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EFFECT OF INCREASE IN METAKAOLIN AND NAOH CONCENTRATION ON FLYASH BASED SCGC

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ABSTRACT: The analysis intends to investigate the effect of an increase in Metakaolin and NaOH concentration on Flyash based SCGC. Different mechanical properties like compressive strength, shear strength and impact strength were studied by replacing fly ash formetakaolin by 0 percent, by 10 percent, by 20 percent and by 30 percent by using alkali solutions such as sodium hydroxide and sodium silicate in the ratio 1:2.5 for different NaOH molarities like 8M, 10M and 12M. Okamura method of mix design was used and then a system of trial and error was employed to achieve the SCGC mix ratio by conducting workability tests like slump flow, T-50 slump flow, V-funnel test and L-box test as per EFNARC guidelines. And after achieving the required flow the concrete was poured into the respective moulds and was cured for 24 hours in the oven at 70° C, and environmental healing is accompanied for rest of the test days. The experimental result showed that slump flow and L-Box decreased with increased molarity and metakaolin content and T-50 slump flow and V-funnel increased with increased molarity and metakaolin content. Mechanical properties such as compressive strength, shear strength and impact strength decreased with increase in metakaolin content and increased with an increase in molarity. Metakaolin replacement by 30% resulted in the lowest compressive strength regardless of any molarity and 12 M NaOH concentrations showed better strength compared to 8M and 10M concentration. Hence SCGC can be a better replacement for normal OPC concrete with reduced CO_2 emission.

Keywords: *Self-Compacting Geo polymer Concrete (SCGC), Metakaolin (MK), Flyash (FA), Molarities (M), Manufactured Sand (M- Sand), Super Plasticizer (S.P)*

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