

## **PART 1 - GENERAL**

### **1.1 Related Sections**

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

### **1.2 Measurement Procedures**

- .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 practical 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 Obstructions.
  - .1 Removal of obstructions, authorized by Departmental Representative will be measured in hours actually used in removal.
  - .2 Dredging equipment used for removal of obstructions will be paid for at rate computed from average hourly earnings of equipment for preceding two weeks negotiated in advance and authorized in writing by Departmental Representative submitted with unit prices included with bid.
- .4 All operations in connection with field positioning of dredging equipment will not be measured separately for payment.
- .5 No separate payment will be made for Contractor's survey vessel, equipment and crew or diving services.
- .6 Payment will include the placement of the dredged material within the crib spans and behind the wharf. It is to be covered with filter fabric and capped with gravel fill as required.
- .7 There will be no additional payment for delays incurred during fishing seasons during periods when no dredging is permitted.
- .8 There will be no additional payment for downtime and for delays caused by vessel traffic.
- .9 Removal of infilling material will not be measured for payment.
- .10 Mobilization and demobilization of dredging equipment is considered to be incidental and to be included in unit price.
- .11 Change in location of disposal site. Base contract unit price on location of disposal site within

1.0 km of dredge area. Unit price will be adjusted up or down, subject to prior negotiation with Departmental Representative for significant change in location of disposal site.

- .12 No separate payment will be made for sweeping.

### 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 m<sup>3</sup> 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 m<sup>3</sup>.
- .4 Obstructions: material other than class A, having individual volumes of 1.5 m<sup>3</sup> or more.
- .5 SQM: area in square metres projected horizontal.
- .6 Debris: pieces of wood, wire rope, scrap steel, pieces of concrete and other waste materials.
- .7 Grade: plane above which material is to be dredged.
- .8 Sub-grade: plane parallel to and 300 mm below grade.
- .9 Estimated quantity:  
.1 Volume of material (cubic meters) calculated to be above sub-grade and within specified side slopes unless otherwise specified.
- .10 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.
- .11 Chart Datum: permanently established plane from which soundings or tide heights are referenced, usually Lowest Normal Tide (L.N.T.).
- .12 Coordinates:  
.1 U.T.M.: universal transverse mercator projection. Horizontal and vertical control information as indicated.
- .13 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.
- .14 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.
- .15 Least of Minimum Plan: hydrographic survey plan in which least sounding in grouping of matrix blocks is plotted.

- .16 Instantaneous Mode: mode of operation of hydrographic survey equipment where only sounding observed at predetermined distance interval is retained in memory.
- .17 Average of Instantaneous Plan: hydrographic survey plan in which average sounding in appropriate grouping of matrix blocks is plotted.
- .18 Lowest Normal Tide (L.N.T.): plane so low that tide will seldom fall below it.
- .19 Cleared Area: area of dredging accepted as complying with plans and specifications.

#### **1.4 Submittals**

- .1 Submit to Departmental Representative for approval, six 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.
- .2 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.

#### **1.5 Regulatory Requirements**

- .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.

#### **1.6 Waste Management and Disposal**

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
- .2 Contaminated sediments must be disposed of in confined disposal facility or capped disposal site.
- .3 Metals, wood and recyclable materials removed during the dredging activities must be diverted to appropriate recycling facilities.

#### **1.7 Scheduling**

- .1 Submit to Departmental Representative, within 4 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 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.

### 1.8 Location

- .1 Work comprises dredging of areas as indicated and as specified herein.
  - .1 Dredging to the specified depths and extent as noted on the drawings, of approximately 681.0m<sup>3</sup>, located adjacent to the new crib installation.

### 1.9 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, 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 harbour or due to other Contractor's operations.
- .3 Keep District Manager, Canadian Coast Guard, Fisheries and Oceans, informed of dredging operations in order that necessary Notices to Mariners will be issued.

### 1.10 Datum, Water Gauges and Targets

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

### 1.11 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 certificate to accompany Tender submission.
- .2 Requests for certification in format of attached questionnaire to be directed to Senior Director, Marine, Energy and Marine Branch, Marine Directorate, Industry Canada, 235 Queen Street, Ottawa, Ontario, K1A 0H5, and to be received there not less than 14 days prior to tender closing.

### 1.12 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 tendering.

### 1.13 Site Information

- .1 Results of prior soundings are as indicated on the drawings.
- .2 Results of divers probes are included in Appendix "A".
- .3 Take necessary steps to become fully familiar with potential inclement weather and sea conditions in this area.

### 1.14 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 5 x 5m UTM grid to approval of Departmental Representative.

### 1.15 Surveys and Acceptance of Work

- .1 As soon as practical after Contract award, Departmental Representative will complete pre-dredge survey of all 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 data 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:
- .4 Contractor to re-dredge as necessary to remove all material within dredge areas which is found to be above grade the least of minimum mode elevations as specified herein.
- .5 One additional survey will be undertaken at Owner'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 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 before area will be considered completed.

## **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 specified.

## **PART 3 - EXECUTION**

### **3.1 General**

- .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 and base lines 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 indicated area to grade depth as shown on the drawings.
- .7 Dredge side slopes to two (2) horizontal to one (1) vertical.
- .8 Remove materials above specified grade depths, within limits indicated. Material removed from below subgrade depth or outside specified area or side slope is not part of Work.
- .9 Remove shoaling which occurs as result of Work at no expense to Owner.
- .10 Remove material cast-over on surrounding area and dispose of it as dredged material. Do not cast-over material unless authorized by Departmental Representative.
- .11 Remove infilling in dredge areas which occurs prior to acceptance by Departmental Representative.
- .12 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 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 Provide specialist with qualifications acceptable to Departmental Representative and Municipal or Provincial Authorities to program and supervise blasting.
- .3 Departmental Representative will retain specialist company 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 made available. Report or any part of it will not over-rule requirements of local authority having jurisdiction unless report requirements are more conservative.
- .4 Seismographic blast monitoring will be provided by Departmental Representative during entire progress of blasting operations.

### **3.3 Disposal of Dredged Material**

- .1 Dispose of dredged material by depositing in disposal areas in manner directed and approved by Departmental Representative.
- .2 All dredged material is to be placed within the crib spans and behind the wharf. It is to be covered with filter fabric and capped with gravel fill as directed.
- .3 Contractor responsible for obtaining and payment of all dumping permit fees.

### **3.4 Dredging in Vicinity of Structures**

- .1 Do not dredge material from areas lying within 2.5 m of existing structure unless authorized by Departmental Representative.

### **3.5 Sweeping**

- .1 Sweep dredged areas on completion of dredging to confirm that grade depth has been achieved.
- .2 Sweeping equipment to consist of heavy steel beam suspended from scow at required grade depth. Beam to be capable of adjustment and calibration and approved by Departmental Representative.
- .3 If, as result of incomplete Work, additional verification of depths by sounding or sweeping becomes necessary, additional costs involved shall be paid by Contractor.

### **3.6 Re-dredging**

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

### **3.7 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.