Dewatering Efficiency of Electroosmosis: Electrodes configuration

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Abstract:

This research conducted a series of experiments to examine electrokinetic performance on dewatering and settlement in soft clay subjected to two configurations of electrode including; 1) anode and cathode were placed at top and bottom boundaries respectively, and vice versa for the other configuration. These configurations were later labeled as 1AT and 1AB respectively. It was found that the 1AB yielded the best result in term of settlement (27.08 mm). It was concluded that the influence of electrophoresis and gravity played roles to the magnitude of settlement. Due to upward moving of clay particles during settlement (influence of electrophoresis), placing an anode above a cathode would generate cracks which interferes drainage of water, and hence settlement. This study also confirms that soil dewatering is governed by electro-osmosis process rather than effect of temperature. Reduction of water content during the experiment affects the efficiency of electrokinetic technique, including electric current and electrical resistance. As such, this technique is suitable for any problem that requires smaller amount of dewatering within very short time period.

Keywords:

Electroosmotic, Water drainage, Electrode arrangement.