

# BASAL REINFORCEMENT





# Basal reinforced embankments on soft soil

High strength reinforcement geosynthetics increase foundation bearing capacity.

## Reinforcement over soft soil

Geosynthetics increase the shear stresses of the fill material leading to an increase of the foundation bearing capacity.

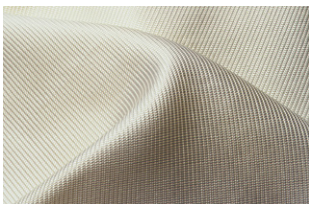
High strength geosynthetics provide a cost effective solution to achieve a greater and quicker stability of embankments constructed on soft foundations.

Geosynthetics allow optimum embankment height over a minimum area, steeper side slopes, increase in construction speed, and resistance to outward movement of the embankment.

## Solmax geosynthetics over soft soils

**MIRAFI**® PET high strength woven geotextiles, **MIRAGRID**® GX geogrids and **MIRAFI**® Polyfelt PEC composite geotextiles (geocomposites), made from high tenacity polymers meet the highest demands of the site such as strength up to 2000 kN/m to ensure embankment stability, long term properties to guarantee performance over the lifetime of the structure, and adaptable rolls to suit various site requirements:

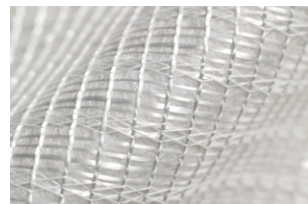
- Long and wide rolls
- Custom made roll sizes to facilitate ease of installation
- Prefabricated panels to ease site installation



**MIRAFI** PET



**MIRAFI** GX



**MIRAFI** Polyfelt PEC



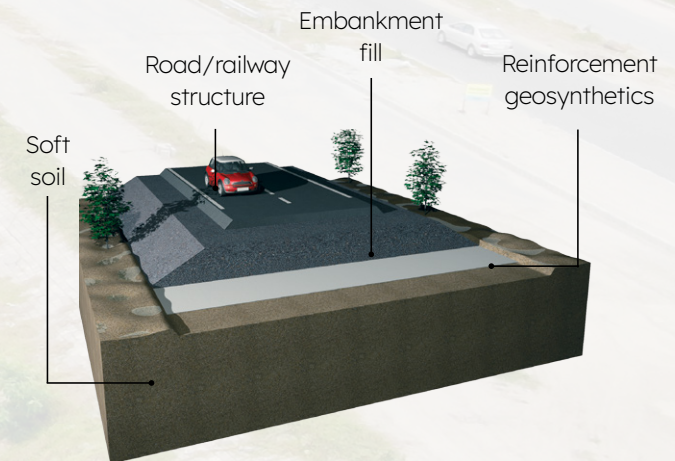




## The Solmax solution

The technical skills of our engineers ensure the most effective and economic solution:

- ✔ Solmax offers a reliable and comprehensive solution to the customer
- ✔ Design suggestions are proposed to the consultant using the most relevant and up-to-date design codes
- ✔ Installation support and advice helps the contractor place the geosynthetic correctly and efficiently





# Basal reinforced embankments on piles

Geosynthetics reinforced structures offers stability, safety and cost savings while minimizing the environmental impact of using valuable mineral sources as fill material.

## Piled embankment with basal reinforcement

Solmax's geosynthetics provide cost effective solutions, spanning across the pile caps to achieve greater stability and surface settlement control. Geosynthetics allow improved load transfer from the embankment through the piles into firmer soils.

In conventional embankments, pile caps would cover 60-70% of the total area. Depending on soil conditions, the size of the pile caps can be reduced by up to 20% with the use of geosynthetics, thus allowing increased speed of earthworks while reaping major cost benefits. The horizontal thrust from the embankment is effectively resisted by the geosynthetics applied thereby avoiding the need for inclined or reinforced piles.

## Geosynthetics for reinforcement purposes

When coarse-grained fill materials are used, optimum friction is achieved with **MIRAGRID GX** geogrids. Conversely with fine-grained fill materials, optimum friction values are obtained with **MIRAFI PET** high strength woven geotextiles and **MIRAFI Polyfelt PEC** geocomposites.

Made from the best performing polymers **MIRAFI** and **MIRAGRID** geosynthetics provide the characteristics needed to reinforce piled embankments with strengths up to 2,000kN/m to ensure embankment stability, high stiffness to control deformation and surface settlement.

Its long term properties guarantee performance over the lifetime of the structure. The need for expensive granular fill material is eliminated which saves cost and limits the environmental impact of utilizing natural resources.



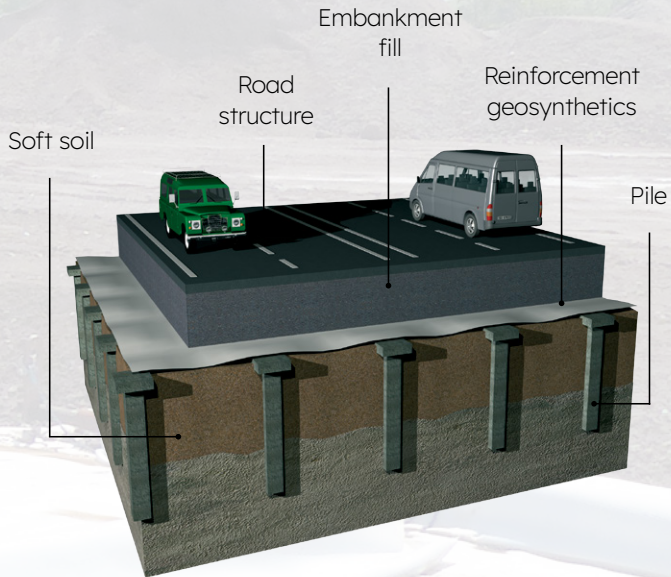




### The Solmax solution

Thanks to active participation in numerous research and construction projects and the technical skills of our engineers, Solmax is able to propose innovative, effective and economic solutions including:

- ✔ Comprehensive designs for the owner
- ✔ Design suggestions using the latest and appropriate design methods to the consultant
- ✔ Advice and installation support to the contractor





# Basal reinforced embankments spanning voids

Avoid the sudden collapse of structures in karst zones with geosynthetics reinforcement.

## Securing areas at risk of subsidence

In areas prone to cavities, such as in karstic zones or old mines, sudden collapse can be prevented where high strength geosynthetics are used to reinforce road embankments or base courses. Geosynthetics reinforce and prevent the collapse of the structure, ensuring safety for the users. Depending on the size of the cavity and the thickness of the structure, the reinforcement limits or avoids settlement at the surface for the design lifetime of the structure. With geosynthetics the needed quantity of granular fill material decreases, providing significant cost reductions and limitation of environmental footprints.

## Reinforcement and monitoring

**MIRAFI** PET high strength woven geotextiles, **MIRAGRID GX** geogrids and **MIRAFI** Polyfelt PEC geocomposites are perfectly adapted to reinforcement over

cavities with strengths up to 2,000kN/m to ensure embankment stability. High stiffness modulus controls deformation and surface settlement. Its long term properties ensures the performance over the lifetime of the structure. The form of supply can be adapted to the application including long and wide rolls, and custom made rolls to facilitate efficient installation.



**Subsidence found at the base of the embankment**

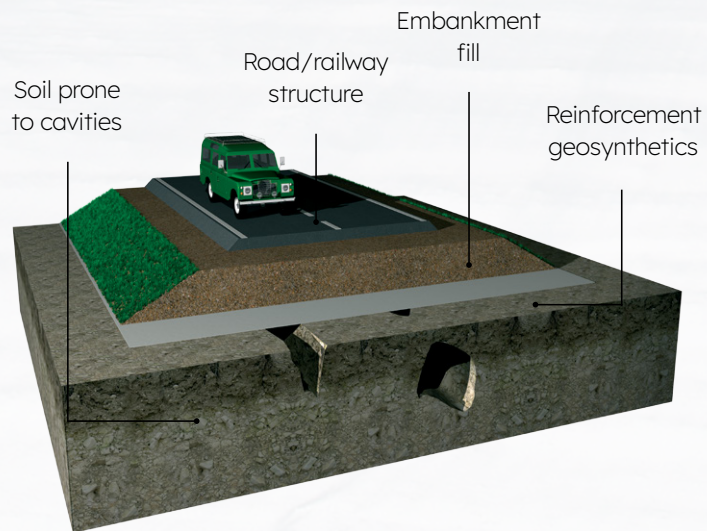






### The Solmax solution

Thanks to the participation at the research project RAFAEL (1997-1998) and the use of the resulting method design in several guidelines over Europe, Solmax acquired a great deal of knowledge in the use of geosynthetic spanning of voids. This experience was completed by numerous construction projects over cavities where Solmax geosynthetics were installed.



## About Solmax

Solmax is a world leader in sustainable construction solutions, for civil and environmental infrastructure. Its pioneering products separate, contain, filter, drain and reinforce essential applications in a more sustainable way – making the world a better place. The company was founded in 1981, and has grown through the acquisition of GSE, TenCate Geosynthetics and Propex. It is now the largest geosynthetics company in the world, empowered by more than 2,000 talented people. Solmax is headquartered in the province of Quebec, Canada, with subsidiaries and operations across the globe. To find out more, contact [infoasia@solmax.com](mailto:infoasia@solmax.com).

## Uncompromised quality

Our products are manufactured to strict international quality standards. All our products are tested and verified at our dedicated and comprehensive laboratories which maintain numerous accreditations. We offer our partners a wide scope of testing according to published standards to ensure products delivered to sites meet specified quality requirements.

# Let's build infrastructure better

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