

## PROJECT MANAGEMENT

PND managed a design team that included electrical and mechanical consultants to assist with public meetings, concept development, provide permitting support, geotechnical engineering, environmental loading analysis, structural engineering, corrosion protection engineering, electrical power and lighting design, fuel and hydraulic system design, bid support and construction support services. During initial planning, PND worked closely with AKDOT, AMHS and the community to develop a construction staging sequence that minimized the duration of time without ferry service and use of the dock, while also developing viable options to provide temporary fueling capability and delivery of freight/cargo. During design, PND coordinated with AKDOT to utilize and incorporate elements of historical ferry terminal designs and drawings to the extent possible. During construction, PND collaborated with AKDOT, the contractor and the AKDOT's construction inspection consultant to provide timely shop drawing and submittal reviews and key construction oversight to facilitate an aggressive construction schedule.

## BENEFIT TO THE COMMUNITY

The multi-use facility that serves primarily as Tenakee's ferry terminal is the focal point and lifeline for the community as it can only be accessed by water or air. Replacing and improving the facility keeps this critical infrastructure operating safely and brings it into compliance with current design codes.

The original facility had limited area for staging while pedestrian and ATV access was one-way only and typically resulted in congestion and conflicts between those trying to load and those trying to unload from the vessel. The new facility has a large, dedicated staging area from which a transfer bridge provides ferry access that allows for two-way traffic and has a greater capacity to accommodate vehicle and forklift traffic. This enables AMHS's luggage truck/cart to operate and provides a means to handle large cargo transported on the ferry which offers greater flexibility and frequency beyond monthly AML barge service.

Improvements to the facility included a new timber moorage float which provides safe access to the facility for skiffs and other small vessels that shuttle from remote homesteads outside of the main community. The design incorporated the existing gangway that had previously served as the ferry access. As a result, these residents now have direct access to the ferry terminal for loading/unloading passengers and transporting groceries, fuel and building supplies.

Other benefits to the community resulted from the value engineering and include a larger utility building relocated from the main dock and sited on a separate, dedicated pile supported dock and a waiting shelter located adjacent to the staging area to provide shelter from the elements and temporary storage for items intended to be loaded onto the ferry.



# Tenakee Springs Ferry Terminal Improvements

Completed November 2020

Juneau, Alaska



ENGINEERS, INC.

2020 Outstanding ASCE Civil Engineering  
ASCE Alaska Section - Juneau Branch

Project of the Year Award



General Construction Contractor:  
Western Marine Construction  
Kriss Hart

Nomination by:  
PND Engineers, Inc. — Juneau Office  
John DeMuth, P.E., S.E.  
Mark Sams, P.E., S.E.  
Matt Holm, P.E.

Owner:  
Alaska Department of Transportation  
and Public Facilities  
Kirk Miller, P.E., S.E.  
David Lowell, P.E.

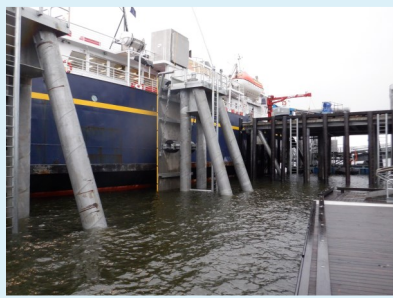


THANK YOU FOR REVIEWING OUR APPLICATION. FOR MORE INFORMATION, PLEASE CONTACT

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## PROJECT DESCRIPTION



In 1977 a pile supported concrete dock with three mooring/breasting dolphins was constructed in Tenakee Springs, Alaska to serve as a ferry terminal, freight dock and fuel dock. Upgrades constructed in 1985 and 2011 improved and expanded upon the facility's functionality as a ferry terminal by adding elements that better accommodated pedestrian and ATV access to Alaska Marine Highway System (AMHS) vessels at all tide levels. The State of Alaska Department of Transportation and Public Facilities (AKDOT) retained PND Engineers, Inc (PND) to design a replacement facility as the primary structure was over 40 years old, the overall facility was nearing the end of its service life, and in many ways was becoming a safety hazard for both the community and AMHS vessels.

The project included:

- Concrete deck replacement for the existing 12' x 216' approach dock
- 50' x 60' pile supported concrete decked main dock
- 50' x 70' pile supported concrete decked staging dock (modified via VE to be a rock fill pad)
- 13' x 100' multi-girder transfer bridge
- Salvaged components from the Gustavus Ferry Terminal that include:
  - 40' x 40' steel bridge support float
  - Intermediate ramp, apron, lift tower frames and hydraulic system
  - Bridge support float restraint dolphins and fender panels
- (3) - Mooring/Breasting dolphins
- 12' x 75' timber mooring float w/ salvaged, modified access gangway
- Steel pipe piles w/ rock sockets and tension anchors
- Utility building with office, and storage for supplies and spill response boom
- Fuel system upgrades – piping and safety controls
- Electrical power and lighting upgrades



## INNOVATION AND VALUE ENGINEERING

Innovation and value engineering went hand-in-hand as a team effort was needed to address project costs and risks associated with the shallow bedrock and underlying natural hot springs that exist at the project site.

PND worked closely with AKDOT and Western Marine Construction (WMC) to address particular concerns over installing piles in such close proximity to the community's hot spring fed bathhouse. Installing the piles as needed for the facility to meet current seismic load requirements posed a risk due to the need for drilling into the bedrock and underlying geothermal layer. Pile sockets and tension anchors were designed to be as shallow as possible, however concerns over the hot springs remained.

To specifically address these concerns, WMC provided a value engineering proposal to AKDOT to construct a rock fill pad for the staging area in lieu of a pile supported dock. PND evaluated the contractor's value engineering proposal and worked with the contractor and the state to incorporate the rock fill pad into the overall design. In addition to utilizing waste rock from Kensington Mine, the fill pad also provided a place to dispose of concrete demolished from the original dock and served as a temporary work pad from which a crane could easily access portions of the project that did not allow for crane barge access. By reducing construction time, and eliminating the risks and concerns associated with the hot springs, this solution ultimately saved the owner and contractor money and allowed the community to benefit further from the project.



In fact, cost savings from installing the rock fill pad led to WMC additionally proposing to relocate the utility building, originally located on the main dock, to a separate, timber pile supported dock. This increased usable space on the main dock for freight operations and allowed for a larger utility building that incorporated an office and storage for a spill response boom. The fast-track permit modifications required to allow these value engineering proposals to move forward and become reality necessitated team work, flexibility and perseverance.

PND also collaborated with the AKDOT to incorporate a salvaged bridge support float, an articulating intermediate ramp, lift tower frames and a complete hydraulic system from the Gustavus Ferry Terminal where the components had been removed as part of a separate project to perform modifications at that facility. PND performed a condition inspection of the Gustavus components to verify they were compatible and suitable for long-term use in the Tenakee project.