

**SOLID MODELING OF REINFORCED  
CONCRETE BEAM  
UNDER DYNAMIC LOADING**

By

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## DECLARATION

Except where reference is made to the work of others, this report is believed to be original.



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# TABLE OF CONTENTS

<i>Title</i>	<i>Page</i>
<b>ACKNOWLEDGEMENT</b>	i
<b>TABLE OF CONTENTS</b>	ii
<b>LIST OF TABLES</b>	v
<b>LIST OF FIGURES</b>	vi
<b>NOTATIONS</b>	viii
<b>LIST OF PLATES</b>	ix
<b>ABSTRACT</b>	x
<b>CHAPTER 1.0: INTRODUCTION</b>	
1.1 General	1
1.2 Objective	2
1.3 Scope of Work	2
<b>CHAPTER 2.0: LITERATURE REVIEW</b>	
2.1 General	3
2.2 The Finite Element Method	4
2.3 The Element Stiffness Matrix	5
2.4 High Strength Concrete	6
2.4.1 <i>Features of Reinforced Concrete Behavior</i>	7
2.5 Loading Conditions	8
2.5.1 <i>Static Analysis</i>	8

## ABSTRACT

A 3-D model for finite element analysis of reinforced concrete beam under dynamic loading is presented. The deflection of high strength concrete under a dynamic loading with respect to the serviceability and ultimate limits were analyzed, where a sinusoidal wave pattern was introduced to the model to investigate stressed regions and deflection patterns. The model was simulated as per experimental work by Sharul Azman Shamsuddin, 1997, which was a reinforced high strength concrete beam. The beam was subjected to a two point load to simulate the static loading as well as dynamic loading.

In static analysis, despite large difference if compared to the experimental result, the linear region is closer towards theoretical values especially Macaulay's. However, after modification of the assumption of the experimental result, the 3-D ANSYS model had achieved less than 10% difference in terms of deflection at yield and ultimate load. In dynamic analysis, the deflection over 3 million cycles was 1.4% smaller than experimental result.