

## **Erosion characteristics of rammed earth**



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### **ABSTRACT**

Rammed earth has re-gained popularity in the UK in recent years because of its low embodied carbon, potential use of local (in-situ) material and high quality aesthetic finish. Architects and clients are attracted by a high quality stratified or layered appearance. Though material costs are low, often zero, labour costs in the UK often result in comparatively high finished build costs. Designers and clients are therefore keen to preserve the aesthetic finish on external wall faces wherever possible. Historically the external faces of earth walls in the UK have been protected from inclement weather by lime renders, extended roof projections and high plinths. These traditional, vernacular, features are not always compatible with desires of modern design. Preserving the aesthetic finish of the rammed earth walls often means it is exposed to rainfall and other weathering effects (including wind and frost). Materials used for rammed earth must be able to resist weathering effects throughout the service life of the building. Specification of materials therefore relies on understanding of likely performance (erosion resistance), determined either through evaluative testing or through precedence (previous uses). As designers are keen to use unproven materials sourced from site, evaluative testing, using accelerated erosion testing, is often required.

The proposed paper will present results from an on-going study of rammed earth durability. The experimental study compares the accelerated erosion performance of different rammed earth materials against their performance when subject to natural weathering over periods between 1.5 and 4 years. The effects of soil grading, soil plasticity and aggregate shape (irregular, rounded, flat) are reported. Recommendations for material specification and interpretation of accelerated testing will be outlined in the paper.

### **KEY WORDS :**

Rammed earth; weathering; erosion testing

