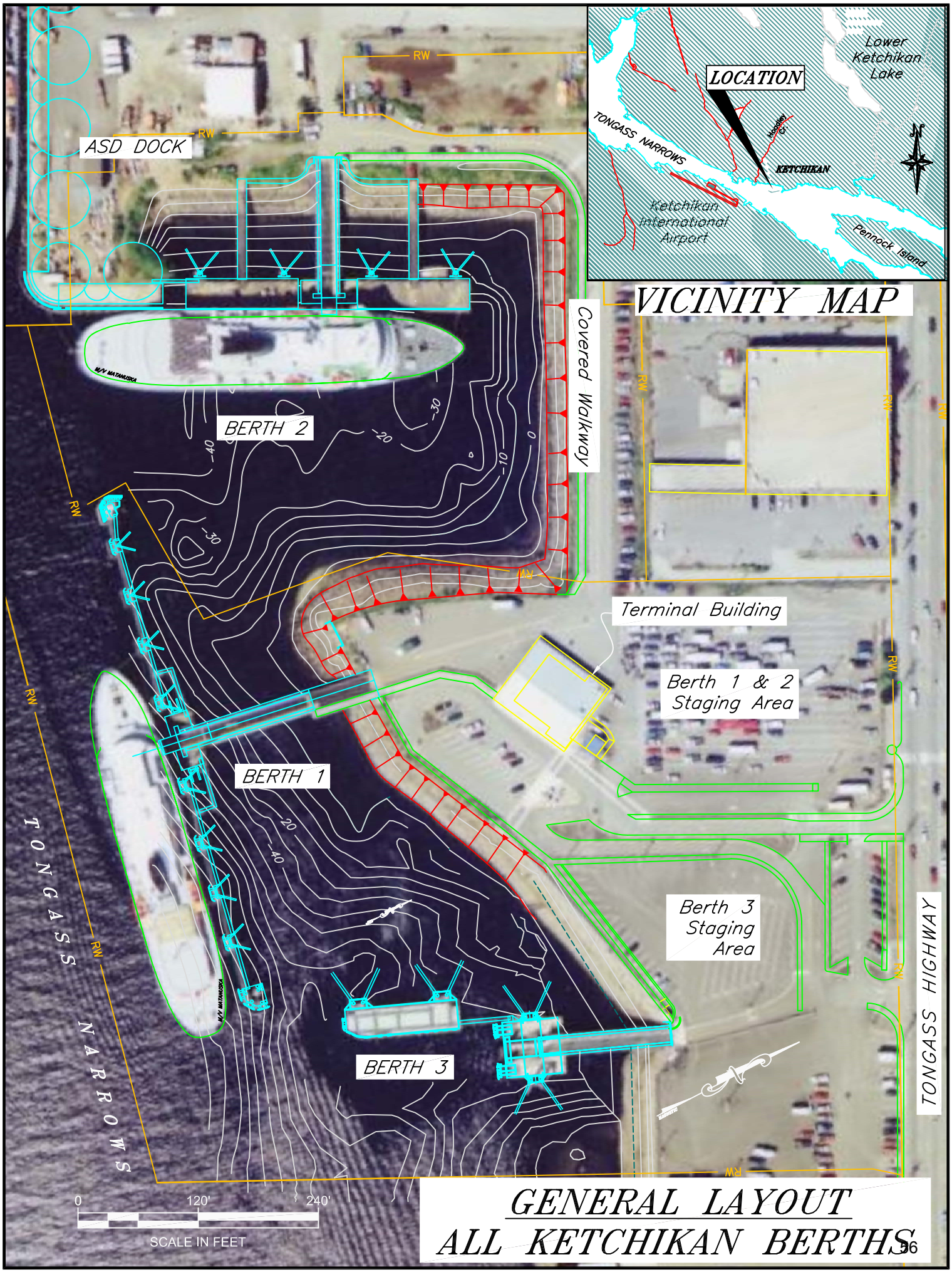
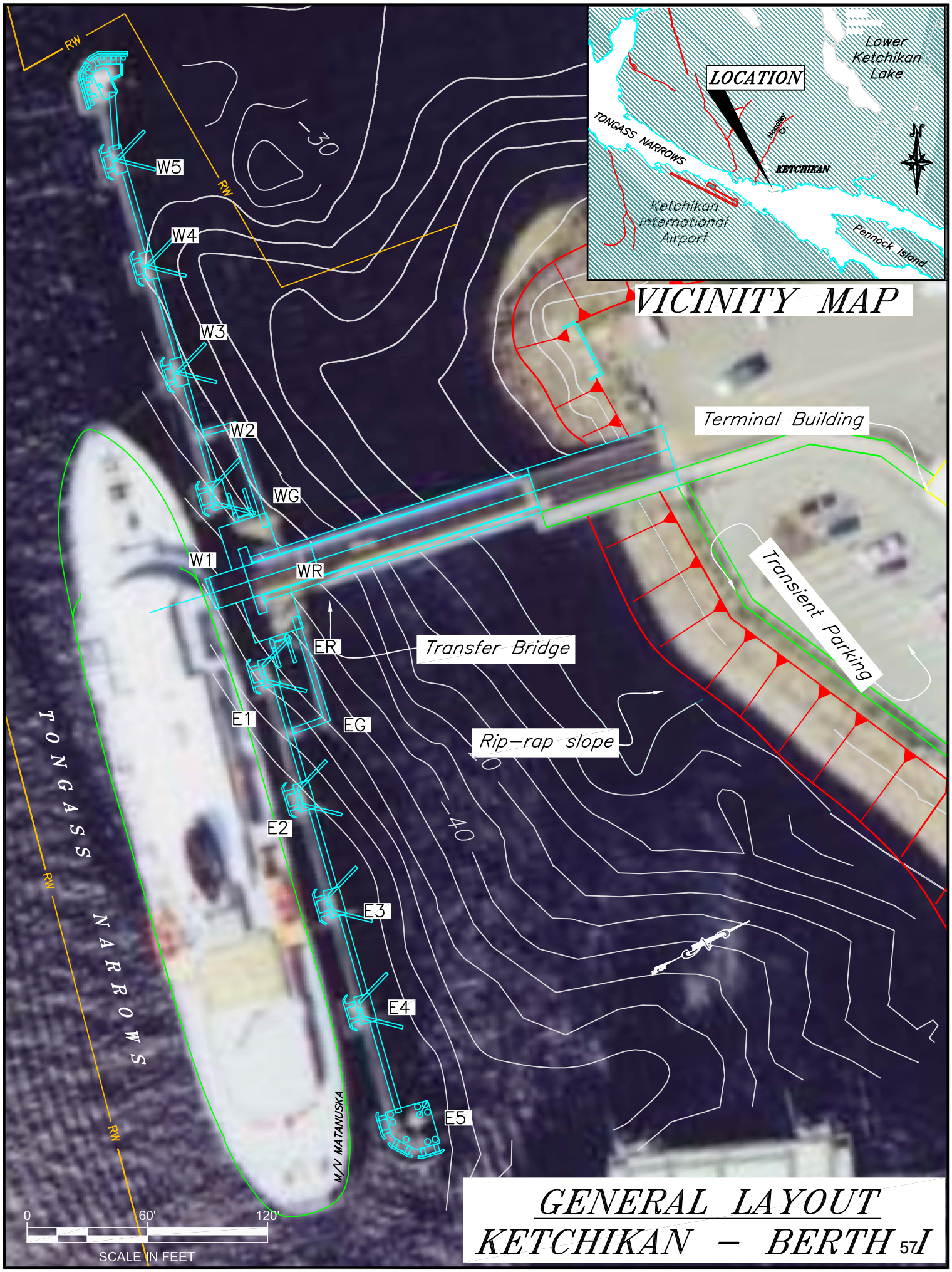


GENERAL LAYOUT
ALL KETCHIKAN BERTHS


VICINITY MAP
LOCATION
Lower Ketchikan Lake
TONGASS NARROWS
Hoadley Cr.
KETCHIKAN
Ketchikan International Airport
Pennock Island
N
Terminal Building
Transient Parking
Transfer Bridge
Rip-rap slope
TONGASS NARROWS
M/V MATANUSKA
RW
W1
W2
W3
W4
W5
WG
WR
ER
E1
E2
E3
E4
E5
EG
-30
-40
0
60'
120'
SCALE IN FEET
GENERAL LAYOUT
KETCHIKAN – BERTH 1

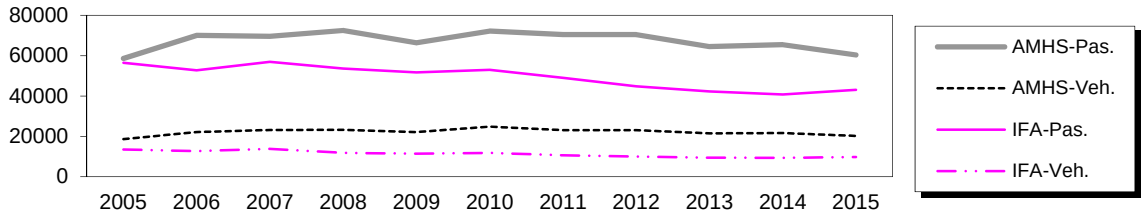
Ketchikan Ferry Terminal, Berth I

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 23, 2015. The underwater inspection occurred on August 15, 2011. The most recent fracture critical inspection occurred on September 4, 2014.

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

Dolphins

Dolphins	Dolphin Piles	Fender Support	Fender Face	Anodes	Built	Cond.	Hawse Extensions	Notes
W5	6B, 3V	7V	Ekki Timber	No	1972	Poor	Yes	
W4	2B, 1V	4V	Ekki Timber	No	1994	Fair	Yes	
W3	2B, 1V	4V	Ekki Timber	No	1994	Fair	Yes	Light Pole mounted
W2	2B, 1V	4V	Ekki Timber	No	1994	Fair	Yes	
W1	2B, 2V	Hanging	UHMW	No	1994	Fair	Yes	Light Pole & Windsock mounted
E1	2B, 2V	Hanging	UHMW	No	1994	Fair	Yes	Light Pole mounted
E2	2B, 2V	Hanging	UHMW	No	1994	Fair	Yes	
E3	2B, 2V	Hanging	UHMW	No	1994	Fair	Yes	Light Pole mounted
E4	2B, 2V	Hanging	UHMW	No	1988	Fair	Yes	
E5	4B, 4V	Hanging	UHMW	No	1994	Fair	Yes	Red Nav Light mounted
ER	2B, 2V	-	-	No	1988	Fair	-	
WR	2B, 2V	-	-	No	1988	Fair	-	
EG	1B, 1V	-	-	No	1988	Fair	-	
WG	1B, 1V	-	-	No	1988	Fair	-	

LEGEND

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.

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.

   Berth II includes a parts warehouse, personnel, supply, and shore maintenance buildings, and the Port Engineers office. A diesel generator housed next to the terminal building provides standby emergency power to Berths I, II, III, and the terminal building.

   The Port Engineer's building is a modular structure built in 1986. This structure is in fair condition.

   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.

Observations (continued)

2. A new open-grate deck approach trestle and bridge abutment pier was constructed in the fall of 1993 and the existing transfer bridge relocated. The new alignment made berthing operations easier by allowing both port and starboard side mooring.

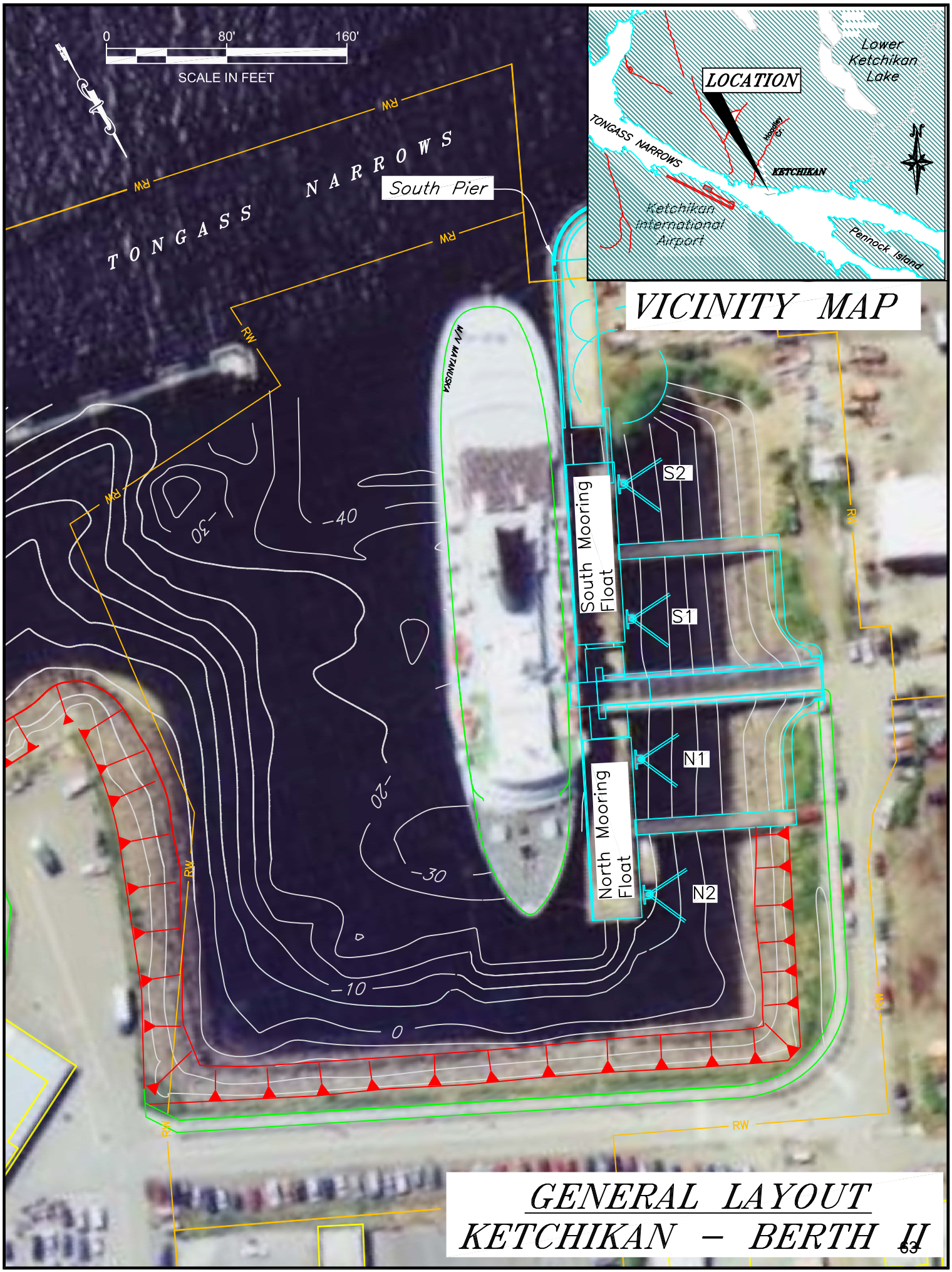
   The galvanized coating is depleted on the support piles for the approach trestle & minor corrosion covers the exterior surfaces.
3. Several holes were discovered in dolphin W5 pipe support piles near the waterline at low tide. Of the three clusters of (3) batter piles, two of the clusters had damaged piles. A fender pile was also found to have 100% section loss near the low tide mark.
4. 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.
5. A section of plastic UHMW has detached from the face of the fender panel of Dolphin W1.
6. 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 & minor section loss. The open-deck grating hold down clips also exhibit 30% section loss along Stringer 1.
7. The most recent Fracture Critical inspection found two weld failures between Stringers and the lifting beam.
   a. A 3-7/16" long crack exists in the bottom flange of Stringer 1 at the lifting beam welded connection on the pontoon.
   b. A 2-3/4" long crack exists in the bottom flange of Stringer 5 at the lifting beam welded connection on the pontoon.
8. 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.
9. 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.
10. 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.
11. The deck clamp bolts are heavily corroded beneath stringer 1 and the pedestrian walkway.
12. AMHS Shore Maintenance replaced the hydraulic apron lift cylinder and custom double sheave cable block in November of 2010.
13. A flex conduit connection is damaged at a utility cabinet mounted on the (seaward) bridge bearing strut, Left side.
14. 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.
15. There is 100% section loss to most utility attachments welded to the underside of the floorbeams.
16. 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.
17. 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		
Dolphin W5	1	Replace this structure with a lead-in dolphin.
Catwalks/Gangways	2	Replace pins in hanger connections for dolphin access gangways adjacent to the bridge.
Transfer Bridge	3	Repair the failed welds between Stringers 1 & 5 and the lift beam.
Category II - Rehabilitation Work		
Transfer Bridge	4	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	5	Straighten support tubes for the eastern platform and re-weld connections.
Dolphins	6	Install anodes on all pipe piling.
Bridge Pontoon	7	Replace anodes as needed. Clean and tighten all cable connections. Repaint the top edges and corners. Monitor the wear on the float fender.
Approach Trestle	8	Install anodes on all piles within the tidal zone.
Terminal Building & Uplands	9	Bring the UST into compliance with current ADEC regulations.
Dolphin W2	10	The dolphin may have been overloaded. Monitor the performance under load, then make repairs as necessary.
Apron	11	Replace small sections of the expanded metal grating on the apron.
Category III - Upgrades Needed		
Turning Dolphin	12	Install new turning dolphin between existing structure E5 and Berth 3.

Project SAMHS0015 – KTN Ferry Terminal Improvements:

This project was awarded to Turnagain Marine Construction in December, 2015. Work includes the replacement of dolphin W5 – Berth 1 with a new lead-in/turning dolphin, construction of a new turning dolphin between the seaward end of the mooring float at Berth 3 and the lead-in dolphin E5 – Berth 1. Completion is set for September 30, 2016.


0
80'
160'
SCALE IN FEET
TONGASS NARROWS
South Pier
RW
M/V MATANUSKA
South Mooring Float
North Mooring Float
S2
S1
N1
N2
-40
-30
-20
-10
0
LOCATION
Lower Ketchikan Lake
TONGASS NARROWS
Hoadley Cr.
KETCHIKAN
Ketchikan International Airport
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 23, 2015. The underwater inspection occurred on August 13, 2011. The most recent fracture critical inspection occurred on September 3, 2014.

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. 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.
2. 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).

3. 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.

4. 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 on all interior surfaces 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.

5. 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.
   b. A 2 3/8" long crack exists in the bottom flange of Stringer 5 at the lifting beam welded connection on the pontoon.

6. 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 2011 were -0.93V on average, which means the immersed steel is adequately protected by anodes.

7. 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

Observations (continued)

oxidation layer and did not display any surface pitting when the piling surfaces were brushed clean. ASD 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.

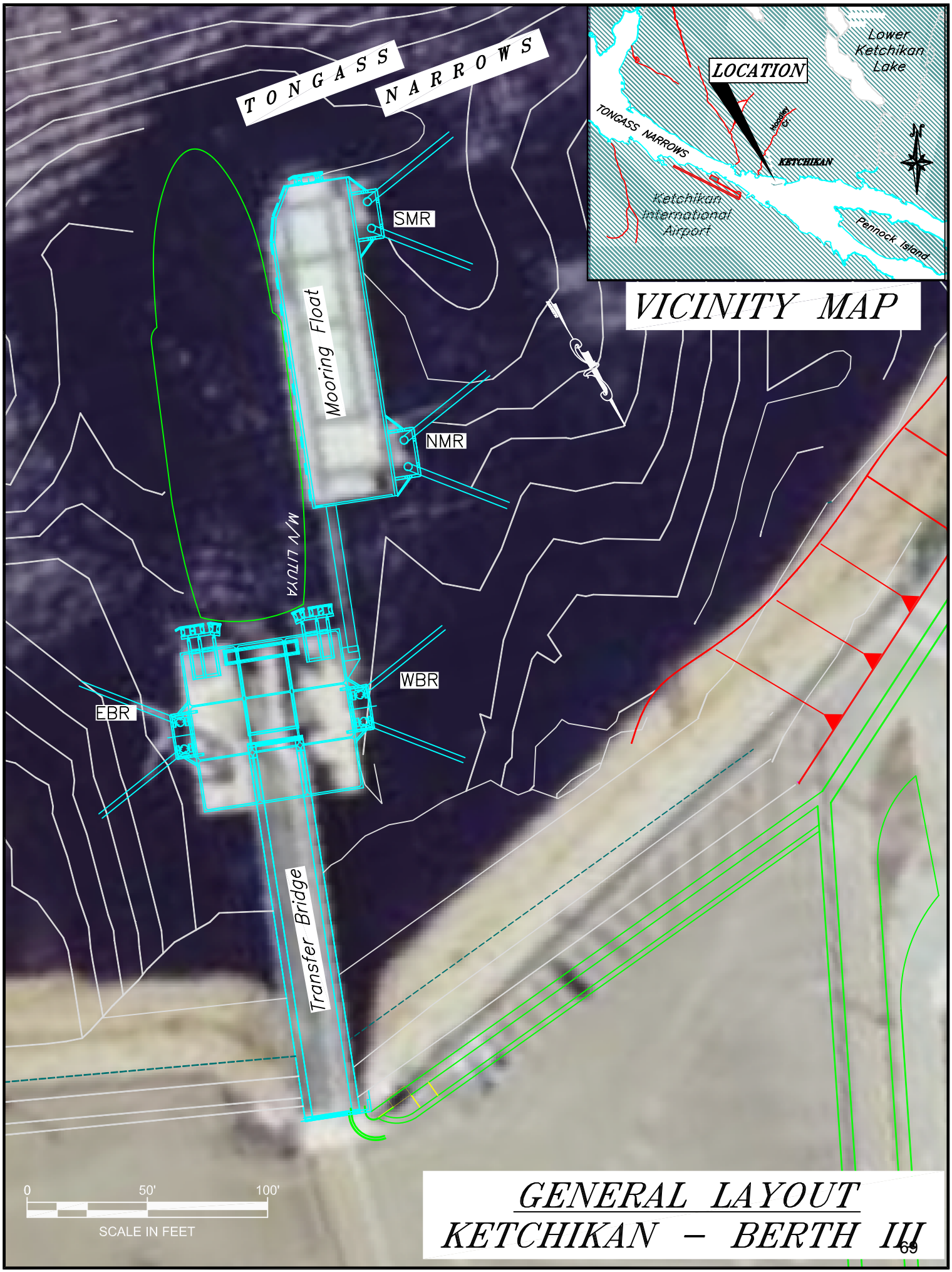
The 2006 underwater inspection found that ~30% of the timber fender chocks within the tidal zone had 80% section loss. Coatings failure is estimated at 15% for the fender and dock support system.

8. 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.
9. 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.
10. Soil was eroding around the timber glulam approach to the north fender float access gangway. Maintenance excavated the material with a backhoe and replaced with well-draining shot rock fill in 2008.

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.
Mooring Float	3	Refit the deck with rolled-roofing or more functional traction improvement.
Transfer Bridge	4	Repair the failed welds between Stringers 1 & 5 and the lift beam.
Category II - Rehabilitation Work		
South Pier	5	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.
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.
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.

Inspection Summary (continued)		
Structure	Priority	Recommendations
Category II - Rehabilitation Work		
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.
Uplands	15	Program for construction of a Staging Area.
Intermediate Ramp	16	Design/install a hinged transtion panel that spans the gap between the catwalk and the bridge ramp deck panel.
Mooring Float	17	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
LOCATION
Lower Ketchikan Lake
TONGASS NARROWS
Hoadley Cr.
KETCHIKAN
Ketchikan International Airport
Pennock Island
VICINITY MAP
SMR
Mooring Float
NMR
M/V LITUYA
WBR
EBR
Transfer Bridge
0
50'
100'
SCALE IN FEET
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 23, 2015. The underwater inspection occurred on August 16, 2011. The most recent fracture critical inspection occurred on September 2, 2014.

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

Restraint Dolphins

Dolphins	Dolphin Piles	Anodes	Built	Cond.	Notes
EBR	2B, 2V	None present	2001	Good	Restraint fenders on seawardside are crushed.
WBR				Good	
NMR				Good	
SMR				Good	

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.

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.

   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. To add heat trace to the lines, all the existing piping would have to be torn out & replaced since the existing piping doesn't have a 'hat channel' for adding the thaw wire.
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. Mooring cables are improperly tied to the bridge float bollards. The eye splice loops should simply be placed over both bollard horns. The current arrangement has the end of the line wrapped several times around the bollard base, then the eye splice loop is placed over one bollard horn. This puts the bollard horns in torsion, which is not what they were designed for.
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.

   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.

Observations (continued)

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.

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 surface.
Category II - Rehabilitation Work		
Mooring Float	2	Project 67446 will refurbish the fender & platform components (damaged support frame, missing fender panel, listing float).
Bridge	3	Relocate the j-box outside of the splash zone. Consider replacing sewer line with new piping & adding heat trace to sewer & water lines. 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	4	Replace the non-skid coating.
Bridge Ramp	5	Coat hydraulic rams with grease and cover with a weather-tight boot/bellows.
Restraint Dolphins	6	Install anodes on all submerged steel pipe piles.
Transfer Bridge	7	Repair the weld at the diagonal brace connection at the bridge float restraint.
Utilities	8	Consider adding heat trace to the sewer and water lines.
Category III - Upgrades Needed		
Turning Dolphin	9	Project 67446 will install a new turning dolphin between Berths 1 & 3, a pedestrian covered walkway from the terminal building, and new anodes on all steel structures.

Project SAMHS0015 – KTN Ferry Terminal Improvements:

This project was awarded to Turnagain Marine Construction in December, 2015. Work includes the replacement of dolphin W5 – Berth 1 with a new lead-in/turning dolphin, construction of a new turning dolphin between the seaward end of the mooring float at Berth 3 and the lead-in dolphin E5 – Berth 1. Completion is set for September 30, 2016.