



## **Comparative Study of the Physical and Mechanical Properties of Sandcrete Block Using Different Types of Fine Aggregates.**

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### **Introduction**

Sandcrete blocks are masonry units, they are the most utilized walling materials in the construction of infrastructures such as shelters, making up 90% of homes and are the most popular type of walling. It is obtained by mixing water, cement, and fine aggregates. A conventional sandcrete block uses river sand as fine aggregates. However, continued exploitation of river sand has led to its depletion, and in most cases leading to environmental degradation. As a result of this, researchers are seeking alternatives to river sand either as partial or full replacements in sandcrete blocks without adversely affecting its structural performance. Granite chipping is a byproduct of stone crushing for coarse aggregate. It constitutes a nuisance in many of the quarry sites across Ogun State. On the other hand, pit sand is readily available at a cheaper rate across Ogun State. This study was undertaken to compare the physical and mechanical properties of sandcrete blocks using different types of fine aggregates.

### **Materials and methods**

The different types of fine aggregates considered are river sand, pit sand, and stone dust. All materials used were sourced locally, from the available construction material dealers in Ilaro, Yewa South Local Government Area, Ogun State, Nigeria. A total of 24 blocks were moulded for each type of fine aggregate mentioned above. The blocks were cured for 28 days. The density, water absorption and compressive strength of the blocks were determined at 7 days, 14 days, 21 days and 28 days. The tests were carried out according to the specifications in the British codes of practice.

### **Results and Discussions**

Results of the tests showed that the densities of the blocks at 28 days are 2278, 2315, and 2212 kg/m<sup>3</sup> for river sand, granite chippings and pit sand, respectively. Water absorption values are 1.61, 4.31 and 2.31% at 28 days for river sand, granite chippings and pit sand, respectively. The compressive strengths are 0.98, 1.05 and 0.8 N/mm<sup>2</sup> at 28 days for river sand, granite chippings and pit sand respectively. The results indicate that granite chipping has the highest density, water absorption and compressive strength. On the other hand, pit sand has the least value for each of the three properties. Since the compressive strength of blocks manufactured using granite chippings is higher than that of river sand, the use of granite chipping will reduce the environmental degradation of river banks as well as the nuisance caused by granite chippings at the quarry sites.

**Key Words:** Comparative, Physical Properties, Mechanical Properties, Sandcrete Block, Fine Aggregates.