

SECUGRID® HS

Enabling of the access to the new watergate in Minden

Secugrid® HS geogrid reinforced load transfer platform (LTP) secures access to the new watergate in Minden, Germany.

Since 1914, the watergate in Minden has enabled the ascent and descent of ships between the river Weser and the crossing, 13 m elevated “Mittelland” ship canal. Due to the increasing traffic flows on the waterways and growing dimensions of inland water vessels, the old watergate had reached its upper load limit. In addition, after almost 100 years of operation its technical service life was achieved. The construction of the new parallel watergate will improve the navigability of the waterway crossroads for large motor cargo vessels. At the same time, the old watergate should be preserved as a historical monument.



The contractor Johann Bunte Bauunternehmung GmbH & Co. KG was commissioned by the Hannover branch of the federal navigation building authority with the construction of the new parallel watergate in Minden. For the construction of a newly designed access road across the existing and the new watergate, it was necessary to improve the ground in the area of the bridge approach ramp to the old watergate, since up to 2.5 m thick soft soil layers were explored.

Reinforced concrete boring piles with a diameter of 0.75 m were used to improve the ground in the area of the bridge abutment in combination with a geogrid reinforced load transfer platform. Due to sloping terrain in the area of the planned bridge approach ramp, the load-

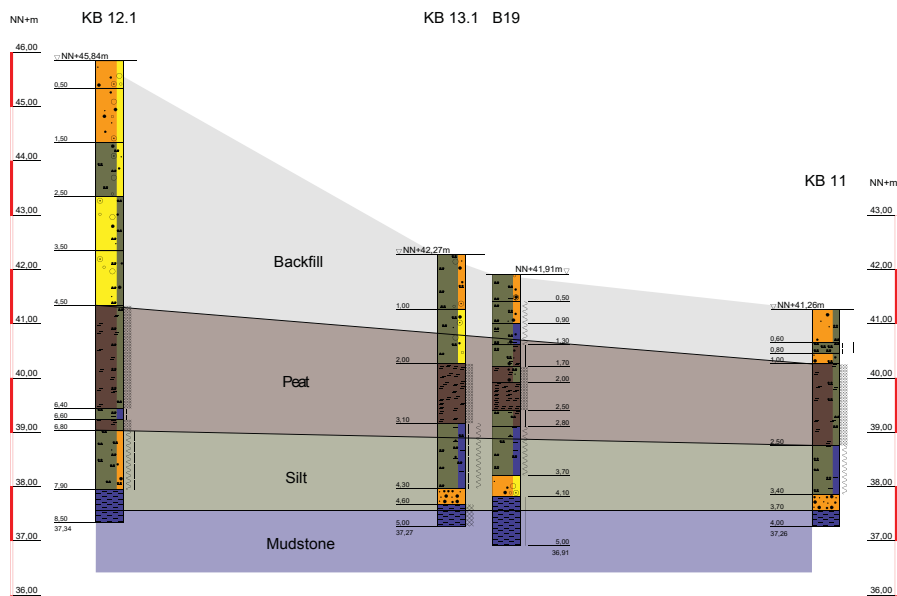
bearing piles were installed on two different levels as part of the ground improvement solution. Directly ahead of the new bridge abutment, the lower reinforcement layer was positioned at 41.00m ASL and about 11m away from the bridge it was located at 44.00m ASL. With a planned maximum embankment height of 46.50m ASL, this resulted in a maximum fill height above the geogrid reinforcement of 5.5m and 2.5m, respectively.

Due to the given construction sequence, a 50cm thick working platform for the piling rig had to be constructed, followed by a 15cm thick levelling layer above the bored piles or below the geogrid reinforcement, respectively. The bored piles were installed with a maximum center

to center distance of 2.60m. The uniaxial Secugrid® HS geogrid reinforcement was arranged crosswise inside the load transfer platform on top of the sand levelling layer.

In the direct area of the bridge abutment, a laid and welded geogrid with a short-term tensile strength of 1200kN/m (Secugrid® HS 1200/100 R6) transverse to the embankment axis and in embankment axis a laid and welded geogrid with a short-term tensile strength of 800kN/m (Secugrid® HS 800/100 R6) was installed. In the area with the lower fill height of 2.5m, a laid and welded geogrid with a short-term tensile strength of 800kN/m (Secugrid® HS 800/100 R6) was installed in both directions.

On both sides of the LTP the geogrid was wrapped around and tied back by the designed anchorage length. The design of the geogrid-reinforced load transfer platform was carried out by ELE Beratende Ingenieure GmbH and BBG Bauberatung Geokunststoffe GmbH & Co. KG.



Project name:
Reconstruction watergate Minden

Consultant:
ELE Beratende Ingenieure GmbH
BBG Bauberatung Geokunststoffe GmbH & Co. KG

Installation Contractor:
Johann Bunte Bauunternehmung GmbH & Co. KG

Product:
Secugrid® HS 1200/100 R6
Secugrid® HS 800/100 R6

Reconstruction watergate Minden
Access ramp UH bridge, section III



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