

MEMORANDUM

State of Alaska

Department of Transportation & Public Facilities
Division of Design & Engineering Services
Preconstruction Southcoast Region

TO: Mary Siroki
Deputy Commissioner

DATE: March 26, 2019

THRU: L. Pat Carroll, PE 
Preconstruction Engineer

PHONE NO: 907-465-4812

FROM: Kirk Miller, PE 
Design Group Chief

SUBJECT: Project No. SSHWY00232
Cascade Point ACF Ferry Terminal

The purpose of this memo is to summarize the findings of a conceptual design study concerning the construction and operation of a new ferry terminal to be utilized by the Alaska Class Ferry (ACF) located at Cascade Point in Berners Bay, Alaska.

Attached is a proposed site plan that shows a planning level concept design for the new ferry terminal and related upland access improvements. Also attached are preliminary planning level cost estimates for the ferry terminal and associated roadway improvements.

General

Cascade Point is sited approximately 30 road-miles north of the existing AMHS ferry terminal in Auke Bay. The existing highway to Besse Creek is a modern, paved roadway with 11 foot driving lanes and 4 foot shoulders (30 foot width). Beyond Besse Creek, the roadway is narrower (26 foot width) and has a chip seal surfacing over a gravel subbase. Beyond Besse Creek, the roadway is narrower (26 foot width) and has a chip seal surfacing over a gravel subbase. Existing traffic use from Besse Creek to Echo Cove is very low. The roadway from Echo Cove to Cascade Point sees even less use. This road system is primarily used for recreational purposes by the residents of Juneau to access the beach and small boat launch ramp facilities at Echo Cove. Echo Cove is also used by the Kensington Mine to transport workers by boat during the winter months. A popular summer camp located nearby also uses the Echo Cove beach front during the summer months. There are no docking facilities currently in Echo Cove.

The Department widened and upgraded the single lane gravel road from Echo Cove to the vicinity of Cascade Point (approximately 2.84 miles in length) to a two lane 26-foot wide gravel surfaced road in 2011. This section of road was chip sealed in 2013. A rough, narrow private access road extends from the end of this roadway to the beach at Cascade Point. The lands surrounding Cascade Point are owned by the Goldbelt Corporation. The Goldbelt Corporation has conducted numerous engineering and planning studies over the past 23 years to develop a small boat mooring and cargo related marine facility at Cascade Point – primarily to transport mine workers and cargo to the Kensington Mine which has been operating since 2010.

AMHS intends to deploy one of the new ACF vessels (MV Tazlina) in northern Lynn Canal starting spring of 2019. This vessel will currently operate out of the existing Auke Bay ferry terminal. The ACF was constructed as a day-boat and must complete its travel in under a 12-hour day per USCG regulations. There is insufficient time to conduct a round trip from Auke Bay to Haines and Skagway in less than 12-hours time. A new ferry

terminal at Cascade Point would eliminate about 30-miles of ferry boat travel time, reduce overall travel time and double daily capacity. The ACF vessel would overnight at Cascade Point. The premise of this study report contemplates that the Cascade ferry terminal facility will only be in service during the spring and summer months and the vessel will not be homeported at this location during the winter.

Highway Access

The existing highway from Auke Bay to Besse Creek (approximately 16-miles) is paved and is in relatively good condition. The roadway has 11 foot driving lanes and 4 foot shoulders for a total width of 30-feet. The roadway from Besse Creek to Cascade Point has a chip seal surface over gravel and is approximately 26-feet in width. This chip-sealed roadway has bumps, potholes, and narrow shoulders. The existing average daily traffic (ADT) on Glacier Highway near Echo Cove was measured to be 179 in 2017. An ADT count in 2014 from Echo Cove to Cascade was measured to be 66.

The ACF ferry is capable of carrying 53 standard vehicles. The increase in ADT would be likely increased by another 150-200 vehicles per day, including vehicles that would either pick up or drop off passengers or park at the new terminal and walk onto the ferry. Traffic to and from the Kensington mine may also increase since this location would likely be used by Goldbelt to provide marine transportation of workers to the Kensington Mine. A detailed analysis has not been performed but highway improvements are likely warranted considering the increased traffic that will occur including motor homes, container trucks and an assortment of trailered vehicles.

Several options are shown in the accompanying cost estimates for possible roadway improvements. Any combination of these options could be considered based on funding availability and perceived need. Only the minimum and the ultimate highway improvement cost options are further discussed below.

At minimum, the roadway segment from Besse Creek to Echo Cove (5.87 miles) could be repaired at localized areas where needed and resurfaced with a chip seal. This would be a relatively low cost improvement - approximately \$900,000. However the existing underlying subbase would not be stabilized. A chip seal is not a structural improvement and would eventually deteriorate under truck traffic and other increased traffic loads. Periodic maintenance costs would likely be incurred by the Department until the subgrade is stabilized.

The existing roadway from Besse Creek to Cascade Point (8.71 miles) could ultimately be widened and improved to wider width standards if Cascade Point is to be used as the primary means of access to the northern Lynn Canal ferry system as well as transport Kensington mine workers year round. The entire section of roadway should be upgraded to a 30-foot width (two 11-foot lanes plus 4-foot wide shoulders) and paved with hot mix asphalt pavement or a stabilized base with chip seal surfacing. The total cost for reconstruction (widening) and enhanced surface course treatment from Besse Creek to Cascade Point is on the order of \$16 million.

Marine

The attached conceptual site plan shows a single, end loading ferry berth and associated upland access, vehicle staging, parking and other features. The total project cost for this facility (including the access roadway and associated upland improvements) is on the order of \$27 million. The concept plan includes accommodation of other marine uses (Kensington Mine boat shuttle) by Goldbelt. The ferry terminal related cost estimate does not include any Goldbelt related marine structures, floats or the ancillary access road to the Goldbelt small boat mooring facility – nor the highway improvement options discussed previously.

This site is located in an exposed and unprotected location from wind and waves. It is exposed to severe wave conditions – especially from northerly storms during the winter months. This plan reflects a rubble mound breakwater structure that also serves as upland access to the marine berthing facility. A sheet pile wave barrier structure is also noted on the plan but is not included in the cost estimate summary. The wave barrier structure is probably not needed if this facility is operated as a summer only ferry service. However, if the vessel is to be homeported at this location in late fall or winter, then the wave barrier structure or other wave protection mitigation would be needed to safely moor the ferry vessel.

The site is located on a beach front that has deep offshore bathymetry. A large, dredged mooring basin is contemplated to keep the facility in manageable water depths for installation of the various structures and to minimize exposure of the berth to the weather.

The marine improvements presently contemplate a lift bridge system (similar to Haines, Wrangell and Whittier). This transfer bridge would be elevated above the water levels which eliminates the need for a bridge support float. A lift bridge system would minimize maintenance and concerns during inclement weather. Mooring structures currently contemplate fixed fender structures. Line handling through the tidal cycles can be accomplished with the use of long mooring lines but some line tending may be needed during the night to adjust for the tidal cycles.

Uplands

Upland access and amenities include vehicle staging and parking areas for one vessel. A pit style, public use toilet system is reflected in the cost estimate. The staging and parking areas are a relatively long distance from the vessel. Pedestrian access from the parking area to the vessel should be supplemented with a passenger van and baggage carts considering the walking distance.

Homeport Considerations

There is no potable water, sewage disposal or electric power utilities at this location. The accompanying cost estimate does not contemplate providing potable water or sewage disposal utilities at this location. For cost and other reasons, it is assumed that the ACF vessel would discharge sewage and take on water periodically in Auke Bay or Skagway (pending further improvements). Skagway currently has potable water and fuel capability but no sewage disposal facilities. Haines does not have potable water or sewage disposal capability. This would incur crew-time out of the 12-hour operational day allotted for the ACF or would require intermittent vessel trips to Auke Bay, say once or twice a week depending on need.

A public water system could potentially be considered but it would need to be treated, maintained and tested. The ferry vessel can hold 18,000 gallons of water for an estimated endurance of 7-days. A small system for public use would be relatively easy to provide. However, supplying potable water to re-supply the vessel could be problematic. It is unknown whether a groundwater (well based) system would prove sufficient or if other means such as rain or creek water collection systems or water brought from Juneau by tanker truck would be needed.

Electric power for upland and ferry terminal operation and lighting is needed. This would be provided by an on-site generator and associated fuel storage. Shore-tie electric power can also be provided to the vessel, but the electrical power generation system would be required to operate during the night. If overnight vessel power is

provided by on-board ship systems, then the uplands generator would only be used as needed to operate the lift bridge motors, hydraulic systems and provide upland lighting during early morning or evening hours. A typical generator would have a fuel consumption rate of approximately 4-gallons per hour or about 50-gallons per 12-hour layover.

The ACF vessel has a 17,000 gallon on-board sewage holding tank. The estimated time before requiring off-load is 7-days. Sewage disposal for volumes of this magnitude could be problematic at this site considering the remote location of this terminal. A holding tank could be provided on shore. AMHS would then need to haul the sewage by truck from Cascade to Juneau every 3-7 days (depending on sewage volumes and how many tanker truck trips) for disposal, similar to what now occurs at Auke Bay. A typical sewage tanker truck has a capacity of about 3,000 gallons. An on-site sewage disposal system (marine outfall or in-ground leach field system) might be feasible but secondary treatment devices would be needed and those require electrical service 24-hours per day resulting in continuous generator use. Marine outfall disposal of treated effluent should be avoided due to environmental and permit monitoring requirements. The Department is currently in the process of eliminating several marine outfall disposal systems for the ferry terminal buildings in Auke Bay, Haines and Skagway due to ongoing permit violations and maintenance considerations.

Vessel fueling is another consideration. The vessel holds 38,500 gallons of fuel for an estimated maximum endurance of 14-days. Tanker trucks from Juneau based fuel companies are certainly feasible and can be done while the ferry overnights in port at Cascade Point. Otherwise, the vessel would need to refuel in Auke Bay or Skagway. On-site bulk fuel storage for the vessel was not included as part of the accompanying cost estimates.

Vessel handling and tie-up needs further consideration. The berthing structures shown on the attached site plan contemplates fixed mooring structures accessed from shore by catwalks. Shore-based line handling would be easiest but the mooring lines to these structures can be potentially accessed by ship-based personnel if shore based line handling is not provided. Additional discussions with AMHS vessel operations staff are needed to confirm line handling details.

Project Development

Goldbelt Corporation has conducted numerous engineering studies and developed plans for a small boat mooring basin at this location. That project was advertised and bid for construction in 2013 but it was not constructed as a result of lack of funding from the Kensington Mine. The as-bid cost of that project was about \$6 million. Those development plans included engineering information that can be salvaged and used on this project. However, additional offshore geotechnical exploration and other engineering work is needed to confirm the feasibility of the attached ferry terminal concept. The new marine structures would be designed based on existing Department prototypes.

There are significant environmental concerns in Berners Bay including an abundance of marine mammals, herring and hooligan (eulachon or candlefish) spawning in the spring and other marine wildlife. This site was not studied in detail as part of the Juneau Access federal project but a relatively nearby location (Sawmill Cove) was included as an alternative in the EIS. Correspondence from US Army Corps of Engineers, US Fish & Wildlife Service and the Environmental Protection Agency during the Juneau Access Improvement Project EIS process indicated that they favored construction of a state ferry terminal at Cascade Point instead of Sawmill Cove. The reasons included minimization of impacts to aquatic resources, lower overall environmental impacts, reducing ferry travel distance and round-trip time, and co-location with an already permitted project. Goldbelt originally secured a Corps of Engineers permit for their previous development plan in 2005 and it has been modified

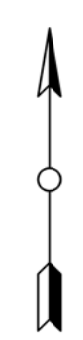
several times and kept current. However, the activities and scope of work proposed for this endeavor are different than the previously contemplated Goldbelt plan. The various environmental regulatory agencies will need to be consulted and the existing permits modified or new permits would need to be secured. An incidental harassment authorization (IHA) permit for potential marine mammal disturbance is also expected to be needed to allow dredging and pile driving. However, the existing Goldbelt permit is notably absent any significant restrictions for marine mammal protection other than timing windows (no in-water work from March 15-June 30). This is somewhat unusual even in consideration of the date of the existing permit. The existing permit conditions further includes the requirement to construct a herring spawning reef at the toe of the rubble mound breakwater.

Rights of Way (ROW) is another consideration that will need to be resolved for the marine facility and the access road extending from the Cascade roadway. The existing property is owned by the Goldbelt Corporation. The Department will need to secure appropriate long term property rights in order to construct and operate this facility. Cost sharing and operational agreements for the access road or other features may also be appropriate considering the intention of future Goldbelt use at this site.

Engineering design and environmental work will take 12-months or longer to facilitate this project. A two year construction season may be needed considering timing windows for marine mammal wildlife and fish permitting issues. At minimum, it would take a time period of two years to design, permit and construct this project from the date of notice to initiate this project. A longer time period is possible as a result of potential delays that could be encountered during design or construction activities.

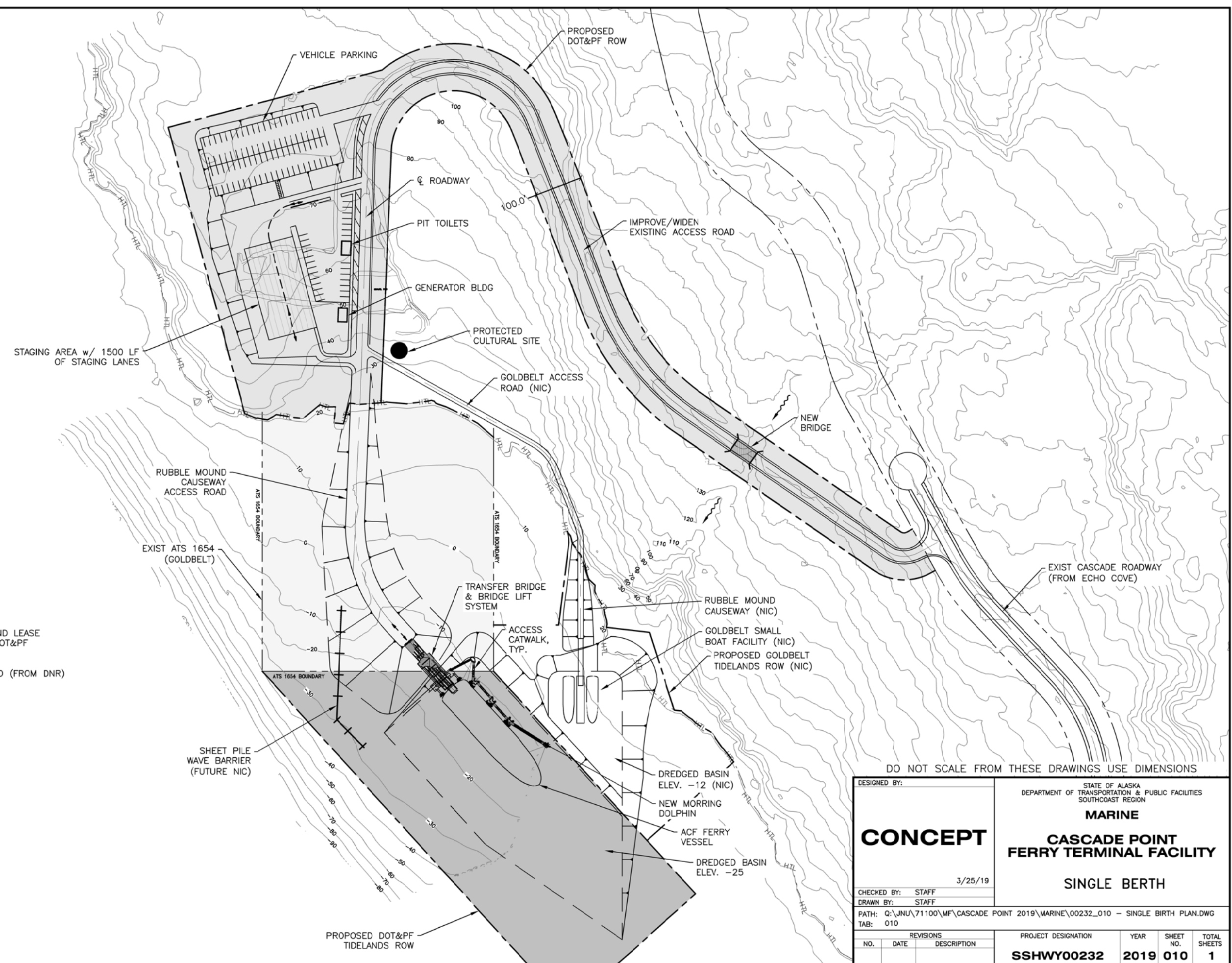
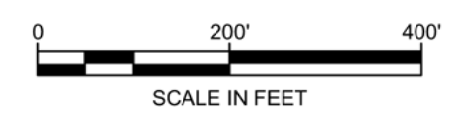
Attachments: Concept Ferry Terminal Plan
Cost Estimates

cc: D. Lance Mearig, PE, Regional Director



BERNERS BAY

- ROW LEGEND
- PROPOSED UPLAND ROW
10.0 ACRES
 - EXISTING GOLDBELT TIDELAND LEASE
TO BE TRANSFERRED TO DOT&PF
6.25 ACRES
 - NEW TIDELAND LEASE REQ'D (FROM DNR)
6.73 ACRES



DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS

DESIGNED BY:		STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHCOST REGION			
CONCEPT		MARINE			
		CASCADE POINT FERRY TERMINAL FACILITY			
3/25/19		SINGLE BERTH			
CHECKED BY: STAFF					
DRAWN BY: STAFF					
PATH: Q:\JNU\71100\MF\CASCADE POINT 2019\MARINE\00232_010 - SINGLE BIRTH PLAN.DWG					
TAB: 010					
REVISIONS		PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
NO.	DATE	DESCRIPTION			
		SSHUY00232	2019	010	1

SC Region - Marine Engineering

Project Cost Estimate

PROJECT NUMBER: SSHWY00232

PROJECT TITLE: Cascade Point Ferry Terminal

DESCRIPTION: Cascade Point - Single Berth

Date: 3/22/2019

Item No.	Item	Units	Unit Price	Quantity	Amount
1	General				
	Mobilization/Demobilization	LS	\$800,000	1	\$800,000
	Temporary Erosion and Pollution Control	CS	\$250,000	1	\$250,000
	Construction Surveying	LS	\$100,000	1	\$100,000
	Field Offices	LS	\$75,000	1	\$75,000
2	Dredged Mooring Basin				
	Dredged Mooring Basin (Includes placement as upland fill or disposal)	CY	\$35	52,000	\$1,820,000
3	Marine Facilities				
	Pile Supported Bridge Approach Abutment	EA	\$80,000	1	\$80,000
	Sheet Pile Wave Barrier Structure	LF	\$40,000	500	
	20'x142' Steel Transfer Bridge	EA	\$900,000	1	\$900,000
	50'x80' Steel Bridge Float (or Lift Bridge System) (w/ Intermediate Ramp, Apron & Fenders)	EA	\$1,600,000	1	\$1,600,000
	4-Pile Stern Dolphin Structures	EA	\$650,000	2	\$1,300,000
	4-Pile Breasting Dolphins	EA	\$650,000	3	\$1,950,000
	3-Pile Mooring Dolphins	EA	\$500,000	2	\$1,000,000
	Steel Access Catwalks	EA	\$65,000	5	\$325,000
	Electrical Power and Lighting System (Terminal)	LS	\$400,000	1	\$400,000
3	Upland Improvements (Access/Staging Area)				
	Access Road Improvements (Widen/Reconstruct/Chip Seal)	LF	\$500	1,600	\$800,000
	Cascade Creek Bridge - 50' Length	EA	\$800,000	1	\$800,000
	Staging/Parking Areas Excavation	CY	\$20	36,200	\$724,000
	Causeway Embankment (Local Excavation + Import)	CY	\$15	77,000	\$1,155,000
	Riprap Slope Protection	CY	\$70	15,000	\$1,050,000
	12" Aggregate Surface Course (Approx 3.62 acres uplands)	CY	\$25	5,840	\$146,007
	Asphalt Concrete Surfacing or Stabilized Base/Chip Seal (Approx 3.62 acres uplands + Access Road)	Ton	\$200	2,437	\$487,403
	Metal Beam Guardrail	LF	\$55	1,120	\$61,600
	Painted Traffic Markings	LS	\$45,000	1	\$45,000
	Potable Water Supply (Well & Piping)	LS	\$200,000	4	
	Sanitary Sewer for Bldg (Pkg Treatment Plant/Outfall/Leach Field or Holding Tank)	LS	\$650,000	4	
	Diesel Generator System, Bldg & Fuel Storage Tank	LS	\$600,000	1	\$600,000
	Electrical Power Supply & Area Lighting System	LS	\$650,000	1	\$650,000
5	Building Structures				
	Utility / Restroom Building (46'x32')	SF	\$500	542.00	
	Pit Toilet Public Restroom Facility	LS	\$80,000	1	\$80,000

Marine Structures = \$7,555,000

Upland / Access = \$5,269,010

Utilities = \$1,250,000

Item Totals \$17,119,010
Estimating & Construction Contingencies @ 15% \$2,567,852

Construction Subtotal \$19,686,862

10% Design & Permitting \$1,968,686
20% Construction Engineering \$3,937,372

5.7% ICAP \$1,458,796.45

Project Total = \$27,051,717

Prepared by: KDM
Checked by: KDM

Date: 03/22/19
Date:

SC Region - Marine Engineering

Project Cost Estimate

PROJECT NUMBER: SSHWY00232

PROJECT TITLE: Cascade Point Ferry Terminal Highway Improvements

DESCRIPTION: Resurface / Reconstruct Existing Highway Besse Creek to Cascade Point

Date: 3/22/2019

Option	Item	Length (miles)	Width (ft)	Surface Area	Units	Unit Price	Amount
A1	Chip Seal Besse Creek to Echo (no stabilized subbase / no widening) 26' Wide Chip Seal no Stabilized Base	5.87	26.00	806,000	SF	\$0.80	644,800

Item Totals \$644,800
Estimating & Construction Contingencies @ 10% \$64,480
Construction Subtotal \$709,280
10% Design & Permitting \$70,928
10% Construction Engineering \$64,480
5.7% ICAP \$48,147
Project Total = \$892,835

Option	Item	Length (miles)	Width (ft)	Surface Area	Units	Unit Price	Amount
A2	Chip Seal Echo to Cascade (no stabilized subbase / no widening) 26' Wide Chip Seal no Stabilized Base	2.84	26.00	390,000	SF	\$0.80	312,000

Item Totals \$312,000
Estimating & Construction Contingencies @ 10% \$31,200
Construction Subtotal \$343,200
10% Design & Permitting \$34,320
10% Construction Engineering \$31,200
5.7% ICAP \$23,297
Project Total = \$432,017

Option	Item	Length (miles)	Width (ft)	Surface Area	Units	Unit Price	Amount
B1	Stabilized Base + Chip Seal Besse Creek to Echo (no widening) 26' Wide Stabilized Base w/ Chip Seal Surfacing	5.87	26.00	806,000	SF	\$4.25	3,425,500

Item Totals \$3,425,500
Estimating & Construction Contingencies @ 10% \$342,550
Construction Subtotal \$3,768,050
10% Design & Permitting \$376,805
15% Construction Engineering \$565,208
5.7% ICAP \$268,473.56
Project Total = \$4,978,536

Option	Item	Length (miles)	Width (ft)	Surface Area	Units	Unit Price	Amount
B2	Stabilized Base + Chip Seal Echo to Cascade (no widening) 26' Wide Stabilized Base w/ Chip Seal Surfacing	2.84	26.00	390,000	SF	\$4.25	1,657,500

Item Totals \$1,657,500
Estimating & Construction Contingencies @ 10% \$165,750
Construction Subtotal \$1,823,250
10% Design & Permitting \$182,325
15% Construction Engineering \$273,488
5.7% ICAP \$129,906.56
Project Total = \$2,408,969

Option	Item	Length (miles)	Width (ft)	Surface Area	Units	Unit Price	Amount
C	Reconstruct Besse Creek to Echo Cove - 30' width 30' width w/ stabilized subbase/chip seal or AC pavement	5.87	30.00	930,000	SF	\$7.00	6,510,000

Item Totals \$6,510,000
Estimating & Construction Contingencies @ 15% \$976,500
Construction Subtotal \$7,486,500
15% Design & Permitting \$1,122,975
20% Construction Engineering \$1,497,300
5.7% ICAP \$576,086.18
Project Total = \$10,682,861

Option	Item	Length (miles)	Width (ft)	Surface Area	Units	Unit Price	Quantity
D	Reconstruct Echo Cove to Cascade Point - 30' width 30' width w/ stabilized subbase/chip seal or AC pavement	2.84	30.00	450,000	SF	\$7.00	3,150,000

Item Totals \$3,150,000
Estimating & Construction Contingencies @ 15% \$472,500
Construction Subtotal \$3,622,500
20% Design & Permitting \$724,500
20% Construction Engineering \$724,500
5.7% ICAP \$289,075.50
Project Total = \$5,360,576