TIMBER IN ARCHITECTURE

adf
10.16

A great deal BETTER than ply

WE MAKE IT BETTER ACROSS THE BOARD

Stronger and tougher than ply.
No knots, voids or de-lamination.

- ☑ Walling & Partitioning
- ☑ Flat & Pitched Roofing
- ☑ Structural Builds
- ☑ Timber Frame/SIPS
- ☑ Garden Sheds
- ☑ Hoarding
- ☑ Shuttering

Find out more at
SterlingOSB.com

Norbord make it better
www.norbord.co.uk

SterlingOSB®
Strength you can build on

Join in the conversation, #SterlingOSB @Sterling_OSB SterlingOSB

10.16

Timber in architecture supplement

CONTENTS

Supplement Editor
Sarah Johnson

Managing Editor
James Parker
james@netmagmedia.eu

Advertisement Manager/ Joint Publisher
Anthony Parker
anthony@netmagmedia.eu

Production Assistants
Mikey Pooley
Shelley Collyer
Rob Duncan
Kim Musson

Editorial Assistants
Roseanne Field
Jack Wooler
Teodora Lyubomirova

Editorial Coordinator
Sue Benson

Contributors
Stephen Cousins
Jess Unwin

Sales Director
Lesley Mayo

Sales Executives
Suzanne Easter
Ian Fletcher
Kim Friend
Steve Smith

Circulation/Reader Enquiry Service
Jane Spice

Managing Director
Simon Reed

netMAGmedia Ltd
Cointronic House
Station Road, Heathfield
East Sussex, TN21 8DF

Advertising & Administration
t 01435 863500
f 01435 863897
info@netmagmedia.eu
www.architectsdatafile.co.uk

Press Releases
editorial@netmagmedia.eu

Annual subscription costs just £48 for 12 issues, including post and packing. Phone 01435 863500 for details. Individual copies of the publication are available at £5 each inc p & p.

FROM THE EDITOR

I am fortunate enough to live in a charming if not quirky timber framed cottage with beautiful exposed oak beams. Keen to learn more about its origins, we had an Archaeological Interpretative Survey undertaken. The experts spent hours examining the beams looking for clues; it was like piecing a jigsaw of history together. The results were equally fascinating, revealing that our house was built in 1520 and is likely to stand on the site of a medieval property from 100 years earlier.

We also learned that the oak frame came in kit form and was assembled on site. The historians were keen to point out markings to a beam showing the 16th century builders where to peg joists. According to the survey the property was "competently carpented using standard pre-fabricated timber-frame techniques." My home, like other historic timber framed buildings, is a testament to how well they stand the test of time and even more so, the method in which they were constructed.

Five hundred years later, the use of timber as a construction material is clearly enjoying a resurgence as new engineered timber materials offer a modern, off-site, pre-fabricated solution while wood buildings become a viable option to steel or concrete. Hybrid buildings using wood in combination with other construction materials, are also allowing architects and engineers to design and build taller and more technically challenging composite buildings.

One excellent example is the 31 m tall Opalia in Paris which Jess Unwin reports upon in this supplement. Built mainly of wood using cross-laminated timber with Douglas Pine wood cladding, it has a steel ring beam round the edge of each floor plate, a concrete lift and below ground level concrete for rigidity.

Not only are engineered woods like CLT driving the construction of larger timber buildings worldwide, they are also providing advantages to smaller scale projects. Experts tell us that precision-engineered factory manufactured panels are light, and easy to transport and erect in tight spaces, as well as being fast and clean to install without reliance on other trades and clement weather conditions.

With the UK's housing shortage in crisis, more factory-built homes using modular construction are emerging. Legal & General Capital (LGC) has announced its modular housing business having signed a long-term lease with Logicor on a 550,000 ft^2 warehouse in North Yorkshire. Legal & General says it is the largest modular homes construction factory in the world, with the homes producted being precision-engineered using CLT and automated technology.

Contrary to widespread misconceptions that using wood destroys forests, sustainable forest management ensures plentiful, renewable timber. Wood also functions as a natural carbon sink, absorbing CO_2 in the atmosphere and storing it. From construction processes to the well being of occupants, using wood in architecture is part of our sustainable future.

Sarah Johnson
Editor

On the cover...
Stanbrook Abbey, shortlisted in the education & public sector section of the 45th annual Wood Awards. Go to page 27.

TIMBER ENGINEERING

Greeting the future with a Smile

A collaboration between the American Hardwood Export Council (AHEC), Alison Brooks Architects, Arup and the London Design Festival has resulted in a landmark urban installation that aims to change the way architects and engineers consider timber construction.

Recently opened on the Rootstein Hopkins Parade at Chelsea College of Arts, for the 2016 festival, the Smile is constructed in cross-laminated American hard tulipwood. It has been hailed as one of the most important developments in structural timber innovation – Andrew Lawrence of project engineer Arup called it "the most complex structure ever built in cross-laminated timber (CLT)."

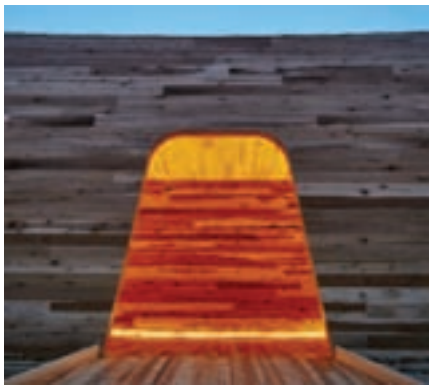
The public are allowed to explore the inside of the showcase tulipwood structure. Although a spectacular 34 m in length it's only 3.5 m high and 4.5 m wide, however the first ever hardwood mega-tube is surprisingly light and spacious inside.

Gracefully curved 12 m open-ended cantilevered arms rise gradually towards the light and touch the ground at the centre point like a wheel, providing both a visitor entrance and an engineering challenge. Walking from one end to another is an illuminating, sensory journey of texture, colour and scale.

Tulipwood has strong sustainability credentials, as every year twice as much tulipwood timber grows in the hardwood forests of America than is harvested. Growing naturally tall, straight and strong for its weight, it is easy to machine and an ideal material for innovative timber construction using CLT, which is usually made from softwood.

Alison Brooks commente: "Tulipwood can be selected clear and knot-free, offering a really clean-looking alternative to softwoods," adding: "I wanted to create something that uses tulipwood CLT in its largest format possible (4.5 m x 20 m plates), and to express the additional strength hardwood CLT can offer. The best way to do this was to combine these plates into a four-sided CLT hollow tube. One of the most amazing qualities of the Smile is the thinness of the majority of its wall and floor panels – only 100 mm thick."

The project's 12 layered panels were manufactured by Züblin-Timber, each formed from short lengths of finger jointed timber, stacked and glued in alternating layers and vacuum pressed. During this process the Smile's CLT panels were curved.



Andrew Lawrence of Arup commented on the engineering challenge: "not only does the Smile have a double cantilever, but the entrance is also placed right at the centre where the stresses are highest. If you turned the structure vertically and added the weight of 60 visitors one end, it's equivalent to the core stabilising a five-storey building. Nobody has ever built a core that slender in timber."

Arup applied the latest timber research combined with steel screws over a foot long to fasten the panels together. To prevent it rocking, the Smile is anchored to a wooden cradle filled with 20 tonnes of steel counterweights. Inches below the cradle are the remains of the 19th century Millbank prison. The structure is designed to resist about 10 tonnes of wind loading and glulam beams hidden in the roof give it rigidity.

David Venables, AHEC's European director says, "The Smile is important. It's effectively the latest stage in a 10 year project that challenges the way hardwood can be used structurally."

The completed piece could transform the way timber is used to make space, form and structure.

CROSS-LAMINATED TIMBER

Europe's largest CLT building nears completion

What is thought to be Europe's largest cross laminated timber (CLT) structure is due to complete construction in Trondheim in December 2016.

Moholt 50|50 will provide a new student village for the city, comprising five blocks housing up to 632 students at the Norweigan University of Science and Technology.

The project has the aim of providing "simple and affordable housing, but also to make everyday life easier for students to allow greater focus on their studies." It also has a strong environmental and community focus, and it is hoped the building will benefit the local community, and not just extend the university's existing accommodation.

The project also includes a car park, activity and fitness centre, library, medical centre, hairdresser, supermarket and clothes shop, plus a kindergarten for 171 children whose parents study at the university.

With a significant emphasis placed on promoting environmental construction, project architect MDH Arkitekter chose Kebony wood as the main building material for the façade. The softwood is treated with furfuryl alcohol, an agricultural by-product, to increase durability and dimensional stability.

Kebony said that a recent study by environmental consulting firm Bergfald & Co. demonstrated that the resulting wood product has "a substantially lower carbon footprint than its tropical hardwood equivalents – between 15 and 30 times lower, inclusive of treatment and transportation to Northern Europe."

Dagfinn Sagen, MDH Arkitekter commented: 'This is an incredibly ambitious project. We chose Kebony for the build as it requires no treatment throughout its whole life cycle. Over time, it also naturally develops an attractive silver grey patina."

RESIDENTIAL

World's tallest timber resi tower

A 73-metre, 21-floor residential block by the river Amstel in Amsterdam, will the tallest timber building of its kind to date when built, it is claimed.

HAUT, which will include 55 apartments, is being developed by Arup, working with Lingotto, Nicole Maarsen, TEAM V Architecture and Nederlandse Energie Maatschappij. The project is targeted for BREEAM Outstanding, and will be 'carbon neutral.' Due to the timber in its construction it is believed the building will be able to store over 3 million kilograms of CO_2.

What Arup described as a "strong and simple" façade design will feature white-grey floor tapes and tall windows, with randomly-arranged cantilevering balconies. There will also be 1,250 m^2 of solar panels and a wetland on the roof to purify water.

The project's name derives from 'haute couture' and the designers aim to create bespoke architecture for residents, offering them a wide choice of apartment size, number of floors and room location.

Arup commented: "The municipality of Amsterdam selected the design team for their vision of the city of the future in which nature and architecture are balanced."

Work is expected to start in the second half of 2017.

SEMINAR

Presenting the timber alternative

An event hosted by London South Bank University (LSBU) saw the benefits of working with modern engineered timber discussed by leading UK architects.

'Urban Wood: An Alternative Architecture' a collaboration between Metsä Wood and LSBU, was attended by more than 100 practising architects, as well as architecture students and professors. The purpose of the event was to "present and discuss alternatives to preferred materials, such as concrete, steel and brick."

The event also marked the launch of what has been claimed as an "innovative" design project between Metsä Wood and LSBU architectural students. They were challenged to identify how timber's cost-effectiveness and flexibility could be effectively harnessed to restore old or iconic buildings in London.

The project was designed to show the next generation of architects that timber can be a "true alternative" for designing exteriors and structures of urban buildings of the future, enabling their cost-effective refurbishment.

Presenters included Jon Broome (Jon Broome Architects), Andrew Waugh (Waugh Thistleton), Professor Alex de Rijke (dRMM Architects) and Metsä Wood's Frank Werling.

AWARDS

Clear Architects shortlisted for timber award

Loughton, Essex-based Clear Architects has been shortlisted for 'Best New Build' in the Structural Timber Awards 2016 for their project 40 Hill Road in Theydon Bois, Essex.

The winners will be announced at the Awards Dinner on 19 October 2016 at the National Conference Centre, Birmingham.

The architects transformed a 1950s bungalow into a modern three-storey home on the fringes of the Essex Green Belt. The site topography influenced the design concept to provide views of London and the surrounding countryside.

Melanie Clear, director of Clear Architects, commented: "The project was incredibly challenging, and transforming the bungalow plot to this amazing new home was us at our creative best." She adds: the site almost guided us to the end design, we wanted to maxim-ise the London skyline yet still address the street, hence the almost T shape form with an angled feature staircase."

NEW BUILD

A bespoke timber frame for a tight Oxford site

A detached house has been completed to a design by WG+P Architects on a narrow site in Oxford, constructed using a specially-designed timber frame, and finished with timber cladding.

According to the architects, the project was also realised on a "very modest budget," but complied with Code 4 of the Code for Sustainable Homes. The client wanted a "striking, modern design that would complement the neighbouring Victorian cottages as well as complying with the Code," said the architects.

The solution proposed used a bespoke, pre-fabricated timber frame structure, with accommodation over three stories and the ground floor extending into the landscaped rear garden. A large roof-light positioned over a double height hall creates a spacious feel, bringing light deep into the centre of the long and narrow property. The architects commented on how the design helped the project blend into its context: "The form, scale and limited palette of materials complement and re-interpret the surrounding vernacular architecture."

COMMENT

Building-in cost benefits

As construction heads towards decarbonisation, choice of building materials is increasingly crucial. Andrew Carpenter of the Structural Timber Association (STA) outlines why timber provides built-in cost benefits

Cost is one of the main considerations for architects and specifiers when choosing a building material. As building professionals are pressed to meet project budgets, opting for 'traditional' build materials like block and brick can be seen as short-sighted.

Structural timber frame has many often overlooked underlying but tangible commercial benefits such as speed of build, superior quality, and sustainability. A number of these benefits are associated with the predictable and consistent nature of building structural timber frame off-site, these being two of the most sought after virtues within the construction sector, helping ensure buildings are constructed in the most time efficient and cost effective manner, and typically at least 30 per cent quicker than 'traditional' methods of construction.

Enhanced control

As prefabricated structural timber frame is manufactured in a controlled and precise manner using the latest industry methods and technology, frames incorporate innovations such as vapour control layers to increase durability and advanced breathable membranes with thermal, acoustic and fire protection inbuilt into the timber design.

This level of automation also means structural timber produced off-site can be monitored at every stage of its construction and is not reliant on a multitude of other trades. Consequently, health and safety costs can be reduced as a factory-based environment ensures safer working conditions and fewer height risks for employees than on-site production. An indoor production setting is also not dependent on favourable weather conditions. This is a substantial cost benefit given the UK's fluctuating climate – strong winds or heavy rain and sub zero conditions have no effect on workers or the manufacturing process, leading to safer, better quality and more efficient and timely production.

Furthermore, off-site construction helps ensure that architects' plans are strictly adhered to, presenting the truest likeness to the original design. This means that there are fewer modifications to designs or unexpected financial costs. Additionally, timber's plentiful supply helps to keep projects within predefined time remits and enables costs to be minimised. Timber is a readily available material that can easily meet industry demands whereas brick and block have recently suffered supply shortages which has resulted in a premium being placed on its price.

In addition, there is an alarming shortage of bricklayers within the UK construction sector, with a recent Royal Institute of Chartered Surveyors (RICS) survey revealing 60 per cent of respondents have difficulty in finding bricklayers for projects.

Reduced carbon

It is not just in the initial build phase that structural timber offers significant cost savings – the material's inherent sustainability and structural performance allows forward-thinking architects to pass on cost savings to clients and users throughout the building's lifetime. Choosing timber can also bridge the performance gap and cut carbon emissions – a significant benefit since according to a Committee on Climate Change (CCC) study, CO_2 emissions from buildings make up a third of UK's carbon footprint. Moreover, the energy used for construction of buildings constitutes approximately 15 per cent of the total energy usage, while heating and lighting during the building's lifetime account for about 83 per cent.

By contrast, buildings made from structural timber provide low

Banyan Wharf, Hackney – a development for Regal Homes built in cross-laminated timber

Off-site construction helps ensure that architects' plans are strictly adhered to, presenting the truest likeness to the original design

embodied energy frames that help minimise in-service energy requirements. Additionally, structural timber frame, with its swift construction and minimal waste, is extremely energy efficient.

With even stricter environmental requirements inevitably on the horizon, the choice of building material is an integral concern. Structural timber frame's low heat conductivity, low embodied carbon, high structural strength, airtight construction and traceable supply chain make it an ideal choice for any contractors, specifiers and architects with sustainability and performance in mind.

Labour and material shortages, as well as a much-publicised housing crisis, have resulted in building professionals starting to shift their habitual mindset. The increasing sightings of structural timber frame across the construction industry, in projects both small and large, is testament to the commercial benefits of the building material.

Initiatives such as the STA Timber Frame Estimating Guide help to drive the message that structural timber frame is sustainable, energy efficient and an ultimately cost effective substitute to concrete or brick and block. With many industry barriers now falling and those within the construction sector beginning to question the monopolistic stranglehold of 'traditional' building materials, the choice of structural timber frame can deliver tangible benefits on an economic and social level, both inside and outside the confines of the sector.

Andrew Carpenter is chief executive of the Structural Timber Association

Banyan Wharf in Hackney provides 50 apartments in a CLT structure designed by Hawkins/Brown

The Experts in Speciality Timber Products

When choosing a material for your project, appearance and performance are of paramount importance. Silva Timber supply the finest selection of speciality timber cladding, decking, fencing and roof shingle products in the UK.

Specialising in Western Red Cedar, Siberian Larch, ThermoWood® and a range of hardwoods, the range is supported by a knowedgable customer support team, factory pre-finishing and fire treatment services, industry leading website, technical specifications and downloadable BIM objects.

For the natural choice, speak to the timber cladding experts.

0151 495 3111 (Cheshire)
020 8150 8055 (West London)

For more information visit:
www.silvatimber.co.uk
enquiries@silvatimber.co.uk

SILVA
TIMBER PRODUCTS

COMMENT

Timber reaches new heights

'How tall' is now the question facing those striving to build the tallest timber buildings around the world. Peter Wilson of Timber Design Initiatives explains that as the boundaries of engineered timber technology expand, the use of wood in buildings is soaring upwards

Before the completion of the Stadthaus in the London Borough of Hackney in 2008, the development of timber construction in the UK was predominantly based upon platform frame technology, a construction method generally considered to be effective up to seven storeys.

The Stadthaus' eight storeys of cross laminated timber (CLT) arranged in a honeycomb structure above a single storey masonry plinth changed this forever. Designed by Waugh Thistleton Architects and Techniker engineers, this residential building in a densely populated part of London ticked many boxes for the local authority, not least for its carbon credentials. Speed of erection, reduced deliveries, minimal waste generated and low noise during construction all added to its case.

Hackney has since become a world epicentre for dense, tall residential structures formed from CLT. The majority are within the 8-10 storey range, but the fact that they are there at all – in a city where the Building Acts are predicated on the 1666 Great Fire of London – is testament to how far the material has come in a relatively short period, a fact confirmed by the sheer number of tall residential CLT structures currently being built or proposed globally.

The next tallest timber structure to be completed was the 10-storey Forte Building in Melbourne (2012) which used imported CLT throughout. Moving beyond the 10 storey level (a height limitation invariably due to local building regulations rather than the ability of structural engineers to design taller buildings with new engineered timber products) has taken a little longer, but ever taller projects are now emerging. At 14 storeys, the Treet Building in Bergen, Norway (2015) is currently the world's tallest residential timber building, but will be overtaken next summer when the University of British Columbia's 18-storey Brock Commons Student Residence in Vancouver opens. The lead position in the race upwards has temporarily shifted to Canada, the result of determination within the forest and timber processing sector there to take advantage of a technological development that can incrementally increase the value of the country's vast raw material resource.

In 2012 Vancouver-based architect Michael Green produced 'Tall Wood', a downloadable research report that pushed forward the possibility of commercial buildings up to 20 storeys in height being formed from hybrids of glulam and cross laminated timber. The architect has since followed up with proposals for 30- and 35-storey towers in Vancouver and Paris respectively, as well as designs for entire urban districts comprised of tall timber structures.

Hackney has become a world epicentre for dense, tall residential structures formed from cross laminated timber

North American endeavour is not confined to Canada, however. The $2m Tall Wood Building Prize to Innovate Building Construction was launched in October 2014 as part of the Obama administration's commitment to mitigating climate change in the US. This focused heavily on cross laminated timber and other emerging timber technologies. The campaign produced not one, but two winning development teams, with 12-storey timber towers now underway in Portland, Oregon and New York. There is also a bill in front of the US Senate to "accelerate the use of wood in buildings, especially tall wood buildings, and for other purposes" which, if and when enacted,

become the Timber Innovation Act of 2016. Elsewhere, architect SOM has redesigned a 42-storey reinforced concrete and glass tower it built in Chicago in 1964 using today's engineered timber technologies. The company's comprehensive research study shows it can be done using a hybrid of solid timber and concrete connections, the latter for stiffness but also to provide the weight necessary to maintain the building's stability in the Windy City.

In Europe, designs for a plethora of tall, engineered timber buildings are in process: four 20 storey apartment blocks for Stockholm's waterfront proposed by Tham & Videgård Arkitekter, the 24-storey Ho-Ho tower in Vienna designed by RLP Rüdiger Lainer + Partner, and the 34 storey Västerbroplan residential tower in Stockholm by C.F. Møller Architects (illustrated on page 13).

In each, the boundaries of timber engineering are being pushed ever further, but the example that takes this endeavour to a completely new level is the Barbican Oak tower in the City of London. This research project exploring the possibility of building up to 80 storeys in timber was initiated by PLP Architects in London, Smith and Wallwork Engineers in Cambridge and Cambridge University's Architecture Department. Speculative and provocative, the project raises many technical and wood science questions, the responses to which will undoubtedly expand the boundaries of engineered timber technology and manufacture far beyond current understanding and industry capacity.

Time will tell just how far these technologies can advance, but the speed of transformation to date suggests Professor Alex de Rijke's prediction that 'timber is the new concrete of the 21st century' is closer than ever before to being fulfilled.

Peter Wilson is managing director of Timber Design Initiatives

Tham & Videgard wooden high-rise apartments, Stockholm

BUILDING PROJECTS

OPALIA
PARIS, FRANCE

French resistance to concrete

A CLT office building currently on site in Paris is set to become an emblem of timber construction in France, as the country's largest building of its kind. Jess Unwin speaks to its architects about how modern engineered timber is gaining traction as a solution

Rivalry exists between French cities to be the first to move towards a low carbon economy

When the €15m Opalia office development is completed next spring it will become the largest timber building in Paris, but the team responsible for its design want it to stand tall for another reason.

Project architects Art&Build hope it will help drive the growing movement to replace concrete with wood in new buildings and thereby dramatically reduce the construction industry's carbon footprint.

The Opalia, located on a thin strip of land right next to the south-east section of the city's inner ring road, the Boulevard Périphérique, will eventually comprise two storeys of below-ground car parking and then eight storeys above ground, rising to a height of 31 m.

Art&Build entered the competition to win the Opalia contract with the company's very first wooden building design – and director Steven Ware believes that commitment to the use of wood, or cross-laminated timber (CLT) to be more accurate, helped sway the decision.

He says: "What has often happened in the past is that wood is suggested for a building but is then abandoned in favour of concrete because of perceived higher costs. But I think wood won us the contract this time. Paris is more ecologically minded now, as are other cities like London. There's rivalry between cities to move towards a low-carbon economy. So the competition jury liked that we proposed a timber building on a large scale because that's the sort of project they want to see."

Building the superstructure

Cross-laminated timber is really gaining ground as a construction material. Unlike glued laminated timber (GLT), also known as glulam, which is layers of wood glued together in the same direction, CLT consists of layers of timber fixed together at right angles to each other.

Austrian company KLH, which is supplying the CLT on this project, says that with structural capabilities akin to concrete in material strength, CLT can be used for all elements of a building's superstructure – wall, floor and roof.

The firm also stresses timber's green credentials as "the only truly renewable construction material, with the lowest energy consumption of any building material across its lifecycle." The company adds: "Using cross-laminated timber will reduce CO_2 because trees act as a carbon 'sink' removing CO_2 from the atmosphere, releasing oxygen and sequestering (storing) carbon."

At the Opalia site, a major design challenge is solar gain. To overcome this, an innovative double-skin facade is to be used all along the south-west side of the building. Steven Ware says: "We knew this approach would provide solar protection – and acoustic protection too – but at the same time, something like this has never

OPALIA IN FIGURES

Max height: 31 m
Highest floor level: 28.47 m
Average floor span:
4.84 m + 6.66 m = 11.5 m
Green roof area:
approx 100 m² over three levels
Plot size: 2,046 m²
GFA: 6,078 m²
Parking spaces: 103
Floor height (overall): 3.55 m²

been done before on a wooden building, so we've had some hoops to jump through with the planning authorities."

He continues: "A double-skin facade means traditional double-glazing then outside of that another single-glazed element, which creates a buffer zone. In that zone, if it's designed properly, you can increase the thermal performance of your building by ventilating or not ventilating that zone. In this case what it mostly does is protect the solar protection system – in this case a venetian blind system – inside the buffer zone."

Maximum transparency

All that glazing suggests the result would be something of a glass box, but Steven points out: "The nice thing about the double-skin facade is that the outer layer of glazing doesn't need the coloured or slightly mirrored treatment used to make it reflective, which results in maximum transparency and means you're going to see the wooden cladding very clearly."

The whole exterior of the building is clad in Douglas pine, sourced from the Morvan forest about two hours from Paris. There is no need for similar glazed protection to the rear of the building but the exposed timber cladding is treated for protection against the elements.

The noise and pollution produced by around 270,000 cars per day on the inner ring road was another design challenge for Art&Build to consider. Ware reveals: "We

The ease of concrete has put us to sleep, but when you look at how much energy is required to make it and demolish it, it's ridiculous not to look at wood

Steven Ware, Director, Art&Build

wanted to create a gentle barrier, protecting the residential buildings north of our site by providing a screen between them and the noise and pollution. We also had to build something fairly high to achieve the gross floor area that the client wanted.

"We came up with the idea of a protective hand shape where each floorplan is a little bit different – rather like with a hand when you curl your fingers slightly and each finger curls in a different way. This hand closes the block off, creating a garden on the inside, yet you can still see through between the different levels and the backdrops. We put this forward as an architectural proposal before even talking about the wood."

Tackling high cost

The different floorplans were one aspect of another major challenge for Art&Build: keeping costs down. Ware explains: "When dealing with wood you're talking about a lot of prefab elements and the more rectangular the better – but our floorplan is unusual. Our aim was to reduce the amount of offcuts so we worked with the timber contractor and moved the supporting beams where possible to address that."

He adds: "One of the main barriers to building in wood is that people generally say it'll be 30 per cent more expensive and we wanted to prove it wouldn't be. With a few extra hours working on design and working with the contractor we've succeeded."

While the load-bearing weight of the building is carried by a timber frame, and the cladding, walls and floors are timber, Steven believes that use of materials other than wood, making the most of their specific advantages, is another way to keep costs down.

"People generally accept that no building needs be 100 per cent wood. Besides the glazing, we have a steel ring beam round the edge of each floorplate to bind every-

One of the main barriers to building in wood is that people generally say it will be 30 per cent more expensive, and we wanted to prove that it wouldn't be

Steven Ware

thing together. In wood it would have been a colossal size and more costly."

Elsewhere, the building is all-concrete below ground and features a concrete lift core. As another measure to counter the transmission of traffic noise from both outside the facade and between floors, a raised and carpet-covered technical floor will be installed on every level.

While carpet will conceal the timber beneath office workers' feet, around 60 per cent of the ceilings will be exposed CLT timber. Says Steven Ware: "We will use varnish with a little white paint in it to even over the finish because it is an industrial-grade timber that's quite knotty and rough. The layer of varnish will protect it while giving a lighter and uniform look. The finish will also assist natural light levels."

The building's roofs are very definitely CLT, which brought another challenge with the three areas covered with plants. Contact between wood and substrate poses a rot problem, says Ware. "We came up with a raised level, onto which the substrate and plants will sit and which is independent from the main structural element – and then you ventilate the gap between."

Understanding hazard

Steven believes cities have taken time to wake up to the potential of modern engineered timber like CLT because its qualities haven't been well known until recently. Test and studies worldwide have helped to erode traditional misgivings.

He says: "Take protection against fire, for example. Most people now accept the concept of what's called the sacrificial char layer, which means that after some burning the charred layer becomes a protective layer protecting the wood below – so the fire goes out." Ware adds: "If timber does fail, firefighters, who after all are the ones who

draw up fire regulations, understand how and when it will fail much better than steel and concrete. Of course, Paris is already 70 per cent wood behind the stone facade on the boulevard. The fire brigade is perfectly comfortable with engineered timber because there's the reassurance of its controllable behaviour in fire."

He says timber buildings twice the height of the Opalia office development are already underway in other parts of Europe and while he says statistics on their height are "great for headlines," he believes modern timber structures are important for another reason.

"If there's one urgent issue we have to deal with and which the construction sector can make a contribution to, it is getting more wood into the buildings because we need to reduce the carbon footprint of the industry, which is huge. The ease of concrete has put us to sleep, but when you look at how much energy is required to make it and then demolish at the end of its life it's ridiculous not to look at wood.

"This is our first wooden building but we now have others in Nantes and in Bordeaux, and we're also doing work on different ways to use CLT – research which we're going to publish."

In support of wood

Ware concludes: "You still have to convince people because the biggest perceived barrier is cost but now companies like ours know how to tackle that. The answer is an overall cost strategy – not just what timber costs compared to steel. When you look at how much you're spending on foundations for steel and concrete and how much your building will weigh you start to see figures that are in favour of wood."

All images © Paul Kozlowski

CLT SUPPLIER KLH SAYS:

- 1 m^3 of CLT panels will remove approximately 0.8 tonnes of CO_2. (The CO_2 is absorbed by the timber). Therefore, 1 m^3 of panels will have approximately 240-250 kg of 'locked-in' carbon
- All timber produced by KLH is certified by the Programme for the Endorsement of Forest Certification, which promotes sustainable forest management
- The adhesive used in the cross-lamination process is completely solvent and formaldehyde free
- Sawdust and shavings produced in timber processing are reconstituted into biomass pellets and used to heat/power the factory
- Speed of construction using CLT provides time savings on building projects
- CLT panels are processed using CAD/CAM technology and state-of-the-art computer-controlled panel-cutting machines

*source = product and sustainability info at www.klhuk.com

PROJECT DETAILS

Main contractor: ABCD
Sub-contractor timber frame/ facade: Briand
Project management: OTCI
Architect: Art&Build
M&E engineer: SNC-Lavalin
Structural engineer: SNC-Lavalin
CLT Panels: Lignatec KLH
Glazing: Tvitec, Madrid
Insulation (exterior): Rockwool
Solar protection: Roma
Vapour barrier: Rotho Blass
Air impermeabilty: Illbruck
Wooden window profiles: Menbat
Timber cladding: Piveteaubois
Lifts: Kone
Glulam post and beam, and steel structural components: Briand

Canopies, walkways and inspiring buildings designed around you

Fordingbridge consistently deliver successful solutions collaborating with Architects and specifiers. With over 50 years of experience, Fordingbridge have the knowledge, in-house expertise and understanding to know what works to enable inspired and durable designs using timber in architecture.

Our specialist design and build team can add value to the whole or part of the life-cycle of your project.

Contact us today to discuss how we can work together

01243 55 44 55
www.fordingbridge.co.uk
info@fordingbridge.co.uk

FORDINGBRIDGE
inspiring · sustainable · design · build

BUILDING PROJECTS

142 BERMONDSEY STREET CENTRAL LONDON

Timber transformation

Cross-laminated timber provided an ingenious structural solution as well as a crisply-lined urban aesthetic for the refurbishment and extension of 142 Bermondsey Street in Central London. Stephen Cousins reports

The groundbreaking structural capabilities of cross-laminated timber (CLT) have raised eyebrows in recent months through several major projects such as HAUT, the world's tallest all-wood residential tower due to be built in Amsterdam, and the 84 metre HoHo tower project in Vienna.

Less well publicised is the material's suitability for smaller scale projects faced with challenges such as restricted site access in urban areas, or limited load bearing capacity on foundations or existing structures.

CLT helped breathe new life into a fast-crumbling building at 142 Bermondsey Street, in the London Borough of Southwark, where it was used to extend the property and give the interiors a soft, precisely crafted finish.

Designed by Hampson Williams Architects, the high-end mixed use development has a 268 m2 gross internal area and cost approximately £660,000 to build. It comprises the extension and refurbishment of an existing unlisted post-war steel framed building to create a small one-bedroom apartment, a two-bedroom penthouse, and a retail unit at ground floor, with a separate live-work unit at the rear.

A total of around 45 machine-engineered CLT panels were installed, in combination with structural glazing, to extend the single-storey rear of the building vertically by two storeys, and create the new top storey penthouse. The penthouse features a striking cantilevered glass box that projects out over the adjacent road, lined internally by a CLT box framing views to the south.

Chris Hampson, founder and director at

A total of 45 machine-engineered panels were installed on the extension

The building was extended by two storeys to the rear

Timber acts as a carbon sink and across its product lifecycle has the lowest energy consumption of any building material

Hampson Williams Architects told ADF: "Our aim was to maximise the size of the building on the existing site while at the same time creating something that is both urban and beautifully crafted and designed. I like the honesty of CLT, which worked at Bermondsey Street where the material is exposed internally."

Fusing old and new

CLT is fast establishing itself as a quicker and more sustainable alternative to concrete or steel structural frames. The prefabricated panels are formed using two-way spanning sections of timber that are glued together to create a light, stable and very strong structure suitable for building walls, roofs and floors across a wide range of building types.

CLT panels are available in a variety of sizes and because they are made from readily available softwoods, they are low-waste and carbon negative in terms of embodied energy. Timber acts as a 'carbon sink' and across its product lifecycle has the lowest energy consumption of any building material.

142 Bermondsey Street is located at the end of Lamb Walk and creates a contemporary bookend to the historic Bermondsey Street which, in recent years, has become a trendy and popular part of the Borough.

The client is a well known and loved community figure, who has lived in the area all her life, and at this specific property for over 20 years where she also ran an antiques business. She commissioned the project to maximise the potential of the site, by fusing the old with the new, and wrapping the facade around the street corner to exploit open views and south facing sunlight.

The building's form was developed through a scale study analysis of the street frontage balanced with the need to retain daylight/sunlight to a ground floor residential unit at 140 Bermondsey Street.

Externally, the building is a simple white box with an industrial appearance, developed to meet planning requirements for the local Bermondsey Street Conservation Area. The new walls of CLT are covered in a layer of insulation and a surface layer of white render.

Internally, the timber is left exposed to reflect the original building's industrial/workplace aesthetic, which is also

The building's age meant a lightweight construction solution was required

characterised by exposed steel columns and connection plates and other original features.

Structural sense

The use of CLT for all new elements of construction was informed by several factors. The lightweight nature of CLT generally enables foundations to be designed smaller and cheaper. At 142 Bermondsey Street it entirely removed the need to dig new foundations by minimising additional loads onto the existing footings.

"The building's age meant there was a very limited capacity for extra loading on the foundations, which required a lightweight construction solution," says Hampson.

In addition, the property is located in an area of Archaeological Interest close to a riverside and any excavation work would have increased the risk of uncovering relics, potentially leading to site closures while archaeological work was completed.

"Previously, we had carried out a design and build project nearby where Roman sandals were uncovered during excavation and that whole section of the project had to be closed down for six months. We were quite conscious of those sorts of issues on Bermondsey Street and tried to minimise any groundwork," adds Hampson.

We had carried out a project nearby where Roman sandals were uncovered during excavation and that whole section of the project had to be closed down

Utilising CLT made logistical sense as lifting prefabricated panels into position quickly by crane reduced construction time to just two and a half weeks, and with limited space for deliveries, it minimised disruption and the need for road closures. Construction was further simplified by limiting the need for wet trades like plasterers and painters.

In addition, the precision-engineered airtight design helped upgrade the building's insulation standards and thermal performance, which were very poor.

"People clamour for an exposed urban warehouse aesthetic in Bermondsey Street, which is not easy to achieve under current Building Regulations due to the stringent thermal requirements, made even tighter when you are changing a building's use," says Hampson. "CLT's inherent thermal value gave us a good start."

The detailed design, supply and installation of the CLT was carried out by Eurban, the only UK contractor delivering solid timber building structures with a fully trained, directly employed labour force.

Green credentials

The CLT product was manufactured by Swedish firm Stora Enso and comprises solid wood boards edge-glued and cross-laminated together to form large panels, suitable for wall, floor and roof applications. The dimensions of each panel at 142 Bermondsey Street varied hugely due to the bespoke nature of the project.

Eurban only supplies CLT panels manufactured with edge glued (closed) faces, which provide an increased performance for air-tightness and are better able to cope with British weather conditions. The firm requires that panels from all its suppliers are bonded with non-formaldehyde adhesive to reduce environmental damage.

The low embodied energy of timber construction chimed with the architects' preference for specifying materials that require minimal energy in the

The designers achieved a high degree of air tightness in the project

Building in exposed CLT is less forgiving than brick and block

manufacturing process, says Hampson: "Where possible, we try to specify materials with low energy related to manufacture, and the energy that goes into producing aluminium, bricks and steel is comparatively enormous. The industry's current focus on designing to reduce operational energy use is quite misleading as it accounts for fewer emissions in terms of the overall building lifecycle."

Achieving high air tightness and +/-1 mm tolerances required close design collaboration between the architect, main contractor, Cityline Construction, and Eurban, from an early stage.

Accuracy was made challenging due to the fact the site was not only tight but also very angular, and the timber would stand on an existing post-war structure, built to less demanding standards with various kinks and inconsistencies.

A digital survey of the existing building was initially completed then modifications made to the structure to create a 100 per cent level surface to found the CLT on.

"Early design was key to enable us to book a manufacturing slot with the Stora Enso factory in Europe," says Hampson. "Eurban typically goes through a 10 to 12 week design process, developing a series of digital drawings before pressing the button to begin manufacture."

According to project architect Chris Hampson, building in exposed CLT is less forgiving than brick and block construction, which is often covered with plasterboard, or skimmed and painted to conceal any blemishes.

"We are familiar with CLT, having used it several times on past projects, including a school block in north London made almost entirely of timber and some housing for the homeless, built in brick with a CLT 'lid'. We always like the way it fits together, the structural dynamics and thermal properties. For this project, on a tight inner city site, the speed and ease of construction was crucial," he concludes.

All photographs © Agnese Sanvito

PROJECT DETAILS

Client: Private
Architect: Hampson Williams Architects
Main Contractor: Cityline Construction
Structural Engineer: Webb Yates
Timber Engineer & Contractor: Eurban
CLT Manufacturer: Stora Enso

WE ASKED OUR CUSTOMERS HOW WE COULD IMPROVE OUR SLIDING SASH RANGE

Our customers said they liked the way original window looked and wanted to leave it unchanged but with a modified drain and vented bead

1 so that's exactly what we've done

Our customers said they liked the aesthetics of a cord connection with the advantages of a spring balance, ideal for conservation areas and market towns

2 so that's exactly what we've done

Our customers said they wanted a window conforming to the Lifetime Homes initiative so it's easy to open and close regardless of a person's circumstances

3 so that's exactly what we've done

We like how this looks so don't change the front of the window

OK - so that's exactly what we've done - apart from the modified drain and vented bead

OUR NEW IMPROVED SLIDING SASH TIMBER WINDOW

The exterior now looks virtually identical to the previous Sliding Sash apart from the modified drain and vented bead. It's the interior were we've made major improvements, now available with 3 configurations to choose from:

1 THE SLIDING SASH CLASSIC TILT OPENING RANGE

2 THE SLIDING SASH TOWN & COUNTRY RANGE

3 THE SLIDING SASH EASY OPEN & CLOSE LIFETIME RANGE

For further information on our new timber Sliding Sash range download our brochure from our website at:
www.howarth-windows.co.uk

or call Enquiries on:
Tel: **0330 119 2332**

MADE IN THE UNITED KINGDOM

Howarth Timber Windows & Doors Ltd, Lincoln Castle Way, New Holland, North Lincs DN19 7AT
Tel (main): **0330 119 2369** Fax: **0844 801 3341** Email: **windows@howarth-timber.co.uk**
Find us on: LinkedIn Follow us on: twitter **@HowarthWindows**

HOWARTH TIMBER WINDOWS & DOORS
innovative products. sustainable solutions

BUILDING PROJECTS

45TH ANNUAL WOOD AWARDS LONDON

Winners in wood design

The winners of the 45th annual Wood Awards will be revealed in November. Ahead of the ceremony, Sarah Johnson exclusively previews the shortlisted projects in the Buildings Competition section.

The Wood Awards have been celebrating excellence in British wood-based architecture and product design since they were established in 1971. In a ceremony on 22 November at Carpenters Hall in the City of London, winners across a range of categories and sectors will be presented with their award.

The awards promote and encourage the use of wood by showcasing what can be achieved by uniting the vision and skills of architects, designers and craftsmen with the versatility, natural aesthetic and sustainability of different timber species.

As a non-profit competition, the Buildings Competition section of the Wood Awards is open to those associated with a UK building completed in the past two years (with the other part of the awards being the Furniture Competition). Judged by an independent expert panel, the awards have had an impact on the architectural and design landscapes by becoming a 'mark of excellence' in wood.

This year's independent judging panel consists of the following:

- Michael Morrison – Purcell UK
- Ruth Slavid – freelance journalist
- Andrew Lawrence – Arup
- Jim Greaves – Hopkins
- Adam Richards - Adam Richards Architects
- Nathan Wheatley – Engenuity
- David Morley – David Morley Architects
- John Wilkie – craft specialist
- Hugh Permian – RIBA Journal

From the 154 entries in the Buildings section, the judges were required to select a shortlist in five categories: Commercial & Leisure, Education & Public Sector, Interiors, Private and Small Projects. Their criteria are "quality of design, craftsmanship and installation regardless of project size and value." The judges are, in short, looking for the best new examples of wood in architecture.

Having chosen twenty 20 finalists, the judges will pick a winner in each category, as well as an overall winner who will receive the prestigious Arnold Laver Gold Trophy.

Past winners of this prize include David Morley Architects for the Hurlingham Club Outdoor Pool in 2012, Adam Richards Architects for the Ditching Museum of Art + Craft in 2014 and Niall McLaughlin Architects for both the Bishop Edward King Chapel in 2013 and the Fishing Hut in 2015.

On the following pages we highlight a project in each of the categories.

SHORTLISTED Maggie's at the Robert Parfett Building, Manchester (Foster + Partners)

Chaiman of the Judges Michael Morrison (Purcell Architects): "The variety of submissions has been terrific; the difficult part is where the judges argue vigorously for their individual favourites. All projects will have been visited by at least two judges. The purpose of the awards is simple. We want to encourage the use of timber by celebrating the best examples and showing the wide range of uses it can be put to. We are interested in intelligent selection of timber, and the quality of the design.

COMMERCIAL & LEISURE: GLOUCESTER SERVICES

Location: Brookthorpe, Gloucestershire
Architect: Glenn Howells Architects
Client/owner: Westmorland Ltd
Structural Engineer: BWB Consulting
Main Contractor/Builder: Buckingham Group
Joinery Company & Wood Supplier: B&K Structures
Post Contract (Construction) Architect: AFL Architects
Quantity Surveyor & Project Management: Frank Whittle Partnership
Planning & Landscape Architect: Pegasus Planning Group
Wood species: European Spruce

Gloucester Services is a 60,000 ft² motorway service area located in the Cotswolds countryside, flanked by an area of natural beauty. It is testimony to family firm Westmorland's intention to apply a different approach to motorway services area design, and provide services dedicated to food, farming and the community.

Inspired by a farming background, Westmorland opened the first family run motorway services in England: Tebay Services in Cumbria in 1972. Gloucester Services is only the company's second services, and reflects the same ethos for sustainable buildings crafted in natural materials.

Glenn Howells Architects was appointed to design a motorway services inspired by a barn-like environment that would use natural, local materials as much as possible. The main building is bedded into the hillside to lessen the impact on the landscape and to provide an acoustic barrier.

The exposed internal glulam roof forms a striking cruck-frame like structure. Glulam was also the perfect material for the front of house areas like the foyer and restaurant. The glulam interior is complemented by retaining walls dressed in Cotswold dry stone.

OTHER SHORTLISTED PROJECTS

Alconbury Weald Club, Alconbury Weald Huntingdon
Architect: Allford Hall Monaghan Morris
Wood species: Austrian Spruce

Sky Health & Fitness Centre Osterley, London
Architect: dRMM
Wood species: Spruce

Stihl Treetop Walkway, Westonbirt Gloucestershire
Architect: Glenn Howells Architect
Wood species: Scottish and Siberian Larch

Mottisfont Welcome Centre Mottisfont, Hampshire
Architect: Burd Haward Architects Ltd
Wood species: European Spruce, European Larch, Canadian Western Red Cedar, Thermally Modified Scandinavian Redwood, European Oak, Plywood and OSB Sheathing

EDUCATION & PUBLIC SECTOR: CONSERVATION & REPAIR OF HARMONDSWORTH BARN

Location: Harmondsworth, Middlesex
Architect: Ptolemy Dean Architects
Client/owner: English Heritage
Structural Engineer: Historic England
Main contractor & Joinery: Owlsworth IJP
Wood Supplier: Whippletree
Wood species: English Oak

Harmondsworth Barn is England's largest surviving timber-framed medieval barn yet it was considered a health hazard by current owner English Heritage when it rescued the building after years of neglect.

The oak framed and weather boarded Grade 1 listed barn built by Winchester College in 1426 is an outstanding example of medieval carpentry, with one of the most intact interiors of the period. At almost 60 m long, 12 m wide and 11 m tall, with 13 huge oak trusses holding up the roof, its conservation and repair was no small undertaking.

The use of timber and the skills of heritage craftsman were pivotal to the complex structural repair, which included the removal of the entire roof to rectify the lopsided frame and reinstate the historic arrangement covered by emergency structural work undertaken in the 1990s.

"It's a work of art", says Nadir Halisch, project manager, English Heritage. "The timber looks beautiful. The scale of work and craftsmanship are impressive, it has been delicately and sensitively done."

The scale of work and craftsmanship are impressive

Nadir Halisch, English Heritage

OTHER SHORTLISTED PROJECTS

Maggie's at the Robert Parfett Building, Manchester
Architect: Foster + Partners
Wood species: Nordic Spruce

Mellor Primary School, Stockport, Manchester
Architect: Sarah Wigglesworth Architects
Wood species: Canadian Western Red Cedar, European Larch, Birch Ply

Springfield St. Clare's Oxford, Oxford
Architect: Hodder + Partners
Wood species: European Oak, Spruce

Stanbrook Abbey, Wass, Yorkshire
Architect: Feilden Clegg Bradley Studios
Wood species: German Oak, Scottish Spruce, Douglas Fir, British Sycamore

In Tufnell Park we wanted to escape the conventional white plasterboard building material

Ogi Ristic, director, Type Studio

INTERIORS: TUFNELL PARK ROAD

Location: London
Architect: TYPE Studio
Structural Engineer: Ellis and Moore
Main Contractor/Builder: Borisa Ristic & Co
Joinery Company: Glennwood Design, Woodjays
Wood Supplier: Coyle's Timber
Floor Supplier: Tintab
Wood Species: Sweet Chestnut, White Larch, Birch Ply

The brief was to create a light, spacious and contemporary living, cooking and dining area within an infill extension to a two bedroom basement flat of a Victorian terrace. Timber has been used to add interest and to help loosely define 'rooms' within an open plan space.

Ogi Ristic, director, Type Studio, explains: "In Tufnell Park we wanted to escape the conventional white plasterboard building material. Timber for us was a relatively affordable way of achieving this and provided a distinct warm tone throughout a space that used to be dark and grey,"

The timber dining area which divides the kitchen from the sitting area is all expressed in sweet chestnut with the exposed steelwork and gridded timber ceiling separating it from the existing building. Chestnut was chosen for its colour, grain, structure and because it could be used both inside and outside where it formed a projecting window seat linking the extension with the garden. Larch floor boards run throughout each space to bring everything together.

OTHER SHORTLISTED PROJECTS

Christ Church Crypt
Spitafields, London
Architect: Dow Jones Architects
Wood species: European Oak

The Portledge Rear Staircase
Tiverton, Devon
Architect: Witcher Crawford Architects and Designers
Wood species: German Walnut, English Oak

PRIVATE: ANSTY PLUM

Location: Wiltshire
Architect: Coppin Dockray
Structural Engineer: Tall Engineering
Main Contractor/Builder: J & C Symonds Ltd
Joinery Company: Westside Design
Wood Supplier: Meyer Timber, SMS Veneering Services, Oscar Windebanks
Wood Species: Douglas Fir, Birch

Located on a steep wooded hillside within the historic village of Ansty, the retrofit and extension to a 1960s house - designed by architect David Levitt, founder member of Levitt Bernsteins – involved the stripping of 50 years of sequential changes to re-instate the architectural qualities of its Douglas Fir construction and improve thermal performance.

Its derelict wood-lined studio designed by Peter and Alison Smithson has also been brought back to life with Douglas Fir says Sandra Coppin, Coppin Dockray: "We chose Douglas Fir for the studio building. It has a fantastic warm, pink colour and a beautiful grain. The cold and cave-like space of the Smithson studio, with its grey stone walls and north facing window, means the temperatures inside are cool all year round."

She added: "We wanted a material that was durable and natural, one that would bring a sense of warmth to this small space. The orangery-pink tone of Douglas Fir provides a keen contrast with the dense green of the mossy bank of ferns into which the building is hedged."

OTHER SHORTLISTED PROJECTS

Contour House, Peak District
Architect: Sanei Hopkins Architects
Wood species: American White Oak, European Oak

Woodpeckers, New Forest
Architect: Strom Architects
Wood species: European Larch, Siberian Larch, Softwood

BELOW
The Twist, installed at Timber Expo

OTHER SHORTLISTED PROJECTS

Doors for 55 St James' Street, London
Designer: Sarah Kay
Wood species: German Oak, French Oak

Hollow, Bristol
Architect: Zeller & Moye
Wood species: Various

The Twist, Timber Expo 2015
Architect: Architectural Association
Wood species: Birch Ply

SMALL PROJECTS: KINGSTON ANCIENT MARKET PLACE & STALLS

Location: Kingston upon Thames
Architect: Tonkin Liu
Client/Owner: Royal Borough of Kingston upon Thames
Structural Engineer: Rodrigues Associates
Main Contractor/Builder: Balfour Beatty
Joinery Company & Wood Supplier: KLH
Part-Funding Client: Greater London Authority
Market Traders Management: Kingstonfirst
Transport & Civil Engineer: JMP
Wood Species: Spruce

The choice of timber for Kingston Market was triggered by the surrounding timber-built Tudor buildings. CLT constructed market stalls and a CLT hybrid roof and canopy use timber in a contemporary and functional way.

"We wanted one material to be used throughout", says Anna Liu, director, Tonkin Liu Architects. "Timber was chosen because of its materiality, durability, and sustainability. Timber also improves with age, even with constant battering, weathering, and usage, of which there will be much in Kingston's daily market.

Liu adds: "A market is both very stable and constantly in flux with core traders who've be there for generations, as well as new emerging ones. Even in the year of designing and delivering the stalls, there must have been 50 iterations in the layout of the designs, responding to the evolving needs of the traders.

The architect concludes: "This CLT timber is the most sustainable material, not just in its sourcing, but also in its future adaptability for the comings and goings of different types of stalls. The timber partitions and roofs can also be easily modified and fixed to as desired."

Timber was chosen because of its materiality, its durability, and its sustainability. Timber also improves with age

Anna Liu, director, Tonkin Liu Architects

Oriented towards design

Stuart Devoil of Smartply explains how the humble sheet of OSB has become a design solution as engineered timber panels are being used across the building sector, from the construction of energy efficient and low carbon homes to site hoardings and everything in between

People often misunderstand engineered boards such as OSB (Oriented Strand Board), and don't really see where the 'engineering' part fits in. A big hint is in the first part of the name: 'oriented.'

Unlike plywood which is built up from thin layers of wood veneer, OSB consists of individual strands and flakes of wood. These are bonded and deliberately arranged in a three-tier structure, with the strands in the outer layers oriented in the same direction as the panel length, and those in the core layer at right angles to it.

The result is a solid panel with no core gaps that will not delaminate under normal use. This structure gives OSB a great deal of strength, which means it can be used in a broad range of applications, everything from the manufacture of furniture to high performance technical solutions for construction. The flakes are specifically positioned or 'oriented' in terms of where they lie within the board, therefore the board is engineered. However, not all engineered boards are the same.

Sourcing sustainably

Not only must any construction board or panel be strong and fit for purpose, but it must also be manufactured from legal, sustainable raw materials. The environmental body Greenpeace has advised as follows: "Demand for tropical hardwood plywood in the UK and internationally is one of the main causes of illegal and destructive logging in the rainforests of countries such as Brazil and Indonesia. This deforestation is causing the loss of biodiversity, displacing local communities and contributing to climate change.

"The construction industry is the biggest consumer of timber in the country which is why it is vital for contractors, architects and builders to source timber from environmentally and socially responsible sources such as those certified by the Forest Stewardship Council (FSC)".

New Smartply has been designed with a superior finish

With this in mind, it is essential to ensure that any timber panel product, be it plywood, OSB, MDF or any other timber based board is sourced, from sustainable, credible, compliant, certificated sources. In the UK, Forest Stewardship Council (FSC) certified products are guaranteed to give you this peace of mind, however just because a product is manufactured from the right material, it doesn't mean it is fit for your specification.

OSB evolution

There was a time when OSB was used purely for boarding up broken windows, or constructing shed roofs and floors. However, recent advances in manufacturing technologies and processes now mean that OSB is the perfect answer to numerous design challenges.

Old 'Daylight Press' technology led to OSB often being out of tolerance, out of square and out of consideration for high quality specified applications. But modern, 'Conti-Roll' manufacture ensures products are flatter, straighter and within stricter tolerances than ever before. And the benefits don't stop there; the continuous

Recent advances in manufacturing technologies and processes now mean that OSB is the perfect answer to numerous design challenges

Flame retardant Smartply

Specialist OSB panels are now available that are not only structural but airtight and vapour tight too

conveyer method and updated controls mean that OSB is now available in a broader range of thicknesses, widths and lengths than physically possible with the 'Daylight Press' technique.

This means OSB can now reach much wider spans, making it ideal for use in timber joist, roof or structural applications where there is no longer a restriction on length. Teamed with the strength of OSB, and technical variants including flame retardant and moisture resistant panels, these extended sizes allow a huge amount of design flexibility.

Where do we go from here?

With fully certified raw material, new manufacturing methods and a whole host of new opportunities, what is next for OSB? Some would say 'the sky's the limit', with longer and wider structural panels allowing the construction of larger, taller, more complex buildings. But sky may not be the next new arena for OSB – air may be.

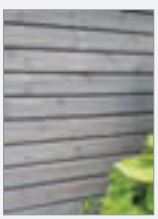
With the growing trend towards low energy or Passivhaus constructions, OSB must look to the future and innovate to stay relevant. For many years, people have assumed that OSB is airtight, however, contrary to popular belief, standard OSB (or any standard wood panel) is not suitable for use as an air and vapour tight layer. This issue has been the subject of much scientific research in order to evaluate the air permeability of OSB panels and to provide limits to manufacturers and end users.

Further to the results of this research and a great deal of development, specialist OSB panels are now available that are not only structural but airtight and vapour tight too, perfect for use in Passivhaus or Low Energy construction. The smooth finish provided by the 'Conti-Roll' manufacture even assists here, where the smooth surface provides ever improved adherence for jointing and sealing tapes.

OSB has moved a long way from its old roots as an emergency hoarding panel and now sits at the top table with the most sustainable, innovative and flexible products on the planet, and they don't cost the earth either.

Stuart Devoil is head of marketing and brand at Smartply

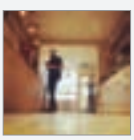
Colourful outdoor wood



New Q-Shades timbers by **Hoppings Q-Deck** are pre-stained with translucent colour-wash prior to TANALITH preservative treatment. The result is stylish shades that allow the beauty of the wood grain to show through with an assured long term preservative protection built-in – the products come with a 15 year performance warranty. The pigment based colour system is extremely durable compared to other treatment colour systems. Depending upon the location, UV exposure expect the shades to remain effective for two to five years respectively.

0800 849 6339 www.qualitydecking.co.uk

The place to be for SterlingOSB



Norbord's SterlingOSB is fast becoming the material of choice for retail outlets, restaurants and cafes. One of the latest establishment to use SterlingOSB as an interior design element is Guat's Up!, a trendy Cafe Bar in Guildhall. SterlingOSB has been used throughout the entire interior from the walls and worktops to the bathrooms and floors. Norbord is one of the leading manufacturers of engineered wood-based panel products. All products are FSC-certified and used extensively in the construction, DIY and furniture sectors. Norbord's brands are well known and are commonly specified by architects, national housebuilders and specifiers.

01786 812 921 www.norbord.co.uk

Stamping out fire risk

Dire consequences await designers and construction firms if fire retardant treatments fail to perform during a blaze. Mike Smith of Lonza outlines how to ensure your protected timbers are compliant

Fire retardant treatments for any construction material are designed with a key role should a fire break out in a building. Essentially, the protected materials slow down combustion and limit the spread of flame and generation of smoke. They provide peace of mind for specifiers and designers by giving extra time to evacuate buildings and limit potential property damage, but most importantly, they help save lives.

Any death caused in a building fire is a tragedy for those linked to the victim. However, due to modern legislation such as the Construction (Design and Management) Regulations, the ramifications can have severe consequences for any company or designer associated with the design and build of the project.

A court of law will want to know how fire protection systems were selected and whether there was adequate liaison between all the parties involved in making sure that the protection was appropriate.

So how can you be sure that your fire retardant protected timbers are fully compliant?

Specifying made easy

Responsible suppliers strive to guide and advise customers towards a robust and ethical specification of timber. Ensuring that fire retardant treatments meet the specific performance requirements of the end use is particularly important. Incorrectly protected timbers could cost lives, and the resulting implications can be severe.

However, fire protection for timber can be seen by some as complex and difficult to co-ordinate. Its value can sometimes be questioned, especially as the dormant protection may never be needed during the service life of the timber. Therefore what can make this process simpler and assured?

A first step for any specification of fire retardant treated timbers should be a reference to an independent trade body, such as the UK Wood Protection Association (WPA) which offers general guidance and listings of approved fire retardant products for timber and board materials and quality treatment companies.

Incorrectly protected timbers could cost lives, and the resulting implications can be severe

You then need to ask if the fire retardant treatments from your suppliers have independent, species-specific Classification Reports. Do they meet the requirements of either Euroclass B or C of the European Standard EN 13501-1 to comply with both national Building Standards and the Construction Products Regulations? Is CE Marking in place to confirm an audited treatment production process has been

TOP
Non-Com exterior treated cladding timbers at Banyan Wharf, Hackney

ABOVE
Culloden Visitor Centre used both interior and exterior fire retardant treated timbers

Robin House Children's Hospice features Dricon fire treated internal claddings

used? Will the protective treatments work properly if and when they are needed?

Meeting industry standards

Independent and species specific Classification Reports from treatment suppliers should be relevant to the timbers you are using and where and how they will be used. They should cover four particular requirements: the timber species; the thickness of the timber; whether there will be an air gap behind the timber; and the nature of any backing materials. All are equally important to achieve an assured and effective fire protection.

The new Euroclasses B and C of EN 13501-1 replace the traditional Class 0 and Class 1 fire performance of National Standards and are certainly more robust, measuring a wider scope of fire critical factors. The fire performance typically required for wall and ceiling linings is Euroclass C, whilst higher risk areas, such as escape routes and staircases, requires the Euroclass B standard.

While the CE marking of fire retardant treated timber is not an actual quality approval it does demonstrate that the production processes for the timbers or board products has been fully independently audited and declares that the product complies with all applicable European Directives and Regulations.

In terms of quality assurance it is prudent to also look for third party accreditation and independent body approvals such as ISO 9001 and 14001, BBA, NHBC, and the WPA. These independent approvals provide the specifier or timber supplier with the reassurance that the fire retardant treatment application process is consistent, controlled and robust.

All-round protection

When specifying you need to be assured that the fire retardant performance of the treated timber is durable in either an interior or exterior end use. Well researched and specified fire retardant timbers will provide permanent fire protection within the timber, and are developed to not require further protection or maintenance during the service life of the building.

Mike Smith is a fire retardants manager at Lonza Wood Protection

Why a wood first policy stacks up

Greg Cooper of B & K Structures discusses the positive impact which cross laminated timber has made within the built environment

As construction makes up a total of 45 per cent of carbon emissions in the UK, sustainability is an important issue for the industry and one that should be addressed throughout every aspect of the build – from the sourcing of materials through to the long-term impact of the final structure.

As one of the most renewable mainstream construction materials, the increased use of engineered timber as the core structural component enhances the construction industry's credentials not only from a sustainable perspective but equally from achieving optimum speed as well as performance.

Identifying and measuring carbon properties is now a fundamental part of any construction business. There are two ways of decreasing carbon dioxide in the atmosphere – by reducing emissions or by removing CO_2 and storing it. Wood has the unique ability to do both.

We may commonly hear the term 'carbon sequestration', which is the process of capturing and long-term storage of atmospheric CO_2. Solid wood products like cross laminated timber (CLT) are natural, renewable and are far less energy intensive to produce and apply. Compared to other building materials such as concrete or steel, the environmental credentials of CLT are far superior. Not only is it a renewable material, it involves very little waste during production and is extremely carbon efficient to transport. Moreover, for the production of each m^3 of CLT, 676 kg of CO_2 will still be stored after the manufacturing process.

University of Essex

Best practice

To help monitor and reduce environmental damage in construction, a Carbon Calculator that gives carbon estimates to help assess the best ecological solution can be used. Material resolutions and transport factors are entered into the system and the calculator then produces carbon estimates to act as a guideline for different project scenarios. This enables professionals to gather early information about the ecological impact of their future development.

Companies leading the way in sustainable construction apply best practice principles throughout all aspects of their processes, from raw material procurement through to manufacturing and offsite processes as well as onsite assembly.

The Chain of Custody Certification for both PEFC and FSC outlines requirements for the ability to track certified material from the forest to the final product. This ensures that both the wood contained in the actual product and wood used throughout the production line originates from certified forests.

Solid wood products like cross laminated timber (CLT) are natural, renewable and are far less energy intensive to produce and apply

For the wood-processing industry, Full Chain of Custody Certification can improve efficiency and production systems by enhancing traceability and accounting. This means that all legal requirements are met, forest cultivation of sourced timber is

managed well and forestry workers are treated fairly.

CLT as an off-site solution

Traditional building processes are noted to be highly wasteful in terms of materials and figures indicated that around 32 per cent of landfill waste comes from the construction and demolition of buildings.

However, cross laminated timber as an off-site solution can dramatically improve these statistics, producing significantly lower amounts of wastage, due to the factory controlled methods of construction. Recycling is far easier to implement in a factory environment, therefore cutting materials to size before delivery to site significantly reduces on-site waste and the associated expense of disposal.

As a rapid, robust and reliable off-site manufactured solution cross-laminated timber delivers many benefits during the construction process and beyond. From reducing loading on foundations through to impressive thermal, acoustic and airtightness performance – CLT construction has the capability to enhance projects across all sectors.

Reducing the loading on foundations is particularly important for inner city construction where the underground infrastructure results in loading restrictions. Using CLT as a lighter weight structural solution can increase, for example, the amount of storeys in a residential build – offering a better return on investment.

Manufactured to exceptional levels of accuracy in factory controlled conditions ensures minimal defects and improves construction and project delivery time, reducing costs and maximising efficiency on all levels, providing cost and programme certainty.

However the benefits do not end after the construction phase. Due to the enhanced performance values and robust nature of cross laminated timber, the on-going life-cycle costs of the building is vastly reduced through fewer maintenance requirements and lower energy consumption.

Better buildings

Finally, and most importantly, the design of a building can be critical to the well-being of its occupants.

Much has been written about the impact construction can have on the environment but very little on the effect a building can have on its occupants. The influence construction materials can have on the comfort and wellbeing of end users is an area where more research is required, however evidence is now emerging about the role cross laminated timber can play in enhancing internal environments.

Engineered timber, as a core structural solution, is gaining traction across the industry demonstrating that a wood first policy not only 'stacks up' from a construction cost and performance perspective but also in creating better buildings for people to live, work and relax.

Greg Cooper is pre-construction manager for B&K Structures

TOP AND ABOVE
Nottingham University and Keynsham Civic Centre

Using CLT as a lighter weight structural solution can increase, for example, the amount of storeys in a residential build – offering a better return on investment

Calling for a shift in focus

Frank Werling of Finnish wood specialists Metsä Wood says the green agenda in construction must shift towards sustainable production of building materials – and timber leads the way as an alternative to steel and concrete

A brief history of timber

Timber is the oldest building material known to man. Since the dawn of construction, when early hunter-gatherers used wood and rudimentary tools to build shelter, through to modern times, timber remains one of the most important and versatile construction materials available.

In comparison, steel and concrete have only found their way into construction over the past 250 years, and despite being the construction materials of choice ever since, timber is now enjoying a resurgence. With the dawn of engineered wood products (EWP) such as Laminated Veneer Lumber (LVL) during the second half of the 20th century, the dimensional restrictions related to tree growth have disappeared. Today, with the inherent predictability and accuracy of physical properties, timber products are now finding their way back into construction.

Light and strong

Building with LVL from the ground up, makes the structure significantly lighter when compared to traditional choices like concrete and steel. The lighter weight of the building materials means less pile-driving and earth-moving when preparing the foundations. When the components are pre-fabricated it also means transportation to site and the actual building process costs significantly less because there are fewer building elements.

LVL is not only light but also extremely strong. The weight-strength ratio of a building material can be expressed in the length a rod of material in tension before it ruptures from its own weight. For concrete this is approximately 0.5 km – and for steel approximately 5.0 km. LVL can achieve one of the highest available strengths for any EWP with approximately 12 km.

The excellent strength-to-weight ratio of LVL enables long spans of up to 25 m. Other benefits of building in timber are that it is warm to touch, i.e. it does not transfer the heat away. Furthermore, it can be used as an effective insulation material as the heat is retained. It also means if it catches fire, it insulates the structure from the fire. Much has been made of the fire risk of timber, however, the rate of charring for timber is very predictable whereas the heat of a steel element cannot be established. Therefore a timber element protects itself in a fire whereas steel requires additional safety measures.

The focus of improving efficiency has to shift to the production of materials – the most energy-intensive phase in a building's life cycle

Case study: Achieving energy self-sufficiency through bio heating

A significant part of global energy consumption is eaten up by the production of steel, aluminium and concrete. Wood, however, is an extremely sustainable alternative.

LVL uses as much of the wood as possible. Part of the sawdust and wood chips that are generated in processing the engineered wood are used in pulp production but also in bio energy. An example of this can be seen in the running of the Metsä Wood Mill in Lohja, Finland, which produces LVL. At Lohja, a bio heating plant has been built next to the mill in order to capture the full potential of the production. The heat energy produced at the plant covers the needs of the mill, resulting in complete energy self-sufficiency.

At the same time, the remaining heat from the production process is sold for district heating to the town of Lohja and

The excellent strength-to-weight ratio of Laminated Veneer Lumber enables long spans of up to 25 m to be achieved

provides significant support for reaching the town's ambitious low carbon energy goals. Lohja is part of Finland's national scheme to reduce greenhouse gas emissions by 80 per cent by 2030. And thanks to the bio heating plant, it has already accomplished its first milestone in achieving a 15 per cent reduction of greenhouse gas emissions by 2016. In addition, as the side streams of the LVL production, (bark and woodchips), are utilised at the same plant, traffic emissions are reduced as well.

A greener future in construction

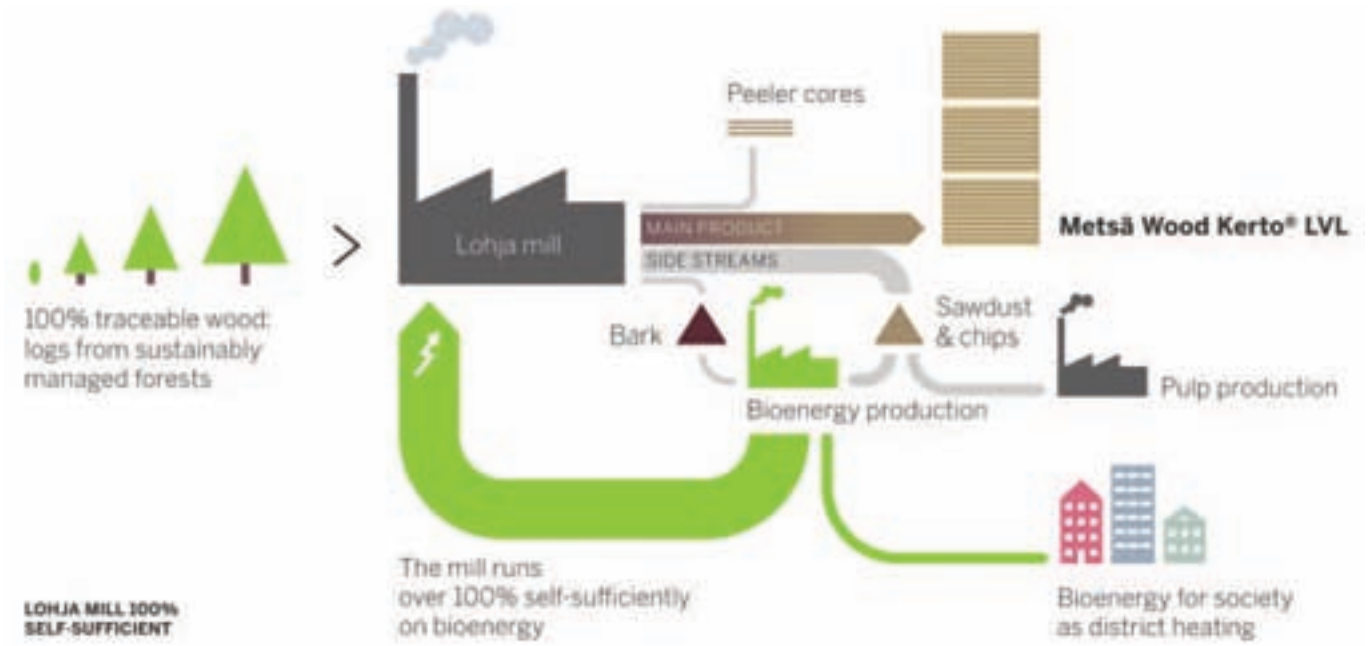
The focus of improving efficiency has to shift from the energy used to operate a house to the production of the construction materials – which is the most energy intensive phase in a building's life cycle. The energy required to produce the materials of a building is 50 times more than the energy used to operate it for a year. Since the production of wooden materials results in an energy surplus, the implications are clear: wood should be used whenever possible.

Designing in wood

The use of timber in modern architecture is something that is becoming more widespread, with students now being educated in these new sustainable materials. Metsä Wood is at the forefront of supporting this educational process, and through its Plan B programme the company is working with architectural students and industry to explore the possibilities of using wood in urban construction.

One recent example of this is Metsä's City Above the City design competition, which is looking for bold and ambitious plans that connect wood construction processes to an existing urban context – in a way that is friendly to both people and nature. Entrants have been challenged to select a centrally-located building in one of the world's most populated cities and develop an innovative wood design solution that adds density through additional floors. Building additional floors with Kerto LVL as the primary material is a central requirement for the design work.

Frank Werling is head of technical, engineering and design at Metsä Wood



Creating usable outdoor spaces on flat roofs made possible with Wallbarn

Creating usable outdoor spaces on flat roofs is possible and easy using Wallbarn's range of adjustable pedestals. Designed specially to support timber decking systems, the hardwearing and durable pedestals are injection moulded in 100% polypropylene with no fillers, so the products can withstand the weight pressures and elements in the long term. They will not become brittle in freezing temperatures and are not affected by being in standing water.

The pedestals lift the timber joist frame off the deck and the heights are adjusted to the millimetre by twisting the telescopic stems. The joists are set flat and cross fixed to give strength to the system. The decking boards are fixed to the joists and remain away from standing water, extending their lifespan. The drainage of the roof deck is unaffected, the lower surface is ventilated and damp courses are uncompromised as no fixings penetrate the upstands. Weight is also minimised.

Attractive leisure areas using natural materials can be created on roofs, terraces, balconies and podium decks. Installation is hassle-free and very fast. Wallbarn can assist users with design ideas and specification tools.

For more details please visit the following: **www.wallbarn.com/products/roof-and-terrace-finishes/support-pads-for-timber-decking**

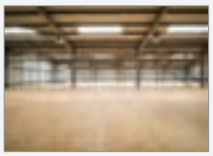
0208 916 2222 sales@wallbarn.com

Racking solutions revisited

Since **Simpson-Strong-Tie** launched unique racking solutions for timber frame structures, Strong-Portal and Strong-Wall, 400 timber framed homes have benefitted from increased build flexibility – wider openings (and more of them), yet with none of the associated racking resistance issues: Easily integrated with existing timber frame design; Secures directly to foundation and adjacent timber frame panels; Easy to handle – no cranes or mechanical handling equipment; No additional framework, simply connect to the adjacent elements; Fixings and adhesives supplied with the system.

01827 155600 www.strongtie.co.uk

The lighter and stronger alternative



EGGER UK has launched OSB HDX a brand new 30mm heavy duty, load-bearing OSB4 panel ideal for use in humid environments. It replaces EGGER 38mm HDX board and is the perfect solution for heavy duty load-bearing environments, where P5 or P6 38mm chipboard would typically be used. Its low swelling properties means it's less likely to pick up moisture which can lead to uneven floors. Due to its 30mm thickness, it's 20 per cent lighter and despite being wider than a typical chipboard panel, it's easier to manoeuvre and quicker to lay.

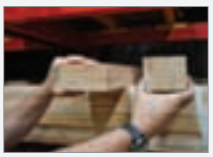
building.uk@egger.com

New guide keeps Sadolin in the picture

Premium woodcare brand **Sadolin** is putting specifiers in the picture after revising its popular Product and Colour Guide. The new-look guide reveals the latest additions to the premier brand and focuses on photographic content to illustrate how they, and others in the Sadolin range, have achieved a transformational effect. One of the highlights of the guide is a feature on the new Sadolin Beautiflex®, which is already becoming a popular choice in the specification sector. It's ideal for new, bare or previously coated exterior wood and is available in opaque shades.

0330 024 0310 www.sadolin.co.uk

Timbmet launches new timber brochure



A new brochure explaining the benefits of **Timbmet** Engineered Components (TEC®) compared to Timber underlines why the company is at the forefront of innovation in the largely traditional timber industry. Manufacturers and installers will find that Timbmet's multi-layered construction of TEC® offers stability and stress performance far in excess of Timber. These highly engineered wood products – available in four key species – are made by joining/gluing multiple pieces of material together. TEC® is designed to provide uniform performance.

01865 862 223 www.timbmet.com

WoodEx® recognised as a registered Trademark

James Latham has announced that WoodEx®, its premium quality, engineered hardwood and softwood timber product, is now recognised as a registered trademark with the UK Patent Office.

Introduced into the market four years ago, WoodEx® is made from European Ash, European Redwood, European Oak, Sapele and Grandis and the UK's biggest independent timber and panel products distributor is now seeing this versatile timber being specified in more and more joinery projects.

WoodEx® offers numerous features and benefits. It has two high-quality, clear faces for use in joinery applications and is ideally suitable for use in timber doors and windows as the product offers greater dimensional stability. In addition, Lathams can supply the product either as finger jointed or as one piece.

James Latham's Group Product Sales & Development Manager for WoodEx®, Paul Leach, commented: "Achieving registered

trademark status is great news for us, apart from the obvious protection and exclusivity it affords, it not only enhances the WoodEx® brand but also demonstrates the support and long term plans we have for this great product.

"Demand is increasing all the time and our stock now covers a wide range of sizes and species, providing a versatile addition to our already extensive timber range."

WoodEx® is available ex-stock in lengths of 0.8m to 3m, (6.0m in finger jointed faced Redwood) and in sizes ranging from 48mm x 95mm to 72mm x 120mm. Special sizes and lengths are also available to order.

0116 257 3415 www.lathamtimber.co.uk

Organic timber reflects circle of life

Canjaere timber cladding from the **A. Proctor Group** has been selected by WCP Architects to perfectly complement a beautiful new graceful design of the Baldarroch Chapel and Crematorium. The symbolism provided by the surrounding landscape was very fitting for an organic timber clad crematorium building. The organic shape was a key element of the design, and the use of timber cladding and an aluminium roof, enabled the curves and fluidity of the building to be maintained, achieving the experience of total peace and harmony.

01250 872261 www.proctorgroup.com

Summer shed revived to perfection

Osmo UK wood finishing products are a favourite among many, from DIY amateurs to professional craftsmen, and now homeowner, Nicola Kefford. After suffering a few complications with her garden shed, including joinery snags, gaps between the wood work and blown wood filler, DIY enthusiast, Nicola was introduced to Osmo's External Sealer. Offering a high quality exterior seal made from eco-friendly products, Osmo provided Nicola with the ideal wood finish treatment to revive her beloved shed back to perfection.

info@osmouk.com

Felmoor Park receives protection

The Scandinavian log cabins and lodges at the picturesque Felmoor Park in Northumberland have been given a striking new finish thanks to **Remmers** wood coatings. Remmers HK Stain was selected to provide not only effective weather protection but protection against blue stain, rot and insects. HK Stain is a "2 in 1" product which eliminates the need for an additional wood preservative primer and is perfect for both soft and hardwoods. The product penetrates deeply into the wood whilst leaving it fully breathable and as it doesn't flake or peel.

01293 594010 www.remmers.co.uk

Architects Datafile website

The Architects Datafile (ADF) website is an online provider of past and present products and news items for the architect or specifier. architectsdatafile.co.uk is a one-stop source for all the latest press releases providing any visitor with access to information about products and services that they may require. From the website, you can find links to digital issues that have live links to advertisers' sites, as well as daily email alerts to keep you as informed as possible.

www.architectsdatafile.co.uk

EGGER OSB HDX is a new 30 mm heavy duty, load bearing panel, suitable for mezzanine flooring. Being wider, yet lighter, than 38 mm chipboard means that it is quicker and easier to lay. Whilst it's superior strength provides higher point loads and UDL's.

For technical benefits and samples contact us on the Building Products Hotline T 0845 602 4444 or email building.uk@egger.com.

MORE FROM WOOD.

EGGER