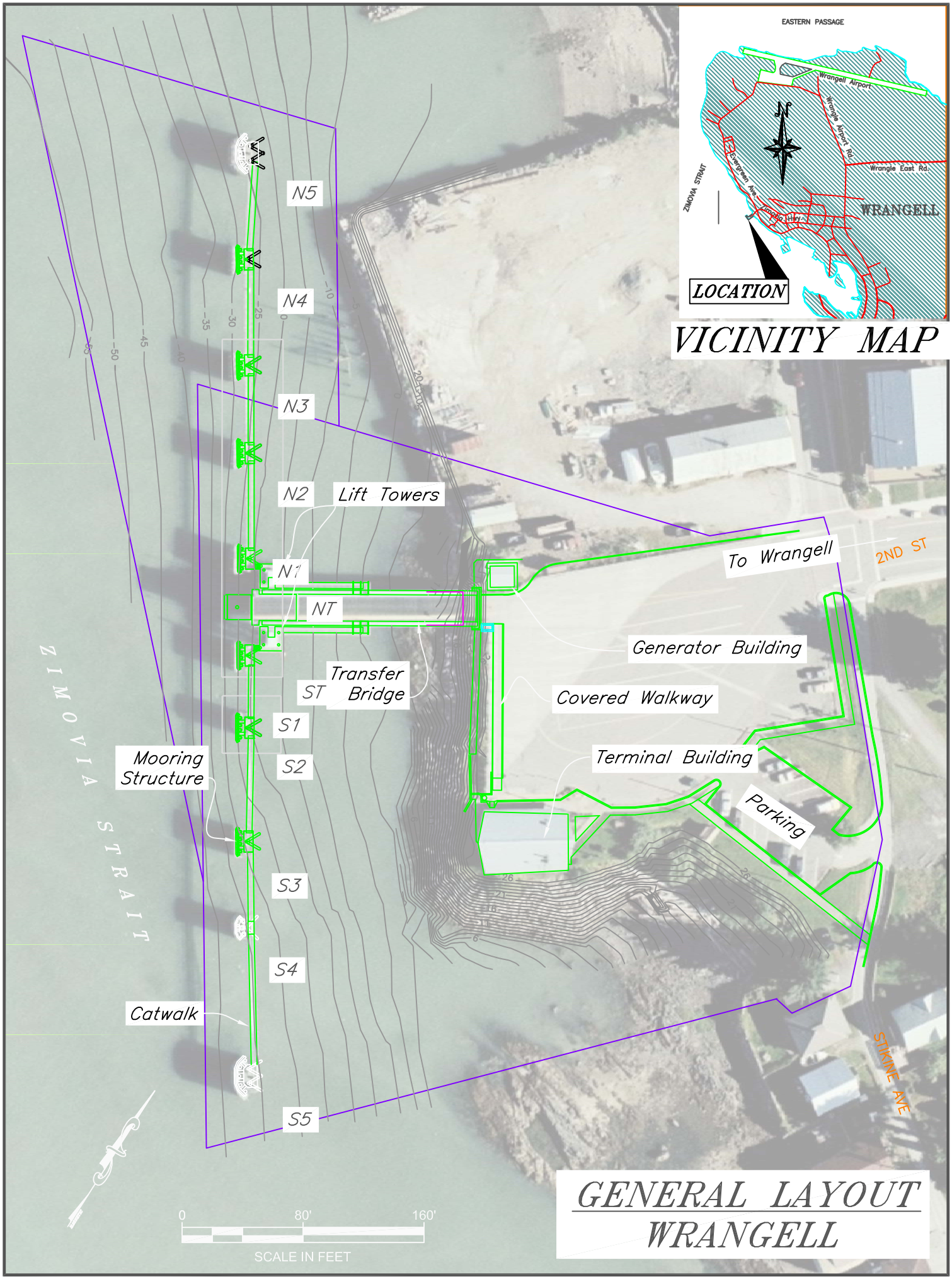

EASTERN PASSAGE
Wrangell Airport
Wrangle Airport Rd.
Wrangle East Rd.
Evergreen Ave.
Zimovia Hwy
ZIMOVIA STRAIT
WRANGELL
LOCATION
VICINITY MAP
N5
N4
N3
N2
Lift Towers
N1
NT
ST
Transfer Bridge
S1
S2
S3
S4
S5
Mooring Structure
Catwalk
To Wrangell
2ND ST
Generator Building
Covered Walkway
Terminal Building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

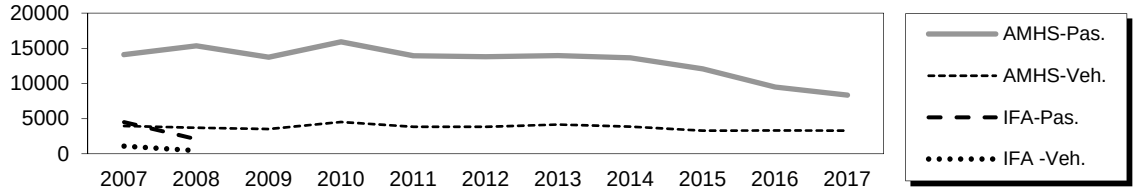
Wrangell Ferry Terminal

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 & underwater inspections occurred on August 1, 2016.

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.