

AN EXPERIMENTAL INVESTIGATION ON STRENGTH PROPERTIES OF CONCRETE BY THE PARTIAL REPLACEMENT OF CEMENT BY SUGARCANE BAGASSE ASH AND FINE AGGREGATE BY GRANITE POWDER AND GLASS POWDER.

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ABSTRACT

In this experimental work, a research has been carried out to study the effects of sugarcane bagasse ash by partial replacement of cement. Granite powder and glass powder both are partially replaced with fine aggregate in concrete. Sugarcane bagasse is the agro waste produced after the juice extraction from sugarcane and granite powder is by-product produced in granite industries while cutting granite rocks to the desired shapes and sizes glass powder is a industrial waste. Disposing these three wastes to vacant areas has been a great threat to environment. The alternative way to reduce the use of cement and fine aggregate is, by its replacement with sugarcane bagasse ash and both granite powder, glass powder which will not be harmful to the environment. A total of 240 concrete specimens were cast, out of which 96 were cubes, 96 were cylinders and 48 were prisms. The % replacement of bagasse ash with cement are 5%, 10%, 15% ,20% and both of (granite powder + glass powder)with fine aggregate are 5%+ 5%, 10% +10%, and 15%+15% for M20 mix concrete. From the results it can be concluded that optimum amount of sugarcane bagasse ash that can be replaced with cement by weight is 10% and both granite powder + glass powder that can be replaced by fine aggregate by weight is 20% in concrete resulted in an increase in compressive strength, split tensile strength and flexural strength. When all the materials are used simultaneously, the optimum strength is observed at 10% for sugarcane bagasse ash and 5% for granite powder 5% for glass powder. So sugarcane bagasse ash and granite powder and glass powder can be successfully used in concrete.

Key words: Sugarcane bagasse ash, granite powder, glass powder compressive strength, split tensile strength and flexural strength.