

# HOBAS® Quality for Challenging Projects

## HOBAS® Pressure Pipes Built into Tunnel with High Groundwater Level, CZ

When it comes to installing sewers, Prague's partly hilly topography poses a challenge to building contractors. Such was the case with collector "P" in 1998: Due to the expansion of the district Reporyje, the consequent extension of the city's subway system and necessary renovation works, this backbone of the sewer system in Prague also had to be extended. The client opted for HOBAS Pipes – a good choice, as tests conducted almost ten years later proved.

The main obstacle for the extension of collector "P" was a hill with highly varied geology between the construction site and the connection point to the existing sewer. There were three possibilities:

- Bypass the hill with a small decline of the pipeline;
- surmount it with a pressure sewer and a pumping station;
- or build a tunnel in which to install the pipeline.

The planners eventually opted for tunneling – since it proved the technically most convenient solution, would not cause any pumping costs and had already been implemented in similar sewer structures in Prague. This solution implied, however, that the project team not only had to find a reliably leak-proof pipe but also had to deal with a high groundwater level. The technicians of the building contractor Vodní stavby Prag and the designers of Metroprojekt a.s. Prague turned to HOBAS requesting pipes that would withstand the challenging external water pressure of 4.5 bar.

The experts at HOBAS Czech Republic studied the installation requirements and consulted experienced colleagues from other HOBAS Organizations for the pipe design. The structural analysis of an external Austrian specialist and calculations of the necessary long-term properties of pipes and pipe joints under the given circumstances led to the following offer: HOBAS Pipes DN 2000, PN 7, SN 17000 were considered the technically best solution. The pipes and couplings were tested in Switzerland and Austria for leak-tightness under high external pressure, adequate stiffness class and ring deflection – with results that left the client with no further doubt.

Installation works started in 1998. HOBAS supplied the pipes and adequately prepared three points on the 1.7 km long route where shafts for possible maintenance works needed to be tightly connected with the pipeline. In order to keep the access shaft as narrow as possible, the 6-m-long HOBAS Pipes DN 2000 were lifted into vertical position, then carefully lowered through the shaft and, in a wider section shortly before reaching the tunnel, rotated into horizontal position. A simple trolley was used to transport them to the point of installation where they were joined to the already installed pipes by hand. In a final step, the annular space between the borehole and the HOBAS Pipes was grouted.

In 2009, HOBAS Czech Republic inspected the installed pipe section of collector "P" in the tunnel together with the operator PVK Veolia. Pipes and pipe joints were examined very carefully. The result: After almost ten years under the given tough conditions, the pipeline still worked flawlessly and the client was convinced to have taken the right decision.

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Year of construction  
**1998-2001**

Total length of pipe  
**1.7 km (DN 2000) +  
1.1 km (DN 500-1000)**

Diameter  
**DN 500, 1000, 2000**

Pressure class  
**PN 1 and 7**

Stiffness class  
**SN 10000 and 17000**

Installation method  
**Relining, open cut**

Application  
**Sewer Line**

Client  
**ZAVOS s.r.o. Praha**

Operator  
**PKVT (now PVK Veolia)  
Prague**

Contractor  
**Vodní stavby a.s.**

Advantages  
**Long service life,  
leak-tightness, tests  
and technical support,  
custom-made solution**