

03050 Hand Placed, Grouted and Random Riprap**Index**

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03050-1 Description

The work shall consist of a protective covering of stone constructed with or without grout on an earth bed or granular filter blanket. Riprap shall be constructed at the locations shown on the plans or as designated by the Engineer.

The Contractor shall supply all labour, material, and equipment necessary to complete the work to the satisfaction of the Engineer.

03050-2 Materials**2.1 Riprap**

Riprap material for culverts and other drainage work, shall consist of hard durable field stones, boulders or quality rock.

2.1.1 Type A Riprap

The minimum requirements of Type A Riprap are: Fifty (50) percent of the material must be greater than forty-five (45) kilograms and ninety (90) percent must be greater than twenty-seven (27) kilograms.

2.1.2 Type B Riprap

The minimum requirements of Type B Riprap are: Fifty (50) percent of material must be greater than thirty-four (34) kilograms and ninety (90) percent must be greater than fourteen (14) kilograms.

No stone shall be less than one hundred and fifty (150) mm dimension, with dimension being defined as length, width and depth.

2.2 Grout

The grout shall consist of a mixture of one (1) part Portland Cement and three (3) parts fine clean sand, or as otherwise designated by the Engineer. The consistency shall be such, that it can be easily worked into the spaces between the stones with a mason's trowel.

03050-3 Construction**3.1 Excavation****3.1.1 Hand Placed and Grouted Riprap**

The aprons and slopes to be riprapped shall be excavated and trimmed to an even, uniform surface so as to provide an adequate foundation upon which the riprap shall be placed. The depth of excavation shall be carried out as shown on plans or as designated by the Engineer.

3.1.2 Random Riprap

The aprons and slopes to be riprapped shall be excavated as shown on the plans or as designated by the Engineer, so as to provide a ledge or support upon which the stones may be dumped.

3.2 Placement of Materials**3.2.1 Hand Placed Riprap**

The stones shall be placed by hand, on the prepared aprons and slopes, with the largest stones being placed at the bottom of the slope.

The stones shall be placed as close together as possible without any shaping of the stones themselves.

3.2.2 Grouted Riprap

The stones shall be placed as in 3.2.1 above. Before placement of the grout, the stones shall be thoroughly wetted. The grout shall then be placed, commencing from the bottom of the slope and progressing upward, ensuring that all voids between the stones are filled with grout. The stones shall project a distance of fifty (50) to one hundred (100) millimetres above the grouted surface, depending upon the dimension of the stone itself. After grouting, the surface shall be thoroughly brushed to expose the stone surface to the extent designated above.

Grout shall not be placed when the temperature is four (4) degrees Celsius and falling.

The finished grouted surface shall, after sufficient setting, be sprayed with a curing compound supplied by the City of Saskatoon.

3.2.3 Random Riprap

Random riprap shall be dumped onto the prepared surface and sufficient handwork utilized, to provide a uniform surface to the satisfaction of the Engineer.

03050-4 Measurement

Measurements shall be based upon surface area (m²) as measured on the accepted completed product and upon one (1) layer of riprapping.

03050-5 Payment

Payment for hand placed, grouted, or random riprap shall be at the contract unit price per square metre as specified on the Tender Form, and be full compensation for supplying, hauling, placing and supplying all labour and equal parts necessary to complete the work to the satisfaction of the Engineer.

End of Specification 03050