

Case Study

# SECUGRID<sup>®</sup>, CARBOFOL<sup>®</sup> AND SECUTEX<sup>®</sup>

Provide Security at the Berlin-Brandenburg Airport (BER)



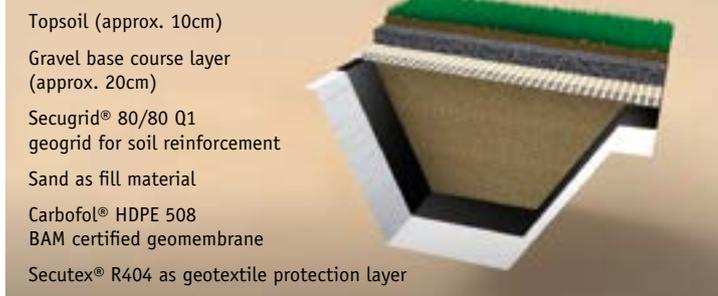


Fig. 1: Design of the soil filters

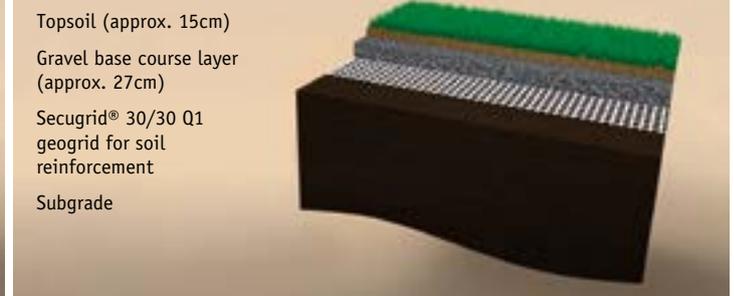


Fig. 2: Design of the graded portions

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. 3).

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 ~70,000m<sup>2</sup> 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 280,000m<sup>2</sup> of Secugrid® geogrids were installed above the filter area to stabilise and reinforce the side strips alongside the runway. A further 500,000m<sup>2</sup> 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.



Fig. 3: Covering of the surface filter

**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

**Products installed in the graded portions:**  
Secugrid® 30/30 Q1



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