

**Rammed earth:
design and construction guidelines**

Rammed earth: design and construction guidelines

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Preface

This publication is believed to be a landmark in that it represents the first guidance document for rammed earth construction published in the UK. It has been compiled as part of Partners-in-Innovation project *Developing rammed earth wall construction for UK housing* funded by the Department of Trade and Industry (DTI). The 30-month project has been led by the University of Bath and In Situ Rammed Earth Co Ltd, working together with Engineers HRW, JM Architects, Knauf Insulation and Mark Lovell Design Engineers as contributing industrial partners. Advisory steering group members included representatives from Bristol City Council, BRE, Day Aggregates, The Ecology Building Society, Feilden Clegg & Bradley Architects, International Heritage Conservation and Management, Grimshaw Architects, Simmonds Mills Architect-Builders and Somerset Trust for Sustainable Development.

The project has included an experimental investigation of material properties, including thermal conductivity testing, structural testing of walls and columns, a worldwide review of rammed earth construction publications and a pilot case study project. As a result we believe that these guidelines represent the current state-of-the-art best practice in rammed earth construction as applicable to the UK. We hope that they will promote and lead to a greater use of rammed earth wall construction and encourage its future development. We welcome feedback and comments for future editions. Finally, we wish to express our sincere thanks to all who have helped to make this publication a reality.

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All photographs were taken by Peter Walker unless otherwise stated.

1 Introduction

1.1 Scope of guidelines

For most building designers, rammed earth walling is a novel, innovative and unfamiliar material and construction technique. These guidelines have been compiled with the specific aim of informing, developing and promoting the use of rammed earth wall construction in the UK as a high-quality and sustainable building technology for walls in housing and other low- and medium-rise buildings. Specifically, the guide seeks to encourage the greater use of rammed earth, free from additives such as cement, as an alternative, sustainable and beautiful wall building material.

These guidelines for rammed earth cover general design considerations, material properties, testing and selection, engineering design, wall construction, construction details, and maintenance and repair procedures. A glossary, reference list and bibliography are also included.

Note on stabilised rammed earth

Stabilised rammed earth is an alternative form of wall construction that uses the rammed earth technique, but includes cement, primarily as an additive to change the material's physical characteristics. Stabilisation enhances material durability and wet strength, but at the expense of using cement, a major contributor to global CO₂ emissions. Much of the guidance given here for rammed earth construction is applicable to stabilised rammed earth as well. Where the approaches differ, in material selection for example, these variances are briefly outlined in Appendix D. Further guidance on stabilised rammed earth is also available elsewhere^[1,2,3].