



Determination of the hole drain position in dams and hydraulic structures in order to reduce the seepage in water structures by Geo studio model

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Stability Analysis of Cutoff Walls, Foundations and Concrete Dams Under the Uplift Force is Very Important. Hole Drain is Considered as Effective Measures to Reduce Seepage, Uplift Pressure and Exit Gradient Under the Foundation of Hydraulic Structures Which Made Up to Vertical Pipes With Different Diameters. Physical Model in The Ferdowsi University of Mashhad Was Applied in Order to Study The Effect of Hole Drains in Estimating Uplift Pressure, Seepage Discharge and Exit Gradient. The Uplift Pressure Was Measured By 14 Piezometers. In Each Experiment, The Seepage Discharge Was Measured For The Located Hole Drains, Separately. Water Head Was at Maximum Level. Results Showed That The Best Position Of Controlling Seepage and Exit Gradient by Vertical Drainages Were $A/L = 0.4$ (A =Distance From Dam Heel, L =Dam Length). And Finally Validated Data and the Results by Geo Studio.

Key words: earth dam, Geo studio, Gradient