City and County of San Francisco
PORT OF SAN FRANCISCO

Maintenance Dredging 2025-2030

CONTRACT NO. 2885

PROJECT MANUAL

VOLUME 3 OF 3

(Division 35)

05/2025

Each Bid shall be enclosed in an envelope bearing the description:
''BID FOR: Maintenance Dredging 2025-2030, Contract No. 2885''.

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DREDGING and DISPOSAL

PART 1 - GENERAL

1.01 DESCRIPTION

This is a 5-year maintenance-dredging Contract for multiple sites at various locations along the San Francisco waterfront. The Contractor shall provide all labor, equipment, and materials required to successfully complete each dredging event. Dredged material will include material suitable for unconfined aquatic disposal (SUAD) and material not suitable for unconfined aquatic disposal (NUAD) and material suitable for placement at permitted beneficial reuse sites. The Contractor needs to become familiar with all the sites designated for dredging and disposal. Actual site(s) to be dredged will be designated by the Port Engineer for each Dredge Event. Each Dredge Event will require a separate mobilization. Specific information for each Dredge Event will be identified by the Port Engineer prior to the Dredge Event and includes Dredge Event schedule, required dredge berths, Required Dredge Elevations, dredge prism (i.e., dredging area limits), and delineation of suitable (i.e. SUAD) vs. unsuitable (i.e. NUAD) material areas as well as material suitable for beneficial reuse. The Port reserves the right to vary the actual sites for each Dredge Event, the area to be dredged within each dredge site, and the volume of material to be dredged for each dredge site. Other pertinent information regarding the Contract is outlined below.

A. Sites that may be dredged as part of this Contract include: Fisherman's Wharf, Hyde Street Harbor, Pier 9, Pier 27, Piers 35 East and West, Pier 40, Piers 80, Islais Creek and Approach, Pier 92, Pier 94, Pier 96, South Beach Harbor and Downtown Ferry Terminal. Some of these sites may not be dredged as part of this Contract.

B. The Required Dredge Elevation(s) will vary depending upon the dredge site as generally shown on the Plans, or as identified by the Port Engineer for each dredge site in a Dredge Event.

C. Port will perform any necessary physical, chemical, and biological testing to establish whether the dredge materials are suitable or not suitable for unconfined aquatic disposal.

D. Contractor shall arrange for transportation of dredged material to and disposal of dredged material at the permitted and approved disposal sites noted in this Section.

E. Debris, where encountered, will be removed and disposed of properly. Contractor shall arrange for transportation and disposal of dredged solid debris such as, but not limited to, wood, metal, or concrete, to an approved landfill permitted for

receiving such debris. Alternately, if such solid debris can be recycled effectively, Contractor shall arrange for its transportation and recycling.

F. As determined by the Port, material suitable for unconfined aquatic disposal (SUAD) shall be disposed of at the following potential disposal sites: in-Bay site (Alcatraz Disposal Site, SF-11), the ocean disposal site (San Francisco Deep Ocean Disposal Site, SF-DODS), or at permitted beneficial reuse sites such as Montezuma Wetlands Restoration Project or equivalent beneficial reuse locations.

G. Dredge materials designated as not suitable for unconfined aquatic disposal (NUAD) may contain elevated concentrations of chemicals of concern (e.g., polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), etc). Port Environmental staff will provide detailed information on the concentrations of PAHs, PCBs, or other chemicals found in any unsuitable material located at each dredge site. Chemical concentrations are not anticipated to be considered hazardous under applicable regulatory criteria.

H. The unsuitable (NUAD) materials shall be placed at either permitted beneficial reuse sites such as the Montezuma Wetlands Restoration Project as non-cover/foundation material, or disposed of on land (upland) at a permitted Class III landfill or other acceptable, permitted landfill depending on chemical concentrations and waste profiling by the landfill. Unsuitable material for upland disposal may be delivered for beneficial re-use to an alternate upland site only after written approval by the Port Engineer and Dredged Material Management Office (DMMO) of the alternate site and the proposed re-use.

1.02 RELATED DOCUMENTS

A. Section 00 41 50 – Description of Bid Items.

B. Section 35 20 30 – Dredging Surveys and Volume Calculations

1.03 WORK INCLUDED

The Contract price per cubic yard for dredging and per ton for disposing shall include the cost of removal and disposal of all materials specified herein or indicated on the drawings for each dredging event. The work under this section consists of providing all labor, plant, equipment, supplies, and materials necessary to excavate, dredge, haul, and dispose of materials, including, but not limited to:

A. Dredging at sites as indicated in the Plans.

B. Transportation and disposal of all dredged materials and solid debris.

C. Additional work under this Contract may include:

1. Providing sampling and analysis of dredged material for the landfill disposal of said dredged material.

2. Providing heavy lift services of barge-mounted crane.

3. Knock down-leveling event, see definition 1.05 R.

4. Herring Observers and Herring Monitoring – On-site herring monitoring for work performed outside of standard dredging environmental work windows as required by the California Department of Fish and Wildlife (CDFW). Herring observers must be approved by CDFW and must be onsite during all dredging activities when herring monitoring is required by CDFW. Herring observers will prepare and complete daily herring monitoring reports. Herring observers will prepare, complete, and submit weekly herring monitoring reports to CDFW.

1.04 REFERENCES

A. All geotechnical and environmental information existing in Port files relating to the bottom materials to be dredged will be made available for Contractor's review in the Port's engineering offices. BLP - Barclays Law Publishers

1. CCOR - California Code of Regulations

a) Title 8 - Industrial Safety Orders, Construction Safety Orders.

B. BPC - Book Publishing Company

C. San Francisco Deep Ocean Disposal Site (SF-DODS) Site Management and Monitoring Plan Implementation Manual (EPA, Current Version)

D. 40 Code of Federal Regulations (CFR) 228, Current Version

E. U.S. Army Corps of Engineers Suitability Determinations and Sampling and Analysis Results for Dredged Sediments.

F. Conditions of Permits: Requirements from permits of the various agencies with jurisdiction over the dredge and disposal operations.

1.05 DEFINITIONS

A. Suitable Material. Dredged sediment that has been tested and determined by the

regulatory agencies comprising the Dredged Material Management Office (DMMO) to be Suitable for Unconfined Aquatic Disposal (SUAD) at Alcatraz Disposal Site (SF-11) or San Francisco Deep Ocean Disposal Site (SF-DODS) or other beneficial reuse sites. Actual disposal site shall be designated by Port in coordination with the DMMO.

B. Unsuitable Material. Dredged sediment that has been tested and determined by the DMMO to be Not Suitable for Unconfined Aquatic Disposal (NUAD). This unsuitable material may be disposed at permitted beneficial reuse sites such as Montezuma Wetlands Project or at an approved upland landfill facility. Actual disposal site shall be designated by Port. Alternate sites for beneficial reuse of the material may also be approved by the Port.

C. Dredge Unit (DU). A dredge unit is defined as an independent area within a dredge site that has been independently characterized to determine whether the material within its limits is suitable for unconfined aquatic disposal (SUAD). The dredge unit(s) will be defined by the Port. Within a given dredge site, different DUs may be designated by the Port for differing disposal options.

D. Dredged Material Management Office (DMMO). The DMMO is the group of regulatory agencies responsible for coordinating the review of sediment characterization data and determination of its suitability for unconfined aquatic disposal. The US Army Corps of Engineers (USACE) is the organizing agency for the DMMO.

E. Debris. Debris is defined as any dredged materials that do not pass through a grid opening sized 12 inches square. Debris shall not be disposed of at any aquatic or beneficial reuse disposal site. Debris shall be properly disposed of only at an approved licensed recycling or landfill facility.

F. Dredge Event. The Contract will be conducted in separate dredging events that will be defined and tasked by the Port Engineer. Each Dredge Event may require dredging and disposal of material from one or more dredge sites. Each Dredge Event will include a separate mobilization. The duration of the Dredge Event will be specified in the Event Notice to Proceed.

G. Allowable over depth tolerance: A specified depth below a project's design depth, from which material is authorized to be dredged. The purposes for an over depth tolerance are to ensure that the project design depth is fully achieved and to ensure that potential environmental impacts associated with removal of substantial volumes of unauthorized and/or untested material are minimized, both while taking into account reasonable inaccuracy/imprecision of the dredging process. It is NOT mandatory that all material be removed from the allowable over depth zone.

H. Permitted depth/permitted dimensions: The "permitted" dimensions typically refer to the overall dredging template (i.e., the design depth and the over depth

tolerance).

I. Dredging template/prism: Overall permitted dimensions of the dredging project, including allowable over depth, advance maintenance depth, and/or any side slope box cuts, etc., but independent of how “pay depth” may be defined for that project. Disposal or fill volume calculations, environmental evaluations, etc. are to be based on these overall approved dimensions.

J. Required Dredge Depth (project grade/project design Elevation): Approved/authorized project depth not including any over depth allowance, any advance maintenance depth, or any side slope cuts, etc. The minimum elevation within a dredge site, above which the Contractor is required to remove all material.

K. Excessive Dredging. Dredging performed below the allowable over depth or otherwise outside the permitted dredging template. Excessive Dredging volume will be deducted from the total volume dredged and payment will not be made for Excessive Dredging.

L. Required Dredge Volume. The volume of dredged material above the Required Dredge Depth.

M. Maximum Pay Depth (Pay Elevation): The project's design depth, plus one foot of the over depth allowance for which the Contractor will be paid. The purpose is to provide financial incentive to ensure the project’s design depth is fully and efficiently achieved, while allowing for reasonable inaccuracy/imprecision in the dredging process.

N. Maximum Pay Volume (Pay volume/pay material). Volume of dredged material above the Maximum Pay Depth.

O. Paid Over depth Volume. Difference between the Maximum Pay Volume and Required Dredge Volume.

P. Non-pay depth/material: That portion of the allowable over depth, if any, for which the dredging contractor will NOT be paid. The purpose is to ensure that there is no financial incentive to remove material in excess of what is needed to fully and efficiently achieve the project’s design depth, while allowing for reasonable inaccuracy/imprecision in the dredging process. Note that non-pay material within the allowable over depth is authorized, but is not mandatory, to remove.

Q. No Pay Volume. Volume of dredged material below the Maximum Pay Elevation.

R. Knock down-leveling event. "Barring, dragging and all other methods of bed leveling are allowed if they are incorporated into the Contractor's Dredge Plan that is approved by the DMMO. The Contractor shall provide descriptions of any

proposed barring activities, to smooth out high spots as needed after dredging is complete in the Dredge Plan. These activities shall be allowed after Clamshell dredging operations are completed in order to knock down spikes left in the previously dredged channels. All costs associated with barring and knock-down dredging shall be included in the dredging line items under the payment schedule. The knockdown episodes must meet the following conditions: (1) the shoal must be located within the maintenance dredging footprint of the berth, marina, or channel; (2) the depression into which the shoal will be knocked must be located within the maintenance dredging footprint of the berth, marina, or channel; (3) each individual shoal to be knocked down must be no greater than 2,000 cy; (4) the Contractor must use either a clamshell or towed I-beam to knock down the shoal into the depression or other DMMO and Port approved method; (5) each knockdown episode must be conducted to minimize the re-suspension of sediment; and (6) the knockdown material must meet chemical and biological criteria specified by the Water Board and DMMO before being knocked down."

1.06 EXISTING SERVICES

A. Contractor shall review any City utility maps and any Port utility drawings available at Port Engineering offices to assure that no utilities are in the area affected by the dredge operations prior to commencing with the dredging. If needed, any utility drawings will be made available prior to a dredge event. It is the Contractor's responsibility to investigate and confirm if utilities are in the areas to be dredged and to protect all utilities from damage.

B. If utilities are located in an area that could be affected by the Work, Contractor shall verify location of such utilities and exercise caution when working around these utilities. If required, Contractor shall arrange for utility disconnection as required by public or private utility companies.

1.07 SUBMITTALS

This section will address both pre-construction submittals and construction submittals. These submittals apply to each Dredge Event that occurs under this Contract.

A. <u>Pre-Construction Submittals</u>

The Port will notify the Contractor of the required schedule and locations of each Dredge Event thirty (30) calendar days prior to the anticipated start date for the Dredge Event. The Port will identify the dredge site/sites, preliminary dredge limits, required elevations, dredge unit (DU) areas, and preliminary volume estimates. At least ten (10) calendar days prior to the Dredge Event, the Contractor shall submit to the Port Engineer or designee the documents listed below. The Port's Engineer or designee will review and forward the documents to the U.S. Army Corp of Engineers and DMMO for approval. No work shall begin prior to the Port and

DMMO's approval of all submittals.

1. **The Dredging Operations Plan,** including but not limited to the following items:

   a) U.S. Army Corps of Engineers permit and other applicable permits numbers (Port will provide these numbers to the Contractor).
   b) Episode number (Dredge Event number under this Contract)
   c) The Contractor business name, telephone number and the dredging site representatives.
   d) Anticipated dredging start date.
   e) Anticipated dredging completion date.
   f) The dredging equipment description and specifications.
   g) Name of each vessel used.
   h) The bin or barge capacity for each vessel used.
   i) Dump scow numbers or identification for each vessel used.
   j) New or maintenance dredging (Information provided by Port).
   k) The method and equipment to be used for dredging position control indicating how vertical and horizontal position control will be maintained.
   l) The method and equipment used for determining the positioning by electronic methods of the dredge and dump scow during entire dredging and disposal operation.
   m) Summary of proposed dredging procedures.
   n) The Required Dredge Elevation(s) and estimated volume of suitable/unsuitable material to be dredged (as estimated for each site per scheduled event). The volume information may not be available by the required submittal date and can be based on the preliminary information provided by the Port since the pre-dredge survey may not be completed by this submittal date.
   o) A pre dredge survey signed by the licensed third party surveyor and Port Engineer/Manager must be included.
   p) A plan showing the dredging area limits and DU areas of suitable versus unsuitable materials. The suitable versus unsuitable DU areas may not be available by the required submittal date and can be based on the preliminary information provided by the Port.
   q) The date of the last dredging event for the site and the required elevation (Information provided by Port).
   r) Where unsuitable material disposal to an upland landfill is required, Contractor shall submit a proposed transportation, offloading, dewatering and truck transport plan for upland disposal of unsuitable sediments as part of this document.
   s) Project Completion Schedule. The schedule should show the actual sequence in which the Contractor proposes to dredge and to grade the individual sites. See Document 00802, Paragraph 1.3 "Liquidated Damages" C. for liquidated damages associated with each event.
   t) Any and all other information required by the U.S. Army Corps of Engineers

and DMMO for approval of the Dredging Operations Plan.

2. The **Solid Debris Management Plan** including but not limited to the following items:

   a) U.S. Army Corps of Engineers' permit number.
   b) Episode number.
   c) Source and expected type of debris.
   d) Debris retrieval and separation method.
   e) Disposal method.
   f) Disposal site.
   g) Schedule for disposal operations
   h) Debris containment method to be used.

3. **Contractor's Quality Control Plan** for dredging operations and disposal, including but not limited to:
   a) Control methods for dredge horizontal and vertical positioning, and positioning for aquatic disposal.
   b) Inspection and testing procedures.
   c) Specification compliance and correction of non-conformance.
   d) Documentation of quality control procedures including samples of daily and weekly forms, reports, and submittals.
   e) Qualifications and training of personnel.
   f) Other quality control processes and procedures.

4. **Waterway Control Plan(s)** including but not limited to:
   a) Coordination to prevent navigation conflicts.
   b) Compliance with U.S. Coast Guard rules.
   c) Water safety.

5. **Notification to the Maritime Community** as required by the U.S. Corps of Engineers, see Paragraph 3.02 "Preparation".

B. Construction Submittals

1. Contractor shall submit notices of project commencement, project suspension, and project completion to each regulatory agency; the Army Corps of Engineers (USACE), San Francisco Regional Water Quality Control Board (RWQCB), and Bay Conservation and Development Commission (BCDC), in accordance with permit requirements.

2. For suitable material disposal at any aquatic or beneficial reuse disposal site, the Contractor shall maintain a daily Disposal Site Verification Log and Electronic Positioning Data Record for weekly submittal to the U.S. Army Corps of Engineers and the Port Engineer. Contractor shall follow all procedures

outlined in the SF-DODS Site Management and Monitoring Plan Implementation Manual (EPA, 1998) as modified by the 40 CFR 228 for ocean disposal.

3. Vessel Traffic Control Log shall be submitted to Port Engineer or designee on a weekly basis (will not be returned to Contractor).

4. Daily log of dredging operations shall be submitted to Port Engineer or designee after dredging operation on a daily basis (will not be returned to Contractor).

5. For unsuitable material disposal at an approved upland landfill or beneficial re-use or recycling facility, the Contractor shall provide copies of certified weight tickets from the facility to the Port Engineer or designee on a weekly basis.

6. Copy of Citations: Contractor shall notify Port Engineer or designee if cited for any regulatory violations related to this contract or the completion of the work described herein and submit a copy to the Port. Contractor shall be responsible for any violations of any local, state, or federal regulations and for any imposed fines.

7. No payments will be made to Contractor until all required submittals are approved by the Port pending review and approval by other regulatory agencies, as appropriate.

8. Closure report: Provide a closure report as required by the USACE, RWQCB, and BCDC. Report shall be submitted within 10 days of completion of dredging and disposal or beneficial reuse, or placement of material at Piers 94/96 or other approved dredged material drying locations. Report shall be submitted to the Port for review and revised if any comments are made. The final report shall be submitted to the USACE, RWQCB, and BCDC.

9. Herring Monitoring Reports: Contractor shall submit weekly herring monitoring reports to CDFW if supplying herring observers during work outside of the dredging environmental work window.

10. See Document 00802, Paragraph 1.4 “Liquidated Damages” D. for liquidated damages pertaining to document submittal associated with each dredging event.

1.08 PROTECTION AND COORDINATION WITH OTHER MARITIME ACTIVITY

A. Contractor shall coordinate with Port regarding scheduled shipping calls and other activities at the various sites to avoid conflicts with other shipping, fishing, cruise operations, etc. Erect and maintain temporary bracing, shoring, lights, navigation

lights, barricades, warning signs, buoys and guards necessary to protect the public from injury in accordance with applicable rules and regulations. Contractor shall not close or obstruct navigation ways, channels, sidewalks, or roadways without proper permits.

B. Condition Survey of Existing Structures: Contractor shall review and verify, the condition of fender systems, dolphins and all other facilities adjacent to their work areas prior to dredging and disposal, following the requirements of Document 00800, Section 1.4A. Contractor shall protect all facilities from damage. Any damage documented as a result of the Contractor's activities will be assessed to the Contractor for repair.

C. Security Concerns: Contractor shall give notice and receive required approval from the Port Wharfinger prior to berthing at any location along the waterfront.

1.09 QUALITY ASSURANCE/ QUALITY CONTROL

A. The Port will provide periodic inspection of all Work, unless noted otherwise. The Contractor shall, without additional compensation, provide complete cooperation and unrestricted access for Port inspection including transport to the floating dredge via Contractor's skiff.

B. The Port inspection will include all dredging, transportation, offloading and truck transport of material unsuitable for in-bay or ocean disposal. The Contractor shall make their daily records of location control (electronic positioning data), soundings, dredge volumes, etc. available to the Port inspector or designee when requested.

C. The Port inspector or designee will review dredging operations to verify that the dredging operations comply with the dredging Contract documents and permit conditions. However, it is the Contractor's responsibility to comply with all requirements, and inspector review does not connote acceptance.

D. Contractor shall follow the approved quality control plan for dredging and disposal. The copy of the quality control plan shall be on the job site at all times.

E. Contractor shall be specialized in performing dredging, and must have a minimum of three (3) years documented dredging experience.

F. Contractor's dredging crew and equipment used for this dredging work shall have a minimum capacity to dredge, transport, and dispose of 5,000 cubic yard of in-place sediment on a daily basis. This minimum capacity will be used to determine the allowable number of days for dredging at each dredge site, unless otherwise specified by the Port Engineer or designee, or otherwise requested by the Contractor and approved by the Port Engineer or designee. If the Port Engineer or designee specifies a lower minimum capacity than 5,000 in-place cubic yard per

day for a dredge site, then that different minimum capacity shall be used to determine the number of allowable days. Prior to the start of a dredging event, Contractor shall notify the Port Engineer or designee in writing of any issues that may limit production to less than 5,000 cubic yards per day.

1.10 REGULATORY REQUIREMENTS

A. All dredging shall conform to the requirements of applicable codes, ordinances and requirements of local, state, and federal agencies for dredging, including, but not limited to, those requirements contained in the Port's dredging permits from state and federal agencies.

B. Contractor shall secure and pay for all permits and licenses required for operating all equipment used in the Work.

C. State and local code requirements shall control the disposal of debris, which shall be at a licensed and approved off-site location.

D. If utilities are affected, notify affected utility companies before starting work and comply with their requirements.

E. Fines imposed by any Regulatory Agency caused by the Contractor and due to violations on the part of the Contractor in the execution of the dredging work shall be paid by the Contractor.

F. The Contractor shall be prepared for and allow for USACE, BCDC, RWQCB, US EPA, California Department of Fish and Game (CDFG), and/or other regulatory agencies inspection at any time during dredging operations.

Contractor is advised that herring-spawning season commences on December 1 of every year and lasts until at least March 1 of the following year. Contractor is responsible for researching and complying with the current CDFG recommendations and all permit restrictions and requirements associated with dredging during spawning season. The CDFG does not allow dredging at the Port of San Francisco during herring season unless the Port obtains a herring waiver from CDFG.

G. Contractor is advised that beginning December 1 and extending through May 31 of every year additional restrictions for migrating fish and wildlife will be in place. Contractor is responsible for researching and complying with the resource agencies' (e.g., CDFG, U.S. Fish and Wildlife Service, and NOAA Fisheries (formerly National Marine Fisheries Service) current recommendations, and all permit restrictions and requirements associated with dredging during this season if dredging is allowed by the resource agencies. Exhibit G indicates graphically

times and areas where additional restrictions may apply. The Contractor shall note that the resource agencies often change applicable restrictions and that the Contractor shall be responsible for knowing and understanding the restrictions that apply at the time of each dredging event.

1.11 CONSTRUCTION ACCESS

A. Construction Access: Contractor will be allowed to access the work sites twenty-four hours prior to commencement of the dredging. Contractor may not access the site more than twenty-four hours prior to the start if dredging without prior written authorization by the Port. For Maritime Transportation Security Act (MTSA) regulated facilities, contractor will need to comply with all applicable regulations, including but not limited to Transportation Worker Identification Credential (TWIC) cards.

B. The Port will provide a berthing location for Contractor's equipment and parking for Contractor's vehicles at an available location at no additional cost to contractor, provided the Contractor request such accommodations at least five (5) calendar days prior to commencing dredging. Port will provide berthing and parking as close as possible to the dredging location, based on availability. Contractor shall note that berthing and parking may not be available at the dredging site.

C. The Contractor shall coordinate with the Port at least five (5) days prior to mobilization to be assured that berthing and dredging operations at a given site does not conflict with other scheduled activities or cause unnecessary security concerns.

1.12 COORDINATION:

A. Contractor shall coordinate scheduling, submittals and Work to assure efficient and orderly sequence of the dredging, and shall not interfere with the operations of Port tenants or shipping in any way. Contractor acknowledges that Contractor shall accommodate vessel traffic and/or berthing at dredging locations. No additional compensation will be paid by the Port for disruptions to dredging operations caused by vessel traffic and/or vessel berthing.

B. Contractor shall comply with any and all U.S. Coast Guard (USCG) security requirements for individual facilities, such as cruise, cargo and ferry terminals. At a minimum, Contractor shall notify the USCG 24 hours in advance of moving equipment, commencing work, or conducting surveys in such areas.

C. Contractor shall coordinate completion and clean up of work site.

D. Contractor shall not interfere with use of or access to adjacent buildings or property throughout the progress of the Work.

E. Contractor shall not close or obstruct waterways, streets or sidewalks without obtaining and paying for permits to do so. Contractor must adhere to permit conditions and clear area upon expiration of permit.

F. Contractor shall maintain accessibility from the street at all times to any fire hydrants within construction area.

G. Contractor shall not disconnect or shut down any part of the existing utilities and services, except by express written permission of the Port Engineer. Contractor shall submit schedule of estimated shut-down time for each service and each location in order to obtain such permission, and shall notify all interested parties, utilities, Municipal authorities, etc., as required.

H. Contractor shall, as necessary, coordinate with any other Contractors working on adjacent Port projects.

I. For dredging in Fisherman's Wharf area, Contractor shall actively coordinate with Fisherman's Wharf Inner Harbor tenants, berthholders, and the Fisherman's Wharf Harbormaster. Contractor shall meet with the Fisherman's Wharf Harbormaster and the Port Engineer a minimum of 14 days prior to dredging to fully understand all restrictions and vessel relocation needs (if any) during dredging.

J. For dredging in the South Beach Harbor Marina, Contractor shall actively coordinate with South Beach Harbor Marina berthholders and the South Beach Harbor Marina Harbormaster. Contractor shall meet with the South Beach Harbor Harbormaster and the Port Engineer a minimum of 14 days prior to dredging to fully understand all restrictions and vessel relocation needs (if any) during dredging.

K. No access to Pier 35 by Contractor's personnel shall be provided by the Port. Contractor shall not tie any equipment to Pier 35, nor take on or discharge any personnel to Pier 35 from the water.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.01 GENERAL

A. The preliminary dredge limits and volumes provided by the Port may be revised for the Dredge Event, and will be based on the pre-dredge survey plan provided by the Port. The pre-dredge survey shall be performed no more than ten (10) days prior to the dredging starting date. Post-dredge soundings shall be performed no

more than 10 days after dredging is completed.

B. Contractor shall layout the Work based on the drawings provided by the Port for each Dredge Event and establish means for determining dredge position control prior to commencing any dredging. Upon written request the Port will provide two benchmarks at the dredge site; one to establish the dredge site coordinate stationing system and one benchmark for project elevations. The Contractor shall provide all additional survey and layout work for Contractor's own control of the dredging operations as incidental.

C. Contractor shall submit all pre-construction submittals a minimum of ten (10) calendar days prior to the Dredge Event for Port review and approval. Contractor shall receive approval from the Port Engineer or designee of the Contractor's pre-construction submittals prior to mobilization.

D. Contractor shall comply with all Coast Guard regulations and display the proper signals during both daytime and nighttime operations.

E. All vessels operated for transport of dredged material are required to participate in the Coast Guard's Vessel Traffic Control Service (VTCS). Five minutes before each departure, the Contractor shall notify the VTCS by radio, via channel 13, of the following:

- The permit number.
- Name of the vessel.
- Dump scow number or identification.
- Time of departure from the dredge site, departure from the disposal site and return to the dredge site.

The above information shall be also provided to the Port Engineer or designee on a weekly basis in the Contractor's Vessel Traffic Control Log.

F. Unless otherwise noted by the Port Engineer in writing, the working hours for this Contract shall be 24 hours per day, seven days per week.

3.02 PREPARATION

A. Contractor shall become familiar with and comply with all provisions of the necessary permits and approvals for the dredging and disposal as obtained by the Port. The Port has applied for new 10-year maintenance dredging permits from the permitting agencies: the Army Corps, BCDC, and the RWQCB. Copies of the Port's previous, expired 10-year maintenance dredging permits from the Army Corps, BCDC and RWQCB are attached as Exhibit D, E, and F for informational purposes only. These expired permits do not authorize dredging under this

contract. The Port will provide copies of the new permits to the Contractor prior to issuing Notice to Proceed to perform dredging.

B. Contractor shall notify the Coast Guard of planned dredging operations in sufficient time to allow publication in the Local Notice to Mariners, Weekly Supplement.

C. Contractor shall submit an Anchor Waiver to the Coast Guard prior to the start of each dredge episode.

D. Prior to start of dredging, Contractor shall verify previously submitted schedule of hours of operations to the Port's Engineer and request update as necessary.

Contractor shall notify the U.S. Army Corps of Engineers, RWQCB, BCDC, and the Port when a Dredge Event commences, completes, suspends (suspension is when the dredge Contractor leaves the site for more than 48 hours for reasons other than equipment maintenance), or restarts. Each notification should include the USACE permit number. The information can be sent to the attention of Melissa France in writing, to the District Engineer, U.S. Army Corps of Engineers; San Francisco District; Operation and Readiness Division, 450 Golden Gate Avenue, 4th Floor, Room 1111; San Francisco, CA 94102-3404. Alternately, notification can be submitted by email to melissa.m.france@usace.army.mil and to dll-spn-dmmo@usace.army.mil.

E. Contractor shall obtain and review the shipping schedule for the area to be dredged and shall make allowances for ship traffic at no additional cost to the Port.

3.03 DREDGING OPERATIONS

A. Contractor shall commence dredging operations only after all necessary permits and other authorizations have been obtained and after receipt of a Notice to Proceed from the Port which will detail the estimated volume and disposal sites for dredging each episode.

B. At least 24 hours prior to the commencement of dredging operations, Contractor shall allow the Port Engineer or designee to observe the Contractor's equipment. Contractor shall correct any equipment deficiencies prior to the start of dredging.

C. All rubbish, garbage, and other discarded solid material resulting from dredging operations shall be retained in containers until removal by the Contractor for recycling or upland disposal at an approved licensed landfill.

D. All chemical waste from the dredge, such as oil and grease, shall be retained in tanks or containers designed and approved for that use and pumped off or otherwise properly removed for proper disposal by Contractor.

E. If dredging occurs within 10 feet of any pier face, Contractor shall report to the Port

Engineer if non-dredge sediment is present such as riprap.

F. During the dredging, a steel grid "grizzly" with twelve inch square maximum openings shall be placed over the hopper of the dump scow for material processing. All dredged material shall be dropped onto the grid. Details of the "grizzly" are subject to U.S. Army Corps of Engineers and DMMO approval via approval of the Contractor's Dredging Operations Plan. Material retained on the "grizzly" will be treated as debris.

G. Solid debris, man-made objects and dredge material remaining on the grid "grizzly" shall be removed for subsequent off-loading for proper recycling or disposal at a licensed facility by the Contractor.

H. Contractor shall cease operations immediately if adjacent piers, aprons, wharf or structures appear to be in danger of structural failure and shall immediately notify the Port's Engineer or designee. Contractor shall not resume operations at that site until directed to do so by the Port Engineer or designee.

I. Contractor shall cease operations immediately if riprap, rock fill, etc., is encountered during dredging and shall immediately notify the Port's engineer. Contractor shall not resume operations in the immediate area until directed to do so by the Port Engineer. Contractor may relocate away from the immediate area and resume operations provided no additional riprap, rock fill, etc., is encountered.

J. Dredging operations shall be conducted using equipment and procedures designed to minimize water turbidity.

K. Contractor shall notify the Engineer immediately of any unforeseen conditions.

L. Contractor shall repair all damage caused by the dredging operations to the extent required to restore the site to its previous condition at no cost to the Port or Port tenant. Repairs shall be completed to the satisfaction of the Port Engineer.

M. Contractor will not receive compensation for any dredged material that is intentionally or unintentionally deposited elsewhere than in places designated or approved by the Port Engineer and regulatory agencies, and the Contractor shall be required to remove such misplaced material and deposit it where directed, at Contractor's own expense.

N. Noise control and abatement

1. Contractor shall provide state-of-the-art mufflers, silencers, and noise control features for all equipment.

2. Contractor shall utilize least noisy procedures and use machines such as electric-powered rather than diesel-powered equipment whenever there is

a choice.

3. Contractor shall provide impact tools and equipment that have intake and exhaust mufflers as applicable.

4. All powered equipment shall be maintained in good working order and shall comply with State and Federal noise emissions standards for construction equipment.

L. Air quality

1. Contractor shall utilize equipment that minimizes emissions and does not violate air quality standards.

3.04 DREDGING OF UNSUITABLE (NUAD) DREDGED MATERIALS

A. Dredge sites that contain unsuitable (NUAD) materials shall have the unsuitable materials completely removed prior to dredging the remainder of the site. The Contractor will perform the dredging to minimize reusing unsuitable materials in the water column, and to prevent the unsuitable materials from being redistributed into DU(s) designated as containing suitable (SUAD) materials.

B. Unsuitable material dredging shall conform to the location and Required Dredge Elevation, including the allowable over depth, as noted on the dredge plans that will be provided to the Contractor by the Port Engineer or designee for each Dredge Event. Dredging of unsuitable areas or dredge units (DU) shall be made in one pass, removing all unsuitable materials from the unsuitable DU to the required elevation.

C. At the boundaries of dredge units (DUs) containing unsuitable material, the following procedures shall be followed:

1. When an unsuitable DU is not adjacent to suitable DU: Material that sloughs from the side slopes along the perimeter of the unsuitable DU into the unsuitable DU will be dredged and disposed of as unsuitable material.

2. When an unsuitable DU is adjacent to suitable DU: Material that sloughs from the side slopes along the perimeter of the suitable DU into the unsuitable DU need not be removed as unsuitable material. The material may be dredged and disposed of as suitable material after the Port Engineer or designee verifies the completion of unsuitable DU dredging.

D. Unsuitable material dredging operations and depth measurements may be

inspected at any time by a Port representative at the Port's discretion. The Contractor will notify the Port Engineer or designee two days prior to the anticipated date for completion of dredging the unsuitable material area. The Contractor may be requested by the Port Engineer or designee to utilize its independent surveyor to complete an unsuitable DU(s) post-dredge survey and submit a hard copy of the survey to the Port Engineer or designee for verification of completeness. The Port Engineer or designee will authorize the start of any suitable material dredging only after verifying and accepting the unsuitable DU(s) post-dredge survey as complete.

3.05 GRADING (Knock Down-Leveling)

A. Contractor shall drag a grading beam along the sea bottom over the dredge site upon completion of the dredging if determined to be necessary by the Port Engineer or designee to remove high spots within the dredge area boundaries. The grading beam shall have a weight of at least 25 tons, a length of at least 50 feet and a height of 36 inches, or other dimensions and weight as proposed by the Contractor and approved by the Port Engineer.

B. The dredge area shall be graded to the Required Dredge Elevation as shown in the dredge plans that will be provided to the Contractor from the Port Engineer or designee for each Dredge Event. No material within the specified dredge area boundary shall be pushed/pulled outside of the dredge area boundary. Any material that is pushed/pulled into an area outside of the dredge area boundary by the grading operation shall be removed by dredging.

C. Grading shall be done in such a manner as to minimize turbidity.

D. If grading is performed as part of a Dredge Event, no additional compensation will be made for any additional grading, associated dredging, and disposal, if any. If grading is not associated with a Dredge Event, and is requested by the Port Engineer or designee, this is characterized as a knock down event and paid at the rate on per the bid schedule.

3.06 DISPOSAL OF SUITABLE (SUAD) DREDGED MATERIALS

A. Contractor shall prepare daily Disposal Site Verification Logs and submit them on a weekly basis each Friday to the U.S. Army Corps of Engineers, with copy to the Port.

B. Contractor shall record and maintain Electronic Positioning Data Records (EPDRs). These records are to be submitted on a weekly basis each Friday during dredging to the U.S. Army Corp of Engineers, with copy to the Port. Such EPDRs shall conform to all requirements in effect at the time of dredging, as set forth by the U.S. Army Corps of Engineers.

C. Contractor shall maintain strict barge overflow control in accordance with the following requirements.

1. No material shall be permitted to overflow or spill from the barge, bins or scow during transportation from the dredging site to the disposal site.

2. Overflow from the barge, bin, or scow is not permitted during mechanical dredging operations.

3. During hydraulic dredging operations, overflow from barges, bins, or scows shall be limited to a maximum of 15 minutes. Adjusting the hydraulic dredging operation may be required to ensure that once overflow commences that it will not exceed the 15-minute allowable duration. Overflow at the barge is not permitted for mechanical dredging.

D. All applicable conditions and regulatory requirements pertaining to in-Bay disposal of dredged material at SF-11 shall be followed.

E. All applicable conditions and regulatory requirement pertaining to placement of material at a beneficial reuse site (e.g. Montezuma Wetlands Project or other regulatory agency approved beneficial reuse site) shall be followed.

F. All permit and regulatory requirement costs, excluding costs associated with third party inspections or observations, shall be included in the bid unit price for in-Bay disposal at SF-11, Montezuma Wetlands Project, or other regulatory agency approved beneficial reuse site.

3.07 DISPOSAL OF SUITABLE (SUAD) DREDGED MATERIALS AT SAN FRANCISCO DEEP OCEAN DISPOSAL SITE (SF-DODS)

A. Dredged materials suitable for ocean disposal shall be transported and disposed of in accordance with paragraphs 3.06 and USEPA requirements as detailed within the USACE permit, to the San Francisco Deep Ocean Disposal Site (SF-DODS). Contractor shall prepare and submit to the U.S. Army Corps of Engineers, with copy to the Port, complete daily Disposal Site Verification Logs on a weekly basis.

B. All applicable conditions and regulatory requirements including, but not limited to, those noted in 40 CFR 220-227, , the Marine Protection, Research, and Sanctuaries Act, and SF-DODS Site Management and Monitoring Plan Implementation Manual shall be followed. These mandatory conditions and requirements include: acceptable weather conditions for transporting dredged material to the disposal site; barge load limitations; surface discharge zone location and dimensions; minimum distance from the Farallon Islands; minimum positioning system performance requirements; provision for bird and mammal observers; and

record keeping and reporting requirements.

C. All permit and regulatory requirement costs, excluding costs associated with third party inspections or observations, shall be included in the bid unit price for ocean disposal.

3.08 DISPOSAL OF UNSUITABLE (NUAD) DREDGED MATERIALS AT MONTEZUMA WETLANDS OR OTHER REGULATORY AGENCY APPROVED BENEFICIAL REUSE LOCATION

A. Unsuitable materials requiring disposal shall be transported in accordance with paragraph 3.06, except that disposal shall be at a DMMO-approved, permitted disposal facility.

Contractor shall prepare complete daily Disposal Site Verification Logs and submit on a weekly basis each Friday to the U.S. Army Corps of Engineers, with copy to the Port.

B. Unsuitable materials shall be removed from the scow and placed at a DMMO-approved, permitted disposal facility by clamshell or other approved method.

C. Placement, spreading (if applicable), and location of materials shall be established and approved by disposal facility managers.

D. Contractor shall note that transport and disposal of dredged materials at disposal facilities may be subject to limited draft that may affect tug and barge operations if the materials are not disposed at a landfill.

3.09 DEWATERING UNSUITABLE (NUAD) DREDGED MATERIALS AT PIER 94-96 OR OTHER APPROVED PORT DEWATERING LOCATION AND UPLAND DISPOSAL

A. Dredged materials requiring dewatering prior to upland disposal shall be stockpiled at a Port-approved dewatering facility such as Pier 94-96 or other approved Port dewatering location until the material is sufficiently dewatered to be stackable and meets the moisture requirements of the approved receiving landfill or beneficial re-use facility. Materials may need to be worked or turned over during the dewatering process by the Contractor as required to achieve the dredging/disposal schedule per Dredge Event and available stockpiling capacity. Dewatered materials shall then be transported and disposed at an approved landfill disposal site suitable and permitted for receiving such materials. The dewatered materials may also be transported by the Contract or to a site for beneficial re-use if so approved by the Port and regulatory agencies. The Port may also make the material available for others to haul away for beneficial re-use if approved by regulatory agencies.

B. Contractor shall note that the capacity of the Pier 94/96 dewatering facility is

approximately 12,000 CY, due to load limits in the area.

C. Dredged materials shall be transported to Pier 94-96 in accordance with the requirements of paragraph 3.06. Contractor shall prepare and submit to the U.S. Army Corps of Engineers, with copy to the Port, complete daily Disposal Site Verification Logs on a weekly basis.

D. Dredged materials shall be offloaded from the transport vessel to the dewatering facility and spread level within the confines of the facility. The height of material must not be more than five (5) feet unless otherwise approved in writing by the Port. Contractor may need front-end loaders and other equipment as necessary to move or otherwise rework dredged material at the dewatering site. Any such equipment shall be provided by the Contractor at Contractors sole cost.

E. A protective “bib” designed by the Contractor and approved by the Port shall be used to cover the over-water area between the scow and the Pier 94-96 deck during the offloading operation. The protective “bib” shall be impermeable and sufficiently durable to catch and contain dredged materials and prevent spillage of material into the Bay. Contractor shall remove material contained on the “bib” on a regular basis during offloading. Contractor shall supply all hay bales and other runoff control measures required to control runoff from unloading operations.

F. After all dredged materials from a given Dredge Event have been offloaded into the dewatering facility, Contractor shall:

a) Clean all dredged material off of the wharf deck in the area extending from the wharf face to the K-rail enclosure, and place this material within the enclosure;
b) Remove and properly dispose of all hay bales and other runoff control measures used in unloading operations;
c) Close and secure K-rail enclosure using existing K-rail and Contractor-supplied filter fabric, HDPE, or other materials or measures approved by Port Engineer or designee such that dredged materials are physically contained and cannot wash over, under, or through K-rail to the Bay;
d) After the above measures have been completed, sweep the wharf deck area between the wharf face and the K-rail, using a mechanical street sweeper. Place material collected with street weeper inside the K-rail enclosure.

G. After sufficient drying, Contractor shall load dredged materials to suitable transport trucks. Trucks shall be lined or otherwise made to be watertight and prevent leakage of dredged materials and water during transportation to the upland disposal site or beneficial re-use area. All trucks or trailers used in hauling dredged materials must be covered to prevent material from blowing out of truck or trailer.

H. The Contractor shall employ spill prevention practices throughout their operations. If spills occur, Contractor shall immediately clean up and sweep adjacent areas and City streets at the end of the day if any visible dredged material is observed. Contractor shall sweep up dirt or debris spilled onto paved surfaces immediately to reduce spreading of these materials over road surfaces. Spilled material shall be disposed at the approved landfill.

I. Contractor shall maintain and operate trucks so as to minimize exhaust emissions. Contractor shall operate trucks only when in use for the work and shall minimize idling time.

J. Contractor may use a portion of the dewatering facility at Pier 94-96 for temporary storage of debris during each Dredge Event. In such case, Contractor must keep debris separate from dredged material within the facility.

K. Contractor shall remove and properly recycle or dispose of solid debris from dewatering site as it accumulates. Contractor shall keep all pavements and areas adjacent to and leading from the dewatering site clean and free of mud, dirt, and debris at all times.

L. Contractor shall submit for approval the proposed transportation, offloading and truck transport plan for upland disposal of unsuitable materials, see Paragraph 1.05, A. This submittal shall include a spill prevention and clean-up plan, including the design of the proposed “bib” for offloading spill prevention.

3.10 CLEANUP

A. Unless otherwise directed by the Port Engineer, transport all dewatered unsuitable materials at the Pier 94/96 dewatering site to an approved upland landfill or beneficial re-use facility once material has dried sufficiently and has been tested by the Port for landfill disposal. A Dredge Event will not be considered complete by the Port Engineer until all dredged material from that event is removed from the Pier 94/96 dewatering facility.

B. After all dredged materials from a given Dredge Event have been removed from the dewatering facility and properly disposed of, Contractor shall sweep the entire dewatering facility area using a mechanical street sweeper. Contractor shall dispose of material collected with the street weeper at a licensed Class III landfill.

C. Contractor shall remove from the site all debris resulting from work in this Section. This shall include all temporary facilities used for spill prevention and shall include leaving all work areas broom clean.

3.11 MEASUREMENT AND PAYMENT

A. Dredged materials removed (Bid Items 2 to 8 and 10) will be measured by a California licensed, third-party surveyor for payment using in-place measurement in cubic yards. Measurement for payment is based on the difference between pre-dredge surveys and post-dredge surveys for each dredge site. No payment will be made for material removed outside the limits of maximum pay elevation and perimeter described below. A qualified third-party surveyor will calculate volume by using the Triangulated Irregular Network or "TIN" method, Autodesk Land Development Desktop, HYPAC, or other method as approved in advance in writing by the Port.

Payment for disposal of unsuitable materials and solid debris at an approved upland landfill (Items 8 and 11) will be based on weight tickets from the landfill facility, with verification by the Port Engineer.

B. Maximum Pay Depth. To cover inaccuracies of the dredge operation within the area to be dredged, Maximum Pay Depth shall be one (1) foot below Required Dredge Depth, unless otherwise specified in writing by Port. No payment will be made for material dredged below the Maximum Pay Depth (see Section 1.05)

C. Volume Calculation at Perimeter

1. Unsuitable DU is adjacent to suitable DU: The volume of the dredged material is calculated based on the elevation at the perimeter of the cut with a vertical side slope.

2. At pier face: The volume of the dredged material is calculated based on the elevation at the perimeter of the cut with a vertical side slope.

3. All other cases: The volume of the dredged material will be based on the material actually removed above a slope of two horizontal to one vertical (2:1) from the toe of the cut.

D. No Pay Volume. Material taken from beyond the limits of Maximum Pay Depth and perimeter will be deducted from the total amount dredged as excessive dredging for which payment will not be made. This volume, however, must be reported to the Port and DMMO agencies.

E. The Contractor shall notify the Port two days prior to the anticipated completion date to allow the Port Engineer to schedule a post-dredge survey. If the Required Dredge Depth has not been satisfactorily achieved as determined by the Port Engineer, the Contractor shall re-dredge or re-grade the “high spots”.

F. Should the Contractor propose disposing of unsuitable materials at a beneficial re-use or recycling facility, payment will be made at the agreed upon price negotiated

between the Contractor and the Port Engineer for disposal at that specified facility, and not at the upland landfill unit price the Contractor shall provide for the bid item.

END OF SECTION 35 20 23

SECTION 35 20 30

DREDGING SURVEYS AND VOLUME CALCULATIONS

PART 1 GENERAL

1.1 Scope of Work

The Port intends to hire an independent surveyor ("the Surveyor") to perform dredging surveys and volume calculations separate from this contract. This Section specifies the minimum qualifications and scope of work to be performed which consists of furnishing all transportation, labor, materials, equipment and incidentals necessary to provide hydrographic surveys, including the following:

A. New baseline and conditions bathymetric surveys of Port berthing, basin, marinas, and channel areas, including those areas depicted in the Port's dredging permits (historic permits attached)

B. Pre-dredging and post-dredging survey of Port berthing areas, including those areas depicted in the Port's dredging permits (historic permits attached)

C. The coordinate system to be used is the California Coordinate System (CCS), Zone 3, 1983 North American Datum (NAD83).

D. Bathymetric surveys shall be performed in accordance with the standards provided in the following reference:

> Engineer Manual 1110-2-1003, 30 November 2013 "Engineering and Design – Hydrography Surveying," prepared by the Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. 20314-1000, except as amended herein (e.g., accuracy requirements below).

E. Bathymetric survey equipment and procedures (positioning modes; EPS [electronic positioning system] calibration; and data-reduction, adjustment, processing. and plotting) shall conform to industry standards. Horizontal location observations shall compensate for errors, geodetic corrections, and atmospheric variations. Data recording, annotation, and processing procedures shall be consistent with recognized bathymetric survey standards.

1.2 SURVEYOR QUALIFICATIONS

A. All surveys shall be performed by an independent hydrographic surveyor. Hydrographic surveyor shall be licensed by the State of California as a Professional Land Surveyor (PLS) and shall be certified by ACSM/THSOA as a Certified Hydrographer.

B. Bathymetric surveys shall be performed by an independent licensed hydrographic surveyor that has actively engaged in bathymetric survey operations during the past three years using the surveyor's own equipment and personnel as required to perform the work specified herein. The surveyor's equipment and personnel shall be separate from that of the dredging Contractor's equipment and work force. The Contractor shall have no investment or financial interest in the surveyor's business entity.

C. The surveyor shall submit a statement of qualifications prior to beginning the work that shall include a list of equipment owned by the surveyor required to complete the type of surveys requested, the names of employees and licenses thereof, if any, and examples of the type of work product requested as produced for other clients over that previous three years. Onshore survey control shall be provided by an independent land surveyor licensed in California. The onshore surveyor may be the same surveyor that performs the hydrographic surveys.

1.3 EQUIPMENT AND ACCURACY

A. Electronic positioning shall be accomplished using Real-Time Kinematic (RTK) Global Positioning System (GPS) technology. All vertical control shall be of third order accuracy, including levels for the setting of tide gauges. An automatic electronic tide recording system shall be required during all surveying and capping operations. The surveyor may use an alternate method that provides the same vertical accuracy, if approved by the Engineer.

All hydrographic surveys shall meet the minimum standards for "Special Order" surveys as described in "Geospatial Positioning Accuracy Standards, Part 5: Standards for Nautical Charting Hydrographic Surveys," Federal Geographic Data Committee, Doc. No. FGDC-STD-007.5-2005.

Equipment: The surveyor shall own the necessary equipment to conduct bathymetric surveys using multibeam echosounder equipment with onboard correction for vessel roll, pitch, heave, and yaw, capable of meeting the requirements specified herein, including at a minimum:

1. "Geospatial Positioning Accuracy Standards, Part 5: Standards for Nautical Charting Hydrographic Surveys," Federal Geographic Data Committee, Doc. No. FGDC-STD-007.5-2005, Current Version

2. "Acousti Multibeam Survey Systems for Deep-Draft Navigation Projects," U.S. Army Corps of Engineers EM-1110-2-1003, Chapter 11, Current Version.

3. “NOS Hydrographic surveys-, Specifications and Deliverables,” NOAA, Current Version.

4. The Surveyor is to have available on-call to the Port at least one primary survey vessel and at least one backup survey vessel. The vessels provided for the survey tasks are to have enclosed wheelhouses capable of protecting sensitive equipment and crew from inclement weather, sea spray and waves. Up to 5 persons - including survey crew as well as Port and Contractor’s representatives - are to be protected from the elements within the vessel cabin of each vessel. Vessels are to be supplied with dedicated trailers for fast response to sites as required by the Port. The Surveyor will prove ownership of the vessels (call-out of vessels relying on an external rental fleet is not preferred as it may hinder a contractor's ability to respond during emergency or quick response efforts required by the Port).

5. The Surveyor shall be able to deploy the Survey Vessel to the Port of San Francisco within 48 hours notice from either the Port or the Contractor.

6. The Primary and Backup Survey Vessels are to have permanent, in-hull, 3 degree, 200kHz transducers installed at the vessel's Center of Motion. Over the Side Transducer Mounts are not Permitted for Port Survey Operations.

7. The Surveyor must maintain its own stock and demonstrate sufficient experience to the Port with use of at least one primary and one secondary electric Sound Velocity Profiler (Odom Digibar or equivalent).

8. The surveyor must maintain its’ own stock and demonstrate sufficient experience to the Port with use of at least one primary and one secondary automated Telemetry Tide Level Recording Gauge (Hazen HTG5000 or Herrin HD3001 or equivalent).

9. The surveyor must maintain its’ own stock and demonstrate sufficient experience to the Port with use of at least one primary and one secondary Position and Orientation System. This system is to be capable of Heave/Pitch/Roll, Heading and RTK-grade Positioning with minimum update rates of 20Hz for Position and Heading and 100Hz for HPR (Applanix POSMV or equivalent). The Survey should be able to provide Post-Processed Kinematic SBET data to confirm local tide data and horizontal accuracies of positioning equipment (via PosPac or equivalent software).

10. The Surveyor must maintain its' own stock and demonstrate sufficient experience to the Port with use of at least one primary and one backup Singlebeam Survey System capable of digital echo- trace logging within the acquisition software (HYPACK - or equivalent and Odom Echotrac Sounder or equivalent). This Digital Echotrace should be capable of being overlaid in the software on the digitized bottom track for data cleaning of outliers, identification of fish and other obstructions on the seafloor.

11. The Surveyor must maintain its' own stock and demonstrate sufficient experience to the Port with use of at least one primary and one secondary Multibeam Survey System. This system is to be capable of operating at adjustable frequencies from 200 to 400 kHz in 10 KHz increments. Swath Sector is to be adjustable from 10 to 160 degrees and capable of ping rates up to 60Hz for Dredge Payment Survey as well as Under-Dock Survey Capability (R2Sonic 2022/2024 or equivalent).

B. Bathymetric surveys: Soundings using a multibeam echosounder system shall be used for all required surveys (i.e., pre-dredge, post-dredge, and progress surveys).

C. Accuracy requirements for bathymetric surveying:
    1. Elevation/Depth Accuracy: +/- 0.2 feet
    2. Horizontal Positioning: +/- 0.1 feet

1.4 PRE-DREDGE SURVEYS

A. A pre-dredge survey of the area to be dredged shall represent the baseline that subsequent surveys shall be compared to.

B. The surveyor shall be able to start a survey within 3 calendar days at the request of the Port, and to complete the survey and provide a plot and quantity calculations in 24 hours and 48 hours respectively.

1.5 PROGRESS SURVEYS

A. The Port may request progress surveys during the course of dredging. Should Contractor desire progress surveys beyond any requested by the Port, those surveys shall be performed at the sole discretion of Contractor and at Contractor's own cost.

1.6 POST DREDGE SURVEY

A. A post-dredge survey of the area dredged shall be performed following the completion of all dredging work. The post-dredge survey shall be used to confirm that dredging to the required extent and depths has been achieved.

B. The post-dredge survey shall be submitted to the Port within three days of dredge event event completion to confirm dredge depths are met..

C. The surveyor shall be able to start a survey within 3 calendar days at the request of the Port, and to complete the survey and provide a plot and quantity calculations in 24 hours and 48 hours respectively.

1.7 PLOTS

A. Cross sections shall be plotted at 25-foot intervals for the echosounder surveys and at 50-foot intervals for the grid surveys. The survey lines for the grid survey shall coincide with the survey lines used for the echosounder surveys.

B. If Contour maps are requested they shall be provided with 1 foot contour intervals.

1.8 QUANTITY CALCULATIONS

A. The surveyor shall have the capability to compute excavation and placement quantities from work performed under this contract. Volume computations shall be generated by using the TIN (Triangulated Irregular Network) computation method, as outlined in the USACE Hydrographic Surveying Manual EM 1110-2-1003, dated January 2002, and any subsequent changes/revisions issued by the USACE. A 5-foot by 5-foot matrix using the average depth of all depths recorded in a cell shall be generated from the edited multi-beam data to perform the TIN volume computations. The surveyor will compute materials quantities to the nearest cubic yard. Tabulated summaries shall be submitted that show volumes dredged and volumes placed within the tolerances provided herein.

1.9 SUBMITTALS

A. The surveyor shall submit the following to the Port Engineer within 7 days of each survey:

1. All survey plans and cross sections shall be plotted in pdf format and submitted electronically unless otherwise noted. Cross sections shall be plotted and scaled to fit one cross section per 11" by 17" sheet. One set of ANSL D-size drawings with the surveyor’s signature and electronic version. The post-placement cross sections shall show both pre-placement and post-placement sections. Two plots are typically required:

    a. One standard dredge plot showing mean soundings

b. One Bar Pilot requested plot showing shoal bias (i.e., keel clearance) soundings

2. Quantity computations: Calculation of material volumes should be presented in excel spreadsheet format.

3. Pre and post dredge final pdfs should be formatted to include the following:

a) The Port border template must be used including any Port stationing in the base map.

b) Both the permit boundary and dredge boundary must be clearly denoted.

c) Key should have Date of Survey, Current USACE Permit Number 2013-00333S, Port Contract No 2776, Episode number, scale and paper size.

d) Volume table

e) Clearly denote if figure is PRE or POST dredge survey

f) Surveyor's stamp and signature

Electronic copies of surveys performed including point files, calculations and a plot of the soundings shall be provided by the surveyor. The electronic point file shall be the same file that the surveyor uses for volume computations. All raw, unedited data, along with all files and associated data used for editing, along with a copy of the survey documentation, updated as necessary, shall be submitted to the Port. All electronic survey data shall contain a string of information in the title that clearly identifies the contents of the data. The string shall uniquely identify the project and time frame of project. The surveyor shall provide a description of any changes that have been made to the originally submitted survey documentation. The surveyor may use web-base secure "Sharepoint" file server systems to transmit survey data files electronically to the Port.

END OF SECTION 35 20 30