

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 74 21 – Construction/Demolition Waste Management and Disposal

1.2 PRICE AND PAYMENT PROCEDURES

- .1 Measurement and Payment:
 - .1 Only material excavated above grade plane and within side slopes indicated or specified will be measured.
 - .2 Dredging: will be measured in cubic Metres, In-place Measurement (CMPM), determined from soundings taken before and after dredging. For purpose of quantity computation, existing seabed elevation will be represented by "Average of Instantaneous" sounding for each matrix block of survey by Departmental Representative as soon as practice after Contract award. Post dredging elevations for quantity computations will be shallowest of grade, bedrock or "Average of Instantaneous" sounding for each matrix block.
 - .3 Operations in connection with field positioning of dredging equipment will not be measured separately for payment.
 - .4 No separate payment will be made for Contractor's survey vessel, equipment and crew or diving services.
 - .5 Payment will include disposal of dredge material, within the containment cell as specified.
 - .6 No additional payment for delays incurred during fishing seasons or other periods when no dredging is permitted.
 - .7 No additional payment for downtime and for delays caused by vessel traffic.
 - .8 Removal of infilling material will not be measured for payment.
 - .9 Mobilization and demobilization of dredging equipment to be lump sum and included with the mobilization for the project.
 - .10 Change in location of disposal site:
 - .1 Base contract unit price on location of disposal site as indicated.
 - .2 Unit price will be adjusted up or down, subject to prior negotiation with Departmental Representative for significant change in location of disposal site.
 - .11 No separate payment will be made for sweeping.
 - .12 Include the cost of the Seismographic Survey and continuous monitoring with the unit price for the dredging.

1.3 REFERENCES

.1 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 cubic metres or more.
- .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 cubic metres.
- .4 Obstructions: material other than Class A, having individual volumes of 1.5 cubic metres or more.
- .5 Debris: pieces of wood, wire rope, scrap steel, pieces of concrete and other waste materials.
- .6 Grade: plane above which material is to be dredged.
- .7 Estimated quantity: Volume of material calculated to be above grade and within specified side slopes unless otherwise specified.
- .8 Side slope: inclined surface or plane from grade at side limit of dredging area to intersect original bedrock or ground line, as applicable, outside of side limit and to be expressed as ratio of horizontal to vertical.
- .9 Chart Datum: permanently established plane from which soundings or tide heights are referenced, usually Lowest Normal Tide (LNT).
- .10 Universal Transverse Mercator Projection (UTM) or Modified Transverse Mercator Projection (MTM) Co-ordinates: plane rectangular coordinates used in grid system in which grid network is applied to UTM or MTM projection. Horizontal control information as indicated.
- .11 Minimum Mode: mode of operation of hydrographic survey equipment where minimum sounding over length of travel between position updates will be retained in memory. Sounding taken in this mode may be shallower than actual bottom elevations due to variations in water depths due to wave action.
- .12 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.
- .13 Least of Minimum Plan: hydrographic survey plan in which least sounding in grouping of matrix blocks is plotted.
- .14 Instantaneous Mode: mode of operation of hydrographic survey equipment where only sounding observed at predetermined distance interval is retained in memory.
- .15 Average of Instantaneous Plan: hydrographic survey plan in which average sounding in appropriate grouping of matrix blocks is plotted.
- .16 Lowest Normal Tide (LNT): plane so low that tide will seldom fall below it.
- .17 Cleared Area: area of dredging accepted as complying with plans and specifications.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Navigation Coordination:
 - .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, marina operations, construction activities at wharf sites, or access to wharves by land or water.
 - .2 Departmental Representative will not be responsible for loss of time, equipment, material or any other cost related to interference with moored vessels in harbor or due to other Contractor's operations.
 - .3 Keep Departmental Representative, Canadian Coast Guard, Fisheries and Oceans and Back Bay Harbour Authority informed of dredging operations in order that necessary Notices to Mariners will be issued.
- .2 Scheduling:
 - .1 Submit to Departmental Representative within 2 weeks after award of Contract, 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 Submit schedule in accordance with Section 01 32 16 – Construction Progress Schedule and Section 01 33 00 – Submittal Procedures.
 - .3 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.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit to Departmental Representative for approval, 4 weeks before blasting, details of proposed blasting operations showing types and quantities of explosives, loading charges and patterns, type of blasting caps, blasting techniques, blast protection measures, time of blasting and other pertinent details. Submit subsequent changes to Departmental Representative before proceeding.
- .3 Submit to Departmental Representative complete photographic and descriptive record of buildings, roads and structures in general area of Project Work, before blasting is started. Describe buildings both inside and out. Record existing cracks in walls or structural components.
- .4 Submit to Departmental Representative a Pre-Blast seismographic survey and reports on continuous seismographic monitoring.

1.6 QUALITY ASSURANCE

- .1 Regulatory agency sustainability approvals:
 - .1 Comply with municipal, provincial and national codes and regulations relating to project.
 - .2 Mark floating equipment with lights in accordance with Regulations for the Prevention of Collisions, requirements and directives of Queen's Harbour Master and Notice to Mariners.
- .2 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, Marine Directorate and this certification to accompany Tender submission.
 - .2 Requests for certifications to be directed to Director, Defense and Marine, Directorate, Industry Canada, 235 Queen Street, 7th Floor, east Tower, Ottawa, Ontario, K1A 0H5, and to be received there not less than 14 days prior to bid closing.

1.7 SITE CONDITIONS

- .1 Contractor to visit and inspect work site and become thoroughly familiar with extent and nature of Work and conditions affecting Work before.
- .2 Results of prior soundings and geotechnical investigations are made available for tendering purposes only. It should be noted that this information may differ from site condition. Take this into consideration when submitting tender.
- .3 Take necessary steps to become fully familiar with potential inclement weather and sea conditions in this area.
- .4 Survey requirements:
 - .1 Provide, at own expense, survey vessel, equipment and crew to set up and maintain control for location of dredge limits and to sound areas immediately after dredging to verify that grade depth has been attained. Areas are to be sounded to provide sounding printout display of at least 2m x 2m UTM grid to approval of Departmental Representative.

Part 2 Products

2.1 DREDGING EQUIPMENT

- .1 Contractor to determine required equipment necessary to dredge material specified and to dispose of dredged material at locations.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of location:
 - .1 Work comprises dredging of areas as indicated.
- .2 Surveys and acceptance of work:
 - .1 As soon as practical after Contract award, Departmental Representative will complete pre-dredge survey of dredge area locations. Survey will be by electronic survey equipment sounding in instantaneous mode. Survey plan at 1:500 scale plotting average of instantaneous depths obtained in this survey will define actual pre-dredge seabed areas.
 - .2 No area will be dredged prior to Departmental Representative's and Contractor's mutual acceptance of pre-dredge survey for that area.
 - .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. Survey will be by electronic sweep equipment. Survey plan at 1:500 plotting least of minimum depths obtained in this survey will identify areas requiring reworking to obtain following elevations using least of minimum mode:
 - .1 -3.0 m based on Chart Datum (LNT).
 - .4 Contractor to redredge as necessary to remove all materials within dredge areas which is found to be above grade as specified herein.
 - .5 One additional survey will be undertaken at Departmental Representative's cost, for those areas not meeting acceptance criteria for dredging. Additional surveys required to clear areas will be undertaken by Departmental Representative at Contractor's cost.
 - .6 Departmental Representative will take average of instantaneous soundings simultaneously with least of minimum soundings.
 - .7 All elevations obtained in minimum mode within specified areas of dredging must be at or deeper than -3.0 m based on Chart Datum (LNT), considered completed and clear.

3.2 DREDGING

- .1 Mark floating equipment with lights in accordance with International rules of Road and maintain radio watch on board.
- .2 Place and maintain buoys, ranges, markers and lights required to define work and disposal areas.
- .3 Lay out Work from bench marks, ranges and base lines established by Contractor in consultation with Departmental Representative. Be responsible for accuracy of Work relative to established bench marks, ranges 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 Areas to be dredged are to be referenced to vertical bench marks for each location of dredging as indicated.
- .5 Chart datum for soundings indicated is Low Normal Tide.
- .6 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.
- .7 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.
- .8 Dredge area indicated to grade depth of EL -3.0 m based on Chart Datum (LNT)
- .9 Dredge side slopes to 0.5 horizontal to one vertical in Class A (rock) material and 3 horizontal to one vertical in Class B material.
- .10 Remove materials above specified grade depths, within limits indicated. Material removed from below grade depth or outside specified area or side slope is not part of Work.
- .11 Class B material to be disposed of in the containment cell. Class A material shall be further processed as necessary and used for construction at the wharf berm and yard and/or become the property of the Contractor and removed from site.
- .12 Remove shoaling which occurs as result of Work at no expense to Departmental Representative.
- .13 Remove material cast-over on surrounding area and dispose of it as dredged material. Do not cast-over material unless authorized by Departmental Representative.
- .14 Remove infilling in dredge areas which occurs prior to acceptance by Departmental Representative.
- .15 Tolerances:
 - .1 Do not dredge material from areas lying within 5 m of existing structures unless authorized by Departmental Representative.
- .16 No work will be permitted from the existing wharf structures.

3.3 CLASS 'A' REMOVAL

- .1 Complete removal of Class 'B' material and obstructions in area before blasting for Class 'A'. Work toothed buckets over area to remove Class 'B' material until Departmental Representative is satisfied that further removal cannot be accomplished without blasting.
- .2 The Contractor shall ensure that sufficient size equipment and effort are provided to remove all of the Class B material, to the satisfaction of the Departmental Representative, prior to starting Class A dredging.

- .3 When the Departmental Representative is satisfied that the Contractor has provided sufficient effort to remove, all of the Class B material the Departmental Representative will arrange to have the area surveyed.
- .4 Provide specialist with qualifications acceptable to Departmental Representative and local authorities having jurisdiction to program and supervise blasting.
- .5 Contractor shall retain a specialist company acceptable to the Departmental Representative to carry out seismographic survey before rock excavation is started, to determine maximum charges that can be used at different locations in area of rock excavation. Following survey, full report detailing control requirement throughout Project will be provided to the Departmental Representative prior to commencing blasting. Report or any part of it will not over-rule requirements of local authority having jurisdiction unless report requirements are more conservative.
- .6 Seismographic blasting monitoring will be provided by Contractor's specialist company during entire progress of blasting operations.
- .7 All necessary precautions to prevent damage to existing structures and private property must be suitably employed by the Contractor to the satisfaction of the Departmental Representative prior to any blasting. Any damage to existing structures and private property as a result of blasting and/or dredging operation will be repaired at Contractor's expense, to the satisfaction of the Departmental Representative.
- .8 Representative of Contractor's specialist company will visit owners of adjacent buildings and structures and describe blasting and seismic recording operations to them and obtain their permission for setting up seismographs.

3.4 SEISMIC MONITORING

- .1 Contractor and Departmental Representative will come to an agreement as to the best location, to install Seismic instrumentation.
- .2 Contractor to perform continuous monitoring of the seismic instrument during all periods of blasting and periods thereafter to the satisfaction of the Departmental Representative.
- .3 Provide a written blasting schedule to the Departmental Representative, the Back Bay Harbour Authority and any utility company or authority that could be affected.
- .4 Contractor will be fully responsible for any damages that occur to any structure near the blasting, and will be responsible to reinstate all damages.

3.5 SITE QUALITY CONTROL

- .1 Site test and inspections:
 - .1 Cooperate with Departmental Representative on inspection of Work and provide assistance requested.
 - .2 Upon 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.
- .3 Sweep dredged areas on completion of dredging to confirm that grade depth has been achieved.
- .4 Sweeping equipment to consist of heavy steel beam suspended from scow at required grade depth. Beam to be capable of adjustment and calibration.
- .2 Non-conforming work:
 - .1 If, as result of incomplete Work, additional verification of depths by sounding or sweeping becomes necessary, additional costs involved shall be paid by Contractor.
 - .2 Re-dredge unsatisfactory Work and verify depths with additional sounding or sweeping to approval of Departmental Representative.

3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 – Cleaning.
 - .1 Leave work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 – Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
 - .2 Contaminated sediments must be disposed of in confined disposal facility.
 - .3 Metals, wood and recyclable materials removed during the dredging activities must be diverted to appropriate recycling facilities.
 - .4 Dispose of dredged material by depositing in disposal areas indicated in manner approved by Departmental Representative.

END OF SECTION