عنوان مقاله:

Optimization of horizontal drain dimensions in homogeneous earth dams using neural network

محل انتشار:

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خلاصه مقاله:

Designing and optimizing the dimensions of drainage systems is very important for keeping the downstream shells dry and preventing the increase of pore water pressure in the body of earth dams. By optimizing the drainage dimensions, the minimum factor of safety, and consequently the construction costs, can be reduced. The purpose of this research was to optimize the size of horizontal drainage that is affected by some important parameters of the dam. In this study, a homogeneous earth dam was modeled using the Geostudio software. The minimum factor of safety was obtained by changing drainage dimensions, materials, and the slope of the dam body. A two-layer neural network was used to predict the least factor of safety resulted from different scenarios created in the software. By training the neural network based on the data obtained from homogeneous dams, the minimum factor of safety for drainage optimization was extracted. For optimal, an Mfile was fitted to the trained neural network function, by which the optimal values of the dam parameters were calculated.The results showed that the optimum values of drainage dimensions obtained for homogeneous dams for three heights of 10, 20, and 30 m could be generalized to other .heights between 10 and 30 m with a simple interpolation

کلمات کلیدی:

Horizontal drainage, Homogeneous dam, Optimization, Minimum factor of Safety