



Construction Geosynthetics

Geotextile for Steepened Slopes Installation Guide

1.0 General

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

2.0 Prepare Subgrade

- 1) Excavate subgrade soil to the lines and grades shown on the construction drawings.
 - a) Clear the subgrade of all deleterious materials and sharp objects.
 - b) Level the subgrade so depressions and humps do not exceed 6 inches.
 - c) Place suitable compacted backfill material in over excavated areas.
 - i) Refer to project engineer for assistance.
- 2) Compact the foundation soils per project specifications:
 - a) Typically:
 - i) 95 percent of optimum dry density.
 - ii) Plus or minus three percentage points of the optimum moisture content.
 - iii) Compact cohesive soils in lifts of 6 to 8 inches.
 - iv) Compact granular soils in lifts of 9 to 12 inches.
- 3) Proof roll the foundation prior to placement of each layer of reinforcement geotextile and backfill.

3.0 Place Geotextile

- 1) Place the reinforcement geotextile at the elevation and orientation shown on the construction drawings.
 - a) Verify the geotextile's primary strength direction for proper installation orientation.
 - i) Correct orientation of the geotextile is critical.
 - ii) Check tensile strength on the geotextile's data sheet.
 - (1) For many reinforcement geotextiles it is in the roll direction.
 - (a) Some reinforcement geotextiles are bi-axial (strength in both directions).
 - b) The geotextile is laid directly on the horizontal surface of compacted fill.
 - c) Place the geotextile in one continuous piece with the primary strength direction extending the full length of the reinforced area.
 - i) The geotextile cannot be spliced or joined in the primary strength direction by any method unless otherwise directed by the engineer.

- d) The geotextile can be cut using a razor knife or similar.
- 2) Tension the geotextile by hand until free of wrinkles and lying flat.
- 3) Minimize unnecessary UV exposure to the geotextile.
 - a) Only place the amount required to complete pending fill placement.

4.0 Overlapping

- 1) Follow project guidelines for overlaps.
 - a) Typically 100% coverage is required.
 - b) 1 to 3 foot overlaps are typical.
- 2) Pins or staples may be required to hold the geotextile in place.
 - a) If needed, 6 or 12 inch sod staples work well.
 - b) Sand bags or piles of backfill are additional options.

5.0 Place Backfill

- 1) Place backfill as indicated in the construction documents.
- 2) Compact backfill per project specifications:
 - a) Typically:
 - i) 95 percent of optimum dry density.
 - ii) Plus or minus three percentage points of the optimum moisture content.
 - iii) Compact cohesive soils in lifts of 6 to 8 inches.
 - iv) Compact granular soils in lifts of 9 to 12 inches.
 - v) Perform soil compaction tests on every soil lift.
 - vi) Maintain consistent lift thicknesses between placements of adjacent layers of geotextile.
- 3) Compact backfill within 3 feet of the slope face with hand compaction equipment.
- 4) Ensure that construction activities proceed in a manner that minimizes wrinkles or movement of the geotextile and prevents damage to the geotextile.
 - a) Dump trucks and rubber tired loaders may be driven directly on the geotextile if needed.
 - i) Avoid quick stops, starts and turns.
 - ii) Keep speeds less than 10 mph.
 - b) A minimum fill thickness of 6 inches on top of the geotextile is required for operation of tracked vehicles over the area.
 - i) Turning of tracked vehicles should be kept to a minimum to prevent displacing the fill and damaging the geotextile.
- 5) At the end of the workday, grade and roll backfill away from the slope crest to prevent ponding of water.
 - a) Prevent water from overtopping the slope crest during and after construction of the slope.
- 6) After installation of the first reinforced fill layer has been completed, the next layer of geotextile can be placed.

6.0 Drainage

- 1) Groundwater infiltration and surface water runoff can saturate fills.
 - a) Saturation of fill significantly reduces soil strength resulting in instability of the reinforced mass.
 - b) The slope may be designed with enough reinforcement to handle these reduced soil strengths.
 - i) If not, place an engineered drainage system to prevent saturation of the fill.

7.0 Slope Face

- 1) For reinforced slopes, 1:1 V or flatter:
 - a) Hydro seed slope face and cover with an appropriate erosion control mat that will retain soil particles and promote vegetative growth.
- 2) For slopes steeper than 1:1 V and areas where vegetation is difficult to establish:
 - a) Use a durable facing such as:
 - i) Welded wire baskets
 - ii) Gabions
 - iii) Shotcrete
 - iv) Landscape timbers

8.0 Repairs

Consult with project engineer.

9.0 Storage

- 1) Geotextile rolls are wrapped in a UV protective cover.
- 2) If stored outdoors for a prolonged period, riprap 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.