

PROJECT REPORT
ON
**STUDY ON SOME MIX DESIGN PARAMETERS OF SCC WITH
RECYCLED AGGREGATES**

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ABSTRACT

The term SCC refers to a new special type of concrete mixture characterized by high resistance to segregation that can flow through intricate geometrical configuration in the presence of reinforcement under its own mass without vibration and compaction. SCC generally possesses a high powder content which keeps a concrete cohesive with high flowability. A substantial part of this powder could contain fillers like fly ash, crushed rock fines, silica fumes etc. Volume of coarse aggregate, paste, powder, dosage of super plasticizer, mixing method plays an important role in the flowability and other requirements of SCC. SCC has been made by research workers and others with filler like fly ash.

The use of recycled aggregate in concrete opens a whole new range of possibilities in the reuse of materials in the building industry. The utilization of recycled aggregates is a good solution to the problems of excess waste materials, provided that the desired quality of product is reached. Recycling of rejected building materials is a very important issue for saving energy resources and environmental protection. The recycled concrete aggregates exhibits different characteristics from natural aggregates.

The use of recycled aggregate gains importance when it is used in SCC, since the advantages of fabricating SCC and the use recycled aggregate leads to high performance concrete along with preserving the natural resources.

In this study cement(OPC 53 GRADE), fly ash, commercially available polycarboxylic ether based superplasticizer, natural river sand and crushed angular normal aggregates and recycled aggregates of maximum size 20mm were used. The mixture proportioning method adopted for fabricating SCC is based on absolute volume concept starting with a volume of paste 0.38. The method involves very few trials for obtaining SCC which can be advantageous in field practices.

Sixteen SCC mixtures were fabricated using cement content ranging from 300kg/m³, 350kg/m³, 400kg/m³, 450kg/m³ with a constant water content of 185 lt/m³. The paste content considered were 0.38, 0.40 and 0.42. The powder content varied from 498-633 kg/m³. The water to powder ratio by mass ranges from 0.29-.37. Cubes of 150mm were caste and tested for compressive strength at 7 and 28days. Comparable normal concrete for water to cement ratios were also caste and tested 28 days.

The findings of study indicates that the range of volume of paste for developing SCC is 0.38 to 0.42, both for crushed angular aggregates and recycled aggregates. The mixture proportioning method based on absolute volume starting with a volume of paste is simple and reduces the number of trials for developing SCC mixes. The higher paste content makes the mix cohesive and the flow ability or slump flow increases as the volume of paste increases. This trend is also seen in case of compressive strength where in the compressive strength increases as volume of paste increases. However, the optimal value of volume of paste 0.42 is noticed for materials used in the study there is an increase long term compressive strength due to pozzolanic activity of filler material (fly Ash). The results however indicate that the compressive strength of SCC with recycled aggregates has a higher value as compared to normal concrete using crushed angular aggregates. The compressive strength of SCC with recycled aggregates has a higher value as compared to normal concrete using recycled aggregates. The compressive strength of SCC with normal aggregates has a higher value as compared to normal concrete using crushed angular aggregates.