

THESIS INFORMATION

PhD. Student: **Le Quan**
Thesis title: **STUDY ON DEFORMATION BEHAVIOUR OF GEOSYNTHETIC ENCASED GRANULAR COLUMN USED IN SOFT SOIL IMPROVEMENT**
Major: **Geotechnical**
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Scientific supervisors: **Dr. Vo Dai Nhat, Assoc.Prof.Dr. Nguyen Viet Ky**
Universty: **Ho Chi Minh City University of Technology, Vietnam National University Ho Chi Minh City**

THESIS ABSTRACT

This thesis presents the results of "**Study on deformation behaviour of geosynthetic encased granular column used in soft soil improvement**".

The improvement of soft soil ground by geosynthetic encased granular column is a new method with many advantages, but in Vietnam there is not any form of adequate research on this method. In order to be able to apply the method of improving soft soil by geosynthetic encased granular column in Vietnam conditions. Therefore, it is necessary to systematically study theory, computational models, and experiment. The Content and results of the study in the thesis focus on the following main issues:

- To study the general overview of geosynthetic encased granular column including research on theoretical basis, studies in the world and Vietnam. The results show that Vietnam has not had any theoretical studies as well as works applied in practice.
- To study, analyse and evaluate the influence of design parameters and column material properties to deformation behaviour of geosynthetic encased granular column. In this study, the researcher simulated the unit cell model using PLAXIS software to investigate the influence of design parameters on deformation behaviour of geosynthetic encased granular columns such as: column diameter, spacing, thickness of soft soil layer, modulus of column material, etc. The input parameters are based on the characteristics and geological conditions of the Vifon II factory in Long An province.
- To study, analyse and evaluate the modelling of geosynthetic encased granular column calculated by numerical method using copyright PLAXIS v2018 with results obtained from measurement monitoring and experimental on site. Through three research contents as mentioned above, the results show that the "Soft Soil" model applied to soft ground

gives results closer to the field test results than applying the “Morh-Coulomb” model. Therefore, soft ground using “Soft Soil” model to simulate is suitable and reality.

- To study, analyse and evaluate the deformation behaviour of geosynthetic encased granular column by Analytical and Numerical method. The study results show that the settlement and deformation of soft ground reinforced by geosynthetic encased granular columns as calculated by numerical method is lower than calculated by analytical method.

Based on the theoretical study and practice of calculation contents as mentioned above. The study results show the outstanding advantages of geosynthetic encased granular column compared to conventional granular column in soft soil improvement. This method also shows the important role effect of geosynthetic in improving the stiffness of the column, thereby significantly improving the load capacity, and reducing settlement deformation. The research results can be used for teaching in the university, as well as in the practice of improving soft soil in Vietnam in near future.

Scientific supervisors

1. Dr. Vo Dai Nhat
2. Assoc.Prof.Dr. Nguyen Viet Ky

PhD. Student

Le Quan