EVALUATION OF VOLCANIC ROCKS OF NAIROBI AREA FOR USE AS RAW MATERIALS IN THE CONSTRUCTION AND CEMENT INDUSTRY

Abstract

Volcanic rocks play an important role in the building and construction industry. Most of the raw materials used by the building industry around Nairobi are the volcanic rocks. The main volcanic rocks considered include Lavas and Pyroclastic rocks. There has been no close monitoring of the proper application of the volcanic raw materials in the construction and cement industry. This might have been resulted due to lack of initiative to study the impacts that results from not applying the right raw materials to the right end use. This has been promoted by fraudulent contractors who could just use this type of rocks without any scientific or mineralogical study. In the world of property valuation, real estate managers have not been able to present objective valuation of such properties due to lack of data on the mineralogical and physical properties of the building materials. Insurance Agencies cannot place realistic premiums on buildings and structures due to lack of geological information of the materials used in the construction.

The aim of this of this research is to provide knowledge on properties of volcanic raw materials and develop their suitable application in construction industry. The method used involved carrying out end use tests which included aggregate test, pozzolanicity tests and building stone tests. Project area is bounded by latitudes $1^0$00' S and $1^0$30'S and by longitudes 36^0 30' and $37^0$00' E and has an area of approximately 1,200 square miles (31,108 km^2). The geological history of Nairobi area is dominated by volcanic activity whereby a thick succession of alkaline lavas associated tuffs began accumulating in Mid-Miocene time and continued into Upper Pleistocene. The result shows that Kapiti phonolites contain zeolites which react with alkalis in concrete to course cracking. It is also noted that most trachytes and tuffs are weak and therefore unsuitable for aggregates. The best material found stronger to be used in aggregate making is the phonolites. It is noted that trachytes and phonolites cannot be used as pozzolana material in cement manufacturing. Most of the volcanic rocks around Nairobi can be used either as walling stones or building stones. The machine cut blocks can only be made from the tuffs because other rocks are harder to be cut.