

USE OF EGG-WHITE AS BINDER IN PRODUCING HIGH STRENGTH SUNDRIED BRICKS

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Abstract

Adobe structures are a common type of low cost construction technique used in Pakistan. About 36% of buildings in Pakistan are adobe type. As adobe structures are cost effective, naturally temperature controlled and cheap to repair. They are well suited in the Pakistani environment and economy. The sundried brick is commonly used to build structures. There are local traditional methods to produce higher quality clay bricks including the use of egg-white as an admixture. The technique of egg-white strengthening of clay bricks has not been evaluated technically yet, in this research we shall explore the optimized usage of egg-white for such applications. Egg-white has proteins that polymerizes or naturalizes in the presence of certain acids, bases, organic compounds, salts or by physical heating. In this research the authors have highlighted the possible usage of these naturalizing methods with advantages and disadvantages. Naturalization of clay egg-white mix has been performed by heating, NaOH, H₂SO₄, water, CaSO₄.2H₂O and their combinations. And also techniques of optimizing the use of these chemical or physical methods producing high strength bricks has been provided in this paper. It was found that CaSO₄.2H₂O and NaOH produced samples that have lesser shrinkage and higher strengths. The shrinkage limit, strength and durability properties are also provided in this paper.