

GEO-POLYMER CONCRETE USING INDUSTRIAL WASTE



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ABSTRACT

Every Civil Engineering activity has its origin in a social need and hence the evolution of construction technology. The call for the day is a search for a new environmental friendly construction material that will overcome the drawbacks of Portland cement like high carbon dioxide liberation and sulphur dioxide emission (depending on the type of fuel used) during its manufacturing process. Of late, the use of industrial waste material in the cementitious systems, has been of great research interest as it avoids the increasing disposal problems of these materials which otherwise result in the ecological disturbances.

This project aims towards the development of Geo-Polymer concrete by using industrial waste such as Fly ash; the alkali reactor used is Sodium Hydroxide (NaOH) which activates and improve the mechanical properties of Fly ash. Waste glass powder of particle size less than 600 micron behaves like reactive silica and hence it is incorporated. Ground granulated blast furnace slag (G.G.B.S) contains higher percentage of alumina than fly ash, further studies were conducted by partial replacement of fly ash with G.G.B.S by keeping glass powder concentration as 10%. The introduction of G.G.B.S in fly ash-glass powder based geo-polymer concrete has showed an increasing trend in compressive strength and has considerably less water absorption. Hence use of industrial waste such as Fly Ash, Glass Powder, and GGBS is found to be feasible and also very economical.