

GEOSYNTHETICS USED IN SUBSURFACE DRAINAGE APPLICATIONS

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General

This document is prepared to help ensure that the subsurface drainage geosynthetic, once installed, will perform its intended design function. To do so, the geosynthetic 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 practices of identifying, handling, storing and installing geosynthetic material. Failure to follow these guidelines may result in the unnecessary failure of the geosynthetic in a properly designed application.

Material Identification, Storage and Handling

The geosynthetic 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 geosynthetic 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 geosynthetic from one location to another, prevent damage to the wrapping, core, label, or to the geosynthetic itself. If the geosynthetic is to be stored for an extended period of time, the geosynthetic 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 geosynthetic. This can be accomplished by elevating the geosynthetic off the ground 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 geosynthetic, verify the roll identification, length, and installation location with the contract drawings. While unrolling the geosynthetic, 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 geosynthetic. However, as a safety precaution, it is recommended that traffic not run on exposed geosynthetic.

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 geosynthetic. Refill any voids with fill dirt so that the excavation sides are smooth.

Geosynthetic Placement

Cut geosynthetic 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 geosynthetic roll over

the trench and unroll enough geosynthetic that the geosynthetic can be placed down into the trench. Anchor the edges of the geosynthetic with heavy objects to prevent the geosynthetic 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 a 5 cm (2 in) to 8 cm (3 in) layer of drainage aggregate on top of the geosynthetic, 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 in a way that ensures geosynthetic conformity to the excavation sides. Allow for a maximum loose lift thickness of 30 cm (12 in). Fold leftover geosynthetic over aggregate to form a longitudinal lap. Backfill the trench to the recommend specifications.

Blanket Drains

Site Preparation

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

Initial Geosynthetic Layer Placement

Place the geosynthetic 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 geosynthetic to conform to the surface, any edge drains and to cover the aggregate raft with a 1 m (3 ft) overlap. Keep geosynthetic in place during installation of the aggregate, pin the geosynthetic to the ground.

Drainage Aggregate Placement

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

Cover Geosynthetic Layer Placement

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

Cover Material Placement

Place cover material using lifts so that no equipment is operated directly on the geosynthetic. Begin placement of the cover material at the downstream end of the drain (if applicable). Place enough material that the geosynthetic will be protected from ultraviolet degradation.

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