



Rehabilitation of adobe buildings. Understanding different materials from Portugal

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Earth construction is the oldest building material known, with documented cases of the use of earth bricks since Mesopotamia around 10 000 BC (Heathcote, 1995). The earth construction exists throughout the majority of the world in different cultures, and for some countries, nowadays it continues to be the main process of construction (Vega et al, 2011). Around 30% of the world's population lives in buildings made of earth materials. Earthen construction is an environmentally friendly technique with a social and cultural contribution; this advantage is increased when this type of construction is applied in developing countries where the material costs counterbalance with labour costs, and where other materials and techniques cannot be available (Ciancio et al, 2013). Studies of materials characterization are required in order to understand the composition and specific properties of the earth buildings, their heterogeneity and their degradation mechanisms. Some adobes from different buildings, ages and regions of Portugal were collected in order to characterize them (mineralogically, chemically and physically). It was possible to understand the composition of these materials and their differences. Main minerals are quartz, feldspars, calcite and phyllosilicates (mica and kaolinite). The mechanical behaviour of these materials isn't the best, but it is possible to improve it with some simple and cheap natural additives (kaolinitic soils). The characterization of these materials allows us to understand the differences between the materials from the different regions (controlled by locally available raw materials). Understanding these materials, and their properties, it is possible to formulate new ones for repair, conservation and rehabilitation works. The adobe bricks are an alternative of kiln baked bricks which has several advantages and one of the most important is that these materials are recyclable. Adobes are an excellent option for building rehabilitation, if composition is optimised.