FINAL YEAR PROJECT REPORT

BACHELOR OF ENGINEERING (HONOURS) (CIVIL)

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SHAH ALAM, SELANGOR DARUL EHSAN

EFFECT OF SHEARING SPEED ON THE

SHEAR STRENGTH PARAMETERS

OF REMOULDED LATERITIC SOIL

BY

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OCTOBER 1998

ACKNOWLEDGEMENTS

In the name of ALLAH the Most Beneficent, and the Merciful. Firstly I would like to express my sincere gratitude to my project supervisor Encik Abdul Rahman bin Mahamood for his valuable contribution, guidance, criticisms and suggestion that enabled me to complete the project.

I would also like to thank the laboratory technicians and all my colleagues for their unselfish help and idea contributing directly or indirectly to this project.

Last but not least, the author wishes to express special thanks to his beloved parents, for their encouragement, understanding, moral and financial support throughout the course of his study at MARA Institute of Technology, Shah Alam, Selangor.

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ITM Shah Alam / OKT 98

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ABSTRACT

The shear strength is an important part in soil engineering. It is the property, which provides the supporting ability and bearing capacity of soil. Shearing speed or rate of loading applied during the process shearing of soil sample is on the basis of value recommended by British Standard (BS). Effect of speed should be curiously taken into consideration especially clay soil as it has a very low permeability with respect to its finer size fraction. The lower the permeability the longer the time needed for the pore pressure equalization (95%) of pore water pressure equalization as recommended by BS.

Shearing speed can be expressed as the deformation of soil during shearing per time to failure. British standard has limited the deformation as maximum as 25% especially for plastic deformation whilst the time to failure is given by the primary consolidation time (t_{100}) multiply by the coefficient of side drain as derived by Bishop and Hakel, 1962 and Blight (1963).

BS have outlined the minimum time to failure for any type of soil as 2 hours. If any soil yields time to failure base on consolidation time is less than 2 hours, then the minimum time of 2 hours should be taken in determining the shearing speed. It should be noted that the time to failure outlined by BS is due to the testing conducted on non-Malaysian soil. Currently Malaysian engineers have questioned the validity of time to failure on Malaysian soil and asked for slower speed, as the behavior of soil is different from one place to another.

1.0 INTRODUCTION

1.1 GENERAL

British Standard for soil testing, BS 1377 1990: Part 8 recommended shearing speed based on the relationship between the amount of deformation and the expected time for the sample to fail. This value of speed is widely used in determining the appropriate shear strength parameters of the soil. However, some engineers in Malaysia are questioning whether this recommended value is sufficient for Malaysian soils especially clay, as pore water pressure needs longer time to dissipate evenly throughout the sample during shearing. Any discrepancy with respect to pore water pressure taken at any time especially during failure will affect the effective stress, σ' of soils and hence, the shear strength parameters.

The study was undertaken to verify the value of shearing speed for lateritic soils as recommended by the British Standard. The shearing speed was calculated based on consolidation time namely t_{100}.