

A STUDY BASED UPON THE EFFECT OF RECYCLED CONCRETE AGGREGATE, SILICA FUME, GGBS AND MARBLE WASTE ON THE STRENGTH PARAMETERS OF CONCRETE

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In current research work, silica fume, ground granulated blast furnace slag, marble waste powder or recycled concrete aggregate were used in combination with one another to improve the strength aspects of the conventional concrete. So, to achieve this goal, all the materials were collected from local sources and then tested for their physical properties and chemical composition: microsilica and slag cement GGBS combined toward exchanging the ordinary Portland cement. Recycled marble waste powder is a substitute for fine ecological aggregate. The recycled concrete aggregate was utilized as well as a fractional substitution of the natural coarse aggregate. For carrying out the research work, silica fume was used from 0% to 30% at an increment of 10% in each case, and ground granulated blast furnace slag was used at a fixed percentage of 10%. In this paper, researchers used the waste powder marble at two different ratios of 20% and 40%, and recycled concrete aggregate was used at a fixed percentage of 25%. Depending upon the ratio of the materials, there were different tests such as compressive strength, bond strength, modulus of elasticity, and flexural strength test. Compressive strength test results showed the maximum strength at 20% usage of the silica fume, 10% for the ground granulated blast furnace slag, 20% for the marble waste powder and 25% for the recycled concrete aggregate. The split tensile strength and flexural strength test results were quite similar to the compressive strength test results, which show the maximum power at 20% usage of the silica fume and 20% usage of the waste marble powder. Test results concluded that using microsilica and GGBS slag cement, marble squander powder, and reused substantial improves the internal microstructure of the concrete. The overall strength of the concrete improves up to a great extent.

Keywords: Silica Fume, Ground Granulated Blast Furnace Slag, Marble Waste Powder, Recycled Concrete Aggregate