

PART 1 - GENERAL

- 1.1 Description
- .1 This section specifies requirements for the **Site Works - Miller Brook Wharf** in preparation of harbour dredging, and the restoration of the site upon completion of dredging.
 - .2 **Site Works - Miller Brook Wharf** preparation will consist of, but not necessarily be limited to, the following at Miller Brook Wharf:
 - .1 Mobilization and demobilization of dredging and construction equipment.
 - .2 Installation and maintenance of erosion control measures.
 - .3 Excavation of containment cell and construction of berms.
 - .4 Regrade parking lot to it's original pre-construction state.
 - .5 Ditching as shown on plan to remove excess water from containment cell and runoff.
 - .6 Installation and maintenance of Floating Silt curtain in the harbour.
 - .7 Installation and maintenance of out Fall Floating Silt curtain at the end of the boat ramp.
 - .8 Surcharging and grading excavated material on site.
 - .9 Installation and maintenance during dredging operations of safety fence (Snow Fence).
 - .10 Supply and install of 31.5mm granulars in parking lot to the lines and grades shown on drawings.
 - .11 Supply and install Hay Bales along both sides of the boat ramp to direct flow of the spill way.
 - .12 Stockpiling of the containment cell material on the Miller Brook site and relocate to containment cell as surcharge material upon dredging operations completed.
 - .13 Supply and install filter fabric and geogrid fabric on top of dredged spoils prior to placement of surcharge material.
 - .14 Contractor to ensure positive drainage around containment cell during and after construction.
 - .15 No heavy equipment or stockpiling on structure 406.

1.1 Description
(Cont'd)

- .2 (Cont'd)
 - .16 Relocate waste oil building to location at Miller Brook wharf, as per HA recommendation.
 - .17 Remove and store on site Floating wharves.
 - .18 Locate, Remove and store on site concrete blocks used as anchors for the Floating wharves.
 - .19 Contact NB Power to de-energize overhead power lines.
 - .20 Ensure noise control and dust control measures are in place during all construction activities.
- .3 The containment cell at Miller Brook Wharf is to be maintained under site work and includes:
 - .1 Security and fencing;
 - .2 Draining of cell.
 - .3 Dust and noise control.
 - .4 Site security measures.
- .4 Site restoration is site work, and will consist of, but not necessarily be limited to, the following:
 - .1 Removal of the berms around containment cell and place on top of containment cell as surcharging material upon completion of dredging and shaped to ensure proper drainage.
 - .2 Rough site grading
 - .3 Reconfiguration of drainage ditches.
 - .4 Grading of parking lot.

1.2 Related Work

- .1 Containment Cell Section 35 31 18
- .2 Filter Fabric and Geogrids Section 31 32 21

1.3 Protection

- .1 Protect existing objects designated to remain. In event of damage, immediately replace or make repairs to approval of and at no additional cost to Departmental Representative.
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1.4 Measurement
for Payment

- .1 **Site Works - Miller Brook Wharf:** as specified including all plant, labour will constitute a fixed price item for measurement purposes.
- .2 **Granular 31.5mm Material:** will be measured by the metric tonnes of material supplied and acceptably placed in the works in the parking lot at Miller Brook to the lines and grades as shown on drawings.
- .3 There will not be any separate payment for the reinstatement of work that was temporarily removed for the installation of the new work. Include cost for this work in the items for payment.

PART 2 - PRODUCTS

2.1 Materials

- .1 Salvaged Sandstone - a one (1) to two(2) metre sandstone fill layer exists above the dredged materials. This material is to be used for berms construction.
- .2 Imported Sandstone: To be of good durability course sandstone rock that is of approved quality, sound, hard, dense, 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.
- .3 All rock material to be granitic or basaltic rock that is of approved quality, sound, hard, dense, angular, resistant to weathering and salt water, free from overburden, spoils, and organic material. Larger sizes to be free from cracks, seams or other defects which may impair durability; specific gravity minimum 2.60; slate, shale, and sandstone not acceptable.
 - .1 The Departmental Representative will inspect and approve the proposed source of supply prior to the start of work
 - .2 Random Rip Rap Mix: Homogeneous blend supply of specific mixture mixed at the proportions of approx 20% by weight to the

2.1 Materials
(Cont'd)

- .3 (Cont'd)
- .2 Random Rip Rap Mix:(Cont'd)
random rip rap material indicated to form a dense material when placed and compacted. R5
- R5 Random Mix
- | ASTM Sieve Size | % Passing |
|-----------------|-----------|
| 200 mm | 100 |
| 190 mm | 70-90 |
| 150 mm | 40-55 |
| 70 mm | 0-15 |
- .4 Granular 31.5mm Material:
- .1 Granular Base rock, clear, hard durable, angular, crushed quarried rock aggregate free from silt, clay lumps, organic matter, foreign substances and free from splits, seams or defects. Specific gravity not less than 2.6 when tested to ASTM C127-77 (AASHTO T85-77).
- .2 Gradation to be within following limits when tested to ASTM C136-84 and ASTM C117-87 and giving a smooth curve without sharp breaks when plotted on a semi-log grading chart.
- .3 Gradation - Granular Base:
- | ASTM Sieve Size | % Passing |
|-----------------|-----------|
| 31.5 mm | 95-100 |
| 25.0 mm | 81-100 |
| 19.0 mm | 66-90 |
| 12.5 mm | 50-77 |
| 9.5 mm | 41-70 |
| 4.75 mm | 27-54 |
| 2.36 mm | 17-43 |
| 1.18 mm | 11-32 |
| 300 µm | 4-19 |
| 75 µm | 0-8 |
- .5 Control of gradation shall be by visual and mechanical inspection. Any difference of opinion between the Engineer and the Contractor shall be resolved by dumping and checking the gradation of individual rocks taken at random. Mechanical equipment, a sorting site and labour needed to assist in checking gradation shall be provided, at no additional cost by the Contractor.
- .6 In the event of more then one category of rock within a truck load arriving on site, only one category will be measured at a time with the remaining category(ies) being removed and stored temporarily for subsequent weighing.

PART 3 - EXECUTION

3.1 Common
Excavation

- .1 Excavate layers of sandstone fill within cell configuration. Salvage layers as indicated in materials description.
- .2 Mix excavated Class B materials with imported sandstone fill if necessary for stable embankments.
- .3 Place backfill material in uniform layers not exceeding 300 mm compacted thickness. Compact each layer to 95% of Standard Proctor dry density before placing succeeding layer.
- .4 When using hand operated tamping devices, place backfill material in layers not exceeding 100 mm in thickness.
- .5 Ground water is expected to be encountered at lower levels of the cell during excavation. Take steps to excavate as much spoils as possible in the dry. This may require dewatering the excavation from time to time if water intrudes or modifying the methods of excavation.

3.2 Ditching

- .1 When berms are removed construct swales at limit of spoils so to collect excess water decanted from spoils, and direct toward cell drain structure.

3.3 Cell
Surcharge

- .1 Consolidation of Dredge material is expected to commence immediately upon decanting water from the upper portion of the cell. Water will continue to be squeezed out over the first few weeks and will be accelerated by surcharging the spoils and allowing water to escape.
- .2 The frozen surface of the dredge spoils is expected to be accessible by foot within a few days of draining the cell.
- .3 Install filter fabric and geogrid fabric over surface of spoils.

3.3 Cell
Surcharge
(Cont'd)

- .4 Install consolidation monitor in center of the cell. The monitor will be a 3m long, 50mm diameter steel pipe welded to a 600 mm sq 12mm steel plate. The plate is sandwiched between the fabric and geogrid. Monitor elevation changes daily when infilling and weekly until end of contract.
- .5 Place layers of salvaged fill on dredged material layers of 300 mm.
- .6 A snow layer can be tolerated on the spoils provided it is no more than 300mm and is uniform. If necessary, excess snow will be removed at contractor's expense.
- .7 Install consecutive layers of sandstone fill to layer thickness of 1200mm.
- .8 Cell is allowed to decant and settle for four (4) months.

PART 1 - GENERAL

- 1.1 Related Work .1 Site Work Section 31 23 13
- .2 Dredging Section 35 20 23
- 1.2 Mill
Certificates .1 At least two weeks prior to start of work,
furnish Engineer with copies of mill test data
and certificate that filter fabric delivered
to job site meets requirements of this
section.
- 1.3 Approval .1 Obtain written approval of Engineer for
filter fabric before installation of material
in work.
- 1.4 Measurement
for Payment .1 **Filter Fabric:** Filter fabric will paid under
the site works section 31 23 13 of approved
material supplied and installed in the work
and accepted by the Departmental
Representative as shown on the plans. No
allowance will be made for variations, i.e.
slopes, bundling of material, overlap, etc.
- .2 **Geogrid:** Geogrid will paid under the site
works section 31 23 13 of approved material
supplied and installed in the work and
accepted by the Departmental Representative as
shown on the plans . No allowance will be made
for seams and overlaps.
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PART 2 - PRODUCTS

- 2.1 Filter Fabric
- .1 Synthetic fibre to be rot proof, unaffected by action of oil or salt water and not subject to attack by marine life, insects, or rodents.
 - .2 Fabric to be of non woven polyester or polypropylene fabric.
 - .3 Seams: sewn in accordance with manufacturer's recommendations
 - .4 Physical Properties to ASTM D4595, CAN/CGSB-4.2 No.4.2, CAN/CGSB-148.1 No 14 and ASTM D4751; supplied in rolls of minimum 3.0 metres width and to 3 the following properties or equivalent:
 - .1 Mass(g/m²) 259 to 270
 - .2 Specific Gravity 1.38
 - .3 Thickness (mm) 3.15
 - .4 Tensile Strength (N) 635 -660
 - .5 Elongation at Break(%) 100-105
 - .6 Mullen Burst Strength (kPa) 1700
 - .7 Opening Size (um) 2.0 X10-1
 - .5 The properties listed meet a Terrafix Terrafix 360R or Mirafi P150.
- 2.2 Geogrid
- .1 Geogrid: open grid polymer having biaxial orientation, free of striations, roughness, pinholes, blisters, undispersed raw materials or any sign of contamination by foreign matter.
 - .1 Roll width: 3.0 - 4.0m
 - .2 Roll length: 75m - 100m
 - .3 Apertures Dimensions 25mm
 - .4 Minimum Rib thickness: 0.76 mm
 - .5 Tensile Strength, 2% strain 4.1 kN/m
 - .6 Tensile Strength, 5% strain 8.5 kN/m
 - .7 Ultimate tensile strength: 12.4 kN/m
 - .8 Junction efficiency: 93%
 - .9 Flexural Stiffness 250 000 mg-cm
 - .10 Aperture Stability: 0.32 m-N/deg
 - .11 Polymer: polypropylene: to ASTM D 4101-02b with inhibitors added to resist deterioration by ultra-violet and heat exposure.

2.2 Geogrid
(Cont'd)

- .2 The properties listed are from Tensar BX1100
Biaxial Geogrid specification.

PART 3 - EXECUTION

3.1 Preparation
of Base

- .1 Fine grade area to be covered with filter
fabric to a uniform surface area. Fill
depressions with suitable material.

3.2 Placing
of Filter Fabric

- .1 Place filter fabric on prepared surface
loosely from top of the slope to the bottom
allowing fabric to conform easily to contours
of the slope.
- .2 Longitudinal seems will have a minimum of 450
mm overlap and will be pinned every 450 mm
with 100 mm nails.
- .3 Anchor top of fabric at 1.0 meter intervals
with 25 mm diameter steel rods 600 mm in
length. Anchor bottom of fabric by folding
fabric and placing fill on top.
- .4 Place granular base material over filter
fabric to a depth of 300 mm. No equipment will
be permitted on fabric

3.3 Installation
of Geogrid

- .1 Place geogrid material by unrolling onto
graded surface in manner and locations
indicated and retain in position in accordance
- .2 Cut around consolidation gauge.
- .3 Overlap each successive strip of geogrid 600
mm over previously laid strip.
- .4 Protect geogrid from displacement, damage or
deterioration before and during placement of
overlay soil layers.
- .5 After installation, immediately cover with
overlay layer.
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of Geogrid
(Cont'd)

.6 Replace damaged or deteriorated geogrid to
approval of Engineer.

3.4 Protection

.1 No vehicles permitted directly on geotextile
or geogrid.