

CHAPTER 8 - DREDGING

8-1. Purpose. This chapter establishes guidance governing accomplishment of dredging at USACE projects.

8-2. Applicability. This chapter applies to all USACE commands performing and/or managing dredging. MSC commanders are authorized to develop specific written guidance to supplement ER 1130-2-520, Chapter 8, Dredging, as necessary, provided, they are fully consistent with the policies in that regulation and guidance in this pamphlet.

8-3. General. Subjects covered in this chapter include the performance of dredging contracts, navigation channel conditions, CERF, CEMDC, small business dredging program, inspection of dredging operations, and plant operations reports.

8-4. Definitions. An explanation of dredging terms applicable to this regulation is contained in the USACE Dredging Desk Reference.

8-5. Performance of Dredging.

a. Project Dimensions: A sectional view of the required prism and technology indicating project dimensions and quantity of material considerations are shown in Figure G-1, Appendix G, ER 1110-2-1302. Detailed descriptions of definitions used for the required pay prism are also provided in Appendix G.

(1) Authorized navigation projects will be maintained to full constructed channel dimensions when feasible and justified. See Figure #1 in Appendix Y.

(2) Allowable overdepth dredging (depth and/or width) outside the required prism is permitted to allow for inaccuracies in the dredging process. Allowable overdepth in excess of two feet or the use of zero allowable overdepth requires the prior approval of the MSC commander. See Figure #2 in Appendix Y.

(3) Written justification for advanced maintenance dredging is required. As a minimum, the justification for advance maintenance should describe historical shoaling rates, frequency of dredging, and cost analysis. Advance maintenance shall not be used to provide navigation channel dimensions for vessels that exceed the design limitations of the project. Before using advance maintenance, the integrity of structures adjacent to the channel and the possibility of the existence of material in the advance maintenance portion of the channel as significantly different from maintenance material should be reviewed. See Figure #3 in Appendix Y.

(4) Unless otherwise provided in the project authorization documents, depths and widths will be construed as actual dredging limits (exclusive of allowable overdepth and advanced maintenance dredging) and not the draft and width limits of any vessel to be accommodated.

b. Side Slopes. Side slopes may be dredged by:

(1) Dredging along the slope of the required dimension.

(2) Dredging an equivalent box cut at the base of the side slope for the required dimension. Material removed from the box cut is payable up to that amount of material above the side slope line. Before using a box cut, the integrity of structures adjacent to the channel should be reviewed. See Figure #2 in Appendix Y.

8-6. Dredging Contracts.

a. Development of Contract Documents. The development of contract documents is applicable to new work dredging, maintenance dredging, and dredging for other purposes such as beach nourishment, dike and levee construction, and other beneficial uses.

(1) Team members responsible for preparation of construction contracts for dredging shall ensure that plans and specifications accurately describe the work to be accomplished, the conditions existing at the work site, the required dredging quantities for unit price contracts, the required prism, allowable over depth, the limits of the work area, and any environmental considerations at the work site.

(2) District commanders shall establish procedures which ensure that appropriate technical and contract administration personnel with dredging experience (both office and field) are included in the constructibility, biddability, and operability reviews of all dredging plans and specifications.

(3) Terminology and standard sections used in contract documents shall be consistent with standard definitions and figures depicted herein.

(4) When zero allowable over depth is specified, the contract documents shall clearly indicate that all material from within the required dredging prism must be removed. The contractor may dredge below the required depth to ensure that all material is removed from within the required prism, however, the contract documents will make clear that no payment will be made for yardage removed below the required prism.

(5) New work dredging plans and specifications, where hard materials exist (e.g., dense clays, rock, or manmade materials), shall have a required depth, required overdepth, required advance maintenance and allowable overdepth, in order to ensure future maintenance of the project to the authorized dimensions.

b. Dredging Contract Methods. Unit price construction contracts are the preferred method of accomplishing dredging work within the Corps of Engineers.

(1) Unit Price Contracts - Volume Measure. To ensure that volume measure unit price contracts are effectively used, the District Commander will:

(a) define the scope of work and determine the required and allowable overdepth dredging quantities;

(b) define bid quantities to reflect the total required and allowable overdepth quantities;

(c) perform payment surveys in an accurate and timely manner;

(d) assure specifications are written to allow the use of all types of dredge plant capable of efficiently, effectively, and safely performing the work in an environmentally sound manner; and

(e) assure that the surveys specified in the contract are sufficient to verify that the contract requirements are met;

(2) Unit Price Contracts - Area Measure. To ensure that area measure unit price contracts are effectively used, the District Commander will:

(a) define the scope of work and determine the depth of the cut;

(b) perform payment surveys in an accurate and timely manner;

(c) assure specifications are written to allow the use of all types of dredge plant capable of efficiently, effectively, and safely performing the work in an environmentally sound manner;

(d) assure that the surveys specified in the contract are sufficient to verify that the contract requirements are met; and

(e) determine that the area to be dredged is the overriding cost factor rather than the depth of cut, but the required channel depth is achieved.

(3) Unit Price Contracts - Time Measure. Leased equipment dredging contracts may be used when the quantities of material to be dredged cannot be accurately estimated (e.g., areas of active or erratic shoaling, where shoaling cannot be determined or is difficult to predict prior to bid opening, or where rapidly fluctuating river stages exist), and accurate and timely surveys are difficult to accomplish. To ensure that leased equipment dredging contracts are effectively used, the district commander will:

(a) assure specifications are written to require adequate plant and personnel to complete contract requirements in a timely, safe, and environmentally sound manner; and

(b) require quality assurance representatives on board the leased dredge whenever the dredge is working for pay.

(4) Unit Price Contracts (Other) - Scow or Bin Measure. Scow or bin measure contracts may be used when the contracting officer determines that a contractor will be at risk of receiving insufficient credit for work performed due to rapid shoaling and/or significant changes in bottom conditions. To ensure that scow or bin measure contracts are effectively used, the District Commander will:

(a) provide quality assurance representatives on board the vessel at all times, or provide a method to determine that the dredging process is being performed in accordance with the specifications;

(b) assure specifications describe the relationship between the quantity of in place material and the measurement of the material. Typically, the relationship might include bulking factor or insitu density;

(c) assure the necessary drawings and/or measurements of vessels used to haul dredged material are available to provide a basis for quantity determination of work accomplished;

(d) assure the specifications provide the dredging depth (required + allowable), and a computation method based on the after dredging survey to determine excess dredging; and

(e) assure specifications are written in order to complete contract requirements in a safe, timely, and environmentally sound manner.

(5) Firm Fixed Price - Lump Sum Contracts. The firm fixed price - lump sum method of payment for dredging contracts may be used primarily for maintenance work, when the contracting officer determines that the rate of shoaling in the navigation channel is slow and/or predictable over the length of the contract. The District Commander will consider the following guidelines to assure that a lump-sum contract is effectively used:

(a) acceptance surveys are sufficient to assure that all material is removed from the required prism and that all contractual requirements are met;

(b) assure specifications are written to allow users of all types of dredge plant capable of efficiently, effectively, and safely performing the work in an environmentally sound manner;

(c) define the necessary parameters in the contract specifications so that prospective bidders can prepare reasonable bids. (District commanders will make available, and contract specifications shall indicate which information is available to prospective bidders.); and

(d) justify the use of firm fixed price - lump sum contracts. (The justification and use of firm fixed price - lump sum contracts will be approved by HQUSACE.)

8-7. Navigation Channel Conditions.

a. Hydrographic Surveys (For Dredging Projects). The performance of hydrographic surveys in support of dredging shall be in accordance with EM 1110-2-1003, Hydrographic Surveying.

(1) Frequency of Surveys.

(a) Project Condition and Reconnaissance Surveys. Active waterways and harbor projects shall be surveyed at a frequency sufficient to maintain adequate information on available project dimensions. Either project condition surveys (Class 2) or more economical reconnaissance surveys (Class 3) may be performed, depending on project requirements. Unless unique circumstances are present, project condition survey schedules should not be more frequent than the maintenance dredging cycle for a given project. General reconnaissance surveys should be performed each year on projects which are dredged at infrequent periods (i.e., less than once per year).

(b) Dredging Measurement, Payment and Acceptance Surveys. Contract hydrographic dredging surveys will be conducted, as needed, during the contract period to ensure that the work is in accordance with the contract plans and specifications.

(2) Execution of Dredging Measurement, Payment, & Acceptance Surveys. The clause at FAR 52.236-16 may be used for dredging or underwater material placement when payment is to be based on quantity surveys. Under that clause, quantity surveys may be performed either by government in-house personnel or by independent contractors. Before approving use of the Alternate I clause, MSC commanders should require district commands to provide sufficient rationale and justification. Hydrographic surveys performed for dredging measurement, payment, and acceptance purposes shall be performed using the following selection progression:

(a) USACE Forces: Government-performed surveys using qualified in-house (hired labor) hydrographic survey forces.

(b) Architect-Engineer (A-E) Contractor Forces: If government forces are not available, then qualified, independent A-E hydrographic survey contractor forces shall be used. A-E contractors shall be selected using Brook's Act (PL 92-582) qualification-based selection procedures.

(c) Dredge Contractor's Forces: If neither Government nor independent A-E survey forces are available, then the use of the dredging contractor's forces may be used, provided that a qualified government representative is on board the contractor's vessel during the surveying operation.

(3) Survey Time Constraints. Plans and specifications surveys will be performed as close to the advertisement date as possible, fully considering the historical shoaling conditions of the project. Before dredging surveys shall be completed as close to the start of dredging as possible, but generally within two (2) weeks prior to commencement of work in the reach to be dredged. After Dredging and/or Final Acceptance surveys shall be completed as close to the end of dredging an acceptance section as possible, but generally within five (5) days after completion of work in the applicable acceptance section or channel reach.

(4) Disposition of Survey Data. Survey data shall be reduced, edited, and plotted as expeditiously as possible, generally within two (2) days after completion of the survey. Government survey data shall be made available to the contractor or a designated representative in accordance with the plans and specifications before requiring the contractor to dredge any portion of the work. If requested, the results of government dredging surveys pursuant to the contract paragraph entitled "Final Examination and Acceptance" shall be furnished to the contractor or an authorized representative after the acceptance section(s) is surveyed. Final Acceptance surveys will be verified by the contracting officer and furnished to the contractor in writing.

(5) Inspection of Dredging Surveys.

(a) When quantity surveys for dredging are performed by the dredging contractor, the surveys shall be inspected and monitored by a qualified government representative on board the contractor's vessel. The government representative shall verify that all survey equipment is properly calibrated at all times and that surveying techniques and equipment conform to the contract specifications and EM 1110-2-1003. When dredging surveys are performed by the government or its independent A-E contractor, the dredging contractor shall have the option to inspect and monitor the surveys in progress.

(b) Survey contract specifications shall include requirements for electronic positioning and depth finding equipment, a safe and suitable vessel meeting U. S. Coast Guard requirements, and personnel staffing and qualifications.

b. Channel Sweep Surveys. Sweep surveys shall be performed as necessary to locate underwater obstructions within the navigation channel limits or when dredging is performed in hard material (e.g., dense clays, rock, or manmade materials). Equipment capable of detecting obstructions will be used to ensure that the project is clear for navigation. Mechanical sweeps may be used for all bottom conditions and shall consist of a drag capable of being moved for complete coverage of the dredged area. Acoustic sweep systems (multiple transducers on booms or interferometric, multi-beam swath/sweep transducer systems) may be used when appropriately designed to provide accurate and full coverage of bottom conditions.

c. Channel Clearing. ER 1105-2-100 provides the policy and procedure to perform emergency snagging and clearing work to benefit navigation, under authority of Section 3 of the River and Harbor Act approved 2 March 1945. For routine maintenance, the project authorization document provides the authority for snagging and clearing for navigation. ER 1130-2-520, Chapter 4, Removal of Wrecks and Other Obstructions provides the policy for removal of wrecks and other obstructions to navigation.

8-8. Corps of Engineers Reserve Fleet. Procedures for assuring response of private industry hopper dredges to support emergency and national defense dredging requirements are provided in Appendix Z of this pamphlet.

a. The CERF program is used to augment the Corps Minimum Fleet hopper dredges, and when it is not feasible or practical to use routine contractual procedures for hopper dredges.

b. All hopper dredging invitation for bids (IFB) shall contain the appropriate instructions and/or clauses for the CERF.

c. The Contracting Officer (CO) for the district making the CERF request shall send a request with justification concurrently to its commanding MSC and HQUSACE (CECW-OD). If approved, the ordering CO will place an order against the Basic Ordering Agreement (BOA). This will establish a contract with the owner of the CERF dredge. Progress payments will be made in accordance with the terms of the BOA.

8-9. Corps of Engineers Minimum Dredge Fleet.

a. The Corps of Engineers Minimum Fleet vessels are national assets available at all times to respond to emergency and national defense needs, both CONUS and OCONUS, as determined and directed by the Chief of Engineers and/or the Director of Civil Works.

b. MSC commanders are responsible for ensuring that Minimum Fleet vessels are maintained in a fully operational and ready state, sufficient to respond to emergency and national defense needs both in CONUS and OCONUS, at all times.

c. MSC commanders will notify HQUSACE (CECW-OD) immediately of any and all instances where a Minimum Fleet vessel is expected to be inoperable for more than 72 hours or is involved in a reportable accident of any kind.

d. In accordance with PL 95-269, the U.S. Army Corps of Engineers minimum dredge fleet is comprised of the following vessels:

<u>Dredge Name</u>	<u>Type</u>	<u>Owning District</u>
ESSAYONS	Hopper	Portland
MCFARLAND	Hopper	Philadelphia
WHEELER	Hopper	New Orleans
YAQUINA	Hopper	Portland
HURLEY	Dustpan	Memphis
JADWIN	Dustpan	Vicksburg
POTTER	Dustpan	St. Louis
THOMPSON	Cutterhead	St. Paul
CURRITUCK	Special Purpose	Wilmington
FRY	Sidcaster	Wilmington
MERRITT	Sidcaster	Wilmington
SCHWEIZER	Sidcaster	Wilmington

8-10. Small Business Dredging Program. In support of Section 722 of PL 100-656, MSC and district commanders will:

- a. Become fully informed of the requirements and goals of the Small Business Dredging program, as well as the Small and Disadvantaged Business program;
- b. Actively support these programs on a regional level;
- c. Ensure coordination with the local Corps small business specialist for acquisition planning of dredge contracts to comply with implementing procedures.

8-11. Inspection of Dredging Operations.

- a. Accurate and complete information and data shall be recorded in official logs and reports covering all significant actions or incidents occurring during work progress. Particular attention shall be given to occurrences which could lead to future claims by or against the United States Government.
- b. The level of inspection required for dredging operations will be determined by the District Commander. On leased dredges operating at an hourly rental rate, full-time inspection and careful logging of various pay-time items shall also be performed.

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c. The inspector shall have knowledge of the dredging operation, hydrographic surveying methods, and safety requirements applicable to the work. Use of the Dredging Inspectors Guide, EP 1130-2-310, and the Safety and Health Requirements Manual, EM 385-1-1, is required. The inspector must be trained in preparing and submitting all dredging reports and any records to be maintained.

d. CECW-OD personnel shall conduct periodic field inspections of each MSC and district command to ensure that dredging operations are conducted in accordance with the requirements in this regulation. Inspections of dredging operations shall also be made by MSC personnel as necessary to ensure that policies and guidelines are carried out in a consistent, timely, and effective manner.

8-12. Plant Operations Reports (Reports Control Symbol ENG CW-O-13).

a. For dredging work performed by contract, district commands shall prepare and submit plant operational reports through their MSC to CECW-OD.

b. For dredging work performed by hired labor, reporting requirements are described in ER 1130-2-500, Chapter 7, Subchapter 3, Inspection, Operation, Maintenance, and Repair of Floating Plant.

c. The Dredging Information System is currently used as a central database containing all Corps performed (in-house) and contracted dredging contracts. Each district has the responsibility for entering and maintaining their district data and monthly transmitting a file to the central database in the Navigation Data Center.