AQUECON, a.s.



Alternative Sewerage Methods

Design of vacuum and pressure sewer systems, pneumatic pumping systems and combinations of these systems with classic systems. Contact:

Roman Kaucky, director, cell phone: +420 724 117 632, e-mail: r.kaucky@aquecon.cz Miloslav Kiezler, design director, cell phone: +420 739 452 145, e-mail: m.kiezler@aquecon.cz

If you have problems with the design of a classic sewer and wastewater drainage system due to terrain configuration and problematic bedrock in your municipality, then implementation of a special sewerage method can present a solution for your municipality.

Aquecon, a.s. provides an integrated set of technical, design and consulting experiences and skills to ensure that the entire delivery process of a water management infrastructure proceeds smoothly and efficiently to the benefit of our clients.

Our success is based on the principles of sustainable development, which means that in selecting the most economic proposal, we focus on the economy of its life cycle, efficiency and reliability. Our experience and expertise consists of comprehensive, multidisciplinary advising in the following areas:

- . General plans for drainage systems and potable water distribution systems
- Design of water management infrastructure from studies to building drawings
- . Investor, engineering and geodesic activities, subsidy advising and advising in the area of flood protection.

Vacuum Sewer

This solution is proposed in the case of a minimum terrain gradient in combination with a high water table or, potentially, a bedrock layer in communities with a rural character of development. The advantage is the average depth of sewers of about 1.5 m, with pipe profiles from DN 80 to DN 150. Several valve sizes are used - for a single property or a group of several houses. Wastewater is discharged from a building and drained by a gravitational sewer connection to a shaft, from which it is extracted. A central vacuum station is located in the municipality, which sucks the wastewater from all shafts in the municipality.

Generally, the wastewater is pumped from the vacuum station by pumps (or displaced pneumatically) to the wastewater treatment plant (unless the treatment plant is part of the vacuum station). Valves do not need electricity to operate, so power only needs to be brought to the vacuum station. A vacuum sewage system is proposed in areas where conventional sewer construction is only possible with the assumption of increased investment costs and operating costs are higher than for classic sewage drains.

Vacuum systems are design tailored to municipalities (100 - 2000 residents). Approximately 25 vacuum systems have been implemented in the Czech Republic based on our project designs.

Pressure Sewer

This type of sewer system is used in terrains with a similar configuration as in the cases where vacuum sewers are used. Its advantage is the ability to overcome inclines substantially greater than that which can be overcome by vacuum sewers, while the laying depth and profiles of the pipes are very similar. The disadvantage is the need to connect each pump to a power source at the property and the inability to back up this power source. The pressure sewer eliminates the need for the implementation of a central vacuum station. The advantage is that there is greater competition in the pump market, and the drawback is a more complicated pump construction than with a vacuum valve system, as well as a shorter lifespan of the pump.

Pneumatic Wastewater Pumping

This solution is proposed where several-kilometer long displacements are required, such as in the case of classic pumping with a number of buildings on the route, (air tanks, catch basins). It even enables overcoming larger inclines. The pipes freely copy the terrain and the prescribed plumbing gradient does not need to be maintained. Pumping takes place using pressurized air with the aid of compressors and usually two pressure tanks. In the night hours, it is possible to blow out the system and access the wastewater pump during minimum wastewater inflow from pipes. Wastewater reaches its destination aerated, which prevents wastewater stagnation. Investment costs for a pneumatic water treatment station are approximately 2.5 x higher than for a classic pumping station, but significant savings are achieved on displacement. It is possible to combine vacuum sewerage with pneumatic displacement. The costs for electric power are approximately double in comparison with classic pumping.

It is possible to test a number of hypotheses, operating seriots, crisis states, and to optimize proposed solutions... ... for efficient and reliable wastewater networks built on the principle of sustainable development.



