

Innovative Base Stabilization Utilizing Mirafi[®] RSi-Series Geotextiles

Geosynthetic Placement and Overlap

Clear, grub and excavate (as required) to the plan subgrade or undercut elevation, stripping topsoil, deleterious debris and unsuitable material from the site. Cut stumps and other projecting vegetation as close and even to the ground surface as practical. Specialized equipment with low ground pressure, as directed by the Engineer, may be required for very soft soils ($CBR \leq 1.5\%$) to minimize subgrade disturbance. In addition, it may also be beneficial to leave root mats in place in such instances. The surface of the subgrade should be relatively smooth and level (Image 1), and depressions or humps greater than 150mm should be graded out (i.e., back bladed/back dragged).

The geosynthetic reinforcement shall be placed directly on the prepared subgrade (Image 2). It should be rolled out flat and tight with no folds or wrinkles. Unroll the geosynthetic in the direction of travel so that the machine direction (i.e., long axis) of the roll is parallel with channelized traffic patterns. Adjacent rolls should be overlapped along their sides and ends as a function of subgrade strength as follows:

| | |
|------------------------|---------------------|
| $CBR \geq 3\%$ | 300 - 450mm overlap |
| $1\% \leq CBR < 3\%$ | 600 - 900mm overlap |
| $0.5\% \leq CBR < 1\%$ | 900mm or Sewn* |
| $CBR < 0.5\%$ | Sewn* |

*Please contact your local TenCate Geosynthetics representative for recommended sewing practices.



Image 1. Subgrade Preparation



Image 2. Geosynthetics Deployment

If the need for 1m of overlap is reached, it is strongly suggested that the overlap is sewn or otherwise adhered to limit the potential formation of a slip plane between the overlapped panels. Note: very heavy loading and very soft subgrades will also warrant sewn seams instead of overlapping panels. Prior to fill placement, the geosynthetic can be held in place using U-shaped sod staples or simply by strategically placing shovelfuls of the fill to weigh down the geosynthetic. Overlap ("shingle") the geosynthetics in the direction fill will be spread to avoid peeling-back of the geosynthetic at overlaps by the advancing fill, just as shingles on a roof are installed to prevent water flowing beneath the adjacent row of shingles below.

Cut and overlap the geosynthetic to accommodate curves. Cutting may be done with sharp shears, razor knives or handheld power (i.e., "cutoff") saws. Cut the geosynthetic to conform to immovable protrusions, such as manhole covers and vertical utilities.

Fill Placement

Aggregate fill, as specified, should be placed directly over the geosynthetic in 200 - 300mm loose lifts. Typically, if the design section thickness is $\leq 400\text{mm}$, the entire section should be placed and compacted in one single lift to minimize further degradation of the subgrade.

On relatively competent subgrades ($CBR \geq 4\%$), standard, highway-legal, rubber-tired vehicles (end dumps and belly dumps) may be

driven over the exposed geosynthetic at slow speeds ($< 8 \text{ km/h}$), and in straight paths. These vehicles can dump aggregate fill as they advance, provided this construction traffic will not cause significant rutting upon bare subgrade. Sudden braking, sudden starting and sharp turning should be avoided. Tracked construction equipment must not be operated directly upon the exposed geosynthetic. A minimum aggregate fill thickness of 150mm is required prior to operation of tracked equipment on the geosynthetic. In addition, turning of tracked equipment should be kept to a minimum to prevent tracks from displacing the fill and damaging the geosynthetic.



Image 3. End Dumping Aggregate

Over softer subgrades ($CBR < 4\%$), aggregate fill should be end-dumped from the edge of the previously placed material (Image 3), spreading from the middle outward (Image 4).



Image 4. Spreading aggregate over geosynthetic

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Compaction

Standard compaction methods may be used unless the soils are very soft ($CBR \leq 1.5\%$). In such cases, static compaction with a light smooth drum roller is considered prudent (Image 5). Once a stable working platform has been achieved, compact aggregate fill to project specifications, after it has been graded smooth and before it is subjected to accumulated traffic.

Aggregate Fill Considerations

Preferred (not required) fill gradation for roadway applications is well-graded crushed aggregate fill with a maximum particle size of 400mm and less than 10% fines (passing #200 sieve). For unpaved applications, most clean granular fills, including sands are acceptable.



Image 5. Smooth Drum Roller

Installation and Repairs for Utility Cuts or Damaged Areas

Repairs to roadway reinforcement geosynthetics can be made in the field by placing a repair panel or patch over the damaged area. The repair panel should extend a minimum of 900mm beyond the edges of the damaged geosynthetics as shown in Image 6. Pullout and/or direct sliding calculations should be performed by the project engineer to verify the minimum required overlap length to meet a specific project's requirements.

When placing roadway reinforcement geosynthetics in trenches or against excavations that terminate at existing curb and gutter, the geosynthetic can be wrapped up the sides of the excavation as shown in Image 7. Doing so provides extra embedment for the geosynthetic to resist pullout and sliding forces by sandwiching the material between the vertical faces of the existing materials and the newly compacted fill.



Image 7. Extending the Geosynthetic Reinforcement up a Vertical Face

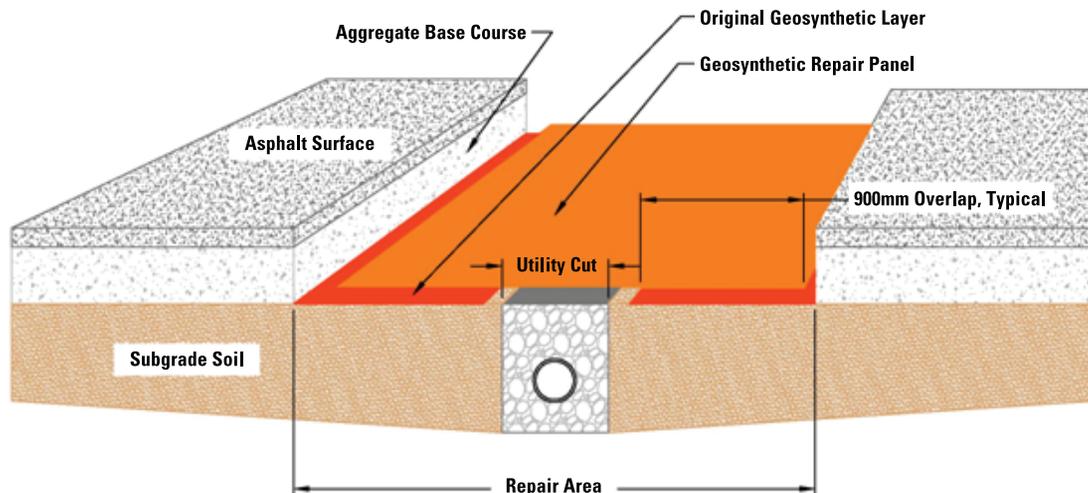


Image 6. Typical Utility Cut Geosynthetic Repair Detail (NTS)

The values given are indicative and correspond to average values.

Further details of this application and products can be obtained by contacting your nearest TenCate Technical Support office.

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