DURABILITY STUDIES OF SPENT MUSHROOM COMPOST ASH (SMCA) AS PARTIAL CEMENT REPLACEMENT IN CONCRETE

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UNIVERSITI MALAYSIA PAHANG
SUPERVISOR’S DECLARATION

I hereby declare that I have checked this thesis and in my opinion, this thesis is adequate in terms of scope and quality for the award of the degree of Bachelor of Engineering (Hons) Civil Engineering.

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I hereby declare that the work in this thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Malaysia Pahang or any other institutions.

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DURABILITY STUDIES OF SPENT MUSHROOM COMPOST ASH (SMCA) AS PARTIAL CEMENT REPLACEMENT IN CONCRETE

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Thesis submitted in fulfillment of the requirements for the award of the Bachelor Degree in Civil Engineering

Faculty of Civil Engineering and Earth Resources
UNIVERSITI MALAYSIA PAHANG

JUNE 2017
ACKNOWLEDGEMENTS

I wish to acknowledge the guidance, advice and assistance given by my supervisor, Dr. Doh Shu Ing and to thank him for his encouragement and motivation, without which this thesis would not be possible. I am also greatly thankful to him for the limitless time he spent in helping through with the writing of the thesis.

In addition, I am also grateful to University Malaysia Pahang for providing us refined equipment and comfortable working environment. Thanks are due to the technicians of the concrete laboratory of the Faculty of Civil Engineering & Earth Resources En. Muhammad Nurul Fakhri, En. Mohd Hafiz, En. Muhammad Fadzil and En. Kamarul Azri for their guidance and instructions during the laboratory works of my research.

Special thanks to Pn. Norazimah from Environmental Engineering Lab for providing chemicals that were needed for my research. I would also like to give special credit to The Grow Enterprise in Maran for supplying me the research material.

Last but not least, I would like to acknowledge my family members for their love and encouragement all the way to the completion of my research works.
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LIST OF SYMBOLS

\begin{itemize}
\item \textit{g} \quad \text{gram}
\item \textit{m} \quad \text{Meter}
\item \textit{°C} \quad \text{Degree Celcius}
\item \textit{ha} \quad \text{hectare}
\item \textit{mm} \quad \text{Millimetre}
\item \textit{%} \quad \text{percent}
\item \textit{kg} \quad \text{kilogram}
\item \textit{μm} \quad \text{micrometer}
\item \textit{N/mm}^2 \quad \text{Newton per millimeter square}
\item \textit{N/(mm}\cdot\text{s}) \quad \text{Newton per millimetre second}
\item \textit{MPa} \quad \text{Megapascal}
\item \textit{N} \quad \text{Newton}
\item \textit{mm}^2 \quad \text{Millimetre square}
\item \textit{h} \quad \text{Hour}
\item \textit{mm/\sqrt{min}} \quad \text{Millimetre per minute square}
\item \textit{g/cm}^3 \quad \text{Gram per centimetre square}
\item \textit{cm}^2 \quad \text{Centimetre square}
\item \textit{min} \quad \text{Minute}
\item \textit{±} \quad \text{Plus minus}
\item \textit{pH} \quad \text{Potential of hydrogen}
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<tr>
<td>Al₂O₃</td>
<td>Aluminium Oxide</td>
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<tr>
<td>ACI</td>
<td>American Concrete Institute</td>
</tr>
<tr>
<td>ASTM</td>
<td>American Society for Testing and Materials</td>
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<tr>
<td>BS</td>
<td>British Standard</td>
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<tr>
<td>BRE</td>
<td>Building Research Establishment</td>
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<tr>
<td>CaCl₂</td>
<td>Calcium Chloride</td>
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<td>Ca(OH)₂</td>
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<tr>
<td>Ca²⁺</td>
<td>Calcium Ion</td>
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<td>CaO</td>
<td>Calcium Oxide</td>
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<td>CEN/TR</td>
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<td>CS</td>
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<tr>
<td>C-S-H</td>
<td>Calcium-Silicate-Hydrate</td>
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