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Assessment of Groutability and Cement Take in Khersan II Dam Site

Cement grouting is a common method for sealing and consolidating dam foundations. Since grouting is a cost and time-consuming process, understanding the amount of cement consumption is essential to estimate the cost of any dam construction. The geological setting is one of the main factors affecting the amount of cement take. In this paper, an attempt has been made to investigate the relation between the amount of cement take and the values of Rock Quality Designation (RQD), permeability, joint spacing, and joint aperture, measured in pilot holes drilled at the Khersan II Dam site (west Iran). The amount of cement take shows a direct relation with the values of permeability and joint aperture but presents a reverse relation with the values of RQD and joint spacing. Among the mentioned parameters, the Lugeon value has the highest correlation with cement consumption, however, poor correlation indicates the influence of other factors. To reduce the influence of other factors, the values of cement take were normalized to the injection pressure and then its correlation with the mentioned parameters was investigated again. Results show a significant improvement, especially between the normalized cement take and Lugeon values, resulted in at least the coefficient of determination of 0.7. After validation, the presented equation could be used to estimate the value of cement consumption at similar dam sites.

Keywords: Grouting, Cement Take, Lugeon Number, Joint Aperture, Khersan II Dam.