

Pressure Distribution on the Upstream Face of Tunnel Gate With Different Lip Shapes.

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ABSTRACT

The lift gate which installed at specified position of the dam tunnel facing a great pressure according to the high water storage level in the reservoir of dam ,and this is the reason behind the need for choosing the suitable gate specifications withstand of such pressures .The one of important factors that affected the stability and bearing of gate is the pressure resulting from pressurized flow established along the tunnel which exerted on the upstream face of gate.

The present research included the analyses of experimental measurements of pressure heads distribution indicated by fifteen peizometric holes located on upstream face of tunnel gate model as five holes on each of three vertical lines. The pressure heads have been obtained for many values of gate opening ratios and different shape of gate lips. These measurements were analyzed in details by using the surfer software program in addition of applying the equations based upon the principles of momentum. The relation among the of downpull forces and pressures on the gate upstream face were also studied .

The analysis include some graphs which have been provided to present the relationship among pressure heads and gate opening ,coefficients of coefficients of downpull forces against pressures on the gate upstream face .The results revealed that pressure head are mostly concentrated at the upper portion of gate for all values of gate openings which indicate the need of make this part to be supported by steel beams or any other shapes and materials more than other parts of gate in order to satisfy the economical and safety requirements of gate design .

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Submission deadline is September 30, 2013. Authors will be notified about the preliminary acceptance by 31 October 2013.