

PART 1 - GENERAL

- 1.1 DESCRIPTION .1 This section specifies requirements for the supply, installation and placement of varying sizes core stone, filter stone and armour stone to the dimensions shown and in the locations indicated on the drawings. Contractor to salvage any existing filter stone and armour stone and re-use in new work.
- 1.2 RELATED SECTIONS .1 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Section 01 45 00 - Testing and Quality Controls.
- 1.3 REFERENCES .1 American Society for Testing and Materials (ASTM)
- .1 ASTM C117-04, Standard Test Method for Material Finer than 0.075 mm Sieve in Mineral Aggregates by Washing.
- .2 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire.
- .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- 1.4 DEFINITIONS .1 cpm: Cubic metres place measurement.
- .2 Cleared: Finally accepted or complying with plans and specifications.
- .3 Grade: plane or planes above which all material is to be placed.
- .4 Estimated Quantity:
- .1 Volume in cubic metres material calculated to be above grade and within specified side slopes, unless otherwise specified.

1.4 DEFINITIONS  
(Cont'd)

- .5 Side Slope: inclined surface or plane from the crest elevation to the original ground line outside.
- .6 Chart Datum: Datum used for this project is the Lowest Normal Tide (L.N.T) which is assumed to be 2.48 metres below the Bench Mark PWC 1-2010.

1.5 SUBMITTALS

- .1 Submit to Departmental Representative for approval, 2 weeks before blasting, details of proposed blasting operations showing types and quantities of explosives, loading charges and patterns, type of blasting caps, blasting techniques, blast protection measures, time of blasting and other pertinent details. Submit subsequent changes to Departmental Representative before proceeding.
- .2 Submit to Departmental Representative complete photographic and descriptive record of buildings, roads and structures in general area of Project Work, before blasting is started. Describe buildings both inside and out. Record existing cracks in walls or structural components.
- .3 Samples
  - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Inform Departmental Representative of proposed source of materials and provide access for sampling at least 2 weeks prior to commencing Work.
  - .3 Submit 20 to 70 kg samples representative of quarry, minimum 2 weeks prior to beginning Work.
  - .4 Ship samples prepaid to Departmental Representative for approval.

1.6 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

- .1 Be familiar with vessel movements and fishery activities in area affected by construction operations.
- .2 Plan and execute work, in a manner that will not impede navigation, including movement of vessels at the facility.
- .3 Plan and execute work, in a manner that will not interfere with fishing operations or access to marine structures by land or water.
- .4 Departmental Representative will not be responsible for loss of time, equipment, material or any other charges related to interference with moored vessels in the harbour or other Contractor's operations.
- .5 Keep the Marine Communications and Traffic Services' Centre, Fisheries and Oceans Canada, informed of construction operations, in order that necessary Notices to Mariners may be issued.

1.8 REGULATORY  
REQUIREMENTS

- .1 Comply with municipal, provincial and national codes and regulations relating to project. Refer to the attachments.
- .2 Mark floating equipment with sound and light signals in accordance with Collision Regulations made pursuant to the Canada Shipping Act and Notice to Mariners.

1.9 MEASUREMENT  
FOR PAYMENT

- .1 Core Stone (0.1kg - 400kg) : Measured in cubic metres of material supplied(cmpm) and placed (cmpm) in the work within the limits specified on the drawings.
- .2 Filter Stone (200kg - 600kg): Measured in cubic metres of material supplied(cmpm) and placed (cmpm) in the work within the limits specified on the drawings.
- .3 Armour Stone (1 - 4 tonne): Measured in cubic metres of material supplied(cmpm) and placed (cmpm) in the work within the limits specified on the drawings.
- .4 There will be no payment made for any material or stone placed beyond limits indicated on the drawings but the final contract lines/grades must be within 200 mm of the specific elevation/grade and quantities will be based on the as-built survey done by PWGSC and adjusted to the max. of +/- 200 mm of the lines and grades shown.
- .5 There will be no additional payment for delays resulting from fishing operations, vessel traffic or any downtime occur during the project.
- .6 There will be no payment for any rock or armour stone that is washed out, removed, missing or deteriorated by weather or wave action.

1.9 MEASUREMENT  
FOR PAYMENT  
(Cont'd)

- .7 Contractor is to provide cross sections to the Departmental Representative at 10 metre stations to show that lines and grades have been achieved as shown on the drawings over each type of material. Contractor will have to provide verification that armour stone has been installed to the limits with no voids (ex. dive video, pictures). Measurement for payment for this will be considered included in the cost of the supply and installation of the materials. There will be no separate payment.
- .8 Construction and maintenance of haul roads over the existing breakwater or anywhere will not be measured for payment.
- .9 Contractor to remove, salvage, stockpile and re-install any armour stone and filter stone to gain access to the site or as indicated and incorporate into new work. Contractor is to make his own assessment and location on where to stockpile the removed material. There will be no separate payment.
- .10 There will be no payment for any material that the contractor may have to place over new filter and armour stone to construct new structure out to required limits. There will be no separate payment.

PART 2 - PRODUCTS

2.1 ROCK MATERIAL

- .1 Hard, angular rock free from cracks, seams and other defects which may impair durability.
- .2 Relative density, 2.65 minimum.
- .3 Absorption, 1.5 to 2.0% maximum as determined by ASTM C127 test procedure.
- .4 Durability, less than 35% abrasion Wear, ASTM C535 test procedure.
- .5 Sulphate Soundness Determination maximum 12% by ASTM C88.

- 2.2 ROCK FILL CORE .1 Material for new rock fill core to be blasted rock.
- .2 Stone size shall be well graded between 0.1 kg to 400 kg.
- .3 No more than 15% of core stone to weigh less than 20 kg.
- .4 Silt content to be less than 3% by mass.
- 2.3 FILTER STONE .1 Material for filter stone to be blasted rock or field stones.
- .2 Stone size to be well graded between 200 kg to 600 kg, in categories specified, well graded within each category.
- .3 Greatest dimension of each stone not to exceed two (2) times the least dimension.
- 2.4 ARMOUR STONE .1 Material for armour stone to be blasted rock or field stones.
- .2 Stone sizes to be in the range of 1 tonne to 4 tonne, in categories specified, well graded within each category. Larger stones will be accepted but must be fitted into the lines and grades shown on the drawings.
- .3 Greatest dimension of each stone not to exceed two (2) times least dimension.

PART 3 - EXECUTION

- 3.1 GENERAL .1 Contractors take note, there are existing light poles, power lines, gravel road, public traffic and guard rail in the area of work. At times there is a very high tourist in this area. Contractor to take pre-caution when excavating, salvaging and placing all material. Any damage will be the responsibility of the contractor to repair.

3.2 PREPARATION

- .1 The Contractor is solely responsible for the construction and maintenance of haul roads. Haul roads are to be removed after completion of work and sites returned to their original condition. Contractor should note the accessibility to this site will consist of narrow roads and steep hills. It's the contractors responsibility to maintain all roads getting to and from site when hauling material.
- .2 Contractor will have to remove all existing material at the start of breakwater. Any designated material will be reused and all other material disposed of at approved disposal site. Contractor should visit site to do his own assessment of the material that is to be re-moved, side-casted, stockpiled and re-installed. Any of this work or material will not be measured and will be considered included in the lump sum portion of the project.
- .3 Contractor must protect all core and filter stone place at the end of each day with armour stone to stop any washout that may occur from wave or sea action. The contractor will be responsible for any wash out that occurs even if protected.
- .4 Contractor will have to provide verification that each type of material was installed to the limits.

3.3 ROCK FILL CORE

- .1 Place rock fill core to lines, grades and dimensions indicated on the drawings. Contractor should realize the large distance required to place the rock fill core out into the water, supply necessary equipment to complete as shown on drawings.
  - .2 Side slopes to be as constructed as indicated on the drawings.
  - .3 Sequence construction operations such that sufficient armour and filter stone is placed to protect the core at all times.
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- 3.3 ROCK FILL CORE .4 The contractor is to provide cross sections to  
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- 3.4 FILTER STONE .1 Place filter stone layers to grades, dimensions,  
profiles and cross sectional elements indicated  
on the drawings. Contractor should realize the  
large distance required to place the filter  
stone out into the water, supply necessary  
equipment to complete as shown on drawings.
- .2 Place filter stone in layers as indicated on the  
drawings.
- .3 Side slopes to be as constructed as indicated on  
the drawings.
- .4 Do not transport different categories of  
material in the same truckload. If rocks of  
markedly different sizes are present in the same  
load, Departmental Representative reserves the  
right to have each rock measured separately and  
sorted prior to installing in structure.
- .5 The contractor is to provide cross sections to  
the Departmental Representative at 10 metre  
stations to show that lines and grades have been  
achieved as shown on the drawings, measurement  
for payment for this will be included in the  
cost of the supply and installing the above  
item. Filter stone must be installed to  
+/-100 mm of the grade lines provided on the  
drawings. Quantities will be adjusted to the  
installed grade or to the max of +/-100 mm of  
the lines shown on the drawings.



3.5 ARMOUR STONE

- .1 Place armour stone to lines, grades and dimensions indicated on the drawings. Contractor should realize the large distance required to place the armour stone out into the water and will not be permitted to enddump armourstone. Contractor to supply necessary equipment to complete as shown on drawings.
- .2 Dumping of armour stone will not be permitted. Each stone will be lifted and individually placed.
- .3 Side slopes to be as constructed as indicated on the drawings.
- .4 Place armour stone to a total layer thickness as indicated on the drawings.
- .5 Choose stones and place them in such a way that the whole structure will be bonded and consolidated to as great an extent as nature of rock will allow. Rocks should vary in size so they don't create steep slopes when placing to the grade lines as indicated on the drawings.
- .6 Contractor to provide cross sections to the Departmental Representative at 10 metre stations to show that lines and grades have been achieved as shown on the drawings. Measurement for payment for this work will be included in the cost of the supply and installing the above item. Armour stone must be installed to  $\pm 200$  mm of the grade lines provided on the drawings. Quantities will be adjusted to the installed grade or to the max of  $\pm 100$  mm of the lines shown on the drawings.

3.6 SALVAGE  
MATERIAL

- .1 Contractor to salvage, stockpile and re-install any armour stone and filter stone to gain access to the site or indicated for removal and incorporate into new work.

3.7 ROCK MATERIAL  
WASHED OUT OF WORK

- .1 Should during the progress of the Work, any rock material be washed out of the Work, or through neglect of carelessness of the Contractor or their employees or from any other cause, be dumped into the water near the Work or anywhere within the harbour or channel so as to interfere in the opinion of the Departmental Representative with actual depths of water and/or impede navigation, it will be removed by the Contractor when ordered to do so by the Departmental Representative. Any material washed out of the Work or displaced beyond the contract limits will be removed by the Contractor at no cost to Canada.

3.8 TOLERANCES

- .1 Note: These tolerances are not to be considered pay limits but are specified to ensure contractor keeps within acceptable lines and grades.
- .2 Completed component layers to be within the following tolerances of lines and grades indicated:
- .1 Core stone +/-50 mm.
  - .2 Filter stone +/-100 mm.
  - .3 Armour stone +/-200 mm.