MADISON'S TIMBER PREVIEW

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New construction projects, notifications, and awards for cross-laminated timber (CLT) are coming so fast and furious that Madison's can hardly keep up. And to think that one short year ago many believed that the potential applications for CLT were greatly exaggerated!

Timber hasn't been used consistently for framing since concrete and steel rose to favour after World War I, wrote Wayne Grayson in *Equipment World* Monday. But on top of timber's carbon-reducing benefits, proponents say it's also simply better looking. Brian Court of Seattle's Miller Hull Partnership (recently named the city's Young Architect of the Year) seems to think so. In an interview with the *Minneapolis Star Tribune*, the architect said there is currently "a huge movement" and a "kind of awakening, sort of the rebirth of timber."

Court desinged the the Bullitt Center, a six-story office building in Seattle, WA, that was recently completed. It is composed of four floors of Douglas fir beams and columns atop two-stories of reinforced concrete base. The building also contains a steel beam core for reinforcement. The Bullitt Center has been been called "The Greenest Commercial Building in the World" and is built to last 250 years.

Some builders in the UK, having suddenly realized the shortage of bricks is presenting a very real challenge, are seeking faster build methods rather than risking programmes and sales target. Brought on by a vastly decreased manufacturing base, the UK brick shortage has resulted in lead times being increased to four months in some cases, said *Digital Construction* Monday.

Recent figures from the Department for Business, Innovation and Skills showed that UK brick production is currently half of 2000 levels, indicating that brick manufactures are unable to cope with a recent rise in demand for new builds, according to *Inside Housing* Tuesday. The UK timber frame market is forecast to be the fastest growing sector of the industry over the next five years as developers increasingly seek cost effective and flexible routes to shorter build programmes and reduced carbon outputs.

With a 30 per cent rise in house building projects during May to July 2013 against the same period last year, some UK developers are experiencing brick supply and delivery delays.

The Structural Timber Association (STA) has called on the UK housebuilding industry to increase timber construction to 30 per cent of all new homes, according to *Specification Online* Wednesday. The STA, a broadened version of the UK Timber Frame Association (UKTFA), launches with a call to its industry to change the face of construction forever.

With timber currently accounting for only 18 per cent of new homes in England and Wales, as opposed to 70 per cent in Scotland, the STA is recognising there is a need for the industry to embrace this energy efficient and naturally renewable form of house building. The organisation is already working on initiatives to ensure this increase happens and has estimated that over 43,200,000kg of CO2 emissions would be saved in just five years.

Elsewhere, Skidmore, Owings & Merrill, the Chicago, IL-based firm that has designed a long list of skyscrapers, including the new One World Trade Center in Lower Manhattan, has developed a structural system that uses so-called mass timber — columns and thick slabs that are laminated from smaller pieces of wood, says the *New York Times* Monday. In a report this year, the firm showed how the system could be used to build a 42-story residential tower that would have a lower carbon footprint than a conventional structure.

The tower in the Skidmore, Owings & Merrill study, for example, would contain about 3.9 million board-feet of wood; a typical single-family home contains less than 20,000 board-feet of framing lumber. With their system, about 70 per cent of the structural material is wood; most of the rest, including the foundation, is concrete.

Meanwhile, Australia's previously-announced CLT building projects are moving forward according to plan. A collaborative development between Melbourne City Council, Lend Lease, and Places Victoria, will see a three-storey library and civic centre as Australia's first public CLT buildings. The sustainable performance of the 18-metre building was crucial to the design which will see 574 cubic metres of CLT as the primary structural material, combining engineered timber and reclaimed wood. According to Clare Design, CLT technology will be applied to the upper floor slabs, roof, columns, beams, and core wall construction while the height and placement of the building directly responds to wind mitigation strategies to protect the new public space, Dock Square, and reduce the effects of downwash from surrounding towers.

The centre is scheduled to be completed by the end of 2013 and to open its doors to the public by March 2014. CLT for the Docklands Library will come from Finland's Stora Enso Building and Living.

This will be the Docklands' second CLT project following Lend Lease's development of the world's tallest timber residential building, the 10-storey, 32-metre Forté Apartments. Forté opened earlier this year and earned a five star Green Star rating for its 760-panel cross-laminated timber construction and sustainable initiatives throughout the structure. Wood was used more than concrete for its façade and its walls, floors, and ceilings were also made of solid timber.

Constructing more and taller towers will require changes in building codes — most of which limit wood structures to four stories or fewer — and construction methods. Architects, engineers, contractors and, crucially, developers, will have to be convinced that wooden buildings can be safe, attractive, and profitable.

Fire protection is a particular concern, but advocates for wooden buildings say mass timber does not ignite easily and forms a layer of char that slows burning. Wooden towers can meet or surpass fire safety standards for steel or concrete buildings.

Production of steel and concrete produces significant amounts of the greenhouse gas carbon dioxide, while wood holds the carbon from CO2 removed from the atmosphere through photosynthesis. So using wood in the structural elements can help offset the carbon emissions from the other parts of the construction process and from the operation of the finished building.

In a demonstration of the wide variety of uses for CLT, British architect Alex de Rijke of dRMM created an Escher-inspired installation of staircases outside Tate Modern in London, England. The Endless Stair installation, constructed on the bank of the River Thames as part of this years London Design Festival, comprises 15 interlocking staircases demonstrating a new cross-laminated timber material.

dRMM chose to create an installation of stairs to demonstrate the material due to the sculptural quality of staircases, de Rijke said to *Dezeen Magazine* last week. "Stairs are one of the nicest things about architecture," he explains. "Somebody once said sculpture's gift to architecture is the staircase."

As if that wasn't cool and futuristic enough, researchers at the University of Stuttgart have developed a lightweight timber construction system combining robotic prefabrication with computational design and simulation processes, as well as three-dimensional surveying technologies, according to *Science Daily* Thursday.

In collaboration with Kuka, a manufacturer of industrial robot arms, and the timber construction and engineering company MüllerBlaustein, the partners investigate the potentials of robotic prefabrication in timber construction. Their goal is to develop innovative, performative, and sustainable construction systems made from wood, which also expand the repertoire of architectural expression in timber construction.

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