

# **GEOSYNTHETICS USED AS LINER REINFORCEMENT**

Prepared by:

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## **General**

This document is prepared to help ensure that the geosynthetic liner reinforcement, 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 practice 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 70°C (160°), and human or animal destruction.

## **Geosynthetic Placement**

Prepare the surface on which the geosynthetic reinforcement is to be placed so that no damage to the geosynthetic will occur. The subgrade should be cleared of all obstacles and proofrolled. The surface should be smooth and level such that any shallow depressions and humps do not exceed six (6) inches in depth and height.

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. Damage that occurs during storage, handling or installation shall be repaired as directed by the Engineer.

Orientation of the geosynthetic is of extreme importance since geosynthetics may vary in strength with direction. The geosynthetic should be rolled out and laid at the proper elevation, location and orientation as shown on the construction drawings. The roll direction of the geosynthetic should be laid in the direction of the primary reinforcement. The Contractor is

responsible for the correct orientation of the geosynthetic. The geosynthetic shall be cut to the measured length using a razor blade, scissors, sharp knife, or equivalent.

After being rolled out the geosynthetic shall be tensioned until taut, free of wrinkles and laying flat. Adjacent geosynthetic rolls should be seamed or overlapped as necessary to ensure 100 percent coverage, unless otherwise specified on the contract drawings. Adjacent geosynthetic panels should be sewn or joined with plastic ties spaced as necessary to prevent the loss of 100% coverage due to geosynthetic panel shifting during backfill operation.

Splices should be minimized in the primary strength direction. Therefore, when possible, the geosynthetic should be installed with the roll direction extending the full length of the reinforced area. Otherwise, splices along the roll direction should be limited to one splice per panel width and it should be constructed to ensure 100 percent strength efficiency. Splices occurring in adjacent panels should be staggered a minimum of fifteen (15) feet.

To install the geosynthetic around manholes and gas collection headers, slice the geosynthetic through the cross machine members an appropriate length to place around the obstacle. This will allow the geosynthetic to be installed in a continuous sheet over the top of the obstacle. Certain fill properties, fill placement procedures and/or weather conditions may require the reinforcement to be held in place by sandbags or fills, as directed by the Engineer.

## **Fill Placement**

Deployment of fill should be performed as directed by the engineer in charge of quality assurance. Fill should be compacted as defined in the project specifications or as directed by the Engineer. Fill placement and spreading should be done in a manner that prevents wrinkles and/or slippage of the geosynthetic. Fill placement should proceed in the direction of the adjacent panel overlap, and from the bottom of the slope upward; however, temporary anchoring may be required, particularly at the top of the slope, to ensure that final anchoring is in accordance with the construction drawings.

After fill material is placed on the geosynthetic, final spreading and compaction may be carried out by a small dozer with low ground pressure and/or front-end loaders as site conditions permit. A minimum cover of twelve (12) inches should be maintained between preparation performed prior to geosynthetic placement and upon the size and angularity of fill material. The contractor is responsible for verifying any equipment loading constraints with the Engineer before fill placement begins.

Construction equipment shall not be allowed onto the exposed geosynthetic. Additional fill compaction can be accomplished after spreading, grading, and track/tire compaction using either a pneumatic or vibratory roller. Sheepfoot rollers shall not be used for initial compaction, as the feet may damage the geosynthetic.

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