Exploratory Characterization of Volcanic Ash sourced from Uganda as a Pozzolanic Material in Portland cement Concrete.

Apollo Buregyeya[1], George Quercia[2,3], Przemek Spiesz[2], Miruna V. A. Florea[2], Ruth Nassingwa[4]

[1]*Department of Civil and Environmental Engineering, Makerere University, P. O. Box 7062, Kampala, Uganda*

[2]*Department of the Built Environment, Eindhoven University of Technology, P. O. Box 513 – Vertigo 6.10, 5600 MB Eindhoven, The Netherlands.*

[3]*Materials innovation institute (M2i), Delft, The Netherlands*

[4]*Entebbe Geological Surveys and Mines, P.O.Box 9, Entebbe, Uganda*

ABSTRACT

The need for alternative cementing materials to ordinary Portland cement (OPC) has promoted characterization research on pozzolana as an important ingredient in cement production. In Uganda, natural pozzolana application in cement production is done by only two producers of Portland cement and at a small scale due to capacity constraints. The capacity constraints, together with other technological issues, continue to hinder realization of the cost reduction and improved quality benefits attributed to the use of pozzolana as a mineral admixture in Portland cement concrete. There is high abundance of natural pozzolana in Uganda in the form of volcanic ash/tuffs which, if adequately characterized, can facilitate production of different cementing materials and increased output from the various players in the cement production industry in Uganda. This paper reviews methods of pozzolana characterisation and presents preliminary research findings on application of natural pozzolana sourced from Uganda in development of Portland cement concrete. Samples collected from two different deposits in the western region of Uganda were prepared and subjected to chemical analysis and tests on compressive strength, flexural strength and flow-ability. The preliminary findings are indicative of good quality pozzolanic materials that can be applied in production of Portland pozzolana cement materials.

Key words: Characterization, Portland pozzolana cement, volcanic ash, natural pozzolana, Uganda

Corresponding author's email: aburegyeya@tech.mak.ac.ug