Use of Natural Pozzolan in Stabilising Lightweight Volcanic Aggregates for Roadbase Construction

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Abstract

The aim of this study was to explore whether marginal materials like lightweight volcanic aggregates (LVA) could economically and effectively be stabilised using natural pozzolan so as to conform to roadbase specifications. The combinations of natural pozzolan with lime; natural pozzolan with natural activator (natural gypsum); and natural pozzolan, lime and natural activator mixes were examined for their binding capabilities. Three types of natural pozzolan and two types of LVA materials from Arusha region in Tanzania were studied. Standard tests on physical, chemical and mineralogical properties of both the virgin materials and the stabilised mixes were carried out. Laboratory test results and statistical analyses show that natural pozzolan–lime binder could stabilise LVA to achieve roadbase strength requirements at a dosage of less than 2% of lime with between 10 and 30% (by mass) of natural pozzolan. Natural pozzolan–gypsum–lime binder mixes were found to develop a significantly higher unconfined compressive strength (UCS).

Keywords: Paradoxes; DART system; MRT system; Affected people; Compensation