

Review

 **Pete Walker** welcomes this new introduction to CLT construction for designers, although notes that structural engineers may be disappointed by the lack of detailed design guidance.

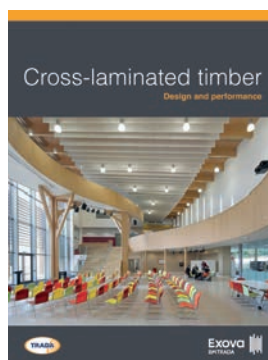
Cross-laminated timber: Design and performance

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Cross-laminated timber (CLT) is a relatively new form of engineered timber made by gluing together layers of wood laminates in successive layers, with each layer laid at right angles to the previous layer. CLT panels are typically made from European softwood species such as spruce, with the thickness of CLT panels varying between 60mm and 300mm, made up using the wood laminations either in three, five or seven layers. Manufacturers are presently able to produce panels up to 22m long and 4.8m wide.

Compared to other forms of timber construction, CLT offers a panelised form ideally suited to modern methods of construction, together with higher strength and stiffness, lower moisture movements and greatly improved construction tolerances. The benefits of CLT, compared with alternative conventional methods of construction such as steel, concrete and loadbearing masonry, include a greatly reduced carbon footprint from construction materials and much faster construction times. CLT is proving versatile, with applications in a range of building types, including residential, public and commercial, for wall, floor and roof elements. Development of multistorey timber structures has also been made possible through the development of CLT panels.

This latest publication from the TRADA publishing house is a welcome addition to the available reference material on CLT. The book, compiled with contributions from a large number of leading designers and practitioners, is presented in four chapters and in just over 150 pages.

Chapter 1 introduces CLT to the reader, primarily expected to be architects and building designers. Together with an overview of how CLT is made, the properties and benefits of the material are presented, including consideration of sustainable credentials compared to competing solutions. The introduction is followed by a summary of the design principles for CLT in Chapter 2. Here the structural forms (arrangements) of CLT are described, helpfully supported by reference to various project case studies. Similarities with the structural arrangements found in loadbearing masonry walls, namely cellular and cross-wall construction, become evident, as well as framed and hybrid construction solutions available with CLT.

The main bulk of this book rests in Chapter 3 (Performance), which covers fundamental design aspects such as structural performance, fire resistance, environmental performance (acoustics and thermal), durability, aesthetics and

sustainability. The information is generally presented in a summary, introductory form with references to more detailed analysis given throughout. For example, the design of structural connections in CLT is covered in less than four pages, including illustrations. Therefore, structural engineers seeking a comprehensive how-to guide for the detailed structural design of CLT may be disappointed by this book.

The final chapter presents various experiences from 13 selected building case studies, ranging between large multistorey residential buildings, small housing projects, commercial buildings, educational buildings, health centres, and exhibition spaces. This experience will be particularly valuable to new designers investigating the potential of CLT for future projects. The case studies are very well illustrated throughout; however, restricting the case studies to English-based projects only is perhaps a self-imposed limitation for a wider readership.

Cross-laminated timber: Design and performance is a very well illustrated book with over 150 colour photographs and drawings to accompany the text. Unfortunately, the font reproduced in a number of the drawing annotations is rather too small for easy reading.

As an introduction to CLT construction for designers and other interested readers, this book is a very welcome addition. It is written with the authority of BM TRADA, and benefits from a number of contributions. Although the price-tag is likely to put some off, the book is likely to become an important reference text for many.

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Professor Pete Walker is Director of the BRE Centre for Innovative Construction Materials at the University of Bath. His research interests and practical experience cover a wide range of bio-based building materials, including timber.