Appendix F

1. Performance Requirements

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ACRONYMS AND ABBREVIATIONS

APA	American Plywood Association
BOD	Basis of Design
DL	Dead Load
ELW	Extreme Low Water
EHW	Extreme High Water
GPM	Gallons Per Minute
HDPE	High Density Polyethylene
IFC	Issued for Construction
KSI	Kilopound per Square inch
lb(s)	pound(s)
lbs/cy	pound per cubic yard
lbs/lf	pounds per linear foot
LL	Live Load
Mil	a unit of length equal to 0.001 of an inch (0.0254 millimeters)
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NETA	International Electrical Testing Association, Inc.
O&M	operations and maintenance
PSF	pounds per square foot
Psi	pounds per square inch
RFP	Request for Proposals
SS	Stainless Steel
UHMW	ultra-high molecular weight
UHMW-PE	ultra-high molecular weight polyethylene
USCG	United States Coast Guard
UTV	Utility Vehicle
UV	ultra-violet
VWL	Vehicle Wheel Loads

LIST OF APPENDICES

TABLES

1 SCOPE OF WORK

This Work of rebuilding of the South Harbor includes these performance requirements to provide a fully functional public harbor facilities with a service life of at least 50 years. The Work includes all labor, materials, tools, and equipment for fabrication, transport, delivery, and installation of floating docks, drive down float and Transfer Bridge, aluminum pedestrian gangways, power, lighting, potable water, fire suppression, sewer utilities, and safety equipment and all other appurtenances and hardware as stated in the Request for Proposals (RFP) and as shown in the Conceptual Drawings.

As a part of the City of Cordova's South Harbor rebuild, the Design-Builder will need to address these following performance requirements as the project progresses from design to completion. The performance requirements include all labor, materials, tools, and equipment for engineering, design and construction, incorporating mandatory design features, design criteria on the Conceptual Drawings under this RFP and other Contract Documents. All final engineering and design shall be performed by qualified Engineers, provided by the Design-Builder, and registered in the State of Alaska.

These performance requirements are provided to define the expectations of the City as to the materials, construction, quality, and functionality of a rebuilt South Harbor. The Design-Builder will be expected to meet or exceed these requirements; and to document their achievement of these requirements, which are consider necessary to meet long term needs of the Cordova based fishing fleet and the users of the rebuilt South Harbor. Design-Builder's proposals must address the approach they will employ to comply these performance requirements.

Construction methods and products not specifically mentioned shall utilize reasonable care and the highest quality construction practices and industry standards in Alaska. Final inspection and acceptance of all work and products will be made by the City. Approval will be based upon conformance to the Contract Documents, quality of workmanship, applicable industry standards, and pertinent fabricator's recommendations.

Construction surveying will be required by the Design-Builder to provide Vertical and Horizontal Control. All construction survey shall be performed by, or under the direct supervision, of a surveyor licensed in Alaska.

Design-Builder assumes full responsibility for any damages or losses resulting from the handling or transporting of all components during loading, shipping, transport, and delivery to/from the fabrication and/or project site, and the subsequent handling required on site for installation and until final acceptance. Any components damaged during transport and delivery and/or during any other handling operations before final acceptance shall be repaired or replaced by the Design-Builder at the discretion of the Engineer and at no additional cost to the Owner.

1.1 Service Life and Maintenance

The design service life of the new harbor facilities and utilities will be 50 years. The City expects realistic operations and maintenance (O&M) expectations for a typical 50-year service life on these facilities. A typical facility's performance level changes over time (i.e., meets or exceeds the design live loads and environmental loads, etc. at the newly installed, optimum performance level). The harbor facilities are

expected to continue to deliver near-optimum performance—barring accidents/catastrophe and with proper use and normal O&M—at a fairly steady level for many years. But there inevitably begins a slow decline in performance due to wear, aging, and functional change. Eventually, performance falls to a level that users judge to be the minimum acceptable, at which time the Owners will take action to renovate and/or plan for replacing the facilities. The design service life is the time required for performance deterioration to reach this minimum acceptable level. Design decisions and Owners' investment decisions typically are based on an assumption that adequate performance can be delivered for the 50-year service life. Rarely, however, does this period elapse without some periodic renewal or refurbishment or replacement. The City expects to replace bullrails and decking or anodes, for example—that increase performance during the service period and can effectively extend the service life beyond the 50 years.

Normal maintenance includes regular inspections (at least annual above water and 5 years below water) and associated repairs, prompt repair of damage from vessel impacts or other incidents, routine/annual repair of damaged decking, bullrails, and utilities, etc.

The following table lists some of the periodic major maintenance/renewal projects that are expected by the City for the float system, to help maintain high performance and extend the service life of the facility. The Proposer shall include all expected O&M for their Proposed Design floats and other facilities and equipment in the Proposal.

Table 1 Maintenance and Renewal Projects

Component	**Renewal Period (Every X Years)**
Detailed above/underwater inspection and routine maintenance	5
Underwater power-wash/clean marine growth	10
Timber Decking (if any), Rubboards & Bullrails	30
Anodes	20
LED light fixtures	5
Heat Trace (service lines on gangway, fire and water risers)	10-15
Flex hose flanges, Hose bibs & fire valve handles	5-10

2 APPLICABLE DESIGN CODES STANDARDS AND REFERENCES

All work associated with furnishing, fabricating, and installing the multiple elements of rebuilding the South Harbor shall be conducted under these performance requirements, and the below listed design codes, standards, and references.

All references shall apply to the latest edition. This list may not be all inclusive; the intent of the Contract is for the Design Builder to provide a functionally complete Project consistent with good engineering practice applicable to a public harbor in Cordova, Alaska. Where conflicts exist between these references, the Design-Builder's Engineer of Record shall select the most appropriate governing standard, code, or specification and justify its use in the Basis of Design document. Engineer of Record may generate sealed, Project-specific special provisions or sheet notes which maintain or exceed these codes and specifications.

AASHTO LRFD Bridge Design Specifications, current edition

Alaska Administrative Code, AAC

Alaska DOT&PF Standard Specifications for Highway Construction, 2015 Edition, including Special Provisions

Alaska DOT&PF Test Methods Manual, 2016

Aluminum Design Manual, 2020

American Association of State Highway and Transportation Officials (AASHTO)

American Concrete Institute (ACI), ACI 318 Building Code Requirements forStructural Concrete and Commentary

American Institute of Steel Construction (AISC) 360, Specifications for Structural Steel Buildings

American Institute of Steel Construction (AISC), Steel Construction Manual

American Institute of Timber Construction (AITC) 200 Inspection Manual

American Society for Testing and Materials (ASTM) A27, A36, A123, A153, A307, A325, A572, A992, A500, A563, A780, C557-03, D-6662

American Society of Civil Engineers, "Planning and Design Guidelines for Small Craft Harbors," ASCE Manuals and Reports on Engineering Practice No. 50,

American Society of Civil Engineers, ASCE/SEI 7 Minimum Design Loads for Buildingsand Other Structures

American Society of Mechanical Engineers (ASME) B18.2., B18.6.1

American Water Works Association (AWWA) C651, C901, others as appropriate

American Welding Society (AWS) C2.23, C2.16, D1.1, D1.2, D1.3, D3.6

American Wood Protection Association (AWPA) Standards

Americans with Disabilities Act 1003, "Recreational Boating Facilities"

ANSI C2, National Electrical Safety Code

ANSI, American National Standards Institute

ASCE 61 (Seismic Design of Piers and Wharves)

ASCE COPRI 61-14, Standards for Seismic Design of Pier and Wharves

ASME Pressure Vessel Code

AWWA M11 Steel Pipe Manual

CRSI (Concrete Reinforcing Steel Institute) Standards

Insulated Cable Engineers Association Standards (ICEA)

Institute of Electrical and Electronic Engineers Standards (IEEE)

Illumination Engineering Society Standards (IES)

Illumination Engineering Society of North America Standards (IESNA)

International Building Code (IBC), as amended by Title 13 of the Alaska Administrative Code

International Fire Code (IFC)

National Association of Corrosion Engineers (NACE) Corrosion Protection of Offshore Structures

National Design Specification (NDS) for Wood Construction

National Electrical Code (NEC)

National Electric Code (NEC)

NFPA 14: "Standard for the Installation of Standpipe and Hose Systems"

NFPA 70E: Standard for Electrical Safety in the Workplace

NFPA 303: Fire Protection Standard for Marinas and Boatyards"

NSF Standard 61 Drinking Water System Components

Occupational Safety and Health Act (OSHA)

OSHA: Walking-Working Surfaces, Subpart D 1910.23(e) 3

Prestressed Concrete Institute Standards (PCI)

Permanent International Association of Navigation Congresses (PIANC): Guidelines for the Design of Fender Systems

Tobiasson, B & R. Kollmeyer, Marinas and Small Craft Harbors

Unified Facilities Criteria (UFC)

UFC 4-150-06 United Facilities Criteria: Military Harbors and Coastal Facilities

UFC 4-152-01 Design: Piers and Wharves

UFC 4-152-07 Design: Small Craft Berthing Facilities

UFC 4-159-03 Moorings

UL Underwriters Laboratories

UPC Uniform Plumbing Code

United States Army Corps of Engineers (USACE), Coastal Engineering Manual

United States Army Corps of Engineers (USACE), "Small Craft Harbors: Design, Construction and Operation," Special Report No.2, December 1974.

West Coast Lumber Inspection Bureau (WCLIB)

WWPA, Western Wood Products Association

3 ENVIRONMENTAL CONDITIONS AND DESIGN LOADS

3.1 General

All dead loads, environmental loads, and other live loads and environmental conditions that affect the design of systems will be assessed by the Design-Builder using the data sources and methods outlined in applicable design guidelines to provide the facilities described in South Harbor Rebuild Project RFP with a 50-year design service life. The methods and resulting design loads will be described in the Basis of Design document, sealed by the Engineer of Record.

All design forces and loads shall be borne by the float structure and transmitted to the piles through an adequate load path.

Design-Builder shall consider overall system loads under full occupancy with consideration for shielding factors and deflections of the system and its effects on pile loads.

Design-Builder is responsible to ensure that all necessary means and methods are properly designed, constructed, and maintained for the loads they are intended to support and the work they are intended to support.

3.2 Tides

Tidal elevations and Tidal current effects on the floats and other structures will be assessed by the Design-Builder.

3.3 Wind and Wave

Wind and wave data, and their environmental loading on the moored vessels and subsequent load on floats and other structures, will be evaluated during the design phase by the Design-Builder. The design vessels are provided in Section 3.10.

3.3.1 Waves

Design wave shall be determined using USACE Coastal Engineering methods, considering protection offered by the breakwaters.

In addition, consider locally generated waves from boat wakes 2-foot height, 2.5-second period.

Consider the effect on the pile collars and float system. Provide measures to minimize adverse pounding and to ensure long service life in the expected wave environment.

3.3.2 Wind

Wind load moored vessels: site specific 50-year return period wind, adjusted to 30 second duration (the amount required to energize a vessel per ASCE 50). Duration adjustment according to ASCE 7-10.

Wind load on fixed structures (i.e., transfer bridge, gangways, abutments, bulkheads): ASCE 7, 3 second gust, Exposure D.

Calculations shall be performed for wind and current loads both parallel to and perpendicular to the slips. For mooring loads apply wind load on exposed over-water vessel profiles. Consider end, side, and 75 degree loading conditions. Consider shielding effect with 100 % slip occupancy in accordance with methods described in “marinas and small craft harbors” (Tobiassan and Kollmeyer).

3.4 Tsunami Procedures

ASCE 7 shall be used by Design-Builder to create recommendations for tsunami preparedness and evacuation plans in coordination with local tsunami guidelines.

3.5 Snow

ASCE 7, Cordova, Alaska Ground Snow Loads: Pg=100 lbs per square foot (PSF)

3.6 Dead Loads

Dead loads shall consist of the weight of all construction materials and permanent components including but not limited to the float framing, decking, floatation, bullrails, rub boards, pile restraint guides, ladders, gangways/ramps, transition plates, utilities (full), utility pedestals, vaults, safety equipment, moorage devices, cranes, and all other metal fabrications, hardware and attached appurtenances.

Allow at least 5 PSF for water absorption and marine growth.

Design-Builder shall exercise caution to ensure that all dead loads are accurately determined and included in buoyancy calculations. These loads shall include safety factors and any specific manufacturing considerations that may affect the final freeboard. Should freeboard adjustments be necessary after installation they shall be accomplished with supplemental flotation approved by the Design Engineer of record. Supplemental flotation shall be installed such that it shall not affect the performance or the longevity of the dock system.

Floats shall float level under dead loads. The decks of the floats shall be within the followings tolerances of being level:

A. Maximum transverse slope for main floats: one inch per ten feet of width.
B. Maximum longitudinal slope: one inch per ten feet of length.

3.7 Live Loads

The Design-Builder will use the following minimum live loads in their design. The required resulting freeboard of floats under various loading conditions are described in Section 4.1.

3.7.1 Moorage Float System

A. Floating docks Uniform Live Load: 40 PSF
B. Floating dock Concentrated Load: 400 lbs, distributed over 30 square inches, placed anywhere on floats
C. Gangway and Moorage floats: Utility Vehicle (UTV) 1,500 lb operating weight, 50.5-inch Wheelbase, 5-foot 4-inch Turning radius, 66-inch plow
D. Gangway Uniform Live Load: 90 PSF
E. Gangway Concentrated Load: 400 lbs applied to any 12-inch by 12-inch area
F. Gangway Electrical Utility Supports: 100 lbs per linear foot (lbs/lf) or calculated weight of planned electrical utilities and conduit, per final design, whichever is greater
G. Gangway Plumbing Utility Supports: 50 lbs of each or calculated weight of planned water/fire/sewer utilities and conduit, per final design, whichever is greater

3.7.2 Drive Down Float (Service Dock) and Transfer Bridge

A. Unform Live Load: 125 PSF

Drive Down Float and Transfer Bridge shall be able to accommodate the following design vehicles:

A. Hyster H60XT 6,000 lb. Capacity Forklift
B. Type III Ambulance – 12,000 lb. axle load with wheels spaced 6 feet on center
C. Kawasaki 4-Wheeler – 1,500 lb. operating weight
D. One-ton truck including gear and 20-foot-long sein net trailer (23,000 lbs)
E. Vehicle Wheel Loads (VWL) from H-20 truck:
    1. Front axle 8,000 lbs
    2. Rear axle 32,000 lbs

Calculations shall assume that any slip may be exposed to the loads created by a design event (wind, wave, and current) as well as design vessel berthing and impact.

All Load cases shall be combined based upon the probability of simultaneous occurrence of the events.

A. The freeboard measurements shall be taken and checked after the dock system is connected and in its final intended condition.

3.7.3 Bulkhead

Parked vehicles (per Design-Builder's design, full occupancy) plus a minimum Unform Live Load of 200 PSF.

3.8 Mooring and Berthing Loads

Mooring and berthing loads shall be considered in the design of bullrails, cleats, floating docks, piles, and pile restraint/collars.

3.8.1 Mooring

Wind loads on moored vessels will be calculated using the site-specific wind speed and Design Vessel profile height as noted in Section 3.10. Current and inner harbor waves shall be considered in the mooring calculation.

3.8.2 Berthing

The Drive Deon float shall be designed for the mooring of design vessels using these parameters:

A. Sheltered Berthing Conditions
B. Berthing Velocity Normal to Berth per UFC 4-152-01

For moorage floats, assume forward velocity of 1.0 knots, vessel berthing angle of 20 degrees for largest boat normally using the slip, striking at the end of a finger or end of a main float and at the main float in the center of the berth.

A. UFC 4-159-03
B. Sustained Wind Speed as calculated by Engineer of Record

3.9 Seismic Load

The seismic performance of fixed structures including gangway and Transfer Bridge abutments and sheet pile bulkhead wall will be for life safety collapse preventions under the design seismic event. Serious damage to the facility may occur under the design seismic event.

A. Seismic design values shall be per ASCE 7 and ASCE 61 for Cordova, Alaska for life safety protection
B. ASCE 61 Design Classification - Low
C. ASCE 7 Risk Category - II
D. Site Class B
E. Seismic Design Category D

3.10 Design Vessels

The following table constitutes the Design Vessels most likely to use the rebuilt South Harbor Float facility upon Substantial Completion of the Project. The facility shall accommodate the below listed Design Vessels, in largest sizes accommodated by the stall float length, drive down float, and/or parallel transient moorage areas as applicable.

Table 2 Vessel Design Lengths

Length	Beam	Profile Height
90*	26	15
80	26	15
60	20	12
50	17	10
40	14	8
30	10	8

* Vessels up to 80 and 90 feet may utilize the east side of G Float. Vessels up to 90 feet length (220,000 lbs displacement) may utilize the drive down float.

4 PRODUCTS

4.1 FLOATS

The float system shall be designed under the most current codes and applicable standards to provide public facilities with a 50-year design service life. The floats shall consist of either concrete or high-quality timber frame and polyethylene float units as required to meet the Performance Requirements and provide the stipulated configuration on the Conceptual Plan. Provide float system units and connections capable of meeting the design criteria. Design-Builders may submit proposals based on either type of float systems.

This facility is intended to remain in place permanently. Exception is the individual float modules shall be removable for replacement in the case of damage. This shall include removable pile guides and/or mooring hoops.

Besides sizing all members per the above referenced codes and specifications, the calculations shall be prepared as a minimum for the dock system:

A. Moorage points to ensure reactions shall be appropriately and rationally distributed throughout the system.
B. Anchorage (guide) piles to ensure reactions and performance shall be appropriately and rationally determined for the system.
C. Lateral loads from current and wind in the shielded and unshielded condition on the T-head and finger pier lengths.
D. Calculations shall provide transfer assumptions for both cantilever and non-cantilever type finger piers, including finger-to-main pier connections.
E. Lateral loads from waves for the T-head and finger pier lengths. Calculations shall include a copy of the written source from a published and recognized method for determining lateral loads due to waves on anchored floating bodies and shall be provided in such detail that clearly demonstrates the appropriateness and accuracy of the method used.

4.1.1 Layout and Configuration

The general layout and configuration of the new South Harbor is shown in the Conceptual Drawings. Design-Builder may deviate from the plans to the extent required to facilitate structural connections, placement of pile restraint guides, and location of utility and other items to ensure the functionality of the rebuilt South Harbor.

A. The float layout including fairways, aisle clearances, and float widths shall be in conformance with ASCE 50 and UFC 4-152-07.
B. The moorage float system shall be wheelchair accessible, including the minimum accessible routes and minimum number and size of accessible slips in accordance with ADA 1003.
C. The Design-Builder shall demonstrate, through use of materials, design, and other factors, that the float system should not lose noticeable freeboard over the design life with similar loading conditions.
D. Floats shall be fabricated in modules corresponding to the nominal length, widths, and geometric cross-sections.

E. Float modules shall be identified and labeled for assembly.
F. All exposed timber corners shall be chamfered by 3/8-inch.
G. The walking surfaces of the floats shall be flush with adjoining float units.
H. The gap between adjacent deck boards shall not be greater than 1/4-inch or less than 1/8-inch.
I. Design drawings for any utility attachments or appurtenance attachments such as ladders, HDPE potable and fire suppression water piping, life ring and fire extinguisher cabinets, power pedestals with lighting, emergency phone system, etc. as required to function with the final geometry of the float system.
J. Float walking surfaces shall be non-slip material.
K. The length and position of the floats shall not encroach on the North Harbor fairway, as shown in the conceptual drawings.
L. To facilitate ease of access for first responders' equipment the connection between the mainwalks and the headwalks shall incorporate a flared connection on both the east and west sides of each connection.
    1. The corner shall be three (3) feet on each side and unobstructed by any equipment except a bullrail.
    2. The emergency response equipment used at the Cordova Harbor is a UTV, noted previously.
M. Cover panels shall be provided as needed to maintain continuous walking surfaces. All cover panels shall be installed flush with adjacent surfaces.
N. All materials for float appurtenances shall be compatible with the marine environment with consideration of corrosion and dissimilar metal use. Use non-metallic insulators were applicable to prevent bi-metallic corrosion issues.
O. Unless otherwise specified fendering shall weigh at least 0.9 lbs/lf and made from a fungus and UV resistant synthetic material.
P. Rubboards: UHMW-PE lumber shall be along the full length of both sides of the stall floats and East side G float, the North side of N floats, and the three sides of the Drive Down float
Q. Corner bumpers shall be provided on all outside corners of stall floats and end floats.
R. Vessel mooring cleats shall be provided on all 32-foot stall floats. Cleats shall be cast iron, 12-inch minimum, designed to withstand calculated mooring loads.
S. Timber bullrails, designed for the applicable vessel mooring loads at each moorage area, shall be provided; full length at all other locations.
T. Cleat bolts shall be recessed and mounted flush with the top surface of the cleat.
U. All steel materials shall be hot dip galvanized under ASTM A123, where applicable.
V. Walking surface of floats shall be level and flush regarding the adjacent floats. After installation, the height variation between adjacent module decks shall not exceed 1/4-inch.

4.1.2 Freeboard

A. The minimum free board for moorage floats under dead load conditions at least 20 inches and no less than 10 inches at 30 PSF live load (per ASCE 50). Additionally, they shall have at least 8 inches of freeboard at 40 PSF live load.
B. Gangway landing floats shall have a minimum of 4 inches of freeboard under design deadload plus live load at extreme low tide.
C. Minimum freeboard under DL+Snow Load to be 6 inches (+/- one inch).

D. Gangway landing floats shall have a minimum of 4 inches of freeboard under design deadload plus live load at extreme low tide.
E. When 200 lbs concentrated load is applied on one outer corner of any stall float, there shall be no more than 2 inches in freeboard change at that corner.
F. When 400 lbs concentrated load is applied at one foot from the outer end of the stall float, the end of the finger shall lose less than 4 inches of freeboard.
G. The Drive Down Float shall have a minimum freeboard of 36 inches.
H. All floats shall be designed such that utility conduits under decking remain dry under applying DL + LL.
I. Freeboard shall not change over 2 inches between the initial installation and the end of the warrantee period. If freeboard changes more than this amount, it shall be considered a warranty issue and the manufacturer shall correct the deficiency at no cost to the City.
J. The Design-Builder shall design the float system buoyancy with the eventual load conditions considered including the gangway, electrical and other utilities, and specified live loads as stated herein. It is expected that minimal supplemental floatation will have to be installed to level the floats after installation.
K. The Design-Builder supplies additional leveling flotation billets along with attachment details and materials as required. Due to the wave environment at this site, leveling billets shall be attached to the floats. It is understood that temporary ballast (such as easily removable sandbags) may have to level some floats before the installation of utility panels and other heavy items.

4.1.3 Timber Materials

A. All timber shall be new and graded under provisions of West Coast Lumber Inspection Bureau (WCLIB), WWPA, or NLGA.
B. All timber shall be grade marked by a licensed grader or shipped under mill certificate.
C. All timber components, including but not limited to walers, bullrails, dimension lumber, decking, beams, and stringers, shall be Coastal Douglas Fir No. 1, or Douglas Fir (North) No. 1, or a better grade.
D. All timber shall comply with the provisions of WCLIB, Rule Book 16 for Douglas Fir.
E. Timber decking shall be S4S surfaced with a skid resistant milled finish.

4.1.4 Glue Laminated Timber

A. Provide factory-glued structural units complying with American Institute of Timber Construction (AITC) A190.1 “Structural Glued Laminated Timber,” and produced by an AITC or American Plywood Association (APA) licensed firm.
B. Inspection shall be under AITC 200 Inspection Manual or applicable sections of American Wood Protection Association (AWPA) Standard M2.

4.1.5 Plywood

A. Plywood, if used, shall be a thin layer graded for severe moisture service and of APA designation Group 1 species, laid with exterior-rated adhesives. APA C-C, Plugged, Exterior, Structural 1 (all plies limited to Group 1 species).
B. Plywood shall bear the grade mark of the APA, certifying conformance to U.S. Product Standard PS 1.

4.1.6 Timber Treatment

A. Timber preservative treatment shall be in accordance with AWPA, as applicable for its use.
B. Creosoted timber is not allowed, unless otherwise approved by the Owner.
C. The edges of plywood panels shall be sealed with a marine grade paint or epoxy.
D. Timber members shall be cut to length, drilled, and dapped before pressure treatment.
E. All pressure treatment processes shall be performed under Best Management Practices for the specified treatment type as published by the WWPA.
F. All nicks, cuts, abrasions, and field drilled holes and saw cuts after pressure treatment shall be carefully trimmed and saturated in the field, in accordance AWPA-M4, with a copper naphthenate solution of not less than 2% copper metal shall be used in 3 applications.
G. Any unfilled holes bored after treatment, after being treated shall be repaired with copper naphthenate saturated plugs.

4.1.7 Fasteners

A. All metal to timber and timber to timber connection bolts shall be American Society for Testing and Materials (ASTM) A 307 grade C minimum.
B. Metal to metal connection bolts shall be ASTM A 325.
C. A hot dipped galvanized coating shall be required on all bolts, miscellaneous hardware, cleats, steel plates, angles, and shapes under either ASTM A-123 or ASTM A-153 as the process applies to the specific material.
D. All metal to timber and timber to timber connection bolts shall have double or jamb nuts and or a lock washer and nut.
E. All bolts in contact with wood members shall have economy heads and or malleable iron washers.
F. Counter bore all bolt heads facing decking or pedestrian areas by 3/8 inch.
G. Bolts shall conform to ASTM A307 or A36 with ASTM A563 heavy hex nuts.
H. Lag bolts shall conform to American Society of Mechanical Engineers (ASME) B18.2.1.
I. Minimum bolt and lag screw diameter shall be ½-inch.
J. Wood screws shall conform to ASME B18.6.1.
K. Malleable iron washers are always required (except economy head bolts) where lag heads or bolt heads or nuts would otherwise bear directly on wood.
L. Stainless steel type 316 fasteners are acceptable.
M. Alternative fasteners may be considered for removable decking. Removable decking fasteners have a history of seizing and breaking when removed for installation or maintenance of utilities. The Design-Builder may propose a system of alternative fasteners, modified hole size, coatings, lubrication, or other means to ensure proper function of removable decking.
N. Steel plates, shapes, bars, pipe, and tubing shall be at least 3/8-inch thick, unless otherwise noted.
O. Coatings: Hot dip galvanize all structural steel, miscellaneous steel, and steel hardware after fabrication under ASTM A123 or A153.
P. Repair areas left uncoated after hot-dip galvanizing, areas where the coating was removed for welding, galvanizing damaged by welding or handling, and field-damaged areas, including pile cut-off areas, must be repaired by spray metalize zinc methods under ASTM A780, American Welding Society (AWS) C2.23, and C2.16. Apply 10 mils of zinc coating.

4.1.8 Rubboards

Rubboard shall be provided throughout the float system, 2-inch x 12-inch nominal dimension.

A. The City's preference is for ultra-high molecular weight polyethylene (UHMW) Rubboards to be provided full length on the sides of floats where vessels may moor (i.e., slips and side tie moorage areas) and pressure treated timber elsewhere. Pressure treated timber rub-boards will be allowed in moorage areas if it results in a significant cost savings to the City.
B. UHMW material, if used, shall be of uniform color, shall be color-stabilized, and shall be resistant to ultra-violet deterioration, mechanical abrasion, chemical attack, detergents, and animals.
C. The material color shall be consistent throughout the facility, unless otherwise approved by the City.
D. Provide in 8-foot minimum lengths and installed to accommodate thermal expansion.

4.1.9 Utility Chase ways

Utilities will be under the decking of the float. Utility chase ways, handholes, and mounting holes, etc. to accommodate field-installed utilities shall be provided on the completed float products.

A. The Design-Builder shall coordinate locations of the in-float utilities (i.e., main utility runs, service runs, hose bib risers, power/light pedestals, safety equipment) and indicate these on a float system layout drawing, to be submitted to the City.
B. The Design-Builder shall design means of connection in the float structure to allow for field installation of electrical shore-tie pedestals, luminaries, electrical panelboards, and below deck HDPE potable water system with valves and fire suppression lines and connections.
C. A minimum electrical utility chase way 2 feet wide and 6 inches deep (clear space), centered in the floats is required. This may consist of several chases that in combination are balanced across the center of the float. A single chase way provides the greatest flexibility for future use. The intent provides sufficient space for electrical and water utilities, centered in the float to ensure the floats remain balanced after future utility installation.
D. All conduits shall include a pull string for future use.
E. Embedded utility chase ways shall be ASTM F512, PVC utility duct with accommodations of designed utilities plus two additional future chase ways.
F. Consider nuisance animal protections.
G. Provide bushings at all penetrations to handholes.
H. Protect open conduits from the entrance of foreign materials.
I. Embedded conduit penetrations at the ends of interconnecting float modules shall be aligned within 1/4-inch after final connection.
J. Utility handholes shall be selected by the float Design-Builder.
K. The handholes shall be of high-density polyethylene or other non-corrosive materials as approved by the Owner.
L. Plastic materials shall be of UV resistant construction.
M. Lids shall be polymer-concrete with a permanent non-skid surface and shall include a water-resistant seal.

4.1.10 Removable covers

A. Removable decking or vaults with removable covers shall be provided at main float intersections and at the service panel locations to provide access for installation and maintenance of under deck utilities.
B. The Design-Builder coordinates exact location of the proposed removable covers on-float utilities on the shop drawings and finished products.

4.1.11 Flotation

Alternative flotation system may be proposed that equal the polystyrene system described below.

A. Float inner cores shall be closed-cell, expanded rigid cellular polystyrene under ASTM C-578.
B. The density of the polystyrene shall be between 0.90 and 1.15 lbs per cubic foot and a maximum absorption of 4 % by volume as tested by ASTM C-272.
C. Polystyrene shall be virgin new material throughout. Material that has exceeded the manufacturer's recommended shelf life will not be allowed nor will molded, stuffed, or reground material be permitted.
D. Voids shall not exceed 1% by area as measured on any internal cross-sectional cut surface.
E. The knit or weld between the individual bead cells shall be such that at least 60% of the beads fracture rather than separate when subjected to bending stresses.
F. All flotation surfaces shall be encased by a rigid polyethylene float shell.
    1. The shell material shall be ultra-violet (UV) stabilized, shall be partially or fully chemically cross-linked, and suitable for long-term exposure.
    2. The material shall also be resistant to mechanical abrasion, chemical attack, ultraviolet deterioration, detergents, and animals.
    3. Color shall be black or as approved by the City.
    4. The minimum nominal wall thickness shall be 0.15 inches
    5. Float shells shall meet or exceed the Hunt Falling Dart puncture and thickness test.
G. Flotation shell if used shall be sealed and resist design ice forces.
H. Permanently installed bungs or plugs shall be placed in all foam filling ports before installation of the tub in the float system.
I. All notches and cuts shall be performed with a hot wire or other approved methods.
J. Flotation encasement coatings, if required, shall be fuel resistant.

4.1.12 Float Corner Bumpers

A. Float corner bumpers shall be fabricated from UV stabilized HDPE. Bumpers shall be energy absorbing and non-marking.
B. Bumpers shall be Ultrapoly “Flexi Fend” or approved equal.
C. Bumpers shall be placed vertically at each outer corner of each finger and on corners of the main floats.
D. The size of the bumper shall match the energy absorbing characteristics of the bumper with the design berthing loads of the vessels for the particular size of the finger.
E. Color shall be pre-approved by the Owner.
F. Secure bumpers to the rubboards with galvanized screws or lag bolts under the bumper manufacturer’s recommendations.

4.2 CONCRETE FLOAT MATERIALS AND FABRICATION

If concrete floats are used, Design-Builder shall provide a concrete moorage float system capable of resisting all design loads and of providing a 50-year service life. Floats shall be manufactured to accommodate utilities including electrical power, pedestals with meters and lighting, potable water, and fire protection, and Safety equipment.

4.2.1 General Requirements

Floats layouts are shown on the Conceptual Drawings. Dimensions are approximate to edge of the floats' framing and include no rubboards or bumpers. All aspects of the floats systems previously described apply for concrete floats, where applicable. In addition, the following apply specifically to concrete floats:

A. The float system shall consist of modular sections designed so concrete modules may be replaced with standard or similar modules if repairs occur.
B. Finger floats shall be made of single piece modules up to 60 feet in length.
C. Float modules shall be structurally connected by a waler system that shall allow replacement without affecting the float modules or the structural integrity of the system.
D. Concrete module connection methods that may cause structural failure of the float module when overstressed will not be allowed.
E. The floating dock systems shall be designed and constructed to include provisions where applicable for accommodating light bollards, power pedestals, fire extinguisher cabinets with integral life ring holders, water and fire standpipes, cleats, bull rails, rubboards, corner fenders, dock ladders, storage boxes, and other components.
F. The float deck surface shall be trowel finished with a steel trowel and a slip-resistant finish applied transversely to the walking surface.
G. Manufacturer shall establish finishing methods and procedures to ensure an even and consistent broom or screed finish on all deck surfaces.
H. All top edges shall have a 3/8-inch tooled radius with a minimum 1-1/2-inch-wide smooth hard steel finished face.
I. Outside top edges and corners shall be filed smooth.
J. All floats shall be of monolithic construction, using individual float sections of the maximum practical length.
K. Modular concrete systems utilizing a system of timber or composite walers and transverse through rods as the structural system shall not be allowed.

4.2.2 Structural Concrete

A. Concrete shall be standard weight, Portland cement and fly ash concrete, appropriately proportioned for durability, cold weather, and exposure to the marine environment.
B. Concrete mixtures shall be designed by a registered professional engineer licensed in Alaska for the float manufacturer under American Concrete Institute (ACI) A318 and ASTM C94 and shall have a proven record of accomplishment of successful performance for the intended service.
C. Concrete mixtures shall meet or exceed the following minimum requirements
    1. Compressive Strength (28 Days), fc = 7,000 psi
    2. Aggregates - Maximum Particle Size of 5/8 inches
    3. Maximum Water to Cement Ratio = 0.30

4. Portland Cement - ASTM C150, Type III, Sulfate Resisting (8% maximum C3A content)
5. Minimum Cement Content = 658 lbs/cy
6. Pulverized Fly Ash = 172 lbs/cy
7. Entrained Air Content = 6% to 8%
8. Admixtures = As Determined by the Float Manufacturer, all to come from one admixture manufacturer. Calcium chloride not permitted
9. All fine and coarse aggregates shall be obtained from an approved source and appropriately tested for suitability under ASTM C33. Lightweight aggregate shall not be allowed

4.2.3 Concrete Reinforcing

A. Reinforcing steel shall be ASTM A706 deformed bars, Grade 60 and galvanized under ASTM A767.
B. Welded wire fabric used for reinforcement shall be provided in sheets (not rolls) and meet the requirements of ASTM A641.
C. All welded wire fabric shall be galvanized after fabrication. At least 1-1/2 inches of concrete cover over rebar and welded wire fabric shall be provided.

4.2.4 Fabrication

A. The precast concrete manufacturing plant shall be certified by the Precast/Prestressed Concrete Institute (PCI) Plant Certification Program.
B. Manufacturer shall be certified at the time of bidding. Certification shall be in the following product groups and categories: C3 or C4.
C. Written evidence may be required listing experience, plant facilities, quality control procedures, staff, and any other documentation needed to establish adequate qualifications for manufacture of the floats.
D. The casting facility shall provide adequate workspace, equipment, level casting surfaces, and protection from detrimental environmental conditions.
E. All corners of concrete shall be eased with chamfers or rounding. Transitions between thick and thin concrete sections or between horizontal and vertical sections shall be eased with chamfers.
F. Floats shall be cast in steel forms. All forms shall be treated with a release agent before casting to provide for ease of form removal and to provide a smooth concrete finish.
G. The concrete shall be mixed in a high shear, counter mixer capable of thoroughly and evenly distributing all ingredients of the low water/cement ratio concrete mix.
H. Aggregates shall be stored in covered bins to limit variations in moisture content.
I. The batching system shall have moisture sensing devices to control total final water in the mix from all sources. The concrete shall be placed in the forms within 30 minutes of the time water is added to the concrete mixture.
J. Concrete shall be vibrated internally and/or externally in the forms under ACI 309 to insure a smooth, dense finish.
K. Small surface holes caused by air bubbles, normal color variations, normal form joint marks and minor chipping and spalls shall be tolerated but shall be minimized using good industry practice of cleaning forms and placing concrete.
L. Major imperfections, large voids, cold joints, or other defects will not be permitted.
M. Acceptable cracks are those limited to hairline nature that show no tendency to open. The engineer will inspect all imperfections and defects and determine if acceptable.

N. At Owners' discretion, a float may be rejected if any large void or imperfection appearing in the float exceeds the following criteria:
    1. The volumes of the voids appearing on the surface of any 1-float unit exceeds 360 cubic inches.
    2. The areas of any localized non-compacted concrete on a surface exceeds 120 square inches.
    3. The areas of concrete in which reinforcing bar and/or wire mesh is exposed exceeds 120 square inches.
O. All other imperfections shall be repaired with Sikatop 122 Plus, following the manufacturer's recommendations for the product. Submit repair procedure for approval.
P. Any floats cast with test cylinder results that have any average of three consecutive strength test results below the specified Fc by over 500 psi may be rejected.
Q. Any concrete with sample testing below 6 % air content shall be rejected.
R. All reinforcement shall be placed as noted on the approved shop drawings. The float manufacturer shall provide adequate means of securing the location of all reinforcing in the proper position before placing concrete.
S. All float tops and exposed horizontal surfaces shall be treated with an approved penetrating concrete sealer after curing and drying.
T. Concrete sealer shall be a VOC compliant blend of siloxane and silane ("CHEMSTOP" or approved equal) or a VOC compliant water-based siloxane sealer ("Burke Shield 244 WB" or approved equal).
U. All sealers shall be applied in strict accordance with the manufacturers' recommendations.
V. Each walkway shall have raceways embedded in the float modules as required for electrical and mechanical systems with access boxes embedded in the decks of the concrete modules.
W. Access boxes, where required, shall be as specified by floating dock manufacturer, unless otherwise required by specific state or local codes.
X. Access boxes shall be flush with the walking surface and shall have a 1-inch nominal concrete bottom with a smooth or light brushed, slip-resistant finish.
Y. All bolts for lids on access boxes shall be stainless steel.
Z. Raceway shall remain above the water surface under dead load conditions and shall facilitate installation, removal, and servicing of the utilities.
AA. Raceway Access openings shall be provided at convenient locations if required for special access.

4.2.5 Fasteners

A. All structural bolts, including cleat bolts, shall be through-bolted in concrete and shall be capable of developing their full allowable strength without causing damage to the concrete float.
B. Mild steel plate washers shall be used on all nut-bearing surfaces.
C. All bolt heads bearing on exposed concrete surfaces shall be low profile, economy head type and have a neoprene or polyethylene washer between the head of the bolt and the concrete deck.
D. Epoxy grouted or cast-in inserts are not acceptable for use as structural connections between floats. Bolts bearing on timber surfaces shall be economy head type.
E. Primary connection bolts shall be at least 3/4-inch diameter or as otherwise noted on the plans prepared by the Design-Builder.
F. Bolts for float connections and for attaching components directly to the concrete floats shall be ASTM F1554 GR50.

G. Fasteners connecting steel-to-steel in fabrications shall be ASTM A325.
H. All fasteners shall be hot dip galvanized after fabrication under ASTM A123.
I. Threaded inserts may be used for non-structural connections such as attaching rub strips to the floats.
J. Threaded inserts (if used) shall be non-corroding, zinc alloy and shall be accurately placed and held in position during float casting.
K. Sleeves shall be cast through concrete float flanges to allow for through bolting.
L. Sleeves shall be Schedule 40 PVC and shall be accurately placed and held in position during float casting.
M. Ultra-high molecular weight polyethylene (UHMW-PE) plastic components shall be made from materials conforming to ASTM 4020. The material shall be partially chemically cross-linked, ultra-violet light stabilized, and suitable for long-term environmental exposure.
N. All UHMW-PE shall be black or as otherwise approved by the Owner.

4.2.6 Curing, Handling and Storage

A. The Design-Builder shall select its own method of curing and be responsible for the result, except that all curing shall include the application of a curing compound as soon as practical after finishing and that the concrete modules shall be placed under cover with complete protection from direct sunlight, wind and freezing for three days.
B. Design-Builder shall provide temperature control and tracking processes
C. After placing concrete, cover forms with moisture-retaining cover and apply heat in uniform manner until concrete reaches sufficient strength to handle units without damage
D. Except as otherwise approved, floats shall be cured for at least 7 days or until the concrete has reached 70 % of its design strength before transporting or assembling.
E. Manufacturer shall take care in establishing handling methods to avoid damage to float modules during form removal, storage, assembly, and installation.
F. Storage of float modules shall be on level surfaces, and it shall be the responsibility of the Manufacturer to determine how high to stack modules to avoid damage. Care shall be taken to avoid damage caused by over-stacking.
G. Float modules shall be protected against damage from any cause. Any units damaged sufficiently to cause structural failure of the float module will be rejected and removed from the job.
H. Markings shall be permanent and be on one side and on one end for ease of field identification

4.2.7 Cracks

A. It is typical for precast concrete to develop cracks. The structural nature of concrete is that the concrete must crack to mobilize the steel reinforcing.
B. Cracks determined to be structural by the float system Design Engineer and not in the deck of the module shall be V-cut out and patched with a non-shrink patching compound approved by the Owner.
C. Cracks determined to be structural by the Design Engineer located in the deck of the float module shall be patched under methods and materials approved by the Owner and the float system Design Engineer case-by-case.
D. The float system Design Engineer shall determine if excessive cracking in a single flotation unit shall be cause for rejecting that unit.

E. Rock pockets exceeding 1-inch in diameter and/or 1/2-inch in depth and/or honeycombing, shall be patched with an approved non-shrink grout of a color similar to the cured concrete.
F. Any pockets which expose mesh or rebar shall be chipped out, cleaned, and filled with an approved epoxy patching compound.

4.2.8 Concrete Testing and Quality Control

A. Quality control of float manufacturing operations shall be under the supervision of a registered professional engineer employed full time by the manufacturer.
B. A quality control plan shall be prepared and approved by the Owner before the manufacture of any floats.
C. A quality control inspector, who is not engaged in production of the floats, shall be assigned to the project during the fabrication process.
D. This inspector will be responsible for verification of concrete testing frequency and procedures and ensuring that all products are constructed under the approved shop drawings and materials specifications. The inspector must have, at minimum, a PCI Level 2 certification.
E. A checklist of conformance items of shall be prepared and submitted to the Owner for each float produced.
F. No floats may be produced absent the quality control inspector.
G. All concrete testing shall be performed by personnel trained and certified, at minimum, as PCI Level 2 Technicians.
H. All testing shall be performed under ACI 318 and applicable ASTM test standards for the specified tests.
I. At a minimum, the following sampling and testing procedures shall be performed:
    1. 4 compressive test cylinders shall be taken for each float produced, each 10 cubic yards of concrete placed, or each production day.
    2. 1 cylinder will be tested at 7 days, 1 at 14 days, and 2 at 28 days. Compressive test cylinders shall be cured in the same location and manner as the floats.
    3. Cylinders to be tested at 28 days shall be moist cured. All compressive strength test cylinders shall be prepared and tested under ASTM C39 and C31.
    4. Air entrainment tests shall be made for the first batch of concrete prepared for the project. In addition, air entrainment tests shall be taken from each batch used for the compressive test cylinders. Perform air testing under ASTM C173 or C231. Concrete found to be of non-conforming air entrainment shall not be incorporated into the product.
    5. Results of compressive test cylinders shall be reviewed and interpreted for acceptability under ACI 214. Not over 10 % of the individual tests shall have an average compressive strength of less than the specified ultimate compressive strength. Failed strength tests may be cause for non-conformance and rejection of the representative float quantities produced.
    6. Unit weight, slump, and entrained air tests shall be taken daily from the same material sample used for the compressive test cylinders.
    7. All concrete testing shall be done at the Design-Builder's expense.

4.2.9 Float Connections

A. Float connections shall distribute loads based on the relative flexibility of the piling and dock assembly.
B. Connections shall be noiseless and non-wearing.

C. Connections shall be constructed of non-metallic flexible connection materials which will permit dampened vertical and torsional articulation without imposing concentrated or shock loads on the adjoining float units.
D. Connection designs shall consider joint rotation effects so contact, abrasion, or subsequent damage between unprotected float elements does not occur due to wave and other load effects.
E. Connections shall be specifically designed to function in the wave environment of Cordova Harbor.
F. Finger float connections shall transfer lateral berthing and vessel wind loads into the main floats.
G. Finger float connections shall be moment resting connections designed to accommodate the cantilever finger float loads. Connection designs shall consider joint rotation effects so contact, abrasion, or subsequent damage between unprotected float elements does not occur due to wave and live load effects.
H. Float connections shall incorporate a redundant bolt system that retains the full effective strength of the connection and becomes active only after failure of the primary bolt system.
I. The minimum dimension for all thru rods for structural attachment shall be 3/4-inch.
J. All thru rods shall be placed within PVC sleeves cast in the float units. The maximum inside diameter of PVC shall not exceed 7/8-inch for 3/4-inch thru rods.
K. Walers shall be securely fastened to the concrete floats using FRP high strength pultruded rods and injection molded nuts. Thru-rods shall be placed through each float unit within 6 inches of each end of that unit and within 6 inches of each wale splice.
L. No connecting device shall protrude beyond the fascia into the berth area.
M. Any connecting device protruding above the surface of the deck shall have a low, rounded profile.
N. Any connecting device cast into the concrete modules shall be stainless steel.

4.2.10 Basis of Design Document

Prepare a Basis of Design document with calculations validating all Key components including at a minimum:

A. Summary of features that will enable the float system to operate in the conditions present in the Cordova Harbor
B. Design Criteria of the Project elements
C. Design verification for all elements of the Work
D. Verification that various freeboard requirements and all other performance specifications
E. Load and load combination verification, including applicable standards, codes, and design guidelines used
F. The basis of design and all calculations shall bear the seal of the Engineer of Record
G. All engineering and calculations shall be done under these guidelines using the appropriate allowable capacities and safety factors

4.3 PILES

4.3.1 General

The Design-Builder is responsible for final pile design including determining lateral loads acting on design vessels and floating docks and applied to piles as well as embedment required to achieve fixity. A preliminary pile design is outlined in the conceptual drawings. The pile size and locations shown in the

Conceptual plans are for reference only. Pile design including pile size, layout, and length/embedment is the responsibility of the Design-Builder.

A. Provide calculations supporting number of pilings, pile spacing, diameter, wall thickness, and embedment length.
B. Provide design drawings for the final pile design and layout sealed by an engineer registered in the State of Alaska.

Anchor the floating docks by connection to steel piling through free-sliding pile guides, designed to resist forces generated by the specified load combinations. All piling should be hot dip galvanized and should be provided in the longest practical lengths. Field splicing is not desirable or anticipated.

The final pile design should incorporate the results of the lateral load analysis on the float system and should optimize the size, number, and placement of the piling to work with the float system structural capacity as well as placement in a manner that does not inhibit proper berthing and mooring.

A. A geophysical report and historical summary are in Appendix J
B. Tentative Final report Date for Geotechnical is October 31, 2022.
C. Socketing piling into bedrock may be required.
D. Design-Builder should incorporate any additional factor deemed necessary for the proposed float design.

Lateral capacity per pile should be limited by the pile material and section chosen by the Design-Builder. Perform lateral pile calculations based on pile guide elevation with tide at mean higher high-water elevation. Larger diameter piling is envisioned for the Drive Down float. Batter piling may need to be anchored into bedrock with tendons.

Final pile wall thickness and spacing shall be designed by the Design-Builder and shall provide compatible lateral displacements of the floats throughout the harbor. Maximum deflection of the piling at the mudline under design wind/vessel loads shall be 2-inch.

A. Determine pile bending moments and deflections using Ensoft's "LPILE" or equivalent software, using soil properties based on soil boring information.
B. Soil properties for use with the software shall be based on the data provided by the planned project geotechnical site investigation or on a report sealed by a professional engineer, specializing in geotechnical engineering, who is registered in the State of Alaska.
C. Other exploratory operations may be made by the Design-Builder at no additional cost to the Owner, provided such operations are approved by the City and permitted by the USACE. It is the responsibility of the Design-Builder and the Design Engineer to determine if such additional borings or exploratory operations are required.
D. Design-Builder shall submit final pile size, embedment, and spacing design along with the Installation Package for the floats, in the 65% design submittal package. Pile guides shall be designed and provided within the floats.

4.3.2 PILE RESTRAINT GUIDES

A. Pile restraint guides and method of attachment to the floats shall be designed by the float manufacturer. These minimum requirements apply:

1. Pile locations, nominal pile diameter, and interior or exterior mounted pile guide designations are to be indicated on the plans.
2. Steel plates and shapes shall be ASTM A36. Fasteners connecting steel-to-steel shall be ASTM A325. All steel components shall be hot-dipped galvanized after fabrication under ASTM A153.
3. All surfaces exposed to the face of pile shall be protected with a full circumference of UHMW polyethylene. Minimum thickness of UHMW-PE shall be 3/4-inch. UHMW-PE liners shall be thru-bolted to a steel backing plate of not less than 1/2-inch thick. Bolts connecting the UHMW to the backing plate shall be countersunk 3/8-inch.
4. Minimum plate thickness for pile guide metal fabrications shall be 5/16-inch (or thicker as required by structural analysis).

B. Pile guides and connections to the floats shall transmit all anticipated loads from the float to the piles without failure of the float system. This load shall be not less than the maximum lateral capacity of the pile (at estimated high tide). All directions of load shall be considered.
C. Pile hoops shall minimize the effects of pounding due to float movement in wave environment found in Cordova Harbor.
D. Pile Hoop UHMW-PE material shall be ultra-high molecular weight (UHMW) polyethylene plastic meeting ASTM D4020 and containing 0.6% carbon black.
E. Provide at least 2 inches of clear space between pile and pile guides and provide a maximum of 4 inches of clear space between pile and pile guide, measured when the pile is centered in the guide fastener.
F. Anchor the float system by connection to steel piling through free-sliding pile guides, designed to resist forces generated by the specified load combinations.

4.3.3 Pile Materials

A. Steel piles shall conform to ASTM A252, Grade 3, or other pipe material of similar strength.
B. Only one shop splice will be permitted in each pile length.
C. Pipe piles shall be round, spiral, or longitudinally welded.
D. Splices shall be full penetration butt weld using a 1/4-inch minimum backing ring and a single vee or single bevel groove weld.
E. Open root shop splices will be allowed if required to work with piling drilling equipment and if all provisions of AWS D1.1 are followed.
F. If the selected base metal is not listed in AWS, perform procedure qualification test under AWS D1.1 for each heat.

4.3.4 Pile Galvanizing

A. Steel piles shall be galvanized per ASTM A123. Piles too long for available galvanizing equipment may be galvanized in pieces and then spliced in the shop. Only one shop splice will be permitted in each pile length.
B. Repair all areas left uncoated after hot-dip galvanizing, areas where coating was removed for welding, galvanizing damaged by welding or handling, and field-damaged areas, including pile cut-off areas, by spray metalizing methods under ASTM A780, AWS C2.23, and C2.16. Apply 10 mils of zinc coating.

4.3.5 Cathodic Protection

Cathodic protection is required for all pile installed under this contract as described below:

A. Anodes Shall be Galvalum 3 or equal.
B. The required number and weight of anodes for pile size are listed in the conceptual drawings.
C. Weight shall be anode material not including mounting material.
D. Anodes shall be installed by an ADCI certified Diver. Wet weld to AWS D3.6 Class B standard.
E. The top of the anode or mounting plates, once installed, shall not come into contact with any part of the float, pile hoop, or other float attachments at extreme low tide.

4.4 TRANSFER BRIDGE AND DRIVE DOWN FLOAT

This element of the South Harbor rebuild includes design, fabrication, handling, transport, and installation of a Transfer Bridge, abutment, trestle pile cap, and all steel framing, metal grate decking, timber curbs, handrail, transition plate assemblies, bearing assemblies, sacrificial anodes, and any miscellaneous appurtenances and hardware, and all other related work on the Conceptual Design. The complete Transfer Bridge and the Drive Down float shall be accurately assembled and installed in accordance with approved Design-Builder Plans.

Design-Builder is responsible to ensure that all necessary means and methods are properly designed, constructed, for the loads they are intended to support.

Design-Builder shall coordinate with the Transfer Bridge and the Drive Down float fabricator(s) and all transport companies to submit a Transfer Bridge and Drive Down float fabrication, assembly, handling and installation plan for review and approval by the City. The Plan shall address fabrication sequence, assembly, and alignment of all Components, steel coating application procedures, and describe all transport and installation lifting equipment and devices and proposed transport configuration of the Transfer Bridge and Drive Dwon float. The above shall be approved, however, approval by the City shall not be relieving the Design-Builder of the responsibility for the safety of his methods or equipment and from carrying out the Work in full accordance with the Contract documents. No work shall be done before the City review and approval.

4.4.1 General Requirements

The Transfer Bridge and Float system of the facility consists the Drive Down dock, a Transfer Bridge, and a sheet pile wall abutment. The basic features of the preliminary design include:

A. An 80-foot x 110-foot Drive Down float.
B. Float restraint dolphins to permanently anchor the Drive Down float.
C. A 15’ X 125-foot-long Transfer Bridge that connects the floating dock to the uplands.
D. Fabricate and install Transfer Bridge to Drive Down dock.
E. An uplands Transfer Bridge abutment and sheet pile wall.
F. 2 cranes on Service float.
G. Sewage pump out station with a service line from the pump station to the City’s wastewater collection system main on Nicholoff Avenue. Utility drawings in Appendix D.
H. Potable water service.

I. Drive Down float shall have two electric pedestals with 110V and 220V service and three phase service.
J. Minimum of two 10-foot-wide aluminum transfer plates with steel brackets and a non-skid surface between G float and Service dock.
K. Transfer Bridge Gradient to be determined by the Design-Builder for safe operation of design vehicles.
L. Engineering judgment based on standard industry practice shall determine the Americans with Disabilities Act (ADA) requirements.
M. Transfer Bridge shall not be for primary pedestrian access to floats.

4.4.2 Structural Steel, Metal Fabrications, And Materials

This section describes the fabrication of steel items. Design, fabrication, and erection shall be under the AISC "Steel Construction Manual," 13th Edition.

A. Structural steel shapes and plates shall conform to ASTM A36. Pipe shall be ASTM A53, Grade B. Steel tubes shall meet ASTM A500, Grade B. All steel members and components shall be hot dip galvanized after fabrication under ASTM A153.
B. Steel members and connections shall be designed by the manufacturer. Steel fabrications and associated connections to the floats shall develop the full capacity of the pertinent structural member connected.
C. Minimum plate thickness shall be not less than 5/16-inch unless otherwise noted on the plans.
D. Holes in steel components shall be drilled or punched 1/16-inch larger than the connecting bolt diameter. Flame cut holes are not allowed.
E. Steel fabrication shall be performed under AISC S335. PILES?
F. Steel Shapes, Bars, and Plates: ASTM A36, A572, or A992.
G. Structural Steel Tubing: ASTM A500, Grade B or B/C.
H. Structural Steel Pipe: ASTM A53, Types E or S, Grade B, 35,000 psi minimum yield strength.
I. All welding shall be performed by certified welders under AWS D1.1.
J. Transfer Bridge Metal ramp grating shall be steel interlocking diagonal grid.
K. Steel components shall have a minimum yield strength of 50 KSI.
L. All metal components shall be hot galvanized after fabrication.
M. Manufactures shall submit complete shop drawing illustrating the entire Transfer Bridge layout, identifying all deck panel types, and dimensions, gap distance between panels, and panel/attachment anchors.

4.4.3 Design Standards

The Design-Builder's Engineer of Record shall select appropriate standards, codes, and specifications for the Transfer Bridge and A. Drive Down float shall have two electric pedestals with 110V and 220V service and three phase service. dock. The design shall also comply with the listed or most current version of the above listed Design Codes, Standards, and references.

4.4.4 Dimensional Tolerances

The following overall dimensional tolerances for Transfer Bridge shall be maintained as follows:

A. Transfer Bridge overall length: +/- 1/4-inch
B. Transfer Bridge overall width: +/- 1/8-inch

C. Transfer Bridge squareness of ends: +/- 1/8-inch
D. Transfer Bridge horizontal alignment from straight line parallel to centerline: +/- 1/2-inch

4.4.5 Coatings and Corrosion Control

A combination of coatings and corrosion protection shall be provided by the Design-Builder, so all structural elements meet the specified design life of the facility.

4.4.6 Transfer Bridge Requirements

The drive down float's access Transfer Bridge will consist of an articulating Transfer Bridge for direct vehicle access, having a minimum clear width of 15 feet and approximately 125 feet length as conceptually depicted in the Drawings. The design shall be prepared by a qualified structural engineer registered in Alaska. Overall design shall conform to International Building Code (IBC) requirements.

A. The articulating Transfer Bridge shall be fixed at the upland abutment and the lower end shall allow movement on the float surface to accommodate the changes in tidal elevations.
B. Design loads as stated previously for Section 3 Environmental Conditions and Design Loads.
C. Transition ramps shall be supplied on each end of the transfer span, designed so maximum slope on either transfer ramp is never greater than the maximum slope on the Transfer Bridge.
D. Design shall consider the maximum expected translations and rotations of the drive down/service float due to wave excitation; breasting, mooring, and all other forces to ensure adequate clearances, boundary conditions, and bearing lengths over the full range of extreme tidal excursion (ELW to EHW).
E. The surface of the Transfer Bridge shall be a heavy-duty durable non-skid surface compatible with the anti-corrosion measures and expected loads and consideration for snow removal requirements.
F. Provide guardrails on both sides of the Transfer Bridge.
G. Design-Builder's facility layout and construction plan shall be approved by the City before pile installation.

4.4.7 Drive Down Float

A. Float dimensions: 80 feet x 110 feet.
B. Drive Down float deadload freeboard, with transfer bridge installed: 36 inches
C. With a lowest astronomical tide predicted for the facility of -4 feet, the facility will be provided with a minimum depth on all sides of the floating dock to 8 feet.
D. Provide bullrail around perimeter of Drive Down Float.
E. Handrails are not required on the Drive Down Float.
F. The Drive Down Float shall not be a US registered vessel. Alternates will be considered if it meets all performance requirements.
G. Floating dock surface shall be solid, non-slip with no perforations.
H. Fabrication shop verification of shop dry-fit assembly of all ramp components.

4.5 ALUMINUM GANGWAYS

4.5.1 General

The Design-Builder must furnish and install new 7-foot x 80-foot (nominal) ADA-compliant aluminum pedestrian gangways as described herein and on the Conceptual Drawings. This Work includes the gangway structures, flooring, transition plate assemblies, hinge assemblies, shore mount assemblies, float guide assemblies, skids, tracks, and all other appurtenances and hardware.

4.5.2 Design

All final engineering and design shall be performed by a qualified gangway fabricator provided by the Design-Builder and registered as a structural engineer in the State of Alaska.

A. The harbor gangways shall be designed according to the Aluminum Design Manual with load combinations as outlined in ASCE 7-10. Loads are as specified in Section 3.Span: 80 feet minimum.
B. Clear width (interior): 6 feet, approximate or as necessary to accommodate the UTV and carts.
C. Aluminum gangway structure, including roof shall be fabricated of marine grade aluminum ASTM 6061-T6.
D. Gangways shall be complete with handrails on each side of the walking surface, a hinged connection at the upper fixed platform structure and a slide (wear) plate connection at the lower, float side end.
E. The pedestrian gangways shall support a uniform live load of at least 90 PSF with a maximum deflection at mid-span less than L/360 where “L” is length of gangway in inches. Connections and bearing points shall be able to withstand the full live load and dead load.
F. The load end connection shall be able to withstand a concentrated lateral force equal to at least 20 % of the total dead load plus 50 % of the full live load.
G. Connection: The gangway shall have an articulated end connection at the fixed concrete platform to allow unrestricted vertical movement at its lower (pier) end. Pier bearing end shall have rollers of adequate bearing area. A hinged apron plate shall be provided at the lower end to assure a safe uniform transition between gangway and pier deck surface.
H. Hardware and mounting assemblies and other components may require steel. All steel shall be hot-dip galvanized and isolated from aluminum materials using UHMW or other approved non-conductive material to prevent bi-metallic corrosion.
I. Continuous aluminum railing (top cap) on each side at least 3 feet 6 inches high and no more than 3 feet 9 inches high.
J. Handrails shall have an outside diameter between 1-1/2 and 2 inches.
K. Handrails shall withstand a uniform horizontal load of 20 lbs./lf applied at the top rail and a separate 200 lb concentrated load applied in any direction. Rails need not be designed for the two load conditions applied concurrently.
L. Floor Decking: fiberglass grating shall be high strength, pultruded, ADA-compliant with extra course and durable grit surface.
M. Transition plates shall also be provided on each end of the gangway, to span the gap between the gangway ramp and the upper and lower deck landings.
N. Guides and transition plates shall support the design loads so as not to ensure a smooth transition from gangway to the float. Variance in adjacent plate thickness should not exceed 1/16-inch.

O. Transition plate material: extra course, non-slip grit surface such as Safplate or approved equal.
P. The load end connection shall be able to withstand a concentrated lateral force equal to at least 20 % of the total dead load plus 50 % of the full live loads.
Q. Secure gangway landing tracks or skids to the landing float in such a manner that the gangway skids are approximately in the center of the landing tracks at mid-tide level. Field verify the location of the tracks on the float to ensure that the landing assembly can move freely and to ensure that the gangway is aligned properly on the landing float tracks such that the tracks span the full length of the gangway's movement throughout extreme tide cycles without coming off either end of the track.
R. Verify final location for guide assembly at bottom of gangway through several extreme tide cycles before final securing the tracks to the float.
S. Following complete installation of gangway, lubricate gangway skids with City approved, graphite-based lubricant.

4.6 POTABLE WATER SYSTEM

4.6.1 General

Provide potable seasonal water (April 15th through October 1) for all moorage floats. The Drive Down Float shall be provided with all-season potable water service via insulated and heat traced systems.

A. Replace existing underground vaults with heated insulated housing that provides minimum 3-inch potable water valve, meter and backflow preventers at each gangway.
B. Minimum HDPE water supply line to the floats and winter drain down valves.
C. Waterlines shall have flushing, draining, and flushing valves at the midpoint to allow for dewatering the system during winter.
D. Double 3/4-inch hose bibs riser at every four stalls inboard side of float only; final locations at every other slip to be approved.
E. Water risers shall be separate from electrical power pedestals.
F. Provide guards to protect from damage by vessel impacts.
G. Use HDPE SDR 11 pipe with heat fused joints to the fullest extent possible, or otherwise approved by ADEC for the water test pressures required.
H. Use corrosion resistant materials suitable for saltwater marine environment for valves fittings fasteners supports and other components.
I. Flexible water main supply hose shall have a minimum rated working pressure of 250 psi. It shall have an abrasion resistant cover that provides protection from UV deterioration and oil. Potable water supply hose shall be an NSF approved hose for use in potable water applications, or ADEC approval as an exception. Continental Vintner Food Hose has been approved in other projects.
    1. Hoses shall be equipped with threaded or flanged connections compatible with the pipe connections. Hose end connections shall be one of the following, or equal:
        a) PT Coupling Pro Grip C50 External Crimp System with PT C50HD Heavy Duty Ferrules.
        b) 316 SS pull mandrel internal expansion body with 316 SS pull mandrel ferrule.
        c) Nipples, ferrules, and all other associated steel hardware shall be constructed entirely of 316 SS.
    2. Manufacturer shall pressure test the flex hose with connections attached. Submit proof of testing prior to delivery.

3. Tape Coat: Provide tape coat for all swaged ferrule fittings. A 65-mil cold applied coating designed to provide protection against corrosion and electrolysis in accordance with NACE SP0109 (Cold-Applied Laminate Polymeric Tapes) and American Water Works Association (AWWA) C209 (Type II).

J. Provide ANSI/NSF 61 approved components to the fullest extent possible. Exceptions from ADEC for non NSF61 materials will be the responsibility of the Design-Builder.
K. Provide 1 all-season, insulated, and heat traced water service on the drive down float.
L. Commission water line in accordance with the ADEC permit.

4.7 FIRE SUPPRESSION SYSTEM

4.7.1 General

A Fire suppression system is required. The International Fire Code (IFC) and the National Fire Protection Association (NFPA) Fire code guide the requirements for the fire suppression systems for marinas and are the Projects compliance documents.

The Design-Builder shall coordinate with the City and the State Fire Marshal for a Fire, Life, and Safety Certificate, throughout the design phase to ensure compliance.

A. Class 1 (dry) Standpipe with the ability to flow at least 300 GPM. Fire hydrant locations are shown in Appendix H.
B. Risers with 1 ¾ inch hose connections, no further than every 100 feet on all main and headwalk floats and the drive down float.
C. Primary connection point shall be 4-inch Storz connections.
D. Provide a charging station near the top of each gangway and near the top of the Transfer Bridge.
E. Valves shall be hydrostatically rated for 300 psi, with a rising stem pattern and fixed handwheel operating nut. The outlet threads shall conform to NFPA #194 for national standard fire hose coupling screw threads.
F. Use corrosion resistant materials suitable for saltwater marine environment for valves fittings fasteners supports and other components.
G. If the fire system distribution piping is above water, it shall be constructed of corrosion resistant metallic piping. HDPE piping is not allowed above water to ensure the system maintains its integrity during a fire.
H. If the fire system piping is below water, it may be constructed of fused HDPE piping.
I. Flexible fire main supply hose shall have a minimum rated working pressure of 250 psi. It shall have an abrasion resistant cover that provides protection from UV deterioration and oil. Fire system flex hose may be Plicord Super Black Flexwing or approved equal.
J. Flex hose fitting as described in potable water section above.
K. Any above water flexible hose connection used in the dry standpipe fire system shall have a fire protection sleeve rated as follows:
    1. Continuous exposure 500-degree F
    2. 15-minute exposure 2000-degree F
    3. Momentary exposure to molten metals up to 3000 degrees F
L. Provide placards and signage to identify fire protection systems valves, clearly distinguishable from potable water valves.

4.8 ELECTRICAL

4.8.1 General

Provide an electrical system including power for shore-tie pedestals, sewer pump-out stations, dock cranes, and lighting. Electrical design shall be performed by an Electrical Engineer registered in the State of Alaska and in accordance with the following codes and standards:

- Alaska Administrative Code, AAC
- NFPA 70, National Electrical Code
- NFPA 303, Fire Protection Standard for Marinas and Boatyards
- Illuminating Engineers Society of North America, IESNA

4.8.2 Service

Provide service equipment for the harbor located in the uplands near to the top of Gangway & Drive-down Ramp G and Gangway K.

A. 208Y/120 volts, three phase, four wire.
B. Padmount NEMA 3R/4X enclosure, 316 stainless steel with stainless steel fasteners and hardware.
C. Utility meter with current transformer compartment. Meter by Cordova Electric.
D. Customer digital meter reading voltages, currents, and power (KW, KVA, KVAR, & Power Factor); and recording energy (KWH).
E. Main service circuit breaker.
F. Ground current relay with alarm and trip functions. Trip the main circuit breaker with excessive ground currents.
G. Space heater and thermostat.
H. Datum Plane Placard noting High-High Water level and code required electrical terminal elevations on the approach docks and floating docks.
I. Separate service with meter and main circuit breaker in the uplands near the top of Ramp G for the dock crane.
J. Short circuit, arc fault current, and coordination calculations and analyses.

4.8.3 Distribution

Provide distribution panels on the floating docks with circuit breakers protecting the feeders to the shore-tie pedestals and lighting.

A. Deck mounted NEMA 3R/4X enclosure, 316 stainless steel with stainless steel fasteners and hardware. Mount on UHMW spacers and fasten to the deck.
B. 208Y/120 volts, three phase, four wire.
C. Main Distribution Panels (MDP's) rated for their loads with extra capacity to include four each, single sided, 100 ampere pedestals per RFP Section 3.6 B.
D. The MDP section feeder circuit breakers internally circuited to a separate section with terminal blocks for the cables installed within the floating docks to the shore-tie pedestals and lighting.
E. Seawater ground electrode at each MDP utilizing stainless steel rods.
F. Type W cables routed within the floats to the shore-tie pedestals and luminaires.

G. Lighting Control panel with "Hand-Off-Auto" controls and photoelectric sensor.
H. Ground current relay with alarm and trip functions for each feeder.
I. Space heater and thermostat.
J. Short circuit, arc fault current, and coordination calculations and analyses.

4.8.4 Shore-Tie Pedestals

Provide shore-tie pedestals with features as follows:

A. Deck mounted NEMA 3R/4X enclosure, 316 stainless steel with stainless steel fasteners and hardware. Powder coat paint. Mount on UHMW spacers and fasten to the deck. Locate between stall floats on each side of the finger floats in accordance to the Project Drawings. Space for "side-tie" mooring along the main and finger floats in accordance with maximum boat lengths established by the Harbormaster.
B. 208Y/120 volts, three phase, four wire; and single phase, three wire with three phase feeder terminals.
C. Loop feed terminals in the base.
D. Predominantly duplex style with a utility meter, circuit breakers, and receptacles assigned to each side of the pedestal.
E. Utility meter base: 5 jaw for single phase pedestals and 7 jaw for three phase pedestals as required by Cordova Electric Cooperative. Meters by Cordova Electric Cooperative.
F. 30 ma ground fault protection for each receptacle.
G. Seawater ground electrodes to specific pedestals at approximately 200-foot intervals along the floating docks.
H. Protective hinged covers over all circuit breakers and receptacles while inactive and active for weather protection.
I. One 30 ampere, 120 volt, NEMA L5-30R marine grade receptacles in all pedestal shore-tie compartments.
J. One 50 ampere, 208/120 volt, single phase, NEMA SS2-50R receptacle in select pedestal shore-tie compartments per the table below.

Drive Down Float	2 each duplex 30A and 50A
32 ft Slips	All duplex 30A
40 ft Slips	All duplex 30A and 50A
50 ft Slips	All duplex 30A and 50A
60 ft Slips	All duplex 30A and 50A

4.8.5 Lighting

Provide luminaires atop select shore-tie pedestals on the floating docks as needed for the specified amount of illumination. Provide pole mounted luminaires on the uplands illuminating the parking areas, pedestrian pathways, transient float, approach docks, gangways, drive-down ramp, and drive-down float. Provide luminaires on the gangways and drive-down ramps.

A. Housings with low copper content cast aluminum IP66 with powder coat paint.
B. Illumination Levels: 3 footcandles average, or better with a 3:1 average to minimum uniformity ratio.
C. Wind Rating: AASHTO LTS6 compliant per Cordova conditions.
D. Bird Wires: On top of all exposed luminaires, brackets, and poles.
E. Uplands: Pole mounted with distribution type as required for optimal area illumination at the approach docks and along the parking and pedestrian areas.
F. Gangways: Linear type mounted near the canopy peak with anodized extruded aluminum body. (Non-marine grade acceptable).
G. Drive down Ramp: LED Globe type mounted to rail.
H. Floats: Pedestal mounted bollard style with 180 degree photometric distribution.
I. Controls: Photoelectric cells and contactors with Manual-Off-Auto selector switch.
J. Poles: Hot-dipped galvanized steel.
K. Photometric calculations and models.

4.8.6 Materials

A. Conduits and Boxes: Fiberglass conduit & stainless steel (316) NEMA 4X boxes.
B. Conductors and Cables: Stranded copper conductors. Single conductors with XHHW-2 insulation in the uplands and within enclosures. Type W cables on the gangways, ramp, and within the floating docks.
C. Hardware: Stainless steel and hot-dipped galvanized steel.

4.9 SAFETY FEATURES

4.9.1 General

As needed, provide and install life rings, fire extinguishers enclosed in cabinets, signage, and egress ladders on main walks floats and shown in the maps in Appendix D.

4.9.2 Safety System Components

Provide safety system systems for the floating docks. Features shall include:

A. Fire extinguishers and cabinets
   1. Portable fire extinguishers shall conform to Type 2A, 20-B:C, 20 lb capacity. Each fire extinguisher will be installed in an approved fiberglass or metal cabinet that is clearly marked, designed, and equipped for emergency access as further noted below. Fire extinguisher cabinets will be Cheyenne Manufacturing or equal. Cabinets shall be weather tight, red in color, and marked “Fire Extinguisher”.
   2. Provide fire extinguishers at intervals no further than 150 feet apart throughout the new floating dock system. Provide 1 fire extinguisher near the bottom of each gangway or Transfer Bridge.
B. Life Rings
   1. Life ring safety equipment shall consist of a United States Coast Guard (USCG) approved buoyant throw ring connected to a polypropylene rope. Life rings shall be 30 inches in diameter and orange in color. Rope shall be 100 feet long, 5/16-inch thick and yellow in color. Enclosures shall be weather tight, fiberglass materials as manufactured by Cheyenne

Manufacturing, or as otherwise approved by the Engineer. Cabinets shall be yellow in color and marked “Life Ring”.

2. Provide life rings at intervals no further than 150 feet apart throughout the new floating dock system. Provide 1 life ring near the bottom of each gangway or Transfer Bridge.

C. Safety ladders

Furnish and install ladders as follows:

1. Retractable self-rescue ladders shall be Model SW 1448 “Up-N-Out” marina safety ladders or approved equal on the moorage system
2. 2 Fabricated steel emergency ladders on drive float as shown Plans

4.10 BULKHEAD

4.10.1 General

Design-Builder shall design and install a bulkhead wall to be at the toe of the existing silt barrier (breakwater) wall along the south shore of Cordova Harbor. The City desires a minimal bulkhead that will provide at least 80 parking spaces, a walkway, and an area for the Existing Fisherman’s memorial. This is shown in the conceptual Drawings.

The Design-Builder will submit a completed design and construction phasing plan for the supplemental full Bulkhead option. The construction of the bulkhead is a separate price tabulation and is required as part of the proposal packet.

The bulkhead will incorporate these components:

A. A retaining wall at the toe of the existing United States Army Core of Engineers (USACE) harbor retention wall, as shown in Concept drawings/plans.
B. Provide utility relocates as required.
C. The design and installation of the bulkhead shall include drainage for surface water.
D. Maintain/preserve the existing Fisherman’s Memorial.
E. Provide cathodic protection for all steel elements of the bulkhead, including both galvanized or other coatings and anodes, as needed to provide the intended service life.
F. Accompanying uplands developments include additional parking, walkways, handrails, and other required features shown on the Drawings or required by design standards and codes.
G. The new wall system is to support the 20-foot wide paved wide design vehicle access to the drive down float.
H. A Transfer Bridge abutment must be included in the bulkhead.
I. Include a 200 PSF live load in the bulkhead wall and backfill design.
J. The bulkhead may consist of interlocking steel sheet piling, combi-piling, pipe piling, or similar steel members.
K. Alternate methods of bulkhead design may be proposed and will be accepted only if deemed suitable by the Owner.
L. The bulkhead surfacing shall be gravel fill or asphalt and include a 6-foot walkway (asphalt concrete).

M. Suitable backfill will be required to bring the surface elevation behind the bulkhead to +/- 22 feet the approximate elevation of Nicholoff Avenue, with consideration for drainage.
N. Refer to geophysical report for the South Harbor is in Appendix J
O. The Geotechnical study is underway and will be provided to the selected Design-Builder or as an addendum if available timely. Tentative Final report Date is October 31, 2022
P. The Design Builder will prepare a plan to accommodate queuing and turning of vehicles accessing the Transfer Bridge for review and approval at 35% and 65% Design.

4.10.2 Base Bid Bulkhead

The Minimum bulkhead will include the above and:

A. The East gangway access to the harbor moorage float system
B. Extend West to accommodate the Fisherman's Memorial, parking to accommodate 80 vehicles and separated from traffic on Nicholoff Way
C. A 6-foot-wide walking path that shall include pedestrian safety measures, including lighting, parking signage, and vehicular/pedestrian separation. The walkway shall be on the uplands and extend to the Breakwater Trail and Veteran's memorial
D. Parking area and walking surface shall be gravel fill or paved.

4.10.3 Supplemental Bulkhead

The Supplemental Bulkhead will include the above and

A. The full supplemental Bulkhead option will include dredging and O float (Transient Float), Two 6-foot x 80-foot gangways, and gangway landing floats for access to the transient float at the east and west ends of the "O" float.
B. Refer to Preliminary Lateral Pile Analysis Table is provided in Appendix D. This table is based on 2004 geotechnical from the North Harbor. The Geotechnical study is underway and will be provided to the selected Design-Builder or as an addendum if available timely.
C. Parking area shall run the length of the bulkhead and be enclosed to separate traffic on Nicholoff Avenue.
D. Parking area surfacing shall be gravel fill or paved.
E. A 6-foot-wide walking path shall include pedestrian safety measures, such as lighting, parking signage, and vehicular/pedestrian separation. To be reviewed at the 35% design phase.

4.10.4 Dredging

Dredging is required for the full bulkhead supplemental option.

A. Dredging to a minimum depth of -10' elevation, will allow for the installation and use of the "O" float shown on the conceptual Drawings.
B. Dredge spoils dewatering and storage space will be provided by the City of Cordova adjacent to the South Harbor See Appendix D.
C. Dredge spoils (if suitable) may be used as fill.
D. The City will sample for contaminated soils during the geotechnical investigation. The Geotechnical study is underway and will be provided to the selected Design-Builder or as an addendum if available timely. The price of the supplemental bulkhead should assume no contaminated soil.

4.10.5 Section 408 Permit

The Design-Builder shall secure a USACE Section 408 permit for any/all activities that potentially impact the USACE revetment. The City will support Design Builder permitting efforts.

5 SUBMITTALS

5.1 Design Submittals

Submit the following as an electronic copy of design drawings 3 days before scheduled reviews at 35%, 65% and 95% phases of design development.

A. Basis of Design document summarizing all features codes and standards Design Criteria drawings and calculations
B. Payment and performance bond forms are in Appendix A Proposal Forms. When the successful Proposer delivers the fully executed agreement to the City, it shall be accompanied by such bonds
C. Drawings and calculations prepared under the direction of an engineer licensed in the State of Alaska
D. Design Quality Control plan
E. Work plan and schedule
F. Construction Cost estimate
G. Section 408 Permit application and materials for submittal to USACE
H. ADEC potable water system construction approval
I. Provide design drawings for the proposed Work including plan view of the harbor layout, elevations, and sections typical float (i.e., Main floats and finger floats), and connection details sealed by an engineer registered in the State of Alaska
J. Final calculations and drawings at 95% for all project components shall be sealed and prepared under the direction of an engineer licensed in the State of Alaska
K. After City review of 95% submittal prepare 100% Issued for Construction (IFC) documents

5.2 Fabrication Procurement and Construction Submittals

Prior to fabrication or procurement Design-Builder shall submit for City review:

A. Basis of Design (BOD)
    1. Design criteria
    2. Summary of features that will enable the float system to operate in the conditions present in the Cordova Harbor
    3. Float system and pile design verification
    4. Buoyancy calculations showing that the various freeboard requirements will be met
B. Pile driving plan to include pile size location and spacing
C. “Simple bridge" AISC certification for the Transfer Bridge
D. Quality control plans proposed for use during fabrication
E. Fabrication Shop Drawings:
    1. Transfer Bridge and Abutment
    2. Drive Down Ramp Float

3. Gangways
    i. Fiberglass gratings
4. Trestles
5. All different type of float module
6. Misc. Steel fabrications
7. Bulkhead
8. Anodes

F. Assembly and handling plans for off-site fabricated assemblies
1. Plans shall address fabrication sequence and schedule
2. Assembly and alignment of components
3. Coating application procedures
4. Written instruction and diagrams indicating acceptable lifting, stacking and storage procedures for all floats
5. A lifting, transport, and installation equipment and devices

Certifications and manufacture cutsheets shall be included with submittals:

A. Manufacturer's published literature for Metal Grating Deck product
B. Welding Procedures and Welder Certifications
C. Piling mill test and material certificates
D. Checklist of conformance for all floats produced
E. Timber Grading and Pressure treatment Certificates
F. Manufacturers published literature for project materials:
1. Metal and fiberglass grating products
2. Rubber bearing pads
3. Ultra-High Molecular Weight (UHMW) products
4. Anodes
5. Substitute Materials, if any

G. Certificate of conformity with the Design Codes, Standards, and references noted in the introduction Section 2.0 of these performance requirements
H. Certification for all fabricated steel shall conform to the Contract Documents
I. Certificate of conformity for Anodes Chemical composition
J. A Final Schedule of Values for the purpose of processing progress payments shall be submitted for approval by the City within 30 calendar days of the Notice to Proceed. The City recognizes significant costs may be associated with material procurements which are in advance of installation; Material on Hand payment requests may be approved when accompanied by acceptable documentation

5.3 Calculations

Submit the following calculations with each design 35%, 65%, and 95%:

A. All engineering and calculations shall be completed in conformance with contract documents and the Loads specified in Sections 3 and 5.
B. All calculations shall bear the seal of a Registered Professional Engineer licensed in Alaska.

5.4 Close out

Before final acceptance of the Work, the Design-Builder shall submit:

A. Operation and Maintenance Manual: provide 3 bound copies and 1 electronic copy (PDF) of all maintenance manuals, which shall include approved shop drawings, maintenance Schedule and data, parts lists, cut sheets.
B. Provide a copy of the 5-year warranty on materials and workmanship of the float system.
C. Provide a copy of the 10-year warranty on the core floats. Polyethylene shell and polystyrene core float, concrete float or steel pipe float.
D. Shop drawings, material certification and product data sheets conforming to the Standards, requirements, and codes in Section 2.
E. As-built drawing from the Engineer of Record developed from contractors redlines provided in AutoCAD and PDF.

5.5 SEWER PUMP-OUT STATION

5.5.1 General

Provide a KECO Model 900D: Peristaltic “Dockside” Pumping System. 50+ Gallons Per Minute (GPM) or City approved equal. Distribution piping shall be HDPE SDR 9 or otherwise rated for the system operating and testing pressures and approved by ADEC.

A. Use corrosion resistant materials suitable for saltwater marine environment for valves fittings fasteners supports and other components.
B. Flexible sewer main supply hose shall have a minimum rated working pressure of 250 psi. It shall have an abrasion resistant cover that provides protection from UV deterioration and oil. Sewer system flex hose may be Plicord Super Black Flexwing, or approved equal.
C. Flex hose fitting as described in potable water section above.
D. Provide placards and signage to identify sewer pumpout systems components.

Appendix G

1. **South Harbor Conceptual Drawings**
2. **Extinguishers 911 phones, & Ladders locations**
3. **Preliminary P6 Schedule**

South Harbor Conceptual Drawings

CITY OF CORDOVA SOUTH HARBOR REBUILD - CONCEPTUAL DRAWINGS

CORDOVA, ALASKA

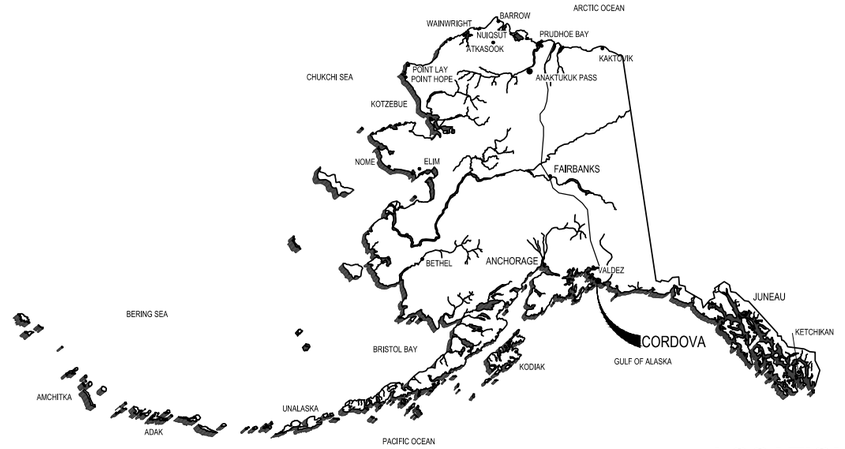
SEPTEMBER 2022

SAMANTHA GREENWOOD
PUBLIC WORKS DIRECTOR

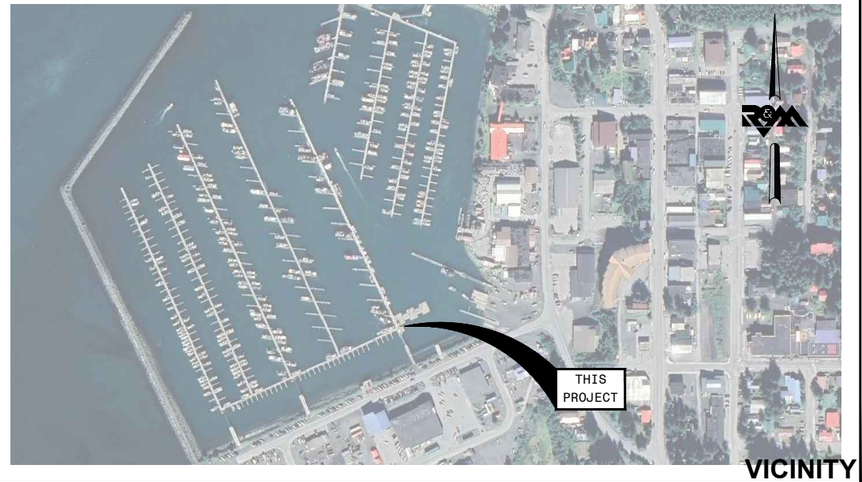
TONY SCHINELLA
HARBORMASTER

Designed By:

R&M CONSULTANTS, INC.
9101 Vanguard Drive
Anchorage, Alaska 99507
rmconsult.com• email@rmconsult.com
phone: 907.522.1707 • fax: 907.522.3403
CORPORATE AUTHORIZATION NUMBER: AECC111

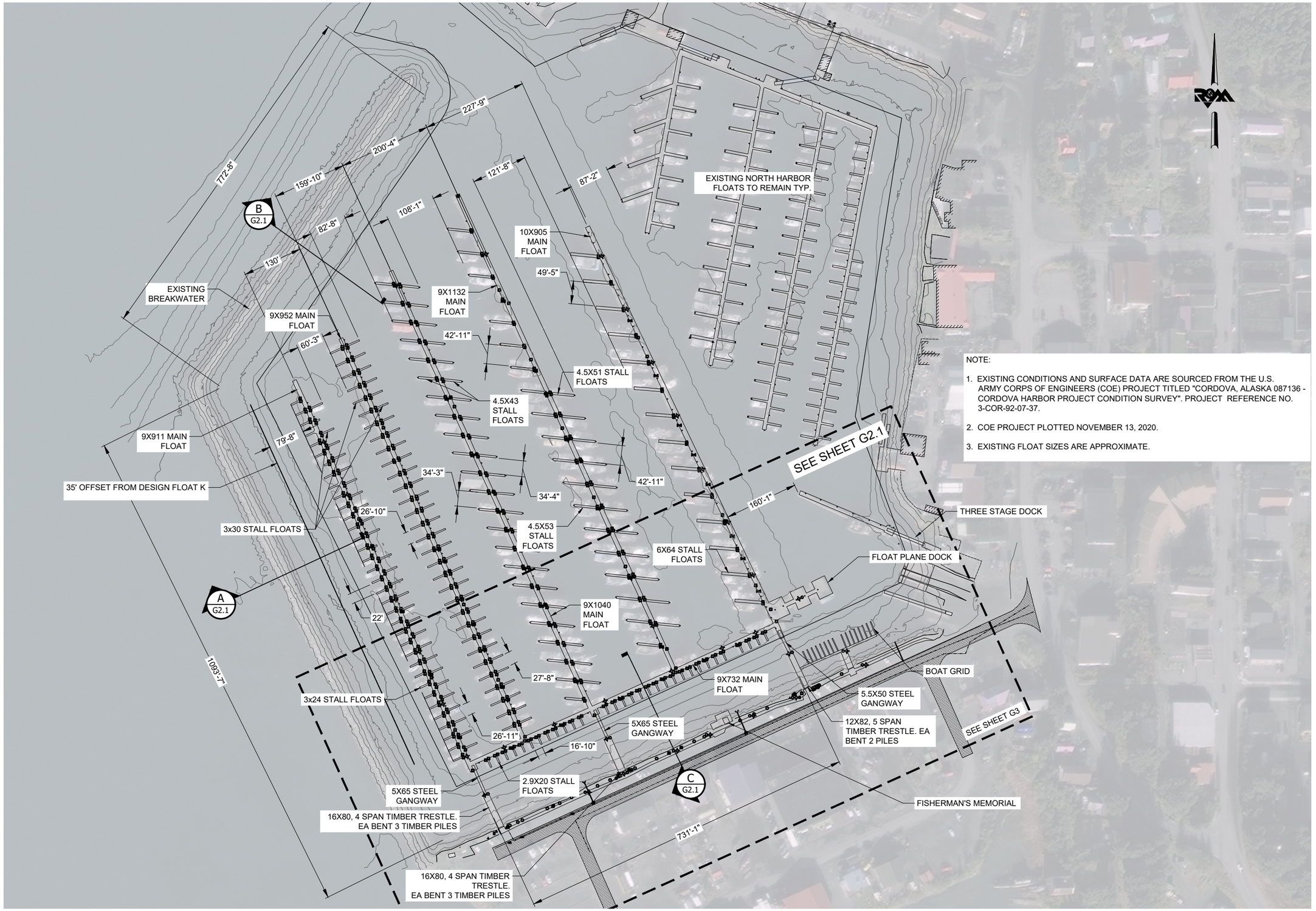


LOCATION



VICINITY

INDEX OF DRAWINGS



NOTE:

1. EXISTING CONDITIONS AND SURFACE DATA ARE SOURCED FROM THE U.S. ARMY CORPS OF ENGINEERS (COE) PROJECT TITLED "CORDOVA, ALASKA 087136 - CORDOVA HARBOR PROJECT CONDITION SURVEY". PROJECT REFERENCE NO. 3-COR-92-07-37.
2. COE PROJECT PLOTTED NOVEMBER 13, 2020.
3. EXISTING FLOAT SIZES ARE APPROXIMATE.

EXISTING SITE PLAN

Scale: 1" = 100'

R&M CONSULTANTS, INC.
9101 Vanguard Drive
Anchorage, Alaska 99507
rmconsult.com• email@rmconsult.com
phone: 907.522.1707 • fax: 907.522.3403
CORPORATE AUTHORIZATION NUMBER AECC111

Cordova South Harbor Rebuild
Cordova, Alaska

No.	Description	Date

Drawn By: RG | Checked By: DP/KN

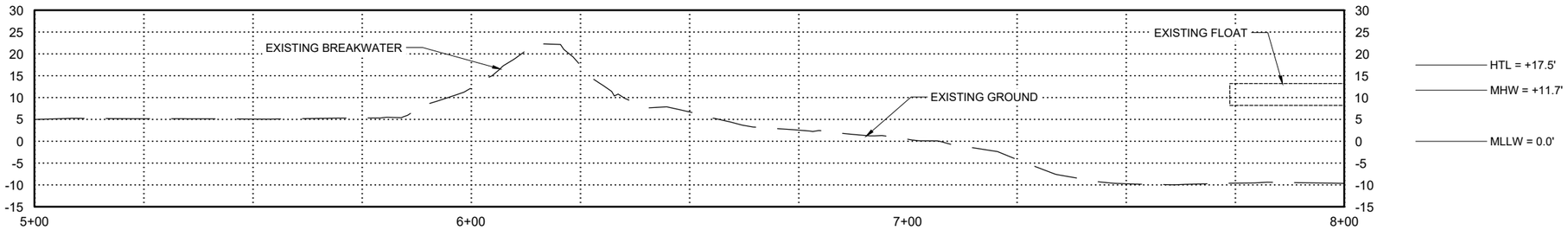
Date: SEPTEMBER 22, 2022

Phase: CONCEPT PLANS

Project No: 2957.01

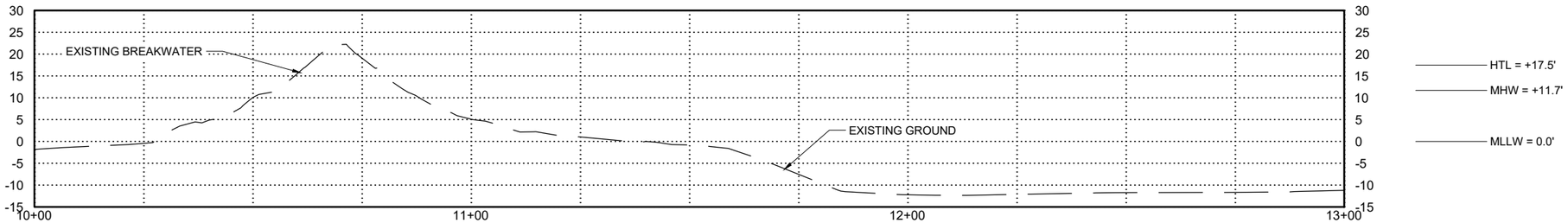
SHEET TITLE: EXISTING SITE PLAN

SHEET NO: **G2**



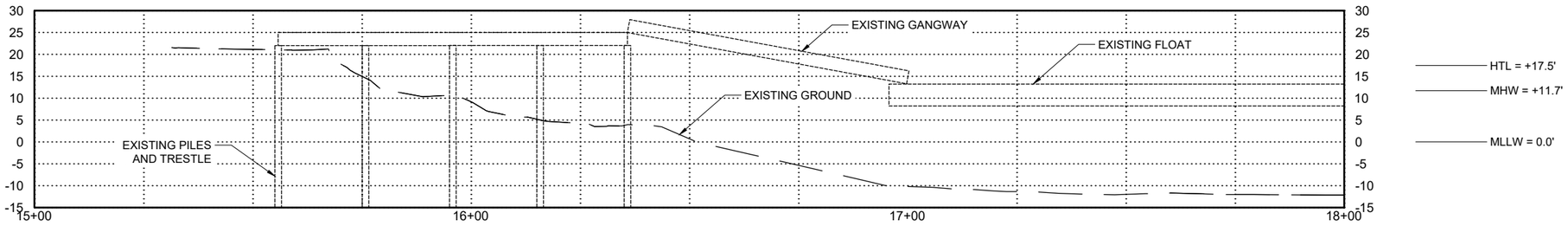
A WEST SECTION

Scale: 1" = 15'



B NORTH SECTION

Scale: 1" = 15'



C UPLANDS SECTION

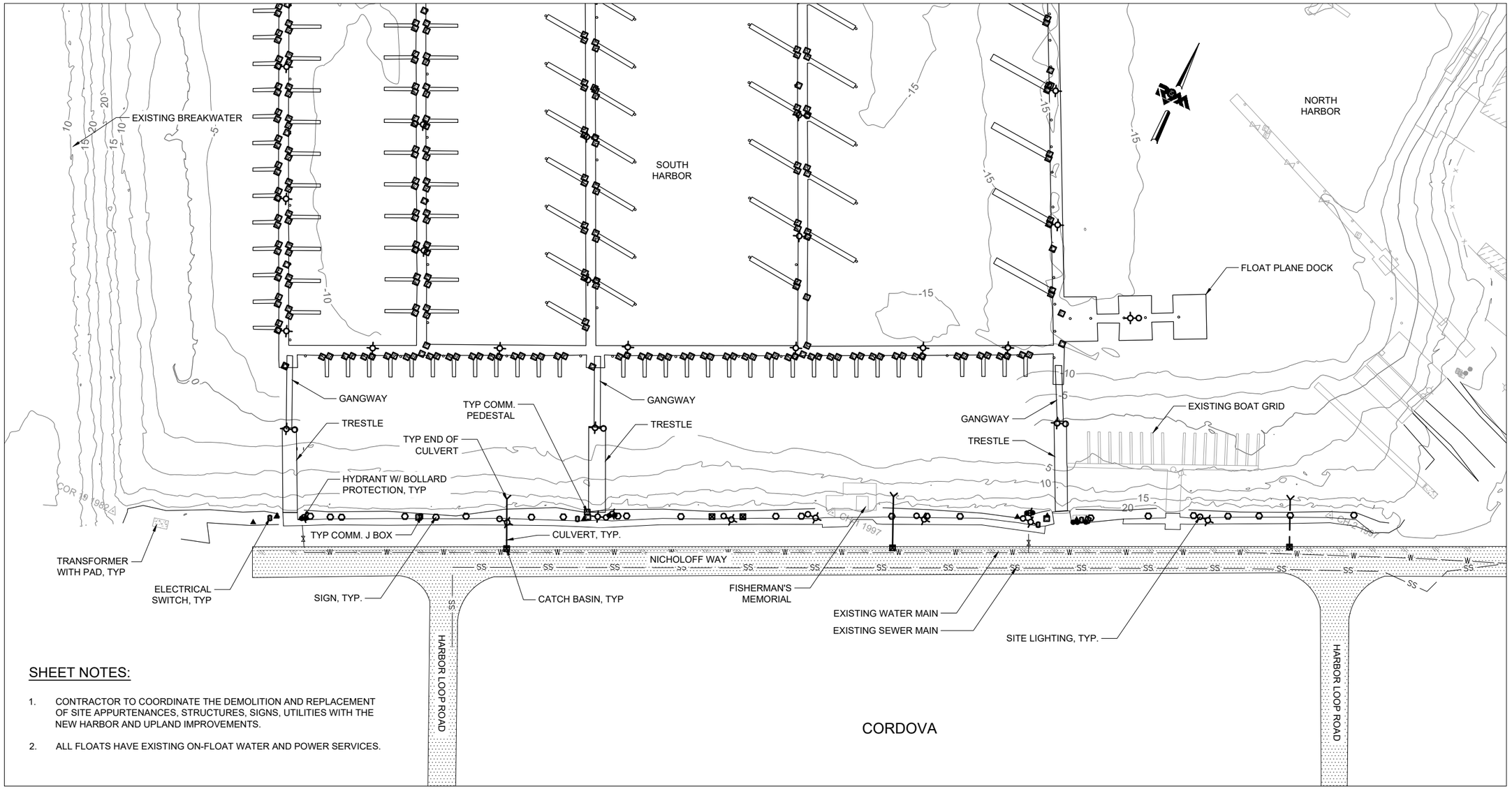
Scale: 1" = 15'

R&M CONSULTANTS, INC.
9101 Vanguard Drive
Anchorage, Alaska 99507
rmconsult.com• email@rmconsult.com
phone: 907.522.1707 • fax: 907.522.3403
CORPORATE AUTHORIZATION NUMBER AECC111

Cordova South Harbor Rebuild
Cordova, Alaska

No.	Description	Date

Drawn By: RG
Checked By: DP/KN
Date: SEPTEMBER 22, 2022
Phase: CONCEPT PLANS
Project No: 2957.01
SHEET TITLE: EXISTING SECTIONS
SHEET NO: G2.1



SHEET NOTES:

1. CONTRACTOR TO COORDINATE THE DEMOLITION AND REPLACEMENT OF SITE APPURTENANCES, STRUCTURES, SIGNS, UTILITIES WITH THE NEW HARBOR AND UPLAND IMPROVEMENTS.
2. ALL FLOATS HAVE EXISTING ON-FLOAT WATER AND POWER SERVICES.

EXISTING UPLANDS UTILITIES

Scale: 1" = 50'

EXISTING SYMBOL LEGEND

- ELECTRICAL PEDESTAL
- COMM J-BOX
- VALVE
- SIGNAGE
- LUMINARY
- HYDRANT
- STORM CULVERT
- STORM INLET

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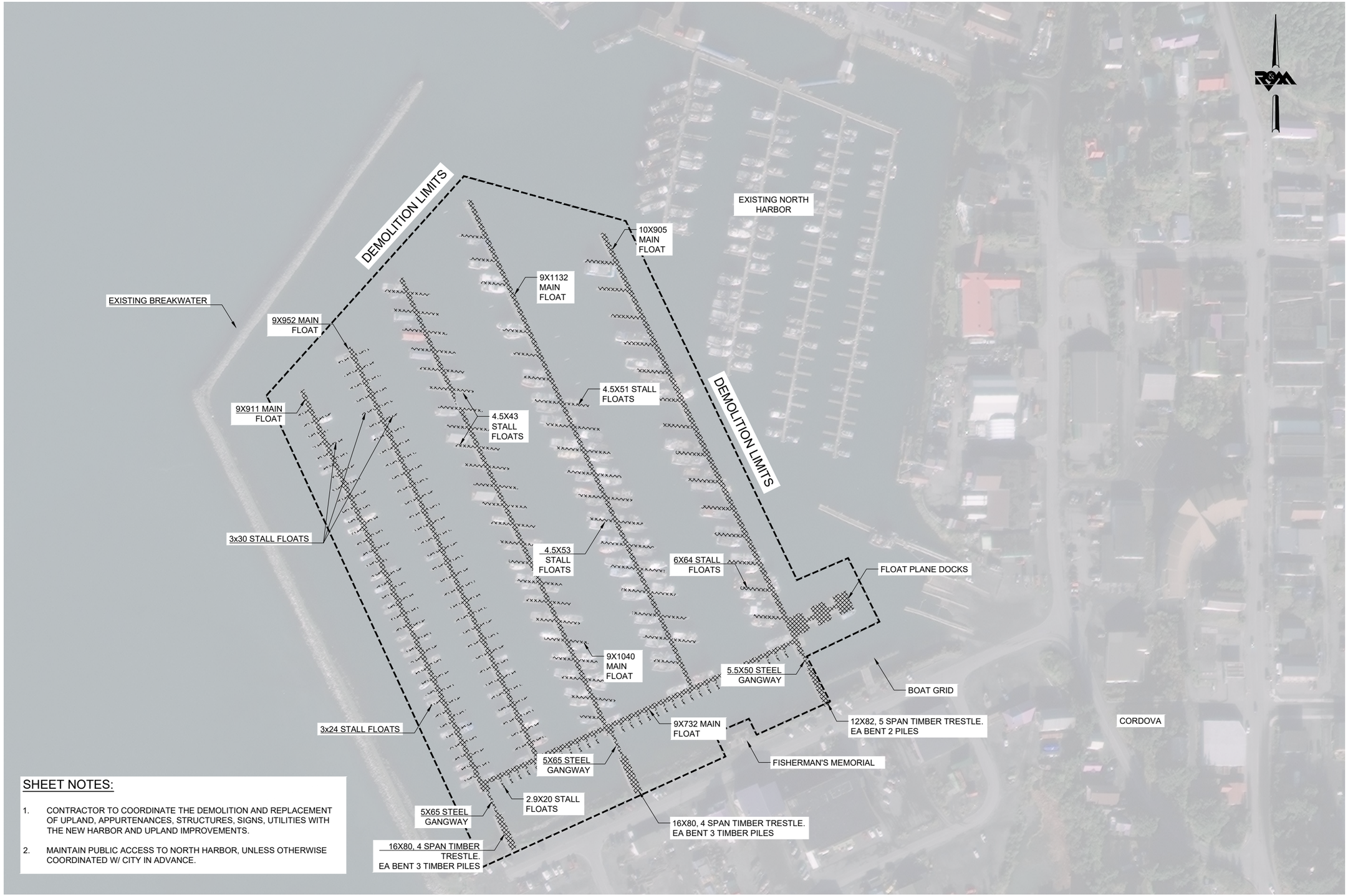
CORPORATE AUTHORIZATION NUMBER AECC111

Cordova South Harbor Rebuild
Cordova, Alaska

No.	Description	Date

Drawn By: RG
Checked By: DP/KN
Date: SEPTEMBER 22, 2022
Phase: CONCEPT PLANS
Project No: 2957.01
SHEET TITLE: EXISTING UPLAND UTILITIES
SHEET NO: **G3**



SHEET NOTES:

1. CONTRACTOR TO COORDINATE THE DEMOLITION AND REPLACEMENT OF UPLAND, APPURTENANCES, STRUCTURES, SIGNS, UTILITIES WITH THE NEW HARBOR AND UPLAND IMPROVEMENTS.
2. MAINTAIN PUBLIC ACCESS TO NORTH HARBOR, UNLESS OTHERWISE COORDINATED W/ CITY IN ADVANCE.

DEMOLITION PLAN

Scale: 1" = 100'

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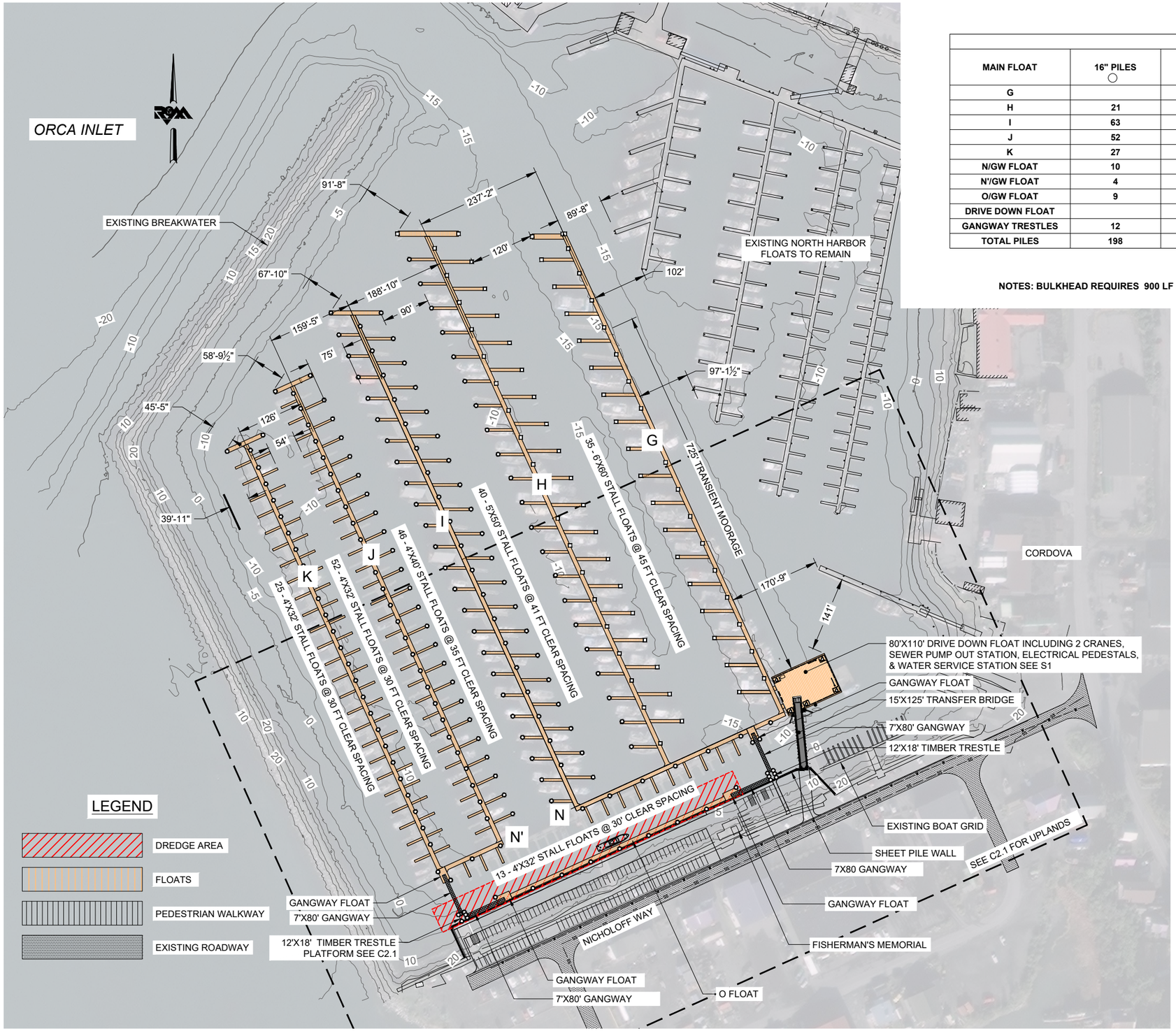
Cordova South Harbor Rebuild
Cordova, Alaska

No.	Description	Date

Drawn By: RG
Checked By: DP/KN
Date: SEPTEMBER 22, 2022
Phase: CONCEPT PLANS
Project No: 2957.01
SHEET TITLE: DEMOLITION PLAN
SHEET NO: G4



PROPOSED HARBOR LAYOUT OVERLAY FULL BULKHEAD

Scale: 1" = 100'

PILES BY FEATURE					
MAIN FLOAT	16" PILES ○	18" PILES □	24" PILES ▲	36" PILES △	TOTAL PILES
G		37			37
H	21	39			60
I	63				63
J	52				52
K	27				27
N/GW FLOAT	10				10
N'/GW FLOAT	4				4
O/GW FLOAT	9				9
DRIVE DOWN FLOAT			4	7	11
GANGWAY TRESTLES	12				12
TOTAL PILES	198	76	4	7	285

NOTES: BULKHEAD REQUIRES 900 LF OF SHEET PILE WALL.

MOORING SUMMARY	
STALL SIZE	TOTAL SLIPS
4' X 32'	189
4' X 40'	96
5' X 50'	86
6' X 60'	76
TOTAL	447

NOTES:

1. 725 LF OF SIDE TIE MOORAGE AVAILABLE ON THE EAST FACE OF G FLOAT.

2. 440 LF ADDITIONAL MOORAGE ON O FLOAT

FLOAT SUMMARY	
FLOAT	FLOAT SIZE
G MAIN	8' X 935'
H MAIN	8' X 1125'
I MAIN	8' X 1030'
J MAIN	8' X 930'
K MAIN	8' X 885'
N MAIN	8' X 395'
N' MAIN	8' X 225'
O MAIN	8' X440'
G END	8' X 60'
H END	8' X 114'
I END	8' X 95'
J END	8' X 80'
K END	8' X 72'
GANGWAY FLOATS 4 EA.	15' X 28'
DRIVE DOWN FLOAT	80' X 110'

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Cordova South Harbor Rebuild
Cordova, Alaska

No.	Description	Date

Drawn By: RG | Checked By: DP/KN

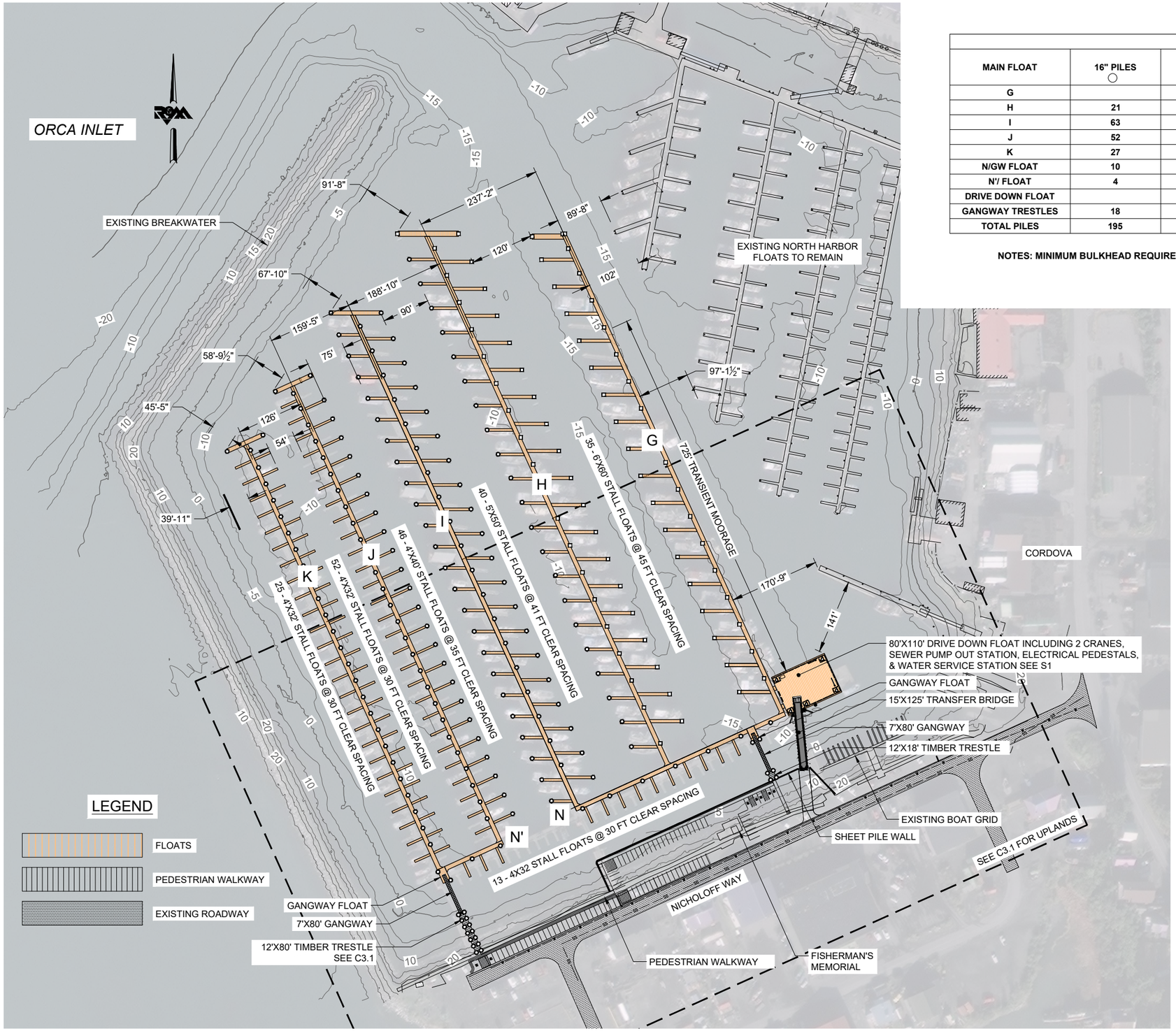
Date: SEPTEMBER 22, 2022

Phase: CONCEPT PLANS

Project No: 2957.01

SHEET TITLE: PROPOSED HARBOR LAYOUT FULL BULKHEAD

SHEET NO: **C1.1**



PROPOSED HARBOR LAYOUT OVERLAY MINIMAL BULKHEAD

Scale: 1" = 100'

PILES BY FEATURE					
MAIN FLOAT	16" PILES ○	18" PILES □	24" PILES ▲	36" PILES △	TOTAL PILES
G		37			37
H	21	39			60
I	63				63
J	52				52
K	27				27
N/GW FLOAT	10				10
N'/ FLOAT	4				4
DRIVE DOWN FLOAT			4	7	11
GANGWAY TRESTLES	18				18
TOTAL PILES	195	76	4	7	282

NOTES: MINIMUM BULKHEAD REQUIRES 600 LF OF SHEET PILE WALL.

MOORING SUMMARY	
SLIP SIZE	TOTAL SLIPS
32'	189
40'	96
50'	86
60'	76
TOTAL	447

NOTES:

1. 725 LF OF SIDE TIE MOORAGE AVAILABLE ON THE EAST FACE OF G FLOAT.

FLOAT SUMMARY	
MAIN FLOAT	FLOAT SIZE
G MAIN	8' X 935'
H MAIN	8' X 1125'
I MAIN	8' X 1030'
J MAIN	8' X 930'
K MAIN	8' X 885'
N MAIN	8' X 395'
N' MAIN	8' X 225'
G END	8' X 60'
H END	8' X 114'
I END	8' X 95'
J END	8' X 80'
K END	8' X 72'
GANGWAY FLOATS 2 EA.	15' X 28'
DRIVE DOWN FLOAT	80' X 110'

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Cordova, Alaska

No.	Description	Date

Drawn By: RG | Checked By: DP/KN

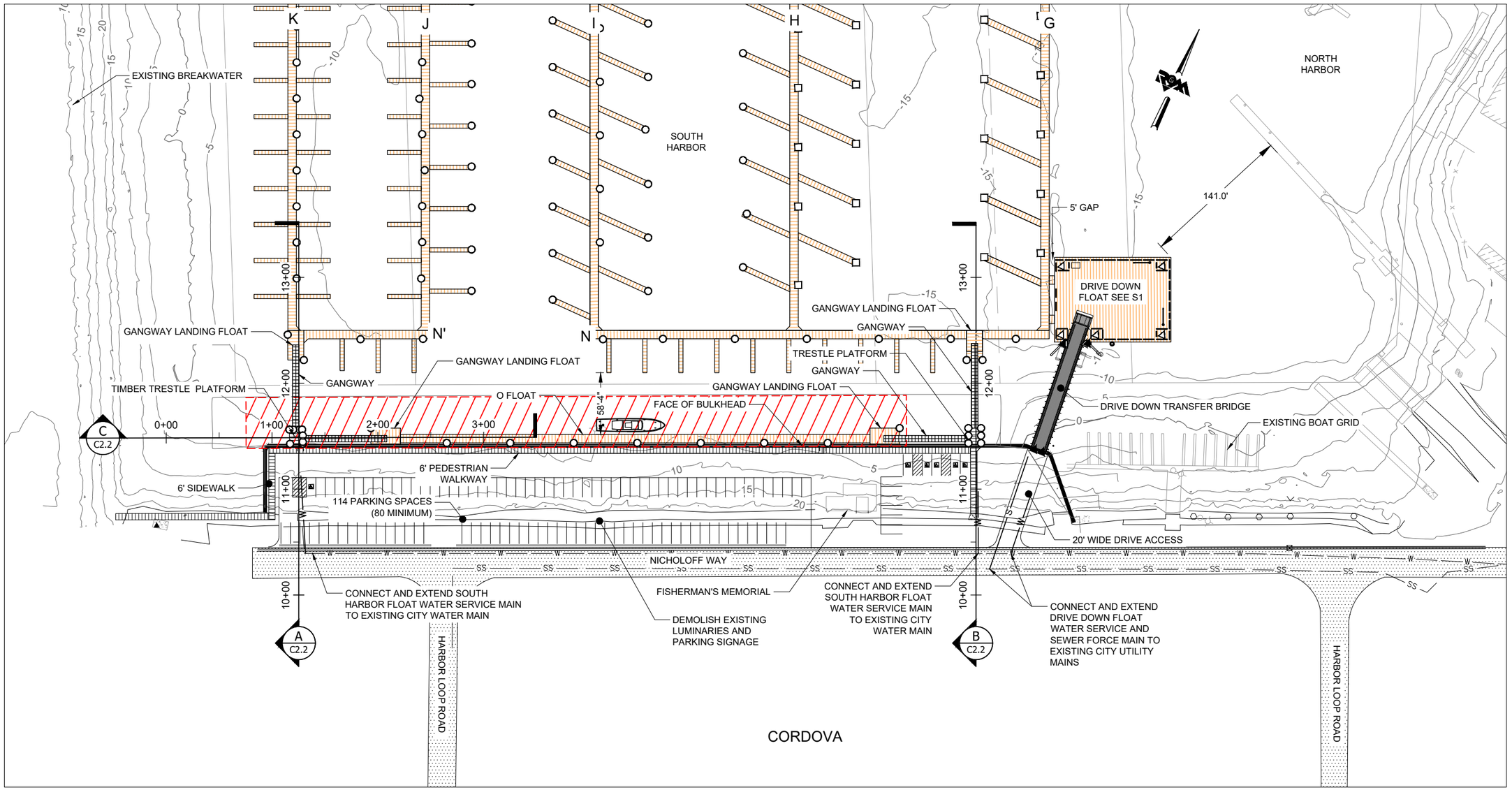
Date: SEPTEMBER 22, 2022

Phase: CONCEPT PLANS

Project No: 2957.01

SHEET TITLE: PROPOSED HARBOR LAYOUT MINIMAL BULKHEAD

SHEET NO: **C1.2**



UPLANDS SITE PLAN WITH FULL BULKHEAD

Scale: 1" = 50'

EXISTING SYMBOL LEGEND

- E — ELECTRICAL PEDESTAL
- C — COMM J-BOX
- VALVE
- SIGNAGE
- LUMINARY
- HYDRANT
- STORM CULVERT
- STORM INLET

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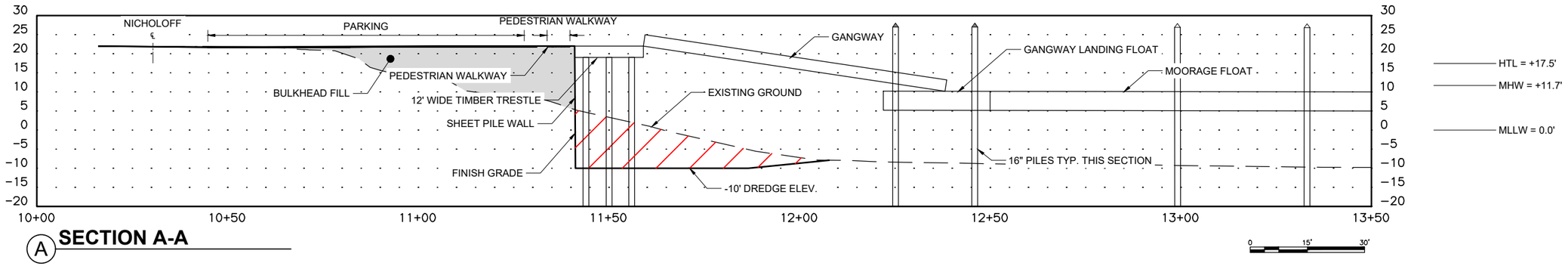
Cordova South Harbor Rebuild
Cordova, Alaska

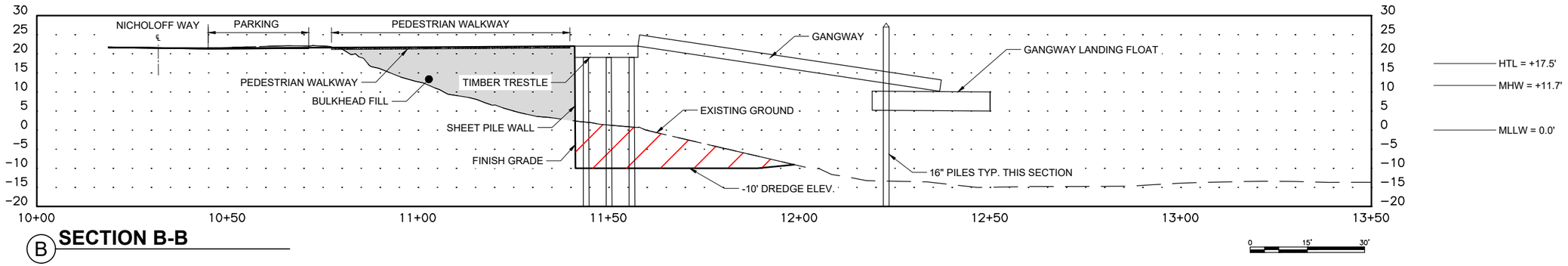
No.	Description	Date

Drawn By: RG
Checked By: DP/KN
Date: SEPTEMBER 22, 2022
Phase: CONCEPT PLANS
Project No: 2957.01
SHEET TITLE: UPLANDS SITE PLAN FULL BULKHEAD
SHEET NO: C2.1

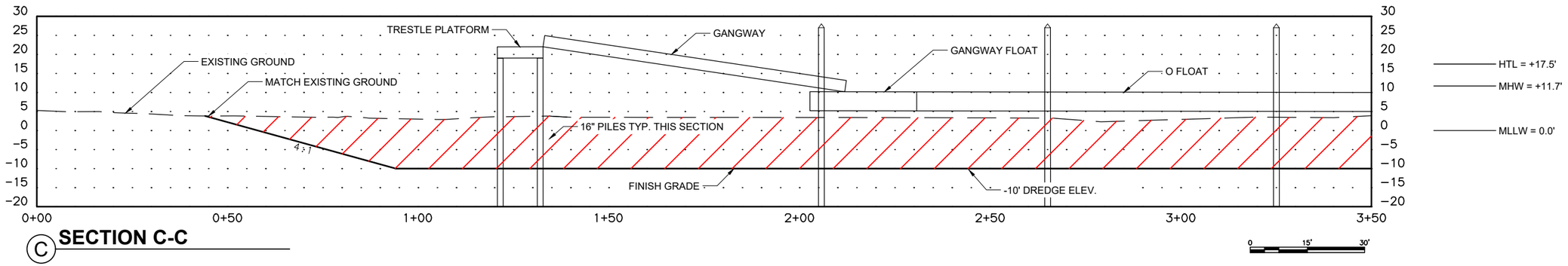
Plotted 9/22/2022 4:18 PM by Russell Gingras
Z:\project\2957.01 C Cordova South Harbor Rebuild\Civil\ACAD\2957.01 – 07–08_C2.1_C2.2 Uplands Bulkhead.dwg



(A) SECTION A-A



(B) SECTION B-B



(C) SECTION C-C

SHEET NOTE: PILE DETAILS CAN BE FOUND ON SHEET S7

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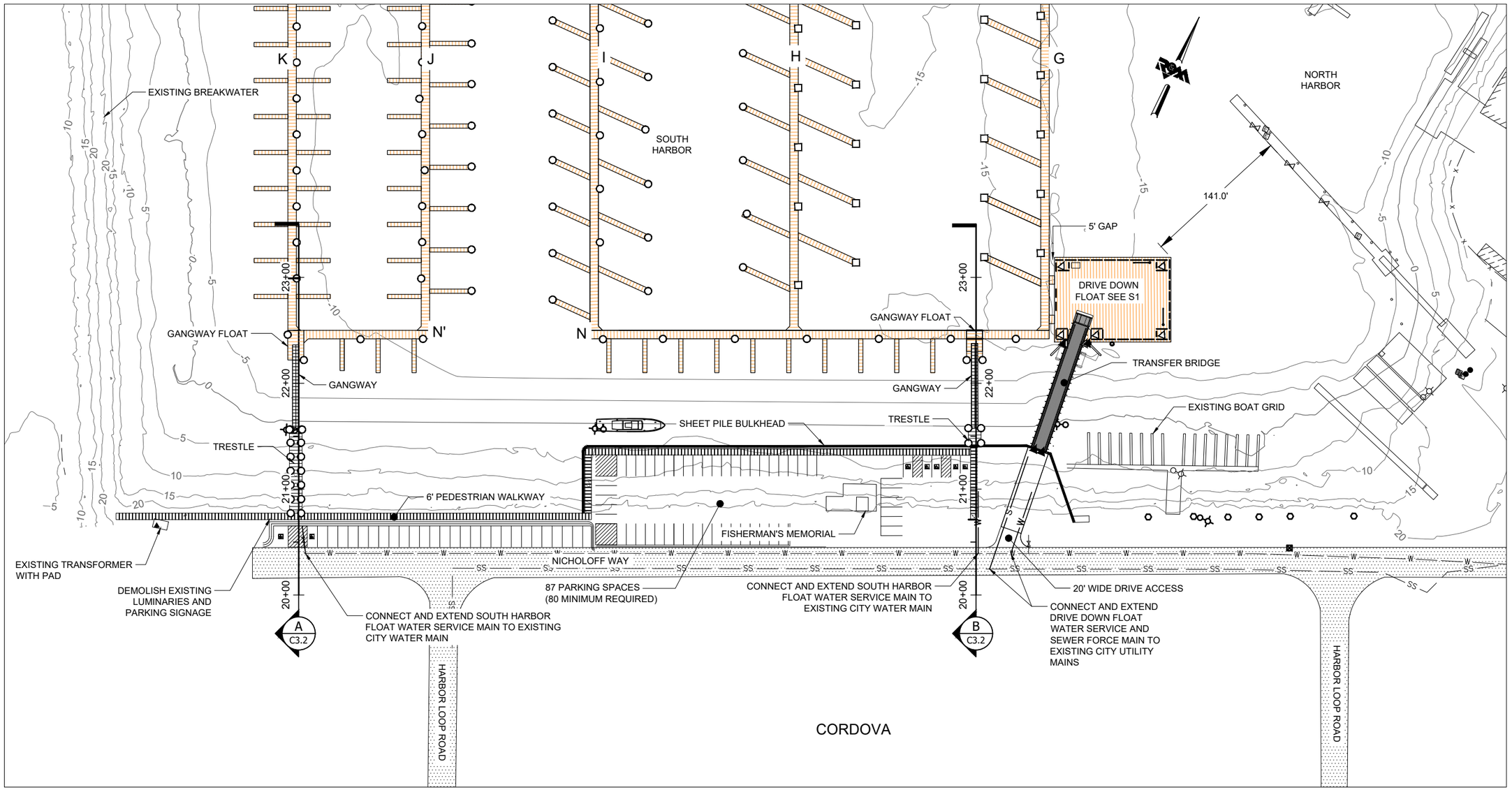
Cordova South Harbor Rebuild
Cordova, Alaska

No.	Description	Date

Drawn By: RG
Checked By: DP/KN
Date: SEPTEMBER 22, 2022
Phase: CONCEPT PLANS
Project No: 2957.01
SHEET TITLE: SECTIONS FULL BULKHEAD
SHEET NO: **C2.2**



UPLANDS SITE PLAN MINIMAL BULKHEAD

Scale: 1" = 50'

EXISTING SYMBOL LEGEND

E	ELECTRICAL PEDESTAL		LUMINARY
C	COMM J-BOX		HYDRANT
	VALVE		STORM CULVERT
	SIGNAGE		STORM INLET

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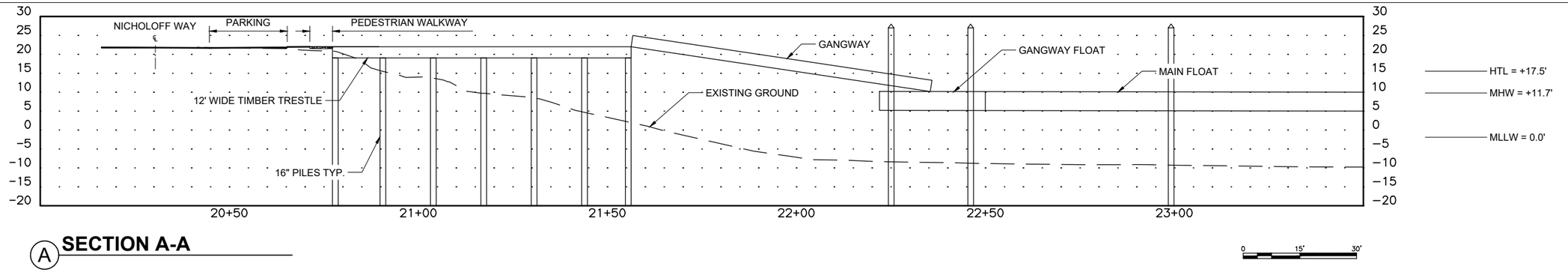
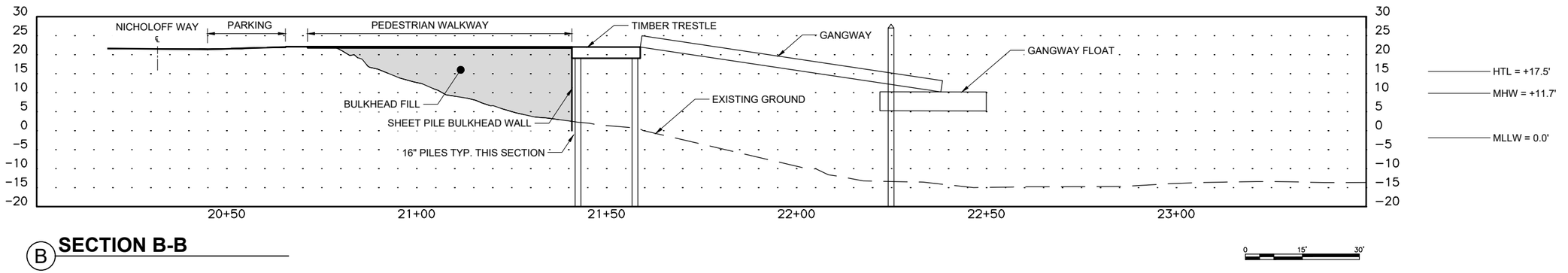
Date: SEPTEMBER 22, 2022
Phase: CONCEPT PLANS
Project No: 2957.01
SHEET TITLE: UPLANDS SITE PLAN MINIMAL BULKHEAD
SHEET NO: C3.1



(A) SECTION A-A



(B) SECTION B-B

SHEET NOTE: PILE DETAILS CAN BE FOUND ON SHEET S7

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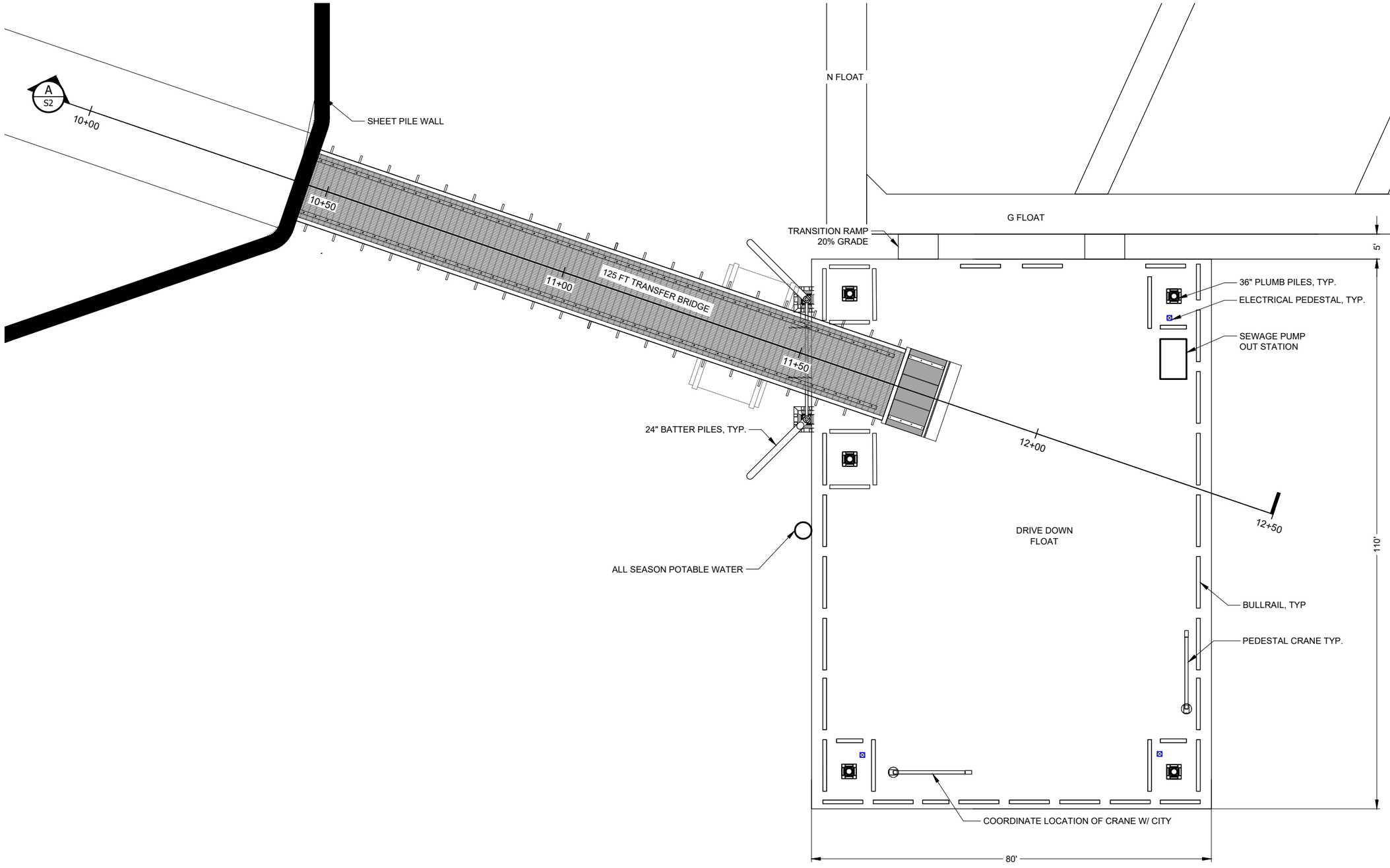
Date: SEPTEMBER 22, 2022
Phase: CONCEPT PLANS
Project No: 2957.01
SHEET TITLE: SECTIONS MINIMAL BULKHEAD
SHEET NO: **C3.2**



DRIVE DOWN FLOAT PLAN

Scale: 1" = 10'

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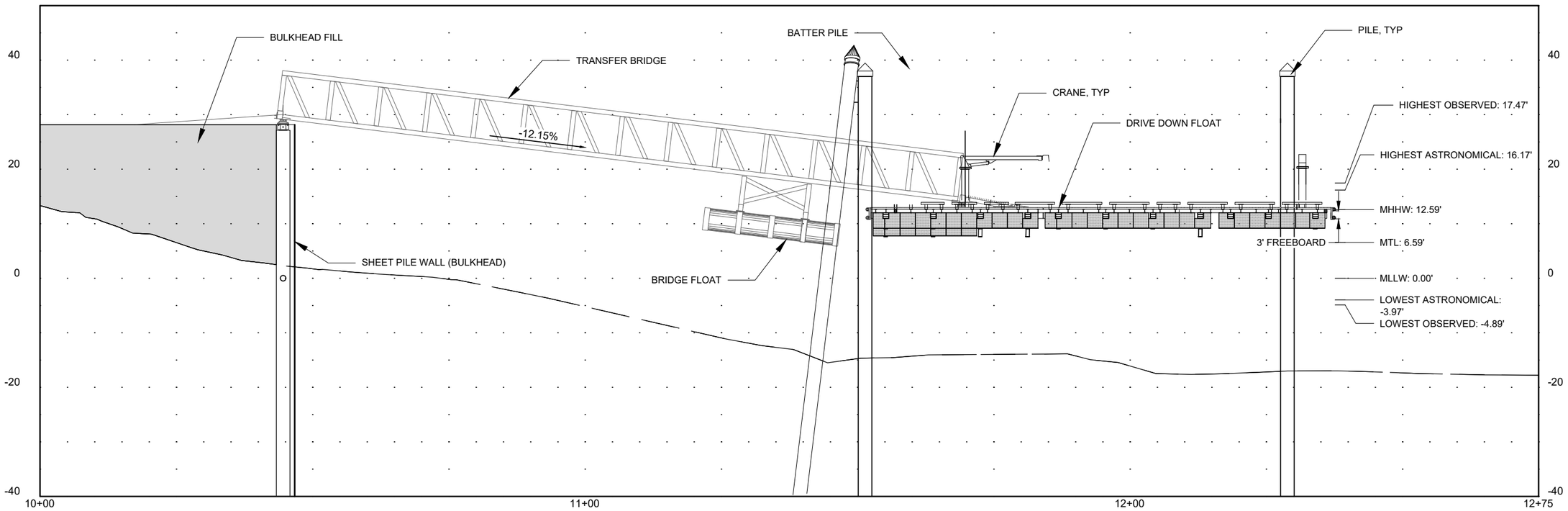
No.	Description	Date

Drawn By: RG
Checked By: DP/KN
Date: SEPTEMBER 22, 2022
Phase: CONCEPT PLANS
Project No: 2957.01
SHEET TITLE: DRIVE DOWN FLOAT PLAN
SHEET NO: **S1**



A TRANSFER BRIDGE - DRIVE DOWN FLOAT ELEVATION

0 10' 20'

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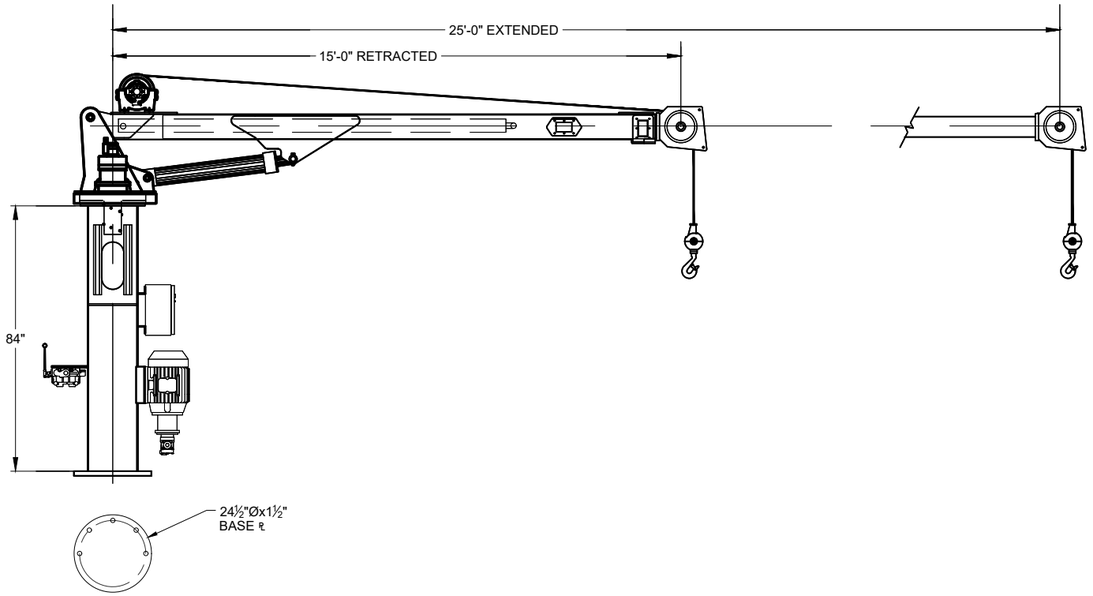
Cordova South Harbor Rebuild
Cordova, Alaska

No.	Description	Date

Drawn By: RG
Checked By: DP/KN
Date: SEPTEMBER 22, 2022
Phase: CONCEPT PLANS
Project No: 2957.01
SHEET TITLE: TRANSFER BRIDGE - DRIVE DOWN FLOAT ELEVATION
SHEET NO: **S2**



1 **PEDESTAL CRANE**

NTS

NOTES:

FURNISH AND INSTALL 5 TON HYDRAULIC CRANE, MINIMUM CRITERIA LISTED BELOW:

SWL:	1,800 LBS @ 25 FEET
MAXIMUM AS-RIGGED LIFT:	4,000 LBS @ 10 FEET
HOIST:	
MAX BOOM REACH:	25 FEET
MIN. BOOM REACH:	5 FEET
MAX. BOOM ANGLE:	78 DEGREES
MAIN HOIST RIGGING:	7/16"x100 FEET, SINGLE-PARTED, 3 TON FALLBALL
PEDESTAL HEIGHT:	7 FEET
SLEWING ANGLE:	360°, CONTINUOUS (STANDARD)
SLEW SPEED:	~1.0 RPM
DESIGN TEMPERATURE:	15°F TO 115°F
CONTROLS:	PEDESTAL-MOUNTED CONTROLS
MOTOR	20HP 3Ø ELECTRIC

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No.	Description	Date

Drawn By: RG
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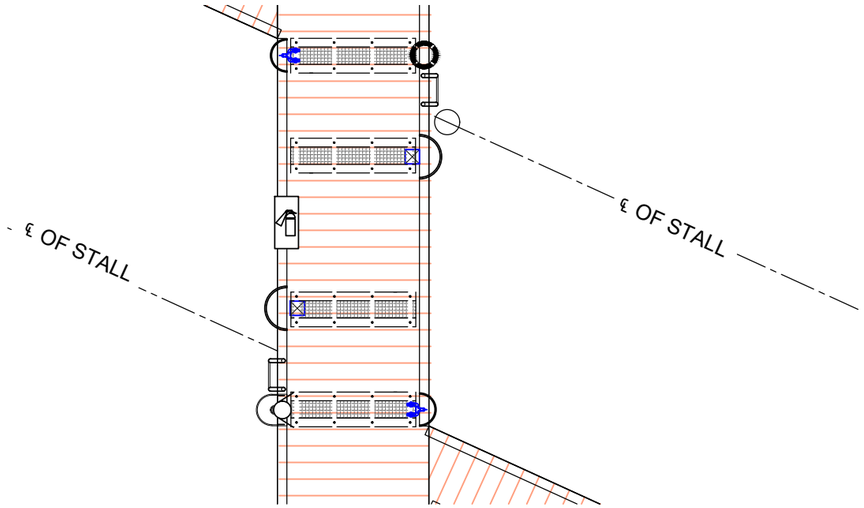
Date: SEPTEMBER 22, 2022
Phase: CONCEPT PLANS
Project No: 2957.01
SHEET TITLE: CRANE DETAILS
SHEET NO: **S3**



1 TYPICAL UTILITY PLACEMENT

SCALE: NTS

NOTE:

1. DESIGN BUILDER SHALL COORDINATE UTILITY RISERS AND SAFETY EQUIPMENT LOCATIONS FOR ALL FLOAT STALLS W/ CITY FOR APPROVAL @ 65% DESIGN.
2. EACH BOAT SLIP SHALL HAVE DEDICATED WATER & POWER.
3. ALL LADDERS AND OTHER EQUIPMENT SHALL BE CENTERED IN THE STALL AS MUCH AS PRACTICAL TO AVOID DAMAGE BY VESSEL IMPACT.

LEGEND:

- PILE
- SAFETY LADDER
- FIRE RISER W/ GUARD EVERY 150 FEET
- WATER SERVICE DOUBLE HOSE BIB RISER W/ GUARD
- REMOVABLE DECK
- ELECTRICAL PEDESTAL
- FIRE EXTINGUISHER (POSITIONED EVERY 150')
- LIFE RINGS (EVERY 150')

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No.	Description	Date

Drawn By: RG | Checked By: DP/KN

Date: SEPTEMBER 22, 2022

Phase: CONCEPT PLANS

Project No: 2957.01

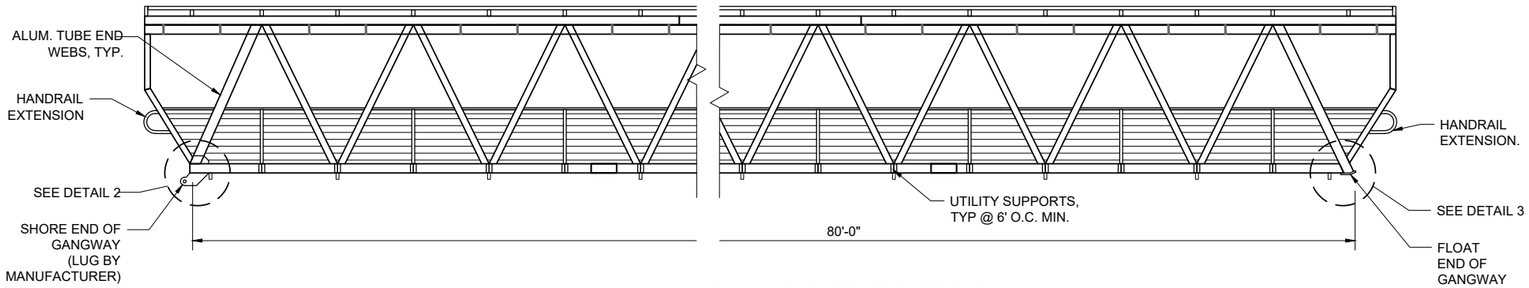
SHEET TITLE:

MOORAGE FLOAT
UTILITY PLACEMENT

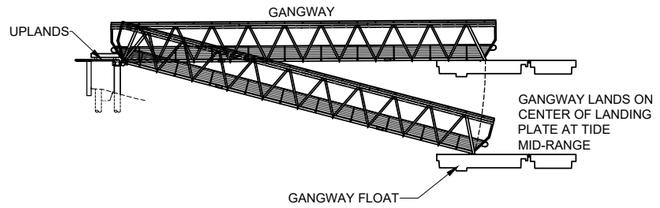
SHEET NO:

S4

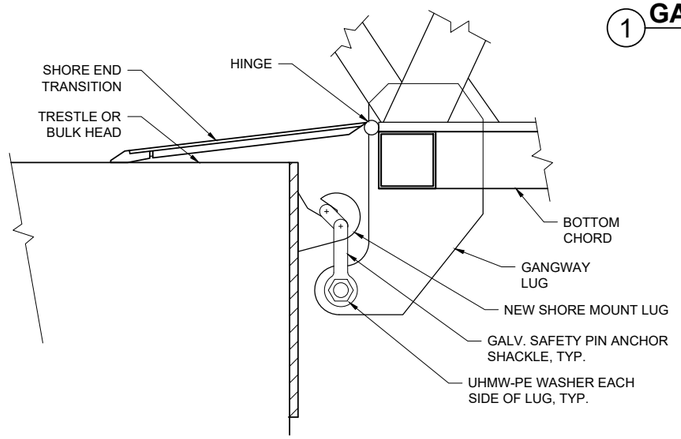
(ROOF COVER NOT SHOWN)



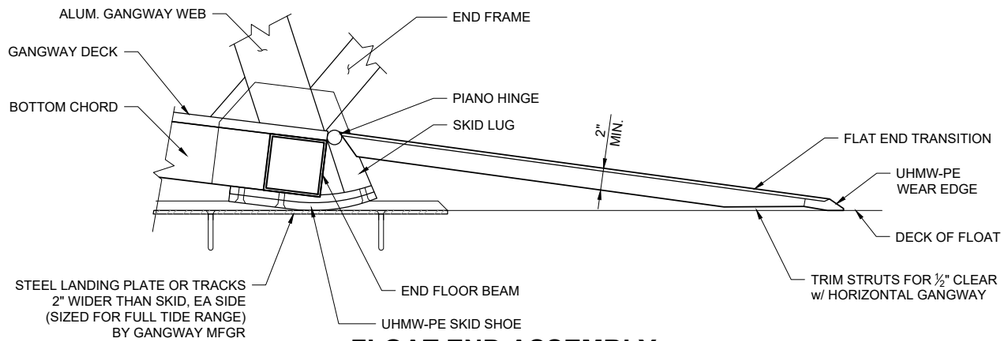
1 GANGWAY ELEVATION
Scale: NTS



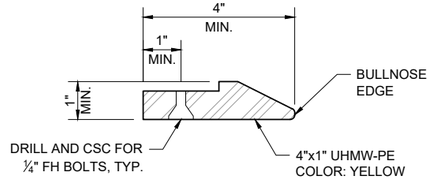
A GANGWAY RANGE-OF-MOTION
Scale: NTS



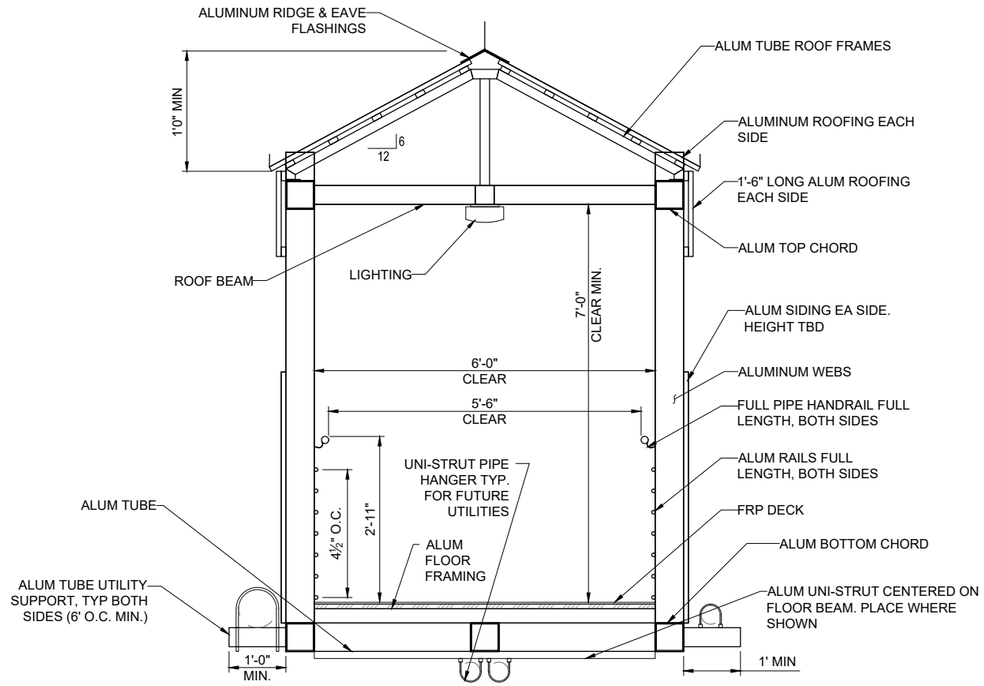
2 SHORE END ASSEMBLY
Scale: NTS



3 FLOAT END ASSEMBLY
Scale: NTS



4 WEAR EDGE
Scale: 1" = 2"



5 GANGWAY
Scale: NTS

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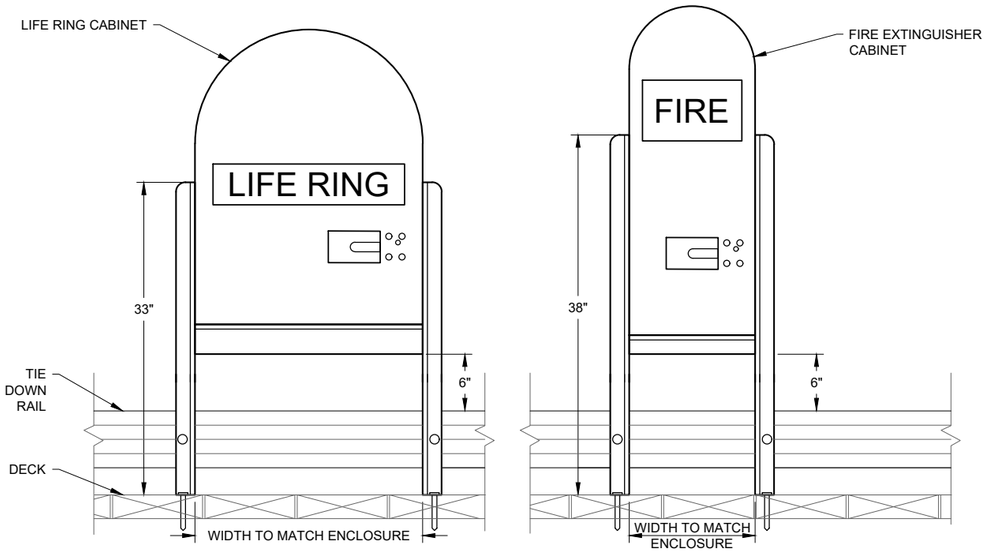
Cordova, Alaska

No.	Description	Date

Drawn By: RG | Checked By: DP/KN
Date: SEPTEMBER 22, 2022
Phase: CONCEPT PLANS
Project No: 2957.01
SHEET TITLE: GANGWAY PERFORMANCE DETAILS
SHEET NO: **S5**



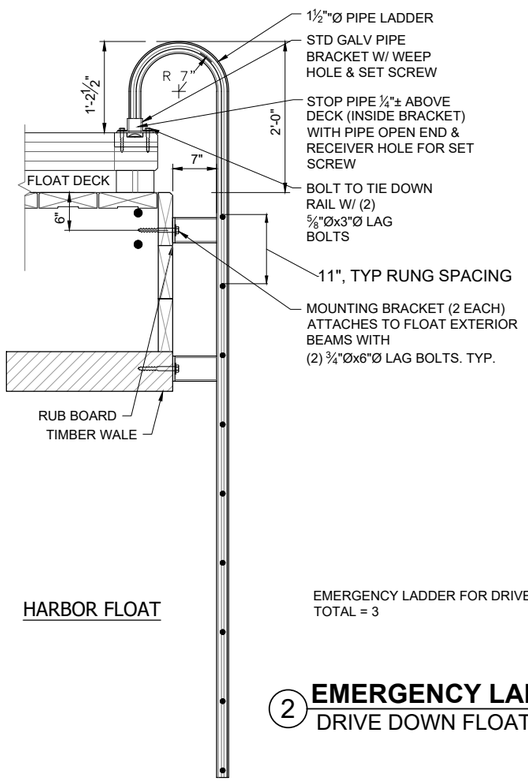
1 TYPICAL FIRE EXTINGUISHER & LIFE RING CABINET DETAILS

MOORAGE FLOATS

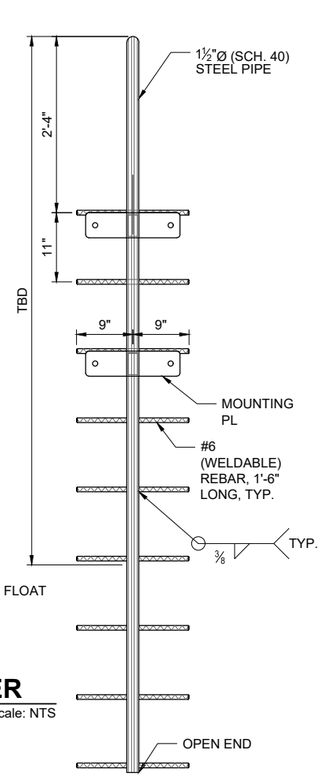
Scale: NTS

EXTINGUISHER AND LIFE RING NOTES:

1. PROVIDE 20 LB FIRE EXTINGUISHERS RATED FOR 2A, 20-B.C. IN A UV STABILIZED ENCLOSURE WITH A "BREAK GLASS" LOCKABLE INTERNAL HANDLE DEVICE. CHEYENNE MANUFACTURING OR EQUAL.
2. PROVIDE A 30 INCH DIAMETER USCG APPROVED LIFE RING WITH 90 FEET OF ROPE IN A UV STABILIZED ENCLOSURE WITH A "BREAK GLASS" LOCKABLE INTERNAL HANDLE DEVICE. CHEYENNE MANUFACTURING OR EQUAL.



HARBOR FLOAT

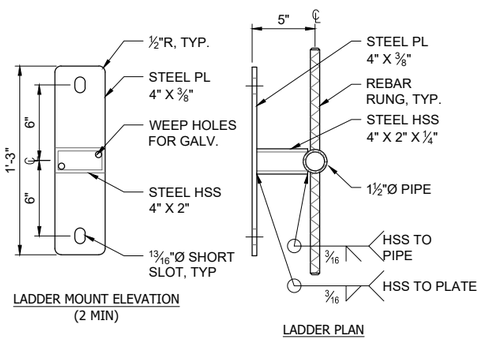


EMERGENCY LADDER FOR DRIVE DOWN FLOAT
TOTAL = 3

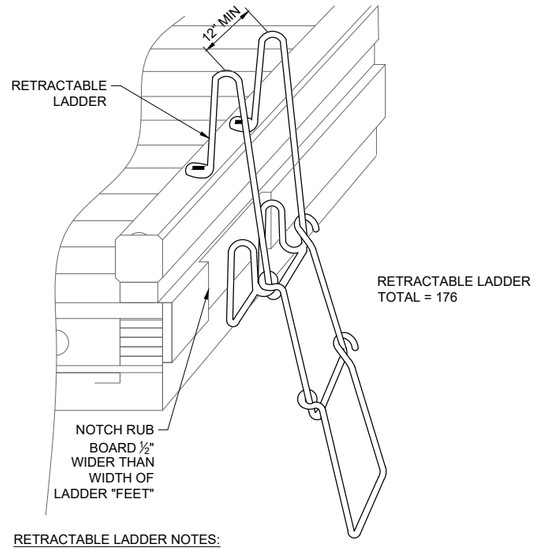
2 EMERGENCY LADDER

DRIVE DOWN FLOAT

Scale: NTS



LADDER MOUNTS



RETRACTABLE LADDER NOTES:

1. PROVIDE RETRACTABLE STAINLESS STEEL LADDER. PROVIDE DIRECT MOUNT 12" WIDE UP-N-OUT #SW1448 OR APPROVED EQUAL.
2. WHEN EXTENDED THE LADDER MUST BE AT LEAST 72" LONG.
3. ATTACH PER MANUFACTURE'S SPECIFICATION.
4. LOWER SECTION OF LADDER SHALL BE COATED YELLOW.
5. PROVIDE ONE PER STALL (DOUBLE SLIP) FOR 40', 50' & 60' SLIPS. PROVIDE ONE LADDER EVERY OTHER STALL FOR 32' SLIPS

3 RETRACTABLE LADDER

MOORAGE FLOATS

Scale: NTS

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9101 Vanguard Drive
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CORPORATE AUTHORIZATION NUMBER AECC111

Cordova South Harbor Rebuild
Cordova, Alaska

No.	Description	Date

Drawn By: RG | Checked By: DP/KN

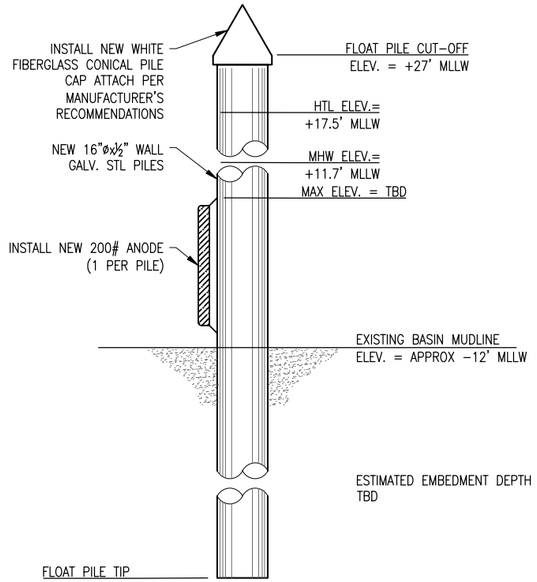
Date: SEPTEMBER 22, 2022

Phase: CONCEPT PLANS

Project No: 2957.01

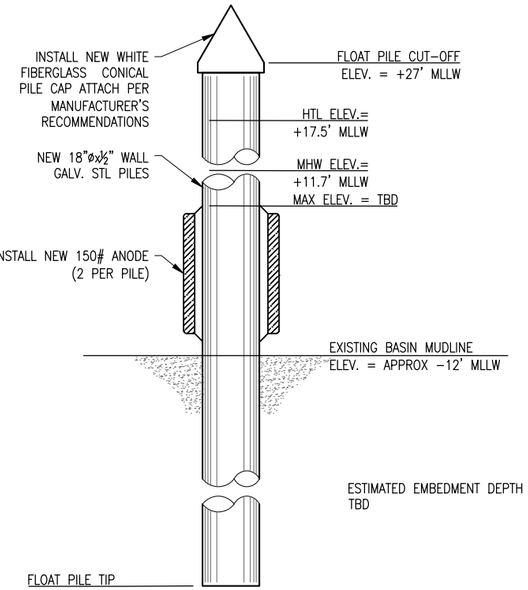
SHEET TITLE: SAFETY EQUIPMENT DETAILS

SHEET NO: **S6**



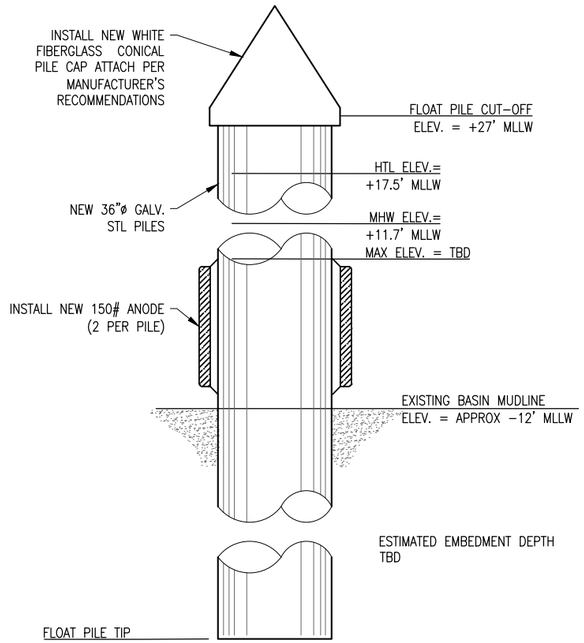
1 TYPICAL 16"Ø FLOAT PILE

Scale: NTS



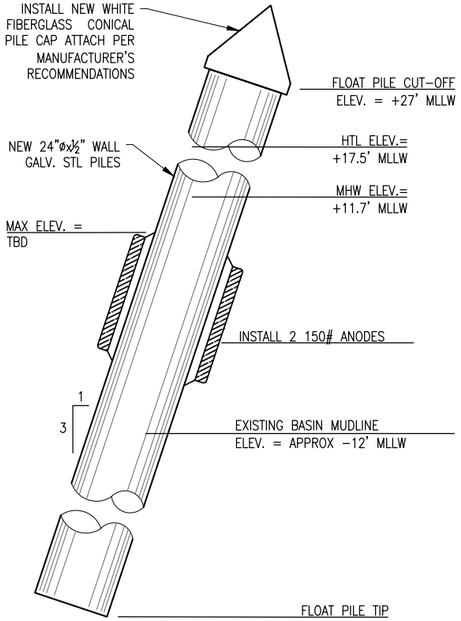
2 TYPICAL 18"Ø FLOAT PILE

Scale: NTS



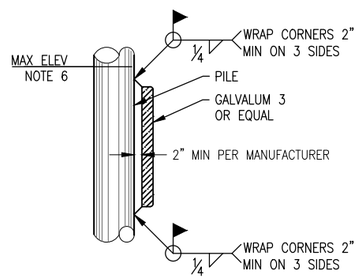
3 TYPICAL 36"Ø DRIVE DOWN FLOAT PILE

Scale: NTS



4 TYPICAL 24"Ø BATTER PILE

Scale: NTS



NOTES:

1. INSTALL ONE EA. 200 LB ANODES PER 16"ø PILING.
2. INSTALL TWO EA. 150 LB ANODES PER 18"ø PILING.
3. INSTALL TWO EACH 150 LB ANODES FOR EACH 24"ø PILING
4. INSTALL THREE EA. 150 LB ANODES FOR EACH 30"ø OR 36"ø PILING.
5. WEIGHT SHALL BE ANODE MATERIAL NOT INCLUDING MOUNTING TAB.
6. TOP OF INSTALLED ANODE SHALL BE NO HIGHER THAN 1' LOWER THAN LOWEST ELEVATION OF FLOAT/PILE COLLAR MEMBERS @ EXTREME LOW TIDE.
7. ANODES SHALL BE INSTALLED BY AN ADCI CERTIFIED DIVER. WET WELD TO AWS D3.6 CLASS B STANDARDS.

5 TYPICAL ANODE DETAIL

Scale: NTS

GENERAL NOTES

REFERENCES

THE PUBLICATIONS LISTED BELOW FORM A PART OF THIS SPECIFICATION. ALL REFERENCES AND STANDARDS LISTED SHALL BE THE LATEST REVISIONS.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B 418	CAST AND WROUGHT GALVANIC ZINC ANODES

ASSOCIATION OF DIVING CONTRACTORS INTERNATIONAL (ADCI)

CONSENSUS STANDARDS

AMERICAN WELDING SOCIETY (AWS)

AWS–D3.6M	CLASS B UNDERWATER WELDING STANDARDS
AWS D1.1/D1.1M	STRUCTURAL WELDING CODE–STEEL

NATIONAL ASSOCIATION OF CORROSION ENGINEERS INTERNATIONAL (NACE)

NACE RP0387	METALLURGICAL AND INSPECTION REQUIREMENTS FOR CAST GALVANIC ANODES FOR OFFSHORE APPLICATIONS AND OTHER ITEMS

SCOPE OF WORK:

PROVIDE ALUMINUM ALLOY SACRIFICIAL ANODES ON THE PILING ASSOCIATED WITH THE SOUTH HARBOR PROJECT. PROVIDE A DESIGN FOR AN ADEQUATE 25 YEAR ANODE SERVICE LIFE ON HDG PILING.

ALUMINUM ANODES

1. ALUMINUM ANODES SHALL BE GALVALUME 3, OR EQUAL. ANODES SHALL HAVE THE FOLLOWING PROPERTIES:

   1A. ENERGY CAPACITY NOT LESS THAN 1150 AMP–HOUR PER POUND.

   1B. A CONSUMPTION RATE OF NOT MORE THAN 7.5 POUNDS PER AMP YEAR.

   1C. AN OPEN CIRCUIT POTENTIAL OF MORE THAN –1.05 VOLTS

PILE NOTES:

PILE NOTES:

CONCEPT DESIGN ONLY FINAL PILE DIAMETERS, THICKNESS & SPACING TBD BY DESIGN BUILDER.

PRELIMINARY PILE EMBEDMENT ESTIMATES ARE AVAILABLE IN GEOTECHNICAL REPORT PROVIDED WITH THE RFP FINAL PILE EMBEDMENT WILL BE DETERMINED BY THE DESIGN–BUILDER.

TIDE LEVELS

NOAA STATION# 9454050 TIDAL LEVELS – ELEVATION DATUM FOR THIS PROJECT IS 0.0 MEAN LOWER LOW WATER

EXTREME HIGH WATER	+17.5 FT.
HIGH TIDE LINE (HTL)	+16.2 FT.
MEAN HIGHER HIGH WATER (MHHW)	+12.6 FT.
MEAN HIGH WATER (MHW)	+11.7 FT.
MEAN LOWER LOW WATER (MLLW)	+0.0 FT.
EXTREME LOWER LOW WATER	–4.9 FT.

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Cordova South Harbor Rebuild

Cordova, Alaska

No.	Description	Date

Drawn By: RG | Checked By: DP/KN

Date: SEPTEMBER 22, 2022

Phase: CONCEPT PLANS

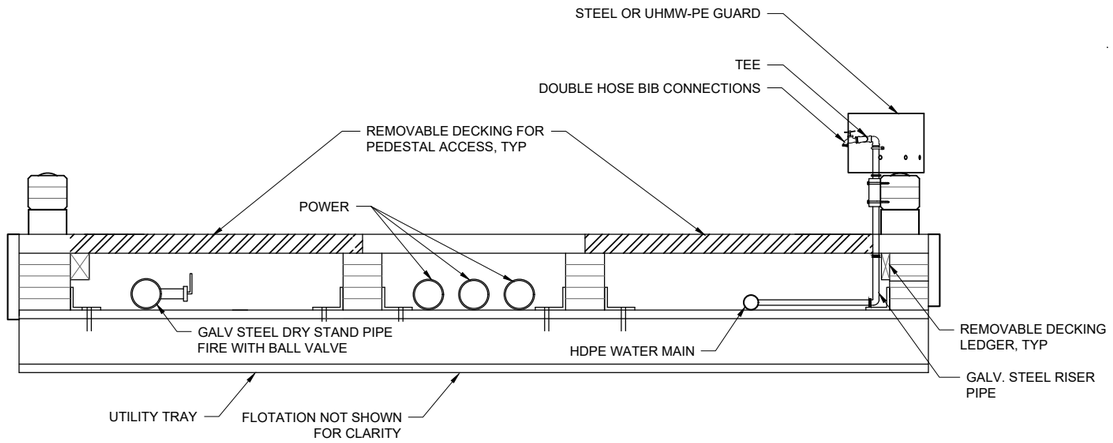
Project No: 2957.01

SHEET TITLE: FLOAT PILE DETAILS

SHEET NO: **S7**

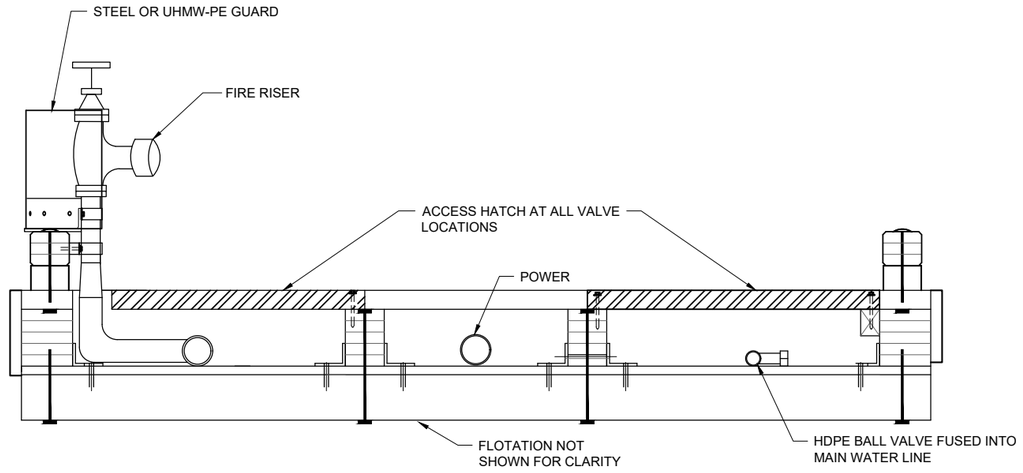
NOTES:

COORDINATE VAULT LOCATIONS AND/OR REMOVABLE DECKING FOR PEDESTAL INSTALLATION AND UTILITY ACCESS WITH FLOAT FABRICATOR.



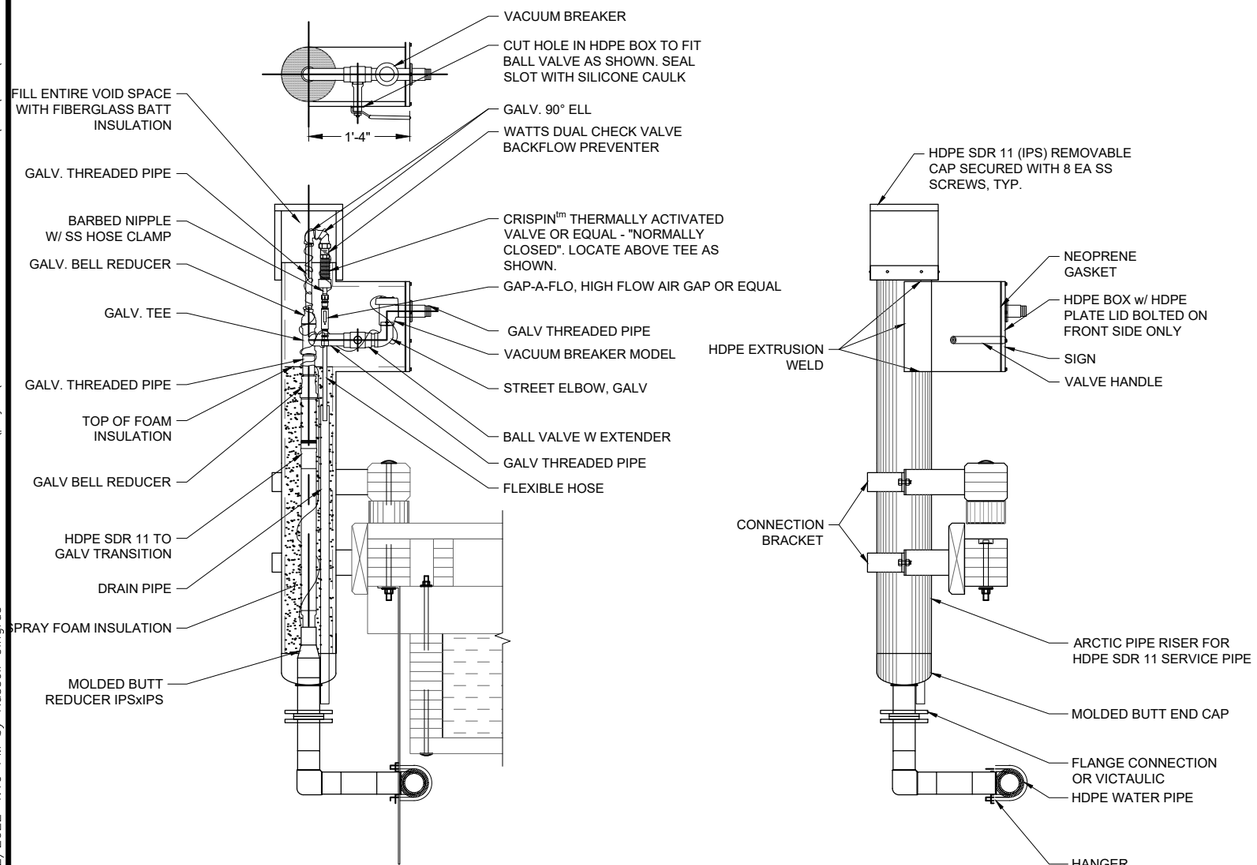
1 TYPICAL UTILITY MAINS AND WATER SERVICE CONNECTION

Scale: NTS



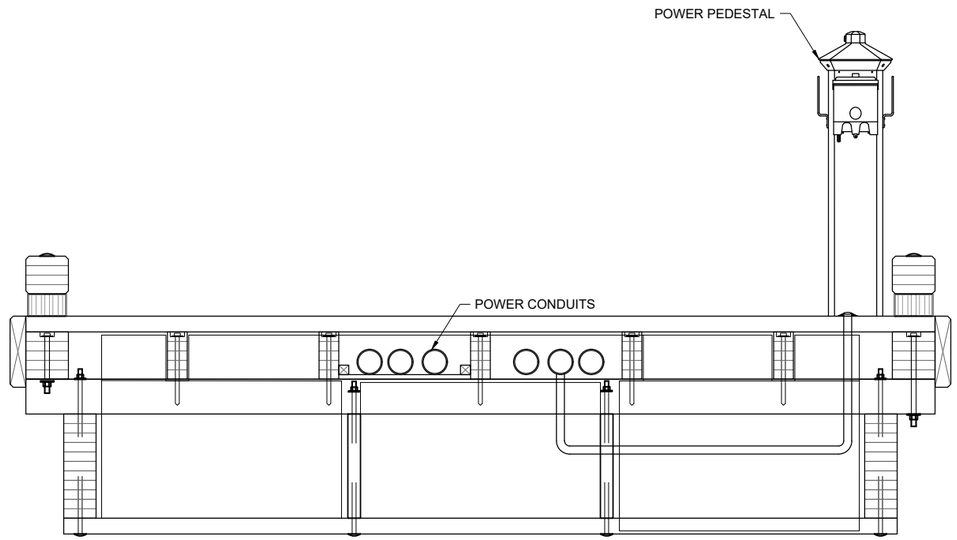
2 TYPICAL FIRE WHARF HYDRANT CONNECTION

Scale: NTS



3 ALL SEASON WATER SERVICE DRIVE DOWN FLOAT

Scale: NTS



4 TYPICAL POWER PEDESTAL CONNECTION

Scale: NTS

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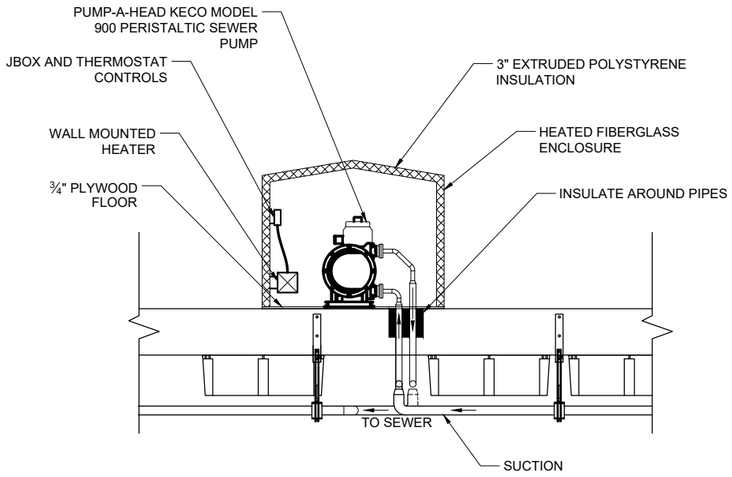
Cordova South Harbor Rebuild
Cordova, Alaska

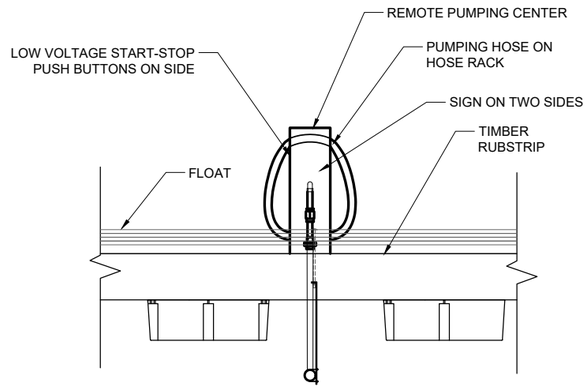
No.	Description	Date

Drawn By: RG
Checked By: DP/KN
Date: SEPTEMBER 22, 2022
Phase: CONCEPT PLANS
Project No: 2957.01
SHEET TITLE: WATER SERVICE CONNECTION DETAILS
SHEET NO: U1



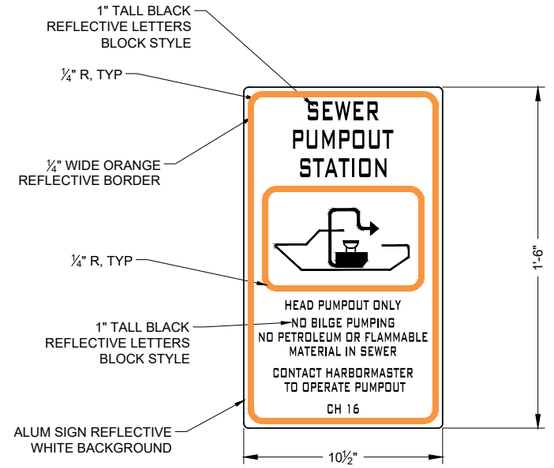
1 SEWER PUMP SECTION TYPICAL

Scale: NTS



2 SEWER PUMPOUT ELEVATION

Scale: NTS



3 PUMPOUT SIGNS

Scale: 3" =1'

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CORPORATE AUTHORIZATION NUMBER AECC111

Cordova South Harbor Rebuild

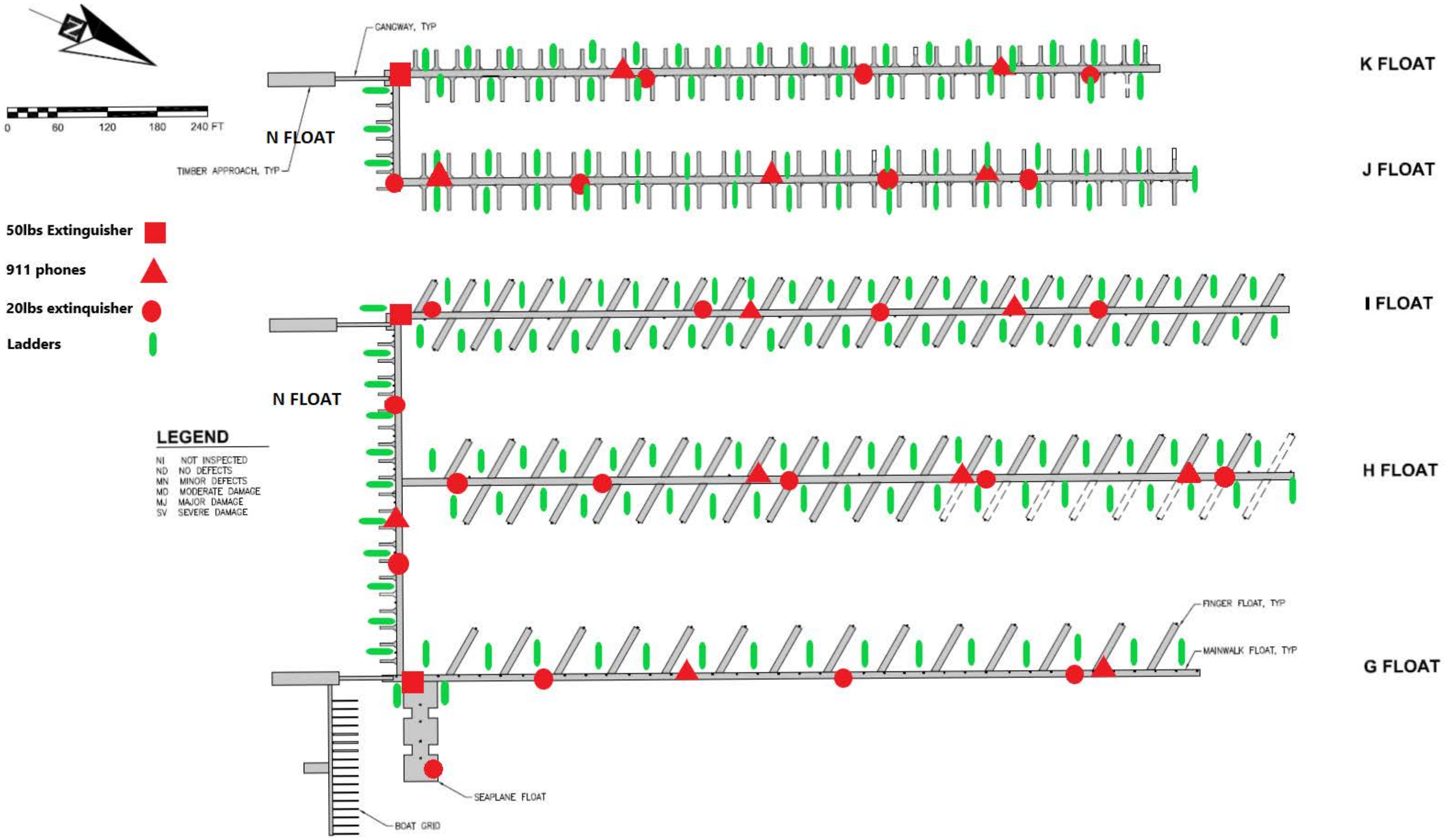
Cordova, Alaska

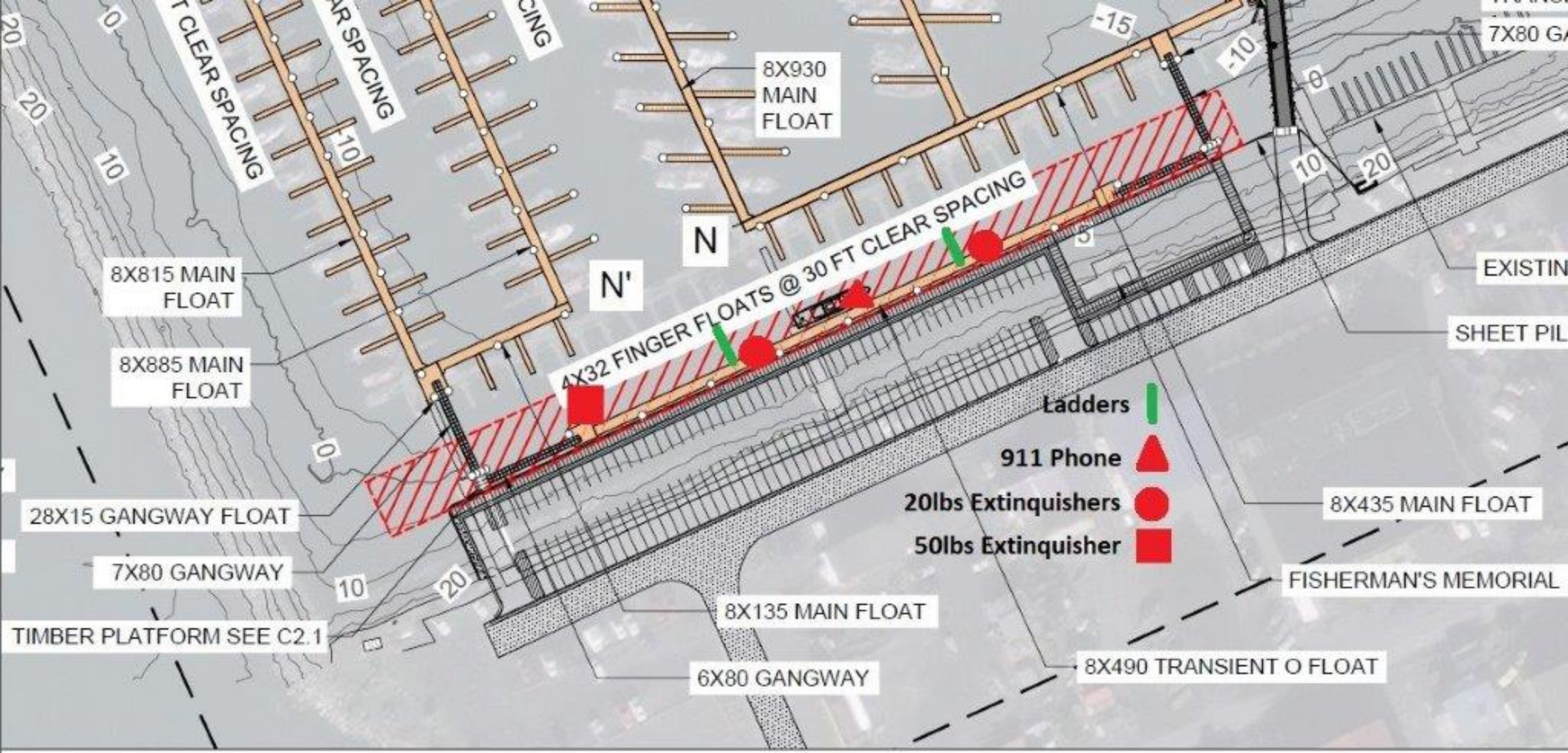
No.	Description	Date

Drawn By: RG
Checked By: DP/KN
Date: SEPTEMBER 22, 2022
Phase: CONCEPT PLANS
Project No: 2957.01
SHEET TITLE: SEWER PUMP OUT DETAILS
SHEET NO: **U2**

Extinguishers 911 Phones, & Ladders Locations

11.16.050 - Reserved mooring spaces.

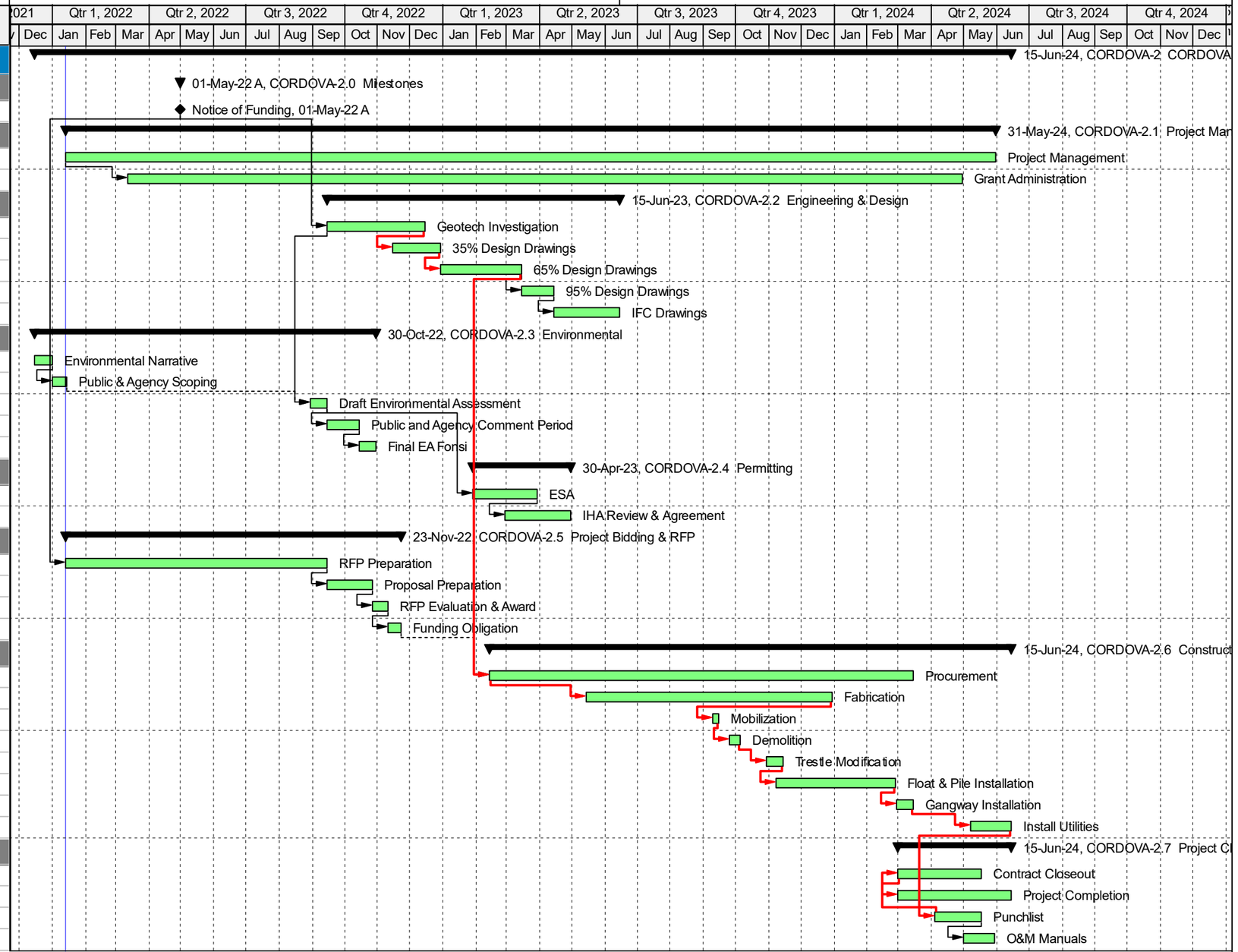



8X930
MAIN
FLOAT
N
N'
8X815 MAIN
FLOAT
8X885 MAIN
FLOAT
4X32 FINGER FLOATS @ 30 FT CLEAR SPACING
Ladders
911 Phone
20lbs Extinquishers
50lbs Extinquisher
28X15 GANGWAY FLOAT
7X80 GANGWAY
TIMBER PLATFORM SEE C2.1
8X135 MAIN FLOAT
6X80 GANGWAY
8X490 TRANSIENT O FLOAT
8X435 MAIN FLOAT
FISHERMAN'S MEMORIAL
SHEET PIL
EXISTIN
7X80 GA

Preliminary P6 Schedule

Preliminary Schedule

Activity ID	Activity Name	Start	Finish
CORDOVA-2	CORDOVA PROJECT SCHEDUL	15-Dec-21 A	15-Jun-24
CORDOVA-2.0	Milestones	01-May-22 A	01-May-22
MILE1000	Notice of Funding	01-May-22 A	
CORDOVA-2.1	Project Management	13-Jan-22	31-May-24
PM1000	Project Management	13-Jan-22	31-May-24
PM1010	Grant Administration	13-Mar-22	30-Apr-24
CORDOVA-2.2	Engineering & Design	15-Sep-22	15-Jun-23
ENG1000	Geotech Investigation	15-Sep-22	15-Dec-22
ENG1010	35% Design Drawings	15-Nov-22	30-Dec-22
ENG1020	65% Design Drawings	30-Dec-22	15-Mar-23
ENG1030	95% Design Drawings	15-Mar-23	15-Apr-23
ENG1040	IFC Drawings	15-Apr-23	15-Jun-23
CORDOVA-2.3	Environmental	15-Dec-21 A	30-Oct-22
ENV1000	Environmental Narrative	15-Dec-21 A	01-Jan-22
ENV1010	Public & Agency Scoping	01-Jan-22 A	15-Jan-22
ENV1020	Draft Environmental Assessment	30-Aug-22	15-Sep-22
ENV1030	Public and Agency Comment Period	15-Sep-22	15-Oct-22
ENV1040	Final EA Fonsi	15-Oct-22	30-Oct-22
CORDOVA-2.4	Permitting	29-Jan-23	30-Apr-23
PERM1000	ESA	29-Jan-23	30-Mar-23
PERM1010	IHA Review & Agreement	28-Feb-23	30-Apr-23
CORDOVA-2.5	Project Bidding & RFP	13-Jan-22	23-Nov-22
BID1000	RFP Preparation	13-Jan-22	15-Sep-22
BID1010	Proposal Preparation	15-Sep-22	27-Oct-22
BID1020	RFP Evaluation & Award	27-Oct-22	10-Nov-22
BID1030	Funding Obligation	11-Nov-22	23-Nov-22
CORDOVA-2.6	Construction	13-Feb-23	15-Jun-24
CON1000	Procurement	13-Feb-23	15-Mar-24
CON1010	Fabrication	15-May-23	30-Dec-23
CON1020	Mobilization	10-Sep-23	15-Sep-23
CON1030	Demolition	25-Sep-23	05-Oct-23
CON1040	Trestle Modification	30-Oct-23	15-Nov-23
CON1050	Float & Pile Installation	08-Nov-23	27-Feb-24
CON1060	Gangway Installation	28-Feb-24	15-Mar-24
CON1070	Install Utilities	07-May-24	1-Jun-24
CORDOVA-2.7	Project Closeout	01-Mar-24	15-Jun-24
PL1010	Contract Closeout	01-Mar-24	18-May-24
PL1020	Project Completion	01-Mar-24	15-Jun-24
PL1000	Punchlist	04-Apr-24	18-May-24
PL1030	O&M Manuals	01-May-24	30-May-24



Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Milestone
summary

Appendix H

1. **State Wage Rates**
2. **Wage and Hour Division Davis-Bacon Wage Determination Conformance Request Guide**

State Wage Rates

STATE WAGE RATES

State wage rates can be obtained at:
http://labor.state.ak.us/lss/pamp600.htm
Use the State Wage rates that are in effect 10 days before the Bid Opening. A hard copy will be provided upon request.

Contractor may **not** begin work until he has submitted proof that a "Notice of Work" has been filed with the Alaska Department of Labor. A temporary receipt of the "Notice of Work" date-stamped by Wage & Hour will serve as proof.

Contractor shall include with his final pay request a "Notice of Completion of Public Works", from the Alaska Department of Labor showing that all employees' wages and employment security taxes have been paid to his employees and the employees of his subcontractors (T36 Clearance Approved). Final payment will not be released until this has been submitted.

The online system can be accessed through the myAlaska portal (https://myalaska.state.ak.us/home/app) after signing on with a user name and Password. The system can be found under "LSS-Online Filing Services" Users of the system will experience increased efficiency and reduced costs and waste, associated with filing paper forms. Once an employee's personal data and classification information has been entered into the system, it will be available for future use, so only weekly changes (classifications, hours, and wages) would be updated. Rather than paying for postage, users will submit payrolls free of charge and receive an electronic confirmation that the information was received.

Wage and Hour Division Davis-Bacon Wage Determination Conformance Request Guide

Wage and Hour Division

Davis-Bacon Wage Determination Conformance Request Guide, September 2021

This guide is intended as general information only and does not carry the force of legal opinion. The Department of Labor is providing this information as a public service. The information contained is of a general nature and should not be construed as legal advice.

September 28, 2021

Wage and Hour Division Davis-Bacon Wage Determination Conformance Request Guide, September 2021

What are the Davis-Bacon and Related Acts?

The Davis-Bacon and Related Acts (DBRA) require payment of local prevailing wages to construction workers performing work on federally funded construction projects. The Davis-Bacon Act (DBA) applies to each federal government or District of Columbia contract in excess of $2,000 for the construction, alteration, or repair (including painting and decorating) of public buildings or public works and requires that contractors and subcontractors pay their laborers and mechanics employed under such contracts no less than the locally prevailing wages and fringe benefits for corresponding work on similar projects in the area. The DBA's prevailing wage provisions also apply to "Related Acts," under which federal agencies assist construction projects through grants, loans, loan guarantees, and insurance. Examples of Related Acts include the Federal-Aid Highway Acts, the Housing and Community Development Act of 1974, and the Federal Water Pollution Control Act. The Wage and Hour Division (WHD) of the U.S. Department of Labor administers the DBRA.

What is a Davis-Bacon prevailing wage?

The Davis-Bacon prevailing wage is the combination of the basic hourly wage rate and any fringe benefits rate listed for a specific classification of workers in the applicable Davis-Bacon wage determination. The contractor's prevailing wage obligation may be met by either paying each laborer and mechanic the applicable prevailing wage entirely as cash wages or by a combination of cash wages and employer-provided bona fide fringe benefits.

What is a wage determination?

A wage determination is the list of basic hourly wage rates and fringe benefit rates for each classification of laborers and mechanics ("labor classification") in a predetermined geographic area for a particular type of construction. WHD conducts surveys of local wages to determine the prevailing wage rates that are included in wage determinations.

There are two types of wage determinations: general determinations and project determinations.

General Wage Determinations

A general wage determination reflects wage rates determined by WHD to be prevailing in a specific geographic area for a certain type of construction and does not expire.

General Davis-Bacon wage determinations are published online at www.sam.gov and are available for contracting agencies to incorporate into covered contracts and for contractors to post at the job site of covered projects.

Project Wage Determinations

A project wage determination is issued at the request of a contracting agency and is applicable to the named project only. These typically expire 180 calendar days from the date of issuance.

Project Wage Determinations must be requested by the agency by submitting SF-308. While uncommon, if you believe you may need a project wage determination, please consult with WHD.

What are the types of construction represented in wage determinations?

Wage determinations are issued for four types of construction categories: building, residential highway, and heavy.

Building construction includes the construction, alteration, or repair of sheltered enclosures with walk-in access for the purpose of housing persons, machinery, equipment, or supplies and the associated installation of utilities and equipment, as well as incidental grading and paving.

Residential construction includes the construction, alteration, or repair of single family houses, townhouses, and apartment buildings of no more than four stories in height and all incidental work, such as site work, parking areas, utilities, streets, and sidewalks.

Highway construction includes the construction, alteration, or repair of roads, streets, highways, runways, parking areas and most other paving work not incidental to building, residential, or heavy construction.

Heavy construction includes projects that cannot be classified as Building, Residential, or Highway. Heavy construction is often further distinguished on the basis of the characteristic of particular projects, such as dredging, water and sewer lines, dams, major bridges, and flood control projects.

For more information, please refer to All Agency Memoranda (AAM) 130 and 131.

How do I read a wage determination?

An understanding of the wage determination helps contracting officers and contractors identify and understand the wages and benefits required to be paid to laborers and mechanics on the contract. The following is a brief guide for reading a wage determination:

1. Identify the geographic area. Typically, the state and the county or counties covered by the wage determination are noted at the top of the wage determination. It is critical to use the correct wage determination for the geographic area where the project will be performed.
2. Identify the construction type. The construction type will be listed at the top of the wage determination (Building, Residential, Highway or Heavy).
3. Identify the proper labor classification(s). Labor classifications, not individual tasks, are listed on wage determinations. It is, therefore, vital to understand the scope of the project and the labor classifications that are necessary for the work to be performed.
4. Understand the labor classification identifier. The labor classification identifier provides information about how the prevailing wage was calculated:

   Those that begin with "SU" denote a prevailing wage that is not based exclusively on union wage rates.

   Example: For identifier **SULA2018-007 05/13/2018**

   SU = the prevailing wage rate is based on a weighted average of survey data
   LA = the state, in this example, Louisiana
   2018 = the year of the survey
   007 = internal number used for producing the wage determination
   05/13/2018 = the survey completion date for the labor classifications and rates under that identifier

   Those that begin with "UAVG" indicate that while no single union rate prevailed for those labor classifications, the average is based upon only union wage data.

   Example: For identifier **UAVG-OH-0010 08/29/2014**

   UAVG = the prevailing wage rate is a weighted union average rate
   OH = the state, in this example, Ohio
   0010 = internal number used for producing the wage determination
   08/29/2014 = the survey completion date for the labor classifications and rates under that identifier

   Those that begin with anything other than "SU" or "UAVG" indicate that a CBA-based rate prevailed.

   Example: For identifier **PLUM0198-005 07/01/2020**

   PLUM = the prevailing wage rate is based on a Plumbers union collective bargaining agreement.
   0198 = the local union (or district council where applicable)
   005 = internal number used in producing the wage determination
   07/01/2020 = the effective date of the most current negotiated (CBA) rate

5. Understand the labor classification as well as wage rates and fringe benefits. On a wage determination, several labor classifications may be listed under a labor classification identifier indicating that these separate labor classifications are based on the same survey or CBA. Each labor classification has a wage rate and employer-provided bona fide fringe benefits rate listed with it on the wage determination.

   Example:

```
BRMA0003-004 02/01/2021
                                      Rates          Fringes
TILE FINISHER.....................$ 42.57           32.00
TILE SETTER.......................$ 54.69           35.79
```

6. Note other relevant information including the application and effect of executive orders related to hourly minimum wages. Some wage determinations may include requirements based on Executive Orders. For example, Executive Order 13658 requires a minimum wage for workers on covered federal contracts. An Executive Order may be referenced at the top of the determination or after the labor classifications.

What is a conformance?

In limited circumstances, when there is no appropriate labor classification on the applicable general wage determination, WHD may add or "conform" a new class of laborer or mechanic and a wage rate to a published wage determination for a specific contract. A conformance may only be granted when certain criteria are met.

First, a conformance is granted by WHD **only when the type of work needed for a project is *not* performed by a labor classification *already* listed on the applicable wage determination.**

Second, the purpose of the conformance process is not to create new construction classifications but to determine the prevailing wage for standard construction classifications when they are missing from the applicable wage determination, often as the result of low participation in a Davis-Bacon wage survey. Therefore, the conformed labor classification must be one that is actually used in the area by the construction industry.

Finally, if WHD grants a conformance, the wage rate selected will be one that bears a "reasonable relationship" to the existing wage rates on the applicable wage determination. As explained in AAM 213, this generally involves a comparison of the proposed wage rate, including any fringe benefits, to the wage rates for similar labor classifications on the wage determination.

How do I know if I need a conformance?

Understanding the wage determination is key to determining whether you need a conformance. Compare labor classifications on the wage determination with the anticipated work to be performed. Conversation between the contracting agency, contractors and WHD will help identify any potential missing labor classifications. ***Typically, the labor classifications***

listed on the wage determination include the work being performed on a Davis-Bacon covered contract.

The scope of work performed by a labor classification will depend on local area practice. Therefore, if it is unclear whether a labor classification on the wage determination performs the work in question, it may be helpful to consult WHD and/or local construction industry stakeholders.

When the type of worker that performs the work needed on your project is listed on the general wage determination, you should not request a conformance.

When do I need to request a conformance?

Only after reviewing the wage determination and identifying a missing labor classification needed to perform the work on the project should you seek a conformance. ***Please note, wanting to pay a lower wage rate rather than the prevailing wage listed is not grounds for a conformance request.*** Laborers and mechanics are required to be paid the prevailing wage for the labor classification of work actually performed.

The following examples discuss whether a conformance is needed in common scenarios involving the types of work performed on federal contracts. Please note that, in some instances, the scope of work performed by these labor classifications may differ based on local practice, and a different conformance outcome may be warranted. When determining whether a conformance is required, it is important to review the applicable wage determinations and, if needed, consult WHD and/or local stakeholders.

Examples:

Broadband: A large infrastructure contract has been funded to promote rural broadband and Davis-Bacon applies due to the funding source.

Q: Do you need to seek a conformance?

A: No, "broadband" is not a labor classification. Typically, a broadband infrastructure project will include the labor classifications for power equipment operators, general laborers, and electricians; if the necessary labor classifications are listed on the wage determination, you do not need to seek a conformance.

Weatherization Carpenter: A large infrastructure contract has been funded to provide weatherization services to residential homes and Davis-Bacon prevailing wage rates apply due to the funding source. Such work is typically performed by carpenters and the wage determination contains a carpenter classification.

Q: Do you need to seek a conformance because the work is called weatherization?

A: No, the required work is typically performed by carpenters, a labor classification included on the wage determination.

Window Seal Worker: The project requires that windows be sealed to create a sound barrier. The wage determination lists a glazier classification.

Q: Do you need to seek a conformance?

A: No, sealing windows is incidental to window repair and window installation, which is covered by the glazier classification.

Mechanical Insulator: The project requires that the mechanical system of a large industrial facility be insulated to prevent heat damage. The wage determination lists the Heat and Frost Insulator classification.

Q: Do you need to seek a conformance?

A: No, the work to be performed typically falls under the Heat and Frost Insulator classification listed on the wage determination.

Bricklayer: The project requires a decorative masonry wall. The wage determination includes a bricklayer classification with a prevailing wage rate based on a union collective bargaining agreement. The contractor is not party to the union agreement.

Q: Do you need to seek a conformance?

A: No, the prevailing rate for the needed labor classification that is listed on the wage determination applies regardless of the union/non-union affiliation of the contractor.

Low-voltage Wiring: The project includes installing audio and video cables throughout a building. The wage determination includes an electrician classification with a union prevailing wage, but does not include a low-voltage electrician classification. The local electrical union identified on the wage determination does not perform low-voltage electrical work.

Q: Do you need to seek a conformance?

A: Yes, the work at issue does not fall within a published labor classification on the wage determination.

Boilermaker: An industrial project includes the retrofitting of a coal fired generator to burn clean fuel. The wage determination does not include a boilermaker classification and this work is not within the scope of work of any other labor classification on the wage determination.

Q: Do you need to seek a conformance?

A: Yes, the work at issue does not fall within a published labor classification on the wage determination.

How do I request a conformance?

If you have identified that a conformance is likely required, WHD recommends the following steps for contracting agencies:

1. Work with the contractors and other affected parties to help develop the conformance request.

   Provide the conformance request form (SF-1444 or similar) to the contractor. Instructions on how to complete the form are printed on the form. The SF-1444 can be downloaded from www.sam.gov. (See Resources below)

   As part of the conformance request, you will need to provide information about the work to be performed on the project, the requested labor classification, the duties to be performed by that labor classification and a recommended wage rate. It may be helpful to consider the input of affected parties, including the prime contractor, subcontractor, union representatives, and workers.

2. Ensure the request meets the conformance criteria to ensure that:

   - The type of work to be performed is not performed by a labor classification already listed on the applicable wage determination;
   - The requested labor classification is one actually used in the area by the construction industry; and
   - The recommended wage rate bears a "reasonable relationship" to other wage rates in the wage determination, specifically those from the same category of classifications and sector of industry as the proposed classification. (See AAM 213 for further guidance on the "reasonable relationship" analysis).

3. Submit conformance request for WHD review and approval, including the following:

   - The applicable wage determination;
   - The completed SF-1444 (or similar), including all required signatures;
   - A written detailed description of the work to be performed by the requested classification; and
   - Any related documentation and agency recommendation.

   Email the completed SF-1444 (or similar) and supporting materials to: WHD-CBACONFORMANCE_INCOMING@dol.gov.

What happens after I submit the conformance request to the Wage and Hour Division?

Once you have submitted your conformance request, WHD staff conducts a thorough review of the requested conformance before final approval or denial. Generally, the process includes the following steps:

1. The conformance request is received by WHD and assigned to a WHD analyst.
2. The WHD analyst works with the requesting contracting officer to ensure that the request includes all necessary information.
3. The WHD analyst reviews the conformance request and:
    - Confirms that the wage determination does not include the requested labor classification;
    - Researches the local area practice, if necessary, to verify the appropriate labor classification; and
    - Determines whether the proposed wage rate bears a "reasonable relationship" to the existing wage rates in the applicable wage determination.
4. The WHD supervisor reviews and finalizes a written response to the conformance request.
5. The Contracting Officer that submitted the request is sent the written response approving or denying the conformance.

Resources:

General

General DBRA information:

- https://www.dol.gov/agencies/whd/government-contracts/construction
- https://www.dol.gov/agencies/whd/government-contracts/construction/faq.

Forms:

- Download Form SF-1444: Request for Authorization of Additional Classification and Rate. Use this form to request a conformance from WHD.
- Download Form SF-308: Request for Wage Determination and Response to Request. Use this form to request a project wage determination.

Applicable Regulations:

- 29 C.F.R. § 5.5(a)(1)(ii): Provides regulatory criteria for a conformance and sets forth conformance procedures.

Guidance:

- AAM 130 and 131: Provide guidance on the categories of construction for which WHD issues WDs.
- AAM 213: Provides guidance on the application of the DBRA requirement that wage rates for additional or "conformed" classifications bear a "reasonable relationship" to the wage rates in that wage determination.

Contact WHD:

WHD is here to help ensure that contracting agencies and contractors understand how to comply with the Davis-Bacon Act requirements and to ensure that federal construction dollars are used to pay laborers and mechanics the wages they are entitled to under the law.

- For specific questions related to wage determinations or conformances, please contact RhonTia S. Thomas-Johnson, Chief, Branch of Construction Wage Determinations, at Thomas.RhonTia@dol.gov, or
- Email us at WHD-CBAConformance_Incoming@dol.gov.

Appendix I

1. **U.S. Department of Transportation exhibits to MARAD grant agreements under the Fiscal Year 2021 raise grant program July 18, 2022**

2. **U.S. Department of Transportation General Terms and Conditions Under the Fiscal Year 2021 Rebuilding American Infrastructure with Sustainability And Equity (Raise) Grant Program: MARAD Projects Revision Date: July 18, 2022**

3. **MARAD Procurement Standards- Procurement Standards 2CFR 200.317 - 200.327**

U.S. DEPARTMENT OF TRANSPORTATION

EXHIBITS TO MARAD GRANT AGREEMENTS UNDER THE FISCAL YEAR 2021 RAISE GRANT PROGRAM

JULY 18, 2022

EXHIBIT A
APPLICABLE FEDERAL LAWS AND REGULATIONS

By entering into this agreement for a FY 2021 RAISE Grant, the Recipient assures and certifies, with respect to this Grant, that it will comply with all applicable Federal laws, regulations, executive orders, policies, guidelines, and requirements as they relate to the application, acceptance, and use of Federal funds for this Project. Performance under this agreement shall be governed by and in compliance with the following requirements, as applicable, to the type of organization of the Recipient and any applicable sub-recipients. The applicable provisions to this agreement include, but are not limited to, the following:

General Federal Legislation

a. Davis-Bacon Act - 40 U.S.C. §§ 3141, et seq.
b. Federal Fair Labor Standards Act - 29 U.S.C. §§ 201, et seq.
c. Hatch Act - 5 U.S.C. §§ 1501, et seq.
d. Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 - 42 U.S.C. §§ 4601, et seq.
e. National Historic Preservation Act of 1966 - 54 U.S.C. § 306108
f. Archeological and Historic Preservation Act of 1974 - 54 U.S.C. §§ 312501, et seq.
g. Native American Graves Protection and Repatriation Act - 25 U.S.C. §§ 3001, et seq.
h. Clean Air Act – 42 U.S.C. §§ 7401, et. seq.
i. Clean Water Act - 33 U.S.C. §§ 1251, et seq.
j. Endangered Species Act – 16 U.S.C. §§ 1531 et seq.
k. Coastal Zone Management Act – 16 U.S.C. §§ 1451 et seq.
l. Flood Disaster Protection Act of 1973 – 42 U.S.C. §§ 4001 et seq.
m. Age Discrimination Act of 1975, as amended - 42 U.S.C. §§ 6101, et seq.
n. American Indian Religious Freedom Act, 42 U.S.C. 1996
o. Drug Abuse Office and Treatment Act of 1972, as amended, 21 U.S.C. §§ 1101, et seq.
p. The Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970, P.L. 91-616, as amended - 42 U.S.C. §§ 4541, et seq.
q. Sections 523 and 527 of the Public Health Service Act of 1912, as amended, 42 U.S.C. §§ 290dd through 290dd-2
r. Architectural Barriers Act of 1968 - 42 U.S.C. §§ 4151, et seq.
s. Power Plant and Industrial Fuel Use Act of 1978, P.L. 100-42 - Section 403 - 42 U.S.C. § 8373
t. Contract Work Hours and Safety Standards Act - 40 U.S.C. §§ 3701, et seq.
u. Copeland Anti-kickback Act, as amended - 18 U.S.C. § 874 and 40 U.S.C. § 3145
v. National Environmental Policy Act of 1969 - 42 U.S.C. §§ 4321, et seq.
w. Wild and Scenic Rivers Act – 16 U.S.C. §§ 1271, et seq.
x. Single Audit Act of 1984 - 31 U.S.C. §§ 7501, et seq.
y. Americans with Disabilities Act of 1990 - 42 U.S.C. § 12101, et seq.
z. Title IX of the Education Amendments of 1972, as amended - 20 U.S.C. §§ 1681–1683 and §§ 1685–1687
aa. Section 504 of the Rehabilitation Act of 1973, as amended - 29 U.S.C. § 794
bb. Title VI of the Civil Rights Act of 1964 - 42 U.S.C. §§ 2000d, et seq.
cc. Title IX of the Federal Property and Administrative Services Act of 1949 - 40 U.S.C. §§ 1101–1104

dd. Limitation on Use of Appropriated Funds to Influence Certain Federal Contracting and Financial Transactions – 31 U.S.C. § 1352
ee. Freedom of Information Act - 5 U.S.C. § 552, as amended
ff. Magnuson-Stevens Fishery Conservation and Management Act – 16 U.S.C. §§ 1801, et seq.
gg. Farmland Protection Policy Act of 1981 – 7 U.S.C. §§ 4201, et seq.
hh. Noise Control Act of 1972 – 42 U.S.C. §§ 4901, et seq.
ii. Fish and Wildlife Coordination Act of 1956 – 16 U.S.C. §§ 661, et seq.
jj. Section 9 of the Rivers and Harbors Act and the General Bridge Act of 1946 - 33 U.S.C. §§ 401 and 525
kk. Section 4(f) of the Department of Transportation Act of 1966, 49 U.S.C. § 303 and 23 U.S.C. § 138
ll. Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) – 42 U.S.C. §§ 9601, et seq.
mm. Safe Drinking Water Act – 42 U.S.C. §§ 300f, et seq.
nn. The Wilderness Act – 16 U.S.C. §§ 1131, et seq.
oo. Migratory Bird Treaty Act 16 U.S.C. §§ 703, et seq.
pp. The Federal Funding Transparency and Accountability Act of 2006, as amended (Pub. L. 109–282, as amended by section 6202 of Public Law 110–252)
qq. Cargo Preference Act of 1954 – 46 U.S.C. § 55305
rr. Build America, Buy America Act – Pub. L. No. 117-58, div. G, tit. IX, subtit. A, 135 Stat. 429, 1298
ss. Section 889 of the John D. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. 115-232

Executive Orders

a. Executive Order 11246 – Equal Employment Opportunity
b. Executive Order 11990 – Protection of Wetlands
c. Executive Order 11988 – Floodplain Management
d. Executive Order 12372 – Intergovernmental Review of Federal Programs
e. Executive Order 12549 – Debarment and Suspension
f. Executive Order 12898 – Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
g. Executive Order 13166 – Improving Access to Services for Persons With Limited English Proficiency
h. Executive Order 13985 – Advancing Racial Equity and Support for Underserved Communities Through the Federal Government
i. Executive Order 14005 – Ensuring the Future is Made in All of America by All of America's Workers
j. Executive Order 14008 – Tackling the Climate Crisis at Home and Abroad

General Federal Regulations

a. Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards – 2 C.F.R. Parts 200, 1201
b. Non-procurement Suspension and Debarment – 2 C.F.R. Parts 180, 1200
c. Investigative and Enforcement Procedures – 14 C.F.R. Part 13

d. Procedures for predetermination of wage rates – 29 C.F.R. Part 1
e. Contractors and subcontractors on public building or public work financed in whole or part by loans or grants from the United States – 29 C.F.R. Part 3
f. Labor standards provisions applicable to contracts governing federally financed and assisted construction (also labor standards provisions applicable to non-construction contracts subject to the Contract Work Hours and Safety Standards Act) – 29 C.F.R. Part 5
g. Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor (Federal and federally assisted contracting requirements) – 41 C.F.R. Parts 60, et seq.
h. New Restrictions on Lobbying – 49 C.F.R. Part 20
i. Nondiscrimination in Federally Assisted Programs of the Department of Transportation – Effectuation of Title VI of the Civil Rights Act of 1964 – 49 C.F.R. Part 21
j. Uniform relocation assistance and real property acquisition for Federal and Federally assisted programs – 49 C.F.R. Part 24
k. Nondiscrimination on the Basis of Sex in Education Programs or Activities Receiving Federal Financial Assistance – 49 C.F.R. Part 25
l. Nondiscrimination on the Basis of Handicap in Programs and Activities Receiving or Benefiting from Federal Financial Assistance – 49 C.F.R. Part 27
m. DOT's implementation of DOJ's ADA Title II regulations compliance procedures for all programs, services, and regulatory activities relating to transportation under 28 C.F.R. Part 35
n. Enforcement of Nondiscrimination on the Basis of Handicap in Programs or Activities Conducted by the Department of Transportation – 49 C.F.R. Part 28
o. Denial of public works contracts to suppliers of goods and services of countries that deny procurement market access to U.S. contractors – 49 C.F.R. Part 30
p. Governmentwide Requirements for Drug-Free Workplace (Financial Assistance) – 49 C.F.R. Part 32
q. DOT's implementing ADA regulations for transit services and transit vehicles, including the DOT's standards for accessible transportation facilities in Part 37, Appendix A – 49 C.F.R. Parts 37 and 38
r. Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs – 49 C.F.R. Part 26 (as applicable under section 18.3 of this agreement)
s. Preference for Privately Owned Commercial U.S. Flag Vessels – 46 C.F.R. Part 381

Specific assurances required to be included in the FY 2021 RAISE Grant agreement by any of the above laws, regulations, or circulars are hereby incorporated by reference into this agreement.

EXHIBIT B
ADDITIONAL STANDARD TERMS

TERM B.1
TITLE VI ASSURANCE
(Implementing Title VI of the Civil Rights Act of 1964, as amended)

ASSURANCE CONCERNING NONDISCRIMINATION IN FEDERALLY-ASSISTED PROGRAMS AND ACTIVITIES RECEIVING OR BENEFITING FROM FEDERAL FINANCIAL ASSISTANCE

(Implementing the Rehabilitation Act of 1973, as amended, and the Americans With Disabilities Act, as amended)

49 C.F.R. Parts 21, 25, 27, 37 and 38

The United States Department of Transportation (USDOT)

Standard Title VI/Non-Discrimination Assurances

DOT Order No. 1050.2A

By signing and submitting the Technical Application and by entering into this agreement under the FY 2021 RAISE grant program, the Recipient **HEREBY AGREES THAT**, as a condition to receiving any Federal financial assistance from the U.S. Department of Transportation (DOT), through the Maritime Administration (MARAD), it is subject to and will comply with the following:

Statutory/Regulatory Authorities

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq*., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin);
- 49 C.F.R. Part 21 (entitled *Non-discrimination In Federally-Assisted Programs Of The Department Of Transportation—Effectuation Of Title VI Of The Civil Rights Act Of 1964*);
- 28 C.F.R. section 50.3 (U.S. Department of Justice Guidelines for Enforcement of Title VI of the Civil Rights Act of 1964);

The preceding statutory and regulatory cites hereinafter are referred to as the "Acts" and "Regulations," respectively.

General Assurances

In accordance with the Acts, the Regulations, and other pertinent directives, circulars, policy, memoranda, and/or guidance, the Recipient hereby gives assurance that it will promptly take any measures necessary to ensure that:

"No person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity," for which the Recipient receives Federal financial assistance from DOT, including MARAD.

The Civil Rights Restoration Act of 1987 clarified the original intent of Congress, with respect to Title VI and other Non-discrimination requirements (The Age Discrimination Act of 1975, and Section 504 of the Rehabilitation Act of 1973), by restoring the broad, institutional-wide scope and coverage of these non-discrimination statutes and requirements to include all programs and activities of the Recipient, so long as any portion of the program is Federally assisted.

Specific Assurances

More specifically, and without limiting the above general Assurance, the Recipient agrees with and gives the following Assurances with respect to its Federally assisted FY 2021 RAISE grant program:

1. The Recipient agrees that each "activity," "facility," or "program," as defined in §§ 21.23 (b) and 21.23 (e) of 49 C.F.R. § 21 will be (with regard to an "activity") facilitated, or will be (with regard to a "facility") operated, or will be (with regard to a "program") conducted in compliance with all requirements imposed by, or pursuant to the Acts and the Regulations.

2. The Recipient will insert the following notification in all solicitations for bids, Requests For Proposals for work, or material subject to the Acts and the Regulations made in connection with the FY 2021 RAISE Grant and, in adapted form, in all proposals for negotiated agreements regardless of funding source:

   "*The Recipient, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that for any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.*"

3. The Recipient will insert the clauses of Appendix A and E of this Assurance in every contract or agreement subject to the Acts and the Regulations.

4. The Recipient will insert the clauses of Appendix B of this Assurance, as a covenant running with the land, in any deed from the United States effecting or recording a transfer of real property, structures, use, or improvements thereon or interest therein to a Recipient.

5. That where the Recipient receives Federal financial assistance to construct a facility, or part of a facility, the Assurance will extend to the entire facility and facilities operated in connection therewith.

6. That where the Recipient receives Federal financial assistance in the form, or for the acquisition of real property or an interest in real property, the Assurance will extend to rights to space on, over, or under such property.

7. That the Recipient will include the clauses set forth in Appendix C and Appendix D of this Assurance, as a covenant running with the land, in any future deeds, leases, licenses, permits, or similar instruments entered into by the Recipient with other parties:

    a. for the subsequent transfer of real property acquired or improved under the applicable activity, project, or program; and
    b. for the construction or use of, or access to, space on, over, or under real property acquired or improved under the applicable activity, project, or program.

8. That this Assurance obligates the Recipient for the period during which Federal financial assistance is extended to the program, except where the Federal financial assistance is to provide, or is in the form of, personal property, or real property, or interest therein, or structures or improvements thereon, in which case the Assurance obligates the Recipient, or any transferee for the longer of the following periods:

    a. the period during which the property is used for a purpose for which the Federal financial assistance is extended, or for another purpose involving the provision of similar services or benefits; or
    b. the period during which the Recipient retains ownership or possession of the property.

9. The Recipient will provide for such methods of administration for the program as are found by the Secretary of Transportation or the official to whom he/she delegates specific authority to give reasonable guarantee that it, other recipients, sub-recipients, contractors, subcontractors, consultants, transferees, successors in interest, and other participants of Federal financial assistance under such program will comply with all requirements imposed or pursuant to the Acts, the Regulations, and this Assurance.

10. The Recipient agrees that the United States has a right to seek judicial enforcement with regard to any matter arising under the Acts, the Regulations, and this Assurance.

By signing this ASSURANCE, the Recipient also agrees to comply (and require any sub-recipients, contractors, successors, transferees, and/or assignees to comply) with all applicable provisions governing MARAD's access to records, accounts, documents, information, facilities, and staff. You also recognize that you must comply with any program or compliance reviews, and/or complaint investigations conducted by MARAD. You must keep records, reports, and submit the material for review upon request to MARAD, or its designee in a timely, complete,

and accurate way. Additionally, you must comply with all other reporting, data collection, and evaluation requirements, as prescribed by law or detailed in program guidance.

The Recipient gives this ASSURANCE in consideration of and for obtaining any Federal grants, loans, contracts, agreements, property, and/or discounts, or other Federal-aid and Federal financial assistance extended after the date hereof to the recipients by the U.S. Department of Transportation under the FY 2021 RAISE grant program. This ASSURANCE is binding on the Recipient, other recipients, sub-recipients, contractors, subcontractors and their subcontractors', transferees, successors in interest, and any other participants in the FY 2021 RAISE grant program.

APPENDIX A

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Maritime Administration (MARAD), as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

2. **Non-discrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 C.F.R. Part 21.

3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to Non-discrimination on the grounds of race, color, or national origin.

4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or MARAD to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor will so certify to the Recipient or MARAD, as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance:** In the event of a contractor's noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or MARAD may determine to be appropriate, including, but not limited to:

    a. withholding payments to the contractor under the contract until the contractor complies; and/or
    b. cancelling, terminating, or suspending a contract, in whole or in part.

6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant

thereto. The contractor will take action with respect to any subcontract or procurement as the Recipient or MARAD may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

APPENDIX B

CLAUSES FOR DEEDS TRANSFERRING UNITED STATES PROPERTY

The following clauses will be included in deeds effecting or recording the transfer of real property, structures, or improvements thereon, or granting interest therein from the United States pursuant to the provisions of Specific Assurance 4:

NOW, THEREFORE, the U.S. Department of Transportation as authorized by law and upon the condition that the Recipient will accept title to the lands and maintain the project constructed thereon in accordance with the Consolidated Appropriations Act, 2021 (Pub. L. 116-260, Dec. 27, 2020) the Regulations for the Administration of FY 2021 RAISE grant program**,** and the policies and procedures prescribed by the Maritime Administration (MARAD) of the U.S. Department of Transportation in accordance and in compliance with all requirements imposed by Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation pertaining to and effectuating the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252; 42 U.S.C. § 2000d to 2000d-4), does hereby remise, release, quitclaim and convey unto the Recipient all the right, title and interest of the U.S. Department of Transportation in and to said lands described in Exhibit A attached hereto and made a part hereof.

(HABENDUM CLAUSE)

TO HAVE AND TO HOLD said lands and interests therein unto Recipient and its successors forever, subject, however, to the covenants, conditions, restrictions and reservations herein contained as follows, which will remain in effect for the period during which the real property or structures are used for a purpose for which Federal financial assistance is extended or for another purpose involving the provision of similar services or benefits and will be binding on the Recipient, its successors and assigns.

The Recipient, in consideration of the conveyance of said lands and interests in lands, does hereby covenant and agree as a covenant running with the land for itself, its successors and assigns, that (1) no person will on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination with regard to any facility located wholly or in part on, over, or under such lands hereby conveyed [,] [and]* (2) that the Recipient will use the lands and interests in lands and interests in lands so conveyed, in compliance with all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Effectuation of Title VI of the Civil Rights Act of 1964, and as said Regulations and Acts may be amended[, and (3) that in the event of breach of any of the above-mentioned non-discrimination conditions, the Department will have a right to enter or re-enter said lands and facilities on said land, and that above described land and facilities will thereon revert to and vest in and become the absolute property of the U.S. Department of Transportation and its assigns as such interest existed prior to this instruction].*

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary in order to make clear the purpose of Title VI.)

APPENDIX C

CLAUSES FOR TRANSFER OF REAL PROPERTY ACQUIRED OR IMPROVED UNDER THE ACTIVITY, FACILITY, OR PROGRAM

The following clauses will be included in deeds, licenses, leases, permits, or similar instruments entered into by the Recipient pursuant to the provisions of Specific Assurance 7(a):

A. The (Recipient, lessee, permittee, etc. as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree [in the case of deeds and leases add "as a covenant running with the land"] that:

    1. In the event facilities are constructed, maintained, or otherwise operated on the property described in this (deed, license, lease, permit, etc.) for a purpose for which a U.S. Department of Transportation activity, facility, or program is extended or for another purpose involving the provision of similar services or benefits, the (Recipient, licensee, lessee, permittee, etc.) will maintain and operate such facilities and services in compliance with all requirements imposed by the Acts and Regulations (as may be amended) such that no person on the grounds of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities.

B. With respect to licenses, leases, permits, etc., in the event of breach of any of the above Non-discrimination covenants, Recipient will have the right to terminate the (lease, license, permit, etc.) and to enter, re-enter, and repossess said lands and facilities thereon, and hold the same as if the (lease, license, permit, etc.) had never been made or issued.*

C. With respect to a deed, in the event of breach of any of the above Non-discrimination covenants, the Recipient will have the right to enter or re-enter the lands and facilities thereon, and the above described lands and facilities will there upon revert to and vest in and become the absolute property of the Recipient and its assigns.*

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

APPENDIX D

CLAUSES FOR CONSTRUCTION/USE/ACCESS TO REAL PROPERTY ACQUIRED UNDER THE ACTIVITY, FACILITY OR PROGRAM

The following clauses will be included in deeds, licenses, permits, or similar instruments/agreements entered into by Recipient pursuant to the provisions of Specific Assurance 7(b):

A. The (Recipient, licensee, permittee, etc., as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree (in the case of deeds and leases add, "as a covenant running with the land") that (1) no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities, (2) that in the construction of any improvements on, over, or under such land, and the furnishing of services thereon, no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or otherwise be subjected to discrimination, (3) that the (Recipient, licensee, lessee, permittee, etc.) will use the premises in compliance with all other requirements imposed by or pursuant to the Acts and Regulations, as amended, set forth in this Assurance.

B. With respect to (licenses, leases, permits, etc.), in the event of breach of any of the above Non-discrimination covenants, Recipient will have the right to terminate the (license, permit, etc., as appropriate) and to enter or re-enter and repossess said land and the facilities thereon, and hold the same as if said (license, permit, etc., as appropriate) had never been made or issued.*

C. With respect to deeds, in the event of breach of any of the above Non-discrimination covenants, Recipient will there upon revert to and vest in and become the absolute property of Recipient and its assigns.*

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

APPENDIX E

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

Pertinent Non-Discrimination Authorities:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq*., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 C.F.R. Part 21.
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 *et seq*.), (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 *et seq*.), as amended, (prohibits discrimination on the basis of disability); and 49 C.F.R. Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq*.), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 U.S.C. § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 – 12189) as implemented by Department of Transportation regulations at 49 C.F.R. Parts 37 and 38;
- The Federal Aviation Administration's Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures nondiscrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);

- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. § 1681 et seq).

TERM B.2
CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS -- PRIMARY COVERED TRANSACTIONS

2 C.F.R. Parts 180 and 1200

These assurances and certifications are applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring MARAD approval or that is estimated to cost $25,000 or more – as defined in 2 C.F.R. Parts 180 and 1200.

By signing and submitting the Technical Application and by entering into this agreement under the FY 2021 RAISE grant program, the Recipient is providing the assurances and certifications for First Tier Participants and Lower Tier Participants in the FY 2021 RAISE Grant, as set out below.

1. Instructions for Certification – First Tier Participants:

a. The prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "civil judgment," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 C.F.R. Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a Recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to

the participant who has entered into a covered transaction with a Recipient or subrecipient of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers to any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (https://www.sam.gov/), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment, including a civil settlement, rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior MARAD approval or estimated to cost $25,000 or more - 2 C.F.R. Parts 180 and 1200)

a. The prospective lower tier participant is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms “covered transaction,” “civil settlement,” “debarred,” “suspended,” “ineligible,” “participant,” “person,” “principal,” and “voluntarily excluded,” as used in this clause, are defined in 2 C.F.R. Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. “First Tier Covered Transactions” refers to any covered transaction between a Recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered

transaction with a Recipient or subrecipient of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (https://www.sam.gov/), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion -- Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

TERM B.3
REQUIREMENTS REGARDING DELINQUENT TAX LIABILITY OR A FELONY CONVICTION UNDER ANY FEDERAL LAW

As required by sections 744 and 745 of Title VII, Division E of the Consolidated Appropriations Act, 2021 (Pub. L. 116-260), and implemented through USDOT Order 4200.6, the funds provided under this award shall not be used to enter into a contract, memorandum of understanding, or cooperative agreement with, make a grant to, or provide a loan or loan guarantee to, any corporation that:

(1) Has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability, where the awarding agency is aware of the unpaid tax liability, unless a Federal agency has considered suspension or debarment of the corporation and made a determination that suspension or debarment is not necessary to protect the interests of the Government; or

(2) Was convicted of a felony criminal violation under any Federal law within the preceding 24 months, where the awarding agency is aware of the conviction, unless a Federal agency has considered suspension or debarment of the corporation and made a determination that suspension or debarment is not necessary to protect the interests of the Government.

The Recipient therefore agrees:

1. **Definitions.** For the purposes of this exhibit, the following definitions apply:

   "**Covered Transaction**" means a transaction that uses any funds under this award and that is a contract, memorandum of understanding, cooperative agreement, grant, loan, or loan guarantee.

   "**Felony Conviction**" means a conviction within the preceding 24 months of a felony criminal violation under any Federal law and includes conviction of an offense defined in a section of the United States Code that specifically classifies the offense as a felony and conviction of an offense that is classified as a felony under 18 U.S.C. 3559.

   "**Participant**" means the Recipient, an entity who submits a proposal for a Covered Transaction, or an entity who enters into a Covered Transaction.

   "**Tax Delinquency**" means an unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

2. **Mandatory Check in the System for Award Management.** Before entering a Covered Transaction with another entity, a Participant shall check the System for Award Management (the "**SAM**") at http://www.sam.gov/ for an entry describing that entity.

3. **Mandatory Certifications.** Before entering a Covered Transaction with another entity, a Participant shall require that entity to:

    (1) Certify whether the entity has a Tax Delinquency; and

    (2) Certify whether the entity has a Felony Conviction.

4 **Prohibition.** If

    (1) the SAM entry for an entity indicates that the entity has a Tax Delinquency or a Federal Conviction;

    (2) an entity provides an affirmative response to either certification in section 3; or

    (3) an entity's certification under section 3 was inaccurate when made or became inaccurate after being made

    then a Participant shall not enter or continue a Covered Transaction with that entity unless the USDOT has determined in writing that suspension or debarment of that entity are not necessary to protect the interests of the Government.

5. **Mandatory Notice to the USDOT.**

    (a) If the SAM entry for a Participant indicates that the Participant has a Tax Delinquency or a Felony Conviction, the Recipient shall notify the USDOT in writing of that entry.

    (b) If a Participant provides an affirmative response to either certification in section 1, the Recipient shall notify the USDOT in writing of that affirmative response.

    (c) If the Recipient knows that a Participant's certification under section 1 was inaccurate when made or became inaccurate after being made, the Recipient shall notify the USDOT in writing of that inaccuracy.

6. **Flow Down.** For all Covered Transactions, including all tiers of subcontracts and subawards, the Recipient shall:

    (1) require the SAM check in section 2;

    (2) require the certifications in section 3;

    (3) include the prohibition in section 4; and

(4) require all Participants to notify the Recipient in writing of any information that would require the Recipient to notify the USDOT under section 5.

TERM B.4
RECIPIENT POLICY TO BAN TEXT MESSAGING WHILE DRIVING

(a) *Definitions.* The following definitions are intended to be consistent with the definitions in DOT Order 3902.10, Text Messaging While Driving (Dec. 30, 2009) and Executive Order 13513, Federal Leadership on Reducing Text Messaging While Driving (Oct. 1, 2009). For clarification purposes, they may expand upon the definitions in the executive order.

For the purpose of this Term B.3, "**Motor Vehicles**" means any vehicle, self-propelled or drawn by mechanical power, designed and operated principally for use on a local, State or Federal roadway, but does not include a military design motor vehicle or any other vehicle excluded under Federal Management Regulation 102-34-15.

For the purpose of this Term B.3, "**Driving**" means operating a motor vehicle on a roadway, including while temporarily stationary because of traffic congestion, a traffic signal, a stop sign, another traffic control device, or otherwise. It does not include being in your vehicle (with or without the motor running) in a location off the roadway where it is safe and legal to remain stationary.

For the purpose of this Term B.3, "**Text messaging**" means reading from or entering data into any handheld or other electronic device (including, but not limited to, cell phones, navigational tools, laptop computers, or other electronic devices), including for the purpose of Short Message Service (SMS) texting, e-mailing, instant messaging, obtaining navigational information, or engaging in any other form of electronic data retrieval or electronic data communication. The term does not include the use of a cell phone or other electronic device for the limited purpose of entering a telephone number to make an outgoing call or answer an incoming call, unless this practice is prohibited by State or local law. The term also does not include glancing at or listening to a navigational device that is secured in a commercially designed holder affixed to the vehicle, provided that the destination and route are programmed into the device either before driving or while stopped in a location off the roadway where it is safe and legal to remain stationary.

For the purpose of this Term B.3, the "**Government**" includes the United States Government and State, local, and tribal governments at all levels.

(b) *Workplace Safety.* In accordance with Executive Order 13513, Federal Leadership on Reducing Text Messaging While Driving (Oct. 1, 2009) and DOT Order 3902.10, Text Messaging While
Driving (Dec. 30, 2009), the Recipient, subrecipients, contractors, and subcontractors are encouraged to:

(1) adopt and enforce workplace safety policies to decrease crashes caused by distracted drivers including policies to ban text messaging while driving—

(i) Company-owned or -rented vehicles or Government-owned, leased or rented vehicles; or

(ii) Privately-owned vehicles when on official Government business or when performing any work for or on behalf of the Government.

(2) Conduct workplace safety initiatives in a manner commensurate with the size of the business, such as—

(i) Establishment of new rules and programs or re-evaluation of existing programs to prohibit text messaging while driving; and

(ii) Education, awareness, and other outreach to employees about the safety risks associated with texting while driving.

(c) *Subawards and Contracts.* To the extent permitted by law, the Recipient shall insert the substance of this exhibit, including this paragraph (c), in all subawards, contracts, and subcontracts under this award that exceed the micro-purchase threshold, other than contracts and subcontracts for the acquisition of commercially available off-the-shelf items.

TERM B.5
REQUIRED USE OF AMERICAN IRON, STEEL, MANUFACTURED PRODUCTS, AND CONSTRUCTION MATERIALS

This award term implements § 70914(a) of the Build America, Buy America Act, Pub. L. No. 117-58, div. G, tit. IX, subtit. A, 135 Stat. 429, 1298 (2021) and Office of Management and Budget (OMB) Memorandum M-22-11, "Initial Implementation Guidance on Application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure."

Requirement to Use Iron, Steel, Manufactured Products, and Construction Materials Produced in the United States.

The Recipient shall not use funds provided under this award for a project for infrastructure unless:

(1) all iron and steel used in the project are produced in the United States—this means all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States;

(2) all manufactured products used in the project are produced in the United States—this means the manufactured product was manufactured in the United States; and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product; and

(3) all construction materials are manufactured in the United States—this means that all manufacturing processes for the construction material occurred in the United States.

Inapplicability.

The domestic content procurement preference in this award term only applies to articles, materials, and supplies that are consumed in, incorporated into, or affixed to an infrastructure project. As such, it does not apply to tools, equipment, and supplies, such as temporary scaffolding, brought to the construction site and removed at or before the completion of the infrastructure project. Nor does a Buy America preference apply to equipment and furnishings, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished infrastructure project, but are not an integral part of the structure or permanently affixed to the infrastructure project.

Waivers.

When necessary, the Recipient may apply for, and the USDOT may grant, a waiver from the domestic content procurement preference in this award term.

A request to waive the application of the domestic content procurement preference must be in writing. The USDOT will provide instructions on the waiver process and on the format, contents,

and supporting materials required for any waiver request. Waiver requests are subject to public comment periods of no less than 15 days and must be reviewed by the Office of Management and Budget (OMB) Made in America Office.

When the USDOT has made a determination that one of the following exceptions applies, the awarding official may waive the application of the domestic content procurement preference in any case in which the USDOT determines that:

(1) applying the domestic content procurement preference would be inconsistent with the public interest;

(2) the types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality; or

(3) the inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent.

There may be instances where an award qualifies, in whole or in part, for an existing waiver described at https://www.transportation.gov/office-policy/transportation-policy/made-in-america.

Definitions

"Construction materials" includes an article, material, or supply—other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives—that is or consists primarily of:

- non-ferrous metals;
- plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
- glass (including optic glass);
- lumber; or
- drywall.

"Domestic content procurement preference" means all iron and steel used in the project are produced in the United States; the manufactured products used in the project are produced in the United States; or the construction materials used in the project are produced in the United States.

"Primarily iron or steel" means that the cost of the iron and steel content in the article, material, or supply exceeds 50 percent of the total cost of all its components. The cost of iron and steel is the cost of the iron or steel mill products (such as bar, billet, slab, wire, plate, or sheet), castings, or forgings utilized in the manufacture of the product and a good faith estimate of the cost of iron or steel components. The origin of the elements of the iron or steel is not relevant to the determination of whether it is domestic or foreign.

"Project" means the construction, alteration, maintenance, or repair of infrastructure in the United States.

EXHIBIT C
QUARTERLY PROJECT PROGRESS REPORTS AND RECERTIFICATIONS: FORMAT AND CONTENT

1. Purpose. The purpose of the Quarterly Project Progress Reports and Recertifications under this agreement for the FY 2021 RAISE grant program are to ensure that the project scope, schedule, and budget will be maintained to the maximum extent possible.

2. Format and Content. The Recipient shall produce a quarterly cost, schedule, and status report that contains the sections enumerated in the following list. At the discretion of the USDOT, modifications or additions can be made to produce a quarterly reporting format that will most effectively serve both the Recipient and the USDOT. Some projects will have a more extensive quarterly status than others. For smaller projects, the USDOT may determine that the content of the quarterly reports will be streamlined and project status meetings will be held on a less-frequent basis. The first quarterly progress report should include a detailed description and, where appropriate, drawings of the items funded.

(a) Project Overall Status. This section provides an overall status of the project's scope, schedule and budget. The Recipient shall note and explain any deviations from the scope of work, the schedule, or the budget that are described in this agreement.

(b) Project Significant Activities and Issues. This section provides highlights of key activities, accomplishments, and issues occurring on the project during the previous quarter. Activities and deliverables to be reported on should include meetings, audits and other reviews, design packages submitted, advertisements, awards, construction submittals, construction completion milestones, submittals related to any applicable Recovery Act requirements, media or Congressional inquiries, value engineering/constructability reviews, and other items of significance.

(c) Action Items/Outstanding Issues. This section should draw attention to, and track the progress of, highly significant or sensitive issues requiring action and direction in order to resolve. The Recipient should include administrative items and outstanding issues that could have a significant or adverse effect on the project's scope, schedule, or budget. Status, responsible person(s), and due dates should be included for each action item/outstanding issue. Action items requiring action or direction should be included in the quarterly status meeting agenda. The action items/outstanding issues may be dropped from this section upon full implementation of the remedial action, and upon no further monitoring anticipated.

(d) Project Scope Overview. The purpose of this section is to provide a further update regarding the project scope. If the original scope contained in the grant agreement is still accurate, this section can simply state that the scope is unchanged.

(e) Project Schedule. An updated master program schedule reflecting the current status of the program activities should be included in this section. A Gantt (bar) type chart is probably the most appropriate for quarterly reporting purposes, with the ultimate

format to be agreed upon between the Recipient and the USDOT. It is imperative that the master program schedule be integrated, i.e., the individual contract milestones tied to each other, such that any delays occurring in one activity will be reflected throughout the entire program schedule, with a realistic completion date being reported. Narratives, tables, and/or graphs should accompany the updated master program schedule, basically detailing the current schedule status, delays and potential exposures, and recovery efforts. The following information should also be included:

- Current overall project completion percentage vs. latest plan percentage.
- Completion percentages vs. latest plan percentages for major activities such as right-of-way, major or critical design contracts, major or critical construction contracts, and significant force accounts or task orders. A schedule status description should also be included for each of these major or critical elements.
- Any delays or potential exposures to milestone and final completion dates. The delays and exposures should be quantified, and overall schedule impacts assessed. The reasons for the delays and exposures should be explained, and initiatives being analyzed or implemented in order to recover the schedule should be detailed.

(f) Project Cost. An updated cost spreadsheet reflecting the current forecasted cost vs. the latest approved budget vs. the baseline budget should be included in this section. One way to track project cost is to show: (1) Baseline Budget, (2) Latest Approved Budget, (3) Current Forecasted Cost Estimate, (4) Expenditures or Commitments to Date, and (5) Variance between Current Forecasted Cost and Latest Approved Budget. Line items should include all significant cost centers, such as prior costs, right-of-way, preliminary engineering, environmental mitigation, general engineering consultant, section design contracts, construction administration, utilities, construction packages, force accounts/task orders, wrap-up insurance, construction contingencies, management contingencies, and other contingencies. The line items can be broken-up in enough detail such that specific areas of cost change can be sufficiently tracked and future improvements made to the overall cost estimating methodology. A Program Total line should be included at the bottom of the spreadsheet. Narratives, tables, and/or graphs should accompany the updated cost spreadsheet, basically detailing the current cost status, reasons for cost deviations, impacts of cost overruns, and efforts to mitigate cost overruns. The following information should be provided:

- Reasons for each line item deviation from the approved budget, impacts resulting from the deviations, and initiatives being analyzed or implemented in order to recover any cost overruns.

- Transfer of costs to and from contingency line items, and reasons supporting the transfers.

- Speculative cost changes that potentially may develop in the future, a quantified dollar range for each potential cost change, and the current status of the speculative change. Also, a comparison analysis to the available contingency amounts should be included, showing that reasonable and sufficient amounts of contingency remain to keep the project within the latest approved budget.

- Detailed cost breakdown of the general engineering consultant (GEC) services (if applicable), including such line items as contract amounts, task orders issued (amounts), balance remaining for tasks, and accrued (billable) costs.

- Federal obligations and/or disbursements for the project, compared to planned obligations and disbursements.

(g) Federal Financial Report (SF-425). The Federal Financial Report (SF-425) is a financial reporting form used throughout the Federal Government Grant system. Recipients shall complete this form and attach it to each quarterly Project Progress and Monitoring Report. The form is available at https://www.grants.gov/forms/post-award-reporting-forms.html.

(h) Certifications.

i. A certification that the Recipient is in compliance with 2 C.F.R. 200.303 (Internal Controls) and 2 C.F.R. Part 200, Subpart F (Audit Requirements).

ii. The certification required under 2 C.F.R. 200.415(a).

U.S. Department of Transportation General Terms and Conditions Under the Fiscal Year 2021 Rebuilding American Infrastructure with Sustainability and Equity (Raise) Grant Program: MARAD Projects Revision Date: July 18, 2022

U.S. DEPARTMENT OF TRANSPORTATION

GENERAL TERMS AND CONDITIONS UNDER THE FISCAL YEAR 2021 REBUILDING AMERICAN INFRASTRUCTURE WITH SUSTAINABILITY AND EQUITY (RAISE) GRANT PROGRAM: MARAD PROJECTS

Revision date: July 18, 2022

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GENERAL TERMS AND CONDITIONS

The Consolidated Appropriations Act, 2021, Pub. L. No. 116-260 (Dec. 27, 2020) appropriated funds to the United States Department of Transportation (the "**USDOT**") under the heading "National Infrastructure Investments." The funds are available to provide Federal financial assistance for surface transportation infrastructure projects that will have a significant local or regional impact. The USDOT program administering those funds is the RAISE grant program.

The USDOT published a "Notice of Funding Opportunity for the Department of Transportation's National Infrastructure Investments (i.e., the Rebuilding American Infrastructure With Sustainability and Equity (RAISE) Grant Program) Under the Consolidated Appropriations Act, 2021," 86 Fed. Reg. 21,794 (April 23, 2021) (the "**NOFO**") to solicit applications for Federal financial assistance.

These general terms and conditions are incorporated by reference in a project-specific agreement under the fiscal year 2021 RAISE grant program. Articles 1–7 are in the project-specific portion of the agreement. The term "Recipient" is defined in the project-specific portion of the agreement. Attachments A through G are project-specific attachments.

ARTICLE 8
PURPOSE

8.1 Purpose. The purpose of this award is to advance capital investments in surface transportation infrastructure that will have a significant local or regional impact. The parties will accomplish that purpose by achieving the following objectives:

(1) timely completing the Project; and

(2) ensuring that this award does not substitute for non-Federal investment in the Project, except as proposed in the Technical Application, as modified by section 3.3 and Attachment B.

ARTICLE 9
USDOT ROLE

9.1 Division of USDOT Responsibilities.

(a) The Office of the Secretary of Transportation is responsible for the USDOT's overall administration of the RAISE grant program, the approval of this agreement, and any modifications to this agreement under section 22.1.

(b) The Maritime Administration ("**MARAD**") will administer this agreement on behalf of the USDOT. In this agreement, the "**Administering Operating Administration**" means MARAD.

9.2 USDOT Program Contacts.

Robert Bouchard
Director, Office of Port Infrastructure Development
DOT – Maritime Administration
1200 New Jersey Avenue, SE
Washington, DC 20590
MAR-510
W21-308
Mailstop 3
(202) 366-5076
robert.bouchard@dot.gov

and

OST RAISE Grants Coordinator
United States Department of Transportation
Office of the Secretary
1200 New Jersey Avenue SE
Room W84-227
Washington, DC 20590
(202) 366-8914
RAISEGrants@dot.gov

ARTICLE 10
RECIPIENT ROLE

10.1 Statements on the Project. The Recipient states that:

(1) all material statements of fact in the Technical Application were accurate when that application was submitted; and

(2) Attachment D documents all material changes in the information contained in that application.

10.2 Statements on Authority and Capacity. The Recipient states that:

(1) it has the authority to receive Federal financial assistance under this agreement;

(2) it has the legal authority to complete the Project;

(3) it has the capacity, including institutional, managerial, and financial capacity, to comply with its obligations under this agreement;

(4) not less than the difference between the "Total Eligible Project Cost" and the "RAISE Grant Amount" listed in section 3.3 are committed to fund the Project;

(5) it has sufficient funds available to ensure that infrastructure completed or improved under this agreement will be operated and maintained in compliance with this agreement and applicable Federal law; and

(6) the individual executing this agreement on behalf of the Recipient has authority to enter this agreement and make the statements in this article 10 and in section 25.7 on behalf of the Recipient.

10.3 USDOT Reliance. The Recipient acknowledges that:

(1) the USDOT relied on statements of fact in the Technical Application to select the Project to receive this award;

(2) the USDOT relied on statements of fact in both the Technical Application and this agreement to determine that the Recipient and the Project are eligible under the terms of the NOFO;

(3) the USDOT relied on statements of fact in both the Technical Application and this agreement to establish the terms of this agreement; and

(4) the USDOT's selection of the Project to receive this award prevented awards under the NOFO to other eligible applicants.

10.4 Project Delivery.

(a) The Recipient shall complete the Project under the terms of this agreement.

(b) The Recipient shall ensure that the Project is financed, constructed, operated, and maintained in accordance with all Federal laws, regulations, and policies that are applicable to projects of the Administering Operating Administration.

10.5 Rights and Powers Affecting the Project.

(a) The Recipient shall not take or permit any action that deprive it of any rights or powers necessary to the Recipient's performance under this agreement without written approval of the USDOT.

(b) The Recipient shall act, in a manner acceptable to the USDOT, to promptly to acquire, extinguish, or modify any outstanding rights or claims of right of others that would interfere with the Recipient's performance under this agreement.

10.6 Notification of Changes to Key Personnel. The Recipient shall notify all USDOT representatives who are identified in section 5.4 in writing within 30 calendar days of any change in key personnel who are identified in section 5.3.

ARTICLE 11
AWARD AMOUNT, OBLIGATION, AND TIME PERIODS

11.1 Federal Award Amount The USDOT hereby awards a RAISE Grant to the Recipient in the amount listed in section 2.2 as the RAISE Grant Amount.

11.2 Federal Obligation. This agreement obligates for the budget period the amount listed in section 2.2 as the RAISE Grant Amount.

11.3 Budget Period. The budget period for this award begins on the date of this agreement and ends on the budget period end date that is listed in section 2.3. In this agreement, "budget period" is used as defined at 2 C.F.R. 200.1.

11.4 Period of Performance. The period of performance for this award begins on the date of this agreement and ends on the period of performance end date that is listed in section 2.3. In this agreement, "period of performance" is used as defined at 2 C.F.R. 200.1.

ARTICLE 12
STATEMENT OF WORK, SCHEDULE, AND BUDGET CHANGES

12.1 Notification Requirement. The Recipient shall notify all USDOT representatives who are identified in section 5.4 in writing within 30 calendar days of any change in circumstances or commitments that adversely affect the Recipient's plan to complete the Project. In that notification, the Recipient shall describe the change and what actions the Recipient has taken or plans to take to ensure completion of the Project. This notification requirement under this section 12.1 is separate from any requirements under this article 12 that the Recipient request modification of this agreement.

12.2 Statement of Work Changes. If the Project's activities differ from the statement of work that is described in section 3.1 and Attachment A, then the Recipient shall request a modification of this agreement to update section 3.1 and Attachment A.

12.3 Schedule Changes. If one or more of the following conditions are satisfied, then the Recipient shall request a modification of this agreement to update the relevant dates:

(1) a substantial completion date for the Project or a component of the Project is listed in section 3.2 and the Recipient's estimate for that milestone changes to a date that is more than six months after the date listed in section 3.2;

(2) a schedule change would require the budget period to continue after the budget period end date listed in section 2.3; or

(3) a schedule change would require the period of performance to continue after the period of performance end date listed in section 2.3.

For other schedule changes, the Recipient shall request a modification of this agreement unless the USDOT has consented, in writing consistent with the Administering Operating Administration's requirements, to the change.

12.4 Budget Changes.

(a) The Recipient acknowledges that if the cost of completing the Project increases:

(1) that increase does not affect the Recipient's obligation under this agreement to complete the Project; and

(2) the USDOT will not increase the amount of this award to address any funding shortfall.

(b) The Recipient shall request a modification of this agreement to update section 3.3 and Attachment B if, in comparing the Project's budget to the amounts listed in section 3.3:

(1) the "Non-Federal Funds" amount decreases; or

(2) the "Total Eligible Project Cost" amount decreases.

(c) For budget changes that are not identified in section 12.4(b), the Recipient shall request a modification of this agreement to update section 3.3 and Attachment B unless the USDOT has consented, in writing consistent with the Administering Operating Administration's requirements, to the change.

(d) If the actual eligible project costs are less than the "Total Eligible Project Cost" that is listed in section 3.3, then the Recipient may propose to the USDOT, in writing consistent with the Administering Operating Administration's requirements, specific additional activities that are within the scope of this award, as defined in sections 8.1 and 3.1, and that the Recipient could complete with the difference between the "Total Eligible Project Cost" that is listed in section 3.3 and the actual eligible project costs.

(e) If the actual eligible project costs are less than the "Total Eligible Project Cost" that is listed in section 3.3 and either the Recipient does not make a proposal under section 12.4(d) or the USDOT does not accept the Recipient's proposal under section 12.4(d), then:

(1) in a request under section 12.4(b), the Recipient shall reduce the Federal Share by the difference between the "Total Eligible Project Cost" that is listed in section 3.3 and the actual eligible project costs; and

(2) if that modification reduces this award and the USDOT had reimbursed costs exceeding the revised award, the Recipient shall refund to the USDOT the difference between the reimbursed costs and the revised award.

In this agreement, "**Federal Share**" means the sum of the "RAISE Grant Amount" and the "Other Federal Funds" amounts that are listed in section 3.3.

(f) The Recipient acknowledges that amounts that are required to be refunded under section 12.4(e)(2) constitute a debt to the Federal Government that the USDOT may collect under 2 C.F.R. 200.346 and the Federal Claims Collection Standards (31 C.F.R. parts 900–999).

12.5 USDOT Acceptance of Changes. The USDOT may accept or reject modifications requested under this article 12, and in doing so may elect to consider only the interests of the RAISE grant program and the USDOT. The Recipient acknowledges that requesting a modification under this article 12 does not amend, modify, or supplement this agreement unless the USDOT accepts that modification request and the parties modify this agreement under section 22.1.

ARTICLE 13
GENERAL REPORTING TERMS

13.1 Report Submission. The Recipient shall send all reports required by this agreement to all USDOT contacts who are listed in section 5.4 and all USDOT contacts who are listed in section 9.2.

13.2 Alternative Reporting Methods. The Administering Operating Administration may establish processes for the Recipient to submit reports required by this agreement, including electronic submission processes. If the Recipient is notified of those processes in writing, the Recipient shall use the processes required by the Administering Operating Administration.

13.3 Paperwork Reduction Act Notice. Under 5 C.F.R. 1320.6, the Recipient is not required to respond to a collection of information that does not display a currently valid control number issued by the Office of Management and Budget (the "**OMB**"). Collections of information conducted under this agreement are approved under OMB Control No. 2105-0563.

ARTICLE 14
PROGRESS AND FINANCIAL REPORTING

14.1 Quarterly Project Progress Reports and Recertifications. On or before the 20th day of the first month of each calendar year quarter and until the end of the budget period, the Recipient shall submit to the USDOT a Quarterly Project Progress Report and

Recertification in the format and with the content described in exhibit C. If the date of this agreement is in the final month of a calendar year quarter, then the Recipient shall submit the first Quarterly Project Progress Report and Recertification in the second calendar year quarter that begins after the date of this agreement.

14.2 Final Progress Reports and Financial Information. No later than 120 days after the end of the budget period, the Recipient shall submit

(1) a Final Project Progress Report and Recertification in the format and with the content described in exhibit C for each Quarterly Project Progress Report and Recertification, including a final Federal Financial Report (SF-425); and

(2) any other information required under the Administering Operating Administration's award closeout procedures.

ARTICLE 15
PERFORMANCE REPORTING

15.1 Baseline Performance Measurement. If the Capital-Planning Designation in section 2.5 is "Capital," then:

(1) the Recipient shall collect data for each performance measure that is identified in the Performance Measure Table in Attachment C, accurate as of the Baseline Measurement Date that is identified in Attachment C; and

(2) on or before the Baseline Report Date that is stated in Attachment C, the Recipient shall submit a Baseline Performance Measurement Report that contains the data collected under this section 15.1 and a detailed description of the data sources, assumptions, variability, and estimated levels of precision for each performance measure that is identified in the Performance Measure Table in Attachment C.

15.2 Post-construction Performance Measurement. If the Capital-Planning Designation in section 2.5 is "Capital," then

(1) for each performance measure that is identified in the Performance Measure Table in Attachment C with quarterly measurement frequency, for each of 12 consecutive calendar quarters, beginning with the first calendar quarter that begins after the Project substantial completion date, at least once during the quarter, the Recipient shall collect data for that performance measure;

(2) for each performance measure that is identified in the Performance Measure Table in Attachment C with annual measurement frequency, the Recipient shall collect data for that performance measure on at least three separate occasions: (i) once during the four consecutive calendar quarters that begin after the Project substantial completion date; (ii) once during the fourth calendar quarter after the

first collection; and (iii) once during the eighth calendar quarter after the first collection; and

(3) not later than January 31 of each year that follows a calendar year during which data was collected under this section 15.2, the Recipient shall submit to the USDOT a Post-construction Performance Measurement Report containing the data collected under this section 15.2 in the previous calendar year and stating the dates when the data was collected.

If an external factor significantly affects the value of a performance measure collected under this section 15.2, then the Recipient shall identify that external factor in the Post-construction Performance Measurement Report and discuss its influence on the performance measure.

15.3 Project Outcomes Report. If the Capital-Planning Designation in section 2.5 is "Capital," then the Recipient shall submit to the USDOT, not later than January 31 of the year that follows the final calendar year during which data was collected under section 15.2, a Project Outcomes Report that contains:

(1) a narrative discussion detailing project successes and the influence of external factors on project expectations;

(2) all baseline and post-construction performance measurement data that the Recipient reported in the Baseline Performance Measurement Report and the Post-construction Performance Measurement Reports; and

(3) an *ex post* examination of project effectiveness relative to the baseline data that the Recipient reported in the Baseline Performance Measurement Report.

ARTICLE 16
NONCOMPLIANCE AND REMEDIES

16.1 Noncompliance Determinations.

(a) If the USDOT determines that the Recipient may have failed to comply with the United States Constitution, Federal law, or the terms and conditions of this agreement, the USDOT may notify the Recipient of a proposed determination of noncompliance. For the notice to be effective, it must be written and the USDOT must include an explanation of the nature of the noncompliance, describe a remedy, state whether that remedy is proposed or effective at an already determined date, and describe the process through and form in which the Recipient may respond to the notice.

(b) If the USDOT notifies the Recipient of a proposed determination of noncompliance under section 16.1(a), the Recipient may, not later than 7 calendar days after the notice, respond to that notice in the form and through the process described in that notice. In its response, the Recipient may:

(1) accept the remedy;

(2) acknowledge the noncompliance, but propose an alternative remedy; or

(3) dispute the noncompliance.

To dispute the noncompliance, the Recipient must include in its response documentation or other information supporting the Recipient's compliance.

(c) The USDOT may make a final determination of noncompliance only:

(1) after considering the Recipient's response under section 16.1(b); or

(2) if the Recipient fails to respond under section 16.1(b), after the time for that response has passed.

(d) To make a final determination of noncompliance, the USDOT must provide a notice to the Recipient that states the bases for that determination.

16.2 Remedies.

(a) If the USDOT makes a final determination of noncompliance under section 16.1, the USDOT may impose a remedy, including:

(1) additional conditions on the award;

(2) any remedy permitted under 2 C.F.R. 200.339–200.340, including withholding of payments; disallowance of previously reimbursed costs, requiring refunds from the Recipient to USDOT; suspension or termination of the award; or suspension and disbarment under 2 C.F.R. part 180; or

(3) any other remedy legally available.

(b) To impose a remedy, the USDOT must provide a written notice to the Recipient that describes the remedy, but the USDOT may make the remedy effective before the Recipient receives that notice.

(c) If the USDOT determines that it is in the public interest, the USDOT may impose a remedy, including all remedies described in section 16.2(a), before making a final determination of noncompliance under section 16.1. If it does so, then the notice provided under section 16.1(d) must also state whether the remedy imposed will continue, be rescinded, or modified.

(d) In imposing a remedy under this section 16.2 or making a public interest determination under section 16.2(c), the USDOT may elect to consider the interests of only the USDOT.

(e) The Recipient acknowledges that amounts that the USDOT requires the Recipient to refund to the USDOT due to a remedy under this section 16.2 constitute a debt to the

Federal Government that the USDOT may collect under 2 C.F.R. 200.346 and the Federal Claims Collection Standards (31 C.F.R. parts 900–999).

16.3 Other Oversight Entities. Nothing in this article 16 limits any party's authority to report activity under this agreement to the United States Department of Transportation Inspector General or other appropriate oversight entities.

ARTICLE 17
AGREEMENT TERMINATION

17.1 USDOT Termination.

(a) The USDOT may terminate this agreement and all of its obligations under this agreement if any of the following occurs:

(1) the Recipient fails to obtain or provide any non-RAISE Grant contribution or alternatives approved by the USDOT as provided in this agreement and consistent with article 3;

(2) a construction start date for the Project or a component of the Project is listed in section 3.2 and the Recipient fails to meet that milestone by six months after the date listed in section 3.2;

(3) a substantial completion date for the Project or a component of the Project is listed in section 3.2 and the Recipient fails to meet that milestone by six months after the date listed in section 3.2;

(4) the Recipient fails to meet a milestone listed in section 4.1 by the deadline date listed in that section for that milestone;

(5) the Recipient fails to comply with the terms and conditions of this agreement, including a material failure to comply with the schedule in section 3.2 even if it is beyond the reasonable control of the Recipient; or,

(6) the USDOT determines that termination of this agreement is in the public interest.

(b) In terminating this agreement under this section, the USDOT may elect to consider only the interests of the USDOT.

(c) This section 17.1 does not limit the USDOT's ability to terminate this agreement as a remedy under section 16.2.

(d) The Recipient may request that the USDOT terminate the agreement under this section 17.1.

17.2 Closeout Termination.

(a) This agreement terminates on Project Closeout.

(b) In this agreement, "**Project Closeout**" means the date that the USDOT notifies the Recipient that the award is closed out. Under 2 C.F.R. 200.344, Project Closeout should occur no later than one year after the end of the period of performance.

17.3 Post-Termination Adjustments. The Recipient acknowledges that under 2 C.F.R. 200.345–200.346, termination of the agreement does not extinguish the USDOT's authority to disallow costs, including costs that USDOT reimbursed before termination, and recover funds from the Recipient.

17.4 Non-Terminating Events.

(a) The end of the budget period described under section 11.3 does not terminate this agreement or the Recipient's obligations under this agreement.

(b) The end of the period of performance described under section 11.4 does not terminate this agreement or the Recipient's obligations under this agreement.

(c) The cancellation of funds under section 21.2 does not terminate this agreement or the Recipient's obligations under this agreement.

17.5 Other Remedies. The termination authority under this article 17 supplements and does not limit the USDOT's remedial authority under article 16 or 2 C.F.R. part 200, including 2 C.F.R. 200.339–200.340.

ARTICLE 18
MONITORING, FINANCIAL MANAGEMENT, CONTROLS, AND RECORDS

18.1 Recipient Monitoring and Record Retention.

(a) The Recipient shall monitor activities under this award, including activities under subawards and contracts, to ensure:

(1) that those activities comply with this agreement; and

(2) that funds provided under this award are not expended on costs that are not allowable under this award or not allocable to this award.

(b) If the Recipient makes a subaward under this award, the Recipient shall monitor the activities of the subrecipient in compliance with 2 C.F.R. 200.332(d).

(c) The Recipient shall retain records relevant to the award as required under 2 C.F.R. 200.334.

18.2 Financial Records and Audits.

(a) The Recipient shall keep all project accounts and records that fully disclose the amount and disposition by the Recipient of the award funds, the total cost of the Project, and the amount or nature of that portion of the cost of the Project supplied by other sources, and any other financial records related to the project.

(b) The Recipient shall keep accounts and records described under section 18.2(a) in accordance with a financial management system that meets the requirements of 2 C.F.R. 200.301–200.303 and 2 C.F.R. 200 subpart F and will facilitate an effective audit in accordance with 31 U.S.C. 7501–7506.

(c) The Recipient shall separately identify expenditures under the fiscal year 2021 RAISE grants program in financial records required for audits under 31 U.S.C. 7501–7506. Specifically, the Recipient shall:

(1) list expenditures under that program separately on the schedule of expenditures of Federal awards required under 2 C.F.R. 200 subpart F, including "FY 2021" in the program name; and

(2) list expenditures under that program on a separate row under Part II, Item 1 ("Federal Awards Expended During Fiscal Period") of Form SF-SAC, including "FY 2021" in column c ("Additional Award Identification").

18.3 Internal Controls. The Recipient shall establish and maintain internal controls as required under 2 C.F.R. 200.303.

18.4 USDOT Record Access. The USDOT may access Recipient records related to this award under 2 C.F.R. 200.337.

ARTICLE 19
CONTRACTING AND SUBAWARDS

19.1 Minimum Wage Rates. The Recipient shall include, in all contracts in excess of $2,000 for work on the Project that involves labor, provisions establishing minimum rates of wages, to be predetermined by the United States Secretary of Labor, in accordance with the Davis-Bacon Act, 40 U.S.C. 3141–3148, or 23 U.S.C. 113, as applicable, that contractors shall pay to skilled and unskilled labor, and such minimum rates shall be stated in the invitation for bids and shall be included in proposals or bids for the work.

19.2 Buy America.

(a) For the purpose of the award term at exhibit B, term B.5, the Project is "a project for infrastructure." The Recipient acknowledges that iron, steel, manufactured products, and construction materials used in the Project are subject to the domestic content procurement preference in that award term and this agreement is not a waiver of that preference.

(b) If the Recipient uses iron, steel, manufactured products, or construction materials that are not produced in the United States in violation of the award term at exhibit B, term B.5, the USDOT may disallow and deny reimbursement of costs incurred by the Recipient and take other remedial actions under article 16 and 2 C.F.R. 200.339–200.340.

(c) Under 2 C.F.R. 200.322, as appropriate and to the extent consistent with law, the Recipient should, to the greatest extent practicable under this award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States. The Recipient shall include the requirements of 2 C.F.R. 200.322 in all subawards including all contracts and purchase orders for work or products under this award.

19.3 Small and Disadvantaged Business Requirements. If any funds under this award are administered by or through a State Department of Transportation, the Recipient shall expend those funds in compliance with the requirements at 49 C.F.R. part 26 ("Participation by disadvantaged business enterprises in Department of Transportation financial assistance programs"). The Recipient shall expend all other funds under this award in compliance with the requirements at 2 C.F.R. 200.321 ("Contracting with small and minority businesses, women's business enterprises, and labor surplus area firms").

19.4 Engineering and Design Services. The Recipient shall award each contract or sub-contract for program management, construction management, planning studies, feasibility studies, architectural services, preliminary engineering, design, engineering, surveying, mapping, or related services with respect to the project in the same manner that a contract for architectural and engineering services is negotiated under the Brooks Act, 40 U.S.C. 1101-1104, or an equivalent qualifications-based requirement prescribed for or by the Recipient and approved in writing by the USDOT.

19.5 Foreign Market Restrictions. The Recipient shall not allow funds provided under this award to be used to fund the use of any product or service of a foreign country during the period in which such foreign country is listed by the United States Trade Representative as denying fair and equitable market opportunities for products and suppliers of the United States in procurement and construction.

19.6 Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment. The Recipient acknowledges that Section 889 of Pub. L. No. 115-232 and 2 C.F.R. 200.216 prohibit the Recipient and all subrecipients from procuring or obtaining certain telecommunications and video surveillance services or equipment under this award.

19.7 Pass-through Entity Responsibilities. If the Recipient makes a subaward under this award, the Recipient shall comply with the requirements on pass-through entities under 2 C.F.R. parts 200 and 1201, including 2 C.F.R. 200.331–200.333.

19.8 Subaward and Contract Authorization. [Reserved]

ARTICLE 20
COSTS, PAYMENTS, AND UNEXPENDED FUNDS

20.1 Limitation of Federal Award Amount. Under this award, the USDOT shall not provide funding greater than the amount obligated under section 11.2. The Recipient acknowledges that USDOT is not liable for payments exceeding that amount, and the Recipient shall not request reimbursement of costs exceeding that amount.

20.2 Projects Costs. This award is subject to the cost principles at 2 C.F.R. 200 subpart E, including provisions on determining allocable costs and determining allowable costs.

20.3 Timing of Project Costs.

(a) The Recipient shall not charge to this award costs that are incurred after the budget period.

(b) The Recipient shall not charge to this award costs that were incurred before the date of this agreement unless those costs are identified in Attachment E and would have been allowable if incurred during the budget period. This limitation applies to pre-award costs under 2 C.F.R. 200.458. This agreement hereby terminates and supersedes any previous USDOT approval for the Recipient to incur costs under this award for the Project. Attachment E is the exclusive USDOT approval of costs incurred before the date of this agreement.

20.4 Recipient Recovery of Federal Funds. The Recipient shall make all reasonable efforts, including initiating litigation, if necessary, to recover Federal funds if the USDOT determines, after consultation with the Recipient, that those funds have been spent fraudulently, wastefully, or in violation of Federal laws, or misused in any manner under this award. The Recipient shall not enter a settlement or other final position, in court or otherwise, involving the recovery of funds under the award unless approved in advance in writing by the USDOT.

20.5 Unexpended Federal Funds. Any Federal funds that are awarded at section 11.1 but not expended on allocable, allowable costs remain the property of the United States.

20.6 Timing of Payments to the Recipient.

(a) Reimbursement is the payment method for the RAISE grant program.

(b) The Recipient shall not request reimbursement of a cost before the Recipient has entered into an obligation for that cost.

20.7 Payment Method.

(a) If the USDOT Payment System identified in section 6.1 is "Delphi eInvoicing System," then the Recipient shall complete all applicable forms and attach supporting documents, including the SF 270, in Delphi eInvoicing System, which is on-line and paperless, to

request reimbursement. To obtain the latest version of these standard forms, visit https://www.grants.gov/forms/post-award-reporting-forms.html/. The Recipient shall review the training on using Delphi eInvoicing System before submitting a request for reimbursement. To guide the Recipient when reviewing this training, the USDOT provides the following additional information, which may change after execution of this agreement:

(1) The Recipient may access the training from the USDOT "Delphi eInvoicing System" webpage at https://einvoice.esc.gov. The training is linked under the heading "Grantee Training." The Recipient should click on "Grantee Training" to access the training.

(2) A username and password are not required to access the on-line training. It is currently available, will be accessible 24/7, and will take approximately 10 minutes to review.

(3) Once the above referenced training has been reviewed, Recipients must request and complete the External User Access Request form. Recipients can request the External User Access Request form by sending an email to a Grants/Contracting Officer who is identified in sections 5.4 or 9.2. A request to establish access will be sent once the External User Access Request form is received.

(b) The USDOT may deny a payment request that is not submitted using the method identified in this section 20.7.

20.8 Information Supporting Expenditures.

(a) If the USDOT Payment System identified in section 6.1 is "Delphi eInvoicing System," then when requesting reimbursement of costs incurred or credit for cost share incurred, the Recipient shall electronically submit and attach the SF 270 (Request for Advance or Reimbursement), shall identify the Federal share and the Recipient's share of costs, and shall submit supporting cost detail to clearly document all costs incurred. As supporting cost detail, the Recipient shall include a detailed breakout of all costs incurred, including direct labor, indirect costs, other direct costs, and travel.

(b) If the Recipient submits a request for reimbursement that the USDOT determines does not include or is not supported by sufficient detail, the USDOT may deny the request or withhold processing the request until the Recipient provides sufficient detail.

20.9 Reimbursement Request Timing and Frequency.

(a) If the USDOT Payment System identified in section 6.1 is "Delphi eInvoicing System," the Recipient shall request reimbursement of a cost incurred as soon as practicable after incurring that cost. If the Recipient requests reimbursement for a cost more than 180 days after that cost was incurred, the USDOT may deny the request for being untimely.

(b) If the USDOT Payment System identified in section 6.1 is "Delphi eInvoicing System," then the Recipient shall not request reimbursement more frequently than monthly.

ARTICLE 21
LIQUIDATION, ADJUSTMENTS, AND FUNDS AVAILABILITY

21.1 Liquidation of Recipient Obligations.

(a) The Recipient shall liquidate all obligations of award funds under this agreement not later than the earlier of (1) 120 days after the end of the period of performance or (2) the statutory funds cancellation date identified in section 21.2.

(b) Liquidation of obligations and adjustment of costs under this agreement follow the requirements of 2 C.F.R. 200.344–200.346.

21.2 Funds Cancellation. Outstanding FY 2021 RAISE Grant balances are canceled by statute after September 30, 2029, and are then unavailable for any purpose, including adjustments.

ARTICLE 22
AGREEMENT MODIFICATIONS

22.1 Bilateral Modifications. The parties may amend, modify, or supplement this agreement by mutual agreement in writing signed by the USDOT and the Recipient. Either party may request to amend, modify, or supplement this agreement by written notice to the other party.

22.2 Unilateral Contact Modifications.

(a) The Recipient may update the contacts who are listed in section 5.2 by written notice to all of the USDOT contacts who are listed in sections 5.4 and 9.2.

(b) The USDOT may update the contacts who are listed in sections 5.4 and 9.2 by written notice to all of the Recipient contacts who are listed in section 5.2.

22.3 USDOT Unilateral Modifications.

(a) The USDOT may unilaterally modify this agreement to comply with Federal law, including the Program Statute.

(b) To unilaterally modify this agreement under this section 22.3, the USDOT must provide a notice to the Recipient that includes a description of the modification and state the date that the modification is effective.

22.4 Other Modifications. The parties shall not amend, modify, or supplement this agreement except as permitted under sections 22.1, 22.2, or 22.3. If an amendment, modification, or supplement is not permitted under section 22.1, not permitted under section 22.2, and not permitted under section 22.3, it is void.

ARTICLE 23
CLIMATE CHANGE AND ENVIRONMENTAL JUSTICE

23.1 Climate Change and Environmental Justice. Consistent with Executive Order 14008, "Tackling the Climate Crisis at Home and Abroad" (Jan. 27, 2021), Attachment F documents the consideration of climate change and environmental justice impacts of the Project.

ARTICLE 24
RACIAL EQUITY AND BARRIERS TO OPPORTUNITY

24.1 Racial Equity and Barriers to Opportunity. Consistent with Executive Order 13985, "Advancing Racial Equity and Support for Underserved Communities Through the Federal Government" (Jan. 20, 2021), Attachment G documents activities related to the Project to improve racial equity and reduce barriers to opportunity.

ARTICLE 25
FEDERAL FINANCIAL ASSISTANCE, ADMINISTRATIVE, AND NATIONAL POLICY REQUIREMENTS

25.1 Uniform Administrative Requirements for Federal Awards. The Recipient shall comply with the obligations on non-Federal entities under 2 C.F.R. parts 200 and 1201.

25.2 Federal Law and Public Policy Requirements.

(a) The Recipient shall ensure that Federal funding is expended in full accordance with the United States Constitution, Federal law, and statutory and public policy requirements: including but not limited to, those protecting free speech, religious liberty, public welfare, the environment, and prohibiting discrimination.

(b) The failure of this agreement to expressly identify Federal law applicable to the Recipient or activities under this agreement does not make that law inapplicable.

25.3 Federal Freedom of Information Act.

(a) The USDOT is subject to the Freedom of Information Act, 5 U.S.C. 552.

(b) The Recipient acknowledges that the Technical Application and materials submitted to the USDOT by the Recipient related to this agreement may become USDOT records subject to public release under 5 U.S.C. 552.

25.4 History of Performance. Under 2 C.F.R 200.206, any Federal awarding agency may consider the Recipient's performance under this agreement, when evaluating the risks of making a future Federal financial assistance award to the Recipient.

25.5 Whistleblower Protection.

(a) The Recipient acknowledges that it is a "grantee" within the scope of 41 U.S.C. 4712, which prohibits the Recipient from taking certain actions against an employee for certain disclosures of information that the employee reasonably believes are evidence of gross mismanagement of this award, gross waste of Federal funds, or a violation of Federal law related this this award.

(b) The Recipient shall inform its employees in writing of the rights and remedies provided under 41 U.S.C. 4712, in the predominant native language of the workforce.

25.6 External Award Terms and Obligations.

(a) In addition to this document and the contents described in article 30, this agreement includes the following additional terms as integral parts:

(1) Appendix A to 2 C.F.R. part 25: System for Award Management and Universal Identifier Requirements;

(2) Appendix A to 2 C.F.R. part 170: Reporting Subawards and Executive Compensation;

(3) 2 C.F.R 175.15(b): Trafficking in Persons; and

(4) Appendix XII to 2 C.F.R. part 200: Award Term and Condition for Recipient Integrity and Performance Matters.

(b) The Recipient shall comply with:

(1) 49 C.F.R. part 20: New Restrictions on Lobbying;

(2) 49 C.F.R. part 21: Nondiscrimination in Federally-Assisted Programs of the Department of Transportation—Effectuation of Title VI of the Civil Rights Act of 1964;

(3) 49 C.F.R. part 27: Nondiscrimination on the Basis of Disability in Programs or Activities Receiving Federal Financial Assistance; and

(4) Subpart B of 49 C.F.R. part 32: Governmentwide Requirements for Drug-free Workplace (Financial Assistance).

25.7 Incorporated Certifications. The Recipient makes the statements in the following certifications, which are incorporated by reference:

(1) Appendix A to 49 CFR part 20 (Certification Regarding Lobbying).

ARTICLE 26
ASSIGNMENT

26.1 Assignment Prohibited. The Recipient shall not transfer to any other entity any discretion granted under this agreement, any right to satisfy a condition under this agreement, any remedy under this agreement, or any obligation imposed under this agreement.

ARTICLE 27
WAIVER

27.1 Waivers.

(a) A waiver granted by USDOT under this agreement will not be effective unless it is in writing and signed by an authorized representative of USDOT.

(b) A waiver granted by USDOT under this agreement on one occasion will not operate as a waiver on other occasions.

(c) If USDOT fails to require strict performance of a provision of this agreement, fails to exercise a remedy for a breach of this agreement, or fails to reject a payment during a breach of this agreement, that failure does not constitute a waiver of that provision or breach.

ARTICLE 28
ADDITIONAL TERMS AND CONDITIONS

28.1 Effect of Urban or Rural Designation. Based on information that the Recipient provided to the USDOT, including the Technical Application, at section 2.4 this agreement designates this award as an urban award or a rural award, as defined in the NOFO. The Recipient shall comply with the requirements that accompany that designation on minimum award size, geographic location, and cost sharing.

28.2 Disclaimer of Federal Liability. The USDOT shall not be responsible or liable for any damage to property or any injury to persons that may arise from, or be incident to, performance or compliance with this agreement.

28.3 Relocation and Real Property Acquisition.

(a) To the greatest extent practicable under State law, the Recipient shall comply with the land acquisition policies in 49 C.F.R. 24 subpart B and shall pay or reimburse property owners for necessary expenses as specified in that subpart.

(b) The Recipient shall provide a relocation assistance program offering the services described in 49 C.F.R. 24 subpart C and shall provide reasonable relocation payments and assistance to displaced persons as required in 49 C.F.R. 24 subparts D–E.

(c) The Recipient shall make available to displaced persons, within a reasonable period of time prior to displacement, comparable replacement dwellings in accordance with 49 C.F.R. 24 subpart E.

28.4 Equipment Disposition.

(a) In accordance with 2 C.F.R. 200.313 and 1201.313, if the Recipient or a subrecipient acquires equipment under this award, then when that equipment is no longer needed for the Project:

(1) if the entity that acquired the equipment is a State or a subrecipient of a State, that entity shall dispose of that equipment in accordance with State laws and procedures; and

(2) if the entity that acquired the equipment is neither a State nor a subrecipient of a State, that entity shall request disposition instructions from the Administering Operating Administration.

(b) In accordance with 2 C.F.R. 200.443(d), the distribution of the proceeds from the disposition of equipment must be made in accordance with 2 C.F.R. 200.313–200.316 and 2 C.F.R. 1201.313.

(c) The Recipient shall ensure compliance with this section 28.4 for all tiers of subawards under this award.

ARTICLE 29
MANDATORY AWARD INFORMATION

29.1 Information Contained in a Federal Award. For 2 C.F.R. 200.211:

(1) the "Federal Award Date" is the date of this agreement, as defined under section 31.2;

(2) the "Assistance Listings Number" is 20.933 and the "Assistance Listings Title" is "National Infrastructure Investments"; and

(3) this award is not for research and development.

ARTICLE 30
CONSTRUCTION AND DEFINITIONS

30.1 Attachments. This agreement includes the following attachments as integral parts:

Attachment A	Statement of Work
Attachment B	Estimated Project Budget
Attachment C	Performance Measurement Information
Attachment D	Changes from Application
Attachment E	Approved Pre-Award Costs
Attachment F	Climate Change and Environmental Justice Impacts
Attachment G	Racial Equity and Barriers to Opportunity

30.2 Exhibits. The following exhibits, which are located in the document titled "Exhibits to MARAD Grant Agreements Under the Fiscal Year 2021 RAISE Grant Program," dated July 18, 2022, and available at http://go.usa.gov/xSWp2, are part of this agreement.

Exhibit A	Applicable Federal Laws and Regulations
Exhibit B	Additional Standard Terms
Exhibit C	Quarterly Project Progress Reports and Recertifications: Format and Content

30.3 Construction. If a provision in the exhibits or the attachments conflicts with a provision in articles 1–31, then the provision in articles 1–31 prevails. If a provision in the attachments conflicts with a provision in the exhibits, then the provision in the attachments prevails.

30.4 Integration. This agreement constitutes the entire agreement of the parties relating to the RAISE grant program and awards under that program and supersedes any previous agreements, oral or written, relating to the RAISE grant program and awards under that program.

30.5 Definitions. In this agreement, the following definitions apply:

"**Program Statute**" means the statutory text under the heading "Department of Transportation—Office of the Secretary—National Infrastructure Investments" in title I of division L of the Consolidated Appropriations Act, 2021, Pub. L. No. 116-260 (Dec. 27, 2020), and all other provisions of that act that apply to amounts appropriated under that heading.

"**Project**" means the project proposed in the Technical Application, as modified by the negotiated provisions of this agreement, including article 3 and Attachments A–E.

"**RAISE Grant**" means an award of funds that were made available under the NOFO.

"**Technical Application**" means the application identified in section 2.1, including Standard Form 424 and all information and attachments submitted with that form through Grants.gov.

ARTICLE 31
AGREEMENT EXECUTION AND EFFECTIVE DATE

31.1 Counterparts. This agreement may be executed in counterparts, which constitute one document. The parties intend each countersigned original to have identical legal effect.

31.2 Effective Date. The agreement will become effective when all parties have signed it. The date of this agreement will be the date this agreement is signed by the last party to sign it. This instrument constitutes a RAISE Grant when the USDOT's authorized representative signs it.

MARAD Procurement Standards

Procurement Standards 2CFR 200.317 - 200.327

Procurement Standards

§ 200.317 Procurements by states.

When procuring property and services under a Federal award, a State must follow the same policies and procedures it uses for procurements from its non-Federal funds. The State will comply with §§ 200.321, 200.322, and 200.323 and ensure that every purchase order or other contract includes any clauses required by § 200.327. All other non-Federal entities, including subrecipients of a State, must follow the procurement standards in §§ 200.318 through 200.327.

§ 200.318 General procurement standards.

(a) The non-Federal entity must have and use documented procurement procedures, consistent with State, local, and tribal laws and regulations and the standards of this section, for the acquisition of property or services required under a Federal award or subaward. The non-Federal entity's documented procurement procedures must conform to the procurement standards identified in §§ 200.317 through 200.327.

(b) Non-Federal entities must maintain oversight to ensure that contractors perform in accordance with the terms, conditions, and specifications of their contracts or purchase orders.

(c)

(1) The non-Federal entity must maintain written standards of conduct covering conflicts of interest and governing the actions of its employees engaged in the selection, award and administration of contracts. No employee, officer, or agent may participate in the selection, award, or administration of a contract supported by a Federal award if he or she has a real or apparent conflict of interest. Such a conflict of interest would arise when the employee, officer, or agent, any member of his or her immediate family, his or her partner, or an organization which employs or is about to employ any of the parties indicated herein, has a financial or other interest in or a tangible personal benefit from a firm considered for a contract. The officers, employees, and agents of the non-Federal entity may neither solicit nor accept gratuities, favors, or anything of monetary value from contractors or parties to subcontracts. However, non-Federal entities may set standards for situations in which the financial interest is not substantial or the gift is an unsolicited item of nominal value. The standards of conduct must provide for disciplinary actions to be applied for violations of such standards by officers, employees, or agents of the non-Federal entity.

(2) If the non-Federal entity has a parent, affiliate, or subsidiary organization that is not a State, local government, or Indian tribe, the non-Federal entity must also maintain written standards of conduct covering organizational conflicts of interest. Organizational conflicts of interest means that because of relationships with a parent company, affiliate, or subsidiary organization, the non-Federal entity is unable or appears to be unable to be impartial in conducting a procurement action involving a related organization.

(d) The non-Federal entity's procedures must avoid acquisition of unnecessary or duplicative items. Consideration should be given to consolidating or breaking out procurements to obtain a more economical purchase. Where appropriate, an analysis will be made of lease versus purchase alternatives, and any other appropriate analysis to determine the most economical approach.

(e) To foster greater economy and efficiency, and in accordance with efforts to promote cost-effective use of shared services across the Federal Government, the non-Federal entity is encouraged to enter into state and local intergovernmental agreements or inter-entity agreements where appropriate for procurement or use of common or shared goods and services. Competition requirements will be met with documented procurement actions using strategic sourcing, shared services, and other similar procurement arrangements.

(f) The non-Federal entity is encouraged to use Federal excess and surplus property in lieu of purchasing new equipment and property whenever such use is feasible and reduces project costs.

(g) The non-Federal entity is encouraged to use value engineering clauses in contracts for construction projects of sufficient size to offer reasonable opportunities for cost reductions. Value engineering is a systematic and creative analysis of each contract item or task to ensure that its essential function is provided at the overall lower cost.

(h) The non-Federal entity must award contracts only to responsible contractors possessing the ability to perform successfully under the terms and conditions of a proposed procurement. Consideration will be given to such matters as contractor integrity, compliance with public policy, record of past performance, and financial and technical resources. See also § 200.214.

(i) The non-Federal entity must maintain records sufficient to detail the history of procurement. These records will include, but are not necessarily limited to, the following: Rationale for the method of procurement, selection of contract type, contractor selection or rejection, and the basis for the contract price.

(j)

(1) The non-Federal entity may use a time-and-materials type contract only after a determination that no other contract is suitable and if the contract includes a ceiling price that the contractor exceeds at its own risk. Time-and-materials type contract means a contract whose cost to a non-Federal entity is the sum of:

(i) The actual cost of materials; and

(ii) Direct labor hours charged at fixed hourly rates that reflect wages, general and administrative expenses, and profit.

(2) Since this formula generates an open-ended contract price, a time-and-materials contract provides no positive profit incentive to the contractor for cost control or labor efficiency.

Therefore, each contract must set a ceiling price that the contractor exceeds at its own risk. Further, the non-Federal entity awarding such a contract must assert a high degree of oversight in order to obtain reasonable assurance that the contractor is using efficient methods and effective cost controls.

(k) The non-Federal entity alone must be responsible, in accordance with good administrative practice and sound business judgment, for the settlement of all contractual and administrative issues arising out of procurements. These issues include, but are not limited to, source evaluation, protests, disputes, and claims. These standards do not relieve the non-Federal entity of any contractual responsibilities under its contracts. The Federal awarding agency will not substitute its judgment for that of the non-Federal entity unless the matter is primarily a Federal concern. Violations of law will be referred to the local, state, or Federal authority having proper jurisdiction.

[85 FR 49543, Aug. 13, 2020, as amended at 86 FR 10440, Feb. 22, 2021]

§ 200.319 Competition.

(a) All procurement transactions for the acquisition of property or services required under a Federal award must be conducted in a manner providing full and open competition consistent with the standards of this section and § 200.320.

(b) In order to ensure objective contractor performance and eliminate unfair competitive advantage, contractors that develop or draft specifications, requirements, statements of work, or invitations for bids or requests for proposals must be excluded from competing for such procurements. Some of the situations considered to be restrictive of competition include but are not limited to:

(1) Placing unreasonable requirements on firms in order for them to qualify to do business;

(2) Requiring unnecessary experience and excessive bonding;

(3) Noncompetitive pricing practices between firms or between affiliated companies;

(4) Noncompetitive contracts to consultants that are on retainer contracts;

(5) Organizational conflicts of interest;

(6) Specifying only a “brand name” product instead of allowing “an equal” product to be offered and describing the performance or other relevant requirements of the procurement; and

(7) Any arbitrary action in the procurement process.

(c) The non-Federal entity must conduct procurements in a manner that prohibits the use of statutorily or administratively imposed state, local, or tribal geographical preferences in the

evaluation of bids or proposals, except in those cases where applicable Federal statutes expressly mandate or encourage geographic preference. Nothing in this section preempts state licensing laws. When contracting for architectural and engineering (A/E) services, geographic location may be a selection criterion provided its application leaves an appropriate number of qualified firms, given the nature and size of the project, to compete for the contract.

(d) The non-Federal entity must have written procedures for procurement transactions. These procedures must ensure that all solicitations:

(1) Incorporate a clear and accurate description of the technical requirements for the material, product, or service to be procured. Such description must not, in competitive procurements, contain features which unduly restrict competition. The description may include a statement of the qualitative nature of the material, product or service to be procured and, when necessary, must set forth those minimum essential characteristics and standards to which it must conform if it is to satisfy its intended use. Detailed product specifications should be avoided if at all possible. When it is impractical or uneconomical to make a clear and accurate description of the technical requirements, a "brand name or equivalent" description may be used as a means to define the performance or other salient requirements of procurement. The specific features of the named brand which must be met by offers must be clearly stated; and

(2) Identify all requirements which the offerors must fulfill and all other factors to be used in evaluating bids or proposals.

(e) The non-Federal entity must ensure that all prequalified lists of persons, firms, or products which are used in acquiring goods and services are current and include enough qualified sources to ensure maximum open and free competition. Also, the non-Federal entity must not preclude potential bidders from qualifying during the solicitation period.

(f) Noncompetitive procurements can only be awarded in accordance with § 200.320(c).

§ 200.320 Methods of procurement to be followed.

The non-Federal entity must have and use documented procurement procedures, consistent with the standards of this section and §§ 200.317, 200.318, and 200.319 for any of the following methods of procurement used for the acquisition of property or services required under a Federal award or sub-award.

(a) ***Informal procurement methods.*** When the value of the procurement for property or services under a Federal award does not exceed the *simplified acquisition threshold (SAT),* as defined in § 200.1, or a lower threshold established by a non-Federal entity, formal procurement methods are not required. The non-Federal entity may use informal procurement methods to expedite the completion of its transactions and minimize the associated administrative burden and cost. The informal methods used for procurement of property or services at or below the SAT include:

(1) ***Micro-purchases*** -

(i) ***Distribution.*** The acquisition of supplies or services, the aggregate dollar amount of which does not exceed the micro-purchase threshold (See the definition of *micro-purchase* in § 200.1). To the maximum extent practicable, the non-Federal entity should distribute micro-purchases equitably among qualified suppliers.

(ii) ***Micro-purchase awards.*** Micro-purchases may be awarded without soliciting competitive price or rate quotations if the non-Federal entity considers the price to be reasonable based on research, experience, purchase history or other information and documents it files accordingly. Purchase cards can be used for micro-purchases if procedures are documented and approved by the non-Federal entity.

(iii) ***Micro-purchase thresholds.*** The non-Federal entity is responsible for determining and documenting an appropriate micro-purchase threshold based on internal controls, an evaluation of risk, and its documented procurement procedures. The micro-purchase threshold used by the non-Federal entity must be authorized or not prohibited under State, local, or tribal laws or regulations. Non-Federal entities may establish a threshold higher than the Federal threshold established in the Federal Acquisition Regulations (FAR) in accordance with paragraphs (a)(1)(iv) and (v) of this section.

(iv) ***Non-Federal entity increase to the micro-purchase threshold up to $50,000.*** Non-Federal entities may establish a threshold higher than the micro-purchase threshold identified in the FAR in accordance with the requirements of this section. The non-Federal entity may self-certify a threshold up to $50,000 on an annual basis and must maintain documentation to be made available to the Federal awarding agency and auditors in accordance with § 200.334. The self-certification must include a justification, clear identification of the threshold, and supporting documentation of any of the following:

(A) A qualification as a low-risk auditee, in accordance with the criteria in § 200.520 for the most recent audit;

(B) An annual internal institutional risk assessment to identify, mitigate, and manage financial risks; or,

(C) For public institutions, a higher threshold consistent with State law.

(v) ***Non-Federal entity increase to the micro-purchase threshold over $50,000.*** Micro-purchase thresholds higher than $50,000 must be approved by the cognizant agency for indirect costs. The non-federal entity must submit a request with the requirements included in paragraph (a)(1)(iv) of this section. The increased threshold is valid until there is a change in status in which the justification was approved.

(2) ***Small purchases*** -

(i) ***Small purchase procedures.*** The acquisition of property or services, the aggregate dollar amount of which is higher than the micro-purchase threshold but does not exceed the simplified acquisition threshold. If small purchase procedures are used, price or rate quotations must be obtained from an adequate number of qualified sources as determined appropriate by the non-Federal entity.

(ii) ***Simplified acquisition thresholds.*** The non-Federal entity is responsible for determining an appropriate simplified acquisition threshold based on internal controls, an evaluation of risk and its documented procurement procedures which must not exceed the threshold established in the FAR. When applicable, a lower simplified acquisition threshold used by the non-Federal entity must be authorized or not prohibited under State, local, or tribal laws or regulations.

(b) ***Formal procurement methods.*** When the value of the procurement for property or services under a Federal financial assistance award exceeds the SAT, or a lower threshold established by a non-Federal entity, formal procurement methods are required. Formal procurement methods require following documented procedures. Formal procurement methods also require public advertising unless a non-competitive procurement can be used in accordance with § 200.319 or paragraph (c) of this section. The following formal methods of procurement are used for procurement of property or services above the simplified acquisition threshold or a value below the simplified acquisition threshold the non-Federal entity determines to be appropriate:

(1) ***Sealed bids.*** A procurement method in which bids are publicly solicited and a firm fixed-price contract (lump sum or unit price) is awarded to the responsible bidder whose bid, conforming with all the material terms and conditions of the invitation for bids, is the lowest in price. The sealed bids method is the preferred method for procuring construction, if the conditions.

(i) In order for sealed bidding to be feasible, the following conditions should be present:

(A) A complete, adequate, and realistic specification or purchase description is available;

(B) Two or more responsible bidders are willing and able to compete effectively for the business; and

(C) The procurement lends itself to a firm fixed price contract and the selection of the successful bidder can be made principally on the basis of price.

(ii) If sealed bids are used, the following requirements apply:

(A) Bids must be solicited from an adequate number of qualified sources, providing them sufficient response time prior to the date set for opening the bids, for local, and tribal governments, the invitation for bids must be publicly advertised;

(B) The invitation for bids, which will include any specifications and pertinent attachments, must define the items or services in order for the bidder to properly respond;

(C) All bids will be opened at the time and place prescribed in the invitation for bids, and for local and tribal governments, the bids must be opened publicly;

(D) A firm fixed price contract award will be made in writing to the lowest responsive and responsible bidder. Where specified in bidding documents, factors such as discounts, transportation cost, and life cycle costs must be considered in determining which bid is lowest. Payment discounts will only be used to determine the low bid when prior experience indicates that such discounts are usually taken advantage of; and

(E) Any or all bids may be rejected if there is a sound documented reason.

(2) ***Proposals.*** A procurement method in which either a fixed price or cost-reimbursement type contract is awarded. Proposals are generally used when conditions are not appropriate for the use of sealed bids. They are awarded in accordance with the following requirements:

(i) Requests for proposals must be publicized and identify all evaluation factors and their relative importance. Proposals must be solicited from an adequate number of qualified offerors. Any response to publicized requests for proposals must be considered to the maximum extent practical;

(ii) The non-Federal entity must have a written method for conducting technical evaluations of the proposals received and making selections;

(iii) Contracts must be awarded to the responsible offeror whose proposal is most advantageous to the non-Federal entity, with price and other factors considered; and

(iv) The non-Federal entity may use competitive proposal procedures for qualifications-based procurement of architectural/engineering (A/E) professional services whereby offeror's qualifications are evaluated and the most qualified offeror is selected, subject to negotiation of fair and reasonable compensation. The method, where price is not used as a selection factor, can only be used in procurement of A/E professional services. It cannot be used to purchase other types of services though A/E firms that are a potential source to perform the proposed effort.

(c) ***Noncompetitive procurement.*** There are specific circumstances in which noncompetitive procurement can be used. Noncompetitive procurement can only be awarded if one or more of the following circumstances apply:

(1) The acquisition of property or services, the aggregate dollar amount of which does not exceed the micro-purchase threshold (see paragraph (a)(1) of this section);

(2) The item is available only from a single source;

(3) The public exigency or emergency for the requirement will not permit a delay resulting from publicizing a competitive solicitation;

(4) The Federal awarding agency or pass-through entity expressly authorizes a noncompetitive procurement in response to a written request from the non-Federal entity; or

(5) After solicitation of a number of sources, competition is determined inadequate.

§ 200.321 Contracting with small and minority businesses, women's business enterprises, and labor surplus area firms.

(a) The non-Federal entity must take all necessary affirmative steps to assure that minority businesses, women's business enterprises, and labor surplus area firms are used when possible.

(b) Affirmative steps must include:

(1) Placing qualified small and minority businesses and women's business enterprises on solicitation lists;

(2) Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;

(3) Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;

(4) Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises;

(5) Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce; and

(6) Requiring the prime contractor, if subcontracts are to be let, to take the affirmative steps listed in paragraphs (b)(1) through (5) of this section.

§ 200.322 Domestic preferences for procurements.

(a) As appropriate and to the extent consistent with law, the non-Federal entity should, to the greatest extent practicable under a Federal award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The requirements of this section must be included in all subawards including all contracts and purchase orders for work or products under this award.

(b) For purposes of this section:

(1) “Produced in the United States” means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

(2) “Manufactured products” means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

§ 200.323 Procurement of recovered materials.

A non-Federal entity that is a state agency or agency of a political subdivision of a state and its contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds $10,000 or the value of the quantity acquired during the preceding fiscal year exceeded $10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

§ 200.324 Contract cost and price.

(a) The non-Federal entity must perform a cost or price analysis in connection with every procurement action in excess of the Simplified Acquisition Threshold including contract modifications. The method and degree of analysis is dependent on the facts surrounding the particular procurement situation, but as a starting point, the non-Federal entity must make independent estimates before receiving bids or proposals.

(b) The non-Federal entity must negotiate profit as a separate element of the price for each contract in which there is no price competition and in all cases where cost analysis is performed. To establish a fair and reasonable profit, consideration must be given to the complexity of the work to be performed, the risk borne by the contractor, the contractor's investment, the amount of subcontracting, the quality of its record of past performance, and industry profit rates in the surrounding geographical area for similar work.

(c) Costs or prices based on estimated costs for contracts under the Federal award are allowable only to the extent that costs incurred or cost estimates included in negotiated prices would be allowable for the non-Federal entity under subpart E of this part. The non-Federal entity may reference its own cost principles that comply with the Federal cost principles.

(d) The cost plus a percentage of cost and percentage of construction cost methods of contracting must not be used.

§ 200.325 Federal awarding agency or pass-through entity review.

(a) The non-Federal entity must make available, upon request of the Federal awarding agency or pass-through entity, technical specifications on proposed procurements where the Federal awarding agency or pass-through entity believes such review is needed to ensure that the item or service specified is the one being proposed for acquisition. This review generally will take place prior to the time the specification is incorporated into a solicitation document. However, if the non-Federal entity desires to have the review accomplished after a solicitation has been developed, the Federal awarding agency or pass-through entity may still review the specifications, with such review usually limited to the technical aspects of the proposed purchase.

(b) The non-Federal entity must make available upon request, for the Federal awarding agency or pass-through entity pre-procurement review, procurement documents, such as requests for proposals or invitations for bids, or independent cost estimates, when:

(1) The non-Federal entity's procurement procedures or operation fails to comply with the procurement standards in this part;

(2) The procurement is expected to exceed the Simplified Acquisition Threshold and is to be awarded without competition or only one bid or offer is received in response to a solicitation;

(3) The procurement, which is expected to exceed the Simplified Acquisition Threshold, specifies a “brand name” product;

(4) The proposed contract is more than the Simplified Acquisition Threshold and is to be awarded to other than the apparent low bidder under a sealed bid procurement; or

(5) A proposed contract modification changes the scope of a contract or increases the contract amount by more than the Simplified Acquisition Threshold.

(c) The non-Federal entity is exempt from the pre-procurement review in paragraph (b) of this section if the Federal awarding agency or pass-through entity determines that its procurement systems comply with the standards of this part.

(1) The non-Federal entity may request that its procurement system be reviewed by the Federal awarding agency or pass-through entity to determine whether its system meets these standards in order for its system to be certified. Generally, these reviews must occur where there is continuous high-dollar funding, and third-party contracts are awarded on a regular basis;

(2) The non-Federal entity may self-certify its procurement system. Such self-certification must not limit the Federal awarding agency's right to survey the system. Under a self-certification procedure, the Federal awarding agency may rely on written assurances from the non-Federal entity that it is complying with these standards. The non-Federal entity must cite specific policies, procedures, regulations, or standards as being in compliance with these requirements and have its system available for review.

§ 200.326 Bonding requirements.

For construction or facility improvement contracts or subcontracts exceeding the Simplified Acquisition Threshold, the Federal awarding agency or pass-through entity may accept the bonding policy and requirements of the non-Federal entity provided that the Federal awarding agency or pass-through entity has made a determination that the Federal interest is adequately protected. If such a determination has not been made, the minimum requirements must be as follows:

(a) A bid guarantee from each bidder equivalent to five percent of the bid price. The “bid guarantee” must consist of a firm commitment such as a bid bond, certified check, or other negotiable instrument accompanying a bid as assurance that the bidder will, upon acceptance of the bid, execute such contractual documents as may be required within the time specified.

(b) A performance bond on the part of the contractor for 100 percent of the contract price. A “performance bond” is one executed in connection with a contract to secure fulfillment of all the contractor's requirements under such contract.

(c) A payment bond on the part of the contractor for 100 percent of the contract price. A “payment bond” is one executed in connection with a contract to assure payment as required by law of all persons supplying labor and material in the execution of the work provided for in the contract.

§ 200.327 Contract provisions.

The non-Federal entity's contracts must contain the applicable provisions described in appendix II to this part.

Appendix J

Cordova South Harbor Geophysical Report

rmconsult.com

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22 September 2022 R&M No. 2957.01

Samantha Greenwood, Public Works Director
City of Cordova
PO Box 1210
Cordova, Alaska 99574

RE: Preliminary Geotechnical Report and Geophysical Survey for
Cordova South Harbor Rebuild, Cordova, Alaska

Dear Mrs. Greenwood,

R&M Consultants, Inc. (R&M) has prepared this Preliminary Geotechnical Report and results of the Geophysical Survey in support of the Cordova South Harbor Rebuild project in Cordova, Alaska. This letter report presents a summary of the historical geotechnical information at the site, presents relevant as-built data from the North Harbor improvements, provides results of the geophysical survey including sub-bottom profiling performed by eTrac Inc., and provides preliminary geotechnical and pile recommendations for the project. A subsurface geotechnical investigation is planned to be conducted in the following weeks, and once complete, the results and recommendations will be incorporated into a report.

BACKGROUND

The project is located at the Cordova South Harbor in Cordova, Alaska. The community is within Southeastern Prince William Sound (PWS) in the Gulf of Alaska. Entrance to the harbor is from the associated waterbody of Orca Inlet, an arm of PWS. The site lies in Section 28, Township 15 South, Range 3 West of Copper River Meridian and lands on USGS Quadrangle Cordova C-5 SW. The site is located at approximately N 60.5430 degrees and W 145.7659 degrees. A location map of the Harbor is presented on the attached **Drawing 1**.

Cordova Harbor was initially constructed in 1938 with its original basin and breakwater, and after a few iterations, was expanded to double its size in 1978 by removing the western breakwater and replacing additional expanded breakwater and basin dredging to its current configuration. The Harbor is "base of operations for commercial fishing and provides moorage for 727 vessels, making it one of Alaska's largest single-basin harbors" (U.S. Army Corps of Engineers, USACE, 2019). The harbor is bound on two-and-a-half sides by land, including Nicholoff Way along the southern side, Railroad Avenue along the eastern side, and partially on the north side of the harbor by Breakwater Avenue. A breakwater rubble mound defines the western and northwestern boundaries, with opening vessel entrance from the north.

This South Harbor Rebuild project encompasses the southern and western portions of the existing small boat harbor, including its navigational access channel from the north, and entails replacing existing Floating Docks G, H, I, J, K, and N. The layout for replacing the existing floats is expected to mimic the current layout with some reconfiguration. A similar rehabilitation was completed at the North Harbor in 2005 including the replacement of Floats A, B, C, D, and E.

PROJECT DESCRIPTION

The project involves the following elements:

- Remove and demolish existing Floats G through K, Float Plane Dock, and trestles and gangways.
- Replace Floats G through K in similar layout and replace and reconfigure Float N.
- Add new Drive Down Service Float and associated Transfer Bridge.
- Place new pedestrian trestles and gangway ramps.
- The project also includes some form of new bulkhead that is built out from existing southern shoreline.
- The proposed overall footprint of the project is similar in extent as the existing South Harbor facilities.
- No modifications to the breakwater are planned.
- Incorporate new utilities including all-season water, fire suppression to all new floats and shore power and lighting.

SCOPE OF WORK

The scope of work included review of existing geotechnical data, directing a geophysical survey conducted by eTrac, Inc., and developing preliminary geotechnical recommendations. These recommendations are interim until completing a subsurface geotechnical investigation that is planned to initiate during ensuing weeks. Pile recommendations are considered preliminary pending confirmation of geotechnical conditions.

EXISTING HYDROGRAPHIC DATA

2020 – USACE / eTrac Cordova Harbor Condition Survey. In September 2020, USACE Alaska District, in association with their geophysical survey subcontractor eTrac, Inc., completed a Project Condition Survey of the Cordova Harbor. This survey included bathymetric survey of the harbor basin and shoreline surveys including the breakwater mound. Bathymetry soundings were collected using a multibeam echosounder. Terrestrial laser scanning was also collected at that time. Methods, results, and plots of the 2020 hydrographic survey are attached in **Appendix A**. Results of this survey have been adopted for this project as representation of existing conditions, and the dataset is reflected as seafloor and ground contours shown on attached **Drawing 1** and other project deliverables.

HISTORICAL GEOTECHNICAL DATA

The City of Cordova provided archived project documents from the 1978 Harbor expansion and 2003 rebuild of the North Harbor. Geotechnical information is limited at the South Harbor; however, it is the only known existing geotechnical data available for the project site. Relevant information from the historic documents is summarized below.

1978 – Cordova, Alaska, Detailed Project Report, Recommended Improvements (USACE, 1978). A total of twelve soil borings were completed in support of 1978 westward harbor expansion. The layout for these soil borings is shown in the original documents that are attached in **Appendix C**, and locations have been approximated and incorporated onto **Drawing 1**. The soil borings were completed within the intertidal zone with surface elevations at the time ranging from +2 to +9 feet relative to MLLW. The soil borings were located within the intertidal mudflats within the harbor footprint prior to dredging of the basin. The soil borings were advanced entirely within soil sediments and no bedrock was encountered within the depths explored. Soil sediments were characterized largely as sandy silt and is intermixed with limited zones of gravelly sandy silt and silt (commonly 3 to 15 feet thick). The bottom of hole (BOH) of explorations ranged between -11 and -29.5 feet elevations relative to MLLW, with an average of about -23 foot elevation, without encountering bedrock. BOH elevations are noted on the plot of historical geotechnical data on **Drawing 1**. Comparing these BOH elevations to the current dredged basin (ranging

between -10 and -16 foot elevations relative to MLLW), it is evident these historic soil borings only had limited advancement (at the most 15 feet) beyond current mudline.

2003 – Cordova Small Boat (North) Harbor Improvements – Test Hole Logs (PND, 2005). PND Engineers, Inc. (PND) completed a total of nine test holes (identified as PND-TH1-03 thru PND-TH9-03) during the 2003 design for the North Harbor Improvements. Locations of the test holes are shown on **Drawing 1** and the records of test hole logs are included in **Appendix D**.

- The test holes were advanced to depths ranging from 18 to 41 feet below harbor basin seafloor.
- General subsurface conditions recorded in the test holes is 14 to over 41 feet of mostly loose silt overlying bedrock described as either fractured graywacke or fragmented shale.
- The predominantly loose silty sediments also contained intermixed layers of silty gravel, gravel, and silty sand with gravel that conversely were reported to be in medium dense to dense condition.
- Five of the test holes (PND-TH1-03 thru PND-TH5-03) were cored into bedrock with top of bedrock elevations ranging from -27 to -45 feet relative to MLLW. Top of bedrock elevations for these holes are noted on the plot of historical geotechnical data on **Drawing 1**.
- Two of the test holes (PND-TH7-03 and PND-TH8-03) met refusal while advancing drill casing or penetrometer rods. In our interpretation, refusal could indicate top of bedrock, or possibly a boulder, but were not cored into bedrock to confirm. The elevations where refusal was met ranged from -37 to -38 feet relative to MLLW, and are noted on the plot of historical geotechnical data on **Drawing 1**.
- The remaining two test holes (PND-TH6-03 and PND-TH9-03) were completed entirely within unconsolidated soil sediments without encountering bedrock, to bottom elevations of -53 and -44 feet relative to MLLW. These two test holes were located furthest West within North Harbor, suggesting a lower elevation of the underlying bedrock in that area. BOH elevations are noted on **Drawing 1**.

AS-BUILT AND PILE INSTALLATION RECORDS (2005) – NORTH HARBOR

2005 – Cordova Small Boat (North) Harbor Improvements – As-Built Pile Plan and Pile Schedule (PND, 2005). Pile installation records from the 2005 North Harbor Improvements were maintained by PND and provided to us by the City of Cordova. As-built Pile Plan and Pile Schedule sheets are included in **Appendix E**. The following was noted based on the as-built records:

- There were a total of 129 piles installed as part of the North Harbor project, including 12.75 and 16.0 inch OD pipe piles.
- This includes 124 piles serving as guide piles for Floats A thru E.
- Float piles were designed to be installed at a minimum 22 foot embedment below mudline, and three-quarters of the piles were installed to that final depth.
- Conversely, a total of 30 of the 124 float piles met driving refusal prior to 22 foot embedment.
- Again, it is our interpretation that refusal depths during pile driving correlate with top of bedrock or a layer of rubble. Most of the float piles that reached refusal on presumed bedrock are located along Float A, which is nearest to the east shore, suggesting shallower bedrock surface in that area.
- One of the gangway piles G3 also met refusal, but at a deeper embedment of 44 feet.
- All of the piles that met refusal are shown on **Drawing 1** and have corresponding tip on bedrock elevations listed. For clarity, any of the piles that did not meet refusal are not shown schematically on the Drawing 1.

GEOPHYSICAL SURVEY – SUB-BOTTOM PROFILING – CONDUCTED BY ETRAC

A geophysical survey was completed in the Cordova Harbor by eTrac Inc., under direction of and sub-contract to R&M. eTrac Inc. was also responsible for the previous 2020 hydrographic conditions survey that was performed in the Harbor for USACE. Data from the previous hydrographic survey was incorporated into this current effort, serving as the definition of seafloor elevations. The current geophysical survey was conducted using sub-bottom profiling methods. The purpose of this geophysical survey was to characterize stratigraphic conditions and geologic characterization below the seafloor and to define lower boundaries of soil sediments and identify any underlying hard facies (such as top of bedrock).

Sub-bottom profiling is a method wherein acoustic waves are introduced into the sea floor in pulses and the return of those signals are recorded as the sound bounces off the seafloor and is reflected from subsequent strata layers below. Differences in acoustic impedance of various layers are related to the hardness and density of the material, which also effect the rate at which sound travels through those materials. Interpreting the rate and amplitude of the returning sound waves can be used to identify acoustically distinct horizons and the collective data is utilized to map stratigraphic boundaries. Equipment, methodology, and discussion of results of the geophysical survey are presented in eTrac's Geophysical Report that is attached in Appendix B.

The primary objective of the sub-bottom profiling is to identify the upper boundary of a hard facies that can be interpreted as the top of the bedrock unit. This was done where there was a strong return of the acoustic waves with minimal penetration below. eTrac's Geophysical Report identifies "Horizon 3" as a pervasive unit throughout the site that produces a strong return of acoustic energy and is defined as an upper boundary of a hard facies that is interpreted as bedrock. This horizon has high rugosity, with jagged slopes and varying depths. Depths of this "Horizon 3" upper bedrock boundary were measured to range from minimum depth at elevation -23 feet to maximum depth of elevation -73 feet, with an average across the basin at elevation -48 feet. Two other acoustic horizons "Horizon 1 and 2" were identified above "Horizon 3" entirely within unconsolidated soil sediments.

eTrac developed contoured elevations for this "Horizon 3" bedrock layer that are plotted in Sheets 1 through 8 of their survey results presented in Appendix B. The geophysical Sheets also provide eight Profiles (A through H) showing "Horizon 3" relative to seafloor. Each of the Profiles A through F are aligned within the clear spaces between the existing floating docks and two Profiles G and H that are near the southeast corner of the Harbor near the boat launch and trend closer to east-west.

REGIONAL SETTING

Regional Geology. The site lies within the Kenai-Chugach Mountains physiographic province (Wahraftig, 1965). The Chugach Mountains form a rugged barrier along the north coast of the Gulf of Alaska and are dominated by extremely rugged east-trending ridges. The Chugach Mountains are composed chiefly of dark gray argillite and graywacke that are mildly metamorphosed and have a pronounced vertical cleavage striking parallel to the trend of the range. Nokleberg et al. (1994) and Nelson et al. (1985) provide details of regional geology.

This portion of Alaska was covered with glacial ice during glacial advances of late Pleistocene age (Coulter, et al., 1965) as evidenced by local topographic form and soil stratigraphy. The area is considered to be generally free of permafrost except for isolated locations at higher elevations (Ferrains, 1965).

The project area lies in Tertiary sedimentary rocks (Orca Formation) that have been subjected to cataclastic metamorphism (shearing). The unit was mapped by the U. S. Geological Survey as containing "thin- to thick-bedded turbidites consisting of sandstone, siltstone, and mudstone; metamorphosed to zeolite or prehnite-pumpellyite facies" (Figure 4). The rocks were generally interpreted to be deposited by turbidity currents on submarine fans. Conglomerate, pebbly mudstone and pebbly sandstone were deposited along channels in the fans.

SITE CONDITIONS

Seafloor Topography. A copy of the most recent bathymetric Project Condition Survey (USACE, 2020) is included as reference in **Appendix A**. Maintenance dredging of the of the harbor last occurred in 2009, including the various mooring basins and navigation channels and harbor entrance.

Seafloor bathymetry has been shaped by the 2009 dredging, reforming the main access channel within the harbor to -18 to -14 feet elevations and two mooring basins located west of the channel that are incrementally shallower to -13 to -9 feet elevations (relative to MLLW datum).

Tides. Tide cycles are mixed semi-diurnal, completing almost two full high and low cycles daily. This equates to a time of just over 6 hours between any respective low or high tide. The mean tide range at Cordova, Alaska is approximately 10.2 feet and the maximum diurnal range is approximately 12.6 feet (NOAA, Station ID 9454050, 2022). Mean Higher High Water (MHHW) reaches an elevation of +12.6 feet, relative to Mean Lower Low Water (MLLW) datum set as zero elevation.

Soil Deposits. Near surface soil deposits within the basin are interpreted as predominantly marine silt intermixed with occasional alluvial sands and gravels. Soil conditions from the North Harbor are predominantly loose silt as indicated in the on the 2005 PND test holes in **Appendix D**.

PRELIMINARY GEOTECHNICAL RECOMMENDATIONS

Preliminary geotechnical pile recommendations are given for the proposed facilities. Recommendations will need to be updated based on subsurface conditions to be determined during the geotechnical investigation that is happening soon.

Main Floats - Pipe Piles. We understand the new main Floats G through K and Float N will be constructed using open-tipped steel pipe piles that are driven into the seafloor sediments. We understand that lateral forces, that are a result of short-term wind gusts, will primarily control design of the float guide piles, and that net axial loads are negligible. Lateral loads are unknown and should be determined by the designers of the floats.

Based on our preliminary understanding of the site conditions, we recommend a minimum pile tip embedment of 25 feet below mudline into soil sediments. Bedrock elevations under the proposed main float replacements are commonly deeper than -42 foot elevation, and it is not expected that bedrock will be encountered within the 25 foot minimum embedment. That is according to results of the geophysical survey, with definition of “Horizon 3” (inferred bedrock) captured in the sub-bottom profiling.

A preliminary lateral analysis of piles was conducted based on assumed soil properties expected at this site, but should be verified contingent upon the pending geotechnical subsurface investigation. The lateral pile analysis was completed using LPILE v2016 from Ensoft. In this analysis, we have given a range of pipe pile diameters (12.75, 16.0, and 18.0 inches) and wall thicknesses that are reasonably expected for this project. Lateral loads are assumed and the resulting lateral deflections and bending moments are predicted. The results of the lateral pile analysis for the Main Floats are attached in Table 1. The application point for the lateral load on float pile is assumed at elevation +14.1 feet, which is roughly a foot-and-a-half above MHHW at elevation +12.6 feet. For each respective Float location, the neatline lengths of piles are given according to estimated mudline, pile tip, and cut-off elevations.

Drive Down Service Float - Pipe Piles. Piles at the proposed Drive Down Service Float will be subject to greater lateral live loads from vehicles and vessels, including where the Transfer Bridge meets the Float. Specific design loads have not yet been developed. However, larger piles sections are anticipated, and we have presumed use of either 24, 30, or 36 inch diameter pipe piles, depending upon loads. It is recommended that each of these guide piles be installed

with tips firmly seated onto top of bedrock. At this location, top of bedrock is estimated to be present near -48 foot elevation. Results of the lateral pile analysis for the Service Float guide piles are included in the attached Table 1 using assumed lateral loads and should be confirmed during design.

Even greater lateral demands are anticipated for piling needed where the Transfer Bridge meets the Float. Again, specific design loads are unknown. We anticipate the need for two pair of piles, one each installed vertically and the other at a 1H:3V batter. It is recommended that these two pair of piles be socketed into bedrock with a minimum 10 foot long rock socket. To meet this, pile tip elevations are anticipated at -58 foot elevation. Pipe pile sections are anticipated to be 18 to 24 inches diameter, depending on loads. A lateral analysis should be completed for this scenario during design.

Other Facilities. Other proposed facilities are included as part of this rebuild project, such as the Drive Down Transfer Bridge, Drive Down Approach Trestle, Pedestrian Trestle, Pedestrian Gangway. Specific configurations, design, and loading details are unknown at this time. Geotechnical recommendations should be developed once those elements are further defined during design.

Bulkhead Wall. A bulkhead wall is planned along the southern boundary of the Harbor for additional parking parallel to Nicholoff Way and for vessels inside of Float N. Dredging in front of the face of the wall is planned down to elevation -10 feet. The finished height of the wall is planned for elevation +22 feet. The sheet pile wall should have tie-back anchors. To meet static load conditions only, the minimum PZ27 sheet pile section should be embedded a minimum of 26 feet below the dredged mudline. Recommendations for the bulkhead sheet piles are given in attached Table 2. Analysis of the bulkhead wall should be considered preliminary and should be verified by the designers once onsite subsurface data is collected.

An additional 5 feet of embedment, thicker sheet section PZ 40, and a second tier of tie-back anchors would be needed in order to meet the added demand from seismic loading. This assumes Contingency Level Earthquake (CLE) per ASCE 61-14 seismic performance criteria, representing 20% probability of exceedance in 50 years (or 225-year return period). Performance criteria and tolerable deformation of the bulkhead structure should be established specifically for this structure by the designers.

CLOSURE AND SIGNATURES

The discussion presented in this report is based on our understandings of the proposed project and the other pertinent information listed herein. Because subsurface characteristics can change significantly within a given area, and with the passing of time, the possibility exists that important conditions not disclosed by this study may be discovered on the site during construction. Should this situation occur, the influence of the new information on the design aspects should be evaluated without delay.

R&M Consultants, Inc. performed this work in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions. No warranty, express or implied, beyond exercise of reasonable care and professional diligence, is made. This report is intended for use only in accordance with the purposes of study described within.

We appreciate the opportunity to produce this geotechnical report. Should you require further information concerning this report, please contact us at your convenience.

Very truly yours,

R&M CONSULTANTS, INC.

Travis Ross, P.E.
Senior Geotechnical Engineer

Reviewed by:

Robert M. Pintner, P.E.
Senior Geotechnical Engineer

ATTACHMENTS:

Table 1:	Summary of Preliminary Lateral Pile Analysis
Table 2:	Summary of Preliminary Bulkhead Recommendations
Drawing 1:	Plot of Historical Geotechnical Data
Appendix A	Cordova Harbor Condition Survey by USACE (2020)
Appendix B	Geophysical Survey Report and Plots and Profiles by eTrac. (2022)
Appendix C	Detailed Project Report, Recommended Improvements, Cordova, Alaska by USACE (1978).
Appendix D	Cordova Small Boat (North) Harbor Improvements – Test Hole Logs by PND (2003).
Appendix E	Cordova Small Boat (North) Harbor Improvements – As-Built Pile Records by PND (2005).

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Cordova South Harbor Rebuild

Table 1: **Summary of Preliminary Lateral Pile Analysis**

Main Float Guide Piles

Main Floats	Assumed Mudline Elevation (feet, MLLW)	Minimum Embedment Below Mudline (feet)	Estimated Pile Tip Elevation (feet, MLLW)	Estimated Pile Cut-Off Elevation (feet, MLLW)	Estimated Pile Length, Neatline (feet)	Pipe Pile O.D. (inches)	Pile Wall Thickness (inches)	Lateral Load (kips)	Estimated Deflection at Mudline (inches)	Maximum Bending Moment (ft-kips)
I, J, K, & West Fingers of H	-12	25	-37	+27	64	12 3/4	1/2	4	1 1/2	115
								4.4	2	144
	-12	25	-37	+27	64	16	1/2	6	1 1/2	173
								6.4	2	188
G & Middle and East Fingers of H	-18	25	-43	+27	70	16	1/2	5.5	1 1/2	192
								6.2	2	217
	-18	25	-43	+27	70	18	1/2	6.4	1 1/2	225
								7.5	2	267
N	-12	25	-37	+27	64	12 3/4	1/2	4	1 1/2	115
								4.4	2	144
N (Eastern 3 piles)	-15	25	-40	+27	67	12 3/4	1/2	4.2	2	134
N (Eastern 3 piles)	-15	25	-40	+27	67	16	1/2	5.2	1 1/2	159
								6.2	2	200

Other Facilities

Facility	Assumed Mudline Elevation (feet, MLLW)	Estimated Embedment Below Mudline (feet)	Estimated Pile Tip Elevation (feet, MLLW)	Estimated Pile Cut-Off Elevation (feet, MLLW)	Estimated Pile Length, Neatline (feet)	Pipe Pile O.D. (inches)	Pile Wall Thickness (inches)	Lateral Load (kips)	Estimated Deflection at Mudline (inches)	Maximum Bending Moment (ft-kips)
Drive Down Service Float [4]	-15	Pile Tips Seated on Top of Bedrock	-48	+27	75	24	1/2	12.7	1 1/2	413
								13.4	2	438
						30	0.438	12.7	1	413
								18	2	625
						36	0.406	12.7	3/4	417
								23	2	767
Drive Down Service Float at Transfer Bridge [4] Vertical Piles & Battered Piles	-15	Rock Socket Piles 10 foot Minimum into Bedrock [5]	-58	+27	85 (vertical piles) / 91 (1:3 batter piles)	18 to 24	TBD	TBD	TBD	TBD
Drive Down Transfer Bridge, Abutment, Land Side	n/a	TBD	TBD	TBD	TBD	18 to 24	TBD	TBD	TBD	TBD
Drive Down Approach Trestle	+15 to 0	TBD	TBD	TBD	TBD	16	TBD	TBD	TBD	TBD
Pedestrian Trestle (non-dredged areas)	+15 to 0	TBD	TBD	TBD	TBD	16	TBD	TBD	TBD	TBD
Pedestrian Trestle (dredged areas)	-10									
Pedestrian Gangway, Harbor Side	-12	30	-42	+27	69	12 3/4	1/2	TBD	TBD	TBD
						16	1/2	TBD	TBD	TBD
Land Side	TBD	TBD	TBD	TBD	TBD	16	TBD	TBD	TBD	TBD

Notes: 1) Lateral pile analysis is based on historical geotechnical information completed in the North Harbor (2004). Pile analysis should be considered preliminary and should be verified once onsite subsurface data is collected.

2) The application point for the lateral load on float pile is assumed at elevation +14.1 feet, which is roughly a foot and a half above MHHW at elevation +12.6 feet.

3) Lateral load is assumed to be a result from short-term wind gusts. Loads are estimated and should be determined by the designers.

4) Top of bedrock underlying the Drive Down Service Float is estimated to be near elevation -48 feet.

5) TBD=To Be Determined. Specific axial and lateral loads are unknown and therefore pile sizes and embedments are not yet known. Rock Socket length to be determined based on lateral load and axial uplift.

Cordova South Harbor Rebuild

Table 2: **Summary of Preliminary Bulkhead Recommendations**

Description	Dredged Mudline Elevation (feet, MLLW)	Minimum Embedment Below Mudline (feet)	Estimated Sheet Pile Tip Elevation (feet, MLLW)	Top of Bulkhead Elevation (feet, MLLW)	Free Height (feet)	Estimated Sheet Pile Length, Neatline (feet)	Sheet Pile Section	Tie-Back Anchors	Load Case
Sheet Pile Bulkhead w/ Tie-Back Anchors	-10	26	-36	+22	32	58	PZ 27	Single Row	Static
	-10	31	-41	+22	32	63	PZ 40	Double Row	Seismic, Contingency Level Earthquake (CLE) [4]

Notes

1) Bulkhead pile analysis is based on historical geotechnical information completed in the North Harbor (2004) and Harbor expansion (1978). Bulkhead analysis should be considered preliminary and should be verified once onsite subsurface data is colle

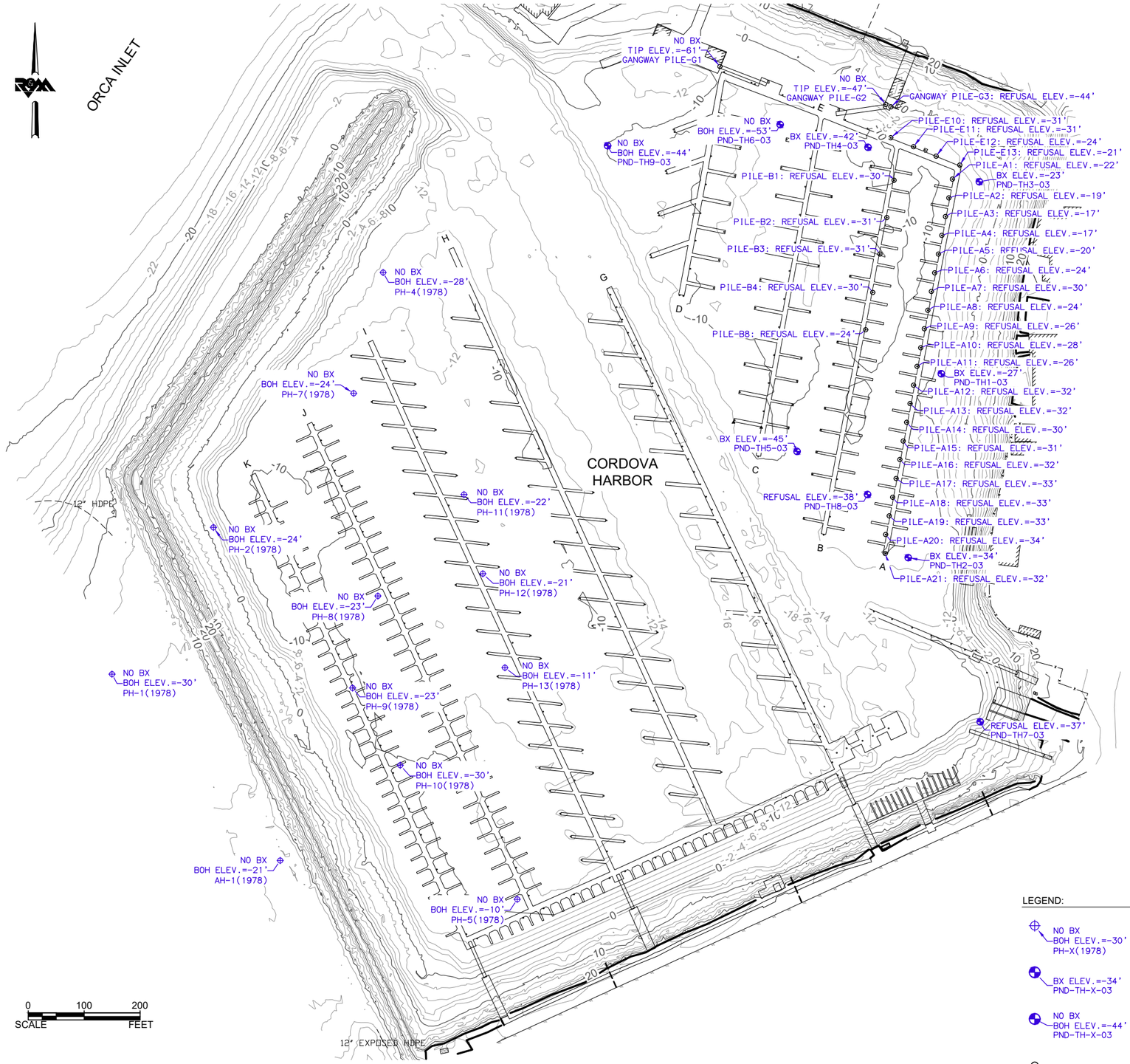
2) Contingency Level Earthquake (CLE) is per ASCE 61-14 seismic performance criteria, representing 20% probability of exceedance in 50 years (or 225-year return period).

3) CLE seismic hazard is from USGS probabilistic seismic hazards analysis using Unified Hazard Tool.

4) Performance criteria and tolerable deformation of the bulkhead structure should be established specifically for this structure by the designers.

Drawing 1

Plot of Historical Geotechnical Data



NOTES:

1) VERTICAL ELEVATION DATUM IS MLLW = 0'.
2) BOREHOLE LOCATIONS ARE APPROXIMATE.

HISTORICAL GEOTECHNICAL DATA

Scale: 1" = 200'

BORE HOLE COORDINATE TABLE

POINT #	RAW DESCRIPTION	NORTHING	EASTING	LATTITUDE	LONGITUDE
1	PND-TH1-03	2391367	1683077	N060.545544	W145.763037
2	PND-TH2-03	2391038	1683018	N060.544645	W145.763372
3	PND-TH3-03	2391710	1683145	N060.546482	W145.762652
4	PND-TH4-03	2391772	1682946	N060.546652	W145.763757
5	PND-TH5-03	2391228	1682819	N060.545166	W145.764473
6	PND-TH6-03	2391812	1682789	N060.546765	W145.764629
7	PND-TH7-03	2390745	1683147	N060.543841	W145.762663
8	PND-TH8-03	2391151	1682945	N060.544954	W145.763774
9	PND-TH9-03	2391774	1682480	N060.546664	W145.766344
10	PILE-A1	2391715	1683097	N060.546495	W145.762920
11	PILE-A2	2391681	1683091	N060.546403	W145.762956
12	PILE-A3	2391648	1683085	N060.546312	W145.762990
13	PILE-A4	2391614	1683078	N060.546220	W145.763027
14	PILE-A5	2391581	1683072	N060.546129	W145.763061
15	PILE-A6	2391547	1683065	N060.546037	W145.763099
16	PILE-A7	2391514	1683059	N060.545946	W145.763133
17	PILE-A8	2391480	1683053	N060.545854	W145.763168
18	PILE-A9	2391447	1683047	N060.545764	W145.763204
19	PILE-A10	2391413	1683040	N060.545671	W145.763240
20	PILE-A11	2391380	1683034	N060.545580	W145.763278
21	PILE-A12	2391346	1683027	N060.545488	W145.763313
22	PILE-A13	2391313	1683021	N060.545398	W145.763348
23	PILE-A14	2391280	1683015	N060.545307	W145.763382
24	PILE-A15	2391247	1683009	N060.545215	W145.763418
25	PILE-A16	2391214	1683003	N060.545125	W145.763452
26	PILE-A17	2391180	1682996	N060.545032	W145.763489
27	PILE-A18	2391146	1682990	N060.544940	W145.763524
28	PILE-A19	2391113	1682984	N060.544849	W145.763559
29	PILE-A20	2391080	1682978	N060.544758	W145.763596
30	PILE-A21	2391046	1682977	N060.544666	W145.763600
31	PILE-B1	2391713	1682993	N060.546491	W145.763499
32	PILE-B2	2391646	1682980	N060.546308	W145.763572
33	PILE-B3	2391581	1682967	N060.546130	W145.763642
34	PILE-B4	2391512	1682954	N060.545942	W145.763715
35	PILE-B8	2391445	1682942	N060.545760	W145.763787
36	PILE-E10	2391789	1682987	N060.546699	W145.763531
37	PILE-E11	2391773	1683027	N060.546654	W145.763304
38	PILE-E12	2391756	1683068	N060.546607	W145.763080
39	PILE-E13	2391740	1683110	N060.546563	W145.762846
40	PH-1(1978)	2390830	1681594	N060.544089	W145.771284
41	PH-2(1978)	2391092	1681775	N060.544805	W145.770272
42	PH-4(1978)	2391548	1682079	N060.546048	W145.768577
43	PH-5(1978)	2390428	1682319	N060.542981	W145.767268
44	PH-7(1978)	2391332	1682026	N060.545458	W145.768874
45	PH-8(1978)	2390970	1682070	N060.544467	W145.768641
46	PH-9(1978)	2390805	1682024	N060.544017	W145.768895
47	PH-10(1978)	2390667	1682110	N060.543639	W145.768424
48	PH-11(1978)	2391151	1682224	N060.544961	W145.767782
49	PH-12(1978)	2391010	1682257	N060.544574	W145.767598
50	PH-13(1978)	2390842	1682297	N060.544114	W145.767382
51	AH-1(1978)	2390497	1681895	N060.543175	W145.769620

LEGEND:

NO BX BOH ELEV.=-30' PH-X(1978)	SOIL LOGS FROM 1978 IMPROVEMENTS. NO BEDROCK (BX) ENCOUNTERED IN SOIL LOGS DOWN TO BOTTOM OF HOLE (BOH) ELEVATIONS NOTED.
BX ELEV.=-34' PND-TH-X-03	TEST HOLE LOGS BY PND 2003. BEDROCK (BX) ELEVATION ENCOUNTERED OR REFUSAL ELEVATION.
NO BX BOH ELEV.=-44' PND-TH-X-03	TEST HOLE LOGS BY PND 2003. NO BEDROCK (BX) ENCOUNTERED WITHIN BOTTOM OF HOLE (BOH) ELEVATIONS NOTED.
PILE-E12: REFUSAL	PILES INSTALLED IN 2005 CORDOVA HARBOR IMPROVEMENTS (NORTH), WHERE DRIVING REFUSAL WAS MET PREMATURE TO 22 FOOT MINIMUM EMBEDMENT (INTERPRETED AS BEDROCK (BX)). ALL OTHER FLOAT PILES WITHIN FLOATS A THRU E (NOT SHOWN) WERE INSTALLED TO 22 FOOT EMBEDMENT.

R&M CONSULTANTS, INC.
9101 Vanguard Drive
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phone: 907.522.1707 • fax: 907.522.3403
CORPORATE AUTHORIZATION NUMBER AECC111

Cordova South Harbor Rebuild
Cordova, Alaska

No.	Description	Date

Drawn By: RG /TER
Checked By: JD
Date: JUNE 3, 2022
Phase: CONCEPT PLANS
Project No: 2957.01
SHEET TITLE: HISTORICAL GEOTECHNICAL DATA CORDOVA HARBOR
DRAWING NO: 1

Appendix A

Cordova Harbor Condition Survey by USACE (2020)

Curve Table			
Curve #	Length	Radius	Delta
C1	149.27	100.76	084°52'45"

VOLUME COMPUTATIONS		
AREA A: ENTRANCE & ACCESS CHANNEL (FEDERAL)	MLLW=0	CU. YD.
AVAILABLE TO PROJECT DEPTH (PD)	-16.0	8,497
AVAILABLE TO MAX PAY DEPTH (MP)	-17.0	15,516
AVAILABLE SIDE SLOPES (SS) AT 3:1 (H:V) & 25' WIDE	VARIES	873
AREA B: MOORING BASIN (NON-FEDERAL)		
AVAILABLE TO PD	-14.0	50,210
AVAILABLE TO MP	-15.0	64,952
AVAILABLE SS AT 3:1 (H:V) & 25' WIDE	VARIES	6,745
AREA C: MOORING BASIN (NON-FEDERAL)		
AVAILABLE TO PD	-12.0	5,106
AVAILABLE TO MP	-13.0	15,968
AVAILABLE SS AT 3:1 (H:V) & 25' WIDE	VARIES	645
AREA D: MOORING BASIN (NON-FEDERAL)		
AVAILABLE TO PD	-10.0	940
AVAILABLE TO MP	-11.0	3,923
AVAILABLE SS AT 3:1 (H:V) & 25' WIDE	VARIES	736
TOTAL MAXIMUM VOLUME AVAILABLE (MP + SS)		109,358

NAVIGATION AIDS

NO.	NORTHING	EASTING	DESCRIPTION
25608	2,392,107	1,682,142	CORDOVA HARBOR LIGHT 1 FI G 4S
25610	2,391,837	1,682,095	CORDOVA HARBOR LIGHT 2 FI R 4S

PROJECT LIMITS

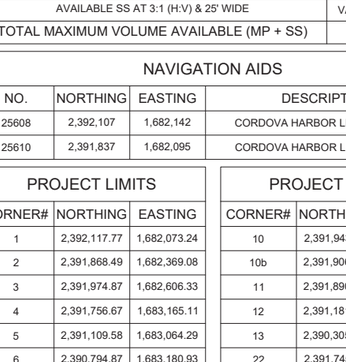
CORNER#	NORTHING	EASTING
1	2,392,117.77	1,682,073.24
2	2,391,868.49	1,682,369.08
3	2,391,974.87	1,682,606.33
4	2,391,756.67	1,683,165.11
5	2,391,109.58	1,683,064.29
6	2,390,794.87	1,683,180.93
7b	2,390,659.20	1,682,968.63
7	2,390,748.96	1,683,164.19
8	2,390,607.03	1,682,854.98
9	2,391,789.67	1,682,268.64

PROJECT LIMITS

CORNER#	NORTHING	EASTING
10	2,391,943.21	1,681,976.14
10b	2,391,906.06	1,682,130.50
11	2,391,890.27	1,682,149.23
12	2,391,181.09	1,681,764.63
13	2,390,305.77	1,682,198.61
22	2,391,745.51	1,682,159.89
23	2,391,755.42	1,682,166.83
24	2,391,339.69	1,681,875.70
25	2,390,376.70	1,682,353.14
26	2,390,558.19	1,682,748.55

LEGEND

- CULVERT
- CATCH BASIN
- SIGN
- COMMUNICATION JUNCTION BOX
- COMMUNICATION PEDESTAL
- ELECTRICAL PEDESTAL
- ELECTRICAL SWITCH
- TRANSFORMER
- LIGHT POLE
- GUARD POST
- FIRE HYDRANT
- MAN HOLE
- VALVE CONNECTION
- BUILDING
- FENCE
- ASPHALT



THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN NSPS/THSOA CERTIFIED HYDROGRAPHER

NOTES

1. PRIMARY PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 3, NAD83 (2011) 2010.00, IN U.S. SURVEY FEET BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING THE PUBLISHED NAD83 (2011) 2010.00 EPOCH VALUES OF NGS CORS STATIONS: "MONTAGUE2 2010 CORS ARP" (AC79 - PID:DO1824); "THOMPSONPA 2006 CORS ARP" (AC57 - PID:6450); "YAKATAGA 2007 CORS ARP" (AB35 - PID:DL7638); EYAC AKDA AK2005 (EYAC - PID:DL6465).

   LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 3, NAD83, IN U.S. SURVEY FEET HOLDING USACE SBC "BK-1 1977" (PID:BBGY34) AS N 2,392,080.92', E 1,682,294.10' AND DOMED BC "CH-1 1997" (PID:BBGY35) AS N 2,390,492.22', E 1,683,761.94'.

2. VERTICAL CONTROL IS MEAN LOWER LOW WATER DATUM (MLLW=0.0'), BASED ON THE NOAA/NOS TIDAL BENCHMARK LIST: "945 4050, CORDOVA, ORCA INLET, PRINCE WILLIAM SOUND, ALASKA" PUBLISHED 05/16/2003.THIS TIDAL DATUM IS BASED ON THE 1983-2001 TIDAL EPOCH AND IS REFERENCED BY HOLDING USCGS TIDAL BENCH MARK "NO 13 1970" (PID:BBBD28/VM#:1237) AS 21.53'.

3. VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD88 (GEOID 12B) ELEVATIONS HOLDING NOAA/NOS TIDAL BENCHMARK "945 4050 H" (PID:BBFS17/VM#:1240) AS 28.51'.

4. SOUNDINGS ARE IN FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.

5. BATHYMETRY WAS COLLECTED SEPTEMBER 2-5, 2020. SOUNDINGS WERE COLLECTED USING AN R2SONIC 2020 MULTIBEAM ECHOSOUNDER OPERATING AT 400 KHZ. SOUND VELOCITY THOUGH THE WATER COLUMN WAS DETERMINED WITH AN AML BASE X SOUND VELOCITY PROBE. POSITION AND VESSEL ORIENTATION WERE MEASURED USING AN APPLANIX POSMV WAVEMASTER V5 SYSTEM RECEIVING RTK CORRECTIONS FROM A TRIMBLE R8 MODEL 3 GPS RECEIVER SET AT CONTROL STATION "BK-1 1977" (PID:BBGY34). DATA WAS COLLECTED AND PROCESSED USING QINSY 8.1 AND QIMERA 1.7 SOFTWARE. HORIZONTAL CONTROL WAS VERIFIED USING RTK GNSS EQUIPMENT AND TECHNIQUES. VERTICAL CONTROL WAS SURVEYED USING DIFFERENTIAL LEVELING TECHNIQUES.

6. TERRESTRIAL LASER SCANNING DATA WAS COLLECTED SEPTEMBER 2-5, 2020. DATA WAS COLLECTED USING A RIEGL VZ400 LASER SCANNER AND PROCESSED USING QINSY 8.1 AND QIMERA 1.7 SOFTWARE. POSITION AND VESEL ORIENTATION WERE MEASURED USING AN APPLANIX POSMV WAVEMASTER V5 SYSTEM

7. THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY.

8. MAP SOUNDINGS ARE BINNED AT 24 FEET AND ARE SHOAL-BIASED. CONTOURS ARE BASED ON 12 FEET BINNED SHOAL-BIASED SOUNDINGS. VOLUME SOUNDINGS ARE BINNED AT 3 FEET AND ARE MEAN VALUE SOUNDINGS.

SURVEY CONTROL DATA

STATION	NORTHING	EASTING	MLLW	DESCRIPTION
BK-1 1977	2,392,080.92	1,682,294.10	19.66	3 1/2 IN. USACE SBC
CB-5 1977	2,392,180.14	1,682,367.61	18.37	3 1/2 IN. USACE SBC
CB-6 1977	2,391,801.75	1,683,389.64	39.81	3 1/2 IN. USACE SBC
CH-1 1997	2,390,429.22	1,682,761.94	21.07	3 IN. BC
CH-2 1997	2,390,622.00	1,683,190.77	21.80	3 IN. BC
CH-6 2003	2,392,372.05	1,683,146.30	22.55	3 IN. BC
CH-8 2006	2,391,513.91	1,681,868.00	21.92	3 IN. BC
COR 19 1982	2,390,148.53	1,682,142.46	22.18	3 1/2 IN. USACE SBC
COR 20 1982	2,391,176.51	1,681,632.69	21.85	3 1/2 IN. USACE SBC

US ARMY CORPS OF ENGINEERS®
ALASKA DISTRICT

REV.	DATE	BY	APPR.	DESCRIPTION

UPC: 087136
CONTRACT NO.: W912RB-20-D-2014
DATE: 13-Nov-20
TASK ORDER NO.: 20FR0051
SIZE: ANSI D
SCALE: 1" = 200'
JOB NO.: 1220
SURVEYED BY: JOINT EFFORT
DRAWN BY: ROBERT GOUGHNOUR
CHECKED BY: TAS/JBG/ALT
APPROVED BY: THOMAS SLOAN, CHIEF GEOMATICS SECTION
FILE: 087136-VH03.DWG
CONTRACTOR: ETRAC INC.,
CITY: WASILLA
STATE: ALASKA

U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
2204 3RD STREET
JBER, ALASKA 99506-2898

CODOVA, ALASKA
087136 - CORDOVA HARBOR
PROJECT CONDITION SURVEY
AUGUST 31 - SEPTEMBER 5, 2020

REFERENCE NUMBER:
3-COR-92-07-37

US ARMY CORPS OF ENGINEERS®
ALASKA DISTRICT

REV.	DATE	BY	APPR.	DESCRIPTION

UFC: 087136
DELIVERY DATE: 13-Nov-20
SIZE: ANSI D
SCALE: 1" = 50'
JOB NO.: 1220
CONTRACT NO.: W912RB-20-D-0014
TASK ORDER NO.: 20F0051
CONTRACTOR: ETRAC INC.
STATE: ALASKA
CITY: WASILLA

SURVEYED BY: LOGAN PETS
DRAWN BY: ROBERT GOUGHNOUR
CHECKED BY: TAS/JBG/ALT
APPROVED BY: THOMAS SLOAN, CHIEF GEOMATICS SECTION
FILE: 087136-VH03.DWG

U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
2204 3RD STREET
JBER, ALASKA 99506-0898

CODOVA, ALASKA

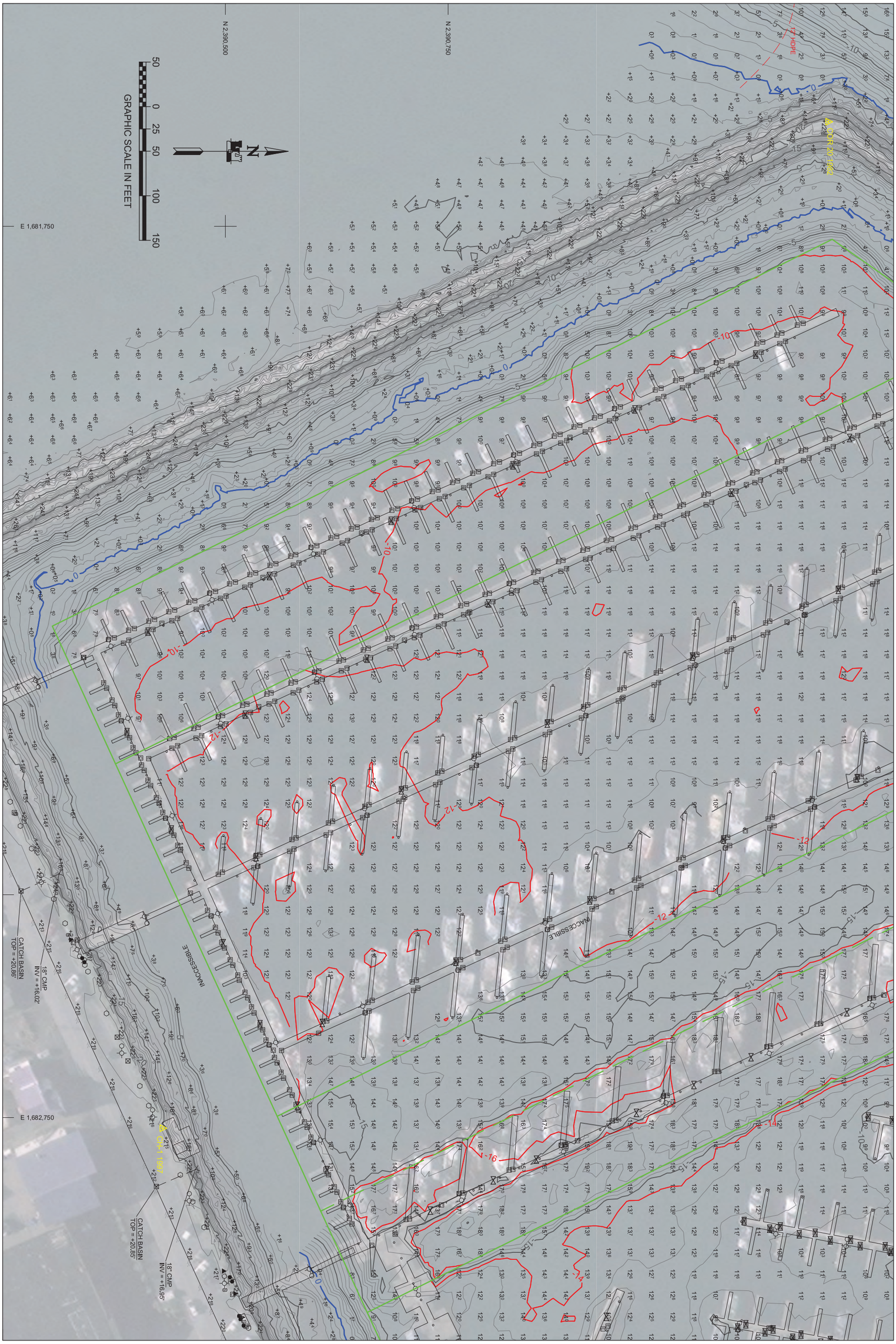
087136 - CORDOVA HARBOR

PROJECT CONDITION SURVEY

AUGUST 31 - SEPTEMEBER 5, 2020

REFERENCE NUMBER:

3-COR-92-07-37



REFERENCE NUMBER: 3-COR-92-07-37
SHEET 3 OF 6

CODOVA, ALASKA

087136 - CORDOVA HARBOR

PROJECT CONDITION SURVEY

AUGUST 31 - SEPTEMBER 5, 2020

U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
2204 3RD STREET
JBER, ALASKA 99506-0898

SURVEYED BY: JOHN EPPS	UPC: 087136		CONTRACT NO.: W911KB-18-D-0014
DRAWN BY: ROBERT GOUGHNOUR	PLOT DATE: 13-Nov-20		TASK ORDER NO.: 20F0051
CHECKED BY: TAS/JBG/ALT	SIZE: ANSI D	SCALE: 1" = 50'	JOB NO.: 1220
APPROVED BY: THOMAS SLOAN, CHIEF GEOMATICS SECTION			CONTRACTOR: ETRAC INC.,
FILE: 087136-VH03.DWG			CITY: WASILLA / STATE: ALASKA

REV.	DATE	BY	APPR.	DESCRIPTION

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ALASKA DISTRICT

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REV.	DATE	BY	APPR.	DESCRIPTION

U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
2204 3RD STREET
JBER, ALASKA 99506-0898

SURVEYED BY: JOHN EPPS
UPC: 087136
CONTRACT NO.: W911KB-18-D-0014
DRAWN BY: ROBERT GOUGHNOUR
PLOT DATE: 13-Nov-20
TASK ORDER NO.: 20F0051
CHECKED BY: TAS/JBG/ALT
SIZE: ANSI D
SCALE: 1" = 50'
JOB NO.: 1220
APPROVED BY: THOMAS SLOAN, CHIEF GEOMATICS SECTION
CONTRACTOR: ETRAC INC..
FILE: 087136-VH03.DWG
CITY: WASILLA
STATE: ALASKA

CODOVA, ALASKA
087136 - CORDOVA HARBOR
PROJECT CONDITION SURVEY
AUGUST 31 - SEPTEMBER 5, 2020

REFERENCE NUMBER:
3-COR-92-07-37
SHEET 4 OF 6

E 1,683,250
E 1,683,500
E 1,683,750
E 1,684,000
E 1,684,250

N 2,391,000
N 2,390,750
N 2,390,500

N

50 0 25 50 100 150

GRAPHIC SCALE IN FEET

18" CMP
INV = +17.14'

CATCH BASIN
TOP = +21.10'

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ALASKA DISTRICT

REV.	DATE	BY	APPR.	DESCRIPTION

SURVEYED BY:
JOHN EPPS
ROBERT GOUGHNOUR

CHECKED BY:
TAS/JBG/ALT

APPROVED BY:
THOMAS SLOAN, CHIEF GEOMATICS SECTION

FILE:
087136-VH03.DWG

UPC:
087136

DATE:
13-Nov-20

SIZE:
ANSI D

SCALE:
1" = 50'

CONTRACT NO.:
W912RB-20-D-0014

TASK ORDER NO.:
20F0051

JOB NO.:
1220

CONTRACTOR:
ETRAC INC.

CITY:
WASILLA

STATE:
ALASKA

U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
2204 3RD STREET
JBER, ALASKA 99506-0898

CODOVA, ALASKA

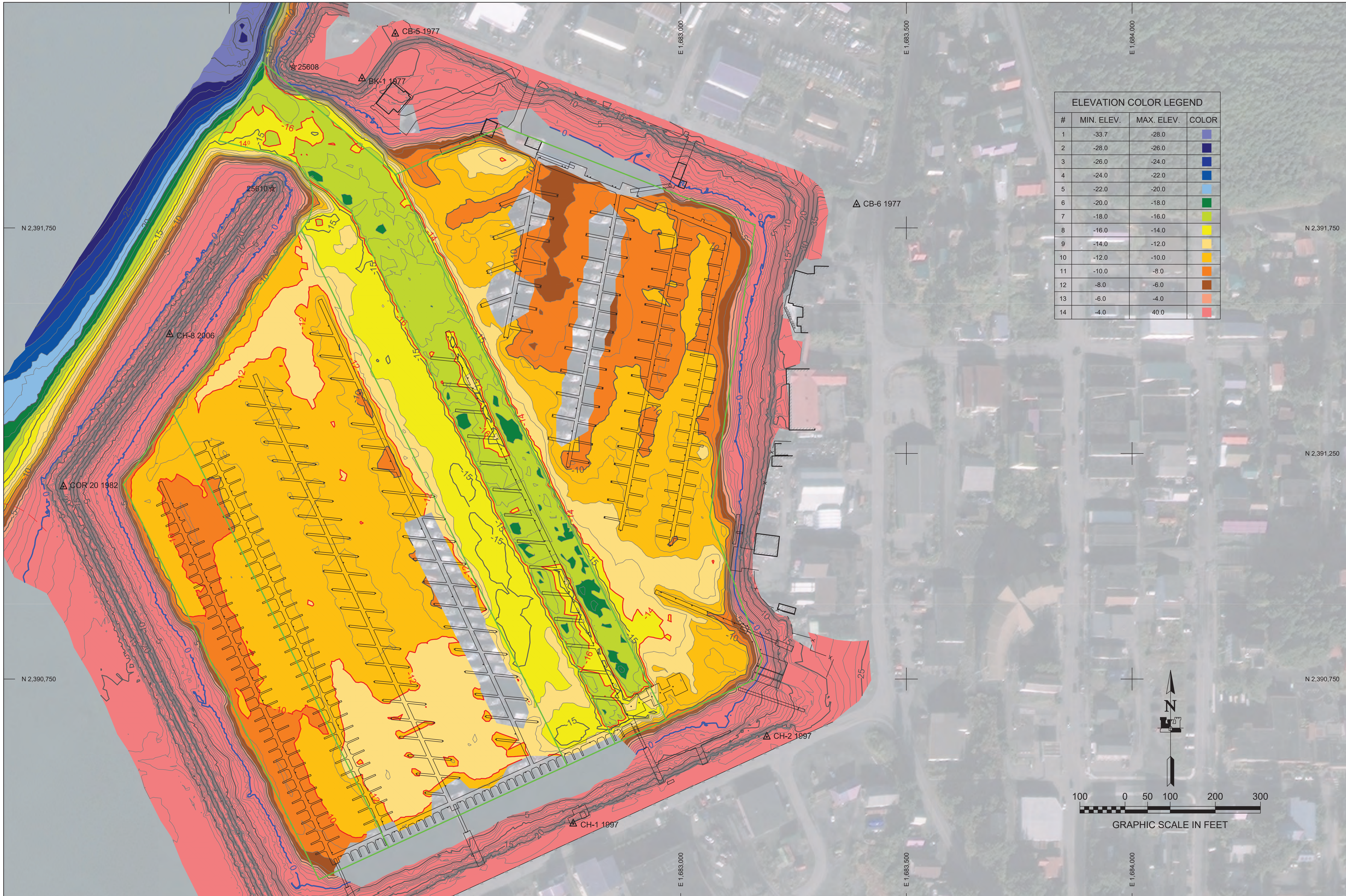
087136 - CORDOVA HARBOR

PROJECT CONDITION SURVEY

AUGUST 31 - SEPTEMBER 5, 2020

REFERENCE NUMBER:

3-COR-92-07-37



ELEVATION COLOR LEGEND

#	MIN. ELEV.	MAX. ELEV.	COLOR
1	-33.7	-28.0	
2	-28.0	-26.0	
3	-26.0	-24.0	
4	-24.0	-22.0	
5	-22.0	-20.0	
6	-20.0	-18.0	
7	-18.0	-16.0	
8	-16.0	-14.0	
9	-14.0	-12.0	
10	-12.0	-10.0	
11	-10.0	-8.0	
12	-8.0	-6.0	
13	-6.0	-4.0	
14	-4.0	40.0	

US ARMY CORPS OF ENGINEERS® ALASKA DISTRICT

REV.	DATE	BY	APPR.	DESCRIPTION

U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
2204 3RD STREET
JBER, ALASKA 99506-0898

SURVEYED BY: JOHN EPPS	UPC: 087136	CONTRACT NO.: W911KB-18-D-0014
DRAWN BY: ROBERT GOUGHNOUR	PLOT DATE: 13-Nov-20	TASK ORDER NO.: 20F0051
CHECKED BY: TAS/JBG/ALT	SIZE: ANSI D / SCALE: 1" = 100'	JOB NO.: 1220
APPROVED BY: THOMAS SLOAN, CHIEF GEOMATICS SECTION		CONTRACTOR: ETRAC INC..
FILE: 087136-VH03.DWG		CITY: WASILLA / STATE: ALASKA

CODOVA, ALASKA

087136 - CORDOVA HARBOR

PROJECT CONDITION SURVEY

AUGUST 31 - SEPTEMBER 5, 2020

REFERENCE NUMBER:

3-COR-92-07-37

SHEET 6 OF 6

Appendix B

Geophysical Survey Report and Plots and Profiles by eTrac (2022)

CORDOVA SOUTH HARBOR REBUILD
FINAL GEOPHYSICAL REPORT
CORDOVA, ALASKA

Contractor Document No: R&M_2022_CORDOVA_GEOPHYSICAL_REPORT_FINAL_A3.docx

09/08/2022	A3	Client Edits	ALT	CRG		TR
09/03/2022	A2	Client Review	CRG	ALT		
09/01/2022	A1	Internal Review	CRG	ALT		
Date	Revision	Description of Revision	Prepared	Checked	Approved	Client

www.etracinc.com

email: Adam Taylor, adam.taylor@woolpert.com or Cody Gibson, cody.gibson@woolpert.com

TABLE OF CONTENTS

FIGURES & TABLES

Acronyms and Abbreviations

°	Degree(s)
°F	Degree(s) Fahrenheit
3D	Three Dimensional
CMR(+)	Compact Measurement Record
CORS	Continuously Operating Reference Station
eTrac	eTrac Inc.
Ft	Feet
GLONASS	Global Navigation Satellite System (Russia's version of GPS)
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
Hz	Hertz
IHO	International Hydrographic Organization
JSF	Java Server Faces
MBES	Multibeam Echosounder System
MLLW	Mean Lower Low Water
NAD83	North American Datum of 1983
NAVD88	North American Vertical Datum of 1988
NOAA	National Oceanic Atmospheric Administration
OPUS	Online Positioning User Service
POSMV	Position and Orientation System for Marine Vessels
PPK	Post Processed Kinematic
R&M	R&M Consultants, Inc.
RTK	Real Time Kinematic
SBET	Smoothed Best Estimate of Trajectory
SEG-Y	Society of Exploration Geophysicists
QA	Quality Assurance
QC	Quality Control
QPS	Quality Positioning Systems
RTK	Real Time Kinematic
SBET	Smoothed Best Estimate of Trajectory
SV	Sound Velocity
SBP	Sub-Bottom Profiler
USM	Universal Sonar Mount

1 EXECUTIVE SUMMARY

From July 21 through July 24, 2022, eTrac Inc. completed a full geophysical survey of Cordova Harbor in support of the Cordova South Harbor Rebuild in Cordova, Alaska. The objective of the geophysical investigation was to provide stratigraphic and geologic characterization to identify the basement below the seafloor.

Horizontal and vertical control was verified by RTK GNSS techniques prior to acquisition.

In September of 2020, eTrac Inc. completed a Hydrographic Survey of the area. Although this task was not specific to this Scope of Work, it will be detailed below as the information collected will support the findings.

Seafloor depths based on the 2020 multibeam survey ranged from -34ft to +8ft MLLW. No obstructions to navigation were identified during this survey, however, a 12" HDPE outfall pipe was located outside the breakwater to the west of the harbor and poses no threat to navigation.

The Innomar Compact SES-2000 Sub-bottom profiler and the Falmouth HMS-620 Narrowband Bubble Gun were used for all sub-bottom data collection. The Innomar Compact Sub-bottom's high-frequency data was collected with a range set to 100ft. The HMS-620 Sub-bottom's low-frequency data was collected with a range set to 150ft. Consistent penetration was observed between 5ft to 60ft across the survey area, with maximum penetration up to 72ft. Course sediments such as gravels, pebbles, and rocks in the area limited penetration, however, the data was used to detail the complex stratigraphy below the seafloor.

There are three common subsurface acoustic horizons that mark the upper and lower boundaries of sediment units across the survey area. Horizon 1 is the upper boundary of a chaotic, mixed deposit facies with high and low amplitude returns when present. Horizon 2 is a deposited or layering of sediments on a tilted plane above Horizon 3 which is semi consolidated but not acoustically impenetrable. Horizon 3 is a strong return with no penetration below. The horizon is the upper boundary of a hard facies which has high rugosity, with jagged slopes and varying depths.

Buried objects or isolated rocks were identified in the sub-bottom profiler and are particularly

evident between the seafloor and Horizon 1 and typically is limited to the upper 15-20ft of the sub-surface.

2 INTRODUCTION

2.1 Contract & Scope

This report is prepared for R&M Consultants, Inc. (R&M) by eTrac Inc. (eTrac) and supports the marine geophysical investigation for the Cordova Harbor located in Cordova, Alaska. This study is in support of anticipated modifications to the Cordova Harbor, including the design of new project structures and related site improvements.

2.2 Survey Area

The survey area is in the western half of Cordova Harbor in Cordova, Alaska. Figure 1 shows the project area location. Figure 2 shows the survey area in Cordova Harbor.

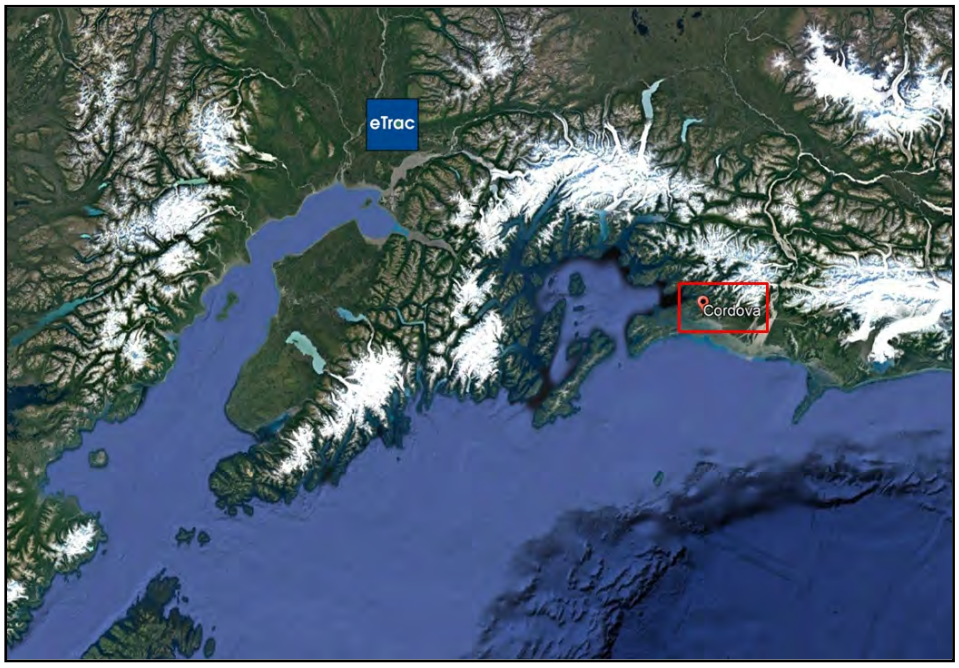


Figure 1 Project Location

Figure 2 Survey Area

2.3 Company Overview

eTrac Inc. was established in 2003 as a hydrographic and geophysical surveys, vessel positioning, and instrumentation firm. eTrac has several offices along the US West Coast, including San Francisco, Seattle, and Anchorage. The firm has earned a strong reputation among many sectors of the hydrographic industry, including government agencies and private industry. Its equipment fleet has also grown to include 18 aluminum survey vessels as well as several ultraportable, shallow water survey craft. eTrac's role has grown over the years to include a strong group of full-time staff as well as several localized vessels to support the work required by the USACE, marine construction, engineering firms, and petroleum industry contractors on the West Coast. eTrac is committed to continual re-investment in industry-leading equipment and knowledgeable staff to complete multibeam, single beam, side scan, LiDAR, Sub-Bottom, and water-level surveys required by our clients. Staffed with professionally licensed land surveyors and ACSM/THSOA (American Congress on Surveying and Mapping/The Hydrographic Society of America) certified hydrographers, eTrac's projects are performed at the highest level of quality and detail that the industry demands.

3 OBJECTIVES

eTrac completed a geophysical survey of the Cordova Harbor, to detail determinations of site stratigraphic conditions and relevant impacts on the proposed design structures.

The objectives of this survey are as follows:

- Determine the stratigraphic and geologic characterization of fine-grained sediment, coarse-grained sediment, and bedrock underlying the defined geophysical investigation limits for use in defining relevant engineering properties of seafloor materials.
- Provide a Geophysical Survey Report to document the geophysical survey work, data reductions and analyses, and determinations of site stratigraphic conditions.

4 SURVEY CALENDAR

The survey began on July 21st, 2022, with the mobilization of the Sub-Bottom systems. The final day was July 24th, 2022, when all systems were demobilized from the vessel. The survey calendar is below in Table 1.

Table 1 Survey Calendar

July 21, 2022	Sub-bottom Profiler Mobilization & Testing
July 22, 2022	Sub-bottom Acquisition
July 23, 2022	Sub-bottom Acquisition
July 24, 2022	Sub-bottom Demobilization

5 GEODESY

All data within Cordova Harbor was collected in reference to NAD83 (2011), State Plane, Alaska Zone 3, U.S. Survey ft. Local project control is based off *BK-1 1977*. The vertical datum for the project is Mean Lower Low Water (MLLW), U.S. Survey Feet, based on the NOAA/NOS tidal benchmark list "*945 4050, CORDOVA, ORCA INLET, PRINCE WILLIAM SOUND, ALASKA*" published 05/16/2003. This tidal datum is based on the 1983-2001 tidal epoch and is referenced by holding NOAA/NOS tidal benchmark *"NO 13 1970*" as 21.53'.

6 EQUIPMENT

6.1 Survey Vessels

All work was completed onboard an eTrac owned and operated survey vessel, *R/V Frequent Sea*. (Figure 3). *R/V Frequent Sea* is a 28ft aluminum monohull stationed in Anchorage, Alaska making it available for rapid mobilization for survey work. A positioning and motion detection system was installed on the vessel with a long antenna base allowing for maximum heading accuracy and better results in areas with low GNSS coverage. All offsets were measured while on a trailer to ensure that: 1) measurements to and from the positioning equipment are accurate to less than 3 cm and 2) GNSS derived QC could be conducted while stationary.

The Innomar Compact Sub-Bottom Profiler was pole mounted on the starboard side of the vessel and the HMS-620 source was towed at the forward, starboard cleat, while the 1-meter streamer was towed from the aft, port cleat. These systems will be detailed in the following sections.

Figure 3 *R/V FrequentSea*

6.2 Positioning System

6.2.1 Applanix POS MV 320 V5 Oceanmaster

The vessel was positioned, and motion accounted for using an Applanix POS MV 320 V5 Oceanmaster.The system allows high accuracy real-time kinematic (RTK) positioning as well as a post-processed kinematic (PPK) solution. All tidal stages are accounted for in real-time through the RTK or PPK vertical position. Details of the system are below in Figure 4.

Applanix POS MV V5 Oceanmaster

Figure 4 Applanix POS MV Oceanmaster

- Position Accuracies PPK:
- Horizontal: +/ (8 mm + 1 ppm x baseline length)
- Vertical: +/ (15 mm +1 ppm x baseline length)
- Motion Accuracies, Roll and Pitch: 0.008° in PPK
- Heading Accuracies: 0.02° (2 m baseline)
- Real-time Heave 5cms and Trueheave Solutions available increasing to 3cms
- With POSPac Processing allows PPK solution with GLONASS AND GPS satellites.

6.3 Sound Velocity

Sound velocity profiles were obtained at pre-planned intervals during acquisition to adjust for refraction and ranging of data due to speed of sound variation in the water column.

AML Base X 2 Sound Velocity Profiler

- Depth Range: up to 500 meters
- Sound Velocity Range: 1375 to 1625 m/s
- Sound Velocity Precision (+/-): 0.006 m/s
- Sound Velocity Accuracy (+/-): 0.025 m/s
- Sound Velocity Resolution: 0.001 m/s
- Pressure Range: Up to 6000 dBar

Figure 5 AML Base X 2 Sound Velocity Profiler

An AML Base X 2 Profiler (See Figure 5 for image and details) was used as the sound speed profiler due to its high accuracy time of flight sound speed sensor, which is capable of measuring sound speed in depths up to 500 meters. The AML Base X 2 is capable of transferringdata via WiFi. AML SeaCast software was run on the acquisition computer to facilitate the data transfer and profile formatting.

6.4 Sub-Bottom Profilers

Two Sub-Bottom profiler systems were used to image deep and shallow subsurface stratigraphy. The low frequency acoustic signal penetrates surface sediments and produces reflections from the subsurface layers. Strong amplitude returns represent harder materials below the surface. Areas where there is a strong return, but nothing below can be considered too hard to penetrate. Changes in amplitude return are detected which represents a change in the sediment type below the surface. Objects appear in the data as parabolas where the return of the echo is dispersed. A narrowband Sub-Bottom system was used for general stratigraphy while the Parametric system has reduced penetration but offers greater resolution and ability to decipher any potential buried objects.

6.4.1 Narrow Band Bubble-Gun Sub-bottom System

The Falmouth HMS-620 Narrowband (shown in Figure 6) was used to determine the deep subsurface stratification (up to 75 feet below the seabed). The system is a narrow band low frequency bubble-gun Sub-Bottom profiler capable of penetrating coarse sand and gravel sediments. This system can differentiate bedrock from other geological environments and is designed to be flown at the surface.

The narrowband Sub-Bottom Digital SEG Y data was acquired using Chesapeake 2-channel NI Analog SB real-time server and SonarWiz Sub-Bottom Acquisition. Hypack was used for navigation and a layback set-up allowed the navigator to view the position of the Narrowband relative to the vessel. The system was controlled using the SonarWiz Sub-Bottom analog server. All setting can be adjusted to include range, frequency settings, DC offset, and AC range.

Figure 6 Falmouth HMS-620 Sub-bottom

6.4.2 Innomar Compact SES-2000 Sub-bottom System

The Innomar Compact SES-2000 (Figure 9) is a Parametric Sub-Bottom Profiler. This system was run in a dual frequency mode with a low frequency to determine the subsurface stratification and a high frequency for object detection and shallow subsurface sediment change.

Figure 7 Innomar Compact SES-2000

Innomar Compact SES-2000 Sub-Bottom Profiler

- Water Depth Range: 2 to 400m
- Sediment Penetration: up to 40m (depending on sediment type and noise)
- Range / Layer Resolution: approx. 1cm / up to 5cm
- Transmit Beam Width (-3dB): approx. ±1° / footprint <3.5% of water depth
- Primary Frequencies (PF): approx. 100 kHz (frequency band 85 – 115 kHz)

7 METHODOLOGY

7.1 Acquisition and Safety

All data was collected from July 22-23, 2022. Data was collected in a safe and efficient manner. All personnel completed a Project Safety Orientation and Vessel Safety Briefing before beginning operations. At the start of the day and before any activity change, a full toolbox talk was completed. The main risk involved was deploying and retrieving the towedsurvey instruments. Two people were always on deck during these operations, and it was done at periods during which ample time could be allowed for the process to be done in a safe manner.

7.2 Survey Areas and Lines

The survey area outlined in the RFP was adhered to with the exception of the immediate areas near existing structures and taking into account water depth. The survey lines were 25ft apart to create a 25ft grid, as shown below in Figure 8.

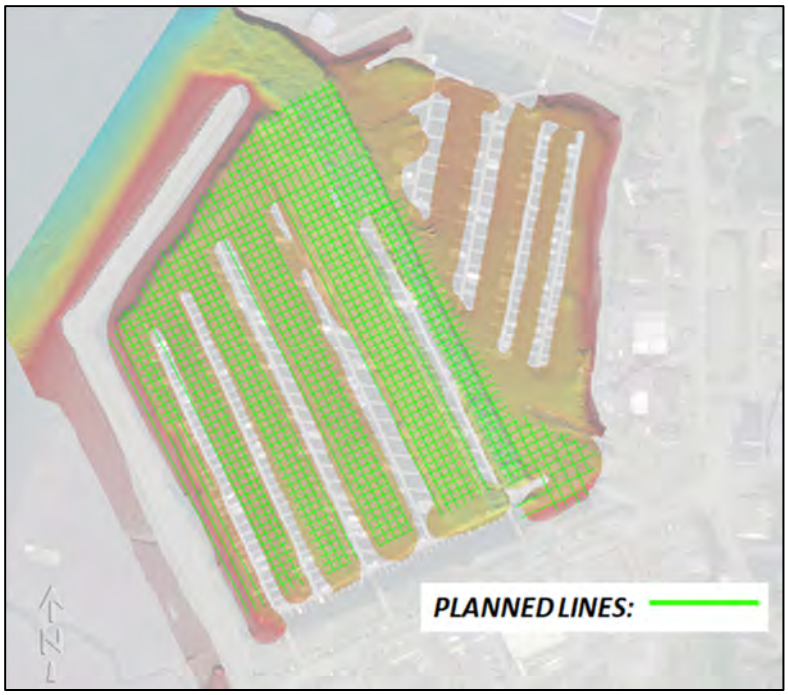


Figure 8 Planned Survey Lines spaced at 25ft (Overview)

7.2.1 Sub-Bottom Profiler

Initial testing lines were run for both systems on the first day of data collection. The first testing lines were to ensure the offsets and calibrations were precise. The second set of lines were run covering different geology types and depths to determine the optimal Sub-Bottom settings. All lines were run at a set speed between 2-4 knots, both to maintain data density.

All SBP data acquisition was completed in SONARWIZ (Falmouth) and SESWIN (Innomar). All settings could be adjusted, including range, frequency settings, gain, and pulse length. Hypack was used for navigation and coverage tracking. Positioning and data was logged to full scale, non-enveloped, binary, files which were then converted to SEGY for processing. The Innomar was fixed mounted to the starboard pole with offsets measured and applied in post-processing. The

Falmouth source was towed from the forward starboard cleat with the 1-meter streamer towed from the aft, port cleat. Sound velocity was measured and averaged to be applied in SONARWIZ and SESWIN software in real-time. All SBP data was acquired when the systems were fixed RTK, and the position of the acoustic center on both systems were fed into the positioning system. Data was viewed, processed, and analyzed using the two-way time measurement relative to the system. Using an estimated subsurface sediment sound speed of 1620m/s, two-way time was converted to depths below the surface. The processed MBES data allowed the creation of a georeferenced depth grid of the seabed surface. This was used to aid positioning and reference the sub-bottom data to a surface in order to then translate subsurface depths to absolute depths in reference to the vertical datum.

The positioning accuracy of the system was at the decimeter level, and the update rates to the helmsman display provided instantaneous feedback for executing the planned survey lines. Sub-bottom passes were conducted in 25ft spaced lines for the low and high frequency within the survey area.

The Falmouth system was set to 20 kHz sampling frequency with a trigger rate of 0.125 seconds and the range at a maximum sync with the trigger rate. A low frequency filter set to 50 Hz and a high frequency filter set to 2000 Hz were set to filter any parametric noise. Gain was set to 21db, so the overload indicator remained off. A real-time display was monitored for penetration and signal attenuation through the sub-surface.

The Innomar system was run in a dual frequency mode with a low frequency (4Hz) with a range up to 100ft for an understanding of the deeper subsurface geology. The low-frequency acoustic signal penetrates surface sediments and produces reflections from the subsurface layers. Strong amplitude returns represent harder materials below the surface. Areas where there is a strong return but nothing below can be considered too hard to penetrate. When changes in the amplitude return are detected, this represents a change in the sediment type below the surface. The system was also run at a higher frequency (8Hz-12Hz) with a range up to 100ft for object detection and shallow subsurface sediment change detection. Objects appear in the data as parabolas where the return of the echo is dispersed.

Both systems were performed within the survey area in accordance with the Scope of Work. Survey lines for both the low and high-frequency data collection followed the planned survey line plan mentioned previously. Vessel moored in the harbor, along with structures associated with

the harbor reduced the ability to complete all the planned run lines as shown in Figure 9 below.

Figure 9 Sub-bottom Profiler Survey Lines

8 RESULTS

8.1 Sub-Bottom Profiler

In total, 193 Sub-Bottom profile lines were run with both the Narrowband and High-frequency parametric system, including 2 lines used for layback calibration. The measured offset of the cable and tow point of the source and streamer allowed the position of the system to be accurate and consistent throughout the entire survey. RTK data was consistent throughout the survey with no lines having to be stopped due to accuracy tolerance alerts.

All data was successfully aligned to the project datum using the Multibeam surface collected and processed by eTrac in August of 2020. Data was processed with optimal gain settings and filtering applied.

Data was clear and the narrow band, low frequency of the system allowed for deep subsurface

stratification through cobble, sand, silt, and bedrock. Penetration of up to 72ft below the surface was achieved in the southwestern survey area. Distinct sediment stratification was observed across the region and a possible identification of bedrock was present as well as sediment stratification layers. Units of strata were able to be identified in the data. 3D surfaces using the digitized horizons, corrected for sound speed changes in the water column and sediment were created across the entire survey area.

The pole-mounted Sub-Bottom was mobilized with precisely measured offsets. This allowed the position of the system to be accurate and consistent throughout the entire survey. The vessel received RTK fixed data throughout the survey, and no lines or time was lost to accuracy tolerance alerts.

Data was processed in relative two-way time from the sensor depth, and final horizons and detections were successfully aligned to the vertical datum using consistent and accurate bottom tracking. Bottom tracking was related to the multibeam surface, which was collected and processed by eTrac in August of 2020. Data was processed with optimal gain settings, and filtering was applied.

The majority of the planned surveyed lines were run. 100% of the lines could not be completed as vessel moored in the marina, and structures associated with the harbor, prevented full coverage.

8.1.1 Sub-Bottom Profiler (Low Frequency)

Data was clear, and the low frequency of the system allowed for deep subsurface stratification. Penetration was limited through coarse sediments such as gravel, pebbles, and rocks; however, penetration was stopped at the start of a hard facies such as glacial moraine or bedrock. Penetration of up to 75ft below the surface was achieved in the survey area. Distinct sediment stratification was observed across the region, and a potential bedrock horizon was able to be identified as well as sediment stratification layers. Units of strata were able to be identified in the data. 3D surfaces using the digitized horizons corrected for sound speed changes in the water column and sediment were created across theentire survey area.

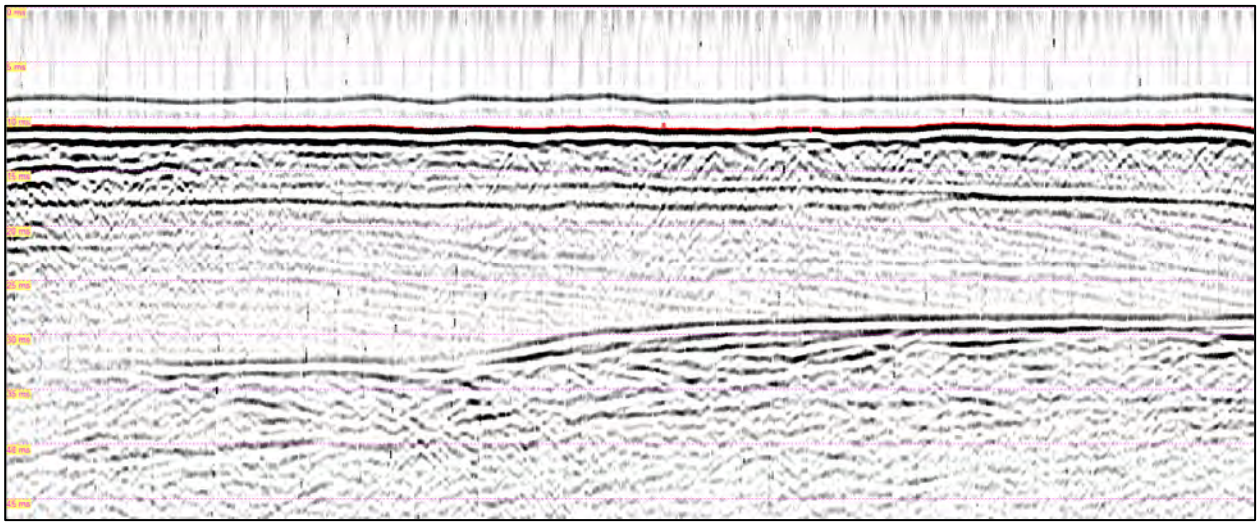


Figure 10 Stratification layers in Low-Frequency Sub-Bottom data

8.1.2 Sub-Bottom Profiler (High Frequency)

Data was clear, and the high frequency of the system allowed for shallow subsurfacestratification through fine and coarse sediments such as cobble, sand, and silt. Penetration of up to 30ft below the surface was achieved in the survey area. Distinct sediment stratification was observed across the region, and glacial moraine was able to be identified as well as sediment stratification layers. Units of strata were able to be identified in the data. 3D surfaces using the digitized horizons corrected for sound speed changes in the water column and sediment were created across the entire survey area.

Figure 11 below shows the high-frequency Sub-Bottom survey lines completed in the survey area with the multibeam (eTrac Sep & Oct 2021) data displayed. **Error! Reference source not found.**Figure 11 below shows an example of data along a similar line with the High Frequency of an Innomar Medium-100 Sub-bottom Profiler in comparison to the Low Frequency.

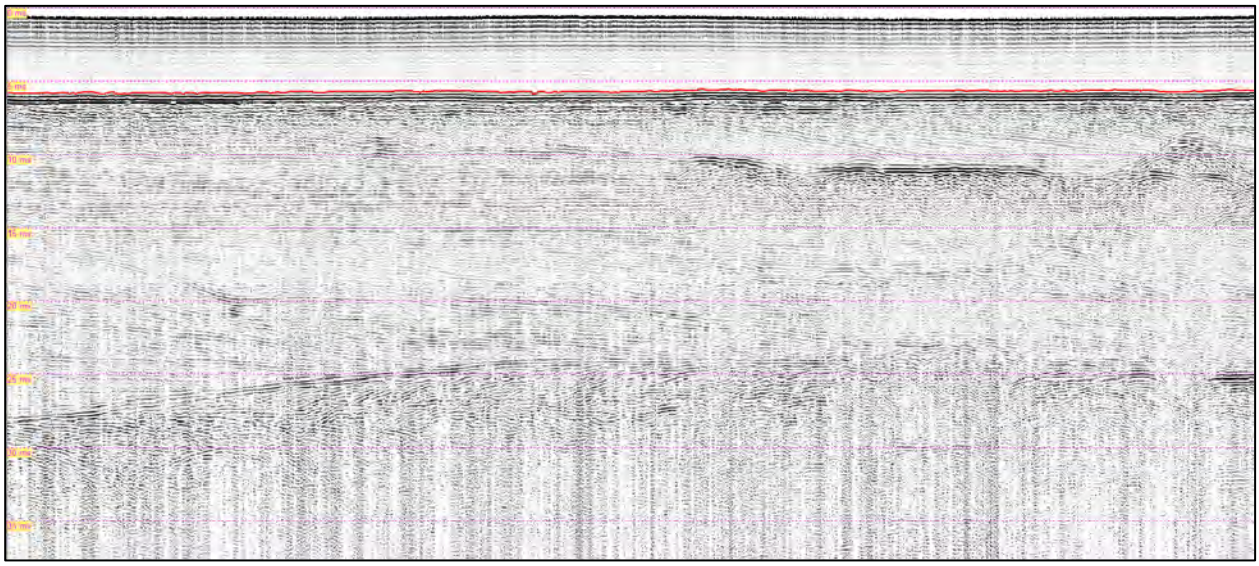


Figure 11 Stratification layers in High-Frequency Sub-Bottom data

9 PROCESSING & SOFTWARE

9.1.1 Sub-Bottom Data Processing

Narrowband single channel SEGY data was processed in SonarWiz software. Position data was cleaned and interpolated where the position was found to be unrealistic. Data was bottom tracked and gain corrected. Time varying gain was applied to enhance buried features. On key lines amplitude correction, swell filtering and de-multiplying were completed in order to reveal subsurface layering that would be otherwise hidden.

The sub-bottom parametric SEGY data was processed in SonarWiz software. Position data was cleaned and interpolated where the position was found to be unrealistic. Data was bottom tracked and gain corrected. Time-varying gain was applied to enhance buried features. On key lines, amplitude correction, swell filtering, and de-multiplying was completed in order to reveal subsurface layering.

Bottom tracked data was then aligned with the Multibeam dataset from 2020 in order to reduce it to the vertical datum (MLLW). Aligning the data to the more accurate multibeam bathymetry dataset greatly improved the dataset positional accuracy. The corrected data was then analyzed by digitizing stratification horizons. The average measured velocity of sound in the water column of 4796.5ft/s and a sound speed of 5058 ft/s below the surface was used to convert two-way

time SEG-Y data to depths for the digitized lines.

9.1.2 Stratification and Quality Control

In order to understand the survey area, stratification layers were analyzed and digitized in the Sub-Bottom datasets. Changing amplitude represented a change in sediment. In addition, high amplitude returns were interpreted as strong returns and, therefore, hard surfaces. The amount of penetration was also analyzed. Based on knowledge of the systems used, sediment type would be determined by penetration. All cobbles and gravel would be penetrated by the sub-bottom with low frequency, but hard rock surfaces would not. The sub-bottom with high frequency would penetrate sand and silt but not gravel. A continuous surface with a high return and zero penetration would be considered a hard facies such as glacial moraine or bedrock. Layers that could be penetrated would be considered deposited material.

All interpretations completed by eTrac were sent to an independent team of geophysicists for quality control through a secondary, combined opinion.

10 ANALYSIS

This section will describe the characterization of sediment layers and areas. Surface and subsurface areas and layers were categorized based on the multibeam and sub-bottom data.

10.1 General Bathymetry

Across the 2020 acquired multibeam data, seafloor depths ranged from -34ft to +8ft MLLW (Figure 12). From the north to the south, through the survey area, the general bathymetry shows an entrance channel running north to south with shoaling on either side with depths ranging from -15ft to -10ft MLLW.

Images and profiles of the survey can be found below in Figure 13 through Figure 15.

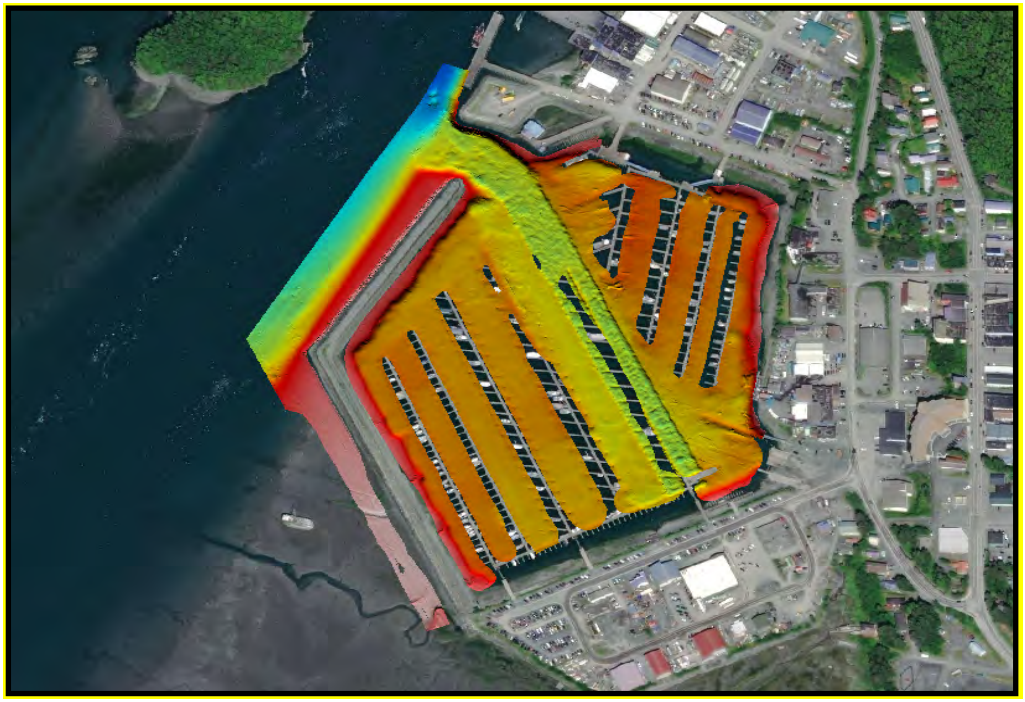


Figure 12 General Bathymetry

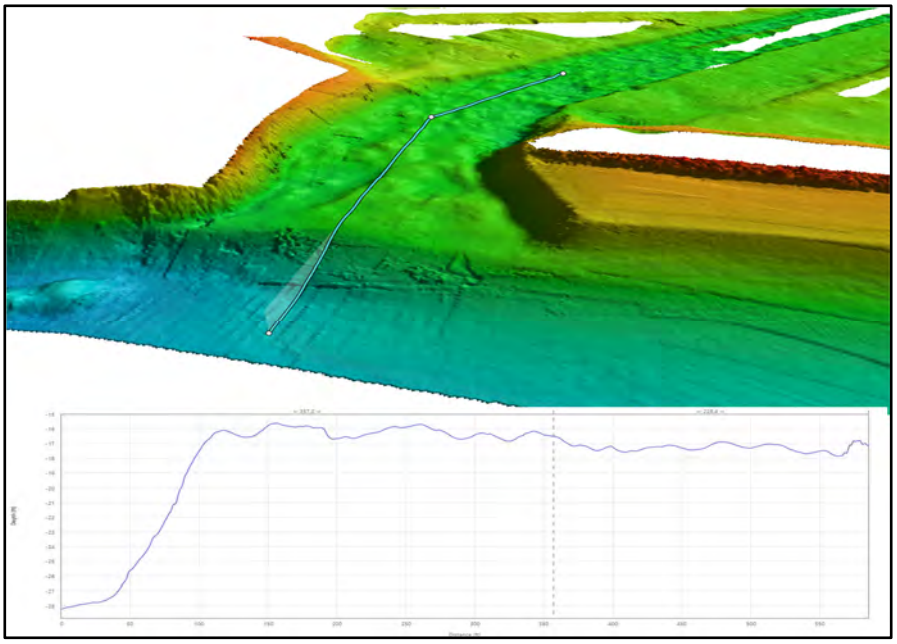


Figure 13 Cross Section from NW to SE of Cordova Harbor Entrance

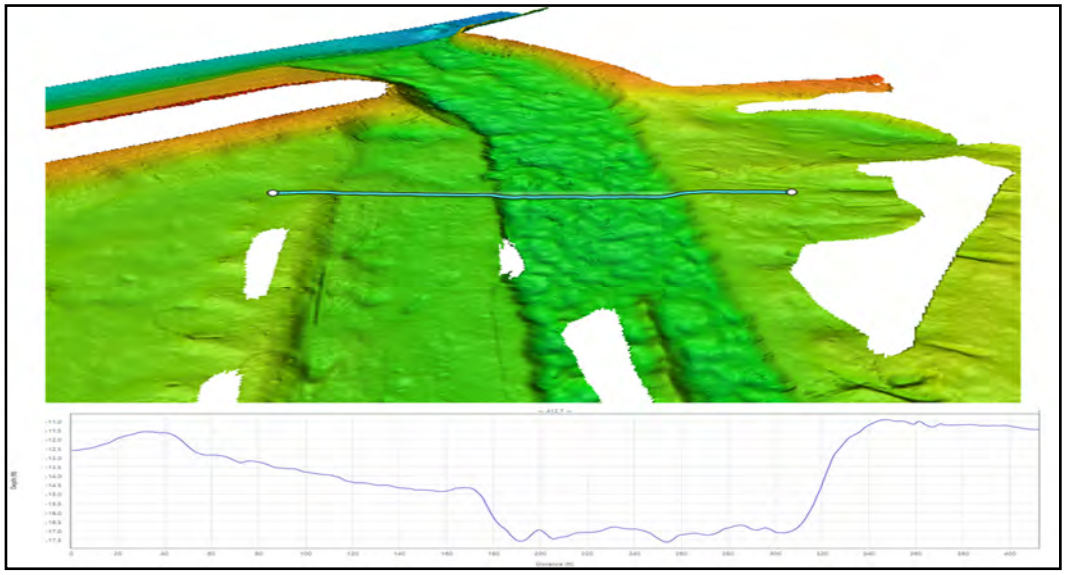


Figure 14 Cross Section from SW to NE of Cordova Harbor

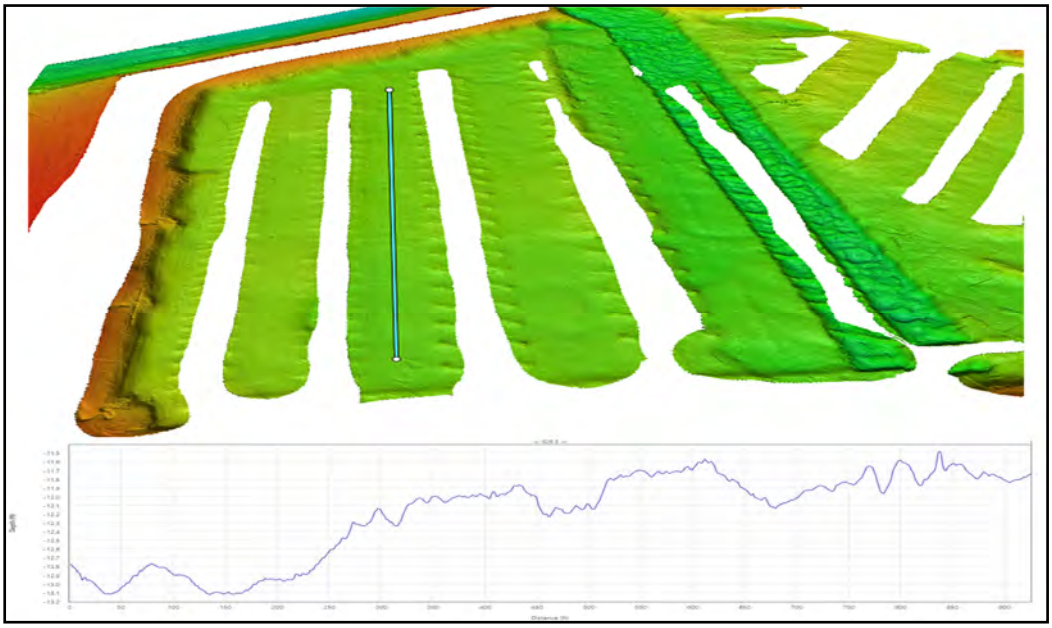


Figure 15 Cross Section from SE to NW of Cordova Harbor

10.2 Sub-Surface Characterization

Three (3) subsurface sediment horizons are common across the survey area. A profile running from nearshore to offshore in between the breakwater and K Dock showing these horizons is located below in Figure 16.

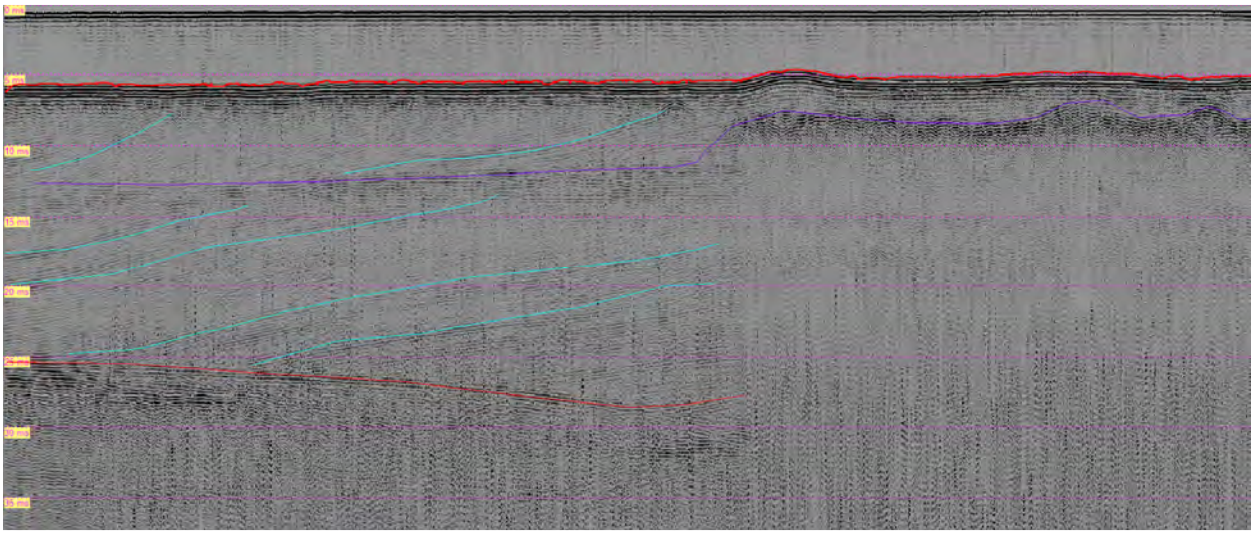
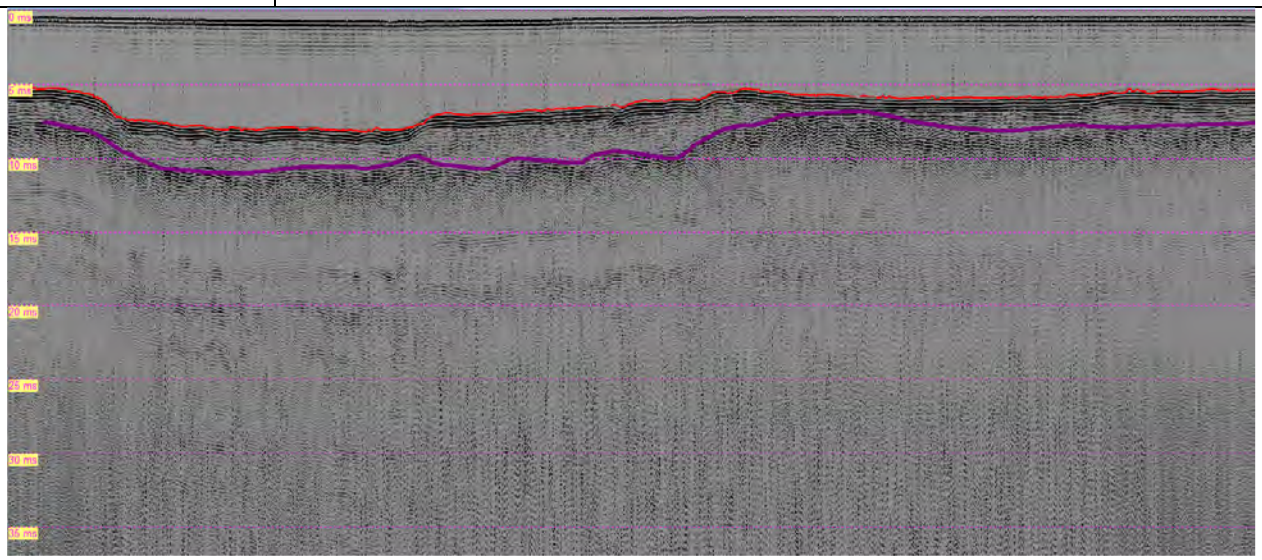


Figure 16 Profile Showing Sediment Horizons

HORIZON 1	
Description	Horizon 1 is the upper boundary of a chaotic facies. The unit has a mix of high and low amplitude returns. The facies is assumed to be a deposit unit due to the differing returns, which are disordered. The horizon is found within the sediment facies, which is below the seafloor and always above Horizon 2 and Horizon 3 where located. It potentially has a relationship with the breakwaters, and the unit could be the result of differing currents creating deposits of unconsolidated material. The horizon is at or below the seafloor across the area.
Depths (MLLW)	Maximum Depth: -35ft; Minimum Depth: -7 ft; Mean Depth: -17 ft
Depth below seafloor	Maximum Depth: -22.5ft; Minimum Depth: -2.5ft or at seafloor



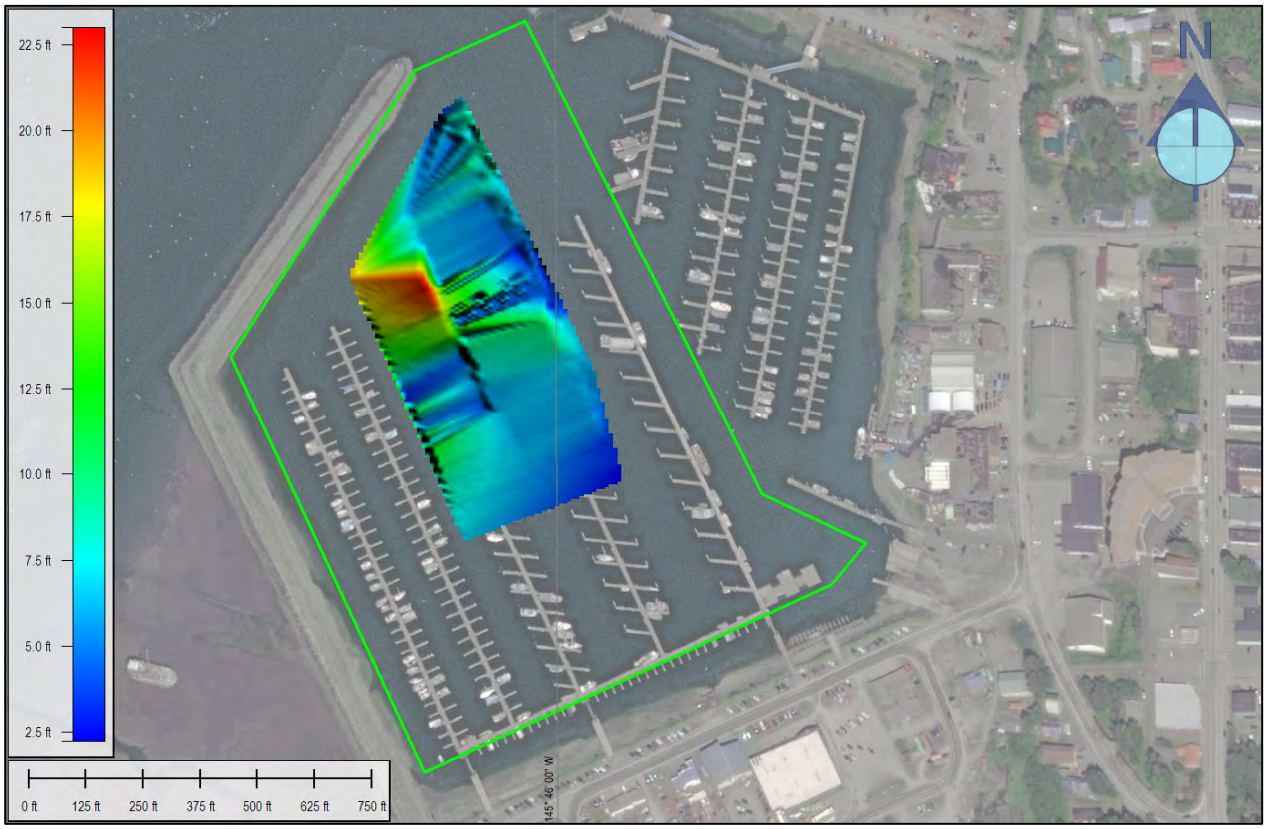
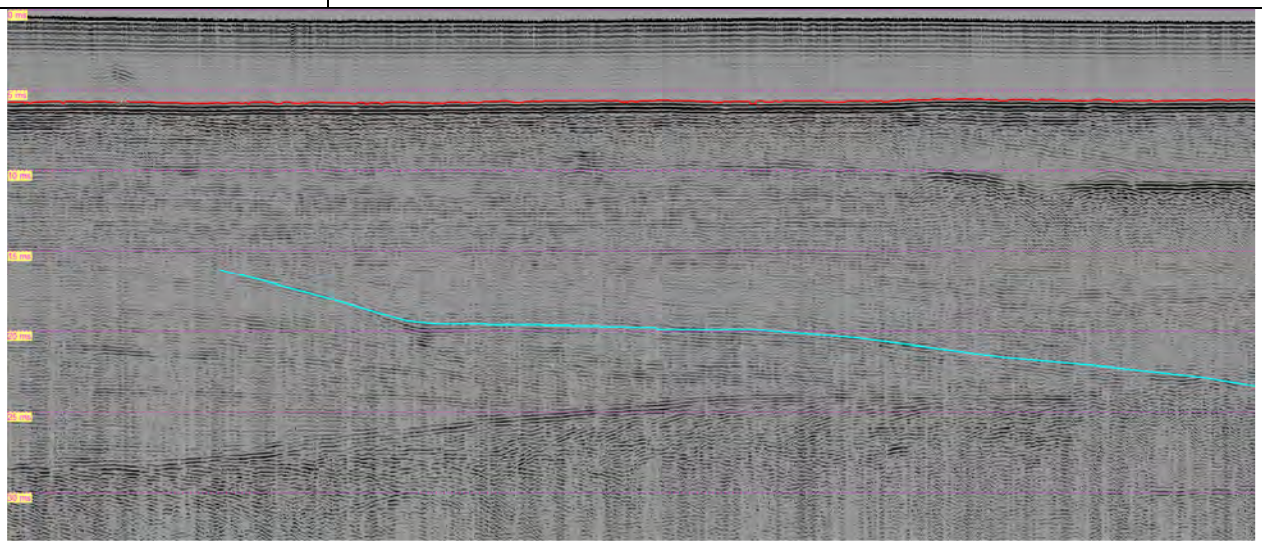


Figure 17 Location and depths below seafloor of Horizon 1

HORIZON 2	
Description	Horizon 2 is a deposited or layering of sediments on a tilted plane above Horizon 3 which is semi consolidated but not acoustically impenetrable. The horizon is found within the sediment facies, which is below Horizon 1 and is always above Horizon 3 where located.
Depths (MLLW)	Maximum Depth: -68ft; Minimum Depth: -39ft; Mean Depth: -48ft
Depths Below Seafloor	Maximum Depth: -58ft; Minimum Depth: -27ft; Mean Depth: -33ft



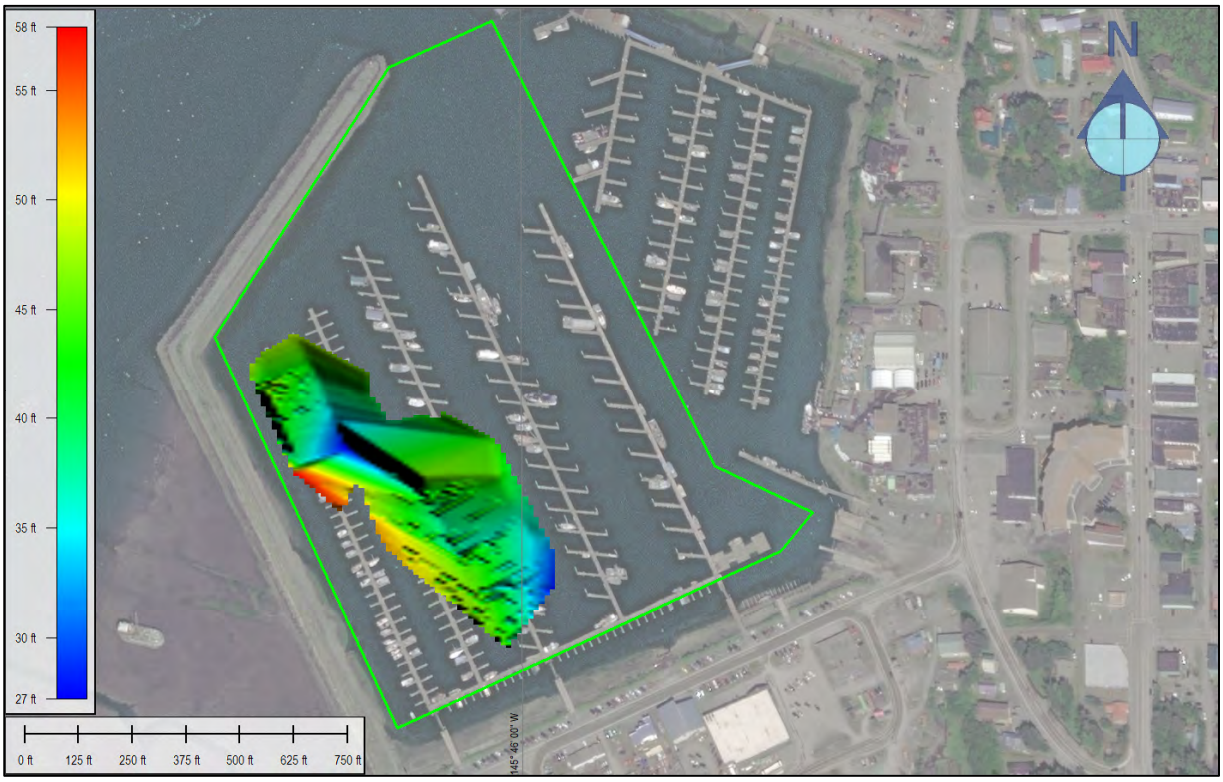
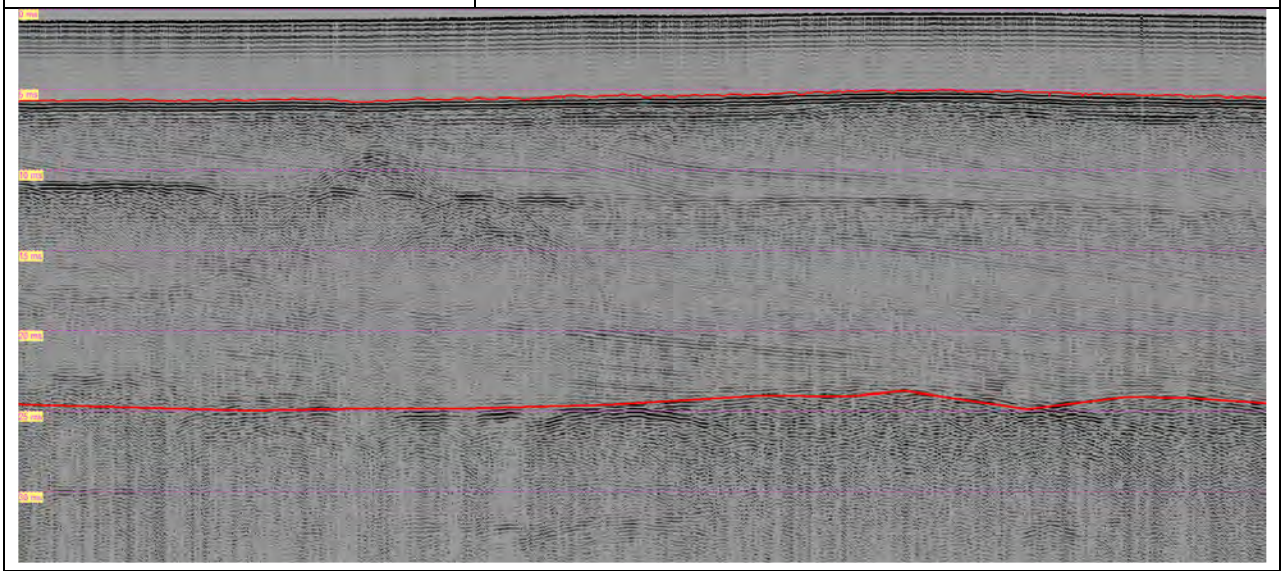


Figure 18 Location and depths below seafloor Horizon 2

HORIZON 3	
Description	This horizon is a strong return with no penetration below. The horizon is the upper boundary of a hard facies. The top surface has high rugosity, with jagged slopes and varying depths Horizon 2 is commonly above this horizon when below the seafloor.
Depths (MLLW)	Maximum Depth: -73ft; Minimum Depth: -23ft; Mean Depth: -48ft
Depths Below Seafloor	Maximum Depth: -62ft; Minimum Depth: -15ft; Mean Depth: -37ft



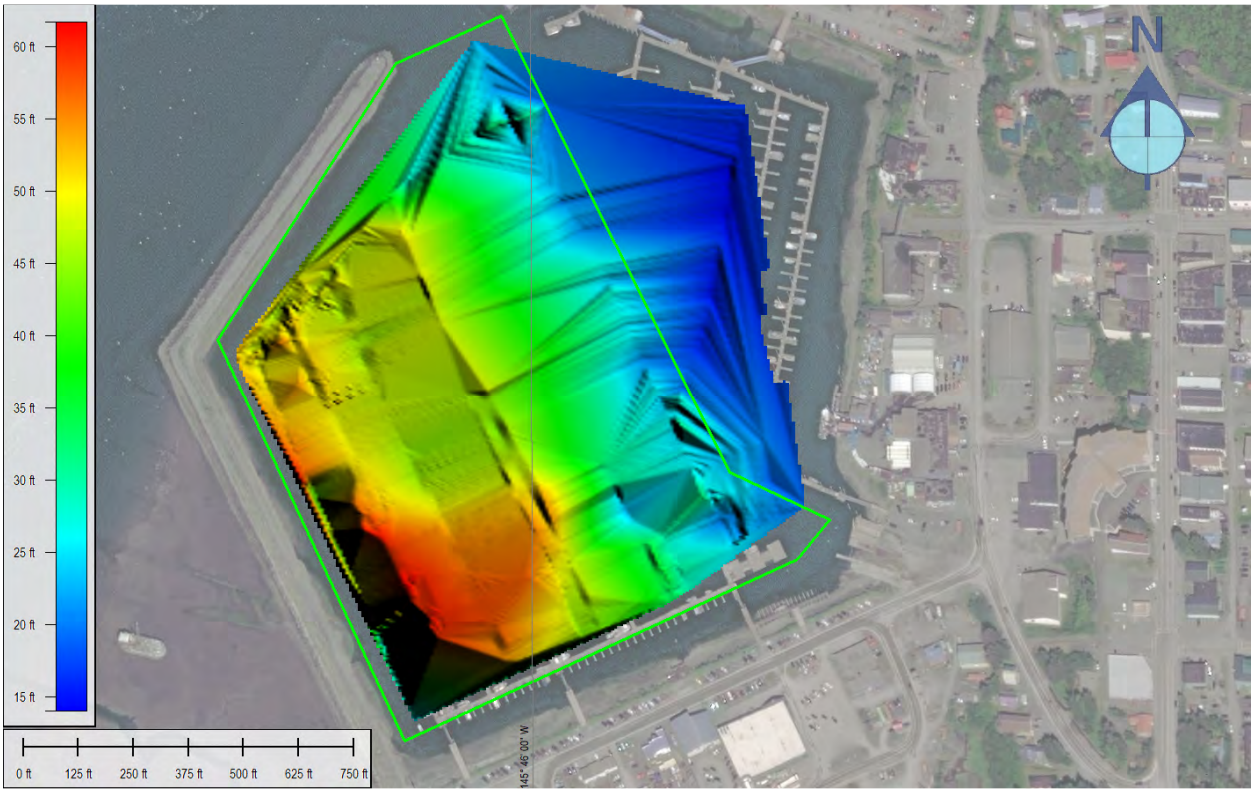


Figure 19 Location and depths below seafloor Horizon 3

10.3 Sub-Surface Objects

Several sub-surface targets were detected in the sub-bottom data. These targets are buried rocks or objects that are detected in the surrounding sub-surface sediment layers and are often located near Horizon 1.

Figure 20 and Figure 21 are examples of the sub-surface rocks or objects being detected in the sub-bottom data.

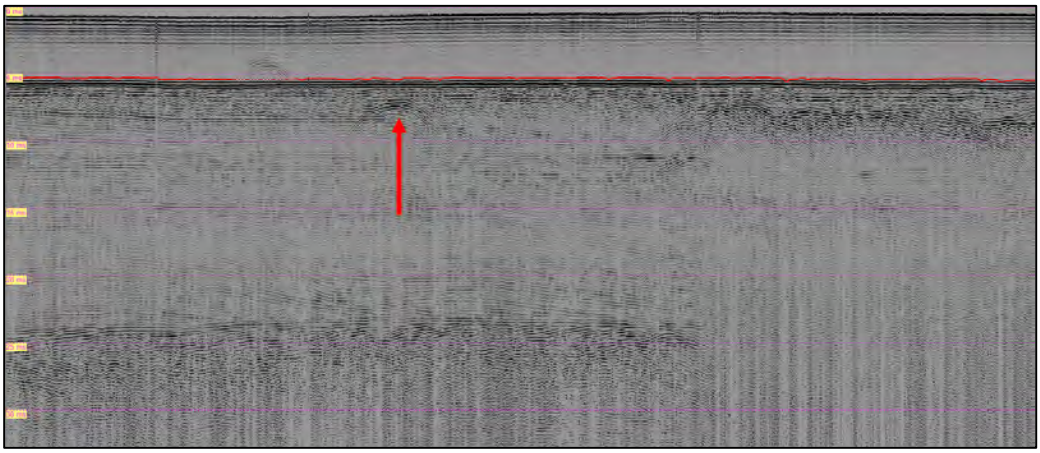


Figure 20 Example of Sub-Surface Object/Rock Detection

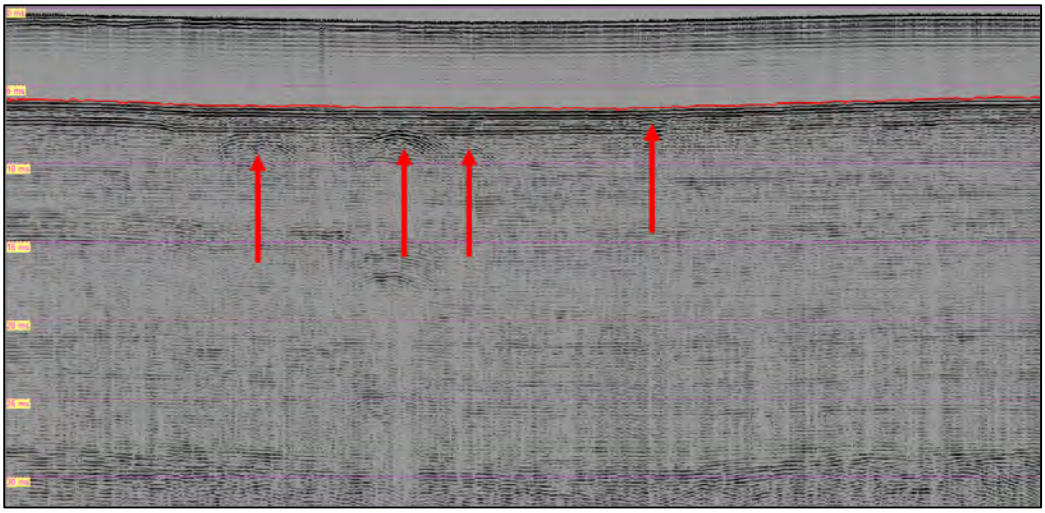


Figure 21 Example of Sub-Surface Object/Rock Detection

11 CONCLUSIONS

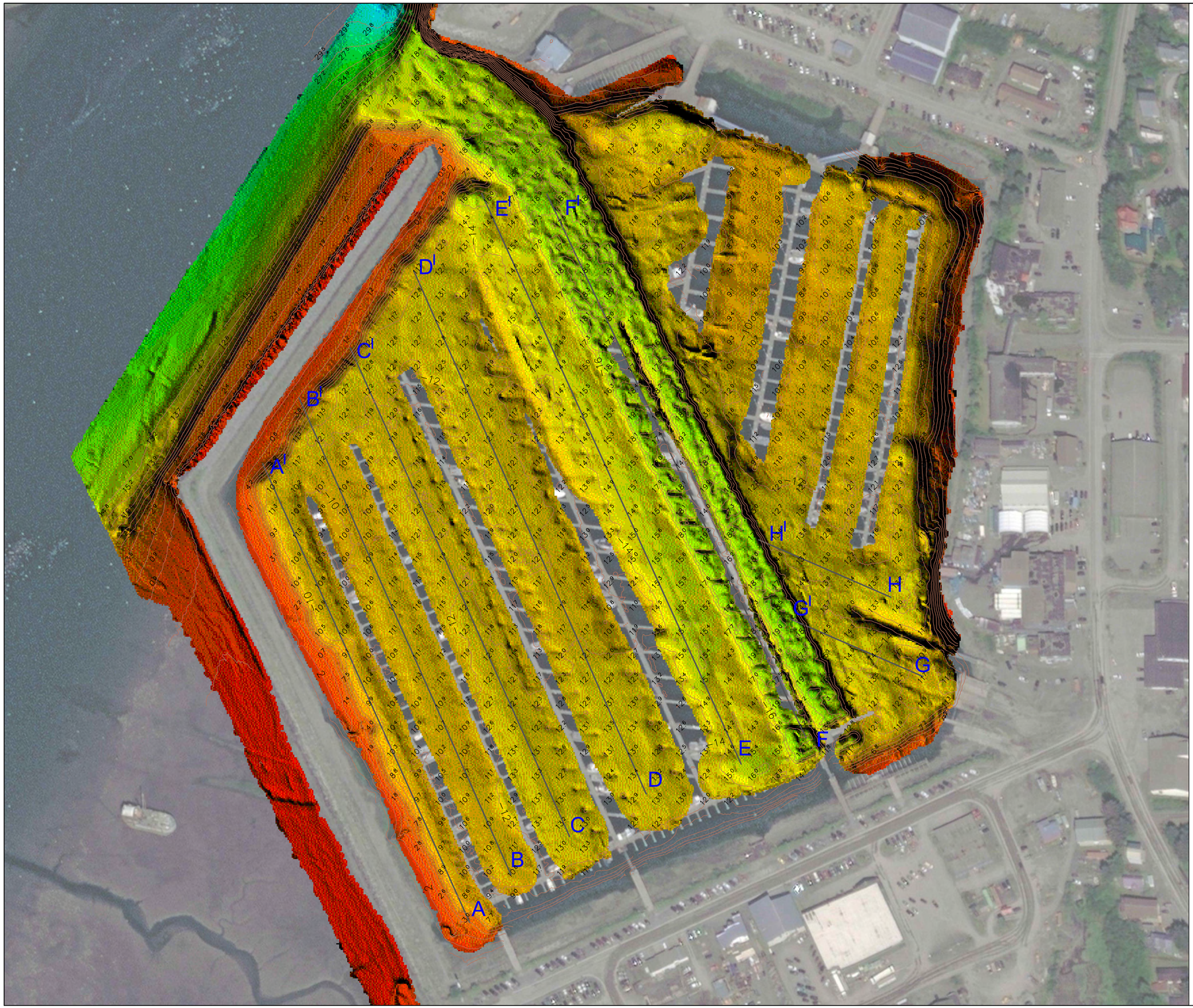
eTrac Inc. successfully completed a full geophysical survey of Cordova South Harbor in support of the Cordova South Harbor Rebuild in Cordova, Alaska.

Horizontal and vertical control were verified by RTK GNSS techniques prior to acquisition.

Seafloor depths based on the 2020 multibeam survey ranged from -34ft to +8ft MLLW. No obstructions to navigation were identified during this survey, however, a 12" HDPE outfall pipe was located outside the breakwater to the west of the harbor and poses no threat to navigation.

There are three common subsurface acoustic horizons that mark the upper and lower boundaries of sediment units across the survey area. Horizon 1 is the upper boundary of a chaotic, mixed deposit facies with high and low amplitude returns when present. Horizon 2 is a deposited or layering of sediments on a tilted plane above Horizon 3 which is semi consolidated but not acoustically impenetrable. Horizon 3 is a strong return with no penetration below. The horizon is the upper boundary of a hard facies which has high rugosity, with jagged slopes and varying depths.

Buried objects or isolated rocks were identified in the sub-bottom profiler and are particularly evident between the seafloor and Horizon 1 and typically is limited to the upper 15-20ft of the sub-surface.



NOTES

1. PRIMARY PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 3, NAD83 (2011), IN U.S. SURVEY FEET.
2. VERTICAL CONTROL IS MEAN LOWER LOW WATER (MLLW=0.0').
3. ALL MULTIBEAM DATA WAS COLLECTED WITH AN R2SONIC 2020 MULTIBEAM ECHOSOUNDER IN AUGUST 2020.
4. ALL SUB-BOTTOM DATA WAS COLLECTED WITH AN INNOMAR COMPACT AND HMS-620 SUB-BOTTOM PROFILER IN JULY 2022.
5. DATA ON SHEET 1 REPRESENTS 2020 MULTIBEAM DATA.
6. SOUNDINGS ON ALL SHEETS REPRESENT 2020 MULTIBEAM DATA.

SHEET LIST

LEGEND

SEAFLOOR 1

HORIZON 1
HORIZON 2
HORIZON 3

HORIZON TYPE	DESCRIPTION
HORIZON 1	CHAOTIC, MIXED DEPOSIT FACIES. HIGH AND LOW AMPLITUDE RETURNS.
HORIZON 2	DEPOSITED OR LAYERING OF SEDIMENTS ON A TILTED PLANE ABOVE HORIZON 3 WHICH IS SEMI CONSOLIDATED BUT NOT ACOUSTICALLY IMPENETRABLE.
HORIZON 3	STRONG RETURN WITH NO PENETRATION BELOW. THE HORIZON IS THE UPPER BOUNDARY OF A HARD FACIES. THE HORIZON SURFACE HAS HIGH RUGOSITY, WITH JAGGED SLOPES AND VARYING DEPTHS.

N

SCALE: 1" = 100'

100 0 50 100 200

THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN NSPS/THSOA CERTIFIED HYDROGRAPHER

ADAM L. TAYLOR C.H. (339)

REV.	DATE	BY	APPR.	DESCRIPTION

PLOT DATE: 08/03/2022
SIZE: ANSI D
SCALE: SCALE

CONTRACTOR: ETRAC, INC.
CITY: WASILLA
STATE: ALASKA

SURVEYED BY: ADAM TAYLOR
DRAWN BY: ADAM TAYLOR
CHECKED BY: CRG
APPROVED BY:
FILE: R&M_2022_CORDOVA

ETRAC, A WOOLPERT COMPANY
617 S. KNIK-GOOSE BAY RD
WASILLA, ALASKA 99654
(907) 521-3370

R&M CONSULTANTS
9101 VANGUARD DR
ANCHORAGE AK. 99507

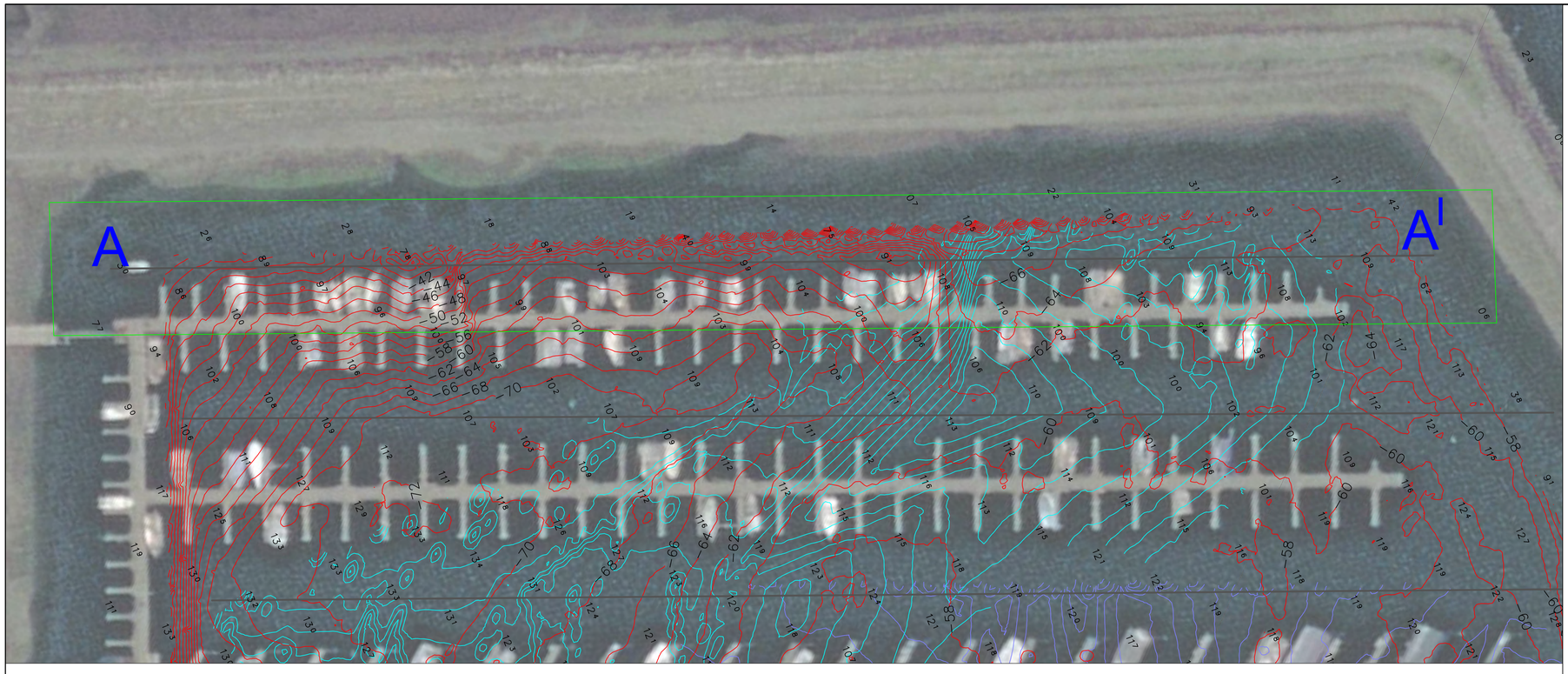
CORDOVA, ALASKA

CORDOVA HARBOR GEOPHYSICAL

CORDOVA SOUTH HARBOR REBUILD

REFERENCE NUMBER:

001-CORDOVA



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SHEET LIST

LEGEND

- SEAFLOOR 1
- HORIZON 1
- HORIZON 2
- HORIZON 3

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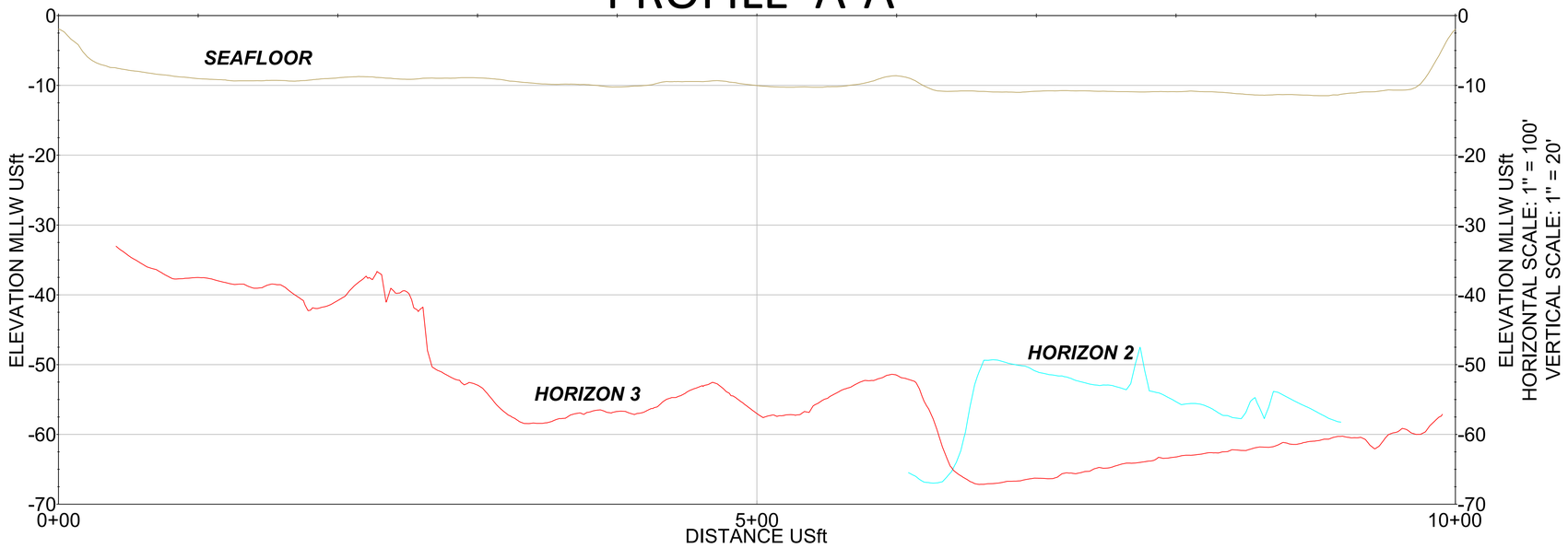
PROFILE A-A'



SCALE: 1" = 50'

50 0 25 50 100

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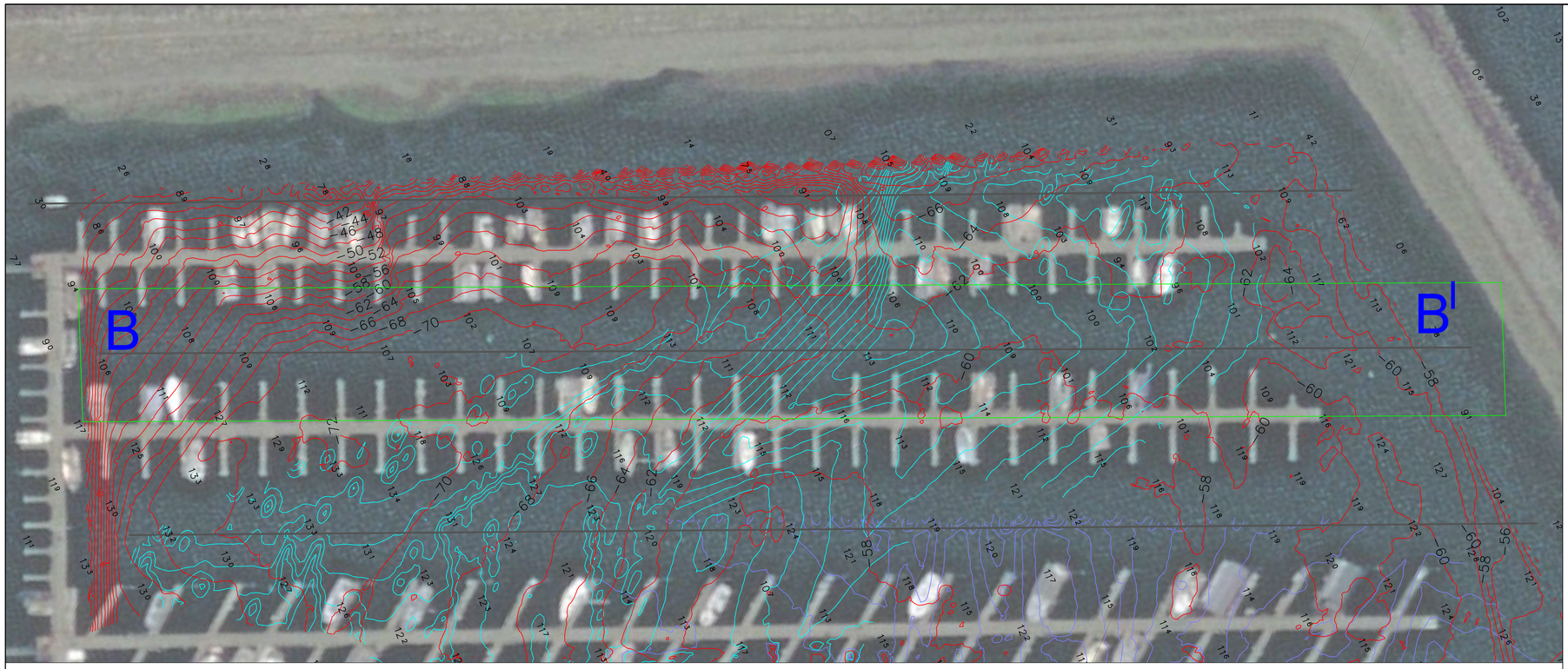
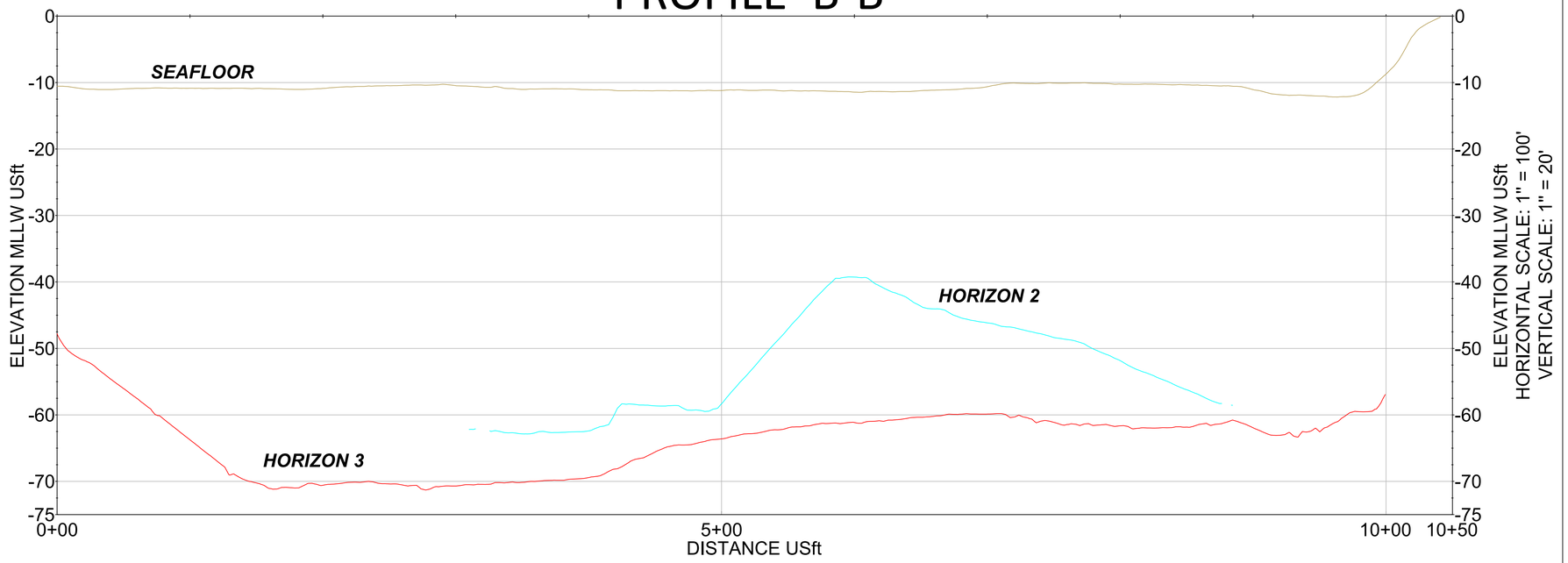


PROFILE B-B'



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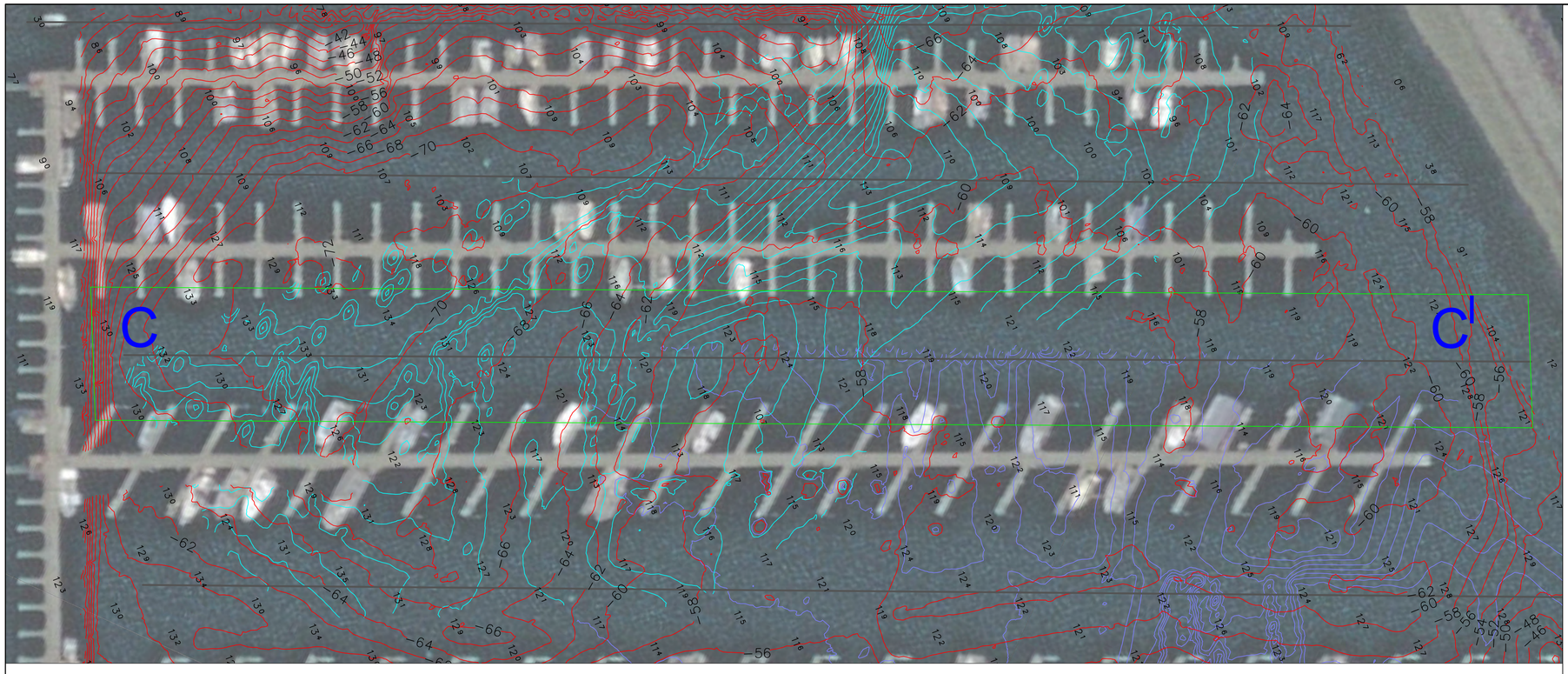
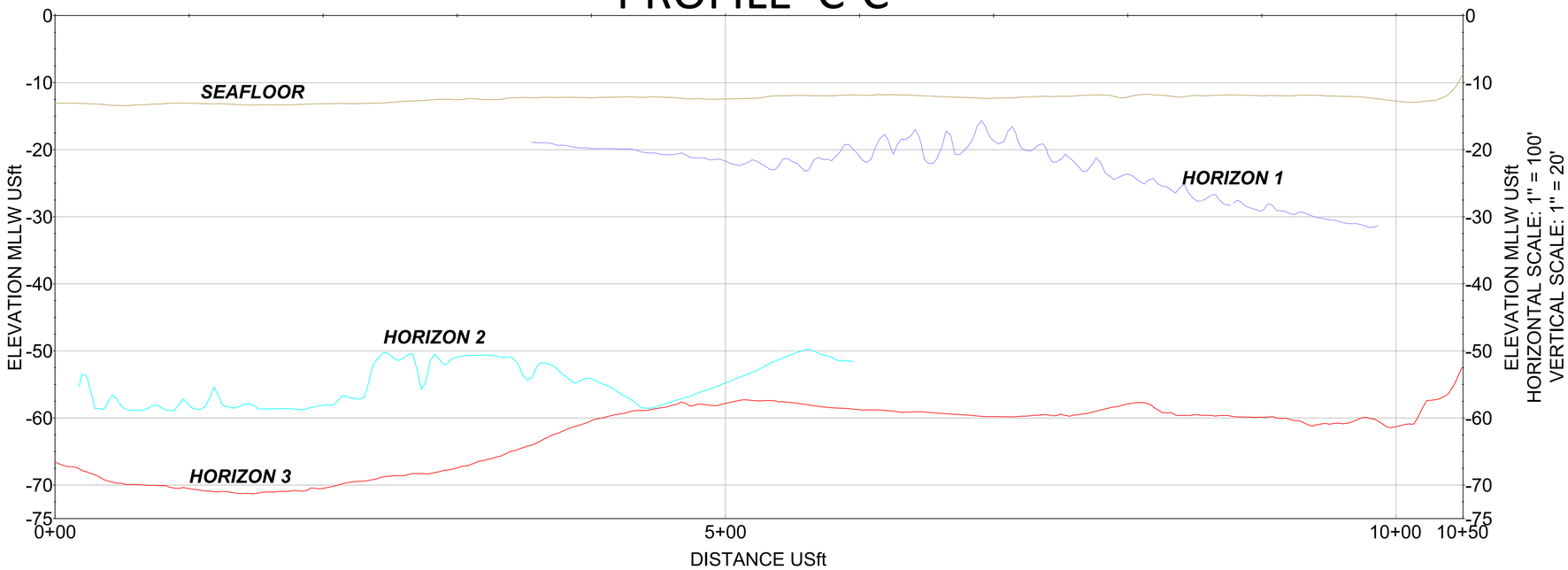


PROFILE C-C'



ELEVATION MLLW USft
HORIZONTAL SCALE: 1" = 100'
VERTICAL SCALE: 1" = 20'

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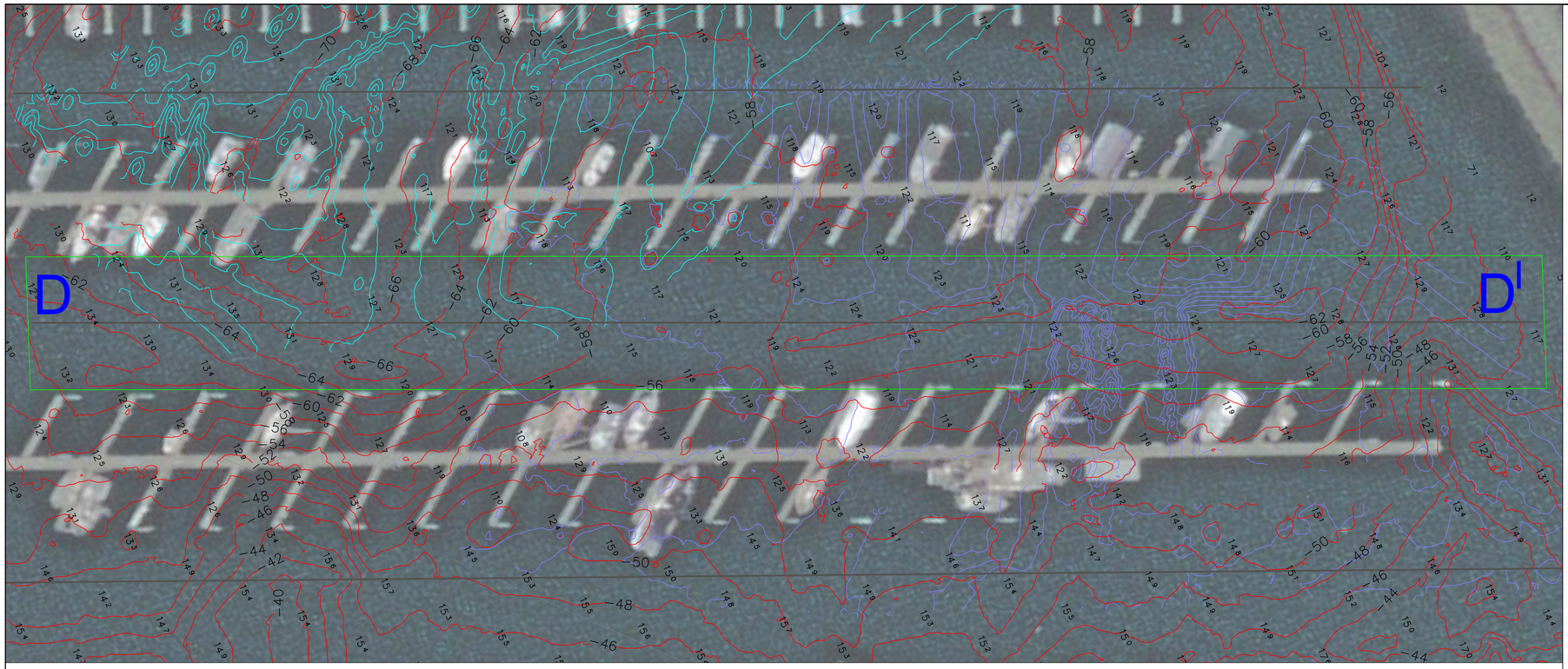
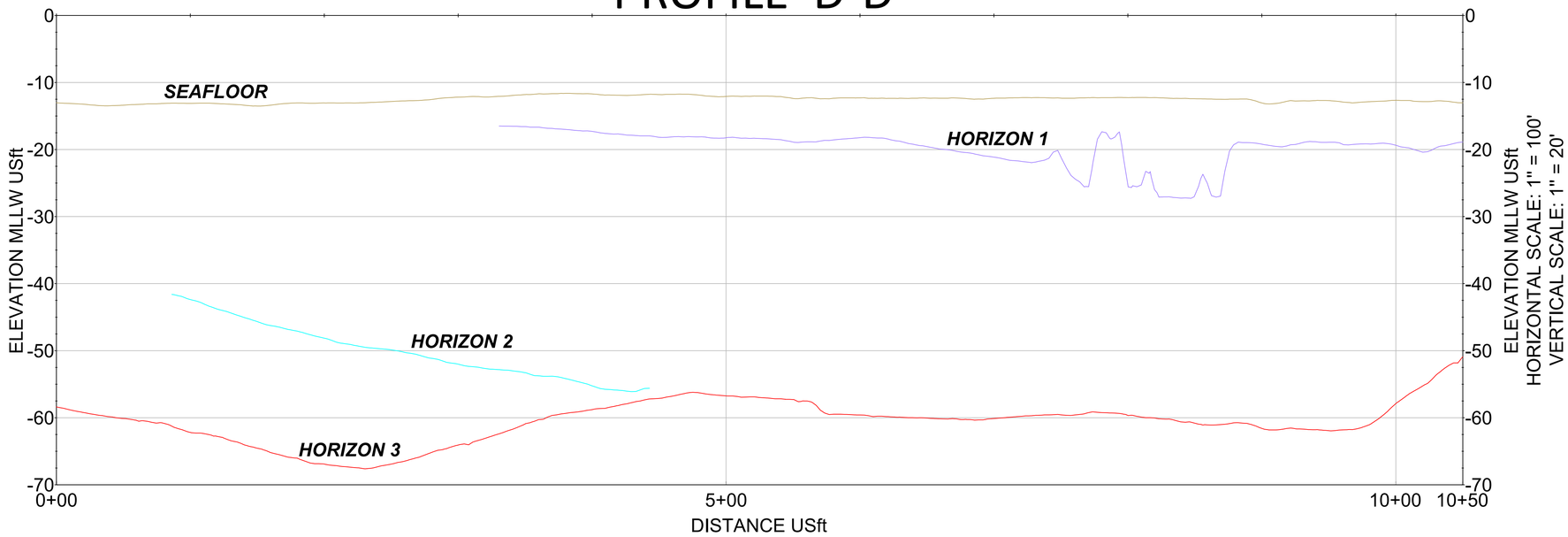


PROFILE D-D'



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R&M CONSULTANTS
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CORDOVA, ALASKA

CORDOVA HARBOR GEOPHYSICAL

CORDOVA SOUTH HARBOR REBUILD

REFERENCE NUMBER:

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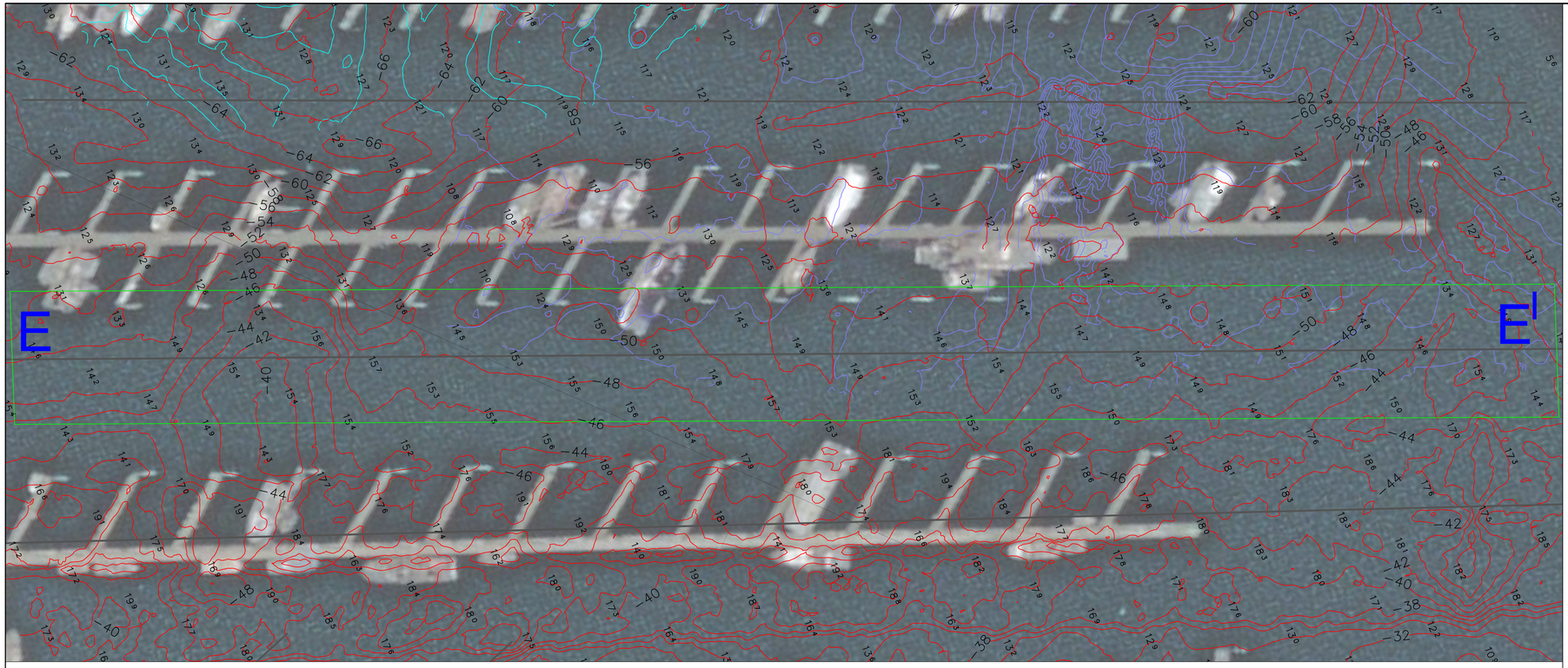
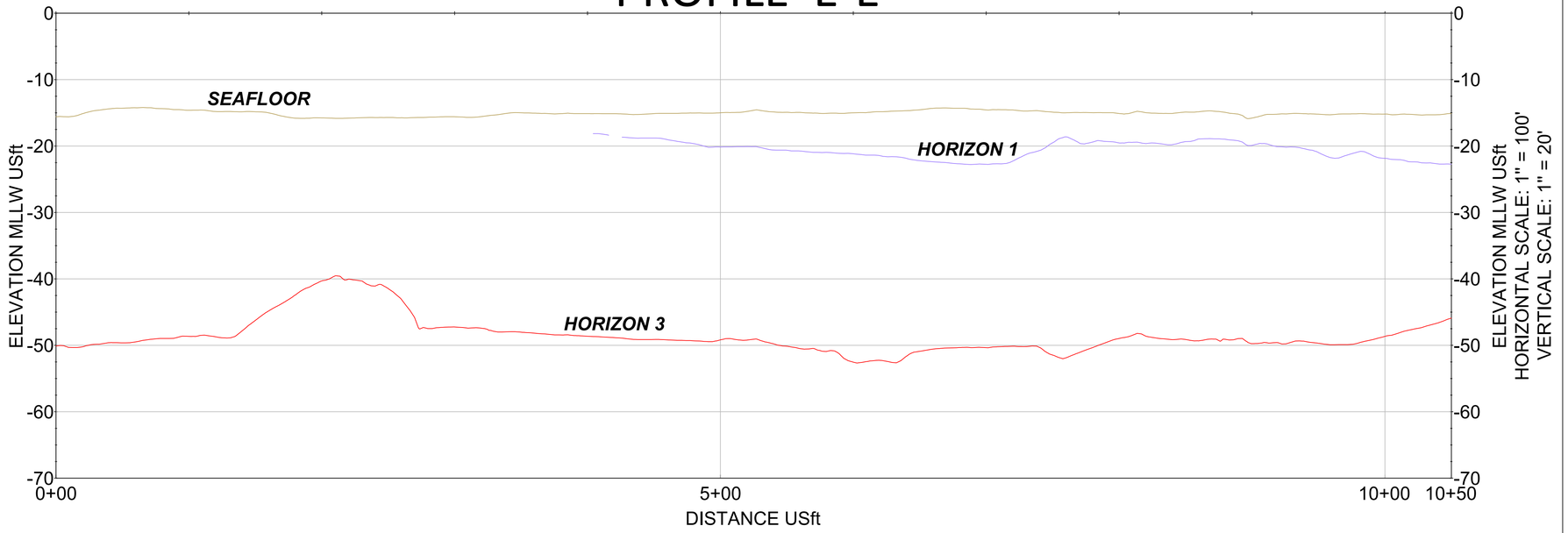


PROFILE E-E'



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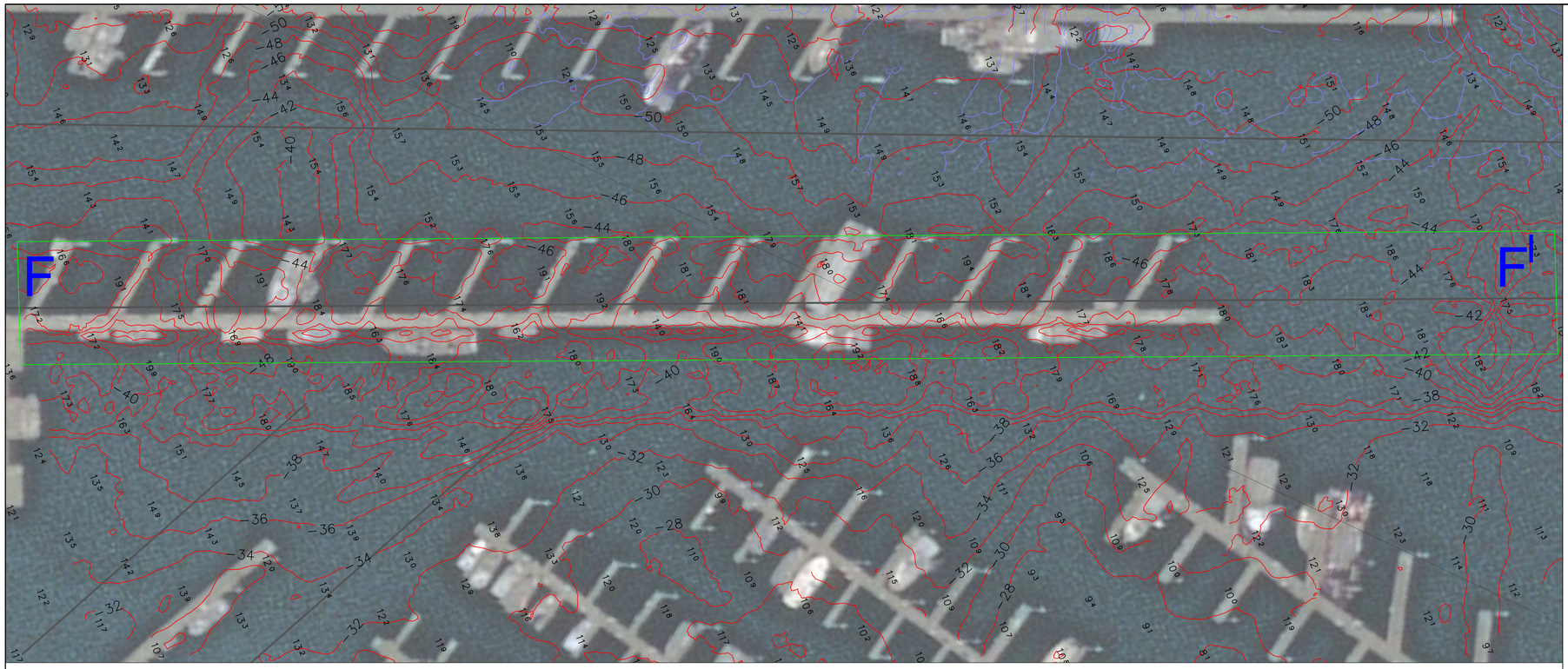

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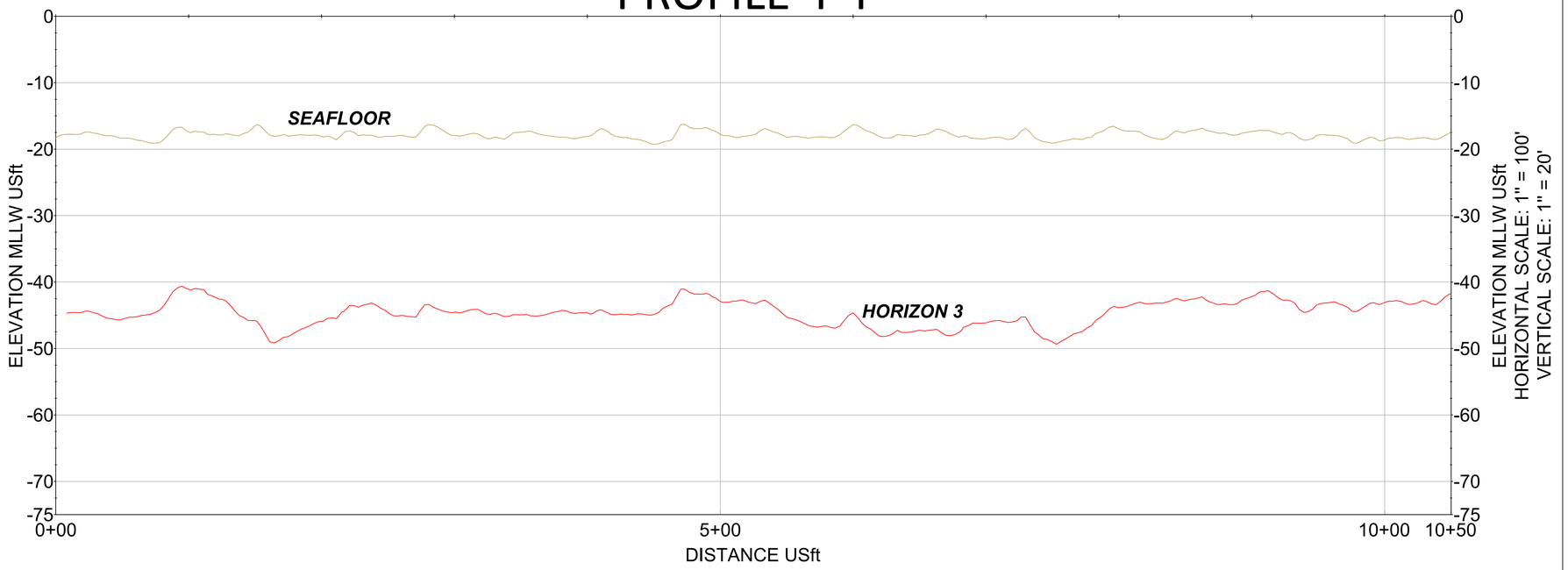

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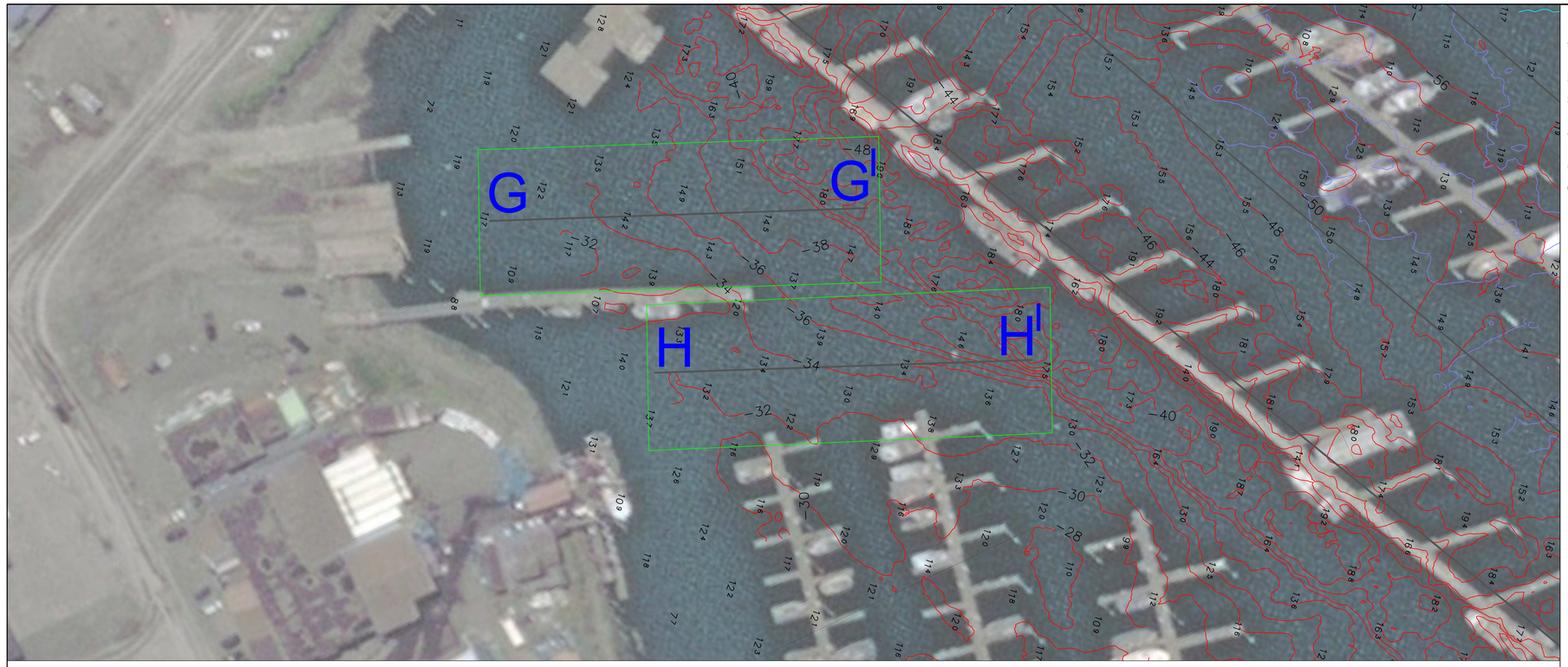

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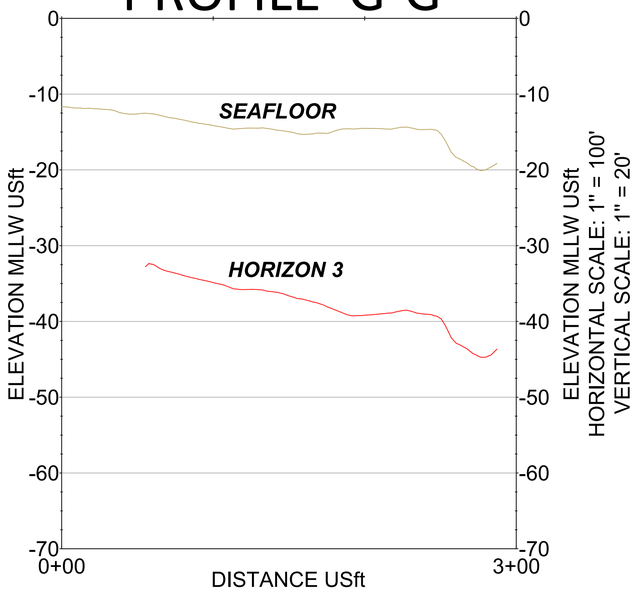
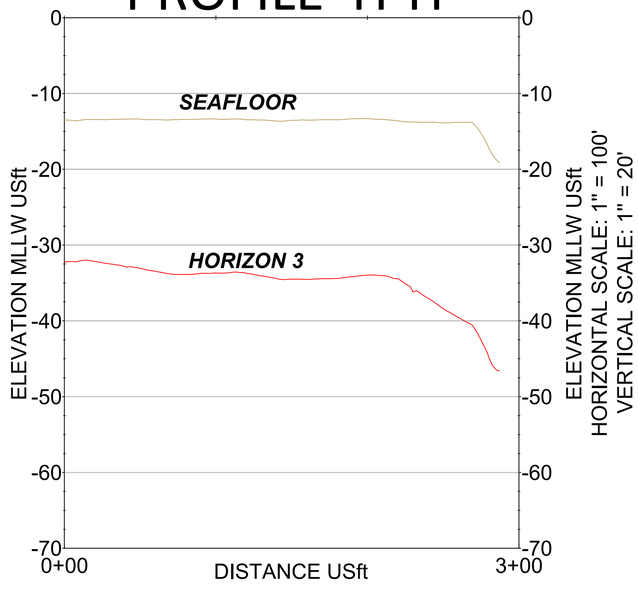


PROFILE H-H'



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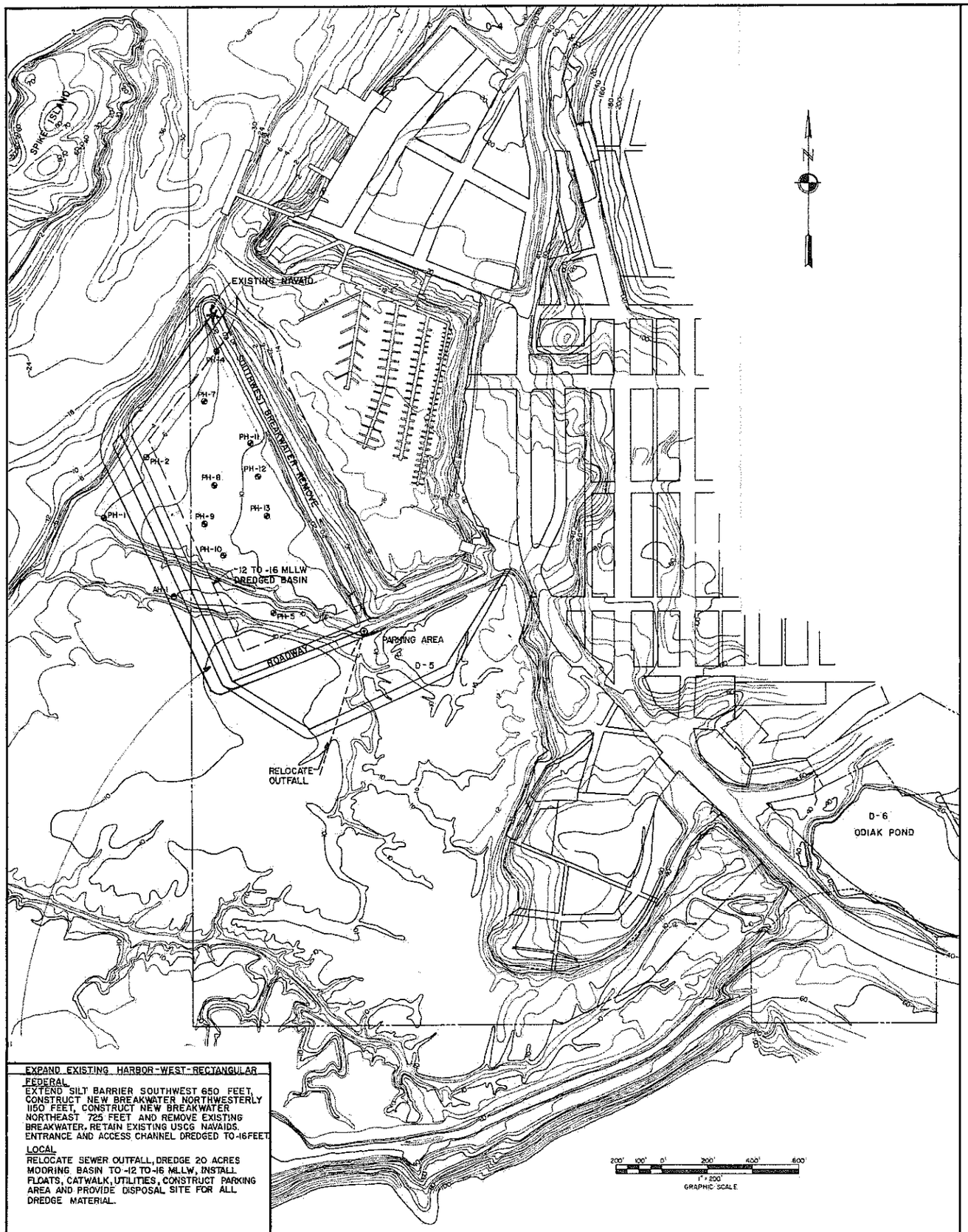
Appendix C

Detailed Project Report, Recommended Improvements, Cordova, Alaska by USACE (1978)



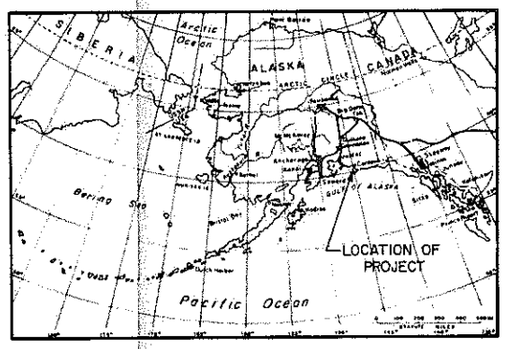
EXPAND EXISTING HARBOR-WEST-RECTANGULAR

FEDERAL

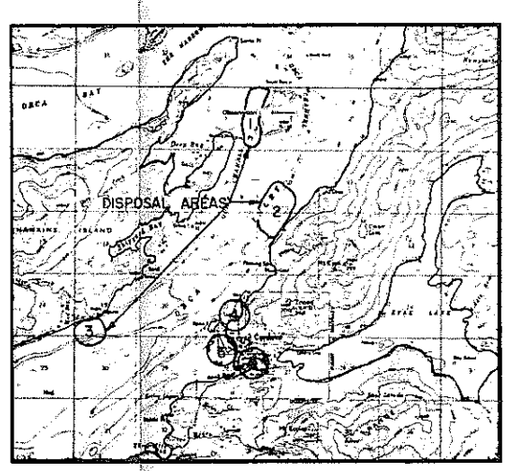
EXTEND SILT BARRIER SOUTHWEST 650 FEET, CONSTRUCT NEW BREAKWATER NORTHWESTERLY 1150 FEET, CONSTRUCT NEW BREAKWATER NORTHEAST 725 FEET AND REMOVE EXISTING BREAKWATER. RETAIN EXISTING USCG NAVAIDS. ENTRANCE AND ACCESS CHANNEL DREDGED TO -16 FEET.

LOCAL

RELOCATE SEWER OUTFALL, DREDGE 20 ACRES MOORING BASIN TO -12 TO -16 MLLW, INSTALL FLOATS, CATWALK, UTILITIES, CONSTRUCT PARKING AREA AND PROVIDE DISPOSAL SITE FOR ALL DREDGE MATERIAL.



LOCATION MAP



VICINITY MAP

	ELEV.	CURRENT @ SET
HIGHEST TIDE (EST.)	14.8	0
MEAN HIGHER HIGH WATER	12.4	1.8 KNOTS FLOOD SW
MEAN TIDE	6.4	
MEAN LOWER LOW WATER	0.0	1.0 KNOTS EBB NE
LOWEST TIDE (EST.)	-5.0	0

TIDE & CURRENT DATA

ELEVATION REFERRED TO MEAN LOWER LOW WATER

DISPOSAL AREAS CONSIDERED

D-1-3 INCLUDES OFFSHORE (# 2 IN SHIPPING LANE)

D-4- INTERTIDAL USCE PERMIT 01-81
D-5- INTERTIDAL
D-6- UPLANDS

CORDOVA, ALASKA

DETAILED PROJECT REPORT

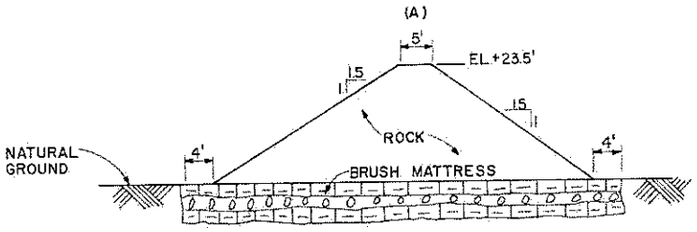
RECOMMENDED IMPROVEMENTS

U.S. ARMY ENGINEER DISTRICT, ALASKA
CORPS OF ENGINEERS

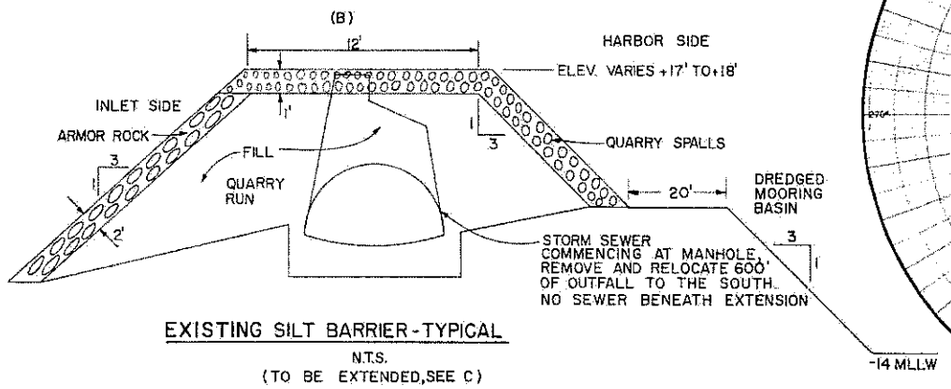
PLANNING AND REPORTS BRANCH

PREPARED BY _____ DATE OCT 1978

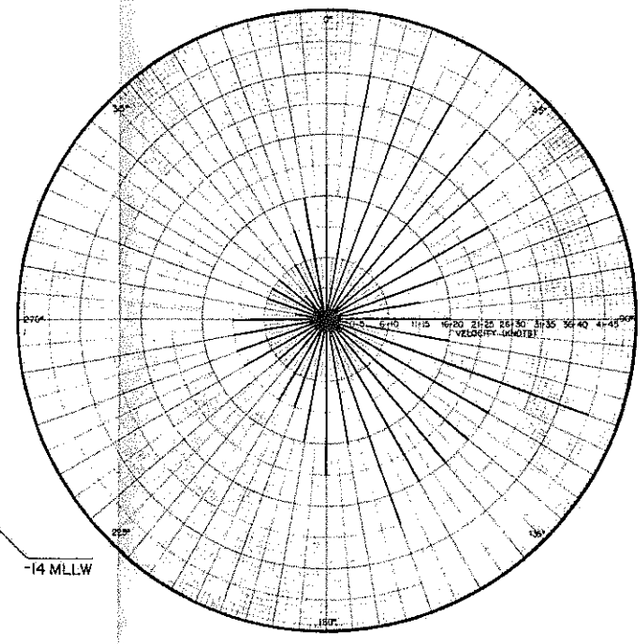
DWG NO. 3-COR-92-07-13/1 PLATE 1



EXISTING WEST BREAKWATER
N.T.S.
(TO BE REMOVED)

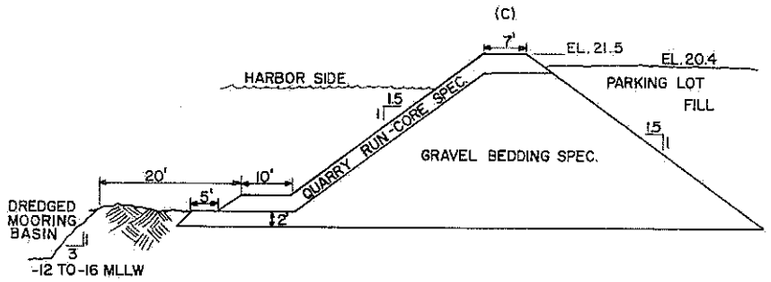


EXISTING SILT BARRIER-TYPICAL
N.T.S.
(TO BE EXTENDED, SEE C)

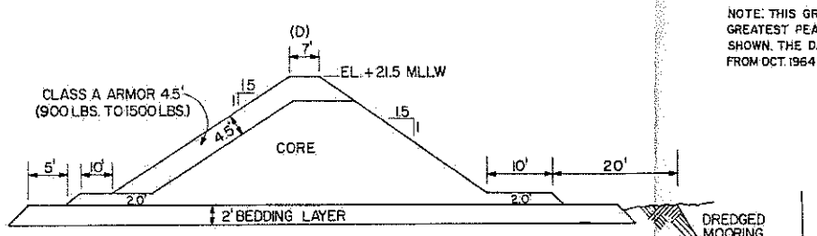


WIND ROSE

NOTE: THIS GRAPH REFLECTS THE GREATEST PEAKS IN THE DIRECTIONS SHOWN. THE DATA WAS ACCUMULATED FROM OCT. 1964 THRU JAN. 1965.



SILT BARRIER EXTENSION
N.T.S.



NORTH AND WEST BREAKWATER
N.T.S.

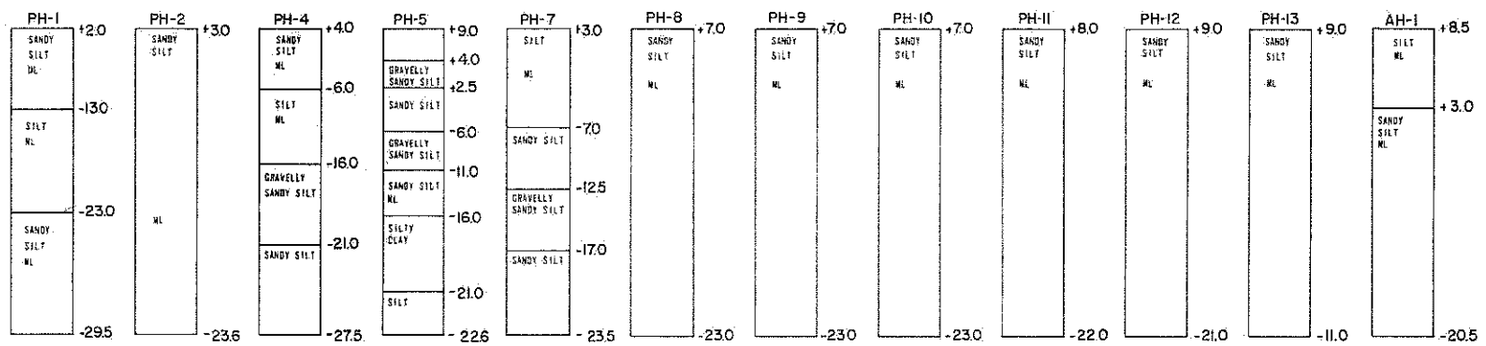
CLASS A ARMOR
900 LBS TO 1500 LBS. 75% 1200 LBS

CORE

% PASSING	SIEVE/GRIZZLY
100	1000 LBS
0-50	100 LBS
0-5	4 LBS

GRAVEL BEDDING

% PASSING	SIEVE/GRIZZLY
100	6"
30-85	3"
0-30	No. 4
0-5	No. 200



SOIL LOGS
N.T.S.
(SEE PLATE 1 FOR LOCATIONS)

CORDOVA, ALASKA

DETAILED PROJECT REPORT

RECOMMENDED IMPROVEMENTS

U.S. ARMY ENGINEER DISTRICT, ALASKA
CORPS OF ENGINEERS

PLANNING AND REPORTS BRANCH

PREPARED BY _____ DATE OCT. 1976

DWG. NO. 3-COR-93-07-13.4

PLATE 3

EUGENE DIETZGEN COMPANY

Appendix D

Cordova Small Boat (North) Harbor Improvements – Test Hole Logs by PND (2003)

SOILS CLASSIFICATION, CONSISTENCY AND SYMBOLS

CLASSIFICATION: Identification and classification of the soil is accomplished in general accordance with the ASTM version of the Unified Soil Classification System (USCS) as presented in ASTM Standard D 2487-93. The standard is a qualitative method of classifying soil into the following major divisions (1) coarse grained (2) fine-grained, (3) highly organic soils. Classification is performed on the soils passing the 75 mm (3 inch) sieve and if possible the amount of oversize material (> 75 mm particles) is noted on the soil logs. This is not always possible for drilled test holes because the oversize particles are typically too large to be captured in the sampling equipment. Oversize materials greater than 300 mm (12 inches) are termed boulders, while materials between 75 mm and 300 mm are termed cobbles. Coarse grained soils are those having 50% or more of the non-oversize soil retained on the No. 200 sieve; if a greater percentage of the coarse grains is retained on the No. 4 sieve the coarse grained soil is classified as gravel, otherwise it is classified as sand. Fine grained soils are those having more than 50% of the non-oversize material passing the No. 200 sieve; these may be classified as silt or clay depending their Atterberg liquid and plastic limits or observations of field consistency. Refer to ASTM D 2487-93 for a complete discussion of the classification method.

SOIL CONSISTENCY – CRITERIA: Soil consistency as defined below and determined by normal field and laboratory methods applies only to non-frozen material. For these materials, the influence of such factors as soil structure, i.e. fissure systems, shinkage cracks, slicken sides, etc., must be taken into consideration in making any correlation with the consistency values listed below. In permafrost zones, the consistency and strength of frozen soils may vary significantly and unexplainably with ice contenet, thermal regime and soil type.

Relative Density of Sands According to results of Standard Penetration Test

	N*(bpf)	Relative Density
Loose	0 – 10	0 – 40%
Medium Dense	10 – 30	40 – 70%
Dense	30 – 60	70 – 90%
Very Dense	> 60	90 – 100%

Consistency of Clay in Terms of Unconfined Compressive Strength (tsf)

Very Soft	0 – 0.25
Soft	0.25 – 0.5
Stiff	0.5 – 1.0
Firm	1.0 – 2.0
Very Firm	2.0 – 4.0
Hard	> 4.0

* Standard Penetration, "N": Blows per foot of a 140-pound hammer falling 30 inches on a 1.4" ID split-spoon sampler except where noted.

SAMPLER TYPE SYMBOLS

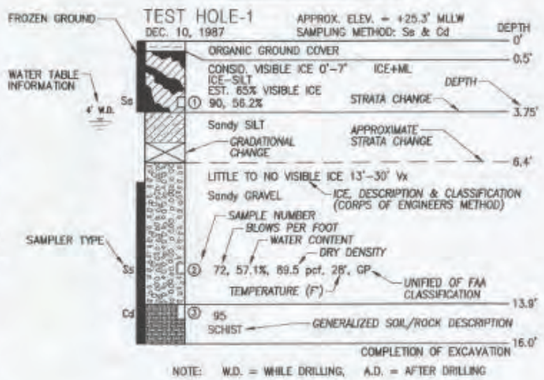
Ts .... Shelby Tube
Ss .... 1.4" Split Spoon W/ 140# Hammer
Cs .... Core Barrel W/ Single Tube
Sh .... 2.5" Split Spoon W/ 340# Hammer
G .... Grab Sample

NOTES:

1. SAMPLER TYPES ARE EITHER NOTED ABOVE THE BORING LOG OR ADJACENT TO IT AT THE RESPECTIVE DEPTH.
2. SPLIT SPOON SAMPLER SIZES PRESENTED ABOVE REFER TO THE INSIDE DIAMETER OF THE SAMPLER.
3. ALL SPLIT SPOONS WERE DRIVEN WITH A CATHEAD-SAFETY HAMMER SYSTEM.

PROJECT AS-BUILT DRAWINGS
THESE AS-BUILT DRAWINGS HAVE BEEN PREPARED BY PND ENGINEERS, INC., BASED ON INFORMATION PROVIDED BY THE GENERAL CONTRACTOR. PND ENGINEERS, INC. IMPLIES NO GUARANTEE AS TO THE ACCURACY OF THE INFORMATION CONTAINED HEREIN.

TYPICAL BORING LOG



NOTE: W.D. = WHILE DRILLING, A.D. = AFTER DRILLING

PND-TH1-03 N 2391366.91, E 1683077.09
12-8-03 ELEV. = -12.5 MLLW 0'
Ss ① 4 bpf, Gray Silt (ML) w/ Crushed Shells
Ss ② 3 bpf, Gray Silt (ML) w/ Crushed Shells 13'-9"
Cs (C)① Recovery 75%, Black Shale Fragments 18'-9"
COMPLETION OF DRILLING

PND-TH2-03 N 2391038.19, E 1683017.88
12-9-03 ELEV. = -13.0 MLLW 0'
Ss ① 7 bpf, Gray Gravely Silt (ML) w/ Crushed Shells and Wood
Ss ② 31 bpf, Silty Gravel w/ Sand (GM)
Ss ③ 34 bpf, Clean Fine Angular Gravel (GP)
Ss ④ 42 bpf, Clean Fine Angular Gravel (GP) 20'-4"
Cs (C)① Recovery 30%, Broken Rounded Rock 23'-10"
COMPLETION OF DRILLING

PND-TH6-03 N 2391812.14, E 1682788.89
12-11-03 ELEV. = -12.0 MLLW 0'
Ss ① 4 bpf, Gray Silt (ML) with Crushed Shells
Ss ② 6 bpf, Gray Silt (ML)
Ss ③ 5 bpf, Gray Silt (ML)
Ss ④ 4 bpf, Gray Silt (ML) 41'-0"
COMPLETION OF DRILLING

PND-TH3-03 N 2391709.99, E 1683145.10
12-10-03 ELEV. = -8.5 MLLW 0'
Ss ① Wood Encountered Blow Count No Good No Recovery
G ② Sampled Tailings w/ Kitchen Strainer (Washed Sample) Fine Gravel w/ Orgainics Recovered 14'-0"
Cs (C)① Recovery 10%, Fragmented Shale 18'-0"
COMPLETION OF DRILLING

PND-TH4-03 N 2391771.56, E 1682945.98
12-10-03 ELEV. = -13.0 MLLW 0'
Ss ① 6 bpf, Gray Silt (ML)
Ss ② 11 bpf, Gray Silt (ML)
Ss ③ 13 bpf Gray Silt (ML)
Ss ④ Refusal, Gray Silt (ML) 29'
Cs (C)① Recovery 10%, Fractured Graywake 31'
COMPLETION OF DRILLING

PND-TH5-03 N 2391228.02, E 16822819.12
12-11-03 ELEV. = -15.0 MLLW 0'
Ss ① 5 bpf, Gray Silt (ML)
Ss ② 11 bpf, Gray Silt (ML)
Ss ③ 23 bpf, Gray Silt (ML) 29'-4"
Cs (C)① Recovery 50%, Fractured Graywake w/ Rounded Rocks 31'-4"
COMPLETION OF DRILLING

PND-TH7-03 N 2390744.83, E 1683146.65
12-12-03 ELEV. = -5.0 MLLW 0'
Ss ① 17 bpf, Well Graded Fine Gravel w/ Sand (GW)
Ss ② 2 bpf, No Recovery
G ③ Sampled Tailings w/ Kitchen Strainer (Washed Sample) Fine Gravel Recovered
Ss ④ 8 bpf, Silty Sand w/ Gravel (SM)
Ss ⑤ 5 bpf, No Recovery
G ⑥ Sampled Tailings w/ Kitchen Strainer (Washed Sample) Fine Gravel Recovered
Ss ⑦ 12 bpf, No Recovery
G ⑧ Sampled Tailings w/ Kitchen Strainer (Washed Sample) Fine Gravel w/ Silt Recovered 31'-6"
CASING REFUSAL/COMPLETION OF DRILLING

PND-TH8-03 N 2391151.04, E 1682945.22
12-12-03 ELEV. = -14.0 MLLW 0'
PENETROMETER DRIVEN TO REFUSAL NO SAMPLING 23'-4"
COMPLETION OF DRIVING ROD REFUSAL

PND-TH9-03 N 2391774.40, E 1682480.31
12-12-03 ELEV. = -12.0 MLLW 0'
Sh ① 7 bpf, Gray Silt (ML)
Ss ② 4 bpf, Gray Silt (ML)
Ss ③ 4 bpf, Gray Silt w/ Sand (ML) 32'-4"
COMPLETION OF DRILLING

AS-BUILT AUGUST 2005

CITY OF CORDOVA
PO BOX 1210
CORDOVA, ALASKA 99574
PHONE: (907) 424-6200
FAX: (907) 424-6000

NOTICE TO CONTRACTOR

The City will provide all timber floats and steel pipe piles required for the Base Bid. The City will also provide timber boat launch floats and steel struts (not piles 128 & 129) for Additive Alternate #1. City supplied materials will be located at the New Float Staging Area as shown in the Plans. The Contractor shall be responsible for transporting all City supplied materials from the New Float Staging area to their installed location as necessary. The Contractor shall install all of the City Supplied Materials as indicated in the project drawings, specifications and contract documents.

REV	DATE	DESCRIPTION
	6/10/04	ISSUED FOR BID
	8/24/04	ISSUED FOR CONSTRUCTION
	8/02/05	AS-BUILT

STATE OF ALASKA 49 TH
John W. Pickering CE-8986
REGISTERED PROFESSIONAL ENGINEER

1506 West 36th Avenue
Anchorage, Alaska 99503
Phone: 907.561.1011
Fax: 907.563.4220
www.pnd-anc.com

P N D Incorporated
CONSULTING ENGINEERS

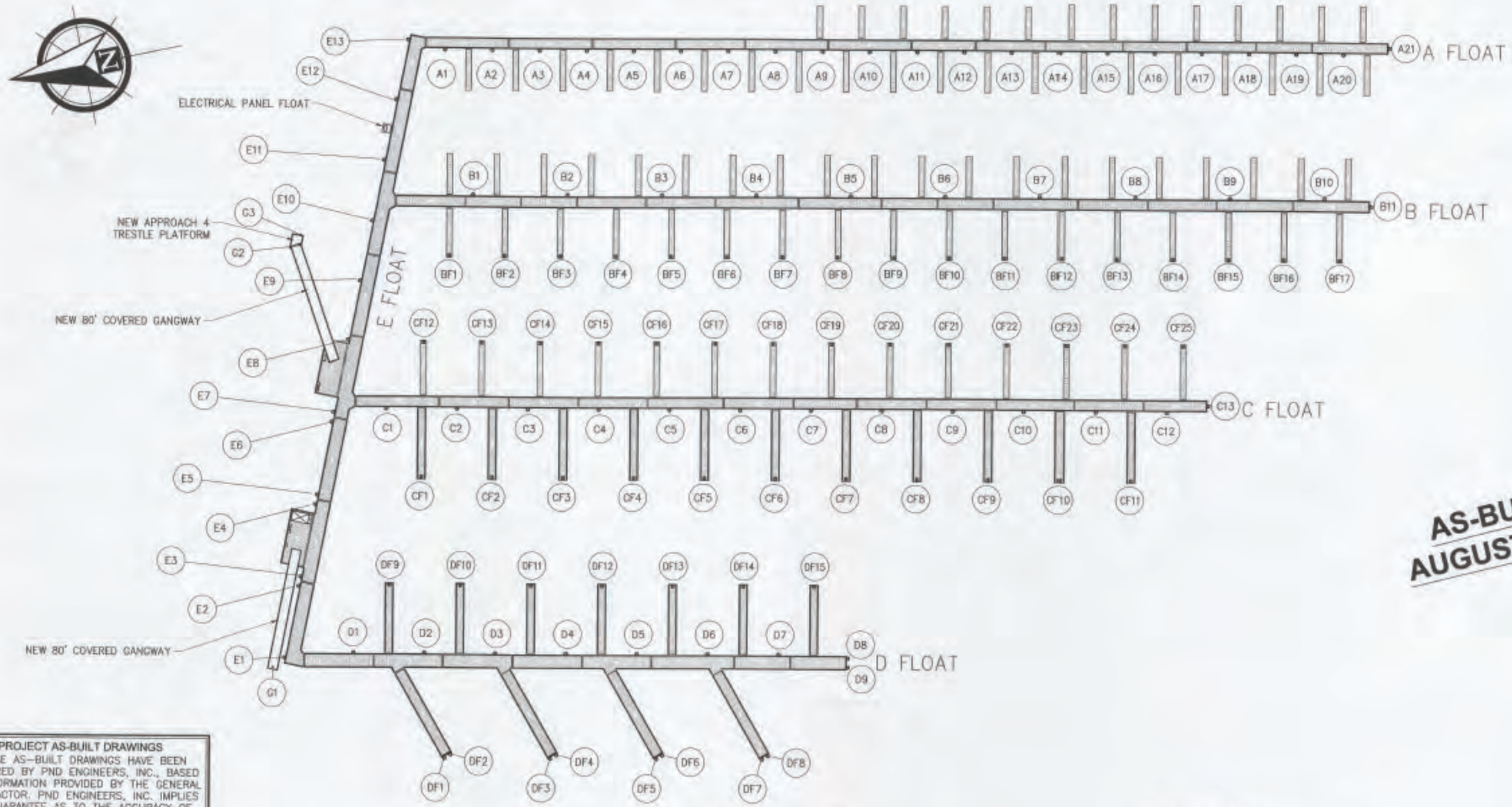
PROJECT: **CORDOVA SMALL BOAT HARBOR IMPROVEMENTS**

TITLE: TEST HOLE LOGS

DRAWN BY:	PND			SHEET NO: 5 of 48
DESIGNED BY:	JWP/EF/BJ	DATE:	8/02/05	
CHECKED BY:	JWP	PROJECT NO:	031135	

Appendix E

Cordova Small Boat (North) Harbor Improvements – As-Built Pile Records by PND (2005)



AS-BUILT
AUGUST 2005

PROJECT AS-BUILT DRAWINGS
THESE AS-BUILT DRAWINGS HAVE BEEN PREPARED BY PND ENGINEERS, INC., BASED ON INFORMATION PROVIDED BY THE GENERAL CONTRACTOR. PND ENGINEERS, INC. IMPLIES NO GUARANTEE AS TO THE ACCURACY OF THE INFORMATION CONTAINED HEREIN.

SCALE IN FEET
0 40 80 120 160

FLOAT PILE PLAN

NOTE: SEE HEADWALK & MAIN FLOAT PLANS FOR EXACT PILE LOCATIONS

LEGEND

(A1) PILE LOCATION DESIGNATION

CITY OF CORDOVA
PO BOX 1210
CORDOVA, ALASKA 99574
PHONE: (907) 424-6200
FAX: (907) 424-6000

NOTICE TO CONTRACTOR

The City will provide all timber floats and steel pipe piles required for the Base Bid. The City will also provide timber boat launch floats and steel struts (not piles 128 & 129) for Additive Alternate #1. City supplied materials will be located at the New Float Staging Area as shown in the Plans. The Contractor shall be responsible for transporting all City supplied materials from the New Float Staging area to their installed location as necessary. The Contractor shall install all of the City Supplied Materials as indicated in the project drawings, specifications and contract documents.

REV	DATE	DESCRIPTION
	6/10/04	ISSUED FOR BID
	8/24/04	ISSUED FOR CONSTRUCTION
	8/02/05	AS-BUILT

STATE OF ALASKA 49 TH
John M. Pickering
CE-6868
REGISTERED PROFESSIONAL ENGINEER

1506 West 36th Avenue
Anchorage, Alaska 99503
Phone: 907.561.1011
Fax: 907.563.4220
www.pnd-asc.com

P N D Incorporated
CONSULTING ENGINEERS

PROJECT: CORDOVA SMALL BOAT HARBOR IMPROVEMENTS

TITLE: FLOAT PILE PLAN

DRAWN BY:	PND		
DESIGNED BY:	JWP/EF/SU	DATE:	8/02/05
CHECKED BY:	JWP	PROJECT NO:	031135

SHEET NO. 7 OF 48

FLOAT PILE SCHEDULE

PILE #	LOCATION	PILE SUPPLY LENGTH (FEET)	DIAMETER/ WALL THICKNESS	FINAL * EMBEDMENT
1	A1	65	12 3/4" x 0.500"	(R) 12.5
2	A2	65	12 3/4" x 0.500"	(R) 10
3	A3	65	12 3/4" x 0.500"	(R) 8
4	A4	65	12 3/4" x 0.500"	(R) 8
5	A5	65	12 3/4" x 0.500"	(R) 11
6	A6	65	12 3/4" x 0.500"	(R) 14.5
7	A7	65	12 3/4" x 0.500"	(R) 21
8	A8	65	12 3/4" x 0.500"	(R) 14
9	A9	65	12 3/4" x 0.500"	(R) 16
10	A10	65	12 3/4" x 0.500"	(R) 17.5
11	A11	65	12 3/4" x 0.500"	(R) 16
12	A12	65	12 3/4" x 0.500"	(R) 22
13	A13	65	12 3/4" x 0.500"	(R) 22
14	A14	65	12 3/4" x 0.500"	(R) 19
15	A15	65	12 3/4" x 0.500"	(R) 20
16	A16	65	12 3/4" x 0.500"	(R) 21
17	A17	65	12 3/4" x 0.500"	(R) 22
18	A18	65	12 3/4" x 0.500"	(R) 22
19	A19	65	12 3/4" x 0.500"	(R) 22
20	A20	65	12 3/4" x 0.500"	(R) 24
21	A21	65	12 3/4" x 0.500"	(R) 22
22	B1	65	12 3/4" x 0.500"	(R) 20
23	B2	65	12 3/4" x 0.500"	(R) 21
24	B3	65	12 3/4" x 0.500"	(R) 20.5
25	B4	65	12 3/4" x 0.500"	(R) 21.5
26	B5	65	12 3/4" x 0.500"	22
27	B6	65	12 3/4" x 0.500"	22
28	B7	65	12 3/4" x 0.500"	22
29	B8	65	12 3/4" x 0.500"	(R) 15
30	B9	65	12 3/4" x 0.500"	22
31	B10	65	12 3/4" x 0.500"	22
32	B11	65	12 3/4" x 0.500"	22
33	BF1	65	12 3/4" x 0.500"	22
34	BF2	65	12 3/4" x 0.500"	22
35	BF3	65	12 3/4" x 0.500"	22
36	BF4	65	12 3/4" x 0.500"	22
37	BF5	65	12 3/4" x 0.500"	22
38	BF6	65	12 3/4" x 0.500"	22
39	BF7	65	12 3/4" x 0.500"	22
40	BF8	65	12 3/4" x 0.500"	22
41	BF9	65	12 3/4" x 0.500"	22
42	BF10	65	12 3/4" x 0.500"	22
43	BF11	65	12 3/4" x 0.500"	22
44	BF12	65	12 3/4" x 0.500"	22
45	BF13	65	12 3/4" x 0.500"	22
46	BF14	65	12 3/4" x 0.500"	22
47	BF15	65	12 3/4" x 0.500"	22
48	BF16	65	12 3/4" x 0.500"	22
49	BF17	65	12 3/4" x 0.500"	22
50	C1	65	12 3/4" x 0.500"	22
51	C2	65	12 3/4" x 0.500"	22
52	C3	65	12 3/4" x 0.500"	22
53	C4	65	12 3/4" x 0.500"	22
54	C5	65	12 3/4" x 0.500"	22
55	C6	65	12 3/4" x 0.500"	22
56	C7	65	12 3/4" x 0.500"	22
57	C8	65	12 3/4" x 0.500"	22
58	C9	65	12 3/4" x 0.500"	22
59	C10	65	12 3/4" x 0.500"	22
60	C11	65	12 3/4" x 0.500"	22
61	C12	65	12 3/4" x 0.500"	22
62	C13	65	12 3/4" x 0.500"	22

* (R) DENOTES REFUSAL AT FINAL EMBEDMENT

3

FLOAT PILE SCHEDULE (CONT.)

PILE #	LOCATION	PILE SUPPLY LENGTH (FEET)	DIAMETER/ WALL THICKNESS	FINAL * EMBEDMENT
63	CF1	70	16" x 0.500"	22
64	CF2	70	16" x 0.500"	22
65	CF3	70	16" x 0.500"	22
66	CF4	70	16" x 0.500"	22
67	CF5	70	16" x 0.500"	22
68	CF6	70	16" x 0.500"	22
69	CF7	70	16" x 0.500"	22
70	CF8	70	16" x 0.500"	22
71	CF9	70	16" x 0.500"	22
72	CF10	70	16" x 0.500"	22
73	CF11	70	16" x 0.500"	22
74	CF12	65	12 3/4" x 0.500"	22
75	CF13	65	12 3/4" x 0.500"	22
76	CF14	65	12 3/4" x 0.500"	22
77	CF15	65	12 3/4" x 0.500"	22
78	CF16	65	12 3/4" x 0.500"	22
79	CF17	65	12 3/4" x 0.500"	22
80	CF18	65	12 3/4" x 0.500"	22
81	CF19	65	12 3/4" x 0.500"	22
82	CF20	65	12 3/4" x 0.500"	22
83	CF21	65	12 3/4" x 0.500"	22
84	CF22	65	12 3/4" x 0.500"	22
85	CF23	65	12 3/4" x 0.500"	22
86	CF24	65	12 3/4" x 0.500"	22
87	CF25	65	12 3/4" x 0.500"	22
88	D1	70	16" x 0.500"	22
89	D2	70	16" x 0.500"	22
90	D3	70	16" x 0.500"	22
91	D4	70	16" x 0.500"	22
92	D5	70	16" x 0.500"	22
93	D6	70	16" x 0.500"	22
94	D7	70	16" x 0.500"	22
95	D8	70	16" x 0.500"	22
96	D9	70	16" x 0.500"	22
97	DF1	70	16" x 0.500"	22
98	DF2	70	16" x 0.500"	22
99	DF3	70	16" x 0.500"	22
100	DF4	70	16" x 0.500"	22
101	DF5	70	16" x 0.500"	22
102	DF6	70	16" x 0.500"	22
103	DF7	70	16" x 0.500"	22
104	DF8	70	16" x 0.500"	22
105	DF9	70	16" x 0.500"	22
106	DF10	70	16" x 0.500"	22
107	DF11	70	16" x 0.500"	22
108	DF12	70	16" x 0.500"	22
109	DF13	70	16" x 0.500"	22
110	DF14	70	16" x 0.500"	22
111	DF15	70	16" x 0.500"	22
112	E1	65	12 3/4" x 0.500"	22
113	E2	65	12 3/4" x 0.500"	22
114	E3	65	12 3/4" x 0.500"	22
115	E4	65	12 3/4" x 0.500"	22
116	E5	65	12 3/4" x 0.500"	22
117	E6	65	12 3/4" x 0.500"	22
118	E7	65	12 3/4" x 0.500"	22
119	E8	65	12 3/4" x 0.500"	22
120	E9	65	12 3/4" x 0.500"	22
121	E10	65	12 3/4" x 0.500"	(R) 22
122	E11	65	12 3/4" x 0.500"	(R) 23
123	E12	65	12 3/4" x 0.500"	(R) 16
124	E13	65	12 3/4" x 0.500"	(R) 13

3

PROJECT AS-BUILT DRAWINGS

THESE AS-BUILT DRAWINGS HAVE BEEN PREPARED BY PND ENGINEERS, INC., BASED ON INFORMATION PROVIDED BY THE GENERAL CONTRACTOR. PND ENGINEERS, INC. IMPLIES NO GUARANTEE AS TO THE ACCURACY OF THE INFORMATION CONTAINED HEREIN.

GANGWAY PILE SCHEDULE (CONICAL TIP)

PILE #	LOCATION	PILE SUPPLY LENGTH (FEET)	DIAMETER/ WALL THICKNESS	MINIMUM EMBEDMENT	FINAL * EMBEDMENT	MEASURED BEARING
125	G1	85	12 3/4" x 0.500"	53'	53'	80,000 LBS
126	G2	70	12 3/4" x 0.500"	47'	47'	70,000 LBS
127	G3	70	12 3/4" x 0.500"	47'	(R) 44'	80,000 LBS

3

* (R) DENOTES REFUSAL AT FINAL EMBEDMENT

GANGWAY PILE NOTES:

1) GANGWAY PILES SHALL ACHIEVE A MIN. BEARING OF 60,000 LBS AS DETERMINED BY THE ENGINEER.

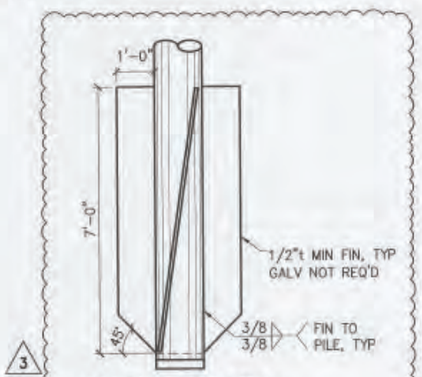
2) IF BEDROCK IS ENCOUNTERED BEFORE MIN. EMBEDMENT IS ACHIEVED, GANGWAY PILES SHALL BE DRIVEN WITH AN IMPACT HAMMER INTO BEDROCK UNTILL BEARING IS ACHIEVED AS DETERMINED BY THE ENGINEER.

ADDITIVE ALTERNATE #1 LAUNCH FLOAT STRUT PILE SCHEDULE

3

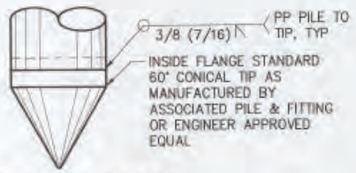
PILE #	LOCATION	PILE SUPPLY LENGTH (FEET)	DIAMETER/ WALL THICKNESS	FINAL EMBEDMENT
128	L1	45	12 3/4" x 0.500"	22'
129	L2	40	12 3/4" x 0.500"	22'

SEE TYPICAL STEEL FLOAT PILE FOR MINIMUM EMBEDMENT.



SHALLOW PILE SPIN FIN DETAIL

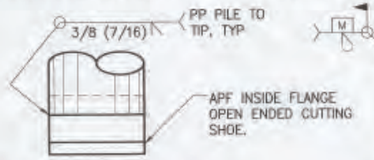
NTS (PILES A3 & A4 ONLY)



CONICAL TIP DETAIL

NTS

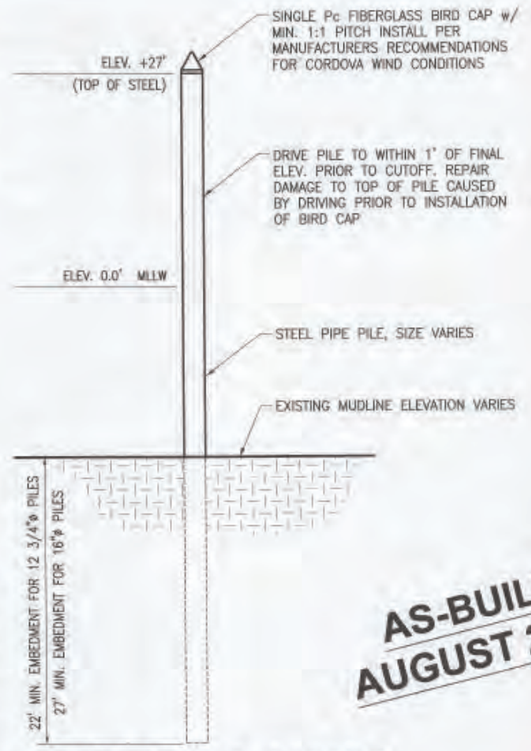
(PILES 125, 126 & 127 ONLY)



OPEN SHOE DETAIL

NTS

(PILES 1 THRU 124, 128 & 129)

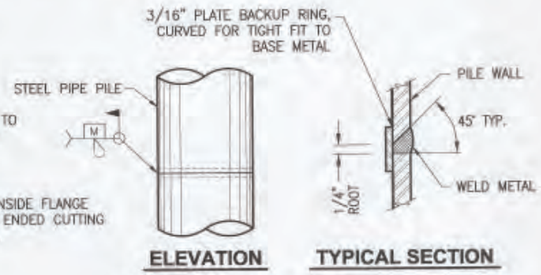


AS-BUILT AUGUST 2005

TYPICAL STEEL FLOAT PILE

NTS

NOTE:
IF BEDROCK IS ENCOUNTERED BEFORE MIN. EMBEDMENT IS ACHIEVED (SEE TEST HOLE LOGS), FLOAT PILES SHALL BE DRIVEN INTO BEDROCK WITH AN IMPACT HAMMER UP TO 10 BLOWS PER INCH.



ELEVATION **TYPICAL SECTION**

TYPICAL PILE SPLICE WELD

TYPICAL FOR ALL SHOP & FIELD PIPE PILE SPLICES NTS

CITY OF CORDOVA
PO BOX 1210
CORDOVA, ALASKA 99574
PHONE: (907) 424-6200
FAX: (907) 424-6000

NOTICE TO CONTRACTOR

The City will provide all timber floats and steel pipe piles required for the Base Bid. The City will also provide timber boat launch floats and steel struts (not piles 128 & 129) for Additive Alternate #1. City supplied materials will be located at the New Float Staging Area as shown in the Plans. The Contractor shall be responsible for transporting all City supplied materials from the New Float Staging area to their installed location as necessary. The Contractor shall install all of the City Supplied Materials as indicated in the project drawings, specifications and contract documents.

REV	DATE	DESCRIPTION
	6/10/04	ISSUED FOR BID
	8/24/04	ISSUED FOR CONSTRUCTION
3	8/02/05	AS-BUILT

STATE OF ALASKA 49TH — John W. Pickering CE-8966 — REGISTERED PROFESSIONAL ENGINEER

1506 West 36th Avenue
Anchorage, Alaska 99503
Phone: 907.561.1011
Fax: 907.563.4220
www.pnd-anc.com

P N D Incorporated
CONSULTING ENGINEERS

PROJECT: **CORDOVA SMALL BOAT HARBOR IMPROVEMENTS**

TITLE: PILE SCHEDULE AND DETAILS

DRAWN BY:	PND		
DESIGNED BY:	JWP/EF/BJ	DATE:	8/02/05
CHECKED BY:	JWP	PROJECT NO:	031135

SHEET NO: 6 OF 48