



### Gniezno

Bypass construction of Gniezno – high-speed communication No. 15

country: Poland

realization: 2004 – 2005

material: KORTEX® TUBE 100/200

30.500 m

KORTEX® GT 200/50

18.000 m<sup>2</sup>

KORTEX® GTPP 40/40

15.000 m<sup>2</sup>

KORTEX® GTPP 14/14

9.000 m<sup>2</sup>



### KORTEX® TUBE

#### purpose of usage:

building the piles increases the load-bearing capacity of the earthworks in building highways over wetlands and areas with peat moss



### KORTEX® GT

#### purpose of usage:

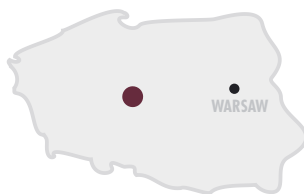
stability and reinforcement of the embankment



### KORTEX® GTPP

#### purpose of usage:

soil reinforcement, separation, moreover resistant against unfavourable chemism in soil, temporary reinforcement



A speedway No. 15 is under construction in central Poland. This project is concerned with successful bypass of the historic city of Gniezno. The city is surrounded by marshes, bog and the ground is mostly peat moss, which means that it doesn't lend itself as the best solid basis for a roadway. The project manager of the bypass is Dr. Ing. Jerzy Rzeźniczak (from the Geotechnika Company in Poznań) who'd proposed to build on sand-gravel bed, reinforced by geosynthetics along the edge. The Kordárna Company had supplied the product it developed, specifically the **KORTEX® TUBE** for this project, a product, which shows a strength of 100/200 kN/m, 0.8 m diameter tube. These geo-tubes are supplied in lengths of 150m per roll. The contractor is the Energopol Company Szczecin, who is adapting the tubes right on site to lengths required (5 - 15m, depending on the length of the gravel piles according the distance from the weight-bearing foundation). The project reckons with more than 3.000 driven piles. At a speed of approx. 180 piles per week, the whole piles' project comes to not quite 4 months.

#### PROGRESS OF WORK ON-SITE:

- Do a survey according to the land plan.
- Drive the casing into the ground with vibrating-ramming ICE machine.
- The outside diameter of the tube is 80 cm, inside diameter is 77 cm.
- Prepare the **KORTEX® TUBE** 100/200 tube on a mobile table; cutting it with hot wire, one end is finished by steel wiring.
- The other end of the tube is attached to a cone.
- Lowering the tube inside the vibration tube and attaching the cone to the casing.
- Fill it with the help of an excavator; gravel with fraction 2 - 40 mm more than 50%, interior friction angle  $\varphi=38^\circ$ .
- Vibration by ICE machine. There are 2 types of vibration – downward and along the sides.  
Removing the casing from the ground by the ICE machine.



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Factory Production Control Certificate 0799-CPD-19



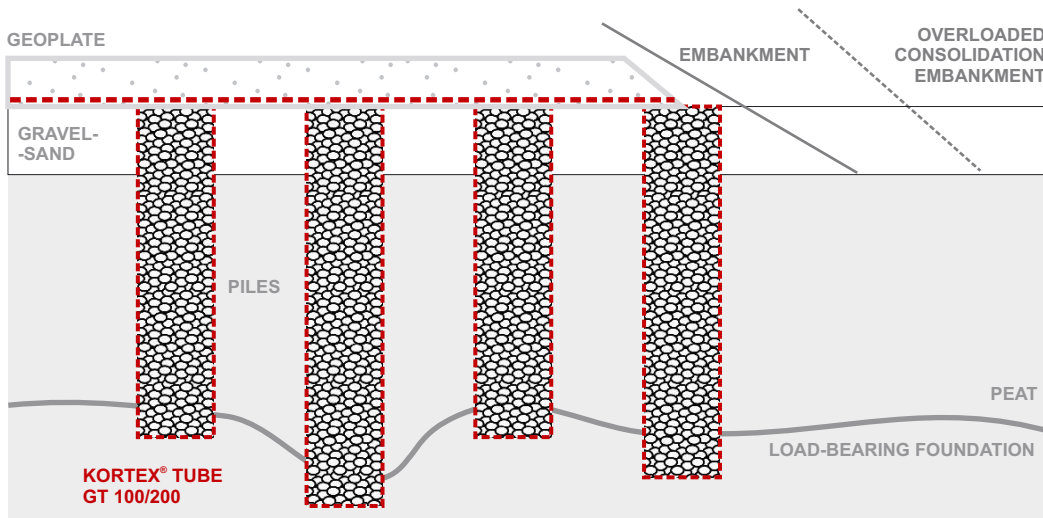
# KORDARNA

A MEMBER OF THE KORD GROUP

Dr. Ing. Rzeźniczak had carried out several tests on the site, which had confirmed that the sand-gravel pile solution is the best one for this particular project. Static tests had established that ground had settled after 21 days to 34 cm (the estimate was at between 40 and 60 cm). The sand-gravel pile density tests have shown that the density index in layers tested is 0.66.

After the pile project is over, a geoplate is built and it consists of the geotextiles **Kortex® GT 200/50** and **Kortex® GTPP 40/40**, which work as reinforcement as well as separator and 40 cm of gravel of 0 - 32 mm fraction. The geotextiles are stretched manually and anchored by steel clasps. The geoplate is covered by a consolidation embankment, which is overloaded. After a partial time of consolidation (3 - 4 weeks) the embankment top layer will be modified to a height of approx. 4 m. The embankment will subsequently serve as the foundation for the roadway.

Geotextiles **Kortex® GTPP 14/14** are used for stabilization (temporary reinforcement) of riverbank. In final construction the stream will be carried by culvert.



**investor:**

government of Poland

**designer:**

GEOTECHNIKA POZNAN

dr. ing. Jerzy Rzeźniczak

**contractor:**

ENERGOPOL – SZCECIN a.s., Szczecin

**realization:**

2004 – 2006

**driven of the piles:**

11/04 – 4/05

