

Investigating the effect of the presence of suspended water tables formed in the support of dams on the stability of the structure during the operation period and the stabilization Method (case study: Masjid Suleyman dam site)

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Abstract

The construction of Masjid Suleyman dam is of considerable importance due to the presence of impermeable clay layers and the conditions for the formation of suspended water tables. In this research, the effect of the presence of suspended water tables formed in the support of dams on the level of stability of the structure during the operation period of the project under the effect of hydromechanical behavior is investigated. first, the engineering geological studies of the construction including office studies, field visits, discontinuities removal, detailed studies were done, then using UDEC software (numerical method) stability analysis and underground water flow modeling were done and the results obtained from numerical modeling in It was a good match with the readings of strain gauges, which confirms the accuracy and validation of numerical modeling. According to the results of numerical modeling, the hydrogeological conditions of the building have caused the formation of suspended water tables inside the layers of conglomerate and sandstone, the lower boundary of which is formed by impermeable clay layers. Because the slope of layering is diagonal and its direction is towards the inside of the slope, the flow of underground water is not easily drained, and over time, the suspended water placed on top of the clay layers due to the property of absorbing water in the fine-grained materials is gradually absorbed by the claystone and causes The occurrence of swelling (increase in volume), production and increase of pressure towards the walls of the support and finally causes it to crack and fall. In these cases, the use of vertical gravity drains at the top of the slope with a greater depth so that it cuts off all impermeable layers (claystone) and also the use of horizontal gravity drains at the bottom of the slope with a longer length at least until reaching the layering boundary in order to stabilize the structure It can work.

Key words: *Perched water aquifers, Masjed Soleyman Dam, hydromechanical analysis, numerical method*

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