Secutex®/Secutex® Green

Trust is good – comparison makes sense.

Technical Note

Naue

Secutex®/Secutex® Green

Technical Note

Trust is good – comparison makes sense.

Cost-benefit comparison of different solutions for the construction of a temporary road

Calculation basis:
400 m long construction road with a width of 4 metres

Considered construction variants were a granular material, a classic PP nonwoven made from petro-based raw materials and a solution with a biodegradable nonwoven.

The granular solution serves as the basis. The respective expenditure of money and time, as well as the CO_2 emissions of the granular solution, are used as a comparative value for the other two variants. In terms of applications, the nonwoven solution is superior to the granular solution in all respects: Simply because of the masses that must be moved with the granular solution, nonwoven solutions are faster, cheaper and can be implemented with fewer emissions.

Fig. 1: Prepared subgrade for the construction of a temporary road

A significant difference lies in the construction and deconstruction of the building measure. The granular solution is time-consuming and logistically complex due to the quantities to be deconstructed. The amount of soil that must be transported to the construction site, installed, later deconstructed, and if necessary, disposed of is considerably higher. If a nonwoven made of polypropylene is used, removal is time-consuming because no residues should remain in the environment. The PP nonwoven must be disposed of properly, which leads to additional costs due to transport and disposal at a landfill or waste incineration plant. After use, the PP nonwoven is interspersed with mineral components embedded in the cavities of the nonwoven. Recycling a used PP nonwoven is, therefore, very costly.

On the other hand, the nonwoven made of biodegradable fibres can be composted or covered with soil if there are still residues after completion of the construction work. The biodegradable nonwoven is converted 100% into water, biomass and CO_2. The CO_2 released during this process corresponds to the amount of CO_2 bound from the environment during the plants' growth for fibre production. For this sector, it is possible to speak of CO_2 neutrality - in contrast to products based on fossil raw materials such as petroleum.

The biodegradable nonwoven material fulfils its function in the phase of „accretion" and consolidation of the subsoil. It ensures a clean, even layer interface between the base course material and the subsoil. After

Fig. 2: Completed temporary construction road

that, the system is „rigid" if the base and surface layers are sufficiently dimensioned. Mixing takes place only to a reduced extent, as the structure (in contrast to the construction phase) is enough thick and load-bearing. The mechanical stress on the separation and filter nonwoven (tensile stress) occurs mainly in the installation phase. In the operating phase, the fibre structure is decisive (filter efficiency).

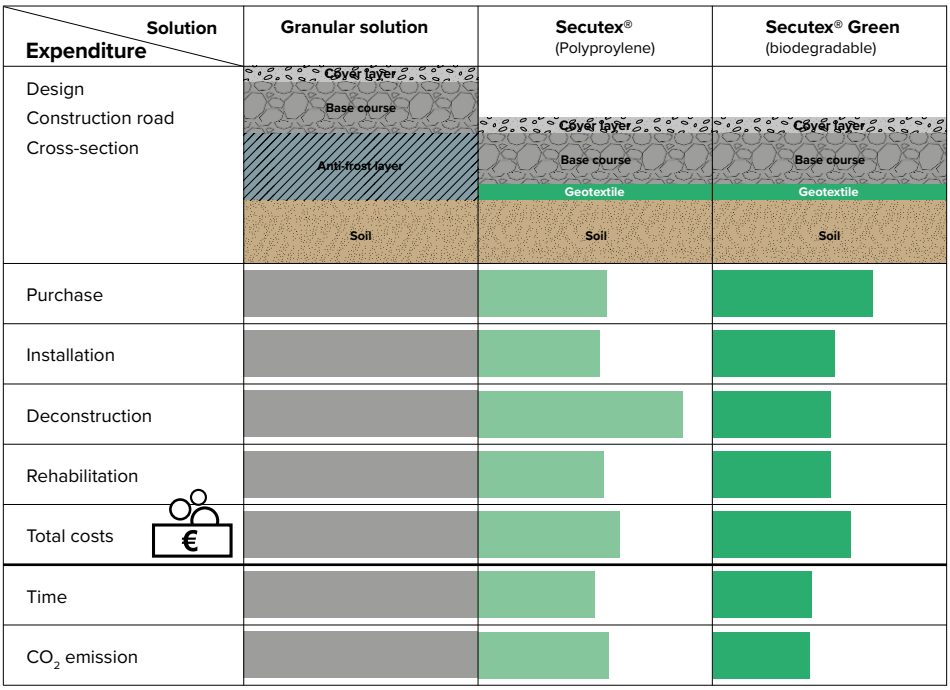

Fig. 3: Cost-benefit comparison of different solutions according to expenditure, time and CO_2 emission.

The solutions with a nonwoven are far superior to a purely granular construction method in terms of cost, time and CO_2 emissions. The total costs of the two nonwoven solutions are comparable in this project example. The reduction of construction time, the reduction of CO_2 emissions and the avoidance of any entry of plastic into the environment additionally speak in favour of the solution with a biodegradable nonwoven.