Design and Construction of Sewage Structures under High-Level Underground Water Conditions Using Top-Down Method: A Case Study of Sewage Pumping Station in Dorood City

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Abstract:

In this paper, by reviewing issues related to the design and construction of a pump station under high-level underground water conditions case study in Dorood City, different approaches have been investigated. These methods include deep wells, sheet pile walls, and secant walls. By evaluating deficiencies of such methods dealing with high-level underground water conditions, a new method called Top-Down has been studied and introduced which has already been presented for the construction of caissons and buildings. By comparison with other methods, the pros and cons of the Top-Down method have been evaluated whereby the approach was finally selected and the problems, including the waterstop placing system and construction details, were modified. Then, architectural and structural details for the construction of such structures applying the Top-Down method, were presented in the research. Finally, the efficiency and robustness of the proposed approach in the design and construction of concrete sewage structures, exposed to high-level underground water, were demonstrated from the technical and economic aspects, construction time, costs, and safety level.

Keywords:

Pumping Station, Sewage, Top-Down Method, High Groundwater Level.