

## Hydraulic rehabilitation of a main sewer with customised SIMONA® PE 100 Shafts



Top: Factory-prefabricated SIMONA® PE 100 Pressure Pipe Shaft with double-containment pipe connections and preparation for accommodation of a leak detection unit; bottom left: Peeler from the SIMONA® tool hire facility; bottom right: Cascade welding of the SIMONA® Double-Containment Pipe d = 355/500 mm

For the hydraulic rehabilitation of a main sewer in the North Rhine-Westphalian town of Wipperfürth a new pumping station was installed and a PE 100 pressure pipeline was laid over a distance of 2.5 km. Despite optimisation measures already implemented, the existing main sewer conduit was no longer capable of handling the volumes of wastewater at the site. The new pressure pipeline made with SIMONA® PE 100 Pipes was therefore designed to bridge a narrow section of the main sewer and relieve the sewer conduit over its total length of 5.6 km.

### The project at a glance

#### Project

Project aimed at relieving the Wipperfürth-Hückeswagen main sewer

#### Client

Wupperverband, Wuppertal

#### Contractor

STRABAG AG, Nordhorn Division

#### Planner

Speikermann GmbH,  
Consulting Engineers Düsseldorf

#### Technical support

SIMONA AG  
Division Pipes and Fittings  
Business Developer Rehabilitation,  
Holger Wobito

#### Products used

- SIMONA® PE 100 Wastewater Pressure Pipes d = 355 mm, SDR 17
- SIMONA® PE 100 Bends, Flanges, Stub Flanges
- SIMONA® PE 100 Double-Containment Piping System d = 355/500 mm
- SIMONA® PE 100 Double-Containment Pipe Bends d = 355/500 mm
- SIMONA® PE Shafts (19 pcs.)
- SIMONA® PE Shaft Covers (19 pcs.)
- SIMONA® Hired Tools (e.g. peeler, welding equipment)

#### Duration of project

11 months



From left to right: Factory-prefabricated SIMONA® PE 100 Pressure Pipe Shafts; view inside the shaft with double-containment pipe to single-pipe adaptor and reduced tee for accommodating the ventilation unit; pressure pipe shafts and double-containment pipe laid in the open trench

## SIMONA® Double-Containment Piping System for the protection of drinking water zones

### Initial situation

The first section of the pipeline along the B237 road had already been built at the entrance to the town of Hückeswagen in 2015. An invitation to tender and execution of the second section followed in 2016 and 2017. Owing to road resurfacing in the area of the reconnection to the existing conduit, the project was split up into two sections.

### Task

The second section of the construction project focused on making an inlet structure/pump shaft in the district of Wipperfürth-Neye and open laying of a new pressure pipeline. Since part of the pressure pipeline runs through a drinking water safeguard zone, that part was constructed accordingly using a double-wall system. The objective was to protect the main sewer, now reduced to DN 700, against flooding events.

### Solution

To relieve the existing legacy conduit, installation of the new inlet structure/pump shaft was accompanied by the laying of a new pressure pipeline. In total, about 2.5 km of SIMONA® PE 100 Pressure Pipes (d = 355, SDR 17) were installed. The team at the SIMONA® plastics workshop had also prefabricated 19 SIMONA® PE Shaft structures at the factory according to the client's requirements and delivered them to the construction site. Two connections to pre-existing shaft structures for the purpose of draining the pressure pipeline were also successfully made during the construction project. One of the specific challenges of the project was, in particular, the crossing of the drinking water catchment area. In order to protect the drinking water zone, the client therefore decided in favour of a double-wall pipe design with continuous low-point monitoring and plastic shafts for maintenance and inspection. In total, the pipeline section laid with double-containment piping was 900 m long. In the event of an accident, double-containment piping systems do not release the medium to the environment. Instead, they discharge it safely to the low-point shaft inside the cavity between the inner pipe and the outer pipe. In such a case the liquid triggers an alarm via the leak detection probe installed (e.g. VEGA system). With a double-containment piping system it is also possible to conduct an incident analysis. In such a situation a check is performed to establish whether the medium that has escaped is either sewerage being conveyed or penetrating rainwater resulting from damage to the outer casing. In addition to detailed planning by Spiekermann, a firm of engineering consultants, many years of good collaboration with the field construction company STRABAG Pipeline Construction, Nordhorn Division, contributed to the success of the project.

### SIMONA® PE 100

#### Properties

- Notch resistance
- Long service life
- Strong, integral and permanently watertight welded joints
- No incrustation
- Excellent hydraulic properties due to very low wall roughness
- High abrasion resistance
- High corrosion resistance
- Excellent flexibility
- Good chemical resistance
- Good storage properties due to insensitivity to frost and ultraviolet radiation
- Continuous leak monitoring (incident analysis option in the shaft without the need for civil engineering work)

### Further information

#### SIMONA AG

Division Pipes and Fittings  
 Phone +49(0)67 52 14-315  
 Fax +49(0)67 52 14-211  
 pipingsystems@simona.de

#### STRABAG AG Nordhorn Division

Alte Piccardie 2  
 49828 Osterwald  
 Phone +49(0)59 46 99 500  
 www.strabag.de

#### Spiekermann GmbH, Consulting Engineers

Fritz-Vomfelde-Straße 12  
 40547 Düsseldorf  
 Phone +49(0)21 15 236-0  
 www.spiekermann.de