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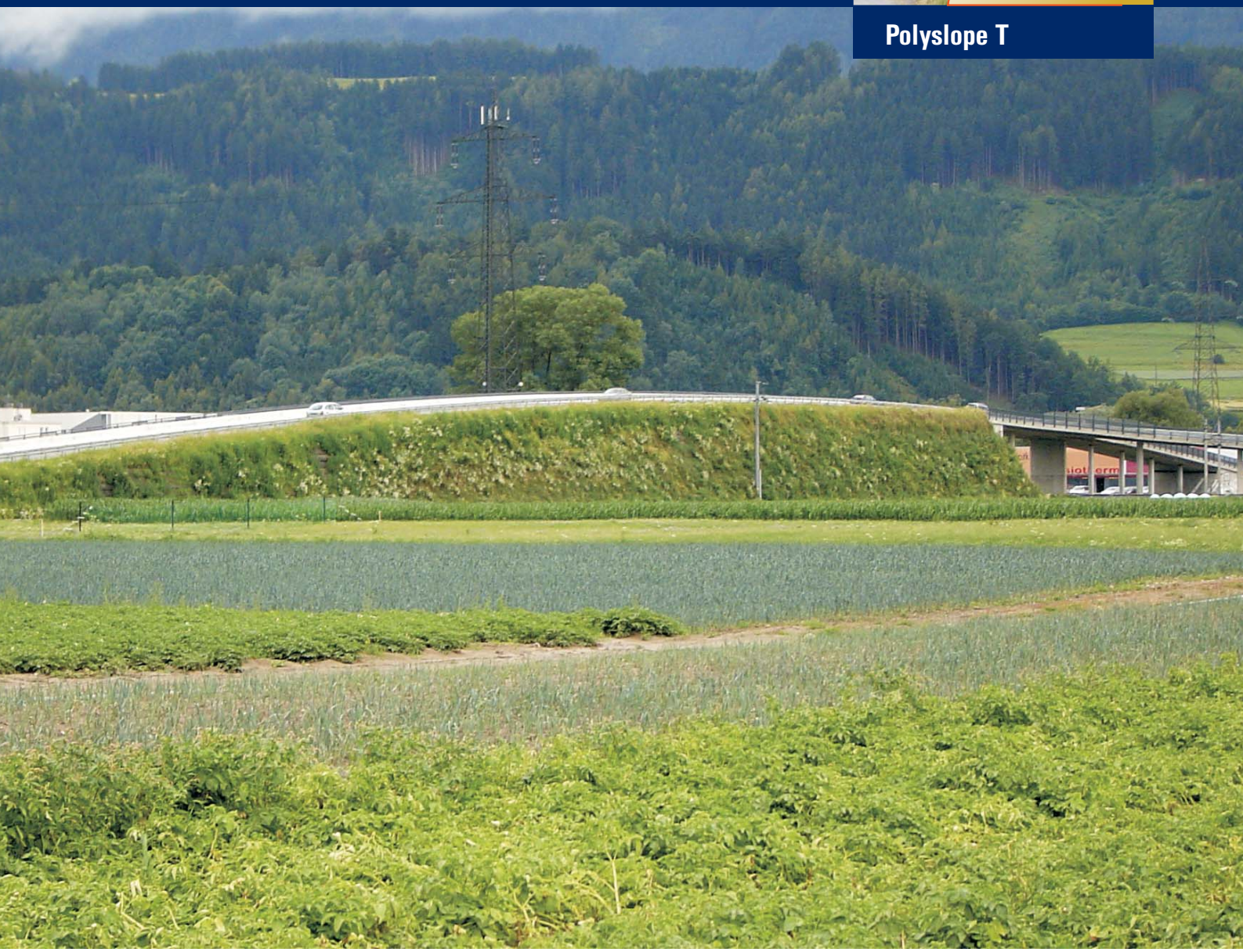
Polyslope T

System Description

Polyslope T is a system for constructing geosynthetic-reinforced retaining structures. It is suited for designing vegetated steep slopes with a slope angle of up to 60° and walls with precast facing elements or shotcrete which are up to 90° steep. Structures of more than 20 metres in height are feasible.

Polyslope T



Protective & Outdoor Fabrics
Aerospace Composites
Armour Composites

Geosynthetics
Industrial Fabrics
Grass

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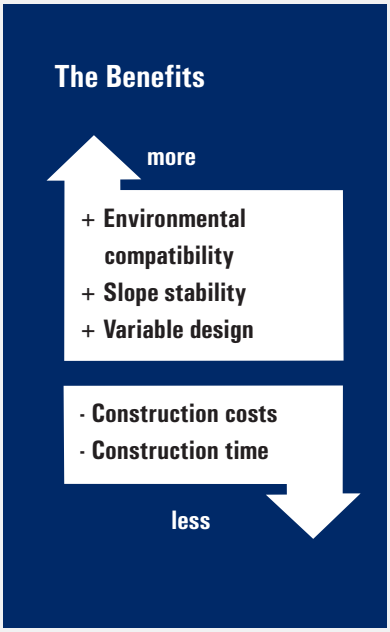
The System Components

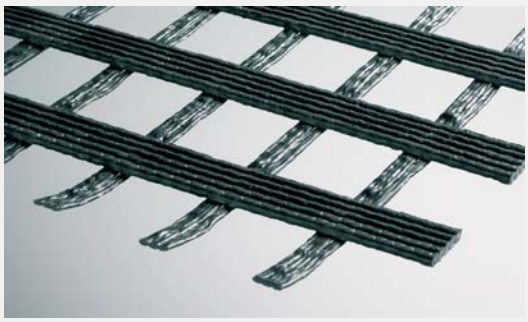
Polyslope T is based on the principle of reinforced earth structures, in which the relevant fracture bodies are stabilised by TenCate Polyfelt Rock PEC or TenCate Miragrid GX, two of TenCate's high-strength geosynthetics. Polyslope T is installed by using the so-called wrap-around installation method, which consists in wrapping the reinforcement layer - and additionally an erosion control mat if needed - over the slope facing and attaching it to the top of the respective earth layer.

During the construction process, each layer is fixed by a temporary formwork. Initially, the front facing is therefore made up only of the geosynthetic material and the soil. After completing the slope, the facing needs to be designed accordingly. The following options have proven successful:

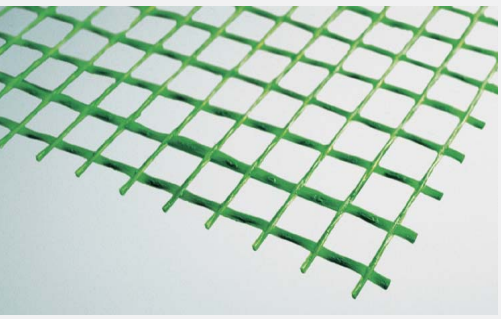
- surface vegetation
- precast concrete facing elements
- natural stone riprap or dry masonry
- shotcrete

As a temporary makeshift solution the slope can also be shaped without a surface cover; in this case the slope facing needs to be adequately protected against mechanical damage.

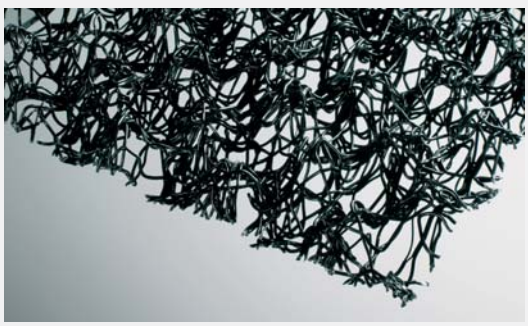




Rock PEC (left) und Miragrid GX (right) - high-strength geosynthetics for cohesive and non-cohesive soils



TenCate Polyfelt Green - Erosion-protection grid



TenCate Polyfelt Polymat - Erosions-protection mat

(1) Geosynthetic reinforcement

TenCate's high-quality geosynthetics are ideal for stabilising and reinforcing earth structures. The load-bearing behaviour of the compound endows the retaining structure with excellent bearing properties. Depending on the properties of the fill material, we recommend the use of the following products:

- Cohesive soils with a high fine particle content
> TenCate Polyfelt Rock PEC

Apart from its high tensile strength at low strain and its low tendency to creep, Rock PEC also has an outstanding capacity to drain water (in-plane permeability). This helps to rapidly reduce any excessive pore water pressure that may develop during fill compaction. The nonwoven component of Rock PEC covers the soil completely so that no additional erosion control mat is needed. Rock PEC is therefore particularly suited for structures with lined facings (precast parts, shotcrete, natural stone riprap).

- Granular soils with a low fine particle content
> TenCate Miragrid GX

On account of its open structure and flexible tensile elements (polyester fibre meshes), Miragrid GX excellently interlocks with the soil. Its high tensile strength at low strain and its low tendency to creep are prerequisites to an outstanding earth reinforcement. Because of its open structure, Miragrid GX also makes slope vegetation much easier as it allows optimal seed-soil contact. To prevent erosion, the installation of an erosion control mat across the slope facing is recommended.

(2) Erosion control mat

Erosion control mats are only used in combination with TenCate Miragrid GX.

TenCate Polyfelt Green is the perfect erosion control grid for slopes where natural vegetation by wind-dispersed plant seeds is to take place. Its open structure facilitates a favourable seed-soil contact. The mesh width is properly dimensioned and does not inhibit vegetational growth. Green is not inflammable, highly UV-resistant and therefore perfectly endurable even after accidental fires.

TenCate Polymat is an excellent erosion control and carrier mat for slopes on which hydroseeding or shotcrete is applied. Owing to its extremely high voids content, Polymat ensures firm embedding of the material applied. This is especially useful in hydroseeding operations as it allows to safely monitor the spreading of adequate amounts of seed. In slopes with a flatter angle (< 45°), humus may be applied on the slope facing to accelerate vegetational growth und provide a smoother appearance. In this case the individual reinforcement layers are arranged in cascade. When used for erosion control, Polymat is placed on top of the humus layer and filled up with fine-grained soil.

(3) Fill material

In most cases the on-site soil may be used for backfilling, provided it is compactable and sufficiently stable. The fill material applied on the facing of vegetated slopes should be able to foster vegetational growth and store adequate amounts of water. Placement of stone aggregate in this area should be avoided.

(4) Slope facing design options

The following slope facing options have proven useful:

(a) precast concrete facing elements
(b) surface vegetation
(c) natural stone riprap or dry masonry
(d) shotcrete
(e) temporary facing without surface cover

(a) Polyslope T with precast concrete facing

(b) Polyslope T with vegetated surface

(c) Polyslope T with dry masonry facing

(d) Polyslope T with shotcrete facing

(e) Polyslope T without facing (temporary structure)

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Polyslope T - Coste effective steep slopes and walls

Installation

Before the retaining structure is installed, a simple temporary timber formwork consisting of L-Shaped steel supports, formwork panels or wooden planks needs to be established.

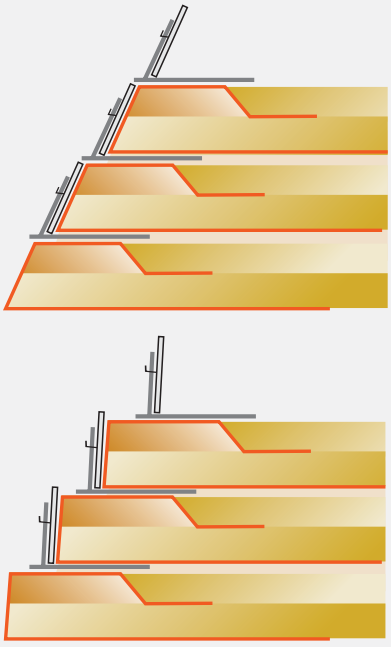
The temporary formwork must be properly positioned to match the desirable slope angle. The steel L-shaped supports can be borrowed from TenCate Geosynthetics. Alternatively, the desired slope angle can also be accomplished by a stepped arrangement of the layers (see bottom right picture).

After removing the formwork, slight deformations may occur on the surface resulting from subsequent settling of the fill material. This, however, is only a temporary visual effect and will disappear once a vegetational cover or surface liner is applied. The slope must not be stepped on, especially for as long as the vegetational cover has not fully developed over the entire surface and/or a liner has been applied.

No foundation base is needed for constructing Polyslope T. All that is required is a subgrade with sufficient load bearing capacity which is adequately levelled and compacted.

How much time will be needed to install one single layer (lining not included) largely depends on the boundary conditions of the individual project. The approximate slope facing area to be completed per day is about 25 to 50 m². Allow for two workers to set up and install your Polyslope T system; one compactor and one excavator will be needed for placing and spreading the fill material.

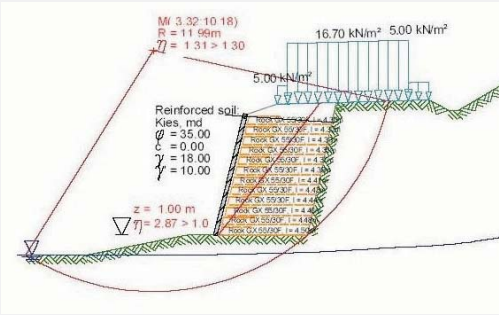
Please read our installation manual for more details.
Our technical service staff will be happy to assist you.



Construction of slopes by means of inclined steel angles (top) or by stepped constructing (below).

Design

For designing geosynthetic reinforced slopes and walls, we offer a comprehensive service based on specialized design software!



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