Turning Old into New
Rehabilitation with **HOBAS®** Pipes in Germany

Project Data Cologne
Year of Construction
2013
Total Length of Pipe
80 m
Diameter
D_e 1280
Pressure Class
PN 1
Application
Combined sewer
Client
Sewage Board of Cologne, AöR
Contractor
Diringer & Scheidel Rohrsanierung GmbH & Co. KG
Advantages
Low roughness coefficient, excellent hydraulic properties, quick installation with minimum space requirements, easy handling, corrosion resistance, on-time deliveries

The need to rehabilitate old sewers poses a big challenge to all cities and urban wastewater associations. Many sewer channels were built of bricks, stoneware, concrete or reinforced concrete. As the years pass, even the highest quality channels show signs of material fatigue and groundwater infiltrations – a development resulting in increasing maintenance costs. Leaking sewer lines also pose a threat to the environment in that the leaking substances can pollute the soil and groundwater. If renovation measures are not implemented in time, the penetration of external water into the sewer systems causes the wastewater treatment plants' operating costs to rise, and consequent soil washouts and subsidences endanger buildings. Over the past two years, two aged sewer channels in Germany required urgent attention: Corrosion, leakages, and a reduced load capacity made their renovation inevitable.

Rehabilition instead of replacement in Cologne

In the course of a routine check of the sewer system, the sewage board in Cologne found a combined sewer DN 1500 in the urban district Sürth to be severely damaged: The concrete pipes showed numerous longitudinal cracks, which affected the 80 m long channel's structural capability. Above all, a leakage of the combined sewage could not be ruled out, and this was a serious problem since the district is located in a water protection area close to the river Rhine. The decision to rehabilitate the affected section with HOBAS Relining Pipes was linked to technical and economic interests.

The specific mirror-like inner surface of HOBAS GRP Pipes made a reduction in the cross section possible. Three meter long circular HOBAS Pipes D_e 1280 were supplied, and starting and receiving pits of 5 x 4 m each excavated for their installation. By means of a winch, the pipes were drawn inside the old structure and jointed. The remaining annular space between the old and new pipeline was filled with a pressure-resistant material, and a sand coating of the pipes' outer surface ensured a particularly good bonding of the grouting. This way, the inserted pipe was fixed in its position and took over the entire load-bearing capacity. Given its walkability, the channel needed to come with ideal anti-slip safety properties, which is why the bottom of the pipe has also been coated with sand.

Thanks to the perfect collaboration of all parties involved and a trouble-free construction process, the rehabilitation works could be successfully completed according to schedule within 50 working days only. The renovated pipeline can compete with a newly-built pipeline in every respect, and the client need not worry about the next quality inspection.

Relining premiere with GRP pipes in Würzburg

The sewage of Würzburg's approximately 125,000 inhabitants runs through a 540 km long sewer network, which has evolved over the years, to the wastewater treatment plant in Mainaustraße Street, where the water is then reprocessed. The Würzburg Sewage Board (EBW) performs regular checks on the city's sewer network. In doing so, damages were detected at the so-called "Hauptsiel 1", the main sewer leading to the wastewater treatment plant. Parts of the main sewer and the connected manhole structures are already more than 100 years old. The damages concerned in particular corrosion of the grouting, leaks, and groundwater infiltrations, which had been favored by the immediate proximity of the River Main. Many of the fittings for ventilation were cracked, and there were deposits at the bottom of the main sewer.

The egg-shaped brick sewer had no standard dimensions, but a special cross-section of 1400 x 2250 mm. For the rehabilitation of the 875 m long section, HOBAS NC Line Profiles 1260 x 2110 mm were used. Prior to the start of the actual rehabilitation works, the old sewer's profile had to be digitized with a 3D laser scanner. The resulting three-dimensional image of the channel served as the basis for the installation plan. In another preparatory step, a water retention system had to be built. A diversion of the wastewater would not have been economically viable, which is why the works had to be interrupted in the event of rain so the channel could be abandoned within 30 min only – in the worst case, the channel would in fact be flooded. This flexibility is in fact one of the big advantages of relining. In order to guarantee a continuous on-the-job safety, a warning system with several level meters was installed. At the same time, a winding mandrel was produced and the HOBAS Pipes' resin-rich inner liner applied to it. Afterwards, the non-circular pipe wall was built up by means of filament winding.

Project Data Würzburg

Year of Construction
2013-2014

Total Length of Pipe
875 m

Diameter
1260/2110 mm, wall thickness: 25 mm

Pressure Class
PN 1

Application
Sewer

Client
Sewage Board Würzburg (EBW)

Contractor
Aarsleff Rohrsanierung GmbH, branch office Nürnberg

Advantages
Just-in-time deliveries, custom-tailored GRP profiles, corrosion resistance, quick and easy installation

A total of 401 NC Line Profiles in lengths of 1 to 2.35 m and with a wall thickness of 25 mm were used in the rehabilitation of the old sewer. Due to the heavy traffic and the limited storage space on site, the GRP pipes' delivery, storage, and installation had to be absolutely reliable and trouble-free. With the help of a so-called "pipe shuttle", a carriage designed specifically for this project by the construction company Aarsleff, the pipes were lifted and transported to the construction pit. The installation works were conducted from one single pit, which is why 533 m pipes were installed in flow direction and another 342 m to the opposite direction. In the areas of manholes and special structures, the GRP profiles were cut open according to the manhole dimensions in order to create accesses and emergency exits. Then, the pipes were connected with push-to-fit couplings using a coupling device and secured against buoyancy by means of spacers. The 3 cm wide annular space was eventually grouted.

Nine months had been scheduled for the implementation of this project. Thanks to the continuous coordination of all involved parties, the installation was completed within 3 months, after no more than one third of the designated construction time. "All services were performed on time and on budget. We are also very satisfied with the technical implementation. The results of external quality inspections have proven that the decision to use GRP pipe relining for the rehabilitation of Hauptsiel 1 has been the right one. We would put this method out for tender again", says Mr. Bergmann from EBW.

Fmd: hobas.germany@hobas.com

Tweet

"With HOBAS, we have a solid and competent business partner by our side. For more than a decade, we have been working closely together in several national and international projects of variable sizes. We rely on the high quality of HOBAS Products as well as the professionalism and expertise of the entire team with whom we collaborate to find optimal solutions for our construction projects. With HOBAS, we have a partner who shares our high quality standards in the interest of our clients 100 %."

Ulf Michel, Managing Director Michel Bau

Click on the video above and learn more about trenchless sewer rehabilitation with HOBAS Pipes by the company Michel Bau.