Ketchikan Berth IV Dock Expansion Project Description
East Tongass Narrows, Ketchikan, Alaska
November 2017

OVERVIEW

The Ketchikan Dock Company, LLC proposes to expand Berth IV, its dock adjacent to downtown Ketchikan in East Tongass Narrows, Alaska. The privately-owned Berth IV along with the City-owned Berths I, II, and III comprise the Port of Ketchikan. The Port is primarily configured to support cruise ships and passengers. The expanded Berth IV would be able to accommodate a new fleet of larger cruise ships that are expected to reach Alaska in the summer of 2019.

The expanded berth including a new larger pontoon dock and attached small craft float would be supported by 16 temporary piles and 18 permanent piles. The project would include the removal of 12 existing piles, the existing floating barge, and the existing float. The project would occur in and over waters of the United States. No fill, dredging, or blasting is proposed as part of this project.

LOCATION

Berth IV is located within the Ketchikan Gateway Borough on Revillagigedo Island in Southeast Alaska; T75S, R90E, S25, Copper River Meridian, USGS Quadrangle KET B5; Latitude 55.344 and Longitude -131.656 (Figure 1 and Sheet 1).

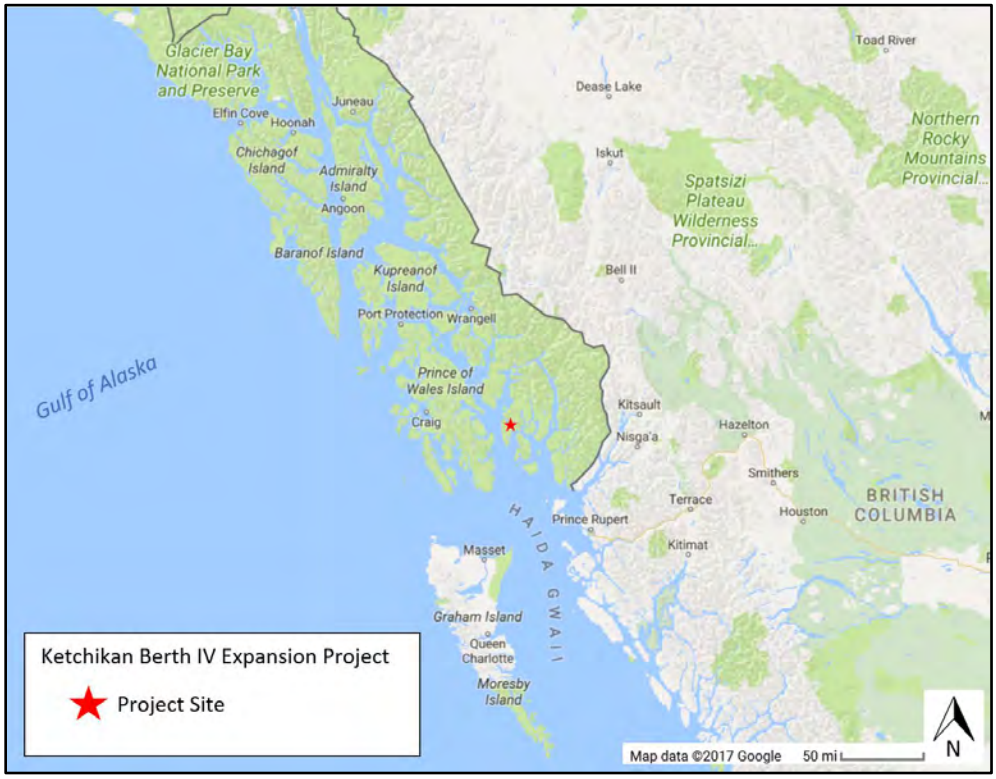

Figure 1. Project Location

The berth is adjacent to downtown Ketchikan on the shore of East Tongass Narrows (Figure 2 and Sheet 1). All Berth IV expansion would occur within the general vicinity of the existing facility (Sheets 2 and 3 of 7).

Figure 2. Berths I, II, III and IV encompassing the Port of Ketchikan.

Figure 3. Photo of Existing Berth IV.
Photo Credit: City of Ketchikan Planning and Design of Port Improvements Report by Moffatt & Nichol 2016.

PURPOSE AND NEED

Ketchikan is one of the main ports-of call for cruise ships in Alaska. Ketchikan receives up to six ships daily from May through September, with over 950,000 annual cruise passenger visits (Moffatt & Nichol 2016). The average length of cruise ships has increased over time. In the 1970s, 550-foot long ships were common and now ships with lengths over 900 feet are becoming the operational standard. These post-Panamax cruise ships which are larger than those that have been coming through Alaska's Inside Passage are expected to reach the Port of Ketchikan in the summer of 2019. Currently Berth IV is not capable of supporting these larger cruise ships.

The purpose of this project is to reconfigure Berth IV so that it can accommodate larger cruise ships, which are expected to require docking facilities in Ketchikan in 2019. This project is needed because the existing Berth IV cannot support the modern fleet of larger cruise ships. Once the project is constructed Berth IV will be able to accommodate larger cruise ships.

ANTICIPATED CHANGES IN VESSEL TRAFFIC

While the size of cruise ships traveling to Ketchikan is expected to increase, this project is not expected to increase vessel traffic in Alaskan waters. According to *The City of Ketchikan Planning and Design of Port Improvements* report, "Conversations with cruise lines and Cruise Line Agencies of Alaska (CLAA) suggest that growth over the next decade will occur primarily as a result of homeports and primary regional ports-of-call being modified to welcome larger vessels, without significantly expanding the number of vessels operating within Alaska" (Moffatt & Nichol 2016). It is expected that more passengers may visit Alaska on these larger ships.

ALTERNATIVES

A no action alternative and two alternatives able accommodate a design vessel of 1,040 feet (i.e. post-Panamax cruise ships) were considered for this project. These alternatives are summarized below.

No-Action Alternative

The Ketchikan Dock Company, LLC considered a no-action alternative. Under this alternative the new pontoon dock and float and expanded mooring structures would not be constructed. This alternative was dismissed because it does not meet the project's purpose and need to provide a berth that can accommodated 1,000-foot vessels including the modern cruise ship fleet. Without the new dock, Berth IV will lack the infrastructure it needs to support these large vessels and the demand for docking locations for large cruise ships will be not be met in Ketchikan.

Pontoon Dock and Float with Extended Mooring Structures (Dismissed Alternative)

The Ketchikan Dock Company, LLC considered expanding Berth IV by replacing the existing floating barge and float with a larger pontoon dock and larger small craft float (as in the

Proposed Alternative), and by extending a new mooring structure beyond the footprint of the existing berth.

This alternative would satisfy the purpose and need of the project; however, the alternative has been dismissed because it would impede access to adjacent property. There is not space available to extend mooring points to the west or east.

Pontoon Dock and Float with Expanded Mooring Structures (Proposed Alternative)
The Ketchikan Dock Company, LLC examined an expansion of Berth IV by replacing the existing floating barge and float with a larger pontoon dock and larger small craft float and by expanding the existing mooring structures (Figure 4, Sheets 2 and 3). The new dock would be supported by two pontoon dolphins and mooring would be expanded by adding two dolphins (Table 1). The existing transfer bridge will be temporarily removed and later reinstalled. The existing floating barge and float and their supporting dolphin structures would be permanently removed (Sheet 2).

This alternative was carried forward because it meets the purpose and need for the project, does not impede access to adjacent property, and meets constructability requirements for geotechnical conditions and space constraints in the Port of Ketchikan.

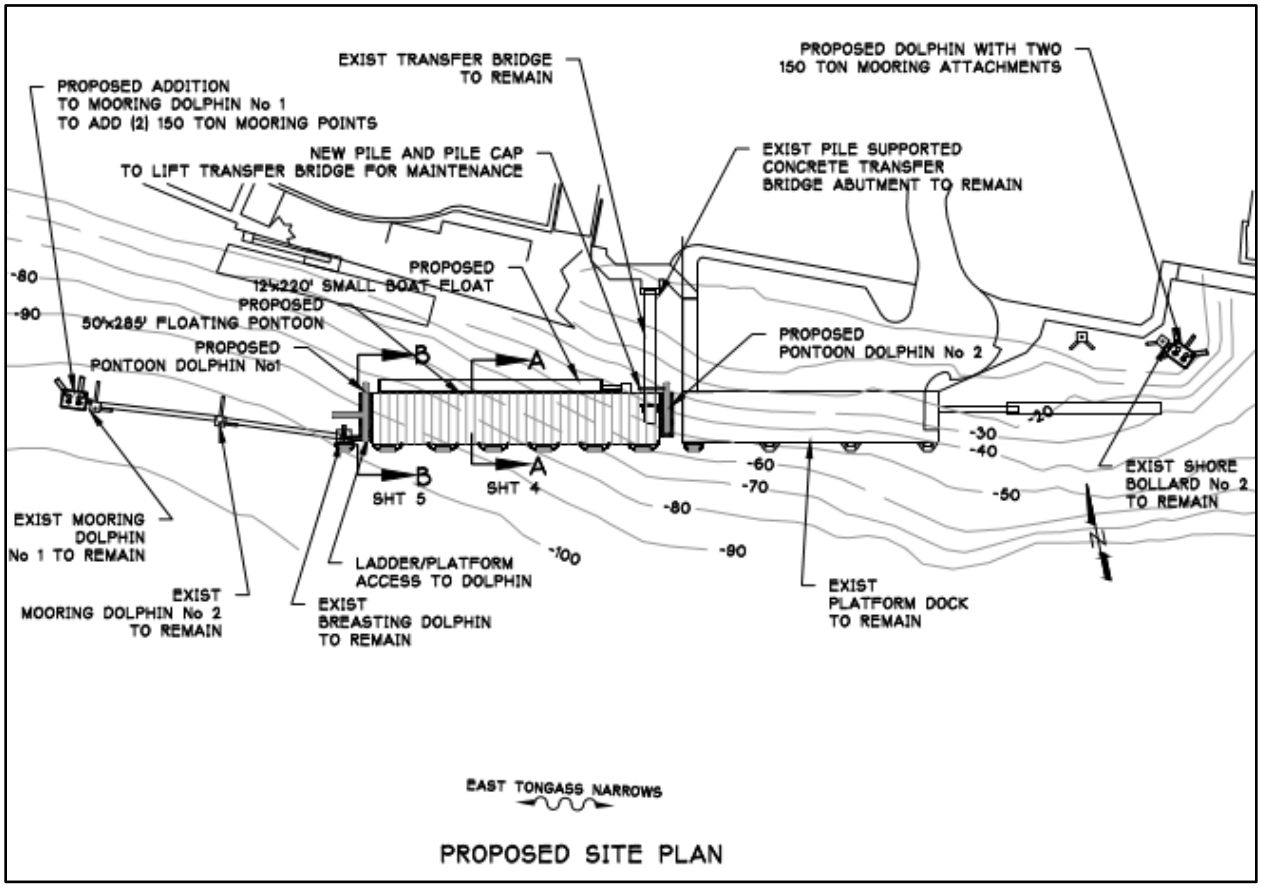

Figure 4. Propose Site Plan (see Sheet 3 for more detail)

Table 1. Propose Pile Schedule

Structure	# and Diameter of Piles
Mooring Dolphin No. 1	(2) 48-inch batter & (2) 48-inch diameter plumb
Shore Bollard No. 2	(2) 48-inch batter, (1) 30-inch batter & (2) 48-inch plumb
Pontoon Dolphin No. 1	(2) 48-inch batter & (3) 48-inch plumb
Pontoon Dolphin No. 2	(1) 48-inch batter & (3) 48-inch plumb

PROPOSED ACTIVITIES

The proposed project includes the following activities over and in navigable waters of East Tongass Narrows (Figure 4 and Sheets 1-7):

- Permanently remove the 124 foot by 34 foot existing floating barge dock, float, and associated three dolphins comprised of 12 steel piles (two 24-inch, six 30-inch, and four 36-inch diameter);
- Temporarily remove the existing transfer bridge and reinstall as part of the new facility;
- Install sixteen temporary 30-inch diameter steel piles as templates to guide proper installation of permanent piles (these piles would be removed prior to project completion);
- Install one 4-pile pontoon dolphin (made up of 48-inch diameter piles) and one 5-pile pontoon dolphin (made up of 48-inch diameter piles) and the new 285 foot by 40 foot by 10 foot floating pontoon dock (Transpac Marinas) and its attached 220 foot by 12 foot small craft float (Figure 4, Sheet 2);
- Install four 48-inch diameter piles to expanded offshore mooring dolphin No. 1;
- Install four 48-inch diameter piles and one 30-inch diameter pile to expand shore bollard No. 2; and
- Install bull rail, floating fenders, mooring cleats, and three mast lights. (Note: these components would be installed out of the water.)

Construction Methods

Dates and Duration of Activities

Construction is expected to take 3-4 months and would occur sometime between October 2018 and April 2019 (depending on weather conditions and contractor availability).

Vibratory removal of old steel piles would likely occur over 5 days, removal of existing structures would likely occur over 4 days, vibratory installation of temporary template piles would likely occur over 4 days, vibratory removal of temporary template piles would likely occur over 3 days, and vibratory and impact pile driving of permanent piles would likely occur could occur over 12 days. Please see Table 2. for the specific amount of time required to install and remove piles each day. In total, pile driving activities are expected to require 24 days throughout the construction window.

The total construction duration of 3-4 months accounts for the time required to mobilize materials and resources and construct the project. The duration also accounts for potential delays in material deliveries, equipment maintenance, inclement weather, and shutdowns that may occur to prevent impacts to marine mammals.

Equipment

The following equipment would be used:

- Vibratory Hammer: APE 200-6/Static weight 18.900 pounds
- Diesel Impact Hammer: Delmag D46/Max Energy 107,280 feet-pounds
- Drilled shaft drill: Holte 100,000 feet-pounds top drive with down-the-hole (DTH) hammer and bit
- Socket drill: Holte 100,000 feet-pounds top drive with DTH hammer and under-reamer bit

Transport of Materials and Equipment

Materials and equipment, including the dock, would be transported to the project site by barge. While work is conducted in the water, anchored barges will be used to stage construction materials and equipment. Twenty-five-foot skiffs with 250 horsepower motors will be used to support dock construction.

Construction Sequence

In-water construction will begin with the removal of existing piles followed by installation of the two dolphins that will support the floating dock (pontoon dolphin No. 1 and No. 2) and the expansion of two mooring dolphins (mooring dolphin No. 1 and shore bollard No. 2). The dolphins will be constructed one at a time. Construction will be sequenced as follows:

First, the contractor will remove the existing steel piles that make up the three dolphins that support the existing dock and remove the existing the floating dock and existing float. As stated above, existing pile removal would take about 8 days and structure removal is expected to take 4 days.

Next, the contractor will construct one of the pontoon dolphins. Each dolphin is expected to take about 14 days to construct with 6 of those days requiring pile driving or removal. The general dolphin pile installation sequence is described below:

- Day 1: Vibrate four temporary 30-inch piles into place to create a template to guide later installation of permanent piles.
- Day 2: Weld frame around the temporary piles.
- Day 3: Vibrate and impact one permanent 48-inch vertical pile into place.
- Day 4: Vibrate and impact one permanent 48-inch vertical pile into place.
- Day 5: Vibrate and impact one permanent 48-inch vertical pile into place.
- Day 6: Vibrate and impact one permanent 48-inch batter pile into place.
- Day 7: Install drilled shaft.

- Day 8: Install drilled shaft.
- Day 9: Install drilled shaft.
- Day 10: Install drilled shaft.
- Day 11-13: Weld dolphin structure.
- Day 14: Remove frame and remove the four temporary piles.

The contractor will construct the second floating dock dolphin and the two mooring dolphins using the construction sequence described above (adjusted for the quantity of piles for each respective structure).

Pile Removal and Installation Methods

Removal of Existing Piles

The contractor would attempt to direct pull existing piles; if those efforts prove to be ineffective existing piles would be removed with a vibratory hammer.

Installation and Removal of Temporary Piles

Temporary 30-inch diameter piles would be installed and removed with a vibratory hammer.

Installation of Permanent Piles

The permanent 30-inch diameter pile will be installed through approximately 15 feet of sand and gravel with a vibratory hammer. Then, the pile will be secured into underlying bedrock with conventional socketing means using a DTH hammer and under-reamer bit to drill a hole into the bedrock and then socket the pile into the bedrock. Socket depths are expected to be approximately 20 feet (as determined by the geotechnical engineer) and take approximately 3 hours per pile to complete.

Permanent 48-inch diameter piles would be driven through sand and gravel with a vibratory hammer operated at a reduced energy setting and impacted into bedrock. After being impacted, a smaller 30-inch diameter drilled shaft will be drilled within the pile and into the bedrock below the pile. Here the 48-inch diameter pile would act as an isolation casing and will prevent drilling noise from propagating through the water column. Once the shaft is drilled a DTH hammer with a 30-inch diameter bit (isolated from the steel casing) will be used to drill an approximately 15-foot long shaft (as determined by geotechnical engineer) into the bedrock. Each shaft will take approximately 2.5 hours to complete.

Table 2 provides a conservative estimate of the amount of time required for pile removal and installation.

Table 2. Ketchikan Berth IV Dock Expansion Pilings Number, Size, and Estimated Number of Hours Required for Vibratory and Impact Pile Driving.

Description	Project Component					
	Existing Pile Removal	Temporary Pile Installation	Temporary Pile Removal	Permanent Pile Installation	Permanent Pile Installation	Max Installation/ Removal per Day
Pile Diameter and Type	24, 30, and 36-inch steel	30-inch steel	30-inch steel	30-inch steel	48-inch steel	--
# of Piles	2, 6, and 4 respectively; 12 total	16	16	1	17	--
Max # of Piles Vibrated Per Day	4	4	4	1	2	4 temporary or 2 permanent
Vibratory Time Per Pile	15 minutes	30 minutes	10 minutes	1 hour	1 hour	--
Vibratory Time per day	1 hour	2 hours	40 minutes	1 hour	2 hours	2 hours
Vibratory Time Total	3 hours	8 hours	2 hours 40 minutes	1 hour	17 hours	--
Max # of Piles Impacted Per Day	0	0	0	0	3	3
# of Strikes Per Pile	0	0	0	0	200 strikes	600 strikes
Impact Time Per Pile	0	0	0	0	5 minutes	--
Impact Time per Day	0	0	0	0	15 minutes	15 minutes
Impact Time Total	0	0	0	0	1 hour 25 minutes	--

POTENTIAL IMPACTS

Wetlands and Waters of the United States

This project will not impact coastal or fresh water wetlands. The project will impact Tongass Narrows, a navigable water under Federal jurisdiction. The project removes and replaces an existing dock and float and associated piles and expands mooring structures in and over the Narrows. No fill is associated with this project.

ESA and MMPA Protected Species

The National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS) Marine Mammal Species Range and Critical Habitat Interactive Map (NMFS 2017) and the U.S. Fish and Wildlife (USFWS) Information for Planning and Conservation (IPaC) Website (USFWS 2017) were used to identify marine mammals and protected birds and their critical

habitat that may occur in the project area. Table 3 lists protected species that may occur in the project area. The project area does not fall within critical habitat of any listed species.

Table 3. Protected Species that May Occur in the Project Area.

Species	Status	Agency
Steller Sea Lion (Western DPS overland into Eastern DPS; *Eumatopia jubatus)*	Endangered under ESA	NMFS
Steller Sea Lion (Eastern DPS; *Eumatopia jubatus)*	MMPA	NMFS
Humpback Whale (*Megaptera novaeangliae*)	Endangered under ESA	NMFS
Fin Whale (*Balaenoptera physalus*)	Endangered under ESA	NMFS
Harbor Seal (*Phoca vitulina*)	MMPA	NMFS
Dall's Porpoise (*Phocoenoides dalli*)	MMPA	NMFS
Gray Whale (Eschrichtius robustus)	MMPA	NMFS
Harbor Porpoise (*Phocoena phocoena*)	MMPA	NMFS
Killer Whale (*Orcinus orca*)	MMPA	NMFS
Pacific White-Sided Dolphin (*Lagenorhynchus obliquidens*)	MMPA	NMFS
Minke Whale (*Balaenoptera acutorostrata*)	MMPA	NMFS
Northern Sea Otter (*Enhydra lutris kenyoni*)	MMPA	USFWS

DPS= Distinct Population Segment; ESA=Endangered Species Act; MMPA= Marine Mammal Protection Act
Sources: NMFS 2016, USFWS 2017

To ensure compliance with the Endangered Species Act (ESA), Section 7 consultation with the NMFS will be required. To facilitate consultation, the Ketchikan Dock Company, LLC plans to develop an ESA Section 7 Biological Assessment (BA) for ESA-listed Western DPS Steller sea lions and humpback whales. In addition, they plan to apply for an Incidental Harassment Authorization (IHA) from NMFS' Office of Protected Resources and plan to develop a Marine Mammal Monitoring and Mitigation Plan (4MP). To ensure compliance with the Marine Mammal Protection Act (MMPA), the Ketchikan Dock Company, LLC plans to consult with NMFS and USFWS. Mitigation measures arising from consultation will be implemented during construction.

ESA Critical Habitat

The project area does not fall within critical habitat of any listed species.

Magnuson-Stevens Fishery Conservation and Management Act/Essential Fish Habitat

The Alaska Department of Fish and Game (ADF&G) does not identify any anadromous steams in the immediate project area. There are approximately ten anadromous streams within 4.8km (3mi) of the project area (ADF&G 2017). Species of fish known to reside in the waters of the ADF&G Ketchikan Management Area include all five species of Pacific salmon, halibut, lingcod, Pacific cod, greenling, herring, and several common species of rockfish (ADF&G 2017a).

Essential Fish Habitat (EFH) exists within the proposed project in East Tongass Narrows for all five species of Pacific salmon (NOAA 2017).

According to NMFS's ShoreZone Mapper, Berth IV in Ketchikan has an anthropomorphic permeable habitat class and solid man-made structures with sheltered rocky beaches environmental sensitivity index (NMFS 2017a).

Because piles would be placed in a previously disturbed industrial area, and because of the conservation measures listed below, the project is not likely to adversely affect EFH.

Contaminated Sites

A number of intentional and accidental discharges of contaminants pollute the marine waters of Alaska annually. Intentional sources of pollution, including domestic, municipal, and industrial wastewater discharges, are managed and permitted by the Alaska Department of Environmental Conservation (ADEC). Pollution may also occur from unintentional discharges and spills.

The 2010 ADEC List of Alaska's Impaired Waters does not list the East Tongass Narrows as an impaired waterbody (ADEC 2010).

The ADEC Contaminated sites database list two contaminated sites (Hazard ID: 25989 City of Ketchikan Pump Station 3 and 4196 Water Street Easement Lots 6 & 8) near the project area. Clean up has been completed at both sites; these sites would not interfere with the proposed project (ADEC 2017).

While these and other un-permitted sources have the potential to produce pollutants in the project area, we do not anticipate pollution to cause adverse effects to marine mammals in the Tongass Narrows, an area which represents a very small fraction of the species' ranges.

National Historic Preservation Act

A review of the Alaska Heritage Resources Survey (AHRS) was conducted by Cultural Resources Consultants, LLC (CRC 2017) within the Berth IV Expansion Project area (attached). They found that Berth IV was constructed too recently to be considered for National Register eligibility. They state that there are numerous historic buildings, some listed on the National Register of Historic Places, inland to the north, northeast, and northwest of Berth IV. However, as there are no recorded archaeological or historical sites at the site of the proposed berth expansion, this project should not directly affect any known cultural resources. Also, as there is already a berth at this location, the expansion should not have a significant visual impact on any adjacent eligible properties.

Avoidance, Minimization, and Mitigation Measures

Waters of the United States Mitigation Statements

Avoidance of impacts to waters of the United States:
The purpose of this project is to reconfigure Berth IV so that it can accommodate larger cruise ships. This project is needed because the existing Berth IV cannot support the modern fleet of larger cruise ships which will begin to arrive in Ketchikan in 2019. To meet the project purpose and need the project must be constructed in and over waters of the United States. The dock expansion will be located within the already industrial Port of Ketchikan, within the vicinity of the existing dock.

Minimization of unavoidable impacts to waters of the United States, including wetlands:
The project uses the most compact design practicable (with the last amount of piles and smallest size of piles) to minimize impacts to waters of the United States.

Compensation for unavoidable impacts to waters of the U.S., including wetlands:
Compensatory mitigation is not proposed for this project because no fill would be placed within waters of the U.S.

Protected Species and EFH Mitigation Measures

The Ketchikan Dock Company, LLC plans to incorporate the following measures to avoid and minimize impacts to protected species and habitat:

General Construction Mitigation Measures
The project uses the most compact design possible, while meeting the demands of the vessels that would use the facility.

- Wood that has been surface or pressure-treated with creosote or treated with pentachlorophenol will not be used. If treated wood must be used, any wood that comes in contact with water will be treated with waterborne preservatives in accordance with Best Management Practices developed by the Western Wood Preservers Institute. Treated wood will be inspected before installation to ensure that no superficial deposits of preservative material remain on the wood.
- The project uses a design that does not require dredging, blasting, or fill.
- Plans for avoiding, minimizing, and responding to releases of sediments, contaminants, fuels, oil, and other pollutants will be developed and implemented.
- Spill response equipment will be kept on-site during construction and operation.

General Pile Driving Measures

- To minimized construction noise levels as much as possible the contractor will first attempt to direct pull existing piles; if those efforts prove to be ineffective, they will proceed with a vibratory hammer.

- Noise associated with in-water pile driving will be localized and short-term. In-water pile driving would occur over a 24-day period (not necessarily consecutive days). During that time, vibratory driving would occur for approximately 32 hours and impact pile driving would occur for approximately 1.5 hours. A maximum of 2 hours of vibratory pile driving and 15 minutes of impact pile driving would occur each day.

Marine Mammal Mitigation Measures

- The USFWS's recommended draft protocols for avoiding harm to sea otters from noise during pile driving will be implemented to protect sea otters.
- NMFS recommended protocols will be implemented to protect ESA and MMPA species as developed in the forthcoming IHA and 4MP.

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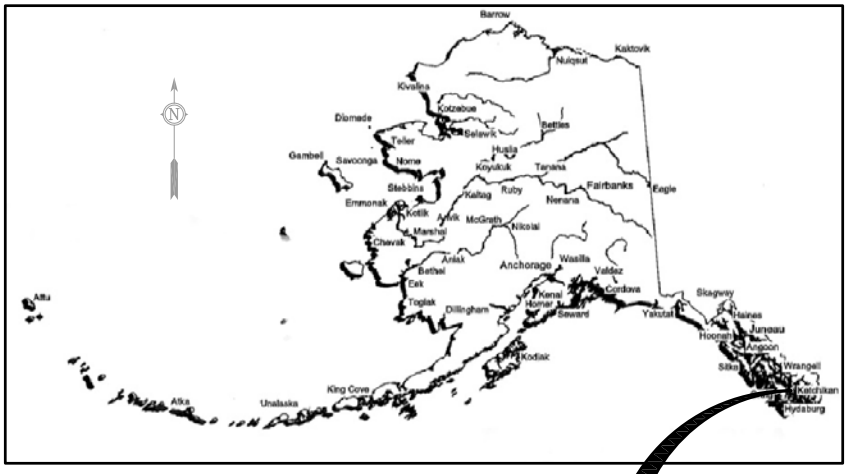
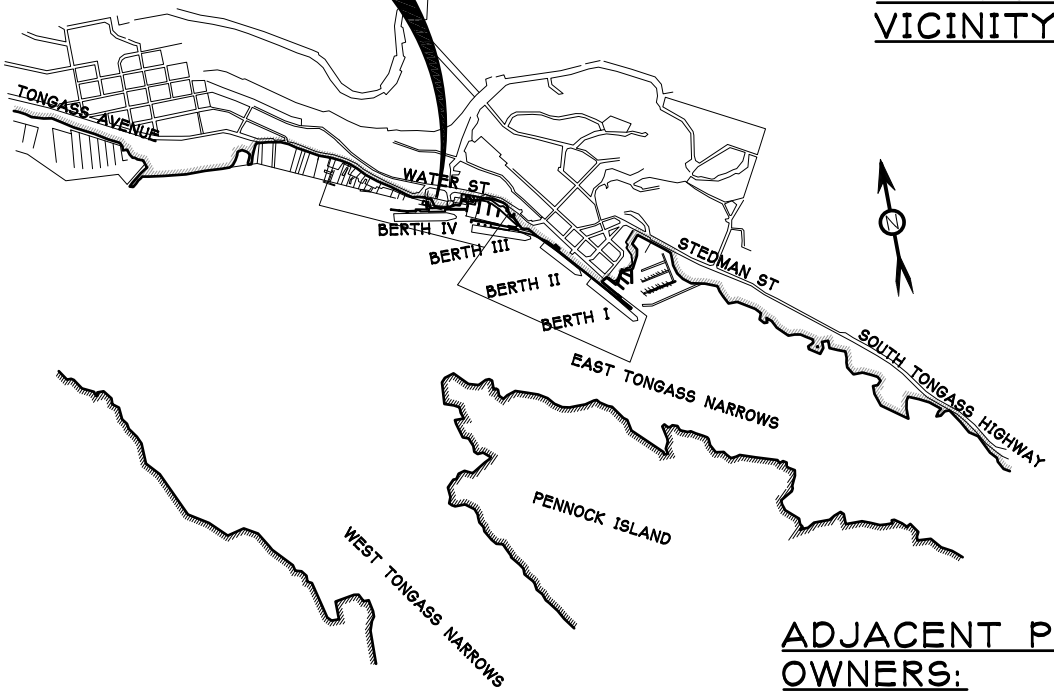


PROJECT LOCATION

PROJECT VICINITY



ADJACENT PROPERTY OWNERS:

CITY OF KETCHIKAN
1000 WATER STREET
KETCHIKAN, AK

TALBOTS INC
1101 TONGASS
KETCHIKAN, AK

PURPOSE: INCREASE CAPACITY OF EXISTING BERTH IV

DATUM: 0.0' HTL = 19.7' MHW = 15.45' MLLW = 0.0'

VICINITY MAP & LOCATION MAP

JOB NO. 17_124_A

PROPOSED: KETCHIKAN BERTH IV

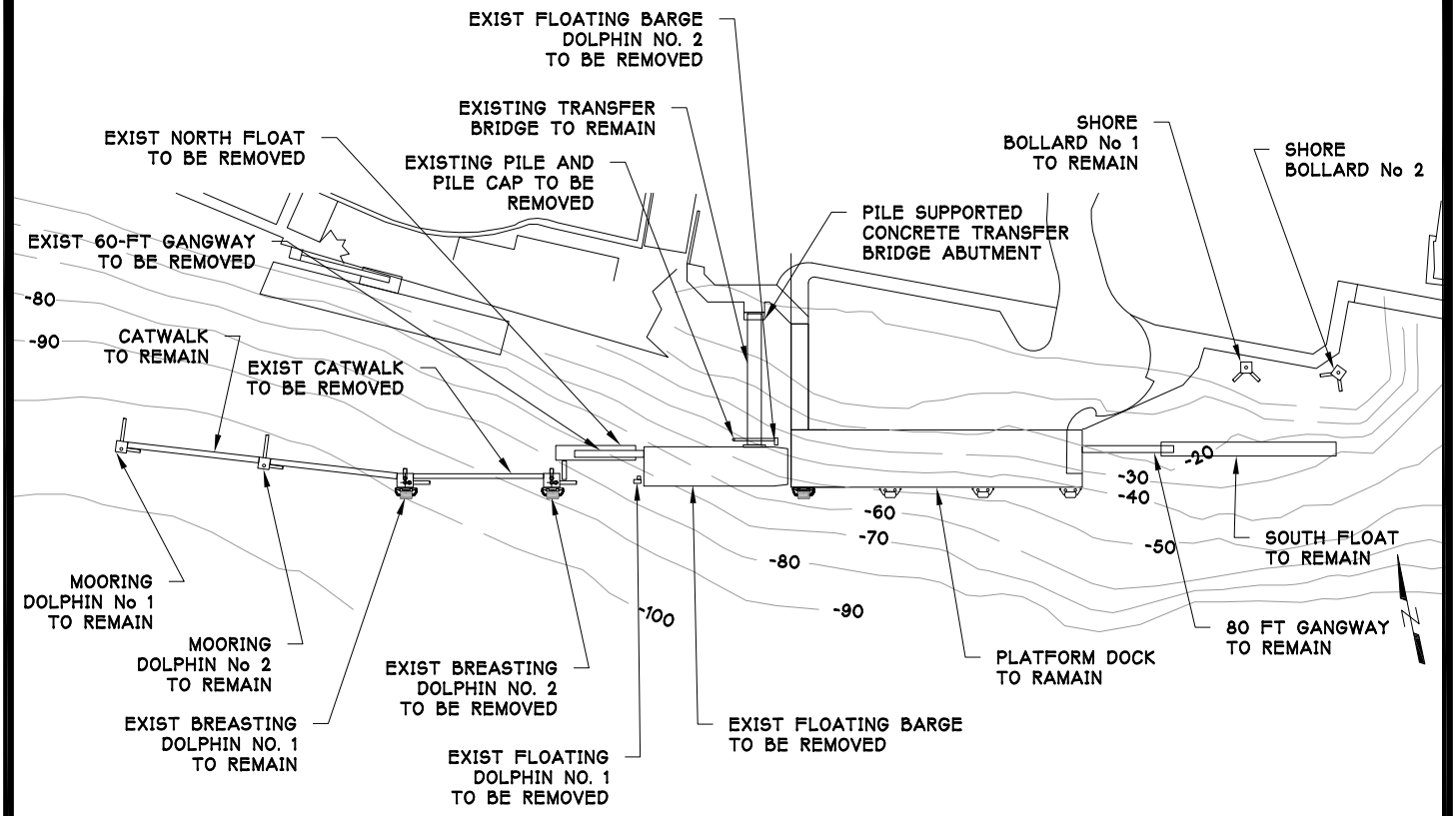
IN: TONGASS NARROWS

AT: KETCHIKAN, AK

APPLICATION BY: KETCHIKAN DOCK COMPANY LLC

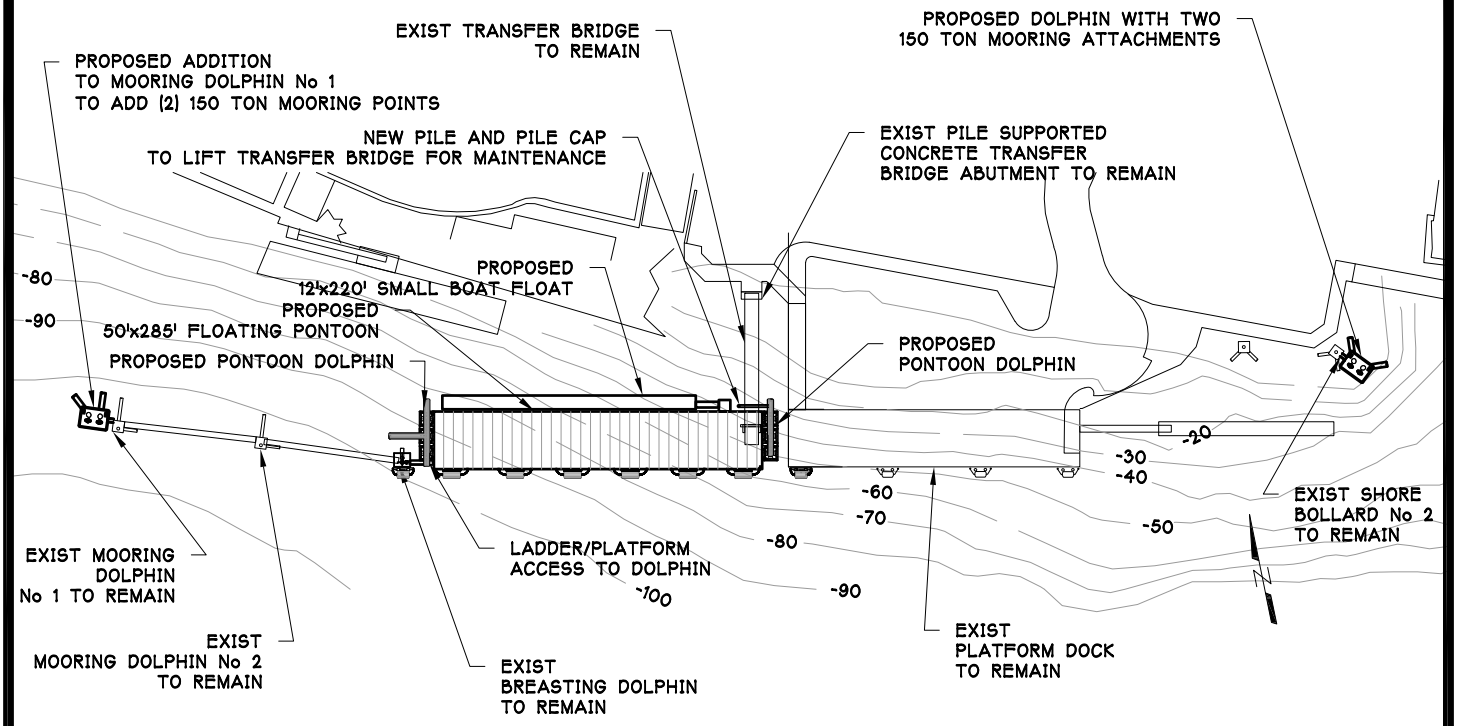
DATE: 30 OCT '17

SHEET: 1 OF 7



EXISTING SITE PLAN

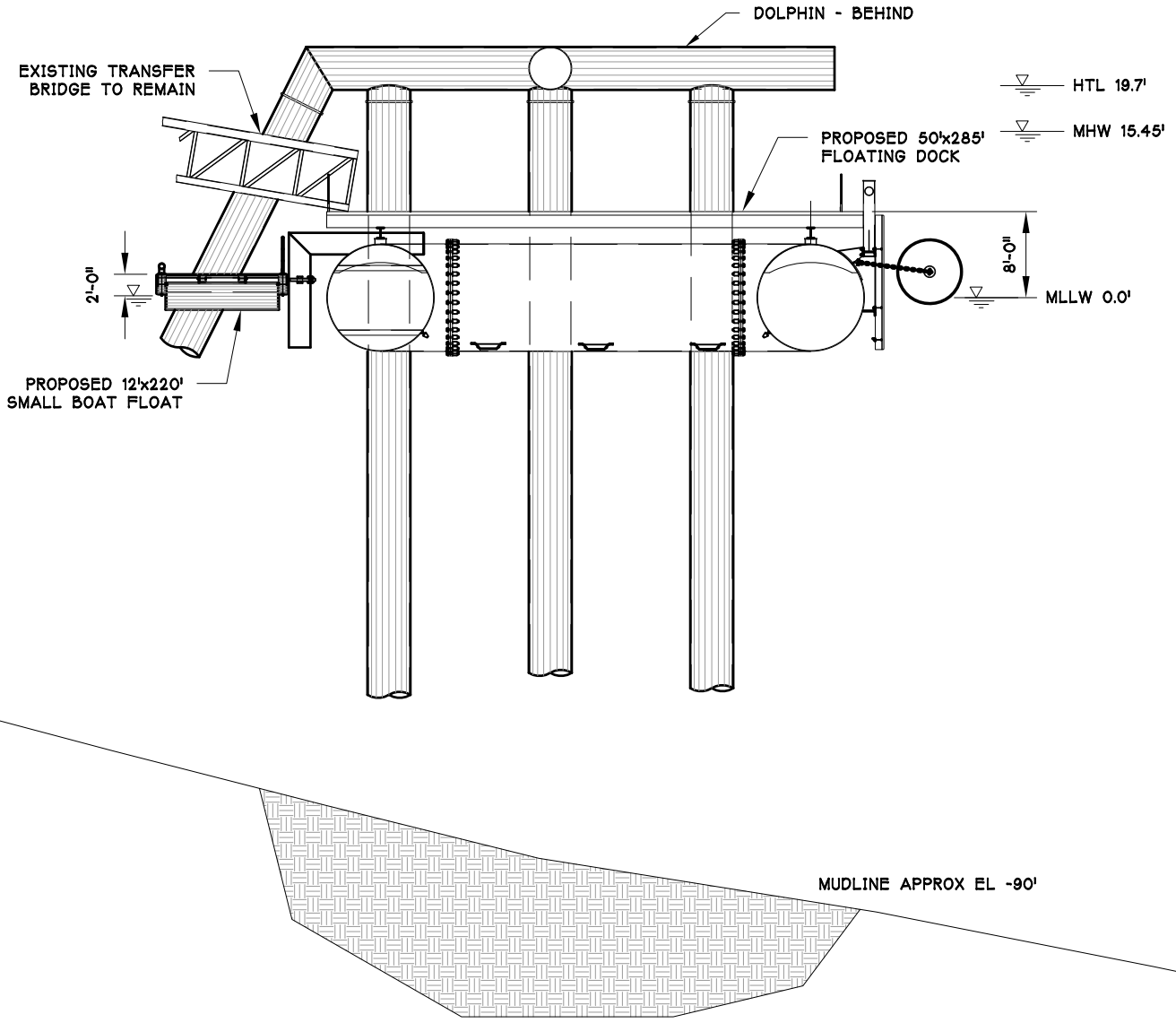
PURPOSE: INCREASE CAPACITY OF EXISTING BERTH IV	EXISTING CONDITION SITE PLAN	PROPOSED: KETCHIKAN BERTH IV
		IN: TONGASS NARROWS
		AT: KETCHIKAN, AK
		APPLICATION BY: KETCHIKAN DOCK COMPANY LLC
DATUM: 0.0' HTL = 19.7' MHW = 15.45' MLLW = 0.0'	JOB NO. 17_124_A	DATE: 30 OCT '17 SHEET: 2 OF 7



EAST TONGASS NARROWS

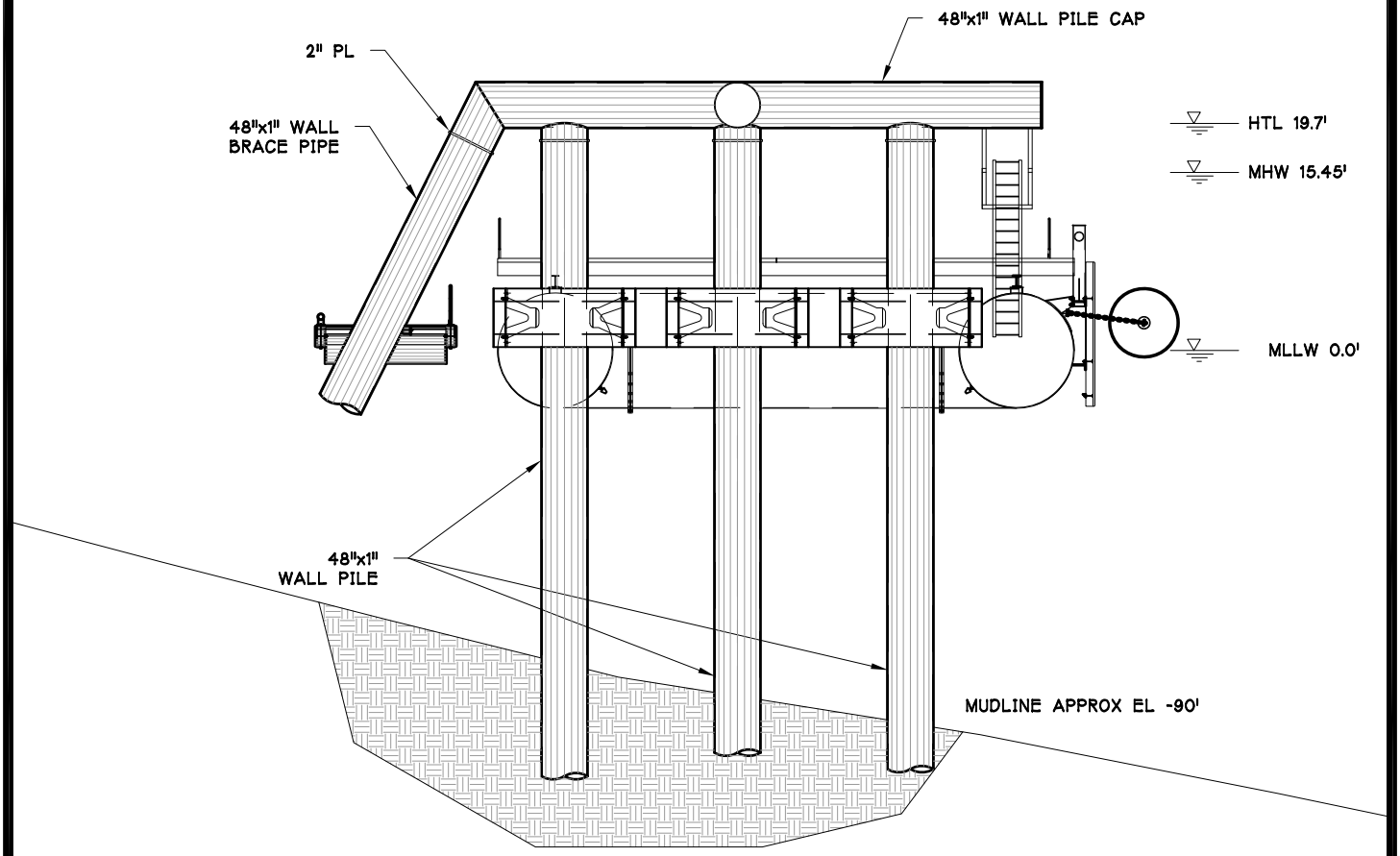
PROPOSED SITE PLAN

PURPOSE: INCREASE CAPACITY OF EXISTING BERTH IV	PROPOSED SITE PLAN	PROPOSED: KETCHIKAN BERTH IV
		IN: TONGASS NARROWS
		AT: KETCHIKAN, AK
		APPLICATION BY: KETCHIKAN DOCK COMPANY LLC
DATUM: 0.0' HTL = 19.7' MHW = 15.45' MLLW = 0.0'	JOB NO. 17_124_A	DATE: 30 OCT '17 SHEET: 3 OF 7



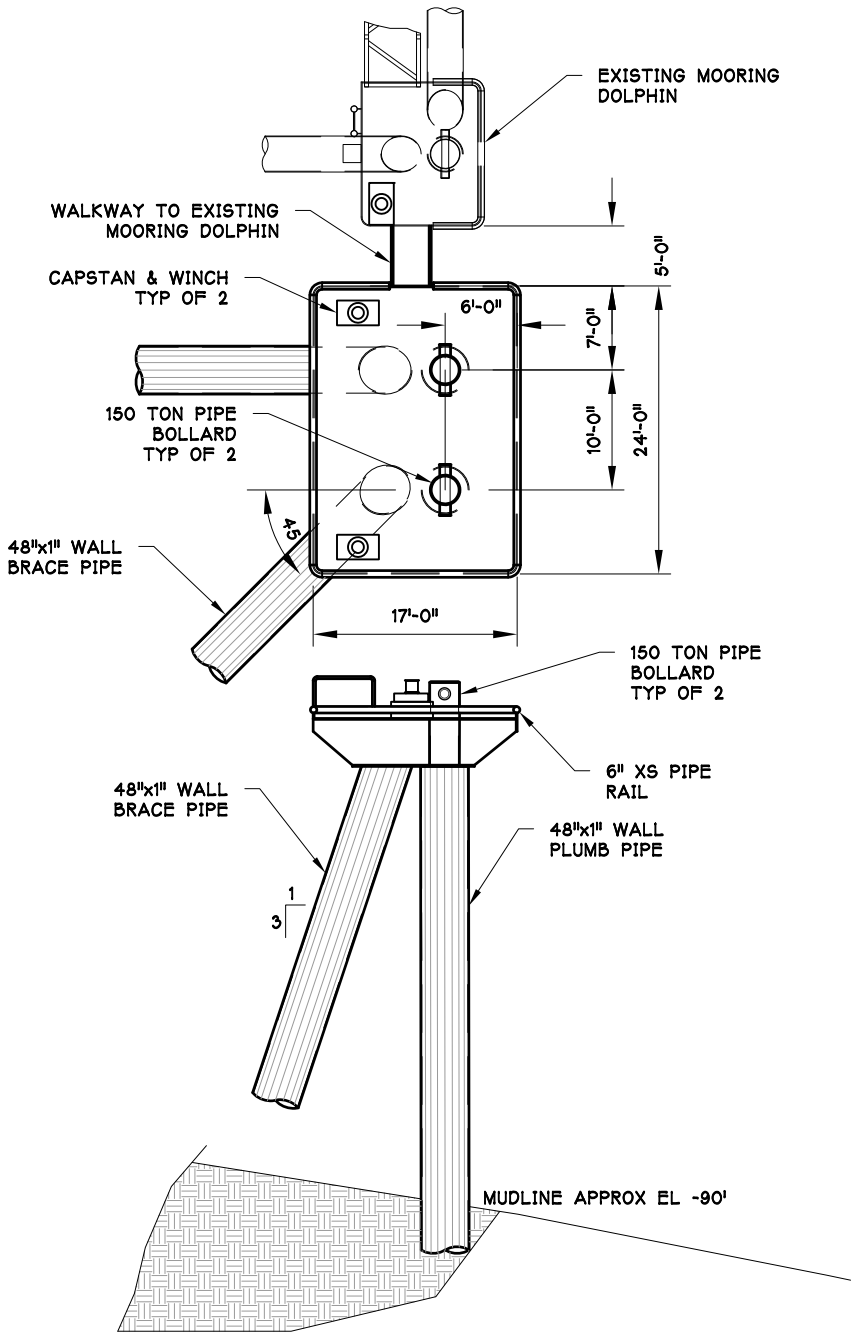
TYPICAL SECTION

PURPOSE: INCREASE CAPACITY OF EXISTING BERTH IV	PROPOSED TYPICAL SECTION	PROPOSED: KETCHIKAN BERTH IV
		IN: TONGASS NARROWS
		AT: KETCHIKAN, AK
DATUM: 0.0' HTL = 19.7' MHW = 15.45' MLLW = 0.0'	JOB NO. 17_124_A	APPLICATION BY: KETCHIKAN DOCK COMPANY LLC
		DATE: 30 OCT '17 SHEET: 4 OF 7



TYPICAL ELEVATION AT PONTOON DOLPHIN

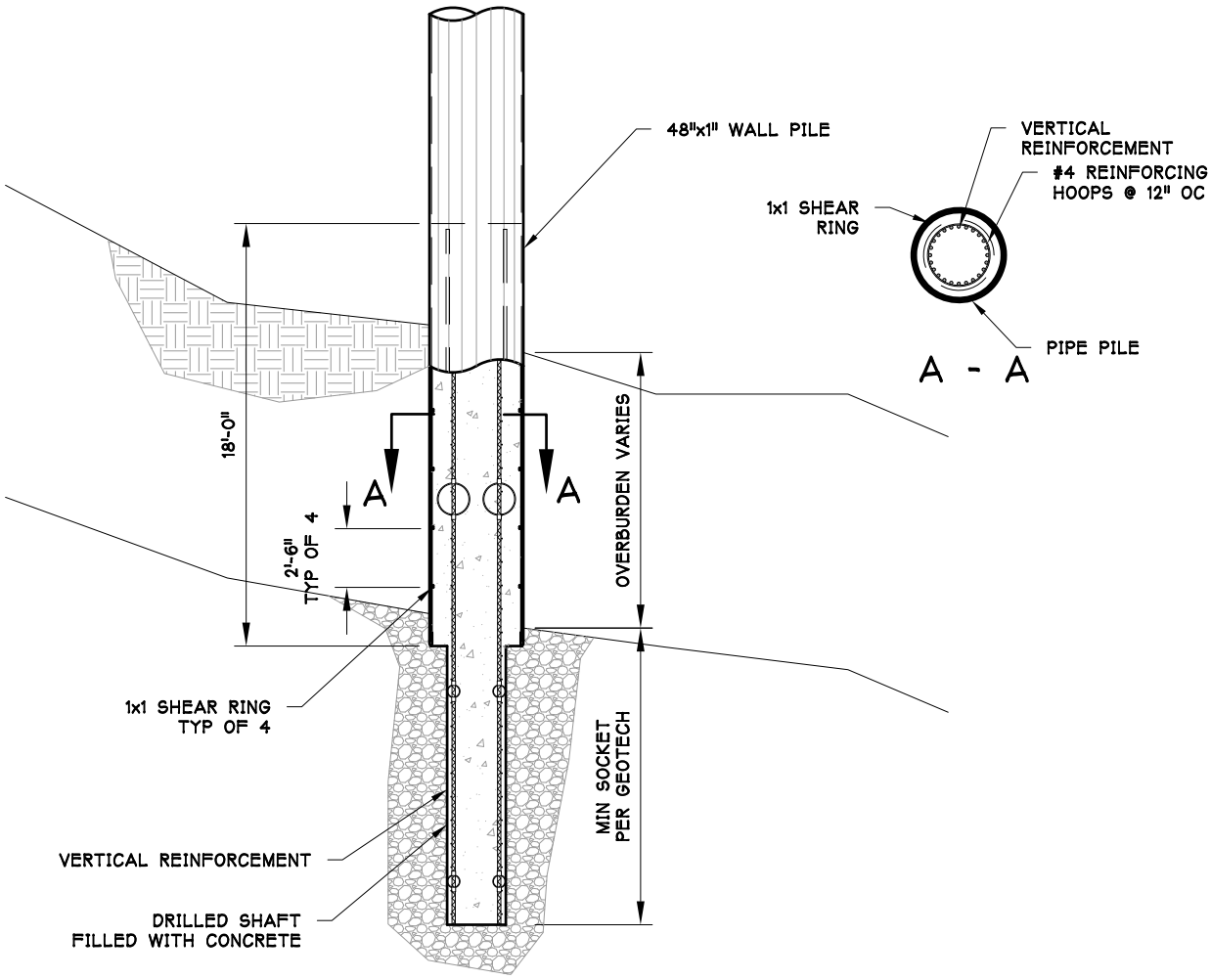
PURPOSE: INCREASE CAPACITY OF EXISTING BERTH IV	PROPOSED TYPICAL SECTION	PROPOSED: KETCHIKAN BERTH IV
		IN: TONGASS NARROWS
		AT: KETCHIKAN, AK
DATUM: 0.0' HTL = 19.7' MHW = 15.45' MLLW = 0.0'	JOB NO. 17_124_A	APPLICATION BY: KETCHIKAN DOCK COMPANY LLC
		DATE: 30 OCT '17 SHEET: 5 OF 7



DETAIL AT MOORING DOLPHIN No 1

SHORE BOLLARD DETAILS ARE SIMILAR

PURPOSE: INCREASE CAPACITY OF EXISTING BERTH IV	PROPOSED DOLPHIN PILE DETAILS	PROPOSED: KETCHIKAN BERTH IV
		IN: TONGASS NARROWS
		AT: KETCHIKAN, AK
DATUM: 0.0' HTL = 19.7' MHW = 15.45' MLLW = 0.0'	JOB NO. 17_124_A	APPLICATION BY: KETCHIKAN DOCK COMPANY LLC
		DATE: 30 OCT '17 SHEET: 6 OF 7



TYPICAL ELEVATION AT ROCK ANCHOR

PURPOSE: INCREASE CAPACITY OF EXISTING BERTH IV	PROPOSED PILE DETAILS	PROPOSED: KETCHIKAN BERTH IV
		IN: TONGASS NARROWS
		AT: KETCHIKAN, AK
		APPLICATION BY: KETCHIKAN DOCK COMPANY LLC
DATUM: 0.0' HTL = 19.7' MHW = 15.45' MLLW = 0.0'	JOB NO. 17_124_A	DATE: 30 OCT '17 SHEET: 7 OF 7