

PART 1 - GENERAL

- 1.1 Description .1 This section specifies the requirements for dredging the channel and includes excavation of the underwater materials in preparation to place breakwater and rock protection.
- 1.2 Related Work .1 Section 1 14 10 Scheduling and Management of Work.
- .2 Section 01 45 01 Weigh Scales.
- .3 Section 35 31 23 Breakwater and Rock Protection.
- 1.3 Payment Procedures .1 **Excavation Footprint of Breakwater** to the lines and grades shown will be paid by the cubic metre place measure of materials calculated to have been removed.
- .1 Material excavated from the breakwater footprint, the offset and its slide slopes will be measured for payment only if the excavated area is immediately infilled with rock.
- .2 Dredging:
- .1 **Mobilization and Demobilization** of dredging equipment to be lump sum. Included in this section will the mobilization and demobilization of equipment and/or constructed works that the Contractor proposes to gain and maintain access the outer dredge limits.
- .2 **Channel Dredging** will be measured

in tonnes of materials excavated, stockpiled, dewatered, weighed and subsequently placed at the disposal sites or used as beneficial construction materials.

- .3 Excavation for construction of the breakwater and dredging are both covered in this section as they share common material descriptions and disposal criteria.
- .4 Only material excavated above grade plane and within side slopes indicated or specified will be measured.
- .5 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 negotiated in advance and authorized in writing by Departmental Representative.
- .6 Operations in connection with field positioning of dredging equipment will not be measured separately for payment.
- .7 No separate payment will be made for Contractor's survey vessel, equipment and crew or diving services.
- .8 Payment will include transportation, disposal and shaping of dredge material, at locations specified.

- .9 No additional payment for delays incurred during blackout periods or periods when no dredging is permitted.
- .10 No additional payment for downtime and for delays caused by vessel traffic.
- .11 Removal of infilling material will not be measured for payment.
- .12 No separate payment will be made for sweeping.

1.4 Reference Standards

- .1 Justice Canada
  - .1 Canada Shipping Act - Collision Regulations (C.R.C., c.1416).

1.5 Definitions

- .1 Average of Instantaneous Plan: hydrographic survey plan in which average sounding in an appropriate group of matrix blocks is plotted.
- .2 Box Cut: dredging channel area with vertical side slopes and allowing side slope of excavation collapse to a natural equilibrium slope.
- .3 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.
- .4 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>.

- .5 Chart Datum: permanently established plane from which soundings or tide heights are referenced, usually Lowest Normal Tide (LNT).
- .6 Cleared Area: area of dredging accepted as complying with plans and specifications.
- .7 Co-ordinates:
  - .1 U.T.M.: Universal Transverse Mercator projection.
- .8 Debris: pieces of wood, wire rope, scrap steel, pieces of concrete and other waste materials.
- .9 Dredging: excavating, transporting and disposing of underwater materials at disposal sites.
- .10 Estimated Quantity:
  - .1 Volume of material calculated to be above sub-grade and within specified side slopes unless otherwise specified.
- .11 Grade: plane above which material is to be dredged.
- .12 Instantaneous Mode: mode of operation of hydrographic survey equipment where only sounding observed at predetermined distance interval is retained in memory.
- .13 Least of Minimum Plan: hydrographic survey plan in which least sounding in grouping of matrix blocks is plotted.

- .14 Lowest Normal Tide (LNT): plane so low that tide will seldom fall below it. This level corresponds with Chart Datum.
- .15 Matrix Block: each dredge area is presented as number of 1.2 x 3 m long blocks. Dependent on position of sounding, block may have 0 to 4 soundings contained within it.
- .16 Measurements:
  - .1 CPM: cubic metres place measurement at excavation site.
  - .2 Tonnes: Dewatered dredged materials weighed on weigh scales.
- .17 Mechanical Dredging Plant: equipment comprising of the following: clamshell, dragline, dipper or backhoe dredge with dump scows.
- .18 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.
- .19 Obstructions: material other than class A, having individual volumes of 1.5 m<sup>3</sup> or more.
- .20 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.

- .21 Sub-grade: plane parallel to and 300 mm below grade.
  - .22 Universal Transverse Mercator Projection (UTM) Co-ordinates:
    - .1 Plane rectangular coordinates used in grid system in which grid network is applied to UTM or MTM projection. Horizontal control information as indicated.
- 1.6 Requirements
- .1 Dredge area and excavation limits are shown on the plan and is further described on the plan with coordinates of the area to be dredged.
    - .1 Dredge Area: to be dredged to -4.0:
    - .2 Dredge Volume, including side slopes, estimated at 152000 m<sup>3</sup>.
    - .3 Excavation from underside of the breakwater and for the rock protection installation: to be excavated to -4.0 on the channel side, and excavated 1500mm below grade on the beach side.
  - .2 Navigation co-ordination:
    - .1 Perform Work in accordance with the Collision Regulations do not obstruct navigation during progress of Work.
    - .2 Observe vessel movements and fishery activities in area affected by dredging operations [including movement of vessels at adjacent

wharves].

- .3 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.
- .4 Keep Watchkeeper Operations Centre, District Manager, Canadian Coast Guard (CCG), Fisheries and Oceans, informed of structures in the channel and dredging operations in order that necessary Notices to Mariners will be issued.
- .5 Make arrangements with CCG to relocate and replace buoys for execution of work. Advise nearest Coast Guard Base of any requirements to relocate channel markers/buoys within dredging area.

.3 Scheduling: Submit to Departmental Representative schedule as per Section 01 14 10 Scheduling and Management of Work.

1.7 Quality Assurance

- .1 Permits and authorizations for work are listed in Section 01 14 10 Scheduling and Management of Work.
- .2 Comply with municipal, provincial and national codes and regulations relating to project.
- .3 Mark floating equipment with lights in accordance with Collision Regulations.
  - .1 Maintain VHF marine radio contact and Harbour Authority and Users, and

update daily during navigational season.

- 1.8 Floating Plant .1 The Floating Plant Clause (FPC) is a Government of Canada requirement that must be satisfied when responding to Federal Work requiring dredging services. The FPC only applies to federal government contracts and is not a requirement for Provincial government or private sector contracts in Canada.
- .2 Obtain a certificate of qualification from Innovation, Science and Economic Development Canada as per [https://www.ic.gc.ca/eic/site/sim-cnmi.nsf/eng/h\\_uv00057.html](https://www.ic.gc.ca/eic/site/sim-cnmi.nsf/eng/h_uv00057.html).
- .1 Requests for certification to be directed to, Innovation, Science and Economic Development Canada, Shipbuilding and Industrial Marine Industry, 235 Queen Street, 7th Floor, East Tower, Ottawa, Ontario, K1A 0H5.
- .2 Certificate of Qualification or Transport Canada Vessel Registration information to be submitted within 14 days of bid closing.
- 1.9 Site Conditions .1 Contractor become thoroughly familiar with extent and nature of Work and conditions affecting Work before tendering.
- .2 Material to be dredged consists of Class 'B' material.
- .3 The most recent soundings and relevant

geotechnical boreholes are included as Appendices to the Tender documents.

- .4 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.
- .5 Some of the Borehole descriptions provided were obtained prior to emergency Dredging (2017) and are provided to give description of overburden and bedrock only.
- .6 Portions of the channel were previously dredged to grade depth of 3.8 m below chart datum in 1983.
- .7 Take necessary steps to become fully familiar with potential inclement weather and sea conditions in this area.

1.10 Positioning Requirements

- .1 The Contractor is to provide at own expense electronic positioning equipment and operators to set up and maintain monitoring of excavation and dredging operations.
- .2 Positioning equipment is to accept as surveyed data and dredge limits in a DXF format.
- .3 Positioning equipment will provide a continuous automatic update of the digging position and depths in all weather conditions. Minimum accuracy of horizontal positioning to be  $\pm 1.0$  metre and vertical positioning of  $\pm 0.10$  metre.

- .4 Output from Contractor's electronic positioning system will verify areas dredged and progress made. This data will be made accessible to Departmental Representative or their representative on site in digital or hard copy if requested.
  - .5 Positioning system is subject to Departmental Representative's approval.
- 1.11 Dredging Sequence
- .1 Submit to the Departmental Representative the plan of dredging sequence and stages, as per the Master Plan required in Section 01 14 10.
  - .2 The Departmental Representative can request the Contractor to modify the sequencing of dredging, if required.
  - .3 Sequence of dredging will consider the following:
    - .1 Construction of a portion of the Breakwater (50m) is to occur before channel dredging so to limit infilling of the channel from offshore.
    - .2 Dredging sequence to consider minimizing the risk of significant infilling of previous dredged areas or possibility of erosion in areas not yet dredged.
- 1.12 Access Roads
- .1 It is important that persons intending to bid on this work understands the conditions of the site and what preparatory work will be required for the following:
    - .1 Access to the site via public and

private roads.

- .2 Access to the disposal site(s) via private, haul roads and beach.
  - .3 Access to the outer dredge limits, originally defines as 30 m beyond the 0.00 m contour line, subject conditions Section 01 14 10 Scheduling and Management of Work.
- .2 The contractor will be solely responsible for construction and maintenance of access roads and private roads during the duration of the project.
  - .3 The contractor will be responsible to make good any damage to public or private roads and structures.

## PART 2 - PRODUCT

### 2.1 Dredging Equipment

- .1 Contractor to determine required equipment, platforms, construction methods and materials necessary to access the dredge limits and to dredge material specified and to dispose of dredged material at locations indicated.
- .2 The dredging facilities and equipment used for the work must have sufficient capacity and be in good working condition to allow satisfactory completion of the work within the specified time and in accordance with specifications.

## PART 3 - EXECUTION

### 3.1 Examination

- .1 Verification of location and quantity:
  - .1 Work comprises of:
    - .1 Excavation of the underside of

the breakwater, defined as the breakwater and rock protection footprint, offset and sideslopes, depth of excavation varies.

- .2 Dredging of channel, as per limits, to El. -4.0, including side slopes.
- .3 Placement of excavated or dredged materials at DS1 and DS2 to lines and grades indicated.

3.2 Surveys and .1  
acceptance of work

- .1 If 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.
- .2 No area will be dredged prior to Departmental Representative's and Contractor's mutual acceptance of pre-dredge conditions for that area.
- .3 Measurement for payment will be based on cleared sections measured each day by observation or electronic equipment. The final survey for acceptance, as per Section 35 20 23, Paragraph 3.2.5 will remain applicable so as to identify post dredge conditions.
- .4 The Contractor will remove any infilling and slump that is within reach of the equipment, but will not be obliged to remove infilling that is no longer in

reach of equipment.

- .5 Post-dredge survey of the channel will be undertaken by Departmental Representative upon completion of dredging. Survey will confirm if dredging is completed as specified and verify depths for navigation. Survey will be by electronic sweep equipment and plotted a 1:500 least of minimum depths.

3.3 Layout of Work .1

Immediately upon entering site for purpose of beginning work on this project, locate reference points and take proper action necessary to prevent their disturbance.

- .2 Departmental Representative will meet with Contractor and survey staff to identify established horizontal control consisting of a baselines and co-ordinate system with reference control monuments and vertical control consisting of benchmarks to define Work and disposal areas.

- .3 Maintain established horizontal and vertical control and lay out work from these established references. Be responsible for accuracy of work relative to established references. Provide and maintain electronic position fixing and distance measuring equipment as required for accurate dredging control. Provide at own expense, survey vessel, equipment and crew to set up and maintain control for location of dredge limits.

- .4 Install and maintain tide boards in vicinity of worksite in order that proper depth of dredging can be determined. Locate tide boards so as to be clearly visible.

3.4 Dredging

- .1 Mark floating equipment or temporary structures with lights and buoys in accordance with Collision Regulations and broadcast VHF notice of position.
- .2 Areas to be dredged are to be referenced to vertical bench marks as shown on the plan.
- .3 Chart datum for soundings indicated is 0.00m.
- .4 Dredge Channel to grade depth of 4.0 metres below chart datum.
- .5 Dredge all other areas and side slopes as shown on Plan.
- .6 Dredged materials will be decanted of seawater before being weighed for payment.
- .7 If opportunities exist for dredging and direct placement of dredged materials (i.e opportunities for direct placement into DS2), then the Contractor and Departmental Representative will negotiate a conversion from cubic metres place measure to tonnes.
- .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 spillage or shoaling which occurs as result of Work at no expense to Departmental Representative.

- .10 Remove material cast-over on surrounding area and dispose of it as dredged material. Do not cast-over material unless authorized in writing by Departmental Representative.
- .11 Remove infilling in dredge areas which occurs prior to acceptance by Departmental.
- .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.

3.5 Sounding  
Survey

- .1 Contract drawings are based on latest soundings taken by Departmental Representative. Contract quantity shown on Unit Price Table are based on this survey.
- .2 Pre-dredging and post dredging sounding survey will be taken by Departmental Representative.
- .3 No area will be dredged prior to Departmental Representative's and Contractor's mutual acceptance of pre-dredge survey for that area.
- .4 Departmental Representative will conduct a single post dredging survey of dredging site at no cost to Contractor.
- .5 Results of pre and post dredging surveys will be distributed to Contractor by Departmental prior to completion of the work.
- .6 Contractor will be notified of post dredging survey results within 4 working

days of survey completion and given subsequent release if successfully fulfilled requirements of Work.

3.6 Disposal of Spoils

- .1 Install Warning Signs "C" at locations shown on plans in advance of placing materials on the beach.
- .2 Restrict public access to the beaches serving as disposal sites during the periods the beach is being accessed with heavy equipment.
- .3 Dispose of dredged material in designated disposal site as indicated.
- .4 Excavated materials from underside of the Breakwater and Rock protection contaminate with core material from construction is not suitable for placement at DS1. The excavated materials from underside of the rock protection is to be placed at DS2 or used at infilling laydown area.
- .5 End dump dredged materials on DS1 and DS2 and spread with the use of earth moving equipment to the lines and grades shown.
- .6 The submerged berm will be shaped during the commencement of disposal activities at DS1. The submerged berm will be replenished on occasion as material disperses.
- .7 Material placement at DS1 will proceed from south to north at the site.
- .8 During prolonged shutdowns, carry out routine inspections of the disposal sites to ensure that beach materials remain configured in a manner that is safe to

public. Should significant danger exists,  
take measures to restrict public access  
to the area.

- .9 Remove access roads and evidence of access  
upon completion of coastline work
- .10 Keep roads and clean for the duration of  
the contract. Repair the damage caused  
by the contractor's operation at no  
additional cost. Restore surfaces to the  
original state at the end of the work.

3.7 Debris

- .1 Expect to encounter debris, especially  
around the wharf ruins, as well as debris  
typical of fishing industry.
- .2 Arrange for removal of debris to approved  
land disposal site.
- .3 Concrete pieces can remain as core to rock  
protection.

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END OF SECTION

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PART 1 - GENERAL

1.1 Description

- .1 This section specifies the requirements for the placement of stone material for the breakwater, rock protection and causeway section of the access road, as shown on the plans.

1.2 Related Work

- .1 Section 01 14 10 Scheduling and Management of Work.
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 45 01 Weigh Scales.
- .4 Section 35 20 23 Dredging.

1.3 Action and  
Information  
Submittals

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province in Canada.
- .3 Samples:
  - .1 Inform Departmental Representative of proposed source of materials and provide access for sampling at least 3 weeks prior to commencing Work.
  - .2 Submit 20 to 70 kg samples representative of quarry, minimum 3 weeks prior to beginning Work.
  - .3 Ship samples Consultant for approval.

1.4 Existing Haul  
Roads

- .1 It is important that persons intending to bid on this work visits the site and a certain what preparatory work will be required to access the site with rock.
  - .1 Access to site via public roads.
  - .2 Access to site via private and haul roads.
  - .3 Access to the shoreline.
- .2 The contractor will be solely responsible for construction and maintenance of access roads and private roads.
- .3 The contractor will be responsible to make good any damage to public or private roads and structures.
- .4 The Contractor is advised that Chemin Chiasson is a secondary road and is vulnerable to damage from loading. NBDTI has established load limits at 43500kg.
- .5 NBDTI has established load limits. It may be possible to increase load limits through application to NBDTI.

1.5 Measurement  
Procedures

- .1 **Supply of Core Stone, Filter Stone, and Armour Stone:** The supply of core stone, filter stone, and armour stone to the site will be measured in tonnes of material supplied.
- .2 **Breakwater and Rock Protection Construction** will be paid by Lump Sum for the rock protection acceptably placed in the breakwater, rock protection and causeway, to the lines and grades specified.
- .3 Miscellaneous rock used as barricades included in these items.
- .4 Mobilization/demobilization of equipment to be included in the above pay items.
- .5 Haulage will be incidental to the work.
- .6 Construction and maintenance of materials laydown or storage areas and their removal will not be measured for payment under this section.

PART 2 - PRODUCT

2.1 Materials

- .1 Core Stone, Filter Stone, and Armour Stone materials:
  - .1 To be granite or basaltic rock that is angular, resistant to weathering and salt water, free from overburden, spoils and organic material. Free from cracks, seams or other defects which may impair durability; relative density 2.64 t/m<sup>3</sup>; slate and sandstone not acceptable. There will be no intermixing of different colours

or types of rock when stone is obtained from different sources.

- .1 The rock, when tested by the Micro Deval test method in accordance with MTO LS-618, shall a Micro Deval loss of not greater than 35%.
  - .2 When tested by the Freeze Thaw test method in accordance with MTO LS-514, the rock material shall have Freeze Thaw loss not greater than 15%.
- .2 Quarry stone individual rock is to be angular and greatest dimensions of each stone is not to exceed two times least dimension.

.1 Core Stone:

- .1 Core stone to be in range of 0.1 kg to 100 kg as indicated on plan.

.2 Grading Limits:

<u>ASTM SIEVE</u> <u>BY DESIGNATION</u>	<u>% PASSING</u> <u>WEIGHT</u>
480.0 mm	100
420.0 mm	70 - 90
330.0 mm	40 - 55
190.0 mm	-
150.0 mm	0 - 15

.2 Filter Stone:

- .1 Filter stone sizes to be in the following ranges where shown on plan:

- .1 200 kg to 400 kg and,

.2 400 kg to 800 kg.

.3 Armour Stone:

.1 The armour stone to be in the following ranges where shown on plan:

.1 1 tonnes to 2 tonnes;

.2 2 tonnes to 4 tonnes;

.3 3 tonnes to 5 tonnes,  
and;

.4 4.5 tonnes to 7.5 tonnes.

## PART 3 - EXECUTION

### 3.1 Preparation

- .1 Storage-Laydown Area: Construct laydown area in vicinity of work within the area shown on the Plan. Delineate the laydown area with stakes and sediment control fence to avoid any travel or storage outside of designated zone
- .2 Rock individual sizes will be delivered and stored in separate piles.
- .3 Haul roads: construct access to the work site and maintain haul roads.
- .4 Remove ice and snow that may affect placement of rock.
- .5 The Contractor is to be aware of the tides in relation to the work surface and build the rock protection according. As well, the Contractor is to be aware of the reach required to place rock at limits of the side slopes, and to plan the work accordingly.

3.2 Core Stone

- .1 Excavate the sea footprint of the breakwater and rock protection to lines and grades shown on the plan under Section 35 20 23, and maintain the depth until core and rock protection have been installed. No excavation is required at the causeway.
- .2 Seabed material excavated that is potentially contaminated with core materials or filter rock is to be placed at DS2 or backfill of rock protection.
- .3 Place core stones to lines, grades and dimensions as indicated on plan.
- .4 Execute work in a manner to protect core material from storm and erosion damage. Replacement of material lost due to storm or erosion damage will be the contractor's responsibility.
- .5 Notwithstanding 3.2.3, do not extend core material more than 10 metres beyond filter stone protection.
- .6 Core stone can be end dumped or placed with aid of mechanical means or other approved method subject to the departmental representative review and approval.

3.3 Filter Stone

- .1 Place the filter stone to lines, grades and dimension as indicated on plan.
- .2 Place stones in manner approved by the Departmental Representative to secure surface and create a stable mass.
- .3 Above elevation 1.0m Chart Datum, do not extend filter stone material more than

10 m beyond the armour stone.

- .4 Material may be placed with the aid of mechanical means or other approved method subject to Engineer's review and approval. End dumping is not acceptable method to place filter.

### 3.4 Armour Stone

- .1 Place armour stone to the lines and grades and dimensions shown on plan.
- .2 Place each unit individually using a crane or other mechanical means to the lines and grades and dimensions shown on plan. Do not end dump the armour units. Commence placing at the toe of slope and proceed up the slope. Place each unit so that it is stable, secure on slope and supported by units below. Control placement of armour units so as to produce a uniform and continuous cover.
- .3 Place armour stone as shown on plan.
- .4 Place large rock, which will become the navigation light base, where shown.
- .5 Coordinate the installation of the navigational light (by others) by providing access to tip of the breakwater.

### 3.5 Protection

- .1 Take into account anticipated weather conditions and degree of exposure of site and tidal conditions in setting requirements for protection.
- .2 Schedule and carry out construction so that each phase of work is not left longer

than necessary.

- .3 Replacement of core stone, filter random rip rap (R5) lost due to storm or tidal erosion will be the responsibility of the Contractors.

3.6 Inspection

- .1 Provide inspector with equipment to assist in inspection to prove no stones have been placed in the channel.

3.7 Tolerances

- .1 Complete component layers to be within following tolerances of lines and grades as indicated:
  - .1 Core stone: plus or minus 100 mm.
  - .2 Filter stone layer plus or minus 200 mm.
  - .3 Armour stone layer: plus or minus 300 mm.

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END OF SECTION