



6000 - SPECIFICATION FOR HAND PLACED, GROUTED, AND RANDOM RIP-RAP

6000 - 1 DESCRIPTION

- 1.01 The work shall consist of a protective covering of stone, with or without grout, constructed on an earth bed or granular filter blanket. Rip-rap shall be constructed at the locations and in conformity with the lines, grades, and dimensions shown on the plans or designated by the Engineer.

6000 - 2 MATERIALS

- 2.01 The Department will select and pay for the portland cement, if required. The Contractor shall supply all other materials.
- 2.02 Rip-rap materials, for culverts and other drainage work, shall consist of hard and durable field stones, boulders, or quarry rock. No stone shall be less than fifteen centimetres (15 cm) in its smallest dimension. For the purpose of this specification, dimension will be defined as being length, width, and depth.
- 2.03 Rip-rap materials for bridges shall consist of hard and durable field stones, boulders, or quarry rock. At least eighty (80) percent of the stone shall have a volume of not less than three and one-half cubic decimetres (3.5 dm³) each.
- 2.04 Unless otherwise designated by the Engineer, grout shall consist of one (1) part portland cement and three (3) parts fine clean sand. The grout shall be of such consistency that it can be placed with a mason's trowel.

6003 - 3 CONSTRUCTION

Excavation

- 3.01 HAND PLACED RIP-RAP - Aprons and slopes to be rip-rapped shall be excavated to provide adequate foundation upon which the rip-rap shall rest, as shown on the plans or specified by the Engineer. The whole area to be rip-rapped shall be trimmed to a uniform and even surface.
- 3.02 GROUTED RIP-RAP - Excavation shall be performed as for 3.01 above.
- 3.03 RANDOM RIP-RAP - If required, a shelf or ledge shall be excavated to permit dumping of the stone.

Placing

- 3.04 HAND PLACED RIP-RAP - Stones shall be placed, by hand, to the required length, width, and thickness. Stones shall be placed so that the largest dimension is perpendicular to the slope, unless such dimension is greater than the specified thickness of the rip-rap. The largest stones shall be placed in the bottom rows. No shaping of stones will be required. Stones shall be laid closely together.

- 3.05 GROUTED RIP-RAP - Grout shall not be placed when the atmospheric temperature is less than five degrees Celsius (5°C).
- (a) The stones shall be placed as specified in 3.04 above. The surface of the stones shall be thoroughly wetted before applying grout. The spaces between the stones shall be filled with grout. Grouting of the slope shall begin at the toe of the slope and shall be worked with suitable tools to completely fill all spaces, except that the outer faces of the stones shall be exposed.
 - (b) When the grout has been placed, the stone surfaces shall be thoroughly brushed so that their top surfaces are exposed. The outer stones shall project five to ten centimetres (5 to 10 cm) above the grouted surface.
 - (c) Grouted Rip-Rap shall be cured using curing compounds, burlap, a blanket of earth kept wet for seventy-two (72) hours, or by sprinkling with a fine spray of water every two (2) hours during the daytime for a period of three (3) days.
- 3.06 RANDOM RIP-RAP - Random rip-rap shall be dumped onto the surface to be rip-rapped. Sufficient hand work shall be performed to produce a uniform surface and the depth shown on the plans.

6000 - 4 MEASUREMENT

- 4.01 Measurements will be based on surface area and average thickness of the rip-rap.
- 4.02 Hand Placed Rip-Rap and Grouted Rip-Rap will be measured in place, in cubic metres, except that rip-rap for culverts may be based on design quantities specified on the plans.
- 4.03 Random Rip-Rap will be measured in cubic metres or in tonnes.
- 4.04 The volume of rip-rap dumped or placed into water, or other sites where measurements in place are impractical, will be computed from the volumetric capacity of the vehicle.

6000 - 5 PAYMENT

- 5.01 Payment for HAND PLACED RIP-RAP and/or GROUTED RIP-RAP and/or RANDOM RIP-RAP will be at the contract unit price per cubic metre or per tonne, as specified on the tender form. The unit price will be full compensation for furnishing all materials except portland cement; excavating and preparing the bed; loading, hauling, unloading, and placing the stones; and mixing, placing, finishing, and curing the grout.
- 5.02 Payment for excavation for bridge piers will be in accordance with the requirements for Foundation Excavation (Specification 2255).