

## ABSTRACT

In this thesis the author undertakes a comparative study of the engineering properties of the two main local concrete-making aggregates Melajo and Guanapo. He subsequently uses these parameters in establishing limits of suitability and performance.

The author selects optimum fine aggregate percentages for both these aggregates based on grading analyses and these are maintained throughout the subsequent work.

An investigation of Workability and Fresh Density of viscous concrete made with these aggregates and the consequent crushing strength developed in the hardened form is undertaken over an aggregate/cement ratio range of 3.0 to 8.0 and a water/cement ratio range of 0.30 to 0.75. The investigation is extended to include the effect of prolonged agitation on these properties of concrete made with these two aggregates.

Three special aspects about concrete are also investigated which include a preliminary study of the production, properties and performance of "no-fines" concrete made from these aggregates.

The author undertakes as well an experimental investigation of the nature of the failure surfaces observed with concrete cubes, strength levels and failure mechanisms and offers theoretical models to link and explain them.

Finally the thesis extends the investigation of the development of strength in hardened concrete and focusses attention on the ratio of seven day to twenty eight day crushing strength.