Field report: Waste water disposal plant (ABA) 
Mautern on the Danube and sewage headers "F" 
and "G" in the voestalpine in Linz

Georg Steibl

A functioning waste water system is a basic requirement for maintaining our quality of life. Even if the current connection rate to municipal waste war treatment plants in Austria is currently well over 90%, it is indispensable to continually invest in the maintenance and optimization of the present systems because of the limited service life of the sewers.

The construction of a waste water disposal plant is a challenging engineering feat, similar, for example, to bridges or tunnels.

A functioning wastewater discharge and disposal can be guaranteed to be taken for granted only if high-quality planning is performed by experienced engineers with construction work at the highest level of quality.

The correct choice of pipe materials plays a crucial role in the construction of a wastewater system.

The following examples illustrate the successful use of concrete and ferro-concrete pipes on the basis of some project-specific particularities.

ABA Mautern on the Danube
Pipe dimensions: DN250 – DN1800 
Total length: approx 8,300 m

Following decades during which hardly any investment was made in maintaining the wastewater system in Mautern on the Danube, the political decision was made a few years ago to rebuild nearly the entire sewer system, but also the drinking water network. This became necessary because of the hydraulic overloading of the old system.

In addition, many sections had surpassed their service life and a non-disruptive restoration no longer made technical and economic sense.

One particularity of this project was the circumstance that it involved a sewer-channel substitution, i.e. the provisional functional capability of the plant had to be guaranteed throughout the construction period.

Since space in the town centre of Mautern was very restricted, a major challenge was choosing the right machinery.

Flexible choice of lengths for the concrete and ferro-concrete pipes was very helpful for the transport to the site and installation.

Several previously unknown domestic waste water channels were found in the town centre of Mautern which could be immediately integrated into the new main system by using a core drilling machine for concrete and the appropriate seals.

This very flexible system made it possible to avoid disruptions in the construction sequence (e.g. due to long delivery times for molded components).

The pressure tubes needed in the area of the rain water outfall pipes into the Danube were armored accordingly and reinforced in the socket area with a steel ring.

Heavily reinforced pressure pipes, reinforced in the socket area with a steel ring
Image: PORR

Manhole base DN2000 with DN1600 main channel
Image: PORR
One of the major challenges in this project was the optimization of the pipe statics in sections with respect to the extraordinary loads, e.g. due to the passage of special voestalpine Stahl GmbH vehicles with up to 200 tonnes total weight or due to the storage of slabs in the alignment area.

Cost-effectiveness and load capacity were maximized by intensive cooperation with the pipe supplier to adapt the reinforcement content, wall thickness and pipe support.

During construction a strict quality control plan ensured precise implementation of the assumptions made in the calculation.

An additional challenge resulted from the fact that the numerous existing structures with the cable collector DN 2600 could not be crossed with culverts as for the waste water header DN 2200. Because of the need to be able to walk over the area, a solution was found whereby the collector was pivoted in three dimensions.

The complex implementation, from a survey-calculation point of view, was performed following exact detail planning with our suppliers.

**Sewage header "F" and 30 kV E-collector**

Pipe dimensions: DN2200 – DN2600
Total length: approx 1,200 m

Construction of a new plant for discharging rain and industrial wastewater was necessary in the course of a massive expansion program of the voestalpine Stahl GmbH.

Since an additional power supply was also needed for the new production locations, and it was possible, with the appropriate planning, to route the pipeline alignments for the power supply and disposal plant (cable collector and sewage header) in parallel, significant synergies could be achieved by using ferro-concrete pipes for both structures.
Sewage header "G"
Pipe dimensions: DN1500 – DN2400
Total length: approx 1,400 m

It became necessary to discharge the incoming coolant water because of the expansions at the voestalpine Stahl GmbH site in the course of the expansion program "L6."

The chosen routing represented the optimal variant for the waste water header "G" on account of the plant location, terrain and grade conditions and the proximity to the river Traun.

The waste water header "G" has two discharge points.
The pipe routing to the distributor structure runs from the discharge point into the river Traun through three pipe systems, each with a nominal diameter DN1500 in graded lengths.

The distributor structure as such is located at a tongue of land bordered on one side by the Traun and on the other wise by the Mühlbach. It serves to distribute the volumes into the river Traun or into the Mühlbach.

Proceeding from the discharge point in the Mühlbach, a pipe was constructed with a nominal diameter of DN 2400, which runs to the previously cited distributor structure.

In the area of the remaining alignment, the Mühlbach was culverted using an inverted siphon with a pipe pressing DM 1600 and a plant railway station was traversed by means of pipe jacking DN 2400.

On a section of some 300 m, a pipe bedding that was needed anyway could also be used as the foundation of a retaining wall.

Total project costs were significantly reduced by these synergies.
Standard cross-section DN2400 with mounted retaining wall
Image: PORR

Construction of the mounted retaining wall
Image: PORR

Finished retaining wall
Image: PORR

Standard cross-section DN2400 in MEGA double slide rail shoring
Image: PORR