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Strength Properties of Concrete with Ground Granulated Blast Furnace Slag (GGBS) as Partial Cement Replacement

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Abstract: *Construction industry consumes a huge volume of concrete every year, and it is expected that it demand may increase soon. Concrete is one of the most widely used construction materials; main ingredient of concrete is cement. The demand for concrete as a construction material is on the increase. However, the production and utilization of cement causes pollution to the environment and reduction of raw material (limestone). The production of Portland cement worldwide is increasing annually. The current contribution of greenhouse gas emission from Portland cement production signifies the need for supplementary cementitious material as a supplementary pozzolanic material for concrete. This leads to the intensification of interest towards the utilization of wastes and industrial by products in order to minimize the Portland cement consumption. This paper reviews on the use of GGBS as a partial pozzolanic replacement of cement in concrete. The literature shows that GGBS was found to enhance the properties of concrete at later age subject to replacement level.*

In this report, GGBS will chemically and physically characterized and will be used as partial replacement in the ratio of 0%, 5%, 10%, 15% and 20% by weight of cement in concrete. Fresh concrete tests like Compressive strength, at the age of 7, 14 and 28 days will have been done for M25 grade of concrete. Test results will compared with conventional concrete and Ultimate Concrete for GGBS with different percentages used as partial replacement.

Keywords: Cement, GGBS, Replacement ratio (0–20%), Partial cement replacement, Industrial by-products utilization