**Effect of Cement Ratio to The Shear Strength and Consolidation Process of Sandwich Soil**

Thanh Tu Nguyen1,\*, Minh Duc Nguyen 1, Thanh Tai Tran 1, Tong Nguyen 1

*1* *Faculty of Civil Engineering, Ho Chi Minh City University of Technology and Education, 01 VoVan Ngan, Thu Duc City, Ho Chi Minh City, Vietnam*

*\*tunt@hcmute.edu.vn*

**Abstract.** Every year, the riverbed soil excavated in rivers in the South of Vietnam was not used due to its poor properties, whereas a large of sand is used as backfill soil for road constructions. So, using soil as a backfill brings many advantages, such as: avoiding the environmental effects of dredging the clay, reducing the use of natural sand, reducing the cost of construction and so on. However, as a very soft clay, riverbed clay is difficult soil for embankment application. After soaking, it becomes not only softer but also looser, reducing substantially the original bearing capacity. To improve those problems, the riverbed clay can be reinforced with cement. A mixture including cement and soil for the surface course was put on top of the soil. To investigate the properties of this structure, a series of consolidation and shear tests will be experimented. The result shows that a sandwich including soil, soil -cement can improve the bearing capacity and the consolidation process. A series of direct sheat test with many shear velocities, different soaking conditions as well as the ratios between soil and cement was performed to investigate the bearing capacity. Additionally, the one-direction test consolidation was done to investigate the consolidation time and settlement of the sandwich soil and cement-soil mixture.

**Keywords:** cement, consolidation, shear strength, soil