

PART 1 - GENERAL

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| <u>1.1 RELATED WORK</u> | .1 | Section 01 74 21 - Construction/Demolition Waste Management and Disposal. |
| | .2 | Section 31 32 21 - Geotextiles. |
| | .3 | Section 31 53 13 - Timber Cribwork. |
| | .4 | Section 35 20 23 - Dredging. |
| <u>1.2 MEASUREMENT FOR PAYMENT</u> | .1 | <u>Rock Mattress</u> : as specified including base layer, bearing layer, the cost of all plant, labour, equipment and materials required to complete the work, will be measured in cubic metres place measure (CMPM) of material placed in work within the limits indicated. The volume of material will be determined in place from measurements taken prior to and at completion of the work. The pay limit for lateral displacement is 600 mm below the sea bottom defined on the drawings. |
| | .2 | No separate measurement for payment to be made for dredging of sea bottom materials, for placement of rock mattress. Included all costs incidental to the unit price for Rock Mattress. |
| | .3 | Rock mattress required to compensate for excessive removal of suitable material under crib area to bring area to grade elevation will not be measured. |
| | .4 | Rock mattress placed in area under crib where unsuitable material is removed will be measured. |

- .5 Provide a sounding survey to Departmental Representative following placement of rock mattress. No separate payment will be made for the sounding survey.
- .6 Scour Protection: Supply and placement of scour protection, including the cost of all plant, labour, equipment and materials required to complete the work as specified, will be measured by the cubic metre place measure (CMPM). The volume of material will be determined in place from measurements taken prior to at completion of the work.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C88-05, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
 - .2 ASTM C127-07, Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate.
 - .3 ASTM C535-03e1, Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Collect and separate plastic, paper packaging, corrugated cardboard, in accordance with Waste Management Plan.
- .3 Place materials defined as hazardous or toxic in designated containers.
- .4 Fold up metal banding, flatten and place in designated area for recycling.

- .5 Divert left over aggregate material from landfill to a local quarry or facility as approved by Departmental Representative.
- .6 Divert left over geotextiles from landfill to local plastic recycling facility as approved by Department Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Mattress material to following requirements:
 - .1 Crushed quarry stone consisting of hard durable particles free from silt, clay lumps, organic matter, frozen material and other deleterious materials, and free from splits, seams or defects likely to impair its soundness during handling or under action of water.
 - .2 Relative density (formally specific gravity): to ASTM C127 (AASHTO T85), not less than 2.65.
 - .3 Base layer will be uniformly graded quarry run rock ranging in weight from 45 to 400 kg. A minimum of 50% of the total base layer will contain stones with individual weights of 200 kg. No more than 5% by weight to be rocks weighing less than 10 kg.
 - .4 Bearing layer will be uniformly graded quarry run rock ranging in weight from 2 to 7 kg with average rock dimensions off 100 and 150 mm respectively. A minimum of 50% of the total bearing layer will contain stones with individual weight of 5 kg.
- .2 Rock scour protection:
 - .1 Quarried rock: uniformly graded.
 - .2 Quarried rock: to be free from splits, seams or defects likely to impair its soundness during handling or by action of water and to approval of Departmental Representative.

- .3 Relative density (formally specific gravity): to ASTM C127, not less than 2.65.
 - .4 Absorption, 1.5 to 2.0% maximum as determined by ASTM C127 test procedure.
 - .5 Durability, less than 35% abrasion wear, ASTM C535 test procedure.
 - .6 Sulphate Soundness Determination maximum 12% by ASTM C88.
 - .7 Rock, cubical and angular in shape with ratio of maximum to minimum dimensions of less than 2.
 - .8 Stone sizes for scour protection will be in the range indicated on the drawings.
- .3 Geotextile: In accordance with Section 31 32 21 - Geotextiles.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 The rock mattress and crib is to be placed as per the following requirements:
- .1 The transition indicated between the bedrock layer and other materials shown on the drawings shall be considered approximate only and shall be confirmed in the field by the contractor. The exact thickness of the overburden layer and the exact depth to the bedrock layer along the new wharf profile is unknown. For these reasons the contractor shall prepare the crib seat to the following requirements:
 - .1 In areas where the existing bottom elevations are one (1) meter or more below the designated crib seat elevation the contractor shall place rock mattress by laterally displacing any loose and soft underlying materials or directly onto an exposed bedrock surface. All work to be completed to approval of Department Representative.

.2 In areas where the existing sea bottom is above or at the designated crib seat elevations the contractor shall do one of the following depending on the actual conditions. All work to be completed to approval of the Departmental Representative.

.1 In overburden material, dredge to one (1) meter below the designated crib seat elevations and place rock mattress by laterally displacing any underlying loose and soft material.

.2 With an exposed bedrock surface, dredge bedrock to within a +/- 200mm tolerance of the designated flat bottom crib seat elevations and scribe crib to this surface.

.3 In areas where the existing sea bottom elevations is less than one (1) meter below the designated crib seat elevation the contractor shall dredge the overburden material (except bedrock) to accommodate the minimum one (1) meter rock mattress thickness and laterally displace any underlying soft and loose materials. All work to be completed to approval of Departmental Representative.

- .2 Excavated sea bottom material must be stockpiled on site for a minimum of 24 hours to drain before transporting to designated waste disposal site using water tight trucks.
- .3 Confirm with Departmental Representative that area is adequate for placement of rock mattress.
- .4 Do all dredging, in accordance with Section 35 20 23 where required for mattress placement.

- .5 Sound area in presence of Departmental Representative before placing mattress material in areas requiring dredging, and record elevation of bottom on which mattress to be placed.

3.2 PLACEMENT

- .1 Ensure that no frozen material is used in placing.
- .2 Do not place mattress material until bottom area has been approved by Departmental Representative.
- .3 Place geotextiles in accordance with Section 31 32 21 - Geotextiles.
- .4 Place mattress materials to elevations and dimensions as indicated.
- .5 Prevent segregation in placing of material sizes. Do not drop material through water.
- .6 Do not place material during weather judged unsuitable by Departmental Representative.
- .7 Place material immediately prior to planned placement of timber cribs.
- .8 Level top surface of mattress to specified grade. Use sweep beam suspended from barge as screed to level surface of each mattress layer. Other methods of leveling may be employed subject to approval of Departmental Representative.
- .9 In areas where the depth of the rock mattress to be placed is less than the 600 mm required for the full thickness of the bearing layer, only place the required thickness of bearing layer to reach the required crib seat elevation.

3.3 SCOUR
PROTECTION

- .1 Place scour protection to details as indicated as soon as practicable after placement of cribs.
- .2 Place scour protection on upland slopes as indicated on the drawings.

3.4 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 or carelessness of the Contractor or workmen 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.

3.5 TOLERANCES

- .1 Surface of bearing layer to be parallel with elevation as indicated with mean elevation of surface within 50 mm of elevations as indicated.
- .2 Surface of base layer to be parallel with elevation as indicated with mean elevation of surface within 100 mm of elevations as indicated.
- .3 Establish mean elevation from spot elevations taken at 2 m intervals. Do not allow spot elevation to differ more than 50 mm from mean.
- .4 Scour protection: +/-100 mm. This tolerance is not to be considered pay limits but is specified to ensure the Contractor keeps with acceptable lines and grades.

3.6 TESTING

- .1 Submit rock materials samples for testing to testing laboratory approved by the Departmental Representative prior to commencement of quarry production. Allow sufficient lead time to perform and report tests before start of production.
- .2 Contractor will be responsible for procurement of samples for testing and arrange and pay for shipment of samples to testing laboratory.
- .3 Departmental Representative will pay for costs associated with laboratory testing. The cost of retesting due to samples failing to meet the requirements of the contract will be borne by the Contractor.
- .4 Only materials satisfactorily tested and approved by the Departmental Representative will be quarried and placed in the work.