

PART 1 - GENERAL

1.1 DESCRIPTION

- .1 This Section specifies the general requirements and execution for dredging, including the removal and disposal of dredged materials.
- .2 The dredging limits are as shown on the drawings.

1.2 RELATED SECTIONS

- .1 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Section 31 53 13 - Timber Cribwork.
- .3 Section 31 36 19 – Rock Mattress.

1.3 DEFINITIONS

- .1 Dredging: excavating, transporting and disposing of underwater materials.
- .2 Class “A” material: solid rock requiring drilling and blasting to loosen, and boulders or rock fragments of individual volumes 1.5 m³ or more. No Class “A” material shall be removed.
- .3 Class “B” material: loose or shale rock, silt, sand, quick sand, mud, shingle, gravel, clay, sand, gumbo, boulders, hardpan and debris of individual volumes less than 1.5 m³.
- .4 Obstructions: material other than Class “A”, having individual volumes of 1.5 m³ or more.
- .5 CMPM: cubic metres place measurement. SQM: area in square metres projected horizontal. CMSM: cubic meters scow measurement.
- .6 Debris: pieces of wood, wire rope, scrap steel, pieces of concrete and/or other waste materials.
- .7 Grade: plane above which material is to be dredged.
- .8 Estimated quantity:
 - .1 Volume of material calculated to be above grade and within specified side slopes unless otherwise specified.
 - .2 Areas in square metres of material calculated horizontally to exist above grade and within dredge limits, unless otherwise specified.

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1.3 DEFINITIONS
(CONT'D)

- .9 Side slope: inclined surface or plane from subgrade at side limit of dredging area to intersect original ground line outside of side limit and to be expressed as ratio of horizontal to vertical.
- .10 Chart Datum: permanently established plane from which soundings or tide heights are referenced, usually Lowest Normal Tide (LNT).
- .11 Coordinates:
 - .1 U.T.M.: universal transverse mercator projection.
 - .2 M.T.M.: modified transverse mercator projection.
 - .3 U.T.M. or M.T.M. Coordinates: plane rectangular coordinates used in grid system in which grid network is applied to U.T.M. or M.T.M. projection. Horizontal control information as indicated.
- .12 Minimum Mode: mode of operation of hydrographic survey equipment where minimum sounding over length of travel between position updates will be retained in memory. Soundings taken in this mode may be shallower than actual bottom elevations due to variations in water depths due to wave action.
- .13 Matrix Block: each dredge area is presented as number of 1.2 x 3.0 m long blocks. Dependent on position of sounding, block may have 0 to 4 soundings contained within it.
- .14 Least of Minimum Plan: hydrographic survey plan in which least sounding in grouping of matrix blocks is plotted.
- .15 Instanteous Mode: mode of operation of hydrographic survey equipment where only sounding observed at predetermined distance interval is retained in memory.
- .16 Average of Instanteous Plan: hydrographic survey plan in which average sounding in appropriate grouping of matrix blocks is plotted.
- .17 Lowest Normal Tide (LNT): plane so low that tide will seldom fall below it.
- .18 Cleared Area: area of dredging accepted as achieving the required grade and verified by a PWGSC survey.

1.4 REGULATORY REQUIREMENTS

- .1 There are strict environmental procedures that must be followed during the Work.

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**1.4 REGULATORY REQUIREMENTS
(CONT'D)**

- .2 Comply with municipal, provincial and national codes and regulations relating to project.
- .3 Mark floating equipment with lights in accordance with the provisions of the Canada Shipping Act Collision Regulations and Notices to Mariners.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Contaminated sediments must be disposed of as required by Authorities having jurisdiction.
- .3 Metals, wood and recyclable materials removed during the dredging activities must be diverted to appropriate recycling facilities.

1.6 SCHEDULING

- .1 Submit to Departmental Representative, within 2 weeks after acceptance of bid, schedule of work including time periods during which each operation involved in Work will be undertaken. At time of submission of schedule, meet with Departmental Representative to review schedule.
- .2 Adhere to schedule and take immediate action to correct any slippage by effectively altering existing dredging operations or mobilizing other equipment. Notify Departmental Representative of corrective action to be taken.

1.7 LOCATION

- .1 Work comprises dredging of areas as indicated on the drawings.

1.8 INTERFERENCE TO NAVIGATION

- .1 Be familiar with vessel movements and fishery activities in area affected by dredging operations. Plan and execute Work in manner that will not interfere with fishing operations, marine operations and construction activities at wharf site, or access to wharves by land or water.

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1.8 INTERFERENCE TO NAVIGATION
(CONT'D)

- .2 Departmental Representative will not be responsible for loss of time, equipment, material or any other cost related to interference with moored vessels in harbour or due to other Contractor's operations.
- .3 Keep the Marine Communications and Traffic Services' Centre, Fisheries and Oceans Canada, informed of dredging operations in order that necessary Notices to Mariners will be issued.

1.9 DATUM, WATER GAUGES AND TARGETS

- .1 Elevations used in this specification and contract drawings are in metres referred to Canadian Hydrographic Services Survey datum.
- .2 Areas to be dredged are to be referenced to vertical bench marks for each location of dredging as indicated.

1.10 FLOATING PLANT

- .1 Dredges or other floating plants to be employed on this Work, to be of Canadian registry, make or manufacture, or, must receive certificate of qualification from Industry Canada, Aerospace, Defence and Marine Branch and this certificate to accompany bid submission.
- .2 Requests for certification in format of form PWGSC-TPSGC 2843 (06/2007) attached to the Bid and Acceptance Form to be directed to Mr. Emile Rochon, Aerospace, Defence and Marine Branch, Industry Canada, CD Howe Building - Room 733C, 235 Queen Street, Ottawa, Ontario, K1A 0H5, and to be received there not less than 14 days prior to bid closing.

1.11 INSPECTION OF SITE

- .1 Contractor to visit site of Work and become thoroughly familiar with extent and nature of Work and conditions affecting Work before bidding.
- .2 The Contractor will be responsible for making his own interpretation of soil conditions at any location, other than borehole locations. Borehole descriptions shown on the logs are only descriptive of conditions at locations described by the boreholes themselves.

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**1.11 INSPECTION OF SITE
(CONT'D)**

- .3 The Contractor shall take the necessary steps to become fully familiar with potential inclement weather conditions in this area.

1.12 SITE INFORMATION

- .1 Relevant geotechnical information logs are provided on the drawings. Additional information pertaining to sub-surface conditions may be available by contacting the contracting officer for viewing by appointment.
- .2 Results of most recent soundings are included on the drawings. This data will be used for all calculations for quantity purposes. If the contractor wishes to perform own survey, a written notice must be submitted to the Departmental Representative (at least 7 days notice) so PWGSC can verify the sounding survey before the commencement of any work.
- .3 Results of prior soundings and geotechnical investigations are made available for bidding purposes only. It should be noted that this information may differ from site condition. Take this into consideration when submitting bid.
- .4 Take necessary steps to become fully familiar with potential inclement weather and sea conditions in this area.

1.13 SURVEY REQUIREMENTS

- .1 Provide, at own expense, survey vessel, equipment and crew as required to set up and maintain control for location of dredge limits and to sound areas both immediately after demolition, prior to dredging, and after dredging to verify grade depths in all areas to receive rock mattress material. Areas are to be sounded at a minimum 2 m x 2 m UTM grid to approval of Departmental Representative.

1.14 SURVEYS AND ACCEPTANCE OF WORK

- .1 After acceptance of bid, Contractor has 14 days to accept sounding survey in contract.
- .2 No area will be dredged prior to Departmental Representative and Contractor's mutual acceptance of pre-design survey for that area.

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**1.14 SURVEYS AND ACCEPTANCE OF WORK
(CONT'D)**

- .3 Post-dredge survey will be undertaken by Departmental Representative upon completion of dredging. Survey will confirm if dredging is completed as specified and whether area can be considered cleared area.
- .4 Contractor to re-dredge as necessary to remove all material within dredge areas which is found to be above grade.
- .5 One additional survey will be undertaken at Canada's cost, for those areas not meeting acceptance criteria for dredging. All additional surveys required to clear areas will be undertaken by the Departmental Representative at Contractor's cost.
- .6 The Contractor shall dredge the existing loose/soft silt and sand layer down to hard bottom elevation, indicated on the borehole logs as the dense sand and gravel layer. This will also require dredging of the existing rock fill, which was placed for the base of a portion of the existing stem cribwork as shown on the existing wharf sections. All rock fill included within the extents of the dredging limits for the new wharf structure to be completely dredged and removed. Given the fact that the existing wharf structure has been in place for over 30 years some of the underlying soft layer may have consolidated over this period and hard bottom may be achieved slightly above the dense layer elevations shown on the borehole logs. As a result, if the Contractor determines that hard bottom is achieved prior to the dense layer elevation shown, the Contractor shall demonstrate through use of dredging equipment or other means, that sufficient material has been removed to ensure rock mattress material will come to rest on hard bottom. Once the Contractor has determined that hard bottom has been achieved through dredging equipment, the Contractor shall thoroughly probe the area in a minimum 1.0 m x 1.0 m grid to confirm that all loose and soft unsound soils have been removed to hard bottom. All probing activities to be completed by divers using 15 mm ø x 2000 mm long steel rod driven with a 2.5 kg hammer. Unless otherwise directed by the Departmental Representative, hard bottom is to be considered to be achieved when the probe cannot penetrate more than 400 mm into the underlying soils, within the footprint of the area to receive rock mattress. All work to be overseen by the onsite inspector. If the probe penetrations exceed 400 mm, than the Contractor shall be responsible to continue dredging to a depth which hard bottom is reached and re-probe to achieve the requirements noted above. The Contractor and the Departmental Representative shall agree on site as to when the dredge depths required to reach hard bottom are met.

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1.15 MEASUREMENT FOR PAYMENT

- .1 Dredging: Dredging of Class “B” materials (below L.N.T.) will be measured in cubic metres, in-place measurement [CMPM], determined from existing seabed elevation established from the current sounding survey, and the Contractor’s sounding survey completed after demolition, down to bedrock or hard bottom and limits specified on the drawings. Quantities will be determined from a sounding survey performed by the PWGSC Survey Crew after dredging survey is completed by using electronic sounding and DGPS positioning equipment. The Departmental Representative will verify that the Contractor has performed dredging down to bedrock or hard bottom. No payment will be made for over-dredging. PWGSC will conduct an interim and final survey. The Contractor will formally request at least seven (7) days in advance that the final after-dredging survey be performed upon completion of dredging. The timing of the survey may be dependent on weather and other circumstances. If the survey and inspection shows that all material has not been removed, the Contractor is to re-dredge to bedrock or hard bottom. The Contractor will perform a sounding survey, using a method approved by the Departmental Representative to verify that the specified dredge depth has been obtained. The Departmental Representative will then perform a third survey for final verification of dredge depth. This third sounding survey and any subsequent surveys will be at the cost of the Contractor.
- .2 Dredge limit slopes shown for measurement for payment purposes only. Contractor to excavate/dredge in such a manner as to ensure stability of slopes prior to and during crib construction. The Contractor is cautioned to make their own assessment of volume of material that may have to be removed outside the pay limits shown on the drawings, as there will be no additional payment for dredging outside the pay limits on the drawings.
- .3 Rock fill required to compensate for excessive removal of material will not be measured.
- .4 All operations in connection with the field positioning of dredging equipment will be considered incidental to the work and will not be measured separately for payment.
- .5 There will be no additional payment for delays incurred during fishing seasons. Contractor should contact the Harbour Authority to determine schedule of operations.
- .6 There will be no additional payment for the Contractor’s survey vessel, equipment and crew, diving services, or probing activities.
- .7 There will be no additional payment for delays caused by vessel traffic.

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1.15 MEASUREMENT FOR PAYMENT
(CONT'D)

- .8 Payment will include disposal of dredge material, using water tight boxes at locations specified or as directed by the Departmental Representative.
- .9 There will be no additional payment for down time.
- .10 The contractor will be responsible for levelling and cleaning up of the disposal site after all the material has been disposed and there will be no additional payment.
- .11 There will be no additional payment for mobilization and demobilization of dredging equipment.
- .12 Contractor to obtain and supply Departmental Representative with all applicable approvals for proposed dredge material disposal site prior to starting any dredging.
- .13 Payment will include disposal of dredge material to appropriate soil disposal facility as approved by the Departmental Representative.
- .14 Removal of infilling material will not be measured for payment.
- .15 Any dredged material removed during demolition and removal of the existing wharf structure will not be measured for payment.

PART 2 - PRODUCTS

2.1 DREDGING EQUIPMENT

- .1 Contractor to determine required equipment necessary to dredge material specified and to dispose of dredged material to an approved landfill site.

PART 3 - EXECUTION

3.1 GENERAL

- .1 Mark floating equipment with lights in accordance with the provisions of the Canada Shipping Act Collision Regulations and maintain radio watch on board.
- .2 Place and maintain buoys, markers and lights required to define work and disposal areas.

PART 3 - EXECUTION
(CONT'D)

3.1 GENERAL
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- .3 Lay out Work from control points and baselines established by Departmental Representative. Be responsible for accuracy of Work relative to established bench marks and baseline. Provide and maintain electronic position fixing and distance measuring equipment, laser transits and such other equipment as normally required for accurate dredging control.
- .4 Establish and maintain water level gauges and/or tide boards in order that proper depth of dredging can be determined. Locate gauges and/or tide boards so as to be clearly visible.
- .5 Establish and maintain on-land targets for location and definition of designated dredge area limits. Targets to be suitable for control of dredging operations and locating soundings. Remove targets on completion of Work.
- .6 Dredge to depths required to reach bedrock or hard bottom, as indicated on the drawings. Required final dredge depths to be agreed on with Departmental Representative.
- .7 Remove materials above specified bedrock or hard bottom, within limits indicated. Material removed from below bedrock or hard bottom or outside specified area is not part of Work.
- .8 Remove shoaling which occurs as result of Work at no expense to Canada. Where shoaling occurs, Contractor to return the sea bottom elevations outside the footprint of the work to its original preconstruction elevations as determined by the pre-construction survey. This includes all areas over or near all dredge operation, excavation, and rock placement activities including barge work, dump scow routing to shore, temporary access infilling, transfer to shore operations as well as areas covered by silt plumes. As a minimum, sea bottom elevations will be compared by PWGSC after completion of Contractors work and their confirmation of the above restoration for all areas within 15 meters of any of the above activities.
- .9 Remove material cast-over on surrounding area and dispose of it as dredged material. Do not cast-over material unless authorized by Departmental Representative.
- .10 Remove infilling in dredge areas which occurs prior to acceptance by Departmental Representative.

PART 3 - EXECUTION
(CONT'D)

3.1 GENERAL
(CONT'D)

- .11 Immediately notify Departmental Representative upon encountering object which might be classified as obstruction. By-pass object after clearly marking its location and continue Work.

3.2 DISPOSAL OF DREDGED MATERIAL

- .1 Dispose of all dredged material by depositing it at an approved disposal site, and placing in such a manner as approved by the Departmental Representative and conforming to municipal, provincial and federal requirements.
- .2 Trucks used to haul dredged material must have water tight boxes. Contractor is responsible for obtaining and payment of dumping permit fees if applicable.

3.3 DREDGING IN VICINITY OF STRUCTURES

- .1 Dredging in the vicinity of existing structures may be required to facilitate construction of new structures. The contractor is solely responsible for protection of all existing structures and shall determine what measures need to be taken during construction activities.

3.4 RE-DREDGING

- .1 Re-dredge unsatisfactory work and verify depths with additional soundings or sweeping to approval of Departmental Representative.

3.5 CO-OPERATION AND ASSISTANCE TO DEPARTMENTAL REPRESENTATIVE

- .1 Co-operate with Departmental Representative on inspection of Work and provide assistance requested.
- .2 On request of Departmental Representative, furnish use of such boats, equipment, labour and materials forming ordinary and usual part of dredging plant as may be reasonably necessary to inspect and supervise Work.