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Influence of Silica Fume Addition on Concrete

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Abstract : The incorporation of silica fume into the normal concrete is a routine one in the present days to produce the tailor made high strength and high performance concrete. The design parameters are increasing with the incorporation of silica fume in conventional concrete and the mix proportioning is becoming complex. The main objective of this paper has been made to investigate the different mechanical properties like compressive strength, permeability, porosity, density, modulus of elasticity, compacting factor, slump of concrete incorporating silica fume. In this present paper 5 (five) mix of concrete incorporating silica fume is cast to perform experiments. These experiments were carried out by replacing cement with different percentages of silica fume at a single constant water-cementitious materials ratio keeping other mix design variables constant. The silica fume was replaced by 0%, 5%, 10%, 15% and 20% for water-cementitious materials (w/cm) ratio for 0.40. For all mixes compressive strengths were determined at 24 hours, 7 and 28 days for 100 mm and 150 mm cubes. Other properties like permeability, porosity, density, modulus of elasticity, compacting factor, and slump were also determined for five mixes of concrete.

Keywords : high performance concrete, high strength concrete, silica fume, strength
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