A LABORATORY STUDY ON THE PROPERTIES OF ALLUVIAL MARINE SOIL: CASE STUDY OF PERAI AREA

By

AINA ADAM

Report is submitted as
the requirement for the degree of
Bachelor Engineering (Hons) (Civil)

UNIVERSITI TEKNOLOGI MARA
April 2007
DECLARATION

I Aina binti Adam, 2003479578 confirm that the work is my own and that other appropriate credit has been given where reference has been made to the work of others.

11th May 2007
ACKNOWLEDGEMENT

First of all, I would like to give my deepest gratitude to the Almighty God for His blessings. Praise to the God as He had given me strength and patience during the time completing this proposal report.

Thank you to my supervisor Ir. Dr. Mohd Farid bin Ahmad @ Majid for giving me guidance and advices that I need.

I also appreciate the contribution given by my team member who had helped me in my laboratory work. Their cooperation was really a big help.

I am grateful to my beloved family for their moral and financial supports and always be there for me.

Last but not least to all the Technicians and my friends who also give a hand from the day I started my proposal work until the moment of submission of this report. Thank you and I really most appreciate it.

For others who have contributed directly and indirectly to the completion of this research, your help is very much appreciated.
ABSTRACT

The objectives of this research were to carry out a laboratory testings on disturbed soil sample of Perai alluvial soil. Laboratory studies were conducted to determine the index properties and the shear strength of the alluvial soil. The laboratory studies were divided into two parts which were laboratory strength test and classification tests. The study involved collection of samples from underneath the Penang Bridge. Based on the test, the alluvial marine soil has been classified as either SILT of high plasticity or CLAY of high plasticity. The shear strength parameters of the soil which is cohesion and friction angle were 6.2 kPa and 20° respectively.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DECLARATION</td>
<td>ii</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENT</td>
<td>iii</td>
</tr>
<tr>
<td>TABLE OF CONTENT</td>
<td>iv</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>viii</td>
</tr>
<tr>
<td>LIST OF TABLE</td>
<td>x</td>
</tr>
<tr>
<td>LIST OF APPENDICES</td>
<td>xi</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>xii</td>
</tr>
</tbody>
</table>

## CHAPTER

### 1.0 INTRODUCTION

1.1 Background 1  
1.2 Problem Statement 2  
1.3 Objectives 3  
1.4 Significant of study 3  
1.5 Scope of work 4

### 2.0 LITERATURE REVIEW

2.1 Introduction 5  
2.2 Basic Properties of Cohesive Soil 5  
  2.2.1 Liquid Limit 6  
  2.2.2 The Casagrande Device 7  
  2.2.3 The Cone Penetrometer Apparatus 8