

عنوان مقاله:

Mechanical Properties of Compressed Earth Block Stabilized with Sugarcane Molasses and Metakaolin-Based Geopolymer

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خلاصه مقاله:

This research aims to investigate the mechanical performance of compressed earth blocks (CEBs) stabilized by a combination of metakaolin-based geopolymer (MKG) and sugarcane molasses (SM), to remedy the limitations present in CEBs stabilized with MKG alone. Two schemes of stabilization were used. In the first, the optimum MKG content for stabilizing CEB was partially substituted with various percentages of SM (۱۰% MKG + ۰% SM, ۸% MKG + ۲% SM, ۶% MKG + ۴% SM, ۴% MKG + ۶% SM, ۲% MKG + ۸% SM). The second stabilization scheme consisted of fixing ۵% MKG and varying SM from ۲% to ۸% (۵% MKG + ۰% SM, ۵% MKG + ۲% SM, ۵% MKG + ۴% SM, ۵% MKG + ۶% SM, ۵% MKG + ۸% SM). The mechanical properties of the CEBs stabilized with SM and MKG were analyzed in terms of compressive strength, dry density, and water absorption. The test results showed that the combination of MKG and SM for stabilizing CEBs was not as effective as MKG alone in increasing the compressive strength of CEBs. However, this combination solved the high porosity of CEBs stabilized with just MKG by increasing their dry density and decreasing their water absorption capacity. In terms of compressive strength and water absorption, the optimum values were obtained respectively with ۵% MKG + ۴% SM (۴.۱۶۳ MPa at ۲۸ days) and ۶% MKG + ۴% SM (۸.۷۳% at ۲۸ days). Therefore, the suggested innovative stabilization approach is suitable for improving the overall mechanical properties of CEBs and addressing the shortcomings of CEBs stabilized only with MKG. Doi: ۱۰.۲۸۹۹/CJ-۲۰۲۲-۰۸-۰۴-۰۱۲ Full Text: PDF

کلمات کلیدی:

.Sugarcane Molasses; Metakaolin-Based Geopolymer; Compressed Earth Block; Compressive Strength; Water Absorption

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