

■ Installation Guide of TMP Biaxial Geogrids for Reinforcement of Earthwork Constructions

Preparation of the sub-base surface

Before installing the geogrid, the sub-base surface must be prepared according to location and height and must be compacted. Tree root residues, stones and other objects that may damage the geosynthetic product insert or that may have negative effects on its functions must be removed from the bed in advance. The usual demands on the preparation of sub-base surfaces must be adhered to, too.

The installation direction is specified in the planning documents. The biaxial geogrids, can be strained equally in longitudinal and lateral direction.

The geogrid sheets must be installed smoothly and, if necessary, be weighted by hand using packing material in order to prevent them slipping or being blown away.

The geogrids must be installed without overlapping in the strain direction in supporting constructions or on embankments. If this is unavoidable, separate validation of the overlapping must be provided.

When dealing with reinforcement of unbound supporting layers in road construction, the overlap must be at least 50 cm in normal circumstances and at least 1.00 m in every direction if the subsurface is very soft.

Installation of the fill material

The granular distribution of the mineral substance mixture in the supporting layer material must be aligned with the geogrid reinforcement. High water content should be expected, especially in cohesive soils, which may fluctuate significantly, depending on the season. Accordingly, the proportion of fine components < 0.063 mm should be restricted to no more than 5 % of the weight, in order to enable smooth water drainage without significant pressure.

This requirement must be defined to an even stricter degree when dealing with recycling construction materials and recycling construction material mixtures, where the proportion of fine components < 0.063 mm must be considerably less than 5 % of the total weight.

Once installed, the geogrids have to be prevented from being directly driven on. An at least 20 to 30 cm thick layer of supporting material must be installed and compacted in front-spread method before the surface can be exposed to traffic. The thickness of the first layer must in this be aligned to suit the granular composition of the supporting layer material and may therefore be larger.



Compaction and compaction control

In order to ensure that the supporting layer material can be easily compressed and to prevent the mixture from breaking down, the water contents in the supporting layer material must be optimized. A combination of initial static followed by dynamic rolling procedures has proven to be favourable. In order to ensure that the reinforcing effects of the geogrid are activated as soon as possible, it is advisable to start the compaction process in the middle of the structure and to then work outwards to the edges.

Whenever possible, the frequency of the compaction equipment should be within the range of the characteristic frequency of the sub-base/sub-structure.

The thickness of the individual fill layers must be in line with the sub-base/sub-structure, the installed material and the equipment available for compaction.

Driving over the installed and compacted supporting layer is a good method to monitor and confirm the systems load-bearing capacity. The observation of deformation on the surface of the ground enhancement layer in those areas that the wheel load passes, and the depths of the tracks enable an initial, rough assessment of the load-bearing capacity of the construction and the effectiveness of the geogrid in dependence on the sub-base/sub-structure.

An unchanged depth of tracks along the entire route is an indication for even quality of the installation up to that point. Pumping under the load reveals the reaction of the sub- base/sub-structure. In such cases, a series of additional plate bearing or CBR tests permits an evaluation and qualitative assessment.