

عنوان مقاله:

Studying the Effect of Horizontal Drains on Stability of Heterogeneous and Homogeneous Earth Dams during Rapid Drawdown Condition

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خلاصه مقاله:

One of the main concerns to design earth dam is the stability of the upstream slope of the earth dam in phase of rapid drawdown. Confined pore water pressure reduces the effective stress in this mode, so possibility of the instability and slippage will be increased. The main goal of this research is to investigate changes in the pore water pressure by using horizontal drains in upstream slope of the earth dams and the improvement in case of the factor of safety. In this study, firstly, the homogeneous and heterogeneous modes of the earth dam are considered and then rapid drawdown mode are modeled in two upstream slope modes without the horizontal drain and with the upstream slope including up to seven horizontal drains. These two modes are modeled by using GEOSTUDIO software. According to the obtained results, improvement by horizontal drains leads to increase in dissipation of pore water pressure and also increase the stability of the safety factor of the upstream slope up to 24% for homogeneous dams and 17% for heterogeneous dams. Practical equations were also presented to show the relation between the numbers of horizontal drains, the factor of safety and the pore water pressure. In order to study the influence of the horizontal drains on the upstream slope of the earth dams during the rapid drawdown condition, Molasadra earth dam geometry is used both in the modes of homogenous and heterogeneous dam. Molasadra dam and power station is located in .about 13 kilometers of southwest of Sadeh county, around of Eghlid town in the north of Fars province in Iran

کلمات کلیدی:

Homogeneous Earth Dam, Heterogeneous Earth Dam, Horizontal Drains, Rapid Drawdown, Slope Stability Analysis

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