APPENDIX C

PERFORMANCE CRITERIA

The following criterion are presented as the minimum requirements for the Passenger Terminal development.

CODES AND REFERENCES

The following codes and guideline references are acceptable, where applicable, to the type of facility and operations proposed.

Design Standards:

AISC Steel Construction Manual
American Concrete Institute ACI 318
ANSI/BICSI 007-2020 Information Communication Technology Design and Implementation Practices for Intelligent Buildings and Premises?
ASCE/SEI 7-16 Minimum Design Loads and Associated Criteria for Buildings and Other Structures
ASCE 61-14, Seismic Design of Piers and Wharves
AWS D1.1 Structural Welding Code
City of Seward Building Code Requirements
International Building Code
NACE SP0176 Corrosion Protection of Offshore Structures
NCHRP Report 611; Seismic Analysis and Design of Retaining Walls
NFPA 303 and 14
PIANC Guidelines for the Design of Fender Systems
UFC 4-159-03 Design: Moorings
UFC 4-152-01 Design: Piers and Wharves
USACE EM 1110-2-2906 Design of Pile Foundations
USACE EM 1110-2-2504 Design of Sheet Pile Walls

Other industry accepted engineering standards/guidelines from recognized entities may be acceptable, as approved by ARRC.

United States Army Corp of Engineers Engineering Manuals Facilities Code (USACE EM)

United States Department of Defence Uniform Facilities Code (UFC)

World Association for Waterborne Transport Infrastructure (PIANC)

American Association of State Highway and Transportation Officials (AASHTO)

American Concrete Institute (ACI)

American Institute of Steel Construction (AISC)

American Society of Civil Engineers (ASCE)

American Welding Society (AWS)

National Fire Protection Association (NFPA)

National Electric Code (NEC)

Alaska Administrative Code Drinking Water Regulations (18 AAC 80)

GENERAL REQUIREMENTS

The new passenger terminal dock will be 1,200 feet long by 120 feet wide, in the footprint of the existing dock, and aligned approximately along the western edge of the existing pier. The top of the deck shall be elevation approximately +24.0 MLLW. Dredging shall be required at both sides to elevation -37.0 feet MLLW.

The project shall include paved surface, bullrails, fenders, mooring bollards, lighting, fencing and security cameras, wireless access points, data connections and other communications or data devices, potable water and fire suppression utilities, a cathodic protection system, dredging, shore protection at the abutment, and other general appurtenances common to passenger and cargo docks.

The layout and configuration of the facility is shown in the concept plans. Contractors may deviate slightly from the concept plans to the extent required to facilitate specific structural systems and details as long as the functionality of the facility is maintained.

DOCK OPERATIONS AND MAINTENANCE

The dock will be designed to accommodate large cruise ships and cargo operations from either side. Design shall include consideration for:

- Redundancy in elements. Failure of one element does not result in progressive failure.
- Resiliency in design. Including to recover from natural disasters. Easily replaceable units.
- Drainage and Snow Removal.
- Equipment and Vehicles. Provide for current and future terminal.
- Low maintenance, including the Cathodic Protection system elements.
- Minimize complex systems which might require special training and qualifications.
- Positive Passenger Experience. Public will be using the dock and it will be the first the Alaskan experience for many.

PLANNING DOCUMENTS

A number of planning documents will be required during design development including a demolition plan, a phasing plan, a permitting and environmental compliance plan, a geotechnical plan, and a corrosion mitigation plan. These are more fully described below:

A **demolition plan** shall include the following as a minimum:

- A plan to demolish the existing building including means to deal with potentially hazardous material.
- A plan to demolish the existing dock including means to deal with potentially hazardous material
- A demolition material disposal plan that includes details of the use of the local disposal areas, local land fill including constraints and capacities, off-site disposal areas, and means to deal with potentially hazardous materials.
- Phasing and coordination of demolition with the operational requirements of the ARRC and with the construction schedule.

A **phasing plan** shall include the following as a minimum:

- Demolition and removal of the existing dock and terminal building shall be coordinated with ARRC operations.
- Phased construction of the new facility.

- At least one berth capable of supporting cruise ship operations shall remain operational during the tourist seasons (May 1 through September 30). This shall include both a means to moor the design cruise vessel and to embark and disembark passengers and get them safely and efficiently to the uplands for ground transportation.
- Operations on the freight dock will continue throughout construction

A **permitting and environmental compliance plan.** The project must comply with all local, state, and federal environmental compliance regulations. The following permits, concurrences, and or authorizations may be required depending on final design. The plan shall include the following as a minimum:

- USACE Section 404/10 Permit
    - Required for all in-water work including dredging, fill placement, pile installation/removal, demolition, etc.
    - Changes to the proposed design would require additional coordination with the USACE and possible resubmittal of the permit modification request.
    - The status of Endangered Species Act (ESA) consultation in support of the USACE permit is unknown. Marine Mammal/Protected Species Observers will be needed to comply with ESA consultation outcomes and the Marine Mammal Protection Act (MMPA). See below for additional details.
    - Proposed dredging activities will likely need to be characterized before the USACE approves dredging and disposal of sediment/material. USACE typically relies on the Dredged Material Evaluation and Disposal Procedures User Manual (Seattle District, July 2021) to outline sampling and analysis requirements. Sediment characterization would require development of a Sampling and Analysis Plan (SAP), field sampling (chemical and/or biological), and preparing a summary report of findings.
- Disposal Planning
    - Dredged material: Need to include disposal plans with SAP and USACE permit application if material is proposed for offshore disposal. If upland disposal is planned, coordination with the Alaska Department of Environmental Conservation (ADEC) will be required.
    - Demolition of existing building: Need to determine if hazardous building materials are present and develop an appropriate demolition plan. Asbestos containing materials and/or other hazardous materials will need to be disposed of by a qualified contractor in accordance with local, state, and federal regulations. Approval from the local (or designated receiving) landfill is recommended to ensure project generated non-hazardous construction and demolition debris can be accepted.
- Incidental Harassment Authorization (IHA)
    - If impacts to marine mammals associated with in water work cannot be avoided, an IHA must be obtained for the project. The status of this application process is unknown. This permitting process typically takes 12 months to complete and would include mitigation measures to reduce impacts to marine mammals (MMO/PSOs, shut down protocols, seasonal/daily construction limits, etc.)
- Alaska Department of Fish and Game (ADF&G)

  - Given the proximity to the Resurrection River, coordination with ADF&G is recommended to ensure no adverse impacts to fish passage or habitat.
- ADEC Engineering Plan Review
  - Water line extensions/improvements need to be submitted to ADEC for review. Upon their review, Approval to Construct would be issued followed by Approval to Operate once construction is complete.
- City of Seward Floodplain Permit
  - The project is located within/adjacent to a designated flood hazard area (FEMA FIRM#02122C5006E eff. 10/20/2016). A floodplain permit would be required from the City of Seward for any work including fill and dredging within a designated flood hazard area.
- City of Seward building code and fire protection review

A **geotechnical engineering plan** shall include the following as a minimum:

- A listing and summary of existing geotechnical information relied on for the design.
- A project specific geotechnical exploration plan or statement that it is not required.
- A summary of the design parameters for the new bulkhead dock including operational and seismic parameters and loading.
- A description of construction of the bulkhead dock including phased construction and filling.
- A description of the design soil pressures including normal operational, design vehicle, equipment, and cargo surcharges, and seismic.
- A settlement analysis including potential effects on the structure, buried utilities, and tie rods.
- A compaction plan for both the existing underlying soils and the new fill.

A **corrosion mitigation plan** shall include the following as a minimum:

- A general outline to include the strategy and use of corrosion resistant materials, coatings, and cathodic protection designed to achieve the project design life.
- Coatings and a coating plan for all steel items.
- Sacrificial or impressed current cathodic protection of submerged portions of the dock.
- Coatings and or materials to resist corrosion in buried utilities and tie rods.
- Sacrificial cathodic protection of tie rods and buried utilities.
- Corrosion mitigation for concrete items including consideration of coated or galvanized rebar, depth of cover, and corrosion resistant mixtures.

ENGINEER OF RECORD

Detailed engineering and design shall be the responsibility of the Contractor. The Contractor shall provide engineers registered in the State of Alaska. The final plans must be signed and sealed by registered engineers. At a minimum the project will include: water-front structural engineering, civil/utility engineering, geotechnical engineering, electrical engineering, and corrosion engineering.

BASIS OF DESIGN

The Designer shall provide a Basis of Design document (BOD) that describes the design criteria and performance expectations.

The BOD document shall include the engineer's expected regular and periodic maintenance and upgrades needed in order to ensure the required design service life is met. For example, it is reasonable to assume that the original cathodic protection system, fendering system, and utilities will not be initially constructed for a 50-yr life but will require periodic replacement or upgrades. These periodic upgrades shall be identified for ARRC programming.

METEOROLOGICAL AND OCEANOGRAPHIC DATA

Environmental loads shall be developed based on local conditions, applicable codes and the Developer's performance and design criteria.

Tides:

NOAA Reported Tidal Statistics and Water Levels	**Elevation (feet, MLLW)**
Highest Observed Water Level (01/01/1987)	15.7
Mean Higher High Water	10.6
Mean High Water	9.7
Mean Sea Level	5.6
Mean Low Water	1.4
Mean Lower Low Water Lowest Observed Water Level (12/14/2008)	0.0
Lowest Observed Water Level (12/14/2008)	-5.0

Wind:
For the design of buildings and other fixed structures the ASCE 7-22 3 second gust will be used**.**

- ASCE 7-22 3-Sec Peak Wind Gust = 160 MPH
- Risk Category II

For the design of mooring and berthing large vessels UFC 4-159-03 Type 1 mild weather mooring will be used

- Sustained winds of 35 knots or less
- Operational procedures will be implemented for the vessels to leave the berth during any wind event of forecast that exceeds these conditions.

Wave Loads:
Provide 50-yr return design waves and incorporate the wave loading into the design of the structure.

Tidal Current Loads:
Consider a nominal 1 knot tidal current speed and vessel load in the berthing and mooring analysis.

Snow: 60 psf

DATUM

- Horizontal Datum: NAD 83 SPC Alaska Zone 1, US Survey Feet (Modified Ground System) with a conversion to local project coordinates.
- Vertical Datum: Mean Lower Low Water (MLLW) = 0.0 feet.

VESSELS

The design shall accommodate two large cruise ship vessel concurrently, one on each side.

Design Vessel* (Large Cruise Ship) *to be confirmed prior to design:

- Length Overall (LOA) = 1150 ft.
- Beam (max) = 160 ft.
- Displacement = 100,000 metric tons (To be confirmed)
- Draft = 30 ft.

Existing Dock Design Vessel:

- LOA 656 ft.
- Beam 106 ft.
- Displacement 44,000 tons

Small Ship: = 80 ft. LOA

Mooring and Berthing of Vessels: Provide a mooring and berthing analysis for review and approval based on the previously described environmental loads and on the following parameters.

Fenders: Provide fenders at approximately 50 feet on both sides of the dock. Provide a berthing analysis for the design vessel with the following parameters. Fender energy units will be designed to accommodate the design vessel. Each fender shall have a steel box panel with UHMW facing and tapered edges. The top of each panel shall be near the deck level of the dock. The bottom of each fender panel shall be no lower than MLLW elevation 0.0.

- Large Ship Approach velocity when berthing: 0.50 ft./sec (PIANC 4.2.1 Moderate Conditions)
- Large Ship Approach angle when berthing: 6 degrees
- Moderate berthing conditions exposed
- Abnormal Berthing Factor = 2.0
- Fenders shall be designed for a service life of 25 years.
- Provisions for berthing and mooring of small ships required.

Mooring Bollards:

Provide bollards at approximately 50 feet on-center on both sides of the dock. It is acceptable to provide two differing bollard capacities; one for large vessels and one for moderate or small vessels. Provide a non-linear mooring analysis of the design vessel with the following parameters.

- Large vessel wind load at berth with a minimum of 12 mooring lines.
- Provide a recommended large vessel berthing arrangement and line loads.

- Large vessel bollards shall be minimum 200 metric ton capacity (440 kip). The rated capacity will apply 0 to 60 degrees relative to the horizon and 0 to 180 degrees relative to the face of the dock.
- Moderate or small vessel bollards of 80 metric ton capacity shall be provided at all other places. The rated capacity will apply 0 to 60 degrees relative to the horizon and 0 to 180 degrees relative to the face of the dock.

CARGO AND VEHICLE LOADS

Uniform Distributed Deck Loading = 600 psf

Truck Load = AASHTO HL93

Loading/Unloading equipment = 30 Ton Container Lift Capacity Forklift Fully Loaded.

Cranes:

The dock shall be capable of supporting industrial cargo cranes. It is acceptable to provide for crane loading in established locations or platforms as shown in the concept plans.

- Manitowoc 4000 fully loaded
- Grove 700E fully loaded

SEISMIC

The designer will propose an appropriate seismic design methodology for approval. This shall be specific to bulkhead docks. At a minimum the design methodology will include:

- Seismic design accelerations and return periods.
- Performance including anticipated permanent displacements at the design level event.
- A seismic stability analysis
- A liquefaction analysis and means to improve existing liquefiable soils, or address life safety requirements of the dock.

DESIGN LIFE

- 50-year with maintenance

CORROSION PROTECTION

Corrosion protection will be required for the steel and concrete elements of the structure as well as utilities. The corrosion protection will include the strategic use of materials, coatings, and cathodic protection. It will include means to reduce corrosion on steel piling, concrete elements, concrete reinforcing, fenders, bollards, tie-rods, tie rod connections, steel piping, various utilities and appurtenances, fasteners and fittings.

- A cathodic protection system will be required to control corrosion on the sheet pile structure.
- A cathodic protection system will be required to control corrosion on the tie rods and fittings.
- Cathodic protection system design will be based on theoretical calculations that include the following parameters:

    a. Estimated surface area of metals exposed to water and soil;
    b. Cathodic protection current density, depending on water or soil exposure condition;

c. Estimated current output per anode;
d. Estimated total number of anodes, size, and spacing;
e. Minimum anode life of 20 years for anodes installed in water and 25 years for anodes installed in soil

UTILITIES

Potable Water

Fire Protection System

Electric (for dock operations),

Shore Power – provisions for future installation including vaults.

Lighting – high mast for winter operations

Communications Systems – provisions for installation

Fuel - provisions for future on dock fuelling from the existing fuel vault

SALVAGED MATERIAL

ARRC will require maintain ownership of some of the items in the terminal including:

1. Contents of terminal building offices
2. Art work
3. Network equipment, phones, misc. communication equipment, computers and associated equipment, and servers. ARRC IT will need to be involved integrated.
4. Security cameras from all locations.
5. Fenders and Fender Panels
6. Light Poles

Some of this will be removed by ARRC and terminal operators. A full list of materials to be salvaged for ARRC will be provided prior to demolition. All materials not included for ARRC salvage shall become property of the Contractor and be removed from the terminal, unless integrated into the new facility.

SAFETY

Ladders @ 400 ft. Minimum of 3 each side and one on the end.

Life Rings @ 150 ft.

Fire Extinguishers @150 ft.

Automated External Defibrillator (AED) cabinet

SECURITY AND COMMUNICATIONS

The Passenger Terminal shall be designed in such a way that it will comply with all applicable security and safety regulations, including, but not limited to, applicable provisions of Title 33 of the Code of Federal Regulations (Navigation and Navigable Waters).

Unless otherwise agreed, ARRC will provide for design of an “in-kind” system consisting of cameras, communication devices, perimeter fencing, barriers, signs, illumination, safety systems for fuelling processes, contract security services as well as card access control on the Passenger Terminal doors and gates.

Contractor’s work force shall be required to comply with ARRC and FCR security protocol when working in an operating terminal.