

عنوان مقاله:

Gravity Dam Shape Optimization Using Simulated Annealing

محل انتشار:

هشتمین کنگره بین المللی مهندسی عمران (سال: 1388)

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خلاصه مقاله:

This paper presents the shape optimization of gravity dam subject to static loadings and restraints. The structural system is discretized by the finite element method. The shape optimization of a concrete gravity dam is posed with the goal of minimum volume of concrete for which the stresses and maximum safety against overturning and sliding are considered as the constraints. The structure is designed for the load combinations which make the maximum effects. The optimization is achieved using a heuristic search algorithm called the Simulated Annealing (SA) algorithm. Just in the same manner the atoms find their way to build a perfect crystal structure through random movements, by mimicking the physical phenomena, SA finds the global optimum through a search within randomly generated configurations. A comparison study was conducted to evaluate the efficiency of the SA against the Sequential Quadratic Programming (SQP) optimization method. The results show that SA can outperform SQP in providing desirable solutions to the shape optimization of gravity dam structure. Finally, conclusions are presented.

کلمات کلیدی:

Simulated Annealing, Optimization, Concrete Dam, Finite Element, SQP

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