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The rise of the plyscrapper

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The rise of the **plyscrapper**

Thanks to the development of engineered timber, wooden 'plyscrapers' could soon be dominating the skylines, reports Holly Squire

THE SAYING goes the sun shines on the righteous and judging from the beams bouncing off the highly polished windows of 24 Murray Grove it certainly looks like somebody did something right when it came to the design of this timber high-rise in Hackney.

The nine-storey Stadthaus – German for town house – which was built in less than a year, was the tallest habitable timber building in the world when it was constructed back in 2009.

The building was assembled using a unique structural system pioneered by KLH in Austria. The structure is fabricated entirely from cross-laminated timber panels, manufactured in Austria and assembled on site by KLH, with the entire erection of the nine-storey structure completed in just nine weeks.

The KLH cross-laminated solid timber panels form a cellular structure of timber load bearing walls, including all stair and lift cores, with timber floor slabs. There are no beams or columns anywhere, making this timber tower a pretty unique build.

Commissioned by Metropolitan Housing Trust and developed by house builder Telford Homes, the tower houses twenty-nine apartments with a neighbourhood office on the ground floor.

The building is insulated and airtight beyond UK requirements. And with sustainability

high on the agenda, the design meets the Lifetime Homes standard and includes a green-wall wrapping on the southern elevation of the building to encourage local biodiversity. The development also includes a landscaped playground for children on the south side, which parents can overlook from half the apartments.



Andrew Waugh

“The unique structure of the building is a result of the practice’s research in reducing the carbon emissions not only of the finished building but also of the whole build process,” says Andrew Waugh director at Waugh Thistleton Architects, who designed the building.

Waugh is a big fan of timber as a material to work with, not only because of his own strong sustainability values, but also because of timber’s ease and speed when it comes to construction.

“The production of concrete and steel are very energy intensive, pumping tons of carbon dioxide into the atmosphere.

“In complete contrast timber stores carbon as it grows, meaning that this building stores 186 tonnes of carbon within its structure for its lifetime,” he adds.

Waugh explains how working with timber is a much more straightforward

process, as when it comes to the design process, a timber building is devised to be built out of wood from the offset, unlike when working with other materials, which are usually decided upon after design. Plus building in pre-fabricated timber is fast.

“The entire building was completed within forty-nine weeks. It is also incredibly accurate, and a healthy environment to both work on and live in,” adds Waugh.

“Upon its completion the building had zero defects and 100% tenants approval successfully demonstrating that solid timber construction is a financially viable, environmentally sustainable and beautiful replacement for concrete and steel in high-density housing,” he says.

So given that timber is such a sustainable and financially economical material to work with, why is it not used more for residential build projects across the UK?

Waugh says that one of the biggest difficulties of working with Timber is challenging the misconceptions people hold about wood as a material – particularly contractors.

“Lots of contractors simply don’t want to work on timber buildings. There is a lot of issues with perception with contractors believing it will cost more to construct with timber or that it won’t be fire safe – none of which are true.”

However Waugh says things are changing, and like our European neighbours, the UK construction industry is finally starting to wake up to the world of timber.

"The number of European buildings built using timber is expected to increase over the next five years – and specifically in England, the number of properties built using timber is increasing year on year," explains Waugh.

"My prediction is that come 10 years time, tall timber buildings are going to be dominating the market place, as industry perception shifts and contractors realise the cost and timesaving benefits of working with timber over other materials," he says.

And recent research certainly supports Waugh's claims. In the UK 59% of architects surveyed said they expected to design more timber frame buildings while only 21% said they expected an increase in use of on-site concrete construction.

Across Europe, the trend appeared most strongly in France – which is already pretty open to the idea of timber construction – here 70% of architects said they expected an increase in timber frame buildings in the next five years.

It is clear then, that when it comes to timber, having a head for the clouds is no bad thing, and it is in his role as a tall timber-building expert, that Waugh was invited to be a judge at the inaugural U.S. Tall Wood Building Competition, which was held at the White House last month.

The Awards come as part of the Obama administration's commitment to mitigate climate change, and looked to showcase the architectural and commercial viability of advanced wood products like Cross Laminated Timber in tall buildings.



Doug McKalip

"Wood is a readily available and renewable building material that creates jobs and stimulates the economy, says Doug McKalip senior policy advisor for rural affairs with the White House

Domestic Policy Council.

"It can be used in urban or rural settings to build energy-efficient houses, buildings, and other needed infrastructure. It is successfully being used around the world and can help mitigate climate change.



Build in progress

"Advanced wood products are becoming the latest innovation in tall building construction. Products like CLT are flexible, strong, and fire resistant. In construction, wood products can be used as a successful and sustainable alternative to concrete, masonry, and steel."

McKaliip adds: "Using wood also reduces greenhouse gas emissions by storing carbon and simultaneously offsetting emissions from conventional building materials. By some estimates, the near term use of CLT and other emerging wood technologies in buildings 7-15 stories could have the same emissions control affect as taking more than 2 million cars off the road for one year.

"Wood can also help struggling rural forest communities. During the Recession, the drop in new construction and decline in home remodeling had a deep impact on wood manufacturing. However, if CLT and similar advanced wood products can penetrate just 5 - 15% of the non-residential North American market, that would mean roughly 0.8 - 2.4 billion board feet of lumber consumed annually. To put that in real-world context, roughly 35 jobs are created for each million board feet of wood processed," he says.

The objective of the Competition was to identify proponents with building project(s) in the concept, schematic or design-development stage in the U.S. that can safely and successfully demonstrate the use of wood as a viable structural material in tall buildings.

Above and beyond the safety, environmental and economic benefits of wood, the initiative aims to challenge developers, designers, building officials, builders and manufacturers to further develop and refine specification and use of structural wood products – ultimately expanding the opportunity for new product and market development.



Marc Brinkmeyer

Marc Brinkmeyer, SLB board chair explains: "There is a breadth of wood-related building science, design and construction that's underway internationally.

"In recent years we've seen a number of buildings over seven stories constructed around the world, including the 10-story Forte building in Melbourne, Australia and the 14-story Treet building in Bergen, Norway.

"The opportunity to learn from what's been done elsewhere, and build on it here in the U.S., is very exciting for our industry, our employees and communities," he adds.

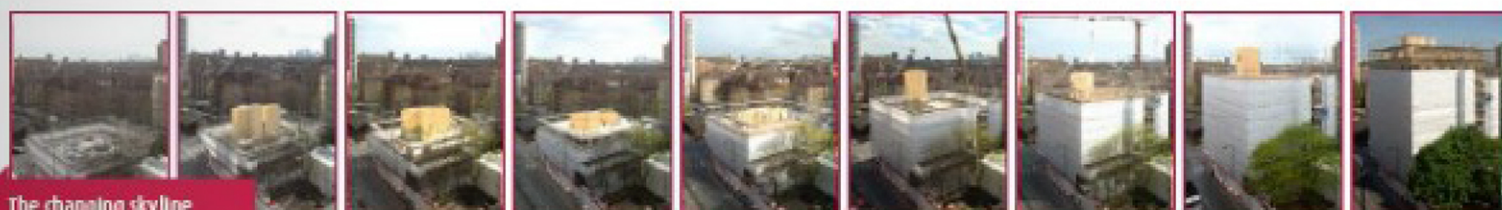
The launch of the competition came as part of USDA's overall strategy to promote the use of wood as a green building material, and the competition required the winning project team to source a share of materials from rural, domestic manufacturers and domestic, sustainably managed forests in order to jumpstart new production and economic opportunities in rural America.

It is clear the U.S. government has really got behind the timber industry in recent years with USDA's Forest Service also partnering with WoodWorks to provide outreach and technical support for architects and engineers of wood construction.

The department has also recently supported a new commercial-scale CLT manufacturing facility in Columbia Falls, Montana, and invested more than \$2 million in research and technical support for emerging wood technologies through the Forest Products Laboratory in Madison, Wisconsin.

When it comes to the States, wood has the potential to mean big money, both to the government and business alike, and with sustainable building and development high on the agenda for some time to come, it is likely that tall timber construction rates are only set to increase across North America.

Back in the UK, Murray Grove, has been more recently joined by Bridport House – the UK's largest cross laminated timber residential scheme, which was completed in 2011 by contractor Wilmott Dixon and formed the first wave of council housing to be built in Hackney for 45 years. Making it clear that within the UK government's push for sustainability in construction and affordable housing, timber is a key resource. ■



The changing skyline