

Strength and Permeability Characteristics of Fiber Reinforced Concrete

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Abstract : The paper reports the results of a study undertaken to study the effects of addition of steel fibres of different aspect ratios on the permeability and strength characteristics of steel fiber reinforced fly ash concrete (SFRC). Corrugated steel fibres having a diameter of 0.6 mm and lengths of 12.5 mm, 30 mm and 50 mm were used in this study. Cube samples of 100 mm x 100 mm x 100 mm were cast from mixes replacing 0%, 10%, 20% and 30% cement content by fly ash with and without fibres and tested for the determination of coefficient of water permeability, compressive and split tensile strengths after 7 and 28 days of curing. Plain concrete samples were also cast and tested for reference purposes. Permeability was observed to decrease significantly for all concrete mixes with the addition of steel fibers as compared to plain concrete. The replacement of cement content by fly ash results in an increase in the coefficient of water permeability. With the addition of fly ash to the plain mix the 7 day compressive and split tensile strengths decreased, however both the compressive and split tensile strengths increased with increase in curing age.

Keywords : curing age, fiber shape, fly ash, Darcy's law, Permeability

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