

## TALKING **TIMBER**



### TAKING TIMBER CONSTRUCTION FURTHER

*Cross-laminated timber (CLT) has been increasing in prominence as a timber construction method, writes **Martin Ansell***



The shortage of low-cost, affordable housing in the UK is a result of many factors including an insufficient rate of house building, the lack of skilled craftspeople to build houses, the sale of council and housing association property in right-to-buy schemes and the demands of an expanding population.

As a result, house prices and rents have been driven up with an impact on homelessness, prompting fierce political debate.

However, the UK timber industry is ideally placed to address this shortage. Successful timber frame companies such as Oregon Timber Frame, based in Selkirk and Burton-upon-Trent, have designed and built timber frame housing since the late 1990s.

Timber frame construction is a modern, low energy method of building with faster erection times than conventional brick and block construction and with lower environmental impacts.

Cross-laminated timber (CLT) takes the timber construction process a stage further and is manufactured in the form of substantial structural timber panels.

Legal & General Homes, based at Sherburn near Leeds, has invested heavily in a new manufacturing facility which offers numerous options for the off-site manufacture of precision engineered houses. Homes will be delivered to site almost complete following assembly from cross-laminated panels, installation of electrical and plumbing services, fitting of doors, windows, internal joinery, kitchens and bathrooms, final decoration and laying of floors.

There is scope for the construction of single storey to 20-storey CLT buildings, which can be delivered to site with only the requirement for a foundation.

Swan Housing has built a modular housing factory in Basildon capable of producing 300 homes per year, based on CLT, with the initial aim of regenerating a 1960s estate.

So what is cross-laminated timber, where was it invented and what are its attributes?

CLT was developed in Austria and Switzerland and combines the attributes of Brettstapel (sawn softwood planks held together by hardwood dowels) and glulam beams, whereby sawn wood is laminated with adhesive into three, five or seven layers to form massive structural CLT panels. Within each layer sawn and planed wood is longitudinally finger-jointed to form continuous lengths and the boards are laid side by side to form wide panels.

These panels are then cross-laminated and adhesively bonded in a press to form CLT. Solvent- and formaldehyde-free polyurethane is a common choice of adhesive.

**Martin Ansell is a reader (associate professor) in materials specialising in cellulosic materials and polymers at the University of Bath. He is a member of the Wood Technology Society**

Companies offer standard panel sizes and KLH panels, for example, range from 57 to 158mm in thickness, 2.40 to 2.95m in width and up to 16.5m in length. In order to form modular units for construction, door openings and windows are cut from the CLT under controlled factory conditions using CNC techniques.

CLT buildings are common in Europe and North America and the best-known example in the UK is Waugh Thistleton Architects' groundbreaking Stadthaus Murray Grove in Hackney, London completed in 2009.

The nine-storey building contains 29 self-contained apartments made from 2,500 KLH CLT panels for load-bearing walls and slab floors.

B&K Structures has considerable experience in the design and construction of hybrid structures including the BskyB Believe in Better Building (BiBB) at the Campus in Osterley, West London. The building frame is fabricated from glulam and the floor, roof and stability walls comprise CLT.

Further afield, the University of British Columbia, Canada has constructed the world's tallest timber structure, the 18-storey Brock Commons student residence, with 17 storeys of CLT floors supported on glulam timber columns. The sky is truly the limit for CLT but in the UK it is the regeneration of housing stock where CLT will pay dividends in the near future. ■

*Below: The Kingsgate House CLT development in London*



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