

Dredging**Glance Bay SCH****Cape Breton County, N.S.****R.112424.001**

Dredging

Page 1

PART 1 - GENERAL1.1 Description

- .1 The site of the work is Glance Bay SCH, Cape Breton County, Nova Scotia, with disposal at the designated disposal site owned by DFO-SCH located along Hinchey Avenue in New Waterford (Lingan). Areas to be dredged are shown on the plan.
- .2 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 location.

1.2 Related Work

- .1 Refer to **Environmental Protection Procedures for Marine Work - Section 01 35 44** for related information.

1.3 Definitions

- .1 Dredging: excavating, transporting and disposing of underwater materials as specified.
- .2 Class "A" Material: boulders or concrete debris with each unit containing 3.0 cubic metres or more, and solid rock requiring drilling and blasting or hydraulic splitting to loosen.
- .3 Obstruction: material other than Class "A", having individual volumes of 3.0 cubic metres or more.
- .4 Class "B" Material: loose or shale rock, sand, quick 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

Dredging**Glace Bay SCH****Cape Breton County, N.S.****R.112424.001**

Dredging

Page 2

chain, wire rope, scrap steel, etc.

- .6 Square meters: area in square meters project horizontal.
 - .7 CMPM: cubic meters place measure.
 - .8 Grade: plane or planes above which all material is to be dredged.
 - .9 Estimated Quantity: volume in cubic meters of material calculated to be above dredge grade and within side slopes, unless otherwise specified.
 - .10 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)
 - .11 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.
 - .12 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.
 - .13 Least of Minimum Plan: a hydrographic survey plan in which the least sounding in that matrix block is plotted.
 - .14 Instantaneous Mode: a mode of operation of hydrographic survey equipment where only the sounding observed at a predetermined distance interval is retained in memory.
 - .15 Average of Instantaneous Plan: a hydrographic survey plan in which the
-

Dredging**Glace Bay SCH****Cape Breton County, N.S.****R.112424.001**

Dredging

Page 3

average of instantaneous soundings in that matrix block is plotted.

- .16 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.
- .17 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.
- .18 Box Cut: dredging and letting the side of the excavation collapse, where possible, to an equilibrium slope.
- .19 Chart Datum: by international agreement, a plane below which the tide will seldom fall. The Canadian Hydrographic Services has adopted the plane of Lowest Normal Tide (LNT) as Chart Datum. As the rise, fall and ranges of tides varies daily, The Canadian Hydrographic Services should be consulted for tidal prediction and other tidal information relating to the work.
- .20 CEPA: Canadian Environmental Protection Act.
- .21 Dredging Area: a rectangle or polygon, defined by coordinates in which dredging is to take place.

1.4 Location

- .1 Contract drawings indicate those areas which require dredging at the time of the most recent surveys. Actual extent of dredging within the areas may vary slightly from those indicated on the drawings.

1.5 Schedule of Work

- .1 Submit to *Departmental Representative*, within 5 working days after award of Contract, a schedule of work including time periods during which each operation involved

Dredging**Glace Bay SCH****Cape Breton County, N.S.****R.112424.001**

Dredging

Page 4

in the work will be undertaken. Also submit an estimated monthly dredging production of material in cubic meters for each operation. At the time of submission of the schedule meet with the *Departmental Representative* to review the schedule.

- .2 Include in the above schedule of work a list of buoys which interfere with the progress of this work. Coordinate with the *Departmental Representative* arrangements to be made to relocate these buoys to avoid unnecessary delay.
- .3 Adhere to the schedule and take immediate action to correct any slippage by effectively altering existing dredging operations or mobilizing other equipment. The *Departmental Representative* is to be notified of the corrective action to be taken.

1.6 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 channel, at any wharf 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.

Dredging**Glace Bay SCH****Cape Breton County, N.S.****R.112424.001**

Dredging

Page 5

-
- .5 Prior to any removal/reinstallation of navigational aids/buoys, contact Canadian Coast Guard in Charlottetown at 1-902-566-7936, Attention: Claire MacClaren.
- .6 Keep Canadian Coast Guard informed of dredging operations, in order that necessary Notices to Shipping can be issued.
- .7 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.
- 1.7 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. (<https://www.ccg-gcc.gc.ca/publications/maritime-security-surete-maritime/aids-aides-navigation/docs/CanadianAidsNavigationSystem2011-eng.pdf>)
- 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*.
-

Dredging**Glace Bay SCH****Cape Breton County, N.S.****R.112424.001**

Dredging

Page 6

Keep Canadian Coast Guard 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.

1.8 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.

1.9 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.
-

Dredging**Glace Bay SCH****Cape Breton County, N.S.****R.112424.001**

Dredging

Page 7

-
- 1.10 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 monuments and their coordinate values are shown on Plan. Additional coordinate monument locations and values can be obtained from the appropriate Land Registration and Information Services department.
- .2 Vertical Datum: All elevations and soundings used in this specification and contract drawings are in meters referenced to Chart Datum. For purposes of this contract see Section 3.1.6 for tidal data information.
- 1.11 Inspection of Site .1 The Contractor must visit the site of the work before tendering and make itself thoroughly familiar with the extent and nature of the work and all conditions affecting the work.
- 1.12 Site Information .1 Results of the most recent soundings are included on the drawings. This pre-tender data is made available for tendering purposes only. It should be noted that this information may differ from present site conditions.
- The Department will carry out a Pre-dredging survey to provide updated information and will provide a pre-dredge plan showing the requirements for contract dredging. The contractor should take this into consideration when submitting the tender.
- .2 It is anticipated that the following materials will be encountered within the dredging limits, but are not limited to:
- Class "B" Materials in all areas
-

Dredging**Glace Bay SCH****Cape Breton County, N.S.****R.112424.001**

Dredging

Page 8

1.13 Dredging
Equipment

-
- .3 The Contractor shall take the necessary steps to become fully familiar with potential inclement weather and sea conditions in this area.
- .4 The Contractor will be responsible for making its own interpretation of soil conditions.
- .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 physical description of materials, as described in **Appendix B** (grain size data from Marine Sediment Sampling Program), 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.

1.14 Survey
Requirements

- .1 The Contractor shall provide, at its 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
-

Dredging**Glance Bay SCH****Cape Breton County, N.S.****R.112424.001**

Dredging

Page 9

printout of at least a 5 meter 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*.

1.15 Sequence of
Acceptable Work

- .1 Pre-dredge and post-dredge surveys will be conducted by PWGSC using electronic survey equipment sounding in the instantaneous mode. Sounder will be the Ross sounder sweep system using a 190-210 kHz transducer frequency positioned by DGPS Trimble R7 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 A pre-dredge survey will be carried out by the *Departmental Representative* prior to commencement of dredging work by the contractor. The dredge limits may be revised by the *Departmental Representative* to accommodate the changes in bathymetry that may have occurred between the pre-dredge survey and the initial tender survey. Revision of the cubic meter quantity will take place accordingly if the dredge limits are revised.
 - .3 No area will be dredged prior to *Departmental Representative* and Contractor's mutual acceptance of the pre-dredge survey for that area.
 - .4 Post-dredge survey will be undertaken by the Contractor upon completion of dredging of all areas identified in pre-dredge survey. 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
-

Dredging**Glace Bay SCH****Cape Breton County, N.S.****R.112424.001**

Dredging

Page 10

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 depths where indicated on the plan.

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.

- .5 All additional surveys require to clear the dredge area will be undertaken by the *Departmental Representative* at Contractor's cost.
- .6 All surveys will be performed to Canadian Hydrographic Service Standards. **Surveys completed with machine mounted equipment will not be considered for payment purposes.**

1.16 Measurement
for Payment

- .1 Dredging and removals will be measured in accordance with Section 01 29 00.
- .2 The dredge areas are defined by coordinates and dimensions, as shown on the drawings.
- .3 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* as soon as practical after contract award. Post dredging elevations for quantity computations will be: (1) grade, or (2) the "Average of Instantaneous" sounding for each

Dredging**Glace Bay SCH****Cape Breton County, N.S.****R.112424.001**

Dredging

Page 11

matrix block of the post dredge 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 the disposal cell, and in manners specified.
 - .7 There will be no additional payment for temporary structures used in dredging operations.
 - .8 There will be no additional payment for delays caused by fishing seasons.
 - .9 There will be no additional payment for delays caused by vessel traffic.
 - .10 There will be no additional payment for down time, mechanical or weather-related.
 - .11 There will be no additional payment for delays caused by navigational buoys in dredge areas.
 - .12 Once designated areas have been dredged and cleared, all subsequent infilling shall be deemed as additional to the contract if removal is required.
 - .13 Removal of material infilling during dredging will not be measured separately for payment.
-

Dredging**Glace Bay SCH****Cape Breton County, N.S.****R.112424.001**

Dredging

Page 12

-
- .14 There will be no additional payment for land disposal of debris not suitable for the disposal cell.
 - .15 There will be no additional payment for berthing or mooring facilities for the dredge plant or any other floating equipment.
 - .16 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 - EXECUTION3.1 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 marks 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
-

Dredging**Glace Bay SCH****Cape Breton County, N.S.****R.112424.001**

Dredging

Page 13

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 meters 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

Dredging**Glace Bay SCH****Cape Breton County, N.S.****R.112424.001**

Dredging

Page 14

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 to two horizontal to one vertical unless otherwise noted.
 - .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 It will be the Contractor's responsibility to gain access to the
-

Dredging**Glace Bay SCH****Cape Breton County, N.S.****R.112424.001**

Dredging

Page 15

dredge area. The construction of causeways, roads, etc., will be at the Contractor's expense and will be removed at the completion of the project. Any derricks, power lines, etc., which will require removal will be done so at the Contractor's expense and will be replaced to satisfaction of the *Departmental Representative*. Contractor to advise *Departmental Representative* of his proposed method to carry out dredging and disposal of the material.

.15 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.

.16 Arrange and pay for berthing and mooring facilities for dredge plant and other floating equipment.

3.2 Encountering
Class "A"
Material

.1 Identify areas where Class "A" material is encountered above specified dredge grade, work equipment, which may require the use of toothed buckets, over areas to remove all Class "B" material, until *Departmental Representative* is satisfied that further removal cannot be accomplished without blasting. Immediately identify these areas with UTM coordinates, and provide information to *Departmental Representative*.

3.3 Rock Removal

.1 If rock or 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

Dredging**Glace Bay SCH****Cape Breton County, N.S.****R.112424.001**

Dredging

Page 16

-
- 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.
- 3.4 Existing
Navigation Buoys .1 The Contractor will make arrangements with Transport Canada for the removal and reinstallation of the existing buoys, as required to carry out the dredging operations.
- 3.5 Disposal of
Dredge Materials .1 Refer to **Environmental Protection Procedures for Marine Work - Section 01 35 44** for related information.
- The Contractor shall dispose of dredged material by depositing in the disposal area as identified in **Section 01 35 44** and in such a manner as approved by *Departmental Representative*.
- .2 The Contractor will only utilize a route to the dredge disposal containment cell that is approved by the *Departmental Representative* and will be responsible to maintain the access in good condition during the dredging period. Depending on the condition of the access road it may be necessary to haul in suitable material to maintain the road. The access road to the site is to be left in good condition at the conclusion of the dredging operations.
- .3 Subject to the time of year and water content of the dredged material, the Contractor will be required to leave the disposal site in good condition and to the satisfaction of the *Departmental Representative* prior to demobilizing from the site.
-

Dredging**Glace Bay SCH****Cape Breton County, N.S.****R.112424.001**

Dredging

Page 17

-
- .4 All materials deposited on private or public roads or properties in vicinity of site or as a result of trucking material to dump site will be removed by the Contractor to satisfaction of owners involved at no additional cost to Department.
 - .5 The Contractor shall ensure that trucks used in the transportation of dredge material are roadworthy and have tight fitting gates to prevent spills on the road. Trucks not meeting this criteria may be removed from the project by the *Departmental Representative*.
 - .6 Clean truck boxes and wheels of dredge material before moving onto provincial roads. Vehicle wash down stations may be required at both the loading and offloading sites to ensure the above requirements are met.
 - .7 Timber, logs and cable must not be disposed of at the dumpsites. 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.
 - .8 Ocean disposal of dredge material is not permitted.

3.6 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. In completing repairs, new materials are to be used. All materials and work performed to be approved by the *Departmental Representative*.
-

Dredging**Glace Bay SCH****Cape Breton County, N.S.****R.112424.001**

Dredging

Page 18

-
- .2 Minimum dredging distances of existing structures are indicated by the site plan. Do not dredge closer unless authorized in writing by the *Departmental Representative*.
 - .3 Dredging operations are not to undermine the existing structures or breakwater.
 - .4 The use of the public wharves will be permitted for dredging operations including offloading **only** if an engineered stamped letter is provided by the contractor attesting to the wharves' structural condition and capacity being sufficient to support load of contractor selected construction equipment. Do not place load(s) upon existing structures until Departmental Representative is satisfied that the contractor has carried out all calculations and tests necessary to confirm that load(s) will not cause damage or create a safety hazard. Calculations and tests to be stamped by a Professional Engineer registered in the Province of Nova Scotia. The Contractor must take all precautions to prevent damage to existing structures. Any damage to the existing structures resulting from the Contractor's operations will be repaired at Contractor's expense.

3.7 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.
-

Dredging**Glace Bay SCH****Cape Breton County, N.S.****R.112424.001**

Dredging

Page 19

-
- 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 2 m 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*.
-