

## Using Electro-Biogrouting to Stabilize of Soft Soil

**Authors :** Hamed A. Keykha, Hadi Miri

**Abstract :** This paper describes a new method of soil stabilisation, electro-biogrouting (EBM), for improvement of soft soil with low hydraulic conductivity. This method uses an applied voltage gradient across the soil to induce the ions and bacteria cells through the soil matrix, resulting in CaCO<sub>3</sub> precipitation and an increase of the soil shear strength in the process. The EBM were used effectively with two injection methods; bacteria injection and products of bacteria injection. The bacteria cells, calcium ions and urea were moved across the soil by electromigration and electro osmotic flow respectively. The products of bacteria (CO<sub>3</sub>-2) were moved by electromigration. The results showed that the undrained shear strength of the soil increased from 6 to 65 and 70 kPa for first and second injection method respectively. The injection of carbonate solution and calcium could be effectively flowed in the clay soil compare to injection of bacteria cells. The detection of CaCO<sub>3</sub> percentage and its corresponding water content across the specimen showed that the increase of undrained shear strength relates to the deposit of calcite crystals between soil particles.

**Keywords :** Sporosarcina pasteurii, electrophoresis, electromigration, electroosmosis, biocement

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