

**BEHAVIOUR OF CONCRETE BEAMS  
REINFORCED JUTE FIBER MAT**

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## **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 Civil Engineering (Hons.).

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## **STUDENT'S DECLARATION**

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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## LIST OF SYMBOLS

%	Percentage
% (W/V)	Percent of weight of solution in the total volume of solution
°C	Degree celsius
c-c	Centre to centre
kg	Kilogram
kg/m <sup>3</sup>	Kilogram per cubic metre
kN/sec.	Kilonewton per second
L	Liter
L1	Length
L2	Width
m <sup>3</sup>	Cubic meters
mm	Millimeter
mm/min	Millimeter per minute
MPa	Mega Pascal
N/mm <sup>2</sup>	Newton per millimeter square

## LIST OF ABBREVIATIONS

ASTM	Amerian Society for Testing and Materials
BS	British Standard
CB	Control beams
CFRP	Carbon fiber reinforced polymer
DoE	Department of The Environmental
FFRP	Flax fiber reinforced polymer
FRP	Fiber reinforced polymer
GFRP	Glass fiber reinforced polyemer
JFM	Jute fiber mat
JFMB	JFM reinforced beams
JFRP	Jute fiber reinforced polymer
KF	Kenaf fiber
LVDT	Linear variable displacement transducer
NaOH	Sodium hydroxide
NSM	Near surface mounted
OPC	Ordinary Portland Cement
RC	Reinforced Concrete
S	Satisfactory failure
SB	Steel bar reinforced beams
TPU	Thermoplastic polyurethane
U	Unsatisfactory failures
UMP	Universiti Malaysia Pahang
UTM	Universal testing machine