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Planning of Sewer Rehabilitation in Minden and Roesrath, Germany

**Repair of Lateral Connections Under Extreme Conditions**

*Invest into a reliably functioning sewer system with the right rehabilitation technology: The Janssen Lateral Rehabilitation Process can be used even with groundwater ingress and the formation of voids.*

The Westphalian city of Minden offers an example. Last October the main sewer was comprehensively repaired at a length of 190 m (appr. 650 ft) including leaking joints, shards, and originally improperly connected laterals. At a depth between 4.80 and 5.20 m (appr. 14 – 16 ft) with the local soil conditions of heavy clay and gravelly sand initially there was no detailed information about the existing compaction of the sewer line. Here the CCTV inspection of the main line and the laterals helped. Soil reports in connection with a geo-physical process by way of geo-radar were to give additional information about voids and bedding problems.

**Quick Solution Needed**

It turned out that there was no srious compaction problem, „yet at the leaking joints and above the lateral connections there was indeed a massive infiltration of groundwater“, explains Ulrich Schmidt of the City Works Minden (SBM). In cooperation with the engineering firm IWA of Minden the option of a constructing a new pipe in an open trench was quickly dismissed – as being too costly and complex: A new construction would have meant the need for groundwater management. A costly undertaking. „It was for this reason and because there were no major hydraulic load problems, we decided for a repair from the inside“, say SBM. „With this option we used a Close-Fit-Liner, which meets the on-site structural requirements and can be installed under the given circumstances. At the same time we trusted the Janssen Lateral Rehabilitation Process. No other lateral repair system can connect and seal these laterals so well.”

This solution is based upon a special packer and a special 2-component resin: After a series of protruding laterals and other obstructions were removed using a cutting robot, the actual rehabilitation could begin. The packer was placed at the damage spots and inflated by compressed air. Then the liquid 2-component resin was injected through the damaged areas. “The resin fills the voids, displaces the groundwater and bonds with the bedding material – this way the actual sealing and stabilizing happens on the outside of the pipe, Managing Director of the Goch based service company Janssen Umwelttechnik GmbH. Even the annulus between the Close-Fit-Liner and the host pipe is filled and sealed up to 1 m to the left and right of the lateral.”

The freshly sealed laterals could then be connected to the HD-PE Liner, the so-called Close-Fit-Liner – now there will be nothing standing in the way of unproblematic sewer discharge in Minden-Letelen. “Because the sewer lines and the laterals are now tight, there will be no more sand washed into the pipe through the damaged areas”, observes Schmidt. The total waste-water volume was reduced from 900 cubic meters to around 300 cubic meters with this constructive measure. The reduction by two thirds has positive effects on the life of the pumps and leads to more economical operation of the pumping station. “Thus a cost reduction at the umping station comes hand in hand with the rehabilitation of the sewer system”, says Diplom-Ingenieur Schmidt.

**Special Resin against Ground-Water Ingress**

These were reasons for the City Works of Refrath as well to trust the Janssen Process for a rehabilitation measure in an industrial zone: In 2009 the sewer had been inspected by CCTV according to the existing ordinance (SuewVKan). Five damages with significant ground-water ingress were found making an immediate repair inevitable. The service company from the Lower Rhine Janssen Umwelttechnik GmbH applied its lateral repair process here as well. “This way all damages could be sealed and repaired”, says Norbert Fischer of Grid Service Waste Water of the City Works Roesrath.

The data of the running times at the pumping station prove the successful repair of the sewer pipe: While the pumping station was operating for eight to nine hours prior to the repair, it needed to run only three to four hours ater. And the waste-water volume actually pumped shows a significant difference: It was reduced from about 200 cubic meters to 90 cubic meters per day. “That – over the year – of course means considerable savings for us,” confirms Fischer. “And in addition we thus prevent the wash-out of the soil because of leaking lateral connections or cracks and the formation of voids.” By reducing the external water inflow into the waste water stream the City Works not only profit in the short term from the reduction of cost and the well functioning waste water system but also long term from a safe waste water management without the danger of streets subsiding according to Rainer Witte, head of the department “Water/Waste-Water Grid” in Roesrath: “Without this technology all this combined would not have been possible in such a short time. Therefore in future we will always rely on the Janssen Lateral Connection Rehabilitation Processer whenever necessary.”

*The company Janssen in Germany is looking for dealers to sell the Janssen-lateral-technology in other countries. The dealer for the USA is Pipeline Renewal Technologies (www.pipelinert.com).*

Further informations: [www.janssen-umwelttechnik.de](http://www.janssen-umwelttechnik.de)

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