

Secugrid®
Carbofol®
Secutex®

Security at the Berlin-Brandenburg
Airport (BER)

Project name
New construction of the runway at the
Berlin-Brandenburg Airport (BER), Germany

Client
Flughafen Berlin-Brandenburg GmbH, Berlin, Germany

Construction design services of the
external surface structures
ABBC - Arbeitsgemeinschaft Airport Berlin-Brandenburg
Consult, Berlin, Germany

Execution of construction work
2009/2010

Main contractor
ARGE BBI GU II - EUROVIA VBU GmbH /
EUROVIA Beton GmbH /
Gebr. Von Wettern GmbH, Germany

Products installed in the soil filter
Secutex® R404
Carbofol® HDPE 508
Secugrid® 80/80 Q1

Product installed in the graded portions
Secugrid® 30/30 Q1





Fig. 1: Covering of the surface filter

Naue geosynthetics play a significant role in meeting the design challenges of the Berlin-Brandenburg Airport (BER) runway. The runway of the BER covers an area of approx. 1,470ha.

Challenge

As aircraft design and construction technology have evolved, larger and stronger runways need to be designed to accommodate the wide range of aircraft types and weights. In addition, runways must withstand frequent, intense loading and unloading cycles during aircraft take-offs and landings. Should an aircraft get off the runway, the so called "graded portion" must be sufficiently stable and meet international standards to prevent serious accidents. It must be ensured that the nose gear cannot sink too deep into the ground.

Solution

The runway at the BER is 60m wide and is supplemented on both sides by a 75m wide strip (graded portion) that is divided into several functional areas:

Immediately adjacent to the runway is an asphalt strip with shoulder and blast pad areas. The surface water flows from the runway over the paved edge strip and then directly into the surface-vegetated, peripheral soil filter system (Fig. 1).

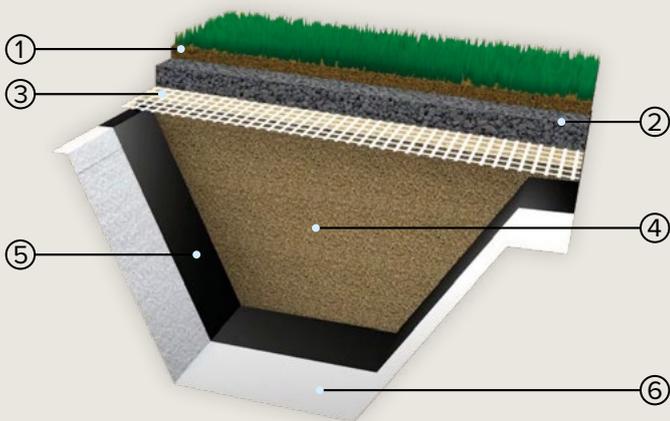
Due to the filter properties of the coarse sand as well as micro bacterial decomposition processes during the flow of the contaminated water, almost all pollutants (e.g., oils, fuels, de-icing agents, tyre abrasion,

etc.) that are carried in from the area of the runway can be removed before being fed into the main outfall.

The installation of ~70,000m² of Carbofol® geomembrane in combination with a Secutex® protection geotextile will permanently protect the groundwater from contamination.

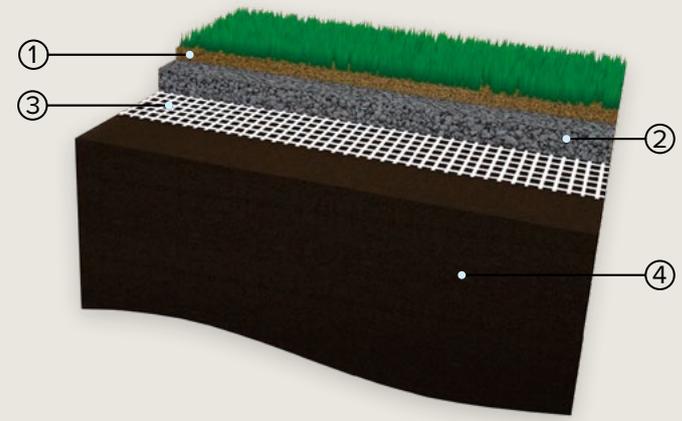
According to the International Civil Aviation Organization (ICAO) 9157, the shoulder of the runway (graded portion) must be designed in such a way that the nose landing gear of an aircraft does not sink more than 15cm into the side strip areas of the runway. Therefore, the ground below the first 15cm must have a bearing capacity, defined by the CBR value (California Bearing Ratio), between 15 and 20%.

Geogrids provide the required safety and support for runways, just as they do for other infrastructure applications with intensive traffic loads, such as e.g., high-speed railway lines. Approximately 280,000m² of Secugrid® geogrids were installed above the filter area to stabilise and reinforce the side strips alongside the runway. A further 500,000m² of another Secugrid® type were used for stabilisation and reinforcement of the graded portions. Secugrid® is characterised by exceptional durability, high stiffness, and tensile strength even at low elongation. These properties help increasing the load distribution within the stabilised and reinforced structure, distribute the load quickly, effectively, and safely, and ultimately maintain or increase the stability of the areas adjacent to the runway.



- ① Topsoil (approx. 10cm) ② Gravel base course layer (approx. 20cm)
- ③ Secugrid® 80/80 Q1 geogrid for soil reinforcement ④ Sand as fill material
- ⑤ Carbofol® HDPE 508 BAM certified geomembrane ⑥ Secutex® R404 as geotextile protection layer

Fig. 2: Design of the soil filters



- ① Topsoil (approx. 15cm) ② Gravel base course layer (approx. 27cm)
- ③ Secugrid® 30/30 Q1 geogrid for soil reinforcement ④ Subgrade

Fig. 3: Design of the graded portions