

Correlation Study of Compressive Strength with Water Absorption and Density for Fly Ash based Geopolymer Concrete

Abstract

Geopolymer Concrete (GPCs) is a novel type of concrete that uses an inorganic alumina silicate binder system rather than the hydrated calcium silicate binder system, which is activated by alkaline liquids. Fly ash is the primary ingredient used to activate the geopolymerization process, as well as to substitute traditional Portland cement. The sole difference between this concrete and standard Portland cement concrete is the binding agent. Sodium hydroxide and sodium silicate solutions were used to activate the substance in fly ash. The geopolymer has the advantages of rapid strength increase, no need for water curing, excellent mechanical and durability features, and is an environmentally safe and sustainable alternative to OPC-based concrete. The manufacture of Portland cement, in particular, results in the release of air pollutants, resulting in environmental pollution in the construction industry. It cuts CO₂ emissions by 80-90 percent. This research is to consolidate on the study on characterization and strength of fly ash based geopolymer rigid pavement through compressive strength, water absorption and density. From the results, it is concluded that when the solid to liquid ratio increased, compressive strength and the density will be increased due to the characteristics and properties of the geopolymer concrete however decrease in water absorption.