trä

ARCHITECTURE, CONSTRUCTION, INSPIRATION.
A MAGAZINE FROM SWEDISH WOOD
NO. 3/2026

NOMINEE 2026 THE PUBLISHING PRIZE



Michael Green *paved the way for building big in timber. Now he's doubly relevant to Sweden.*

INTERVIEW P. 18

GROUND

ground *noun* · *foundation, base; cause*

Substrate or supporting element that provides stability for a building or other structure. Also used to describe the basis from which something proceeds – for example a line of reasoning, a training programme or a process of development.



”Det är fint att kunna spegla miljön med fasaden”

För arkitekten och inredningsarkitekten Linda Samuelsson börjar god arkitektur med platsen. När hon tittar närmare på SCAs nya generation ytterpaneler ser hon nya möjligheter att låta träfasaden samspela med både arkitektur och omgivning.

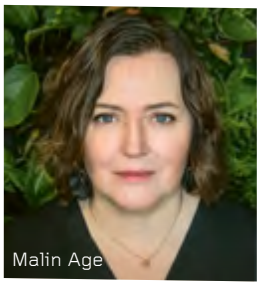
”Moderna träpaneler har gett oss ett nytt verktyg för exteriöra uttryck där vi kan jobba med så mycket mer än bara kulör.”

Med olika strukturer och uttryck kan träpanelen bli ett verktyg för gestaltning, från känslan av traditionellt hantverk till fasader med ett helt annat uttryck än det vi vanligtvis förknippar med trä.

scasmarttimber.com

Part of our history

PHOTO JOHAN BERGMARK



Malin Age

For millennia, timber has shaped building in our latitudes – from the very first lean-to shelters to today's Attefall cabins and spectacular buildings such as Wisdome Stockholm and Sara kulturhus. So it's no surprise that an architecture magazine about timber has chosen 'ground' as its theme.

History comes alive in this issue when you encounter the proud dragon head that once crowned the Oseberg ship – built in the early 800s – telling us about our origins, engineering and craftsmanship. See pages 8–9.

Sometimes the foundations set the conditions. That was the case at the edge of Masthuggskajen in Gothenburg, where clay, seawater, sunken ships, barges and piles all had to be factored in when building Habitat. Read more on pages 10–16.

Someone who, firmly grounded in his love of timber, especially likes looking ahead is Canadian architect Michael Green. Perhaps you've seen his now somewhat legendary TED talk? Hopefully you'll take the opportunity to hear him live in Gothenburg this autumn – meet him on pages 18–21.

At other times, the foundation may already be in place. Then, as with the reused Lumi, timber can become the key to a new sustainable approach to building. Now the lessons learned in Uppsala are spreading across the world. Read about it on pages 28–32.

Don't miss Emelie Holmberg's architecture based on the module, the exciting research from Rise exploring the potential of timber as a foundation element, or the rather magical Portuguese winery where the landscape's rolling hills form the basis for its expression.

Enjoy the read!

Malin Age

MALIN AGE, EDITOR

Curious about Trä?

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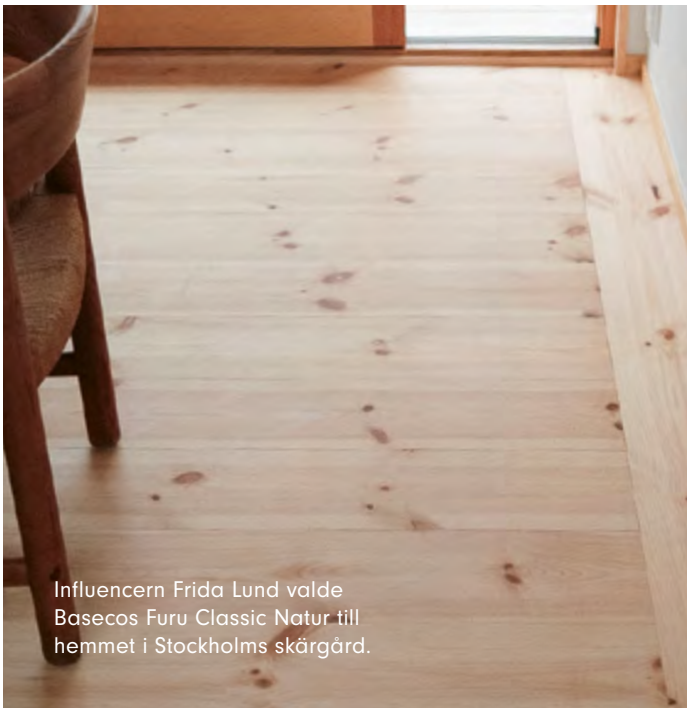
Stop the presses!

Just as we were going to print, we received the wonderful news that Trä has been nominated for the Publishing Prize! Keep your fingers crossed on 3 November when the winner is announced – and do keep sending us tips and telling us what you think of the magazine. Your emails mean so much! The address is tidningentra@svenskttra.se

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Influencern Frida Lund valde Basecos Furu Classic Natur till hemmet i Stockholms skärgård.

Foto:Frida Lund @_fridalund

Tidlöst på Torö.

När Frida Lund med familj valde golv till sitt arkitektritade hem på Torö i Stockholms skärgård föll valet på Baseco Furu Classic Natur. Golvet är traditionellt behandlat med lut och olja vilket låter träets egen värme och levande struktur ta plats. Ett furugolv i absolut norrländsk kvalitet som åldras vackert och skapar en tidlös känsla.

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För starka förband i massivt trä

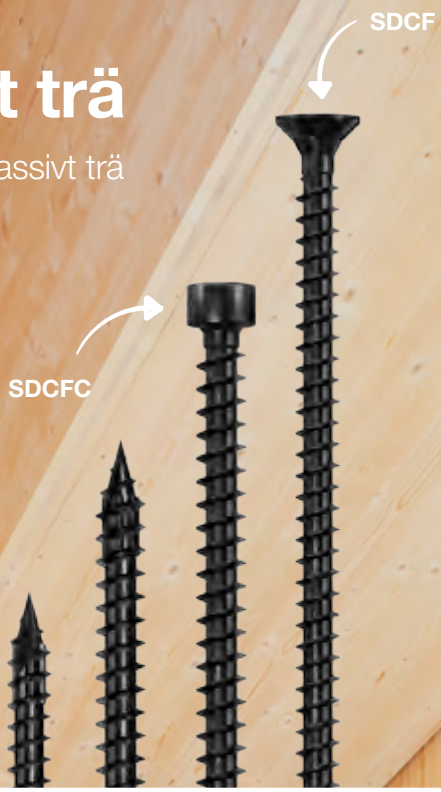
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New height record in Sydney

The Atlassian Central office tower in Sydney reached its full height of 180 metres in July 2026 and is now the world's tallest hybrid timber tower. The 39-storey building, designed by SHoP Architects and BVN, features concrete cores supporting the floor slabs and an internal frame of solid cross-laminated timber (CLT), wrapped in a steel exoskeleton. The tower is expected to be completed by the end of 2026. It beats the previous record holder – the 86.6-metre Ascent in Milwaukee, USA – by almost 100 metres. Stora Enso supplied 10,000 m³ of CLT for the project, which has halved its carbon footprint compared with a conventional office tower. ●



Cheers to 40!

Who's springing into their fourth decade? Why, we are! Trä magazine is celebrating a milestone with a quick look back at our first cover from 1986. What a difference! If you've missed any issues over the years, you can catch up on the past 27 years' editions on our website. While you're there, sign up for our newsletter to really maximise your intake.●

PHOTO SHUTTERSTOCK



Forest network rallies around Ukraine

At a ministerial conference in Stockholm in June, the Forest Friends for Ukraine initiative was launched under the aegis of the pan-European forestry cooperation Forest Europe. The goal is to coordinate international support for Ukraine's forest industry during and after the war. The focus is sustainable forestry, EU alignment and rebuilding the entire value chain. ●

Timber decking gives children a soft landing

PHOTO RAMPLINE

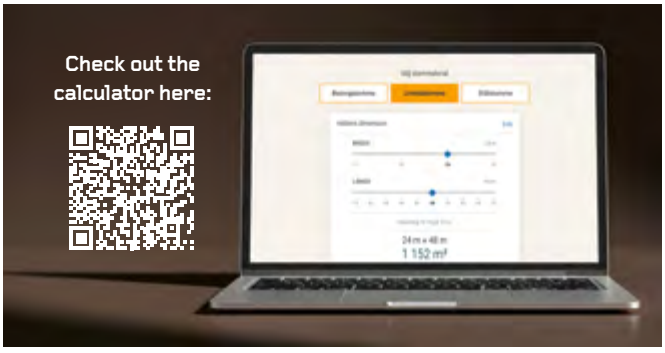


Norwegian company Rampline has developed ShockDeck, an impact-absorbing safety surfacing for playgrounds. The surface is pine decking with concealed natural rubber dampers, free from microplastics and adhesives. The solid timber surface is wheelchair-friendly and meets fall-height requirements of up to 1.8 metres. ●

Calculate your climate footprint

Swedish Wood has launched a climate calculator for hall-type buildings, enabling developers and designers to compare the climate impact of different structural frame materials at an early stage. The tool uses the same hall volume and methodology for all options, making it easy for users to obtain a fair comparison. ●

COLLAGE INTELLECTA





An echo from antiquity

The dragon head that once crowned the Oseberg ship, the world's best-preserved Viking vessel, is currently on display at the Museum of Cultural History in Oslo. The ship itself is oak. The dragon head, a priceless example of ancient craftsmanship, was carved around AD 820 from a softwood, probably alder or lime. It is so fragile that it has never been refitted to the restored ship, nor shown publicly until now. ●

TEXT ANNA STRÖMBERG
PHOTO TT





Beneath the Gothenburg clay lie layers upon layers of history – timber piles, old quay walls, sunken barges. When NCC and Krook & Tjäder built one of Sweden's largest timber office buildings at Masthuggskajen, they continued the city's story – partly by reusing 200-year-old heartwood preserved by the sea.

TEXT MATTIAS BOSTRÖM **PHOTO** KROOK & TJÄDER

ON HISTORIC GROUND





Beneath the waterline lay a graveyard of boats. Parts of the 200-year-old heartwood were salvaged and used, among other things, to clad the outside of a planter bed and to build a bench.

The topping-out party was held in the basement. Not because it was cold outside or the weather was bad – but because that was precisely where everyone wanted to be. Down in the bicycle garage, gathered around the trunk of the seven-metre-tall tree that rises all the way to the entrance level, its crown visible through a glass opening in the floor.

"I've never experienced a situation where it's obvious you should be down in the basement. But we had created something of real value here. This is where you bring guests, and people think it's incredibly cool," says Anders Pettersson, lead architect at Krook & Tjäder.

The building is called Habitat Masthuggskajen and is NCC's third office building on Masthuggskajen in Gothenburg. Having built two office buildings in steel and concrete, the company decided to go for timber in the third. They approached the architecture firm Krook & Tjäder with a straight question: Can you build a timber frame on this plot, with these heights and widths?

After an investigation, Krook & Tjäder came back with an equally straight answer: Yes.

"We sat down with NCC and brainstormed what this building should be. It centred on a nature concept – an office for wellbeing, with people at its heart. We were encouraged to talk about the experiences, movements and feelings we have out in nature, and how we could bring that into a building," says Anders Pettersson.

Three design themes emerged: nature with exposed timber and greenery, the harbour's industrial aesthetic with exposed trusses, and the dark, rustic timber façades of the old warehouses. All three pointed in the same direction.

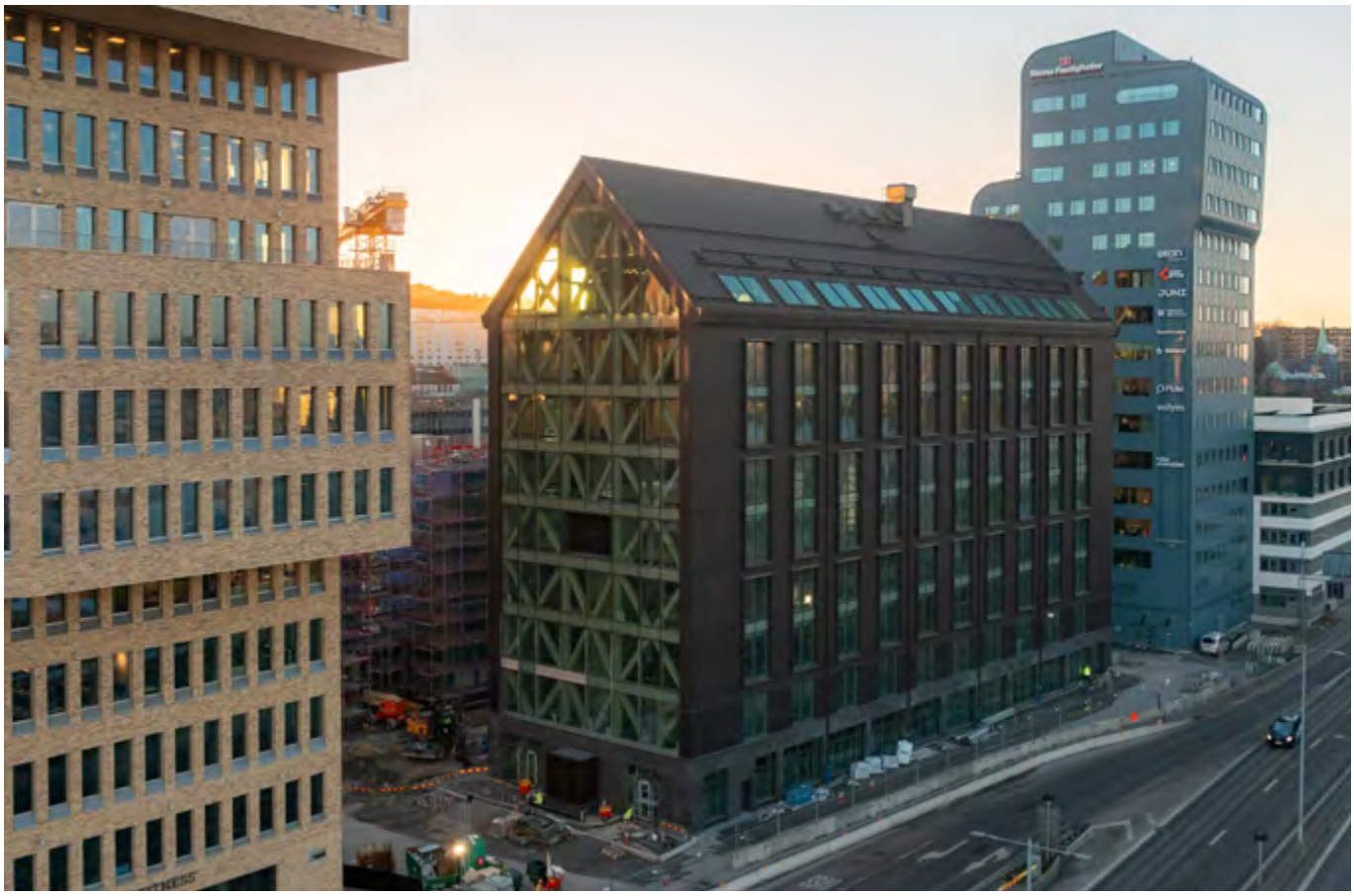
"We landed on timber, of course. We wanted exposed timber and we wanted to maximise it. And those old warehouse buildings with their dark timber façades and exposed trusses were the model. We had already designed trusses for stability – why not display them the way they used to?"

The structural frame was supplied by Martinsons in Skellefteå. The floor slabs received a concrete topping for acoustic reasons, and for flexibility in future refurbishment. But concrete was also needed for another reason.

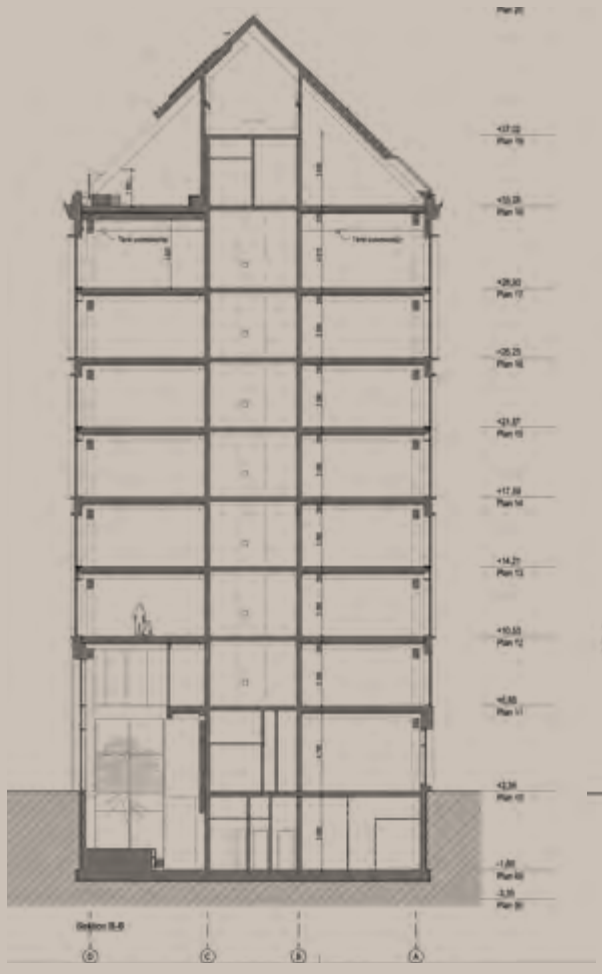
In the Gothenburg clay, with its high groundwater pressure, you cannot simply assume a building will stay where you put it. A pure timber frame of nine storeys does not weigh enough – it risks being pushed up from below. The solution was stairwell walls and lift shafts in concrete.

"Stairwell walls in timber were too light. When the structural engineer was able to place that lump of concrete in the middle, the building suddenly had the weight it needed," says Anders Pettersson.

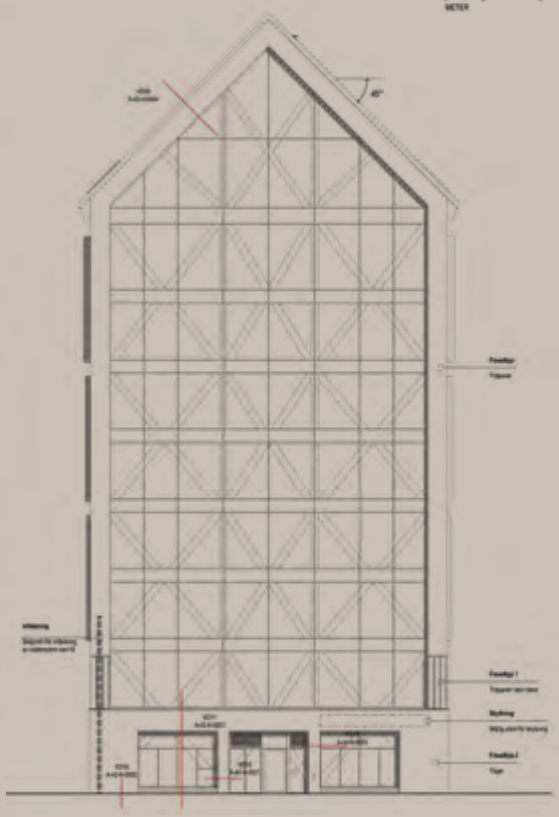
Masthuggskajen bears its name for a reason. As early as 1647, thirteen mast-hewers were granted burgerskap (the right to trade or practice a craft) in Gothenburg and cut ship masts here. Centuries of harbour and industry followed, then decline and decay. ›







SECTION DRAWING



SECTION DRAWING



»Concrete is climate-heavy, while timber is climate-light. Every metre of timber that can replace concrete is a gain, and the philosophy is the same as in the frame above: the right material in the right place. In total, the project reduced its carbon footprint by 40 percent compared to a reference office building.»

ANDERS PETTERSSON, LEAD ARCHITECT AT KROOK & TJÄDER.

In recent years, however, the area has been reborn as a new neighbourhood takes shape, also called Masthuggskajen. Today little of the old remains above ground, but traces of bygone times live on beneath the surface.

Beneath Habitat Masthuggskajen, for example, lies a forest of piles.

"They sit deeper in the ground than the building is tall – about thirty metres," says Anders Pettersson.

The lower half of each pile – the part below the groundwater level, in oxygen-deprived clay – is timber. On top sits a concrete pile that reaches up towards the building's foundation. The principle is simple: in oxygen-free, water-saturated clay, timber does not decompose and rot. Large parts of Gothenburg rest on the same principle.

"Concrete is climate-heavy, while timber is climate-light. Every metre of timber that can replace concrete is a gain, and the philosophy is the same as in the frame above: the right material in the right place. In total, the project reduced its carbon footprint by 40 percent compared to a reference office building," says Anders Pettersson.

Before the piles were driven, archaeologists arrived. Masthuggskajen is not natural ground – it is filled and reclaimed land, a former seabed. Beneath the modern quay lay an older one. And beneath that, an even older one. When the excavators dug down, timber piles from the 1600s and 1700s were exposed, datable by their growth rings. And then vessels: old barges that had ended up in the clay when the quay was extended and filled.

"There was an entire boat graveyard beneath us. It wasn't exactly museum-quality material. But we still felt we wanted to try to preserve the history and reuse parts of the timber," says Anders Pettersson.

According to the experts, it couldn't be done – they wrote the timber off as spent. But they would be proved wrong. A wooden-boat builder at Krook & Tjäder sawed open a few planks, and the verdict changed. The nearly 200-year-old heartwood was of superb quality.

Anders Pettersson and his team salvaged the old timber. They used it for the planter bed, where the bicycle garage tree stands. The heavy beams became benches. In the concrete floor they also marked out where the old quay line ran.

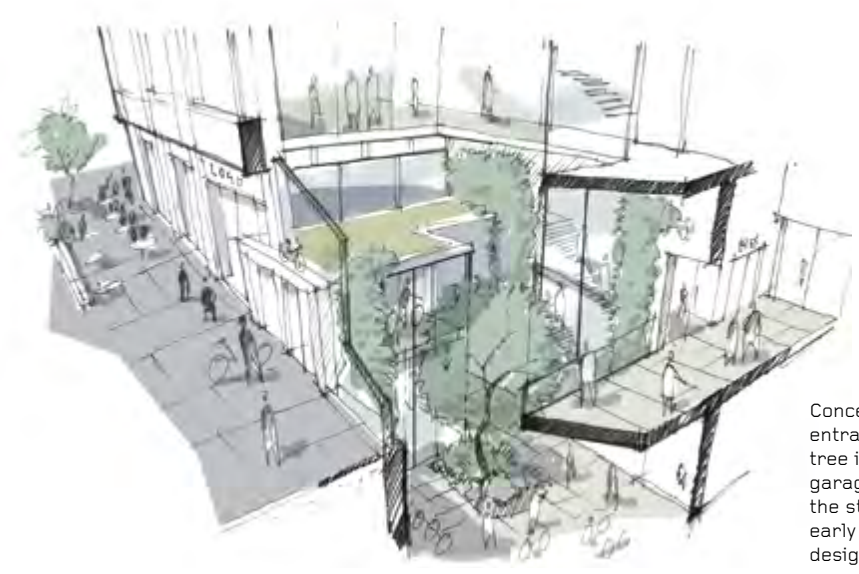
"It doesn't turn an entire project around. But it really lifted it. There's something special about building layer upon layer and carrying the history forward," he says.

Inside Habitat Masthuggskajen the load-bearing elements are exposed. Columns and beams of glulam, floor slabs of cross-laminated timber (CLT) – all visible and on display. The floor structure consists of cassettes combining CLT panels and glulam beams, with acoustic panels and services installed between the beams so as not to conceal the timber surface. The window frames' structural profiles are not aluminium, as they usually are, but glulam – around two kilometres of linear metres that in another project would have been metal. This reduced the carbon footprint substantially. The façade is dark brownish-black timber cladding in the visual language of the old harbour warehouses.

"It smells of timber in there. And timber creates atmosphere in a room in a way that engages all the senses. It's visual – but not only visual," says Anders Pettersson.

The entrance hall is fourteen metres high. A living wall and a tree crown greet anyone who steps inside – the crown of the tree rooted in the bicycle garage on the floor below. The staircase is placed in front of the lifts and framed by greenery, an invitation to move rather than stand still. At the very top, on the roof terrace overlooking the rooftops of Linnéstaden, tenants sit surrounded by planting. "Like sitting in a tree crown," Anders Pettersson describes it. He is quick to point out that these details are not add-ons. They are the concept – agreed in the early meetings with NCC and maintained all the way through to completion. That is unusual.

"I've never seen the like. In most projects you cut half the ideas along the way. But here NCC believed in the concept and chose to commit fully to the project". ›



Concept sketch of the entrance zone. The tree in the bicycle garage, visible from the street, was an early key idea in the design.





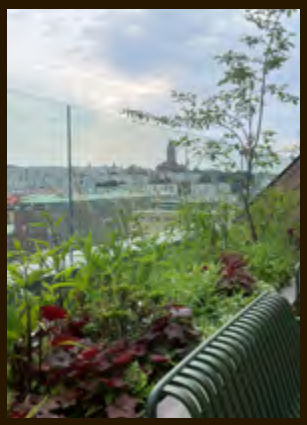




WOOD AS THE GUIDING CONCEPT
Wood is visible everywhere in the building. The old warehouses, with their dark timber façades and exposed trusses, served as the model.







»Like sitting in a tree crown»

ANDERS PETTERSSON

Anders Pettersson describes the good collaboration with the developer as the reason the project became so successful. Good intentions alone are not enough, he argues. Timber construction, sustainability and nature-inspired interiors can feature in a brief and still be cut when the costs mount up.

"Fundamentally, it's about a developer who genuinely wants something. The foundation for a successful project is the same as the foundation for a building in clay: it comes down to a stable starting point."

Anders Pettersson has shown groups from across the Nordic region around Habitat Masthuggskajen – architects and developers from Sweden, Norway and Denmark who have heard about the building and want to see it for themselves. Every time, they stop at the same things: the tree in the basement, the benches made of old timber, the quay lines in the floor. Beneath their feet, deep in the clay, the remains of the boat graveyard still lie.

"There's something very beautiful about that. Making something new out of something old. It enriches the architecture." ●

Habitat Masthuggskajen

Client: NCC Property Development
Contractor: NCC Building
Structural engineer: NCC Teknik
Construction period: 2022-2025
Material/timber: Mass timber frame, Thermowood façade
Material suppliers: Martinsons (timber frame), Moelven (timber façade), bARK (infill walls)
Gross floor area: 8,900 m² GFA
Completed: 2025
Certification: Noll CO_2 & BREEAM Excellent
Awards: Glaspriset 2026 and Träflugan 2026



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BUILDING BIG IN TIMBER

»This is just the beginning«

Michael Green is the Canadian architect who convinced the world that timber's time is now. Today, more than a decade after his legendary TED talk, he is looking beyond mass timber towards a fifth building material, a new cost model and a better-educated generation of leaders.

TEXT ANNA STRÖMBERG **PHOTOS** MGA | MICHAEL GREEN ARCHITECTURE, DANIEL SONNTAG (GLÖDEN)

Michael Green is the man behind the term mass timber, a concept he coined in his book The Case for Tall Wood Buildings, at a time when there was still no umbrella term. CLT, LVL (laminated veneer lumber) and LSL (laminated strand lumber) needed a family name, and he gave them one.

"There are now mass-timber conferences all over the world, and it's surreal that there's even a real word I came up with," says Michael Green.

Thirteen years have passed since he gave his TED talk "Why we should build wooden skyscrapers", the unofficial starting point for the international discussion about timber's potential as a high-rise building material. The talk has been translated into more than 30 languages and remains one of the most viewed in the fields of architecture and sustainability. That is no accident.

A story for everyone

Michael Green understood early on that being right is not enough: you must also be able to tell, explain and argue your case.

"The hard part of my job has never been proving that what I do and advocate holds up technically. The challenge lies in persuading the public and changing their perception of what is possible."

Choosing tall timber buildings as the centrepiece of his narrative was a deliberate move. To spread the idea of timber as the obvious building material, he needed to capture people's imagination. The timber high-rise became the symbolic tool, not the goal. And vivid storytelling was the key.

The impact of the TED talk was tangible. It articulated for a broad audience how significant the climate impact of buildings really is – about 40 per cent of global emissions – at a time when the discussion focused almost exclusively on transport. It also offered a different narrative about forests and harvesting: that sustainable forestry with replanting is actually part of the solution, not part of the problem.

"When we harvest and replant responsibly, timber is the most renewable resource we have," says Michael Green.

Now, more than a decade later, Green's focus is on the next step. His vision for the coming ten years is about articulating a new way for the industry to talk about costs. He calls it The True Cost Envelope.

"We tend to define the cost of a building very narrowly: materials and labour. What we don't do is account for what society pays for climate change, construction noise, slow build times, stress, mental-health issues and healthcare use. Society pays all the time – but we don't book it as a construction cost."

Here Green sees artificial intelligence as a tool with real potential. If one can statistically prove that schools built in timber deliver better educational outcomes, lower stress levels and improved mental health among students, the playing field changes. Then no one will ever choose to build in any other material again.

Michael Green's hope is that the Nordic countries and Canada, with their robust health registries and long traditions of comparative research, can lead this work.

" I think we should apply for funding to prove we can reduce healthcare costs by building more in timber. These are things that have always been difficult to connect – but that's what the next decade should be about." ❯

CLT

Cross Laminated Timber – A solid, load-bearing building panel made from strength-graded boards glued together in crosswise layers.

LVL

Laminated Veneer Lumber – A strong beam made from thin, glued-together veneer layers that all run in the same direction.

LSL

Laminated Strand Lumber is made by pressing thin wood strands together with waterproof adhesive under high pressure.

Curious about Michael Green?

Come to the Seminar for Engineered Timber Construction taking place on **4 November in Gothenburg** and hear his talk, where he will share more about the Glöden project in Gällivare.
Read more about the programme and register here:



»I have a big woodworking shop at home. Whenever I can, I'm in the shop all day – that's why I understand timber. ***How it moves, how it cracks, what happens when I put in a screw one way or another****. Getting your hands dirty is essential to education.»*

Today much of the construction industry's debate is driven by emotion rather than data. Green cites the tragic Grenfell Tower fire in London in 2017 as an example, arguing that the wave of new regulations that followed was an emotional reaction, not a scientific one. The laws of physics work the same whether you're in Norway, Sweden, Finland or Canada – fire behaves identically. Yet every country, and sometimes every state or region, creates its own rules.

"It's absurd. You can't solve problems when you create the conditions for change in a system that's so bureaucratic."

The fifth material

But Michael Green does not stop at mass timber. In his 2023 TED talk he introduced a concept that reaches even further: FIVE, the fifth building material. The premise is this: if steel, concrete, masonry and timber have built the world over the past two centuries, what happens if we start afresh and create a fifth? A material inspired by the inner structure of trees and plants. Fibre-based. Organic. Cultivable with the power of the sun.

The fifth material is not intended as a criticism of mass timber. Mass timber is the best we can do right now. But we will not be able to supply the whole world with it. Africa's and Asia's rapidly growing cities lack access to northern-European or Canadian forests. What they do have, however, is sunlight and land to cultivate.

Green is clear that this is also about directing capital in the right direction. He refers, with a certain wistfulness, to how venture capital flows to the tech sector while building-material science is sidelined and large forest companies are often conservative in their approach to both investment and change.

An entirely new way of thinking also demands a new generation of leaders in the timber and forest industries. We need younger CEOs and forest owners with a drive to innovate and a willingness to take risks.

The future of timber construction will be decided largely in the lecture halls, and Michael Green has strong opinions about what is missing. It is not technical competence; it is leadership.

"We don't teach what it means to be a leader. You can't persuade clients, cities and contractors to do difficult or new things if you don't understand what it means to lead."

Michael Green is convinced that whoever can lead, listen, draw out the best from a team and turn ideas into reality is the one who drives genuine change. His view is that because leadership is not taught in schools today, leaders are not being created.

He takes the construction industry as an example. It represents a significant share of many nations' entire economies. Yet there is a shortage of powerful voices speaking up for the industry, challenging it and pushing it forward, Michael Green argues.

"There are lobby groups, but there are no real leaders talking about what the industry needs to do better. It's crazy. Absolutely crazy."

He also points out that craftsmanship itself has been lost in the education system. Those who design and those who build need to learn from each other. Over the past century these skills have drifted apart; now it's time to bring them together again.

"I have a big woodworking shop at home. Whenever I can, I'm in the shop all day – that's why I understand timber. How it moves, how it cracks, what happens when I put in a screw one way or another. Getting your hands dirty is essential to education."

Back to the shared space

In November, Michael Green is speaking at the Seminar for Engineered Timber Construction at Chalmers in Gothenburg. He is looking forward to it – perhaps most of all because he will be there in person. After the pandemic he prefers physical meetings; they offer a better opportunity to read the audience and relate to them.

"It's only when we're in the same room that we can truly share ideas. We need international meetings with different perspectives that stimulate new thinking and challenge the obvious. Not just locally. Globally," says Michael Green.



Gällivare's new meeting place is currently under construction. Here, culture and sport will converge in a shared venue designed by Michael Green Architecture. Follow the build via the contractor's site camera here:

Glöden – a heart in the Arctic

Above the Arctic Circle in Gällivare lies one of Michael Green's construction projects. Here, Glöden – a multi-activity centre housing a library, gym, theatre halls, swimming pools, restaurant and bowling alleys – is taking shape.

It is a project he describes with passion. A small town with big dreams. A place where darkness prevails for a month every year, and where a shared, warm and well-lit indoor space in timber fills a function that is hard to overstate.

It is about giving everyone a place to be during winter. A truly shared environment – something people gather around.

The timber for Glöden is locally sourced. Martinsons, with deep roots in northern Sweden, supplies the material. It is a model Green believes in: outsiders with knowledge and vision meeting local partners who bring material and local embeddedness.

"It's a privilege to come in from outside on a project like this. But it also feels like home to me. I grew up in Arctic Canada. The landscape, Sámi culture, reindeer – none of it is unfamiliar," says Michael Green.

More than a decade has passed since Michael Green's TED talk about tall timber buildings. A generation of architects and engineers has grown up treating mass timber as a given. The construction industry is building more in timber than it did ten years ago, in more locations worldwide and in ever more ambitious formats. The term mass timber appears in building codes, industry documents and university courses on several continents. This is, at least in part, Michael Green's doing. Yet he is still not satisfied.

"Over the past ten to fifteen years, together we've changed how buildings are constructed and how they look – but we've only just begun. There's a long, long, long way to go."

A message that chimes with the theme of this issue. The foundations are laid, but the work continues. ●

Michael Green

Michael Green recognised early on both the construction industry's negative climate impact and the opportunity to do something about it. The answer was the firm MGA, Michael Green Architecture, founded in 2012 in Vancouver, Canada.

Today MGA is world-renowned for sustainable and innovative architecture and for creating buildings that take mass timber to new heights.

He has authored several books: The Case for Tall Wood Buildings, Technical Guide for the Design and Construction of Tall Wood Buildings in Canada, Alpenglow and Tall Wood Buildings: Design, Construction and Performance (third edition).

IN HARMONY WITH THE LANDSCAPE

It's hard not to fall head over heels for the Quinta de Adorigos winery, where the architecture unites contemporary winemaking and construction with the sensitive Portuguese setting, high in the UNESCO-listed Douro Valley.

TEXT CARL JOHAN LILJEGREN **PHOTO** FERNANDO GUERRA



Externally, the winery's colour palette and the sinuous, slender timber skeleton of the roof trusses converse quietly with the dramatic landscape of the Douro Valley and the zigzagging terraces of the vineyards. Inside, the combined industrial and visitor facility is almost sacral.

"When you stand in the ten-metre-high storage hall – which almost feels like a church, with light streaming down onto 50-year-old port barrels – a deep sense of timelessness and connection to the landscape takes hold," says Sergio Rébelo, founder of the architecture practice that bears his name.

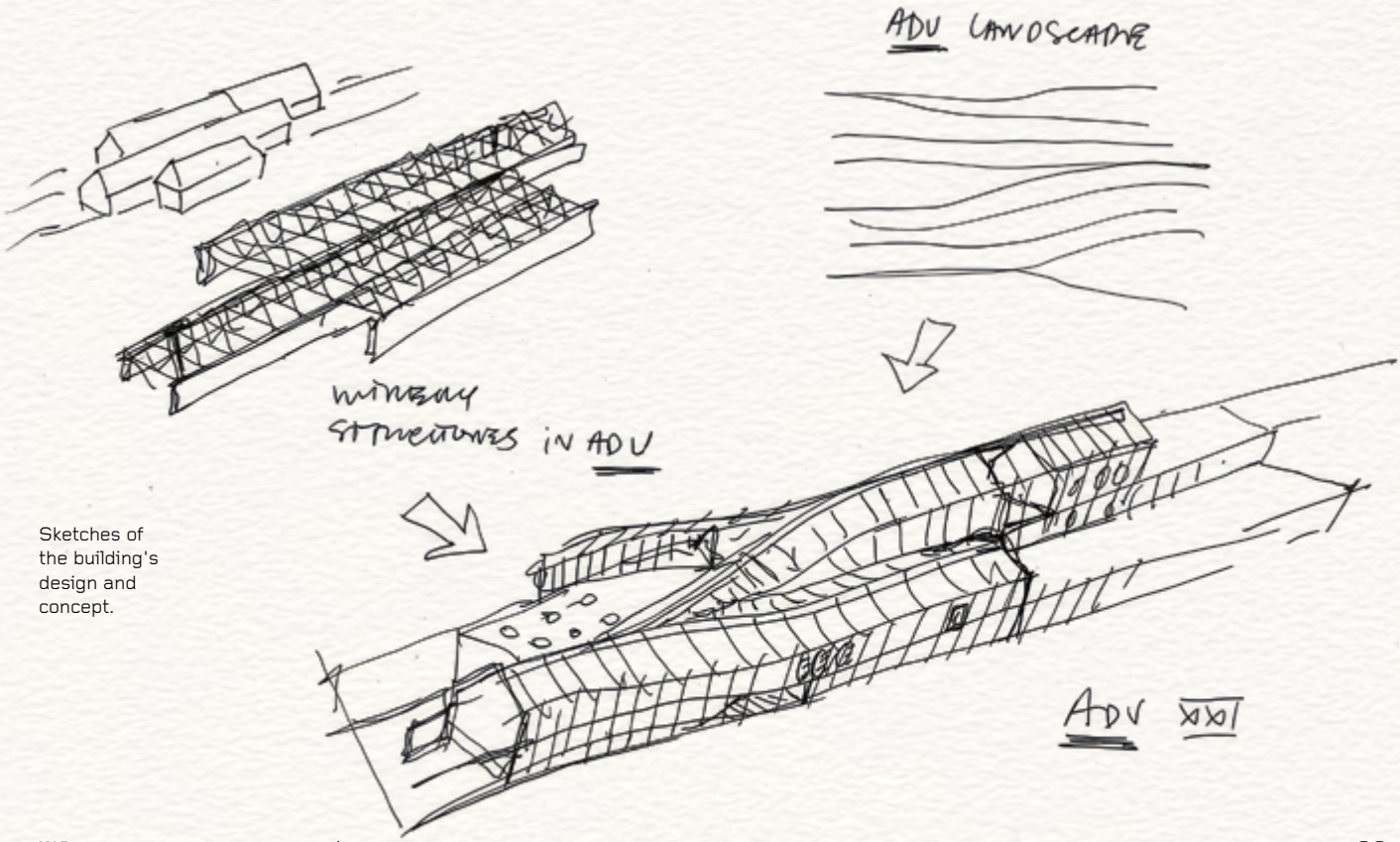
With a strong emphasis on the locally specific, the historical context and the roots of traditional Portuguese architecture, together with a clear point of departure in minimalist modernism, Quinta de Adorigos winery is a striking example of architecture that, with a respectful footprint, enhances the experience of a place's distinctive character. The building has also won a host of international awards.

The most challenging aspect of the project was designing a building that honours a sensitive landscape designated as a UNESCO World Heritage Site, while uniting tradition with modern methods of winemaking, says Sergio Rébelo.

"The Douro Valley demands deep spatial responsibility. We had to weave 1,200 square metres of interconnected bays into the steep, terraced slope without overwhelming the centuries-old topography."

The solution was to let the slope dictate the inner logic. The architecture naturally steps downwards, allowing the entire winemaking process to operate within a traditional, gravity-fed system common in the region.

Another advantage of the partially buried building is that it enables passive strategies for maintaining the wine storage area's indoor temperature between 14 and 16 degrees, in a location where outdoor temperatures range from –5 to +45 degrees from winter to summer. This is achieved by positioning the southern building envelope in contact with the ground – to exploit its thermal mass – while the main façade faces north, where sunlight is limited even in summer. In addition, a geothermal system produces electricity. Together, this keeps energy consumption low, significantly minimising the winery's environmental impact. The same approach applies to water; rainwater and used water are collected, ›



Sketches of the building's design and concept.







The winery's main façade houses the entrance to a visitor centre with reception and wine shop. From here, visitors ascend to a meeting room with a fully glazed wall and continue to the wine-tasting area, located in a spacious gallery with a balcony overlooking both the wine storage area in the building's central bay, the vineyard and the river. These rooms have access to the outdoors, the vineyards and the chapel via a large terrace with views over the river.

purified and used for irrigation. Drinking water comes from artesian wells.

The winery's materials echo the surrounding nature's palette of pinkish-brown, green and grey tones, in traditional materials and craftsmanship, but updated with modern technology. Local slate and granite were used for both the exterior elements and the internal concrete retaining walls.

But what is perhaps most striking about Quinta de Adorigo, both inside and out, are the roofs.

"What I'm most proud of! How we transformed the traditional pitched roof into a continuous, sinuous and organically sculptural timber skeleton. It flows beautifully along the tangential curves of the vineyards," says Sergio Rébelo.

The load-bearing structure of the interconnected bays consists of glulam frames and cross-laminated timber (CLT) panels, externally clad with prefabricated GRC façade panels (glass-fibre reinforced concrete), manufactured locally in northern Portugal.

Portilame was the timber supplier and was responsible for on-site assembly. The glulam frames and CLT panels were primarily manufactured from high-quality, sustainably certified Nordic spruce.

"This specific choice of timber enabled us to achieve the roof's sweeping, organic curves with extreme geometric precision," says Sergio Rébelo.

Timber structures have been used where the building does not touch the ground, also to minimise the use of concrete, which has reduced carbon dioxide emissions to the atmosphere by 40 per cent compared with what a building constructed entirely in concrete would emit.

Exposed to the effects of climate, all these materials develop beautiful tones and textures over time, better integrating the winery into its natural surroundings and ensuring the building improves with age, just like a fine port. ❯



Atelier Sérgio Rebelo, is emerging as one of the leading exponents of the Porto School (FAUP). The school is the foremost expression of modern architecture in Portugal. It is defined by the importance placed on contextualising and integrating the functionalism and minimalism typical of modernism with the specific local and historical background of each work, as well as with the roots of traditional Portuguese architecture.

Freehand drawing s another hallmark of FAUP. Paper and pencil are seen as a central pedagogical tool for understanding space, context and human scale, thereby serving as a bridge between conceptual thinking and physical construction.



SERGIO RÉBELO, ARCHITECT.





Quinta de Adorigo winery

Client: Quinta de Adorigo

Architect: Atelier Sérgio Rebelo

Location: Tabuaço, Alto Douro Vinhateiro, Portugal

Building area: 1,100 m²

Materials: Concrete foundation. The load-bearing structure of the bays consists of glulam frames and CLT panels in high-quality, environmentally certified Nordic spruce, clad with prefabricated façade panels of glass-fibre reinforced concrete.

Timber supplier and installer: Portilame

Timeline: Project start 2019. Completed 2024.

Selected awards: Architizer A+ Awards, 2026 – Details +Wood. Architizer A+ Awards, 2026 – Bars & Wineries. Dezeen Awards, 2025 – Hospitality. World Architecture Festival, 2025 – Production, Energy & Logistics. World Architecture Festival, 2025 – Best Use of Timber. World Architecture Festival, 2025 – Best Use of Light, Highly Commended. Archisearch Awards 2025 – Best Mixed Hospitality Design of the Year.





THE GREAT REUSE

The building was too heavy and the foundation couldn't support an extension. But when the concrete façade was replaced and timber was used for the new storeys, it became possible to build on the existing structure. Now Lumi in Uppsala is the reuse project the whole world is talking about.

TEXT GUSTAV SCHÖN **PHOTOS** MÅNS BERG/WHITE ARKITEKTER

Lumi means "light of life" in Latin, and when the Swedish Food Agency vacated the Hugin block in Uppsala, Vasakronan was left with an office building that was anything but luminous. Low ceiling heights, small windows and poor insulation meant demolition long seemed the obvious choice.

Today the drab 1970s complex has been transformed into a desirable, expressive office building in central Uppsala. The atrium shows why. A lift shaft has been clad in reclaimed roof sheeting, and the many timber surfaces bring warmth to the interior.

In 2015, Vasakronan announced an architectural competition. Anders Tväråna and his colleagues at White Arkitekter proposed that parts of the building should be retained, but their entry did not win. Demolition plans dragged on, and meanwhile Vasakronan's sustainability work had gained momentum.

"Our initial plan was to demolish and build new, but at the same time we began looking at how we could reduce our carbon dioxide emissions. That's when we started to question whether it really was right to demolish the entire building," says Anna Denell, Head of Sustainability at Vasakronan.

White was commissioned to investigate how much of the existing building could be retained. One of the major challenges was the foundation. The building stands on Uppsala's deep clay deposits, and the foundation could not support unlimited additional load.

The solution was to make the building lighter. By replacing the old concrete façade with a steel structure and adding infill walls with timber studs, it became possible both to install larger windows and improve the insulation.

"We realised that if we removed the heavy concrete façade, we gained a weight margin that allowed us to add three storeys while retaining 80 per cent of the concrete frame," says Anders Tväråna.

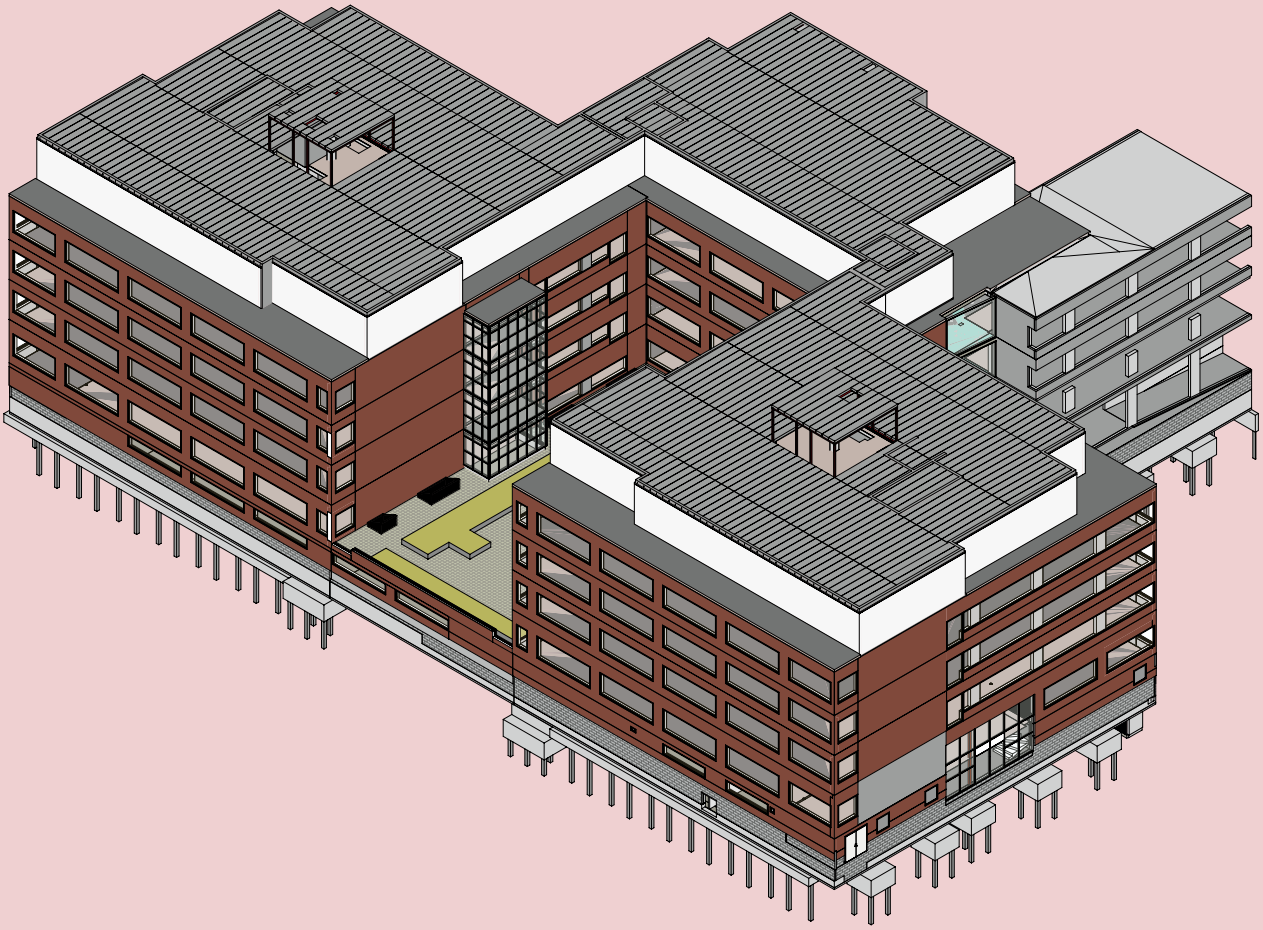
The new storeys were built with a hybrid frame of timber and steel, with two of the floor slabs constructed in cross-laminated timber (CLT). The roof over the atrium is carried by exposed glulam beams, and the external walls have a timber stud ›



Interest in Lumi has also reached far beyond Sweden. This autumn, Anna Denell and Anders Tväråna will present the project at Greenbuild Expo in New York, the world's largest conference for sustainable building.

ANDERS TVÄRÅNA
WHITE ARKITEKTER

Before:





80 percent of the structural frame and the entire foundation could be retained – the project's biggest climate saving.

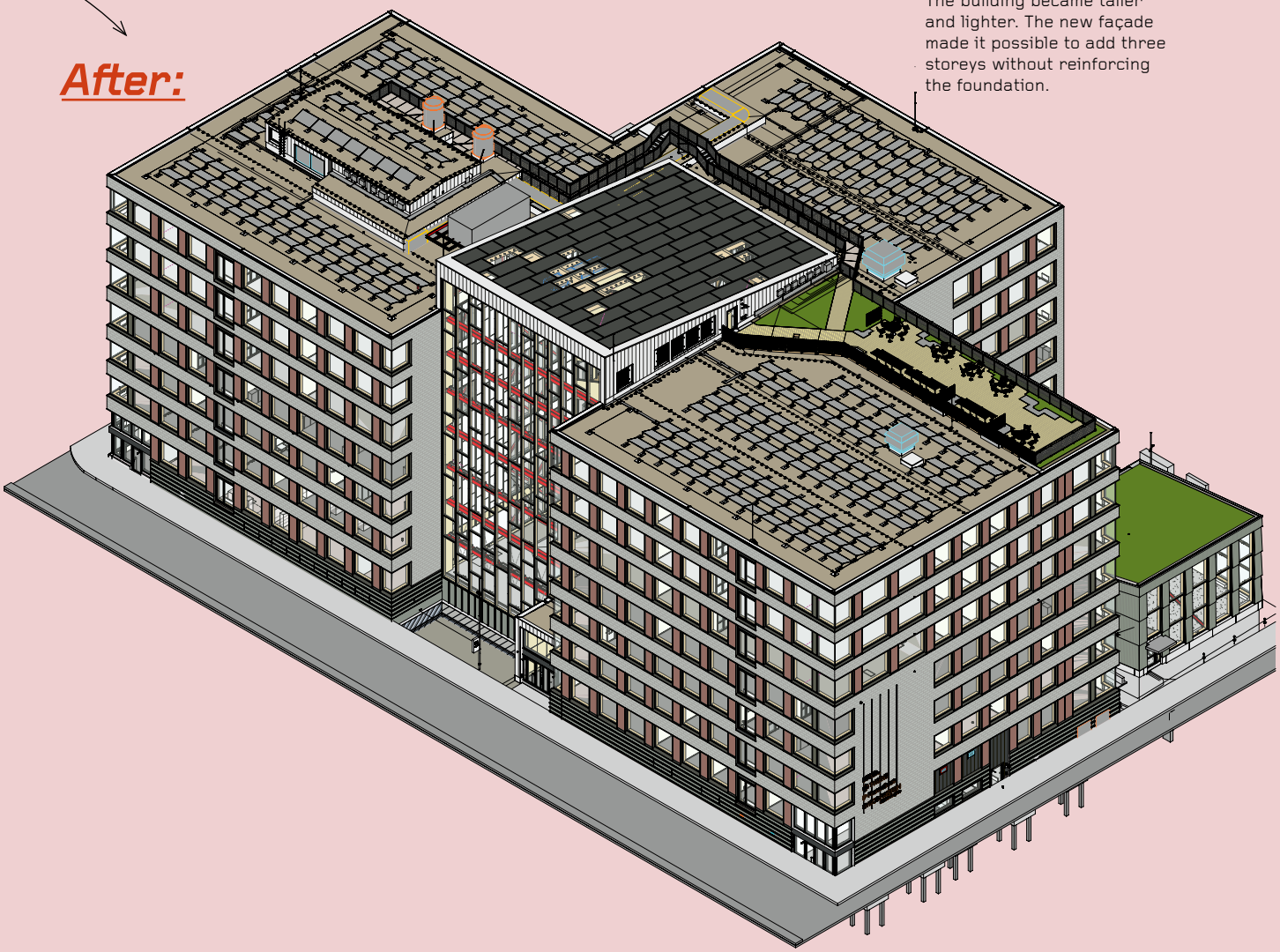


The old façade was closed and difficult to access from street level.



The old office spaces were cramped and dark.

After:



The building became taller and lighter. The new façade made it possible to add three storeys without reinforcing the foundation.



The new façade is clad in slate, a natural material with a low climate impact that ages well and can be dismantled for future reuse.



The atrium now connects the three building volumes. The former exterior walls became interior walls facing the courtyard, and new walkways link the buildings together.



Acoustic panels and radiators have been reused. Vasakronan has also sourced carpet tiles from other tenant fit-outs and had an interior architect "piece" them together into new floors.



»I believe we would see significantly more timber construction in Sweden if the mandatory limit values, which were planned for summer 2025, had been introduced.»

ANNA DENELL, HEAD OF SUSTAINABILITY VASAKRONAN

frame. In total, Setra supplied around 1,200 cubic metres of CLT and glulam to the project.

"By using lightweight materials like timber, we could add several storeys without having to reinforce the foundation," says Anders Tväråna.

Weak legislation holds back timber

The Lumi reuse project has won international acclaim and is one of the most highly rated office buildings in the world. According to Vasakronan's calculations, they have managed to halve their emissions compared with demolishing and constructing a new timber-framed building.

"Vasakronan's goal is to reach net-zero emissions by 2030, which requires drastically reduced emissions from building production. The decision to retain the existing structural frame at Lumi, rather than demolish and build new, was a direct consequence of these sustainability goals and ambitions for circular construction," says Anna Denell, who believes Sweden was long at the forefront of sustainable building.

"We were one of the countries that had come furthest in openly reporting emissions in building processes. But now we've been overtaken by Finland, Denmark and the Netherlands, for example."

Since 2022, the climate impact of building must be reported–but there are still no limit values for how high emissions may be. According to a proposal by Boverket – the Swedish National Board of Housing, Building and Planning, limit values are not due to come into force until 2030.

"I believe we would see significantly more timber construction in Sweden if the mandatory limit values, which were planned for summer 2025, had been introduced," says Anna Denell.

A world-class reuse project

Retaining 80 per cent of the structural frame and the entire foundation has delivered the single greatest climate benefit. But reuse of kitchenettes, radiators, glass partitions and large quantities of building materials has also contributed to reduced emissions. Some components come from the building itself, others from nearby refurbishments. In total, around 1,300 tonnes of material were reused.

"Vasakronan's approach in this project was that we would try to reuse everything we could. Even though we didn't know from the start exactly what would work, we tested it," says Anna Denell.

Reusing on a large scale requires storage space, digital systems and a great deal of hands-on work. Particularly when it comes to salvaged doors. Each door must fit its new location, meet fire and acoustic requirements, and often be adapted or refurbished in a joinery workshop.

The plasterboard, by contrast, was considerably easier to handle. Before dismantling, several companies were invited to demonstrate how plasterboard could be removed without being damaged. The company deemed to have the best method used, among other things, a large magnet to locate the screws in the walls. In total, around 100 tonnes of plasterboard were reused.

"Plasterboard is a very rewarding bulk material to reuse. It usually comes in standard sizes, and when you reinstall it you can turn the inner side, which is often in mint condition, to face outward. What's more, the working environment is better during dismantling because there's less construction dust," says Anders Tväråna.

Bulk materials and fixtures are precisely what Anna Denell believes the property sector must get better at not throwing away. When an office space gets a new tenant, perfectly functional fixtures are often ripped out for aesthetic reasons.

"It might be the wrong colour of carpet or tiles in the toilets. The items aren't technically worn out, but they're discarded anyway. If you do that with every tenant fit-out, the climate impact over time becomes significant."

Another important lesson was to first build half a storey as a test. There, the project team could see how the reused components worked together, both technically and visually. The space also became a showroom for potential tenants.

"Many people still think reused means poorer quality, or that it will look second-hand. It's very much about changing people's attitudes," says Anna Denell. ●

Lumi

Developer: Vasakronan

Architect: White Arkitekter, Anders Tväråna

Timber supplier: Setra supplied 1,200 cubic metres of CLT and glulam in spruce. Nissabo Trä supplied three-layer wood panels for cladding the atrium. Almedalsgolv supplied timber flooring, a staircase and walkways.

Project and design management: Byggstyrning

Structural engineer: Knut Jönsson ingenjörsbyrå

Procurement: Separate-trades contracting

Construction start: 2022

Occupancy: 2024

Cost: SEK 740 million

Floor area: Approx. 21,000 sq m GFA, 16,500 sq m NLA plus parking garage

Tenants: Försäkringskassan, Sveriges geologiska undersökning, Gyros Protein Technologies, Tyréns och Pharmetheus.

Awards: Building of the Year 2026, trade magazine Byggindustrin; Best Renovation and Reuse Project 2026, Life Sciences, Tech & Research Clusters Awards; LEED Building of the Year 2025, Sweden Green Building Awards. The project achieved 99 of 110 possible points in the LEED certification system, which is Platinum level. Lumi is thus the highest-scoring project in Europe, and the highest-scoring office building in the world.

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BACK TO BASICS?

The concrete slab has long been one of the most taken-for-granted elements in industrial housebuilding—something that a research team at Rise spent three years questioning.

TEXT MATTIAS BOSTRÖM **AI-GENERATED ILLUSTRATION** INTELLECTA

Traditional foundations of concrete, reinforced steel and insulation account for up to 40 per cent of carbon dioxide emissions when constructing new buildings with a timber frame. This was one of the reasons why Rise initiated the research and innovation project Sustainable Foundations for Industrially Manufactured Houses, funded by Vinnova – the Swedish innovation agency, the CBBT research foundation, the Swedish Federation of Wood and Furniture Industry, and Swedish Wood.

The aim was to explore the potential for reducing the climate impact of house foundations by providing a basis for decision-making for industrial timber-house manufacturers. In this way, the project hoped to find alternatives to traditional foundations and thereby achieve a lower carbon footprint.

The project ran from 2023 to 2025. Its coordinator was research and development engineer Irina Martynyuk.

"When the climate declaration was introduced, it became clear where the emissions came from. In very many cases, when we're talking about prefabricated timber houses, the foundation can account for between 20 and 40 per cent of the carbon dioxide emissions. It's a part of the building that house manufacturers can't actually influence themselves – they procure it through an external contractor. That made it low-hanging fruit to look at alternatives to concrete foundations," she says.

The project consisted of several different work packages. In one of them, Rise carried out climate calculations to determine what carbon footprint four different foundations would generate if placed beneath two different reference houses: OBOS Kolonilotten (three storeys, with a timber stud frame in volumetric modules), and Masonite Beams' Flexibilitetshuset (four storeys with an I-joist frame in panel elements). The climate calculations were carried out according to Boverket's methodology for climate declarations, in collaboration with IVL.

The four foundations were a traditional concrete slab, a heated crawl space foundation, an optimised concrete foundation, and a solid timber foundation, each calculated separately for both houses. The purpose was to make the results comparable.

The figures were clear. With a traditional concrete slab, Flexibilitetshuset produced 24 kilograms of CO_2 equivalents per square metre for the foundation alone, and Kolonilotten 20. With a solid timber foundation, the values dropped to 9 and 12 respectively.

»In very many cases, when we're talking about prefabricated timber houses, the foundation can account for between 20 and 40 per cent of the carbon dioxide emissions.»

For Kolonilotten, the optimised concrete foundation performed almost as well – 13 kilograms of CO_2 equivalents per square metre compared to the solid timber foundation's 12 – because the beams in that house had more scope for optimisation. For Flexibilitetshuset, where the traditional foundation was already relatively well-dimensioned, the optimisation yielded considerably less benefit: both the heated crawl space foundation and the optimised concrete foundation came in at 18. The concrete slabs had been optimised by reducing thickness, lowering strength grade and using climate-improved concrete at level 4.

The good result is primarily due to replacing concrete with timber.

"But it was also interesting to see that an optimised traditional foundation shows excellent values. It's possible to reduce emissions even when using concrete," says Irina Martynyuk.

The project's main focus – and, according to Irina Martynyuk, its most interesting one – was on timber foundations.

"Timber foundations are sufficiently different and complex to deserve their own work package. It's a more untested and uncertain solution than the other alternatives, which required more in-depth verification," she says.

In this work package, a cross-laminated timber (CLT) foundation was used as a direct replacement for the ›



M SOM I MÖJLIGHET

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Kort sagt: Vi gör det möjligt att bygga mer i trä.

MARTINSONS
POWERED BY HOLMEN

Läs mer om hur vi kan bidra i ditt projekt

› concrete slab. Klara Byggsystem, one of the industrial partners in the project, manufactures prefabricated foundation elements of CLT with multiple layers of insulation. CLT foundations are based on the same principle as a traditional slab-on-ground, but instead of concrete, panels of cross-laminated timber serve as the load-distributing layer.

"The elements are prefabricated and delivered directly to site. It's a change of material, not of system," says Irina Martynyuk.

A CLT foundation follows the same load principle as concrete: the CLT slab rests on reinforcement beams, where load-bearing walls and columns transmit their loads downwards. Where loads are low, the beams can be replaced with load-bearing insulation.

And then there's he matter of moisture – a question that often arises when it comes to building in timber. When it comes to foundations, it naturally becomes even more important. Consequently, moisture performance was given its own work package, on which the project spent the most time.

To investigate moisture performance, Rise used two different houses with timber foundations. Derome's Villa Klivet, where Rise was involved in the design from the outset, and the already completed Villa Zero, a collaborative project between Fiskarhedenvillan, Structor Byggteknik and Mondo Arkitekter. Both houses were equipped with moisture-monitoring sensors to track how the timber foundations behave in reality over time.

Villa Klivet showed good results. Relative humidity stayed at around 60 per cent, compared to a threshold of 75–80 per cent. The moisture content in the timber stabilised at approximately 12 per cent. During the construction phase, the foundation was left exposed to rain for over a week as a stress test. The moisture level rose – and then dried out rapidly.

"I wasn't really surprised. The foundation is well insulated, it's warm inside the house, and the structure is raised from the ground. The temperature gradient pushes the moisture downwards and away," says Irina Martynyuk.

Villa Zero did not show the same good results. The sensors inside the house displayed excellent values, with a moisture content below 9 per cent, a stable temperature around 20 degrees and a relative humidity of 50–55 per cent. But on the north-west side, at the gable end, the picture is different. Three sensors show relative humidity of 75–100 per cent. Two of the three sensors show 100 per cent relative humidity during winter, when the risk of microbial growth is lower, according to Irina Martynyuk.

She describes how the construction differs from Villa Klivet's on a small but crucial point: a plastic layer between the first and second insulation layers. The sensor is positioned at the edge of the edge beam, close to the plastic layer.

"Our theory is that the temperature difference between the two layers creates condensation against the plastic, and that the moisture is then unable to migrate away. It's a concerning result, and Fiskarhedenvillan are aware of it," she says.

Rise are not entirely certain about the cause of the moisture accumulation in Villa Zero, since they were not involved when the house was built. Suspicions point to the damage – the presence of moisture or the elevated humidity – occurring during the construction period. And if moisture is built into a structure that is airtight and difficult to dry out, it has nowhere to go.

"The moisture content varies over the year but shows no gradually increasing trend. It repeatedly reaches high values in the slab at the gable end. If there were an ongoing leak at the vapour barrier, we would expect it to rise progressively. It doesn't. We believe the moisture is built in and cannot dry out, either downwards or to the sides."

Sandra Tysell, Head of Product and Sustainability at Fiskarhedenvillan, explains that they raised questions about timber and moisture early in the project, since organic materials are more moisture-sensitive.

"That's why we've monitored moisture content, temperature and relative humidity in the foundation structure, both during the construction phase and in-use phase, with sensors placed at particularly critical locations," she says.

When deviating values have occurred, they have supplemented with core samples. The analyses have not identified any microbial damage.

"Villa Zero demonstrates the importance of following up and evaluating new solutions over time. Identifying risks, learning from the results and applying that knowledge is an important part of development," says Sandra Tysell.

The results show that timber foundations can work from both load-bearing capacity and moisture perspectives, provided that the design, production and construction process are executed correctly.

"Timber foundations can be applied, but they will require measures depending on the ground conditions, such as reinforcement beams and more extensive drainage," says Irina Martynyuk.

The project presents its results in, among other things, a decision matrix – an Excel document that helps structural engineers and house manufacturers choose a foundation type based on ground conditions, building systems and climate requirements. Irina Martynyuk emphasises that the matrix is a discussion tool rather than a definitive answer. ›



IRINA MARTYNYUK, RESEARCH AND DEVELOPMENT ENGINEER, RISE.



Nya byggregler: från krav till effektiv projektering

Nya krav på byggande och konstruktion innebär ett ökat fokus på kvalitet, dokumentation, spårbarhet och kontroll i alla projektets skeden. För branschen innebär detta att viktig information om konstruktioner, material, beräkningar och ändringar i utformningen måste vara korrekt och lättillgänglig – från tidig projektering till produktion och förvaltning. För att uppfylla dessa krav krävs strukturerade, digitala arbetsflöden som eliminerar fel och förhindrar kostsamt omarbete.

Omvandla komplexa krav till säkra beslut med Tekla

- **Tekla Structures:** Skapa detaljerade 3D-modeller för stål, betong och trä, med korrekt information för projektering, tillverkning och byggnation.

- **Tekla Structural Designer:** Kombinera hållfast beräkning och dimensionering i ett modellbaserat arbetsflöde för effektiv konstruktion.

- **Tekla Tedds:** Automatisera vanliga konstruktionsberäkningar och skapa tydlig, spårbar och dokumentation enligt gällande standard.

Teklas lösningar förbättrar även samarbetet mellan olika parter i projektet. Detaljrika modeller ger teamen den insyn som krävs för att tidigt upptäcka och åtgärda krockar, optimera produktionsplaner och ta fram korrekt underlag för både tillverkning och montage på byggplatsen.

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Trimble Tekla

› So what does a potential breakthrough for timber foundations look like?
"Several technical challenges remain, such as continued knowledge-building around load-bearing capacity, handling of lateral loads, odour and emission tightness, and moisture safety during the construction phase, particularly when exposed to precipitation and ground moisture. But CLT foundations are nonetheless a promising alternative for the sustainable construction of the future. Interest within industry and research is growing, which is driving development forward. But we need continued empirical validation, standardisation and development of technical guidelines. And information dissemination is important," says Irina Martynyuk.

The segments where Irina Martynyuk believes timber foundations have the greatest potential are primarily smaller buildings and detached houses:

"Imagine not having to pour a slab? You lay out foundation blocks, erect the Attefall house, and within a week it's finished. It would be perfect for extensions, outbuildings and ancillary structures. That's the segment where I believe timber foundations have the greatest potential to establish themselves initially." ●

»We've learnt a great deal»

JIMI LEO, HEAD OF SUSTAINABILITY, DEROME



Derome's Villa Klivet performed well in Rise's evaluation. Head of Sustainability Jimi Leo sees timber foundations as an interesting part of the future of construction – both for reducing climate impact and for creating more efficient building processes.

What are your comments on Rise's report and the results?
"We view the project and the results from Villa Klivet very positively. It has contributed to increased knowledge of alternative foundation methods and shows that there are opportunities to reduce the climate impact from a part of the building that often accounts for a significant share of emissions in single-family house construction."

How have you taken the work forward?
"The experience from Villa Klivet has led us to proceed with timber foundations in a new housing project. There we have installed four timber foundations that will now be measured and monitored over time. One of the foundations was developed and manufactured by Derome, while the others are based on the same principle used in Villa Klivet."

How do you see the future for timber foundations?
"We see great potential for timber foundations, not least because they can be prefabricated and installed quickly and efficiently. Using a renewable material in the foundation also delivers a clear climate benefit. Timber foundations are particularly well suited where ground conditions are good and buildings have a relatively simple form. At the same time, continued development and more reference projects are needed to broaden the range of applications." ●



Villa Klivet is located in Fjärsås, outside Kungsbacka.



LOCALLY SOURCED

With the forest just round the corner, architect Emelie Holmberg's locally produced modular homes break with the old catalogue-house template. But the journey has demanded compromises she didn't always anticipate, and shifted her focus as much towards business as aesthetics.

TEXT MATTIAS BOSTRÖM **PHOTOS** JAMES SILVERMAN, EMELIE HOLMBERG





PHOTO MIKAEL LUNDBLAD.

EMELIE HOLMBERG, ARCHITECT

If it weren't for the name, you might think the Gimme Shelter story was unfolding at the turn of the last century. When the distance between forest and production was short, and the timber followed a chain spanning just a few kilometres; when the logger knew the sawmill foreman who knew the factory director.

Because that is what founder Emelie Holmberg's life looks like – her working methods and logistics are rooted in precisely that logic. From the production facility in Vimmerby it is only a few minutes' drive to both the forest and the sawmill.

"I can basically walk out into the forest and see the trees we then use in production. It's really wonderful. You safeguard quality in a way that's otherwise hard to achieve. It runs deep in your soul, because that's how people used to work. It's a special feeling," she says.

The idea behind Gimme Shelter is simple: architect-designed modular homes in timber. And the reason Emelie Holmberg came up with it is also relatively simple. From her position as an architect running her own practice, she saw time and again how difficult clients found the process, and that the existing timber catalogue houses weren't sharp enough – whether in terms of sustainability or aesthetics.

"That's where I felt we could do something to make life easier, both for myself and for clients. The big, space-hungry catalogue houses cost more to build and heat than many people need. If you start by building smaller, it doesn't cost as much, and you end up with more considered, smarter solutions. You can also start with a small module and add on if the family grows or finances allow. It's an organic way of looking at a home," says Emelie Holmberg.

The result was Gimme Shelter – built to grow in step with life. Under the Attefall rules, a smaller modular home can now be built without planning permission. The day more space is needed, you apply for an extension permit and attach another module, perhaps for a small office or guest cabin. Most of her clients stop at around 120 square metres, however. ›

»The housing industry is like a world of dinosaurs – a very old culture and tradition holds sway. I believe that in the future we'll order a house like a car: you click your choices, and it goes straight into production.»

EMELIE HOLMBERG, ARCHITECT



Full-height glazed openings that draw in the surrounding nature run as a unifying thread through the building.





"For me, large is around 120, not 300," says Emelie Holmberg.

Designing in modules is a different kind of work from designing a house from scratch, and Emelie Holmberg is candid about what she has given up and what she has gained.

"There are limits to how special something can become. The constraints of industrial production, price and budget put a stop to both the very time-consuming and the tricky bespoke requests. That total creative freedom an architect who is passionate about the artistic side might want probably isn't as exciting here. I'm more interested in the manufacturing method, in the rational aspects of building, and in how you do it in Sweden. So I've probably ended up more as an entrepreneur than as an architect, actually," she says.

The compromises have been many, and the early years were defined by one house: the prototype on Väddö, outside Stockholm – her own home. The aim was to develop optimal modules.

"It was a real challenge. We had to work within a certain height and a certain width. The materials and assembly couldn't become too expensive – but it still had to be exciting enough. The whole time you had to step back or push forward," says Emelie Holmberg.

Development has continued since then, in small steps rather than major overhauls. She follows up on how the houses are holding up and what the people living in them think, while constantly searching for simpler assembly and new, cheaper material choices without compromising on architecture.

"We look at new timber materials all the time: what do they cost, where do we find them, what does it cost to install them? It's usually a big process to work out what a particular material choice actually costs and what it delivers. We've replaced finishes with other types of timber flooring, for example. You look at the whole house, all the time, and whether you can swap something out," says Emelie Holmberg.

Ninety per cent of the timber comes from the forests around Vimmerby. The façade's spruce cladding is local, chosen for its durability, and is delivered already treated with iron sulphate by the sawmill next to the factory. The ceiling's clear pine panel is manufactured fifty metres away. The birch-veneer walls, which give the houses' interiors their pale figuring, she had to order from the Baltics, however.

"That's where I've compromised. I wanted birch-veneer walls, and they weren't available locally. I look at the supply chain, price, how beautiful it is and whether it's worth it. Then I work out what's best. A budget alternative would be to use a local timber panel instead – easier to install and more attractive precisely because it's local."

Photos of the inished houses reveal a common thread: almost all sit in secluded natural settings, often by water or deep in the forest. Emelie Holmberg describes it as an interplay rather than coincidence.

"Architecture has a life of its own. It speaks to its surroundings, and the surroundings speak back. But one of the houses is on a suburban plot – an extension to another house – and creates a small atrium courtyard. Almost Japanese. You see the building from all sides, and it manages without much surrounding nature. But at the same time, it becomes very beautiful when there's wild nature around too," she says.

Roughly half the houses become permanent homes, half holiday houses – a boundary that Emelie Holmberg says has blurred since the pandemic.

"People realised they could work from their holiday house, and then it wasn't a holiday house any more. You usually want to build it as a permanent home, even if the environment feels more like a holiday house. You can live a bit further from town and commute a few days a week," she says.

Despite her practice being founded on timber as a material, she remembers her training as surprisingly light on the subject.

"We visited some timber projects during the first year in Lund, but otherwise you didn't learn much that was useful for the actual job during the course. Five years is only enough for basic methods and mindsets. The rest – learning to test, read up, talk to builders – you have to do for real, like when I built the prototype on Väddö. There was no experience to draw on. I had to learn from scratch," she says.

The reactions from colleagues in the industry have surprised her. Architects are heavily over – represented among the clients who get in touch.

"It's really interesting, because somewhere many of them must share my interest in building rationally. As an architect you know exactly what can go wrong, how the budget can spiral. If you suddenly become the client for your own house, you don't want that to happen. I think most people find rational building – building uniquely yet still rationally – an interesting track."

Beyond the choice of materials, the environmental benefit lies mainly in logistics. A project in the archipelago, where all the material would otherwise have had to be shipped out loose, is the clearest example.

"You can only imagine how many transports you avoid. The material is collected locally from the sawmill, next to Vimmerby, and then the whole house is shipped out in one go. Even the workers gather in the same place – they already live in the area," she says.

Emelie Holmberg sees modular construction as an inevitable development rather than a niche, even though the industry as a whole moves slowly.

"The housing industry is like a world of dinosaurs – a very old culture and tradition holds sway. But I believe that in the future we'll order a house like a car: you click your choices, and it goes straight into production."

That development only requires clients to be willing to decide early, she argues. She does, however, take issue with another trend in new-builds: declining quality.

"You can see the joint on the module if you don't want to spend extra money hiding it. It costs a huge amount to build in Sweden anyway, so if it's only about maximum margin I'm not interested at all. Then you have to rethink. How are people even supposed to afford to buy a house? Building sustainably and solidly with Swedish labour is expensive."

Despite the industrial logic, the standard dimensions and the budget calculations, she is careful to stress that the artistry hasn't vanished – it has simply moved.

"If you like playing with Lego, you probably do it because there's creativity in how you put the pieces together. Every sketch is a new site, a new family, a new composition. And seeing it on site in reality, every time a new house is built, is still very exciting." ●

The rules for Attefall houses

The Attefall rules are an everyday term for permit-free small buildings that fall outside the local plan. It is not active legislation.

The houses may have a kitchen, bathroom and year-round standard.

The gross floor area for an Attefall house may be a maximum of 30 square metres within a local plan and 50 square metres in non-planned areas.

The houses may be erected without planning permission if built at least 4.5 metres from the plot boundary; otherwise, consent from the neighbour is required.

A requirement for building an Attefall house is that a main building classified as a one- or two-dwelling house already exists on the plot.

Source: Attefallshus.se



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Benjamin Björksell, Helge Berntsson, Oskar Nesset Mattsson. Daga Karlsson and Hanna Bergqvist are Tänk om Trä.

FROM OFFCUTS TO STRUCTURE

For the project Spill till stomme (From Offcuts to Structure), the group Tänk om Trä made a little go a long way. From a pile of timber blocks, these former students from Chalmers' Architecture and Engineering programme built a load-bearing structure.

"We need to see offcut timber as a fully fledged resource," says Daga Karlsson.

A couple of years have passed since the group Tänk om Trä was formed. A study visit during the renovation of Feskekörka in Gothenburg during their student years sparked the idea of working more with timber – and doing it together.

Today, the group's members are spread across workplaces and universities around the country.

"I think we all had a longing for more hands-on learning. It's a bit strange that you can study to become an architect or engineer without ever having been on a building site. We saw this as a way to learn more about timber and the industry," says Oskar Nesset Mattsson.

One project led to another. Ahead of Trä & Teknik 2024, they were commissioned to create an entrance pavilion and stage for the fair. They approached the timber company Derome and asked what offcut timber was available from production.

The company donated waney-edged sarking board (underlay panel) and a large pile of short offcuts from the production of finger-jointed structural timber.

"We wanted to show that it's possible to build a structural frame from "slender" offcut timber, as long as you think one step further and work with the material," says Daga Karlsson.

The structure is made almost exclusively from this timber. Each arch consists of 100 timber blocks and 100 plywood connectors, joined together by around 400 small wooden pegs. The pegs were made from what was left over when the group processed the sarking board. ❯

All about offcut materials

Waney-edged sarking board: Lower-quality sarking board was used for the stage cladding and the arch feet, made from self-produced glulam.

Offcuts from finger-jointed structural timber: Pieces with defects that were sawn off during the production of finger-jointed structural timber. The blocks, approximately 20–30 centimetres long, are the pavilion's primary building componentl.

Secondary offcuts: The offcuts generated during the group's work were put to use. The tongue and groove of the sarking board were sawn off, then turned and whittled into pegs. The end-grain block flooring on top of the stage is made from offcuts from the production of the arches.

All the material for 'Spill till stomme' is Swedish spruce from Derome's sawmill in Veddinge.

'We noticed that circular building requires a lot of logistics and hands-on work. Even though this was a relatively small project, we had problems with storage, and all the offcut timber needed to be sorted and processed by hand,' says Daga Karlsson.

Tänk om Trä draws inspiration from historical and material-efficient building techniques, where offcut timber and timber with uneven dimensions have been used to build large load-bearing structures. One example is Hilding Brosenius's HB beam, developed to span large distances using short planks. Another model is the Zollinger construction.

To adapt their structure to the uneven timber dimensions, the group coded a parametric script that automatically generated the drawings.

"The structure consists of so many connections that without the script it would have been extremely time-consuming to manage them," says Benjamin Björksell.

After the fair, the finished work was exhibited both at Chalmers and at Virserums konsthall in Småland. The project was also awarded Swedish Wood's stipend Ung Svensk Form 2026. The award included a study trip to Östergötland. There, the group visited sawmills, took part in a forest excursion and met people in the industry.

"We had the opportunity to meet many interesting people and visit inspiring places. A highlight was the villa 'House for mother' in Linköping by Förstberg Ling," says Oskar Nesset Mattsson.

The project has also raised questions about how timber is used in today's construction.

"There are unique qualities to architecture where the natural behaviour of timber is legible. We need glued products too, not least as another way to make use of more of the raw material, but in cases where the structure also reveals the properties of timber, how it has been worked and the craftsmanship behind it, the experience becomes richer. It would be a loss not to have both," says Hanna Bergqvist. ●

TEXT GUSTAV SCHÖN **PHOTO** BENJAMIN BJÖRKSELL

Tänk om Trä

Members: Daga Karlsson, Benjamin Björksell, Helge Berntsson, Hanna Bergqvist and Oskar Nesset Mattsson. They studied Architecture and Engineering at Chalmers together.

Project: Spill till stomme. The project comprises a pavilion and a stage/seating element.

Award: Tänk om Trä was awarded Swedish Wood's stipend Ung Svensk Form 2026. The stipend included a knowledge trip with a forest excursion, sawmill visit and meetings with stakeholders in the timber and forest industry.

Dimensions: The arches are approximately 6.3 metres long and just over 3 metres high. The round stage is 200 centimetres in diameter and 40 centimetres high.

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A FOUNDATION THAT INSPIRES US TO KEEP BUILDING



PHOTO JOHAN BERGMARK

THIS ISSUE OF Trä is themed around foundations – and a solid foundation matters, not just for buildings, but for you and me, and for the society we build together. At a time when so much feels uncertain, I've been reflecting on what is truly fundamental. What is it that makes a society function, grow and remain resilient when the world around us shifts?

I believe the answer lies in many of the strengths Sweden has developed over time: a strong knowledge tradition, entrepreneurship, and the ability to make the most of our resources. The forest – and the industry that has grown up around this renewable raw material – has helped generate both export revenue and jobs right across the country.

BUT THE STRENGTHS of the Swedish forest industry are not merely historical. We have companies that are constantly developing their operations. There is growing interest in sustainable construction solutions. More and more people recognise the potential of building in timber – not only to reduce climate impact, but also to create attractive, efficient and well-functioning buildings. The continued development of products, building systems and industrial processes is advancing what is possible.

In a world marked by geopolitical instability, trade disruptions and an increased focus on preparedness, the value of domestic production capacity becomes ever more apparent. A nation that can process its own raw materials, develop its industry and create value within its borders stands strong – both economically and as a society.

AND PERHAPS THE most vital foundation of all is people. Those of you who work in sawmills, construction firms, architecture practices, development environments and research projects. Those of you who see opportunities where others see challenges. It is your knowledge, your drive and your capacity for innovation that will ultimately shape the future.

The forest and the industry that has grown up around it have long been part of Sweden's foundation. I am convinced it will remain a vital part of the foundation for Sweden's future as well. Because the best foundation is not one that keeps us where we are. It is one that gives us the courage to keep building.



ANNA RYBERG ÅGREN
DIRECTOR, SWEDISH WOOD

Did you know...



1 ... Träslaget?
At last, architecture students have their own competition – the student equivalent of the Swedish Wood Award! The brief for this ideas competition will be announced soon, with a first prize of SEK 50,000. Keep an eye on svenskttra.se.



2 ... the Wood Research Portal?
Are you keeping up with developments in timber research? Through a collaboration between Swedish Wood and the National Library of Sweden, you can easily find research articles, reports and theses related to wood and timber construction here: traguiden.se/forskning/



3 ... that 9 in 10 young adults would like to be more practical?
Young adults feel less hands-on than older generations, and 68 per cent of respondents believe practical subjects such as woodwork should be given more space in schools. These findings come from a Sifo survey commissioned by Swedish Wood.

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