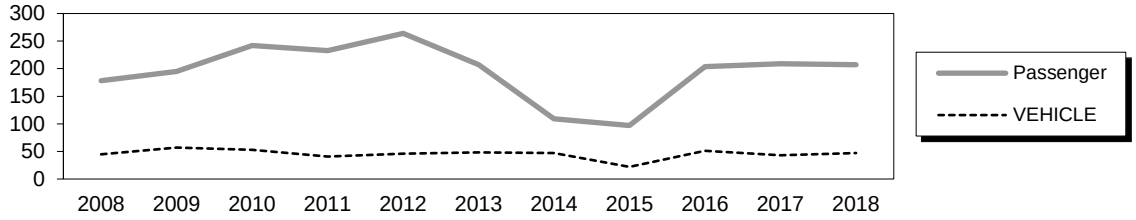
Tatitlek Dock

Owner: North Pacific Rim Housing Authority

Terminal Manager: Floyd Robart – 907-325-2352

Terminal Description: The Tatitlek facility is a multipurpose dock structure that was originally constructed in 1995 to accommodate the M/V BARTLETT. The Tatitlek facility consists of a staging area, an approach, a dock and two tidal ramps constructed of concrete panels welded supported by steel beams and piles. AMHS has an MOA for use of the dock for ferry operations. Ownership of the facility was transferred to the North Pacific Rim Housing Authority (NPRHA) in 1999.

The past 10 years of total passenger and vehicle traffic at Tatitlek is shown below.



The most recent above water & fracture critical inspections occurred on August 22, 2018. The most recent underwater inspection occurred on August 20, 2016.

Vessels	
Name	Berthing, Alignment
Aurora	Stern

Tidal Data (MLLW 0.0 feet)	
EHW	15.3
MHHW	12.6
MHW	11.8
ELW	-3.9

Utilities @ Dock
This facility does not have utilities at the dock.

Generator & Building
This facility does not have a generator on-site.

Approach Trestle	
Dimensions:	21' wide x 600' long
Year Built:	1995
Shoreward support:	Concrete abutment
Seaward support:	Steel pipe piling
Pile Coating:	Galvanizing
Anodes:	No
Lighting:	N/A
Condition:	Good
Load Posting Sign:	30 Ton Axle/45 Ton Max
Original Design Load:	AASHTO HS-25

Uplands	
Short-Term Parking:	N/A
Long-Term Parking:	N/A
Staging Area:	N/A
Paint Striping:	No
Driving Surface:	Gravel

Terminal Building
This facility does not have a terminal building.

Dock & Tidal Ramps - #0183	
Type:	40' x 515' Concrete Panel Dock; (2) - 18' x 130' tidal ramps
Year Built:	1995
Support:	Vertical & Battered Steel Pipe Piles
Steel Coating:	Galvanizing
Fender Support:	Steel Pin Piles
Fender Face:	12"x12" Douglas Fir
Anodes:	No
Lighting:	Tall Mast Light in parking lot
Condition:	Good
Notes:	Red navlight, southeast corner
Load Posting Sign:	30 Ton Axle/45 Ton Max
Original Design Load:	AASHTO HS-25/30 Ton Forklift/250 psf Uniform Load/ 40 Ton Mobile Crane w/ Crane Mats Centered on Girders

Dolphins							
Dolphin	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Notes**
W1	2B, 1V	-	-	No	1995	Fair	Red navlight

LEGEND
V = Vertical Steel Pipe Piling B = Battered Steel Pipe Piling TR = Tidal Ramps

Catwalks / Gangways								
#	**From Struct.**	**To Struct.**	**Length / Style / Main Members**	**Built**	**Safety Chains?**	**Cond.**	**Lighting**	**Notes**
C1	TR	W1	25' / Catwalk / Pony Truss	1995	No	Good	None	

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1995	N/A	Tatitilek Dock & Tidal Ramps	Original construction of the dock and tidal ramps, uplands, lighting, and electrical installations.

Observations

1. The dock is currently in good condition. The dock driving surface is prestressed concrete panels, with a rough traffic surface, welded to the bridge superstructure. The bridge beams are continuous span, welded box beams, and the substructure is composed of pipe piles driven and socketed to the underlying bedrock. The dock does not have a cathodic protection system. The bridge abutment is concrete. Portable construction barriers are placed at the end of the dock, behind the two dock light fixtures. The permanent light fixtures do not function, which helps explain why the reflective barriers were placed. The swinging bullrail on the dock, for the TUSTUMENA, does not close properly. The galvanized coating is failing and various areas on the girders are blistering.
2. There is surface rust on the bullrails and some of the bullrails are missing bolts from their attachment plates in several places on the dock.
3. Rust is bleeding through the spray metallized coating on the steel pile caps and girders. The coating on most of the field welds has failed and the splices are corroding. The most recent underwater (UW) inspection reported minor corrosion of the galvanized piles at the field splices, field connections, and at isolated locations of mechanical damage. The most recent fracture critical (FC) bridge inspection noted that the box beam girders are sealed and cannot be inspected. There is no cathodic protection system for the piling, however the galvanized coating appears to be adequate. The rubber ramp fenders are generally in good condition with minor mechanical abrasion damage in places.

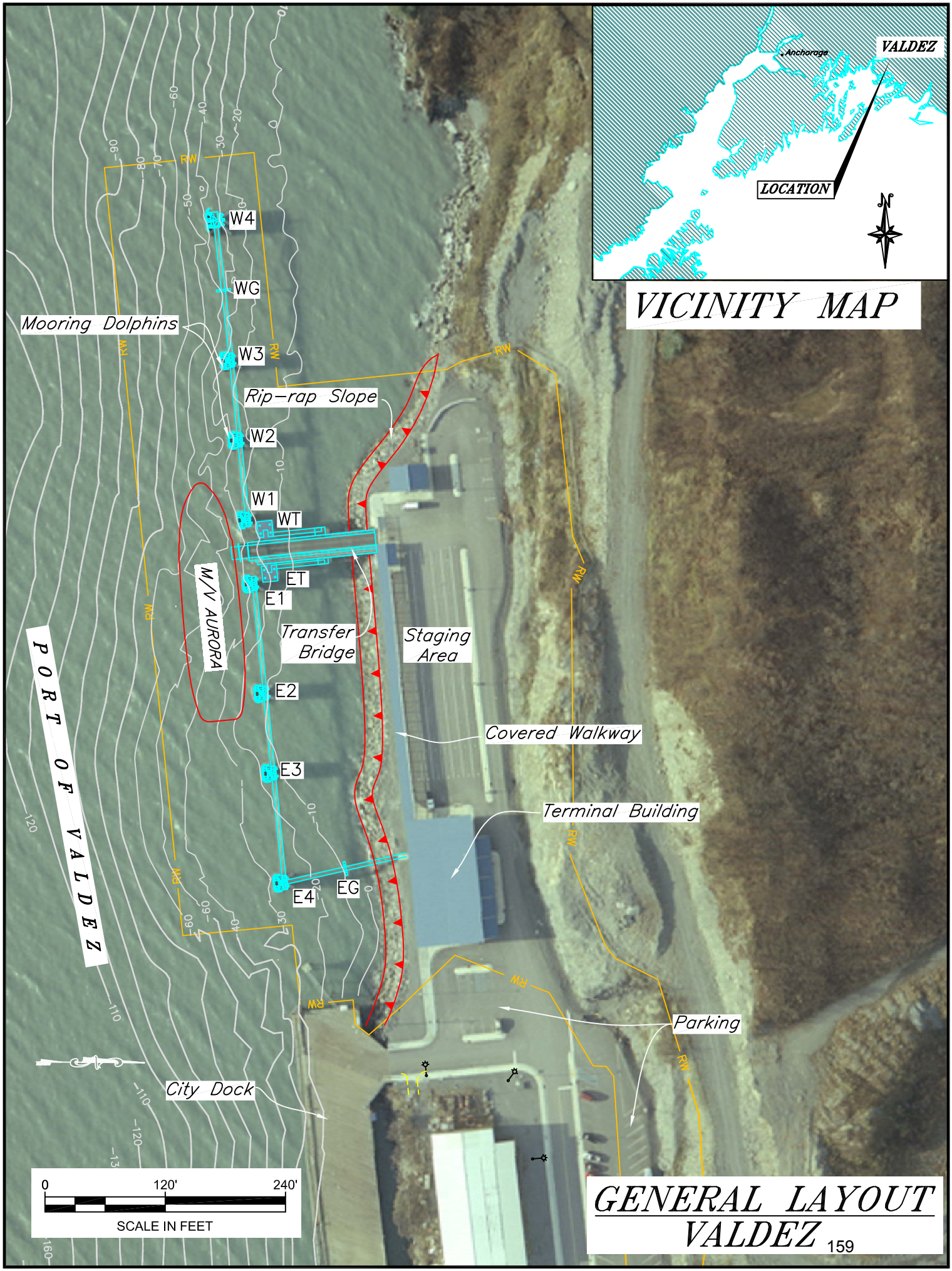
   According to the most recent FC inspection report it is noted that the box girders, especially those at the tidal ramps, have algae and white rust on the exterior surfaces. The white rust is an indication that the protective zinc coating has failed. There is also a great amount of corrosion occurring due to the high electrical conductivity of the seawater facilities.
4. The most recent UW inspection indicated that the support piles have light to moderate corrosion in various locations, but most are within the tidal zone. The piles exhibiting the most corrosion were located towards the seaward side of the dock.

   There has never been either an active or passive cathodic protection system on the dock.
5. The ends of the lower tidal ramp are very slippery due to marine growth. The marine growth needs to be removed periodically. The ends of the pre-stressed strands in the deck are exposed and beginning to corrode. The Aurora has a narrow tidal window to safely bear on the 24”Ø rubber fender mounted to the leading edge of the tidal ramps.
6. The transition plates from the trestle to the tidal ramp are warped and the transition plate between the trestle and the dock is loose and makes noise when vehicles are passing over.

Observations (cont'd.)

7. The concrete backwall, which retains the approach embankment, is undermined for full length x 12-inches high x 27-inches deep of penetration. The backwall is supported by the girders cantilevering across Bent A1 and the undermining does not affect the stability of the backwall. According to the design plans, the lower 18 inches of the backwall should be buried in the embankment. This condition could allow the approach fill to spill out from under the backwall and cause settlement of the approach roadway at the backwall.
8. Potholes up to 3 ½" deep are present at the approach roadway adjacent to the Approach Dock.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Nothing required.		
Category II - Rehabilitation Work		
Concrete Dock Panels	1	Clean and seal exposed steel on ends of precast concrete panels.
Concrete Backwall	2	Place riprap in front of the backwall, and in-fill shot-rock behind the backwall.
Steel superstructure	3	Install anodes on all piling and repair the coating on field welds using Galvcon or simliar products to extend pile life. Drill and tap inspection port holes in the box beam end caps.
Miscellaneous	4	The marine growth needs to be removed periodically on the tidal ramps. Repair the bull rail gate by shimming the roller.
Support Piles	5	Monitor the rate of corrosion in the support piles and PT strand end terminals (tidal ramp decks).
Miscellaneous	6	Replace the missing bolts on the bullrails and monitor the wood for deterioration and monitor the transition plates.
Category III - Upgrades Needed		
Fender Panel	7	Program a future project to install a fender panel in front of the tidal ramps. The Aurora has a narrow tidal window to safely bear on the substandard rubber D-fender mounted to the leading edge of the tidal ramps.


VALDEZ
Anchorage
LOCATION
N
VICINITY MAP
W4
WG
W3
W2
W1
WT
ET
E1
E2
E3
E4
EG
Mooring Dolphins
Rip–rap Slope
M/V AURORA
Transfer Bridge
Staging Area
Covered Walkway
Terminal Building
Parking
City Dock
PORT OF VALDEZ
RW
0
120'
240'
SCALE IN FEET
GENERAL LAYOUT
VALDEZ

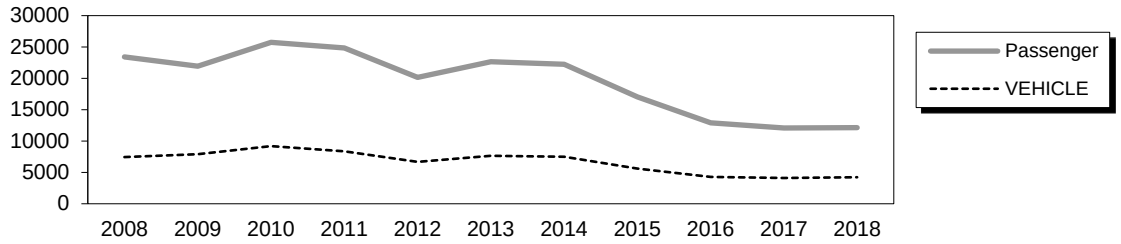
Valdez Ferry Terminal

520 Ferry Way

Owner: State of Alaska

Terminal Manager: Allen Chafin, 907-835-4503

Terminal Description: Valdez is a side-loading facility consisting of a dedicated staging and parking areas, terminal building, covered pedestrian walkways, steel transfer bridge with a cable supported bridge lift (Syncrolift) system, eight steel pile dolphins and catwalks/gangways for line-handling access. The past 10 years of total passenger and vehicle traffic at Valdez is shown below.



The most recent above water survey & fracture critical inspection was completed on August 22, 2018. The underwater inspection occurred on August 11, 2017.

Vessels	
Name	Berthing, Alignment
Aurora/Kennicott	Port/Starboard
FVF	Starboard

Tidal Data (MLLW 0.0 feet)	
EHW	16.5
MHHW	11.8
MHW	10.9
ELW	-6.0

Terminal Building	
Year Built:	2006
Square Footage:	4500 s.f.
Heating System:	Furnace
Fuel Storage:	UST
Fire Protection:	Alarm Pyrotronics
Condition:	New

Generator & Building	
Year Built:	2006
Square Footage:	300 s.f.
Heating System:	Electric
Fuel Storage:	AST
Fire Protection:	Halon
Condition:	New

Uplands	
Short-Term Parking:	6 cars, 2 hcp
Long-Term Parking:	38
Staging Area:	1500 lineal feet; 250 lineal feet-buses/trucks
Paint Striping:	Yes
Driving Surface:	Asphalt

Utilities		
	at Terminal	at Ramp
Electrical:	Yes, city & backup power	
Water:	Yes	Yes
Sewer:	Yes (City)	Yes
Telephone:	Yes	Yes
Fuel:	Yes, UST	No
Wireless Bridge:	Yes	-

Vehicle Transfer Bridge - #1429	
Type:	21' x 125' steel plate girder
Year Built:	2004
Shoreward support:	Concrete abutment
Seaward support:	Steel Lift Beam-Syncrolift
Coating:	Wasser Paint
Pedestrian Access:	Covered walkway, guardrail separation
Lighting:	Overhead fixtures
Condition:	New
Load Posting Sign:	N/A
Original Design Load:	HS 25

Dolphins								
Dolphin	Dolphin Piles	Fender Support	Fender Face	Anodes	Built	Cond.	Hawse Extensions	Notes
EG	1V	-	-	Yes	2004	New	Yes	
E4	2B, 2V	Hanging	UHMW	Yes	2004	New	Yes	Red navlight
E3	2B, 2V	Hanging	UHMW	Yes	2004	New	Yes	
E2	2B, 2V	Hanging	UHMW	Yes	2004	New	Yes	
E1	2B, 2V	Hanging	UHMW	Yes	2004	New	Yes	
ET	4V	-	-	Yes	2004	New	-	
WT	4V	-	-	Yes	2004	New	-	
W1	2B, 2V	Hanging	UHMW	Yes	2004	New	Yes	
W2	2B, 2V	Hanging	UHMW	Yes	2004	New	Yes	
W3	2B, 2V	Hanging	UHMW	Yes	2004	New	Yes	
WG	1V	-	-	Yes	2004	New	-	
W4	3B, 3V	Hanging	UHMW	Yes	2004	New	Yes	Red navlight

Catwalks / Gangways								
#	From Struct.	To Struct.	Length / Style / Main Members	Built	Safety Chains?	Cond.	Lighting	Notes
C1	Shore	EG	50' / Catwalk / 10"x10" Tube Girders	2004	Yes	New	Tubuloid	
C2	EG	E4	64' / Catwalk / 10"x10" Tube Girders	2004	Yes	New	Tubuloid	
C3	E4	E3	99' / Catwalk / 10"x10" Tube Girders	2004	Yes	New	Tubuloid	
C4	E3	E2	69' / Catwalk / 10"x10" Tube Girders	2004	Yes	New	Tubuloid	
C5	E2	E1	99' / Catwalk / 10"x10" Tube Girders	2004	Yes	New	Tubuloid	
C6	E1	ET	9' / Catwalk / 2.5"x2.5" Bottom Chord	2004	No	New	None	
G1	ET	EBP	44' / Gangway / 2.5"x2.5" Bottom Chord	2004	No	New	Tubuloid	
G2	WT	WBP	44' / Gangway / 2.5"x2.5" Bottom Chord	2004	No	New	Tubuloid	
C7	WT	W1	9' / Catwalk / 2.5"x2.5" Bottom Chord	2004	No	New	None	
C8	W1	W2	69' / Catwalk / 10"x10" Tube Girders	2004	Yes	New	Tubuloid	
C9	W2	W3	69' / Catwalk / 10"x10" Tube Girders	2004	Yes	New	Tubuloid	
C10	W3	WG	64' / Catwalk / 10"x10" Tube Girders	2004	Yes	New	Tubuloid	
C11	WG	W4	64' / Catwalk / 10"x10" Tube Girders	2004	Yes	New	Tubuloid	

LEGEND

ET = East Lift Tower
G1 = Gangway
V = Vertical Steel Pipe Piling
EG = East Gangway Dolphin
B = Battered Steel Pipe Piling
WBP = West Bridge Platform

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1963	WM 63419	Valdez Ferry Terminal Facilities	Original stern-loading terminal constuction consisted of uplands fill, three timber tidal ramps, and seven timber Duncan dolphins. Built next to the Valdez Boat Harbor pre-Good Friday Earthquake.
1968	3-68419	Valdez Ferry Temrinal	New terminal consturction, adjacent to the City Dock, consisting of new terminal building, two timber tidal ramps, four steel pipe pile and concrete capped breasting dolphins and two steel pipe pile and concrete capped mooring dolphins, with four timber access catwalks.
1987	RS-0400(2)	Valdez FT Rehabilitation	Replace timber tidal ramps and timber support piles with steel tidal ramps and steel support piles. Installed water, shorepower and illumination upgrades.
2004	75098 & 73652	Valdez FT Replacement	Demolished the existing stern-berth. Constructed new side-loading terminal facility consisting of terminal building, new uplands parking and staging areas, steel transfer bridge with Syncrolift system, and 8 breasting dolphins with catwalk access.
2009	69050 / SHAK - 0005(575)	Valdez - Ferry Dock Hoist Upgrade	Replaced the existing relay-based control panel for the transfer bridge lift system with a PLC-based control panel.
2009	73076	Valdez FT Security Upgrades	Installed security cameras on exterior of temrinal building, in the staging area and at dolphins on either side of the transfer bridge. Cameras are tied in to the AMHS security network.

Observations

1. The concrete sidewalk between the maintenance building and the transfer bridge is heavily scraped from snowplows pushing snow along the sidewalk and over the edge of the slope. There is a weight and length scale located on the north side of the terminal building for automated measurements of vehicles. The plastic wall covering in the terminal building has warped due to heat reflected from sunlight through the windows. Sections forward of the bathroom entrance are okay.
2. On February 27, 2014 the bridge was damaged when it was lowered and the stringers came into contact with a build-up of snow and ice under the west side of the abutment. The snow and ice acted as a fulcrum and pried three of the bridge bearings from the concrete abutment by fracturing the attachment bolts. A temporary repair was made that enclosed the damaged hinge base plates with a steel plate of a larger footprint. (8) ¾" dia. bolts were drilling and epoxied into the concrete abutment to hold each new plate into position. The new plate was welded to the old base plate with (4) 8 inch-long fillet welds. At the time of inspection these new base plates appeared to be in working order and in good condition.
3. The crew expressed having regular issues during loading and unloading operations of long wheel base vehicles due to having too small of a turning radius. One of the primary concerns is a narrow apron and railing that limits maneuverability.
4. On the 2016 above water survey it was observed that there are rust and coating failures along the welds of bridge lateral bracing connections at the girder webs. The root of the welds appear to be cracked as well.
5. The concrete bridge abutment was first noted as undermined in 2006. The construction drawings depict a 6"-thick layer of rock spalls beneath the abutment, with riprap piled ~12" above the front edge of the abutment toe. There is clearly a gap – roughly 2-6" high, full-length and width – beneath the concrete abutment.
6. The bridge uses a Syncrolift bridge lift system (electric winches with wire rope on both sides) to lift the seaward end of the bridge through the 20 foot tidal range. The apron is adjusted with hydraulic cylinders mounted on either side of the apron.

Observations (continued)

The non-skid coating on the apron has been scraped off in the middle due to low clearance vehicles bottoming out. The bridge has to be lowered and raised several times during loading and unloading operations to accommodate vehicles with low clearance.

The right syncrolift winch support beam was damaged in the winter of 2006 as a result of a frozen high-limit switch. The other side lowered while the right side stayed fixed, effectively transferring the entire bridge load to this single support. The flange of the west lift support beam was bent upwards 3/8" at the seaward, right side bolted connection. Maintenance repaired this by installing a shim in the gap between the winch connection plate and the support beam.

Perlson Shiplift was hired by AMHS Shoreside Maintenance to provide inspection services of the syncrolift system in 2010. The final report noted that repairs to the frame of both hoists (from '06 damage, noted above) were temporary and required a permanent fix. They recommended replacing the section of damaged top flange with a new piece of plate.

Controls for both the bridge lift system and the apron are located on the seaward end of the covered walkway. The original solid-state controls were replaced with digital controls in 2009. The new controls are backed up by software that has limits on the freedom of movement between the two lift towers. Faults are logged online, and major faults generate an email to AMHS Shoreside Maintenance.

On the lift tower enclosures, most of the bolts that fix the steel frame to the concrete cap have backed out from not being epoxied in place, or the bonding agent failed. The entire surface of the lower sheave pin on the seaward bridge lift beam is openly corroding (both left and right sides).

7. The access gangways do not have angle treads, which make it difficult to climb during low tide. The roller bearings in these gangways are corroding, neither have grease fittings.
8. The 2012 underwater inspection (UW) noted that all of the support piles have light to moderate marine growth from the low water mark to the channel bottom. The protective coating is in good condition

   The support piles were constructed with fresh anodes in 2004. The CP readings taken on the 2018 above water survey averaged -0.76, which indicates all dolphins are not adequately protected against corrosion. This indicates that the sacrificial anodes are depleted and require replacement.

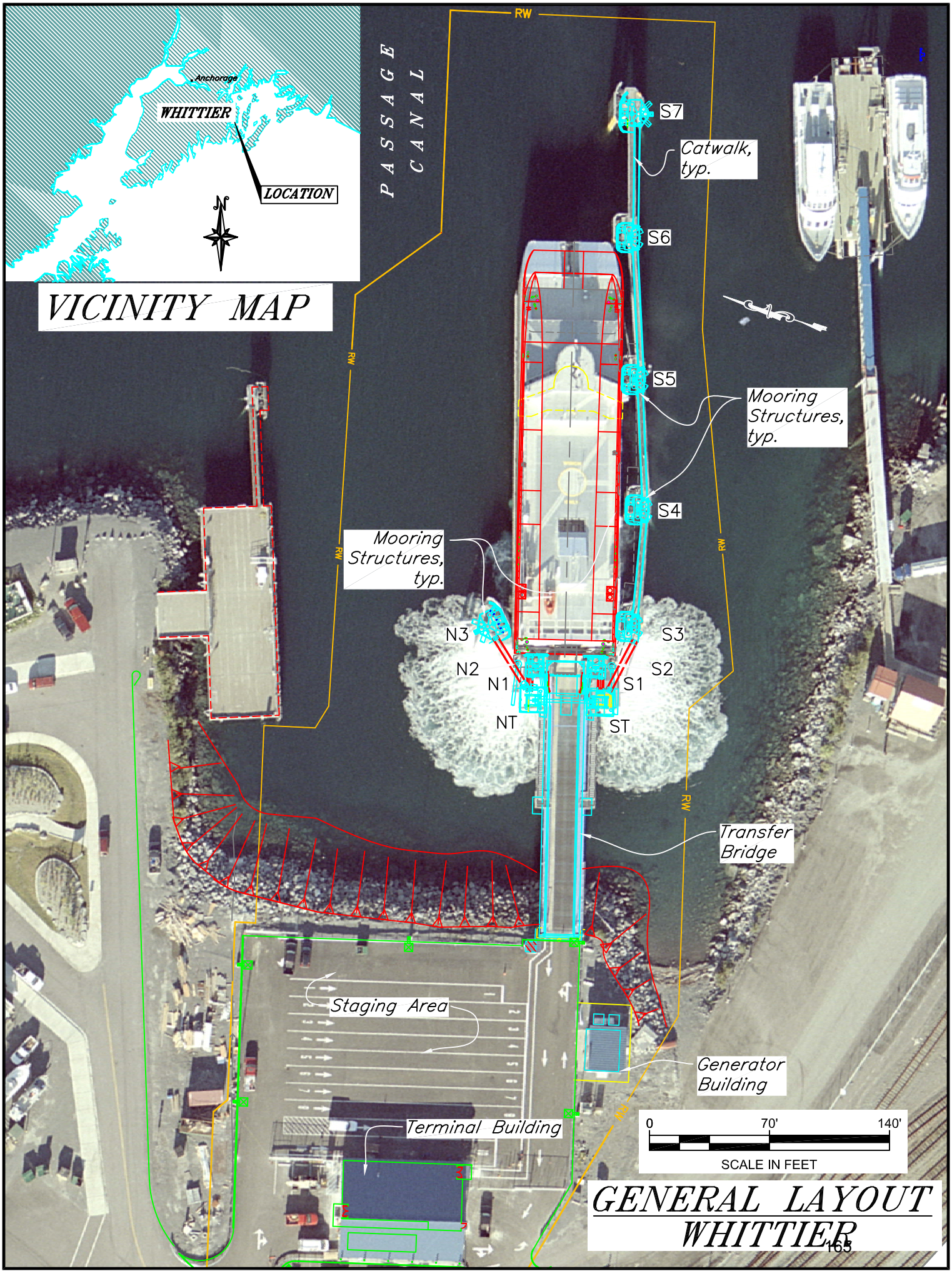
   Depth to mudline elevations, taken with leadline readings at each mooring dolphin along the fender face in 2018, range from -25 to -38 MLLW.
9. The dolphin caps were re-coated with a non-skid epoxy and are in good condition. Recoating of the caps was necessary as the initial coating had failed during construction.
10. Most of the non-skid coating application has failed on the bridge apron transition plate. There are several areas in which the paint has failed on the left side of the bridge apron, near the hinge beam-lift tower brace connection. The coating has failed on the inner flange of the sewer line valve at the bridge ramp. There are several areas in which the paint has failed on the left side of the bridge apron.

    The apron's hydraulic cylinders have leaky seals, and may require rebuilding soon.
11. The lowest donut fender bracket connection on the RT side (facing seaward) of dolphin E3 is broken or lost a mounting bolt.
12. The cover plate over the king pile was forced off the welded connection to the east gangway access dolphin (EG) cap assembly, exposing the interior of the king pile and bending a plate member of the cap above.
13. There are missing bolts on the UHMW panels on the following dolphins: W4: approx. 6 bolts, W2: approx. 32 bolts, 2 panels warping, W1: approx. 28 bolts, E1: approx. 16 bolts, 1 warped panel, E2: approx. 4 bolts, E3: approx. 25 bolts, 1 warped panel, E4: approx. 24 bolts, 2 warped panels
14. The splice in the mooring line for the Chenega bears and rubs directly against the hawse rail, causing high chafe.

Inspection Summary

Structure	Priority	Recommendations
Category I - Safety Repairs		
Syncrolift	1	Perform permanent repairs to lift hoist frame, both LT & RT towers. Repair the broken grout leveling pads as well. Installing the PLC system should solve most of syncrolift reset problems. Train all terminal personnel to properly rest the syncrolift and add the procedure to standard training manuals.

Inspection Summary (continued)		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Bridge Abutment	2	Place shot rock fill beneath the abutment, and add riprap scour protection in front of the toe at least 12" high, full-length.
Category II - Rehabilitation Work		
Shoreward Bridge Bearing	3	Monitor the temporary hinge baseplate repairs. Program a project to replace with galvanized steel and permanent concrete anchors.
Bridge	4	Inspect the bridge lateral bracing connections at the girder webs with NDT methods.
Bridge Apron	5	Re-coat the apron transition plate with non-skid.
Anodes	6	Program a project to replace anodes on all pile supported structures, and install bonding cables to all fenders.
Terminal Building	7	Replace the warped plastic wall covering with thin veneer plywood or other. Consider installing a dual-signal wireless router for public & business Wi-Fi.
Bridge Ramp	8	Monitor condition of the inner flange of the sewer line valve at the bridge ramp.
Bridge Apron	9	Monitor the condition of the steel in these areas.
Lift tower enclosure	10	Re-install bolts that fix the lift tower enclosure to the concrete cap; epoxy in place.
Weld coating repairs	11	Program a project to re-coat field-welds with zinc solder.
Dolphin E3	12	Repair the damaged fender donut bracket.
Pedestrian Walkway	13	Monitor the crack in the plastic of the gerbil cage pedestrian walkway along the bridge.
Syncrolift	14	Monitor the condition of the broken grout pads beneath the syncrolift winch support beams; replace if they deteriorate further. Monitor the corrosion of the lower syncrolift sheave and bridge lift beam pins and program for NDT testing at the 10-year service mark.
Dolphin W2	15	Remove debris caught in the lower fender connection bracket.
Access Dolphin	16	Repair the pile cap that has pried off of the east gangway access dolphin.
Catwalk Lights	17	Replace the tubuloid fixtures with jelly-jar fixtures when they have failed.
Fender Panels	18	Remove the UHMW plastic, replace failed steel suds on fender panels, increase the bore hole in the UHMW, and set the UHMW back in place.
Handrails	19	Drill a 3/8" Ø hole 4" from the base of each vertical handrail pipe in catwalks and especially gangways for drainage.
Bridge	20	Re-apply paint coating to areas of localized failure on the underside of the girders.
Concrete Abutment	21	Monitor the corrosion of the water pipe fittings inside the enclosure by the concrete abutment on the RT.
Category III - Upgrades Needed		
Bridge Apron	22	Program a project to install a wider apron with foldable railings to improve maneuverability for larger vehicles, also program a project to replace the hydraulic cylinders.
Gangways	23	Install gangway angle treads to provide a foothold for climbing the gangway at low tide.


Anchorage
WHITTIER
LOCATION
VICINITY MAP
PASSAGE CANAL
RW
S7
Catwalk, typ.
S6
S5
Mooring Structures, typ.
S4
Mooring Structures, typ.
N3
N2
N1
NT
S3
S2
S1
ST
Transfer Bridge
Staging Area
Generator Building
Terminal Building
0
70'
140'
SCALE IN FEET
GENERAL LAYOUT
WHITTIER

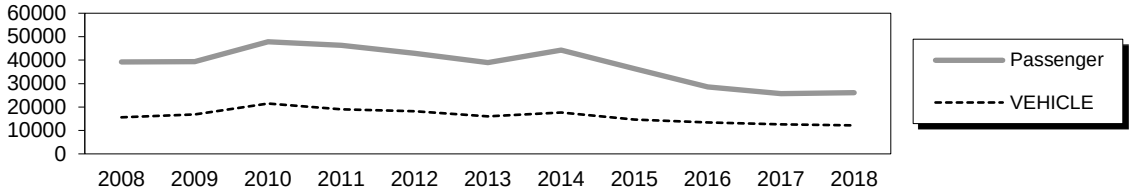
Whittier Ferry Terminal

¼ Mile Depot Road

Owner: State of Alaska

Terminal Manager: Stephanie Carlson, 907-472-2378

Terminal Description: Whittier is a stern-loading facility consisting of a transfer bridge, twin lift tower syncrolift, 10 steel pile dolphins and associated catwalks/gangways for line-handling access. The facility was upgraded from a timber tidal ramp to a lift and transfer bridge with steel mooring structures in 1988. Modifications were made in 2005 to accommodate the M/V AURORA, M/V KENNICOTT and the Fast Vehicle Ferry, MV CHENEGA. A single-lane highway tunnel and the Alaska Railroad provide access to Whittier from Anchorage and Portage. Like Valdez, this is a key connection point between Cordova and Anchorage. Tourism accounts for much of the summer traffic volume through this port. The facility went to year round service starting in 2005 with the reopening of the new modification project. The past 10 years of total passenger and vehicle traffic at Whittier is shown below.



The most recent above water survey & fracture critical inspections were completed on August 12, 2018. The underwater survey occurred on August 3, 2018.

Vessels	
Name	Berthing, Alignment
Aurora/Kennicott/FVF	Stern

Tidal Data (MLLW 0.0 feet)	
EHW	18.7
MHHW	12.3
MHW	11.3
ELW	-6.0

Terminal Building	
Year Built:	2005
Square Footage:	2200 s.f.
Heating System:	Furnace (Natural Gas)
Fuel Storage:	City Supply (Natural Gas)
Fire Protection:	Alarm Pyrotronics
Condition:	New

Generator & Building	
Building/Generator:	2005
Square Footage:	260 s.f.
Heating System:	Electric
Fuel Storage:	City Supply (Natural Gas)
Fire Protection:	Halon
Condition:	Good

Uplands	
Short-Term Parking:	3 cars
Long-Term Parking:	N/A
Staging Area:	1200 lineal feet; 125 lineal feet-buses/trucks
Paint Striping:	Yes
Driving Surface:	Asphalt

Vehicle Transfer Bridge - #1424	
Type:	16' x 140' twin box beam
Year Built:	1986
Shoreward support:	Concrete abutment
Seaward support:	Steel Lift Beam-Syncrolift
Coating:	Wasser Paint
Pedestrian Access:	Concrete 4' wide on bridge
Lighting:	None
Condition:	Good (see findings)
Load Posting Sign:	N/A
Original Design Load:	HS 20-44

Utilities		
	at Terminal	at Ramp
Electrical:	Yes, city & backup power	
Water:	Yes	No
Sewer:	Yes (Septic)	No
Telephone:	Yes	Yes
Cable TV:	No	No
Fuel:	No	No
Wireless Bridge:	Yes	-

Dolphins								
Dolphin	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Hawse Extensions**	**Notes**
N3	3B, 3V	Hanging	UHMW	Yes	2005	New	Yes	Red navlight
N2	1B, 1V	Floating	Rubber Fender	Yes	2005	New	Yes	
N1	2B,2V	Hanging	UHMW	Yes	2005	New	Yes	
ST	4V	-	-	Yes	1988	Good	-	
NT	4V	-	-	Yes	1988	Good	-	Light Pole
S1	2B,2V	Hanging	UHMW	Yes	2005	New	Yes	
S2	1B,1V	Floating	Rubber Fender	Yes	2005	New	Yes	
S3	2B,2V	Hanging	UHMW	Yes	2005	New	Yes	
S4	2B,2V	Hanging	UHMW	Yes	2005	New	Yes	
S5	2B,2V	Hanging	UHMW	Yes	2005	New	Yes	Light Pole
S6	2B,2V	Hanging	UHMW	Yes	2005	New	Yes	
S7	3B, 3V	Hanging	UHMW	Yes	2005	New	Yes	Red navlight & windsock

Catwalks / Gangways								
#	**From Struc.**	**To Struc.**	**Length / Style / Main Members**	**Built**	**Safety Chains?**	**Cond.**	**Lighting**	**Notes**
C1	N3	NT	34' / Catwalk / W 12x26 Custom Girders	2005	No	Good	Tubuloid	
C2	NT	N1	9' / Catwalk / W 4x13 Bottom Chord	1988	No	Good	Tubuloid	
G1	ET	EBP	52' / Gangway / S 4x9.5 Bottom Chord	1988	Yes	Good	Tubuloid	
G2	WT	WBP	52' / Gangway / S 4x9.5 Bottom Chord	1988	Yes	Good	Tubuloid	
C3	ST	S1	9' / Catwalk / W 4x13 Bottom Chord	1988	No	Good	Tubuloid	
C4	S3	ST	33' / Catwalk / W 12x26 Custom Girders	2005	No	Good	Tubuloid	
C5	S4	S3	57' / Catwalk / W 18x40 Custom Girders	1988	Yes	Good	Tubuloid	
C6	S5	S4	65' / Catwalk / W 18x40 Custom Girders	2005	Yes	Good	Tubuloid	
C7	S6	S5	72' / Catwalk / W 18x40 Custom Girders	2005	Yes	Good	Tubuloid	
C8	S7	S6	61' / Catwalk / W 18x40 Custom Girders	1988	Yes	Good	Tubuloid	

LEGEND

ET = East Lift Tower
G1 = Gangway
V = Vertical Steel Pipe Piling
EBP = East Bridge Platform
B = Battered Steel Pipe Piling

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1988	RS0830(1)	Whittier Ferry Terminal	Expanded uplands staging and parking area and constructed generator building. Dredged the mooring basin. Removed existing transfer structures and replaced with new steel transfer bridge and Syncrolift system. Removed existing timber mooring structures and replaced with steel mooring/fendering structures connected with steel access catwalks. Lighting and hydraulic lift control upgrades.
2005	67883 / NH-0496(007)	Whittier FT Improvements - Uplands & Terminal Building	Constructed uplands improvemnets, built new terminal and generator buildings and made utility upgrades.
2005	68335 / NH-0830(2)	Whittier FT Terminal Modifications	Removed existing mooring structures and replaced with ten new steel mooring/fendering structures.

Terminal Projects (cont'd.)			
Year	**Project #**	**Project Name**	**Description**
2008	73741	WIT Ferry Terminal Transfer Bridge Repairs	Harbor Welding repaired the FB-Girder weld cracks Dec 4th - 18th, 2008.
2008	69050 / SHAK - 0005(575)	Whittier - Ferry Dock Hoist Upgrade	Replaced the existing relay-based control panel for the transfer bridge lift system with a PLC-based control panel.
2011	N/A	WIT FT Building Repairs	Remove clerestory window & water-damaged wall frame.
2013	73125 (1)	WIT Staging Area Lighting Replacement	Remove & replace all exterior light fixtures in the staging area; replace conduit/wiring below the bridge, relocate to above the girder; other miscellaneous electrical
2013	N/A	Emergency Hoist Repairs	Repairs consisted of the complete replacement of all lift system components.
2016	N/A	WIT FT Bridge Strengthening	Installed a structural retrofit to the seaward end of the bridge to bring the load rating within standards for highway vehicles.

Observations

1. A repair project for the terminal building was designed & constructed in 2011.
2. Land area in Whittier is constrained. The ferry terminal property is substandard in size for the parking & staging needs of the Whittier terminal. Public parking near the terminal building may be insufficient. The staging area should be bigger to accommodate current & future traffic. The bridge transition plate is wearing into the pavement at the shore approach. There is a damaged section of guardrail near the bridge abutment. There are long pavement cracks near the transfer bridge abutment.
3. A project in 2013 replaced all the light poles with new high-wind rated poles.
4. The bridge is supported on the seaward end by a Syncrolift cable support system. The shore side end is supported by hinge bearings on a concrete abutment. In 2007, a frozen “normal up” limit switch on the left hoist of the Syncrolift led to one of the bridge girders being raised 4-feet higher than the other. Terminal personnel determined the cause of the problem, cleared the ice from the switch, and then the bridge operated normally. The problem has not reoccurred. Follow-up inspection revealed failed welded connections between the first floor beam and both girders. AMHS Shoreside Maintenance contracted the repair out to a certified-welder, Harbor Welding, and repairs were completed in December of 2008. On-site QC, including various methods of NDT, was performed by Mayes Testing Engineers.

   On the following inspection cycle in 2010, rust staining was discovered along the bottom of the first floor beam-to-girder connections. QA Services, out of Anchorage, removed the paint and verified the extents of the weld cracks with NDT methods. The most recent inspection found the following weld cracks:

   Girder 2 (RT) – FB 0 Exterior:

   - 1-1/2” crack between the top flange of FB and the Girder web.
   - A crack wraps around the top shoreward corner that is 1-1/2” along the top flange and 6-1/2” along the shoreward web of the FB.

   Girder 1 (LT) – FB 0 Exterior:

   - 1-1/8” long crack between the top flange of FB and the girder web.
   - A crack wraps around the top shoreward corner that is 7-1/2” along the top flange and 4” along the shoreward web.
   - There is a 3-3/4” long crack between the girder end plate and girder web
   - A crack along the entire lower flange of the FB and wraps around both corners and up the web of the FB on both sides 3”

   Girder 2 (RT) – FB 0 Interior:

   - 1-3/4” crack reflecting through the web from the exterior, near the first bearing stiffener

- 5” crack reflecting through the web from the exterior, near the girder end plate

Girder 1 (LT) – FB 0 Interior:

- 3” crack reflecting through the web from the exterior, near the first bearing stiffener
- 4” crack reflecting through the web from the exterior, near the girder end plate

These weld cracks have continued to propagate, albeit at a slow annual rate, along the web weld between the FB and Girder. This weld is the primary path for load transfer of vehicle loads.

5. The 2006 inspection of the transfer bridge discovered that the pin of the right shoreside hinge is rotating relative to the base. The keeper bars, that restrict movement of the outboard nut, have been forced aside, permitting the nut to rotate as the bridge is raised and lowered. Shore personnel have been alerted to monitor the position of the pin. The most recent inspection found the gap between the nut and the bearing assembly hasn’t changed in several years.

   The seaward hinge bearings, on the lift beam, do not appear to rotate as the bridge is raised or lowered. Most likely the bearing surfaces seized due to inadequate lubricating grease. The platform on the lift beam for maintenance access is too narrow to use, so greasing can only be done from skiff.

6. An AMHS Maintenance project replaced the 2005 PLC controls with a new PLC automated control system in 2008. The bridge controls have stabilized, but if faults occur, they can be monitored on the internet. The elevation of both girders is gauged, and the software was written to stop operations and reset levels when an elevation variation greater than 2” occurs.

7. Heavy condensation exists on the interior of girder 1 and 2 and all associated components. These moist conditions have resulted in heavy laminating corrosion on top of the bottom flange plate, with up to 1/16-inch section loss. Several custom clamps holding down the open grid deck are loose or unfastened. When the apron is stowed in the ‘up’ position, during heavy offshore winds it can be blown shoreward and locked in place. The only method of freeing up the apron is to lower the bridge, which drops the apron suddenly onto the apron lift beam. Water enters the box girders thru open vent caps on the seaward ends, gaps in the access hatch doors & the multiple cracks at the shoreward ends

8. The Whittier facility is unique in that the apron rotates to a vertical, down position for use by the MV Aurora. The bridge apron is lowered out of the way to permit the Aurora to place its stern apron directly on the bridge. In the down position (only when the Aurora is in port), approximately half of the apron is submerged and the apron is subjected to wave forces. Wave motion causes the apron to pound against the stops and purportedly deflects the lift arm support some 4 inches in severe weather.

   Typically the bridge is lifted all the way up to the tower, in order to reset the syncrolift winches. But if the apron is left in the water, the force of the waves may cause damage to the apron hinges, lift arm, or its supports. The simple solution is to keep the apron out of the ocean environment as much as possible. Perforating the apron will reduce the induced wave forces. In addition, the apron may be braced by supports at a lower elevation to reduce the loads resisted by the arm support.

9. In August, 2013 an electrical contractor was employed to relocate conduits and conductors from under the bridge to the top flange of both box girders. A level bench of riprap extends several feet in front of the abutment creating a shelf for snow to accumulate under the bridge. Electrical conduits suspended from the floor framing are repeatedly crushed against the snow mound when lowering the bridge at low tides. This work remedied the problem by moving the conduits to the top of the box girders where they are no longer at risk for damage. When replacing the conductors the electrical contractor mistakenly reversed the power feed to the Syncrolift hoist motors. When the hoist was activated after the wiring modifications, the brake pawls did not retract as the bridge was lowered. The winch drum was driven against the pawl, completely failing the winch drum pillow blocks on both hoists. Replacement parts required a 6 month lead time; therefore, the hoists were replaced in their entirety with used units and the terminal was reopened in November, 2013.

10. In 2015 a bridge load rating performed by Burgess & Niple, Inc. consulting engineers indicated deficiencies in floor beam 14 and some of the cantilevered stringers at the seaward end of the bridge. An independent rating by ADOT&PF Marine confirmed a component LFR of 0.36 for the floor beam and similarly low values for the stringers. On November, 2015 the Marine Design section conducted a special inspection of the overloaded members but found no indication of distress or excessive deflection.

    In May 2016 a bridge strengthening project added two floor beams to the underside of the bridge’s seaward floor framing to remedy the deficient floor beam and stringers. The rating factors of all

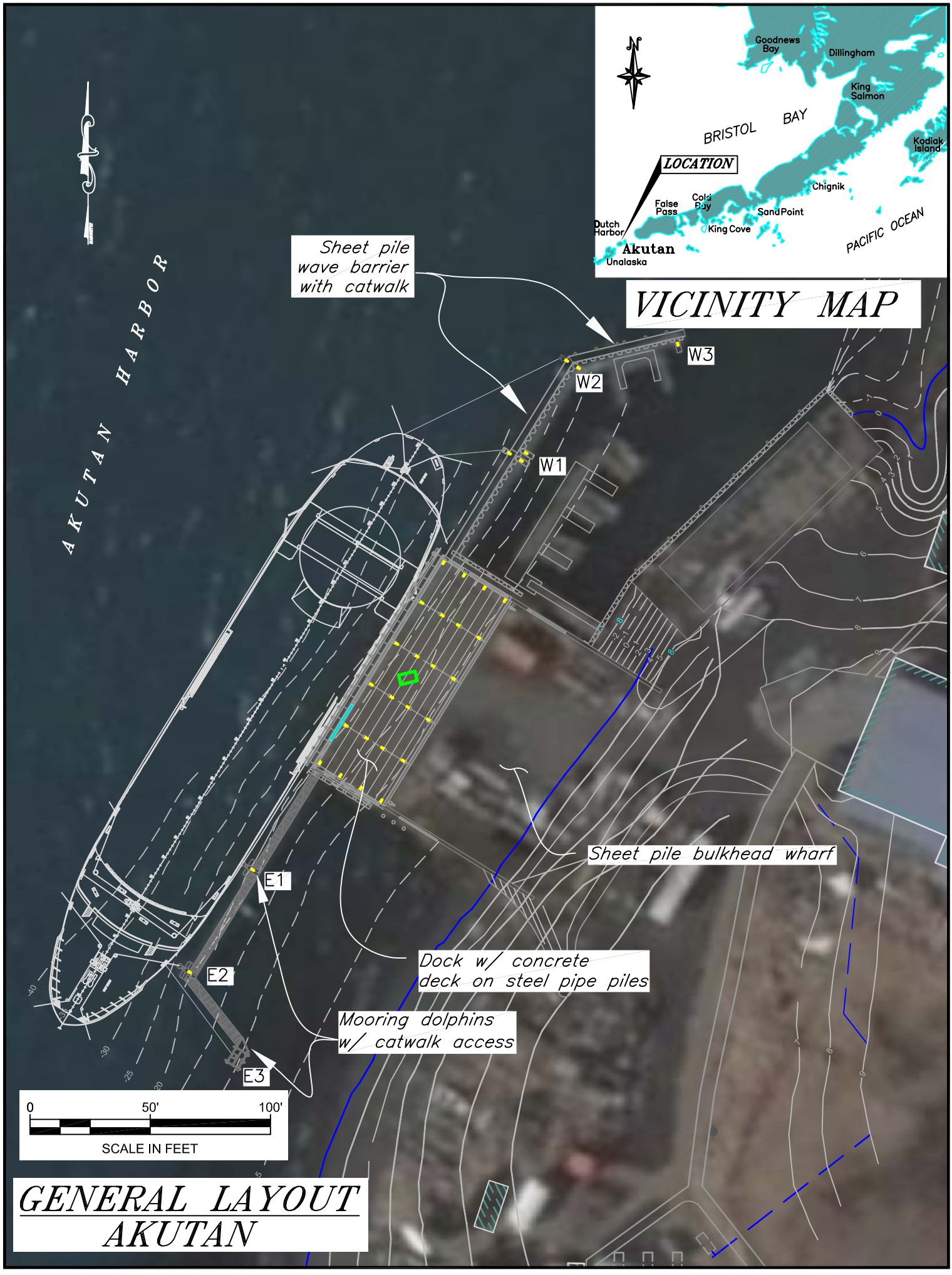
elements at the seaward end increased above 1.0 but the overall bridge rating factor is 0.82, limited by the capacity of floor beam 11. ADOT&PF policy does not require posting of this bridge as the LFR rating exceeds 0.75.

11. The tube shaped light fixtures, mounted on bridge, catwalk & dolphin handrails, have failed due to infiltration of rain water. There are several loose connections in the liquid-tight plastic conduit beneath the transfer bridge. Several bridge grating clamps are broken. The 2006 inspection noted that the catwalks still sway/rotate under pedestrian loads, even after the addition of cross bracing. The non-skid coating is cracking along the edges of the dolphin caps, but is in serviceable condition. The stern all-tide mooring floats (single vertical pile and batter pile) sway sideways approximately 1 foot during high wave conditions. This could be minimized by installing a strut to the stern mooring structure batter pile.
12. The UHMW face was detached from the fender panel of dolphin N1. Thermal expansion of the plastic causes the panels to expand, and shear off the metal studs. Lower fender panels on dolphin N3 were pried off, bolts were missing and numerous scrapes were observed on the UHMW. AMHS Maintenance repaired both the N1 and N3 fender panels in April of 2013. Depth to mudline elevations, taken with leadline readings at each mooring dolphin along the fender face in 2018, range from -28 to -46 MLLW.
13. The steel retaining brackets for the lowest elevation energy-absorbing rubber donuts have failed on dolphin N1. The most recent underwater inspection found all piles exhibit loss of galvanizing within the splash zone, while below low water level the galvanizing is generally intact – except for isolated areas of coating damage. Section loss at coating damage is consistently 4-5%, very minor. Most of the cathodic protection consists of stainless steel cables hung from a welded stud on the pile, connected to an aluminum bar anode. Most of the anodes are buried in the seafloor, rendering them ineffective. Seawater potentials measured at each structure ranged from -0.63 to -0.64 V, thus indicating inadequate Cathodic Protection (CP) readings, freely corroding steel.
14. The northwest edge of the bridge stringer has a section of damaged coating, with corresponding scrape mark on the batter pile from dolphin N1. Assumption is that the stringer bears on the edge of the batter pile, possibly only during rough weather (when apron is placed on the vessel deck). Another possible cause could be seized hinge bearings on the seaward lift beam. This was first noted on inspection in 2006, one year after the project added a riser between the bridge and lift beam. Investigations of this matter to date are inconclusive.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Transfer Bridge - Shoreward bearings	1	Program a project to repair the cracks in the connection between Floorbeam 0 and both Girder webs. Analyze what the potential causes of the cracks stem from (seaward end of bridge contacting piles of stern dolphins, bearing on packed snow/ice at abutment, cyclical fatigue from movement at Syncrolift, etc). Remove the stop bars on the south bridge hinge pin, tighten the nut down, re-weld stop bars.
Category II - Rehabilitation Work		
Bridge Lifting Beam Access	2	Program a project to install an access ladder on the lift tower and a wider platform on the seaward bridge lift beam, similar to the designs in Valdez/Wrangell.
Bridge Apron	3	Consider replacing the hinges and/or modifying the apron to allow it to be left in 'stowed-down' position, such as installing open-grid decking to pass water through. Build stop wedges so the apron doesn't rotate shoreward when left in 'stowed-up' position during high winds.
Transfer Bridge	4	Repair the paint coating to the interior girders, stringers, and bridge curb during the floor beam weld repair project. Replace broken open-deck grating hold down rods and plates.
Hawse Rails	5	Program a project to cut back the hawse rail extensions and replace them with welded padeyes on hawse rail ends and catwalk railing with heavy rope in-between.

Inspection Summary (continued)		
Structure	Priority	Recommendations
Hand Rails	6	Program a project to drill holes at the bottom of vertical chords in the hand rails. Straighten bent handrails where damage is observed when funding is available.
Dolphins	7	Replace the hanging anodes with welded-on bar anodes. Repair the broken fender mounting bracket on dolphin N1. Remove & replace all damaged stud welds on UHMW facing panels. Monitor donut bracket plates at S5 and N1 dolphins and monitor the deck surface corrosion on dolphin S6.
Miscellaneous	8	Remove gouged pavement and install a concrete pad beneath the shoreward bridge transition plate. Replace the tubaloid light fixtures with 'jelly jar' fixtures. Install a strut between the all-tide mooring dolphins and the stern mooring dolphins. Install safety cables on catwalks. Repair field-applied weld coatings where they're failing. Install a vent cap on the seaward end of the bridge girders.
Category III - Upgrades Needed		
Lift Tower	9	When funding is available, program a project to design/construct a full enclosure for the lift towers (similar to Valdez).
Structure Removal	10	Schedule to remove a structure in front of the ferry terminal to improve traffic flow and parking.
Terminal Parking	11	Program a project to increase the parking capacity at the ferry terminal.

Southwest Alaska Marine Route



VICINITY MAP

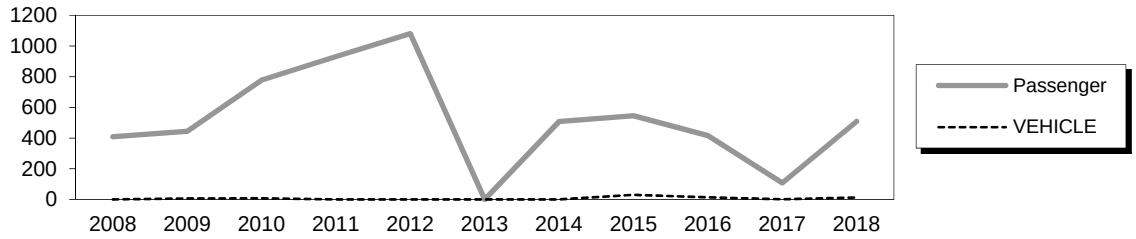
GENERAL LAYOUT
AKUTAN

Akutan City Dock

Owner: Aleutians East Borough

Terminal Manager: 907-381-1366 – Brett Willis, Harbormaster

Terminal Description: The M/V TUSTUMENA docks in Akutan during its May through September Aleutian Chain trips. AMHS has previously discharged only passengers at this facility; however, sailings now include some vehicles. The Akutan City Dock is a platform dock constructed of concrete panels, steel pile caps and steel support piling. Abutting the back of the dock is an earth filled sheet pile bulkhead for the full length of the dock. There are two mooring dolphins with fender units on each side of the dock. In line with the western dolphins is a sheet pile wall that acts as a wave barrier for a small boat harbor, with a 50-foot extension installed in 2005. The past 10 years of total passenger and vehicle traffic at Akutan is shown below. Akutan had no/low ferry service in summers 2013 & 2017 while the M/V Tustumena was in the shipyard for repairs.



The most recent above water survey was completed on September 22, 2018. The underwater inspection occurred on July 17, 2014. The most recent fracture critical inspection was on September 18, 2012.

Vessels	
Name	Berthing, Alignment
Tustumena	Port / Starboard

Tidal Data (MLLW=0.0 feet)	
Highest Observed	6.7
MHHW	3.7
MHW	3.4
Lowest Observed	-1.8

Terminal Building
This facility does not have a terminal building.

Generator & Building
This facility does not have a generator on-site.

Utilities @ Dock
There are no utilities at the City Dock.

Uplands	
Short-Term Parking:	N/A
Long-Term Parking:	N/A
Staging Area:	N/A
Paint Striping:	No
Driving Surface:	Ashalt/Gravel

City Dock - #1946	
Type:	35' x 100' Concrete Panels
Year Built:	1982
Support:	16" dia Steel Pipe Piles
Coating:	Coal Tar Epoxy
Fenders:	(21) - 16" dia Steel Pipe Piles
Fender Face:	UHMW wear strips
Anodes:	Yes
Lighting:	Light poles, east and west ends of dock
Condition:	Fair
Load Posting Sign:	Single Axle 7 Tons; Tandem 12 Tons

Sheet Pile Bulkheads							
Section	**Length**	**Type**	**Coating**	**Anodes**	**Built**	**Cond.**	**Notes**
1	90'	Z-Section	None	Yes	2002	Good	
2	100'	Z-Section	None	Yes	2005	Good	

Dolphins							
Dolphin	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Notes**
W3	1B, 1V	-	-	No	2005	Good	
W2	1B, 1V	2V	Plastic Rub Strip	No	2002	Good	
W1	2B, 2V	2V	Plastic Rub Strip	No	2002	Good	Rubber Fenders & steel wale are severely damaged.
E1	3B	1H	Rubber donut, vertically mounted	Yes	1993/2015	Fair	Fender re-built in '15
E2	3B	1H	Rubber donut, vertically mounted	Yes	1993/2015	Fair	Fender re-built in '15; Red Navlight
E3	5B	-	-	Yes	2015	New	

Catwalks / Gangways								
#	**From Struct.**	**To Struct.**	**Length / Style**	**Built**	**Safety Chains?**	**Cond.**	**Lighting**	**Notes**
C1	W3	W2	45' / Catwalk	2005	Yes	New	None	Catwalk is integral with sheet pile wave barrier
C2	W2	W1	90' / Catwalk	2002	Yes	Good	None	Catwalk is integral with sheet pile wave barrier
C3	W1	Dock	90' / Catwalk	2002	Yes	Good	None	Catwalk is integral with sheet pile wave barrier
C4	Dock	E1	50' / Catwalk	1993	Yes	Fair	None	
C5	E1	E2	50' / Catwalk	1993	Yes	Fair	None	
C6	E2	E3	30' / Catwalk	2015	Yes	New	None	

LEGEND
V = Vertical Steel Pipe Piling B = Battered Steel Pipe Piling H = Steel H-Pile
C1 = Catwalk

Projects			
Year	**Project #**	**Project Name**	**Description**
1982	N/A	Akutan City Dock	Original construction of the City dock and sheet pile retaining structure. Plans not on file.
1993	N/A	Akutan City Dock Modifications	Install the west dolphins W1 & W2 and catwalks C3 & C4
2002	N/A	Akutan City Dock Modifications	Installed section 1 of the east sheet pile bulkhead, dolphins E1 & E2, and catwalk C2.
2005	N/A	Akutan City Dock Modifications	Installed section 2 of the east sheet pile bulkhead, dolphin E3 and catwalk C1.
2015	67745	Akutan City Dock Improvements	Raised the height of the existing fender system, installed a new mooring dolphin on the east side and made other miscellaneous repairs

Observations

1. The precast concrete panels of the deck are in fair/poor condition. The top surfaces are showing signs of degradation from weathering. Roughly 25% of the panels have drain holes drilled through the deck and soffit on 12" centers. Several panels have fine cracks radiating transverse to the span direction and distributed along the longitudinal panel edges. In some panels the grout in the closure pour has eroded and the aggregate is loose. A chain drag test over the deck indicated that approximately 10 percent of the panels have some areas of delaminated or porous concrete.

   The most recent Fracture Critical inspection report found several locations of moderate cracking, spalling, and delamination on the underside of the precast deck panels with exposed pre-stressing strands. The piles were reported in fair condition, though they typically exhibit 1/32" pitting and 1/8" laminar rust. All of the piles supporting pier cap 3 are misaligned by roughly 2". Piles B and C are misaligned at pier cap 5 by roughly 1".

   Load Rating and Posting: Weight limit 17 tons, 7 tons axle, and 12 tons tandem group. Load posting signs are located on the left side of the dock. This is a multipurpose dock managed by the City to transfer freight. The City transfers freight using a JCB 9301 rough terrain forklift (15000 lb machine wt capacity).

   The underside of the dock framing (steel caps and piles) all exhibit failed coatings and extensive rust and scaling. The 2015 project installed 100# bar anodes on dock support piles & dolphin piles. The most recent above-water inspection found that the average Cathodic Protection (CP) readings averaged -1.0 V, which indicates adequate protection against corrosion.

2. The western dolphin piles, the sheet pile wave barrier, and the sheet pile bulkhead are uncoated. These steel elements may be thicker than necessary to permit a long-term corrosion loss. The 2015 project installed 100# bar anodes on the sheet piles. The most recent above-water inspection found that the average Cathodic Protection (CP) readings averaged -0.76 V, which indicates the sheet-pile is not protected against corrosion and is freely corroding. Any readings less negative of the baseline value -0.8V
3. CP anodes were installed on piling of the dock, dolphins and harbor breakwater in the 2015 refurbishment project; however, no anodes were installed on the approach bulkhead. Seawater-structure measurements of the bulkhead sheet piles indicates the steel is freely corroding. Potential voltage readings of the sheet piles on the harbor breakwater indicate the interior and exterior faces are not sufficiently protected.
4. In the splash and atmospheric zones, approximately 50 percent of the epoxy coating on the piling has failed. There is widespread corrosion of the upper segment of the piles, along the edges of the pile cap flanges and on all surfaces of the bearing plates.
5. The dolphins and catwalks on the east side of the dock were originally coated with epoxy. Only 15 percent of the coating remains and the flanges of the catwalk stringers are freely corroding. The stringers are bolted to the dolphins using a single plate shear connection. The connection restricts the longitudinal movement between the dolphin and catwalk.
6. Depth to mudline elevations, taken with leadline readings at locations along the fender face in 2018, range from -26 to -33 MLLW.
7. The moveable bull rail section has been removed from the dock front and set off to the side. The break in the rail along the dock face is a safety hazard.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Issues		
Movable bull rail	1	Replace the heavy bullrail with a design that is balanced on one wheel or pivot pin, and can swing easily pulled with human power.
Category II - Rehabilitation Work		
Dock - Concrete Deck Panels	2	Seal the deck panels with a concrete topping lift.

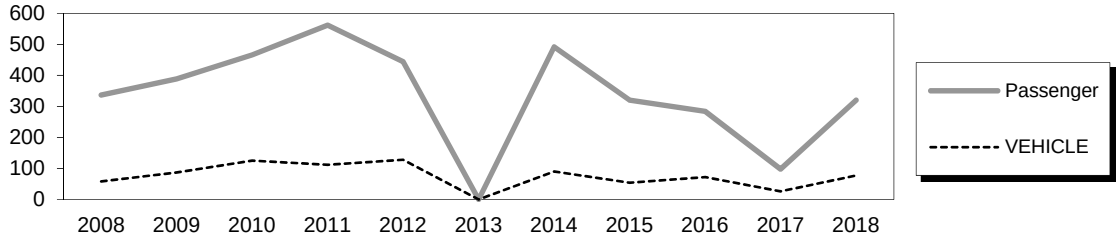
Inspection Summary (cont'd.)		
Structure	Priority	Recommendations
Category II - Rehabilitation Work		
Submerged support steel	3	Program a project to re-coat the sheet piles of the bulkhead & pipe piling of the dock and dolphins.
Category III - Upgrades Needed		
General	4	The dock is rated for passing light vehicle loads, and is load rated for minimal freight transfer. The community should seek funds for a dock replacement in the future.

Chignik Dock

Owner: Trident Seafoods

Terminal Manager: Robert Carpenter, Trident Seafoods 907-749-2277

Terminal Description: The M/V TUSTUMENA docks at the newly built City Dock in Chignik during its May through September Aleutian Chain trips. The City Dock is an open-cell sheet pile bulkhead structure with steel pin-pile fender units and a mooring dolphin. The dock was built in 2017 and is connected to a 5-acre approach lot. The dock face is 220-ft long with four (4) fender units along its seaward face. The past 10 years of total passenger and vehicle traffic at Chignik is shown below. Chignik had no ferry service in summer 2013 while the M/V Tustumena was in the shipyard for repairs.



The most recent above water inspection occurred on September 20, 2018.

Vessels	
Name	Berthing, Alignment
Tustumena	Starboard

Tidal Data (MLLW=0.0 feet)	
Highest Observed	12
MHHW	7.3
MHW	6.6
Lowest Observed	-3.5

Terminal Building
This facility does not have a terminal building.

Generator & Building
This facility does not have a generator on-site.

Utilities @ Dock
There are no utilities at the City Dock.

Uplands	
Short-Term Parking:	N/A
Long-Term Parking:	N/A
Staging Area:	N/A
Paint Striping:	No
Driving Surface:	Gravel

Chignik City Dock	
Type:	Open-cell sheet pile bulkhead, 220' seaward dock face
Year Built:	2017
Dock Support:	N/A
Pile Coating:	Galvanized
Fenders:	Four (4) pin-pile fender units
Lighting:	None
Condition:	New
Load Posting:	N/A

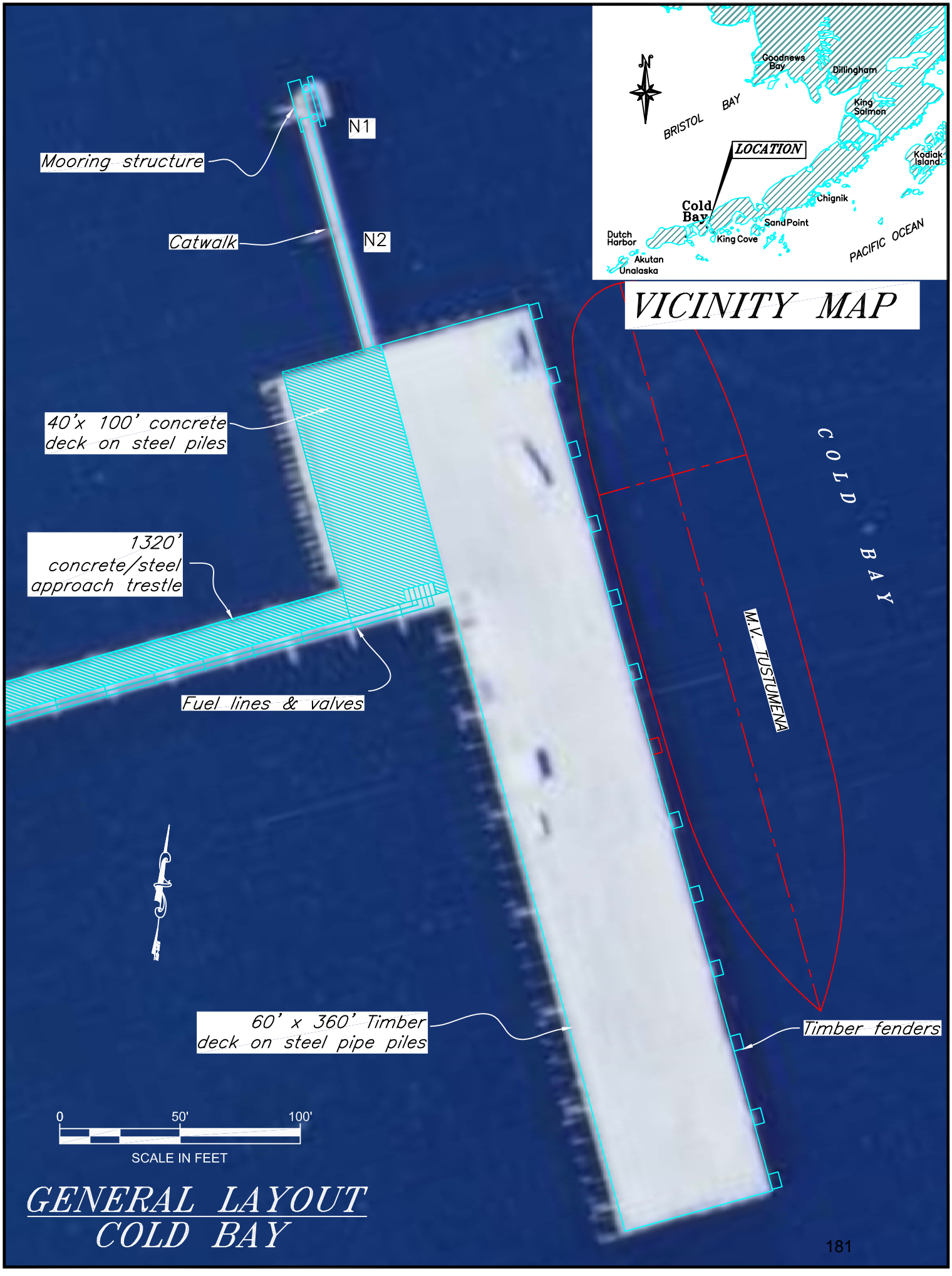
Dolphins						
Dolphin	Dolphin Piles	Fender Face	Anodes	Built	Cond.	Notes
N1	2B, 1V	None, mooring only	N/A	2017	New	

Observations

1. The facility is new and there are few deficiencies.
2. With the vessel transfer bridge centered on the concrete landing, the Tustumena's sponson, just forward of the elevator opening, bears against the corner of fender module 2 (Frame 34 and 35). The sponson contacts a small area of the fender face and the UHMW facing is being gouged by the sponson.

   Wear may be avoided by shifting the ferry farther to the right to increase the sponson's contact with the fender facing. If wear of the UHMW facing is excessive over time, consider replacing this UHMW panel with a composite material with greater abrasion resistance.
3. Cathodic Protection readings taken on the most recent inspection ('18) ranged from -0.88 to -0.94V. Any value more negative than -0.8V indicates adequate protection of the submerged steel.
4. Soundings taken from the top of the bull rail or fender panel on the most recent inspection ('18) ranged from 61 to 63 feet.
5. Load Rating and Posting – The bulkhead and retained fill is posted for a dock load limit of 1000 PSF.
6. At the time of the '18 inspection a pedestal mounted hoist was under construction. A transformer was being installed to provide electrical power to the hoist. Future planned improvements include area lighting and possibly navigation lighting, pending funding.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Nothing required		
Category II - Rehabilitation Work		
Nothing required		
Category III - Upgrades Needed		
Nothing required		



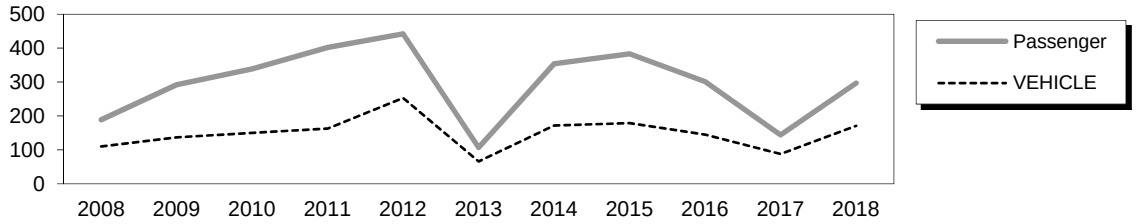
GENERAL LAYOUT
COLD BAY

Cold Bay Dock

Owner: Aleutians East Borough

Contact: Kurt Uttecht, Public Works Director, City of Cold Bay 907-532-2684

Terminal Description: The M/V TUSTUMENA docks at the Cold Bay Dock during its East/West passage through the Aleutian Chain. The Cold Bay facility is made up of two dock sections that were constructed at different times. The original structure, designed and built by the State in 1978 consisted of a 100' x 40' concrete panel dock and a 1,320' long concrete panel approach. There is a mooring dolphin and catwalk northwest of the original dock. In 1993, a 360' x 60' addition was constructed to the northeast of the original dock; the newer dock abuts the face of the original structure. The facility is owned by the Aleutian East Borough and managed by the City of Cold Bay. The past 10 years of total passenger and vehicle traffic at Cold Bay is shown below. The M/V Tustumena was out of service most of 2013, causing a steep dropoff in traffic at the terminal.



The most recent above water survey & fracture critical inspection were completed on September 21 & August 13, 2018. The most recent underwater inspection occurred on July 15, 2014.

Vessels	
Name	Berthing, Alignment
Tustumena	Starboard

Tidal Data (MLLW=0.0 feet)	
Highest Observed	11.6
MHHW	7.2
MHW	6.5
Lowest Observed	-3.7

Terminal Building
This facility does not have a terminal building.

Generator & Building
This facility does not have a generator on-site.

Utilities @ Dock	
Water:	Yes (lines replaced in 1998)
Fuel:	Yes (lines replaced in 2006)

Uplands	
Short-Term Parking:	N/A
Long-Term Parking:	N/A
Staging Area:	N/A

Original L-Shaped Dock - #1755	
Type:	12' x 1824' concrete panel approach & 42' x 100' concrete dy-core panel dock
Year Built:	1978
Dock Support:	16" dia. Steel piles with steel WF-beam pile caps
Pile Coating:	Epoxy/Galvanizing
Anodes:	Yes, welded directly to piling with bond cables to pile caps. Cables replaced in 1998.
Lighting:	None
Condition:	Fair
Notes:	The approach has two vehicle turnouts, located on the northwest side of the trestle.
Load Posting Sign:	20 Ton Max
Original Design Load:	HS 20-44 / 400 psf

Dock Addition	
Type:	360' x 60' steel beam and timber decking
Year Built:	1993
Dock Support:	Steel pile bents spaced ~30' o.c. Each bent has (4)-26"dia. Vertical steel piles & (1) batter pile connected to steel H-pile caps. Salvaged W36x182 bridge beams span the length, with pressure-treated 12x12 timber stringers and 4x12 timber decking above.
Pile Coating:	All steel is uncoated.
Fenders:	13 timber-faced pin pile fender units, spaced roughly 30' o.c. along northeast face of dock. The ends and southwest face of the dock are protected with treated timber pile fenders.
Anodes:	(39) 200# aluminum anodes suspended from the superstructures by galvanized wire rope. The City replaced the cables in 1998.
Lighting:	None
Condition:	Poor
Load Posting Sign:	N/A
Original Design Load:	HS 20-44 / 350 psf

LEGEND
V = Vertical Steel Pipe Piling B = Battered Steel Pipe Piling

Catwalks / Gangways							
#	From Struct.	To Struct.	Length / Style	Built	Safety Chains?	Cond.	Lighting
C1	Dock	N2	54' / Catwalk / W21x55 Girders	1978	Yes	Good	None
C2	N2	N1	54' / Catwalk / W21x55 Girders	1978	Yes	Good	None

Dolphins							
Dolphin	Dolphin Piles	Fender Support	Fender Face	Anodes	Built	Cond.	Notes
N1	1B, 2V	4V	Sitka Spruce	Yes	1978	Good	Red Navlight
N2	1V	-	-	Yes	1978	Good	

Observations

1. The undersides of the concrete deck panels are covered with efflorescence, an indication of water intrusion. The Fracture Critical (FC) reports note that panels spanning the final two bents (75 & 76) at the end of the approach trestle have three full-length cracks up to ¼" wide. There is also a 24" long x full-width delaminated section. On the underside soffit of panel 76, there is a hole 18" long x 6" wide within the delaminated section that extends into the hollow-core of the panel.

   The poor condition of these two panels has been known for many years now, yet the load capacity of these panels has not been estimated. The first reference for the need to monitor cracks in the panels and to perform a load rating analysis was in 2001. It should be mentioned that a spall in one of the panels was noted in 1994. The cause of the cracking in these last two panels at mid-span (corrosion of prestressing strands, overloading, etc) is unknown.

   The FC report also notes that there is an 8 sf area of dense longitudinal cracking and delamination with small spalls on the soffit of slab 3, span 2. There were 11 instances of small edge spalls at the soffit corners with exposed prestressing strands.

Also found were numerous locations where shims are rusting and staining the slab soffits. This is due to the shims being partially dislodged between the deck and the top of the cap.

2. The pier caps on the approach trestle and original deck have various problems. There is a full-width, ½" deep gouge in the bottom flange of the bent 3 pier cap; a 1-5/8" crack in the stiffener to bottom flange weld at the north, far side stiffener at bent 54; a 3" distortion to the exterior edge of bottom flange of bent 1 in span 2 from vessel impacts; a 37" circumferential crack at the toe of weld between the pier cap and pipe pile on the old dock, bent 1, west; impact damage to the outboard top & bottom flanges of bent 56 pier cap near column 2 (the impact areas were flame-cut and ½" bars welded over the gaps as an attempted repair).
3. All steel used in the dock addition is neither galvanized nor coated for marine exposure. The H-pile caps and steel girders of the dock addition are rapidly corroding. The caps are covered with heavy rust and scale. The FC reports note that there is section loss on all components.

   The most recent FC report notes that there is a 4" long crack at the bearing stiffener to bottom flange weld over the centerline of column 5 in bent 1.The longitudinal steel stringers are not centered over the support piling, introducing eccentricities to any load paths being transmitted to the foundation.

   There is severe distortion in the Girder 1 web and bottom flange from multiple vessel impacts approximately 5' from bent 8 in span 9. There is a 1"x 11" missing section of bottom flange at bent 3, span 3. There's also extensive impact damage to bent 12, span 2, far side bottom flange. A replacement flange was welded to the web overlapping with the damaged/removed section of bottom flange.
4. The support piling of the approach, the original dock, and the dock addition are all in good condition in the submerged zone but in fair to poor condition in the splash zone. The epoxy coating has failed in the upper portions of the approach dock piling; the same areas on the steel piles for the new dock addition have laminating corrosion. The sides of piles supporting the original dock show signs of impact damage.

   The most recent fracture critical inspection found that the piles are exhibiting 100% paint flaking and up to ½" laminar corrosion with section loss of up to ¼".
5. There are (13 ea.) fender modules at a nominal spacing of 30 ft. across the face of the dock. There are two types: (6 ea.) that are full height of the dock with integral access ladders and (7 ea.) standard fenders that are 3 ft. shorter. The fender modules are supported on two pin piles, faced with timber beams and bear against the pile cap with a single side-loaded cylindrical rubber fender. Pipe bollards are aligned with each of the standard fenders along the dock face. The sides and shoreward face of the dock are protected with timber pile fenders. Emergency access ladders are spaced on the sides and shoreward face.

   The fender units are in fair condition. Underwater inspection revealed that several of the fender units are damaged at the bottom of the pipe sleeves. The sleeves are 4" larger in diameter than the pin piles, thus allowing the bottom of the fender units to oscillate back and forth in the waves. The bottom lip of the pipe sleeve bangs against the pin pile causing appreciable wear on the pile and in some cases, cracking at the base of the sleeve.The fender units are fastened to the dock with a rubber energy-absorbing cylinder. The cylinder-retaining bracket of one fender is missing some fasteners. Fender panel access platforms, that span between the dock and the fender panels, are loose.

   The bottom half of the timber fender panel on dolphin N1 is rotten and has only 10% section remaining. This dolphin is off the fender line, so does not affect vessel mooring.
6. Several of the bull rails along the concrete dock have broken supports and are sitting on the deck. The navigation light on the southeast end of the dock was not functioning. Average soundings to mudline, from the top of deck, along the face of the dock were 50' during the 2018 inspection.
7. The south end of the catwalk bears on only a few inches of the dock, the bearing plate and connection bolts are highly corroded, and some concrete has spalled from under the supports. The catwalk and mooring dolphin are oriented on the face of the original dockline. A more functional configuration would be where the dolphins and catwalk were oriented on the face of the current dockline.

   The Public Works Director reports that there is no need for dolphin structures N1 & N2 anymore. They are sometimes used for barge line tie-up, but not very often. These dolphin structures could potentially be removed.
8. Three types of anodes were noted during the underwater inspection: hanging anodes on the dock addition, welded anodes on the original portions and older anode bracelets on the original dock and

Observations (continued)

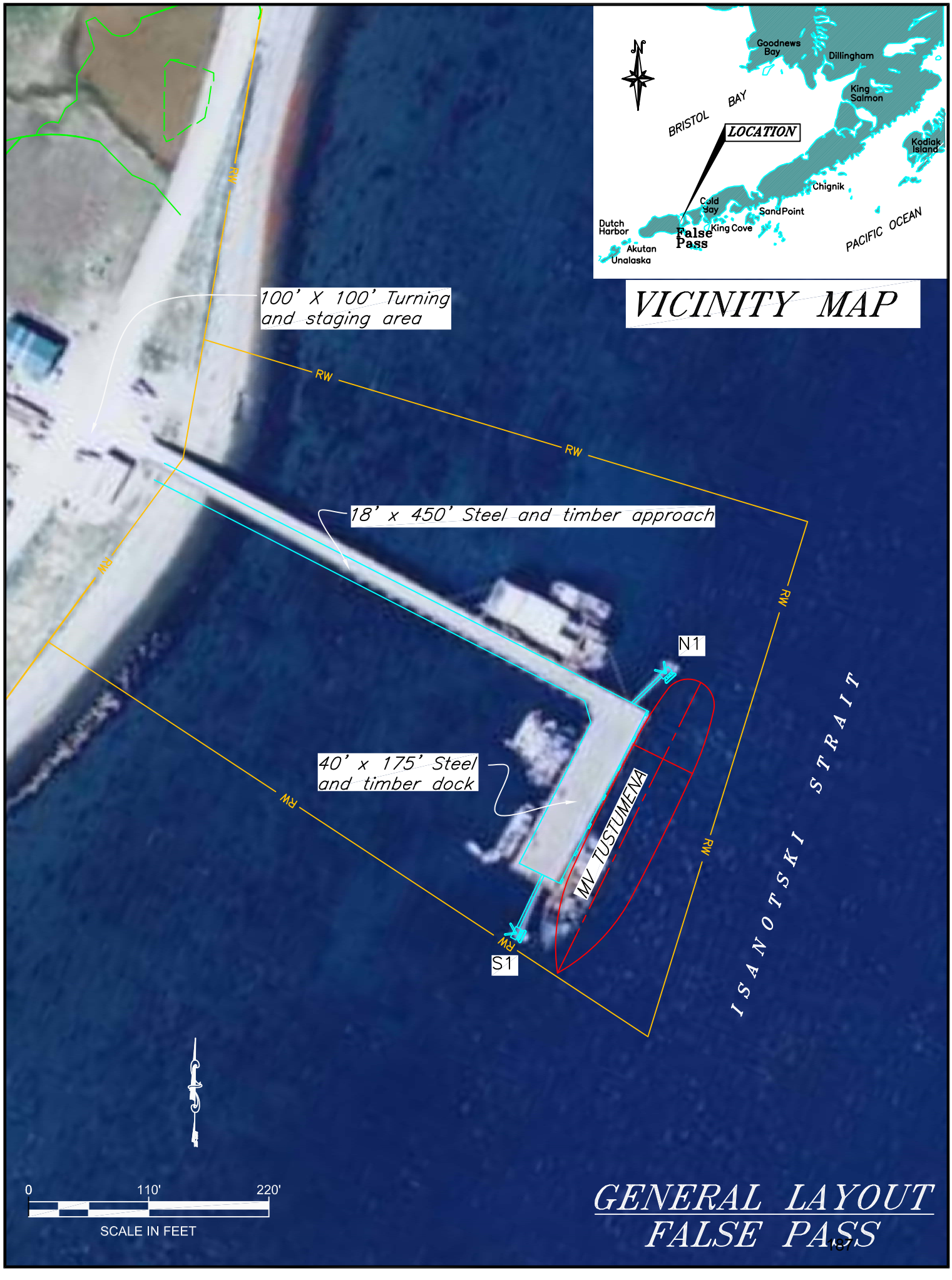
approach. The majority of the anodes are almost completely consumed. Several hanging anodes had broken wires under the deck.

The recent 2015 project installed new anodes at various points along the facility, and cathodic protection readings on the most recent inspection averaged -1.0V. Any reading more negative than -0.8V indicates the steel is adequately protected.

9. The dock approach pile caps were shop fabricated with short stubs of piles beneath, and was spliced to field-driven POL piles during construction. The alignments of the spliced piles are slightly eccentric in most cases, and vary in style from ring stiffeners to multiple plate stiffeners.
10. Grout is failing between precast panels at pile caps along the dock approach.
11. 50% of dock approach guardrail connections are failing along the dock approach. Connections vary widely, most likely due to field repairs made over the years. Many of the welded connections are broken and freely corroding. The field repairs include coped rails, welded steel bars between rails & posts, field welded posts to rails – to name a few. Rail sections were misaligned with adjacent sections and none of the field welds appear to have been field coated.
12. There are 3 types of fuel lines (Diesel, Avgas, Autogas) and a water line that run from shore to the main dock, supported on the cantilevered pile bent cap of the approach span, right side (facing seaward).

    Utility (fuel line) supports were field welded to approach rails and many are either bent, cracked, or have cracked welds.
13. Project 67714 (2015) replaced damaged deck panels (slab #1) in spans 75 & 76 and in the old dock (slab 3, span 2 and slab 2, span 3), replaced damaged bullrails, repaired fender units, replaced access plates and refurbished an access ladder.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Issues		
Concrete Dock Panels	1	Monitor the condition of the hollow-core concrete deck panels.
New Dock pile caps	2	Monitor the distortions and impact-related damage in Girder 1 of the dock addition for further deformations. Program a project to replace any of the pier caps or girders whose top/bottom flanges are damaged beyond 1/4 span.
Old Dock pile caps	3	Repair the circumferential crack at toe of weld between pier cap and pipe pile on the old deck, bent 1, west.
Category II - Rehabilitation Work		
New Dock Piling & Superstructure	4	Sandblast and coat steel surfaces above submerged zone. Move longitudinal girders to line up over the center of the steel support piling.
Anodes	5	Maintain cathodic protection system.
Dock Approach	6	Repair the grout between precast panels at pile caps along the dock approach. Repaire failing guardrail & utility support connections along the dock approach.
Category III - Upgrades Needed		
Dock Replacement	11	Original dock and approach is 34 years old and in poor condition. Program a project to replace the facility with a new dock.

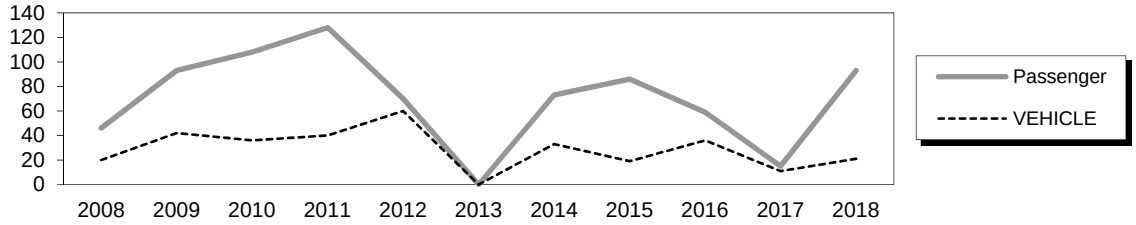

Goodnews Bay
Dillingham
King Salmon
BRISTOL BAY
LOCATION
Kodiak Island
Chignik
Cold Bay
Sand Point
Dutch Harbor
King Cove
False Pass
Akutan
Unalaska
PACIFIC OCEAN
VICINITY MAP
100' X 100' Turning and staging area
RW
18' x 450' Steel and timber approach
N1
40' x 175' Steel and timber dock
MV TUSTUMENA
ISANOTSKI STRAIT
S1
0
110'
220'
SCALE IN FEET
GENERAL LAYOUT
FALSE PASS

False Pass Dock

Owner: Village of False Pass

Contact Person: Tom Hoblet, 907-548-2319

Terminal Description: The M/V Tustumena docks at the False Pass Dock during its East/West passage through the Aleutian Chain. Service to False Pass was initiated in 1993.The False Pass facility consists of an L-shaped 175' x 40' dock, 450' long approach trestle, with a mooring dolphin located on each end of the dock and connected via a steel catwalk. There is a 100' x 100' staging area upland of the dock. The facility is a multi-purpose facility and could be in use by other vessels when the ferry arrives. AMHS is not in control of the operation or maintenance of this facility. The past 10 years of total passenger and vehicle traffic at False Pass is shown below. False Pass had no ferry service in summer 2013 while the M/V Tustumena was in the shipyard for repairs.



The most recent above water survey & fracture critical inspection were completed on September 22 & August 15, 2018, respectively. The underwater inspection occurred on July 16, 2014.

Vessels	
Name	Berthing, Alignment
Tustumena	Starboard

Tidal Data (MLLW=0.0 feet)	
Highest Observed	7.0
MHHW	4.4
MHW	3.5
Lowest Observed	-3.0

Terminal Building
This facility does not have a terminal building.

Generator & Building
This facility does not have a generator on-site.

Utilities @ Dock	
Water:	Yes
Fuel:	No

Uplands	
Short-Term Parking:	N/A
Long-Term Parking:	N/A
Staging Area:	900 lineal feet

L-Shaped Dock - #1945	
Year Built:	1993
Dock Stucture:	Galvanized steel pipe piles with steel WF pile caps, treated glulam stringers and heavy timber decking.
Pile Coating:	Galvanized
Fenders:	7 fenders along face of dock, each with 16" dia. Pipe pile and vertically oriented rubber cylinder.
Anodes:	No
Lighting:	Yes, jelly jar fixtures along the bullrails.
Condition:	Good
Notes:	Red navlights on either end of dock.
Load Posting Sign:	N/A
Original Design Load:	HS 20-44 / 350 psf / Cat 980 Loader (reference plans for other loads)

Dolphins							
Dolphin	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Notes**
N1	2B, 2V	2V	Timber	Yes	1993	Fair	Does not have tire fenders on the upper sections
S1	2B, 2V	2V	Timber	No	1993	Fair	

LEGEND
V = Vertical Steel Pipe Piling B = Battered Steel Pipe Piling

Catwalks / Gangways							
#	**From Struc.**	**To Struc.**	**Length / Style**	**Built**	**Safety Chains?**	**Cond.**	**Lighting**
C1	Dock	N1	54' / Catwalk / W21x55 Girders	1993	No	Good	None
C2	Dock	S1	54' / Catwalk / W21x55 Girders	1993	No	Good	None

Observations

1. The decking is 6x12 planks over glue-laminated timber beams. The city maintains a crab pot storage yard near the dock approach and transferring the pots across the dock has worn the deck. The City has banned pot hauling across the dock.

   The deck planking is in fair condition with signs of wear. There is a large area of damage to the decking with up to 1-1/2" gouges, a portion of which is within the vehicle path for the Tustumena. Typical wear consists of intermittent areas of up to ½" deep surface checking.
2. The superstructure consists of ten adjacent timber 8¾" x 27" glulam beams in the approach trestle and twenty-one glulam beams in the main dock section. The beams are supported on rolled steel bent caps with supplemental welded bearing stiffeners.

   The glulam beams are in good condition, with minor damages from boat impacts along the north (harbor) side beams of the approach trestle. The most recent inspections also found a 1/4"-3/8" deep split, roughly 15' long, in a glulam beam on the north side of the approach trestle between the barge mooring dolphins but does not seem to be affecting structural capacity. Further investigation could be warranted.
3. The bent caps consist of a rolled steel W18x76 beam with welded bearing stiffeners supported by two vertical and one battered steel pipe pile in the approach trestle. In the main dock section the W18x76 steel caps are supported by three vertical and one battered steel pipe pile. The pipe piles are beveled and fillet-welded directly to the steel cap bottom flanges.

   The bent caps are in good condition with minor surface corrosion occurring at the welded connection between pile & cap. The most recent underwater inspection ('18) found new anodes installed since the '14 inspection with an average of 85% remaining section, and cathodic protection readings averaged -1.0V. Any reading more negative than -0.8V indicates the steel is adequately protected.
4. The 16"ϕ x ½" wall dock support pipe piles are galvanized and filled with gravel. Without any cathodic protection system (i.e. anodes) installed, the galvanizing has failed within the splash zone. There are several areas of dents & gouges to the dock and fender piles along bent 17 from vessel impacts. There is one missing steel pipe pile at both the North and South gangway support dolphins.
5. The mooring dolphins are in good condition. On the '18 underwater inspection, the northern batter pile on the north mooring dolphin was found with a dent and scrape at about –10' elevation. The dent is 2" deep, 6" wide and 2' long, probably caused by vessel impact.

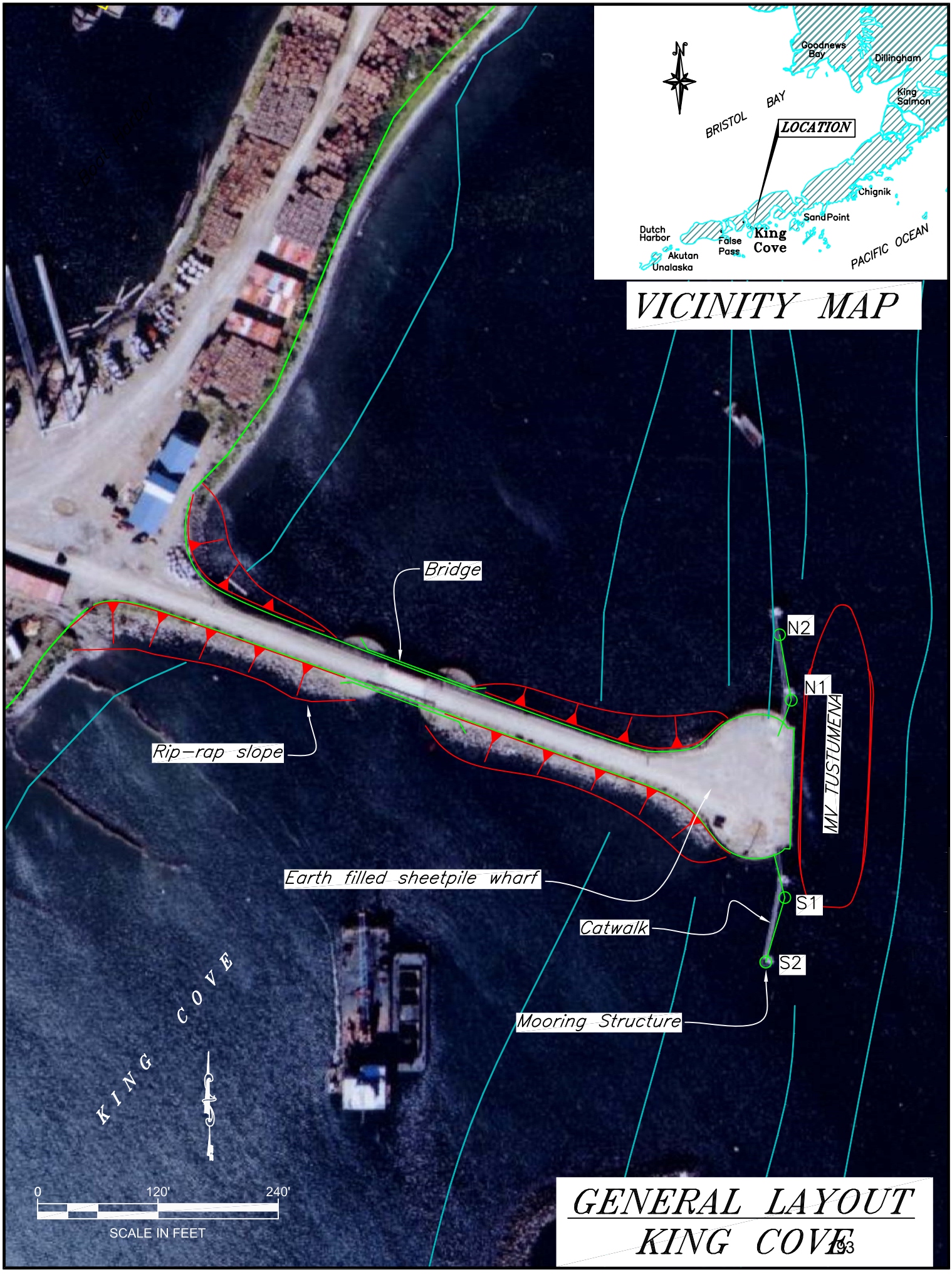
   The M/V Tustumena typically berths starboard, except for windy conditions when they berth portside.
6. The fender/bollard pipe piles and ladders on the face of the dock are in good condition. The northernmost bollard is missing one of its two horns. The fender system is considered marginal for the berthing loads of the M/V TUSTUMENA.

Observations (continued)

7. The southernmost fender on the dock face has been damaged from vessel impact. Additionally, the pile cover plate is missing and the pile is full of water. The third fender from the north end of the dock has been hit hard and the upper portion of the backup structure has been bent.
8. A bolt is missing on the northernmost rubber donut fender mount on dolphin N1.
9. The north barge dolphin does not have tire fenders on the upper section as does the south barge dolphin.
10. The catwalks are welded to the dolphin caps on one end, and slide on a wood skid plate on the dockside end. The guide pin on the catwalk has been torn away, so that now the only guides for the catwalk are the bullrails. There are no safety chains/cables installed to keep the catwalk from falling in the ocean.
11. The opening in the bull rail for the ferry's vehicle-loading ramp is too narrow. The constricted opening makes vehicle loading difficult in all but favorable weather. A ladder near the north corner of the dock has been hit and subsequently cracked the bullrail up on deck.
12. A new fuel line on the approach has reduced the inside curb width to 15'-7". The approach width is still adequate for one-lane ferry traffic. The arctic pipe waterline, mounted beneath the dock, froze in the winter of 05-06 and an elbow, at the junction of the approach and main docks, was damaged. Several utility hangers that are loose, damaged, or missing including two between bents 18 and 19. Eventually the City abandoned the arctic pipe and installed a ½" HDPE plastic waterline to service water to the main dock.
13. Potholing is prevalent where the gravel approach road meets the approach dock. Surface water ponding and heavy dock traffic has worked to erode the gravel above and behind the timber backwall at the head of the dock. A gap has formed and surface water drains freely along the backwall.
14. Heavy chains around the vertical piles in the seaward barge dolphins contribute to corrosion/section loss. All horns on the seaward barge dolphin bollards are missing.
15. Both navigation lights are not functioning. The crane mounted to the main dock is also not functional; signs posted warn of 'electrical shock'.
16. All freight and POL operations have moved to the sheet pile dock near the City Harbor.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Issues		
Nothing required.		
Category II - Rehabilitation Work		
Bottom Debris	1	Remove crab pots from the front of the southernmost fender. The pots, lines, and buoys pose risk of fouling vessels during low tides.
Dock - Misc.	2	Widen bull rail opening to 16 ft. to accommodate M/V TUSTUMENA vehicle-loading ramp. Repair the damaged fender unit on the south dock, pump out the seawater, and re-weld the pile cover plate. Repair the upper bent portion of the third fender from the north end of the dock. Repair damaged bullrail near the north corner of the dock.
Anodes	3	Install anodes on dock support piling and dolphin S1.
Dock planks	4	Install timber wearing surface to protect timber planking of deck.
Catwalks	5	Install guide pins on the dock mounting plate connection.
Mooring Dolphins	6	Monitor the damaged batter pile of dolphin N1 and program the pile for replacement. Also install a bolt that is missing on the northern-most rubber donut fender mount on dolphin N1.
Barge Dolphins	7	Install tire fenders over the king pole of the north barge dolphin. Install chafe protection between heavy chains and vertical piles in the seaward barge dolphins. Repair mooring bollards on the seaward barge dolphins by installing full pipe section horns.

Inspection Summary (continued)		
Structure	Priority	Recommendations
Category II - Rehabilitation Work		
Mooring Bollard	8	Repair broken horn on northernmost bollard.
Approach Transition	9	Repair gravel-to-timber transition at head of dock.
Category III - Upgrades Needed		
None noted.		

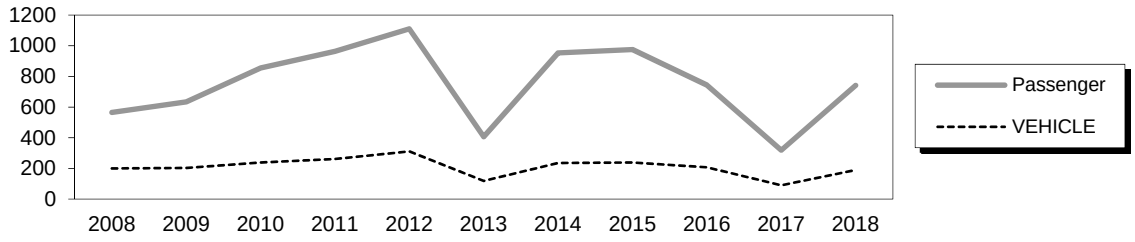

Boat Harbor
Bridge
Rip–rap slope
N2
N1
MV TUSTUMENA
Earth filled sheetpile wharf
S1
Catwalk
S2
Mooring Structure
KING COVE
0
120'
240'
SCALE IN FEET
Goodnews Bay
Dillingham
King Salmon
BRISTOL BAY
LOCATION
Chignik
Sand Point
Dutch Harbor
Akutan
Unalaska
False Pass
King Cove
PACIFIC OCEAN
VICINITY MAP
GENERAL LAYOUT
KING COVE

King Cove Dock

Owner: Aleutians East Borough

Contact: City of King Cove, Charles Mack, Port Director 907-497-2340

Terminal Description: The M/V Tustumena docks at the Aleutians East Borough facility in King Cove on its east/west passage through the Aleutian Chain. The King Cove facility consists of a sheet pile cell structure with a face approximately 125' long, and 4 steel pile mooring dolphins (two on each side of the dock) connected to the dock by steel catwalks. Access to the dock is via an embankment and paved roadway. There is a breach in the embankment at about its midpoint to permit juvenile fish migration. A steel girder/concrete deck bridge spans the breach; open sheet pile cells protect the abutments. The facility is a multi-purpose facility and could be in use by other vessels when the ferry arrives. AMHS is not in control of operation or maintenance of this facility. The past 10 years of total passenger and vehicle traffic at King Cove is shown below. The M/V Tustumena was out of service most of 2013, causing a steep dropoff in traffic at the terminal.



The most recent above water survey was completed on September 21, 2018. The most recent underwater inspection was completed on July 14, 2014.

Vessels	
Name	Berthing, Alignment
Tustumena	Port / Starboard

Tidal Data (MLLW=0.0 feet)	
Highest Observed	9.0
MHHW	-
MHW	-
Lowest Observed	-3.3

Terminal Building
This facility does not have a terminal building.

Generator & Building
This facility does not have a generator on-site.

Utilities @ Dock
There are no utilities at the City Dock.

Uplands	
Short-Term Parking:	N/A
Long-Term Parking:	N/A
Staging Area:	900 lineal feet

Sheet Pile Dock - #1954	
Year Built:	1993
Dock Structure:	Open cell sheet pile structure
Coating:	None
Fenders:	6 timber pile fenders along the face of the dock; 5 pipe pile bollards with a vertically oriented rubber cylinder also act as fenders.
Anodes:	Yes
Lighting:	Light posts on either side of the dock
Condition:	Fair
Load Posting Sign:	N/A
Original Design Load:	HS 20-44 / 400 psf / Cat 980C Loader / 40 Ton Crane

Dolphins						
Dolphin	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**
N2	2B, 1V	1V	Rubber Cylinder	Yes	1993	Good
N1	2B, 1V	1V	Rubber Cylinder	Yes	1993	Good
S1	2B, 1V	1V	Rubber Cylinder	Yes	1993	Good
S2	2B, 1V	1V	Rubber Cylinder	Yes	1993	Good

LEGEND
V = Vertical Steel Pipe Piling B = Battered Steel Pipe Piling

Catwalks / Gangways							
#	**From Struct.**	**To Struct.**	**Length / Style**	**Built**	**Safety Chains?**	**Cond.**	**Lighting**
C1	N2	N1	85' / Catwalk / Steel pony-truss	1993	No	Good	None
C2	N1	Dock	35' / Catwalk / Steel pony-truss	1993	No	Good	None
C3	Dock	S1	35' / Catwalk / Steel pony-truss	1993	No	Good	None
C4	S1	S2	85' / Catwalk / Steel pony-truss	1993	No	Good	None

Observations

1. This facility was constructed in 1993. The sheet piles of the cells are in fair condition. The 2009 underwater inspection report noted that there is moderate corrosion and scale in the splash and atmospheric zone. Inspectors in 2014 scraped ~1/4" of pack rust off the top of the cells to obtain clean steel for a potential reading. The submerged portions of the dolphins and steel pile fenders are in good condition. Anodes are reported to have 75 to 80 percent material remaining. CP readings on the most recent inspection were -0.80 and -0.85 on the north & south ends, respectively. -0.85V is considered the minimum voltage level for protected steel.
2. The fill inside the sheet pile cell has settled approximately two inches. The Harbormaster reports that the fill has previously settled about eighteen inches. This consolidation was anticipated and is discussed in the Maintenance and Operations Manual for this facility. The cell wall on the north side of the structure has a bulge. Depth to mudline measurements along the seaward face of the bulkhead & dolphins range from -30 to -43 on the 2018 inspection.

   The City installed timber mats in the main loading area near the fender face and approximately 100-feet leading towards town. This reduces wear in the gravel from vehicle turning movements and tracking mud/dirt onto the vessels.

   Some of the dock elements along the face are damaged. The ladder and timber pile between F2 and F3 are still damaged. The ladder between fenders F3 & F4 is damaged. The southernmost timber fender pile was dislodged from its upper bracket and is gone. Several of the fenders appear to have been damaged by large loads bearing on the tops of the fenders. The ends of the timber fenders are splintered and the upper fasteners for two of the rubber cylinders have failed.

   The timber pile near the bulwark opening between fenders F1 & F2 is missing. The timber pile in front of the bulwark opening between fenders F4 & F5 is damaged. Multiple rubber fender mounts have broken retaining bolts and exhibit evidence that the fender capacity was overloaded (bent steel behind fender).

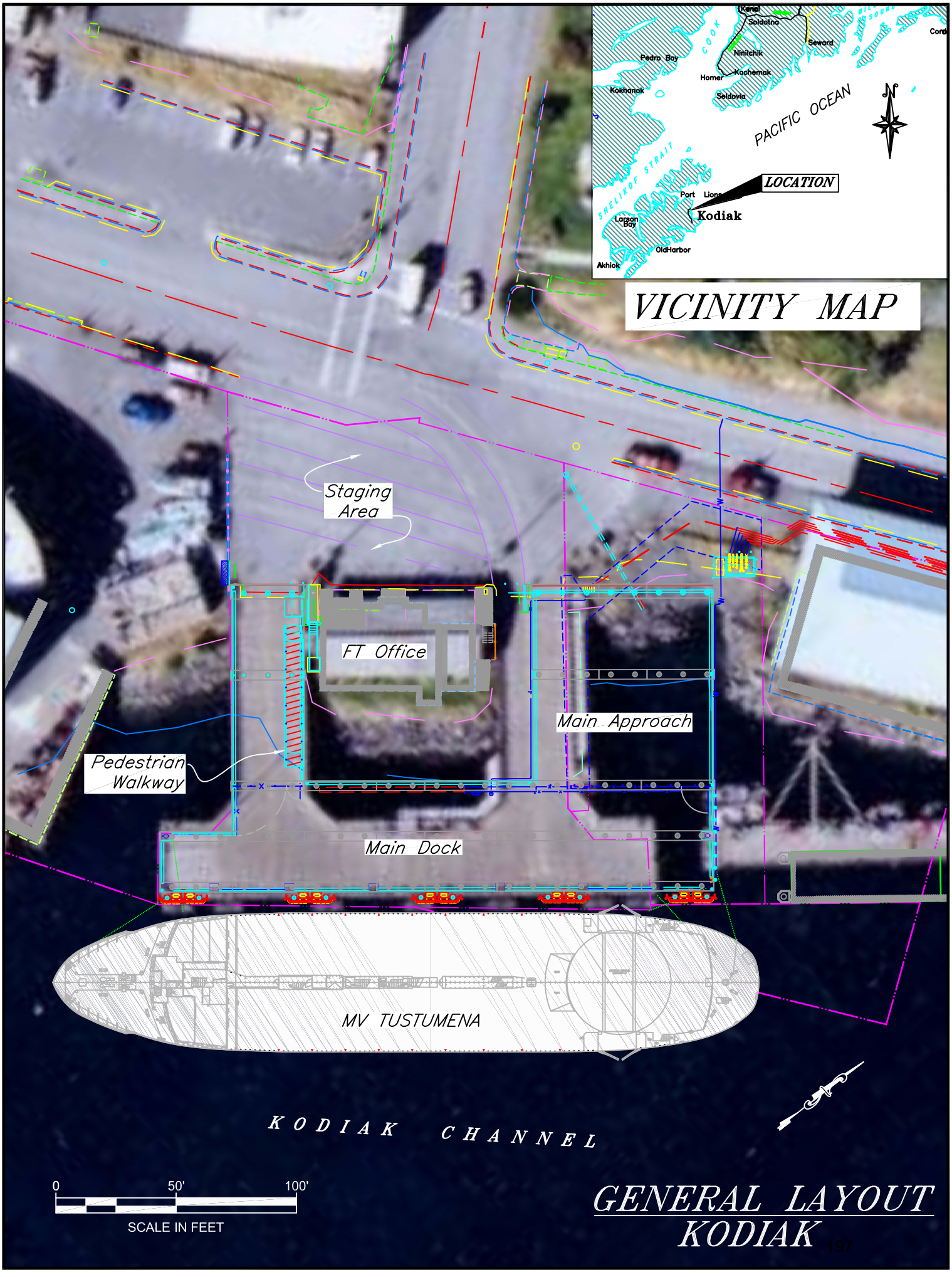
   The most recent inspection ('18) found the cathodic protection readings averaged -0.85V. Any reading more negative than -0.8V indicates the steel is adequately protected.
3. Line loads on dolphins N1 and S1 appear to have exceeded their capacities. Dolphin N1 was pulled to the southeast and the dolphin leans to the south. Dolphin S1 was pulled to the northeast and leans to the northwest. Dolphin S1 does not appear to have leaned further north or northwest since the 2006 inspection based on catwalk misalignments. Displacing these dolphins caused failure of the bolts securing the catwalks to the dolphin caps and the catwalks no longer bear equally on the caps. The catwalk to dolphin S2 is chained to the bollard and bears on only 8" of the cap. The gratings on the

Observations (continued)

catwalks to N1 and S1 are loose, and have not been improved since the last inspection. A section of grating on the south side of the dock, near the sheet piles, is warped enough to provide a tripping hazard. Dolphin caps have no traction coating, and therefore are very slick when wet.

4. The catwalk between dolphins N1 & N2 has been impacted on the seaward side. The entire catwalk has been bent horizontally shoreward slightly. No members or their connections were observed to show signs of cracking.
5. The openings in the bulwarks for the ferry's vehicle-loading ramp were widened from 16' to 20' sometime between 2012 and 2014. The City has installed new removable bull rails (2016).
6. The steel girder of the bridge in the approach embankment shows signs of coating failure and minor corrosion. The bridge guardrail consists of timber posts, a timber beam, and wire rope. The approach guardrail is formed with timber posts and wire rope. These systems do not meet AKDOT standards. Several wood spacer blocks along the cable guardrail on the south side of the dock approach road are broken or missing.
7. A weld has failed in the top flange connection between sheet piles near fender F1. A weld has failed at the union between the top of a steel curb section and the south side of the bollard behind fender F2.
8. The City has made repairs to the light poles in the staging area – straightening the leaning light pole and replacing luminaires with LED fixtures. Both red navigational lights, each mounted on the end dolphins (N2 & S2), are not functioning. Fuel utilities appear to be functioning at the face of the dock.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Issues		
Mooring Dolphins & Catwalks	1	Monitor the slopes of mooring dolphins caps on N1 and S1 for any additional deflection. Reattach the catwalks to the dolphin caps. Secure the catwalk grating to the framework. Program to repair the dolphin caps. Monitor the condition of the catwalk between dolphins N1 & N2.
Category II - Rehabilitation Work		
Dock	2	Repair the ladder mounts and rungs. Replace damaged/missing timber fender piles. Repair the upper fender mounts and fasteners as required. Replace the creosote log at the opening in the bulwarks with a moveable steel bull rail section. Monitor the deflections in the cell walls to determine if the cells have stabilized or if changes are occurring. Repair broken welds between sheet piles and curbs/bollards.
All submerged steel	3	Continue to monitor and replace anodes.
Guardrail	4	Bring approach and bridge guard rails up to state standards.
Luminaires	5	Install a globe on the luminaire at the north end of the approach. Replace the luminaire post & base that is damaged and leaning on the seaward side of the approach bridge. Repair the damaged conduit & wiring on the luminaire near the north edge of the dock.
Category III - Upgrades Needed		
None noted.		


Kenai
Soldotna
Seward
Cordova
Pedro Bay
Cook Inlet
Nanilchik
Homer
Kachemak
Kokhanok
Seldovia
PACIFIC OCEAN
N
SHELIKOF STRAIT
LOCATION
Port Lions
Kodiak
Larson Bay
OldHarbor
Akhiok
VICINITY MAP
Staging Area
FT Office
Main Approach
Pedestrian Walkway
Main Dock
MV TUSTUMENA
KODIAK CHANNEL
0
50'
100'
SCALE IN FEET
GENERAL LAYOUT
KODIAK

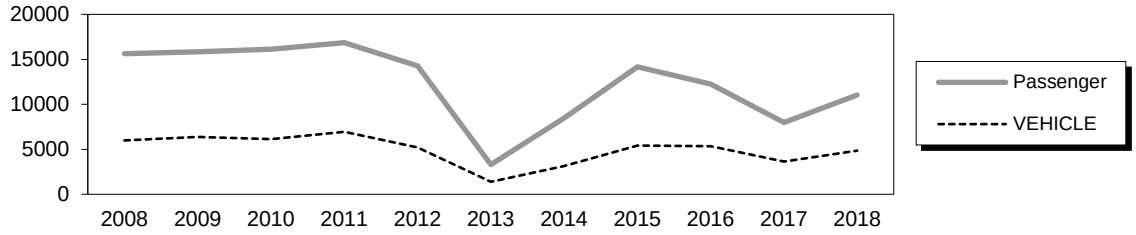
Kodiak City Dock (Pier 1)

100 Marine Way

Owner: City of Kodiak

Terminal Manager: Steve Penn, AMHS Terminal Manager, 907-486-4443
Martin Owen, Harbormaster, City of Kodiak, 907-486-8080

Terminal Description: The M/V Tustumena docks at the Kodiak City Dock (also called Pier 1) on its east/west passage between Homer and the Aleutian Chain. The Kodiak City Dock structure is supported by steel pipe piles, with concrete pier caps, p/c concrete channel beams (approach), & p/c concrete haunched deck panels (main dock). The fender system consists of five pin-pile supported fender panels. The facility is a U-shaped concrete structure with a main dock section approximately 230'x 25', and two 103' approach trestles, one at each end of the dock. The dock is currently used for transfer of general cargo and fuel, in addition to ferry operations. The paved area between the street and the terminal building has a shared use for parking and vehicle staging. Embarking vehicles line up on the adjacent city street, in the paved area and along the 75'-wide north approach trestle. The contractor operated ticket office is located in a city owned building, on shore, between the two approach trestles. The wharf is crowded between a marine fuel service depot to the north and a shore based seafood processor to the south. Vessels moored at the adjacent facilities encroach on berthing the dock. The past 10 years of total passenger and vehicle traffic at Kodiak City Dock is shown below. The M/V Tustumena was out of service most of 2013, causing a steep dropoff in traffic at the terminal.



The most recent above water survey was completed on August 13, 2018. The underwater inspection occurred on July 8, 2014.

Vessels	
Name	Berthing, Alignment
Tustumena	Port / Starboard

Tidal Data (MLLW=0.0 feet)	
EHW	13.1
MHHW	8.7
MHW	7.8
ELW	-3.5

Terminal Building
The ticket office is located in a city-owned building, on shore, between the two access trestles.

Generator & Building
NA

Utilities @ Dock	
Water:	Yes

Uplands	
Short-Term Parking:	N/A
Long-Term Parking:	N/A
Staging Area:	150 lineal feet

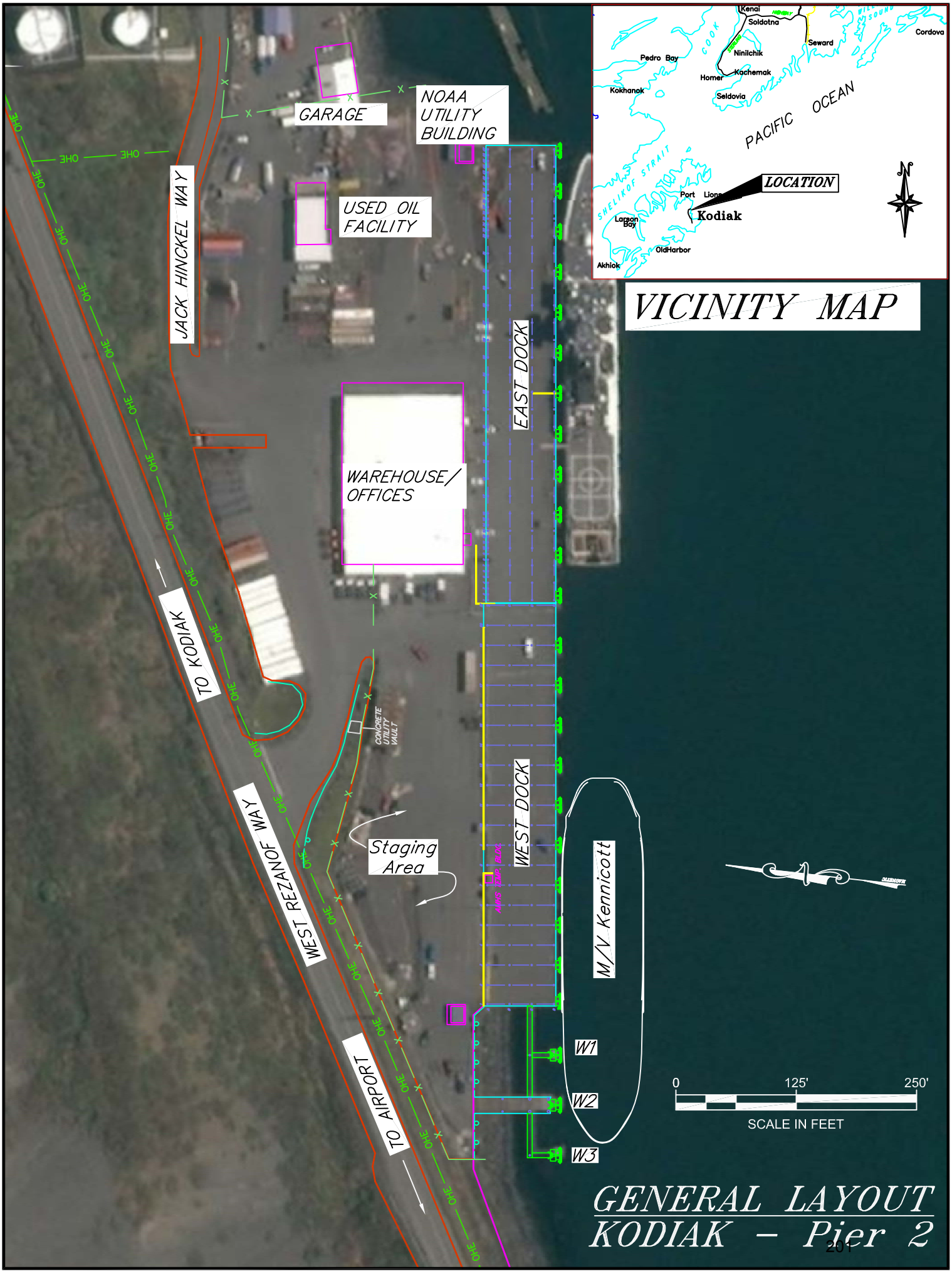
U-Shaped Dock - #1425	
Year Built:	2016
Dock Structure:	Steel pile supports, concrete pier caps, p/c concrete channel beams (approach), & p/c concrete haunched deck panels (main dock)
Fenders:	Five (5) pin pile supported fender panels
Mooring Bollards/Cleats:	Bollard mounted at both ends of dock; several cleats mounted to bullrail along the dock face.
Lighting:	Yes
Condition:	New

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1964	P-Alaska-3107	City of Kodiak Ferry Terminal	Construct new timber dock.
2014	68938	Kodiak Ferry Terminal & Dock Improvements	Replace aging timber dock with new concrete dock.

Observations

1. The moveable bullrail hinge is seizing when closed, making it difficult to swing open. Once the bullrail starts to swing, it moves easily. May be alignment of hinge plates and/or size or alignment of hinge pin.
2. There are several small spalls along the seaward edge of the dock, in the vicinity of the bullrail opening. No reinforcement is exposed. There are several hairline longitudinal cracks emanating from the edge of the dock in this same vicinity.
3. The M/V Tustumena overhangs approximately 50' on the south end of the dock (during starboard side berthing), which can be an issue when a packer is offloading at the fish plant next door.
4. Soundings taken along the face of the dock from North to South resulted in mudline elevations ranging from -29 to -20 below MLLW (0.0').
5. The 90-foot long double-truss aluminum security gate has been damaged and requires sensitive care when in use. The terminal manager said this was the longest gate the manufacturer had ever built. Two-thirds of the gate, sixty-feet, is left in a cantilevered state, as the only portion supported is 30-feet between gate posts. We found minor weld cracks at the leading edge corners. The gate requires guide brackets to be deployed when closing, removed when opening. These brackets fit into holes in the concrete deck, which freeze over in the winter. There have been reinforcement improvements made to the gate in the past year, mainly adding diagonal tension cables between all frame members.
6. Transverse cracks are spaced approx. 3-feet apart in the concrete sidewalk at the south approach pedestrian canopy.
7. The terminal building is owned by the City of Kodiak, and space is shared with other tourism-related businesses. The exterior cedar shake siding is heavily weathered and needs to be replaced. Cracks are evident in the building foundation and indicate previous settlement of the fill. Wood decks adjacent to the terminal building have severe structural deficiencies. Rot is prevalent in the framing and sheet metal hangers are corroded or missing.
8. The overall stability of the terminal building embankment was investigated during design of the new dock facility. This analysis indicates the embankment may be unstable during a design seismic event. The riprap slope under the dock is stable with no obvious signs of erosion.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Nothing required		
Category II - Rehabilitation Work		
Dock	1	Take a closer look at the bullrail hinge, and repair the sticky pin/hinge plates. Repair patch the spalls at the dock edge; monitor the hairline cracks. Monitor the transverse cracks in the south approach sidewalk. Hire a welder to make repairs to the security gate. Install intermediate supports along the shoreward bullrail to eliminate cantilever loads while in the open position.
Category III - Upgrades Needed		
Nothing required		


GARAGE
NOAA UTILITY BUILDING
USED OIL FACILITY
JACK HINCKEL WAY
WAREHOUSE/ OFFICES
EAST DOCK
WEST DOCK
TO KODIAK
WEST REZANOF WAY
TO AIRPORT
Staging Area
CONCRETE UTILITY VAULT
M/V Kennicott
W1
W2
W3
OHE
Kenai
Soldotna
Cordova
Seward
Ninilchik
Pedro Bay
Homer
Kachemak
Kokhanok
Seldovia
PACIFIC OCEAN
LOCATION
Port Lions
Kodiak
Larson Bay
OldHarbor
Akhiok
VICINITY MAP
0
125'
250'
SCALE IN FEET
GENERAL LAYOUT
KODIAK – Pier 2

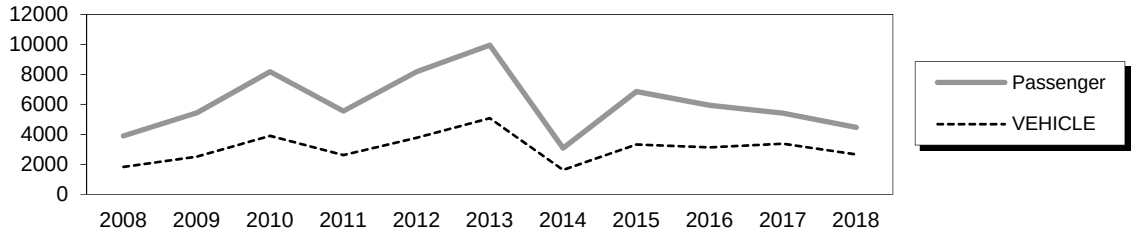
Kodiak Pier 2

Jack Hinckel Way

Owner: City of Kodiak

Terminal Manager: Martin Owen, Harbormaster, City of Kodiak, 907-486-8080

Terminal Description: The M/V Kennicott docks at Pier 2 on its turnaround between Homer and Kodiak. The facility is a rectangular dock comprised of two adjacent dock sections: AMHS primarily uses the West dock which was constructed in 1988 (approximately 418'x 75'). The East dock was constructed in 2006 and is approximately 475'x 73'. There is no apparent division or break between the two dock sections. The past 10 years of total passenger and vehicle traffic at Kodiak Pier 2 is shown below. The M/V Kennicott was only in service for 7 months in 2014, resulting in a steep dropoff in traffic at the terminal.



The most recent above water survey was completed on August 13, 2018. The most recent underwater inspection occurred on July 9, 2014. The most recent fracture critical inspection was on September 29, 2012.

Vessels	
Name	Berthing, Alignment
Kennicott	Port / Starboard

Tidal Data (MLLW=0.0 feet)	
EHW	13.1
MHHW	8.7
MHW	7.8
ELW	-3.5

Terminal Building
There is no terminal building at this dock. Tickets are taken from an 8'x8' pursers shack.

Generator & Building
This facility does not have a generator on-site.

Utilities @ Dock	
Water:	Yes
Electric:	N/A
Fuel:	Yes (Truck Fill)
Telephone:	N/A
Sewer:	No

Uplands	
Short-Term Parking:	0
Long-Term Parking:	0
Staging Area:	4 lanes, ~ 1600 ft

Pier 2 Dock	
Year Built:	1988/2006
Dock Structure:	Steel pipe piles supporting steel girder and floor beam fram with prestressed concrete deck panels
Steel Coating:	Galvanized
Fenders:	22 pin pile units spaced ~ 42' apart; east unit consists of a pair of steel support piles, a steel framework, a timber wearing surface and two rubber cylinders.
Mooring Bollards/Cleats:	20 bollards/cleats mounted between breaks in the bullrail along the dock face.
Lighting:	6 light poles spaced 150'-200' apart, mounted ~87' back from the dock face
Condition:	Good
Load Posting Sign:	N/A
Original Design Load:	400 psf / 988 Wheel Loader / 150 Ton Track Crane

Observations

1. The dock is comprised of precast, pre-stressed concrete deck panels spanning between steel pier caps supported by steel pipe piles. There are three steel pile supported mooring/breasting dolphins off the end of the West dock connected by steel catwalks. The middle dolphin is connected to the dock by an 80'x 17' timber dock extension. The Kennicott ties up so that the vehicle ramp lines up with the moveable bullrail in the center of the West dock. Embarking vehicles line up on an adjacent paved area behind concrete barriers. Ticket sales are performed at the Pier 1 facility and passenger amenities are not available at this location.

   The dock is currently used for transfer of general cargo/fuel, mooring of the NOAA R/V Oscar Dyson, fishing vessels and summer cruise ships, in addition to ferry operations. There are potential conflicts in mooring and dock activities, especially during the summer cruise ship season. There is not enough dock space for simultaneous moorage of both the Kennicott and large cruise ships.
2. Overall the deck panels appear to be in fair condition. Steel plates, cast into the precast concrete deck panels above the floor beams, are severely corroded and cracks run longitudinally from these plates in the concrete. The cracks are parallel, not perpendicular to the direction of reinforcing as would occur if the panel had been overloaded. These cracks may have occurred after the panels were installed to the stringers and developed when shrinkage and temperature movement was restrained. Asphalt concrete covers the surface of the deck, so inspection of the topside of the concrete panels is not possible. The dock sees a variety of heavy traffic, but is not load posted.
3. The pier caps consist of built-up steel box girders supported by vertical steel pipe piles. The pipe piles are fillet-welded directly to the bottom flange of the cap. The pier caps are in good condition, but exhibit minor misalignment and excessive weld build-up at all field splice locations, surface rust is typical on the girder flanges at pile connections, and white rust covers the rest of the exposed surface of the caps.
4. The support pipe piles are 18" diameter and are in good condition. All piles exhibit surface rust with the splash (tidal) zone. Galvanized coatings on the steel pipe piles of the eastern dock are clearly depleted.
5. The timber planks show moderate signs of wear on the dock extension to dolphin W2. A fence, originally intended to restrict access from the uplands, is missing a 3-foot section and is open to dock traffic. There is a sign posted on the remaining fence that reads 'SEE HARBORMASTER FOR VEHICULAR ACCESS GVW 30,000 LBS. MAX AXLE 24,000 LBS.'. While not used by AMHS traffic, the timber dock extension to dolphin W2 appears to be in good condition.
6. Soundings taken along the dock face during '18 inspection resulted in mudline elevations ranging from -26 to -31 below MLLW (0.0').
7. The moveable bull rail does not have any bolts placed in base plates or between sections of rail to lock it in place, i.e. restrain a moving vehicle.
8. The windsock is hanging threadbare from the frame & support post.
9. The steel fender piling and frames are in good condition. Steel is galvanized. Minor abrasions were noted on the timber face but the surface is still serviceable. The 2016 inspection measured structure-seawater potentials of -0.84 V at the western dock, and -0.66V at the eastern dock. The most recent Fracture Critical (FC) report found that there is surface rust within the tidal fluctuation zone of the piles.
10. Dock-side studs for fender donut mount brackets have insufficient thread length and multiple washers were used as spacers to make up the difference during construction. This feature is common throughout the facility.
11. Fishing vessels tie to horns of bollards because mooring line end loops are too small to pass over main bollard pipes. A pipe on the side of the fender panels runs full length and provides smaller vessels an all-tide mooring point. Unfortunately the only horizontal connection from the fender panel to the dock is the rubber donut bracket, which was not designed for transfer of mooring loads.
12. At the transition of the uplands to dock, a pavement crack and one-inch grade drop runs the length of the dock due to settlement of structural uplands fill. The uplands and staging area were paved with new asphalt within the past 2 years ('18 inspection). All looks good except for an area of light abrasion damage, where M/V Kennicott lays down her vehicle-loading apron, and a low spot with puddling in the staging area.

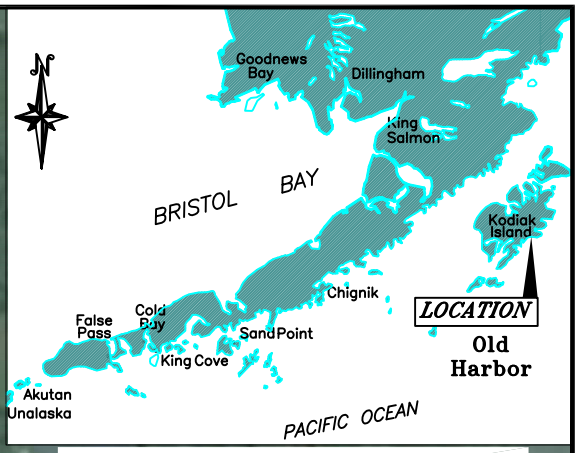
Observations (cont'd)

13. In October of 2010, a mooring cleat was pulled out of the reinforced concrete base. Both the coast guard ice breaker Healey and M/V Kennicott were tied off to the cleat during a storm.

    The concrete mounting bases for all the mooring bollards were replaced with same geometric shape but heavier steel reinforcement. Bollards 5 & 9 were rebuilt within the past 2 years with heavier steel reinforcement and a higher 30-ton capacity than the other bollards (17-ton), as they are primary spring line mooring points for cruise ships & the M/V Kennicott.

14. Wave activity at the Pier 1 location can result in difficult mooring and elevator loading operations – primarily during winter months.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Issues		
Safety Ladders	1	Inspect all fasteners to ensure ladders are securely and safely fastened.
Category II - Rehabilitation Work		
Concrete Dock Panels	2	Monitor the cracked dock panels
Fender Panels	3	Install sacrificial anodes on steel pin piles and framework of fender units. Also install lateral cross-chains that will distribute mooring loads from the fender panel mooring pipes to the dock backup structure.
Wind Sock	4	Replace the wind sock (fabric only). Frame appears to be in good condition.
Category III - Upgrades Needed		
Upland Staging Improvements	5	Investigate provision of upland improvements for vehicle staging, security and visitor amenities (heated waiting and restroom facilities) if Pier 2 is to remain in long term use by the M/V Kennicott.



VICINITY MAP

UPLANDS PARKING/ STAGING AREA

APPROACH TRESTLE

W1

MAIN DOCK

E1

E2

MOORING DOLPHIN, TYP.

M/V TUSTUMENA

SITKALIDAK STRAIT

0 100' 200'

SCALE IN FEET

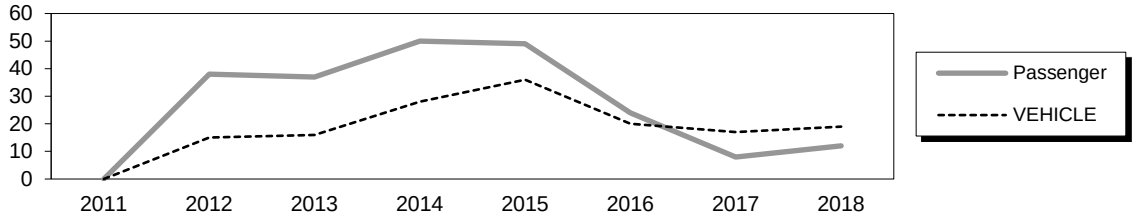
GENERAL LAYOUT
OLD HARBOR

Old Harbor City Dock

Owner: City of Old Harbor

Contact: Allen Christiansen, Harbormaster – 907-575-6614

Terminal Description: A new multi-use dock facility was recently constructed by the City of Old Harbor on Kodiak Island (50 miles southwest of City of Kodiak). The M/V Tustumena provided ferry service on four occasions in 2012. The frequency of future scheduled service is unknown as Old Harbor is out of the way of the normal route that the ferry takes from Kodiak to Chignik. The facility consists of a 55'x102' pile-supported dock with 3 fender panels, 3 mooring dolphins with access to the dock by steel catwalks, and an 18'x 280' pile-supported approach trestle connected to shore. The dock was built in 2012 to replace the aging timber freight dock. This is a multi-purpose facility utilized by other vessels. AMHS is not in control of operation or maintenance of this facility. The most recent annual passenger and vehicle traffic at Old Harbor is shown below.



The most recent above water survey and fracture critical inspection were completed on August 11, 2018. The underwater survey occurred on July 11, 2014.

Vessels	
Name	Berthing, Alignment
Tustumena	Port

Tidal Data (MLLW=0.0 feet)	
Highest Observed	11
MHHW	-
MHW	-
Lowest Observed	-3

Terminal Building
This facility does not have a terminal building.

Generator & Building
This facility does not have a generator on-site.

Utilities @ Dock	
Water:	N/A
Fuel:	Yes

Uplands	
Description:	50' x 70' gravel area
Short-Term Parking:	N/A
Long-Term Parking:	N/A
Staging Area:	N/A

Dock - #186	
Type:	55'x102' dock & 18'x280' approach trestle (prestressed concrete panels)
Year Built:	2012
Dock Support:	30" & 36" dia. steel pipe piles w/ steel w-beam pile caps
Pile Coating:	Galvanizing
Anodes:	Yes, welded directly to piling
Lighting:	Light poles on dock & trestle
Condition:	New
Notes:	
Load Posting Sign:	N/A
Original Design Load:	30-Ton forklift with 70-Ton front axle / HS25-44 Truck / 250 PSF

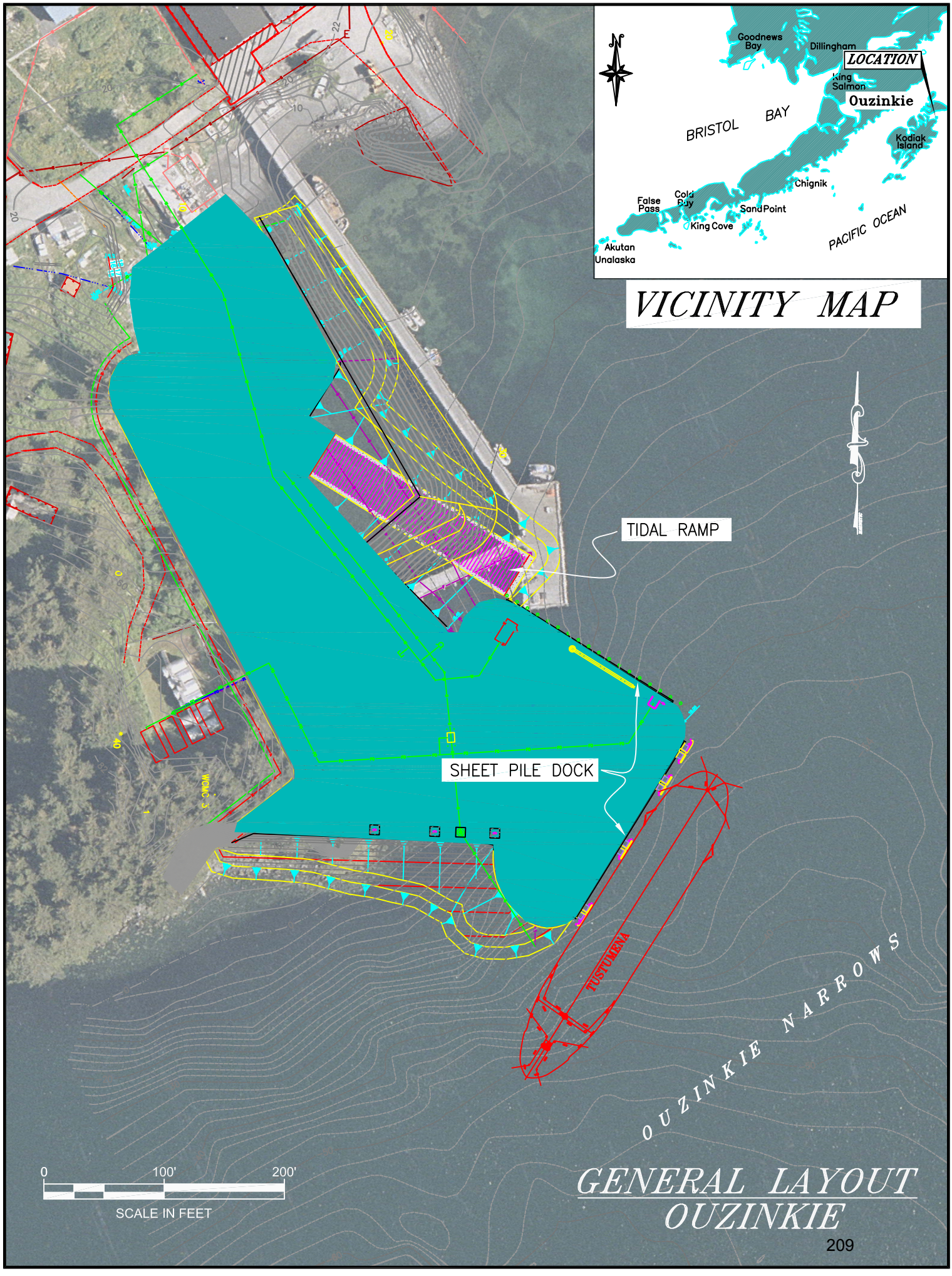
Dolphins							
Dolphin	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Notes**
W1	4B	2V	Sitka Spruce	Yes	2012	New	
E1	4B	2V	Sitka Spruce	Yes	2012	New	
E2	4B	2V	Sitka Spruce	Yes	2012	New	

Catwalks / Gangways							
#	**From Struc.**	**To Struc.**	**Length / Style**	**Built**	**Safety Chains?**	**Cond.**	**Lighting**
C1	Dock	W1	4'x87' Catwalk / Tube Deck Truss	2012	Yes	New	None
C2	Dock	E1	4'x87' Catwalk / Tube Deck Truss	2012	Yes	New	None
C3	E1	E2	4'x87' Catwalk / Tube Deck Truss	2012	Yes	New	None

Observations

1. Depth to mudline elevations, taken with leadline readings at locations along the fender face in 2016, range from -27 to -31 MLLW.
2. The most recent underwater inspection (’18) found anodes with an average of 85% remaining section, and cathodic protection readings averaged -0.98V. Any reading less negative than -0.8V indicates the steel is not adequately protected from corrosion.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Issues		
Nothing Required		
Category II - Rehabilitation Work		
Dolphins	1	Recommend cleaning dolphin caps and unblocking drainage holes.
Dock Misc	2	Recommend securing “Flammable” sign for the dock fuel line connection to grating.
Concrete deck	3	Recommend completely filling all grout tubes flush to the deck surface to prevent collection of water and possible freeze damage to the deck.
Steel coating	4	Recommend cleaning and repairing galvanized coating on steel connections per ASTM A780 – using zinc-based alloys. Recommend monitoring the condition of splice plates and cleaning and re-coating plates with a zinc rich paint when the hot dip galvanizing has been depleted.
Utilities	5	Recommend shimming fuel pipelines at the first channel support at the end bent. Ensure electrical panel is tightly closed to prevent seawater intrusion
Category III - Upgrades Needed		
Nothing Required		

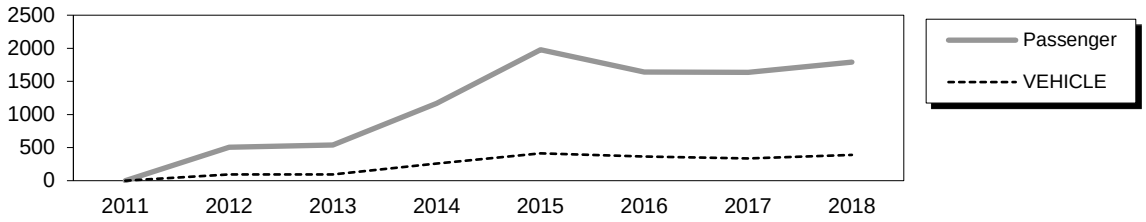

Goodnews Bay
Dillingham
LOCATION
King Salmon
Ouzinkie
BRISTOL BAY
Kodiak Island
Chignik
False Pass
Cold Bay
Sand Point
King Cove
PACIFIC OCEAN
Akutan
Unalaska
VICINITY MAP
TIDAL RAMP
SHEET PILE DOCK
TUSTUMENA
OUZINKIE NARROWS
0
100'
200'
SCALE IN FEET
GENERAL LAYOUT
OUZINKIE

Ouzinkie City Dock

Owner: City of Ouzinkie

Contact: Dan Clarion, Mayor/Harbormaster – 907-680-2209

Terminal Description: The M/V Tustumena stops in Ouzinkie, on Spruce Island (15 miles northwest of Kodiak) as part of its scheduled voyage between Kodiak and Homer. This is a new port of call for AMHS as of 2012. The open-cell sheet pile wharf was built in 2012 to replace an aging timber dock. The ship breasts against four (4) fender panels on the 175-foot long southeast dock face. This is a multi-purpose facility utilized by other vessels. AMHS is not in control of operation or maintenance. The most recent annual passenger and vehicle traffic at Ouzinkie is shown below.



The most recent above water survey was completed on August 14, 2018.

Vessels	
Name	Berthing, Alignment
Tustumena	Port (opening for apron)

Tidal Data (MLLW=0.0 feet)	
Highest Observed	12.0
MHHW	-
MHW	-
Lowest Observed	-3.0

Terminal Building
This facility does not have a terminal building.

Generator & Building
This facility does not have a generator on-site.

Utilities @ Dock	
Fuel:	No
Electric:	No
Water:	No

Uplands	
Short-Term Parking:	N/A
Long-Term Parking:	N/A
Staging Area:	N/A

Bulkhead Dock	
Year Built:	2012
Submerged steel coating:	Uncoated steel sheets - Plans show 260# anodes welded to sheets
Fenders:	Steel pin piles with timber & UHMW plastic facing
Mooring bollards/cleats:	Cleats mounted along edge of dock
Lighting:	No lighting
Condition:	New
Load Posting Sign:	N/A
Original Design Load:	500 psf / Taylor 950 Forklift / 150 Ton Mobile Crane picking 75 Ton load

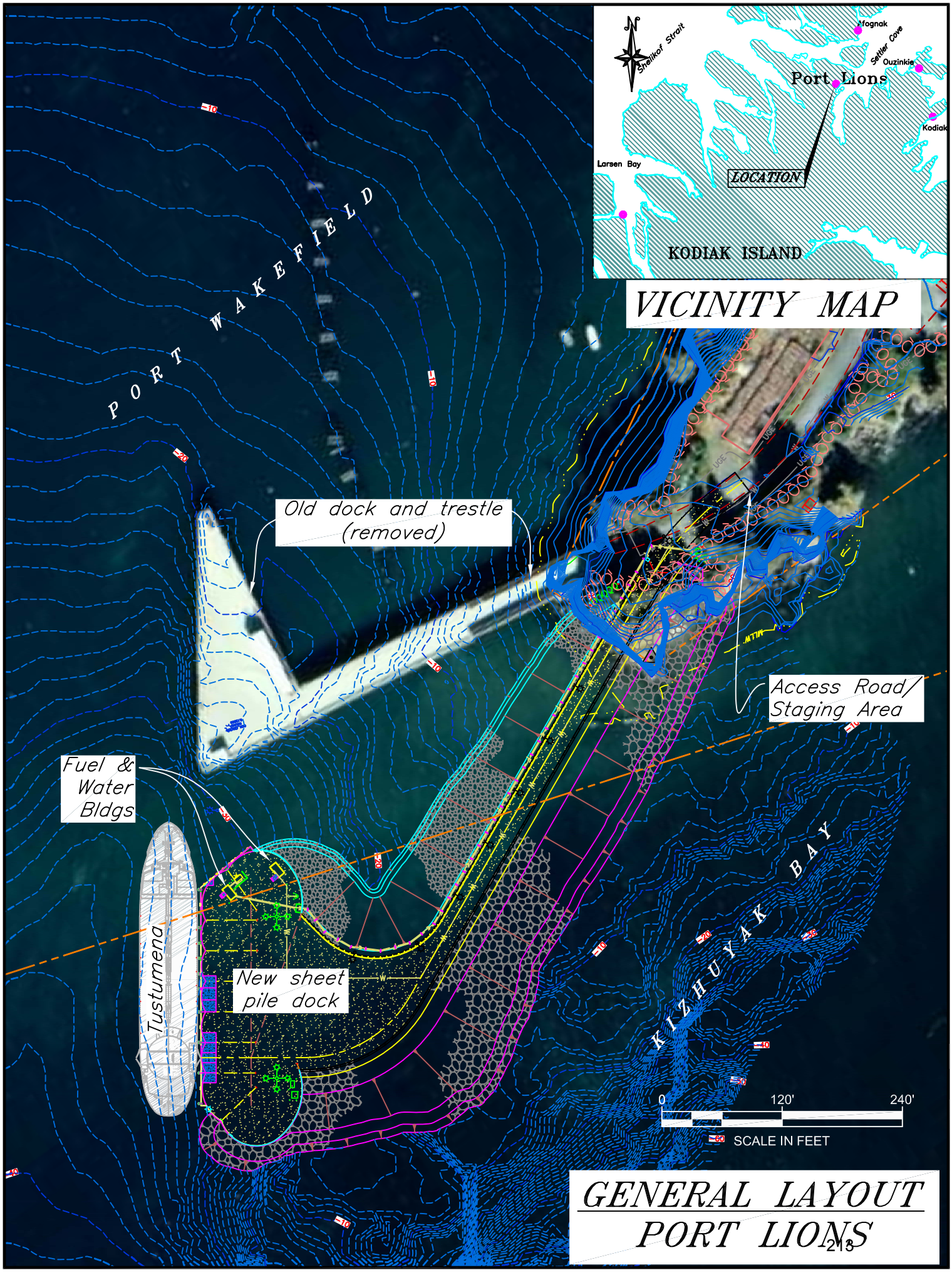
Observations

1. The City of Ouzinkie assists with shore-based line handling for AMHS.
2. There is a bollard along the dock face that is in the way of the pedestrian ramp coming off the M/V Tustumena. So pedestrians board via the vehicle ramp.
3. Structural or federal bridge program inspections are not required at this facility as it is an earth filled bulkhead structure.

Observations (cont'd.)

4. The average structure-seawater potential along the steel bulkhead was -0.90V (Ag/AgCl), indicating full CP protection. Structure-seawater potentials of the dock fender modules averaged -0.71V, while the south west side of the steel bulkhead was measured at -0.67V. Any CP readings less negative than -0.8V indicate lack of corrosion protection, and consequently freely corroding steel.
5. Depth to mudline elevations, taken with leadline readings at locations along the fender face in 2018 range from -31 to -44 below MLLW (0.0).
6. The strain relief fitting is not secured at the end of the catwalk electrical conduit. An "Authorized Personnel" sign is damaged at the end of a catwalk.
7. An electrical box is not secured at the east corner of the dock, next to the red navigational light.
8. A piece of steel appears to be embedded in the HDPE sleeve at the easternmost fender pile.
9. The handle is broken on the fiberglass door of a life ring cabinet. Several cabinets had similar damage to the doors.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Issues		
Nothing Required		
Category II - Rehabilitation Work		
Fender	1	Remove piece of steel embedded in fender pile at the eastern corner of the dock.
Anodes	2	Place anodes on the southwest side of the bulkhead. Place anodes on the four fenders on the southeast side of the dock.
Life Rings	3	Repair or replace the broken fiberglass doors on the life ring cabinets.
Utilities	4	Secure the electrical box at the solar powered nav light.
Catwalk	5	Install 3/8" diameter drain holes in the lowest point of the catwalk frame members. Repair "Authorized Personnel" sign on catwalk. Repair the strain relief fitting on the electrical conduit.
Category III - Upgrades Needed		
Nothing Required		

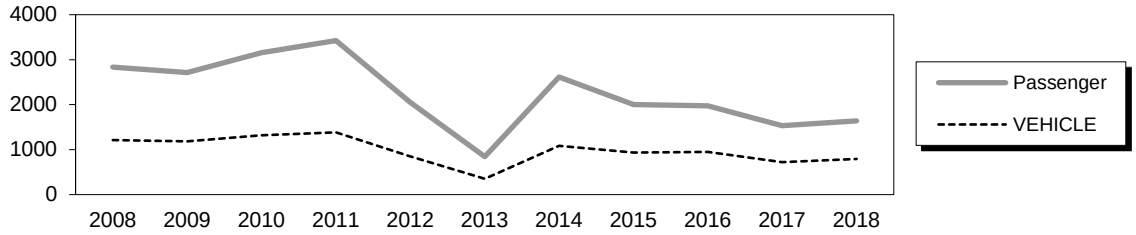

Shelikof Strait
Afognak
Settler Cove
Ouzinkie
Port Lions
Kodiak
Larsen Bay
LOCATION
KODIAK ISLAND
VICINITY MAP
PORT WAKEFIELD
Old dock and trestle (removed)
Access Road/ Staging Area
Fuel & Water Bldgs
Tustumena
New sheet pile dock
KIZHUYAK BAY
0
120'
240'
SCALE IN FEET
GENERAL LAYOUT
PORT LIONS

Port Lions Dock

Owner: City of Port Lions

Contact: Russell Gunderson, Harbormaster 907-454-2477

Terminal Description: The M/V Tustumena docks at Port Lions on its east/west passage between Kodiak and Homer. Port Lions is the second busiest port of call along the southwest route after Kodiak. The Port Lions facility is an earth-filled open-cell sheet pile wharf constructed in summer 2014. The dock has an approximately 214' berthing face with two mooring dolphins along the north end. Access to the dock is via a rubble-mound breakwater. The facility is a multi-purpose dock and could be in use by other vessels when the ferry arrives. AMHS is not in control of the operation or maintenance of this facility. The past 10 years of total passenger and vehicle traffic at Port Lions is shown below. The M/V Tustumena was out of service most of 2013, causing a steep dropoff in traffic at the terminal.



The most recent above water survey was completed on August 13, 2018.

Vessels	
Name	Berthing, Alignment
Tustumena	Starboard

Tidal Data (MLLW=0.0 feet)	
Highest Observed	13.1
MHHW	8.7
MHW	7.8
Lowest Observed	-3.5

Terminal Building
This facility does not have a terminal building.

Generator & Building
This facility does not have a generator on-site.

Utilities @ Dock	
Fuel:	No
Electric:	No
Water:	No

Uplands	
Short-Term Parking:	N/A
Long-Term Parking:	N/A
Staging Area:	N/A

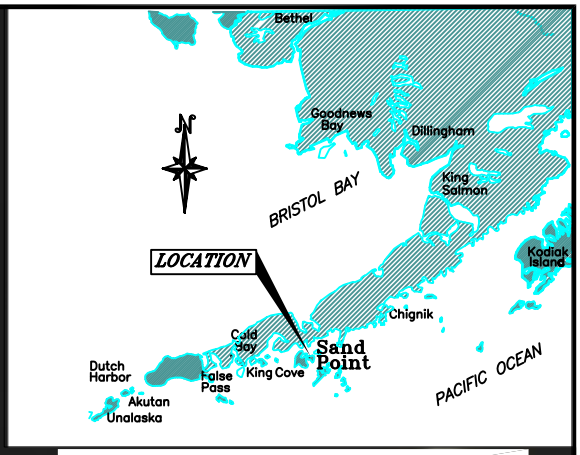
City Dock & Approach - #1428	
Year Built:	2014
Dock Structure:	Steel sheet pile bulkhead with
Coating:	Uncoated steel
Fenders:	Pin pile fenders along the face of the dock.
Mooring bollards/cleats:	Bollards along edge of dock; 2 dolphins north of dock
Lighting:	Light posts mounted on dock
Condition:	New
Load Posting Sign:	N/A
Original Design Load:	HS20

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
1960's	N/A	Port Lions Dock (original timber)	Construct new timber approach trestle and triangular main dock with crab pot holding pens and ice house.
2014	N/A	Port Lions Dock (new PND open cell sheet pile)	Construct new open cell sheet pile bulkhead, berthing fender structures, and dolphins.

Observations

1. The restraining nut is missing on catwalk restraining bolt connections. A pile cap at breasting dolphin N1 is damaged and is jacking up one corner of the catwalk
2. There are Tek screws missing on the catwalk railing in numerous locations.
3. The small radius of the circular rubber fenders along the dock face doesn't allow for much energy absorption. The top of the rubber ends below the steel mounting hardware, which can potentially damage vessel sponsons. Signs of impact damage should be monitored.
4. The average structure-seawater potential along the steel bulkhead was -0.85V (Ag/AgCl), indicating full CP protection. Structure-seawater potentials of the mooring dolphin averaged -0.97V, while the breasting dolphin was measured at -0.96V. Any CP readings less negative than -0.8V indicate lack of corrosion protection, and consequently freely corroding steel.
5. Depth to mudline elevations, taken with leadline readings at locations along the fender face in 2018, range from -25 to -36 MLLW.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Issues		
Nothing required		
Category II - Rehabilitation Work		
Catwalks		Install restraining nuts missing on catwalk restraining bolt connections. Install Tek screws that are missing on catwalk railings.
Category III - Upgrades Needed		
Fendering System		Extend the height of the fenders above the top of the dock to keep vessel sponsons from overtopping at high tide.



VICINITY MAP

POPOF STRAIT

Mooring Structures

N1

MV TUSTUMENA

Dock

S1

Breakwater/
Dock Access Road

City Boat Harbor

0 150' 300'

SCALE IN FEET

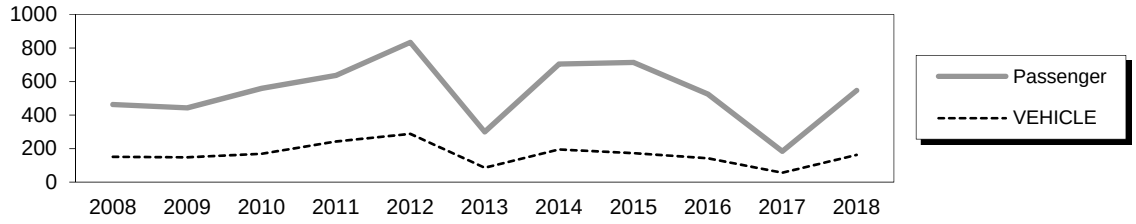
GENERAL LAYOUT
SAND POINT

Sand Point City Dock

Owner: City of Sand Point

Contact: Richard Kochuten, Harbormaster 907-383-2331

Terminal Description: The M/V TUSTUMENA docks at the Sand Point city dock on its east/west passage through the Aleutian Chain. The Sand Point facility is a multi-use freight wharf, constructed in 1983 by the City of Sand Point. It is located at the northeast end of the small boat harbor breakwater. The dock is approximately 200' long and 60' wide and consists of pre-stressed concrete deck panels supported by steel beams and steel pipe piles. There are six fenders along the dock face. Each fender has two steel pin piles, a steel framework with timber face and is attached to the dock with rubber cylinders. Steel mooring dolphins with fender systems are located at each end of the dock and accessed by catwalks. The US Army Corps of Engineers extended the riprap breakwater around to the East to protect the City's small boat harbor in 2006. The breakwater serves as a new single-lane access road. The facility is a multi-purpose facility and is utilized by other vessels. AMHS is not in control of the operation or maintenance of this facility. The past 10 years of total passenger and vehicle traffic at Sand Point is shown below. The M/V Tustumena was out of service most of 2013, causing a steep dropoff in traffic at the terminal.



The most recent above water survey was completed on September 21, 2018. The underwater inspection occurred on July 12, 2014. The most recent fracture critical inspection was on September 15, 2012.

Vessels	
Name	Berthing, Alignment
Tustumena	Starboard

Tidal Data (MLLW=0.0 feet)	
Highest Observed	9.5
MHHW	-
MHW	-
Lowest Observed	-3.0

Terminal Building
This facility does not have a terminal building.

Generator & Building
This facility does not have a generator on-site.

Utilities @ Dock	
Fuel:	No
Electric:	No
Water:	No

Uplands	
Short-Term Parking:	N/A
Long-Term Parking:	N/A
Staging Area:	250 lineal feet

City Dock - #1756	
Year Built:	1983
Submerged steel coating:	Black coal tar epoxy; 80% of the coating has failed
Fenders:	Steel pin piles with timber face
Mooring bollards/cleats:	Cleats mounted along edge of docks
Lighting:	Light posts mounted on dock
Condition:	Fair
Load Posting Sign:	N/A
Original Design Load:	400 psf / 988 Loader / 150 Ton Mobile Crane

Dolphins							
Dolphins	**Dolphin Piles**	**Fender Support**	**Fender Face**	**Anodes**	**Built**	**Cond.**	**Notes**
N1	1B, 1V	Mooring Only		No	1983	Poor	Red navlight & reflector
S1	1B, 1V	Mooring Only		No	1983	Poor	Red navlight

Observations

1. The dock deck consists of precast concrete panels spanning between pier caps. There is no additional wearing surface on the panels. The most recent Fracture Critical inspection found enough deficiencies to rate the deck in **poor** condition. There is cracking, spalling and delamination in the underside of deck panels between Stringers 2 and 5. There are a pattern of circular spalls, lateral cracks along a line coincident with steel rods embedded in the panels between steel angles. Moderate efflorescence and rust staining is also evident within the cracks, at the angles along the panel edges. There are also several spot spalls up to 3' diameter that occur at the quarter points of the panels. Efflorescence, rust staining and where exposed, corroded reinforcement, is typical.

   The concrete deck was heavily traversed by forklifts, with chains on the tires during the winter, for many years. The City has recently restricted forklift access, but the top surface of the concrete panels area abraded with widespread spalling around the edges of deck panels. The City's Harbor Dept. staff monitor loads on the dock when they're on shift during the day.

   A load rating study by the DOT&PF bridge department, completed in 2015, found that the dock has the capacity for carrying standard highway vehicle loads. The City should hire an Engineering firm to evaluate the dock for heavier freight loading.
2. The pier caps consist of rolled steel girders supported by vertical steel pipe piles. Stringers consisting of rolled steel girders span between the pier caps. The pipe piles are welded to 24" diameter circular bearing plates, which are welded to the bottom flanges of the pier caps. The most recent Fracture Critical inspection found enough deficiencies to rate the pier caps/stringers in **poor** condition.

   The splice plates at the stringer/pier cap connections and bolted field splices were replaced with smaller plates with no paint coating, so excessive corrosion (and white rust) has formed and spread to other parts of the stringers and pier caps. 20-30% section loss is typical on flanges, webs, splice and stiffener plates, with higher section loss at isolated locations. Bolts are missing or too short in stringer to pier cap connections and there are several 1/2" to 1" deep impact damages on flanges.
3. The piles consist of 16" diameter steel pipe piles. According to the most recent fracture critical inspection the piles are in **poor** condition with laminar corrosion up to ¼" and 1/16" of pitting is typical. Ultrasonic thickness measurements indicate that there is up to 25-30% section loss in the areas with heavy corrosion. It was also noted that numerous piles were driven out of alignment with the pier caps. The caps are off-center 2-3" from the centerline of the pier caps.
4. There are six fender modules equally spaced along the face of the dock. Each is supported on pin piles with large side-loaded rubber cylindrical energy absorbing units bearing against the dock face. The fender panels consist of steel framing and vertically oriented timbers. Each fender module includes an integral emergency ladder. Retaining brackets are damaged on all modules, likely from the combination of vessel impact and mooring line loads. Fender 4 is displaced 32" to the left and the retaining brackets are destroyed. Several timber elements are broken or missing on each module. It also appears that the support piles have settled on several of the fender units. Fender 4 is missing its transition plate. There are no lateral chains on any modules.

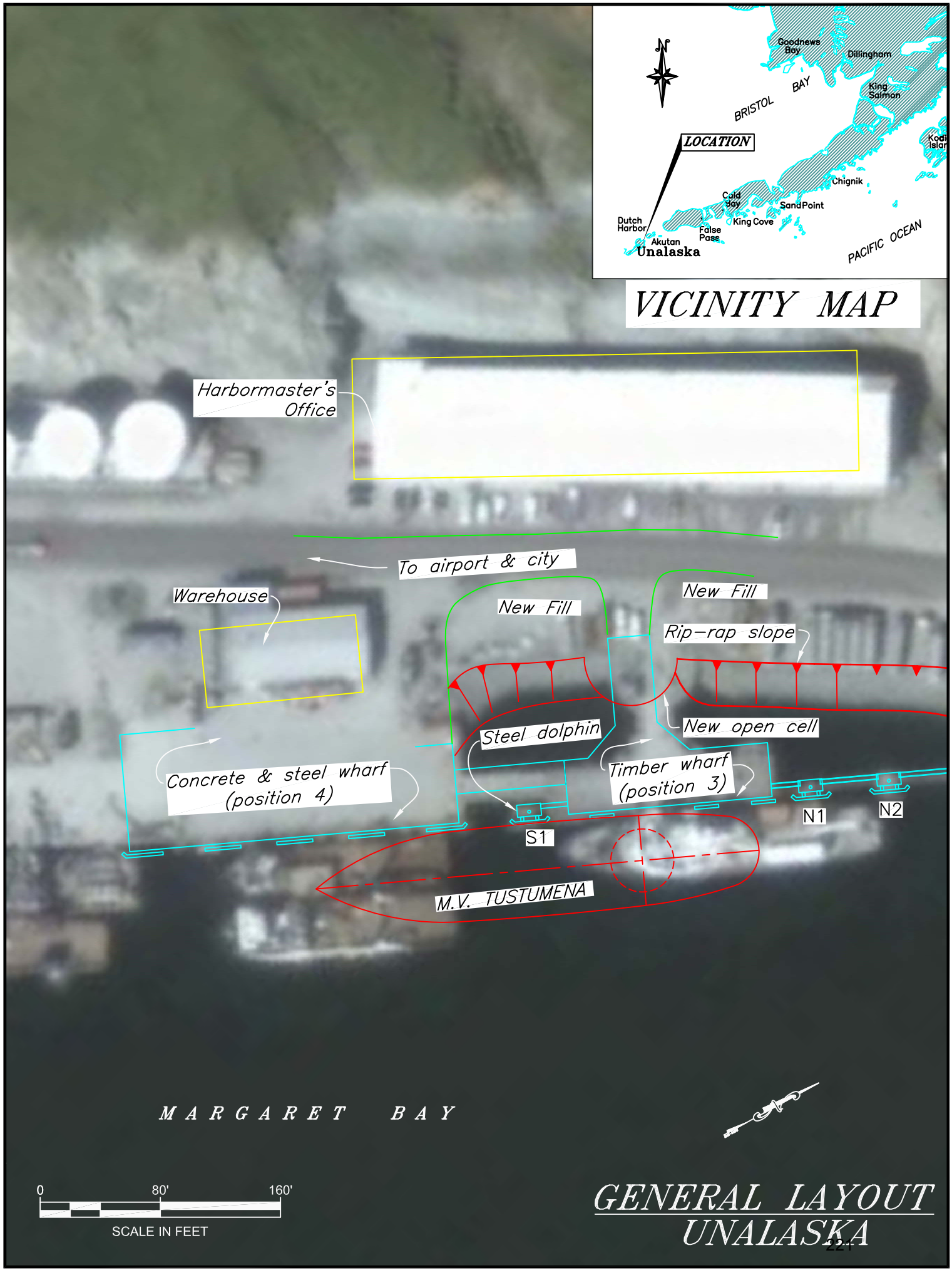
   The AMHS vessel Tustumena Master was on-site during the '18 inspection, and noted that he must be very cautious when landing at the dock.
5. Dolphin N1 appears to have been impacted by a vessel. Sections of open grating are missing on top of the dolphin & catwalk, grating that remains on the dolphin is severely bent, the tube frame support for the grating has sheared away from the dolphin cap & the end catwalk handrail & navlight support are bent shoreward. Coatings are failing on the catwalks and dolphins.
6. The bollards are fastened to cast-in-place concrete pedestals and the surface of the concrete has failed prematurely. The concrete has spalled, exposing some of the steel reinforcement. Two pedestals have been repaired yet three still need repair. Cracks line the concrete curb along the outer face of the dock, likely transferred from vessel impacting the fender system.

Observations (continued)

7. The dock is relatively narrow and vehicle transfer can be difficult, particularly when there are vehicles dropping off or meeting passengers on the dock. The cable guardrail, north of the dock, is substandard and failing. The last section of cable rail, transitioning to the dock, was not reassembled after construction and the cable lies on the riprap slope.
8. The City of Sand Point provides line handling for the M/V Tustumena. Exterior lights affixed to the City Building on the dock are glaring, and seriously disturb visibility for approaching vessel captains. Navigational lights are missing on the end dolphins (S1 & N1).
9. Soundings between top of deck and mudline, are leadline readings at locations along the fender face in 2018 and range from 41 to 46-feet.
10. The most recent inspection (’18) took cathodic protection readings averaging -1.04V on the dock support piles & mooring dolphins, and -0.67V on the fender modules. Any reading less negative than -0.8V indicates the steel is not adequately protected from corrosion.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Issues		
Dock - Fender Modules	1	Replace damaged fender mount brackets and cracked timbers. Install cross chains between the top fender panel and the dock to properly transfer mooring line loads. If fender support piles have settled, then install vertical support chains & dock connections.
Load Rating	2	The cracking, efflorescence, and rust staining on the underside of the dock indicate overloading of the concrete. The City should hire an Engineering Firm to load-rate the dock for heavy freight loads. Or post a sign restricting use to standard highway vehicles only.
Dock Support Piles	3	Repair the damaged pile on the dock face. Cut out the damaged portion, install a new pile section, and reapply the protective coating. The pile cap may require repair as well.
Transition Guardrail	4	Re-install the transition section of guradrail adjacent to the north corner of the dock.
Lighting	5	Install non-glare lighting along the dock and repair damaged/missing navigational lights at each end dolphin (S1 & N1).
Category II - Rehabilitation Work		
Dolphins	6	Repair the cap (including the tube frame support , open grating, end catwalk handrail, & navlight support) on dolphin N1.
Coating Repair	7	Coatings are failing on both catwalks. Re-coat the steel superstructure and the splash zone portion of the piling.
Mooring cleats	8	Repair remaining damaged concrete cleat supports.
Category III - Upgrades Needed		
Dock Replacement	9	The new dock under construction will be the AMHS port of call. But this facility will still be open for use by the City of Sand Point. It is recommended that they procure funding for repairs, especially to the fendering modules and the steel support piles. We also highly recommend a Structural Engineering firm perform a load rating of the dock in it's current state.

Project #SFHWY00006 – Sand Point City Dock Replacement:
This project is currently under construction. The project is being constructed adjacent to the southwest end of the existing dock and will be approximately 70-ft wide and 220-ft long. The dock will be constructed utilizing concrete deck and framing on driven steel piles. New shot rock fill will be placed behind the structure to extend the existing breakwater and to create additional uplands area for safe passenger staging and maneuvering of equipment. Project completion slated for Fall 2019.


Goodnews Bay
Dillingham
BRISTOL BAY
King Salmon
LOCATION
Chignik
Cold Bay
Sand Point
Dutch Harbor
King Cove
False Pass
Akutan
Unalaska
PACIFIC OCEAN
VICINITY MAP
Harbormaster's Office
To airport & city
Warehouse
New Fill
New Fill
Rip–rap slope
Steel dolphin
New open cell
Concrete & steel wharf (position 4)
Timber wharf (position 3)
N1
N2
S1
M.V. TUSTUMENA
MARGARET BAY
0
80'
160'
SCALE IN FEET
GENERAL LAYOUT
UNALASKA

Unalaska/Dutch Harbor Dock

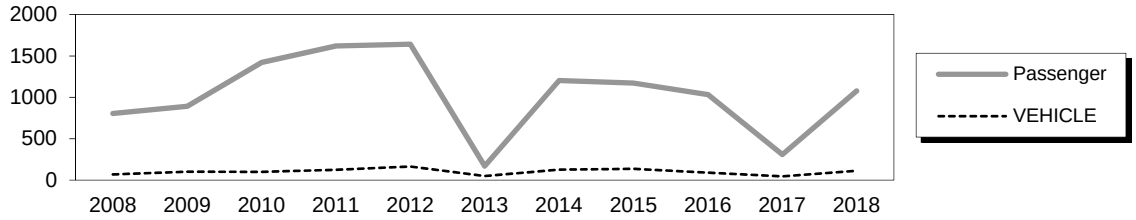
Owner: City of Unalaska

Contact: John Days, Harbormaster, City of Unalaska 907-581-1254

Terminal Description: The M/V Tustumena's last stop on its westward route is at Dutch Harbor where it serves the City of Unalaska. The ferry berth once occupied portions of two City owned docks; the entire face of a timber dock and a portion of an adjoining concrete platform dock. Recently the timber dock was torn out and replaced with a continuous sheet-pile cell, earth filled wharf. The City of Unalaska designates these dock areas as Positions 3 and Position 4 respectively.

This is a multi-purpose facility utilized by other vessels. AMHS is not in control of operation or maintenance.

The past 10 years of total passenger and vehicle traffic is shown below. The M/V Tustumena was out of service most of 2013 & 2017, causing steep drop-offs in traffic at the terminal.



The most recent above water survey was completed on September 23, 2018. The underwater inspection occurred on July 18, 2014. The most recent fracture critical inspection was on September 19, 2012.

Uplands	
Short-Term Parking:	N/A
Long-Term Parking:	N/A
Staging Area:	N/A

City Dock	
Year Built:	2018
Construction:	Steel open-cell sheet pile, earth-retained wharf
Fenders:	Steel pin-pile fender units
Mooring bollards/cleats:	Cleats mounted along edge of dock
Lighting:	High mast lights mounted on dock
Condition:	New
Load Posting Sign:	N/A
Original Design Load:	750 psf uniform + HL93 & several freight vehicles

Vessels	
Name	Berthing, Alignment
Tustumena	Starboard

Tidal Data (MLLW=0.0 feet)	
Highest Observed	6.4
MHHW	3.7
MHW	3.4
Lowest Observed	0.9

Terminal Building
This facility does not have a terminal building.

Generator & Building
This facility does not have a generator on-site.

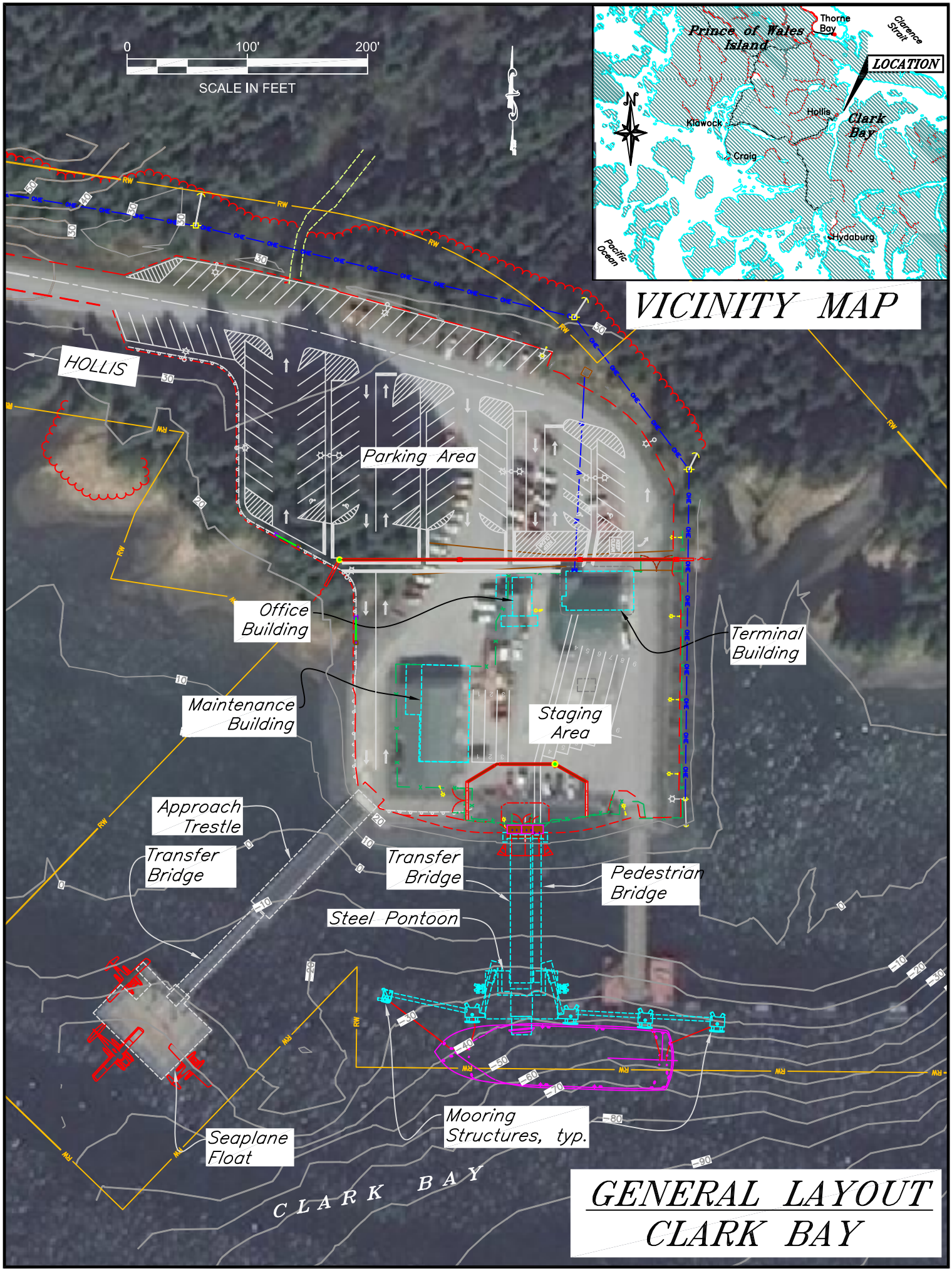
Utilities @ Dock	
Water:	Yes

Observations

1. The facility was under construction during the 2018 inspection.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Nothing required		
Category II - Rehabilitation Work		
Nothing required		
Category III - Upgrades Needed		
Nothing required		

IFA ROUTE


0
100'
200'
SCALE IN FEET
Prince of Wales Island
Thorne Bay
Clarence Strait
LOCATION
Klawock
Hollis
Clark Bay
Craig
Hydaburg
Pacific Ocean
VICINITY MAP
HOLLIS
Parking Area
Office Building
Terminal Building
Maintenance Building
Staging Area
Approach Trestle
Transfer Bridge
Transfer Bridge
Pedestrian Bridge
Steel Pontoon
Mooring Structures, typ.
Seaplane Float
CLARK BAY
GENERAL LAYOUT
CLARK BAY

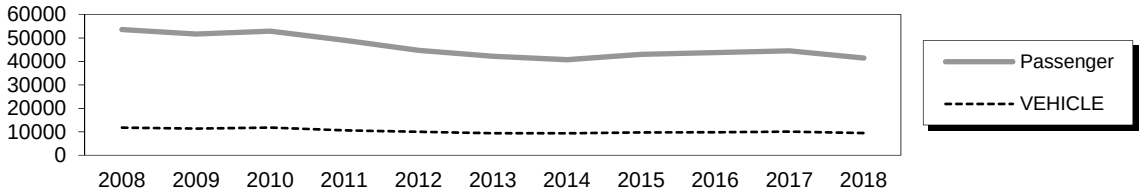
Clark Bay Ferry Terminal

Mile 31 Hollis-Klawock Hwy.

Owner: Inter Island Ferry Authority (IFA)

Terminal Manager: Donna Halvorsen – 907-826-4848

Terminal Description: Clark Bay Ferry Terminal is a side-berth facility consisting of a transfer bridge, steel support float, and 6 steel mooring dolphins. Uplands include a terminal building, maintenance warehouse, secure (fenced) staging area, paved parking and overhead lighting. The Clark Bay facility links Prince of Wales Island to Ketchikan with ferry service via the InterIsland Ferry Authority (IFA). The IFA has had operation and maintenance responsibility of this ferry terminal since 2002. AMHS provided ferry service prior to 2002. IFA operates one of two vessels to this port, the MV Prince of Wales and the MV Stikine. Total passenger and vehicle traffic counts for the past 10 years at Clark Bay are shown below.



The most recent above water survey was completed on July 25, 2017.

Uplands	
Short-Term Parking:	47 cars, 5 HCP
Long-Term Parking:	45 cars
Staging Area:	700 lineal feet; 180 lineal feet-buses/trucks
Paint Striping:	Yes
Driving Surface:	Asphalt

Utilities		
	at Terminal	at Ramp
Electrical:	Yes, city & backup power	
Water:	Yes	No
Sewer:	Yes (Septic)	No
Telephone:	Yes	No
Cable TV:	No	No
Fuel:	Yes	No
Wireless Bridge:	No	No

Maintenance Building	
Year Built:	2006
Square Footage:	3500 s.f.
Heating System:	N/A
Fuel Storage:	N/A
Fire Protection:	N/A
Condition:	Good

Vessels	
Name	Berthing, Alignment
Prince of Wales / Stikine / FVF	Starboard

Tidal Data (MLLW 0.0 feet)	
EHW	20.0
MHHW	18.0
MHW	15.0
ELW	-4.0

Terminal Building	
Year Built:	2007
Square Footage:	1,600 s.f.
Heating System:	Toyo Furnace
Fuel Storage:	AST
Fire Protection:	N/A
Condition:	New

Generator & Building
This facility does not have a generator on site.

Vehicle Transfer Bridge - #0182	
Type:	16' x 130' steel multi-girder
Year Built:	2015
Shoreward support:	Concrete abutment
Seaward support:	Steel Support Float
Coating:	Spray metallized w/topcoat
Pedestrian Access:	Concrete 4' wide on bridge
Lighting:	(3) Overhead Light Posts
Condition:	New
Load Posting Sign:	N/A
Original Design Load:	HL93

Bridge Support Float	
Type:	40' x 60' Steel Flexi-float
Year Built:	2015
Ballasted:	Yes
Ramp lift:	Hydraulic/Block & Cable
Apron lift:	Hydraulic/Block & Cable
Anodes:	Yes
Condition:	Float (new); Ramp/apron (fair)

Dolphins

Dolphins	Dolphin Piles	Fender Support	Fender Face	Anodes	Built	Cond.	Notes
W2	2B, 1V	-	-	Yes	2015	New	
W1	2B, 2V	Chains	UHMW	Yes	2015	New	
E1	2B, 2V	Chains	UHMW	Yes	2015	New	
E2	2B, 2V	Chains	UHMW	Yes	2015	New	
E3	2B, 2V	Chains	UHMW	Yes	2015	New	Red navlight
RW	2B, 1V	-	-	Yes	2015	New	
RE	2B, 1V	-	-	Yes	2015	New	

LEGEND
RE = East Float Restraint Structure
B = Battered Steel Pipe Piles
V = Vertical Steel Pipe Piles

Catwalks / Gangways

#	From Struc.	To Struc.	Lenth / Style / Main Members	Built	Safety Restraints	Cond.	Lighting	Notes
C1	W1	W2	66' / Catwalk / 16"x4" Tube Girders	2015	Yes	New	Jelly Jar	
G1	W1	WFP	38' / Gangway / Pipe Truss	1988	No	Good	Jelly Jar	
G2	E1	EFP	38' / Gangway / Pipe Truss	1988	No	Good	Jelly Jar	
C2	E1	E2	53' / Catwalk / 16"x4" Tube Girders	2015	Yes	New	Jelly Jar	
C3	E2	E3	51' / Catwalk / 16"x4" Tube Girders	2015	Yes	New	Jelly Jar	

Terminal Projects

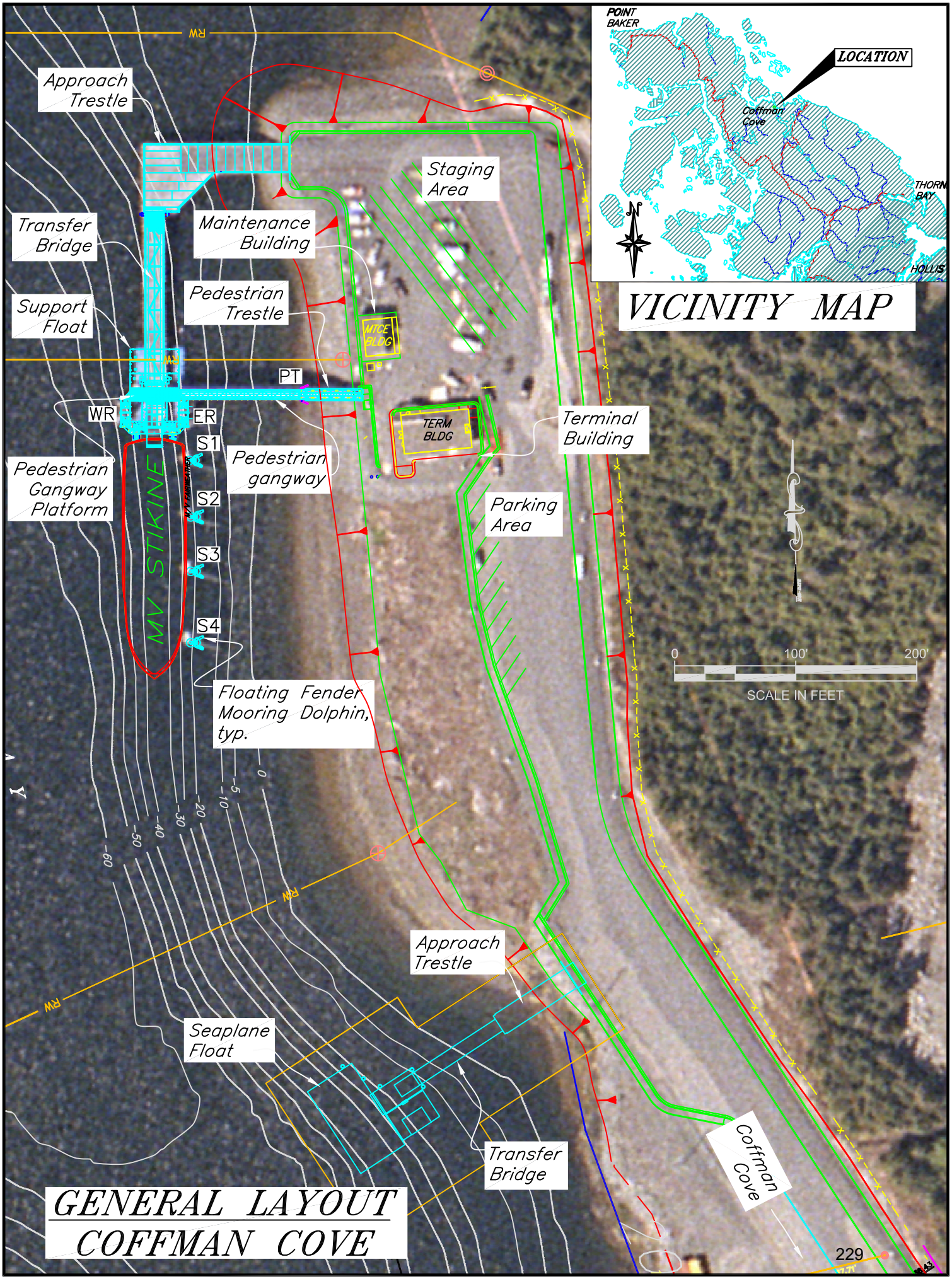
Year	Project #	Project Name	Description
1975	S-0926(1)	Hollis Ferry Terminal Facility	Constructed new stern-loading facility with uplands fill, timber dock and timber duncan dolphins.
1977	TQS-RS-0926 (2)	Clark Bay Ferry Terminal	Uplands fill for new terminal parking and staging areas. Constructed new steel transfer bridge & cable/hydraulic lift system, and four new steel mooring/fendering structures.
1988	N/A	Clark Bay FT Dolphin Modifications	Installed new steel dolphin, E4.

Terminal Projects (cont'd.)			
Year	**Project #**	**Project Name**	**Description**
1993	N/A	Clark Bay FT Mooring Improvements	Installed new steel dolphin, E5
2004	N/A	IFA - Clark Bay FT Improvements	Re-painted transfer bridge, repaired bridge abutment upgraded utilites to bridge and lighting on uplands.
2006	N/A	IFA - Clark Bay Terminal Building and Maintenance Shop	Constructed new terminal building and maintenance shop, including secure staging and security upgrades.
2015	67449	Clark Bay Ferry Terminal Improvements	Constructed new transfer bridge & float, 4 new mooring structures in a new re-aligned location, away from the acreting riverbed.
2018	SFHWY00005	Clark Bay Ferry Terminal & Seaplane Float Expanded Parking	Expanded uplands parking area with tidelands fill, riprap, guardrail, paving & drainage systems. Grading improvements at bridge abutment approach.

Observations

1. The marine structures were re-built completely in 2015, along with uplands paving.
2. Grading improvements were made at the uplands paved area near the bridge to improve drainage & correct the bridge vertical transition angle to prevent vehicles from high-centering at low tide.
3. The existing parking lot was doubled in size to meet the needs of the community. Previously vehicles parked (long-term) along the shoulder of the road approaching the terminal after the main lot was full, which created a hazard to 2-way vehicle movements – especially during winter months with snow plowing operations.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
No safety repairs needed		
Category II - Rehabilitation Work		
No rehabilitation work needed		
Category III - Upgrades Needed		
No upgrades needed		


Approach Trestle
Transfer Bridge
Support Float
Pedestrian Gangway Platform
Maintenance Building
Pedestrian Trestle
Staging Area
WTCE BLDG
PT
WR
ER
S1
S2
S3
S4
MV STIKINE
Pedestrian gangway
TERM BLDG
Terminal Building
Parking Area
Floating Fender Mooring Dolphin, typ.
RW
Approach Trestle
Seaplane Float
Transfer Bridge
Coffman Cove
POINT BAKER
LOCATION
Coffman Cove
THORN BAY
HOLLIS
VICINITY MAP
0
100'
200'
SCALE IN FEET
GENERAL LAYOUT
COFFMAN COVE
229

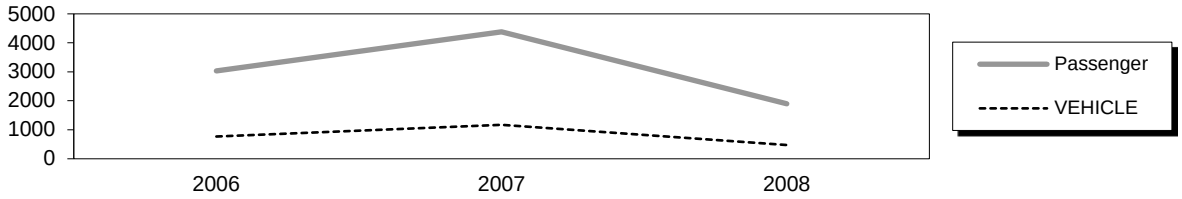
Coffman Cove Ferry Terminal

110 Stikine Way

Owner: City of Coffman Cove – 907-329-2233

Terminal Description: Coffman Cove is a stern-loading facility consisting of a terminal building, maintenance shop, paved parking area, secure (fenced) staging area, steel approach trestle, transfer bridge, steel support float and four steel pile all-tide mooring dolphins. The Coffman Cove facility, constructed in 2006, serves the Prince of Wales Island communities by linking them via the IFA's M/V Prince of Wales to AMHS mainline service in Petersburg. The most recent above water survey was completed on October 26, 2015. The most recent fracture critical & underwater inspections occurred on August 2, 2016. The IFA northern route has not been operational since 2008.

Coffman Cove's total passenger and vehicle traffic from 2006 through 2008 is shown below.



Vessels	
Name	Berthing, Alignment
Prince of Wales / Stikine / FVF	Stern

Tidal Data (MLLW 0.0 feet)	
EHW	20.0
MHHW	15.5
MHW	14.3
ELW	-4.5

Terminal Building	
Year Built:	2006
Square Footage:	1800 s.f.
Heating System:	Oil Furnace
Fuel Storage:	300 gal. AST
Fire Protection:	Alarm
Condition:	New

Generator & Building	
Building / Generator:	2006
Square Footage:	N/A
Heating System:	Electric
Fuel Storage:	150 gal AST
Fire Protection:	N/A
Condition:	Good

Uplands	
Short-Term Parking:	22 cars, 2 HCP
Long-Term Parking:	27 cars, 2 HCP
Staging Area:	1000 lineal feet, 8 lanes
Paint Striping:	Yes
Driving Surface:	Asphalt

Bridge Approach	
Type:	4000 s.f. pile-supported steel frame
Year Built:	2006
Shoreward support:	Steel Beam/Driven Piling
Seaward support:	Steel Beam/Driven Piling
Anodes on piles:	Yes
Condition:	New

Bridge Support Float	
Type:	40' x 70' Steel Pontoon
Year Built:	2006
Ballasted:	Yes
Ramp lift:	Hydraulic
Apron lift:	Hydraulic
Anodes:	Yes
Condition:	New

Maintenance Building	
Year Built:	2006
Square Footage:	720 s.f.
Heating System:	Oil Furnace
Fuel Storage:	275 gal. AST
Fire Protection:	Alarm
Condition:	New

Pedestrian Trestle	
Type:	4000 s.f. pile-supported steel frame
Year Built:	2006
Shoreward support:	Concrete Abutment
Seaward support:	PT
Anodes on piles:	Yes

Vehicle Transfer Bridge #193	
Type:	14' x 143' twin box girder
Year Built:	2006
Shoreward support:	Steel Beam/Driven Piling
Seaward support:	Steel Support Float
Coating:	Wasser Paint
Pedestrian Access:	Concrete 3' wide on bridge
Lighting:	Tubuloid Fixtures
Condition:	New
Load Posting Sign:	N/A
Original Design Load:	HS-20

Utilities		
	at Terminal	at Ramp
Electrical:	Yes	Yes
Water:	Yes	Yes
Sewer:	Yes (City)	Yes
Telephone:	Yes	Yes
Cable TV:	No	No
Fuel:	Yes (AST)	No
Wireless Bridge:	No	No

Dolphins

Dolphins	Dolphin Piles	Fender Type	Anodes	Built	Cond.	Notes
S4	2B, 3V	UHMW Floating	Yes	2006	New	
S3	2B, 3V	UHMW Floating	Yes	2006	New	
S2	2B, 3V	UHMW Floating	Yes	2006	New	
S1	2B, 3V	UHMW Floating	Yes	2006	New	
ER	2B, 2V	-	Yes	2006	New	
WR	2B, 2V	-	Yes	2006	New	
PT	2B, 2V	-	Yes	2006	New	

LEGEND

V = Vertical Steel Pipe Piling
B = Battered Steel Pipe Piling
ER = East Bridge Support Float Restraint Dolphin
PT = Pedestrian Trestle Support Pier
PP = Pedestrian Platform
G1 = Gangway

Catwalks / Gangways

#	From Struct.	To Struct.	Length / Style / Main Members	Built	Safety Chains?	Cond.	Lighting	Notes
C1	Shore	PT	51' / Steel Trestle / TS 6x4 Bottom Chord	2006	No	New	Overhead Fixtures	
G1	PT	PP	106' / Aluminum Gangway / TS 6x10 Bottom Chord	2006	No	New	Overhead Fixtures	

Terminal Projects

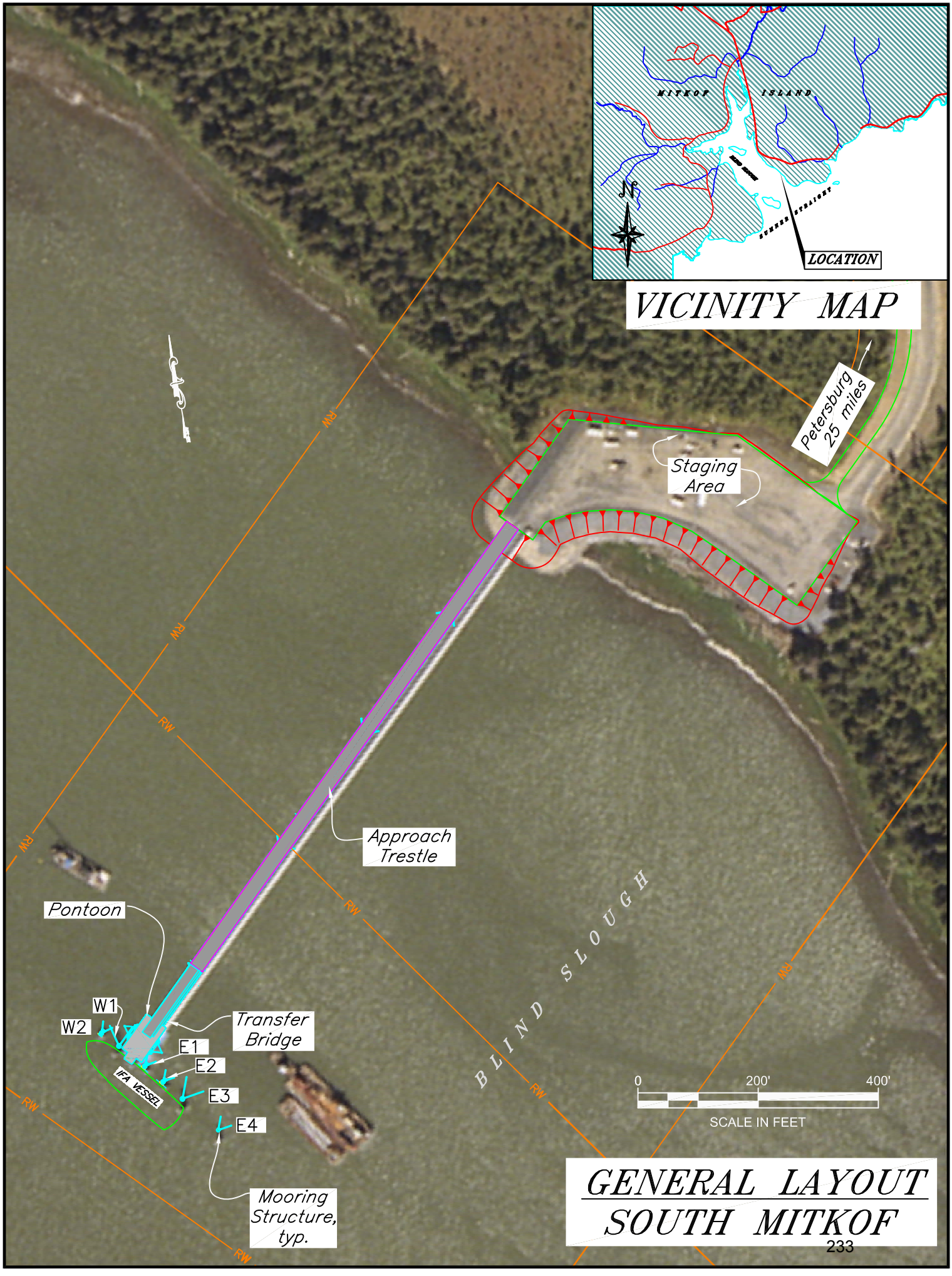
Year	Project #	Project Name	Description
2006	67844 7 67667 / STP - 003 (66)	Coffman Cove Ferry Terminal	New ferry terminal construction. Uplands consisted of blasting and filling earthwork; parking lot/staging area paving; security fencing. Built new terminal building & maintenance shop; all mooring and vehicle transfer structures.

Observations

1. The IFA has not operated the northern route since 2008. AMHS scheduled monthly RT sailings from Juneau to South Mitkof (Petersburg) and Coffman Cove between July and September of 2016 & 2017.
2. Grease fittings at all bridge bearings are dry.
3. The canvas roof cover has been removed from both the pedestrian gangway & catwalk.
4. Electrical & hydraulic cabinets mounted on the bridge pontoon are sealed to protect from rainwater, but condensation has caused the bottom pans to pond with water. All terminal posts & metal fittings inside the cabinets exhibit white or freckle rust.

   City maintenance drilled drain holes in the bottom of all utility cabinets in '11, to eliminate standing water & reduce condensation.
5. A water line was disconnected from the seaward end of the pedestrian gangway, where it connects to the intermediate ramp, and was lying in the ocean.
6. The intermediate ramp was constructed without a hydraulic lift system, since there was only one design vessel using the port. The ramp may be manually lifted with a crane or heavy-duty jacks, and elevation fixed at 5 different levels, each separated by 12-inches. The ramp is currently fixed at the lowest level.
7. A timber work float has been tied between dolphin S1 & ER since shortly after the terminal was opened.
8. The bridge float is listing 5-inches to the south and the anodes are all depleted.
9. The anodes connected to mooring dolphins are all lying on the shore bottom covered in mud, not protecting the steel.
10. All overhead light post base fasteners are loose, allowing the poles to rock back & forth. Repeated rocking motions may induce bending in the base plates. City maintenance tightened down the light post base bolts on all but one light pole. Jam or lock nuts also need to be installed to keep the nuts from turning.
11. Two (2) sections of UHMW plastic facing are missing from the southwest float guide pile structure. Likely these 1st generation plastic panels fell into the ocean when their steel anchor bolts sheared off due to thermal expansion, and lack of proper overbore at bolt hole to allow movement.

Inspection Summary		
Structure	Priority	Recommendations
Category I - Safety Repairs		
Nothing recommended.		
Category II - Rehabilitation Work		
Float restraint guide	1	Hire a diver to recover the UHMW facing panels from the ocean floor and re-install on the southwest float guide pile.
Light Posts	2	Install jam or lock nuts on base bolts.
Bridge Float	3	Evaluate causes of float listing 5-inches (ballast water levels, friction at float restraints, etc) and perform work to level freeboard. Install new 50# anodes on float.
Anodes	4	Cut the length of the hanging cables so the anodes hang in the water without touching the shore bottom.
Grease Fittings	5	Grease all bearings as soon as possible.
Utility Cabinets	6	Spray all electrical connections with corrosion-proof dielectric grease.
Fuel Supply line	7	Replace disconnected fuel line lying in salt water with a new hose. Fasten securely.
Pedestrian Gangway	8	Move the conduit away from the batter pile. Replace the canvas roof cover when service is restored, prior to allowing public use.
Category III - Upgrades Needed		
Nothing recommended.		


MITKOF ISLAND
LOCATION
N
VICINITY MAP
Petersburg
25 miles
Staging
Area
Approach
Trestle
Pontoon
W1
W2
Transfer
Bridge
E1
E2
E3
E4
IFA VESSEL
Mooring
Structure,
typ.
BLIND SLOUGH
RW
0
200'
400'
SCALE IN FEET
GENERAL LAYOUT
SOUTH MITKOF

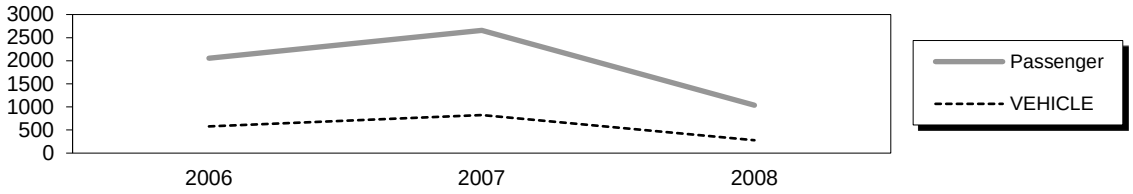
South Mitkof Ferry Terminal

Mile 25 South Mitkof Hwy.

Owner: Inter Island Ferry Authority (IFA)

Terminal Manager: N/A

Terminal Description: South Mitkof is a new side-loading facility constructed in 2006 consisting of a modular ticketing office, secure (fenced) staging area, 900-foot long steel approach, steel transfer bridge, steel support float and five steel pile mooring dolphins. The IFA northern route has not been operational since 2008. South Mitkof's total passenger and vehicle traffic between 2006 and 2008 is shown below.



The above water inspection was completed June 28, 2017. The most recent fracture critical & underwater inspections occurred on August 6, 2016.

Vessels	
Name	Berthing, Alignment
Prince of Wales / Stikine / FVF	Starboard

Tidal Data (MLLW 0.0 feet)	
EHW	20.0
MHHW	15.5
MHW	14.3
ELW	-5.0

Modular Ticketing Office	
Year Built:	2006
Square Footage:	N/A
Heating System:	N/A
Fuel Storage:	N/A
Fire Protection:	N/A
Condition:	New

Generator Compartment	
Year Built:	2006
Square Footage:	200 s.f.
Heating System:	Oil Furnace
Fuel Storage:	550 gal. AST & Daytank
Fire Protection:	N/A
Condition:	New

Uplands	
Short-Term Parking:	60 cars
Long-Term Parking:	N/A (gates locked between vessels)
Staging Area:	1200 lineal feet, 8 lanes
Paint Striping:	No
Driving Surface:	Gravel

Bridge Approach	
Type:	900' x 24' pile-supported steel fram
Year Built:	2006
Shoreward support:	Steel Beam/Driven Piling
Seaward support:	Steel Beam/Driven Piling
Pedestrian Access:	Covered walkway, guardrail separation
Lighting:	Light Posts 20' o.c.
Anodes on piles:	Yes
Condition:	New

Bridge Support Float	
Type:	40'x70' Flexifloat
Year Built:	2006
Ballasted:	Yes
Ramp lift:	Hydraulic
Apron lift:	Hydraulic
Anodes:	Yes
Condition:	New

Vehicle Transfer Bridge	
Type:	16'x143' twin box beam
Year Built:	2006
Shoreward support:	Steel Beam
Seaward support:	Steel Support Float
Coating	Wasser Paint
Pedestrian Access:	Covered walkway, guardrail separation
Lighting:	Tubuloid fixtures on guardrail; overhead fixtures in pedestrian walkway
Condition:	New
Load Posting Sign:	N/A
Original Design Load:	AASHTO HS 20/85 psf

Utilities		
	at terminal	at ramp
Electrical:	Yes	Yes
Water:	Yes (Tank Fill)	No
Sewer:	No	No
Telephone:	No	No
Cable TV:	No	No
Fuel:	Yes (AST)	No

Dolphins						
Dolphins	**Dolphin Piles**	**Fender Type**	**Anodes**	**Built**	**Cond.**	**Notes**
W2	2B, 1V	Steel panel, UHMW face	Yes	2006	New	
W1	2B, 1V	UHMW Floating	Yes	2006	New	
E1	2B, 1V	Steel panel, UHMW face	Yes	2006	New	
E2	2B, 1V	Steel panel, UHMW face	Yes	2006	New	
E3	2B, 1V	UHMW Floating	Yes	2006	New	
E4	2B, 1V	UHMW Floating	Yes	2006	New	
ER	3V	-	Yes	2006	New	
WR	3V	-	Yes	2006	New	

LEGEND
V = Vertical Steel Pipe Piling
B = Battered Steel Pipe Piling
ER = East Bridge Support Float Restraint Dolphin

Terminal Projects			
Year	**Project #**	**Project Name**	**Description**
2006	67833 / MGS-MGE-STP-0003(65)	South Mitkof Ferry Terminal	New ferry terminal constuction. Uplands consisted of blasting and filling earthwork; parking lot-staging area grading; secuirty fencing. Built new ticket office & generator shed; all mooring and vehicle transfer structures.

Observations

1. The IFA has not operated the northern route since 2008. AMHS scheduled monthly RT sailings from Juneau to South Mitkof (Petersburg) and Coffman Cove between July and September of 2016 & 2017.
2. The uplands parking and staging areas were paved in 2008, along with the 26-mile South Mitkof Highway. The staging and parking areas are divided by an 8-foot chain-link fence with separate entry and exit gates. A portable ticket office is parked inside of the staging area between the gates.

Observations (continued)

The ticket office was removed from the property at some point prior to the ’13 inspection.

There is damage to the chain link fence in the staging area due to snow removal.

Two electrical vaults adjacent to the beginning of the approach trestle were not adjusted when the uplands was paved, and water ponds on their lids create a hazard for short-circuiting.

3. Elastomeric bearing pads are creeping out from between the open-grate decking and the approach/bridge frame.
4. The LT shoreward bridge bearings are difficult to access due to the overhang of the pedestrian walkway.
5. The 2010 Fracture Critical (FC) inspection found broken anchor bolts under Girders 2 & 5 @ Bent 3, and Girders 1, 4 & 5 @ Bent 16. The anchor bolt under Girder 4 @ Bent 6 is cracked along the base weld. Damages were confirmed on the 2014 FC inspection and still exist.
6. Bridge alignment cables between seaward bridge roller bearings are completely slack.
7. The gap between the girder bottom flange and the seaward bearing plate has been filled in with caulking. Moisture is backing up and rust water is seeping out.
8. Several sheared off bolts in the seaward bridge bearing were discovered during the 2011 inspection. The connection is between the base plate of the girder roller and the support frame on the float. Bolts were installed upside down (double nuts UP) and the bolts were sheared off at the heads. Cause of bolt failure largely unknown. Within a month of the inspection, a Contractor was hired to replace all fasteners with new A325 galvanized bolts.

   One base bolt, on the left (south) roller bearing, was found sheared-off on the 2013 inspection. This was confirmed on the 2015 inspection. And once again, two (2) bolts were found sheared off on the 2017 inspection. There is no known cause for this damage.
9. The anodes on the floats are 100% consumed. The anodes on the mooring dolphins have 50-70% remaining and are half buried in the shore bottom mud. Trestle bent piers have 80-90% anodes remaining and are half buried in the shore bottom mud. Cathodic potential (CP) readings for mooring structures E1 – 4 and float restraint structures average -0.82V. CP readings on trestle piers average -1.00V. The CP readings for mooring structures W1 -2 average -0.77V. The cutoff for adequate protection is -0.8V, so CP readings less negative indicate the steel piles are freely corroding. Depth to mudline elevations, taken with leadline readings at locations along the bridge support float in 2015, average -22’ MLLW.
10. Stainless steel utility cabinets mounted on the ramp & apron, for electrical and hydraulic power, are collecting water from condensation. Exposed metal fittings & conduit within the cabinets have significant white rust and some brown rust.
11. This facility has not been utilized for ferry service since 2008. The facility does not see regular use or inspection that would normally occur if the facility was operational. Continue to monitor and service at regular intervals in order to minimize potential maintenance issues that may occur.

Inspection Summary

Structure	Priority	Recommendations
Category I - Safety Repairs		
Approach Trestle	1	Re-weld the anchor bolts to the bent caps where they're broken off and cracked.
Category II - Rehabilitation Work		
Transfer Bridge	2	Install bolts at seaward roller bearing frame, monitor the creep of elastomeric bearing pads beneath the decking. Tighten the bridge alignment cables on the float to 'just slack' condition. Improve access to the LT shoreward bridge bearings by installing a remote greasing station, or an access platform.
Anodes	3	Install new 50# anodes on the bridge support float. Shorten the cables for hanging anodes on the mooring structures and trestle piers.
Utilities - Bridge	4	Drill drain holes in bases of all utility cabinets.

Inspection Summary (continued)		
Structure	Priority	Recommendations
Category II - Rehabilitation Work		
Uplands	5	Raise the elevation of electrical vaults adjacent to the beginning of the approach trestle to eliminate the ponding hazard.
Bridge Support	6	Monitor the condition of the UHMW-faced rubber fenders - the UHMW has cracked on other projects. Also monitor the seaward bridge roller bearings & bolts between the base plate of roller assembly & support frame on float. Repair coating failure on bridge support float.
Staging Area	7	Design/install a gate in the chain-link fence for pushing snow out of the back of the staging area.
Approach Trestle	8	Clear brush from south side of trestle to expose "No Trespassing" sign.
Ramp	9	Replace missing life ring in enclosure at intermediate ramp.
Category III - Upgrades Needed		
Nothing required.		

SECTION II

SHORE FACILITIES PROJECTS

(STATE & NON-STATE OWNED)

Active or Programmed Projects

ACTIVE OR PROGRAMMED PROJECTS - AMHS FACILITIES

Project No	Project Title	Need ID	Project Description	Project Cost	Estimated or Actual Obligation Date	Notes
Z681280000	AMHS GST Ferry Terminal Improvements	28789	Install new pile supported lift towers with associated bridge lift system. Expand existing dock to provide new bridge abutment and dedicated harbor access gangway and refurbished gangway landing float	$6,500,000	FY18	Project under Final Design. Obligation expected August 2018.
Z681450000	Tenakee Ferry Terminal Improvements	18359	Replace existing ferry terminal facility.	$10,000,000	FY18	Project under Preliminary Design and Environmental Documentation.
Z685310000	Prince Rupert Ferry Terminal Replacement	17141	Replace stern berth ferry terminal facility.	$13,000,000	TBD	Awaiting resolution of Buy America issues before advertising for construction bids.
Z674660000	Ketchikan Ferry Terminal Improvements	27450	Phase 2: Refurbish mooring float and fender system at Berth 3 and construct new waterline at Berth 1 transfer bridge.	$3,500,000	Phase 2: FY18	Phase 1 construction complete. Phase 2 remains in preliminary design.
Z696240000	Skagway Ferry Terminal Improvements	13883	Restore existing concrete float and associated vehicle transfer structures as needed.	$5,500,000	TBD	Project delayed to further coordination of scope with local municipality.
Z701610000	AMHS Waste Water Treatment System Upgrades	28791	Upgrade to waste water treatment facilities at Auke Bay, Sitka, Skagway, and Haines.	$2,000,000	FY18	Project under Preliminary Design and Environmental Documentation.
SAMHS00084	Auke Bay Ferry Terminal Modifications and Improvements	29709	Replace three (3) side dolphins and make other modifications as needed for fitup of ACF.	$3,000,000	FY19	Project under Preliminary Design and Environmental Documentation.
SAMHS00088	AMHS Storage Tank Replacement	30529	Remove and replace underground fuel storage tanks with above ground tanks at Auke Bay, Skagway, Cordova, Ketchikan, Petersburg, Sitka, Wrangell, and Valdez Ferry Terminals	$800,000	FY19	Project under Preliminary Design and Environmental Documentation.
Z684640000	AMHS HNS Ferry Terminal End Berth Facility	28669	Design & construct a new end berth at the existing ferry terminal facility for use by the ACF.	$25,000,000	FY18	Project to be re-scoped and inserted to the STIP. Obligation expected 2020
SFHWY00006	Sand Point City Dock Replacement	29989	Construct new mult-use docke to serve as Sand Point's ferry terminal.	$11,000,000	FY19	Project under Construction. Completion expected October 2019.
Z700060000	Ward Cove AMHS & NOAA Moorage Facility		Design & construct a mooring facility, with uplands staging & parking, to support AMHS & NOAA vessel needs	$8,000,000	TBD	Offshore structure removal complete. Design and permtting for offshore dredging and marine/uplands facilities ongoing.

Project Needs

PROJECT NEEDS - STATE FACILITIES

Location	Project Title	Need / Description	Estimated Cost	Notes
Auke Bay	Terminal Uplands & Building Improvements	Construct sanitary sewer and shore-tie power connections , and remodel ferry terminal building	$3,000,000	Project was pulled from scope of SAMHS00084. Program project for design.
Cordova	Mooring structure and utility improvements for ACF vessel.	Investigate mooring structure modifications and sewage disposal issues for new ACF class vessel.	$3,000,000	No activity. Program project for design.
Cordova	Analyze Wave Forces on Sectional Bridge Support Floats	Estimate wave forces and structural strength of float systems to determine if future modications/strengthening is required.	$50,000	No activity. Program project for design if warranted.
Cordova	Side Berth Container Van Modifications	Investigate and design improvements to allow safe loading of 40-foot container vans for Aurora if the Aurora stays in service.	$750,000	No activity. Program project for design.
Valdez	Sewage Disposal for ACF Vessel	Investigate feasibility of sewage disposal for new ACF vessel should the ACF be homported in Valdez.	$25,000	No activity. Program project for design.
Whittier	ACF Vessel Modifications	Design and construct project to relocate existing fender structure to accommodate ACF. ACF will not fit into this port without modification.	$500,000	Project design has been intiated. Construction desired to be completed by Spring, 2018.
Yakutat	New Facility or Fender Improvements	Investigate viability of providing transfer bridge or new facility and fendering improvements if existing City Dock is to be continued to be utilized.	$50,000	Preliminary evaluation and study was initiated but not completed. Comparing existing ferry terminal site with other site in Yakutat Bay.
AMHS Terminals System-Wide	Mooring Dolphin Replacements (Auke Bay East, Haines, Pelican, Skagway, Wrangell, Kake)	Remove & replace older mooring dolphin structures as needed.	$15,000,000	Prioritize structures/locations by condition & need. Phase construction over multiple years or combine with other capitol improvement projects.
AMHS Terminals System-Wide	Cathodic Protection Anodes	Monitor existing & place new cathodic protection anodes at various ferry terminals, system-wide.	$500,000	Anode replacement work being conducted as part of other projects.
AMHS Terminals System-Wide	Transfer Bridges and Floats Paint Coating Refurbishment *(Auke Bay East & West, KTN Berths 1 & 2, Petersburg, Haines, Wrangell, Metlakatla)*	Replace/repair protectective paint coatings and conduct other structural repairs or refurbishment where required.	$3,000,000	Prioritize bridges by condition & need. Phase construction over multiple years.
AMHS Terminals System-Wide	Box Girder Transfer Bridge Floor Beam Modifications (Ketchikan, Whittier, Auke Bay)	Investigate and design improvements to correct cracking issues present at the first floor beams of several box girder bridges	$1,000,000	Prioritize bridges by condition & need. Phase construction over multiple years.
AMHS Terminals System-Wide	Synchrolift System Retrofit (Haines, Valdez, Whittier)	Design improvements to provide secondary breaking system in the event of failure of the primary lift system.	$2,000,000	Prioritize bridges by condition & need. Phase construction over multiple years.

PROJECT NEEDS - STATE FACILITIES

Location	Project Title	Need / Description	Estimated Cost	Notes
AMHS Terminals System-Wide	Fracture Critical Transfer Bridge Retrofit (Ketchikan, Whittier, Auke Bay, Wrangell, Petersburg, Haines)	Design improvements to provide redundant load path for fracture critical transfer bridges	$5,000,000	Prioritize bridges by condition & need. Phase construction over multiple years.

PROJECT NEEDS / NON-STATE FACILITIES

Location	Project Title	Need / Description	Estimated Cost	Notes
Chenega / Tatitlek	ACF Improvements	Existing tidal ramp berthing structures will not accommodate new ACF vessel. Investigate dock and vehicle loading ramp improvements to allow berthing and cargo transfer by ACF vessels.	$12,000,000	Project need, scope and estimated cost uncertain.
Pelican	ACF Improvements	Existing tidal ramp berthing structures will not accommodate new ACF vessel. Investigate dock and vehicle loading ramp improvements to allow berthing and cargo transfer by ACF vessels.	$8,000,000	Project need and scope uncertain.

SECTION III

VESSEL INFORMATION TABLE

Alaska Marine Highway System

Vessel Information Table

Updated January 2018	Matanuska	Malaspina	Tustumena	Columbia	Leconte	Aurora	Kennicott	Fairweather	Chenega	Lituya
Date Built	1963	1963	1964	1974	1974	1977	1998	2004	2005	2004
Length (feet)	408	408	296	418	235	235	382	235	235	181
Beam (feet)	74	74	59	85	57	57	85	60	60	50
Displacement (long tons)	5,569	5,552	3,067	7,683	2,132	2,132	7,503	787	787	647
Loaded Draft (feet-inches)	16'-11 5/8"	16'-11 3/8"	14'-4 1/2"	17'-6 1/8"	13'-10 7/8"	13'-10 7/8"	17'-6"	8'-6"	8'-6"	10'-6"
International Tonnage: Gross	9,214	7,302	4,529	13,009	3,124	3,124	12,635	3,442	3,420	n/a
(cubic capacity) Net	3,824	2,496	1,451	4,932	987	987	3,790	1,032	1,026	n/a
Domestic Tonnage: Gross	3,029	2,928	2,174	3,946	1,328	1,280	9,978	1280	1333	99
(cubic capacity) Net	1,235	1,494	898	2,683	566	453	7,354	870	827	66
Horsepower @ Service Speed	7,400	8,000	5,100	12,350	4,300	4,300	13,380	15,360	15,360	2,000
Service Speed (knots)	16.5	16.5	13.8	17.3	14.5	14.5	16.75	32	32	11.5
Fuel Use (Gallons/hour) *	234	270	151	397	188	190	354	600	600	55
Crew Capacity	50	50	37	66	24	24	56	10	10	4
Passenger Capacity	499	499	174	499	300	300	499	250	250	149
Staterooms - 4 berth	4	46	8	44	n/a	n/a	48	n/a	n/a	n/a
Staterooms - 3 berth	23	0	0	0	n/a	n/a	0	n/a	n/a	n/a
Staterooms - 2 berth	80	26	17	56	n/a	n/a	56	n/a	n/a	n/a
ADA Staterooms (4 b)	0	0	0	0	n/a	0	3	n/a	n/a	n/a
ADA Staterooms (2 b)	1	1	1	3	n/a	n/a	2	n/a	n/a	n/a
Total Staterooms	108	73	26	103	0	0	109	0	0	0
Total Berths	247	238	68	294	n/a	n/a	320	0	0	0
Vehicle Capacity (lane-ft.)	1,760	1,760	720	2,680	680	680	1,600	720	720	360
(Qty of 20 foot vehicles)	88	88	36	134	34	34	80	36	36	18
Van Capacity - Booking Limit	12	14	10	16	9	9	20	5	5	2

*Gallons per hour fuel consumption figures are averages based on weekly engineering reports, and include fuel usage to generate heat and electricity.