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## Consistent corrosion protection at DN1000 – reinforced concrete pipes from Tamara Grafe Beton convince all along the line at sewer renewal in Hessen

The trend towards high quality and durable sewer systems shows no sign of slowing down in 2016. Aside from new infrastructure projects, this trend also applies for the renovation of existing installations in particular. Contractors, construction companies and last but not least manufacturers of the products used share a common interest in a future-proof wastewater disposal. Within a large-scale road reconstruction concept of the Hessian municipality of Niestetal near Kassel, the competent local building authority decided to replace an existing mixed water channel in the district of Sandershausen by a completely new installation. Apart from the increased capacity required, it has been clear for the responsible persons from the very beginning that a new sewer must fulfil also the criteria of high load capacity, longevity and increased corrosion resistance in order to represent a future-proof solution. Accordingly, it was no surprise that a composite pipe made of concrete and synthetic was required in the course of the projects underlying public tender. And it was the construction company Bauer GmbH from Leinefelde-Worbis which was successful, with a bid featuring a consistent lined pipe system produced by the well established manufacturer Tamara Grafe Beton based on the Perfect Pipe Technology developed by Schlüsselbauer Technology.

On the part of the contractor there were several decisive arguments for the choice of Perfect Pipe. On the one hand, it was influenced by the large variety of product advantages of the pipes made from fluid concrete with consistent inner HDPE-liner, that are characterised by their robustness and corrosion resistance. On the other hand, the decision was also taken because of the ease of installation along with rapid construction progress and the proven watertightness of the Perfect Pipe system. Mr. Claus Mattersberger, responsible technical employee in the building authority of Niestetal municipality, is very satisfied with the project development so far: „By choosing the Perfect Pipe system from Grafe Beton we surely took the right decision for the urgently needed renewal of the sewer in the suburb Sandershausen. Aside from

qualitative criteria like longevity, corrosion resistance and high static load capacity a quick installation process free of complications is very important for us, just like it is done by the company Bauer in accordance with the wishes of the local residents.“

### Installation in open trench construction

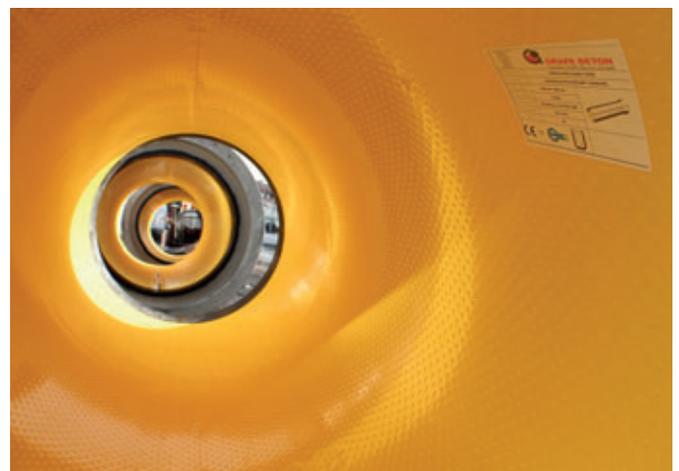
The installation of Perfect Pipe reinforced concrete pipes with consistent HDPE-liner in Sandershausen started in the middle of February this year.

The entire section has a length of 300 m and is done in open trench construction. Alongside the pipes with a standard length of 3 m each some short distance pipes, also with HDPE-liner, are used during the construction as well as 6 Perfect manhole bases all produced by Tamara Grafe

Beton. The new sewage channel is distinguished by its higher water capacity and mainly because of its increased corrosion resistance alongside with enhanced static load capacity at the same time. Whilst the removal of the old pipes in need of renovation has been rather difficult because of material damages and rocky soil conditions, all persons involved are enthusiastic about the rapid installation of the new Perfect Pipe system. Furthermore, the workers at the building site are impressed by the overall quality as well as from the well thought out and easy handling of the pipes. Particularly during connecting the pipes via the so called Perfect Connectors, integrated plug-in connectors made from resistant EPDM with double tilting edge gaskets that are characteristic for Perfect Pipe, the whole system shows its strengths, like Mr.



Temporary storage of DN1000 Perfect Pipe reinforced concrete pipes with pre-installed connectors at the building site in Sandershausen, municipality of Niestetal.



The internal Perfect Liner made from highly durable HDPE is characterised by its long-term resistance against chemical attacks.

## CONCRETE PIPES AND MANHOLES



Lifting of a ready-to-install Perfect Pipe with two lateral inlet openings.

Ingolf Schäfer, foreman of the company Bauer GmbH confirms: „The pre-mounted connectors on the bell-shaped pipe ends lead to a significant relief when fixing the tight pipe connection. Once two pipes are joined together via the Perfect Connector, the consistent corrosion-protection of the whole sewer section is guaranteed.“

The installation of the reinforced pipes lined with HDPE is done in a tried and tested method. First, each Perfect Pipe is lifted up at the pre-integrated anchors by using a chain sling fixed at the excavator and is put down safely in the trench with a maximum depth of 3.5 m. Immediately thereafter, the pipe is carefully pushed towards the existing channel with the help of sliders and is finally fixed, after short application of a lubricant, via the integrated Perfect Connector. Dipl.-Ing. Markus Steinhäuser, responsible site manager of the company Bauer, points out: „The outstanding component quality combined with the unique ease of assembly of Perfect Pipe guarantees a smooth installation. Not least because of the excellent cooperation with Tamara Grafe Beton, which delivers the pipes on time directly to our building site, we are very happy about the fast construction progress!“



Safely setting down of a pipe into the trench before connecting to the already existing new sewer channel.



Inserting of a pipe in the trench by using a chain sling fixed on two anchors.

### Tamara Grafe Beton – tradition meets innovative strength

The family-owned company Tamara Grafe Beton was founded in the year 1903. Many years of experience, the affinity to the materials used, entrepreneurial spirit as well as a high demand on product quality have been passed down through the generations. Due to consistent innovations, creativity and highest quality standards in production and service, Grafe Beton is an established and well regarded medium-sized company in Saxony and sought-after partner in different industries. Various awards and the loyalty of customers clearly underline this reputation.

A distinctive feature of Tamara Grafe Beton is the wide range of manufactured concrete products. Special requests and demanding orders are an interesting and welcome challenge for the company and often mark the start of new solutions, systems and products. The manufacturing takes place in four concrete plants and two gravel pits. Each plant is specialised for a certain product range. Grafe Beton delivers to customers far beyond the Saxon borders, e.g. to Czech Republic and to Poland.

Tamara Grafe Beton is characterised in particular by its more than 160 employees,



Concrete pipes with integrated gaskets produced with the Perfect Pipe system.



Our sealing solutions for all types of application and our supplementary range of accessories make us your first point of contact for both standard and demanding applications in the area of sewer construction.

**WE ARE EXHIBITING AT  
IFAT 30.5. bis 3.6.2016!**

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*With the help of a robot, a welding seam is created using PE wire to establish a solid connection between the two ends of the foil. After welding the foil has transformed into a Liner-cylinder.*

who work with specialised know-how and a professional honour. In the end, their engagement and wealth of ideas guarantee the company's success. Grafe Beton is certified according to DIN EN ISO 9001 and was also awarded the Saxony state prize for quality. By receiving the „TOP-Innovator 2011“-award the company proved, that it belongs to those German mid-sized enterprises that are able to react quickly to changing economic and market conditions.

Before Tamara Grafe Beton GmbH restarted its concrete pipe production the market situation was analysed for a longer period. Based on the positive experience, the company began in 2014 with the production of wet cast concrete pipes by using the Perfect

Pipe manufacturing system by Schlüsselbauer Technology at its site in Stölpchen, near Dresden (as reported in CPI 3/2014).

A well filled order book right from the beginning proves that Grafe Beton chose the right path for the company's development. One of the first orders was very remarkable when DN300 jacking pipes have been delivered and successfully installed in Singapore already in 2014. Additional pipes were reordered too.

**Flexibility thanks to upright production**

Grafe Beton is using the vertical manufacturing method. This means that the closed pipe mould is filled with flowing concrete from above. After curing the mould is

opened and the pipe can be released from the shrinkable core. The pipe moulds consist of two halves which are moveable via sliding rails. The rails as well as the steel core are firmly mounted on a carrier unit below.

Currently Tamara Grafe Beton is working with a dozen of casting moulds that are used to produce pipes both for open construction as well as for jacking in nominal widths from DN300 up to DN1000. All pipes can be manufactured with or without Liner – reinforced or not - but always in the same moulds. Short distance and adaptor pipes can also be produced with the Perfect Pipe method. To manufacture different kinds of pipes with only one system, that was also a decisive argument for Grafe



*The tight connection of the Liner with the surrounding concrete in the subsequent pipe is guaranteed by multiple anchoring points at the back of the Liner-cylinder.*



*The pipes are carefully released and lifted up from the mould core by a robot equipped with a universal gripper for all pipe diameters.*



The pipes are consistently checked for tightness.

Beton to choose the Perfect Pipe Technology.

### Automation of the Perfect Pipe production process for an efficient operation

#### Manufacture of the HDPE-Liner

If a pipe is to be manufactured with firmly anchored HDPE lining, the production of the Perfect Liner is the first step of the process. The liner foil is made of high-grade polyethylene (PE), a weldable and non-abrasive material that is resistant against chemical attacks. The tight connection of the Liner with the surrounding concrete in the subsequent pipe is ensured by multiple anchoring points at its rear side.

The Liner material is stored on rollers. In a fully automated process, the HDPE-foil is initially cut to size (equal to the inner surface of the mould) on a table. The so created plate is put into a welding machine that turns the two cut surfaces directly together. By using a robot, developed by Schlüsselbauer, a welded joint made from PE-wire is applied in order to form a frictional connection of both foil ends. After welding, the foil has transformed into a Liner-cylinder. Finally, the cylinder ends undergo an automatic thermoplastic transformation to be exactly shaped for the connector position in the subsequent pipe.

#### Automatic demoulding robot

The production line allows a proper and smooth manufacturing process in cycles. The moulds with the cured products are put down on the starting position by an electric transporter. Afterwards the moulds are opened and moved to the demoulding station. The pipes are carefully released and lifted up from the mould with a universal gripper that can be used for all pipe diam-

### World premiere of Perfect Forming Technology

During this year's bauma - the world's leading trade fair of the construction industry, visitors of the booth from the plant manufacturer Schlüsselbauer Technology were able to convince themselves personally of the high quality of the concrete pipes from Tamara Grafe Beton. As part of the presentation of Perfect Forming

Technology, a system developed by Schlüsselbauer for the economic industrial production of customised concrete products hardened in a mould, once again Perfect pipe, the successful concrete-HDPE composite pipe, has been in the focus of interest.



eters. Right after, the pipes are carried out by a transporter to be cured in the storage section. During this procedure the pipes are rotated by 90 degrees and laid down on a conveyor belt. After an automatic vacuum tightness test the ready pipe is brought out to the storage area by an electric transporter.

#### Cleaning, greasing and setting-up

After demoulding of the pipe the empty mould is again repeating all stages of the manufacturing cycle, whilst the next filled mould moves towards the demoulding station. The emptied mould is properly cleaned and prepared for the next usage in the following steps. If a lined pipe is going to be produced, the liner with already shaped joint end is fixed on the steel core first. Afterwards an optional reinforcement cage with spacers can be put over the core. Finally, the inner surfaces are lubricated before the mould is closed and is therefore ready for concreting.

Pipes without internal HDPE-Liner can be produced in the same way excluding the process of setting-up the liner. Thus, the system allows a simultaneous manufacture of different pipes in one production line without the need of further adjustments.

#### Concreting station

The setted-up casting mould is afterwards brought to the concreting station. As soon as the filling with fluid concrete is finished the mould is carried out by a transporter to be cured in the storage section.

### FBS-quality mark for manholes and reinforced concrete pipes

Since 2014, Tamara Grafe Beton GmbH is a member of the „Fachvereinigung Beton-

rohre und Stahlbetonrohre (FBS) e.V.“, the association of renowned producers of concrete pipes with or without reinforcement and concrete manhole components to be used for sewerage systems. ■

#### FURTHER INFORMATION



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