

1.0 GENERAL

1.1 Scope

1.1.1 The work shall consist of the construction or renovation of erosion control products as detailed on the plans or where designated by the Engineer in the field. Should the Contractor wish to propose alternate materials or methods, details must be submitted and approved in writing to the Engineer before proceeding.

1.1.2 **Note to Specifier:** These specifications are intended to provide a general guideline for erosion control materials. It is the specifier's responsibility to ensure the materials specified meet the specific conditions of each project.

1.2 Related Sections

1.2.1 Section 02110 – Excavation

1.2.2 Section 02120 - Embankments

1.2.3 Section 02155 – Geotextiles

1.2.4 Section 02230 – Granular Base Course

1.2.5 Section 02271 – Rip Rap

1.2.6 Section 02500 – Supply of Portland Cement Concrete

2.0 PRODUCTS

2.1 Granular Material

2.1.1 Granular material shall conform to Section 2230 Granular Base Course. The base type to be used shall be designated by the Engineer.

2.2 Bedding Sand

2.2.1 Bedding sand shall consist of screened or crushed washed sharp sand. The bedding sand shall be free from injurious quantities of soft or flaky particles, shale, loam and organic matter or other deleterious material.

2.3 Precast/Cast-in-place Concrete Pads

2.3.1 Precast concrete shall be designed and constructed to the requirements of ASTM C478 with dimensions shown on the drawings and/or as designated by the Engineer in the field. Cement shall be Type S Sulphate Resistant Portland Cement meeting CAN/CSA-A3000.

2.3.2 Concrete (Cast-in-place) shall be in accordance with Section 2500 for Supply of Portland Cement Concrete and the following:

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|----|-------------------|--|
| .1 | Type of Cement: | Type HS Sulphate Resistant Portland Cement |
| .2 | Minimum Thickness | 150 mm |

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- | | | |
|----|--|-----------------------------------|
| .3 | Specified Strength: | 20 MPa |
| .4 | Air: | $6.5 \pm 1\%$ |
| .5 | Maximum water/cementing materials ratio: | 0.50 |
| .6 | Specified Slump: | $70 \text{ mm} \pm 10 \text{ mm}$ |
| .7 | Reinforcement: | 15M bars at 300mm
O.C. |
- 2.3.3 Concrete pad size and pattern of reinforcement metal bars shall be as shown on the drawings.
- 2.4 Rip Rap
- 2.4.1 Refer to Section 2271 for Rip – Rap.
- 2.5 Geotextile
- 2.5.1 Refer to Section 2155 for Geotextile Fabric
- 2.6 Gabions
- 2.6.1 Gabion wire mats shall be manufactured to ASTM A975, must be galvanized to ASTM A641 with PVC coating and match the following dimensions:
- .1 Wire for Mesh: 2.20 mm core
 - .2 Lacing: should be with stainless steel rings for PVC coated gabions to ASTM A975.
 - .3 Selvedge and Corner Wires: 2.65 mm in diameter
- 2.6.2 Wire mesh should be in double twist pattern with uniform hexagonal openings, sized 80 mm by 100 mm.
- 2.6.3 Gabion Basket:
- .1 Single unit construction, or with joints having the same strength and flexibility as the mesh.
 - .2 When length exceeds 1.5 times the horizontal width, divide the basket with the same mesh as the gabion wall.
 - .3 Binding wire or galvanized steel wire (approved by Engineer) can be used for gabion basket assembly and fastening baskets to one another.
 - .4 Gabion basket details shall conform to standard Sewer Drawing S-31A and S-31B.
- 2.6.4 Rock
- .1 Durable hard stone sized 70mm to 150mm.

2.7 Erosion Control Blanket

2.7.1 Unless otherwise specified, erosion control blanket shall provide a temporary, biodegradable cover material to reduce slope and/or channel erosion and enhance vegetation growth. Erosion control blanket shall be made from straw, straw and coconut or coconut fibres, bound together with photodegradable or biodegradable netting.

2.7.2 Unless otherwise indicated on the plans or specifications, the blanket performance requirements shall be as follows:

C Factor	≤0.25 @ 1:1 slope and flatter
Permissible Shear Stress	96 Pa
Velocity	2.44 m/s
Functional Longevity	24 months

2.8 Silt Fence

2.8.1 Non-woven or woven: elongation less than 50%, minimum grab strength 450 N, minimum permittivity of 0.05 per second, maximum AOS of 600 µm, ultraviolet stability of 70% after 500 hours.

3.0 EXECUTION

3.1 Construction

3.1.1 All erosion control products shall be constructed in accordance with the appropriate Standard Drawings and manufacturer's specifications. The exact location of erosion control products shall be indicated by the Engineer in the field.

3.1.2 The erosion control products shall be constructed such that the elevations will conform accurately to the elevations specified.

3.1.3 The excavation for the erosion control products shall be in accordance with Sections 2110 Excavation and 2120 Embankments. If the foundation is unsuitable, the bottom of the bed shall be sub-cut to the dimensions staked by the Engineer. The sub-cut shall be backfilled in accordance with the requirements for embankments (Section 2120) as designated by the Engineer.

3.1.4 The granular material shall be placed as indicated in Section 2230 Granular Base Course.

3.1.5 Geotextile fabrics shall be installed as per Section 2155 Geotextile.

3.1.6 Installation of rip rap shall be in accordance with the requirements described in Section 02271 for Rip Rap.

3.1.7 Placement of gabions

.1 Site preparation:

- ◆ Perform excavation and grading for the gabion structure as per design. Remove and dispose of stumps, roots, and debris.

- .2 Assemble Gabion Baskets
 - ◆ Assemble gabion basket as per manufacturer recommended procedures or method approved by the engineer.
 - .3 Placing Baskets:
 - ◆ Place the initial level of empty baskets into position. Secure adjacent baskets together and ensure there is no void left between adjacent baskets.
 - ◆ Place geotextile fabric against the gabion wall and top in contact with surrounding ground. Lap the fabric at joints a minimum of 500 mm.
 - ◆ Stagger vertical joints so that no vertical joint is directly in line with a vertical joint in the next lower level.
 - .4 Filling Rock
 - ◆ Fill each basket to a depth of 300 mm at a time, and then distribute evenly by hand to minimize voids. No basket shall be filled more than 300 mm higher than the adjoining baskets.
 - ◆ Backfill gaps between the gabions and surrounding ground as directed by the Engineer.
- 3.2 Erosion Control Blanket
- 3.2.1 Unless otherwise directed, blanket shall be placed on finished grade and stapled in place following the manufacturer's installation instructions.
 - 3.2.2 Rolls shall be overlapped a minimum 300 mm and secured to the ground using staples and at intervals recommended by the manufacturer based on anticipated water flow velocities.
- 3.3 Silt Fence
- 3.3.1 Unless otherwise directed in the manufacturer's specification and approved by the Engineer, the preparation and placement of silt fence shall be as specified herein.
 - 3.3.2 The Contractor shall install silt fences as indicated on the drawings, or as directed by the Engineer. If silt fences are to be installed in designed ditch excavation areas they shall be installed immediately after excavation is complete. The silt fence shall be installed to prevent sediment from passing from one side of the barrier to the other.
 - 3.3.3 Stakes, 1.2m long, shall be spaced a maximum of 2.5 m apart, and shall be driven vertically into the ground to a minimum depth of 600 mm.
 - 3.3.4 A trench measuring approximately 200 mm wide by 200 mm deep shall be excavated along the entire line of stakes. The trench shall be on the side of the stakes where grading work is to be conducted.

- 3.3.5 The geotextile from the silt fence shall extend into the trench a minimum of 300 mm. The prefabricated silt fence shall be installed without sags and have an overlap of 450mm wherever the length is extended.

 - 3.3.6 The trench shall be backfilled and tamped to existing grade so as to hold the base of the geotextile firmly in place. The completed silt fence barrier shall have a minimum height of 600mm above the ground surface.

 - 3.3.7 The Contractor shall maintain silt fence during the length of construction or longer if specified elsewhere.
- 3.4 Renovation of Erosion Control Products
- 3.2.1 Abandonment
- During the course of construction it may be required that existing erosion control products may have to be abandoned. The products shall be removed to at least 0.3 m below the proposed subgrade. Salvageable material shall be returned to the City Yards, as required by the contract document or as directed by the Engineer.