Riprap Geotextile Installation Guide

RIP-RAP

Geotextile
1.0 General

1) This guideline covers general installation of geotextiles in riprap applications.
2) Where contradictions occur follow the instructions of the project engineer.

2.0 Prepare Site

1) Smoothly grade the surface as approved by the project engineer.
2) Make sure the surface is smooth and free of deleterious materials such as sharp objects or large protruding rocks and grubbed to remove all roots and vegetation.
3) Compact any fill material to the density of surrounding undisturbed soil.
4) Make sure to excavate deep enough for both filter and riprap.

3.0 Geotextile Choice

1) For fine-grained beach sands, use a woven monofilament.
2) For coarse sands, silts and clays use a nonwoven geotextile.

4.0 Place Geotextile

1) Place the riprap geotextile without wrinkles or folds.
   a) Avoid stretching and tearing the geotextile.

4.0 Orientation

1) Always orient the geotextile with the machine (roll) direction parallel to the direction of water flow.
   a) For erosion control runoff and wave action: Typically parallel to the slope.
   b) For stream bank and channel protection: Typically parallel to the stream or channel.
2) If required, use key trenches or aprons at the crest and toe of the slope to anchor the ends of the geotextile.
   a) 18 inch anchoring pins may be an acceptable option to expedite construction.
   b) The key trench should be excavated in stable material.
   c) Key trench should backfilled with soil and compacted on completion of the geotextile installation.
   d) Key trench depth should be 1.5 times the design thickness of riprap and extend a horizontal distance equal to the design thickness.
   e) It is recommended that the front of anchor trenches are rounded and smooth to reduce stress on the geotextile.

5.0 Joining Adjacent Sheets

1) Soil CBR will determine if overlapping or sewing is the correct option. AASHTO offers these general guidelines for sewing versus overlapping:
   a) Soil CBR > 3 Minimum overlaps of 1 – 1.5 feet
   b) Soil CBR 1–3 Minimum overlaps of 2 – 3.25 feet
c) Soil CBR < 0.5 Must be sewn

2) In cases where wave action or multidirectional flow is anticipated, all adjoining sheets perpendicular to the direction of flow must be sewn.

6.0 Overlapping

1) Successive sheets of riprap geotextile must be overlapped upstream over downstream and/or over down slope in a “shingle effect.”
   a) In lieu of specific CBR information, overlap adjacent rolls a minimum of 1 foot in all instances except when placed under water.

7.0 Underwater Applications

1) Overlaps under water must be a minimum of 3 feet.
   a) Refer to our Installation Underwater Geotextile Installation Guide for more information.
   b) For underwater applications, place the geotextile and backfill material on the same day.

8.0 Riprap Placement

1) Begin the riprap placement at the toe and proceed up the slope.
   a) Riprap weighing 220 lbs. or less may be placed directly onto the riprap geotextile.
      i) Cannot be dropped onto unprotected geotextile.
   b) Riprap weighing 220 lbs. or less may be dropped from a height not to exceed 3.25 feet if the geotextile is protected by a 6 inch aggregate bedding layer.
   c) Do not place riprap heavier than 220 lbs.
   d) Installations exceeding these guidelines must not be attempted unless past experience or field testing has demonstrated the geotextile will not be damaged.
   e) Field monitoring must be performed in all instances to verify that the riprap placement does not damage the geotextile.
   f) Do not allow riprap with a mass of more than 220 lbs. to roll down the slope.
   g) Backfill all voids in the riprap with smaller stone to ensure the geotextile is fully covered.
2) After placement of the riprap, avoid any grading above the geotextile that results in movement of the riprap.

9.0 Repairs

In lieu of specific project guidelines, overlap any damaged geotextile by a minimum of 3 feet in all directions with the replacement piece.
10.0 Storage

1) Riprap Geotextile rolls are wrapped in a UV protective cover.

2) If stored outdoors for a prolonged period, geotextile must be elevated from the ground and covered with a tarpaulin or opaque plastic.
   a) Contractor must insure rolls are adequately protected from:
      i) Moisture
      ii) Ultraviolet radiation
      iii) Chemicals that are strong acids or bases
      iv) Temperatures in excess of 140°F
      v) Animal destruction

This material is presented for general information only. Always verify the suitability for a specific application with the project engineer. Where contradictions occur, follow the instructions of the project engineer. There is no implied or expressed warranty regarding the installation procedures or the geosynthetic products in this guide. Installation procedure and product choice is the sole responsibility of the contractor and contractor assumes all liability.