

Effect of Fine Aggregate Blending with Slag on Mechanical Properties of Geopolymer Concrete

P. Abhilash^{*,1}, C. Sashidhar², and I.V. Ramana Reddy³

¹Department of Civil Engineering, Annamacharya Institute of Technology and Sciences, India

²Department of Civil Engineering, Jawaharlal Nehru Technological University, Anantapur, India

³Department of Civil Engineering, Sri Venkateshwara University, Tirupati, India

Abstract: Geopolymer concrete (gpc) is a special type of concrete that is manufactured using industrial wastes like fly ash, ground granulated blast furnace slag (ggbs) etc. Gpc is considered as a more eco-friendly alternative to ordinary portland cement concrete. Promotion of gpc reduces the consumption of cement which in turn minimizes the emission of green house gases into the atmosphere. The present investigation is mainly focused on finding the mechanical properties of geopolymer concrete (gpc) mixes with different fine aggregate blending. Sand and slag are blended in different proportions (100:0, 50:50 and 0:100). Coarse aggregates of size 20 mm and 10 mm are blended in 60:40 proportions by percentage of weight of total coarse aggregate. Fly ash (class f) was used as geopolymer binder. Combination of sodium hydroxide (10m) and sodium silicate solution was used as an alkaline activator. Compressive strength, splitting tensile strength (sts) and flexural strength (fs) were studied after 7, 14, 28, 56 and 112 days of curing at ambient room temperature. From the results, it is revealed that the mechanical properties were increased till fine aggregate blending with slag up to 0:100.

Keywords: geopolymer concrete, fly ash, slag, fine aggregate, alkaline activator, mechanical properties.

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