

Effect of Electrodes Configuration on Dewatering Efficiency with Electroosmosis

Authors : Avirut Chinkulkijniwat, Cholticha Jeebtaku, Somja Yubonchit

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 terms of settlement (27.08 mm). It was concluded that the influence of electrophoresis and gravity played roles in the magnitude of settlement. Due to the upward moving of clay particles during settlement (influence of electrophoresis), placing an anode above a cathode would generate cracks that interfere with the drainage of water and, hence settlement. This study also confirms that soil dewatering is governed by electro-osmosis process rather than effect of temperature. The 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 a smaller amount of dewatering within the very short time period.

Keywords : electroosmotic, soft clay, soil water drainage, electrode configuration

Conference Title : ICSMGE 2025 : International Conference on Soil Mechanics and Geotechnical Engineering

Conference Location : Phuket, Thailand

Conference Dates : February 24-25, 2025