THESIS

UPLIFT PRESSURE ON DIVERSION STRUCTURES USING A NUMERICAL MODEL

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ABSTRACT

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The purpose of this study is to solve the twin problem of uplift pressure and the exit gradient by using digital computers.

The analytical and experimental methods are mostly available for hydraulics of structures on homogeneous isotropic or homogeneous anisotropic foundations, also the available methods have certain limitations like, geometry of the structure, boundary conditions and design time (when number of options required to be undertaken) etc. The foundation soil may have any type of stratification. So this problem should be undertaken.

To solve the problem of design, operation and maintenance of structures on any type of geological formation of the foundation, numerical solutions are proposed. The author considers three practical examples, namely, Sukkur Barrage, Rasul barrage and Chashma Barrage, and presents selected applications. The model results are compared with theoretical (that determined from other methods) as well as with experimental ones.

This report will be useful for the professional engineers involved in work on hydraulic structures for solving the subject problem, and emphasizes the need of use of numerical model especially when foundation strata is non-homogeneous.

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