

Electrokinetic Application for the Improvement of Soft Clays

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Abstract : The electrokinetic application (EKA), a relatively modern chemical treatment has a potential for in-situ ground improvement in an open field or under existing structures. It utilizes a low electrical gradient to transport electrolytic chemical ions between bespoke electrodes inserted in the fine-grained, low permeable soft soils. The paper investigates the efficacy of the EKA as a mitigation technique for the soft clay beds. The laboratory model of the EKA comprises of rectangular plexiglass test tank, electrolytes compartments, geosynthetic electrodes and direct electric current supply. Within this setup, the EK effects resulted from the exchange of ions between anolyte (anodic) and catholyte (cathodic) ends through the tested soil were examined by basic experimental laboratory testing methods. As such, the treated soft soil properties were investigated as a function of the anode-to-cathode distances and curing periods. The test results showed that there have been some changes in the physical and engineering properties of the treated soft soils. The significant changes in the physicochemical and electrical properties suggested that their corresponding changes can be utilized as a monitoring technique to evaluate the improvement in the engineering properties EK treated soft clay soils.

Keywords : electrokinetic, electrolytes, exchange ions, geosynthetic electrodes, soft soils

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