

**LATERIZED QUARRY DUST AND RECYCLED CONCRETE
AS ALTERNATIVE BUILDING MATERIALS**

TIMOTHY MUSIOMI MUSEMBE

MASTER OF SCIENCE

(Civil Engineering)

**A thesis submitted in partial fulfilment for the Degree of Master of Science in Civil
Engineering in the Jomo Kenyatta University of Agriculture and Technology**

2009

ABSTRACT

The use of conventional materials is facing two main challenges of high cost and large-scale depletion of the sources thus creating environmental problems. These challenges demand that alternative materials be explored that are not only affordable but are also environmentally friendly. In this regard, laterized quarry dust and recycled concrete are proposed as possible alternative building material.

To date, extensive studies have been done on laterite, quarry dust and recycled aggregates, separately. However, there is lack of data on performance of blended materials as well as large scale tests on structural elements made from the alternative materials. This research therefore seeks to assess the performance of blended alternative materials when used in concrete and blocks. In the study, samples of materials were investigated to determine basic properties following which the optimum proportions of ingredient materials were determined for concrete and block mix. Finally, the viability of using the materials was assessed for large scale concrete beams and wall panels.

The results demonstrate that there is great potential of laterized quarry dust concrete and blocks. When recycled concrete aggregates are used, 30% of river sand can be replaced with laterized quarry dust and still attain compressive strength of 20 N/mm². In addition, the flexural capacities of alternative as well as conventional concrete beams were found to be within 5%. The findings are intended to contribute to sustainable construction of low cost housing and development.