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## Mix Design Development of Fly Ash and Ground Granulated Blast Furnace Slag based Geopolymer Concrete

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### ABSTRACT:

The paper presents a rational mix design methodology to produce fly ash and ground granulated blast furnace slag (GGBS) based geopolymer concrete under ambient temperature curing condition. Efforts are made to develop the mix design by integrating ACI strength versus water to cement ratio curve of normal concrete, absolute volume method and combined grading concept. The proposed mix design methodology is not only user friendly, but offers also an option to choose between the desired compressive strength and specific alkaline activator content, AAC, to binder solids, BS, ratio or vice-versa. Several samples have been cast and are subjected to experimental investigations in order to produce concrete of required strength and properties. Strength attained by the geopolymer concrete for similar AAC to BS ratio that mimics water to cement ratio of normal concrete has found to be significantly high, in the range from 66 to 32 MPa for AAC to BS ratio from 0.4 to 0.8, respectively. Attempts are also made to propose a modified strength versus AAC to BS ratio curve based on the obtained test results. Finally, the mix design methodology has been depicted in the form of a flow chart, and its usefulness is illustrated with the help of an example.

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