Geotechnical Investigations And
Seismic Hazard Evaluation at
*Karamah Dam Site*

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Abstract

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In this study the basic parameters for dam site selection have been estimated based on a case study of Karameh dam site selection. Karameh dam project is located across Wadi Mallaha 6km north of Karameh town on the eastern side of the Jordan Valley. This area is part of a major morpho-structural and seismotectonical feature, namely, the Jordan- Dead Sea Rift valley. The present study was carried out to assess the suitability of the chosen dam site based on the determination of geological, geotechnical and seismotectonic studies of the bedrock and construction material. This study included an assessment of the regional tectonic activity of the area where the dam is being constructed. The analysis of the structural data has shown that the area is affected by three sets of joints; J1A, J1b, J2 and J3 with attitudes 90/84 N, 95/85 SWS, 55/81SE and 145/75 SW respectively and affected by one fault system with attitudes 7/75 SE. In addition to that the physical and strength parameters were determined. The results show that the bed rock is formed partly of Ghor El Katar and Lisan Formations. Middle Clay materials are of moderate strength with cohesion and friction values (14.6-190.5 Kpa) and (0.0° -10.5°) respectively. The middle clay unit that is used as core material consists of about 10% clay and 89% silt. This material is formed of Kaolinite, Illite and mixed layer (I/S) clay minerals and of Quartz, calcite and dolomite as nonclay minerals. It is characterized with low to medium plasticity. The permeability of the foundation material is found to be low with a value of 5 x 10^{-7} m/s. This indicates a very low settlement rate under the dam body. Seismic hazard of the area indicate that the dam is being constructed in an active zone where the Jordan valley transform fault passes. The Operating Base Earthquake (OBE) was calculated to generate a PGA of 0.11 g while the Maximum Design Earthquake (MDE) gave a value of 0.45 g.