Analyses of Deteriorating Old Masonry Buildings; Characterisation of Materials for Establishment of their Compatible Repairs

Authors

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Abstract

Most of the Governmental and religious building structures in Rungwe district are masonry structures built during the German East Africa period. These structures are deteriorating despite of various efforts on their repair intervention using modern cements and paints. This paper studies the types of mineral binders used, composition and physical characteristics of these in-situ mortar materials for the purpose of deciding on their appropriate compatible repair materials. Field observations and investigations, laboratory materials testing and review of the literature showed that the in-situ mortar materials constituted of sub-hydraulic lime mineral binders to natural sand (1:3) mortars. Currently there are no producers of hydraulic lime in Africa and a limited production worldwide. Mix design and analysis of locally available hydrated lime plus pozzolana natural sand (1:3) mortar material have shown compatibility in chemical and major physical properties and characteristics with the substrate in-situ hardened sub-hydraulic masonry mortars. Therefore use of these repair mortars is recommended for compatible repairs to these masonry structures and as a regional alternative to cement based materials for low rise masonry structures.

Keywords

Binding Materials, Hydraulic Lime, Masonry,Rehabilitation, Repair Mortars