



SECTION 917

HYDRAULIC RIP RAP

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917.01 SCOPE

This specification covers the construction of hydraulic rip rap protective covering placed to protect causeways and structures.

917.02 MATERIALS AND GRADING

The quality of rock shall be approved by the Engineer. Rock subject to deterioration by water or weather will not be accepted. Field stones and boulders may be used where acceptable to the Engineer.

Rip rap shall consist of clean hard durable rock having a density of not less than 2.6 t/m³. The rock material when subjected to the Los Angeles Abrasion Test CSA A23.2-17a shall have a loss not greater than 35%.

When tested for soundness according to CSA A23.2-9A, the rock material shall have a loss not greater than 15% after five cycles.

The following classes of hydraulic rip rap will be used graded as follows (Taken from "Guide to Bridge Hydraulics" published by RTAC):

Class I NOMINAL 300 MM DIAMETER OR 40 KG MASS ALLOWABLE LOCAL VELOCITY UP TO 3 M/SEC. GRADING SPECIFICATION: 100% SMALLER THAN 450 MM OR 130 KG AT LEAST 20% LARGER THAN 350 MM OR 70 KG AT LEAST 50% LARGER THAN 300 MM OR 40 KG AT LEAST 80% LARGER THAN 200 MM OR 10 KG	Class II NOMINAL 500 MM DIAMETER OR 200 KG MASS ALLOWABLE LOCAL VELOCITY UP TO 4 M/SEC. GRADING SPECIFICATION: 100% SMALLER THAN 800 MM OR 700 KG AT LEAST 20% LARGER THAN 600 MM OR 300 KG AT LEAST 50% LARGER THAN 500 MM OR 200 KG AT LEAST 80% LARGER THAN 300 MM OR 40 KG	Class III NOMINAL 800 MM DIAMETER OR 700 KG MASS ALLOWABLE LOCAL VELOCITY UP TO 5 M/SEC. GRADING SPECIFICATION: 100% SMALLER THAN 1200 MM OR 2300 KG AT LEAST 20% LARGER THAN 900 MM OR 1100 KG AT LEAST 50% LARGER THAN 800 MM OR 700 KG AT LEAST 80% LARGER THAN 500 MM OR 200 KG
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The class of rip rap to be used will be designated in the contract documents.

Location of a suitable source for the hydraulic rip rap shall be the responsibility of the Contractor.

917.03 PLACING

Where and as directed by the Engineer excavation shall be performed to provide a shelf or ledge to provide adequate foundation for the bottom of the hydraulic rip rap.

Material shall be placed as shown on the plans or as otherwise directed by the Engineer.

Material may be dumped into position to completely cover the area to be protected to the depth specified. In some locations it may be necessary to place the hydraulic rip rap by crane.

Placing shall be done in such a manner that the surface of the finished rip rap shall have a uniform appearance. The Engineer shall be the final and sole judge of the quantity of hydraulic rip rap required.

917.05 MEASUREMENT FOR PAYMENT

Rip rap shall be measured in cubic metres in place to the nearest one decimal place and only that material placed as directed by the Engineer shall be included.

Where measurement is impractical due to placement under water an estimate of that rip rap correctly placed will be made by converting the truck load into cubic metres.

Measurement for any excavation requested by the Engineer will be in accordance with Section 902, "Excavation for Foundation, Unwatering and Extra Backfill for Structures".

917.06 BASIS OF PAYMENT

Payment shall be made at the unit price per cubic metre as specified in the contract. Payment shall constitute full compensation for all labour, materials and equipment to supply and place hydraulic rip rap protection as required under the contract.

Where excavation for foundation is required, the basis of payment for the same shall be as per section 902.09 of the Specification Book; Excavation for Foundations.