CERIS : Civil Engineering Research and Innovation for Sustainability

Effects of cow dung addition on the psysical and mechanical properties and water resistance of eco-efficient clay mortars

Summary

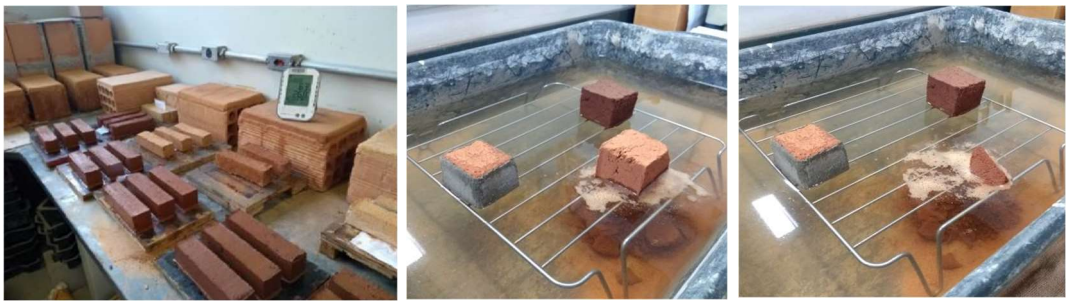
Vernacular earth building technologies are used in Brazil particularly on rural areas. It is possible to find clay-based renders with good performance independently of finantial conditions or local culture. But also, there are some techniques and pratices that can be improved on how to stabilize expansive or weak soils to be used for rendering and also some strategies to increase durability and water resistance using local bio-materials, valuing local traditional knowledges for low embodied energy solutions.

This research investigates what preparation should be performed and which percentage of cow dung addition is more efficient to improve the physical and mechanical propertie, and namely the durability when facing wate and contribution to act as moisture buffers, of clay mortars for rendering and plastering, respectively. Four differents earths (two from Brazil and two from Portugal), with different fractions and types of clays, have been used to compare the behavior of cow dung addition. The test methods and parameters for evaluation are based on the German standard DIN 18947 and the EN 1015 (several parts).

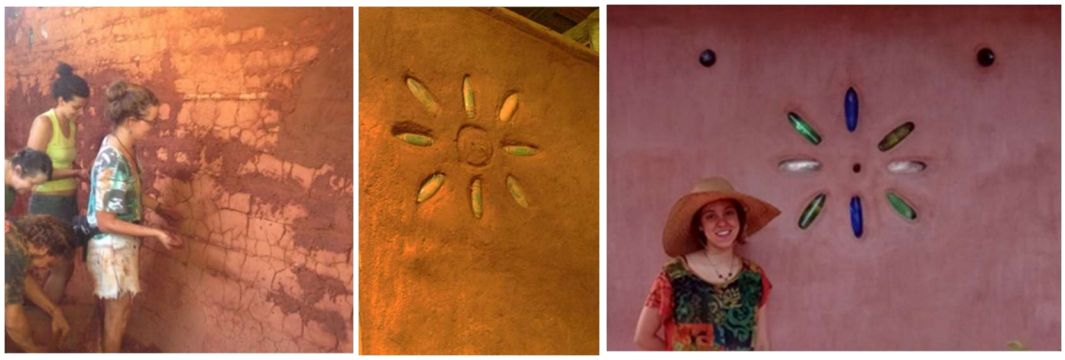
Contributions will be generated for the normalization of clay mortars in Brazil, what will also contribute to justify governmental financial support for earth building in indigenous and quilombola communities in Brazil, and contribute to a RILEM technical test proposals.

Keywords

Earthen construction, eco-efficient clay mortars, bio-stabilised clay renders, cow dung, tradition and innovation.



Prismatic and rendering specimens (left) and samples being tested with water: on the right is possible to see how the cow dung addition can improve the water resistance of clay mortars.



The cow dung addition on clay plasters reduces shrinkage, improve water resistance and provides a better finishing for renders.

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