**EXPERIMENTAL INVESTIGATION ON BEHAVIOR OF HIGH-GRADE CONCRETE (PSC) WITH FULL AND PARTIAL REPLACEMENT OF FINE AGGREGATES USING GBFS**

**ABSTRACT:**

Concrete is widely used material in the world. In concrete 65% to 85% of the total volume is occupied by aggregates. Out of which 20% to 30% is consumed by fine aggregates. The river beds are the main sources for the natural sand. Manufactured sand is abstracted from rock i.e. quarries by crushing of rock in machinery. As the government restricted the dredging of river sand and environmental restrictions of manufactured sand and river sand have resulted in search for alternative sources of fine aggregate, particularly near the larger metropolitan areas.

With the rise in awareness of environmental issues and diminishing natural resources, the focus of construction industry has shifted towards eco-friendly materials and technologies. We can balance the ecology on the earth by using replacement of fine aggregate by industrial byproduct. It further reduces the pollution effect on the environment by increasing the usage of industrial byproducts in our construction industry. In this context we have conducted a study to check feasibility of use of GBFS (Granulated Blast Furnace Slag) as alternate to manufactured sand and river sand in PSC cement concrete.

This experimental study focuses on investigating behaviour of M60 grade concrete by full and partial replacement of fine aggregate by Granulated blast furnace slag (GBFS). Concrete cubes are tested for compressive strength after 7, 28 days and concrete beams and cylinders are tested for flexural and split tensile strength after 28days traditional curing. Concrete cubes and cylinders are used to find the compressive strength and split tensile strength on Compressive testing machine. Beams are used to determine the flexural strength on Flexural testing machine. In aspects of durability, sulphate attack test is conducted on the specimens. Replacement percentages of fine aggregate by GBFS are 30%, 50%, 80% and 100% respectively.

By interpreting the test results of full and partial replacement with GBFS in concrete comparing with normal mix concrete with 100% manufactured sand and river sand, the optimum percentage of the slag(GBFS) to be used can be determined.