

SECTION 02510

ROCK RIP-RAP CONSTRUCTION

PART 1 - GENERAL

1.1 Description

A. Description of Work

The work to be performed in accordance with this section includes furnishing and installing stone, with or without grout as indicated on the plans and specified herein. The work shall include the furnishing of all labor, tools, equipment, materials and the performing of all operations required to provide with the project plans and these specifications.

B. Related Work Specified Elsewhere

Earthwork.....Section 02200
Storm Drain Construction.....Section 02500

1.2 Quality Assurance

A. Reference Test Standards and Specifications

ASTM C131, Standard Test Method for Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

ASTM C144, Standard Specification for Masonry Mortar

ASTM C404, Standard Specification for Aggregate for Masonry Grout

1.3 Submittals

A. Materials Test Reports

1. Report on Rip-Rap Gradation and Abrasion Loss.
2. Report on Portland Cement Grout Including Mix Design and Aggregate Properties.

B. Frequency for Testing

1. One test for each source of stone and grout.

PART 2 - MATERIALS

2.1 Stone

Sound and durable, free from seams and coatings. Loss by abrasion not to exceed 10 percent by weight after 100 revolutions nor 40 percent after 500 revolutions when tested in accordance with ASTM C131.

A. Shape

Do not use rounded boulders or cobbles on slopes steeper than 2 to 1 unless grouted. The thickness of each stone shall be more than 1/3 the length.

B. Size

Stone shall be as large as can be conveniently placed in a layer of the required depth. Except for small stones used to chink interstices, stone shall not be less than 10 pounds and at least 50 percent of the stone shall not be less than 100 pounds.

C. Type

Waste concrete is not to be used unless specifically approved by the **OWNER**.

2.2 Portland Cement Grout

One part Type V portland cement, three parts aggregate by volume. The aggregate shall be two parts sand and one part 3/8 inch aggregate. The sand shall meet the requirements of ASTM C144. The aggregate shall meet the requirements of ASTM C404, Size No. 1.

PART 3 - EXECUTION

3.1 Preliminary Investigation of the Work

Verify all preliminary work has been performed in accordance with these specifications prior to placement of rock rip-rap.

3.2 Preparation of Ground Surfaces

Trim and shape bed to provide even surfaces to the plan elevation. Excavate, backfill and compact bed for rip-rap in accordance with Specification Section 2200, Earthwork.

3.3 Rock Rip-Rap

A. Depth Less Than 20 Inches

Place stone by hand to provide a minimum of voids. Place larger stone in the trench at the slope toe; as foundation course and on the perimeter. Place stones with longitudinal axis normal to the face of the embankment and arranged so that each stone has at least 3 point bearing on underlying stones. Chink interstices with small stones. The finished surface shall be even and tight and shall not vary from the planned surface by more than 3 inches per foot of depth.

B. Depth Greater Than 20 Inches

Stone may be placed by dumping and spreading in layers with suitable equipment. Arrange with equipment to produce stable and dense layer.

3.4 Grouted Rock Rip-Rap

Place rip-rap as specified above and grout with portland cement grout. Mix grout in an appropriate machine mixer. Place grout to the depth as shown on the plan but in no case less than 70 percent of the depth of rip-rap. Place and consolidate grout so as to provide a dense stone and mortar layer with all voids and interstices filled.

The stone face surface shall be exposed. If required, use water pressure to clean stone faces after the mortar has achieved sufficient strength. Cure grouted rip-rap in accordance with Specification Section 3300, Concrete.

PART 4 - MEASUREMENT AND PAYMENT

4.1 Measurement

The surface area of rock rip-rap construction to be paid for will be that of the completed bid item, in place, within the limits of dimensions shown on the plans. The **OWNER** will compute the quantities of rip-rap by a method which, in his opinion, is best suited to obtain an accurate determination.

4.2 Payment

Payment for rock rip-rap will be made at the contract unit price for the number of square yards of rock rip-rap in place for each depth required on the basis of unit prices stipulated in the proposal and shall include preparation of ground surfaces and trenching.

Payment will be made under Item Number:

NOT USED - "X" Rock Rip-Rap, S.Y.

****END OF SECTION****