

EFFECT AND OPTIMIZATION OF FOUNDRY SAND, GGBS & STEEL FIBER ON STRENGTH OF CONCRETE

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ABSTRACT

As the technology keeps on growing day by day, it helps in the development of our nation, but at the same time it damages our surrounding environment too.

Concrete, which is the most important construction material, has some limited properties such as low tensile strength, low ductility and shrinkage and cracking problem related to hardening. These problems related to concrete can be tackled. To neutralize the problem related to low tensile strength, some material like steel fiber can be added to increase its tensile strength, along with its steel fibers also protect our structure from cracking and gives strength to concrete.

GGBS in concrete is used to reduce the rate of heat of hydration, improves its durability by giving high hindrance against sulphate and chloride attack. It goes on to improve resistance against corrosion of reinforcement bars. Another thing it provides to concrete is, it improves the compressive strength [1] and along with that the setting time of concrete, improvements in these properties increases the workability of concrete makes concrete. GGBS also holds a little edge in comparison to OPC as it provides longer service life and less maintenance of structures.

Foundry sand, when used in concrete [2], increases its strength and durability. Foundry Sand also adds to the workability of concrete and beside all these parameters, it may be used as an addition to improve different properties of concrete which may all lead to make concrete much stronger and durable.

This research paper concentrates on the study of tensile, compressive and flexural behavior of concrete by varying the percentage of GGBS & Foundry Sand.

Also, this research paper focuses on the characteristics of M25 concrete by adding 1% of steel fibers.

The varying percentages of GGBS & foundry sand are considered, on the basis of these varying percentages, eight samples of mix were prepared including a control sample. Each sample, excluding control sample consists a concrete mix with GGBS, foundry sand and steel fiber. The variation in the compressive strength, flexural strength and tensile strength is observed.

KEYWORDS: Compressive Strength, Flexural Strength, Foundry Sand, Ground Granulated Blast Furnace Slag, Steel Fiber, Tensile Strength