The Krakow DTW Is Built to Last – Economic Microtunneling with HOBAS Jacking Pipe Systems

Year of Construction
2008 - 2009
Total Length of Pipe
6.5 km
Pressure Class
PN 1, PN 6
Diameter
D_e 530, 1099, 1229
Installation
Microtunneling, open trench
Application
SewerLine®
ShaftLine®
Client
Krakow Waterworks
Contractor
HB 9, PRG Metro, INKOP
Advantages
ideal for micro-tunneling, low friction, durability

Establishing the main collector of the Lower Bench of Vistula River (DTW - Dolnej Terasy Wisły) is very important for Krakow, the second largest city in Poland. The city's growth as well as EU requirements spurred on the extension and modernization of the existing water and sewage system. A large part of the projects is funded by the EU and also the DTW collector is a so-called ISPA project.

The DTW consists of a 6.5 km pipeline of which 6 are installed by microtunneling. Once completed, it will connect two sewage systems, one of them being overloaded and one having reserves. Its function is to even out the flow to the treatment plants Kujawy and Płaszów during heavy rainfall ensuring their optimal operation. In addition to this, areas which currently use septic tanks will be connected to the new collector, preventing the soil from further contamination and improving the groundwater quality. Construction works for the collector are conducted in three stages and in two parts regarding contractors.

DTW Collector Part I: The installation of the first part of the Vistula Lower Route collector in Krakow was initiated in March 2008, the line going into service within the next months. This part of the project is realized by a consortium consisting of Hydrobudowa 9 & PRG Metro. Microtunneling was chosen for mainly economic reasons. Since the planned pipeline route runs in 6 m depth nearby the Vistula River where water collects in layers of sand and gravel, the costs for dewatering and excavation works would have been considerably higher than for tunneling.

The pipes used for the project are HOBAS CC-GRP Jacking Pipes with outer diameters of 1,099 and 1,229 mm. Two independent microtunneling machines were utilized and the right amount of lubricant was applied to maximize the progress. The smooth and non-absorbent surface of the pipes doubled the effect of bentonite lubricant so that the installation ran smoothly over the 200 m long drives and without the help of intermediate stations. The latter would only have been activated if allowed jacking forces had been exceeded. Since their help was not needed, the installation speed was doubled. The achieved jacking rate of up to 25 m per 24 h was the result of the contractors' experience, the pipes' properties and good planning. The thrust and reception pits are made of steel piles. This solution has proved its worth in the past and is now an accepted technique in Poland. Pits of any required shape can be made this way, adapted to local conditions and the optimal pipe length, which in this case is 3 m. The piles are extracted once the pipe installation has been completed.

Concrete sunk shafts are utilized where intermediate stations are taken out after the pipe has been installed, to make way for a HOBAS CC-GRP Shaft. Due to the high precision of microtunneling it is possible to drill through the provided and temporarily sealed sparings in the reinforced concrete walls. Once the pipeline is laid, the intermediate jacking stations are lifted out and CC-GRP Shafts are placed in the 3 m diameter sunk shafts. Thanks to their comparatively small dimension and low weight, this is done with ease.

It was important for the contractor that all parts of the new collector, such as also manholes and fittings, were prefabricated and from one source, which together with microtunneling guarantee a complete high-quality leak tight system. It was furthermore of great importance to be able to continue installation works during the winter months. Taking the high durability of the pipeline system into account, a pressure line of the system will also be established with CC-GRP utilizing DN 500 Pipes PN 6.

DTW Collector Part II: The remaining 3.4 km line is realized under the direction of INKOP, another contractor specialized in microtunneling. Its construction was commenced in September 2008 and is expected to be completed by the end of 2009.

The works were conducted under similar soil and groundwater conditions as for Part I. Outstanding progress was achieved with installation rates up to 24 m / 12 h. The intermediate stations once again stood still during all drives, even lengths up to 208 m were easily tackled without help. Optimal technological parameters, the smooth surface of HOBAS Pipes and sufficient lubrication applied every 21 m make an efficient and economic realization of the project possible.

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Bulgaria in Full Bloom

Irrigation Line Rehabilitation with **HOBAS®** Pressure Pipes

Thrace is one of the most fertile regions of Bulgaria. Its climate - hot summers and mild winters - is ideal for growing sunflowers, maize, and corn but also for viniculture and Bulgaria's renowned rose cultivation for the precious rose essence.

However, summer rainfalls are not sufficient for this agricultural abundance and a concrete irrigation system had therefore been built somewhat 30 years ago, bringing water from the river Striama and the Pyasachnik to supply the town Chirpan.

At the end of 2008 and with the decision of Bulgaria's Ministry of Environment and Water, a project was initiated to rehabilitate approximately 2.1 km of the line close to the town Rakovski. It was decided to utilize HOBAS® CC-GRP Pipe Systems DN 500, PN 6, due to the products' high quality, long lifetime, excellent hydraulic characteristics, long term static properties and their simple and fast installation.

The pipes' easy handling and comparably light weight were further important criteria for they had to be stored around 15 km away from the construction site and a small special truck had to transport one after the after to the site. Reason for this was that the road was far away from the construction site and the site itself lay between a wide wheat field and an impressively large vineyard.

Thanks to the outstanding cooperation of the Bulgarian contractor Lomstroy, who is specialized in hydraulic applications, HOBAS Bulgaria and the production facilities in Czech Republic and Romania, the first 500 m part could be installed within a week only. The remaining 1.6 km of the line were accomplished in merely three weeks. All in all, including installation time and pipe testing, added up to a month and a half.

The contractor and client Lomstroy confirmed that HOBAS Pipes were remarkably easy to handle, not only due to their light weight but also because of their simple push to fit couplings and compatibility with other materials. In the client's point of view, the success of HOBAS can be ascribed to the professional commitment of the HOBAS team as well as made-to-measure solutions. HOBAS Bulgaria does not simply sell pipes yet offers competent technical advice and strives to find the best solution for every individual situation. To ensure an optimal result, the construction team was technically advised on site and the thought-out logistics gained the clients trust.

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Year of Construction
2009
Total Length of Pipe
~ 2.1 km
Pipe Specifics
PN 6, SN 5000, DN 500
Installation
Open trench
Application
WaterLine®
Client | Contractor
Lomstroy Ltd.
Advantages
High quality, long service life, excellent hydraulic properties, longterm static properties, light weight, simple and fast installation