

The Behavior of Dam Foundation Reinforced by Stone Columns: Case Study of Kissir Dam-Jijel

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Abstract : This work presents a 2D numerical simulation of an earth dam to assess the behavior of its foundation after a treatment by stone columns. This treatment aims to improve the bearing capacity, to increase the mechanical properties of the soil, to accelerate the consolidation, to reduce the settlements and to eliminate the liquefaction phenomenon in case of seismic excitation. For the evaluation of the pore pressures, the position of the phreatic line and the flow network was defined, and a seepage analysis was performed with the software MIDAS Soil Works. The consolidation calculation is performed through a simulation of the actual construction stages of the dam. These analyzes were performed using the Mohr-Coulomb soil model and the results are compared with the actual measurements of settlement gauges implanted in the dam. An analysis of the bearing capacity was conducted to show the role of stone columns in improving the bearing capacity of the foundation.

Keywords : earth dam, dam foundation, numerical simulation, stone columns, seepage analysis, consolidation, bearing capacity

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