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Measure - Control - Regulate

Wastewater association Korneuburg (AT) area

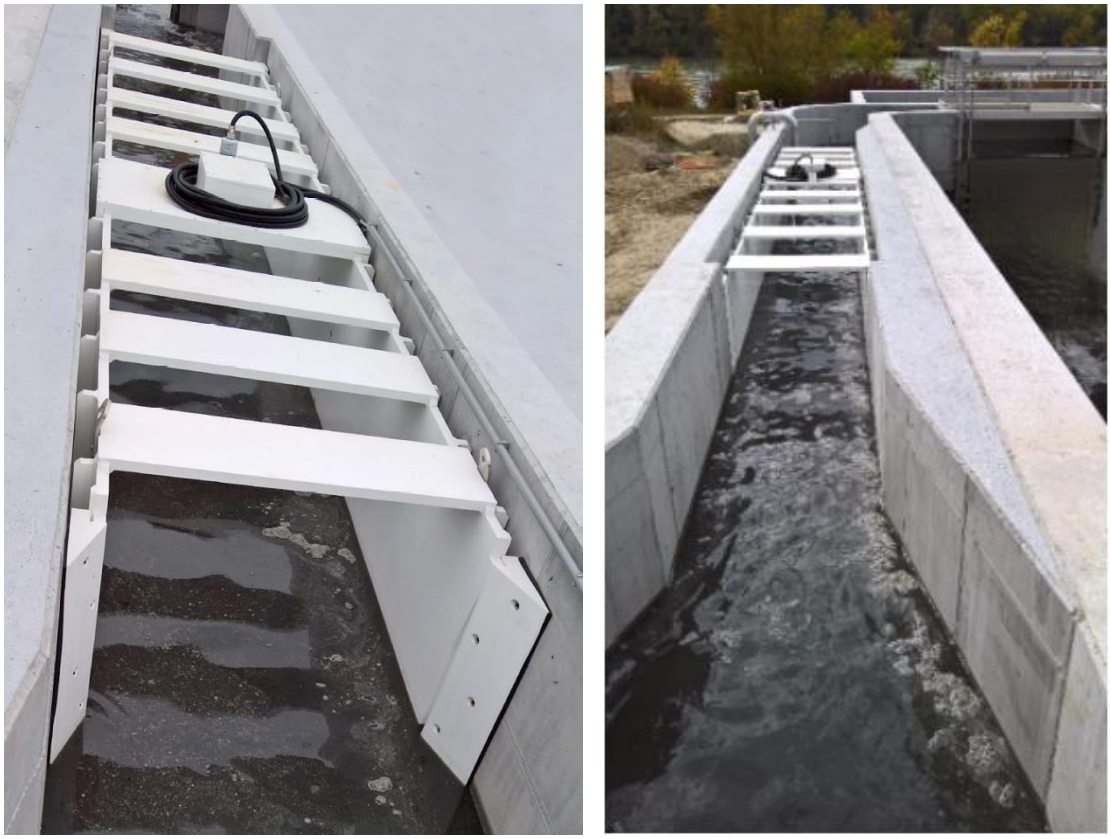


Figure 1: View after conversion

Situation

The wastewater treatment plant (WWTP) of the wastewater association of the Korneuburg area was built in the 1980s and designed for 40,000 inhabitants. In 2016, due to the high population growth, the wastewater treatment plant and the flood pumping station situated upstream had to be extended to 85,000 p.e. and adapted to the state of the art.

In the course of this expansion of the Korneuburg wastewater treatment plant, special emphasis was placed on flow measurements, as the Venturi measurements previously used proved to be unreliable and inaccurate. Above all, the strongly fluctuating waste water quantities between dry weather in the summer and mixed water accumulation during extreme events, or rather the large measuring ranges, place high requirements on the measuring technique.

Since there were no conclusive records in the catchment area of the association as to how high the discharge from the entire catchment area was, the following measures were taken:

- Recording of the amount of wastewater generated in the entire catchment area of the association in the event of rain and dry weather, directly before the flood pumping station (before the discharge of excess rainwater into the Danube receiving water)
- Wastewater treatment plant inflow measurement (after primary clarifier)
- Wastewater treatment plant effluent measurement (after the two secondary clarifiers)

The aim of the installation of the measurement technology was to determine the basic data for the subsequent expansion of the rainwater treatment system with a continuous tank, which was also required.

Requirements for the measurement technology

- High measuring accuracy between Qmin and Qmax

HWS pumping station:	Qmin approx. 50l/sec
	Qmax approx. 2000l/sec
WWTP:	Qmin approx. 50l/sec
	Qmax approx. 740l/sec

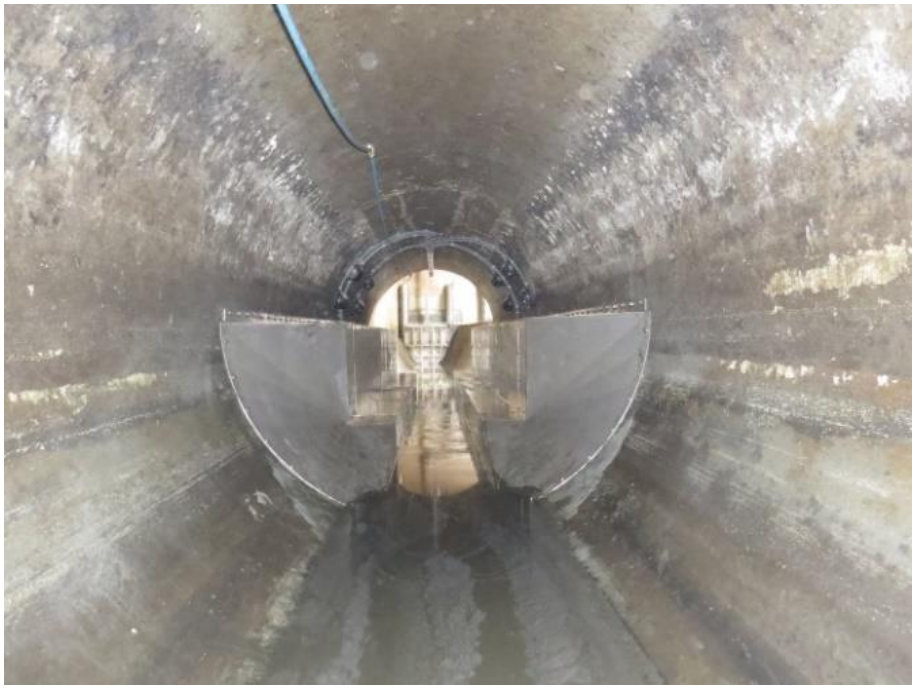
- High reliability and self-monitoring
- Lowest possible hydraulic loss
- Low maintenance requirements

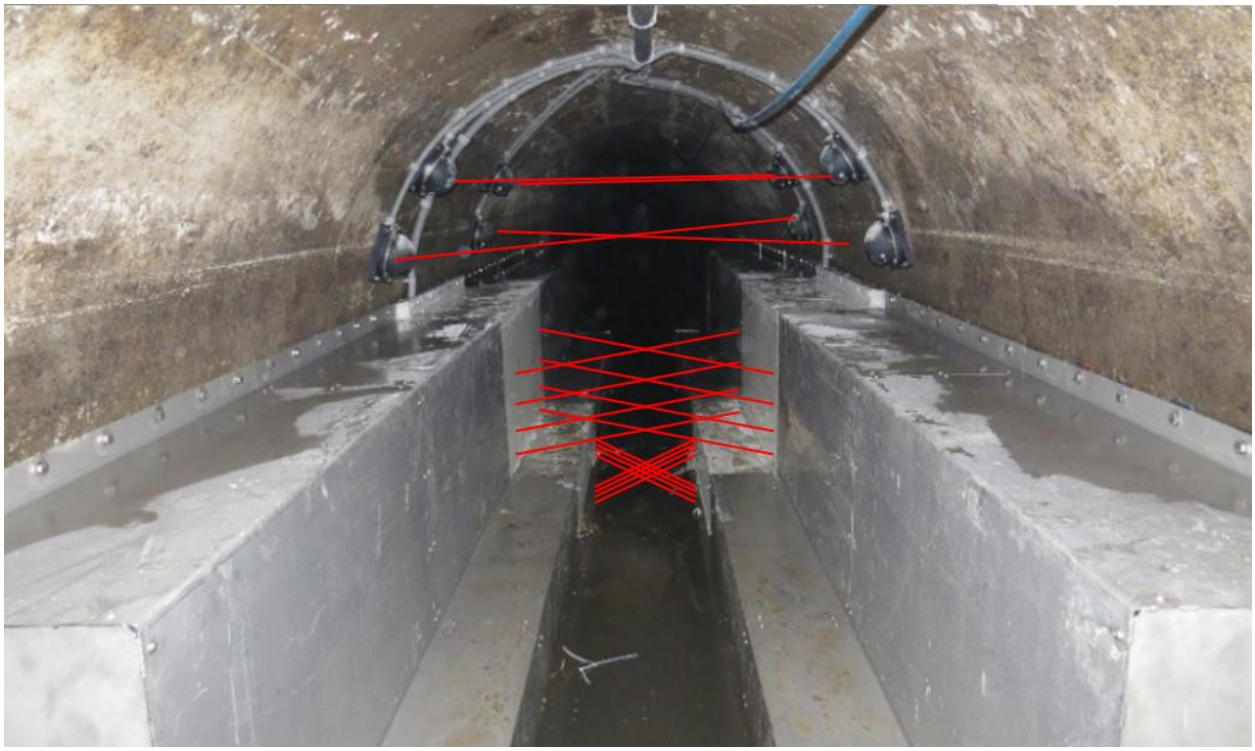
Realization

Flow measurement HWS pumping station

In the inlet channel DN1800 of the HWS pumping station, a measuring channel with a specially shaped dry weather channel for the measurement of low flow rates with a total length of approx. 7.6 m was constructed and installed. The installation was carried out during operation as part of the reconstruction and renovation of the flood pumping station upstream of the WWTP. During the execution, the entire wastewater had to be rerouted at short notice. The installation of the measuring channel and the measuring technology could be realized within a few days.

In this measuring channel there are 12 levels of ultrasonic running time sections for high-resolution scanning of the entire flow profile.





Figures 2 + 3: Flow measurement in the DN 2000 storage sewer with inserted dry weather channel for the large measuring range of 50 - 2000 l/s. In the bottom picture, the red lines depict the ultrasonic measuring tracks.

Flow measurement inlet and outlet wastewater treatment plant

The same physical flow measurement principle was chosen for the inlet and outlet measurement. Since the two existing activated sludge tanks were converted into secondary clarifiers for cost reasons and an intermediate pumping station was to be avoided, these two measurements were only allowed to have an insignificant influence on the hydraulics. In addition, the large measuring range and the required measuring accuracy across the entire tier posed a challenge.

So far, the measuring systems have absolutely proved their value both in the area of inlet measurement at difficult inlet conditions (in some instances concentrated raw waste water with a high proportion of industrial waste water, in some instances with foam on the surface of the inlet channel) and in the new aeration basins with a basin volume of around 14,000 m³.

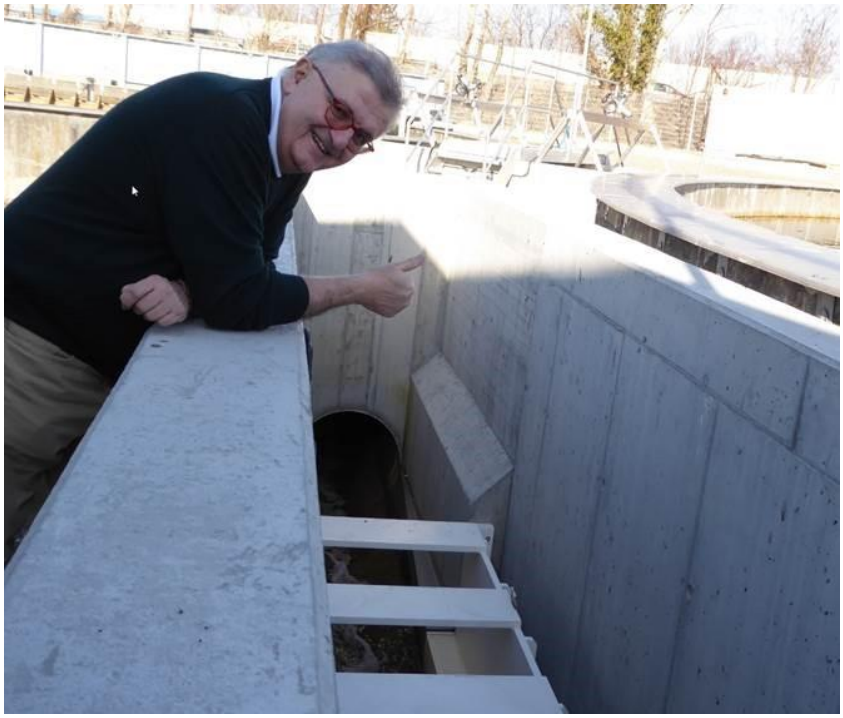


Figure 4:

The managing director of the waste water association Korneuburg area, DI Dr. Kiril Atanasoff-Kardjalieff, is visibly pleased with the reliable measurement data and newly acquired hydraulic knowledge of his wastewater treatment plant.