

**FINITE ELEMENT ANALYSIS OF RC BEAMS  
WITH BAMBOO FIBER REINFORCED  
COMPOSITE PLATE USING ABAQUS**

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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 Bachelor of Engineering with Honours Civil Engineering.

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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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FINITE ELEMENT ANALYSIS OF RC BEAMS WITH BAMBOO FIBER  
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## LIST OF SYMBOLS

E	Modulus of Elasticity
$\nu$	Poisson's ratio
kN	Kilo Newton
m	Meter
mm	Millimetre
MPa	Mega Pascal
GPa	Giga Pascal
tonne/mm <sup>3</sup>	Tonne per cubic millimetre

## LIST OF ABBREVIATIONS

3D	3 Dimensional
RC	Reinforced Concrete
CB	Control Beam
BFRCP	Bamboo Fiber Reinforced Composite Plate
UBF	Unstrengthened Beam in Flexural
SBF	Strengthened Beam in Flexural
PSBF	Polyester-Strengthened Beam in Flexural
VSBF	Vinyl ester-Strengthened Beam in Flexural
UBO	Unstrengthened Beam with Openings
SBO	Strengthened Beam with Openings
PSBO	Polyester-Strengthened Beam with Openings
VSBO	Vinyl ester-Strengthened Beam with Openings
FE	Finite Element
FEA	Finite Element Analysis
FRP	Fiber Reinforced Polymer