



Structural, Economic and Environmental Study of Concrete and Timber as Structural Members for Residential Buildings in Nigeria

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-----ABSTRACT-----

The construction Industry in Nigeria is relatively monotonous in terms of the building material used, as evidenced by the vast number of residential buildings in Nigeria made of heavy weight materials such as concrete blocks. Since concrete is in high demand in the society, the cost of getting concrete constituent materials is becoming high thereby leading to high cost of living. This is largely due to the fact that alternatives to concrete for residential buildings in Nigeria are not readily available or explored. It is therefore of necessity to motivate stakeholders to alternative building materials that will not only rival concrete in cost, but also serve as a viable competitor in terms of sustainability, maintenance, constructability and client satisfaction in all necessary ramifications. With this in mind, timber has been selected in this research as “the” alternative material to rival concrete in the Nigerian building sector. This research studies both concrete and timber materials under structural, economic environmental and energy perspectives as to help designers with a choice of considering one over the other. This will give the Nigerian client, architect, engineer and builder the justification to choose one material over the other in order to meet the needs of the society. Various Autodesk software are adopted for Modelling and Structural Design of a duplex building of concrete and then timber materials. Cost Analysis of the two models are compared. Environmental Impact Assessment is conducted on the two building models with Athena Impact Estimator software. Results obtained are very promising for timber material.

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