

Sewage plant Limmattal

# Instrumentation and control technology makes optimum use of available infrastructure

A newly fitted part-filled permanently installed flow metering system from STEBATEC acquires important measuring data on the distribution of inflows in the waste water treatment plant of Limeco. The system marks another step towards the optimum management of a sewerage system in which advanced measuring, control and regulating systems permit the optimized use of available infrastructures before extensions have to be implemented.

The waste water treatment plant of the Interkommunale Anstalt Limeco in Dietikon treats the waste water of nine municipalities with over 110,000 population equivalent. The modern waste water treatment plant is situated in a scenic landscape next to a former course of the Limmat River.

## Daily load variations

To put up with the lack of space in the nature reserve, the plant is already equipped with an efficiently orking biological filter in vertically arrangement. The waste water passes through four cleaning steps in a little less than four hours, in which it must be pumped up 12 meters high into the biological filter. "The biological filter is very efficient but reacts very sensitively to load surges, which we would like to have more balanced", Thomas Di Lorenzo, manager of the waste water treatment plant since March 2015, says. Like all waste water treatment plants, the purpose of the plant in Limeco is to discharge water in the main drain that meets the required specifications of cleaning and thereby to reduce

the load in the main drain as much as possible. In addition to that, Thomas Di Lorenzo and his team would also like to see the plant running at optimum capacity. Firstly, we can ensure that the water we discharge after cleaning meets the statutory requirements and secondly this is a way of cutting the operating cost. For example, if a part of the peak load can be shifted to low-load nighttime hours, the progress line can be smoothened considerably. Of course, an ideal inflow without peak loads would be ideal but that is influenced by many different factors, some of which cannot always be controlled.

## Make good use of the sewerage system

You can try to approach an ever more balanced progress line. This, exactly, is Thomas Di Lorenzo's intention. At first, however, he wants to be clear about the untapped potentials in Limeco's available sewerage system before any new expansion projects are undertaken. In the past, only the total inflow in the waste water treatment plant was measured, but the waste water

arrives in two trunk sewers. So Limeco asked STEBATEC to install a measuring point in one of the two sewers. Together with the recorded total inflow, the data that point permanently feeds in the process control system can now be used for calculating the flows in both trunk sewers. The extensive system of main sewers managed by Limeco covers a total length of 9,440 meters, comprises eighteen storm-water basins and ten pump houses. Due to the different lengths of the sewers the inflow times also vary from a few minutes to more than three-and-a-half hours. So knowledge of the main parameters is important to maintain a detailed overview of the available control options. Basically, Limeco wants to ensure the optimum management of the complete sewerage system in the interest of the conservation of water resources. This has for quite some time also been a primary aim for STEBATEC on the background of which the project for the Integral Control of Sewerage Systems and Waste Water Treatment Plants (INKA) was proposed by the company. Despite the dynamic processes and the occasional difficulties in forecasting the rainfall, the capacity of the available infrastructure should be used permanently, if possible, and optimally.

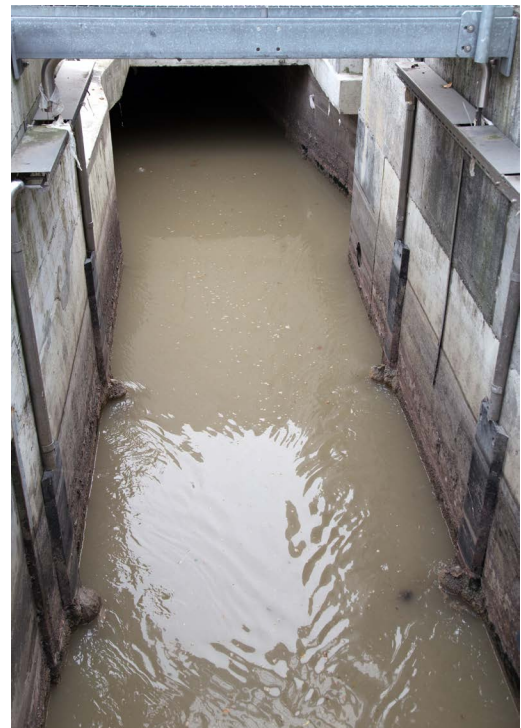
### Modern measuring equipment in use

The measuring point which has been installed by STEBATEC in one of the trunk sewers for that purpose works on the principle of dynamic flow measurement; it operates reliably also under conditions of large volumes of water and identifies and compensates secondary and transverse flows. The measuring point marks a major step towards a comprehensive data base for the waste water treatment plant in Limeco while the design and handling of the plant also meet the customer's requirements. Thomas Di Lorenzo is convinced of that compact product, which can be lifted out of the sewer and placed on dry ground when maintenance work must be carried out or the equipment must be cleaned. The smooth surfaces are easy to clean and the ultrasonic sensors do not project in the mea-

suring section. So flotsam cannot get caught anywhere or reduce the width of the flow passage. "The cooperation with STEBATEC was also competent and uncomplicated", Thomas Di Lorenzo is full of praise. With the installation of the measuring point and additional concentration measurement, we now will know the load in both trunk sewers, in addition to the flows.

### With ambition and passion

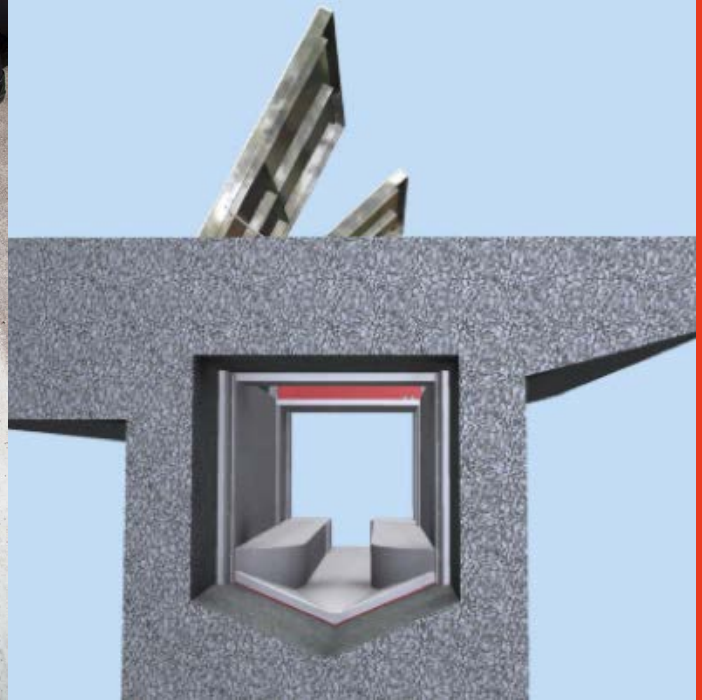
The additional measuring data can be used for version studies and conclusions can be drawn as to where more details need to be known or optimization potential can be expected. In addition, Thomas Di Lorenzo has also requested a forecast of the future growth of the Limmat Valley so that coming projects can build on a sound basis. Gradually, it will be seen where additional measuring points are needed or other precision-control throttles – like the dynamic outflow controller first installed in one of the storm-water basins in year ago – must be provided. Limeco will go on optimizing the local sewerage until the load discharged in the different main drains is as low as possible the waste water treatment plant operates on a base load as ideal as can be.



For a long time, the total inflow has been measured by a permanently installed contactless ultrasonic measuring point (ultrasound runtime).



Thomas Di Lorenzo and Andreas Zingg (STEBATEC) are seen watching the newly fitted part-filled permanently installed flow measuring point at a trunk sewer.



Schematic cross section of a part-filled permanently installed flow measuring point.



The ultrasonic sensors do not protrude into the measuring cross section so no flotsam can get caught.

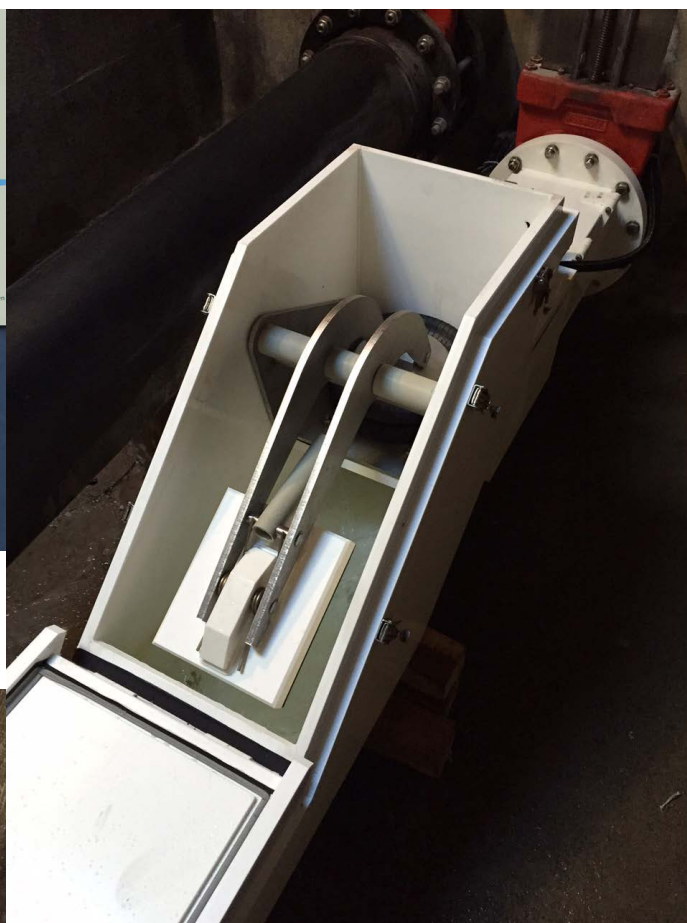


The waste water treatment plant of Limeco directly adjoins a nature reserve with alluvial forest and former river course.





Thomas Di Lorenzo explains the catchment area of the Limeco waste water treatment plant.



Dry-installed part-filled pneumatic drain control in the Krummacker storm-water basin.

The dynamic drain controller (above, with open maintenance cover, below: closed ), was installed at the end of 2014.

