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IMPACT RESISTANCE OF FLY ASH BASED GEO POLYMER CONCRETE USING COCONUT SHELL AGGREGATE

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ABSTRACT

Global warming is a serious concern of the present day. One of the main reasons for global warming is the excessive emission of carbon dioxide. The world wide use of concrete is next to water. Production of Port land cement is highly energy intensive. Port land cement is the prime component of concrete. During the production of one tone of cement an equivalent volume of carbon dioxide is emitted. Hence, reduction in cement consumption will bring about reduction in the use of energy resources and reduction in the formation of green house gases responsible for global warming. There should be some alternative material to replace cement in concrete. In this context, use of Geo polymer concrete, where no cement is consumed, has to be encouraged. Geo polymer concrete is formed by the reaction of a source material which is rich in silica and alumina with alkaline liquids. Low calcium Fly Ash is source material used in this study. Sodium hydroxide and Sodium silicate are the alkaline activators. The coarse aggregate which is broken granite stone is partially replaced with coconut shell aggregates which is lighter than granite stone and is an agricultural waste product from coconut industries which is disposed as waste material. This study reveals that partial replacement of coarse aggregate with coconut shell can be used for making light weight geo polymer concrete which is having better Impact Resistance properties making it ideal for Prefabricated Structures and Precast Structural elements. Addition of Steel fibre enhances the impact resisting capacity.

Key words: Alkaline Solution, Coconut Shell, Fly Ash, Geo Polymer Concrete, Impact Resistance, Steel fibre.

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