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PipeLine

HOBAS®

Contents

Always a Winner with HOBAS® CC-GRP

Microtunneling HOBAS Jacking Pipes for a Combined Sewage Collector, FR

Only shortly after receiving the renowned international No-Dig Award from the ISTT (International Society for Trenchless Technology) at the No-Dig fair in Berlin for the best project 2010, HOBAS has come up trumps at the VST (Ville Sans Tranchée), No-Dig trade fair, in France for supplying pipes for the best construction site 2010. The project awarded by the FSTT (French Society for Trenchless Technology) comprised 1340 m of De (external diameter) 1940 mm pipes installed by microtunneling for a combined sewage collector with a total capacity of 3300 m³ and was implemented by the city Rennes in France.

In the face of an accelerated increase of sediments in the canal d'Ille-et-Rance and the river Vilaine in the heart of Rennes and the therefore significant impact on these waterways, the city adopted a perennial program in 2008 to improve the pipelines and hydraulic properties of its wastewater system. The aim was to reduce the amount of overflow into the river during periods of heavy rain by 50 %. A total of 8,000 cubic meters of storage capacity were to be added to the combined sewer system of which 3300 m³ have been implemented downtown, along the river Vilaine beneath a lane for public green transport.

For the latter part, the technical service department of the city Rennes designed a 1340 meter-long collector with a pumping station that controls the flow to the wastewater treatment plant. A combination of an average installation depth of 7 m and high groundwater levels that partly even reach the surface asked for trenchless installation – microtunneling. HOBAS GRP Pipe Systems were a firsthand choice, for their resistance to chemical attacks by hydrogen sulfide and the products' optimal hydraulic properties as well as internal and external leak tightness. The pipes with their, in the trenchless sector much appreciated, smooth outer as well as inner walls and precise outer diameter were designed at 1940 mm De and a wall thickness of 77 mm. Despite their comparably light body (in this case 3 tons per 3 m pipe) they easily withstand the required 800 ton axial loads which are evenly distributed along the whole length of the pipe.

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A protective resin rich layer on the inside of the pipe, the so-called liner, ensures resistance against aggressive urban sewage that may have a pH value up to 10 and contain hydrogen sulfide. Its low roughness coefficient of 0.01 mm offers optimal hydraulics, and abrasion resistance and a long product life up to 100 years add to the numerous benefits.

Two receiving pits were erected on each end of the 1340 m line and a jacking station was arranged intermediately dividing the drive lengths into 565 m and 775 m respectively. Conducting the drives on an even 0.2% slope and large horizontal curves with radii ranging from 1000 to 1200 m did not require a reduction in jacking force and was at the time the longest jacked drive with GRP in France. The designated contractors decided to conduct the job with 7 intermediate stations every approximately 150 m (3 on the short stretch, 4 on the long) each of which has a drive force equaling 1078 tons. These were usually put to service for initiating the drives.

Three manholes were installed 200 to 250 m apart from each other and 2 special chambers, one hosting a flushing and the other equipped with a vacuum system for deodorization, have been included along the collector. Preparing for their installation, the contractor neatly cut the soil and cast concrete to establish walls around a part of the pipe route without prior excavation works and before the boring machine had passed the section. After the concrete cured, the bore head drilled through the establish walls and the soil around the pipe in the concrete chamber was excavated; either completely as for the flushing and deodorizing chambers or down to the pipe in order to install the tangential manholes. The latter were erected by cutting and laminating a HOBAS DN 1000 GRP Pipe vertically onto the jacking pipe DN 1800 and the easy handling and manipulation of GRP on site considerably facilitated and sped up the process.

The construction of the complete project including the installation of supplementary equipment and the pumping stations has been finalized within 13.5 months. This was considerably short regarding the scope of the job and the difficult geological conditions - inhomogeneous, abrasive soils soaked with ground water. The remarkable idea, the design and smooth realization with HOBAS Pipe Systems not only satisfied the client but earned also the attention of the public, which was not least honored with the national No-Dig award.

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Year of construction
2010-2011
Installation time
13.5 months
Total length of pipeline
1340 m
Diameter
D_e 1940
Pressure class
PN 1
Stiffness class
SN 64000
Installation
Microtunneling
Application
SewerLine®
Client
Rennes Métropole
Contractors
SADE & SMCE Réha
Advantages
Resistant to H_2S, possibility to opt for trenchless installation, remarkable hydraulic properties, long product life