



Vacuum Sewer System in Wierzchosławice, Poland

A Roediger® vacuum sewer system has been installed as the economic alternative for almost 100 km of wastewater pipe network in the southeast of Poland



Vacuum Stations

5 units, above ground

Vacuum Vessels: 9 pcs. with a total capacity of 81 m³

Vacuum Pumps: 16 pcs. of oil-cooled rotary vane pumps, with a total capacity of 130 kW

Discharge Pumps: 10 pcs. of submerged pumps, with a total capacity of 57 KW

Technical Data

Pipe Network: approx. 96,500 m

House Connections: 1,280 pcs. of Roediger collection chambers, including Roediger 2.5" vacuum valves

Situation

The municipality of Wierzchosławice incorporates 11 villages situated in the river valley of Dunajec, in the southeast of Poland, near to the city of Tarnów. Here, the many forests, the river of Dunajec and the lakes—formed as a result of previous stone quarrying work—provide for an idyllic and most attractive landscape for tourists. It is also historically important to Poland, as here was born and lived Wincenty Witos, a triple prime minister of the country. As a typical suburban community, Wierzchosławice depends for the future on the further development of tourism, as well as that of light industry, general commerce and medium-sized agriculture. In order to attract more investors, many new developments have been realized. Installation of the Roediger vacuum sewer system, built in the years 2004/2005, together with a modernization of local roads, was part of the extensive so-called PHARE-projects, funded by the European Union in this area.

Special Features

Taking into account a total value of more than 2 million Euros for the technical equipment alone, Wierzchosławice is the biggest single investment in vacuum sewerage in the whole of Poland. The construction of almost 100 km of vacuum sewer network took only 20 months. Connected to the new system are the inhabitants of Wierzchosławice and those of 4 other villages or communities, totaling approximately 5,000 persons.

Solution

Loose soil (gravel and sand) results in there being a high ground water table. The initially investigated gravity system would require the installation of 139 pumping stations for the total sewage network of almost 100 km. After a technical and economic comparison of possible alternatives, and subsequent to a public tendering, the decision was taken to construct a wastewater collection system using Roediger vacuum sewer technology. A Roediger collection chamber has been installed at each plot. The collection chamber is the point of exchange between conventional gravity sewerage issuing from buildings and the vacuum system itself. It complies with the following two requirements: (i) The pneumatic vacuum valve is located inside the chamber, and (ii) The gravity inlet line, together with the sump, provides for the total minimum collection volume as required by the norm DIN EN 1091. When a certain fill-level is reached inside the sump, the valve automatically opens and wastewater inside is evacuated, together with a portion of air, thereby self-cleaning the sump. The wastewater evacuated from all five sewer networks is collected in one of the 5 vacuum stations, then conveyed to the central sewage treatment plant in the city of Tarnów.



Typical road view
in the village of
Katowice



PE vacuum sewer
pipe, together
with PE inspection
pipe



Buried vacuum
vessel of 10 cbm



Vacuum pumps



Vacuum station
with buried vac-
uum vessel of 10
cbm

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