

GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES STUDY ON MECHANICAL PROPERTIES OF FIBER REINFORCED SELF COMPACTED CONCRETE

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ABSTRACT

Self compacting concrete is a flowing concrete that does not require vibration. It uses superplasticisers to significantly increase the ease and rate of flow. It achieves compaction into every part of the mould and formwork simply by means of its own weight without any segregation of the coarse aggregate. Incorporation of fibers further enhances its properties specially related to post crack behaviour of SCC. The fibers used in the study are 14mm long chopped glass fiber and carbon fiber. The volume fraction of fiber taken are 0.1%,0.2%,0.3%.The project comprised of two stages. the first stage consist of development of SCC mixed design of M30 grade and in the second stage, different fibers like glass, carbon fibers are added to the SCC mixes and their fresh and harden properties were determined and compared. SCC offers safety , faster construction times, enhanced workability and ease of flow around reinforcement and excellent durability.

Keywords:- *Fiber Reinforced, Concrete etc.*

I. INTRODUCTION

- Self compacting concrete developed in 1988 . Since then, various investigations have been carried out and this type concrete has been used In practical structures in Japan, mainly by large construction companies.
- Several studies have shown that fiber reinforced composites are more efficient than other types of composites. the main purpose of fiber is to control cracking.
- Different types of fibers used are glass fibers, carbon fiber etc. Glass fibers are formed in a process in which molten glass are drawn in the form of filaments. Different types of glass fibers are C-glass, E-glass, S-glass etc are manufactured having different properties and specific application.
- Carbon fibers have low density, high thermal conductivity, good chemical stability and can be used to decrease shrinkage.

II. METHODOLOGY

- SCC of M30 Grade.
- Determination of SCC fresh properties in terms of flow ability by using slump apparatus.
- Casting of standard specimen for determining of harden SCC properties like compressive, tensile, flexural strength.
- Mixing of different fibers in different dosage in SCC and determination of properties of fresh SCC incorporating glass and carbon fiber by using slump apparatus.
- Determination of properties of harden SCC incorporating glass and carbon fiber by using CTM or UTM.
- Testing of standard specimen for strength determination after 7 days and 28 days.

III. SCOPE FOR FURTHER STUDY

- There are lot mineral admixtures which are the wastage of the industry. The other type of ingredients wastages used for manufacture of concrete to reduce the problem of environmental attack.
- Find flexural strength of ordinary concrete and SCC.
- Test result of self compacting concrete + rise ash hunk
- According our study we can replace ordinary concrete by SCC.

IV. CONCLUSION

- Addition of fibers to SCC cause loss of slump value.
- Addition of fibers in SCC increases compressive ,tensile and flexural strength.
- Carbon fiber addition should not be more than 1.98%.
- 2% of glass fiber to SCC was observed to increase the 7-days compressive strength by 1.60%, 28-days compressive strength by 14.98%,split tensile strength by 19.54% and flexural strength by 35.58%.
- 0.15% addition of carbon fiber to SCC was observed to increase the 7-days compressive strength by 30%,28-days compressive strength by 47.88%,split tensile strength by 26.67%,flexural strength by 62 %.

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