

Preliminary studies on the development of lime-based mortar with added egg white

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Abstrak

Lime is among the binding agents used in binding masonry units, such as brick, in many historical buildings around the world. Its physical strength, mechanical strength, and durability properties, as well as its raw material composition, can play substantial roles in the structural behavior of historic buildings. The production technologies may also differ according to their specific use in the structural layout. Hence, the characteristics of lime mortars are of interest in the assessment of the structural characteristics of historic buildings. In addition, the determination of characteristics of lime mortars is also important for the production of intervention mortars to be used in the restoration of historic buildings. This research focused on the effects of egg white on lime mortar's physical and mechanical properties. Five mixes were prepared by maintaining a constant lime–sand–water ratio of 1:2:0.035. As the binder material, the control mixture comprised only lime putty, while various percentages of egg white in the range of 2–10% were used to prepare the remaining mixtures. An experiment was then performed with different percentages of egg white to examine the lime mortar's axial compressive and flexural strength, as well as the water absorption. The results indicated that the compressive and flexural strength of the lime mortar increased with the increasing percentage of egg white added into lime mortar until the mixture reached 6% egg white. The addition of 8% and 10% egg white made the compressive and flexural strength start to decrease. Lime mortar that contains 6% egg white had the highest compressive and flexural strength compared to the other mix design groups. The axial compressive strength and bending strength of lime mortar can also be influenced by the air pores.