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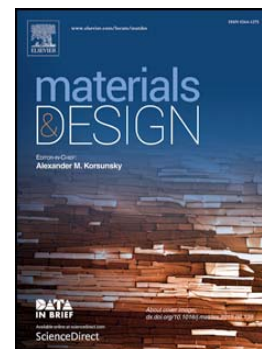
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Comprehensive design method for earthbag and superadobe structures

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Abstract

The earthbag and superadobe techniques consist of introducing soil in degradable bags that are stacked to form adobe structures. They represent sustainable, rapid and low-cost alternatives for the construction of social housing, emergency shelter and ecovillages with the resources available at each location. Despite their potential, several aspects still compromise the efficient and safe use of these techniques. For instance, the design of the structures is currently based on empirical or semi-empirical guidelines since no general method exists on the matter. The present work focuses on the proposal of simple, comprehensive and rational design method for earthbag and superadobe walls and domes. Formulations are proposed considering the previous studies from the literature. Parametric studies are conducted in order to evaluate the influence of several geometrical and mechanical variables on the response and safety of the structures built with this technique. The design method is then evaluated numerically through a finite element analysis. The developments derived from this study represent a contribution towards the safe and optimized design of earthbag and superadobe structures, being a valuable guide for future construction.

Keywords: earthbag; superadobe; design method; wall; dome; finite element

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