

trä!

A MAGAZINE ON INSPIRING ARCHITECTURE
FROM SWEDISH WOOD » ISSUE 2 » 2022

**FRAMING AND
LIGHT FOR PRAYER
ON STILTS AND
ON A HILLSIDE
NEW VOLUME
SPANS THE OLD**

**TRÄ MEETS
Lesley Lokko**

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ISSUE 2 » 2022
VOL. 35 » CONTENTS

17 » Rock solid design

To achieve as minimal a footprint as possible, the architects suspended the wide, shallow house between the Bohuslän cliffs on Hamburgö, following the principle of the tied-arch bridge.

32 » Discreetly placed on a slope

It began as an experiment to see how one might build a CLT house with a considerate approach to the plot, no insulation in the walls and the surface layer exposed inside and out.

49 » Extension with teeth

A 1970s house outside Melbourne boasts an elegant upward extension. The sawtooth roof recalls old farmsteads and forms a cohesive whole with the interior, where everything is made of CLT.



24 »

Space formed by frame and ornamentation

An imaginary forest walk leads into the Japanese city of Takasaki's new chapel, where architect Takaharu Tezuka has interwoven art and architecture into one. The chapel is not just for prayer, but also the venue for concerts and student gatherings.

- 4 **In brief** » Efficient space » Modernised stone building » Created for students » New hall for music » Circus tent reimaged » Youth hostel » Decoratively clad bridge » Built for friends » Tunnel determined material
- 11 **Chronicles** » Jesús Azpeitia
- 12 **The photo** » Split pavilion
- 38 **Interior** » Tradition and contradiction
- 42 **Trä meets** » Lesley Lokko
- 44 **History** » Ground-breaking glulam
- 46 **Knowledge** » Material research
- 54 **Good read** » Bertil Fridhagen

 **SVENSKT TRÄ**

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Trä magazine is aimed at architects, structural engineers and everyone else interested in architecture and construction.

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Mathias Fridholm Director, Swedish Wood

Share knowledge where it's needed most

STOCKHOLM, SWEDEN I was recently asked whether I thought Boverket's estimate that 600,000 new homes were needed in Sweden by 2030 seemed reasonable. It's a relevant question and the answer partially depends on how we define the word »need«.

The UN's first goal for 2030 is »to end poverty and create a life of dignity and opportunity for all«. Reasonably enough, this also means everyone having a safe and secure home. It is estimated that over a billion people around the world live in slums, and of course the need for more and better housing is much greater in many other countries than ours. Added to this is a forecast for global population growth of around 2 billion people by 2050. The picture that emerges is of an enormous global need for new housing over the next few decades. And we have to resolve this while meeting the climate goal. Business as usual is not an option. Instead, we must find new ways to give future generations dignified housing worldwide.

Forest growth, entrepreneurship and wood construction could be part of the solution. The potential for growing forest is considerable in many poor countries. Much of the land is unused and could be forested. Pakistan, for example, has a project to plant 10 billion trees over a five-year period. Where we have the raw material and the demand for housing, there needs to be a link between them – an industry, small-scale or large-scale, that can turn the forest into wooden housing.

With financing and knowledge, this could be an incredible opportunity for local entrepreneurs to form companies and create jobs. The managed forest is regenerated and continues to store carbon dioxide, employment is created in a new wood industry, the new timber buildings store carbon for the whole of their life, and people enjoy dignified housing. This way, it would actually be possible to meet the housing need and the climate goal.

In fact, this is the same journey that we in Sweden have been on since the early 20th century. At that time we were a poor country, our forests only had half the volume of wood we have today and, as we know, it took a long time to develop industrial construction of tall wooden buildings using modern technology. Now, Sweden could contribute knowledge and technology in the field of forestry and wood construction to accelerate development in the parts of the world where it's really needed. I believe this should be a priority. Does Sweden need 600,000 homes? It depends how you define »need«.


Mathias Fridholm

Editorial



Catharina Dahi Palmer

The home is built to make most efficient use of the space, but with quality materials and a welcoming, sociable kitchen.

Corridor of lights

OBJECT House Vallda
ARCHITECT Fabel arkitekter
STRUCTURAL ENGINEER Derome and Massiva trähus

VALLDA, SWEDEN How much space do we actually need in our homes? This was the question raised in designing the villa in Vallda. Sitting on a wide-open plot, it has been kept small and low-key, with a focus on eliminating all unnecessary space and making what is left as efficient as possible. The structural frame is CLT, and the pale wood is exposed throughout the interior, on the floors, ceiling and walls. A corridor runs the length of the barn-like building, housing utilities and storage. The

bedrooms are small, making the kitchen the place where family and friends socialise. The space can be expanded by sliding back the generous windows and glass doors along the back of the house, minimising the boundary between inside and out. Both the façade and the roof are clad in timber, treated with black tar. The pitched roof extends over one gable, capping a weather-proofed conservatory. « **wj** fabelarkitektur.se

Reworked and multifunctional barn

KERGROËZ, FRANCE An old farm in the south of France featured a 20-metre building split into two parts. One had originally housed animals and was later used for storage. The other comprised a bedroom and living room. But the building was in a bad state and in the 1990s a storm threatened to bring down the whole of the attic floor. The current owners therefore wanted to carefully renovate the building into a single unit.

OBJECT Farm
ARCHITECT Rupin Conq architecture

The old stone walls remain on the exterior, and to avoid making holes in the façade, the design has employed the existing apertures. The old openings for loading hay into the barn have now been replaced by rooflights, and the living room has an extra high ceiling to make use of the light. Much of the interior is now also insulated and clad in wood, but retaining parts of the older timber structure as a reminder, along with the polished concrete floor, of the building's origins. «

wj rupinconq.fr



The former farm building has been carefully restored, retaining features like the stone wall and old timber frame.

Adrien Conq



The glulam frame is visible externally and internally, so the students can learn more about technology and design.

Stijn de Witte Fotografie

Visible structure conveys knowledge

BOLDUQUE, NETHERLANDS Koning Willem I College in the Netherlands is staking its future on two pillars: technology and creativity. So it is entirely appropriate that the college has a new building that demonstrates how both aspects can be combined and how the technology works.

The diagonal glulam beam structure frames the building and is completely visible through the glazed façade. The interior is modular, so the college can

expand and contract the size of the spaces according to the activity and student numbers.

The construction's visually simple joints conceal steel reinforcements, and instead of hiding the building's technology, it has been placed behind glass in the entrance hall, so the students can learn how it works. The performance of the various installations can be read on screens, and the walls display full-scale architectural drawings. In addition, QR codes are placed here and there, so inquisitive students can learn even more about technology and design. « **wj** nieuwearchitecten.nl

OBJECT Koning William
ARCHITECT Nieuwe architecten
STRUCTURAL ENGINEER Pieters Bouwtechniek Delft



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Investera i något bestående.

Golv och tak i massiv furu är så klassiskt det kan bli. Ingen övergående trend. Och som du vet är trä ett förnybart material. Kvalitetsvirke utvunnet ur norrländskt skogsbruk är totalt sett ett mycket bra miljöval.



The theatre's new permanent home was designed to recall the ensemble's days of touring in a tent.

Sophie Odde

Performances in three volumes

OBJECT Theatre stage
ARCHITECT K architectures
STRUCTURAL ENGINEER Batiserf

BEZIERS, FRANCE The historic Domaine de Bayssan in southern France dates back to the Gallo-Roman period and is an important cultural hub. The local theatre offers a broad programme that seeks to increase interest in what they do.

For the past 15 years, the theatre has been housed in a circus tent, a venue that suits its performances, in terms of both form and content. The concept inspired the architects to create three separate tent-shaped volumes that house a stage, amphitheatre, shop and restaurant.

Each volume is draped in wood, with the cladding in a V pattern making use of a repetitive modular system to take the folded, geometric shape of a fabric circus tent and reinterpret it.

The interior of each building displays wooden details. In the restaurant building in particular, with its wooden frame, the pale wood cladding is key to creating the calm feel that offers a tranquil moment, both before and after the performance.

w|k-architectures.com

Origami panels for good acoustics

TOKYO, JAPAN Over the years, Toho Gakuen School of Music has taught many leading names in classical music. Now architect Kengo Kuma has brought a modern new concert hall to the campus, placing it alongside the school building and practice rooms that the same firm designed previously. The new concert hall builds on the material choices made for the earlier building.

The 2,500 square metre newcomer is designed like a

gigantic wooden instrument, with the interior shaped like a resonance chamber inside the instrument. CLT cladding in a hybrid of cedar and cypress has been erected in a folded geometry that serves as a load-bearing frame. The CLT also acts as a sound reflector, contributing to good acoustics. The exterior is covered with wooden louvres, evoking the strings of instruments. The slender boards are angled slightly, as if inviting visitors to gently strike a note. Small spaces between the shell and the façade offer shelter on rainy days.

OBJECT Toho Gakuen
ARCHITECT Kengo Kuma
STRUCTURAL ENGINEER Holzstr

w|kkaa.co.jp



The hall is shaped like the resonance chamber of an instrument. The load-bearing panelling also ensures good acoustics.

Kengo Kuma & Associates



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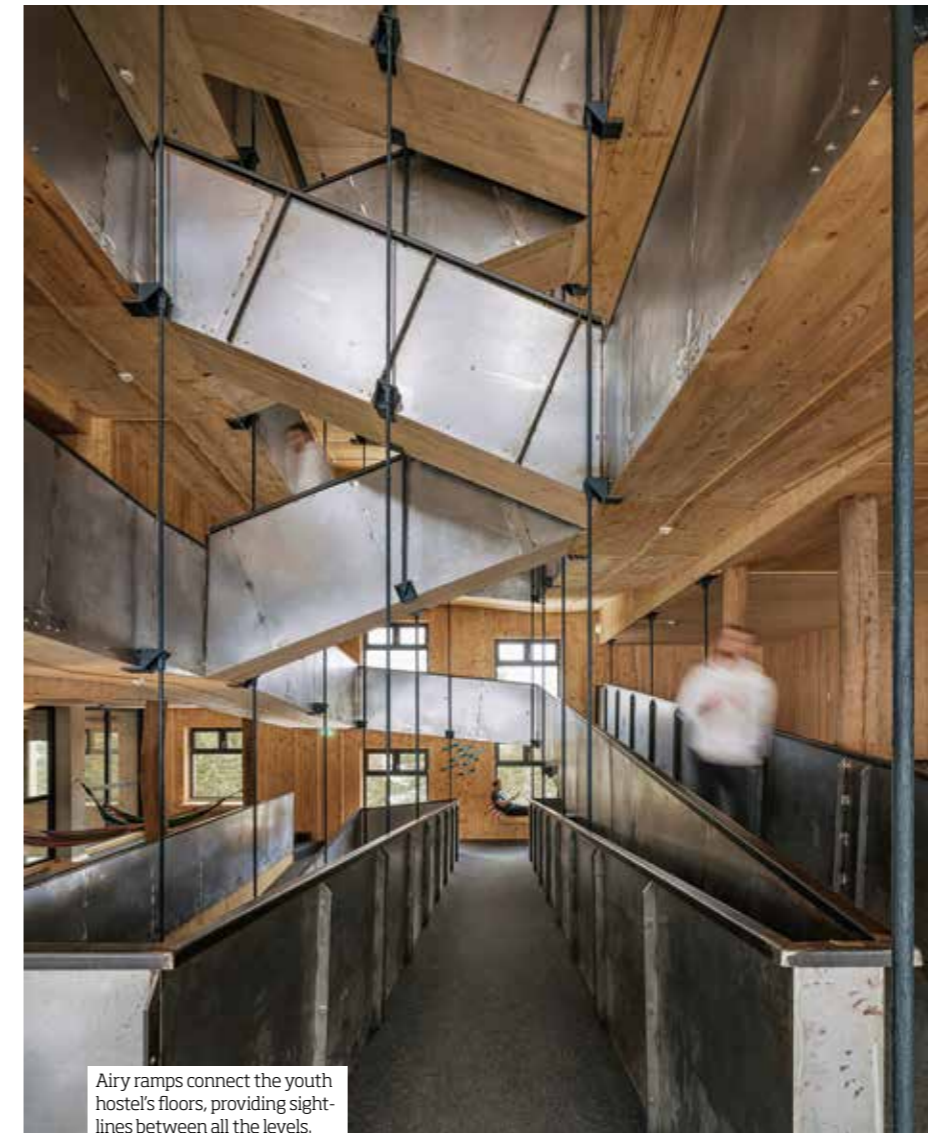
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Airy ramps connect the youth hostel's floors, providing sight-lines between all the levels.

Julian Höck

Sustainable youth hostel and activity centre

HOCHKRIMML, AUSTRIA In Austria, skiing is such an important activity that it is taught at school. Now a new youth hostel in the village of Hochkrimml is enabling school classes to explore the Alps from a more sustainable perspective. To this end, it is built in CLT

made from locally grown spruce, and the offcuts have been reused for furniture instead of being discarded. The youth hostel has 450 beds and a large sports hall with a gym and a three-storey high climbing wall.

The building is designed so visitors can see all the levels from wherever they are. The foyer is two floors up, with views of the interior sports facilities, and the usual stairs have been replaced with carpeted steel ramps that create open spaces and unify the different floors.

The main building is joined by two lower wings containing the communal spaces, clad in greenery on the outside to merge into the surroundings and lead the eye towards the main building's exposed wood façade. «

w| lechner-lechner.at

Sculptural bridge connects water system with city

JIANGMEN, CHINA The flat landscape in southern China has inspired the locals to dig ponds and channels to create a water system that supports both fishing and farming. The villages are connected by bridges, one of the latest of which has a high, arched design that allows small fishing boats and larger tourist boats to pass below. The structure comprises three curved glulam beams in pine, arranged in parallel and spaced 2.8 metres

OBJECT Wooden bridge
ARCHITECT Luo studio
STRUCTURAL ENGINEER Lalu structural consulting

apart. Each beam was cut into three sections for transport to the site, then assembled there using steel fixings and bolts. They are reinforced with horizontal and diagonal beams in smaller dimensions, forming triangles that stabilise the structure.

To mark the transition between the shopping streets on the one side and the recreational area on the other, the bridge is shaped like a corridor, with the external walls clad in metal plates to protect the wood, while side gaps give a glimpse of the view. «

w| luostudio.cn

Jin Wei



Inspired by ancient times, the bronze shell reinforces the structure and keeps the wood dry.

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The unbroken row of houses gets daylight from three directions, and each home has a private back garden.

Unbroken terrace of houses

OBJECT Townhouses
ARCHITECT Izquierdo Lehmann
STRUCTURAL ENGINEER Luis Soler P. y asociados

SANTIAGO, CHILE A group of friends dreamed of very different homes to what the housing market in Santiago had to offer. So they clubbed together to buy a corner plot and erect a terrace designed as a single unit but with space for five homes. The pine CLT structure is exposed on the façade, where the beams create a repetitive pattern and the street-facing silhouette is united, with no dividing fence.

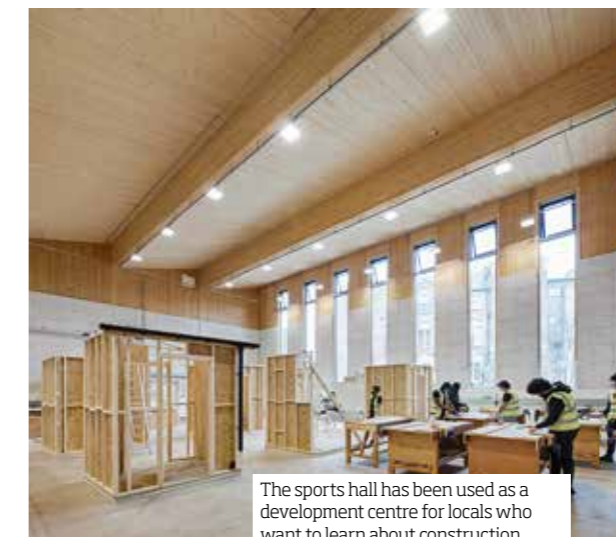
The interior also features exposed wood in the form of plywood ceilings and glulam beams and posts, contrasting with the concrete walls that separate the five two-storey homes. The lower floor contains the social spaces, with the more private rooms upstairs. A small area on the upper floor separates the rooms, while ventilating and providing light for adjoining bathrooms. The rooflights also draw light down to the ground floor, so that all the homes have natural light from three directions. The back of each home has direct access to its own small garden. «

w|izquierdolehmann.com

Sports hall above London's tunnels

LONDON, UNITED KINGDOM Three train tunnels run less than 3 metres below ground at King's Cross station in London. They were built in the late 19th century and are still in daily use. However, the ground around the tunnels is sensitive, so the solution for building a new sports hall on top of them was to use CLT to avoid high loads and subsidence. The foundations comprise a custom concrete slab laid at right angles to the tunnels to limit the loads.

The zinc-clad façade's serrated roof is a reference to the local railway heritage and contrasts with the warm, exposed CLT of the interior. The two-storey gym and the hall,



The sports hall has been used as a development centre for locals who want to learn about construction.

OBJECT Sports hall
ARCHITECT Bennetts associates
STRUCTURAL ENGINEER Ove Arup & Partners

designed for various team sports, are arranged around a core of social spaces. Although

sport is the building's main purpose, during the construction phase it was also used as a development centre for locals, who could come and learn more about wood construction and sign up for apprenticeships. «
w|bennettsassociates.com

Robert Hallbö

Jesús Azpeitia, architect & creative leader at Tengbom, lecturer at KTH School of Architecture, board member Architects Sweden and Royal Dramatic Theatre.

My key task is to ask why

STOCKHOLM, SWEDEN It's important to remind ourselves why we do what we do. For me the answer is simple: I like challenges and development, and I love good architecture, which is why I've long worked to help everyone from architectural firms to academia, culture providers and boards to become better at what they do.

So when Tengbom asked me, a few years ago, whether I wanted to be creative leader at their architectural practice, I was curious. Why? They wanted to gain a deeper understanding of what architectural quality means today and find concrete ways of achieving it. Having encouraged students and others to challenge the generic, sometimes forlorn architecture we often see in Sweden these days, it felt like a dream to be able to pursue the issue on the front line.

Swedish architects often talk about how we've lost the power over how the built environment is shaped. I'm convinced there is only one way forward: we have to be better at explaining why. Why quality design is the only viable option and why we need it to create a sustainable society.

The first step in getting what you want is to put it into words. Hence Tengbom's Architecture Manifesto, which describes the architectural quality we're striving for. This forms the basis for the shared vocabulary I believe is crucial in driving this issue forward. Quality architecture must be both sustainable and beautiful. Can we justify why, and explain how, to ourselves and our clients? Only then can we make the quality possible.

I believe we can only create the architecture that society needs right now by working together. The more relevant perspectives we bring in, the better the architecture. It shouldn't be about either ego or consensus, but about using the whole of our collective intelligence.

Architectural discourse, co-creation and an open and creative culture are key, with engaging leaders and structural support.

One of my focuses at Tengbom is on integrated design and sustainability processes, a design leadership role that supports and challenges through projects and tools for feedback and follow-up. But I devote at least as much time to practical work: coaching, lecturing, promoting good examples, and participating in forums and debates.

In short: I keep the discussions alive and I never miss a chance to ask why. True progress is made when we collectively take small steps each day. This is the kind of power that really brings about relevant and lasting change in society.

This is a chronicle. Positions in the text are the writer's own.



ILLUSION IN MEDIEVAL CITY CENTRE

PHOTOGRAPHER

Iwan Baan

OBJECT

Diptych

ARCHITECT

Para project

BRUGES, BELGIUM From a distance, it looks like a new wooden building has been squeezed into the medieval centre of Bruges, but from other angles the airy pavilion presents as two volumes floating on the city's canal. Shaped like a diptych, it was created for last year's Bruges Triennial, where it was used as an events venue. The design was inspired by the architect's fascination with duplicates and doppelgängers.

The pavilion comprises a duplicated shell, with both parts beginning at the stone façade of the neighbouring building and then fanning out over the canal. The

two carefully interlinked parts give the illusion of slowly being pulled apart and invite visitors to explore the hidden spaces concealed within. The timber frame is fully exposed in the interior, so that visitors can see where the two sections meet. The exterior is partially clad in plywood, with openings cut out to allow views from inside and out. ◀

• Bruges' medieval centre is a UNESCO World Heritage Site, and to avoid any wear on the ground or buildings, the pavilion floats on 15 connected pontoons.

• Slender mirrors are fixed to the inner posts to create a surreal feeling and reflect fragments of the historical setting.

www.para-project.org

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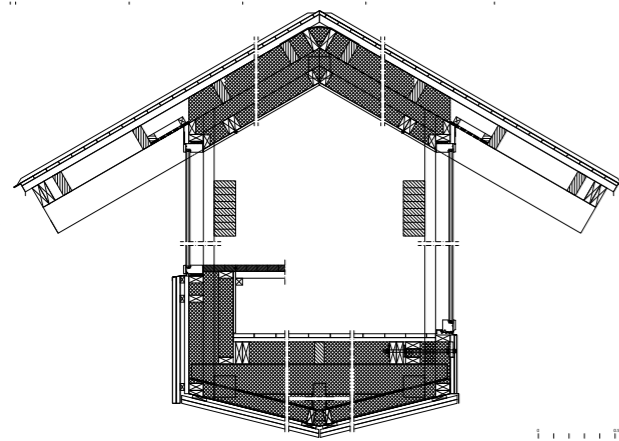
BETWEEN

THE ROCKS

This elongated wooden house in Bohuslän is like no other - designed like a tied-arch bridge, it spans between two rocks to make minimal impact on nature. This makes its footprint less than one square metre. »

TEXT Sara Bergqvist PHOTO Mikael Olsson

The inaccessible plot in the rocky landscape of Hamburgö required a number of specialist solutions to complete the highly customised house.



Cross-section



With blasting off the agenda, the rock informed the design of the house, resulting in a wide, shallow house anchored in the rock just on the ends of the two glulam arches.

On the island of Hamburgö in Bohuslän perches a long wooden house that almost seems to float above the rolling granite boulders. The villa was designed by Per Tamsen and Beate Hølmebakk of Norwegian practice Manthey Kula, informed entirely by the site conditions. The couple had a chance to buy the inaccessible plot four years ago, and immediately agreed that they wanted to make as little impact on nature as possible. Along with structural engineer Finn-Erik Nilsen, they developed this unusual house as a tied-arch bridge, with two glulam arches from which the house is suspended on posts.

»Every job and plot is different, and here we didn't want any blasting or filling in such a beautiful setting. The house

links the attractive outdoor spaces on the site and the location captures plenty of sun and views for the rooms inside,« explains Beate Hølmebakk.

The chosen solution influenced the wider design of the building.

»When we settled on this rocky plateau, we had a span of 29 metres and a house length of 25 metres. The building had to be shallow in order not to exceed the permitted development,« says Per Tamsen.

The load-bearing structure comprises two glulam arches that are anchored in the rock and also form a key element of the home's visual appearance. Wooden posts have then been

added, either hanging down or rising up, depending on where in the arch they are. The 1.8 metres between the posts is occupied by the windows.

»The roof trusses rest on the hanging posts and on the posts in the middle wall, except in three places where there are open spaces and we've used ties instead,« states Per Tamsen.

To stabilise the building against the strong winds up on the hill, the roof and floor feature stiff panels on top of diagonal beams.

»The beams carry the forces out to each gable wall and into the ends of the glulam arches. In the middle of the wide house, where you come out onto the hillside via the dining area, steel ties secure the roof and floor beams to the outside

decking and railings, which are anchored in the bedrock. This all combines into a construction that can withstand a full-blown west coast storm,« says Finn-Erik Nilsen, who was responsible for the structural engineering.

The glulam arches are fixed to the rock with four pierced steel feet and 20 millimetre stainless steel rebar that has been drilled down and chemically anchored in place.

»One of the biggest challenges was measuring and making the fixing points in exactly the right place, so the prefabricated glulam could just be lifted onto them,« says Finn-Erik Nilsen.

The location up on the hill, with no direct link to the road, was another major challenge. When Patrick Edvardsson, foreman for local construction company JND Byggt teknik »



Architect **Beate Hølmebakk**

» **WE DIDN'T WANT ANY BLASTING IN SUCH A BEAUTIFUL SETTING.** «

» which built the house, first saw the site, he realised they were going to need to build a temporary wooden work platform around the whole structure.

»The first thing we did was to buy a consignment of pulpwood, which we used as posts. Then we built a work platform onto them. We used a four-wheel drive with a petrol-driven winch to pull the material up a slipway that we made. The platform started 20 metres from the road, then we were able to lift the material onto it using a crane,« he says.

Some of the material was also lifted into place by helicopter, not least the glulam arches, which weighed 1400 kilos each. But because the helicopter could only lift a tonne, they were delivered in two 700 kilo sections.

»To be on the safe side, I bought a hanging scale and checked the first elements by suspending them from a crane,« adds Patrick Edvardsson.

The glulam arches are a prominent feature of the design, both externally and internally. From the outside, the arch is an attractive shape glimpsed through the façade, with the upper part of the front wall made entirely of glass. The lower part of the façade and the gable ends are clad in spruce from northern Sweden, and treated with iron sulphate. The underside of the house is shaped like a pitched roof, but upside down. This accommodates all the infrastructure – pipes and cables – while adding a sculptural note to the building.



The interior features simple forms and exposed pine plywood. With no decorative mouldings, the thoughtful details do all the talking.

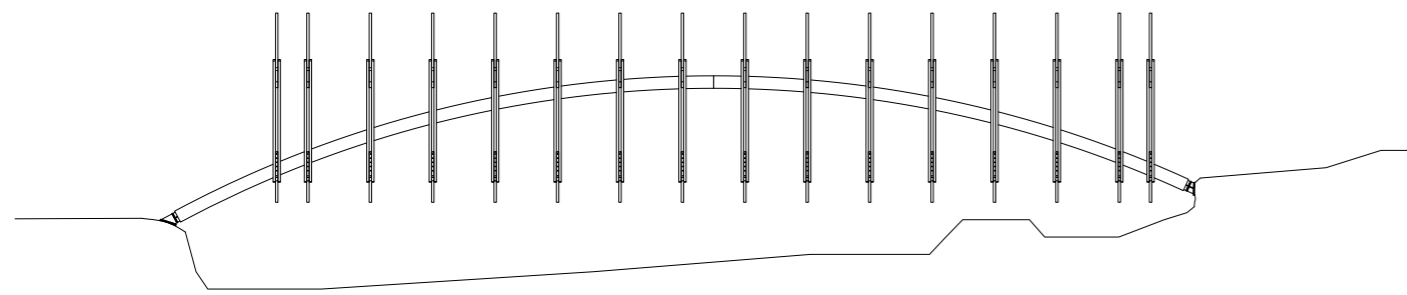
»It's exciting when you get an idea where one thing leads to another and where the structure, architecture, light and space combine so boldly and become part of the landscape,« says Beate Hølmebakk.

And the house is just as striking inside. From end to end, there is an unbroken 25 metre view through the whole building. Combined with a ceiling height of 4.2 metres and sea views through the glazed walls, the overall impression is of incredible space and light. Per Tamsen and Beate Hølmebakk also designed the site-built desks, benches and kitchen cabinets for the house, so they can enjoy the panoramic views that, in the summer, are partially framed with trees and greenery.

One of the challenges was that the house sagged slightly during construction. Patrick Edvardsson thinks this is because the wood in the glulam arches was not completely dry to begin with.

»The question was whether to make the kitchen counter different heights or follow the floor. In the end, we decided to give the counter a slight incline that matches the slope of the floor. If you were to put a drop of water on the counter, it would probably run to the middle. But because we're only talking about a couple of millimetres, it's not obvious,« he says.

The four bedrooms are arranged in a row along the back of the house. When the sliding doors to the rooms are open, you get



Structure with arch, hanging posts and cross-beams.



The house floats freely among the Bohuslän rocks with a minimal footprint. The underside is shaped like a pitched roof, but upside down.

» the same amazing sightlines through the house – and for privacy you just close them.

All the cupboards, drawers and doors were specially designed and custom-built for the house. Like the other internal surfaces, they are made of knot-free pine plywood. The only things painted are the pine floor, which is a high-gloss grey, and the window frames in the same grey.

»There are no exclusive material choices here – we've used pine throughout. The exclusivity lies in the attention to detail,« says Beate Hølmebakk.

Per Tamsen points up at where one of the ties runs into the wall.

»Because we couldn't drill holes for the tie, we made an

House Hamburgö HAMBURGSUND, SWEDEN

ARCHITECT Manthey Kula.
CLIENT Beate Hølmebakk och Per Tamsen.
STRUCTURAL ENGINEER Siv.ing. Finn-Erik Nielsen.
CONTRACTOR Projek manager Patrick Edvardsson,
joiners Andreas Carlsson and Erik Dristig, JND byggt teknik.
AREA 108 sqm.
www.mantheykula.no

ornamental little triangle there. And because of that, we also fitted the power socket on the diagonal next to it. There's a real joy in working on the details like this, and getting to design and construct at the same time.«

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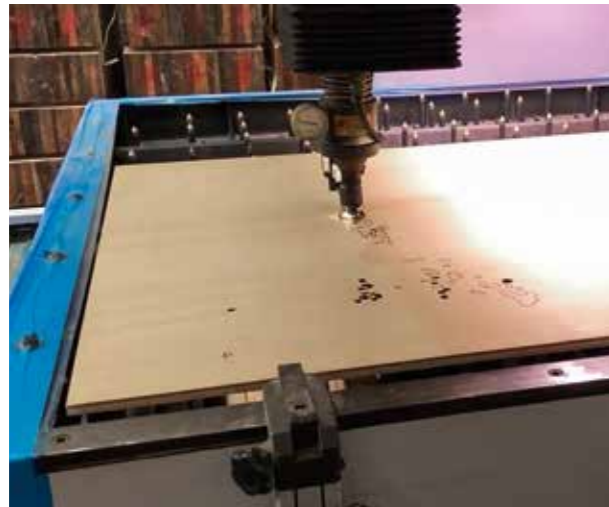
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Forest motif filters the light

Japanese architect Takaharu Tezuka spent six months drawing the 56 metre long ornamented panel that envelops Nijjima Gakuen Junior College Hall & Chapel. The result is an imaginary forest walk where trees' leaves and branches work their magic on the light in the space. »

TEXT Katarina Brandt PHOTO Fototeca

Like being in a forest where the light helps the students move out into the world. Posts, beams and panels create a dramatic play of shadow.



Laser-cutting the pattern.

A cobalt blue T-shirt has become something of a signature for Japanese architect Takaharu Tezuka, and true to form he is wearing blue when we meet via a video link. It is 8:30 pm in Japan and Takaharu's wife Yui, also a partner and co-founder of Tezuka Architects, occasionally pops up in the background, dressed in red. The two children, who have been allocated the colours yellow and green, are not present.

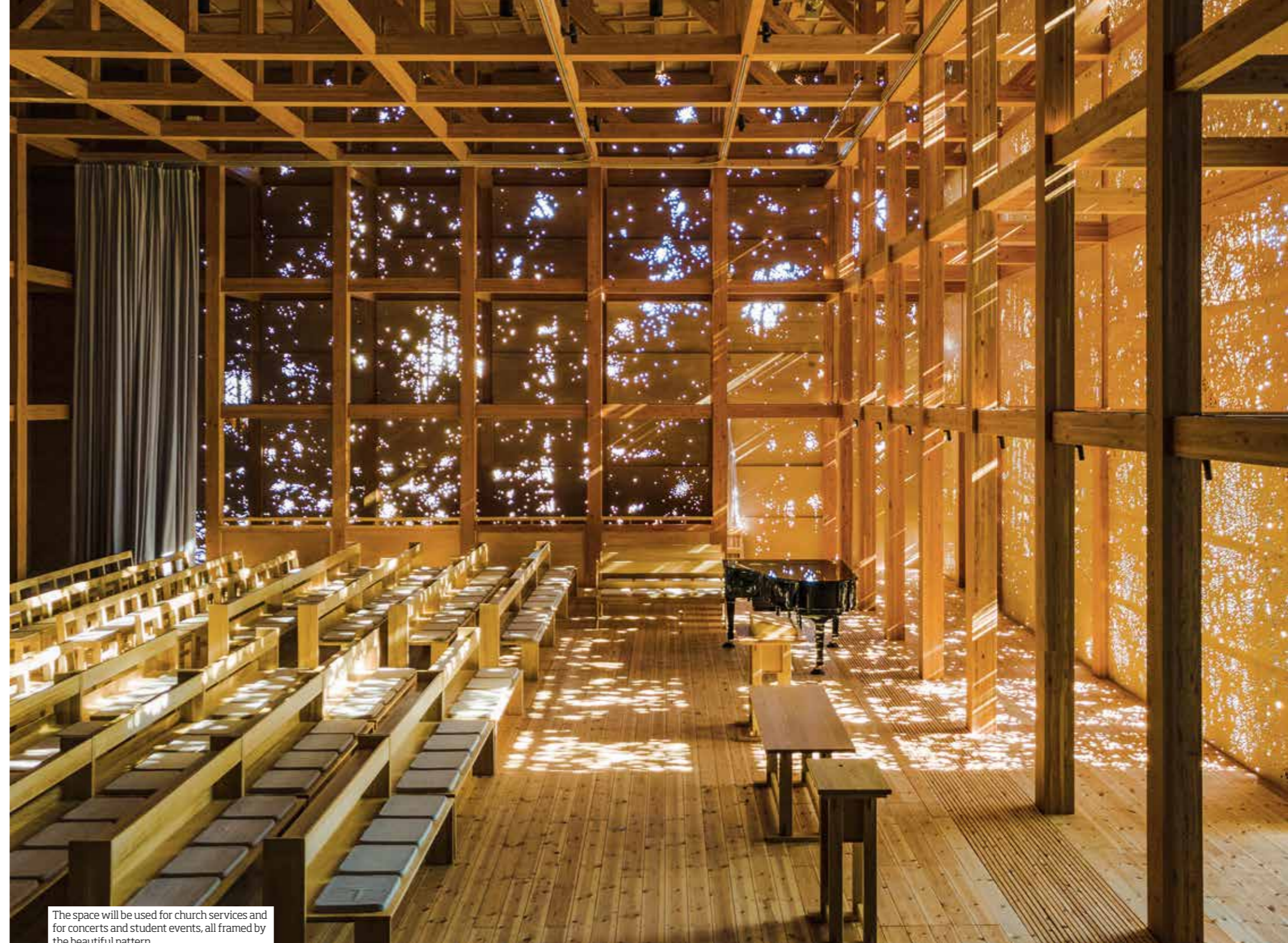
Tezuka Architects was founded in 1994 with a mission to make the world a better place through architecture. The Tezuka couple believe architecture encompasses so much more than physical objects on a large or small scale. With architecture comes the power to change people's lives and communities.

One of the firm's latest projects is a chapel at Niijima Gakuen Junior College in Takasaki that has been given multiple functions. In addition to religious services, it also has to serve as a concert venue and assembly hall for the students at the school. The chapel was completed in March 2020, and was named Building of the Year 2022 by ArchDaily in the religious architecture category.

Takasaki is the largest city in the Gunma region, around an hour from Tokyo by Shinkansen high-speed train. The city has so far maintained a low profile and is perhaps best known for silk weaving. With Niijima Gakuen Junior College Hall & Chapel, however, it is likely to attract more attention, particularly from architects.

»There were six practices competing to design a master-plan for the school's campus. Over the course of the exercise, we were able to reformulate the assignment to also include a multifunctional chapel building, in close collaboration with the management,« explains Takaharu Tezuka.

To understand the story behind Niijima Gakuen Junior College Hall & Chapel, you need to first understand the story of Joseph Hardy Niijima. He was a Japanese school reformer who was active in the mid-19th century. Despite a ban on young Japanese people travelling abroad at the time, Niijima headed to the U.S. as a young samurai, where he converted to Christianity. On returning to Japan, he dedicated the rest of his life to offering Christian education to the young people of



The space will be used for church services and for concerts and student events, all framed by the beautiful pattern.

Japan. In 1874, Niijima founded the Christian Doshisha University in Kyoto, from which Niijima Gakuen Junior College is an offshoot.

»The interesting thing about Japanese religion is that there is no separate existence. God is everywhere, including in you and every child you meet on the street. We often say there are 8 million gods in Japan. When Christianity came to Japan, we welcomed Jesus and gave him a place among all our gods. Here in Japan, you can build a mosque, a church or synagogue next to a Shinto temple. We can marry in a Catholic church and be buried in a Buddhist temple. We simply pick out the bits we want. It's perfectly normal.«

Takaharu Tezuka explains that the inspiration for the new building comes from an imaginary forest that has grown up from the seeds of ideas sown by Joseph Hardy Niijima. Obviously it had to be a wooden building, and not just because of

Architect **Takaharu Tezuka**

»WOOD IS A LIVING MATERIAL THAT WORKS FOR EVERYTHING.«

the connection with the forest. Wood is Takaharu Tezuka's preferred material.

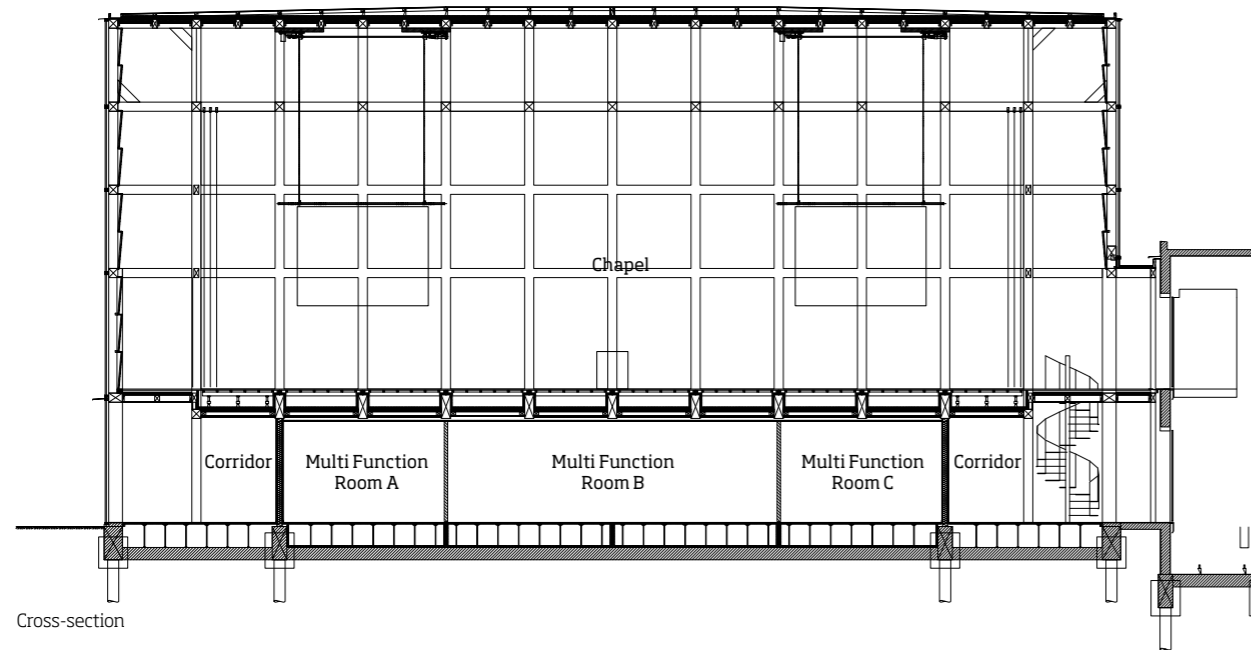
»There's a continuity in wood that I love. It's a living material that works in everything from the main structure to the small details. Of course, there are great architects who've achieved fantastic things in concrete, but I wouldn't sleep well among concrete. Wood is the link between artificial existence and living tissue.«

Takaharu Tezuka is obsessed with the timelessness and

continuity of architecture. He feels that, whatever the changing times and trends, there are elements of architecture that remain constant.

»Roofs, walls, floors and columns are the very essence of a building, features that we humans have learned over a long period to take for granted. Nor does the relationship between people and architecture change much, as demonstrated by our eternal desire to be able to open a window onto the landscape outside.«

Niijima Gakuen Junior College Hall & Chapel is shaped like a simple, rectangular box on two levels, with a load-bearing wooden frame arranged as a Vierendeel structure. This is a kind of grid system that, instead of being divided into triangles with stabilising diagonals, comprises rectangles stabilised through the moment-resisting joints between the »



» verticals and the horizontals. The benefit of this kind of construction is that much of the outer carcass is left free to be used for windows and door openings, without being blocked by the diagonal braces in the traditional lattice systems.

The structure is made of prefabricated pine glulam beams that were shipped from Oregon on the west coast of America. The factory in Japan then used a 3D model to precision-cut the frame's parts, ready to be quickly and easily assembled on the construction site. The structure is the same from floor to ceiling, and sits on steel plinths driven and anchored in the ground.

The entrance level comprises three rooms that can be used for gatherings that need not be of a religious nature. For example, the students can get together, have lessons or carry out leisure activities. Two staircases running along the ends of the building lead to the chapel itself, shaped like a long nave, the most common format for Christian churches.

Architect **Takaharu Tezuka**

» **FINALLY, IT FEELS LIKE I'M FREE TO DO EXACTLY WHAT I WANT.** «

»Light is the crucial factor in a Christian church. So there's a challenge in understanding it, showcasing it and making it part of the space. It sits in stark contrast to Japanese temples, which tend to be very dark.«

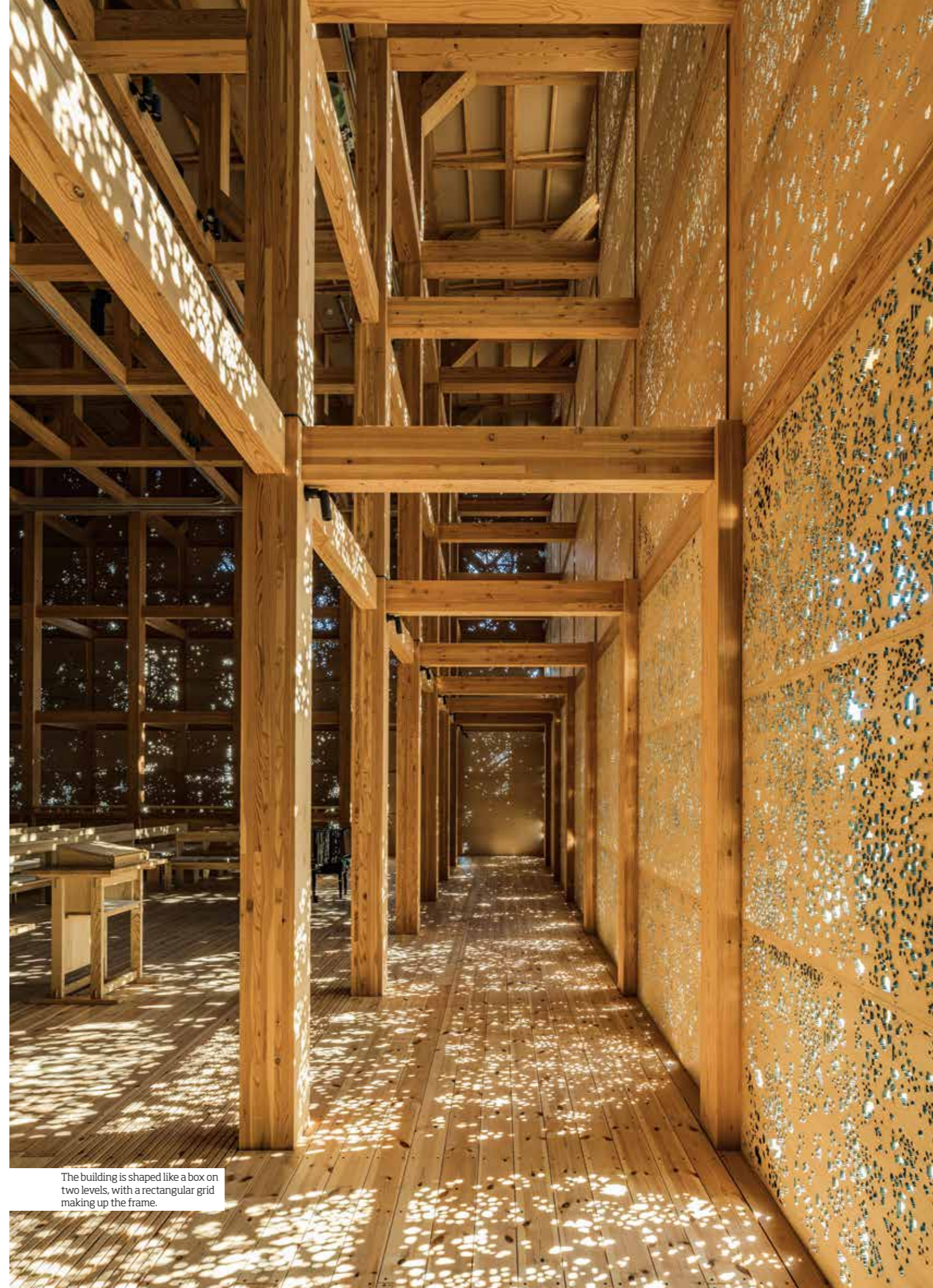
It took Takaharu Tezuka six months to complete the sketches behind the refined, 56 metre long ornamented panel that is mounted inside the building's fully glazed façade. The sketches are made up of myriad hexagonal points that were transferred to around 80 wooden panels and then cut out with a laser cutter. When daylight filters through the holes, it softly diffracts and diffuses on the inside, creating a sense of dappled sunlight through a forest canopy. The beams of light fill the whole room, blurring reality and attracting visitors into a kind of kaleidoscope of infinite depth. The imaginary forest is denser to the east and west, opening up to the south, behind the simple altar.

»I spent an average of four hours a day producing these sketches, which form a picture I had in my head. I saw a path leading out of the forest, to an illuminated field. After reading the Book of Genesis in the Bible, I understood that this was the path that Adam and Eve followed when they were expelled from the Garden of Eden. Similarly, one day the students will have to leave the safe confines of the school and, like Adam and Eva, deal with the harsh realities of the outside world.«

Japan is situated in one of the world's most seismologically active areas. Most earth tremors are too small to register, »



The advanced light effect is achieved by masses of hexagonal points cut out by laser.



The building is shaped like a box on two levels, with a rectangular grid making up the frame.



The Vierendeel structure is clad with glass walls. The side corridors recall the aisles in Gothic cathedrals.

» and major earthquakes are relatively uncommon. However, several major cities have been destroyed over the years. Under this constant threat, the risk of earthquakes has helped to shape Japanese construction techniques in many ways. Although the techniques developed are among the most advanced in the world, most are based on constructing a flexible and pliable frame that can distribute the forces and allow the building to move.

The great thing about the wooden frame of Niijima Gakuen Junior College Hall & Chapel is that it absorbs energy. It is strong, but also supple enough to be able to channel away the vibrations that occur in an earthquake, while small, randomly placed noggings make the structure sufficiently stiff. The double posts create a kind of side corridor, like the aisles found in Gothic cathedrals. They support each other and when the light streams in, the posts are transformed into trunks and branches in the swaying forest.



The boundary between art and architecture is blurred inside the building, as they merge into a unified whole.

Niijima Gakuen

TAKASAKI, JAPAN

ARCHITECT Tezuka architects.

CLIENT Niijima gakuen junior college.

STRUCTURAL ENGINEER Sato Sangyo Co.

AREA 784 sqm.

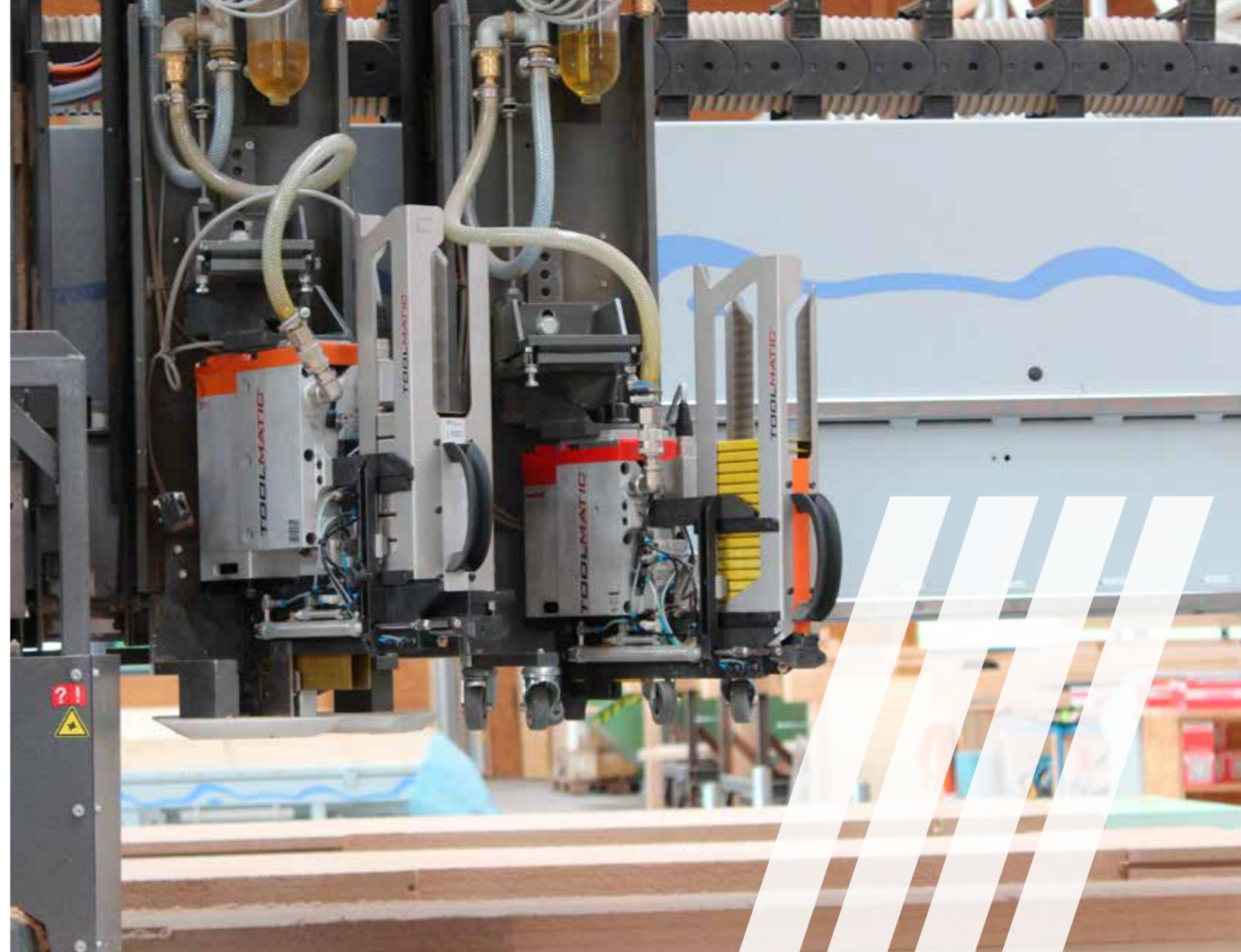
WJ | tezuka-arch.com

Takaharu Tezuka strongly believes that few architects would have devoted as much time to decorating a building as he has with this panel. Although he doesn't consider himself an artist, he sees the work as an attempt to revive a methodology that has been lost in the field of architecture.

»There's no boundary between art and architecture in this project. It has changed my attitude and helped me to let go a little. Finally, it feels like I'm free to do exactly what I want.«

Niijima Gakuen Junior College Hall & Chapel is not the first of the architectural practice's projects to combine multiple functions. In fact, many of their works are characterised by a desire to unite two unexpected and disparate activities in one building, as seen in Chigasaki Zion Christian church and Mihato kindergarten, where a church and a nursery school are housed under the same roof. The firm also has a broad repertoire, covering everything from villas and schools to religious buildings and healthcare facilities. One example is Fuji kindergarten, located in a western suburb of Tokyo, which has been named the best nursery school in the world by UNESCO and others.

Now though, Takaharu Tezuka and his colleagues are waiting anxiously for feedback on how the teachers and students are finding the new chapel building. It was completed right at the beginning of the coronavirus pandemic, so it was not until April this year that the school finally reopened and Niijima Gakuen Junior College Hall & Chapel was put to its full use.®



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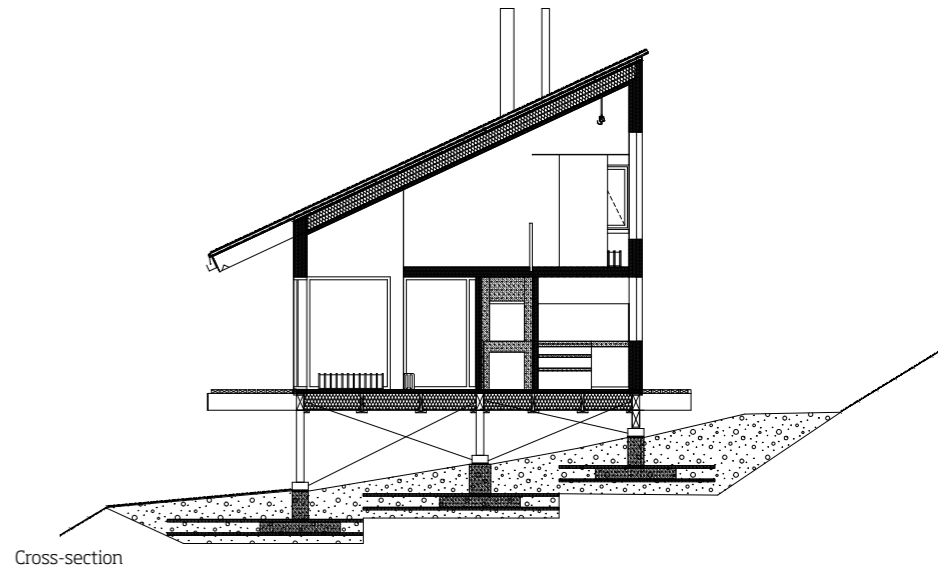
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The CLT house sits on a post and beam structure supported on low plinths, in order to reduce the footprint.



WITH ITS MINIMISED FOOTPRINT AND THICK CLT WALLS WITH NO INSULATION, THE HOUSE FLOATS ABOVE THE PLOT.

TEXT Marit Engstedt PHOTO Erik Lefvander

Architect Johnny Andersson sits at a round table in the office of Jordens Arkitekter in Stockholm. The scent of pale wood and soap punctuates his story about the place that would mark the start of a new life for him and his wife Ina.

»Our first impression of the site was one of deafening silence, with just the sound of two ospreys who were building a gigantic nest at the top of a dilapidated tree on the plot. We put up our tent and began to explore. The birds building their nest inspired us, and we named the whole project Osprey Nest, after the regional bird of Södermanland.«

The time spent in the tent, getting to know the site, helped the couple to decide where they wanted to put down their roots. Project Osprey Nest now boasts three houses on the slope up from the swaying cereal field on Lake Mälaren.

The houses have a simple design with geometric forms, based on the idea that the buildings and their occupants are visitors, so they should make as small an impression on the land as possible. Above a gravel bed, the houses are placed on plinths and wooden

posts that support the building and its terrace.

»The roof has the same incline as the slope and is clad with sedum. The aim is for the planting to grow in under the house. From a distance, the building is practically invisible,« says Johnny Andersson.

Project Osprey Nest began around eight years ago, when building in CLT was far from common in Sweden. Jordens Arkitekter had completed several experimental projects and Johnny wanted to try something new. He started with his own family home to see whether the principal worked. The buildings would be made of solid, 300 millimetre thick CLT elements in slow-grown spruce, with no insulation, leaving both outer layers exposed. Like a wooden box, as he puts it.

»What I like most about CLT is its dimensional stability. All the openings cut out for windows and doors are precise to the millimetre, but you get the soft values from the organic material. It's a fascinating combination of high-tech and low-tech.«

Glulam manufacturer Martinsons had not done anything like this before and was happy »

» to get involved, but without giving any guarantees. The usual approach is to use CLT for load bearing on the inside, add insulation and then have sacrificial cladding on the outside. Here, the aim was to keep the outer layer exposed on the exterior.

The consequence of having mass timber elements is that all the cables and pipes have to be run along the surface. They cannot be sunk into the wall, so the installations remain visible. In the window niches, the sawn cross-section of the CLT elements is also in plain view. Johnny Andersson finds the cut surface attractive. The windows are fitted and fixed from the outside, with a narrow black seal.

»We're exposing the craftsmanship in many of the details. It's easy to draw, but difficult to build and install, because the tolerances are zero. We're not using mouldings or architraves to hide any faults.«

Krister Wretström is the builder that Johnny and Ina Andersson used for Osprey Nest. He says that building without any tolerances for gaps was different but fascinating.

»It's a challenge to get the measurements accurate at every stage. The pieces are made in

a factory, where software works out and cuts all the dimensions. Not having visible gaps is interesting, and it can be tight lifting things into place. But it never became a problem.«

When the first Osprey house was built, Martinsons was working from an old factory that could only deliver sheets no more than 1.2 metres wide. In the new factory, they now make 3 metre wide elements and use wider planks.

»The neighbouring house used the new dimensions, so we can compare them. The smaller elements are easier to handle. But I would have chosen the 3 metre width today. Assembly would have been faster, because every joint means more work connecting and fixing a cover plate. The wider elements are also staggered by half a length, which is more secure against the wind.«

This leads us on to what sets this house apart – the uninsulated walls. So is it warm enough inside? Yes, says Johnny, explaining that the wood acts as a heat exchanger. The huge mass absorbs heat in the day and releases it at night. And it works all year round, even in winter.

Architect **Johnny Andersson**

»IT'S EASY TO DRAW, BUT DIFFICULT TO BUILD.«

»We have no problem with the heating, and no high energy costs. The key is for the joints to be tightly sealed.«

It should be added that the roof and floor, made of 70 millimetre glulam panels, are insulated. They sit on glulam beams, which creates a deep space for insulation.

Since the exterior walls are not insulated, they have also not been finished with cladding. The outer layer of the CLT is thus exposed to the elements. Few protective products would adhere to the planed surface. Johnny Andersson has treated the façade with a silicon mix usually used on decking. The product soaks into the wood and crystallises with water, giving a glassy, weather-proof finish.

»We've painted the house with four coats of the silicon mix, and we'll do it again in three years' time. It's expensive, but is supposed to last for 15 years. Spread out across 18 years, the cost isn't too bad.«

The façade has now faced six years of weather. On the side exposed to the south, there are some places where the sun has 'eaten into' the material. Johnny might give these an extra coat. But he is not concerned. After all, it's just wood – all 30 centimetres of it.

At the same time, he feels that damage has its place.

»In some spots where damage has occurred or the factory has used filler in a hole, I've sawn the bit out and put in a new, visible repair.«

It has become part of the façade's character.

Another attractive detail is the black chains from the roof's gutter. The rainwater splashed against the façade, and with no exterior cladding on the house, the chains proved a good solution. Now the water flows down the links and gathers in barrels for use on the garden's impressive vegetables.

The chains also solved another problem – the sound of dripping water. Wood is sometimes criticised for the way sound propagates



The house has a simple geometric shape that follows the slope of the land. The idea is to feel like a visitor in nature.



The cut CLT is a feature of the window surround. Cables and pipes are fixed to the surface.



The fireplace and kitchen counters are concrete to contrast with the pale wood.



As the walls are uninsulated, the CLT has no protective cladding. Instead, a silicon treatment has been applied. The interior is treated with soap.



» in the light but solid floor structure.

»Sound can be carried a long way in the house. Surface-mounted sliding doors are not ideal, as the sound slips through the gaps. We regret not putting in regular doors,« says Johnny Andersson.

He admits that sound propagation is the most difficult issue to solve, but explains that the acoustics in the house are excellent because the wood is able to absorb sound waves.

Because Johnny designed the house, he and his wife have been involved in every detail. As an architect, he is conscious of the aesthetics, but realises that he missed the target in some cases.

»We chose concrete as the material for the counters and sinks, and we used slate for the kitchen floor. The fireplace is also cast concrete. I would have chosen brick today. Södermanland is big on brick, and we could have used reclaimed bricks for better sustainability. I regret that a little. I was so focused on everything being black, with black cables, switches, black metal stairs and slate. It all had to be black and untreated as a

counterpoint to the wood, which we gave a soaped finish to make it lighter.«

But the main feel and impression of the house comes from the wood – and the scent of soap. Johnny Andersson considers wood to be the way forward.

»Wood is the preferred choice as a building material at Jordens Arkitektkontor, particularly on a large-scale project, but it has to be combined with sustainable forestry.«

CLT has become more advanced since the first Osprey house was built. Different grades of surface finish are now available, with fewer knots or a different material, such as oak, on the inside.

»Today, you can get glueless panels with concealed nailplates, which I think is a great innovation. The glue in my walls is said to be eco-friendly. But Martinsons opted not to give any guarantees, because they didn't know how the glue would react to the weather. My house is an experiment, so we'll see what happens. As pioneers, we've had an influence on the industry's development,« concludes Johnny Andersson.®

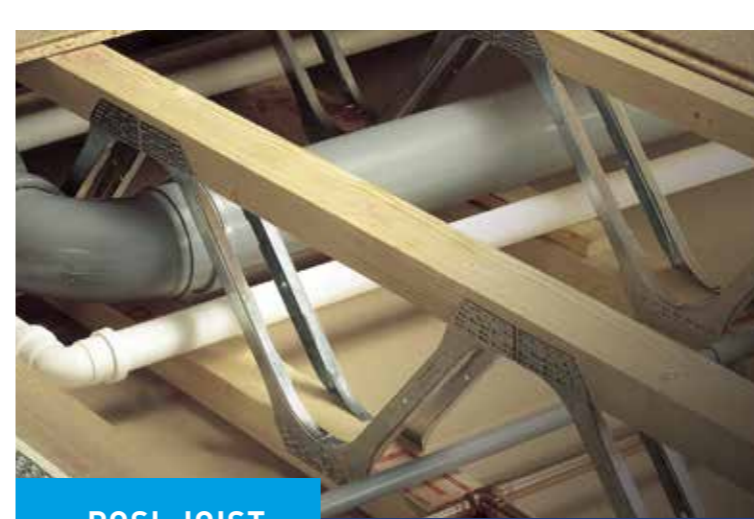
Osprey nest STRÄNGNÄS, SWEDEN

ARCHITECT Jordens arkitekter, Johnny Andersson.
CLIENT Johnny och Ina Andersson.
CONTRACTOR Wretströms bygg.
STRUCTURAL ENGINEER Martinsons.
COST SEK 4,5-5 million including garage.
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Johnny Andersson

Patching of the façade.



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Timber tradition with modern design cues

On a hill in the Norwegian mountain village of Sinnes stands a house dedicated to the surrounding forest. Made entirely of wood, the building is a modern take on the Norwegian cabin, with the playfully cheeky name Timber Temple.

TEXT Catrin Hellmark PHOTO Knut Folstad

With a smile, architect Knut Folstad explains what lies behind the modestly spectacular house, and its name Tømmertempelet (Timber Temple).

»The name is a bit of a joke, as it's a little cabin, not a huge temple. But it does have a ring to it, and the house has made use of great craftsmanship and fine materials,« he says.

The Norwegian timber tradition dates back centuries. But Knut Folstad wants his wooden temple to be hard to place in a particular time and context, while still drawing on skilled artisans and rustic materials.

Together with the carpentry team from contractor Kjernebygg, he adapted old wood-working techniques to today's circumstances and building regulations – and even took them a step further. The result: a building that has grown out of the local tradition, while demonstrating contemporary design cues.

1. The small windows high up the wall are inspired by ancient arrow slits and light wells in Viking farm buildings. Instead of an angled panel below, the sill is stepped in a solution developed specially for the cabin.
2. Wood is everywhere, with spruce floors, hardwax oiled walls in pine and furniture made of ash.
3. The stairs to the sleeping loft appear like a split in a tree trunk, in a wonderful interplay with the diagonal line that connects both parts of the cabin.
4. Plan.

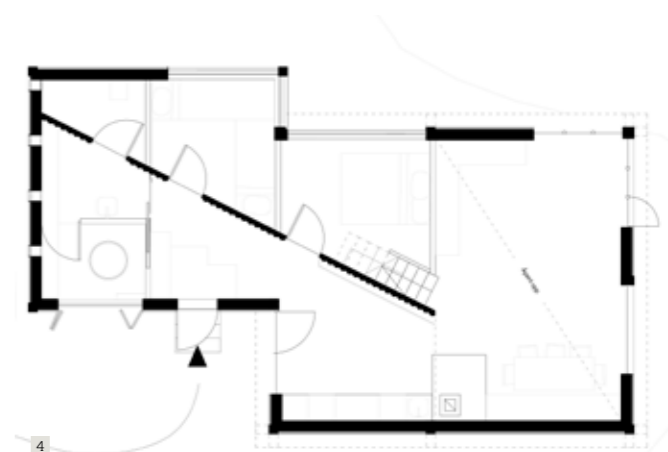
»Clearly, some of the cabin's features refer back to the past. And they quickly begin to feel nostalgically romantic, so it was important for me to give the house a kind of aggressiveness, as expressed in the concertinaed cladding on the outside and in the clear structural simplicity of the interior. There has to be a little contradiction,« he says.

Knut wanted the cabin to feel as if it had emerged organically from the ground in the birch woodland.

»The starting focus was on creating the atmosphere of a log cabin, with that warm weight that timber gives.

The wood in the cabin comprises spruce floors and pine walls, treated with a coat of hardwax oil, along with custom-built furniture in ash. This lends the structure added aesthetic value,« according to Knut.

The cabin can actually be seen as two connected buildings: one small volume with the »





» bathroom and toilet, and one main one with a sleeping loft, kitchen and living room. A diagonal line cutting through the building makes it feel bigger than it actually is:

»Take the kitchen for example. The diagonal creates a slightly narrower entrance from the corridor, then the kitchen opens up, before narrowing again,« explains Knut Folstad.

He believes that, when building on a smaller scale, it is important that the rooms have a clear identity, creating a strong hierarchy between intimate, smaller areas and generous communal spaces.

The diagonal layout also has a clear interplay with the narrow stairs up to the sleeping loft, which are practically hidden in the wall.

»The stairs almost became like a rock crevice or a split in a log. To me, there is something of the landscape about it,« says Knut.

He is keen to draw on the analogy of the

cabin as a naturally grown part of the landscape, and not just in the use of wood. The rocks that surround the cabin also continue indoors, in the paving stones that feature in the entrance and bathroom.

»You come in via some large stones that kind of lift you in from the hill outside, and I thought it would feel odd to walk in on concrete. Because my whole concept was to create something that had grown up from the land, it was important to give that some recognition – and the stones do that. I also thought it would be quite nice to walk barefoot on the stones in the bathroom.«

The bathroom unites the natural and the industrial. Knut Folstad had a bright green aluminium bathtub made to his own design.

»It was a smart solution. It was easy to get up here, but had something slightly industrial about it. And a simplicity: just a barrel to put water in. The green makes it a metaphor, like bathing in a pond.«

5. Bathing in the green aluminium barrel is meant to evoke a dip in a forest pond.

6. The concertinaed exterior cladding contrasts with the simplicity of the interior so as not to make the building too romanticised.

7. The architect wanted the cabin to feel like it had grown naturally out of the ground.

8. The stairs splitting the house diagonally, viewed from the top floor.

Tømmertempelet

SINNES, NORWAY

ARCHITECT Arkitekt Folstad, Knut.

CLIENT Private. STRUCTURAL ENGINEER Kjernebygg.

AREA 106 sqm. COST SEK 4.4 million. w| a-fk.no

Architect **Knut Folstad**

»The stairs almost became like a rock crevice.«

Facing the bath are two levels of shutters. Open the top shutters and you can sit in the bath and admire the view outside. When the shutters are closed, the light filters through perforations in a slightly tongue-in-cheek flickering cross shape. The material needs to be not too compact, the impression not to stiff, says Knut Folstad.

»Punching holes in the shutters was a great way to avoid an overly monumental feel. I did smile to myself when I designed these sacred forms for the perforations. It was cool to have this tiny little bath and these pretentious crosses.«



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» HOW CAN PEOPLE'S ATTITUDE TO CONSUMPTION BE CHANGED? «

Trä! caught up with Professor Lesley Lokko during her brief visit to Sweden as keynote speaker at the Architecture Gala. Lesley Lokko is the founder of the African Futures Institute (AFI) in Accra, Ghana, and has been appointed curator of the Venice Biennale in 2023.

TEXT David Valldeby PHOTO Debra Hurford Brown

How do you think the architecture world needs to change to become global?

»I think for quite a long time, certainly in architectural discourse, it was very clear that there was a center which was more or less the global north and, maybe Japan. And the discourse in that world was canon. 20–25 years ago, we began to see people from »other« worlds coming into the global north and bringing experiences and histories and ways of talking about architecture, that the canon was not well equipped to hear.

There was a sense that if you suddenly opened the door to other views or other ways of thinking, your own authority would be questioned. The only way to deal with this was to say, it's peripheral, it's to the side of architecture.

And I think what's happened over the past five years, climate change, racial justice, social justice, the pandemic, public health, even war, suddenly now these things they're center stage and architects who thought of themselves as being at the center suddenly don't have the language for it. And I think this has been a real shift.«

How can this shift be used to maintain momentum?

»When I started working in South Africa, we were dealing with an architectural profession that was closely aligned with apartheid. The spatial ideology of apartheid could not have happened if the architecture profession at some level was not complicit. In the South African context, architects could not be these left-leaning, Avant garde, innocent community. Actually, they were implicated. I realized quickly that in order to move beyond the, let's say the binary of good and evil, black and white, you had to rely on another figure. Somebody else had to be the bridge between these two camps.

For me, architecture has always been a discipline of translation. You translate an idea into a drawing, a drawing into a model, a model into a building, a building into a city. There's something about the DNA of the way architects think that is really to do with translation.

In South Africa, I understood that the black students – most Africans speak more than one language – know how to translate between worlds, because you live generally in one world, black African world, but you have to negotiate every day with the Western world, with modernity. I figured out that if we could equip those students to become the translators, they could take both parties by the hand. So the architect for me became this really interesting figure, somebody who resolves in really profound ways, like a negotiator.«

It doesn't feel like you are in Accra, but the whole of Africa, how do you work to be everywhere?

»Growing up in Ghana, we always thought of ourselves as other, outside the global north. But we were very aware of the world. That's maybe one of the conditions of growing up in a post-colonial context, is that you're very aware of other places. Ghana and the UK have had this traffic for a long time. Sometimes with my close group of friends in Ghana, we

could be in London on a Wednesday and in a Accra on a Saturday. The conversations and the language is the same. From a very early age, I had a sense that geography is not always the best indication of where you are. You carry other things with you. Sometimes that's language, sometimes it's manners like your etiquette, sometimes it's relationships. I think your sense of identity is much more complex than your territory.«

You have done some teaching in Sweden with Ana Betancour. What is your view of the Nordics?

»I remember thinking, we look at the Nordic countries and we think of that being the ultimate experiment in the relationship between democracy, social welfare, egalitarianism, equality and so on – a role model. There's a kind of confidence and security, I think, that comes from people who grow up in this system. But when it hits the complexity of the outside world, then you suddenly realize that the security and the protection, it can also blunt how you deal with complexity. And I think the world is more complex now than it's ever been.«

Do you think we need to maintain this complexity to move the world forward?

»What we need to do is to understand which of the values in a modern, complex, diverse, fragmented world that we need to keep. But how do we build them in such a way that we allow difference?«

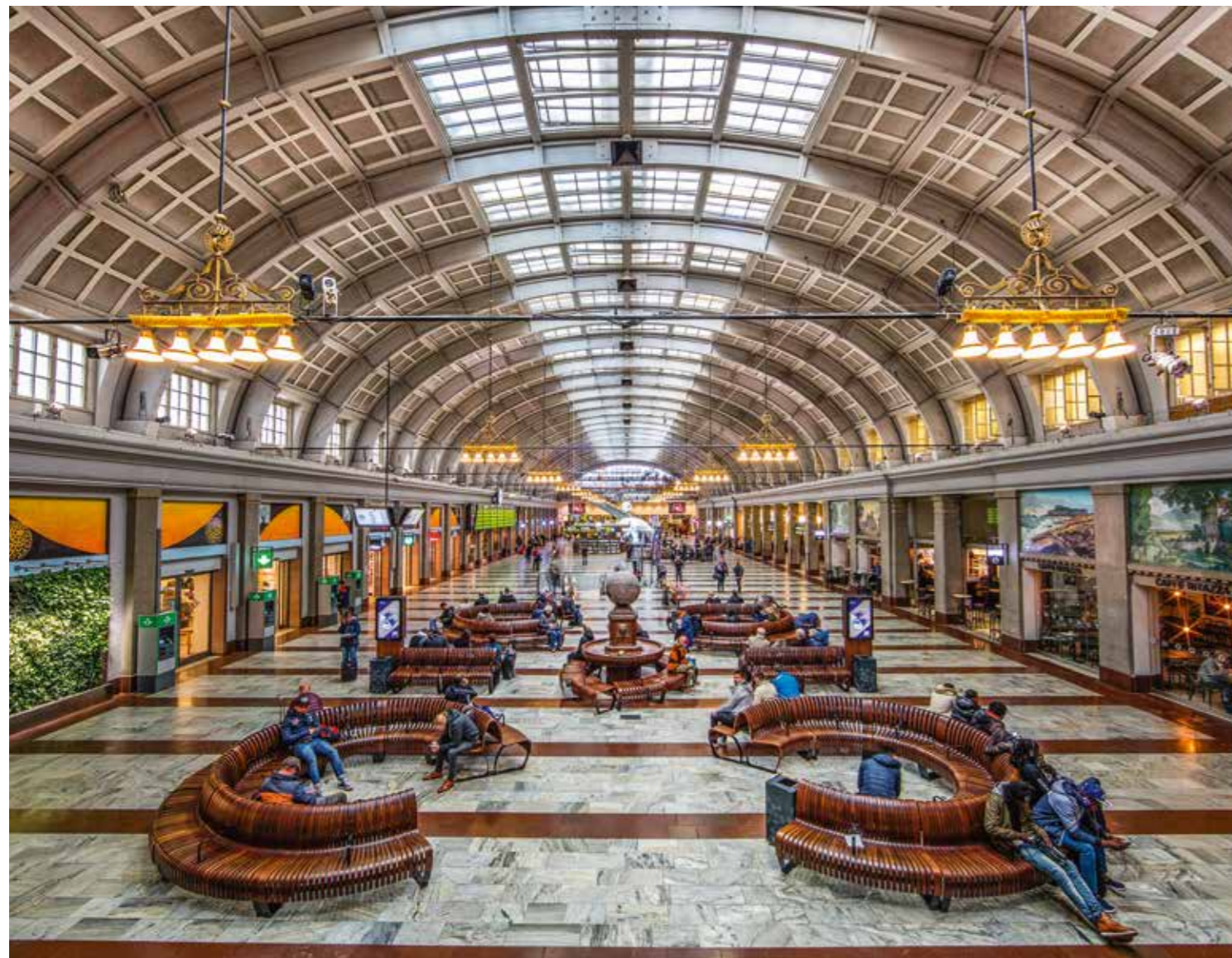
What is your view on sustainability?

»We have a group of young diaspora researchers who are working with the AFI. We met in London recently and one of them made such a brilliant point. She said, »We talk about the management of waste. That's how we talk about sustainability. How do you manage waste? What we never talk about, is how you change your habits so that you don't produce it.«

We don't have the cultural conversation around sustainability. And when I look at where I'm from, from west Africa, people would say that people's behavior comes from the fact that we don't have a huge amount of resources, which may be true, but it also means that people's attitudes to consumption are different. The question for the global north, is how do you change people's attitudes towards consumption? Because getting rid of the waste through carbon offsetting or planting trees or whatever, that's only delaying the problem.«

What do you think the future holds for architects?

»The emphasis on training people to construct buildings, I think, has taken the profession down a path of the consumption of resources. David Adjaye and I talk about this a lot when we meet. On the African continent, the job of an architect is also to build knowledge. It's to build confidence. The building is only one part of it. There's something about the training of an architect, which is about the construction, but I think it doesn't only have to be a material construction. It can be about the construction of society, of institutions, and of systems. So there's something, for me, very hopeful and optimistic about the training of an architect. And for me, this is the beginning of change.©



Stockholm Central Station is set to be redeveloped. The question is whether the structures will be as elegantly designed as those in the listed arrivals hall.

Glulam shaped railway stations with innovative technology

Few buildings embody modernity quite like railway stations. As well as meeting constantly changing logistical needs, they regularly reinvent themselves. Ever since the 1860s, they have served as experimental workshops for technical advances and been built using innovative, daring structures and materials.

TEXT Stina Hagelqvist PHOTO Sören Håkanlind

Stockholm Central Station, which is once again set to be transformed to increase passenger capacity and regenerate the centre of Stockholm, is no exception. Built in 1871, the main hall was reworked in the 1920s using that period's newly invented solution for large spans – the simply supported glulam structure.

Glulam had properties that iron and steel lacked. The aggressive environment of the station halls, with all the sulphur and steam, took a severe toll on the station buildings' iron structures, making wood a better

choice. The glulam arch solved the problem. For practically all of the 19th century, structural engineers and architects had tried to combine timber battens into beams and arches to overcome the limitations of timber logistics and the sawmill process, thus curing the lack of longer timber dimensions required in the construction boom. In Weimar in 1906, engineer and innovator Otto Hetzer obtained a patent for a laminated three-piece arch glued and joined under pressure. He managed the feat of replacing the mechanical joints with chemical ones, and so the glulam arch began to challenge constructions in iron, which had been considered the cutting-edge material of the age.

The glulam arch made its public and international breakthrough at the Brussels International Exposition of 1910, significantly in the pavilion for the German state railway, Reichseisenbahn Halle. Ten years later, over 200 buildings with glulam structures had been created in Europe, with the technology mainly

used in railway stations to support large spans.

In Sweden, the Hetzer roof truss came to be described as the »Töreboda system«, after the newly formed company AB Fribärande Träkonstruktioner in Töreboda received an order for glulam arches for Stockholm Central Station. The former station hall was converted into an arrivals hall, designed by Folke Zettervall and completed in 1927. And the rest, as they say, is history – or is it?

The 24 metre spans were modest compared with the material's true capabilities even then. The German railway pavilion from the International Exposition of 1910 boasted a span of 43 metres, a cross-section of 3 metres and a width of 30 centimetres. That would more than meet today's strength requirements. If it was possible to bridge such distances back then, what opportunities and benefits do glulam structures offer now?

In 1942, the glulam structure was presented as a realistic alternative to concrete. At that point, the casein glue was replaced with a new, synthetic, moisture-proof adhesive

with better performance that also improved fire safety. Compared with steel and concrete, glulam structures are cheap – a fact established early on in the 20th century. Today, the emphasis is placed on the material's flexibility and formability. The benefits of glulam structures were more or less predicted by Hetzer in 1906, as he kept his glue recipe a closely guarded secret.

The arrivals hall at Stockholm Central Station, with its elliptical glulam arches, remains one of the city's most impressive spaces, and in 1986 the whole building was listed as a historical monument, not least due to the innovative construction technology of the glulam arches. The new, extended arrivals hall now being planned by the winning competition entrants Foster + Partners builds on the glulam arch from AB Fribärande Träkonstruktioner. The question is whether the new glulam structure will be as groundbreaking as its predecessor or whether history has already given us all the answers. ©

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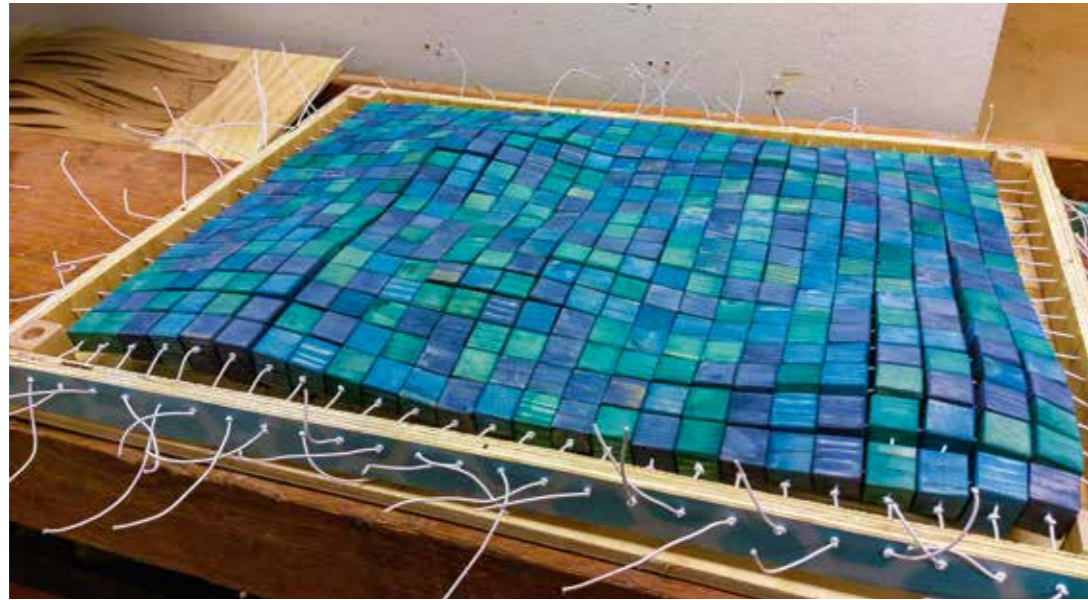
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Student & photographer Tung Yun Wang

Wood has many properties, and the students are constantly exploring new possibilities.

A feel for the material

A good item of furniture is all about the user's experience. And to create a good experience, the designer needs to have full mastery of the material. But with a material like wood, it is not enough just to understand the technical details. The designer also needs to learn to use their senses to capture all the qualities available.

TEXT Torsten Hild

»Touch wood!« That might sound a bit superstitious, but on the furniture design programme at HDK Valand Campus Steneby, it means something very different. The Academy of Art and Design trains students to understand the qualities of furniture by both thinking and doing. "Thinking with your hands" is not just an evocative expression, but a method that encompasses the physical tangible and the experientially abstract.

A traditional design process begins by defining a need, after which information is gathered and analysed. This leads into a creative phase, where ideas are developed on how to meet the need. Once the idea is sufficiently developed, work begins on manufacturing a prototype as a manifestation of the chosen idea. It is usually only in the prototype stage that the material enters the

picture. The prototype is assessed and worked on until a final variant is reached, and this is what then goes into production.

At Campus Steneby, the students learn to approach the material and work on it from the information phase, at the same time as sketching, building models, testing and experimenting.

»It's important to be able to combine approaches in order to move forward. Sometimes a particular function is crucial, and being able to first make it and then continue designing means you can create completely new forms that you hadn't thought of before,« says Emelie Sjöberg, who is in the second year of the furniture design programme.

The analysis of the collected information is conducted both theoretically and practically: activating the body in many different ways opens the door to capturing more qualities than those we can measure or register via conscious cognitive processes.

This way of working both rationally and with an experiential focus goes back to what is usually called »tacit knowledge«, which in simple terms can be described as the bodily experience of a practical action. It is this knowledge that many craftspeople possess, but can't be written down in manuals or instructions – the kind of skill that is passed on from master to apprentice. It could be compared to driving a car. To be able to drive

safely, a great deal of theory has to be read, analysed and understood. However, for the theoretical knowledge to be of any use, it has to be accompanied by plenty of practice. Not just in applying traffic rules, but also in terms of physical motor skills, actually learning to operate the car. Coordination, movements, control and balance have to be learned through practical experience.

»During the design process, you might sometimes get 'writer's cramp', and then all you have to do is go out to the workshop and do some work with your hands,« says Emelie Sjöberg.

Tacit knowledge relies in turn on what is called perception psychology: the way we help our senses to take in information about our surroundings in order to create an accurate and reliable picture of them. The process is not easily documented, because it largely takes place on an unconscious level. By the time the information about our surroundings reaches the conscious mind via our senses, so we can give it some thought, the body has already made its choices and interpretations. Most of the body's »thinking« is carried out without us being aware of it, in what we colloquially refer to as intuition, something in your bones or a gut feeling. What has been stored within us as experiences is a form of knowledge. It is also the foundation of, and a necessary precondition for, our ability to consciously reflect and think rationally.

Design courses at art colleges train in this through activities such as drawing, painting and sculpture. It is about learning to make judgements that are more than just conscious and rational, bringing the unconscious into the equation. This way a designer with the right training can meet more than just the measurable needs relating to size, volume, function, strength, economics, technology and so on. Qualities such as values,



Student & photographer Gergely Kovacs

Material combinations emphasise qualities and properties.



Student & photographer Samir Saba

Different techniques are tested on wood-based materials.



Student & photographer Gergely Kovacs

Testing the capacity to reflect light and cast shadow.



Student & photographer Leo Palmer

Prototype demonstrating new forms of ornamentation and decoration.



Student & photographer Maïke Brandt

Surface structures can add new value.

feelings, experiences, reactions and associations can also be incorporated and realised.

»As a lecturer in furniture design, I work on enabling the students to tackle different contexts. This might involve partnering with furniture companies or designing a piece of furniture for a public environment. The most important tools for anyone working in design are empathy and engagement,« says Sara Szyber, who lectures on furniture design programmes.

The artistic training is a complement to the design studies. The students are given tasks with questions that they need to work on in a design piece. They are trained to approach the material early in the design process and begin to explore it, sparking ideas on how to solve problems and meet needs. Working

practically with a material like wood involves not only learning to understand the technical aspects, but experiencing qualities such as sound, smell, touch, flexibility and even taste, all of which vary from wood to wood. Through this work, the students draw on knowledge from the long woodworking tradition and incorporate it into their design process. It is a question of having the knowledge and ability to apply a broader spectrum of qualities to interior products.

»This is where the wood workshop comes in, as the place where thinking becomes doing. With a good understanding of the wood and its materiality, we're able to test ideas in a very practical way. Working on different scales also provides an interesting insight into how the user might perceive the furniture in the room,« says Sara Szyber.

In a society in which our products are subject to evermore complex requirements, it is crucial that a designer is able to master all the qualities that affect the users. To understand the potential and limitations of a material like wood, the knowledge horizon needs to be expanded to include more than what we can measure and document in writing – not least the experiential qualities that we barely notice are affecting us. That is, until we encounter them as quality issues in our environment. Ultimately, proof that a product meets the identified need only comes from the human interaction. It doesn't matter how functional, cheap and hard-wearing the product is, if it doesn't feel good. In the end, the user's experience is what determines the success of a piece of furniture. ☺



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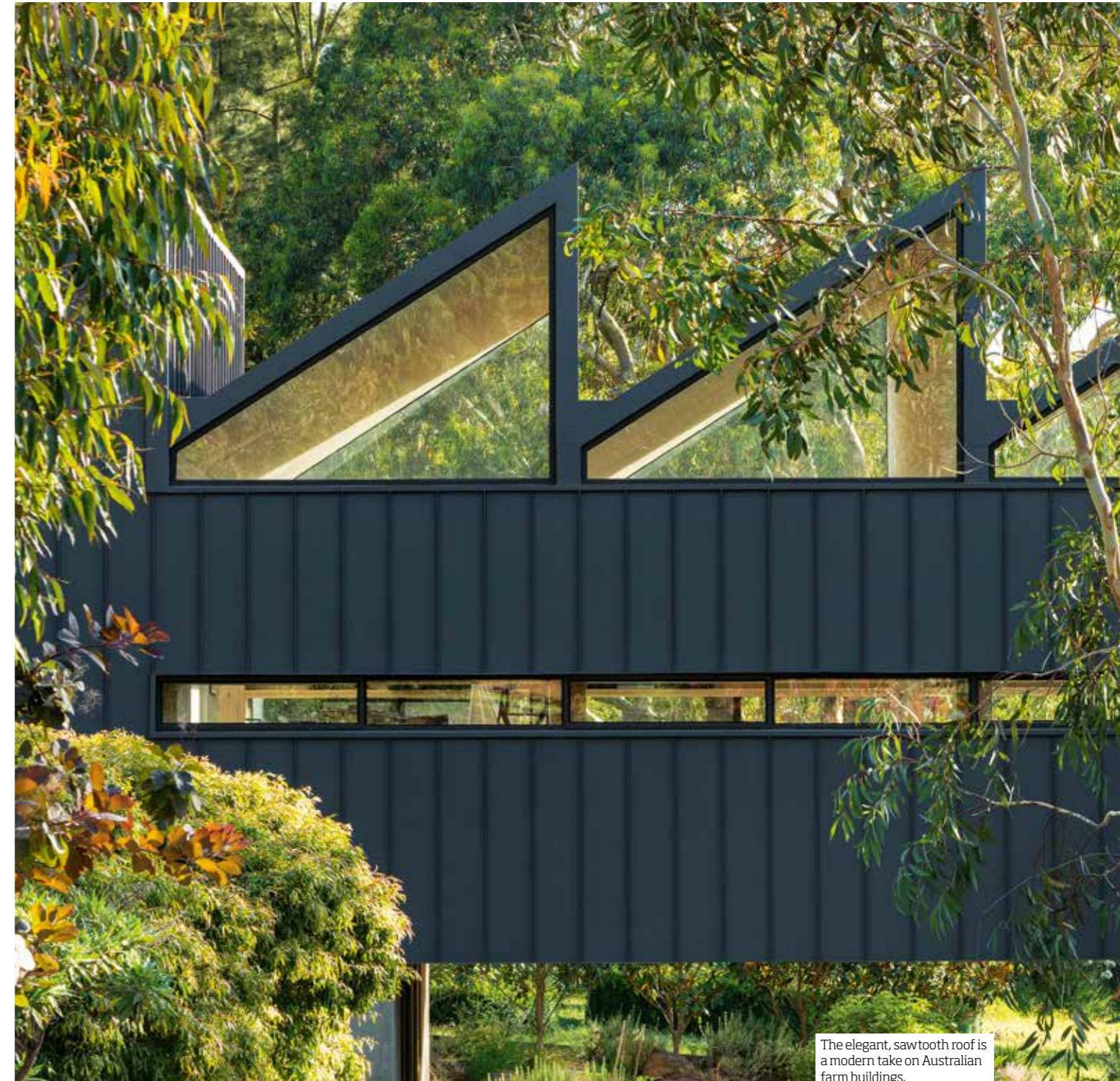
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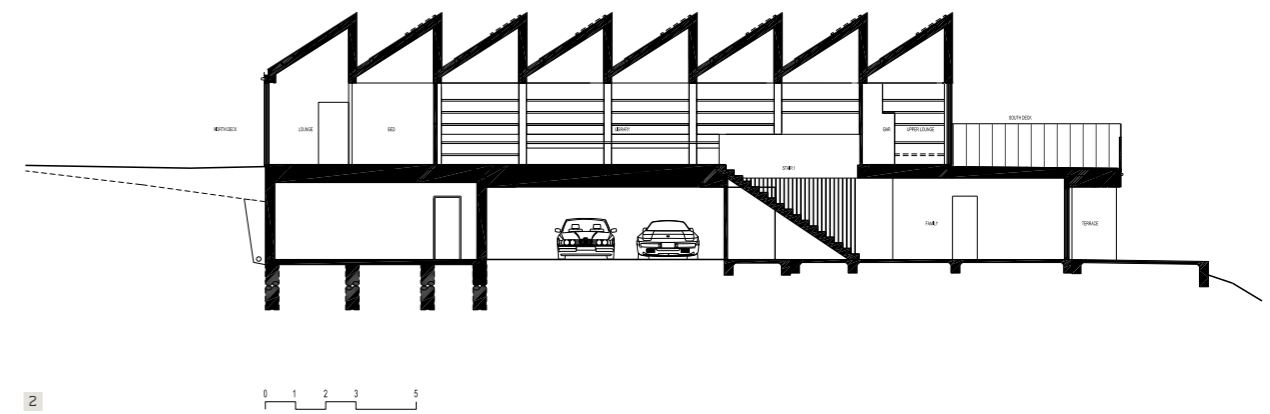


The elegant, sawtooth roof is a modern take on Australian farm buildings.

Volume spans over older house

When it came to extending a brick-built house from the 1970s, the owners were clear: the upward extension should be made of CLT. The result was an elegant upper floor, inside which the material is fully exposed, with a roof that evokes the building's earlier agricultural life. »

TEXT Johanna Lundeberg PHOTO Dianna Snape



It took almost 10 years for the owners to decide on how their holiday home should be developed and an additional floor added. The children became adults, moved out and had families, changing the intended layout and function. Then as the family began to expand with grandchildren, the plans had to be revised once more. But on the generous plot in Mornington, a suburb of Melbourne, with sea glimpses on the horizon, the brick house has now had a substantial facelift, with the addition of a stunning upward extension in CLT.

The original bungalow was built in the 1970s and was a kind of heavy lump, recalls Fiona Dunn, chief architect at FMD Architects. »It was old-fashioned and uninsulated, so we reimagined it and made it part of the new design, and now the whole building feels like a single entity, despite the different materials, although we have tried to connect them visually both internally and externally.«

To give the house a smarter appearance, the architects cut away part of the original building to create a large enough space for a carport. Then they placed an uninterrupted level on top, with a CLT floor system. The 14 metre span runs like a bridge over the carport and onto the sloping part of the plot on the north side.

»The upper level is supported at the south end by the original building, and at the north end by the higher natural level of the slope. It works really well,« says Fiona Dunin.

The neat design of the upper floor was made possible by the use of CLT, something that the clients specified from the beginning.

»We had to pause the work several times while they thought some more about what they wanted, but they were sure about using CLT from the outset – there was no plan B,« says Fiona.

1. The CLT has been left exposed in the interior. As far as possible, CLT has been kept as the only material, and to preserve the clean lines, the LED strip lighting has been rebated into the wood.
2. Cross-section.
3. The open space on the upper floor is designed to meet the needs of three generations, with areas for play, social activities and work. The shape of the roof can also be appreciated from the inside.
4. The cross-lamination is clear in the steps leading up to the new level.

In the first decade of the 2000s, CLT was not a particularly common material in Australia, at least not for single-family houses. Fiona Dunin explains that the practice had to do a lot of research on how they could use the material and which of its properties they could draw on. To learn more, they turned their attention to Europe. By the end of the 2010s, when the time came to begin work, CLT had become increasingly common in Australia. Since then, the architectural firm has used it in many of its buildings, and Fiona Dunin says that the hours they spent on their meticulous research have paid dividends, even though it was a rather protracted process at the time.

The house was once a smallholding, and the architects were keen to reference this in a clearer way alongside the greenery surrounding the plot. As a playful nod to both the

setting and agricultural architecture, one side has therefore been given a sawtooth roof profile whose rhythm defines both the exterior and the interior.

»Old agricultural buildings in Australia are often sawtooth-shaped, and we wanted to bring that connection into the new building, albeit on a smaller scale. There are also functional reasons for the design,« explains Fiona Dunin.

The shape of the roof made it possible to maximise the number of solar panels that could be fitted, for example. The high double-glazed windows also capture the changing light during the day and can be opened on hot summer days to get a good flow of air inside and let out excess heat. The shape means that rainwater easily drains away, even in a heavy downpour. The dark grey sheet-metal that clads the roof and much of the façade also provides weather protection,

and the older building's brick has been rendered for a more neutral finish.

As the family expanded, they wanted the house to be big enough for everyone to get together. What was initially meant to be a cellar in the north part of the building instead became the grandchildren's favourite room – a space with bunk beds that is almost like their very own cabin. A separate area for them, but with their parents still nearby.

»There's room for all the grandchildren in there, and they love it! The parents love it too, because it means they get some peace and quiet,« says Fiona Dunin.

As part of the transformation, the ground floor was carefully renovated. The kitchen, with its stone counters and a shelf clearly referencing the sawtooth roof, serves as a bridge between old and new, making use of materials from both sides. The stairs leading »



» to the new upper floor are made of CLT in Monterey pine (*pinus radiata*), making a feature of the cross-lamination, and halfway up, a glulam post gives a hint of what awaits.

The upper floor's open space – the bridge over the carport – has become the new heart of the home, functioning as a sociable room for the three generations of the family. As well as workstations for the adults, there are play areas for the youngsters and options for relaxation and family activities. This is also where the geometric shape of the sawtooth roof profile and its triangular windows can be experienced up close. In addition, windows have been cut out of the 10 metre high CLT walls at the height of the integrated workstations. For Fiona Dunin, who is also an interior designer, keeping the wood exposed in the room felt like the obvious choice.

»CLT is often hidden away in the interior,

but my idea was to maximise the exposure instead. I wanted as much as possible of the interior to be CLT, so we only really had one material,« she says.

The walls, shelves and integrated workstations are therefore also made of CLT that has been scaled down to smaller dimensions.

»You get very clean lines when you have everything in the same wood material, and that's also why we didn't want to install any fitted lamps.«

Instead, all the ceiling and wall lighting is made up of LED strips sunk into channels milled into the CLT. Another choice was to turn the screw fixings for the roof and posts into a design feature.

»Great care was taken over the screws, and we wanted to show the connections between the different fixings by keeping them as visible details, so everyone could understand how beautifully the house is constructed,« says Fiona Dunin. ©

5. The leafy plot frames the house, helping to create small, intimate spaces.

6. The kitchen provides a link between old and new. The shelving offers a visual connection with the sawtooth roof.

7. The sloping plot helps the extension to gently merge into the landscape. The façade is clad in sheet metal, with the roof shape maximising space for solar panels.

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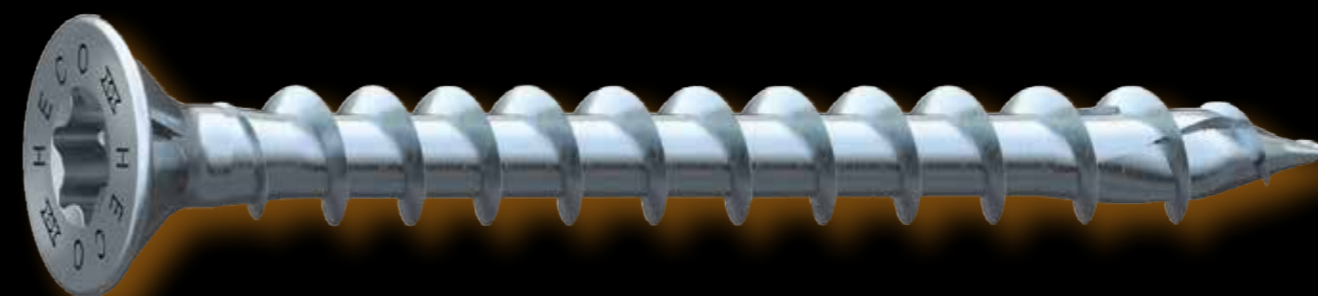
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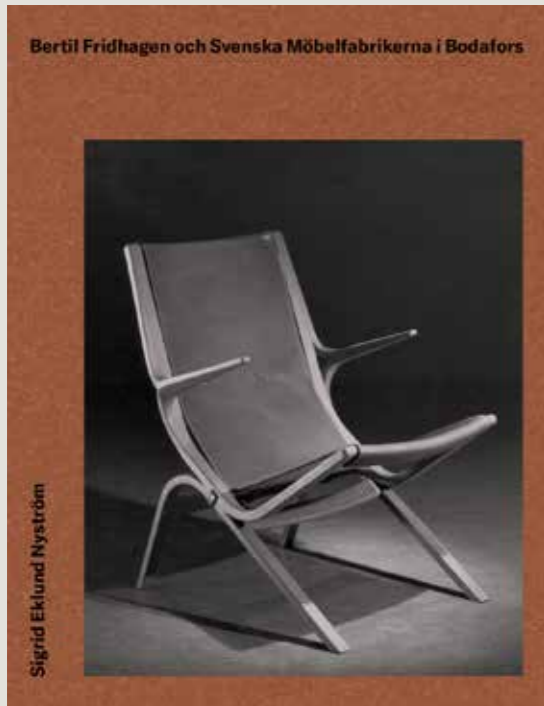
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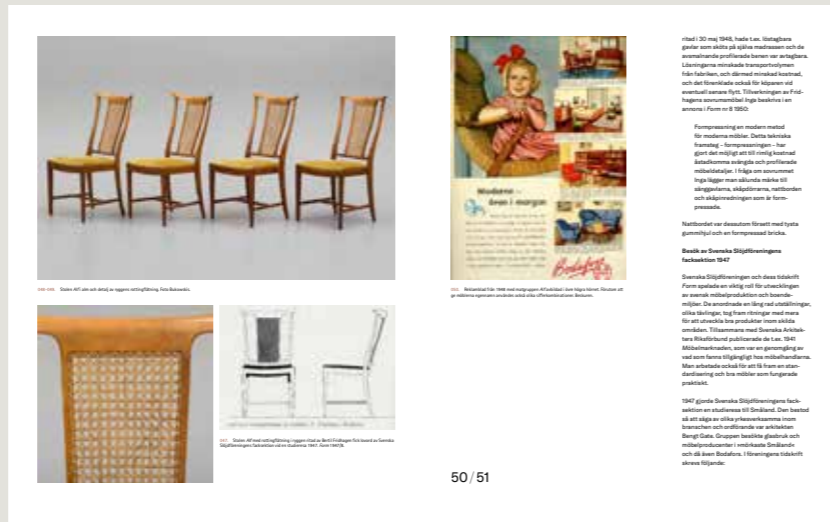


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Bertil Fridhagen and the Swedish furniture factories in Bodafors
Sigrid Eklund Nyström
 Carlsson bokförlag (in Swedish)
 978-91-8906-505-5

Bertil Fridhagen (architect SIR) was an incredibly prolific furniture designer working primarily in the 1940-70s, and best known for the



award-winning Limento armchair (see book cover). He spent most of his working life at the furniture factory in Bodafors, contributing to furniture lines such as Librett, Bonett and Facett. The furniture was made of teak, jacaranda and other exotic woods that feel alien to modern designers.

The book offers a great insight into Bertil Fridhagen as a person, not to mention the many changes of ownership that affected the furniture factory and the impact this had on production. The book also mentions Carl Malmsten, another leading Swedish furniture designer who worked in Bodafors for a while. However, the main strength of the book lies in the narrative told by author Sigrid Eklund Nyström, taking us through how the furniture

was designed, manufactured and marketed. The texts are made more interesting by their variety, with details about materials and treatments and how they were promoted in advertisements. A presentation of how trends were discussed, and how ideas about pricing might have affected the popularity of a particular furniture design, add extra depth.

As a designer, Bertil Fridhagen created furniture for numerous Swedish manufacturers, including Dux and Grythyttan. An interesting detail is that he designed many interiors, mainly churches, and even a whole church, alongside his regular work. The richly illustrated book turns the spotlight on an exciting time in Swedish furniture production.

www.carlssonbokforlag.se

H22 City Expo – Parapeten
 The mission of the H22 exhibition at Parapeten is to provide a creative arena for architecture and design. Tradition and identity come together, with a human focus, not least in the Pergola and features such as Young Swedish Design and Woodlife Sweden.
www.h22cityexpo.se/program/parapeten-arkitektur-form-design

HELINGSBORG, SWEDEN
 30 May-3 July

Wood Products & Technology
 This year's iteration of the much-missed Wood Products & Technology exhibition focuses on four themes: new urban planning in wood, digitalisation, sustainability and circular solutions, and skills provision. Swedish Wood will be there as a partner and a provider of inspiration and knowledge.
www.troachteknik.se

GÖTEBORG, SWEDEN
 30 Aug-2 Sep



13 September 2022 | Trä!
issue 3
 A new issue of Trä! The Nordic region's biggest architecture magazine is distributed in Sweden and internationally. Would you like to be inspired, enlightened and informed about sustainable and innovative architecture? Subscribe for free here:
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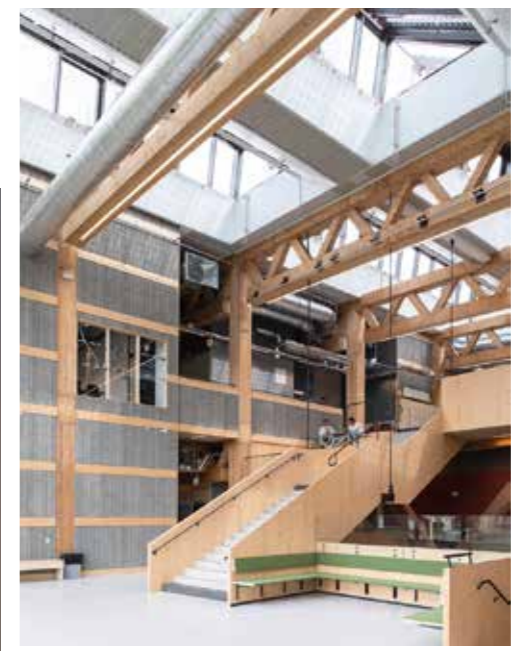


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Martinsons stomsystem i limträ och KL-trä är utvecklat i nära samarbete med Sveriges byggherrar, arkitekter och entreprenörer. Läs mer om våra projekt och inspireras på martinsons.se



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SNABBT. SMART. SNÄLLT. KL-TRÄ FRÅN SETRA

Att bygga med KL-trä är en grönsam affär. Alltså en som alla inblandade tjänar på: Du, naturen och samhället. För KL-trä är ett förnybart alternativ till betong och stål, som står för en stor del av byggbranschens klimatpåverkan.

I vår KL-träfabrik i Långshyttan kan vi producera de största KL-träelementen på marknaden och fräsa fram urtag för dörrar, fönster och installationer direkt i byggelementen. Det gör både logistik och byggande smidigare och snabbare. Och all råvara kommer från ansvarsfullt brukade skogar i vårt närområde.

Läs mer om vårt KL-trä och hur vi kan hjälpa dig att bygga grönsammare på setragroup.com/kl-tra

 **Setra**

Vi vill vara grönsamma.