Embankments

Bridging of Sinkholes

A 143 Motorway Western Relief Road Halle/Germany
Fortrac® Aramid Geogrids protect motorway against sinkholes

Background

Part of the German government’s post-reunification transportation infrastructure renewal project "Verkehrsprojekte Deutsche Einheit", VDE Road Project No. 13 comprises the A 38 motorway connection Göttingen-Leipzig and includes the A 143 western relief road at Halle. The scheme involves the construction of interchanges on the A 7 at Göttingen and the A 14 at Leipzig as well as the western relief road around Halle between the A 38 and A 14 motorways. As it approaches the residential suburb of Halle-Neustadt, the route crosses an area of former brown coal workings prone to the formation of sinkholes.

Solution

The most economic solution was chosen from the range of different options for ensuring the safety of the road. The Fortrac® geogrid type R 1200/100-10 AM used for this project was made-to-measure in accordance with the placing drawings. When a sinkhole forms, the Fortrac® bridges the resulting void and ensures the safety of the traffic above. The system for bridging sinkholes was designed assuming a hole diameter of 4.00 m. The project documentation called for dynamic compaction of the ground prior to installation.

A continuous quality assurance chain involving in-house testing of the yarn and geogrid carried out by the accredited HUESKER laboratory was backed up with third party quality monitoring to DIN 18 200 and compliance testing by the client, DEGES, Berlin. Only after this was the material approved for installation.

The Fortrac® geogrid was placed in one layer longitudinally. The transfer of force was ensured by overlapping the geogrid longitudinally and transversely by the specified amounts. In order to mobilise the load capacity of the geogrid as quickly as possible in the event of a sinkhole forming, it was given a certain amount of pre stress during...
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Installation. To do this, HUESKER has designed a special placing beam, which applies a known pre stress related to the setting of its unrolling resistance.

Fill was then placed over each length of geogrid, working forward progressively to fix the tensioned geogrid in position. This was followed by compaction of the gravel bedding layer. Thus 2.6 km of the A 143 road in the Teutschenthal valley were protected. The all-purpose road L 164 crosses the A 143 motorway here. A 280 metre length of this road was also protected by Fortrac® geogrid reinforcement against sinkhole formation in this area.

Project/location: A 143, Western Relief Road
Halle/Germany

Client: DEGES, Berlin

Planning/design and site supervision: Ing.-Büro WBI, Aachen

Placing drawings: Das Baugrundinstitut
Dipl.-Ing. Knierim, Leipzig

Contractor: Walter-Heilit, Verkehrswegebau GmbH, ZNL, Magdeburg

Constructed: 2003/2004

Product: Fortrac® geogrid, type R 1200/100-10AM

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