trä

ARCHITECTURE,
CONSTRUCTION,
INSPIRATION
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NO. 4/2025

Pioneer

**pioneer [ˈpaɪəˌnɪə] noun ~s settler, trailblazer.
One who goes ahead, who tests, explores and shapes what has not yet found its given form.**

"Why do you do it like that?"

PHOTO JOHAN BERGMARK

Malin Age

Standing before me was perhaps not a know-it-all, but certainly a young woman questioning why we always did things a certain way. We were both summer workers, but I had been working a few weeks longer than her. "Because that's how we usually do it," I heard myself say, and in that very moment I realised the absurdity of the situation.

Questioning old routines isn't easy – but in this issue of Trä we choose to highlight the curiosity and courage to dare something new under the theme of pioneers. How do you build a large, sustainable and innovative urban district? Property company Atrium Ljungberg asked the question and the answer was in timber. Now the whole world is making the pilgrimage to examine Stockholm Wood City. On page 14 we take the pulse of the first upper secondary school that has been completed.

How do you build flexibly for the future and facilitate reuse? The Cradle in Düsseldorf experiments with different wood species, dismantling and lets the façade bear the load. Read more on page 22.

How do you build healthcare environments in timber, with the special requirements that entails? Join us in Karlstad, where construction of Sweden's largest large-scale hospital building in timber is in full swing. Read more on page 30.

In this issue we also tell you about finding new collaboration models, 3D printing, Spanish smart geometry, forestry and meet the timber pioneers at British architecture firm Waugh Thistleton.

Happy reading!

Malin Age

MALIN AGE
EDITOR

PS! Thank you to all our readers for your thoughts and reactions to the magazine's redesign! It's also fantastic to see that so many new subscribers want to follow us. Keep getting in touch with tips and tell us what you think of the magazine. The address is tidningentra@svenskttra.se

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SVENSKT TRÄ

SWISSPEARL

swisspearl.com

Punkthus, Rapperswil-Jona. Sunskin Facade Flat.
Arkitekt : BGS & Partner Architekten Foto: Winterthur

Solenergi har aldrig sett så bra ut.
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Med Swisspearl Sunskin får du ett fullt integrerat solcellssystem som ersätter konventionella tak- och fasadmaterial. Systemet är utvecklat för att möta höga krav på estetik, hållbarhet och energieffektivitet – i både nyproduktion och renovering.

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PHOTO ERIK DJURKLOU

THEME
pioneers

Read more about acoustic panels made from leftover walnut timber in 3D printers.
PAGE 26

PHOTO KOLLAGE

Early checks for timber frames

THE PROJEKTERINGSGUIDEN (Design Guide) is a new tool from Swedish Wood. It helps architects and structural engineers select the right wall and floor slab assemblies in the early stages of timber-frame building projects. The tool gives a quick indication of whether a construction meets the acoustic requirements in the new building regulations while simultaneously displaying the climate impact of the building materials. Projekteringsguiden is free and available at traguiden.se ●

PHOTO SHUTTERSTOCK

Stately Swedish pines bound for Copenhagen's Børsen

FOLLOWING THE DEVASTATING fire in April 2024, it was decided that Copenhagen's iconic stock-exchange building should be restored to how it looked when completed in 1625. Inspired by the rebuilding of Notre-Dame, the same materials and craft methods used when the exchange was first constructed will be employed here too. Originally, the timber came from Skåne and Gotland – then under Danish rule. Accordingly, half of the 886 straight-grained pines needed, each at least 150 years old, will now come from Sweden. ●

PHOTO MIA FERNLUND

A gingerbread house with a challenge

WHAT BETTER WAY to celebrate the festive season than baking a gingerbread version of a 16th-century log-built mining farmstead? Ornässtugan – famed for a visit by Gustav Vasa in 1520, when legend has it he fled through the cottage's privy to escape the soldiers of the Danish union king Christian II – is today managed by Statens fastighetsverk (the National Property Board of Sweden), which has also created the biscuit version. Pastry chef Livia Thors' templates and instructions for the Ornässtugan gingerbread house are available at www.sfv.se/pepparkakshus2023. ●

German building blocks use damaged timber

TRIQBRIQ IS AN INNOVATIVE German modular building system that uses windthrown timber, insect-damaged wood, top offcuts and residual timber to manufacture building blocks that are easily assembled and disassembled using pre-drilled holes, knobs and beech wooden dowels. According to the company, this makes sustainable, circular solid-wood frame construction possible for the first time, based entirely on damaged timber. ●

PHOTO TRIQBRIQ

Congratulations to Varberg's new station building!

IN OCTOBER 2025, Varberg's new station building won an award at the UIC Railway Station Awards in the Station & Urban Design category. The station was honoured for its innovative design. The building sets a new standard for sustainable station development. The architecture and design are by Okidoki Arkitekter. Jernhusen is the owner. ●

Stammhaus: double-curved structures

SWISS FIRM BLUMER LEHMANN is one of the true pioneers in digital timber construction and freeform design – something clearly reflected in its own headquarters, Stammhaus, in Gossau, Switzerland.

Here, a central freeform staircase winds sinuously through the Atrium, connecting the building's four storeys. The structure was developed in collaboration with the ICD institute at the University of Stuttgart and K&L Architekten AG. The curved timber components were manufactured from proprietary cross-laminated timber (CLT), enabling the undulating forms.

Blumer Lehmann is also behind the award-winning construction of Wisdome Stockholm. ●

TEXT ANNA STRÖMBERG **PHOTO** JAN THOMA, BLUMER-LEHMANN AG

ALL EYES ON THE

Just south of Stockholm lies Sickla – a seemingly ordinary neighbourhood that has captured international atter

Stockholm Wood City

In the Sickla district, Atrium Ljungberg is developing the world's largest urban quarter built in timber. Ground was broken in 2024, and the project encompasses 250,000 square metres across 25 blocks and more than 30 buildings with timber frames. Plans include 7,000 workplaces and 2,000 homes, along with retail, services and cultural facilities.

The project demonstrates how timber can be deployed in large-scale urban development to reduce the climate impact of new construction.

Atrium Ljungberg has owned the land since 1998 and is driving the project in collaboration with a range of partners. The area will benefit from strong public transport links via the Tvärbanan light rail, the Saltsjöbanan commuter line and a forthcoming new metro line.

Wood City is scheduled for completion in 2033.

TIMBER CITY ›

ntion. This is where the world's largest urban timber quarter is taking shape: Stockholm Wood City.

The family quarter at Nobelberget will offer homes for households of all sizes.

We receive international visitors every week – from Japan, Canada, Switzerland and beyond. It's not just the fact that we're building an entire district in timber that draws people here; it's also how we, as a private developer, are creating a mixed-use urban district with culture, housing, retail and offices. Everything you need should be within a five-minute walk," says Håkan Hyllengren, Business Developer at Atrium Ljungberg.

Wood City is rising on the former Atlas Copco industrial site, where the company once developed machinery for a growing world. Today, the innovation happening in Sickla is about how to build a thriving, sustainable city – one that is attractive to residents, workers and visitors alike. The sheer ambition is reflected in the giant scale model of Wood City on display at Atrium Ljungberg's Sickla office.

In total, 25 blocks and more than 30 buildings will be constructed in timber. The first residential buildings at Nobelberget are due for occupancy by the end of 2025.

"When you see the model, you grasp the scale. This isn't just a few timber buildings – it's a city in its own right, a place designed to thrive for at least a hundred years," says Håkan Hyllengren.

The initiative stems from a board decision in 2022, when Atrium Ljungberg adopted new sustainability targets: to halve the carbon footprint of new construction from 2025, reduce energy consumption and increase the reuse of materials.

"We hadn't built in timber before, but we saw it as the fastest and most powerful way to reach our goals. That's where the idea for Wood City was born," says Håkan Hyllengren.

PHOTO GUSTAV SCHÖN

»This isn't just a few timber buildings – it's a city in its own right, a place designed to thrive for at least a hundred years.»
HÅKAN HYLLENGREN, BUSINESS DEVELOPER ATRIUM LJUNGBERG

Working with the best

Timber is a key tool for halving the climate impact – but it is also becoming part of Sickla's identity. Here, timber will meet brick, glass and greenery in a mixed-use district that has evolved over several decades. From industry to retail, and now to timber city – a new growth ring for the area.

"Sickla has grown organically over a long time and has a distinctive patchwork character. We want to build on that. The old industrial buildings will remain as a reminder of the site's history, but also to create contrast with the new timber architecture."

Most of the buildings will be between five and eight storeys – a height well suited to timber-frame construction. Projects are delivered through multiple prime contracts, with Atrium Ljungberg assembling teams of architects, structural engineers and contractors for each phase. White Arkitekter, Liljewall, TL Bygg, Setra and Stora Enso are among those involved.

"We try to select the best in the industry for each phase. It drives innovation and means we can learn from every building," says Håkan Hyllengren.

Timber also enables smoother logistics: fewer heavy transports, shorter construction times and quieter building sites. That said, some buildings will require hybrid solutions.

"We're going to build a 16-storey residential block above the metro line. A hybrid structural frame will most likely be the best solution there, combining timber with concrete and steel."

A 25-storey innovation hub

The new timber quarters will foster a more pleasant urban environment: car parking at the retail centre will move underground, making way for more pedestrian streets and greenery. Below ground, surplus heat will be stored in the bedrock through geothermal energy storage. Offices, homes and shops will also be able to share energy, heating and cooling with one another.

"Instead of every building solving its own energy supply, we're creating a system where buildings help each other. That allows us to cut energy consumption significantly."

Sickla Central – a 25-storey tower completed in September this year – is also set to become an innovation hub for sustainable construction. The new landmark brings together companies to develop the solutions of the future.

"By gathering expertise and companies at the forefront of sustainable construction under one roof, we hope that exchange and collaboration can accelerate the development of new, innovative solutions," says Håkan Hyllengren. ●

TEXT GUSTAV SCHÖN
PHOTOS ATRIUM LJUNGBERG

DRÖMMEN: ATT MISSA TÅGET

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THE TIMBER SCHOOL LEADS THE URBAN TRANSFORMATION

TEXT GUSTAV SCHÖN **PHOTO** ATRIUM LJUNGBERG, JAMES STOKES **DRAWINGS** LILJEWALL

The first building in Stockholm Wood City now stands on Marcusplatsen in Sickla. The expansion of Campus Sickla marks the starting point for the timber city – where the material not only shapes the architecture, but also influences how people feel.

The students at Young Business Creatives, YBC, are on break. Everyone we speak to says the same thing: the timber school has good air quality, pleasant acoustics and lighting. And their impressions are well founded – research shows that students in timber environments experience lower stress levels, better concentration and improved academic results.

In autumn 2025, the upper secondary students moved into the 2,500 sq m extension, designed by architecture practice Liljewall on behalf of Atrium Ljungberg. The school thereby grew from 660 to just over 1,000 places.

The prefabricated timber façade reflects both the site's industrial heritage and points towards sustainable urban development of the future. It also demonstrates an exciting design solution, where the segmented assembly of prefabricated wall elements works elegantly with the varied setbacks and recesses. Joints are concealed in a natural way.

PHOTO GUSTAV SCHÖN

"The façade is a modern interpretation of an industrial building. The repetitive design helps connect the building to the site's industrial history," says Veronica Sundqvist, project architect at Liljewall.

Glass walls – a reassurance

Inside, the school architecture is modern and warm. The scent in the stairwell is palpable, and the partly exposed stair structure in cross-laminated timber (CLT) catches the eye. The four storeys are dominated by whitewashed walls in laminated timber cladding, while the ceilings and classrooms are lined with sound-absorbing wood wool board.

"In the classrooms we've also installed internal fully automatic blinds. We've concealed them behind a projecting timber panel," explains Veronica Sundqvist.

Glass walls separate teaching rooms and staff areas from communal spaces.

"It lets in more light, but also provides reassurance. Teachers always have a view of the common areas, which reduces the risk of vandalism and graffiti," says Veronica Sundqvist.

Height was the biggest challenge

Campus Sickla comprises several upper secondary schools. The new timber building adjoins an older industrial brick building, home to another school. At the far end of the timber school, the old brick wall emerges – a reminder of the site's history.

"In this way, Sickla's industrial heritage is woven into the interior as well," says Veronica Sundqvist, and continues:

"We initially thought students would be able to move freely between the buildings, but for various reasons we now only have emergency exits between them."

When the old industrial building was converted into a school, a local plan already existed with a designated building right in front. This meant the new building had to be adapted to given heights and proportions.

"The biggest challenge in the project was the height. A timber frame requires larger floor slab dimensions than steel and concrete. We solved it by running electrical, ventilation and pipes through the corridor ceilings, which made it possible to maintain generous ceiling heights in the communal areas," she says.

With the expansion of Campus Sickla, the timber city has gained its first building. Here, the values on which all of Stockholm Wood City will rest are being tested: sustainability, innovation and closeness between people.

"Campus Sickla is a key hub in a unique urban district where sustainability, innovation and community meet. Beyond its architectural significance, the building also takes social responsibility. It is designed to have a positive impact on people's lives and on the place as a whole," says Veronica Sundqvist. ●

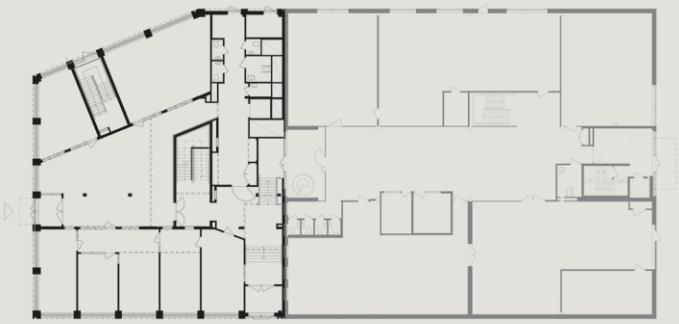
Campus Sickla

Developer: Atrium Ljungberg.
Architect: Liljewall.
Structural engineer: Looström Konstruktionsbyrå.
Tenant: Young Business Creatives, YBC, a municipal upper secondary school.
Year of construction: 2024-2025.
Area: 2,500 sq m, 4 storeys plus basement.
Structural frame: Timber frame with glulam post-and-beam system, CLT floor slabs.
Main contractor: TL Bygg.
Frame erector: Dalahusgruppen.
Supplier: Setra.
Building materials: Post-and-beam frame in glulam, approx. 76 m^3. Floor slabs, exposed stairwell walls and partly exposed stair structure in CLT, approx. 530 m^3. Timber façade, prefabricated infill walls and roof elements with timber frame. Basement and plinth in concrete.

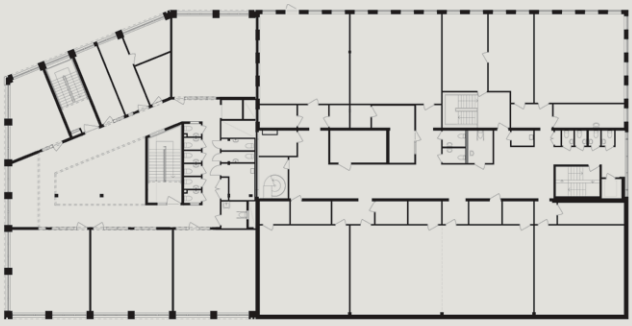
1. The school is beautifully situated beside leafy Marcusplatsen. Here, restaurants, hotels, shops, cultural venues and now education share the space.
2. Sink into a beanbag or take the stage. The timber modules in the common rooms serve dual functions.
3. Between storeys, the cross-laminated stair structure is revealed.
4. The façade's repetitive design pays homage to Sickla's industrial heritage, while the setbacks naturally incorporate the prefabricated infill walls.
5. The structural frame was erected in seven weeks. The glulam columns have been clad in timber panelling, giving the rooms a warm and cohesive expression.

› Technical details

GROUND FLOOR PLAN



FLOORS 2–4



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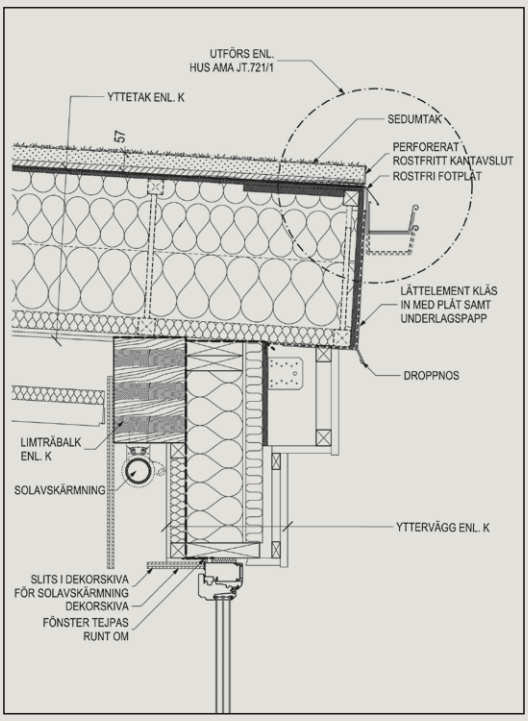
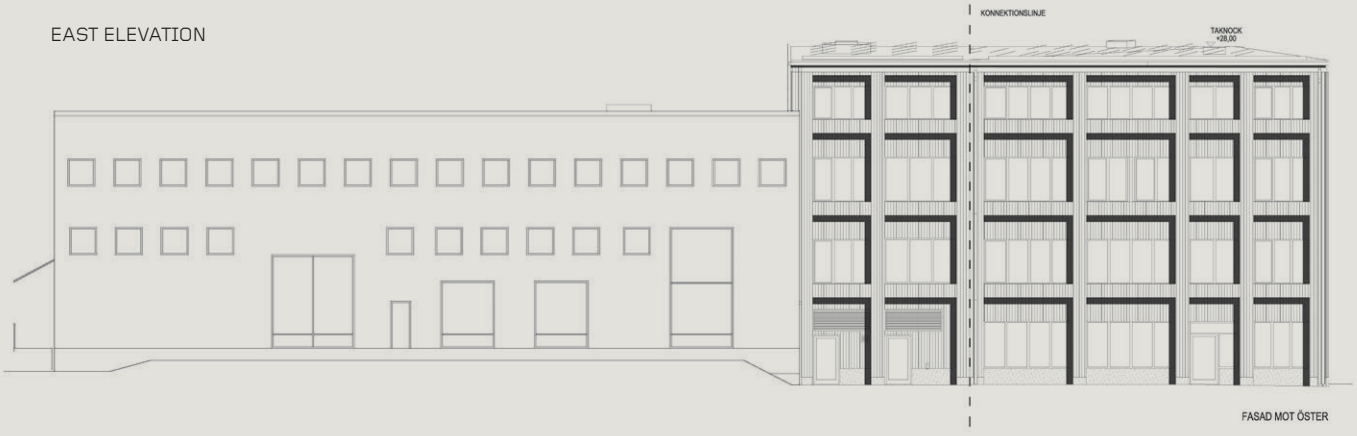


SECTION

EAST ELEVATION



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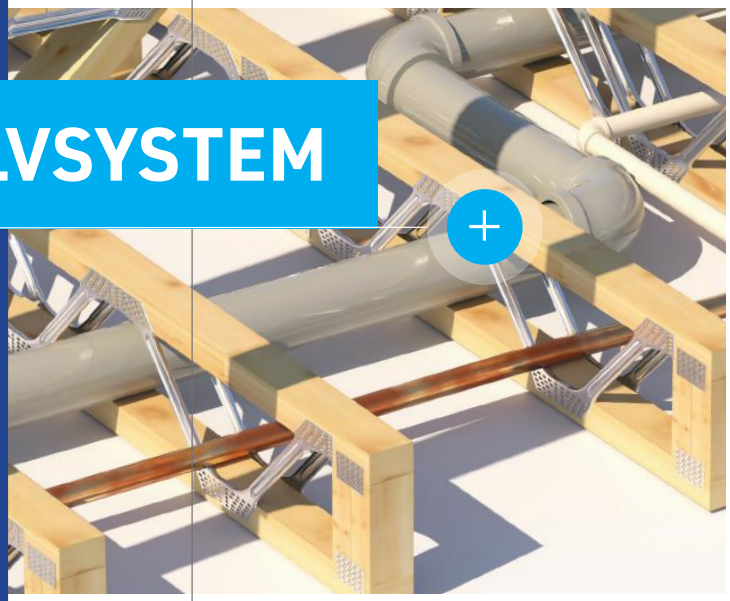

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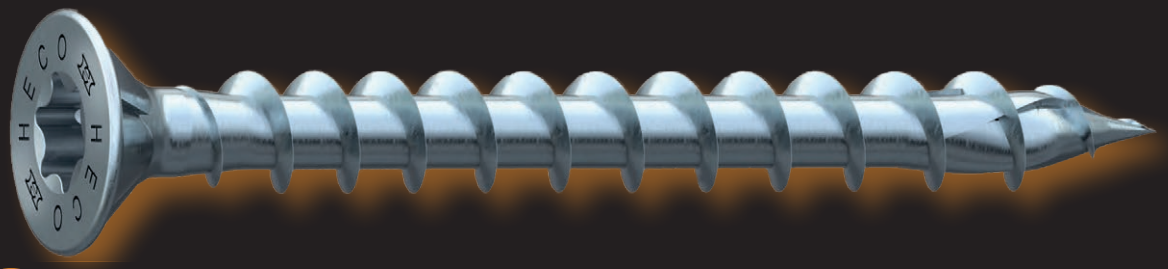

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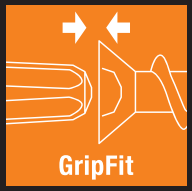

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A SCHOOL IN BUILDING WITH TIMBER

When Archus was commissioned to design Vallaskolan in Sala ten years ago, no one anticipated that the project would mark the start of a development journey leading to more timber schools and a refined method where sustainability, collaboration and innovation go hand in hand.

TEXT MATTIAS BOSTRÖM **PHOTO** ARCHUS

The year is 2016 and Sala municipality is planning its first major school project in 50 years. The choice of structural frame material remains open. The municipality is interested in new and sustainable building methods. When Byggpartner is contracted to construct Vallaskolan, the project takes on a clear sustainability focus, with the ambition to build the school in mass timber.

"In close dialogue with Sala municipality, we chose to invest in timber as the structural frame material, and Vallaskolan became both our and the municipality's first timber school building. Sala is a smaller municipality with short decision-making chains. That helped drive the process forward in a smooth and constructive way," says Anna Kovacs, Head of Architecture Västerås, at Archus.

Vallaskolan was completed in 2020, and for Archus the project became a school in a double sense: a successful school project and the starting gun for their journey in building with mass timber. And even though it was a test bed, the work ran smoothly. All parties were involved from the start, which enabled them to find solutions that were both economically viable and environmentally sustainable.

That experience laid the foundation for the expertise Archus has continued to build on since then. Through several timber school projects, they have refined their processes and found efficient solutions that combine economy and sustainability.

"There are certainly challenges in building with timber, but as we have evolved, so has the industry. As knowledge grows, the difficulties ease," says Anna Kovacs.

ONE OF THE MAJOR CHALLENGES in Archus's school projects was acoustics, which is particularly important in school environments. Timber is lighter than concrete, meaning sound travels more easily through the structural frame. Examples include impact sound and structure-borne sound. Solving the problem requires building up the construction and supplementing the frame to interrupt the sound path. This is particularly important in sensitive rooms, such as woodwork rooms and music rooms. But views on how acoustic challenges should be addressed can vary between different acousticians and projects.

"A solution that works well in one project doesn't necessarily fit in another. But as more buildings are constructed in timber, knowledge spreads, and acousticians are becoming increasingly experienced in working with timber frames," says Margareta Löfgren, architect at Archus in Västerås.

Since acoustics can sometimes be a cost driver, it is important to engage consultants with experience in timber. Incorrect or over-specified measures can easily become costly, Margareta Löfgren points out.

"One positive aspect of acoustics is that exposed mass timber walls have a beneficial effect on room acoustics regarding airborne sound. Timber absorbs and diffuses sound waves in a pleasant way, which reduces the need for wall absorbers."

THE DEVELOPMENT of fire protection has also taken major strides forward. Issues that previously caused uncertainty have now been replaced by well-proven solutions and a growing knowledge base. One approach is to install sprinkler systems, which enables both exposed timber surfaces and shorter escape routes. Without sprinklers, more emergency exit doors are required and the timber surfaces need to be clad in plasterboard. That was the approach Arboga municipality took at Gäddgårdsskolan, to reduce investment costs and future maintenance of a sprinkler system.

"In the ten years since we built our first timber school, knowledge among our industry colleagues has increased markedly, and technology has developed at a rapid pace. Today there are both more suppliers and more consultants with deep experience of timber," says Anna Kovacs.

Another recurring challenge has been the interpretation of local plans. Since timber often requires somewhat deeper floor slabs than concrete, the building can end up taller than what the plan specifies. At Kvarngärdesskolan in Uppsala, Archus has been able to influence the building height during the review period.

"It is becoming increasingly common for municipalities to allow for timber already in local plans. With greater awareness and dialogue, more opportunities are created to realise timber buildings," says Anna Kovacs.

All of Archus's timber schools have been built as partnering contracts, where architects, structural engineers, contractors and consultants sit down at the same table from the very beginning.

"That is really a prerequisite for being innovative. If all disciplines are involved early and share their previous experience, the risk of costly detours further down the line is reduced," says Anna Kovacs.

IN PARALLEL with the industry's growing knowledge of timber construction, municipalities' expertise in the field has also developed. Archus's first mass timber school projects were often driven by enthusiasts – people within municipalities or building contractors who, with courage and curiosity, wanted to try something new to advance sustainable development.
But now Archus is seeing that change.

"Knowledge throughout the entire chain has increased enormously. There is a built-up experience bank that did not exist to the same extent when we started in 2016," says Mikael Hassel, architect responsible for sustainability. With each new school, both clients and contractors have become more experienced, and the sustainability requirements in procurements are being tightened more and more. The level can still vary between different municipalities, but development is progressing rapidly and the exchange of experience between municipalities is growing – something that benefits the whole industry and drives the transition towards more sustainable construction. The industry has simply caught up.

PERHAPS ARCHUS'S GREATEST lesson has been how perceptions of timber have changed over the years. Previously, a timber building was automatically classed as sustainable. That is no longer the case, Mikael Hassel argues.

"You shouldn't simply build in as much timber as possible. It's about material efficiency, flexibility and having the right material in the right place. We increasingly advocate post-and-beam systems over solid load-bearing walls. That reduces material use and makes the building more adaptable over time. A school should be able to adapt to the pedagogy of the future, not be locked into today's floor plan," he says.

Margareta Löfgren adds:

"Exposed timber creates a calm environment. Research shows that natural materials can reduce stress and promote wellbeing. It becomes a positive side effect. We build for the climate and get a better learning environment into the bargain." ●

»There are certainly challenges in building with timber, but as we have evolved, so has the industry. As knowledge grows, the difficulties ease.»

ANNA KOVACS, HEAD OF ARCHITECTURE VÄSTERÅS, ARCHUS

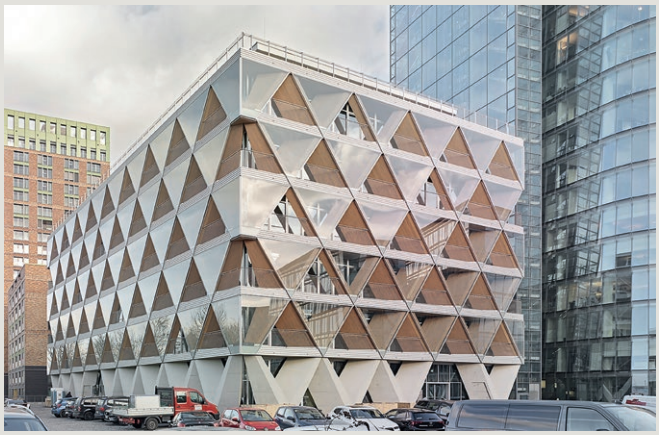
BOLD IN DÜSSELDORF

An office building engineered for disassembly,where the façade forms part of the load-bearing structure. The Cradle demonstrates how circular construction can be both technically precise and architecturally expressive.

"It is an important step towards showing how materials can be reused," says Roman Schieber, CEO of Knippershelbig.

Roman Schieber, CEO, Knippershelbig.

TEXT GUSTAV SCHÖN **IMAGES** ACHIM BIRNBAUM, CHRIS RAUSCH, RALPH RICHTER, KNIPPERSHELBIG **DRAWINGS** HPP ARCHITEKTEN **RENDERS** KNIPPERSHELBIG



JUST A FEW mehundred metres from HPP Architekten's head office in Düsseldorf's old harbour district stands The Cradle – a building where almost every component can be reused. It is Germany's first office building developed entirely according to the Cradle to Cradle principle, an international standard for circular and sustainable design. The principle is based on keeping everything in closed loops, and on every solution creating added value; it underpinned the sustainability strategy developed together with the client, The Cradle GmbH & Co. KG.

"Düsseldorf's harbour district is known for its iconic and diverse architecture. In this vibrant and heterogeneous environment it was important for us to create a building with a clear identity – one that not only stands out visually, but also responds to today's societal challenges. The Cradle embodies this ambition: it is bold, forward-looking and rooted in sustainability," says Antonino Vultaggio, senior partner at HPP Architekten.

The façade's rhombic structure is more than a decorative skin. Engineering firm Knippershelbig, specialists in structural and façade engineering, developed a design where V-shaped larch columns connect to edge beams via beech connectors, allowing easy disassembly.

"We chose high-grade larch because it is naturally weather-resistant, and beech for its hardness and dimensional stability. Spruce or pine would probably not have worked in these components," says Roman Schieber, CEO of Knippershelbig.

ACCORDING TO THE Cradle to Cradle principle, every component has been documented in a circular passport describing the materials' contents and origins. The documentation tool is also used to calculate the building's circularity.

Compared to a conventional building, The Cradle has reduced its carbon footprint by 50%, and over 90% of the materials can be

»We chose high-grade larch because it is naturally weather -resistant, and beech for its hardness and dimensional stability.«

ROMAN SCHIEBER,
CEO OF KNIPPERSHELBIG

recycled. The building's hybrid structure comprises concrete in the basement and core, along with timber in the five upper storeys.

Spruce was used in the internal structure, while larch and beech were used in the load-bearing façade structure. In total, 2,150 cubic metres of timber, mainly from forests in Germany and the rest of Europe, were used in the structural frame.

"The large volume of timber helped reduce the building's carbon footprint," says Roman Schieber.

Inside, the building is characterised by exposed timber, clay plaster and green walls that create a warm and natural working environment.

"With The Cradle we wanted to create a work environment that supports health and wellbeing. By combining natural timber, living walls and clay surfaces we achieve an atmosphere and air quality that makes people feel alert, focused and inspired every day," says Antonino Vultaggio. ●

The Cradle

Architect: HPP Architekten GmbH.

Structural engineer & façade consultant: Knippershelbig GmbH.

Developer: The Cradle GmbH & Co. KG.

Completed: 2023.

Area: Approximately 11,400 m².

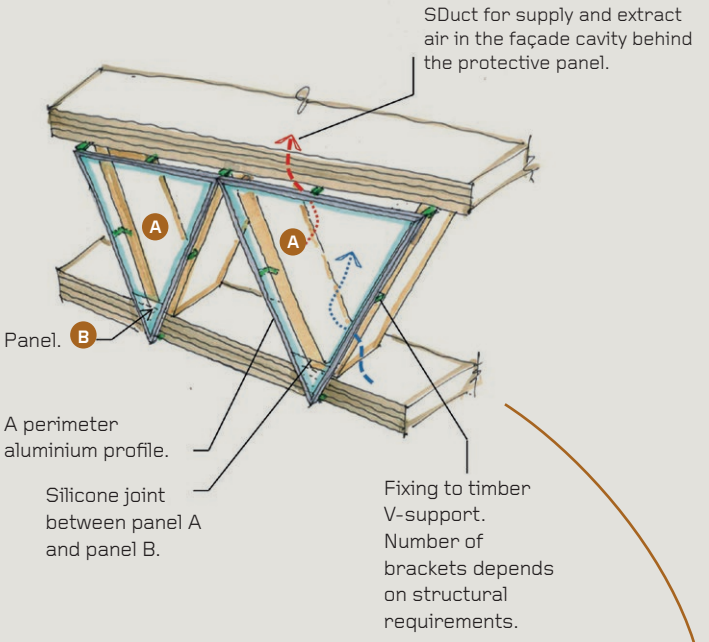
Awards: Holzbaupreis NRW 2024, Sonderpreis; MIPIM/ The Architectural Review Future Project Award 2018; ICONIC AWARD: Innovative Architecture 2018; Sonderpreis BIM Heinze Architekten AWARD 2020.

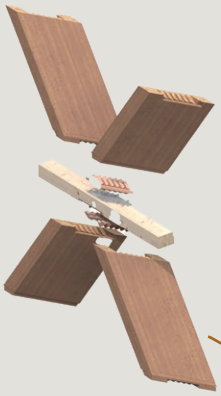
The columns carry the structure

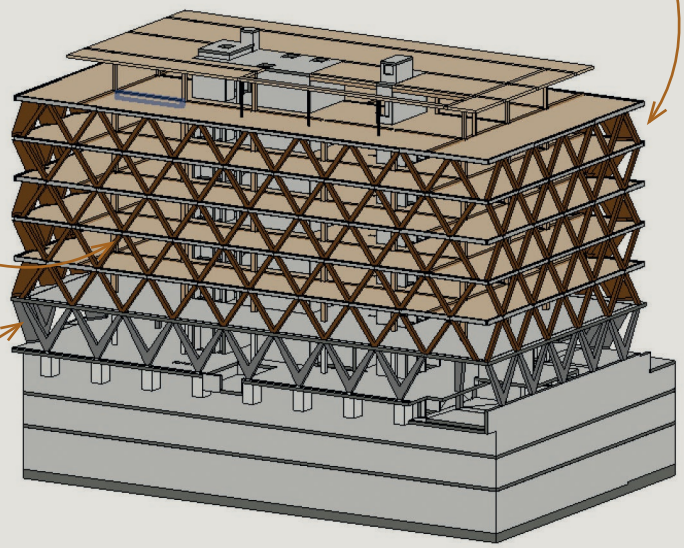
The V-shaped larch columns function as both solar shading and load-bearing structure. The depth of the façade's recesses varies by orientation – to the south and west they form loggias that open the building towards the water. The columns transfer vertical and horizontal loads and interact with the building's concrete core to provide stability. Columns and beams are joined together with connectors in laminated beech veneer.

"Many simulations were required to optimise each node," explains Roman Schieber.

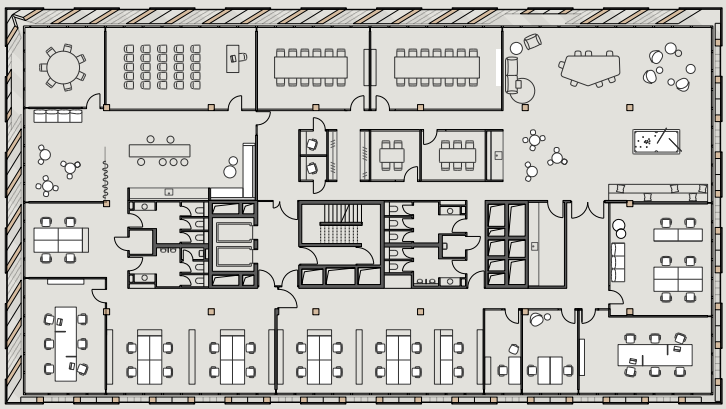
The structure is designed so that components can easily be dismantled and reused in the future. Therefore, minimal screws and adhesive have been used.●







OFFICE FLOOR PLAN LEVELS 2-6



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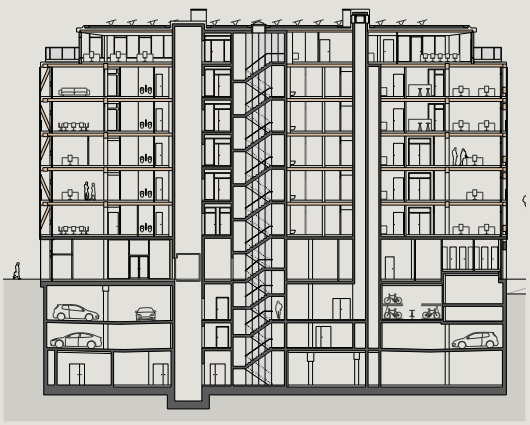

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Stiftelsen har till ändamål att genom stöd åt vetenskaplig forskning och undervisning främja svensk skogshushållning samt utnyttjandet och förädlingen av svenska skogsprodukter även som angränsande näringars utveckling och förkovran.

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Ove Nilsson
ove.nilsson@slu.se

Charlotte Bengtsson
charlotte.bengtsson@skogforsk.se

Anders Pettersson
anders.olov.pettersson@gmail.com

Sista ansökningsdag 2026-01-31

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Sedan starten år 1967 har ca. 200 miljoner kronor delats ut.

THE MATERIAL OF THE FUTURE CAN BE USED AGAIN AND AGAIN

Simon Mattisson is a pioneer in 3D printing with wood composites – a technique that challenges both industrial processes and preconceptions about what wood can be.

TEXT MATTIAS BOSTRÖM **IMAGES** ERIK DJURKLOU

ACCORDING TO THE Swedish Forest Agency, spruce bark beetle has destroyed around 34 million cubic metres of spruce in southern and central Sweden since 2018 – representing tens of billions of kronor in timber value. It was these figures that prompted designer Simon Mattisson, during his degree project at Beckmans College of Design, to start thinking. What could be done with all this damaged timber?

"My degree project focused on spruce bark beetle. What if you could grind down the timber they had damaged into wood flour and use it in a 3D printer?" he says.

By mixing wood flour with bioplastic made from starch and sugarcane, Simon Mattisson developed a material the 3D printer could work with. The result was something that looks like wood but feels slightly different to the touch.

"That's what captivated me when I first saw the result. You can see it's not quite wood, but it's not plastic either. It really is an entirely new material, and I find that exciting," says Simon Mattisson.

NOW HE HAS moved on to experiment with other wood-based materials. He has printed objects of many different kinds: furniture, artworks and acoustic panels. The latter came about through a collaboration with Gustafs, a manufacturer of timber interiors for public spaces.

The aim was to recycle the offcuts generated during production.

"Gustafs' production is very sustainable. They make panels from recycled gypsum, among other things, with a thin layer of high-quality walnut veneer. On each piece of veneer, they trim off a centimetre. That was the bit they wanted to do something with. So I ground down the walnut pieces, made my own composites and 3D-printed new panels," says Simon Mattisson.

TODAY'S 3D PRINTERS can print objects up to two cubic metres in size. This means the technology isn't yet mature enough for industrial production of, say, multi-family timber housing. Whether and when that will happen remains uncertain, according to Simon Mattisson.

"Architectural elements of all kinds in wood should be explored more than they are today when it comes to 3D printing. There are huge possibilities, both in terms of new forms and more efficient use of wood as a material. Everything from cabinet doors to built-in furniture and mouldings. The only thing stopping us is a lack of curiosity and imagination," he says.

But when it comes to load-bearing structures, solid timber will continue to be the material of choice, according to Simon Mattisson.

"If you 3D-print a structural frame, it ends up hollow in the middle. And it goes without saying that's not a good idea for load-bearing structures," he says.

Simon Mattisson's printed material currently consists of around 30 percent wood. But he is collaborating with a Finnish materials manufacturer to increase the wood content. The advantage is that offcuts, waste and old panels can all be ground down and used again – time after time.

"You can recycle the same material ten times. A chair can be ground down and become something new, without adding anything else. It's like a circular loop at the molecular level."

SIMON MATTISSON DOESN'T see himself as a tech enthusiast, but as a designer who wants to tell stories through materials. His work is as much about communication as innovation – a way of giving new value to what would otherwise be regarded as waste.

"I started by trying to solve a problem in the forest, and ended up in the future. That's how it feels – like I'm creating with the sawdust of tomorrow." ●

»You can recycle the same material ten times. A chair can be ground down and become something new, without adding anything else. It's a circular loop at the molecular level.«

SIMON MATTISSON

The acoustic panels in ground walnut were produced in collaboration with Gustafs. It was one of the first walnut composites suitable for 3D printing.

THE QUEST FOR THE MIXED FOREST

TEXT MALIN AGE ILLUSTRATION INTELLECTA

"We are in the midst of a transition. Soon we will have an entirely different mature forest than we have had before, with more pine and hardwood," says Erika Olofsson, Associate Professor of Forest Management at Linnaeus University in Växjö.

Global biodiversity may be under severe pressure. But in Sweden's forests, the picture looks different. There, several key indicators are trending positively. At the same time, the effects of climate change are leaving their mark on forestry. "Variation" has become a watchword.

To understand why Sweden's forests look the way they do today, we need to go back to the 18th and 19th centuries. Back then, vast quantities of wood fuel were needed to power all the ironworks and glassworks that were so vital to Swedish industrial development. At the same time, timber was being exported to Europe. The result was a forest that was both sparse and depleted.

In true pioneering spirit, various measures were taken to save the Swedish forest. In 1903 came what is generally considered the world's first modern Forestry Act, with requirements for replanting and regeneration. A few years later, in 1915, Sweden established its first university forestry programme.

New forest policy in the 1990s

At Linnaeus University in Växjö, Erika Olofsson is Associate Professor of Forest Management. She has studied how a changing climate may come to affect decisions relating to forests and forestry.

Erika Olofsson points out that the forest we have today – dominated by spruce and pine – is the result of decisions made quite some time ago. A large proportion of the timber we harvest today was planted just after the end of the Second World War.

But 30 years ago, major changes were made to forest policy, and in 1994 Sweden's new Forestry Act came into force. It became just as important that the forest be used responsibly, so that it could yield good returns, as that biodiversity be safeguarded.

Since the new law was introduced, more old dead trees have been left in the forest – precisely the kind of deadwood that is a vital prerequisite for many species to thrive. In southern Sweden, the area of old-growth forest has tripled, the area of forest with large-diameter trees has doubled, and the area of older broadleaf-rich forest has increased substantially. "Variation" has become a watchword. If there are different environments – light, dark, dry and damp – the chances are naturally greater for more species to find a place where they can flourish.

"We are in the midst of a transition, but it may not be easy to see with the naked eye. Soon we will have an entirely different mature forest than we have had before, with more pine and hardwood. I see greater interest among forest owners in wanting to try new tree species and management methods. Climate change is also contributing to an awareness of not putting all your eggs in one basket," says Erika Olofsson.

Her colleague Åsa Rydell Blom, Associate Professor of Wood Science at Linnaeus University, is confident that in the future we will have more – and different – tree species in Swedish forests. Although spruce has long been the most common species, pine has now overtaken it. (Read more about this in Trä, issue 2/2025). In a milder climate with more extreme weather, it becomes important to match tree species and forestry methods to the site.

"We will see a different composition in the forest, particularly in southern Sweden. That is why we in the research community have already started experimenting with other species. When it comes to timber-framed buildings, we need to learn more about how other tree species perform. Perhaps we can use more birch and beech. In Denmark and Germany, they are trialling Douglas fir and Sitka spruce from North America. They seem to have good properties and grow well," says Åsa Rydell Blom.

Development heading in the right direction

She sees a danger that the debate over how Swedish forests are managed, and should be managed, risks disrupting the positive development that is already under way.

"We have already recognised that the forest should be managed in different ways. However, I believe that as a client you should not demand one method over another, because so many factors come into play. There is no single solution – there are several."

Åsa Rydell Blom is not particularly worried about the survival prospects of different species in Swedish forests, even though improvements can be made.

"Development is already clearly heading in the right direction. What concerns me is the increase in invasive species such as lupins, Canadian goldenrod and Japanese knotweed. There is a great deal of work to be done there, and these are real, tangible threats to biodiversity in Sweden." ●

PHOTO LINNAEUS UNIVERSITY

Erika Olofsson, Associate Professor of Forest Management, Linnaeus University, Växjö.

PHOTO LINNAEUS UNIVERSITY

Åsa Rydell Blom, Associate Professor of Wood Science, Linnaeus University, Växjö.

Want to know more?

Last year, Åsa Rydell Blom gave a lecture at the Seminar for Industrial Timber Construction entitled "The journey begins in the forest". In it, she explains how Swedish forests are managed and why things look the way they do. You can watch the lecture here:

TIMBER TAKES CENTRE STAGE IN THE HOSPITAL OF THE FUTURE

In Karlstad, Swedish healthcare architecture is taking a historic leap. Using locally sourced timber, Sweden's first large-scale hospital building in wood is now under construction.

"A huge innovation for Sweden – and Europe," says Cristiana Caira, professor of healthcare architecture.

TEXT GUSTAV SCHÖN **PHOTO** WHITE ARKITEKTER

The new Centralsjukhuset in Karlstad, Nya CSK, is one of Sweden's largest healthcare construction projects. At its heart stands Mottagningshuset – a pioneering building testing new approaches to healthcare architecture – with timber as its guiding principle. Commissioned by Region Värmland and Skanska, White Arkitekter have designed a building aimed at meeting as many of the UN's Sustainable Development Goals as possible.

"Timber can be used as an aesthetic element or as a sustainable material, or, as here: both," says Cristiana Caira, artistic professor of healthcare architecture at Chalmers, and lead architect at White Arkitekter.

Värmland is one of the Swedish forest industry's strongholds. Eight per cent of the county's population earn their living from forestry. There is abundant forest here. The timber for Mottagningshuset comes from the region and the structural frame is manufactured at Stora Enso's sawmill in Grums.

"The project is locally produced in the truest sense. If timber hadn't delivered a final product equal to conventional materials, it wouldn't have been used," explains Jens Axelsson, architect at White Arkitekter.

Mottagningshuset uses a hybrid structural frame in timber and steel. It is optimised to create as much floor area as possible. The columns become more slender higher up the building, and steel beams are used so that floor levels can align with an existing hospital building adjacent.

"We've also made the corridors slightly wider. This allows the technical installations, such as electrical and ventilation systems, to be arranged horizontally rather than stacked vertically," explains Jens Axelsson.

In two years, outpatient clinics for rheumatology, gynaecology and other specialities are expected to move into Sweden's first timber hospital.

"Mottagningshuset is a large healthcare building with day care and outpatient services, even if it isn't the biggest building within Nya CSK. Akuthuset, which will be built at a later stage, covers 90,000 square metres and will house high-tech medical care," says Jens Axelsson.

"The façade comprises 200,000 reclaimed bricks from Denmark. Internally, there will be timber features in certain public areas. In Akuthuset, the larger new building included in the Nya CSK project, timber will play a more visually prominent role,"says Cristiana Caira.

"We see that timber in hospital environments is becoming increasingly common, precisely because it is aesthetically appealing and provides a warmer feel. Research also shows that visible timber can have a positive effect on patients.

Cristiana Caira, artistic professor of healthcare architecture at Chalmers, and lead architect at White Arkitekter.

Jens Axelsson, architect at White Arkitekter.

Sweden's first large-scale hospital building in timber

Developer: Region Värmland.
Architect: White Arkitekter.
Contractor: Skanska.
Construction start: 2023.
Occupancy Mottagningshuset: 2027.
Total area Nya CSK: Approximately 100,000 sq m (completion 2036).
Mottagningshuset: 14,000 sq m, eight storeys.
Structural frame: Hybrid structural frame in cross-laminated timber (CLT), glulam and steel.
Façade: 200,000 reclaimed bricks from Denmark.
Timber supplier: Stora Enso and Setra.

Mottagningshuset is being built primarily with timber in the structural frame and a façade of 200,000 reclaimed bricks.

Akuthuset, with Akuttorget at its centre, will be the heart of Nya CSK and is by far the largest building being constructed on the hospital site.

New timber report: Intensive care is possible

The report Hälsa i Trä, produced by RISE, was recently published. Through fictitious design studies they have investigated how timber can be used more extensively in hospital construction. Fire requirements pose no technical barriers, but recommendations for non-combustible materials complicate the use of timber as a structural material. Vibration requirements are also a challenge. This is why Akuthuset, which will house high-tech medical care, will be built with a concrete frame.

"When you have vibration-sensitive equipment such as MRI scanners, plus a helipad on the roof, it isn't suitable to have timber in the structure. Timber technology must develop further before that becomes possible," says Cristiana Caira.

The report shows, for example, that care functions for intensive care, which have equipment with tight tolerance requirements for building vibrations, can be accommodated if the timber frame is designed accordingly. This opens up possibilities for a greater proportion of timber even in more advanced healthcare buildings than the one being constructed in Mottagningshuset in Karlstad.

"In the report, three different types of high-tech operations were compared, and the results show that it is possible to use hybrid structural frames with timber in both general wards and intensive care units. But operating theatres, which according to Swedish standards need to be at least 60 square metres, are not feasible with current timber construction technology. They require large column-free areas, which leads to spans too great to meet the strict vibration requirements,"says Cristiana Caira, who participated in producing the report.

To increase the use of timber in hospitals, the report proposes that further research and development of material-based requirements must be converted to performance-based requirements. Likewise, decision-makers and property owners need more knowledge about modern timber construction.

Two international timber hospitals

White Arkitekter are involved in two other high-profile healthcare construction projects that demonstrate how high-tech medical care and timber frames go hand in hand. One is a cancer clinic in Wales, the other a hospital in Tübingen in southern Germany.

"In Wales, they're building multiple buildings horizontally, which of course requires more ground area,"says Cristiana Caira and continues:

"In Tübingen, the hospital is being built vertically. The first storeys have a concrete frame and will house high-tech medical care. On top of that, three storeys with a timber frame are stacked, where there will be wards, and in the patient rooms, timber beams will be visible.'

Policy shows the way

Two years ago, a report from Program för teknisk standard (PTS) suggested that larger hospital buildings in timber are not suitable. One of the greatest obstacles was considered to be fire risk.

"Unfortunately, that has created apprehension in the regions. But in Germany, for example, which is also an EU country, fire requirements look completely different,"says Cristiana Caira.

In Karlstad, the structural frame is clad with plasterboard and surface-treated to meet the stringent fire requirements.

"According to Region Värmland's timber construction strategy, timber should be the first choice for new builds, and it should always be investigated which parts can be built in timber. This political ambition is an important prerequisite for this project," says Cristiana Caira. ●

Three myths about timber in hospitals

1 Timber is unhygienic
Research shows that viruses survive for a shorter time on wood than on plastic or steel. Some timber species even have natural antibacterial properties. With the right surface treatment, timber can withstand cleaning even in care zones with stringent hygiene requirements.

2 Timber is a fire hazard
Timber has a predictable fire behaviour and can be dimensioned to retain its load-bearing capacity for extended periods. To achieve fire class Euroclass B, there are two methods: surface treatment with tested fire-protection coatings or industrial impregnation with fire-retardant chemicals.

3 Timber cannot meet the demands of advanced healthcare
Hybrid solutions with timber, steel and/or concrete make it possible to achieve long spans combined with stringent vibration requirements. Several European hospitals demonstrate that even patient wards and intensive care units can be built in timber. ●

SOURCE: WOOD FOR HEALTH

Want to read more about how timber can be used in healthcare buildings?

Read more in the reports Hälsa i trä from RISE and Wood for health from White Arkitekter.

Health in Wood

THE RESEARCH PROJECT has brought together two sectors that have not traditionally collaborated: timber construction and hospital building. Hälsa i trä (HiT) is a Vinnova-funded project that started in May 2023 and ran for 26 months. A fictitious design study of a structural frame for an operating theatre, intensive care room and patient room was carried out to test various timber construction techniques based on current practice.

The project was coordinated by RISE. Other project participants were Centrum för vårdens arkitektur, Region Västerbotten Fastighet, Södra, Moelven Modulbyggnad, Moelven Töreboda, Masonite Beams, AFRY, Sitowise Sverige, CF Møller Arkitekter, White Arkitekter, ByggDialog, Swedish Wood and AcouWood. ●

ARCHITECTURE IN HARMONY WITH THE FOREST

In the German state of Thuringia, Matteo Thun & Partners and healthcare specialist HDR Germany have created a hospital that is literally embraced by dense pine and beech forest.

The timber facade of Waldkliniken Eisenberg hospital and its expansive glazing establish a visual connection with the outdoors; daylight and views of nature are defining features throughout. Architect Matteo Thun believes they won the commission because they recognised an industry ripe for revolution. Matteo Thun & Partners had extensive experience in hotel design, and at Waldkliniken Eisenberg they have created a fusion of both worlds: hospitecture.

"It's a design language that combines the aesthetics of hospitality projects with those of healthcare. Waldkliniken is neither a clinic nor a hotel. We call it 'hospitecture' – tomorrow's hospitals should not be 'sterile boxes'. As the fa√βade weathers to a silvery patina, it will blend into the forest. In 50 years, this building will look even better," says Matteo Thun, founder of Matteo Thun & Partners.

The hospital's circular floor plan ensures that every patient room enjoys views of the surrounding forest. Here, architecture and nature converge with the aim of promoting patient wellbeing.

"Wood is a living material that conveys warmth and a sense of security. It creates a connection to nature that is often absent in clinical environments. Healing Architecture may be a buzzword now – but it strikes at the heart of the matter. For us architects, it's about creating physical and spatial psychological wellbeing in the interplay between staff, patients and their families," says Matteo Thun. ●

TEXT MATTIAS BOSTRÖM **IMAGES** MATTEO THUN & PARTNERS

1

Waldkliniken Eisenberg hospital

Developer: Saale-Holzland-Kreis.
Contractor: Matteo Thun & Partners and HDR Germany, together with regional firms.
Construction: 2016 – 2020.

Verandan på Arlanda – Sveriges mest besökta träprojekt

En hållbar konstruktion som välkomnar resenärer från hela världen

Image: Swedavia

När resenärer kliver in på Arlanda Airport möts de av Verandan – en varm och inbjudande träkonstruktion som på ett naturligt sätt binder samman flygplatsens byggnader och skapar ett välkomnande första intryck. Med sin öppna form och nordiskt inspirerade estetik är Verandan både funktionell och visuellt imponerande.

Bakom projektet står **Tyréns**, som på uppdrag av **Martinsons** ansvarade för projektering och beräkningar av den bärande trästommen. Träet valdes med omsorg – inte bara för sin estetiska kvalitet, utan också för sina hållbara egenskaper. Som en förnybar resurs bidrar trä till ett lägre klimatavtryck och är ett naturligt val för en byggnad som ska välkomna miljontals resenärer varje år.

För Tyréns var valet av digitala verktyg avgörande. Genom att använda **Tekla Structures** kunde teamet modellera hela träkonstruktionen i detalj och säkerställa att varje komponent passade perfekt redan innan produktionen startade. Det gjorde det möjligt att hantera komplexa former, optimera materialåtgången och minimera spill – en kombination av digital precision och hållbarhet som genomsyrar hela projektet.

"Vi brukar internt prata om att det förmodligen är Sveriges mest välbesökta träprojekt – alla som reser via Arlanda passerar under den här konstruktionen," säger Gustav Essebro, Avdelningschef för Byggprojektering Trä på Tyréns.

"Det gör det också till ett av Sveriges mest besökta Tekla-projekt."

Verandan visar tydligt hur trä som materialval, modern ingenjörskonst och digital modellering kan samverka. Resultatet är en byggnad som är lika funktionell som den är vacker – och framtidssäker, med hållbarhet och precision i centrum.

Trimble. Tekla Structures

"The biggest challenge was that building codes didn't support the use of timber in healthcare environments"

TYE FARROW, ARCHITECT AND CO-FOUNDER OF FARROW PARTNERSHIP ARCHITECTS

Tree-like, load-bearing columns branching into cantilever beams create a unique, uplifting space at Canada's Credit Valley Hospital.

Visitors stepping into the cancer centre at Credit Valley in Mississauga, Ontario, Canada are greeted by something extraordinary. Broad, tree-like forms reach towards the ceiling, evoking a sense of both shelter and encouragement. These "trees" are in fact structural Douglas fir columns that branch out into smaller, curved columns and radial cantilever beams. The design is by the Toronto-based firm Farrow Partnership Architects.

"The design comprises multiple arches/circles combined with triangular, truss-like space structures, which is a highly efficient system. The biggest challenge when the centre was built was that building codes didn't support the use of timber in healthcare environments," says Tye Farrow, architect and co-founder of Farrow Partnership Architects.

The aim was to create a tranquil space for cancer patients. To that end, the architects conducted a survey prior to construction.

"The responses were without exception variations of: 'Cancer can be a devastating disease. The place we come to for treatment should give us hope.' When we asked what gives them hope, they said: 'Something that's alive." ●

TEXT MATTIAS BOSTRÖM **IMAGES** TOM ARBAN

Credit Valley Hospital

Developer: Credit Valley Hospital.

Contractor: PCL Constructors.

Timber frame supplier: Timber Systems.

Year of completion: 2004.

Upptäck Fastener Designer – ditt nya digitala hjälpmedel

FD Fastener Designer

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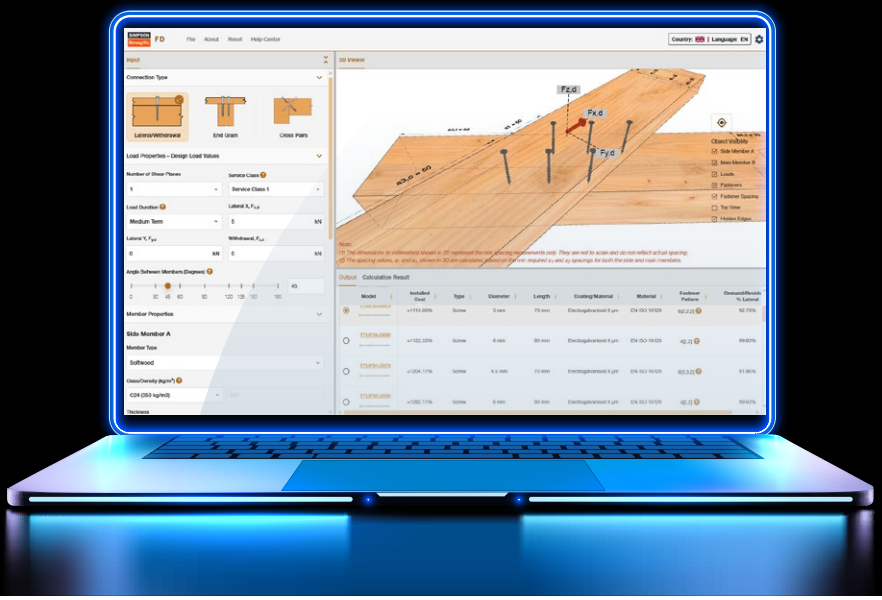

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SIMPSON Strong-Tie

PUTTING PEOPLE FIRST

When Nordic Arch took on the task of designing the LHL Hospital in Gardermoen, Oslo, the goal was clear: to create an environment that heals not only the body, but also the mind.

"Healing architecture built on daylight, natural materials and spaces that create a calming, homelike atmosphere, reducing the stress that a hospital stay can bring. Timber was chosen for its tactility and warmth," says Alexander Wærsten, lead architect at Nordic Arch.

Visitors and patients are greeted by a carefully considered palette of materials. Externally, the building is clad in iron sulphate-treated heartwood pine. Inside, white-oiled oak dominates – a choice that contributes to a bright, welcoming feel.

Timber features throughout, from the parquet flooring in the restaurant and exercise rooms to corridors and partition walls. In the communal areas, reception desks are built from solid wood to withstand wear and convey a sense of quality, while wall claddings and slats are primarily fire-retardant lacquered, veneered MDF.

DESIGNING A HOSPITAL is a complex challenge. It is a building type that demands high-tech infrastructure and strict regulations go hand in hand with human needs. At the same time, the core of the project has been an awareness of patients' vulnerability. "You have to consider that patients and visitors in a hospital find themselves in a vulnerable situation, and create environments that address this," says Alexander Wærsten. ●

TEXT ANNA STRÖMBERG **IMAGES** NORDIC ARCH

LHL Hospital, Gardermoen, Oslo

Year: 2013 – 2017

Architect: Nordic Arch

Client: LHL Helse/Aspelin Ramm

Area: 30,000 m¬≤

Construction cost: NOK 1.5 billion.

Awards: Building of the Year 2018 by Byggeindustrien, and finalist in the healthcare buildings category at World Architecture Festival.

Ingenious geometry

Illa Glòries is a ground-breaking social housing initiative designed by Cierto Estudio. Developed as part of a broader urban renewal plan for the Plaça de les Glòries area, the project responds to Barcelona's housing crisis with an inclusive, sustainable and flexible architectural model.

TEXT CARL-JOHAN LILJEGREN **IMAGES** JOSE HEVIA OCH MARTA VIDAL

Cierto Estudio is a cooperative architecture studio comprising Lucia Millet, Clara Vidal, Anna Llonch Sentis, Ivet Gasol Escuer, Carlota de Gispert and Marta Benedicto.

In many ways, this is an impossible site. Right at the mouth of the tunnel where the Gran Via arterial road has been decked over to make way for Barcelona's new focal point – the large park area Plaça de les Glòries Catalanes – stands Illa Glòries: a social housing block comprising four interconnected buildings with a total of 238 apartments. The buildings were ready for occupation in spring 2025.

Yet back in 2017, the City of Barcelona launched an international competition. The format was unusual: there would be four winners, one for each building, and one of the winners would determine the urban planning for the entire block. The other teams had proposed four small towers. But the winner, Cierto Estudio – which designed the overall concept and the westernmost of the four buildings, Illa Glòries A – wanted the buildings to be interconnected and to interact with the city and with each other, creating opportunities for residents to meet.

"The collaboration with the other winners has meant that despite the buildings having completely different façade expressions and floor plans, they interact as a single unit – with shared entrances, stairwells, lifts, courtyards and access balconies running through the different buildings, as well as a public passage through the block," says Ivet Gasol Escuer, one of six architects who together founded and run the collective architecture practice Cierto Estudio in Barcelona.

CIERTO ESTUDIO'S BUILDING is innovative and pioneering in many ways. Already at competition stage, the building was designed with a structural frame entirely in cross-laminated timber (CLT), and despite higher material costs, they were permitted to build in timber. Low climate impact, shorter construction time and reduced water consumption were arguments that supported this unusual material choice for Spain.

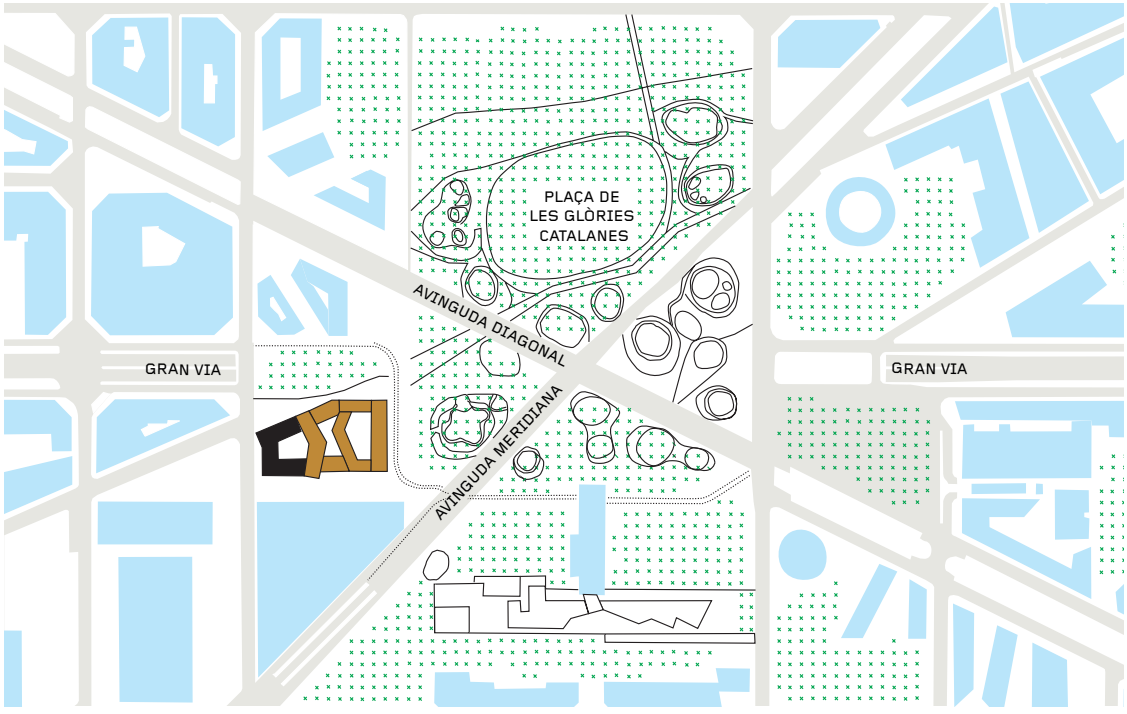
SOCIAL ASPECTS GUIDED the building's design. For Cierto Estudio, key concepts such as sustainability, anti-hierarchy, inclusivity, gender perspective, visibility, multiple connections, and ideas of playfulness with geometry and colour permeate both the overall plan and the individual apartments. Ivet Gasol Escuer gives an example:

"We want to use every angle in the world, and the reason is neither trivial nor random. By exploring geometry, a multitude of possibilities emerge. A rectangular room allows for four entrances, while a hexagonal one enables six."

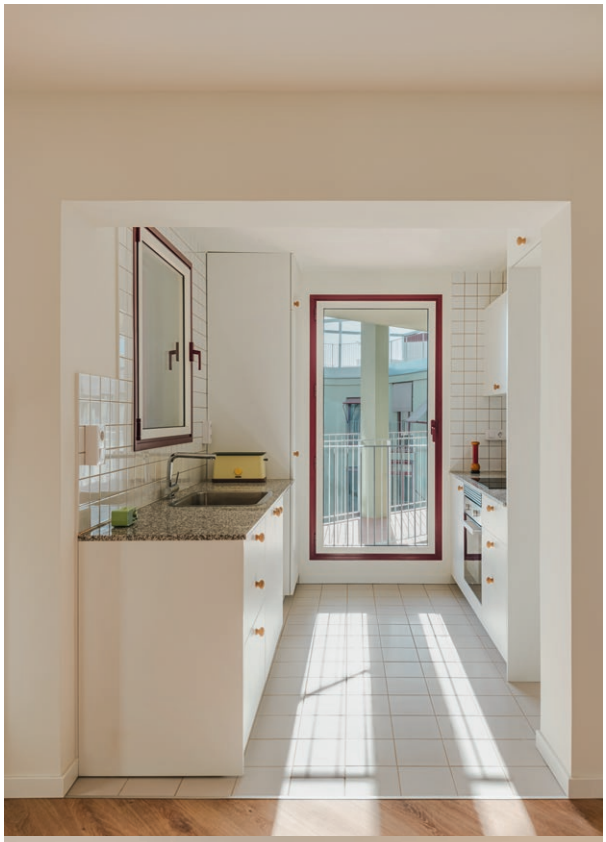
> "By exploring geometry, a multitude of possibilities emerge. A rectangular room allows for four entrances, a hexagonal one six..."
>
> IVET GASOL ESCUER, ARCHITECT, CIERTO ESTUDIO

SOCIAL HOUSING IN Spain is typically very small. Most apartments in Illa Glòries A are four-room units of 52–55 m² (gross area 63 m²). With two bedrooms of 10 m² and a bathroom of less than 5 m², that leaves 25–30 m² for kitchen, living room and dining area.

But with the help of geometry, Cierto Estudio has made the apartments feel substantially larger. Thanks to rotating the kitchen, the centrally placed bathroom and the north-facing bay window by 45 degrees, sightlines of more than 11 metres extend through the apartments.



For a long time, Plaça de les Glòries Catalanes was the point where three of the city's main roads meet: Avinguda Diagonal, Gran Via and Avinguda Meridiana – an inhospitable thoroughfare. But after more than 20 years as a construction site, it is now Barcelona's second largest park area and a new focal point in the city.



The room orientation provides contact with the outside world in different directions, more sunlight and shade where you want it, greater privacy from neighbours, and better views towards the mountains.

"Rotating the rooms in this way also works extremely well with timber. The load-bearing structure becomes stronger than if the rooms had been rectangular," says Ivet Gasol Escuer.

Also fundamental is the non-hierarchical and flexible floor plan. All rooms have equivalent dimensions, allowing residents to choose what function each room should have and adapt it to the family's changing structure and needs.

Giving the kitchen a special status is another unusual solution in Spain. Despite its central function in the home, Spanish apartment kitchens are usually placed inside the dwelling without windows.

"We want to change that and have coined the term 'kitchroom'. In Illa Glòries, the kitchens are consequently positioned against the external wall and the access balconies. They have windows in two directions, providing views and access to natural light and ventilation. The kitchens are also positioned so that sightlines into the apartment are as long as possible," says Ivet Gasol Escuer.

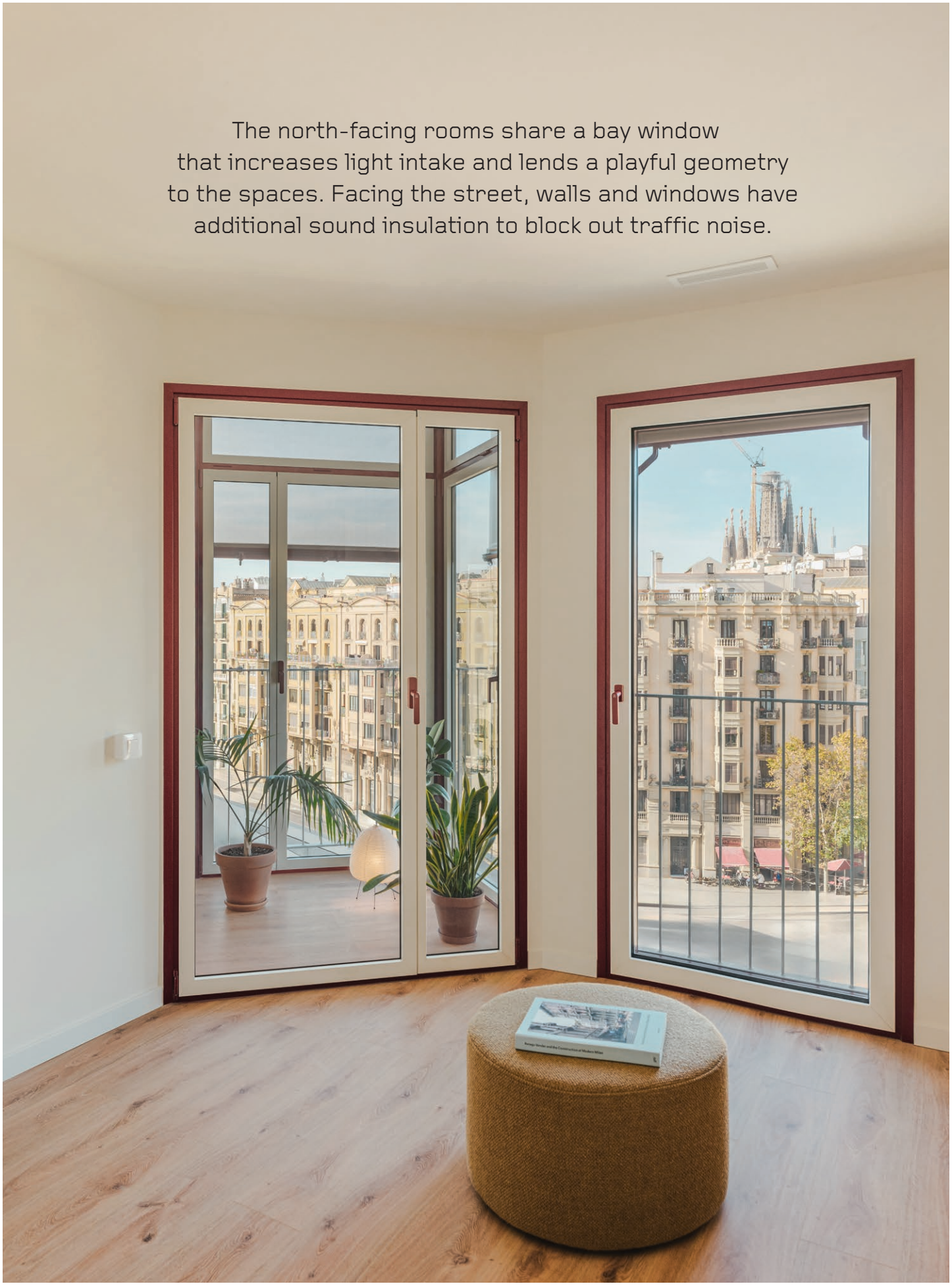
The placement facing the wide south-facing access balconies – which also function as outdoor spaces – makes domestic work visible and creates a transition between the private sphere and the shared areas. The access balconies also set the apartments back within the building, protecting them from direct sun in summer while admitting light in winter when the sun is lower.

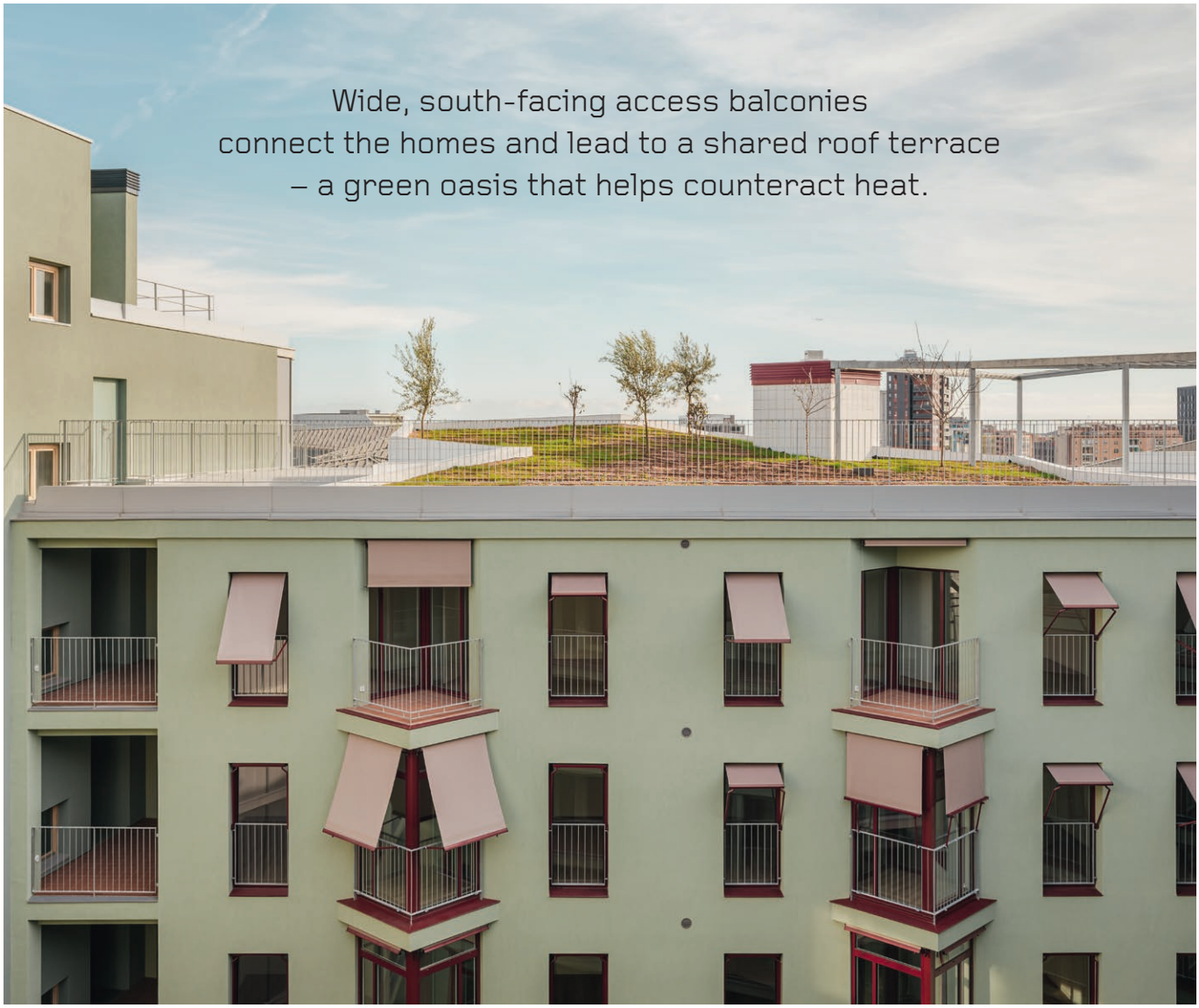
"The access balconies also serve an important social function. When neighbours see each other and have more contact, it increases safety for residents. This is not least important from a gender perspective," says Ivet Gasol Escuer. ●

Spanish strategy for increased timber construction

With 19 million hectares of forest, Spain is Europe's third largest forest country. The forestry industry, however, is relatively small. In 2024, for example, Spain produced only 74,000 m^3 of CLT, and solid timber accounts for just a few per cent of total construction. However, capacity is increasing rapidly and interest in timber construction likewise. This year, the Association for Forest Management and Timber Construction,
AGEFEM, was formed with a dual goal: to promote the use of timber in residential construction and to drive active forest management that reduces the risk of forest fires.
Spanish strategy for increased timber construction

The north-facing rooms share a bay window that increases light intake and lends a playful geometry to the spaces. Facing the street, walls and windows have additional sound insulation to block out traffic noise.





Wide, south-facing access balconies
connect the homes and lead to a shared roof terrace
– a green oasis that helps counteract heat.

Illa Glories A

Location: Plaça de les Glòries, Gran Via de les Corts Catalanes, Barcelona, Spain.

Architect: Cierto Estudio, Barcelona.

Team: Marta Benedicto, Ivet Gasol Escuer, Carlota de Gispert, Anna Llonch, Lucia Millet and Clara Vidal with Mariana Gomes.

Client: IMHAB (Institut Municipal de l'Habitatge i Rehabilitació de Barcelona).

Structural frame: Seven storeys in cross-laminated timber, locally produced Galician pine from forests in north-western Spain, supplied by Xilonor. Basement and ground slab in concrete.

Size: Entire block with 238 dwellings: 35,000 m².

Building A: 51 apartments and four commercial units: 8,700 m².

Budget: €45,000,000 for all 238 dwellings, of which €11,595,000 for Cierto Estudio's Building A with 51 dwellings.

Design: May 2017 – May 2021.

Construction: February 2022 – October 2024.

Teknisk fakta

THE STRUCTURE IS BUILT in cross-laminated timber and meets the EU standard for Nearly Zero Energy Buildings (NZEB).

Cross-ventilation, solar shading with awnings and external louvres in breathable fabric, protection from the southern aspect provided by the access balconies, and double-glazed windows with low-emissivity coating contribute passively to

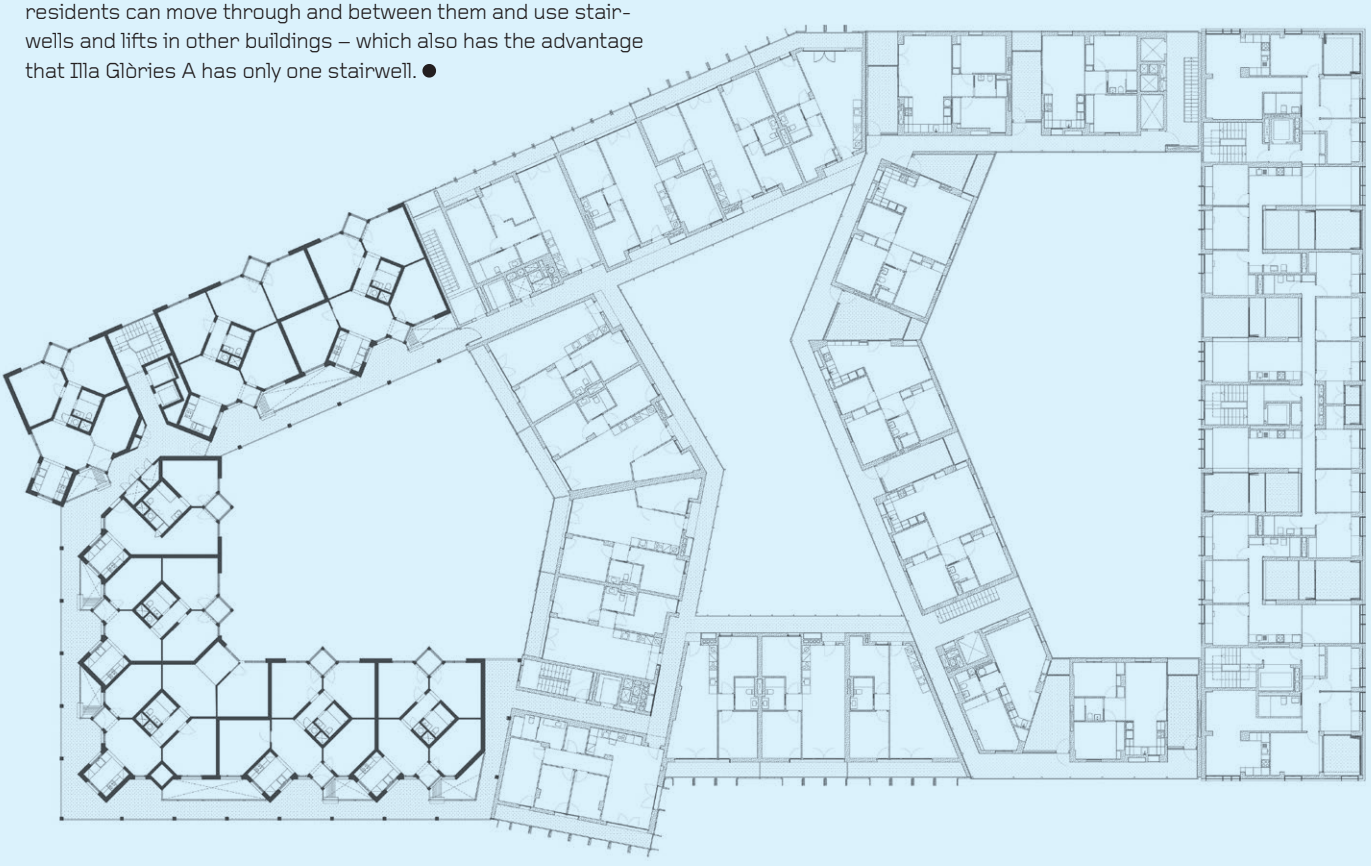
the building's thermal comfort. This is supplemented by a mechanical ventilation system and an air-source heating system. Over 60 per cent of the plot is designated for planting to counteract the urban heat island effect.

Particular attention was paid to acoustics and fire safety. To increase acoustic insulation and reduce vibration between dwellings, the CLT floor slab is supplemented with a 2 cm thick layer of stone wool, an impact-resistant board and a layer of morite on top. In addition, fibreglass panels were placed directly on the floor slab element and on the suspended ceiling panels, fixed with anchors and vibration dampers.

The walls are fire-protected internally with laminated plasterboard and externally with cement boards. All internal walls are sound-insulated with glass wool and the façade with 10 cm stone wool boards. On façades with the highest acoustic requirements, a self-adhesive synthetic sound insulation membrane based on high-density polymer, called Tecsound from manufacturer Soprema, was also applied directly to the timber panel to reduce noise. ●

FLEXIBLE FLOOR PLANS for the apartments make them adaptable and ensure that the dwellings can evolve in step with residents' changing needs. The apartments are also designed to de-hierarchise the home by not having any predefined spaces. Instead, rooms of similar size and character allow residents to allocate space freely according to their needs, with the intention of promoting equality in everyday life. ●

ACCESS BALCONIES connect the different buildings. This means residents can move through and between them and use stairwells and lifts in other buildings – which also has the advantage that Illa Glòries A has only one stairwell. ●



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TRAILBLAZERS

British practice Waugh Thistleton are not just pioneers in constructing tall timber buildings with cross-laminated timber. The firm's work has become synonymous with sustainability, innovation and the conviction that architecture can contribute to a better future. And they are eager to share their insights and knowledge.

TEXT MATTIAS BOSTRÖM **IMAGES** WAUGH THISTLETON, TOG

Kirsten Haggart, vice vd på Waugh Thistleton.

Waugh Thistleton was one of the first architecture practices to begin exploring timber construction back in the early 2000s. Their f irst project was the nine-storey Stadthaus, also known as Murray Grove in London, completed in 2009 and boasting load-bearing walls and floor slabs as well as stair and lift cores in cross-laminated timber (CLT).

It is no exaggeration, then, to call Waugh Thistleton pioneers – not only in timber construction, but also in building tall in timber. And when you are a pioneer, you will inevitably encounter the occasional sceptic.

Kirsten Haggart, deputy managing director at Waugh Thistleton, explains that the prejudices they faced in the early days are the same as those they encounter today. Fire risk and moisture problems were obstacles that many regarded as insurmountable. But Waugh Thistleton has demonstrated that these challenges can be addressed through carefully considered design, innovation and research. It is not about avoiding the difficulties, but about meeting them with the right tools and knowledge, she says.

"Many people assumed that building in timber would mean higher costs. But we were able to show early on that we are cost-neutral. Building in timber is faster, and the faster a building goes up, the shorter the financing period. That results in lower interest costs on loans and means flats can be let much sooner. It was a powerful argument in the beginning."

SHARING KNOWLEDGE ABOUT timber construction has been a common thread running through Waugh Thistleton's work. The lessons they have learned by overcoming problems and surmounting challenges are shared in publications such as the New Model Building Guide.

"That book is a direct response to the Grenfell Tower fire in 2017. We wanted to create an industry-wide guide on how to build multi-residential buildings in mass timber safely and in compliance with regulations in the UK," says Kirsten Haggart.

Grenfell Tower was a building with a concrete structural frame and a façade of aluminium, polyethylene, plastic and foam insulation. The fire started in a flat, and the catastrophe – which claimed 72 lives – also led to the banning of combustible materials in the façades of residential buildings over 18 metres in the UK and residential buildings of all heights in London.

Waugh Thistleton proactively addressed the challenges head-on and contacted José Torero, a leading fire engineer from University College London, and NHBC, one of the UK's largest inspectors and warranty providers for housing.

The aim was to review NHBC's requirements and then collaborate with them, which resulted in a performance specification and 26 details that NHBC pre-approved. New Model Building can be described as a construction system for multi-storey buildings, with columns and beams without combustible materials in the non-load-bearing façade, which is pre-approved and permits the use of timber structures in residential buildings.

Because Waugh Thistleton openly shared their experiences, others can now use these details and methods, knowing they have already been through an approval process.

"Fire design in timber is a science, and innovative architects risk encountering varying assessments from fire safety inspectors and building control authorities, who often lack experience with the specific science behind timber structures. If they follow the advice in the New Model Building Guide, they can feel confident that their methods should pass through the approval process relatively smoothly," says Kirsten Haggart.

WAUGH THISTLETON ARE pioneers in more ways than one. But although they are known for building tall buildings in timber, it is not something they actively advocate. According to Kirsten Haggart, it is not about building tall, but about building more in timber.

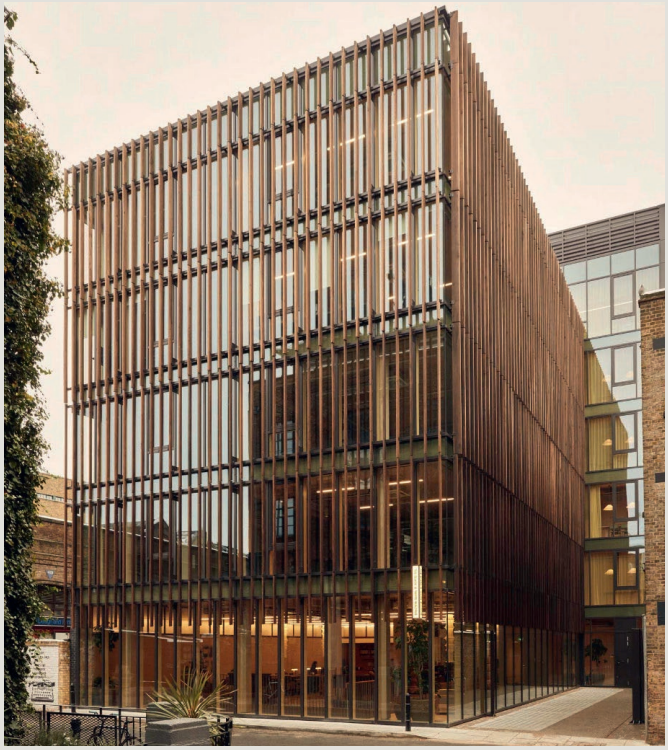
"One of the great advantages of timber is that buildings can be adapted when they reach the end of their lifespan. Timber can be disassembled and reused in a way that many other materials cannot," she says.

Circularity was something Waugh Thistleton explored in the office building Black and White Building in London, which was also the focus of the Horizon-funded research project Woodcircles, aimed at increasing the circular use of timber in the construction sector.

"We truly see a future where timber can be part of a circular economy. By building with timber, we can create buildings that are not only sustainable during their lifespan, but also possible to reuse when they are no longer needed. It is time to change the way we build, for the sake of both people and the planet. Timber is a vital part of that change," says Kirsten Haggart. ●

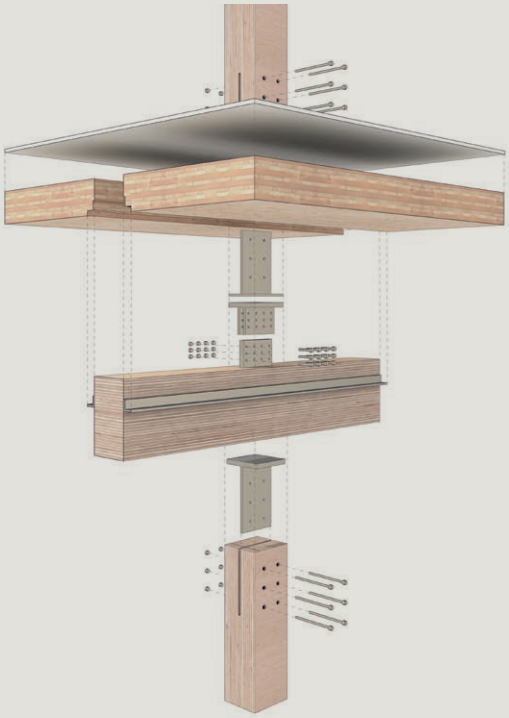
The New Model Building Guide can be downloaded free of charge from Waugh Thistleton's website.

Two examples of how Waugh Thistleton work



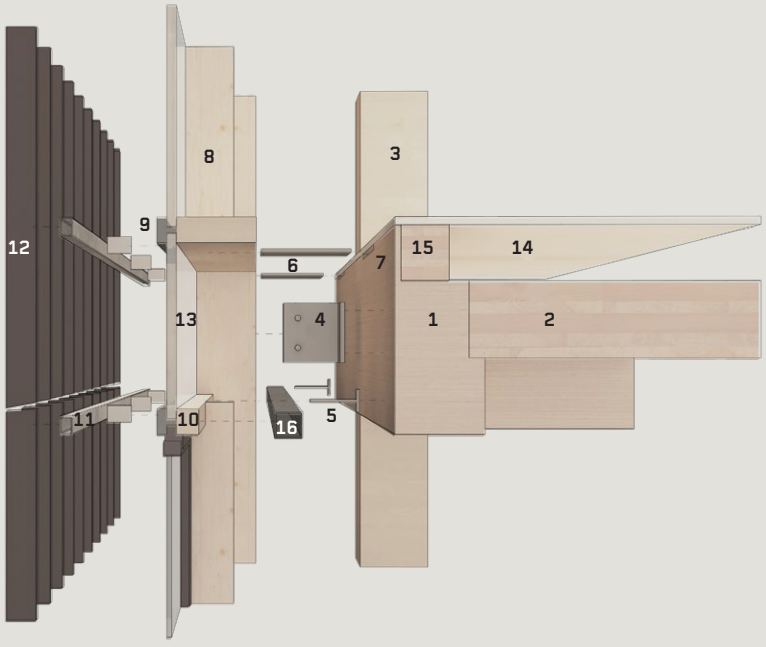
THE BLACK AND WHITE BUILDING, completed in 2022, in central London, is the city's tallest office building constructed in timber. The building has won several awards, most recently in October, when it received the Built by Nature Global Award for best commercial timber building.

THE DRAWING SHOWS the design for disassembly approach used in the Black and White Building. All connections are bolted rather than screwed, making it easier to take the elements apart. The raised floor rests directly on the CLT floor panel and there are no wet finishes such as floor levelling compound in the construction.



THE CLT FLOOR PANEL sits in the L-shaped LVL beam, rather than on top of it, which reduces the overall floor depth and optimises the floor-to-floor height.

1. Baubuche beam
2. CLT slab
3. Baubuche column
4. Primary curtain wall bracket
5. Secondary curtain wall bracket
6. Steel transom support bracket
7. Baubuche vaneer
8. Timber curtain wall
9. Aluminium curtain wall capping - RAL 8019
10. Brise soleil connection bracket
11. Box profile brise soleil support rail
12. Thermally treated brise soleil
13. Low iron double glazing
14. Raised access floor
15. CLT upstand
16. Detatchable blinds



Feel confident building with timber from Swedish forests!

Christmas is upon us, and for many the calendar is packed. Presents to buy, gingerbread to bake, mulled wine to taste, and the working year to wrap up. But it's also a time for reflection.

PHOTO JOHAN BERGMARK

THIS TIME of year gives me reason not only to look ahead, but also to look back at the year gone by. And 2025 has certainly been a challenging year for the Swedish sawmill industry. High production costs and sluggish demand have made it difficult to cover expenses. In their wake we have seen production cutbacks, redundancies and even closures.

Yet despite tough times, there are bright spots. Many Swedish sawmills are investing in new technology to boost efficiency. Log scanning, for example, makes it easier to determine which log is best suited for which product, and to adapt the sawing accordingly, maximising the value of every log. These investments demonstrate the willingness of our Swedish sawmills to stay at the cutting edge and look forward – precisely the pioneering spirit that defines the industry!

One thing I hope for is that 2026 will bring a more nuanced view of Swedish forests. Meeting the green transition requires renewable materials that can replace fossil-intensive alternatives. Here, Sweden – one of the world's largest exporters of sawn timber – plays a key role. We can supply the world with sustainable building materials and climate benefits. To do so, we must manage our forests.

EVERYTHING WE HUMANS do leaves its mark on nature. The same is true when we manage our forests. That is why it is essential to care for and tend them. Sweden was a pioneer, when at the start of the 20th century we became the first country in the world to require replanting after felling. When the new Forestry Act came into force in 1994, production and environmental objectives were given equal weight. Growing productive forests is just as important as preserving their natural values. The goal of Swedish forestry is to develop habitats that are vital for all the plants and animals that live in forests.

The forests being harvested today were planted around the end of the Second World War, and are the product of a more production-oriented forestry. Now we are beginning to see how forests planted after the policy shift in the early 1990s have entirely different natural values, and as Erika Olofsson and Åsa Rydell Blom at Linnaeus University describe in the article on page 29, we are in the midst of a transformation. Swedish forests are becoming ever more varied; development is heading in the right direction – which is also a prerequisite for them to be well equipped to face climate change.

IF I COULD WISH for one thing in 2026, it would be for everyone to feel confident using and building with timber. It is a fantastic material with unique properties, and a major part of the solution when we need to reduce our climate footprint. How we develop forestry, our innovative sawmill industry, the high quality of Swedish timber, and how Swedish forests contribute to climate benefits worldwide – these are things we should be proud of!

ANNA RYBERG ÅGREN
DIRECTOR, SWEDISH WOOD

Don't miss!

1 Easier calculations! Swedish Wood's new design guide makes it easier to meet acoustic requirements and build with lower climate impact. Read more on page 7.

2 Standard is the new black! Earlier this year, ISO standard 13391 was published for calculating greenhouse gas emissions and removals for wood and wood-based products. CEN has also published guidance on calculating greenhouse gas emissions and estimating carbon credits in renovation.

3 Raise the standard of Christmas! Get help from the Christmas Handbook 2025 from SIS – with standardised guidelines for everything from gift wrapping to Christmas carols.

11 JANUARY

Gingerbread galore

ArkDes, Stockholm

Last chance to visit ArkDes's joyful gingerbread exhibition. Creations from professionals and amateurs alike come together in a visual and fragrant gingerbread-house bonanza.

PHOTO VIKTORIA GARVARE

5 FEBRUARY

Preparedness at Boverket Day

Hotel At Six, Stockholm

An annual conference focusing on future issues in planning, building and housing for sustainable community development. The 2026 theme is "Preparedness and resilience in community building", hosted by Boverket – the Swedish National Board of Housing, Building and Planning.

26-27 MARCH

Skellefteå to host Arkitekturgalan 2026

On 26–27 March Arkitekturgalan returns with lectures, the Kasper Salin Prize ceremony and a networking dinner. Expect study tours showcasing timber architecture in one of Sweden's most exciting timber towns!

Arkitektur GALAN

15 APRIL

University admissions deadline

Antagning.se

Time to build on your skills? Don't miss the final day to apply for autumn courses at universities and higher-education institutions.

PHOTO SHUTTERSTOCK

21-24 APRIL

Nordbygg 2026

Stockholmsmässan, Älvsjö

The year's biggest construction fair brings together players from across the urban-development sector in four exhibition areas: construction, plumbing/HVAC, tools/machinery and solar technology. Swedish Wood will be there – come and say hello!

22-26 JUNE

Almedalen 2026

Visby

Right now summer may feel like an eternity away, but before you know it June will arrive and you'll have forgotten to book your Gotland ferry. Start planning your visit today.

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