ANALYSIS OF A 3-D FINITE ELEMENT MODEL OF REINFORCED CONCRETE (RC) BEAM UPON TREATMENT OF CRACKS

By

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DECLARATION

I Mohd Zafri Bin Mohd Ridzwan, 2002611625 confirm that the work is my own and that appropriate credit has been given where reference has been made to the work of others.

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ABSTRACT

Cracks are common phenomenon to concrete structures. The initial cause of cracking in concrete is due to shrinkage during setting. Cracks contribute to the deterioration of residual strength to concrete members. The applications of treatment are often required to rehabilitate the affected area.

The aim of this study is to analyse reinforced concrete (RC) beam upon treatment of cracks, using Finite Element Method (FEM). A beam was modelled in 3-D solid using LUSAS version 13.6 sortware. The study considered all flexural, shear and cracking behaviour of the RC beam.

CHAPTER 1

INTRODUCTION

1.1   General

Tension crack most often occur in concrete beams when bending caused, tension forces stretch the reinforcing steel. Cracks must form in the concrete in order to transfer the force to the steel, but the cracks normally are quite numerous, small and undetectable. They form, perpendicular to the long axis of the member, and as long as they remain hair like, the structure is behaving normally.

Nowadays, there are many ways to do analysis on reinforced concrete beam upon treatment of cracks. One of them is by using Finite Element Method. The Finite Element Method is a numerical method for solving problems of engineering and mathematical physics[1]. It can be used to calculate deflection under loading or applied displacement and many other phenomenon.

In this study, cracks appeared in RC beam due to loading conditions and or support conditions. An analysis with non-linear routines on residual strength before and after the crack treatment is applied using Finite Element Method.