

SECTION 02205 - RIPRAP

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The WORK under this Section includes providing all labor, materials, tools and equipment necessary for furnishing and placing a protective covering of stone, as shown on the Drawings, or as directed by the ENGINEER.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Stone for this WORK shall be hard angular quarry stones and have a percentage of wear of not more than 50 at 500 revolutions as determined by ASTM C 535. The least dimension of any piece of stone shall be not less than 1/4 its greatest dimension. Rounded boulders or cobbles shall not be used on slopes steeper than 2:1. Stones shall meet the following gradation requirement for the Class specified:

Class I

No more than 10% of the stones by total weight shall weigh more than 50 pounds per piece, and no more than 50% of the stones by total weight shall weigh less than 25 pounds per piece.

Class II

No more than ten percent of the stones by total weight shall weigh more than 400 pounds per piece, and no more than 15% of the stones by total weight shall weigh less than 25 pounds per piece. The stones shall be evenly graded and a minimum of 50% by weight of the stones shall weigh 200 pounds or more per piece.

Class III

No more than 10% of the stones by total weight shall weigh more than 1,400 pounds per piece, and no more than 15% of the stones by total weight shall weigh less than 25 pounds per piece. The stones shall be evenly graded and a minimum of 50% by weight of the stones shall weigh 700 pounds or more per piece.

- B. Filter cloth shall conform to the requirements of Section 02714 - Filter Cloth.

PART 3 - EXECUTION

3.1 CONSTRUCTION

- A. Foundation or toe trenches and other necessary excavation shall be completed and approved by the ENGINEER before the placing of riprap is begun. Slopes to be protected with riprap shall be free of brush, trees, stumps and other objectionable material and shall be dressed to a reasonably smooth surface.
- B. Filter cloth shall then be placed as provided for in Section 02714 - Filter Cloth, Article 3.1.

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- C. The stones shall be handled or placed with an excavator as to secure a stone mass of the thickness, height and length shown on the Drawings, or as staked, with a minimum of voids.
- D. Undesirable voids shall be filled with small stones or spalls. The rock shall be manipulated sufficiently by means of a bulldozer, excavator, rock tongs, or other suitable equipment to secure a reasonably regular surface and mass stability.
- E. Riprap protection shall be placed to its full course thickness at one operation and in such manner as to avoid damaging the filter cloth or displacing the underlying material. Placing of riprap protection in layers or by dumping into chutes or by similar methods likely to cause segregation will not be permitted.
- F. All riprap shall be so placed and distributed that there will be no large accumulation or area composed mainly of either the larger or small sizes of stone.
- G. Unless otherwise authorized, the riprap protection shall be placed in conjunction with the construction of the embankment with only sufficient lag in construction of the riprap protection as may be necessary to place filter cloth and to prevent mixture of embankment and riprap material.
- H. The CONTRACTOR shall provide a level, compact area of sufficient size to dump and sort typical loads of riprap at an approved location; and shall dump loads, as specified, in this area; and shall assist the ENGINEER as needed to sort and measure the stones for the purpose of determining if the riprap is within Specifications. Mechanical equipment as needed to assist in this sorting shall be provided by the CONTRACTOR at no additional cost.

END OF SECTION