



BEDRAIN

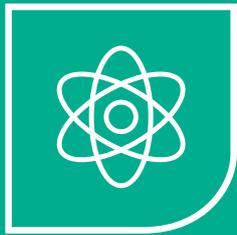
Drainage Grids

KEY ADVANTAGES

at a glance



→ High drainage capacity maintained with an overburden of up to 1,000 kPa



→ Excellent chemical resistance



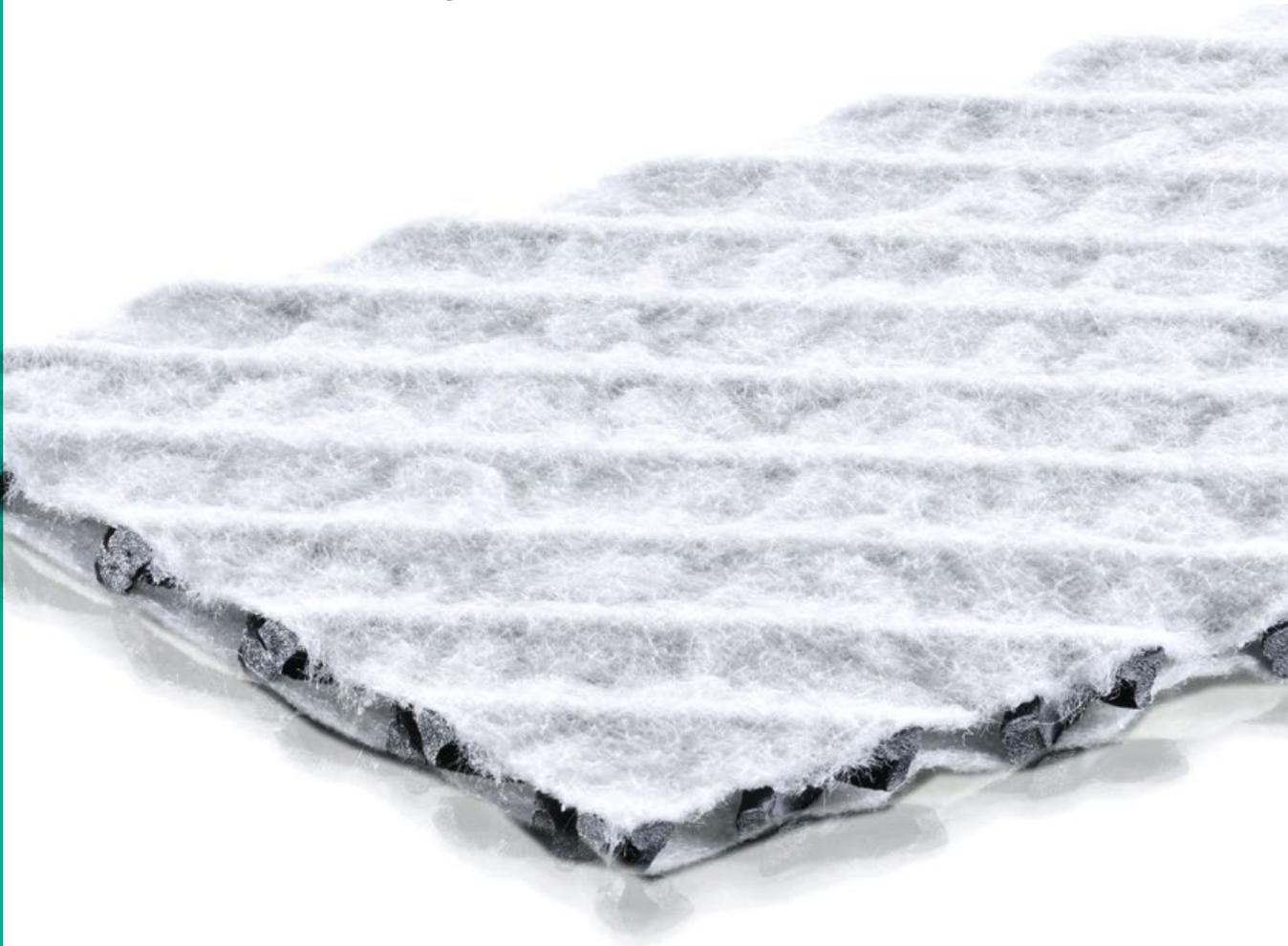
→ Good cost-benefit ratio



→ Outstanding long-term stability

BEDRAIN

Drainage Grids



“Soil drainage is the removal of water from the ground via a drainage layer and drainage pipes to prevent the build-up of pressing water. Flushing out of the soil particles should not occur (soil particles should not be able to pass through the drainage system).”

This short but precise definition is given in German standard DIN 4095 to describe an important construction task.

In addition to its vital role as a natural resource, water also presents a professional challenge for geologists, engineers and environmentalists.

It is not always possible to predict with the required precision where and in what quantities water will collect. But structures still need to be constructed with adequately reliable structural stability. At the same time, responsible handling of this valuable resource is very important.

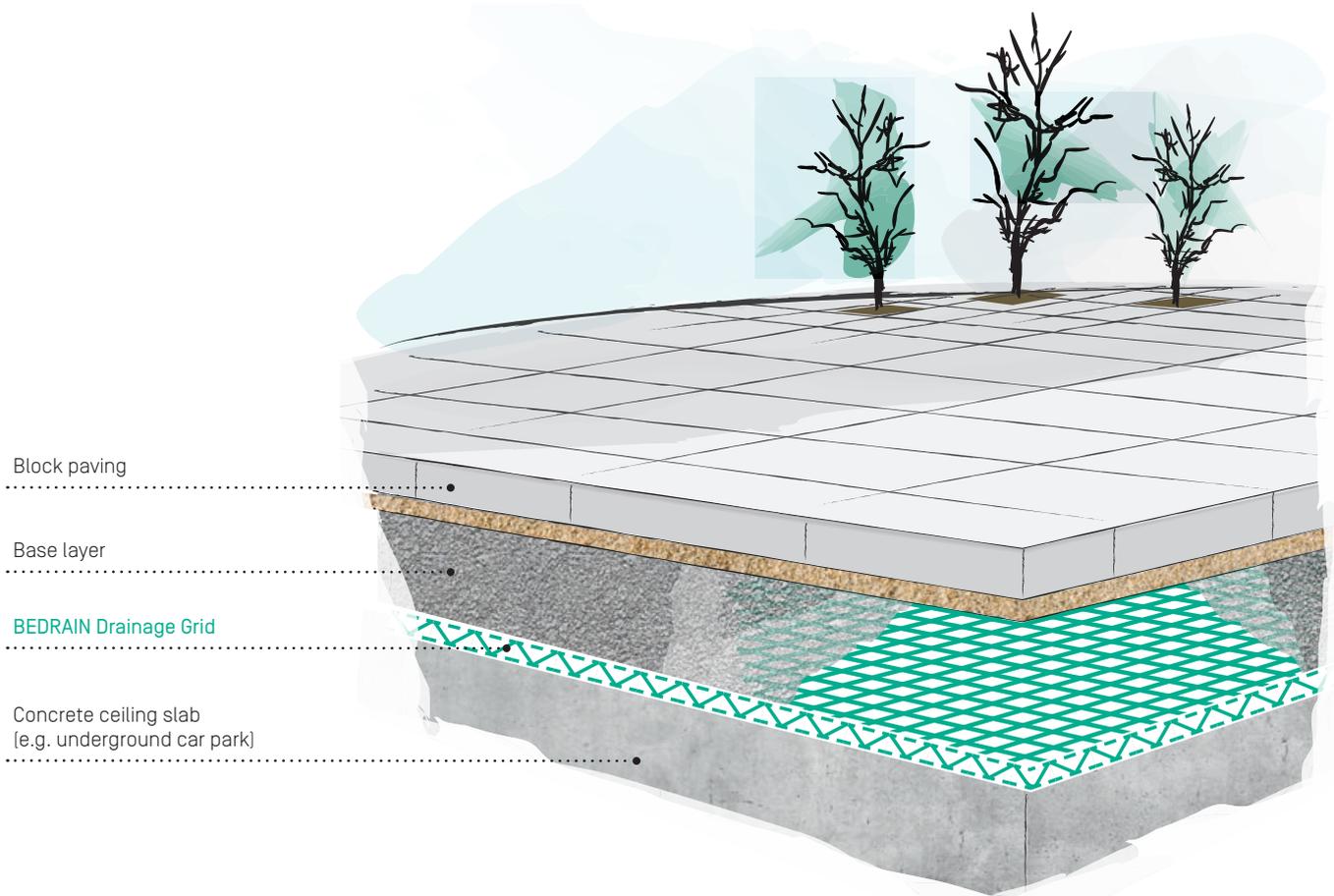
PRODUCT DETAILS

and properties

BEDRAIN Drainage Grids are particularly resistant geotextiles with a drainage core made of extruded high-density polyethylene (HDPE). This polymer demonstrates excellent chemical resistance, even to aggressive media such as soils with a high pH value.

BEDRAIN Drainage Grids have excellent resistance to compressive loading. The high tensile strength of the material also enables it to withstand high mechanical loading, for example during installation. Depending on the type of application, a geotextile filter or a geotextile and a membrane can be bonded on one or both sides of the drainage core.





For structures that come into contact with soil, in the fields of civil engineering, building construction and geotechnics, the various stress cases caused by water can be divided into three main groups:

- Soil moisture
- Non-pressing water
- Pressing water

In the case of non-pressing and pressing water, BEDRAIN Drainage Grids provide useful solutions to design requirements. Aufgaben.

BEDRAIN Drainage Grids can be laid both horizontally and vertically.

FUNCTIONS

BEDRAIN Drainage Grids

Drainage

BEDRAIN Drainage Grids can be used to full advantage on any reasonably even surface. It doesn't matter whether the surface against which the BEDRAIN Drainage Grids are to be laid is a soil subgrade or a vertical structure or building element.

BEDRAIN Drainage Grids can be laid both horizontally and vertically. The excellent pressure/compression characteristics of the grid maintain the required drainage capacity even under very heavy loading, to ensure unpressurised discharge of the collected water. Depending on the type of application, ground water, aquifer water or surface water can be systematically collected and drained away.



Filtration

The non-woven geotextile that is bonded to the grid acts as a filter, holding back the fine soil particles and preventing them from being washed into the drainage core. The ideal aperture size creates a stable filter system, effective for all common types of soil.



Separation

BEDRAIN Drainage Grids can also be used as a separation layer in the boundary layer between two different types of soil. This can increase erosion stability and also lead to an increase in interfacial tension due to the draining of the interface. This increase in tension at the contact surface is an important factor in the structural analysis of surface sealing systems in landfill sites, for instance.



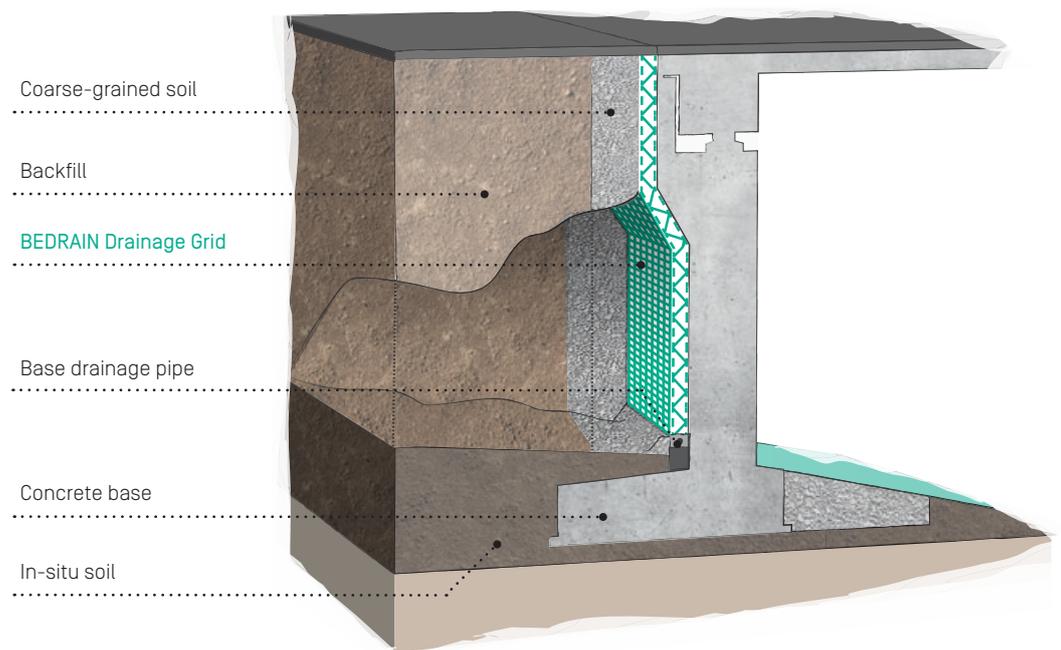
APPLICATIONS

BEDRAIN Drainage Grids



Bridge abutments

(in compliance with german standard RiZ Was 7)



BEDRAIN Drainage Grids with a bonded geotextile on both sides meet the requirements of german standard "Was 7" for the drainage of contact surfaces between bridge abutments and backfill materials.

They also represent a cost-effective alternative to hand-laid concrete filter blocks, since the rolls of drainage grid are significantly easier and quicker to install.



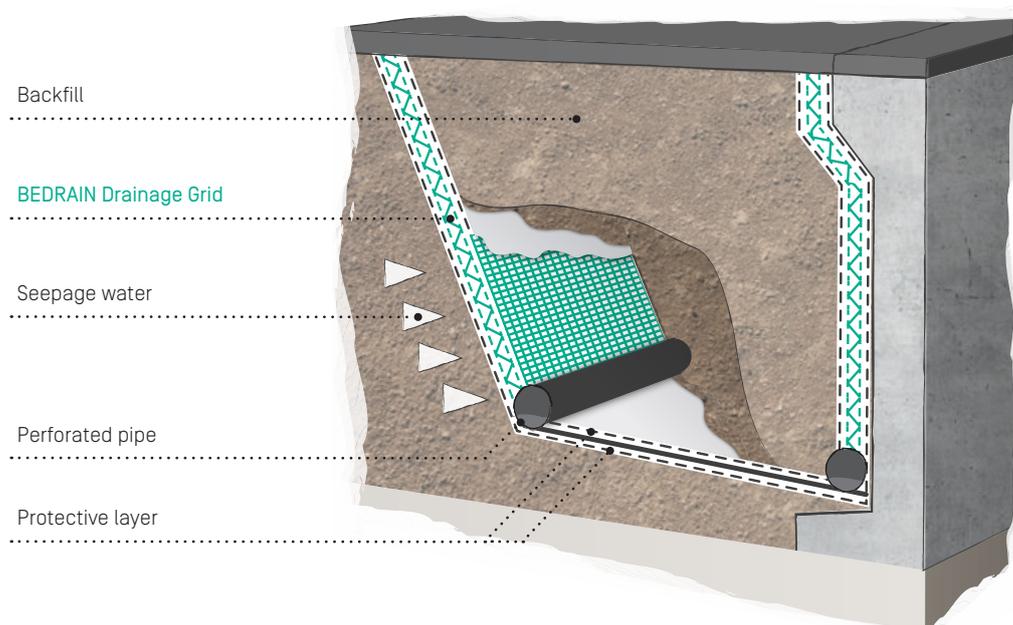
BEDRAIN Drainage Grids are used in civil engineering and building construction where seepage or slope runoff water needs to be drained away as quickly as possible in order to avoid the accumulation of water. With the help of BEDRAIN Drainage Grids laid beneath the foundation slab, water can be permanently prevented from circulating around the structure.

Protection of structures and buildings

As with bridge abutments, BEDRAIN Drainage Grids can be used on the soil side behind concrete cantilever wall or other facing elements. The filtering function of the bonded geotextile is of particular benefit here. The fine particles of the backfill soil cannot be washed out. As a rule, a drainage grid with a geotextile bonded on just one side, the side in contact with soil, is sufficient.

As in the two previous examples, BEDRAIN Drainage Grids can also be used to provide vertical drainage for basement walls. The grids support the sealing effect of a bituminous waterproofing coat and protect it from damage when the excavation pit is backfilled and compacted.

Drainage of backfill to structures

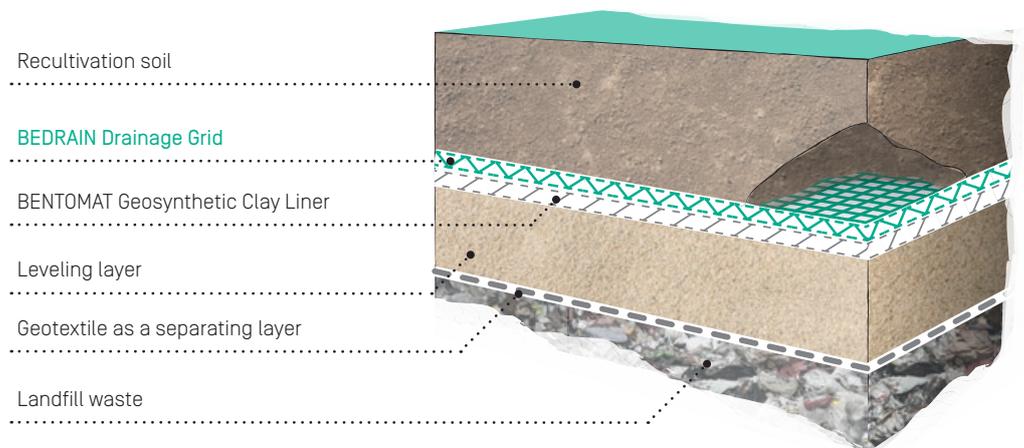


Landfill sites and contaminated sites

Due to their excellent durability and chemical resistance, BEDRAIN Drainage Grids can be used for the purpose of gas and water drainage in landfill sites.

As part of the surface sealing system of landfill and contaminated sites, BEDRAIN Drainage Grids increase the structural stability of the sealing system by draining seepage water away quickly and effectively.

Landfill and contaminated sites

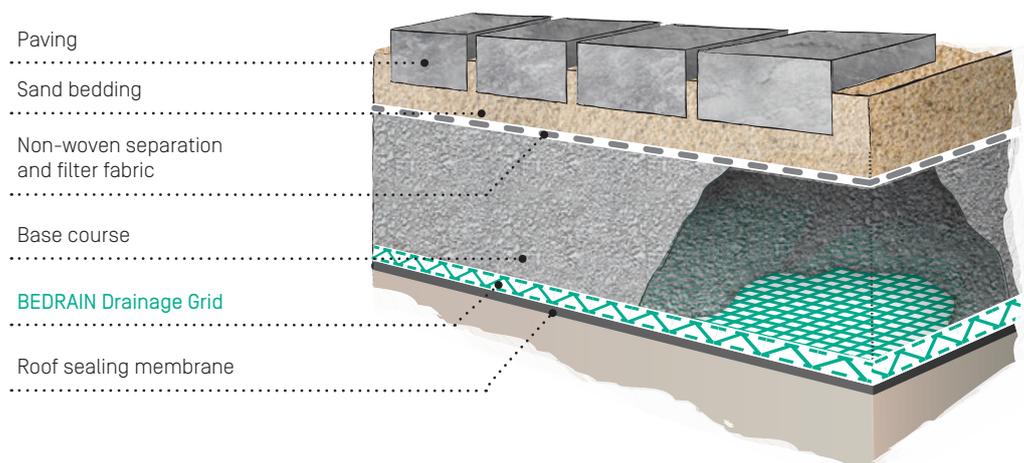


Paved surfaces

One of the special features of BEDRAIN Drainage Grids is their suitability for use as a high-performance horizontal drainage layer under roads and paved areas.

The combined benefits of reduced layer thickness and high drainage capacity, even under heavy loading, make it possible to create stable solutions for green roofs, multi-storey car parks, tunnels etc.

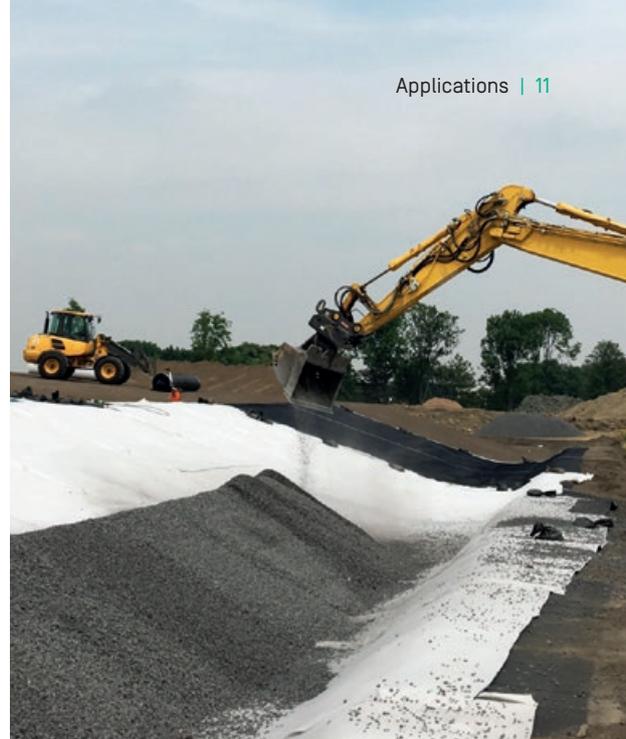
Paved surfaces



Applications matrix at a glance

We are happy to supply current data sheets, specifications, certificates and technical verifications on request.

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Properties	VG 1	VG 3	VG V 1	VG V 3	WAS 7
Product type	Drainage grid with one-sided non-woven fabric		Drainage grid with double-sided non-woven fabric		
Raw material	Drainage grid: PEHD; Non-woven: PP				
Thickness (mm)	5.3	9.6	5.5	10.0	5.0
Non-woven	160 g/m ²				120 g/m ²
Fields of application					
Bridge abutments			●		●
Roof greening		●		●	
Landfill construction and contaminated sites	●	●	●	●	●
Drainage systems	●	●	●	●	●
Foundation wall protection	●	●	●	●	●
Parking decks		●		●	
Road and traffic areas		●		●	
Underground car park greening		●		●	
Tunnel constructions		●		●	

● suitable

APPLICATION

in practice

Ergoldsbach Green Bridge

Site location: Federal highway 15 n
System: BEDRAIN VGV 3
Quantity: 2,500 m²
Completion date: June 2019



The new route of the B15n highway extension near Ergoldsbach cuts through the Galgenberg forest area.

Such a dissection of the landscape not only negatively affects the diversity of the wildlife population, but also increases the risk of accidents for humans and animals caused by wild animals crossing the road. For this reason, the project included the construction of a green bridge to allow the safe passage of wild animals and to reduce the impact on the natural environment.

The green bridge has an arched surface area of 2,200 m². It has a clear width of 47.48 m, a total length of 62 m and a height of about 10 m. The BEDRAIN VGV3 drainage grid was used as an alternative to laying a mineral drainage layer with a separate filter fabric.

The pressure-resistant BEDRAIN VGV3 Drainage Grids made it possible to create a strong and durable drainage layer on the arched surface of the bridge. Rain and seepage water is drained away to the sides.

The non-woven fabric overhang means that the drainage grids can be laid with butt joints to create a flat surface.



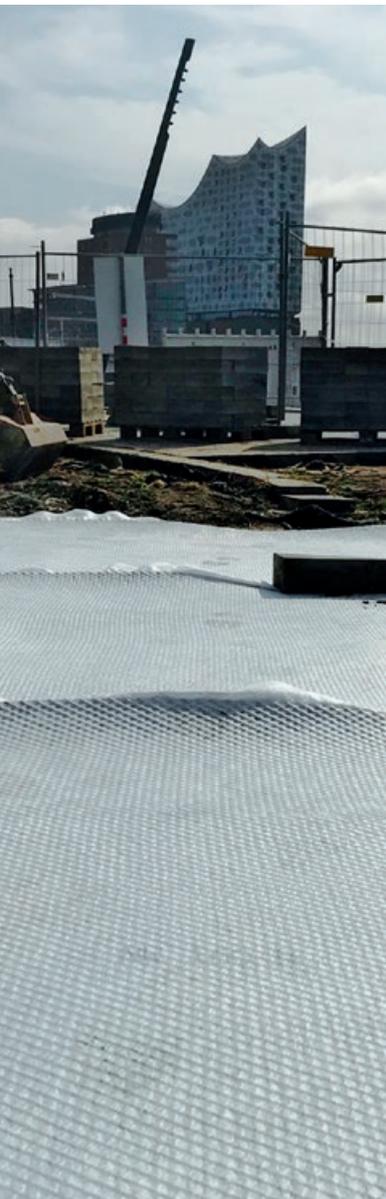
The use of a geosynthetic in place of conventional materials (with gravel fill material for drainage) has proven to be the more ecological solution.

In contrast to the complex earthworks required for traditional solutions, especially at the sides of the bridge, the installation of the grids is simple. This considerably reduces the construction time and thus the total costs for the drainage layer.

Green bridges are structures that are covered with plants and are at least 50 m wide. They are designed to provide a route for wild animals to safely cross important infrastructure corridors. Green bridges are usually concrete structures with a multi-layer superstructure consisting of protective layers for the structure, a drainage layer and a substrate for the greening and planting.

INSTALLATION

BEDRAIN Drainage Grids



To be considered:

1. The subsoil surface should be as smooth and even as possible in order to ensure full contact with the composite material across its entire surface.
2. The drainage grid must be laid flat and without creasing. Creases resulting from the shape of the structure should be removed by cutting the material and allowing it to overlap like roof shingles.
3. The longitudinal joints must be formed by butting the drainage cores together. The geotextile that projects on one side should overlap the neighbouring grid to form a continuous filter layer. At the edges of the area to be drained, the geotextile overlap at the sides should be folded down around the drainage core to prevent fine particles from washing into the drainage grid from the side.
4. At the end faces of the area to be drained, a strip must be cut from the drainage core so that the nonwoven geotextile overlaps and can be folded around the end faces of the drainage core in the same way as at the sides. Alternatively, an additional nonwoven geotextile can be used.
5. Vehicles must not drive directly on the geosynthetic material. When filling and compacting material on top of the drainage grid, care must be taken to prevent displacement or creasing of the drainage grid.

Our detailed installation and laying instructions for BEDRAIN Drainage Grids must also be observed.

ADVANTAGES

BEDRAIN

Drainage Grids



- High drainage capacity maintained with a load of up to 1,000 kPa
- Excellent chemical resistance (even to chlorinated hydrocarbons), well into the highly alkaline range
- Robust, to cope with installation conditions on site
- Easy to prepare and easy to lay
- The bonded nonwoven geotextile has good mechanical and hydraulic filter properties
- Outstanding long-term stability





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