

GEOTEXTILES USED IN FILTRATION AND DRAINAGE APPLICATIONS

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GENERAL

This document is prepared to help ensure that a subsurface drainage geotextile, once installed, will perform its intended design function. To do so, the geotextile must be identified, handled, stored, and installed in such a way that its physical property values are not affected and that the design conditions are ultimately met as intended. This document contains information consistent with generally accepted methods of identifying, handling, storing and installing geotextile materials. Failure to follow these guidelines may result in the unnecessary failure of the geotextile in a properly designed application.

MATERIAL IDENTIFICATION, STORAGE AND HANDLING

The geotextile shall be rolled on cores having strength sufficient to avoid collapse or other damage from normal use. Each roll shall be wrapped with a plastic covering to protect the geotextile from damage during shipping and handling, and shall be identified with a durable gummed label or the equivalent, clearly readable on the outside of the wrapping for the roll. The label shall show the manufacturer's name, the style number, and the roll number. Roll identification corresponding to the proposed location of the roll as shown on the construction drawings and as approved by the Engineer, Owner and Contractor can be provided.

While unloading or transferring the geotextile from one location to another, prevent damage to the wrapping, core, label, or to the geotextile itself. If the geotextile is to be stored for an extended period of time, the geotextile shall be located and placed in a manner that ensures the integrity of the wrapping, core, and label as well as the physical properties of geotextile. This can be accomplished by elevating the geotextile off the ground on dunnage and ensuring that it is adequately covered and protected from ultraviolet radiation including sunlight, chemicals that are strong acids or strong bases, fire or flames including welding sparks, temperatures in excess of 60°C (140°F), and human or animal destruction.

Before unrolling the geotextile, verify the roll identification, length, and installation location with the contract drawings. While unrolling the geotextile, inspect it for damage or defects. Repair any damage that occurs during storage, handling or installation as directed by the Engineer. Normally light traffic will not damage the exposed geotextile. However, as a safety precaution, it is recommended that traffic not run on exposed geotextile.

FRENCH AND TRENCH DRAINS

Site Preparation

Excavate the drainage trench to the design dimensions, placing excavated material well away from the sides of the trench. If unstable soil conditions exist, it may be necessary to excavate a trench with sloping sides to ensure wall integrity during the rest of the project. Trim any large roots to be flush with the trench sides to prevent puncturing or tearing the geotextile. Refill any voids with fill dirt so that the excavation sides are smooth.

Geotextile Placement

Cut geotextile to proper width prior to placement. Width should be enough to conform to the trench perimeter with at least a 15 cm (6 in) top overlap. Place the geotextile roll over the trench and unroll enough geotextile that the geotextile can be placed down into the trench. Anchor the edges of the geotextile with heavy objects to prevent the geotextile from falling into the trench. Where overlaps are necessary between rolls, allow for 1 m (3 ft) overlap from the upstream to the downstream roll.

Aggregate Placement and Compaction

If drainage pipes are to be used, place an 8 cm (3 in) to 15 cm (6 in) layer of drainage aggregate on top of the geotextile, then install the drainage pipe.

Fill the trench with the specified aggregate and compact using plate compactors. Ensure that no foreign material is included in the aggregate. Compact aggregate to ensure the geotextile conforms to the excavation sides. Allow for a maximum loose lift thickness of 30 cm (12 in). Fold leftover geotextile over aggregate to form a longitudinal lap. Backfill the trench to the recommended specifications.

BLANKET DRAINS

Site Preparation

Grade the protected soil surface to be smooth. Remove any roots, vegetation or sharp objects that might puncture or tear the geotextile. Fill in any surface voids that might exist.

Initial Geotextile Layer Placement

Place the geotextile to be as smooth and wrinkle free as possible. Make any laps in either direction to be at least 1 m (3 ft) wide. Allow enough geotextile to conform to the surface, over top of any edge drains and to cover the aggregate raft with a 1 m (3 ft) overlap. In order to keep geotextile in place during installation of the aggregate, pin the geotextile to the ground.

Drainage Aggregate Placement

Place the aggregate using lifts such that no equipment is operated directly on the geotextile. Smooth the aggregate to the thickness designed by the engineer. If edge drains are to be used, follow the above procedures for filling a French or Trench drain.

Cover Geotextile Layer Placement

Lap the remaining geotextile over the aggregate raft following the same overlap dimension requirements stated above. Smooth any wrinkles that may form during geotextile placement. Secure the geotextile with pins, sand bags or other heavy objects until the cover material can be applied.

Cover Material Placement

Place cover material in lifts such that no equipment is operated directly on the geotextile. Begin placement of the cover material at the downstream end of the drain (if possible). Place at minimum, enough cover material that the geotextile will be protected from ultraviolet degradation.

BANK STABILIZATION / ROCK (ARMOR) UNDERLAYMENT

Site Preparation

Clear the site of all large stones, roots, or other debris that might damage the geotextile. Excavate and shape the site to the lines and grades as directed by the Engineer. Fill depressions or holes to ensure intimate contact between the geotextile and the prepared surface.

Place the geotextile in close contact with the soil, eliminating folds or excessive wrinkles both longitudinally and transversely. Tension is not required on the geotextile prior to placement of riprap or other materials. Use care in placing the geotextile to avoid possible damage.

The geotextile can be joined by overlapping or sewing. The minimum overlap distance in the transverse or longitudinal direction is 0.6 m (2 ft), except in underwater installations where the minimum overlap is 1 m (3 ft). Sewn seams are allowed if the overlap in the transverse or longitudinal direction is at least 15 cm (6 in).

Anchor the geotextile firmly at the top of the slope using an anchor trench. For maximum effectiveness, the trench should be at least 1 m (3 ft) from the crest of the slope and at least 0.6 m (2 ft) deep. To ensure good anchorage in the trench compact soil thoroughly.

When placing geotextile along a stream or other places where water movements are expected, anchor the toe of the geotextile in a similar fashion as at the top to prevent scour beneath it.

Rock (Armor) Placement

Stone or armor block shall be placed directly on the geotextile material as directed by the Project Engineer. Riprap and heavy rock cover shall not be dropped onto the geotextile from a height of more than 0.3 m (1 ft). Slope protection and smaller sizes of rock cover shall not be dropped onto the geotextile from a height exceeding 1 m (3 ft). Any geotextile damaged during placement shall be replaced as directed by the Project Engineer.

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