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Breakwater Construction
Mary's Harbour, NL

2018-06-29

PART 1 - GENERAL1.1 RELATED
SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.

1.2 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.

1.3 SUBMITTALS

- .1 Submit to Departmental Representative for approval, 4 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

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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.

1.4 INTERFERENCE TO NAVIGATION

- .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.

1.5 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.

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1.6 MEASUREMENT
FOR PAYMENT

- .1 Core (0.1kg to 200kg): Measured in cubic metres of material and supplied and placed (CMPM) in the work within the limits specified on the drawings.
- .2 Filter Stone (200 kg - 600 kg): Measured in cubic metres of material and supplied and placed (CMPM) in the work within the limits specified on the drawings.
- .3 Armour Stone (1 - 2 tonne): Measured in cubic metres of material and supplied and placed (CMPM) in the work within the limits specified on the drawings.
- .4 Armour Stone (2 - 4 tonne): Measured in cubic metres of material and supplied and placed (CMPM) in the work within the limits specified on the drawings.
- .5 There will be no payment made for any material or stone placed beyond limits indicated on the drawings or settling into the harbour bottom. The final contract grade must be within 200 mm of the specific elevation. Quantities will be based on an as-built survey. Any material placed outside the lines and grades as shown on the drawings will not be measured.
- .6 There will be no additional payment for delays resulting from fishing operations.
- .7 There will be no additional payment for delays caused by vessel traffic.
- .8 There will be no additional payment for downtime.
- .9 There will be no payment for any rock fill core, filter stone or armour stone that is washed out, removed, missing or deteriorated by weather or wave action.

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- .10 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. 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.
- .11 Construction and maintenance of haul roads will not be measured for payment.
- .12 There will be no payment for any rock fill core, filter stone or armour stone that settles into the harbour bottom during construction. Due to the nature of the bottom sediments, settling of rock is expected. DFO's assessment of the amount of rock that could settle below the harbour bottom is 1,500m³, and any costs associated with this rock that settles is to be included in the lump sum.

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.

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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 200 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 ranges noted on the drawings, well graded.
- .3 Greatest dimension of each stone not to exceed two (2) times least dimension.

PART 3 - EXECUTION3.1 GENERAL

- .1 Contractors take note, there are existing light poles, power lines, roadways, public traffic and guard railing in the area of work. At times there could be high activity in this area. Contractor to take precaution when excavating, salvaging and placing all material. Any damage will be the responsibility of the contractor to repair.

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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 is the Contractor's responsibility to maintain all roads getting to and from site when hauling material.
- .2 Contractor must protect work site 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 indicated on the drawings.
- .3 Sequence construction operations such that sufficient armour and filter stone is placed to protect the core at all times.
- .4 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. Rock fill core must be installed to +/-50mm of the grade lines provided on the drawings. Quantities will be adjusted to the

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installed grade or to the max of +/-50mm of the lines shown on the drawings. Measurement for payment for this will be included in the cost of the supply and installing the above item.

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 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. Filter stone rock must be installed to +/-100mm of the grade lines provided on the drawings. Quantities will be adjusted to the installed grade or to the max of +/-100mm of the lines shown on the drawings. Measurement for payment for this will be included in the cost of the supply and installing the above item.

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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, 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 indicated on the drawings.
- .4 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 or 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.
- .5 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.
- .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. Armour stone must be installed to +/-200mm of the grade lines provided on the drawings. Quantities will be adjusted to the installed grade or to the maximum of +/-200mm of the lines shown on the drawings. Measurement for payment for this work will be included in the cost of the supply and installing the above item.

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- 3.6 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 replaced by the Contractor at no cost to Canada.
- 3.7 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 Rock fill core +/-50 mm.
 - .2 Filter stone +/-100 mm.
 - .3 Armour stone +/-200 mm.