



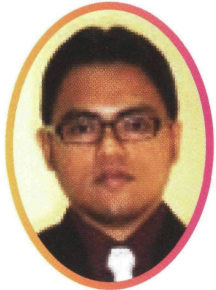
UNIVERSITI
TEKNOLOGI
MARA

Institut
Pengajian
Siswazah

THE DOCTORAL RESEARCH ABSTRACTS

Volume: 14, October 2018

14th
ISSUE



Name : NAZARUDDIN BIN ABDUL TAHA

Title : PERFORMANCE OF FLOATING SEMI RIGID PULVERIZED FLY ASH STONE COLUMN

Supervisor : PROF. IR. DR. DATIN HJH. ZAINAB MOHAMED (MS)

ASSOC. PROF. DR. MOHD JAMALUDDIN MD NOOR (CS)

Stone column is among the method commonly used in ground improvement work. Simplicity on installation, cheapest cost and its effectiveness on ground improvement. In this study, Pulverized Fly Ash (PFA) applied as additive material to solve the bulging problem of stone column. Sample of PFA have been used taken from power plant Sultan Salahuddin Abdul Aziz Shah and considered as Class F PFA. In the beginning of study, ten configurations of mixture material (PFA, cement and sand) was proposed to identify the optimum of PFA content. The configurations grouped in two cement content, 10% and 5%. Unconfined Compression Test (UCT) and modified big shear box were conducted to study the behaviour of each configuration before tested on plate load test. From the result obtained found that sample of 70%PFA SC was the highest compressive strength. Meanwhile in direct shear test, 65%PFA was obtains the highest interface shear strength. However, results of interface shear strength for each configuration does not give significant difference. The optimum amount PFA as a filler material was in range 65% to 70% and for sand was in range 30% to 40%. Afterward, three configurations from each group 10% and 5% cement content tested on plate load test to observe the performance of sample on treated soft ground. Comparison study was applied on plate load test, six samples of PFA stone column compared with the conventional stone column

and untreated soft soil. The result from plate load test shows that by applying additive materials such PFA and cement on conventional stone column have gave a better result two to four times on settlement improvement ratio and bearing capacity ratio. Numerical modelling was conducted using PLAXIS software in 2-Dimensional model. The numerical model has been verified with the experimental results. Four length and two value of area replacement ratio of each configuration were carried out to study the effect on treatment soft ground. From the generated results shows length of column and wide load area play a vital role on improving soft soil. Dimensional analysis method by using Buckingham Pi-Theorem was applied to analyse the results generated from numerical model for empirical equation prediction. six parameters involved for analysis of settlement improvement ratio and coefficient bearing capacity; undrained shear strength of PFA SC and soft soil, area replacement ratio, depth of soil, length and diameter of column. Both of equation prediction for settlement improvement ratio and coefficient bearing capacity have been compared with previous studies for further evaluation.