

## **Empirical and Numerical Solution of Seepage Problems Underneath Hydraulic Structures**

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### **Abstract**

Hydraulic structures are structures submerged or partially submerged in water, they're used to retain or divert natural water flow. Any hydraulic structure that retains water is faced with seep-age problems as the water seeks the path with the least resistance through or under the hydraulic structure. If the water carries materials as it flows or exerts high pressure on the floor of the structure, it will cause failures such as piping and cracks and there are many ways to prevent that, including cutoffs. In this paper, seepage is analyzed for different cases by using the empirical method (Khosla's theory) and the numerical method by using computer software (SEEP/W). The results had some slight differences between the two methods as a result of not taking into account the effect of soil characteristics of the empirical method. However, the water pressure heads underneath the impervious floor that calculated by the numerical method were greater.

### **Keywords**

numerical solution, seepage.

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