CASE STUDY
SPR™

KETY, POLAND
DN1000/1720 (39/68 in), 420 M (1378 ft)
DN1400/2100 (55/83 in), 93 M (305 ft)

The town of Kety contracted the renewal of two sewers with accessable diameters. The trenchless technology Spiral-Wound ensures a good hydraulic function for the next decades and prevents infiltrations. The special requirements of the two egg-shaped profiles with diameters of 1000/1720 mm (39/68 in) and 1400/2100 mm (55/83 in) made the Spiral-Wound product SPR™ the obvious choice. In principle, the concrete pipes with diverse inlets and bends could have been rehabilitated using CIPP lining; however, not in these dimensions and not with the special egg-shape profile. The main collection sewer is located on Wzdluz Torow Street and feeds directly into Kety's treatment plant. The wastewater sewer on Slowackiego Street is located in the middle of a residential area. Because both of these sewers reach high peaks of wastewater flow distributed over the day, taking them out of operation for renewal was not an option. With controlled live flow the SPR™ liner was installed in the two egg profile pipes; the first with diameters of 1000/1720 mm (39/68 in) and a length of 420 m (1378 ft), the second with diameters of 1400/210 mm (55/83 in) and a length of 93 m (305 ft).

Sewer rehabilitation with the SPR™ spiral-wound pipe technology is no problem under live flow conditions.

The rehabilitation process

With the SPR™ Spiral-Wound pipe method an endless PVC profile strip was wound into a pipe inside the sewer; till the required diameter was reached. A normal inspection manhole was sufficient to bring the winding machine and the PVC profile strip into the sewer. The rehabilitation equipment above ground, which includes the drums with the endless PVC profile strips and the rehabilitation vehicle, required significantly less space than the equipment required for open-cut renewal. This benefited the installation team, because the sewer with diameters 1000 mm (39 in) was located in the middle of a residential area and the sewer with diameters 1700 mm (68 in) was located in a narrow street 500 m (1640 ft) in front of the treatment plant. In a period of less than 10 weeks, with controlled live flow in place, the steel-reinforced, endless PVC strips with key-and-slot joints were wound into a new waterproof pipe inside the existing sewer. The winding machine, which was installed in the existing pipe, moved continuously with the profile strip as the coils are joined together. The winding machine presses and locks together the edges at each wind, to ensure that water cannot leak through. Once a drum was used up, the new profile strip was joined to the existing strip with a portable butt welding unit. Since the winding machine was set to wind with annular space between the host pipe and the wound PVC profile, the bends in the two sewers were also no problem.

A fine conclusion

The bracing, grouting as well as the final opening of of many lateral connections with 200/300 mm (8/12 in) diameters were carried out by the Polish partner company INFRA. They bricked off the end terminations of the Spiral-Wound pipe to the concrete wall and sealed the edges between Spiral-Wound pipe and branches with glass fibre laminate. Annular space that had been intentionally left open between the new Spiral-Wound pipe and the existing pipe was then filled with high-strength grout, to ensure the static characteristics of the Spiral-Wound pipe. The entire rehabilitation project was completed to the full satisfaction of the town of Kety.

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