

Trenchless Renovation - Out of Sight, Out of Mind – Dresden, Germany, Relines Old Town Collector with HOBAS® NC Line®

Year of Construction

2009

Installation Time

5 months

Total Length of Pipe

HOBAS Pipe: 880 m

Pressure Class

PN 1

Diameter

2157 x 2129,

2242 x 2195 mm inner

diameter (wall thickness

32 mm)

Installation Method

Relining with short profiles

Application

NC Line®

Client

Stadtentwässerung

Dresden GmbH

Constructor

Insituform Rohrsanierungstechniken GmbH,

Dresden, and Heinrich

Lauber GmbH, Coswig

Advantages

Profiles made to fit original sewer, no disruption

of tourism and traffic, the special profiles bear

the full static loads

with comparatively thin

walls, top quality,

delivery reliability

Imagine you are responsible for a sewer system that is 100 years old and needs immediate renovation, you have to discharge 60 million cubic meters of wastewater per year, the pipeline runs directly along a river and thousands of tourists pass by to admire the historic center of your city with its numerous sights. What do you do? Exactly, you utilize HOBAS NC Line Pipes for relining.

The sewer mains were built over the last three decades of the 19th century. They run perpendicularly towards the Elbe and lead into collectors paralleling the river along the old and new town side. A survey showed that the so-called Old Town Collector of compressed concrete on the left side of the Elbe urgently needed to be renovated. There were several signs of damage and a safe load capacity was no longer guaranteed. The section to be renovated spans over 1.3 km and runs through the old town quarter and along the left bank of the Elbe.

Home to the Semper Opera House, the Zwinger Palace, the Old Masters Picture Gallery, the treasure chamber of the Electors and Kings of Saxony, etc. Dresden attracts around 7 million tourists per year. The only possibility to ensure Dresden's visitors a pleasant stay is to renovate the old sewer by trenchless means, namely relining. Compared to the open trench installation the construction time as well as inconveniences regarding traffic flow and tourism can be kept to a minimum. The renovation costs for the sewage collector amount to around 7 million Euros and construction works will be completed by the second half of 2010.

During construction works, the wastewater is diverted with a siphon pipe DN 1200 with a maximal flow rate of up to 1900 l/s. It runs on supports underneath the quay so as not to hamper the Saxon steamboats and above the quay wall beyond the Augustus Bridge. That the Stadtentwässerung Dresden GmbH was also able to turn the sheathing of the provisional pipeline into a further tourist attraction is demonstrated by the artistic design of the artist Christian Gerdorf.

After a thorough comparison Stadtentwässerung Dresden GmbH opted for the HOBAS NC Line® alongside other brands. With a k-value of less than 0.01 mm the smooth inner surface of the profiles proved to be a decisive advantage since hydraulic requirements are met despite the slightly reduced diameter of the relining profiles. During preparations technical details were arranged with the planning office ACI-Aquaprojekt Consult and contractors Insituform Rohrsanierungstechniken GmbH and Heinrich Lauber GmbH in Coswig. The contractors paid particular attention to meeting the required quality parameters and to technological processes. The existing pipe was first inspected and calibrated by laser scan and manually with a mold to determine the exact outer dimensions of the future profiles. This was necessary to maximize the capacity of the new sewer while ensuring an easy installation. A precise plan including standard and short profiles and some with special oblique couplings was worked out.



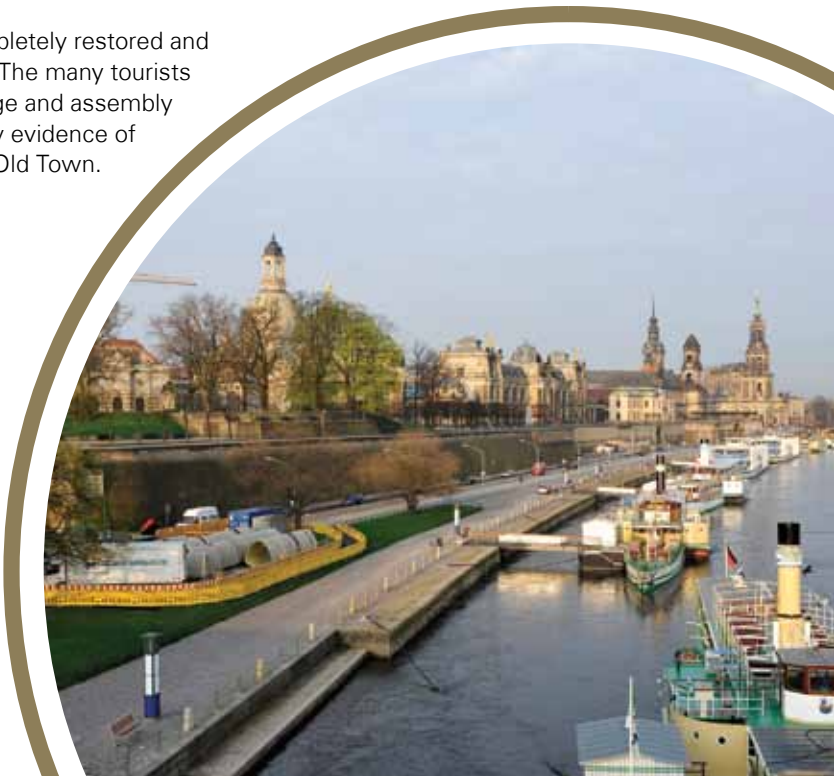
The static design is based on the rules and regulations M-127 T2 set by the ATV-DVWK (Abwassertechnische Vereinbarung – Agreement regarding Wastewater - and Deutscher Verband für Wasserwirtschaft und Kulturbau – the German Association for Water Management and Land Improvement). Because the condition of the existing sewer is categorized class III, the calculations by LGA Nürnberg / Ingsoft GmbH were carried out with due consideration of the special geometry and the grouting procedure. Here it proved advantageous that HOBAS NC Line® Profiles are manufactured with definable wall thicknesses, which keeps statically inconvenient imperfections to a minimum. Since the profiles are produced at the factory, there is no subsequent shrinkage that could lead to circular cracks. Because deformations due to inconsistencies in the old sewer are not transferred to the new pipe as would be the case with cured-in-place relining methods these need not be considered.



Special requirements were set to the quality of the NC Line® Profiles. The production facility was audited for production approval. This was done for inspection, to check the quality assurance system and to see if standards were kept according to specifications. The supplied product was analyzed in addition to the assessment. The engineering office Siebert und Knippschild therefore took specimens from the construction site and checked them for given parameters.

In two separate construction stages a 520 m and a 320 m stretch of HOBAS NC Line® Profiles were installed with internal dimensions of 2157 x 2129 mm and 2242 x 2195 mm. The 2.35 m long HOBAS Profiles were lowered into the assembly pits by crane. With a specially built transportation vehicle the profiles were fed into the old sewer and assembled. Using special technology ensured an optimal pipe transportation and installation. Finally, the new line was secured against uplift and the space between the old and new structure was grouted in accordance with the static calculations.

Once the project is finalized, the collector will be completely restored and should last for the next 100 years even during floods. The many tourists barely notice the works beneath their feet. Pipe storage and assembly pits that are set in relatively large intervals are the only evidence of the ongoing activities under the streets of Dresden's Old Town.



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