NON LINEAR FINITE ELEMENT MODELLING OF REINFORCED CONCRETE BEAM

by

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A Report Submitted to the School of Civil Engineering
In Partial Fulfillment of the Requirements for the award
of a Degree in Bachelor of Engineering (Honours) (Civil)

May 1997

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ACKNOWLEDGMENT

I would like to take this opportunity to extent and express my sincere thanks and deepest gratitude to the Project Supervisor ,

Encik Ahmad Ruslan Mohd Ridzuan and Dr Azmi Ibrahim for their guidance, supervision and encouragement throughout the preparation of the project.

I would also like to thank Puan Afidah bt Abu Bakar for her advises and valuable guidance during towards completion of this project.

I also would like to thank to my beloved wife and son

who had given their moral support and very understanding for me to complete this project.

Finally , thanks to the lecturers and colleagues for supporting me

to complete the project successfully

ABSTRACT

In recent years, reinforced concrete has been used with increasing sophistication in the construction of complex structures, such as multi story tall buildings, long span bridges, LRT track and dam.

These structures are subjected to a variety of environmental loads, wind, wave forces and do not forget earthquake motions. Under extreme conditions, a structure may be deformed well beyond its linearly elastic range, and hence a nonlinear analysis becomes necessary.

In this study, the linear and non linear finite element analysis have been used to modelled the reinforced beam which we can find the suitable model to represent by comparing the non linear and linear result.

For linear analysis, a model with varying E-value for concrete in tension were adopted with two different type of element. The result form non linear analysis will compared with the linear model varying E-value and existing experimental result. Finally, we can conclude of the adtanges of designing non linear analysis instead of linear analysis.

CHAPTER 1

INTRODUCTION

1.1 GENERAL

In recent years, reinforced concrete has been used with increasing sophistication in the construction of complex structures, such as multi story, tall buildings, long span bridges etc. In our country Kuala Lumpur Tower has been a prominent concrete structure recently . These structures are subjected to a variety of environmental loads, including earthquake motions, wind and wave forces. Under extreme conditions, a structure may be deformed well beyond its linearly elastic range, and hence a *non-linear* analysis become necessary. The finite element techniques has the potential to play an increasingly important role in all areas of reinforced concrete research, design and analysis. The availability of finite element software have contributed a great deal of analyzing the behavior in terms of displacement, thermal effect, stress, deflection, cracking etc.

In **Finite Element Modeling** reinforced concrete may be described by different, separated elements for concrete, reinforcement and bond or may be integrated in one element with a constitutive law for concrete and steel or for both together.