STRENGTHENING OF CONCRETE USING GLASS FIBER

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ABSTRACT

KEYWORDS: **Glass Fiber Reinforced Concrete, AR glass fiber,Static load,compressive strength,split tensile strength Toughness, Energy Absorption.**

Glass-fiber reinforced concrete (GRC) is a material made of a cementations matrix composed of cement, sand, water and admixtures, in which short length glass fibers are dispersed. In this study trial tests for concrete with glass fiber and without glass fiber are conducted to indicate the differences in compressive strength by using cubes of standard sizes. In the present experimental investigation the alkali resistance glass fibers has been used to study the effect on compressive strength of concrete. Researchers all over the world are attempting to develop high performance concretes by using fibers and other admixtures in concrete up to certain proportions. In the view of the global sustainable developments, it is imperative that fibers like glass, carbon, polypropylene and armid fibers provide improvements in tensile strength, fatigue characteristics, durability, shrinkage characteristics, impact, cavitations, erosion resistance and serviceability of concrete.In this experiment it is the study of compressive strength of concrete with Glass-fiber and without glass fiber.The use of GFRC (glass fiber reinforced concrete) permanent formwork is currently limited to relatively short spans due to the mate-rial's modest flexural capacity. These limitations can be overcome by reinforcing GFRC with rod reinforcement. To avoid durability problems FRP (fiber reinforced polymer) reinforcement has been used by the authors to develop thin GFRC permanent formwork capable of spanning up to 3 m. Although there is abundant research information on the use of FRP in ordinary concrete, the composite per-formance of FRP reinforced GFRC needs special investigation. To demonstrate the concept, this paper presents the results of experiments on the behavior of GFRC panels containing FRP reinforcement. It also confirms that the flexural behavior of FRP rein-forced GFRC can be predicted by using section analysis.

This paper describes an experimental investigation into the relationship between the splitting tensile strength and compressive strength of glass fiber reinforced concrete (GFRC) and polypropylene fiber reinforced concrete (PFRC). The splitting tensile strength and compressive strength of GFRC and PFRC at 7, 28 and 90 days are used. Test results indicate that the addition of glass and polypropylene fibers to concrete increased the splitting tensile strength of concrete by approximately 20–50%, and the splitting tensile strength of GFRC and PFRC ranged from 9% to 13% of its compressive strength. Based on this investigation, a simple 0.5 power relationship between the splitting tensile strength and the compressive strength was derived for estimating the tensile strength of GFRC and PFRC. Sixty three glass fiber reinforced concrete (GFRC) beam specimens of size 150×150×150mm will be tested under four-point flexural fatigue loading by electro-hydraulic universal testing system (MTS) to obtain the fatigue-lives of GFRC at various stress levels. The specimens incorporated 0.6%, 0.8% and 1% glass fiber volume fraction. The results indicate that the statistical distribution of fatigue-life of GFRC is in

agreement with the two-parameter Weibull distribution.The coefficients of the fatigue equation have been determined corresponding to different survival probabilities so as to predict the flexural fatigue strength of GFRC for the desired level of survival probability.