



BONTEC NW

Non-woven Fabrics



KEY ADVANTAGES

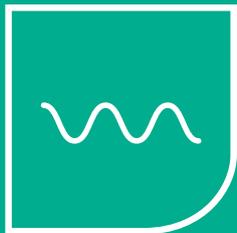
at a glance



→ Good mechanical and hydraulic filtration properties



→ Weatherproof



→ Good adaptability



→ Easy to install

BONTEC NW

Non-woven Fabrics



Non-woven fabrics belong to a group of construction materials that perform important functions in earthworks, road construction and civil engineering. The various special functions, such as separating different types of soil and filtering soils that need to be drained, make it necessary to differentiate between the non-woven fabrics in order to select the right one.

It is often possible to simply choose the correct fabric according to the geotextile robustness classes (GRK) as defined in the "Merkblatt über die Anwendung von Geokunststoffen im Erdbau des Straßenbaues M Geok E" [Leaflet on the use of geosynthetics in earthworks for highway construction]. In other cases, the fabric must be chosen according to the site conditions.

The suitability of the non-woven fabric is determined with reference to the M Geok E leaflet.

PRODUCT DETAILS

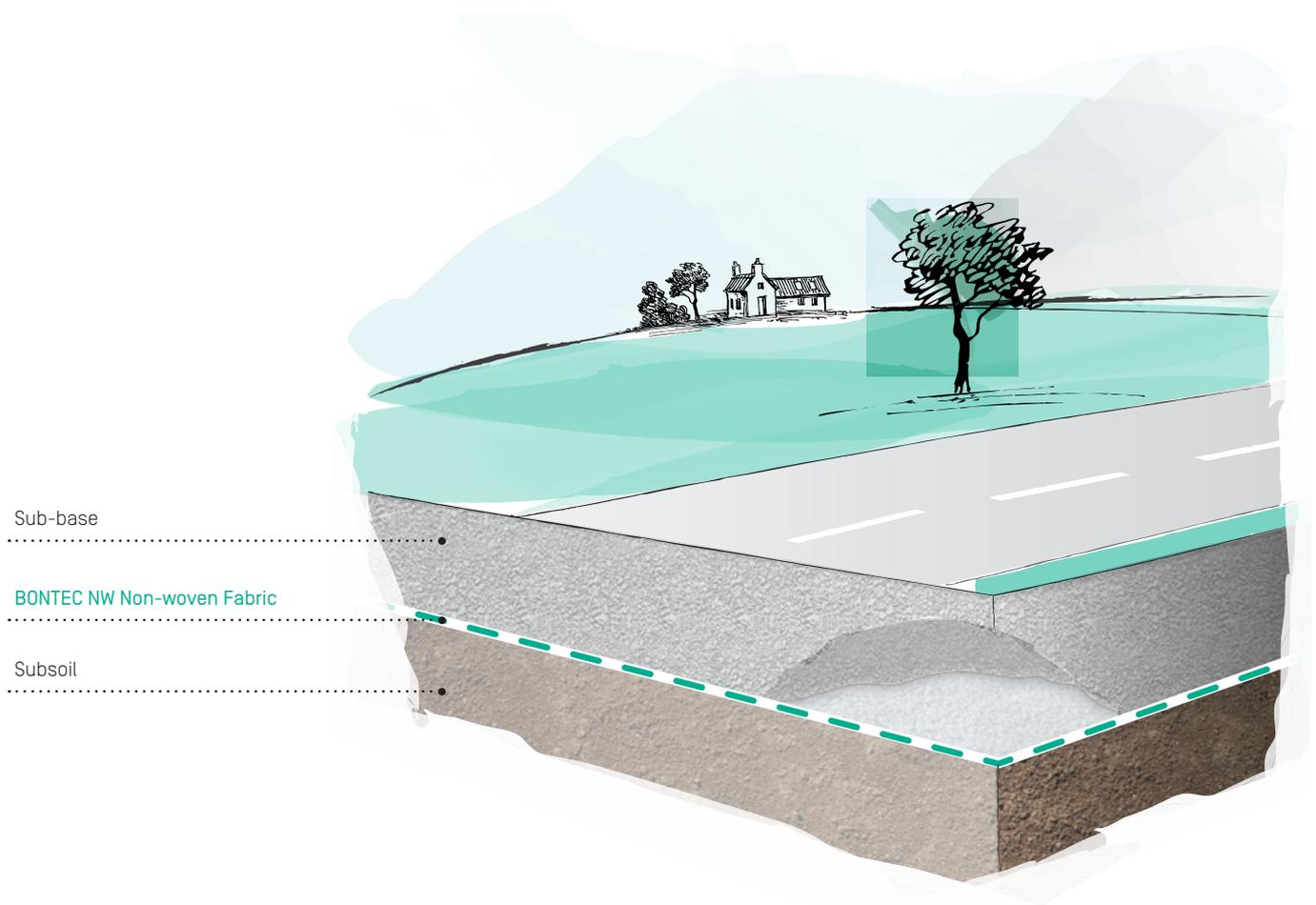
and properties

BONTEC NW Non-woven Fabrics are manufactured from high-quality polypropylene spin fibres in one of the most modern production plants in Europe.

This polymer has high chemical resistance, even to aggressive media such as those with a high pH value. In contrast to conventional, purely mechanically bonded products, BONTEC NW Non-woven Fabrics are also thermally treated, in a second production stage.

Thanks to this second-phase treatment, the advantages of mechanically bonded non-woven fabrics, such as flexibility and effective filtering, are combined with the robustness and tensile strength of thermally bonded products.





BONTEC NW Non-woven Fabrics have a small characteristic mesh size and high water-permeability and thus meet the requirements of even the most demanding types of application.

Non-woven fabrics are assigned to geotextile robustness classes 3 to 5. Their use is specified in the "Merkblatt über die Anwendung von Geokunststoffen im Erdbau des Straßenbaues M Geok E" [Leaflet on the use of geosynthetics in earthworks for highway construction], which ensures correct selection and handling by everyone involved in the construction process.

Non-woven fabric as a separating layer beneath a layer of coarse and mixed grainsize fill material

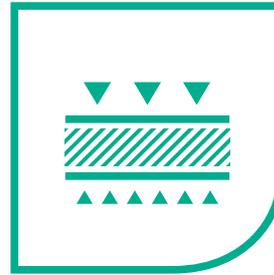


FUNCTIONS

BONTEC NW Non-woven Fabrics

Separation

BONTEC NW Non-woven Fabrics separate different types of soil. During installation and when the completed structure is in use, they prevent the different materials from becoming mixed as a result of external mechanical or hydraulic loading. This separation allows each different soil layer to maintain its specific properties.



Separation and filtration are the primary functions performed by BONTEC NW Non-woven Fabrics in earthworks and traffic infrastructure.



Filtration



The filtration effect of a non-woven fabric becomes more important when, in addition to separation, it also has to contend with the effects of water. In such cases, the structure relies on both the separation and filtration functions of the fabric.

When constructing traffic routes or drainage systems in soils that present a filtration problem (such as silty sands), a suitable filter must be used that can keep the soil in place and drain away pore water without any significant raising of the seepage line.

The right combination of mechanical and hydraulic filtration has been achieved if the soil is held securely in place and water can easily drain away.

The thermally bonded surface of the mechanically-bonded BONTEC NW Non-woven Fabrics has an adequately dimensioned characteristic opening size and good water permeability.

TECHNICAL DETAILS

at a glance

Special guidelines are available for the different applications of non-woven filtration fabrics and these should be consulted when selecting products. Guidelines for the use of non-woven fabrics in road construction are contained in the “Merkblatt über die Anwendung von Geokunststoffen im Erdbau des Straßenbaues M Geok E” [Leaflet on the use of geosynthetics in earthworks for highway construction]. Reference to these guidelines is also made in the recommendations of “Geotechnik der Deponien und Altlasten” [Geotechnical Aspects of Landfill and Brownfield Sites] published by the DGGT [German Society for Geotechnical Engineering].

In order to ensure that non-woven fabrics continue to perform their intended function within the structure after installation, geosynthetics are assigned to geotextile robustness classes [GRK] in accordance with M Geok E [Leaflet on the use of geosynthetics in earthworks for highway construction]. The geotextile robustness classes take into account the installation method and the type of fill material used.



Geotextile robustness classes for non-woven fabrics

Geotextile robustness class [GRK]	Static puncture resistance $F_{P,5\%}$	Mass per unit area $m_{A,5\%}$
3	$\geq 1,5 \text{ kN}$	$\geq 150 \text{ g/m}^2$
4	$\geq 2,5 \text{ kN}$	$\geq 250 \text{ g/m}^2$
5	$\geq 3,5 \text{ kN}$	$\geq 300 \text{ g/m}^2$

Class value: Requirement for a 5 % minimum quantile of the static puncture resistance and mass per unit area.



Important parameters for the allocation to GRK classes include the soil class and grain shape of the soil to be filtered, the load applied by the fill material, and also the stresses encountered during the installation and construction works. The type and method of installation and compaction of the fill material are just as relevant as the expected loading by construction traffic.

The various non-woven fabrics in the BONTEC NW range, with their different mass per unit area values and corresponding static puncture resistance values, cover all GRK classes.

Non-woven fabrics are assigned to geotextile robustness classes 3 to 5. Their use is specified in the "Merkblatt über die Anwendung von Geokunststoffen im Erdbau des Straßenbaues M Geok E" (Leaflet on the use of geosynthetics in earthworks for highway construction), which ensures correct selection and handling by everyone involved in the construction process.



Find the ideal non-woven fabric.

Use the following table to determine the right geotextile robustness class (GRK)* for the non-woven fabric to use in your road construction project.

2. Combine with application factors								
Installation of the fill material								
By hand		By machine						
Stress during compaction								
None		By machine						
Depth of construction traffic ruts								
None		Up to 5 cm		5 – 15 cm		15 – 30 cm	> 30 cm	
1. Specify the fill material	Has no influence		AS1	GRK 3	-	-	-	-
	Coarse and mixed grain sizes	Rounded	AS2	GRK 3	GRK 3	GRK 3	GRK 4	GRK 5
		Sharp	AS3	GRK 3	GRK 3	GRK 4	GRK 5	A
	Coarse and mixed grain sizes with ≤ 40 % stones	Rounded						
	Coarse and mixed grain sizes with ≥ 40 % stones	Sharp	AS4	GRK 4	GRK 4	GRK 5	A	A
		Rounded						
	Sharp	AS5	GRK 5	GRK 5	A	A	A	

*In accordance with the "Merkblatt über die Anwendung von Geokunststoffen im Erdbau des Straßenbaus, M Geok E" (Leaflet on the use of geosynthetics in earthworks for highway construction) issued by the German Road and Transportation Research Association (FGSV).

A: Please contact our application engineers



Overview of GRK classes for non-woven fabrics

GRK class*	Product	Separation	Filtration	Reinforcement	Applications
None	BONTEC NW 9	○		To select the right reinforcing material, please contact our application engineers.	Garden and landscaping works with minimal requirements, e.g. garden paths, separating layer between different layers of fill
GRK 3	BONTEC NW 13	●	○		Separating and filtering layer on fine-grained subsoil with low deformation; separating layer in the construction of roads with low loading; enveloping drainage cores with sandy soils or round-grain aggregates up to 16 mm
GRK 4	BONTEC NW 21	●	●		Separating and filtering layer on soft, fine-grained subsoil with lorry ruts up to 15 cm deep; filtering layer wrapped around drainage installations, drainage trenches, perforated pipes etc.
GRK 5	BONTEC NW 26	●●	●		Separating and filtering layer on very soft, fine-grained subsoil with lorry ruts up to 30 cm deep, e.g. soil replacement measures

*In accordance with the "Merkblatt über die Anwendung von Geokunststoffen im Erdbau des Straßenbaus, M Geok E" (Leaflet on the use of geosynthetics in earthworks for highway construction) issued by the German Road and Transportation Research Association (FGSV).

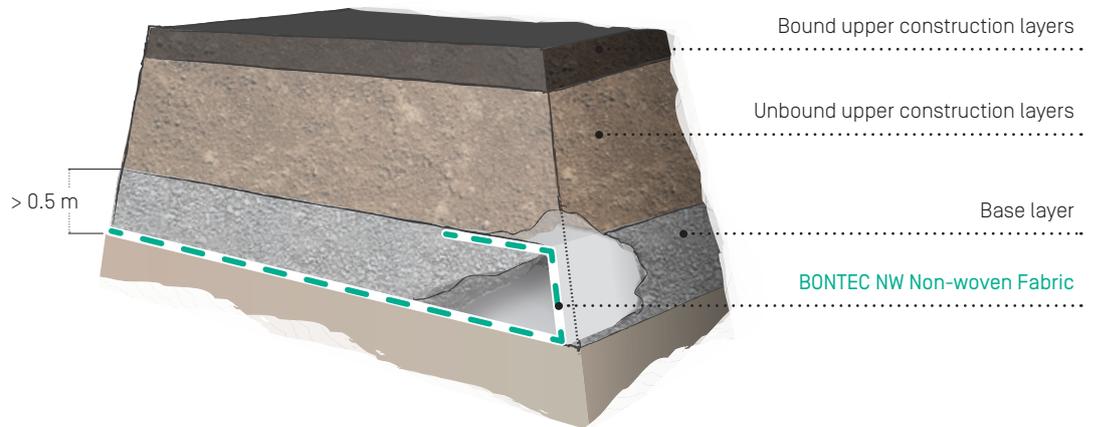
●● Extremely well suited ● Very well suited ○ Well suited

APPLICATIONS

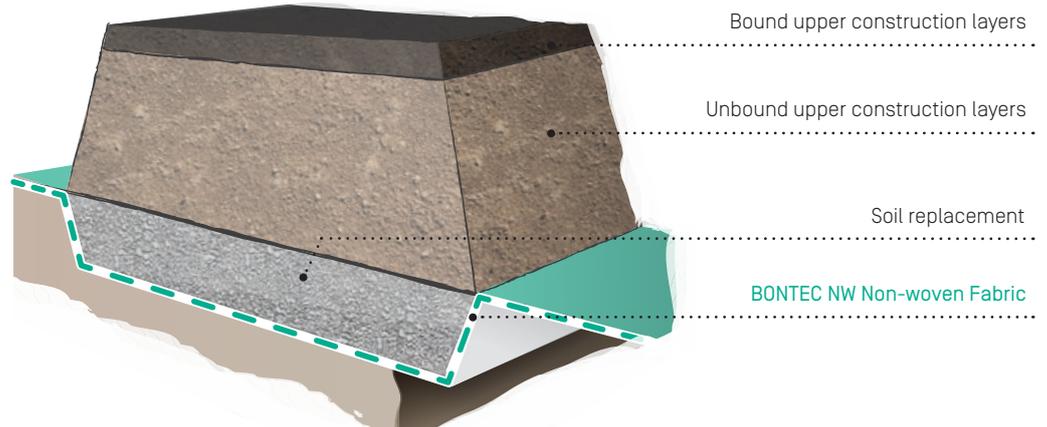
BONTEC NW Non-woven Fabrics

BONTEC NW Non-woven Fabrics are used in situations where seepage water from soils with fine or mixed-size grains needs to be drained from poorly draining soils into a drainage system. The fabric separating the soil layers has the task of preventing fine grains from entering and clogging the drainage system and causing it to fail.

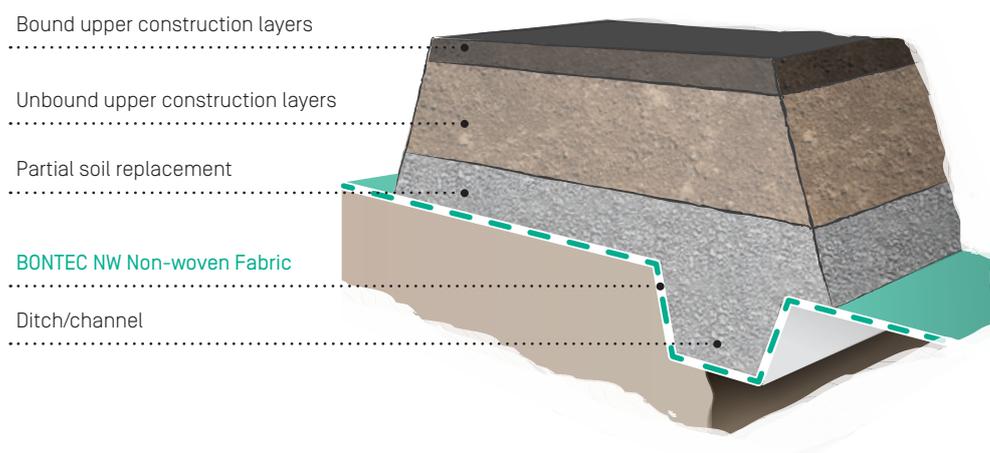
Separation layer under a dam



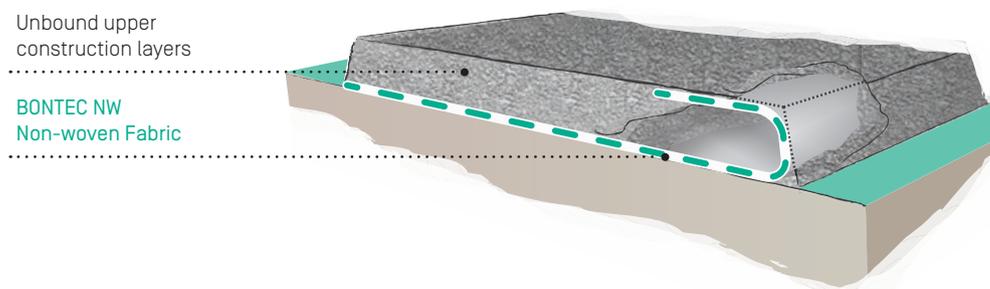
Separation layer in the case of partial soil replacement



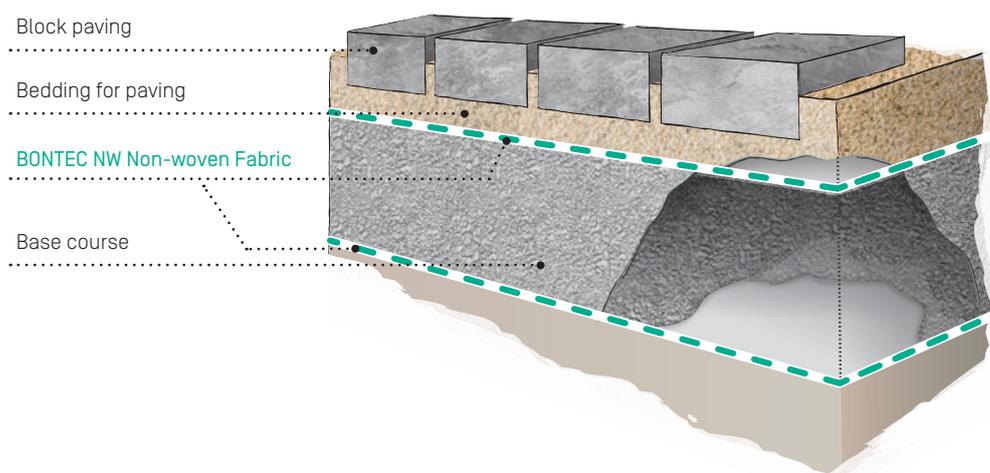
Separation layer for infilling and covering ditches and channels



Separation layer under bound and unbound traffic routes

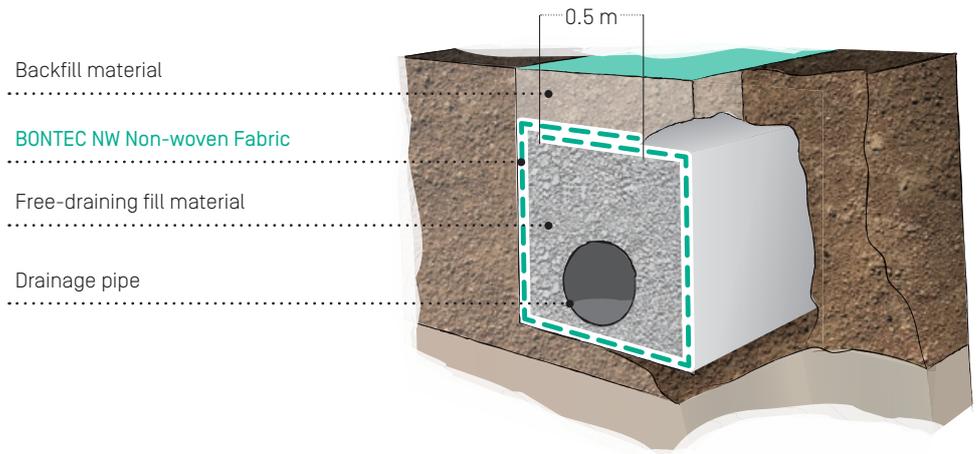


Separation and filtration in traffic infrastructure

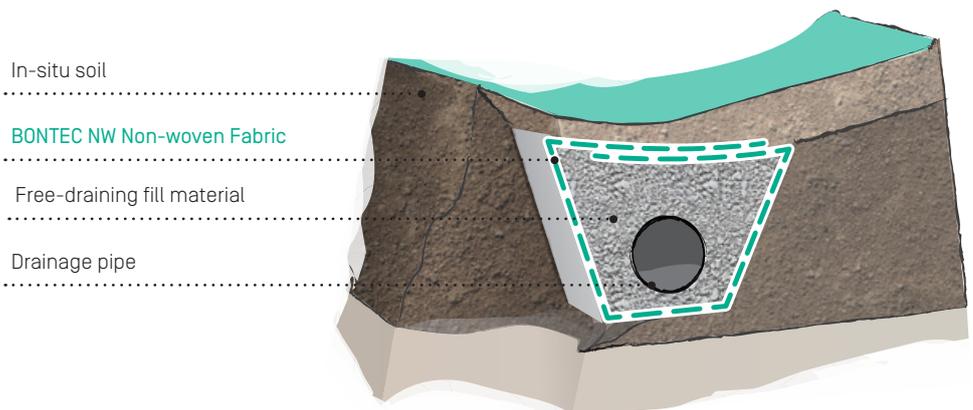




French drain



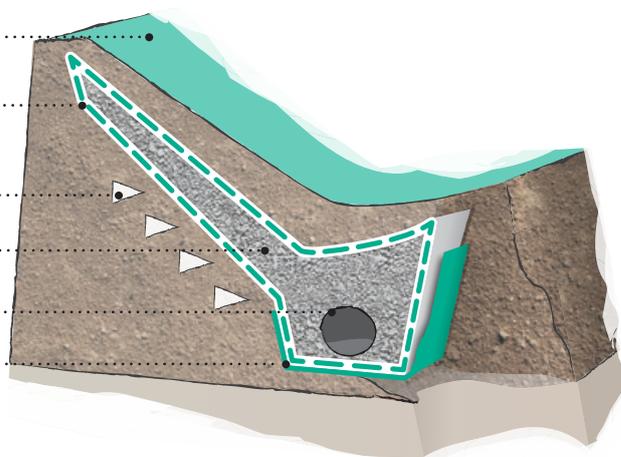
Trench backfill





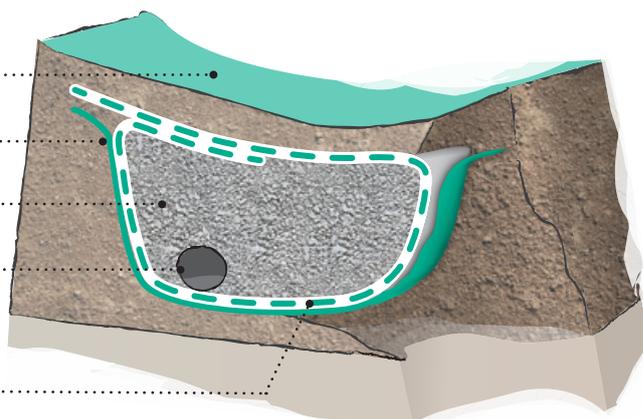
**Drainage layer
for slopes
(perforated pipe)**

- Topsoil
- BONTEC NW Non-woven Fabric
- Seepage water
- Free-draining fill material
- Drainage pipe
- Sealing membrane, if required

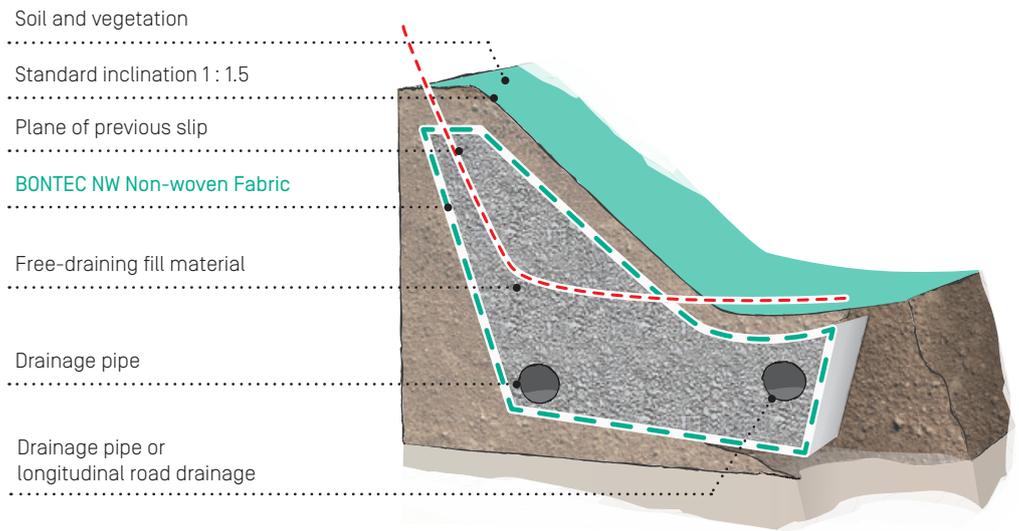


**Separation and
filtration layer for
drainage systems**

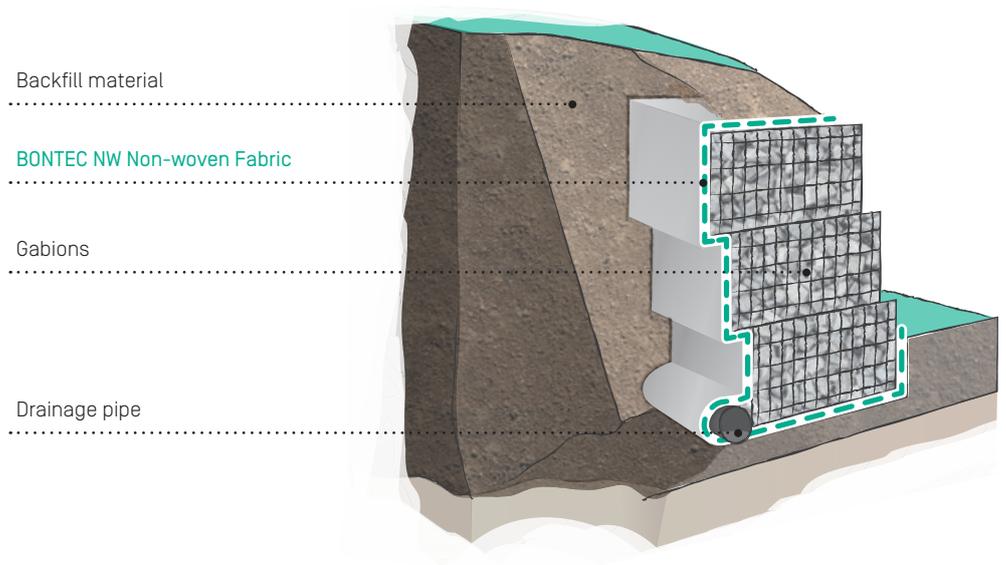
- Soil and vegetation
- Sealing membrane
- Free-draining fill material
- Drainage pipe
- BONTEC NW Non-woven Fabric



Reinstatement of a slipped embankment by installing a perforated pipe



Filter layer behind gabions



Applications matrix at a glance

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

Tel.: +49 (0) 911 642 00 – 0
 Fax: +49 (0) 911 642 00 – 90
 Website: www.beco-bermueller.com
 Email: info@beco-bermueller.com



Properties	NW 9	NW 10	NW 13	NW 16	NW 21	NW 26
Product type	Mechanical bonded and thermally treated nonwoven					
Raw material	Polypropylene [PP] white					
GRK	without	without	3	3	4	5
Fields of application						
Roof greening	●	●	●	●	●	●
Drainage systems			○	○	●	●
Railway construction (with approval)			●	●	●	●
Green areas	●	●	●	●	●	●
Road and traffic area			●	●	●	●
Underground car park greening	●	●	●	●	●	●
Road construction			●	●	●	●

● suitable ○ partly suitable (project-related assessment necessary)

INSTALLATION

BONTEC NW

Non-woven Fabrics



To be considered:

1. The subsoil should be as flat and even as possible in order to ensure full contact with the fabric across its entire surface.
2. The fabric must be laid flat and free of creases. Creases resulting from the shape of the structure should be removed by cutting the fabric and allowing it to overlap.
3. Then follows the installation of the fill material, on the basis of which the corresponding non-woven fabric was selected according to the GRK class. The covering of the non-woven fabric with soil can be easily slotted into the construction schedule within a two-week period.
4. When filling and compacting material on top of the fabric, care must be taken to prevent displacement or creasing of the fabric.

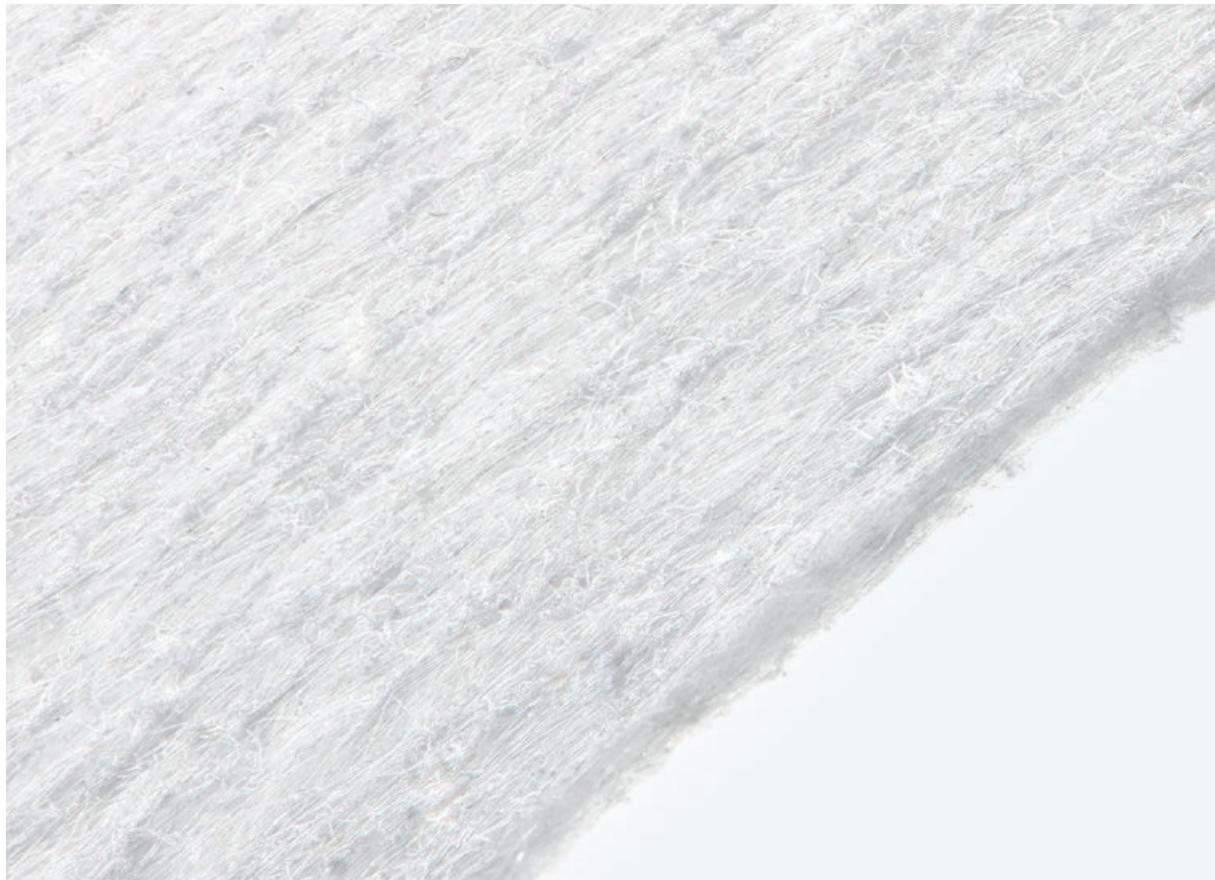
Our detailed installation and laying instructions for BONTEC NW Non-woven Fabrics must also be followed.

ADVANTAGES

BONTEC NW



- Good mechanical and hydraulic filtration properties
- Excellent chemical resistance
- Good weather resistance
- Robust, to cope with installation conditions on site
- Malleable and easy to lay
- Easy to cut to size using a cutter or Stanley knife





Bermüller & Co GmbH

Rotterdammer Str. 7
90451 Nuremberg, Germany

Telephone: +49 (0) 911 - 64200 - 0
Telefax: +49 (0) 911 - 64200 - 90

beco-bermueller.com

