CW 3615 – RIPRAP

TABLE OF CONTENTS

CW 3615 - RIPRAP

1. GENERAL CONDITIONS

The General Conditions and Standard Provisions attached hereto shall apply to and be a part of this Specification.

3. DESCRIPTION

This Specification shall cover the operations relating to the supply and placement of approved riprap and other works relating to the placing of riprap.

The work to be done by the Contractor under this Specification shall include the supply of all materials, and the furnishing of all superintendence, overhead, labour, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all work as hereinafter specified.

5. MATERIALS

5.1 General

The Contractor shall be responsible for the supply, safe storage and handling of all materials set forth in this Specification.

5.2 Rock

Rock for riprap shall consist of hard, dense, durable rock. The rock shall be quarried rock or fieldstone, dense and durable, and resistant to the action of frost and water and suitable in all other respect for the purpose intended. Stone rip-rap shall be free of sod, roots, organic material and debris prior to placement. Individual pieces of stone shall be free of defects such as seams or cracks prior to placement. Where stipulated, rock is to be of the same type as that existing in place. In other installations, the stones shall range in size from 100 mm to 350 mm in diameter with at least seventy-five (75%) percent ranging from 200 mm to 300 mm in diameter. The Contract Administrator shall approve the rock for riprap prior to placing.

Quarried rock shall have a maximum Los Angeles Abrasion Loss of 32% when tested in accordance with ASTM C535 and a maximum Magnesium Sulphate Soundness Loss of 13% when tested in accordance with ASTM C88.

5.3 Random Stone Riprap

Random stone riprap shall be placed over a non-woven geotextile fabric which shall conform to requirements of CW 3130.

5.4 Grout

Concrete grout shall be 15 MPa compressive strength at 28 days, with sand aggregate of a consistency to ensure total penetration to fill all voids in the riprap.

5.5 Sand Bags

Sand bags shall be of 225 g jute 300 mm x 600 mm with salvage top and tie string attached to the side approximately 100 mm from the top.

5.6 Sacked Concrete

Concrete for sacked concrete riprap shall consist of a mixture of 20 kg of normal Portland cement to 50 kg of aggregate. Aggregate shall be well graded and have a maximum aggregate size of 40 mm.

5.7 Flexible Joint Sealant

Flexible joint sealant shall be guaranteed non-staining, grey polyurethane, as approved by the Contract Administrator and applied in strict accordance with the manufacturer's instructions.

5.8 Expansion Joint Material

Expansion joint material shall be rot-proof and of the preformed, non-extruding, resilient type made with a bituminous fibre and shall conform to the requirements of ASTM Standard D1751, Specification for Preformed Expansion Joint fillers for Concrete Paving and Structural Construction.

9. CONSTRUCTION METHODS

9.1 Preparation of Existing Ground

The bed for riprap shall be shaped and trimmed to the lines as shown on the Drawings or as staked in the field by the Contract Administrator, prior to placing of any riprap. No riprap shall be placed until the bed has been inspected and approved by the Contract Administrator.

9.2 Random Stone Riprap

Place a layer of geotextile fabric under the riprap. Anchor the geotextile fabric on the upstream and downstream end of the rock filled trenches as shown on the Drawings.

Place the rock riprap carefully on the geotextile fabric so that it does not tear. Place the rock in such a manner that the larger stones are uniformly distributed and smaller rocks serve to fill the spaces between the larger rocks. Sufficient hand work shall be done to procure a neat and uniform surface with the thickness as shown on the Drawings.

9.3 Grouted Stone Riprap

Placing of the stone riprap shall be in accordance with Section 9.2 of this Specification.

The concrete sand grout shall then be vibrated or rodded to ensure that the voids between the stones are filled, resulting in total penetration and worked such that the top surfaces of the exposed stones are not covered by grout. The finished surface shall present an even, closed surface, with at least fifty (50%) percent of the rocks on the surface projecting approximately 25 mm to 100 mm above the specified thickness. The grout layer shall be a minimum of 300 mm in thickness or greater as shown on the Drawings.

The outside perimeter of the riprap shall be constructed using a vertical formed edge equal to the depth of the grout layer.

After initial set of the grout, the portion of the rocks projecting above the grout layer shall be thoroughly cleaned of all grout by sandblasting, to the satisfaction of the Contract Administrator. Following sand-blasting, all loose material shall be removed from the site.

Expansion joints shall be constructed where the riprap is placed against any structure, or where directed by the Contract Administrator. A 13 mm thick fibre joint filler shall be installed in expansion

joints. The fibre joint shall extend from the base of the grout layer up to 13 mm below the grout surface. A bond breaker, as approved by the Contract Administrator, shall be placed along the bottom of the 13 mm deep by 13 mm wide notch, and the top shall be filled with flexible joint sealant in accordance with the manufacturer's recommended procedures, as approved by the Contract Administrator.

The Contractor shall be responsible for removal, off site, of all surplus excavated material.

9.4 Sacked Concrete Riprap

Sacked concrete riprap shall consist of jute bags filled with a dry concrete mix watered after placement.

The concrete mixture shall be mixed in a batch mixer until the aggregate is uniformly coated with cement.

The bags shall then be filled two thirds full with the dry mix and securely tied.

The filled bags shall be hand placed with close broken joints, firmly bedded into the slopes and securely butted against adjacent bags. The riprap shall have a minimum thickness of 150 mm and shall not vary more than 75 mm at any point. The bags shall be thoroughly compacted as construction progresses and the finished surface shall present an even, closed surface.

The dry mix bags shall be thoroughly wetted down with water after laying is complete.

12. METHOD OF MEASUREMENT

12.1 Random Stone Riprap

Random stone riprap will be measured on a volume basis. The volume to be paid for shall be the number of cubic metres installed in accordance with this Specification and accepted by the Contract Administrator, based on the surface area multiplied by the specified thickness.

This work shall include all necessary trimming and excavation and the removal off site, of the excess excavated material, unless otherwise specified in the Specifications for the Work.

12.2 Grouted Stone Riprap

Grouted stone riprap will be measured on a volume basis. The volume to be paid for shall be the number of cubic metres installed in accordance with this Specification and accepted by the Contract Administrator, based on the surface area multiplied by the specified thickness.

This work shall include all necessary trimming and excavation and the removal off site, of the excess excavated material, unless otherwise specified in the Specifications for the Work.

12.3 Sacked Concrete Riprap

Sacked concrete riprap will be measured on a volume basis. The volume to be paid for shall be the number of cubic metres installed in accordance with this Specification and accepted by the Contract Administrator, based on the surface area multiplied by the specified thickness.

This work shall include all necessary trimming and excavation and the removal off site, of the excess excavated material, unless otherwise specified in the Specifications for the Work.

13. BASIS OF PAYMENT

13.1 Random Stone Riprap

Random stone riprap will be paid for at the Contract Unit Price per cubic metre for "Random Stone Riprap", measured as specified herein, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the work included in this Specification.

13.2 Grouted Stone Riprap

Grouted stone riprap will be paid for at the Contract Unit Price per cubic metre for "Grouted Stone Riprap", measured as specified herein, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the work included in this Specification.

13.3 Sacked Concrete Riprap

Sacked concrete riprap will be paid for at the Contract Unit Price per cubic metre for "Sacked Concrete Riprap", measured as specified herein, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the work included in this Specification.