

Effect of Fly Ash and Superplasticiser on the Hardening Properties of Self Compacting-Concrete.

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ABSTRACT:

The self-compacting concrete is a relatively innovative type of concrete that differs from the conventional vibrated concrete in that it contains a novel superplasticiser, Fly ash which contributes significantly to increasing the ease and rate of its flow and another advantage is that the novel superplasticiser is very cheap and available compared with the conventional one because it originated from waste material. It was first introduced in late 1980s in Japan when the researcher realized that poor compaction was the major contribution to the decline of quality construction work. Since then various research investigations have been carried out for establishing rational mix design methods in order to be self-compactable. The fresh concrete must show high fluidity beside good cohesiveness to make self-compacting concrete a standard concrete. This research presents the result of an experimental programme that has been carried out, aimed at investigating the fresh properties of SCC containing fly ash and novel superplasticiser. The fresh state properties of the concrete were evaluated. Finally, some hardened state properties of the concrete were assessed. Portland cement was partially replaced with 30%, 50%, 70% and 90% fly ash the water cement ratio was maintained 0.5 for all the mixes. Properties included workability, compressive strength, all were evaluated. The result indicated that the medium volume content of fly ash can be used in SCC to produce good strength concrete with this type of superplasticiser that originated from waste material. High absorption values are obtained with increasing amount of fly ash however almost all the specimen exhibits absorption of less than 5%. The concrete mixes contained 3 different dosages of a novel superplasticiser based on the carboxylic with and without fly ash. The percentage of dosage of superplasticiser is 0.25%, 1%, and 2% respectively. The increase in superplasticiser dosage from 0.25% to 2% the workability increase so the required slump flow meets the criteria of EFNARC also the result of mechanical

properties compressive strength for 0.25% ,1% and 2% have shown significant performance compare with the control mixes The workability test utilised in this research were the slump flow, L-box and j-ring, which can be used to assess the passing ability of self-compacting concrete .based upon the experimental result there are some linear relationship between fresh properties and each of the workability tests achieved.

Keyword: Self-Compacting, Concrete, Novel Super Plasticiser, Fly Ash, Fresh Properties.

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