Installation recommendations

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Fortrac® 3D as surficial erosion control mattress on slopes

1. Scope instruction

This installation manual provides generic instructions for the installation of Fortrac 3D as protection from surficial erosion. Fortrac 3D is a flexible, three-dimensional reinforcement grid made from high-tensile, low-creep multifilament synthetic yarns.

Fortrac 3D provides erosion protection and long-term site armoring, and assist in the establishment of vegetation while permanently reinforcing vegetation.

The information provided herein is for general information only and is intended to present installation guidance. Site-specific conditions may require an alternative installation procedure to be adopted.

2. Packaging, transportation, storage and cutting to size of rolls

Fortrac 3D is supplied either in the standard width of 4.5 m or in fractions thereof, rolled up over its full width. Fortrac 3D rolls are packaged in such a way as to provide protection against normal weathering and transportation damage. Upon delivery, the rolls shall be inspected for transport damage. All movement of the goods within the construction site shall be done in such a way as to prevent any damage to the rolls. HUESKER Synthetic GmbH shall be notified promptly by the site manager of any damaged or unlabelled goods.

The rolls should be stored on a levelled, capable of bearing area and protected from conditions that will affect the properties or performance of the product. The rolls can be stacked if stacked rolls are secured against slipping and rolling. Fortrac 3D can be simply cut to size on site. For large-scale applications, it may be appropriate to cut the required sheets in advance at a separate location on site before transporting them to the place of installation. This procedure is particularly efficient and cost-effective on major projects.

Fortrac 3D as all Fortrac geogrids, have no „memory effect", i.e. the geogrids do not roll up after cutting or laying and there is no need to ballast the sides or ends of the sheets.

3. Installation steps

The main construction sequences are summarized in the following.

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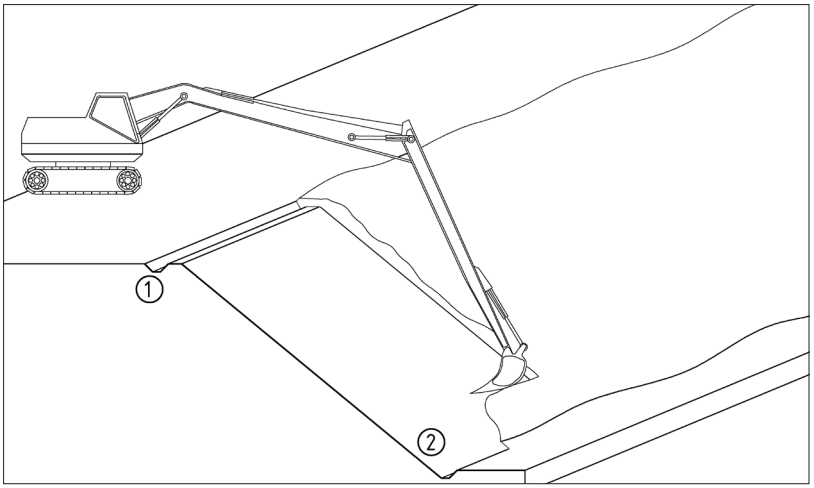
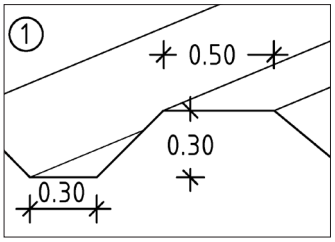
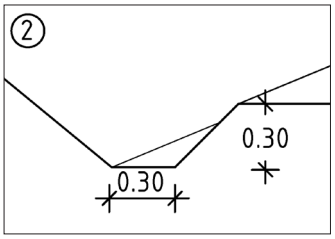
A. Subgrade preparation







Fortrac 3D should be installed in a stable, properly levelled and free of protrusions surface. The subgrade preparation may include excavation, removal of vegetation, roots and stones or any other protruding elements, grade and compaction. Any major hollows in the formation and gullies should be filled and compacted.

Anchor trenches should be built at the top (1) and at the bottom (2) of the slope.

The geometry of the anchor trenches may vary according to the site conditions (i.e., length and steepness of the slope). However, as a rule of thumb, an anchor trench depth of minimum 0.30 m x 0.30 m at the top and at the bottom of the slope is recommended.

In case of installation in channels only the anchor trenches at the top of the slope on each side is required (1). Deeper trenches and /or hard armoring may be required for channels that have the potential for scour.

Other geometries of the anchor trench to suit site specific conditions are possible prior consultation with HUESKER Synthetic GmbH.

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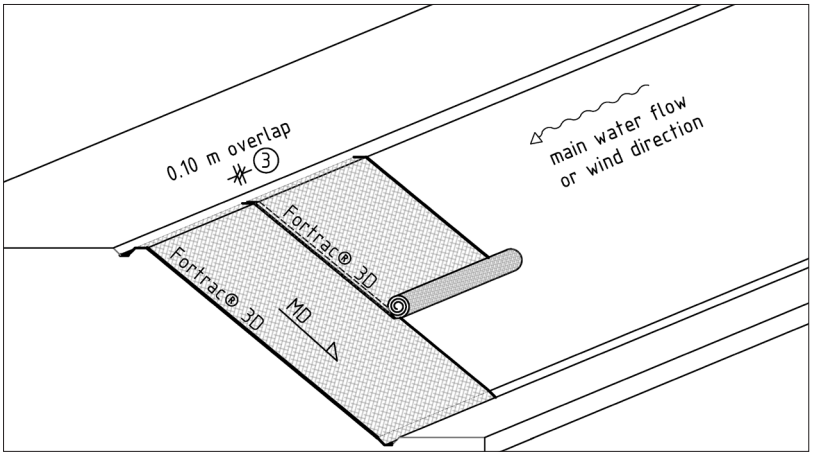
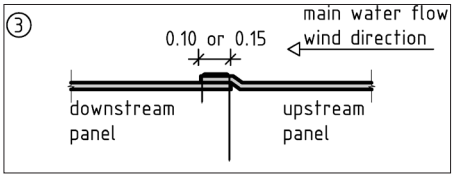
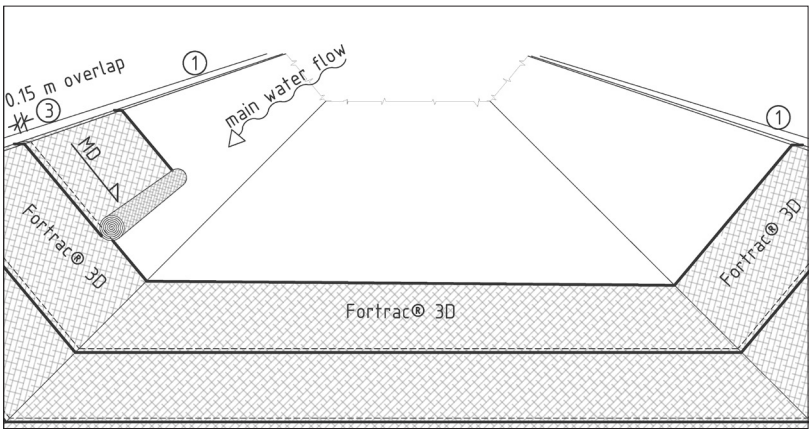
B. Fortrac 3D laydown and arrangement of overlaps







It is recommended to install Fortrac 3D unrolled downwards (from the top to the bottom of the slope) in material machine direction (MD).

The unrolling process shall be carried out slowly and in a controlled manner by preventing any wrinkles in the material and by guaranteeing an intimate contact between the subgrade and the Fortrac 3D. During unrolling, the panel shall be positioned parallel to one another and free of folds, while maintaining the required overlaps.

A minimum overlap of 10 cm should be guaranteed between two successive panels on dry slopes. In channels, overlaps of minimum 15 cm should be made.

The overlap should always be carried out in the main water flow/wind direction. This means that the downstream panel should be below the upstream one (3). Vehicles should not drive directly over Fortrac 3D.

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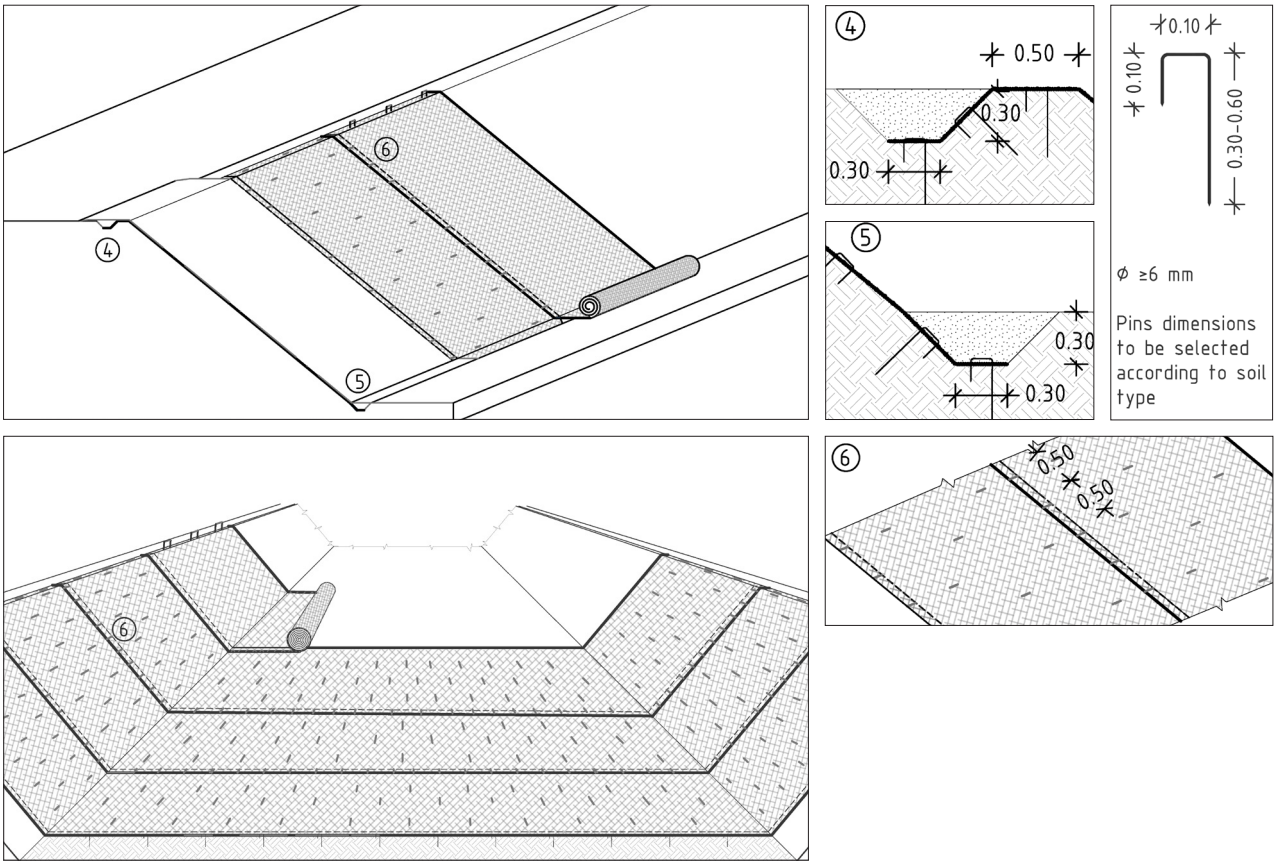
C. Securing



Fortrac 3D should be anchored at the top and at the bottom of the slope by backfilling and compacting the anchor trenches (4) and (5).

Fortrac 3D should be fixed in the slope with fixing bars (i.e., steel pins) with sufficient ground penetration to resist pullout, to guarantee intimate contact of the product with the subgrade, to fix it properly against downward/ downstream/ downwind forces.

The properties of the fixing method (i.e., length and diameter) and the number of the required bars strongly depends on the subgrade characteristics. Steel bars minimum diameter of 6 mm and a length varying between 0.30 – 0.60 m are required. However, it is recommended to test the fixing method directly in situ (i.e., field test) prior to the installation start.

It is recommended to install the steel bars following a checkerboard pattern across the slope surface. The pins should be installed in order to guarantee an intimate contact of Fortrac 3D with the subgrade. As rule of thumb 2 pins/m^2 might be suggested in gentle slope but needs to be checked on site. Particular important is the fixing of the roll ends point in the anchor trenches and in the overlaps between the panels. Thus, in such areas the number of required fixing elements (i.e., steel bars) might increase. As rule of thumb, a distance of 0.5 m between two consecutive pins might be suggested (6) and might be adjusted according to the site specific conditions.

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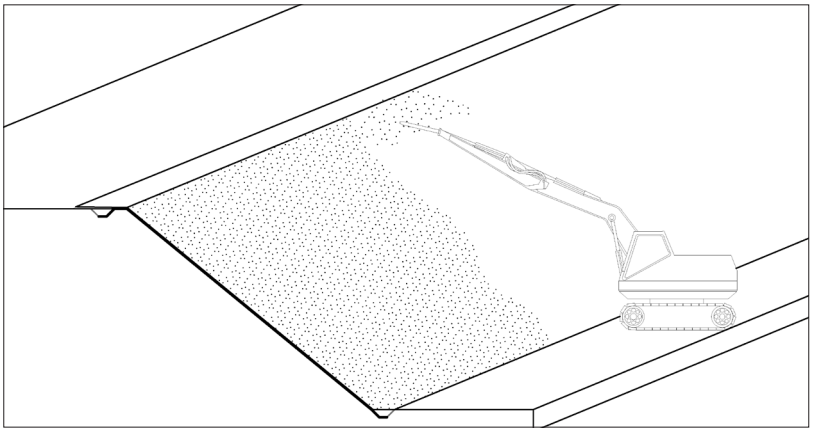
D. Vegetation and maintenance



Vegetation plays a fundamental role in the erosion control system.

The vegetation method should be selected prior to the project start according to the local site conditions. For good performance the soil used should be appropriate to enable the vegetation growth.

If the vegetation establishment is achieved by sowing, Fortrac 3D could be covered with 2 cm – 3 cm of top soil where seed can be placed. Alternatively, another possibility would be to sow the subgrade and install the Fortrac 3D on top.

The seed mix and/or cuttings or creepers shall be selected so as to be compatible with local conditions. An extensive planting with indigenous species, which, once established, require little maintenance is generally suggested.

It is recommended to appoint a specialist contractor to plan and maintain the vegetated surface during and after the initial growth period.

Please do not hesitate to contact HUESKER Synthetic for application- and project-specific advice regarding situations not covered by these installation instructions.

The details provided in these installation instructions are based on our latest findings. We reserve the right to make amendments in line with technical advances. No liability may be construed and no claims shall be accepted in respect of the information presented in this document.

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