

SECTION 02230**DREDGING and DISPOSAL****PART 1 - GENERAL****1.01 DESCRIPTION**

This is a 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. The sites identified in this Contract are for an on-call five-year program and may or may not be accomplished in this Contract depending upon funding and other priority decisions made at the sole discretion of the Port. Dredged material will include both material suitable for unconfined aquatic disposal (SUAD) and material not suitable for unconfined aquatic disposal (NUAD). 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. 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, as needed. 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, Berth 27, Berths 35 East and West, Berths 80 A through D, Islais Creek and Approach, Berths 92 East and West, Berth 94 and Berth 96. Some of these sites may not be dredged as part of this Contract, and other facilities on the San Francisco waterfront may be added.
- 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

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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 Project or Hamilton Wetlands Restoration,
- 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)). Port environmental staff can provide detailed information on the concentrations of PAHs or other chemicals found in the unsuitable material at each site. Chemical concentrations are not anticipated to be considered hazardous under applicable regulatory criteria.
- H. The unsuitable (NUAD) materials shall be disposed of either at the permitted beneficial reuse sites such as Montezuma Wetlands Project or Hamilton Wetlands Restoration, or on land (upland) at a permitted Class III landfill. Alternately, 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 of the alternate site and the proposed re-use.

1.02 RELATED DOCUMENTS

- A. Document 00420 – Description of Bid Items.
- B. Section 02235 – Dredging Survey

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:

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1. Providing third-party pre- and post-dredging surveys and volume calculations
2. Providing sampling and analysis of dredged material for the landfill disposal of said dredged material.
3. Providing heavy lift services of barge-mounted crane.

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.
- B. BLP - Barclays Law Publishers
 1. CCOR - California Code of Regulations
 - a) Title 8 - Industrial Safety Orders, Construction Safety Orders.
- C. BPC - Book Publishing Company
- D. BC -City and County of San Francisco Municipal Code, Building Code, 1999 Edition.
- E. San Francisco Deep Ocean Disposal Site (SF-DODS) Site Management and Monitoring Plan Implementation Manual (EPA, 1998)
- F. 40 Code of Federal Regulations (CFR) 228 dated July 1999
- G. U.S. Army Corps of Engineers Suitability Determinations and Sampling and Analysis Results for Dredged Sediments.
- H. 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 Materials 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.

- 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 Hamilton Wetlands Restoration 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 overdepth tolerance: A specified depth below a project's design depth, from which material is authorized to be dredged. The purposes for an overdepth tolerance are (A) to ensure that the project design depth is fully achieved and (B) 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 overdepth zone.
- H. Permitted depth/permitted dimensions: The "permitted" dimensions typically refer to the overall dredging template (i.e., the design depth and the overdepth tolerance).
- I. Dredging template/prism: Overall permitted dimensions of the dredging project, including allowable overdepth, 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 overdepth 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 overdepth 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 overdepth 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 Overdepth Volume. Difference between the Maximum Pay Volume and Required Dredge Volume.
- P. Non-pay depth/material: That portion of the allowable overdepth, 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 overdepth is authorized, but is not mandatory, to remove.
- Q. No Pay Volume. Volume of dredged material below the Maximum Pay Elevation.

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. 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

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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. Pre-Construction Submittals

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 the documents listed below. The Port's Engineer will review and forward the documents to the U.S. Army Corp of Engineers for approval. No work shall begin prior to the Port'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 predredge survey signed by the licensed third party surveyor and Port

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- 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 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 the Army Corps of Engineers, in accordance with Army Corps 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 on a weekly basis (will not be returned to Contractor).
4. Daily log of dredging operations shall be submitted to Port Engineer 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 reuse or recycling facility, the Contractor shall provide copies of certified weight tickets from the facility to the Port Engineer on a weekly basis.
6. Copy of Citations: Contractor shall notify Port Engineer 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 U.S. Army Corps of Engineers. Report shall be submitted within 10 days of completion of dredging and disposal, or placement of material at Piers 94/96. Report shall be submitted to the Port for review and revised if any comments are made. The final report shall be submitted to the Army Corps of Engineers (USACE), San Francisco Regional Water Quality Control Board (RWQCB), and Bay Conservation and Development Commission (BCDC).

9. 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 Engineer 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 when requested.
- C. The Port inspector 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

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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 otherwise requested by the Contractor and approved by the Port Engineer. If the Port Engineer 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 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.
- G. Contractor is advised that herring-spawning season commences on December 1 of every year and lasts until 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. Typically, the CDFG does not allow dredging at the Port of San Francisco during herring season. Therefore Contractor shall assume that no dredging will be permitted from December 1 until March 1 of each year.

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- H. 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., California Department of Fish and Game, 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 I indicate 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 of dredging without prior written authorization by the Port.
- 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 terminals 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.

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- 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 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 relocation needs (if any) during dredging.
- J. 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, or by the Contractor (Contract Surveyor) as Port requests. The pre-dredge

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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.
- 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 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 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. Copies of the Port's current permits from the Army Corps, BCDC, RWQCB, and State Lands Commission are attached as **Exhibit D, E, F and G.**
- B. Contractor shall notify the Coast Guard of planned dredging operations in sufficient

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time to allow publication in the Local Notice to Mariners, Weekly Supplement.

- C. 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.
- D. Contractor shall notify the U.S. Army Corps of Engineers, RWQCB, BCDC, and the Port when a Dredge Event commences, 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 Robert Lawrence, DMMO Mgr (or alternate), in writing to the U.S. Army Corps of Engineers, Regulatory Branch; San Francisco District; 1455 Market Street; San Francisco, CA 94103-1398. Alternately, notification can be submitted by email to robert.j.lawrence@usace.army.mil, or by fax to (415) 503-6690. If needed, Mr. Lawrence may be contacted via telephone at (415) 503-6808.
- 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 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. To protect rock fill and fender piles, no dredge material shall be removed below the Required Dredge Elevation within 10 feet of any pier face.
- 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 approval via approval of the Dredging

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Operations Manual. 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. Contractor shall not resume operations at that site until directed to do so by the Port Engineer.
- 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.
- L. Air quality

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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 overdepth, as noted on the dredge plans that will be provided to the Contractor by the Port Engineer 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 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 two days prior to the anticipated date for completion of dredging the unsuitable material area. The Contractor may be requested by the Port Engineer 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 for verification of completeness. The Port Engineer 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

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- 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 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 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 associate with a Dredge Event, and is requested by the Port Engineer, Port and Contractor shall agree in writing as a change order prior to the start of grading.

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

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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 Hamilton Wetlands Restoration 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, and Hamilton Wetlands Restoration Project.

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, except that the disposal site shall be at 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 228, as amended July 1999 and July 2000, and the February 1998, 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 WINTER ISLAND

- A. Unsuitable materials requiring disposal at Winter Island shall be transported in accordance with paragraph 3.06, except that disposal shall be at Winter Island. Winter Island is located near Pittsburg, California in Contra Costa County (see plan

sheet no. 18). 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. Contractor shall also furnish material receipts from Winter Island to the Port on a weekly basis each Friday.

- B. Unsuitable materials shall be removed from the scow and placed on Winter Island by clamshell or other approved method.
- C. Materials placed on Winter Island shall not be piled more than six (6) feet high on the levees.
- D. Placement and location of materials shall be established and approved by Winter Island managers.
- E. Winter Island personnel will be responsible for spreading the materials placed on Winter Island by the Contractor.
- F. Contractor shall note that transport and disposal of dredged materials at Winter Island is subject to limited draft that may affect tug and barge operations.

3.09 DEWATERING UNSUITABLE (NUAD) DREDGED MATERIALS AT PIER 94-96 AND UPLAND DISPOSAL

- A. Dredged materials requiring dewatering prior to upland disposal shall be stockpiled at an existing Port dewatering facility at Pier 94-96 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. The Port may also make the material available for others to haul away for beneficial re-use.
- 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.

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- 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:
- 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;
 - Remove and properly dispose of all hay bales and other runoff control measures used in unloading operations;
 - 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 such that dredged materials are physically contained and cannot wash over, under, or through K-rail to the Bay;
 - 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.

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Contractor shall operate trucks only when in use for the work and shall minimize idling time.

- J. Contractor may use part 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 sweeper 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 6) 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

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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 7 and 8) 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, and the plan sheet C-18).
- 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, as shown in the plan sheet C-18.
 - 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, as shown in the plan sheet C-18.
 - 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, as shown in the plan sheet C-18.
- 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 Corps.
- 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". If the Port performs the post-dredge re-survey, the Contractor's payment will be reduced by \$2,000.
- 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 02230

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SECTION 02235**DREDGING SURVEYS AND VOLUME CALCULATIONS****PART 1 GENERAL****1.01 DESCRIPTION**

The Contractor shall provide for the services of an independent surveyor, California licensed and experienced in performing hydrographic surveys to perform dredging related surveys, when requested by the Port. Such survey work shall be performed by a third-party surveyor, and not be commenced prior to the Port's approval of the Contractor's choice of surveyor. These surveys will serve multiple purposes, including, but not limited to:

- A. Determining the boundaries and dredge depths at each proposed dredge site.
- B. Calculating quantities of dredged materials.
- C. Determining whether or not the Contractor has achieved Substantial Completion for each dredge site.
- D. Other uses as determined by the Port Engineer.

1.02 RELATED DOCUMENTS

- A. Section 02230 - Dredging.

1.03 SURVEY REQUIREMENTS AND EQUIPMENT:

- A. Surveyor shall be licensed to practice in the State of California. Survey team members shall each have a minimum of three (3) years experience performing hydrographic surveys
- B. The surveyor shall use Coastal Oceanographic's Hypack™ software, or Port approved equal, and shall provide to the Port both raw and edited ("cleaned") data files of the survey, and an ASCII *.xyz file of the data.
- C. Horizontal position of soundings shall be stated in California State Plane Coordinates, Zone III, North American Datum of 1983 (NAD83), U.S. Survey Foot. Depths shall be stated in terms of Port of San Francisco (Mean Lower Low Water) datum.
- D. The Port Engineer will provide drawings in AutoCAD™ DXF format to the Contractor which shall show schematically the location and layout of all vertical and horizontal control points to be used for the hydrographic survey. Contractor shall, no more than three (3) days after receipt of the drawings, complete the survey and provide to the Port raw data files of the survey, and an ASCII *.xyz file of the data, along with paper

plots. Such plots shall show the relationship of the planned survey lines, or stationing, and soundings to piers, shoreline, and other physical features as delineated on the Port furnished base drawings. When directed by the Port Engineer, Contractor shall, within no more than seven (7) days, complete and provide to the Port the edited ("cleaned") data files, the paper plots, and the volume calculations.

- E. The surveyor shall use an echo sounder to obtain soundings. The analog recording of soundings shall indicate a calibration check (bar check) of the echo sounding at the beginning and end of each analog paper change and at such times as necessary to ensure sounding accuracy. The echo sounder shall have a frequency of 200 kHz, with a 3 or 3.5 degree cone measured at the 6-dB point, unless otherwise approved by the Port Engineer in writing. The top of the return signal trace shall be the point of interpretation of sounding. The bar check shall be taken at identical locations. Soundings shall be based on PORT OF SAN FRANCISCO datum as provided by the Port Engineer to the surveyor.
- F. Hydrographic survey procedures shall conform to Class 1 criteria as set forth in the current edition of the U.S. Army Corps of Engineers Hydrographic Surveying Manual, unless otherwise set forth herein. In the event of a conflict between Port Specifications and Corps of Engineer's Class 1 criteria, the Contract Surveyor will present such conflict(s) to the Port Engineer for resolution. Horizontal location observations shall compensate for standard electronic positioning system (EPS) systematic (calibration) errors, geodetic corrections, and atmospheric variations. Data recordings, annotation, and processing procedures shall be consistent with recognized hydrographic survey standards. Failure to perform and process such surveys in accordance with these standards may result in a rejection and nonpayment for the work performed.
- G. Horizontal fixes shall be continuous and associated with each sounding.
- H. Tidal Control:
 - i. Method 1. – During the hydrographic survey the Contract Surveyor may install an automatic recording tide gauge with water level sensor placed in a location approved by the Port. The tide gauge shall provide a continuous recording of tidal change for every 15-minute interval or each 0.1-foot change, whichever occurs first. Tidal changes shall be recorded in Port of San Francisco Datum, with these changes synchronized in time with cross-section survey time. A printed record of the tidal changes and time correlation shall become part of the Contract Surveyor's survey records. Should the Port decide to exercise this option, payment for such an installation shall be made on a time and expense basis.

or

- ii. Method 2. – In Lieu of Method 1, the Contract Surveyor may submit a manual method of keeping track of tidal changes for approval by the Port Engineer.

- I. Hand soundings, where needed along face of pier, shall be taken using an 8.5 to 10 pound sounding lead with an 8" diameter bottom unless otherwise approved by the Port Engineer. Alternatively, soundings may be taken by echo sounder, subject to periodic check by the above sounding lead or other approved method. Horizontal control will be by electronic instrumentation.

1.04 QUALITY CONTROL

- A. Horizontal and/or vertical control points will be provided by the Port for each berth/site. The location of these points shall be shown on the plotted sounding sheets.
- B. The Port reserves the right to have an inspector present at any point during the performance of the Work either on shore or aboard the sounding vessel. From time to time representatives of other agencies, such as the Corps of Engineers, Port tenants, etc. may also be present. The Port further reserves the right to stop the work at any point if the Work is not being performed in accordance with this specification.

PART 2 PRODUCTS

2.01 HYDROGRAPHIC SURVEY

- A. Final products of a survey shall be field notes, raw data files, edited ("cleaned") data files, electronic drawing files in AutoCAD™ format (version 2002 or earlier), and 11" x 17" or other sizes paper drawings plotted from CAD files. Such drawings shall show depths and 1 foot contours in relationship to the base map furnished by the Port, at a scale of 1 inch = 100 feet (100 scale), unless otherwise directed by the Port Engineer. Numbers representing depths shall be written at a scale to display no less than 0.9" high in a 100 scale plot, and shall spaced as closely as possible without overwriting.
- B. Survey lines shall be run perpendicular to the face of the pier, the berth of which is to be dredged, or to the channel (where applicable) at twenty-five foot (25') maximum intervals, including one line 25 feet landward of the dredge limit, where possible. Such survey lines shall terminate not more than ten feet (10') away from the pier face, nor extend less than fifty feet (50') outside the dredge limit, except where prevented by adjacent piers, in which case, they shall terminate not more than ten feet (10') from such adjacent pier. Surveyed lines shall not vary from planned survey line by more than twelve feet (12') either side of planned line. Additionally, one survey line shall be run parallel to the face of the pier, the berth of which is to be dredged, as close to said pier as safely feasible, but not more than six feet (6') away from the face, and extending the full length of the portion of the pier adjacent to the dredge limit.

- C. Field notes shall indicate the location of each sounding line, the date and the time (hour and minutes) each sounding line was taken, and explanation for any line terminated early. Notes shall also include tidal data, i.e., height of tide (Port of San Francisco Datum), bar checks, time of the tide readings and date and location of the tide gauge. Field notes may be made on electronic media.

2.02 VOLUME CALCULATIONS

- A. Final products of volume calculations shall be the electronic files in Excel 97™ format showing calculated volumes, and paper printouts of such files.
- B. For estimate purpose, volumes of material to be dredged shall be computed from edited survey data, divided for each Dredge Unit (DU). For each DU, total volume shall be sub-divided into Required Dredge Volume and Overdredge Volume.
- C. For payment purpose, volumes of material dredged shall be computed from edited predredge and postdredge surfaces, as measured, and divided for each Dredge Unit (DU). For each DU, total volume shall be sub-divided into Required Dredge Volume, Overdredge Volume, and No Pay Volume. Refer to Document 02230.
- D. Volume calculations shall be done in Land Development Desktop™ software, utilizing the composite DTM surface method, and on a 1 foot grid (preferable) or 5 foot grid (maximum).
- E. Contractor may be further directed by Port's Engineer to use the average end area method to calculate volume. Average end area volume calculations shall use 25 foot (25') maximum length sections; with an Excel spreadsheet showing calculations.
- F. Volume calculations shall be performed according to Project Plan Sheet C-18.

PART 3 EXECUTION

3.01 GENERAL

- A. At the time of Contract award, the Contractor shall provide the Port a qualification statement from at least two (2) surveyors meeting the qualifications listed in 1.02 of this Section. The qualification statement shall include the hourly rates of survey and volume calculation. The Port shall review the qualifications of the proposed surveyor and approve for use on this Contract. If rejected, the Contractor must re-submit until two qualified surveyors are approved.
- B. Upon notification from the Port of a need for survey, the Contractor shall notify the surveyor to meet with the Port and establish a defined scope. The Port and surveyor shall agree on the required number of hours to perform the survey and data processing. No survey work shall begin unless the proposal is accepted and the Port authorizes the surveyor to begin.

- C. All products and recorded data generated by the dredging survey will become property of the Port.

3.02 MEASUREMENT AND PAYMENT

- A. The Port has established this item as a means to provide hydrographic survey services when the Port's own surveyors are not available to perform the work themselves.
- B. The work will be paid for based on the hourly rates submitted by the Contractor and approved by the Port. The actual required number of hours to complete any surveying task will be negotiated between the Port and Contractor.

END OF SECTION 02235