UNIVERSITI TEKNOLOGI MARA

INVESTIGATION OF STEEL FIBRE REINFORCE CONCRETE SLAB UNDER BENDING

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Candidate's Declaration

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknoligi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledge as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any other degree or qualification.

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ABSTRACT

This research work presents the investigation and study on the application of steel fibre as reinforcement in concrete slab. The reinforced concrete samples were prepared previously in study made by Abdul Rahman (2008). The size of the SFRC slab is 1500x1000x75 mm (span-width-thickness). In this research, the SFRC slabs are tested for bending to investigate its structural behaviour. Unlike other research made on SFRC slab, no other reinforcement such as BRC was added to the slab. Result from the experimental works is compared theoretically to BRC slab analysed using Esteem Software. The SFRC slabs has been prepared using 0.345 of water-cement ratio and 5kg (0.4%) dosage of hooked end steel fibre of 1200 MPa strength. Initial grade 30 concrete was changed to grade 40 in order to achieve early high strength of the concrete mix. No admixtures were added to the concrete during batching process. The experimental work arrangement for the slab to be simply supported with load applied on the mid span of the slab. The load is applied incrementally until failure. There are numerous studies made on the addition of SFRC in concrete and prove that steel fibres increased the flexural and ultimate capacity of the plain concrete. This improvement includes fracture toughness, concrete ductility, better carrying capacity and enhances overall durability. It is hope from this study, the use of steel fibre will expand in construction industry in Malaysia.

TABLE OF CONTENTS