**ABSTRACT**

*Long Term Durability Studies of Glass Fibre Reinforced Concrete*

Extensive experimental investigation on glass fibre reinforced concrete was carried out by researchers. Glass fibre mesh is more effective in resisting bending and punching shear. Steel Fibres are most popular metallic fibres used for the production of Steel Fibre Reinforced Concrete particularly from the point of view of strength and ductility. Test results conducted by various researchers revealed that the use of non-metallic fibre like Nylon, Polythene, Organic fibres, Vegetable fibres etc. are more effective in resisting bending and punching shear. Usually, usage of fibres enhances the properties of concrete structures. Glass Fibres are used for the production of Glass Fibres Reinforced Concrete in this study. Glass fibres of size 1mm dia are available for industries. Fibre reinforced concrete is used for the construction of airport pavements to improve the properties of strength and toughness.

At present, research studies are made on various properties of glass fibre reinforced concrete by using AR-Glass fibres in concrete in various percentages.

In the present experimental investigation, attempts are made to study on the various strength properties like compressive strength, split tensile strength, flexural strength and secant modulus of elasticity and also durability properties like Acid and Sulphate attack on both ordinary concrete and Glass Fibre Concrete, using alkali-resistant glass fibres at stipulated ages. RCPT test were held on long
term durability properties of GFRC. Experiments were conducted for both Ordinary Concrete and Glass Fibre Concrete with different percentages of AR-Glass fibres. Studies were made on strength properties of Ordinary Concrete and Glass Fibre Concrete mixes by exposing the specimens for 28, 56, 90 and 180 thermal cycles at 50°C and 100°C. Studies were made on residual compressive strength, weight loss and pulse velocity of Ordinary Concrete and Glass Fibre Concrete mixes subjected to temperatures at 200°C, 400°C and 600°C. At specified ages of 28, 56, 90 and 180 days experimental tests on Glass Fibre Reinforced Concrete and ordinary concrete mixes were held on impact strength. Experimental test were also held on Glass Fibre Reinforced Concrete and ordinary concrete beams.

So far, a very limited quantity of research work has been done on the application of glass fibres in structural concrete. Hence, the present research would lead to a stronger and durable Glass Fibre Reinforced Concrete, which can be recommended for applications like construction of special building and shelters, slab panels, wall planes, special repair job work, rigid pavements etc.

It is observed that studies showed Glass Fibre Reinforced Concrete mixes provide improvement of high performance and high strength concretes. The present thesis would contribute to the efforts being made in the field of concrete technology towards development of concretes possessing very much enhanced and special durable properties. Based on the study, valuable advice will be given for concrete structures.