

FINAL YEAR PROJECT REPORT
BACHELOR OF ENGINEERING (HONS) (CIVIL)
SCHOOL OF CIVIL ENGINEERING
MARA INSTITUTE OF TECHNOLOGY
SHAH ALAM , SELANGOR D.E

EFFECT OF SHEARING SPEED ON THE
SHEAR STRENGTH PARAMETERS
OF REMOULDED LATERITIC SOIL

MOHIDEEN ABDUL KADER BIN ABDUL HAMID

NOVEMBER 1996

ACKNOWLEDGEMENT

In the name of ALLAH, the most Beneficent and Merciful, Lord of the Universe, Alhamdulillah, with His help the author manage to complete his final year project. Praise be to Prophet Muhammad, his companions and those who follow his path as what he preached upon, may Almighty Allah keep us in His blessing.

The author wishes to express deepest gratitude to his advisor, Encik Abdul Rahman Mahamood for his valuable contribution, guidance, criticisms and suggestions which enabled him to complete the project.

Heartfelt thanks are also due to those friends, especially to Intan Rohani Endut and Kamaruzzaman Mohamed, laboratory staffs En. Mohd Hafiz, En. Ahmad Razman, En. Mohd Yusof and the rest for their unselfish assistance and guidance in carrying out the experiment towards the completion of the project.

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

Mohideen Abdul Kader Abdul Hamid

94125550

ITM Shah Alam/NOV 96

CONTENTS

Acknowledgement	i
Table of Contents	ii
List of Tables	vi
List of Figures	viii
Principal Symbols	x
Abstract	xi

CHAPTER 1 : INTRODUCTION

1.1 General	1
1.2 Objective	2
1.3 Scope of study	2
1.3.1 Collection of soil sample	2
1.3.2 Classification of soil	3
1.3.3 Compaction test	3
1.3.4 Consolidated undrained test	3
1.3.5 Analysis of data	4
1.4 Flow chart of study	4

CHAPTER 2 : LITERATURE REVIEW

2.1 Definition of laterite soil	6
2.2 Formation of laterite soils	8
2.3 Laterite soil profiles	9

ABSTRACT

Shearing speed or rate of loading applied during the triaxial test normally is being practised on the basis of the value recommended by the British Standard on soil testing. The value recommended is based on the consolidation time for a particular soil.

Shearing speed that is being widely practised represent the recommendation given based on the testing done on non-Malaysian soils. However, for Malaysian soils, the behaviour may not necessarily be the same. In fact, some engineers have questioned on the validity of recommended speed and have asked for a much slower speed.

From the study there was no significant changes in shear strength parameters due to variation in shearing speed of the laterite soil. The shearing speed might affect the effective stress since the equalisation of pore water pressure depends on the rate of shearing applied. In terms of deviator stress the effect of shearing speed can be omitted as the pore water pressure is the same for both total and effective stresses. The increase in pore water pressure with time might have a considerable changes for different rate of speed.

The study also concluded that as far as the lateritic soil is concerned, the shearing time for CIU could be faster i.e. less than 2 hours as recommended by BS. This being supported from the results of the shear strength parameters.

1.0 INTRODUCTION

1.1 GENERAL

British Standard for soil testing, BS1377. 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} .