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The influence of cement, gypsum and lime on the compressive strength of un-fired earth bricks

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Earth as mud bricks has been used in the construction for thousands of years, and approximately 30% of the world's present population still lives in earthen structures. Earth is cheap, environmentally friendly and abundantly available building material. On the other hand, increasing agricultural production and the development of agro-based industries in many countries of the world have brought about the production of large quantities of agricultural wastes, most of which are not adequately managed and utilized. Agricultural wastes were used for animal feed, fertilizer and fuel for energy production, but little work has been carried out to develop utilization of these wastes in the production of building materials. The needs to conserve traditional building materials that are facing depletion have obliged engineers to look for alternative materials. Environmentally friendly, energy saving recycle property of material production has been one of the very important research fields for decades. Due to environmental policy, the demand for high insulation ability bricks is increasing. This paper outlines results of a comprehensive investigation to assess the influence of cement, gypsum and lime content for unfired earth bricks. The cement, gypsum and lime were mixed (by dry weight). For the mixture of cement, gypsum and lime were added in different percentages such as 1%, 3% and 5% from soil dry weight. The compressive strength of each block was determined from its failure load. The averages of minimum compressive strength at 1% are 6.29, 7.79 and 2.05 N/mm2 for cement, gypsum and lime respectively. While the averages of maximum compressive strength at 5% are 9.84, 12.19, and 3.20 N/mm2 for cement, gypsum and lime respectively.