

SPECIFICATIONS FOR STONE RIP-RAP

1297. 1. Scope

These Specifications govern all operations necessary for and pertaining to the supplying and placing of approved stone as a protective covering along the side slopes and bases of river channels, around piers and abutment footings and wing walls, on slopes around culvert inlets and outlets and on embankments, or such other places as may be indicated on the plans or designated by the Engineer in the field.

1297. 2. MATERIALS

2.1 Stone Rip-Rap Quality

The Contractor shall supply field stone, quarried rock, or quarried limestone which is dense, durable, sound, resistant to the action of water and frost, and suitable in all respects for the purpose intended. Stone rip-rap shall be free from sod, roots, organic material and debris prior to placement. Individual pieces of stone shall be free of defects such as seams or cracks that would cause rapid or excessive deterioration or degradation.

Quarried limestone shall have a maximum Los Angeles Abrasion Loss of 32% (ASTM C535) and a maximum Magnesium Sulphate Soundness Loss of 13% (ASTM C88). Representative sample limestone, from the intended source, crushed to maximum 75 mm aggregate size, shall be supplied by the Contractor to the Department for approval a minimum of two weeks prior to its use.

2.2 Stone Rip-Rap Gradation

The stone rip-rap shall be well graded having a full range and even distribution of sizes and shall conform to the following gradation:

STONE RIP-RAP GRADATION

SIZE Smaller Than (mm)	CLASS 600	CLASS 450	CLASS 350
600	100%		
450		100%	
350	15-50%		100%
250		15-50%	
200	0 - 15%		15-50%
150		0 – 15%	
100			0 – 15%

Dependent on conditions and provided there is no additional cost to the department, the Engineer may accept a larger size of stone rip-rap than what is called for on the tender bid page.

1297. 3. CONSTRUCTION METHODS**3.1 Preparation of Bed**

The ground surface shall be **excavated and neatly shaped** to the lines as shown on the plans or as staked by the Engineer in the field prior to the placing of any rip-rap.

The supply and installation of any geotextile, granular filter, and/or bedding material shown on the plans shall be according to their respective specifications and paid for as separate items.

3.2 Placing of Stone Rip-Rap

The stone rip-rap shall be dumped or placed in such a manner that the larger stones are uniformly distributed, the smaller rocks serve to fill the spaces between the larger stones, and that excessive segregation of the various stone sizes does not occur.

Sufficient placing and leveling shall be done to produce a firmly bedded neat and uniform surface conforming to the thickness, shape, and dimensions shown on the plans.

4. METHOD OF MEASUREMENT

Stone rip-rap will be measured on a volume or a mass basis, as indicated on the tender bid page.

Where the unit bid item for Stone Rip-Rap is in cubic metres, the volume to be paid for will be the number of cubic metres placed in the completed work as determined by multiplying the actual surface area by the thickness shown on the plans or by using the volume rated capacity of the hauling vehicle.

Where the unit bid item for Stone Rip-Rap is in tonnes, the mass to be paid for will be measured in tonnes of material placed in the completed work.

The area to be rip-rapped shall not exceed the dimensions shown on the plans or as established by the Engineer in the field.

5. BASIS OF PAYMENT

Stone rip-rap will be paid for at the unit price for "Stone Rip-Rap", measured as specified herein, which price will be payment in full for **excavating and shaping the rip-rap bed**, supplying, loading, hauling, and placing rip-rap and for performing those operations described herein and those incidental to the work.