

Parametric Investigation on Partial Replacement of Sand by Iron Ore Tailing and Cement by Ground Granulated Blast Furnace Slag in Concrete

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Abstract: India is a developing country, requirements of structure is need of our nation, Structure requires huge amount of concrete and depletion of river sand and increasing price of sand is causing a severe effect. Even the disposal of waste materials causes environmental and health problems. Therefore, partial or full replacement of fine aggregates by other compatible materials is required in concrete. In this present project work, utilizing the waste materials and industrial by products in concrete such as Ground Granulated Blast Furnace Slag and iron ore tailing to enhance the mechanical strength of concrete in construction field. In this project work we bought IOT & GGBFS from Gogga Minerals, Karnataka and IVS Industries, Nagpur respectively. Present project work carried out for partial replacement of sand by iron ore tailings and cement by ground Granulated Blast Furnace Slag In this present project work for M25 grade of concrete is used and total 30 no. of cubes of size (150×150×150mm) and total 15 no. of beam of size (150×150×750 mm) were casted and several test such as compression, flexural and water absorption have been performed for various combination of iron ore tailing and ground granulated blast furnace slag respectively from (0%+0%), (15%+5%), (30%+10%), (45%+15%) & (60%+20%) for the curing period of 7 days and 28 days. When the test results were compared with conventional concrete the age of 7 days of curing compressive strength greater than traditional mix by 5.39% and conventional concrete the age of 28 days of curing compressive strength greater than traditional mix by 5.29% Replacing fine aggregate by 30% IOT and 10% GGBFS is effective at age of 7 & 28 days of curing compressive and flexural strength increase Therefore, effective utilization of waste materials in different construction materials increases the compressive strength.

Keywords: waste materials