
PART 1 - GENERAL

- 1.1 Description .1 This section specifies requirements for excavating underwater materials in areas and to dimensions and coordinates indicated on plan, and for transporting and disposing of excavated materials to specified disposal site.
- 1.2 Related Work .1 Environmental Protection Section 01 35 44.
- 1.3 Definitions .1 Dredging: excavating, transporting and disposing of underwater materials as specified.
- .2 Class "A" Material: boulders of any size, and solid rock requiring drilling and blasting or hydraulic splitting to loosen.
- .3 Obstruction: material other than Class "A", ie. concrete, having individual volumes of any size.
- .4 Class "B" Material: loose or shale rock, sand, mud, shingle, clay and sand, gumbo, hardpan, clay, marine clay, clay sizes, marine silt, silt and gravel, gravel, cobbles, boulders, marine shells, or any other materials not defined under Class "A" material.
- .5 Debris: pieces of wood, wood chips, bark, logs, submerged logs, tree branches, scrap vehicle tires, concrete, steel cable, steel chain, wire rope, scrap steel, etc.
- .6 Grade: plane above which all material is to be dredged.
- .7 Estimated Quantity: volume in cubic metres of material calculated to be above dredge grade and within side slopes.
- .8 U.T.M. Coordinates: Universal Transverse Mercator plan rectangular grid system to be used for all horizontal control of dredging operations as indicated on plan. (NAD 83)

- .9 Matrix Block: each block area is presented as a number of 1.2 X 3.0 m long blocks. Dependent on the position of the sounding a block may have 1 to 4 sounding contained within it. A blank Matrix Block will indicate that no sounding was registered for that matrix.
- .10 Minimum Mode: a mode of operation of hydrographic survey equipment where the minimum sounding over the length of travel between position updates will be retained in memory.
- .11 Least of Minimum Plan: a hydrographic survey plan in which the least sounding in that matrix block is plotted.
- .12 Instantaneous Mode: a mode of operation of hydrographic survey equipment where only the sounding observed at a predetermined distance interval is retained in memory.
- .13 Average of Instantaneous Plan: a hydrographic survey plan in which the average of instantaneous soundings in that matrix block is plotted.
- .14 Side Slope: inclined surface or plane from grade at side limit of dredging area to intersect original ground line outside of side limit and to be expressed as a ratio of horizontal to vertical. All material above side slopes is to be dredged.
- .15 Cleared Area: a dredge area that has been accepted by the *Departmental Representative* as complying with plans and specifications and all material removed to grade.
- .16 CEAA: Canadian Environmental Assessment Act.
- .17 Dredging Area: a rectangle or polygon, defined by coordinates in which dredging is to take place.

1.4 Location

- .1 Contract drawing indicates the areas which required dredging. Actual extent of dredging

within the areas may vary slightly from those indicated on the drawings.

1.5 Interference
to Navigation

- .1 Be familiar with activities at dredging sites and vessel movements in areas affected by dredging operations.
- .2 Plan and execute work in a manner that will not impede navigation including movement of vessels in the basin or channel, at any basin site being dredged, or any other boat traffic at adjacent wharves in the harbour.
- .3 Plan and execute work in a manner that will not interfere with activities at wharf sites, or access to wharves by land or water.
- .4 The *Departmental Representative* or owner will not be responsible for loss of time, equipment, material or any other charges related to interference with vessels in the harbour, weather conditions, or due to other Contractor's operations.
- .5 Keep District Manager, Canadian coast Guard, Transport Canada, informed of dredging operations, in order that necessary Notices to Shipping can be issued.
- .6 Be responsible for damage to buoys or other navigation markers cause by dredging operations. If such occurs, notify Canadian Coast Guard. Assume responsibility for replacement or repairs.

1.6 Interface to
Fishery Operations
and Damage to
Fishing Gear

- .1 Become familiar with fishery activities. Clearly mark dredging area, disposal areas and routes to and from dredging and disposal areas during periods when fishing gear is set in areas adjacent to dredging operations with "Cautionary Buoys" in accordance with Coast Guard Standard TP968. ([http://www.ccg-gcc.gc.ca/eng/CCG/ATN_Aids To Navigation System](http://www.ccg-gcc.gc.ca/eng/CCG/ATN_Aids_To_Navigation_System)) All buoys must be coloured cautionary

yellow - CGSB # 505-108, and be equipped with radar reflectors.

Be responsible for all costs associated with the supply, installation and removal of all necessary temporary aids. The Contractor will receive approval from the District Fisheries Officer for the location of the buoys, upon review and acceptance of temporary aids by the *Departmental Representative*.

Keep District Manager, Canadian Coast Guard, Transport Canada, informed of buoyed corridors in order that necessary Notices to Shipping can be issued.

- .2 Execute the work to ensure damage does not occur to fishing gear and interference to fishing operations is minimized by conducting operations within the areas so marked.
- .3 Be responsible for damage to fishing gear outside marked areas, if as a result of dredging activities, and if damage occurs, assume responsibility for replacement or repair costs and cost of lost fishing opportunity.

1.7 Requirements of Regulatory Agencies

- .1 Perform work in accordance with the National Building Code of Canada (NBC) and any other municipal, provincial and/or national codes relating to the project. In any case of conflict or discrepancy, the more stringent requirements will apply.
- .2 Meet or exceed requirements of specified standards, codes and referenced documents.
- .3 Mark floating equipment with lights in accordance with Regulations for the Prevention of Collisions, as required by Transport Canada.
- .4 Contractor will be required to obtain prior approval from applicable regulatory agencies

for any dredging outside specified dredging limits.

- 1.8 Floating Plant .1 Dredges or other floating plants which are to be employed on this work, must meet the requirements as specified in General Instructions R2710T.
- 1.9 Datums .1 Horizontal Datum: All horizontal coordinates used in this specification and contract drawings are in metres referenced to U.T.M. projection based on the North American Datum, 1983, (NAD83, Zone 19). Survey control monument shown on Plan. Additional coordinate monument locations and values can be obtained from Land Registration and Information Service (L.R.I.S.), Surveys and Mapping Division, 120 Water Street, Summerside, Prince Edward Island, C1N 1A9, Phone: (902) 436-2107.
- .2 Vertical Datum: All elevations and soundings used in this specification and contract drawings are in metres referenced to Chart Datum. For purposes of this contract see Section 3.1.6 for tidal data information.
- 1.10 Inspection of Site .1 The Contractor must visit the site of the work before tendering and make himself thoroughly familiar with the extent and nature of the work and all conditions affecting the work.
- 1.11 Site Information .1 Results of the most recent soundings are included on the contract drawing. This pre-tender data is made available for tendering purposes only. It should be noted that this information may differ from present site conditions.
- All material to be removed from within the dredge limits is known to be bedrock. The soundings on the drawing are from the post dredge survey from the last dredging project when all the overburden was removed down to bedrock. The Contractor should take this into consideration when submitting his tender.**

- .2 The Contractor shall take the necessary steps to become fully familiar with potential inclement weather and sea conditions in this area.
- .3 The Contractor will be responsible for making his own interpretation of soil conditions.

1.12 Dredging
Equipment

- .1 Provide suitable lighting on the dredge for free movement of *Departmental Representative* to inspect work in progress during night dredging operations. Lighting to illuminate all walkways, ladders etc. to safely permit inspection of dredging operation.
- .2 The description of materials is based on small samples and is not necessarily indicative of the overall soil conditions.
- .3 On request, prove to the satisfaction of the *Departmental Representative* that the dredging equipment and plant are adequate to finish the work to quality, time and production rates specified. If inadequate, replace or provide additional equipment or plant as directed.
- .4 Contractor shall be responsible for ensuring that equipment can access and function at the disposal site.

1.13 Survey
Requirements

- .1 The Contractor shall provide, at his expense, a survey vessel, equipment and crew to set up and maintain survey control for the location of the dredge and dredge limits and to sound areas immediately after dredging to verify that grade depth has been attained. Areas are to be sounded with adequate coverage to provide a bathymetric printout of at least a 5 metre spacing on a UTM grid to the approval of the *Departmental Representative*. A copy of the Contractor's positioning and sounding records shall be provided to the *Departmental Representative*.

1.14 Sequence of
Acceptable Work

- .1 Post-dredge survey will be conducted by PWGSC using electronic survey equipment sounding in the instantaneous mode. Sounder will be the Navitronics MCS1 multi-transducer system using a 200 Khz transducer frequency positioned by DGPS Ashtech Z-12 system. The results will be shown on survey plan at scale of 1:500 plotting average of instantaneous depths. Other survey procedures may be approved by the *Departmental Representative*.
- .2 The elevations shown on the contract drawing will be considered the predredge survey.
- .3 Post-dredge survey will be undertaken by the Contractor upon completion of dredging limits identified on the contract drawing. Submit results as indicated in item 1.14 above. Only when this survey shows that all soundings are at or below grade that the *Departmental Representative* will do a post-dredge survey. The survey will use the same type of equipment as used in the pre-dredge survey. It will be subject to weather conditions and the availability of functional survey equipment. The survey will confirm if dredging is completed as specified. Survey will be by electronic sweep equipment sounding in instantaneous mode. Survey plan at 1:500 scale plotting the average of instantaneous depths obtained in this survey will identify areas requiring reworking to obtain the dredge grade.

The Contractor will redredge as necessary to remove all material within the dredge areas which is found to be above the average of instantaneous elevations as specified on post dredge survey drawings.
- .4 All additional surveys require to clear the dredge area will be undertaken by the *Departmental Representative* at Contractor's cost.
- .5 All surveys will be performed to Canadian Hydrographic Service Standards.

1.15 Measurement
for Payment

- .1 Mobilization and Demobilization of dredging equipment will be measured for payment by the lump sum. For measurement purposes this item will be considered 50% complete upon commencement of dredging and 100% complete upon project completion.
- .2 The dredge areas are defined by the Dredge Coordinates table and dimensions shown on the contract drawing.
- .3 Dredging: Dredging will be measured for payment by the cubic metre of material removed as specified. For the purpose of quantity computation, existing seabed elevation will be represented by and "Average of Instantaneous" sounding for each matrix block of the pre-dredge survey performed by the *Departmental Representative*. The elevations shown on the contract drawing will be considered the pre-dredge elevations.

Post dredging elevations for quantity computations will be: (1) grade, or (2) the "Average of Instantaneous" sounding for each matrix block of the postdredge survey, whichever is shallower. The method of calculation and the quantity of material removed for measurement for payment will be determined by the *Departmental Representative*.
- .4 No payment will be made for the Contractor's survey vessel, equipment and crew or diving services.
- .5 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.
- .6 Payment for dredging shall include the disposal of dredge material, at location and in manners specified.
- .7 There will be no additional payment for temporary structures used in dredging operations, for delays caused by fishing

seasons, for delays caused by vessel traffic, for down time, or for delays caused by navigational buoys in dredge areas.

- .8 Once designated areas have been dredged and cleared, all subsequent infilling shall be deemed as additional to the contract if removal is required.
- .9 Removal of material infilling during dredging will not be measured separately for payment.
- .10 There will be no additional payment for berthing or mooring facilities for the dredge plant or any other floating equipment.
- .11 The entire area of the site shown on the plan shall be fully covered during dredging.
- .12 There will be no additional payment for side slopes as they are box cuts.
- .13 There will be no additional payment for delays or changes in dredging methods required as a result of water quality monitoring results.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.1 General

- .1 The Contractor shall do the following in executing the work:
 - .1 Mark floating equipment with lights in accordance with International Rules of Road and maintain a radio watch on board.
 - .2 Place and maintain buoys, ranges, markers and lights required to define work. The *Departmental Representative* will provide the coordinate values for all dredge limits on the drawings.
 - .3 Maintain and lay out work from bench mark provided and control points as

shown on Plan and noted in the Specifications. Any additional control points and tidal reference stations required to control dredging operations are the responsibility of the Contractor. The Contractor is to maintain these control points and tidal reference stations for the duration of the project and at the Contractor's cost.

Obtain owner's permission, in writing, to establish layout monuments and erect targets on private property and pay all associated rental costs. Provide access to layout monuments for departmental survey crews. Any damage to private property will be made good by the Contractor to the satisfaction of the *Departmental Representative* at no cost to the owner.

- .4 For accurate dredge control, the Contractor is to provide and maintain on the dredge electronic position fixing and distance measuring equipment with associated computer software capable of providing a printout showing dredge position. Equipment is to provide a continuous coordinated position of the dredge in the U.T.M. Coordinate Grid System with an accuracy of ± 3.0 metres or less.
- .5 All survey equipment provided on the dredge by the Contractor is to be made accessible to the *Departmental Representative* for his use.
- .6 Establish accurately and maintain water level gauges or tide boards in order that proper depth of dredging can be determined. Locate gauges so as to be clearly visible at all times.

The Contractor is to provide a tidal monitoring system to read and record the tide level at a maximum of 15 minute intervals. These records are to be made

available for the inspection and use of the *Departmental Representative*. If using an electronic tide gauge, the Contractor must check the accuracy of the gauge daily. The gauge must be accurate to ± 2 cm. The monitoring system is to be approved by the *Departmental Representative*.

- .7 Dredge areas to grade depths below Chart Datum where indicated on the drawing.
- .8 Dredge all side slopes vertical, ie. box cut, with exception of around perimeter of steel pipe pile as detailed on the drawing.
- .9 Remove all materials above specified grade depth and side slopes, within limits indicated. Material removed from below grade depth or outside specified area or side slope is not part of work and will not be measured.
- .10 Remove shoaling which occurs as a result of the work at no expense to *Departmental Representative*.
- .11 Remove material cast-over onto surrounding area and dispose of it as dredged material at Contractor's expense. Casting over of material is not permissible unless authorized by the *Departmental Representative*.
- .12 The Contractor is responsible for the removal of infilling in dredge areas which occurs prior to acceptance by the *Departmental Representative*.
- .13 Immediately notify the *Departmental Representative* upon encountering any object which might be classified as an obstruction. By-pass the object, after clearly marking its location by coordinates and continue work.

- .14 Provide dump scows capable of maintaining dredge materials within hoppers until delivery to disposal site. The *Departmental Representative* has the right to order removal of dump scows from the site where leakage from the dump scows is deemed to be excessive.
- .15 Arrange and pay for berthing and mooring facilities for dredge plant and other floating equipment.

3.2 Rock Removal

- .1 If rock and boulders are to be removed by blasting submit to *Departmental Representative* for review, two weeks before removal, details of proposed blasting operations showing types and quantities of explosives, loading charges and patterns, type of caps, blasting techniques, blast protection measures, time of blasting and other pertinent details. Submit subsequent charges to *Departmental Representative* before proceeding.
- .2 **It is mandatory that contractor contact PWGSC minimum five days prior to commencing any drilling and blasting operations to discuss details shown on the plan with PWGSC geotechnical engineer regarding precautionary measures of drilling and blasting near the steel pipe pile.**
- .3 No drilling or blasting permitted within 3.0 metres of steel pipe pile. No drilling for blasting deeper than elevation -3.5 metres within a 3.0 to 5.0 metre radius of pile.
- .4 Contractor is permitted to drill and blast deeper than elevation -3.5 metres beyond the 5.0 metre radius.
- .5 No blast pattern permitted that contains pile location within inside of blast pattern.
- .6 Failure for contractor to comply with PWGSC drilling and blasting requirements shall render the contractor responsible for any damage to the pile..

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- 3.3 Disposal of
Dredge Material .1 The Contractor shall dispose of the dredged material at the Dredged Material Disposal Site where shown on the Chart on the contract drawing. The Disposal Site is located in a field southeast of the basin. Exact location to be discussed with Comeau's Sea Foods.
- .2 Timber, logs and cable must not be disposed of at the dumpsite. This debris must be disposed of ashore at an appropriate landfill other than the containment facility. This debris and its disposal will not be measured for payment but is incidental to dredging.
- 3.4 Operations in
Vicinity of
Structures .1 Use extreme care when dredging adjacent to existing structures. Any damage to these structures caused by dredging closer than specified to be repaired at Contractor's expense.
- .2 No work to be done within within minimum 4.0 metres of the toe of the rip rap slope. Contractor to use discretion to ensure that the rip rap is not disturbed or undermined.
- 3.5 Cooperation and
Assistance to
Departmental
Representative .1 Cooperate with *Departmental Representative* on inspection 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 monitor work. Provide approved duty boat to transport inspectors to and from dredge, at beginning and end of each inspection shift. Inspection shifts will be 8 hours in duration. The duty boat must be of adequate size and power to operate safely in conditions encountered. It must be fitted with a sufficient number of approved life jackets and hard hats for inspection staff.

- .3 Provide adequate, weather-tight, heated work space for exclusive use by the *Departmental Representative* and inspection staff, on board the dredge or dredges used to carry out dredging under this contract. Equip with 1 X 2m table, 3 chairs, one 3 drawer filling cabinet, and maintain in clean condition. The work space is to be for the sole use of the *Departmental Representative* and inspection staff. Work space shared with Contractor's staff will not be permitted.
- .4 Provide *Departmental Representative* or inspector with copies of, or access to, daily records of dredging activity, including areas dredged, type of material, scow measure of material dredged (daily and accumulated), hours of dredging, hours and reasons for downtime, and other information regarding dredging and disposal as requested by the *Departmental Representative*.