

SECTION 02 32 00.22

BATHYMETRIC SURVEYS

PART 1 GENERAL

1.1 SOIL BORINGS AND GEOTECHNICAL DATA INFORMATION

All available soil boring and geotechnical information has been provided with the reference and construction documents and serve as the basis of the design for the contract repairs.

1.2 BATHYMETRIC SURVEYS

All available information pertaining to the existing water depths along the piers, bulkheads, existing underwater structures, and the locations of missing and damaged piles have been provided with the reference and contract documents.

1.3 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2014) Safety and Health Requirements Manual

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-012 Preconstruction Submittals

Bathymetric Survey Company; G

Underwater Dive Inspection Team; G

SD-06 Test Reports

Underwater Existing Debris and Obstruction Survey; G
Post Construction Underwater Survey; G

SD-03 Product Data

Permits, Certifications, and Licenses
Schedule for Bathymetric Surveys and Inspections; G

1.5 BATHYMETRIC SURVEY SYSTEM DESCRIPTION

In addition to contract requirements for quantity verification, compliance

requirements of the ACOE permit "Water Resource Policies and Authorities POLICY AND PROCEDURAL GUIDANCE FOR PROCESSING REQUESTS TO ALTER US ARMY CORPS OF ENGINEERS CIVIL WORKS PROJECTS PURSUANT TO 33 USC 408" requires assurance that the performance of this project does not result in any additional deposit of debris into the waterways that could become a hazard to navigation or future dredging operations. A pre construction underwater survey will be required to identify existing underwater debris fields conditions, and a post construction survey and report shall be required upon completion of all underwater work to ensure no additional debris has been deposited.

The Government will forward to the responsible agency the final survey and report for contract compliance.

1.5.1 Bathymetric Survey Company

The Contractor shall employ an independent licensed Surveyor and organization with at least 10 years experience specializing in Bathymetric Surveys and underwater data and object identification who shall perform underwater site survey, water depth determinations, identification of debris fields and structures, and provide plot drawing surveys and reports during the performance of this contract.

1.5.2 Horizontal Datum

All positions will be referenced to the North American Datum of 1983 (NAD 83). This datum must be used throughout a survey project for everything that has a geographic position or for which a position is to be determined. In addition, all software used on a survey must contain the correct datum parameters.

1.5.2.1 Sounding Datum

All sounding data will be reduced to Mean Lower Low Water (MLLW). Heights of top of curb will be referenced to Mean High Water (MHW).

1.5.3 Horizontal Position Uncertainty

The Total Horizontal Uncertainty (THU) in position of soundings, at the 95 percent confidence level, will not exceed 10 feet. This accuracy requirement is independent of survey scale.

1.6 SURVEY AND INSPECTION REQUIREMENTS

1.6.1 Underwater Debris and Obstruction Surveys

Side-scan sonar and divers will be required to be employed for these surveys and inspections.

1.6.1.1 Pre Construction Underwater Survey and Inspections

Prior to commencing demolition at a each work site, the contractor shall conduct an above water inspection and survey to identify the location and quantity of all existing piles and those piles that may have been damaged of are now observed to be missing. An underwater survey and inspection shall also be conducted that is to identify the location of the existing piles, any pile stud found above the river bottom, and any exposed or partially buried debris in the defined work areas.

Note: Any timber element encountered with a diameter of 10" or more, found partially or fully embedded or buried, shall be considered a missing pile and identified as a pile stub. Over time these piles may have been displaced or be found at any angle. The exposed length of each one encounter may vary but the exposed length shall be documented.

The contractor shall compare the finding of his above and below water surveys and inspections to that of the contract documents. All existing, damaged, and missing piles reflected on the contract drawings shall be identified in the contractor's survey and inspection reports. All additional piles, not reflected in the contract documents, but found by the contractor shall be identified and delineated from the piles reflected in the contract drawings.

In addition, for areas in which the "prestressed concrete" fender piles and the composite piles for the "Barge bumper" are to be provided, the river bottom shall be probed for debris or broken piles, which may exist below the river bottom surface, that could affect the installation of these fender piles. Locations for prestressed fender piles shall be probed to a minimum depth of 15 feet for broken piles, timbers, debris, or rubble that could affect the installation. Below grade probing, at all other locations is not required.

All additional piles, pile stubs, and debris found during the surveys and inspections shall first be correlated to those "missing" or "damaged" piles identified in the original contract documents, prior to them being classified as "new".

The scaled survey drawing results and written description report shall graphically depicts all existing fender piles and identifies any changes that may have occurred since the award and include any additional piles, pile stubs, and debris found during his underwater surveys and inspection. Included on the drawings will the relationship of all items found to the locations and position to existing piles identified in the contract documents sand to those piles identified in the contract to be provided. The report shall delineate those items which are required to be removed and those that would not affect the pile installation that are not already reflected in the contract drawings. All items in the original contract documents are required to be removed and disposed unless those identified as "missing" can not be found. The Contracting Officer will review the submission and identify those additional items, previously not included in the contract, that may be included for removal prior to beginning any demolition.

1.6.1.2 Post Construction Underwater Survey and Inspections

Upon completion of all work at each work site, a post construction inspection survey and inspection shall be required to ensure no additional debris has been deposited due to the demolition and or construction. Additional debris, not reflected on the preconstruction report, and determined to be material from this contract, shall be required to be removed by the contractor at no additional cost to the government.

A scaled drawings and a descriptive report for all debris found during his inspection shall be provided to the Contracting Officer for his review to assure that all required items have been demolished and for permit compliance. The contractor shall not relocate to the next worksite until the Contracting Officer has approved of the post construction survey results.

1.6.2 Side Scan Sonar System Requirements

Provide a side scan sonar system shall consisted of a digital, dual-frequency, towfish interfaced to the topside data-logging computer with acquisition software. Deploy the towfish and traversed all accessible areas along the bulkhead work sites out to 25 feet from the face of the bulkheads and the bathymetric coverage of the vertical bulkhead face shall be within 1.5 feet of the water surface. In areas in which the marine mattresses will be provided, extend the subsurface survey out to 75 feet from the face of the bulkhead.

The surveys will be conducted with a minimum 400-kHz multi-beam side scan sonar. Minimum data density not to average less than 300 soundings per square foot along the vertical bulkhead surface and 90-100 soundings per square along the foot overall.

1.6.2.1 Processing

Utilize government compatible software to complete post-processing. Corrected for towfish altitude during data processing and edit navigation data for errant position fixes and velocity errors. Analyze each line for debris, piling, vegetation, stone deposits, marine mattress location, and any incidental object or obstruction that could affect the work.

1.6.2.2 Survey Crew and Equipment

The Lead Member of the Survey Crew shall have a minimum of (10) years experience with underwater inspection. The personnel make up of the crew shall comply with EM 385-1-1, OSHA, and all contract and local requirements for conduction their operations. The lead member must be thoroughly familiar with the design plans and specifications to sufficiently understand the engineering aspects of the underwater construction and to be able to recognize and document potential problem areas such as improperly constructed or defective areas.

Provide all necessary equipment to provide the surveys and conduct surveillance and inspection services, including survey equipment, survey boat, and communication equipment. Diver(s) must be equipped to maintain two-way communication with QC and government personnel during all operations.

The Survey Crew shall be an independent third party hired directly by the Prime Contractor and approved by the Contracting Officer and shall have no involvement with the design, preparation of Contract, or installation of the work.

1.6.3 Underwater Dive Inspection Team

The Dive Team employed to perform the underwater surveys, inspections, and work progress surveillance for the Contractor must have current commercial diver's license, with a minimum of ten (10) years experience with underwater inspection. The personnel make up of the team shall comply with EM 385-1-1, OSHA and local requirements for Contract diving operations. The lead diver must be thoroughly familiar with the design plans and specifications to sufficiently understand the engineering aspects of the underwater construction and to be able to recognize and document potential problem areas such as improperly constructed or defective areas.

Provide all necessary equipment to conduct surveys, inspections, and surveillance, including diver's equipment, dive boat, communication equipment, and photographic/video equipment. Diver(s) must be equipped to maintain two-way communication with QC personnel during diving operations and the boat personnel my maintain contract with Port Operations.

The Dive Team shall be an independent third party hired directly by the Prime Contractor and approved by the Contracting Officer and have no involvement with the design, preparation of Contract, or installation of the work. The Dive Team member(s) may also perform the same functions required for the underwater QC if they meet those requirements.

1.7 SEQUENCING AND SCHEDULING

1.7.1 Schedule for Bathymetric Surveys and Inspections

Prior to starting work, submit a plan for each survey to be preformed and include a safety plan. The plan shall include, but shall not be limited to, the proposed methods for each survey and include a description of the survey equipment and watercraft that will be used, a listing of any subcontractors to include a description of how the subcontractors will be used and a description of all methods and procedures that will be utilized to insure a safe operation and to protect the environment. No work shall be performed until this plan has been approved and no deviation from the approved plan will be permitted without prior approval by the Contracting Officer. The locations and assumed methods for obtaining data are listed in the following schedule:

SCHEDULE OF BATHYMETRIC SURVEYS			
Pier 14 & Pier 04	side-scan sonar/dive team	For existing debris and permit compliance provide required survey and inspections along the perimeter of each pier outward into the waterways and approximately 5 feet beneath the perimeter of each pier. Provide additional investigation at the prestressed pile locations as defined in the "Pre Construction Underwater Survey and Inspections".	Pre construction and post construction condition surveys for underwater debris and Permit Compliance and prestressed pile installation

SCHEDULE OF BATHYMETRIC SURVEYS			
CEP-111 Bulkhead & Q-8 Bulkheads	side-scan sonar/diver team	For existing debris and permit compliance provide required survey and inspections along the perimeter of each bulkhead outward into the waterways. Provide additional investigation at the "barge bumper" pile locations with similar requirements for the prestressed piles as defined in the "Pre Construction Underwater Survey and Inspections".	Pre construction and post construction condition surveys for underwater debris and Permit Compliance and composite pile installation

1.8 ORDER OF WORK AND PERFORMANCE OF SURVEYS

The order in which the surveys will be accomplished will be determined after contract award and based upon the contractor's approved construction schedule.

1.9 QUALITY ASSURANCE

Comply with all Federal, State and local laws, regulations and ordinances relating to the performance of this work. Procure all required permits, certifications and licenses required by Federal, State, and local law for the execution of this work. Submit copies of all permits, certifications, and licenses prior to starting work. This submittal shall also include a statement of the prior experience, in the type of work described in these specifications, of the person or persons designated to perform the work specified herein.

1.10 PROJECT/SITE CONDITIONS

1.10.1 Environmental Requirements

In order to prevent and to provide for abatement and control of any environmental pollution arising from Contractor activities in the performance of this contract, the Contractor and its subcontractors shall comply with all applicable Federal, State, and local laws, regulations, and ordinances concerning environmental pollution control and abatement.

- a. The Contractor is responsible for keeping informed of all updates and changes in all applicable laws, regulations, and ordinances.
- b. Do not pollute waterways or groundwater with fluids, fuels, oils,

bitumens, calcium chloride, insecticides, herbicides, or other materials that may be harmful to the environment.

PART 2 PRODUCTS

2.1 INSPECTION REPORTS AND BATHYMETRIC SURVEYS

2.1.1 Survey Result Drawings, Findings, and Reports

Submit complete and legible copies of all surveys and reports for each preformed survey or inspection to the Contracting Officer within 5 working days of the completions of the work. Surveys and reports shall be signed by the organization who preformed the work.

The information provide with the survey and inspection reports shall reflect all aspects of underwater conditions that pertain to the construction.

Post Construction and Post Underwater Debris Verification Surveys and Report shall be submitted and approved by the Contracting Officer prior to moving to the next Work Quadrant or work area.

PART 3 EXECUTION

Not Used.

-- End of Section --