Performance and Correlation of the Properties of Fly Ash Cement Concrete

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Abstract: This investigation was conducted to evaluate the performance of fly ash cement concrete specimens made by cement replacement levels of 0, 10, 20, 30, and 40% with Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete (ASTM C 618) Class F fly ash. Compressive strength, pulse velocity, porosity, and water permeability were determined after 28, 90, 180, and 360 days of water curing. Reinforced concrete specimens were used to assess the corrosion-resistance of plain and fly ash cement concretes in chloride environments. The corrosion potentials on steel were measured at periodic intervals to determine the time-to-initiation of reinforcement corrosion. The data generated was statistically analyzed to ascertain the relationship between the various properties of plain and fly ash cement concretes. Results indicated a better performance by the 20% fly ash cement concrete than plain cement concrete and those made with other cement replacement levels. A good correlation between porosity, compressive strength, permeability, and porosity was observed.