DEPARTMENT OF BUILDING SURVEYING
FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING
UNIVERSITI TEKNOLOGI MARA

TITLE OF DISSERTATION:
CONCRETE REPAIR FOR BUILDING MAINTENANCE WORK

NOOR SAADIAH BT BIDIN
2006699772
BACHELOR OF BUILDING SURVEYING (HONS)

APRIL 2009
Concrete is made up of three basic components which are water, aggregate (rock, sand or gravel) and Portland cement. Cement usually in a powder form, act as a binding agent when mixed with water and aggregates. This combination or concrete mix will be poured and harden into the durable material with which we are all familiar. Concrete is a versatile building material that is cast inexpensively and is durable, strong and takes the shape of the form in which it is cast. Most concrete members are cast on site and in their final location. Marginal works and construction procedures cause imperfections that required repair. Natural forces and use in service cause deterioration or damage which must be repaired or replaced during maintenance of the structure. The choice of a repair material must consider thermal compatibility with the base concrete, durability requirements, service conditions, chemical and electrical environment, shrinkage characteristics, modulus elasticity and placement conditions. Most concrete repairs involve the removal of concrete which may either have deteriorated or have a construction defect or be damaged. There are various methods of removal and repair which are economic, safe and easy which suitable with the concrete damage or crack.
### TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DECLARATION</td>
<td>ii</td>
<td></td>
</tr>
<tr>
<td>ACKNOWLEDGEMENT</td>
<td>iii</td>
<td></td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>iv</td>
<td></td>
</tr>
<tr>
<td>ABSTRAK</td>
<td>v</td>
<td></td>
</tr>
<tr>
<td>TABLE OF CONTENTS</td>
<td>vi</td>
<td></td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>xii</td>
<td></td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>xiii</td>
<td></td>
</tr>
<tr>
<td>1 INTRODUCTION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1 Preface</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1.2 Problem Description 3
1.3 Project Objectives 4
1.4 Project Scope 5
1.5 Project Significance 6
1.6 Conclusion 7

2 LITERATURE REVIEW

2.1 Introduction 8
2.2 Building Materials 9
2.3 Concrete Material 9
  2.3.1 Reinforced Concrete 9
  2.3.2 Mass Concrete 10
  2.3.3 Steel 10
  2.3.4 Sand 11
  2.3.5 Rock 13
  2.3.6 Wood 14
2.3.7 Brick and Block 15

2.3.8 Metals 16

2.3.9 Glass 16

2.3.10 Cement Composite 17

2.3.11 Concrete 18

2.4 Concrete Use in Building Structural Element 20

2.4.1 Column 20

2.4.2 Beam 21

2.4.3 Foundation 23

2.4.4 Wall 24

2.5 Types of Concrete Defects and Causes 26

2.5.1 Crack 26

2.5.2 Excess Water 28

2.5.3 Segregation 30

2.5.4 Drying Shrinkage 31

2.5.5 Plastic Shrinkage Crack 35