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TECHNICAL, ECONOMICAL, SOCIAL AND ECOLOGICAL CHARACTERISTICS OF VACUUM SEWAGE SYSTEM

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Abstract

In this paper we analyzed some characteristics of vacuum sewer systems from technical, economical, environmental and social perspectives. The vacuum sewer systems transport wastewater with lower pressure ($p<p_{at}$), and are compared to conventional sewer systems with free level ($p = bed$) - gravity and under pressure systems ($p>p_{at}$) - gravity or pumping systems. Vacuum sewer systems are recommended for rural communities and residential neighbourhoods surrounding urban areas, developed on sites with low slope.

The analysis of the impact on the environment (soil, air, flora - fauna and human beings) based on the *global pollution index*, I_{PG}, can determine the order/sequence of sewerage systems ranking used for collecting and transport wastewater in plain areas, with low slope of the land as follows: vacuum sewer systems (IPG = 1.14), drains through pumping pressure sewer systems (I_{PG} = 1.52), gravity free level sewer systems (I_{PG} = 3.22).

The vacuum sewer system proved to be with 23.91% cheaper than the gravity sewer system, from the economical point of view while the pumping sewer system is only with 1.7% cheaper than the gravity system.

Vacuum sewer system is recommended especially for lowland rural communities (with maximum 5000 inhabitants), developed on a distance by which the main sewer collectors do not exceed a length of 3,750 m.

Key words: gravity sewerage, pumping system, vacuum sewerage

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