

Foreword

First published in 1983 under the name “Leichtlehbau – alter Baustoff – neue Technik” (Light Earth Building: New Techniques for an Old Building Material), this book arose in conjunction with a renewed interest in earth as an environmentally-friendly building material in the early 1980s and quickly became the first major reference book of its kind.

The intention was to undertake an in-depth study of all the available literature and norms and to systematically examine ways in which walls, floors and roofs could be built using earth and straw. Aside from the lack of building codes, there was little knowledge of the building physics of earth as a building material. The key physical characteristics of earth, e.g. thermal performance, moisture resistance, sound insulation and its reaction to fire, had not been fully quantified. Initial comparative fire performance tests were undertaken to establish that the material has good fire-resistant properties, even with a high straw content. However, expensive thermal insulation testing methods were not possible, and a more pragmatic approach was taken by compiling information that already existed on the material’s thermal conductivity properties. Later sources corroborated these values and they were adopted, following a proposal by the author, in the “Lehmbau Regeln” (the German earth building codes) and in DIN 4108-4 (the German standard governing thermal protection and energy economy in buildings).

While the homogenous, single-leaf light earth wall detailed in the original book has become the signature form of light earth construction, it is just one of a range of different possible applications. In the early 1990s we developed multi-leaf constructions with additional layers of insulation to improve energy economy and comfort levels as well as to meet the requirements of stricter regulations. These were included in the fifth edition of this book. In combination with natural, renewable or recycled thermal insulation materials such as cellulose fibres, it was possible to build sustainable and more energy-efficient constructions using timber and earth. With the introduction of additional layers of insulation, the light earth layer could be made thinner but heavier and more thermally retentive, enabling it to dry out more quickly on site.

In 2013, the seventh edition of this book was published under a new title – “Bauen mit Leichtlehm, Handbuch für das Bauen mit Lehm und Holz” (Building with Light Earth, A Handbook for Building with Earth and Wood) – and with a new organisational structure that better reflects the division in earth building materials and building elements used in the “Lehmbau Regeln”. The book was expanded to include both traditional historical techniques as well as new methods of manually applying straw-clay and heavy light earth mixtures. These were based on the results of a research project in Limburg and numerous practical tests and investigations.

Light earth is used solely in a non-loadbearing capacity as an infill material. In (timber) skeleton frame constructions it presents an alternative to the usual lightweight insulation materials, improving the physical characteristics of the building envelope and the room climate within. This edition of the book contains numerous practical examples of simplified wall constructions using earth and light earth that offer improved material characteristics, for example a very simple design-based means of moisture protection