

**Mirafi® High Strength Reinforcement Geotextiles for
Basal Reinforced Embankment Applications**



Mirafi[®] High Strength Reinforcement Geotextiles for Basal Reinforced Embankment Applications

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Mirafi® High Strength Reinforcement Geotextiles for Basal Reinforced Embankment Applications

1. General

This document is prepared to help ensure that the high strength reinforcement geotextile, once installed, will perform its intended design functions. To do so, the product must be identified, handled, stored and installed in such a way that its physical property values are not affected and the design conditions are ultimately met as intended. This document does not account for every possible construction scenario. This document contains information consistent with generally accepted practices of identifying, handling, storing and installing high strength reinforcement geotextiles for most basal reinforcement applications. Failure to follow these guidelines may result in the unnecessary failure of the geotextile in an otherwise properly designed application.

2. Product and Application

Mirafi® high strength reinforcement geotextiles are manufactured from high modulus polyester multifilament yarns woven to form a high tensile modulus and robust fabric (see Figure 1). Mirafi® high strength reinforcement geotextiles are engineered to perform long-term soil reinforcement function in variety of civil and environmental applications such as basal reinforced embankments without the use of PVDs (see figure 2a) and with the use of PVDs (figure 2b).

Mirafi® high strength reinforcement geotextiles provide tensile modulus to restrain lateral spreading of embankment fill and increase the factor of safety against embankment and foundation failure.



Figure 1. Mirafi® high strength reinforcement geotextile

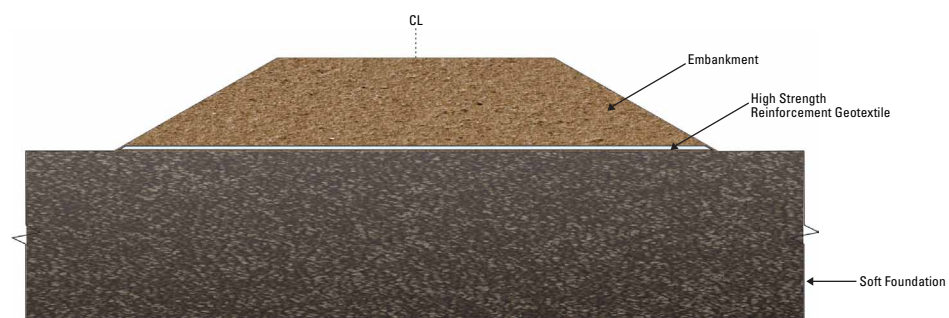


Figure 2a. Typical section of Mirafi® high strength reinforcement geotextile reinforced embankment without installation of PVDs

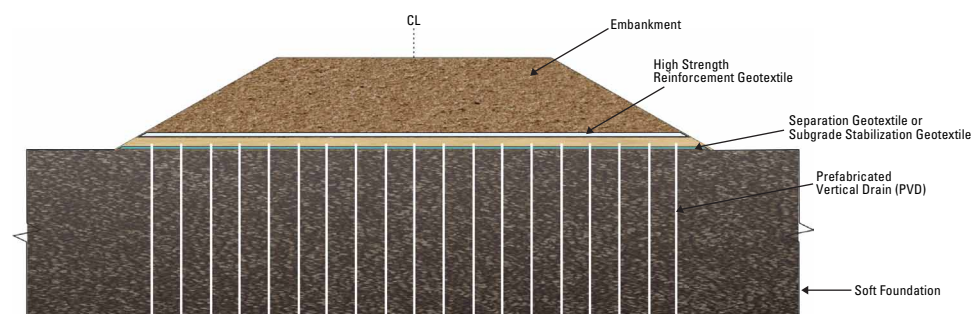


Figure 2b. Typical section of Mirafi® high strength reinforcement geotextile reinforced embankment with installation of PVDs

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3. 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 product from damage during shipping and handling. Each roll shall be identified with a durable gummed label or the equivalent, clearly legible on the outside of the roll wrapping. The label shall indicate the manufacturer's name, the style number and the roll number.

Upon delivery, check the roll labels to verify that the correct geotextile product has been received. Immediately inspect the geotextile rolls to ensure it is free of any flaws or damage that might have occurred during shipping or handling. While unloading or transferring the geotextile from one location to another, care should be taken to prevent damage to the wrapping, core, label or 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 the geotextile product. This can be accomplished by elevating the geotextile rolls off the ground on dunnage (see Figure 3).

Care should be taken to ensure that the geotextile rolls are adequately covered and protected from ultraviolet radiation, chemicals that are strong acids or strong bases, fire or flames including welding sparks, temperatures in excess of 60°C, and human or animal destruction.

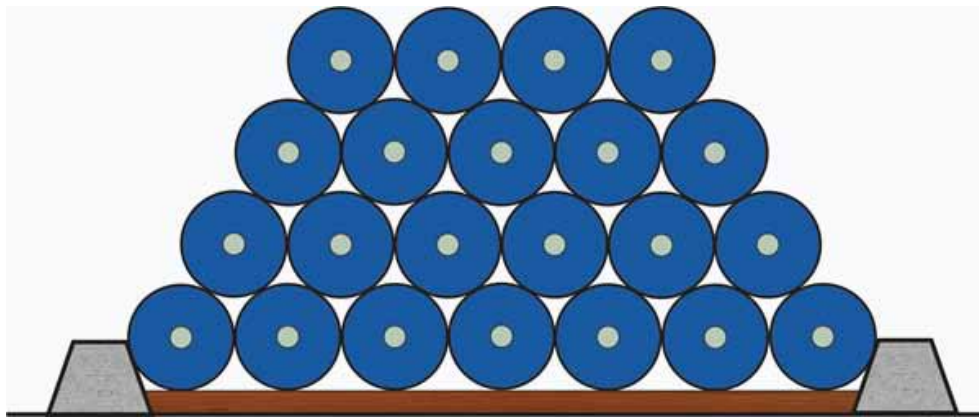


Figure 3. Recommended setup for safe onsite stacked storage of Mirafi® high strength reinforcement geotextile rolls

4. Ground Preparation

Excavate and grade the ground surface, according to the Engineer's design and drawings. Trim or remove any large roots, or sharp objects that might puncture or tear the geotextile, refilling any voids created if necessary.

5. Installation

Mirafi® high strength reinforcement geotextiles are supplied generally in standard rolls of specific roll length and width. 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. Discard or repair any damage that occurred during storage, handling or installation as directed by the Engineer.

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5.1 For basal reinforced embankment without installation of PVDs

Place the Mirafi® high strength reinforcement geotextile over the prepared ground to be as smooth and wrinkle free as possible. Engineered backfilling shall be carried out using bulldozer to spread engineered fill evenly on the Mirafi® high strength reinforcement geotextile as per design drawings and/or the Engineer's instruction (see Figure 4). The primary machine direction of Mirafi® high strength reinforcement geotextile shall be laid perpendicular to the alignment of embankment (see Figure 5). If more than one layer of Mirafi® high strength reinforcement geotextile is required, it is recommended to separate each layer of geotextile with minimum 150 mm of compacted fill material placed between adjacent geotextile layers.

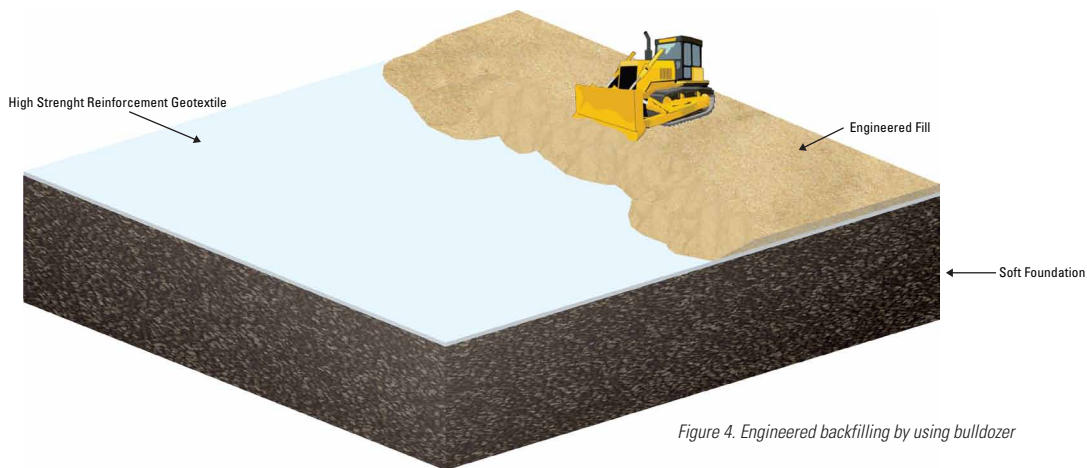


Figure 4. Engineered backfilling by using bulldozer

5.2 For basal reinforced embankment with installation of PVDs

For basal reinforced embankment with installation of PVDs, the PVDs are typically installed before the Mirafi® high strength reinforcement geotextile is laid. This is to avoid the need of damaging the Mirafi® high strength reinforcement geotextile. Typically, a layer of separation or subgrade stabilisation geotextile is laid over the prepared ground to be as smooth and wrinkle free as possible before a layer of free draining granular drainage blanket is placed over the geotextile. The installation of PVDs will then be carried out above the granular blanket layer. For guidance on installation of PVDs please refer to Installation Guidelines - Alidrain® Prefabricated Vertical Drains for Consolidation Acceleration Applications (a copy of which may be provided upon request).

Next, place the Mirafi® high strength reinforcement geotextile over the PVD installed granular blanket layer. Engineered backfilling shall be carried out using bulldozer to spread engineered fill evenly on the Mirafi® high strength reinforcement geotextile as per design drawings and/or the Engineer's instruction (see Figure 4). The primary machine direction of Mirafi® high strength reinforcement geotextile shall be laid perpendicular to the alignment of embankment (see Figure 5). If more than one layer of Mirafi® high strength reinforcement geotextile is required, it is recommended to separate each layer of geotextile with minimum 150 mm of compacted fill material placed between adjacent geotextile layers.

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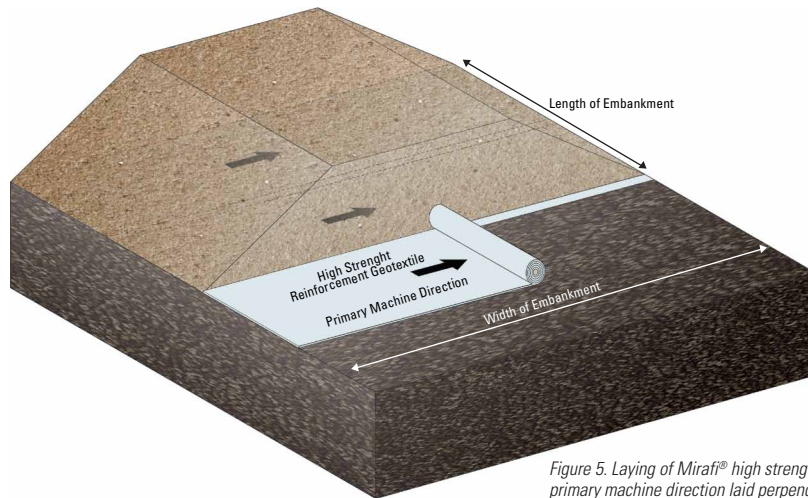


Figure 5. Laying of Mirafi® high strength reinforcement geotextile with the primary machine direction laid perpendicular to the alignment of embankment

6. Jointing

The Mirafi® high strength reinforcement geotextile shall be laid in a continuous layer in the primary machine direction; no jointing shall be allowed in this direction. In the cross direction the Mirafi® high strength reinforcement geotextile may either be overlapped or sewn together. A minimum geotextile edge overlap of 300 mm is generally sufficient to prevent formation of geotextile discontinuity during backfilling operation (see figure 6). However, sewing is usually more economical especially in poorer ground conditions.

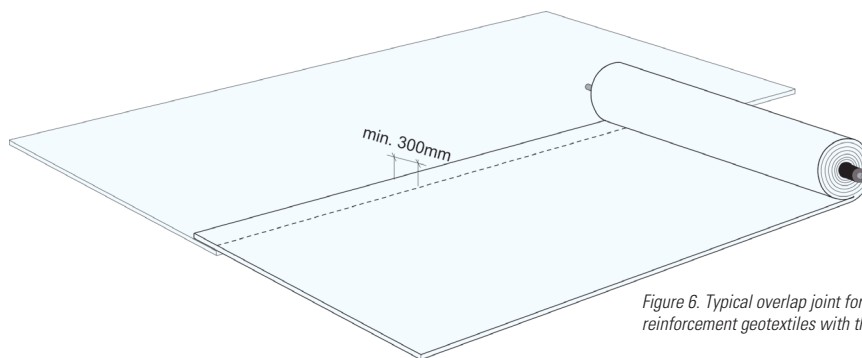


Figure 6. Typical overlap joint for Mirafi® high strength reinforcement geotextiles with the cross direction

7. Backfilling and Compaction

Subsequently, embankment backfilling in approved lifts shall be carried out over the Mirafi® high strength reinforcement geotextile until the designed platform level. Unless otherwise instructed by the Engineer, embankment soil backfills are generally compacted to a minimum of 95% of the optimum dry density and +2% of the optimum moisture content, according to the AASTHO T-99.

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