ConstruckSlope® Stabilization Systems

Combining engineered Geo-Synthetics with Slope Stabilization

CONSTRUCK
SYSTEMS &
TECHNOLOGY

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Overview

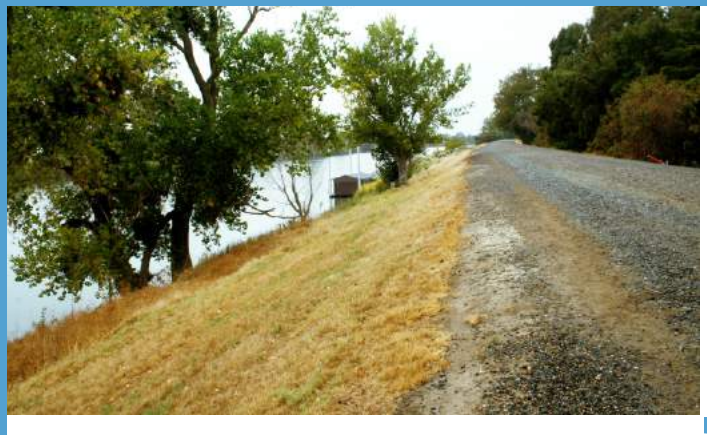
Slope Protection is a very important part of any Civil Projects.

Slopes are made by either man made fill or natural fills cut into the desired geometry or even plain sand dunes. Such slopes can vary in height, length and slope angle. Hence there is no fixed slope protection solution for all situations but a modified version to handle the technical challenges of any substrate.

Slopes can be naturally stable or unstable.

Stable slopes are slopes that are under no risk of collapse by itself as its under global stability. However, they require protection from natural erosion causes like wind and rains as such activity can erode the top layers and finally cause future stability issues. Hence, the Stable slopes require a system keeping these natural rain/wind away from the surface.

Unstable slopes are created when excavations are required for projects and hence the resultant slope can become unstable. Unstable slopes are further stabilized by Geometric remodeling during these excavations where benches are made to give stability to the remaining structure after excavation. Sometimes its also possible to excavate at a shallow angle to bring this structure under global stability. Once under Global stability, this structure still shall be protected from erosion.



Construck Systems brings you innovative slope protection technologies suited for all the conditions.

Salient Features of ConstruckSlope® Systems

- Fully Engineered Systems Designed and Manufactured in Europe
- Geosynthetics based systems for enhanced long life, sometimes upto 120 years*
- Least usage of concrete elements, energy and water thereby creating Environment Friendly Solutions
- Upto 10 times faster completion compared to traditional methods
- One stop design,manufacture, installation and warranty support helping to create reliable partnership
- Drainage and Waterproofing requirements inbuilt to make the system seamless and homogenous*
- Provides additional soil stability when compared to equivalent steel mesh/other systems.
- Demonstrable technical properties of each components for fully compliant to performance requirement

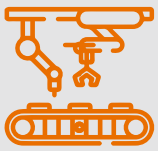
*for selected systems based on design and requirements, not valid for all systems

Intelligent Economics

We remain the most competitive slope protection systems for a given range of terrain

Intelligent Materials

Our innovative approach to reducing the dependence on traditional materials brings a new perspective to the slope design



Intelligent Methods

By reducing the labourious tasks under harsh climate conditions, we bring new methodology of execution

Intelligent Designs

By bringing various innovative ideas together, we bring the best of solutions to you.

ConstruckSlope® proves that the life of a Geosynthetic based system is longer than any steel based system.

The steel based systems rely on the concrete elements and reinforcements to achieve structural stability.

Long term studies have proven that such systems will become less stronger with the ingress of water into the system.

Concrete elements are always prone to cracking.

Environmental benefits are another great aspect of such engineered systems.

Due to reduced use of natural resources like cement and sand, it helps to reduce the carbon footprint associated with such activities.

Independent studies prove that a reduction of 1% energy in construction reduce the carbon foot print by a long way.

Drainage requirements are a very important element in any earth structures.

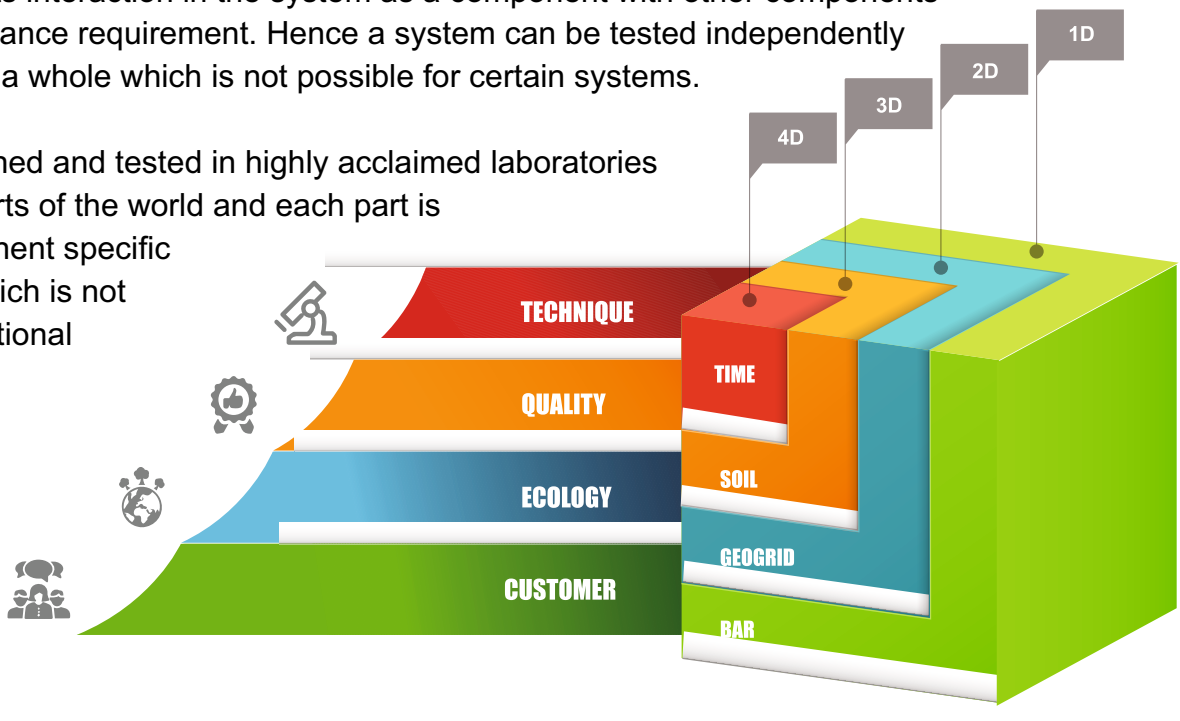
The weight of the soil structure increases based on any water retained in the structure and must be drained out.

The Construck Slope Protection systems are designed with inbuilt drainage and waterproofing abilities to hold the structures in place.

Engineered systems are the best for performance monitoring as they have demonstrable technical properties.

This will help us study its interaction in the system as a component with other components and its ultimate performance requirement. Hence a system can be tested independently without being tested as a whole which is not possible for certain systems.

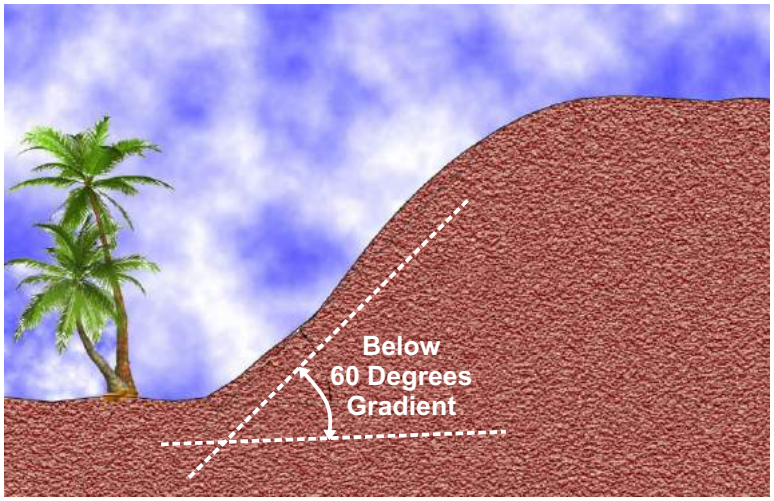
Our products are designed and tested in highly acclaimed laboratories in the EU and other parts of the world and each part is designed with a component specific technical data sheet which is not usually possible in traditional systems.



Construck Slope® Basic

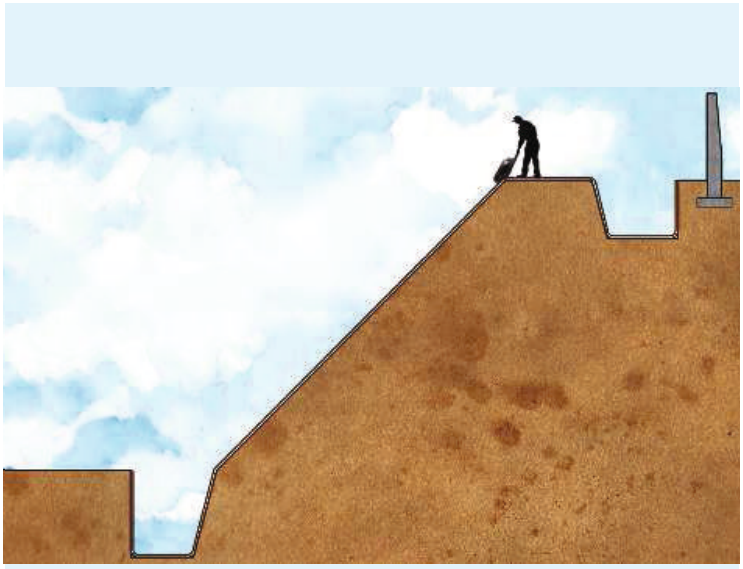
- **Slope Embankment**
- **Ramp Embankment**
- **Fill Area Embankment**

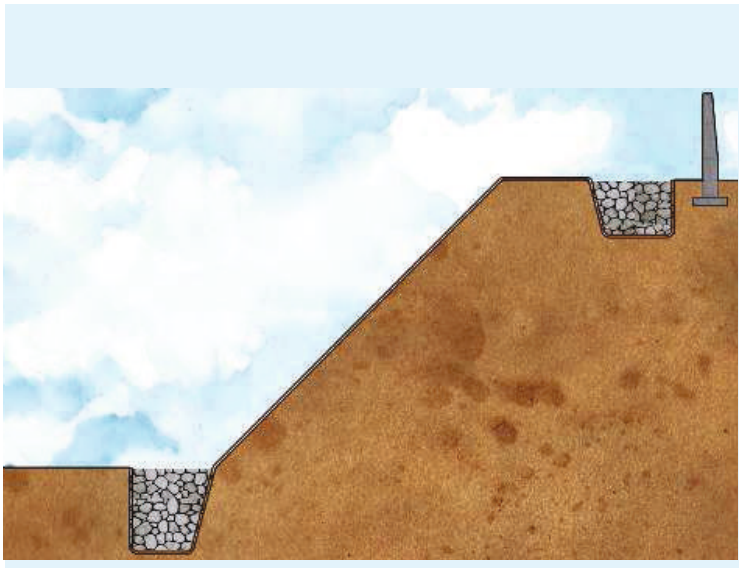
All embankments below 60 degrees, natural or man made including dune sands

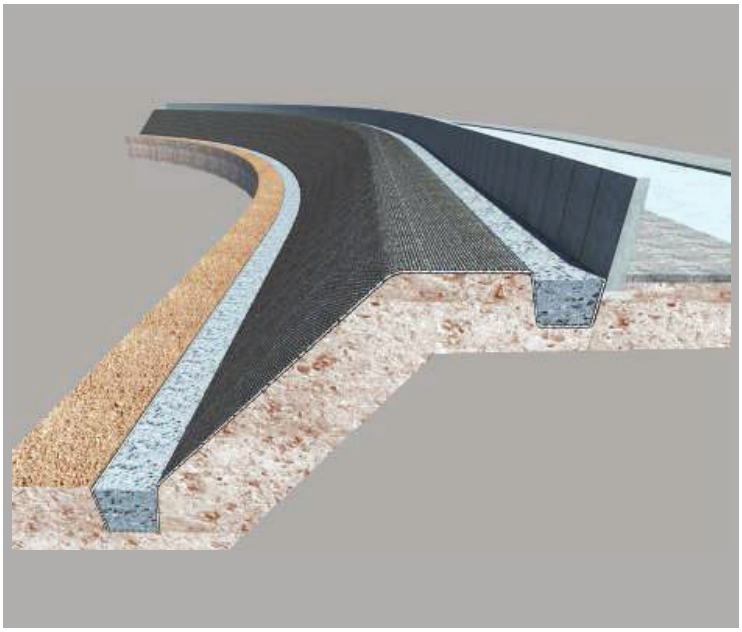


ConstruckSlope® Basic

Stages of Construction

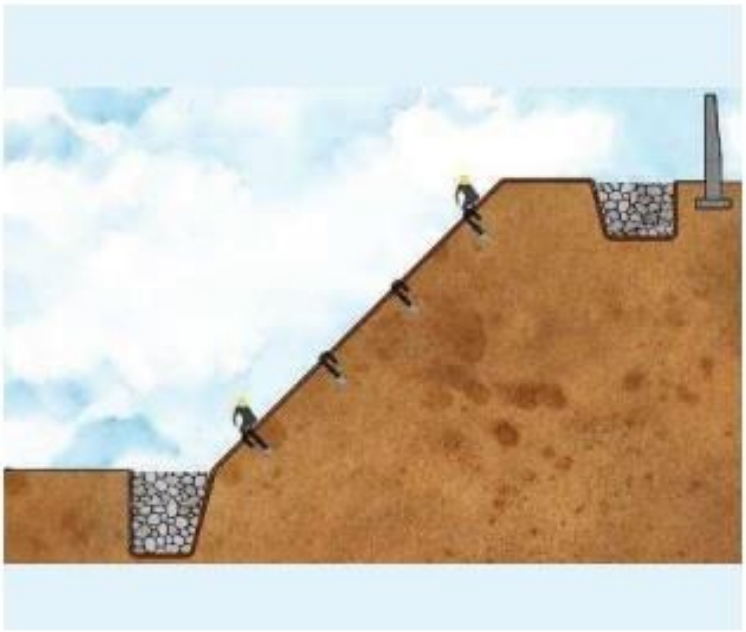


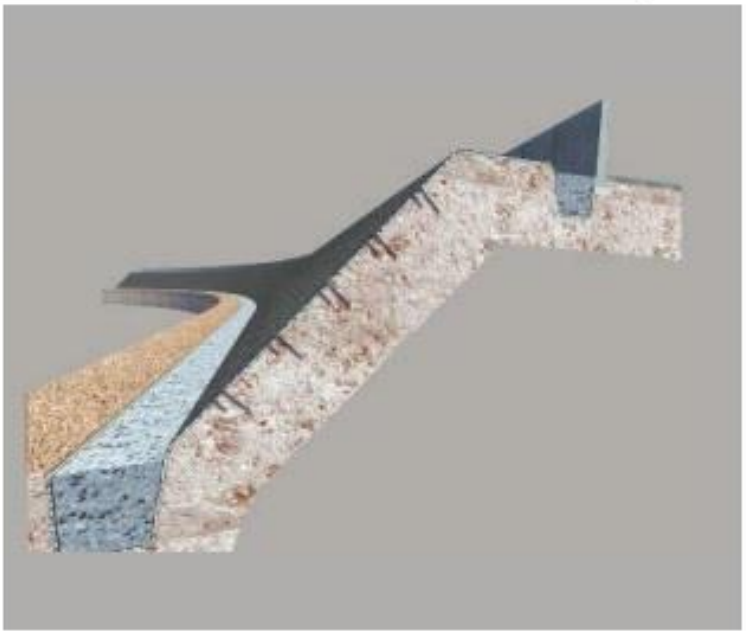


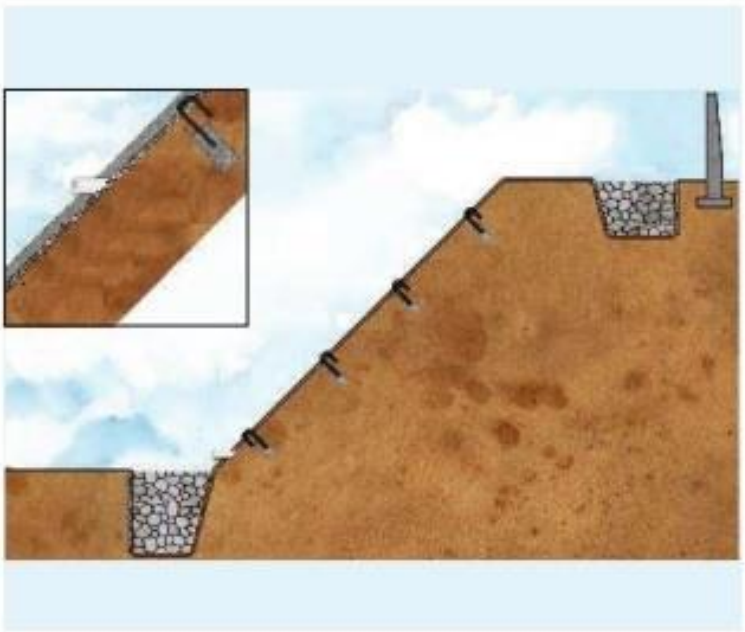


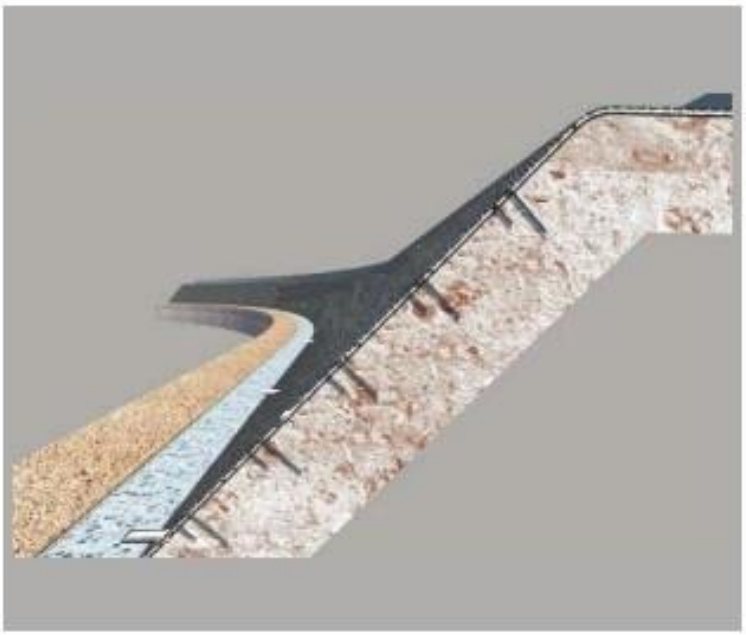
ConstruckSlope® Basic

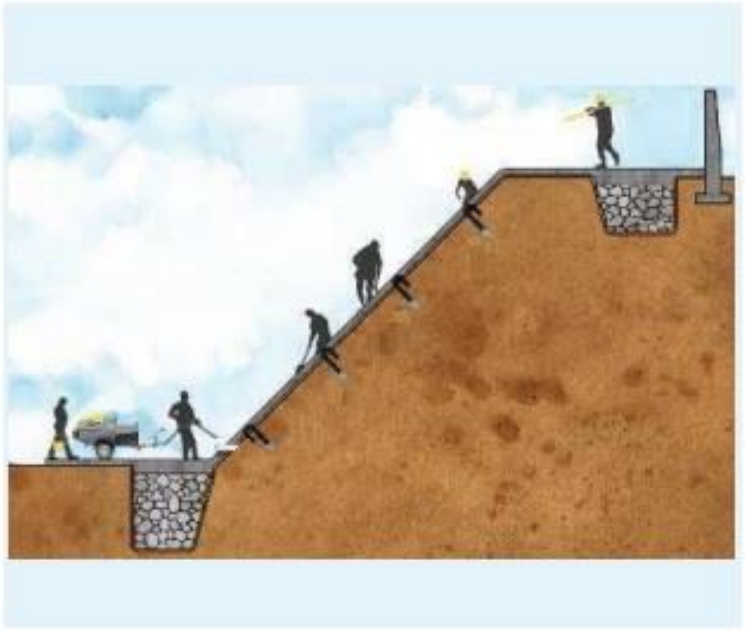
Stages of Construction







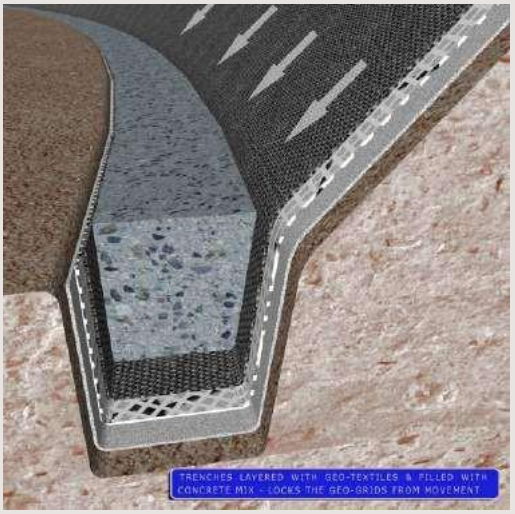




ConstruckSlope® Basic
Stages of Construction

Trench

The trench acts as the main anchor of the system locking the covering layer at top and bottom with either rip rap mortar stones/fiber screed/C25 Concrete.This ensures a flexible mattress like mat cover is fixed in place and allow for slight natural possible movement of the middle of embankment based on settlement and differential loading of the road over period of time but at same time is unmoved because of the anchors. The trench at bottom also acts as a scour protection in terms of water flow. The depth shall be designed as per the water level expected.



The trench acts as main anchor by ensuring the pullout strength of the erosion mat will be higher than the stress experienced by the movement on the embankment structure slope.

Erosion Control Mat Slope Profile

The erosion control mat is highly specialized and engineered polymer unlike regular geo-textile.

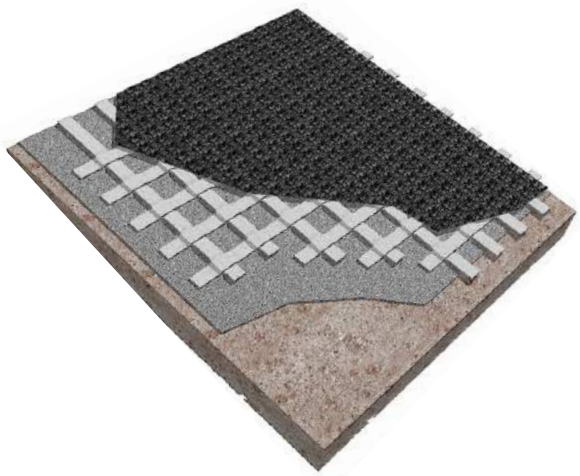
It has a peak load of 20kn but allows for elongation up-to 5% of the structure still keeping the integrity of the slope in place.

The 3D Filament allows for the concrete/asphalt filling to be held together.

Under layer of the Erosion Control Mat

A Geo-textile underlay below the mat which is bonded with the erosion control mat ensures that no fines are eroded from the embankment structure.

With enough allowable elongation, the system becomes a breathable system allowing for less stress buildup at the same time preventing any erosion.



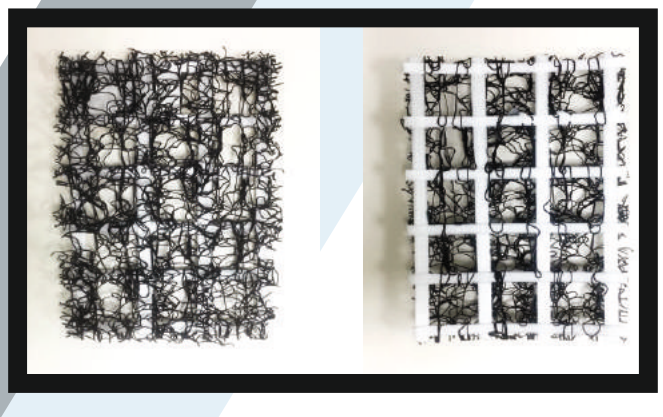
Fiber Concrete/Plaster Cover

The Construck Slope is based on Geo-synthetic items providing the erosion control for 5 decades and more of years due to the durability of polymeric nature. Hence the mat by itself is totally erosion control capable with no maintenance required.

However, due to external causes like UV Radiation and Vandalism, it is required to be protected by a thin layer of UV resistant material. This top layer doesn't provide any structural component to the system but only allows for the Geo-synthetic material to be covered and well protected. A layer of Fiber Concrete developed specially by Construck or a layer of spray plaster shall be applied based on the slope profile, accessibility and ease of use.

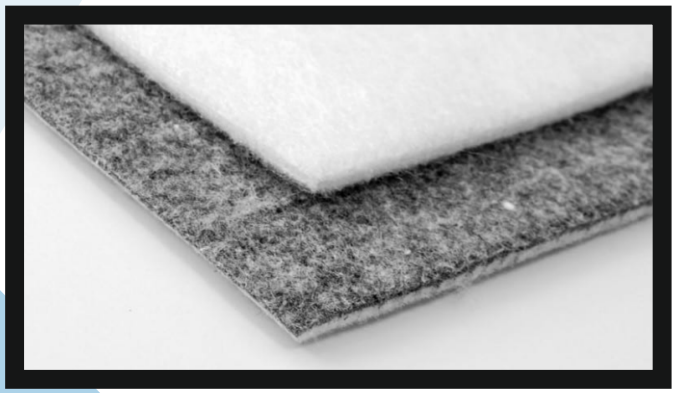
As a non-structual component of this system, the top layer is sacrificial and can be replenished every 20-30 years to increase the life of the system. Due to the 3D Filament nature of the Mat, the fiber concrete is held close to the mat and also gives additional durability.

Products used in this system

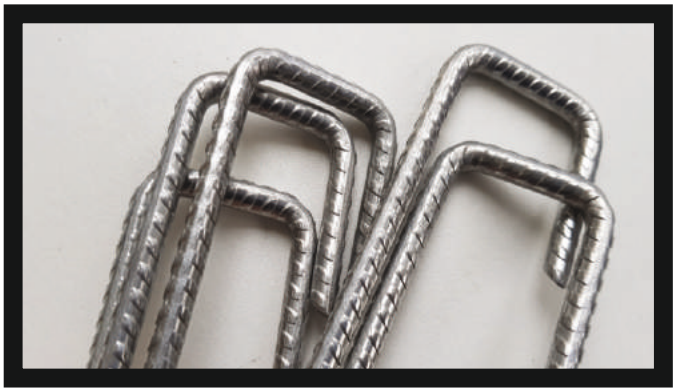


ConstruckMat

Plaster & Screed Concrete



Geotextile

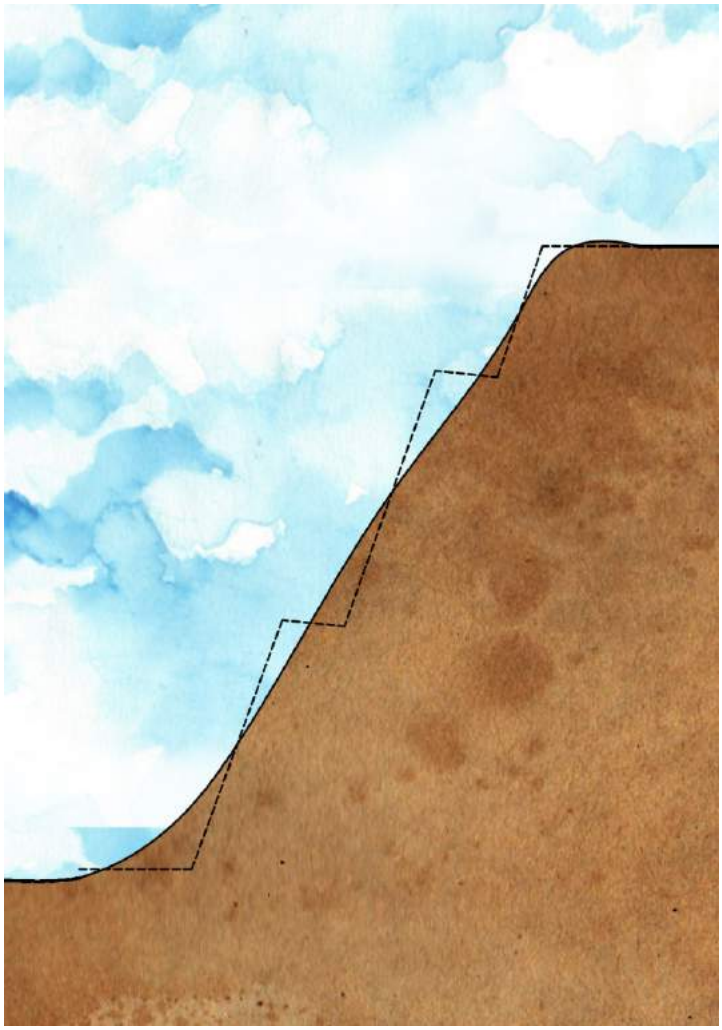


‘J’ shaped Rebar clips

Variations of ConstruckSlope® Basic can be used for more shallow embankments, ditch lining and other regular erosion control elements

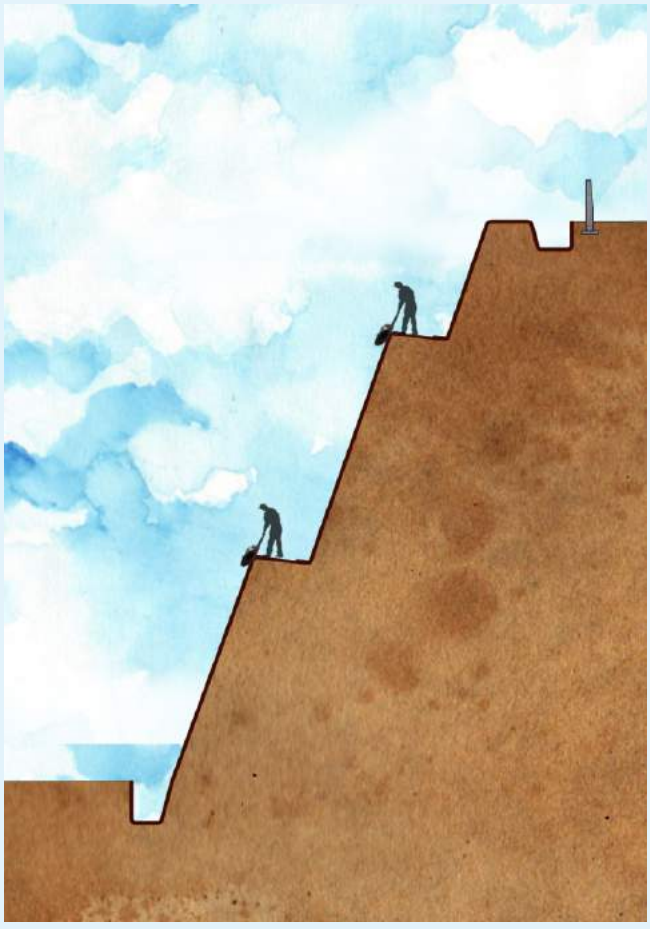
Construck Slope® Plus

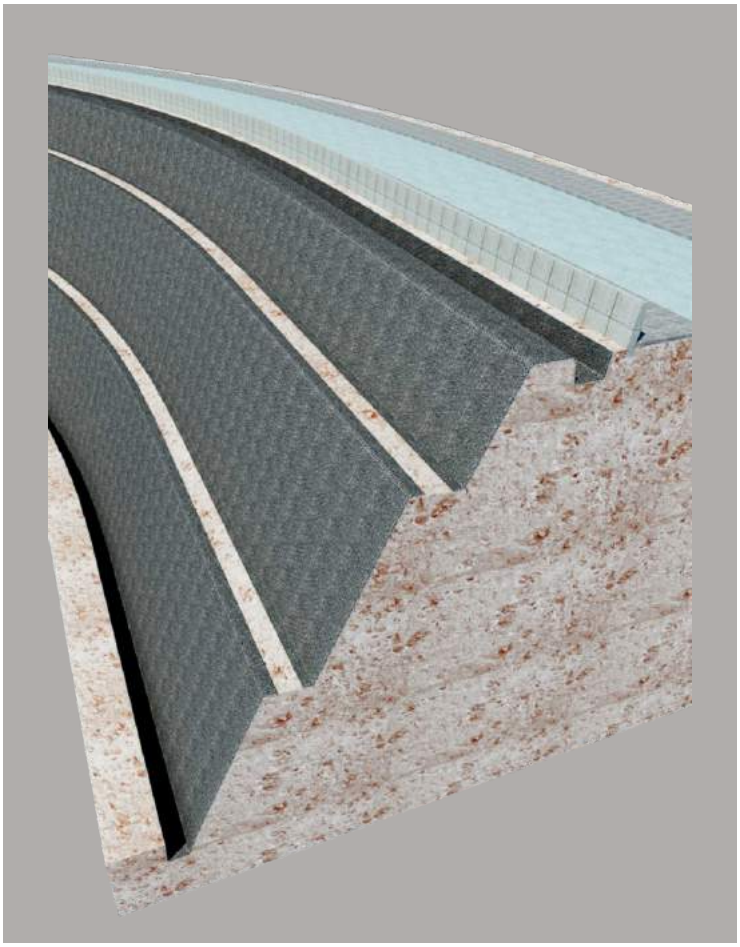
- **Cut Slopes**
- **Geometric Modelled Earthworks Protection**



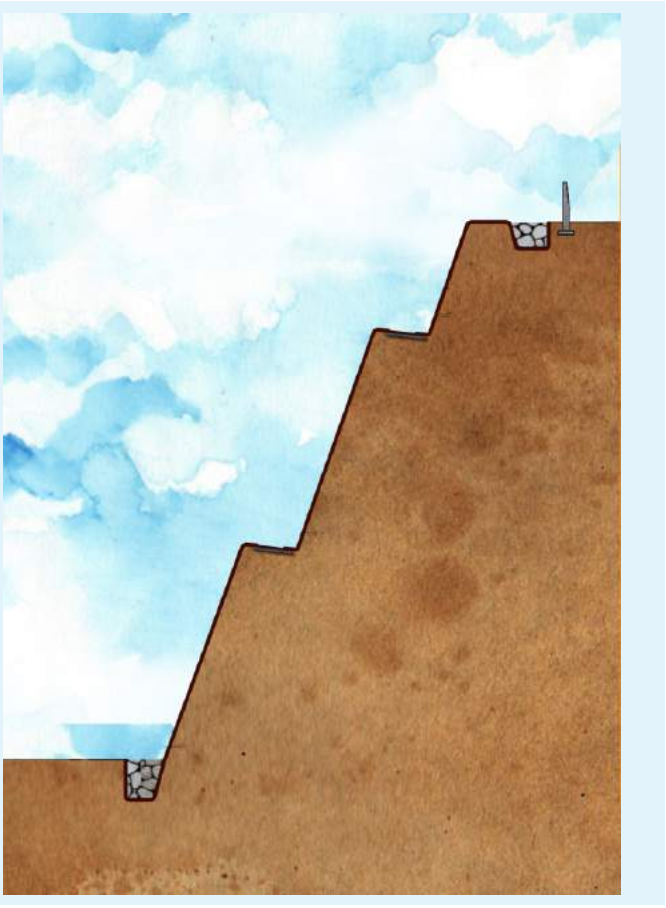
ConstruckSlope® Plus

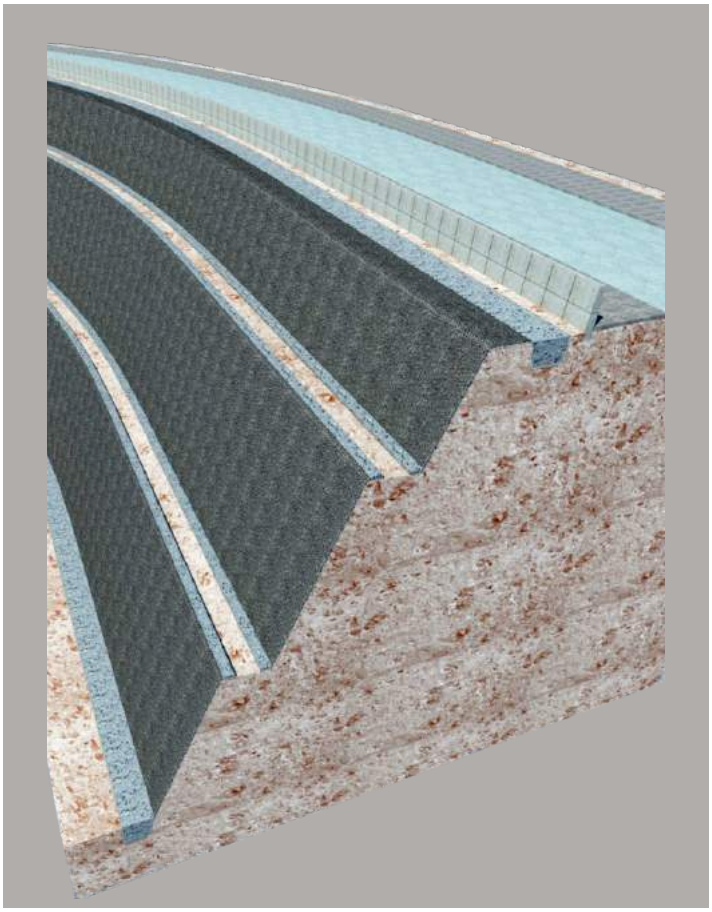
Stages of Construction

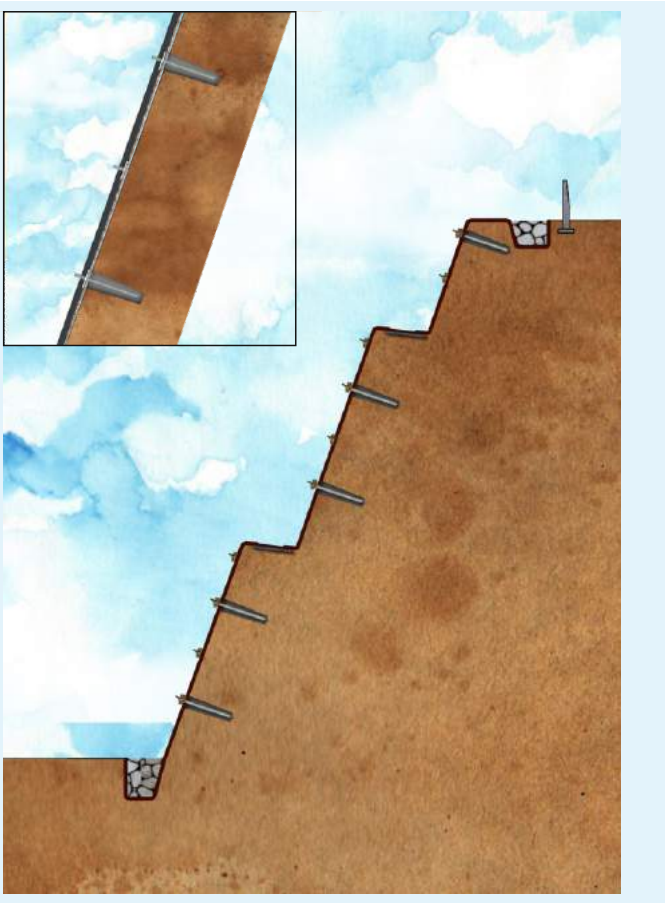


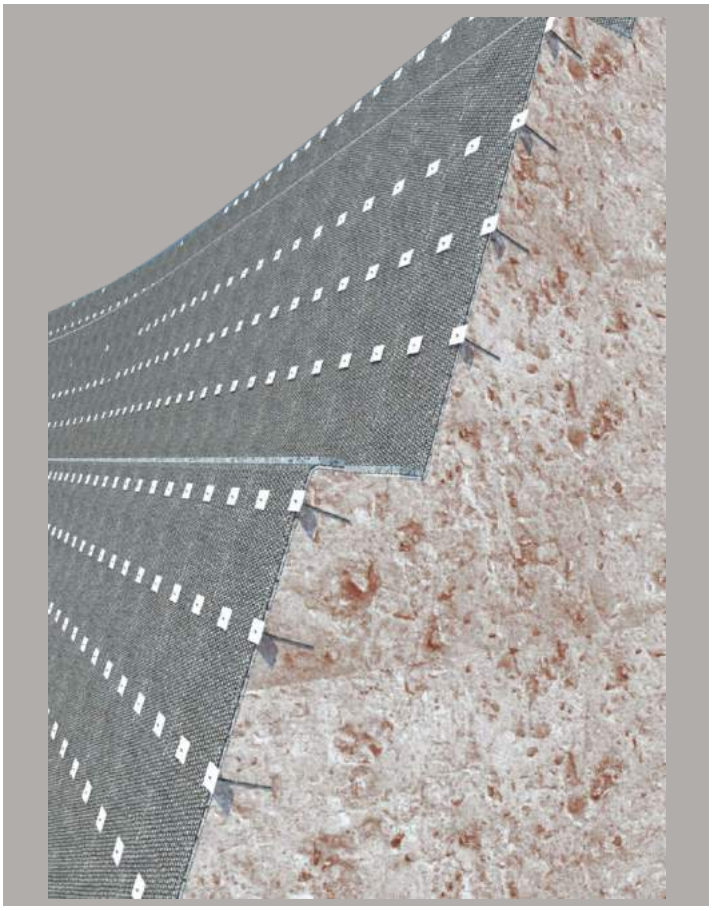


ConstruckSlope® Plus
Stages of Construction









ConstruckSlope® Plus
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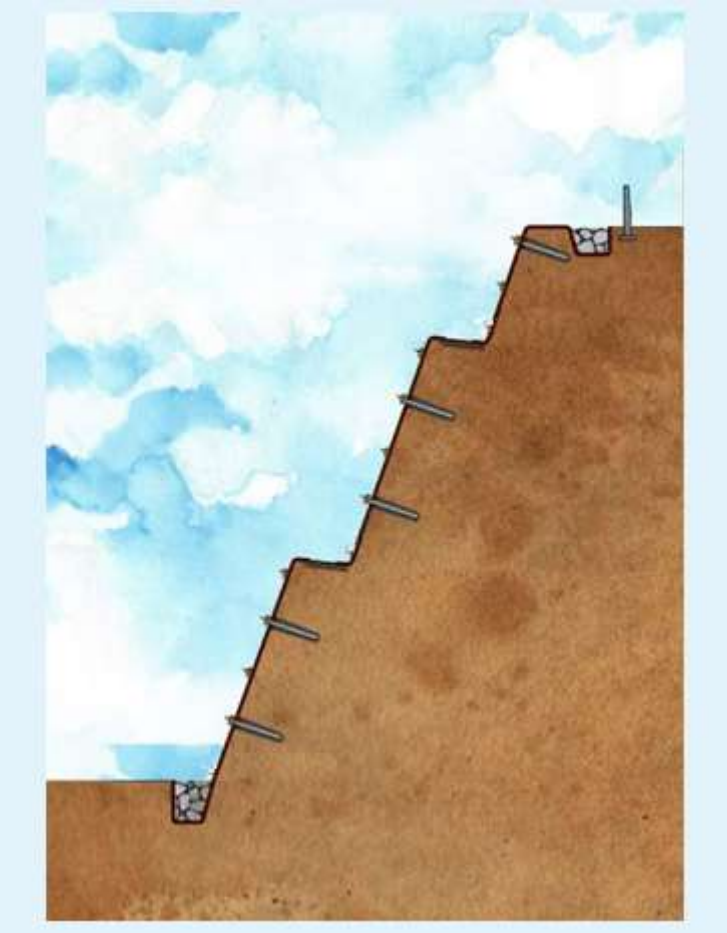

ConstruckSlope® Plus

Stages of Construction

Trench

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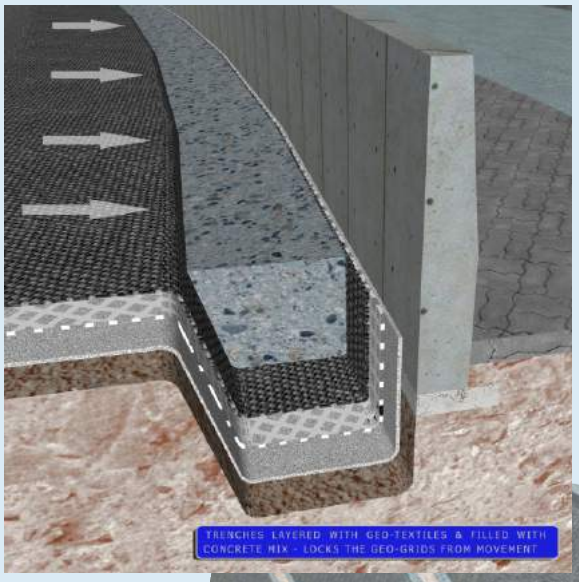
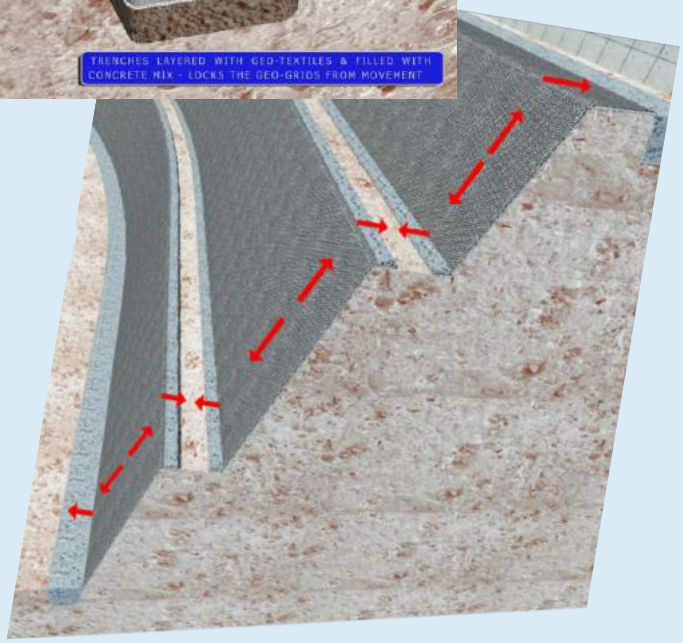


The trench acts as main anchor by ensuring the pullout strength of the erosion mat will be higher than the stress experienced by the movement on the mountain structure slope.



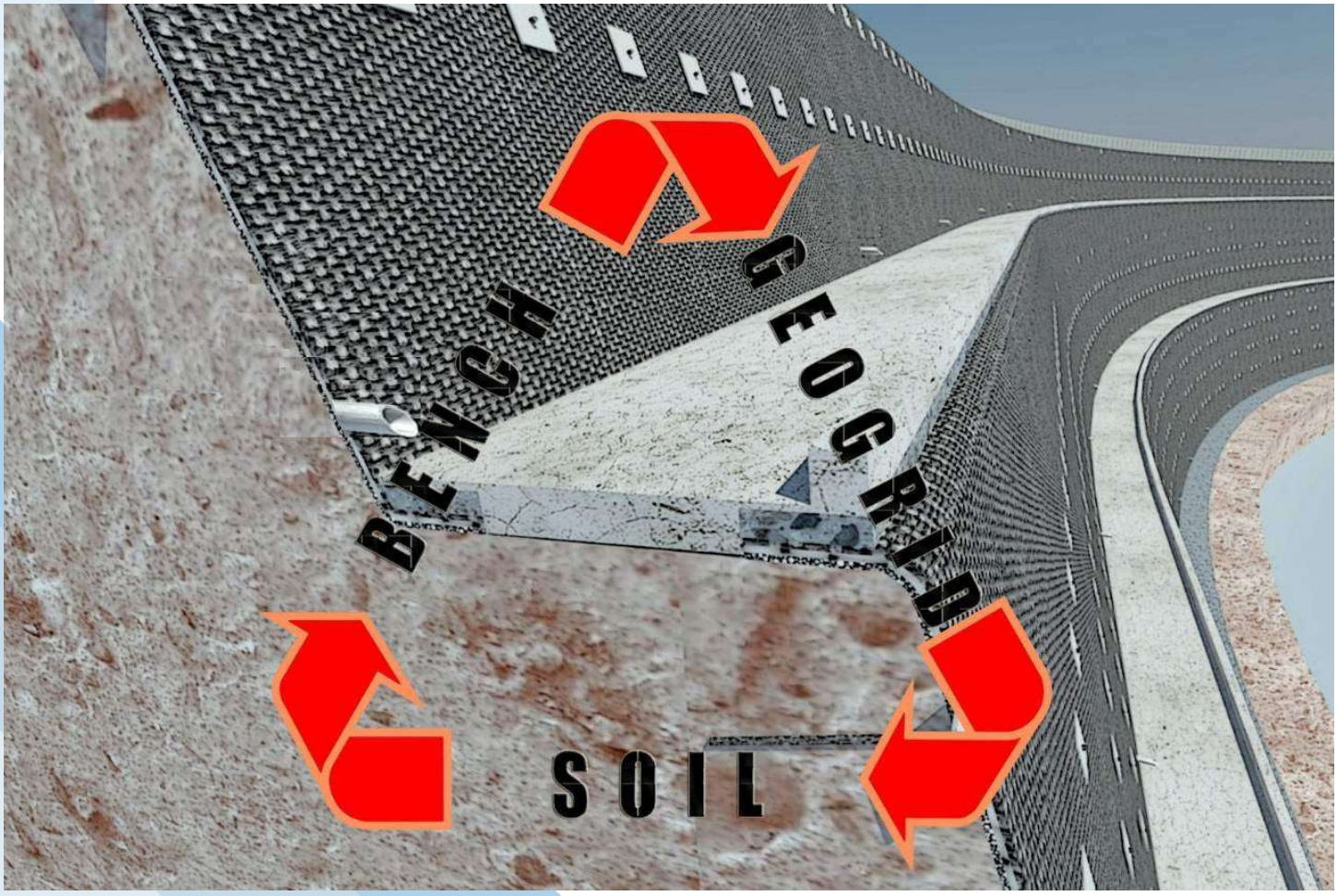
Bench

The bench is a one of the main structural parts of the system. Each bench layer acts both as an anchor layer for each grid layers and also as a waterproofing layer that disallows water to enter into the structure.

The Geogrid embed into the bench screed on both the sides based on the top edge or bottom edge holding both grids in place. The Fiber Screed layer is directly applied on the bench acting as structure of the mountain itself due to the friction interaction with the mountain bench. Hence when the Geogrid is embed into screed its as good as the Geogrid is embed into the mountain itself like self anchored nail. This provides a pull out strength that is quite higher than the allowed shear forces on the structure.

The maximum shear force that can come on the front face is contributed by the weight of the soil on top of area of the bench. However, the same shear force is absorbed by the geogrid and transferred back to the bench and hence provides a perfect circular stress action which keeps the slope stable.

In addition if required, an upstand is provided for guided water drainage and the use of semi-dry fiber screed mix allows the construction of upstands not relying on framework there by making it easier to do in various heights.

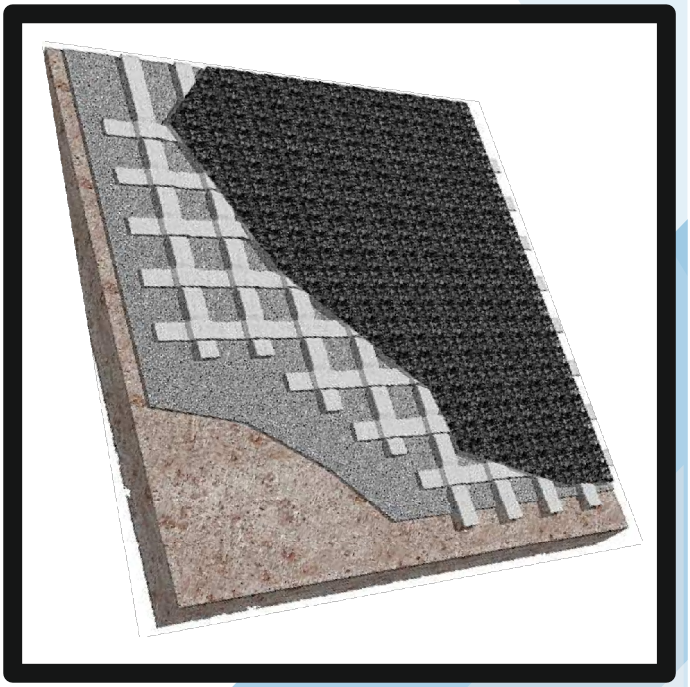


High Strength Geogrid Slope Profile

The ConstruckGrid HS is a highly specialized and engineered geogrid. The reinforcing bars are made of high tenacity polyester (PET) filaments with a co-extruded polyethylene (PE) protective coating. This gives it an ability to mobilize high tensile forces at low strains. It has a peak load of up to 200 kN but allows for elongation up to 2% of the structure keeping the integrity of the slope in place. The 3D filament ConstruckMat applied on top allows for the Cement Plaster or Screed filling to be held together. Anchor pins in the form of rebar/tie rods are placed at various intervals to create a prestressed environment to achieve the near pack strength of the High Strength at the time of application.

Under layer of the High Strength Grid

A Drainage mat underlay below the high strength grid which is bonded with the erosion control mat and ensures that no fines are eroded from the slope or embankment structure. This also ensures the proper drainage of the water within the system all along the surface of the slope through the drainage mat there by reducing the pore pressure. With enough allowable elongation, the system becomes a breathable system allowing for less stress buildup and at the same time, prevents any erosion. Weep holes are required only for the drainage collection towards the toe of each slope.



Fiber Concrete/Plaster Cover

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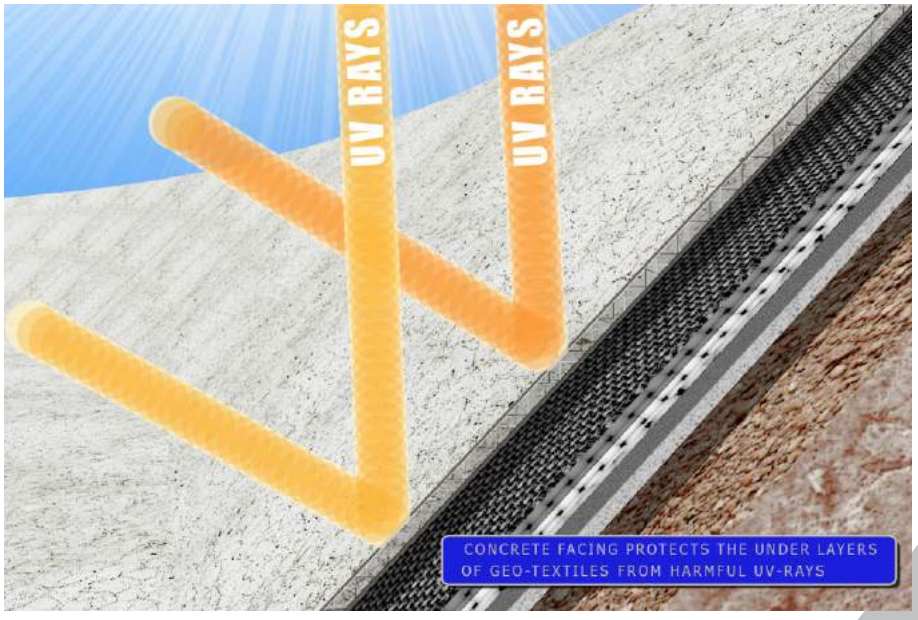
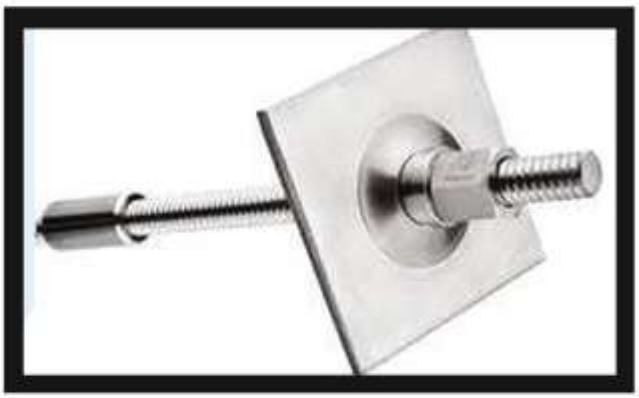


Products used in this System

ConstruckGrid HS

ConstruckDrain

ConstruckMat

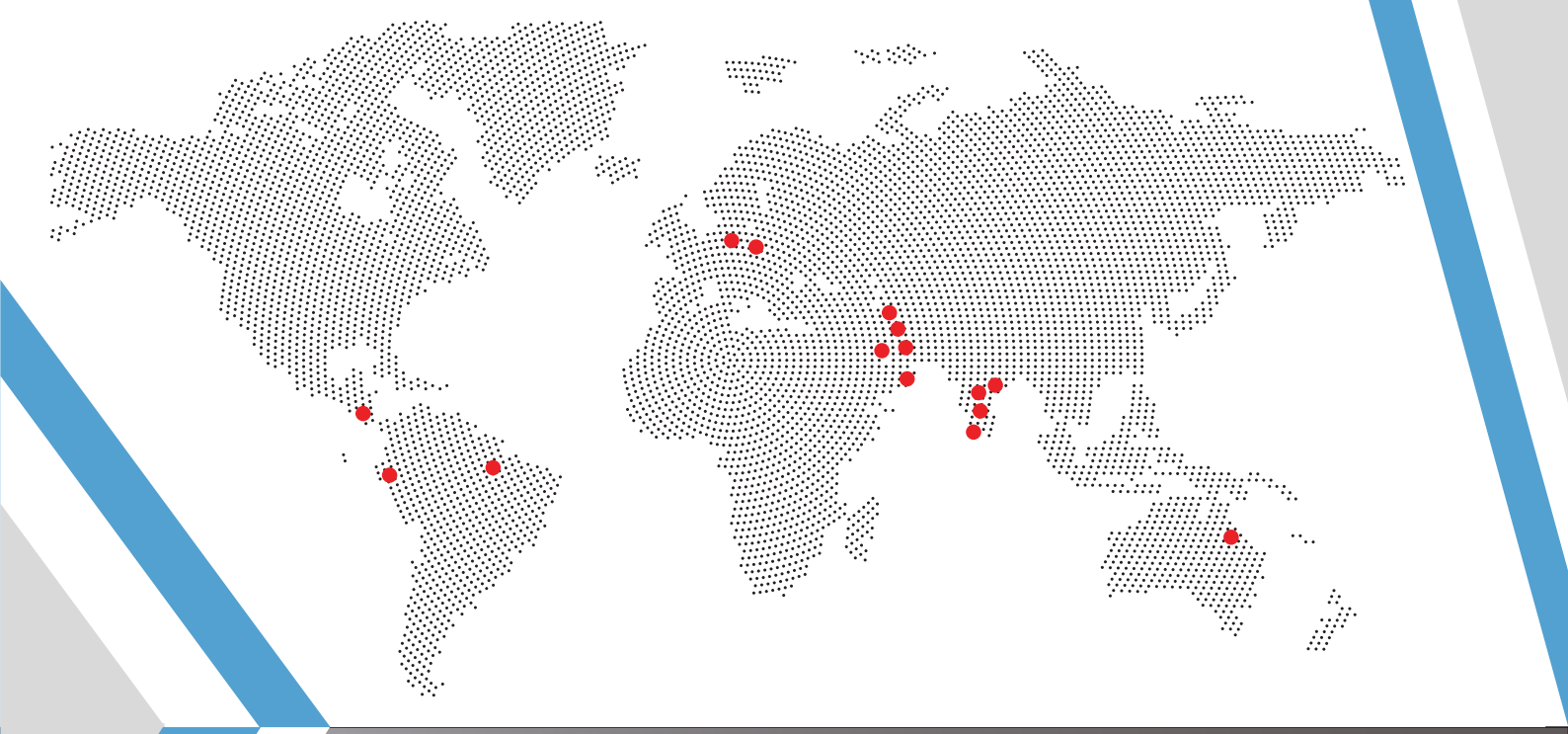


Tie Rods, Base Plates & Nuts

Plaster & Screed Concrete

'J' shaped Rebar clips

Variations of ConstruckSlope Plus® can be adapted for Clay Soils/Dune Sands/Unsuitable Soils & slopes up-to 14 meters for erosion control with Stability.



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