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**Determination of modulus of deformation using
engineering geology studies and in situ tests
(Case study)**

The engineering properties of geomaterials are determined by laboratory and In-situ testing. Problems associated with sampling, especially in coarse-grained soils, limit the laboratory testing applications to determine the engineering properties of these types of soils. Engineering geological studies would help in-situ test selection as well as managing of the coast and the validity of test results. To increase the height of the Gotvand regulatory dam, determining deformation modules of subsurface material is needed, so a multistage method has been suggested and done. For this purpose, a multi-step method was proposed and performed. In the first stage, the engineering geological properties of subsurface materials have been investigated by using geological study and exploration borehole data. The subsurface materials are gravel with some sand, silt, and clay. At this stage, to determine the modulus of deformability, pressuremeter (PMT), downhole and crosshole tests were performed. Due to the coarse texture and, heterogeneity of the materials, good results were not obtained from the pressuremeter test. In the second stage and with reference to data in first stage, the extension of same strata beneath the dam has specified in river's left bank and the measurement of deformation modules has done by plate loading test (PLT) using circular plates of 60 cm diameter. In the last stage, to investigate the effect of plate dimensions and particle size, PLT using circular plates of 120 cm diameter has been done. By changing the loading plate diameter from 60 to 120 cm, the average measured modulus decreases from 2868 to 1075 kg/cm². In this paper, while expressing the importance of engineering geology studies in selecting suitable in situ tests, the results obtained from various tests have been reviewed.

Keywords: Plate load test, Downhole and Crosshole test, Coarse-grained soil, In situ tests, Engineering geology.

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