



Effect of Crude Oil Spill on Geotechnical Properties of Silty Sand Soil by Using Taguchi Method

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(Date of received: 10/01/2020, Date of accepted: 15/05/2020)

ABSTRACT

To investigate the effects of crude oil leakage on silty sand soil, a functional device was set up; it is highly similar to column test. Some factors were altered during tests such as time leakage, porosity, and water content. Direct shear and permeability tests have been also done on contaminated soil and the curves of tests results were extracted by Taguchi method and Minitab software. This method could present the effects of each factor on internal friction angle, cohesion and permeability separately. Results indicate that by increasing the time leakage, shear strength parameters raised while permeability considerably reduced. Furthermore, with increase in porosity of soil samples, the values of shear parameters were decreased while permeability was increased. The only factor which has brought a positive impact to shear strength parameters is water content; because this factor has fallen permeability and improved the shear parameters. Taguchi method is the most effective method to investigate the behavior of contaminated soil, which can be used in other related studies.

Keywords:

Crude oil, Contaminated soil, Permeability, Shear strength, Taguchi design method.