

1. GENERAL

1.1 RELATED WORK

- .1 Section 31 32 19 – Geosynthetics.

1.2 MEASUREMENT AND PAYMENT

- .1 Riprap will be measured by either the square metre at the top of the finished surface for the quantity of rock riprap acceptably supplied and placed within the dimensions indicated on the Drawings or as required by the Engineer or by the cubic metre of material incorporated into the Work, as specified within the Bid Forms. Materials placed outside the specified areas will not be measured. Payment shall be compensation in full for the supplying, loading, hauling and placing, excavation, bedding, backfilling and all other items related or deemed incidental to complete the work prescribed. No direct measurement will be made for the supply and placement of the geotextile material which shall be considered incidental to the Work.

2. PRODUCTS

2.1 MATERIALS

- .1 Rock Riprap
 - .1 Materials for rock riprap shall be sound and durable field stone, or rough unhewn quarry stone as nearly rectangular as practicable, conforming to the following class gradations:
 - .1 Class 1:
 - No more than 10% of the stone will have a diameter greater than 300mm;
 - No more than 50% of the stone will have a diameter less than 250mm; and
 - No more than 10% of the stone will have a diameter less than 150mm.
 - .2 Class 2:
 - No more than 10% of the stone will have a diameter greater than 400mm;
 - No more than 50% of the stone will have a diameter less than 300mm; and
 - No more than 10% of the stone will have a diameter less than 150mm.
 - .3 Class 3:
 - No more than 10% of the stone will have a diameter greater than 550mm;
 - No more than 50% of the stone will have a diameter less than 400mm; and
 - No more than 10% of the stone will have a diameter less than 200mm.
 - .4 Class 4:
 - No more than 10% of the stone will have a diameter greater than 675mm;
 - No more than 50% of the stone will have a diameter less than 550mm; and
 - No more than 10% of the stone will have a diameter less than 250mm.
 - .5 Class 5:
 - No more than 10% of the stone will have a diameter greater than 850mm;
 - No more than 50% of the stone will have a diameter less than 675mm; and
 - No more than 10% of the stone will have a diameter less than 400mm.

- .2 The rock riprap shall be well graded between the sizes specified.

2.2 GEOTEXTILE MATERIAL

- .1 Non-woven geotextile shall be in accordance with Section 31 32 19 – Geosynthetics.

3. EXECUTION

3.1 PLACING

- .1 The hand laid rock riprap erosion protection shall be placed in the areas indicated on the Drawings or as designated by the Engineer.
- .2 The Contractor shall ensure that the surface upon which the riprap material is to be placed is graded to an even, uniform surface, with no depressions, humps or protrusions.
- .3 Geotextile material shall be placed in accordance with Section 31 32 19 – Geotextiles.
- .4 Riprap Placement:
 - .1 Nominal size riprap as specified, as defined in Section 2.0 - Products, shall be used.
 - .2 The riprap stones shall be placed on the surface to be covered as shown by the Drawings or as directed by the Engineer, on slopes not exceeding 3H:2V starting with the larger stones on the bottom row. Each stone shall be placed with the broad flat surface resting on a horizontal earth bed prepared for it such that the weight of the stone is carried by the earth and not by the underlying stones. Stones shall be laid in successive rows, or layers, proceeding upward with the joints staggering those of the adjacent rows as so to secure a "shingled" effect, evenly stepped. Voids between stones shall be filled with spalls rammed into place.
 - .3 Care shall be taken not to puncture the geotextile material when placing the riprap. Any damaged material shall be repaired or replaced as requested by the Engineer.
 - .4 The Contractor shall, at its entire cost, restore any surface that may have been disturbed through this rip-rapping operation to a condition satisfactory to the Engineer.

END OF SECTION