

PART 1 - GENERAL

1.1 Definitions

- .1 Dredging: excavating, transporting and disposing of underwater materials.
- .2 Material: loose or shale rock, silt, sand, quick sand, mud, shingle, gravel, clay and sand, gumbo, boulders, hardpan, debris, solid rock or boulders of any size, drilling and blasting or hydraulic splitting, required to facilitate removal.
- .3 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.
- .4 Grade: plane above which all material is to be dredged.
- .5 Estimated Quantity: area in square meters calculated from neat plan view dimensions as indicated.
- .6 Sideslope: 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.
- .7 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.
- .8 CMPM: cubic metres place measurement.
- .9 CMTM: cubic metres truck measurement.

1.2 Description of Work

- .1 Work under this section covers the following:
 - .1 Dredging of material to lines and grades as shown on the drawings and to complete Work.

1.3 Related Work

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

- .2 Refer to **Section 01 33 00** for Shop Drawing/Submission requirements. .
- 1.4 Submissions
- .1 Certificates:
.1 Provide copies of all permits and licenses required to carry out the work.
- .2 Methodology:
.1 Provide methodology for carrying out the work.
- .3 Provide submissions in accordance with **Section 01 33 00**.
- 1.5 Schedule of Work
- .1 Submit to Departmental Representative within 10 working days after award of contract, a schedule of work including time periods during which each operation involved in work will be undertaken.
- 1.6 Interference to Navigation
- .1 Be familiar with vessel movements and fishery activities in area affected by dredging operations. Plan and execute work in a manner that will not unnecessarily impede navigation and fishing operations including movement of vessels at adjacent structures.
- .2 Keep Canadian Coast Guard informed of dredging operations in order that necessary Notices to Shipping will be issued.
- 1.7 Requirements of Regulatory Agencies
- .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, as required by Transport Canada.
- 1.8 Datum, Water Gauges and Targets
- .1 All elevations used in this specification and contract drawings are in metres referred to Chart Datum.
- 1.9 Protection
- .1 Prevent damage to surroundings and injury to persons for duration of Work.
- 1.10 Equipment
- .1 Determine the equipment required to dredge the area and material specified.

1.11 Site Information

- .1 Results of prior soundings, soil borings and soil investigations may be available for inspection at offices of Public Works and Government Services Canada, P.O. Box 2247, 1713 Bedford Row 2nd Floor, Halifax, N.S. B3J 3C9
- .2 Results of most recent soundings are included with the drawings. This data is made available for tendering purposes only. It should be noted that this information may differ from present site conditions.
- .3 The Contractor will be responsible for making his own interpretation of soil conditions at any location, other than borehole locations. Borehole descriptions shown on the logs are only descriptive of conditions at locations described by boreholes themselves.

1.12 Measurement for Payment

- .1 Only material excavated above grade plane and within side slopes indicated or specified will be measured.
- .2 Dredging and site preparation will be measured in accordance with Section 01 29 00.
- .3 Material removed and dumped in the absence of the Departmental Representative will not be considered for payment.
- .4 Material disposed of without written approval of dumpsite will not be measured for payment.
- .5 There will be no additional payment for delays incurred as a result of weather conditions.
- .6 There will be no additional payment for delays caused by vessel traffic in and out of the harbour.
- .7 There will be no additional payment for down time.
- .8 The Contractor will adhere to the schedule and take immediate action to correct any shortfall, by effectively altering existing dredging operations or mobilizing other equipment. The Departmental Representative is to be notified of the corrective action to be taken.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

3.1 General

- .1 Mark floating equipment with lights in accordance with International Rules of Road and maintain a radio watch on board.
- .2 Lay out work from bench marks and base lines established by Departmental Representative. Be responsible for accuracy of work relative to established bench marks. Provide and maintain electronic position fixing and distance measuring equipment, laser transits and such other equipment as normally required for accurate dredging control.
- .3 Establish and maintain water level gauges in order that proper depth of dredging can be determined. Locate gauges so as to be clearly visible.
- .4 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.
- .5 Dredge area to the grade depths indicated on the plan.
- .6 Dredging is to take place during the time periods indicated in these specifications.
- .7 Dredge side slope to allow material to freely fall inwards to form natural side slope.
- .8 Use extreme caution when dredging adjacent to existing structures. Damages are to be repaired at contractor's expense.
- .9 Remove materials above specified grade depths, within limits indicated. Material removed from below grade depth or outside specified area or side slope is not part of work.
- .10 Remove shoaling which occurs as a result of work. Once dredged, maintain dredged area at grade.
- .11 Remove material cast-over on surrounding area and dispose of it as dredged material. Do not cast-

over material unless authorized by Departmental Representative.

- .12 Immediately notify Departmental Representative upon encountering an object which might be classified as an obstruction. By-pass the object after clearly marking its location and continue work.
- .13 It will be the Contractor's responsibility to gain access to the 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.

3.2 Disposal of
Material

- .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 on the drawings and in such a manner as approved by Departmental Representative.

- .2 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 Contractor to satisfaction of owners involved at no additional cost to Department.
- .3 The contractor shall ensure that trucks used in the transportation of spoils are roadworthy and have tight fitting gates to prevent spoils spills on the road. Trucks not meeting this criteria may be removed from the project by the Department Representative.
- .4 Clean truck boxes and wheels of dredge spoils 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.

- 3.3 Final Dredge Grade .1 The Contractor is to verify the final grade in the dredged area by an acceptable method.
- .2 Inspect area where cribwork wharf is to be placed using divers and determine that required grade has been reached. Sound this area and record elevations of dredged grade. Inspection and verification is considered incidental to work.
- .3 If, as a result of incomplete work, additional verification of depths by sounding or sweeping becomes necessary, additional costs involved shall be paid by Contractor.
- .4 Dredge area to lines and grades specified as shown on the drawings. Material removed from outside specified limits is not considered part of work and will not be measured for payment.
- 3.4 Co-operation and work assistance to Departmental Representative .1 Co-operate with Departmental Representative for inspection of and 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.

END OF SECTION

PART 1 - GENERAL

- 1.1 Description .1 This section specifies the requirements for supplying and placing filter stone and armour stone at the locations and to the dimensions indicated on the plans.
- 1.2 Reference Standards .1 ASTM C127-15, Specific Gravity and Absorption of Coarse Aggregate
- .2 AASHTO T85-08, Specific Gravity and Absorption of Coarse Aggregate
- 1.3 Source of Material .1 Inform the Departmental Representative at least two weeks prior to commencing work of the location of the source of materials.
- 1.4 Submissions .1 Product Data/Samples:
.1 Provide samples of materials proposed for the work.
- .2 Methodology:
.1 Provide methodology for carrying out the work.
- .3 Provide submissions in accordance with Section 01 33 00.

PART 2 - MATERIALS

- 2.1 Stone .1 Filterstone:
.1 Filterstone must be hard, dense, durable, angular stone, free from cracks, or other structural defects.
.2 Filterstone to consist of stones within the following weight ranges as indicated on the Project Drawings:
.1 10kg to 60kg, with M50f = 20kg.
.3 Fifty percent (50%) by weight of the filter stone must be individual stones greater than, or equal to M50f as indicated in 2.1.1.2.1 above.
- .2 Armourstone:
.1 Armourstone must be hard, dense, durable, angular stone, free from cracks, or other structural defects.
.2 Armourstone to consist of stones within the following weight ranges as indicated on the plans:
.1 100kg to 300kg, with M50a = 200kg.
.3 Fifty percent (50%) by weight of the armourstone will be individual stones greater

than, or equal to M50a as indicated in 2.1.2.2 above.

.4 Greatest dimension of each stone will not exceed two times the least dimension.

.3 Field Stone: All field stone must be accepted before it is used in the work.

.4 Corestone:

.1 Will be used for the crushed rock mattress.

.2 Pit run or quarried material rough and angular in shape requiring approval by the Departmental Representative prior to being used in the work.

.2 Material not to contain organic matter, frozen lumps, sod, roots, logs, stumps or any other objectionable matter.

.3 Corestone gradation shall be within the following limits:

IMPERIAL SIZE	METRIC SIZE	% PASSING BY MASS
18"	450 mm	100
8"	200 mm	44 - 75
4"	100 mm	25 - 50
2"	50 mm	7 - 14

.4 Material to be screened, if required, to ensure no fines or stones less than 0.2 kilograms are placed in the work.

.5 Material to be blended so that a homogeneous mix of smaller and larger sizes within the approved range is attained.

PART 3 - EXECUTION

3.1 Placing

.1 Filterstone:

.1 Place filterstone on slope as shown on the drawings or as directed by the Departmental Representative.

.2 Completed filterstone in place to consist of two (2) layers, with thicknesses as shown on plans.

.3 Tolerance: 100mm

.2 Armourstone:

.1 Place armourstone as shown on the drawings or as directed by the Departmental Representative.

.2 Completed armour stone in place to consist of:

.1 Two (2) layers on the seaward face of the breakwater, as shown on plans

.2 Two (2) layers around the 180-degree-wide end cone of the breakwater including against the new end timber crib, as shown on plans

.3 Two (2) layers along the whole crest of the breakwater, as shown on plans

.4 One (1) layer on the inside slope of the breakwater between the crest and the existing concrete structure, as shown on plans, with total thicknesses and crest elevations as shown on plans.

.3 Place armour stone in an approved manner to produce regular surface and a stable mass.

.4 Tolerances:

.1 200mm for lines and grades

.2 Armourcrest must reach minimum design elevation.

.3 End dumping of armour and filterstone on prepared slopes will not be permitted.

.4 Corestone:

.1 Do not place corestone until bottom area has been accepted by Departmental Representative.

.2 Do not place material under poor weather conditions. Place immediately prior to planned placement of timber cribs.

.3 Tolerance: Surface of bearing layer to be within 50 mm of elevation indicated and variation in elevation over whole area of bearing layer not to exceed 75 mm.

.1 Other layers to be within 100 mm of lines shown.

3.2 Protection

.1 Take into account anticipated weather conditions and degree of exposure of site in setting requirements for protection.

.2 Schedule and carry out construction so that each phase of work is not left exposed longer than necessary.

.3 The work site is subject to water level variations due to tidal action.

.4 Replace any stone lost due to storms, tidal erosion or by their own activities.

END OF SECTION

PART 1 - GENERAL

- 1.1 Description of Work .1 This section specifies requirements for the following items:
.1 Mooring cleats
- 1.2 Related Sections .1 Section 05 50 00 - Metal Fabrications
- 1.3 Reference Standards .1 ASTM A48-03 (R2016), Gray Iron Castings.
.2 ASTM A123-15, Standard Specification for Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products.
.3 ASTM A307-14, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile.
.4 CAN/CSA-G40.21-13, Structural Quality Steels.
.5 CAN/CGSB-1.181-1999, Ready-Mixed Organic Zinc-Rich Coating.
.6 CAN/CSA S16-14, Design of Steel Structures.
.7 CAN/CSA W55.3-08 (R2013), Certification of Companies for Resistance Welding of Steel and Aluminum.
.8 CSA W59-13 Welded Steel Construction (Metal Arc Welding).
- 1.4 Submissions .1 Shop Drawings:
.1 Clearly indicate the following items:
.1 General arrangements, dimensions, clearance locations and directions of assemblies as installed on structures.
.2 Locations, sizes and installation tolerances of anchor bolts, eye bolts and embedded parts.
.3 Types of materials used, finishes and core thickness.
.4 All other pertinent details and accessories.
.2 Product Data/Samples:
.1 Provide product data and manufacturers brochures for the mooring cleats.
.3 Test Results:
.1 Provide test results for the galvanized items.
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- .4 Submissions
 - .1 Provide submissions in accordance with Section 01 33 00.
 - .2 Product Data/Samples:
 - .1 Provide product data and manufacturers brochures for the mooring cleats.

PART 2 - PRODUCTS

- 2.1 Materials
 - .1 Hardware and miscellaneous items must meet the following specifications:
 - .1 Machine bolts, lag bolts, drift bolts, anchor bolts, nuts, washers to ASTM A307.
 - .2 Steel plates, ladder rungs, holdfasts and miscellaneous steel: to CSA G40.21, Grade 300W.
 - .3 Mooring cleats: cast iron to ASTM A48, Class 25, with approximate weight of 41kg (90 lb.) each.
 - .4 Do not use items manufactured or fabricated from scrap steel of unknown chemical composition or physical properties.
 - .5 Hot dip galvanize bolts, anchor bolts, nuts, washers, pip sleeves, steel plates, rungs, holdfasts U-bolts and any other miscellaneous steel to ASTM A123 with minimum zinc coating of 600 g/m².
 - .2 Miscellaneous metal works items
 - .1 Miscellaneous anchors, bolts and inserts:
 - .1 Where size, spacing and the like are not indicated, provide as necessary for the purpose.
 - .2 Galvanize all miscellaneous anchors, bolts and inserts.
 - .2 Miscellaneous Steel:
 - .1 Provide miscellaneous steel as required to the shape, size and details required.
 - .2 Galvanize all miscellaneous steel items.

PART 3 - EXECUTION

- 3.1 Fabrication
 - .1 Build work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
 - .2 Fabricate items unless otherwise noted.
 - .3 Where possible, fit and shop assemble work, ready for installation.

- .4 Ensure exposed welds are continuous for length.
- 3.2 Installation
 - General
 - .1 Boreholes for drift bolts to be 1.5mm smaller in diameter than bolt and for full length of bolt. Boreholes for machine bolts to be same diameter as bolts. Boreholes for lag bolts to be same diameter as shank for unthreaded portion and 0.70 times the shank diameter for the threaded portion. Threaded portion of lag bolts will be installed using a wrench, not by driving.
 - .2 Contain all debris and leachates (films on water surface) within the area of the work by using containment facilities such as floating booms or screens.
- 3.3 Erection
 - .1 Install metalwork square, plumb, straight and true, accurately fitted, with tight joints and intersections.
 - .2 Make field connections with bolts to CAN/CSA-S16.1, or weld.
 - .3 Touch-up bolts and scratched surfaces after completion of erection with zinc primer.
- 3.4 Mooring Cleats
 - .1 Install mooring cleats as shown on drawings and fasten to concrete deck and curb using anchor bolts as indicated.
 - .2 Do not make alternations to any components without written permission of Departmental Representative.

END OF SECTION