# 18th century meets contemporary

Ps.

AIRPORT HIGHLIGHTS LOCAL WOOD INDUSTRY CANTILEVER OPENS UP ENTRANCE FLOOR PAVILION HIDDEN IN THE PARK

CHITECTURE

Petra Videstorm

Five principles for a better climate

# DET HANDLAR OM MER ÄN TRÄSTOMMAR





#### Vårt mål är att överträffa dina förväntningar.

Vi ser varje projekt som en möjlighet att dela med oss av våra kunskaper och vår långa branscherfarenhet. Det kan till exempel handla om att utveckla nya hållbara lösningar, som gör det möjligt att se grönt på framtiden. Läs mer om våra klimatsmarta stomsystem på martinsons.se



Martinsons utvecklar, konstruerar och levererar stomsystem i limträ och KL-trä. Som drivande kraft i projektsamarbeten skapar teamets experter hållbara värden för samtliga berörda.

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The dark and the light meet in a dynamic flow. The 18th century building housing a museum in Bezau has been given a modern addition where the intersection of different eras enhances spatiality and interaction.

### **Focus on winter gardens** and frame

In Malmö, Sweden's tallest timber-framed office building is setting the standard for future building. In the newly emerging neighbourhood, several properties will share geothermal heating and communal spaces, while the architecture demonstrates the possibility of going both big and sustainable.

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50 Good read » In Praise of Shadows

# SWEDISH WOOD

Swedish Wood disseminates knowledge about wood, wood products and wood in construction, contributing towards a sustainable society and a thriving sawmill industry. We achieve this by inspiring, educating and driving echnical advances

Swedish Wood represents the Swedish sawmi industry and is part of the Swedish Forest Industries Federation. Swedish Wood repre-sents the Swedish glulam, cLT and packaging industries, and collaborates closely with wedish builders' merchants and wholesale of wood products.

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Johanna Lundeberg, Ordaglad Cover Museum Bezau in Bezau, Austria by Innauer Matt architekten. Photo Dominic

times a vear. Trä!



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### **Good conditions for** increased construction

ONSALA, SWEDEN The election superyear of 2024 has featured several important votes around the world that will, in various ways, have an impact

on the Swedish sawmill industry, which is still struggling with weak demand and relatively high costs. There are fears that the election result across the Atlantic will lead to the introduction of US trade tariffs. In the assessment of our market analyst, this could certainly put European exports at a slight competitive disadvantage, but the tariffs on wood products may be more likely to affect American consumers, who will probably have to pay more.



Editorial

The United Kingdom also held elections this year, resulting in a new Labour government. In December 2023, the previous Conservative government unveiled its Timber in Construction Roadmap aimed at increasing wood construction to achieve the national target of net zero by 2050. It is now up to the new government to realise these plans. The UK is already the single largest export market for Swedish sawn timber. and while the Timber in Construction Roadmap also focuses on increasing the supply of homegrown timber, we are confident about what it might mean - not just for Swedish sawmills but also for the climate.

One positive development over the past year is that the economic situation has improved, with inflation stabilising and interest rates falling. But although many indicators are pointing in the right direction, there is reason to believe that the effects may be delayed, and there are no concrete signs of improvement yet. Personally, I hope that the start of the spring construction season will kickstart the construction industry and the demand for wood.

One of Swedish Wood's missions is to spread knowledge. Among other things, we have produced a guide on how to handle CLT elements in construction without full weather protection. The publication, called »Damp-proof CLT construction without a full temporary shelter« can be downloaded from the Swedish Wood website. The publication is intended to guide designers and contractors on how to achieve industrial and moisture-proof CLT construction. This issue also contains a column on the subject.

In the last issue I wrote about how we were looking forward to our seminar on engineered wood construction, which was held in Stockholm in November. All the presentations from the day were videoed and are available on Swedish Wood's website. I can especially recommend the lecture »The journey begins in the forest« by Åsa Rydell Blom, Associate Professor and Vice Dean at Linnaeus University.

Lalyberg form Anna Ryberg Ågren



## **Modern timber** over three levels

**OBJECT** School ARCHITECT AOR arkkitehdit STRUCTURAL ENGINEER TUUSULA, FINLAND A new upper secondary school and cultural centre is an example of what the sharing economy can look like. Outside school hours, the building's spaces are shared by several cultural providers, and besides being good from both an economic and a sustainability point of view, the combination also encourages people with different interests and backgrounds to meet and collaborate

The area around Lake Tuusula, about 70 kilometres north-east of Helsinki, consists of historic timber buildings originally occupied by artists. This has inspired the form and materials of the new A-Insinöörit Suunnittel building, which will also help to connect the historic part with the new areas. The school consists of six volumes with timber frames. The exterior and load-bearing walls are made of cross-laminated timber, which has the advantage of not settling over time. Internally, the volumes are linked by a network of corridors, which are like internal streets with associated squares, from which there are views up to the three floors.

The school is the first public three-storey timber building in Finland and explores how traditional housebuilding methods can be scaled up in size. The thick and solid façades mean that no additional insulation is needed in the walls.« wl.aor.fi

#### Toilet in nature represents ecocycle

MIYOSHI, JAPAN Can a toilet make the world more sustainable? Well, the two buildings commissioned by a recycling

#### **OBJECT** Bio toilet **ARCHITECT** Tono Mirai STRUCTURAL ENGINEER Systems Nakashima

company and placed carefully in a grove at least prompt thoughts of the circular economy. The softly curved external

walls of the toilet block are made from recovered soil, and the timber frame is built using traditional carpentry techniques. The foundation employs crushed stone to reduce the need for concrete. Much of the building is made from recycled materials, wooden sliding doors allow for privacy, and the toilets are even made from wood composite. The roof beams provide a sense of space, while also framing the skylights that draw light into the stalls. Next door, a tank building provides an educational demonstration of how the project's water treatment works. Its façade is clad in locally grown cedar, with the varied shades of the wood reflecting the surrounding forest.

The local paths are made of wood chips and lava stone, plus branches, leaves and charcoal have been used to improve the soil in the forest.« w tonomirai.com





also support its sustainability ambitions.



toilet itself is made of a wood comr

### Exposed-frame fire station leads the way in sustainable construction

REINBEK, GERMANY The role of a fire station is to ensure safety in the event of a fire, but with the right materials it can also help point the way to a more sustainable society. The discreet façade is clad horizontally in pressure-treated softwood, with exposed glulam beams under the eaves giving the building a welcoming appearance.

The glulam beams, which underpin the simply supported roof, are also clearly visible in the interior,

**OBJECT** Brandstation **ARCHITECT** Rimpau Bauer Derveaux STRUCTURAL ENGINEER Bollinger + Grohmann ingenieure

along with the cross-laminated timber (CLT) wall elements and roof. Because the two L-shaped buildings handle different loads, different solutions have been chosen for the frame: CLT elements for the west section and timber framing for the east. The visible wood is whitewashed to provide a coherent aesthetic.

Sustainability is also reflected in the building's green roof and rainwater storage system. Along the street next to the site stands a line of welcoming old oak trees, which have determined the position of the entrance and exit.« w rbd-architekten.com



# Nyhet. Svensk granparkett.

Rejäla svenska trägolv, det har vi gjort länge. Nu lanserar vi en helt ny produkt på marknaden. En parkett tillverkad av gran som växt länge i de djupaste norrländska skogarna, där vintrarna är både långa och kalla. Det har gett träet tätare årsringar och gjort det till ett hållbart material. Av det gör vi golv som är både klassiska till stilen och slitstarka i konstruktionen.





Ground piles leave nature untouched

**PATAGONIA, CHILE** With distinct mountains on the horizon and a beautiful lake nearby, it was important not to let the holiday home take over the landscape - in terms of either its footprint or design. Instead, the topography has been the guiding factor, and to achieve a low-key feel, the owners decided early on that the building would be kept to just two levels.

**OBJECT** Villa Monreal ARCHITECT SAA arquitectura + territorio STRUCTURAL ENGINEER HUGO Hidd

The house is adapted to the slope of the terrain and built using diagonal wooden posts for support, with foundation piles driven into the ground to minimise the

### Summerhouse with open solution

PRAGUE, CZECHIA Within an area of allotments along the Vltava River, the owners of one of the plots wanted to replace the original, now dilapidated, summerhouse with a new one. As they like to spend as much time as possible outdoors, they wanted a new building that worked with the garden in bad weather and enabled occasional overnight stays. It would also be used to store plants during the winter

The solution was a front with **OBJECT** Paviljong

**ARCHITECT** Byró architekti STRUCTURAL ENGINEER Viktor Bakstein

a polycarbonate window section that can be angled upwards to open the entire side and allow the interior to seamlessly transition into the garden. When up, it also forms a canopy that provides shelter on rainy days. The façades are clad in charred wood, and when the window section is down, it harmonises well with the rest of the almost windowless building.

The back internal wall has an integrated bookcase with a ladder leading to the upper floor, all made of wood in a bright interior. A solar panel covers the electricity needs of the summerhouse « w byro.cz

excavation work required - so the grass could continue to grow under the house. The layout is arranged into two parts, a private and more secluded area and a social, open area with panoramic views.

Winters can be snowy and windy here, and black zinc cladding provides some protection, but the structure has also been designed as a system of overlapping elements, stacked in a shape that provides natural ventilation, allowing the wood to dry.« w saarquitectos.cl





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#### Glulam arches strengthen sense of community

SAINT MICHAEL, AUSTRIA A new sports and recreation centre aims to bring together local clubs and strengthen social cohesion between people and sports. The area has a village-like feel, with small houses, lots of greenery and farmland, and this has fed into the design of the new multi-purpose hall. The building is based on local traditions and materials, with wood dominating both the exterior and interior. The light, exposed wood creates a warm atmosphere in the hall, with a roof supported by strong glulam

**OBJECT** Lungau arena **ARCHITECT** LP architectur STRUCTURAL ENGINEER Conlignum

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helping to improve the acoustics.

arches that extend between the ends of the hall. Coupled with the glulam beams on the sides, they also contribute to good acoustics and a pleasant environment

The walls are made of horizontal planks, complemented by angled and vertical glulam beams. The generously sized windows are lined with slender laths, which regulate harsh sunlight while allowing light to filter in and provide a pleasing contact with the world outside. The facility also includes a grass pitch and a beach volleyball court.«

w Iparchitektur.at



### Local vernacular for warming moments

BATTLE, UK The High Weald Area of Outstanding Natural Beauty in England is known for its woodlands, and now a small wood-fired sauna, clad in redstained shingles in British-grown larch, has been added as a complement to the area's small overnight cabins.

The bench inside uses the trunk of a silver birch that had fallen near the site. Grooves have been cut in the levelled trunk to create comfortable seating. Much of the trunk's bark has been left in place, adding to

> OBJECT Bastu ARCHITECT Built works

the aenuine sense of being in the middle of nature. The interior walls are lined with alder to match the surroundings. The design of the bijou building, which is set on stone blocks, is a nod to the area's historic drying sheds – a use that remains relevant, albeit in a different way

The insulation is a combination of sheep's wool and recycled plastic to keep the environmental footprint of the building as low as possible. And of course, the wood for the saunas comes from the surrounding forest. It could hardly be more local.« w built works

### **VI UTVECKLAR TRÄ-**BYGGNADSKONSTEN **GENOM TYSTA HUS**

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#### Sculptural entrance in redeveloped area

**OBJECT** Extension

architects

**ARCHITECT** Benthem Crouwel

**STRUCTURAL ENGINEER** Van Rossum

AMSTERDAM, NETHERLANDS Over the next few years, an old industrial zone near Amsterdam's train station is set to be developed into a new neighbourhood. While retaining the old factory feel, the development will also bring warmth to the area, and make use of sustainable materials. First up is a 15,700 square metre office building that has been partially redesigned with a wooden upper storev extension The façade may have an industrial feel, but thanks to generous

windows and glulam in various dimensions, the interior creates a warm and welcoming feel. Inside the main entrance, a bright atrium opens up and a sculptural staircase leads visitors to the upper floors, while offering views of both the outdoor and indoor spaces. It is hoped that this connection will encourage spontaneous encounters.

nents and the prefabricated elements can be reused later. In the outdoor spaces, paving stones have been used instead of concrete slabs for climate reasons.« w benthemcrouwel.com

### Shelter defined by the site's history

UMEÅ, SWEDEN On a summer course, students from Umeå School of Architecture explored nature based on ideas of self-sufficiency, resilience and community engagement. Some of the results can now be seen at Vindbåken, just off a hiking trail, where the students have created a shelter inspired by the history of the site and adapted to its current state. The idea for the design comes from an old lighthouse, and as the land uplift

is so evident here, this has also been incorporated into the building: the top is at the same height as the sea level was when the first people started to populate the island. The facade is divided into four bands, each



OBJECT Vindbåken **ARCHITECT** UMA School of Architecture

representing a hundred years of land uplift The building is intended as

both a lookout point and an

The modular extension is fully demountable; both the compo-

of land uplift at the site.

overnight shelter. Stone counterweights hold the side hatch open. To withstand the occasional strong winds, old metal hooks have been repurposed as anchors buried under the surrounding boulders « w umu.se/arkitekthogskolan

Johan Tannfors, moisture expert in property damage ontrol, Polygor

### The challenge of moisture in multi-layer constructions

UPPSALA, SWEDEN Wood is a wonderful material, but it requires some thought - in advance!

Mould damage in wooden buildings caused by lack of knowledge when specifying requirements, and following up on weather protection and production strategy, costs the construction industry, and by extension the property owners, huge amounts every year. At the same time, there is a desire to transition the construction industry from concrete and steel frames to wood-based options. This change in framing brings the issue of weather protection and



the need for a production strategy to the fore, as full temporary shelters are often rejected due to practical obstacles and rental costs.

The challenge for moisture experts at the design stage is to explain to the client the risks and costs of different strategies. Often they find themselves in the situation of assessing acceptable levels of microbial presence.

Historically, the production strategy has been that »we accept more or less unprotected wood that is exposed to periodic wetting«, but my understanding is that this is starting to change. Moisture risk reduction measures such as adhesive cover sheets are available as an option from suppliers of cross-laminated timber (CLT) and they are being used more widely. If the frame assembly is also carefully controlled, the result is significantly lower moisture risks for not too much effort.

For acoustic and fire reasons, intermediate floors in CLT are often covered on the upper side. for example with concrete cast on top of acoustic matting. A »creeping« water leak in this type of frame can last for months and create major rot or mould damage before it is discovered. Even if the carcass is exposed, it is practically impossible to access all the hidden contact surfaces for remediation measures (often sanding/blasting), making it difficult to guarantee the success of the measure. The technology to spot ongoing water leaks, for example via pressure sensors on the tap water system and sensors to detect free water in the structure, has not only become cheaper but also more effective.

Dry mould damage that is not addressed in production will potentially have a negative impact on the perceived indoor environment in the management phase. The challenge is to map the presence and extent of damage hidden in a multi-layer construction.

The CLT industry, like the concrete industry, only delivers a »raw« product. The responsibility for whether the CLT has time to develop moisture damage or for the concrete time to dry lies with the contractor. The ideal is for elements to be optimised for rapid installation, and for there always to be a discussion about how to avoid moisture damage during construction. This is an opinion piece. The views expressed are the writer's ov

## **RALLING PLANKS UCE SIMPLE GEOMETR**

Felix Gerlach OBJECT Kärven ARCHITECT White arkitekter Rambøll

**VARBERG, SWEDEN** Getterön Nature Reserve, where sea and land meet, attracts 80,000 visitors every year, who come to see the wetland's rich birdlife. Now the site has a landmark in the form of a viewing tower with **PHOTOGRAPHER** panoramic views of the varied landscape.

The tower, 12 metres high and 7 metres wide, is constructed using 140 timber planks, assembled in a three-dimensional web-like structure. The load-bearing planks are attached to ten steel rings of different diameters, creating the illusion of a bundle of straws **STRUCTURAL ENGINEER** tied together at the centre, like a sheaf.

But the shape is not just about making a lovely

silhouette, identical from all angles. The design also effectively breaks up the onshore winds. A galvanised spiral staircase leads all the way to the upper level of the tower, and on the way up there are several levels for those who want to take a break while at the same time exploring the internal play of light and shadow created by the wooden ribs. There is also a sheltered meeting place on the ground floor.«

• Wood was chosen partly for its low climate impact and partly because it combines light weight with solidity. It also ties in with the surrounding countryside.

• The starting point was that being inside the tower should be just as exciting as looking at it from a distance or enjoying the view from the top.

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An earthquake measuring 9 on the Richter scale will knock down most things - but Portland's new airport is designed to withstand it. The structure, which includes a giant undulating wooden roof, is expected to remain standing when everything else has collapsed.»

техт Sara Bergqvist рното Ema Peter





Design principle for the vaulted airport roof.

n Portland, on the US West Coast, the city is preparing for the big earthquake that everyone knows is coming in the not-too-distant future. All new public buildings are required to be earthquake-proof – but few have gone as far as

Portland Airport, with the recently completed remodelling expected to withstand earthquakes of up to magnitude 9 on the Richter scale.

»In the earthquake we're expecting, bridges and other infrastructure will be knocked out. For society to continue to function, it's essential that we can bring in resources from outside, and the airport is the first link in the chain. So it was important to our client that we really aimed as high as possible,« says Nat Slayton, lead architect at zGF, which designed the remodelled and expanded airport.

With more than 19 million passengers annually, Portland Airport is one of the 20 busiest in the United States. It has also long been one of the most popular, due in part to the human scale of the airport, its interior design with lots of greenery and abundant natural light, and its generous shopping and dining areas.

When the airport decided it needed to double its capacity, it was keen to maintain that feel. Other important aspects to consider – besides earthquake-proofing the building – were sustainability, reduced energy use and future flexibility. In addition, the refurbishment and expansion had to be done without disrupting ongoing operations.

»Our region is a real wood economy, with sawmills, wood product manufacturers and significant timber exports. So we were clear early on that we wanted to use local wood resources to build our new airport,« says Nat Slayton.

Both the design and construction are inspired by the surrounding landscape – almost half of Oregon, Portland's home state, is covered by forest. The vision was therefore to make you feel like you are in the forest as soon as you enter the building. The airport has more than 5,000 plants and 72 trees, many of them up to eight metres tall. Growing them in pots



helps to keep their root systems in check, thus preventing them from growing too tall.

»This only works for certain species, such as fig and black olive trees. The idea of the trees and all the natural materials in general is also to establish a more human scale that reduces stress levels,« says Nat.

Each part of the building has been given its own identity, and the trees therefore appear with varying frequency. The same applies to the rest of the building – no two parts are alike.

The load-bearing roof structure is created from a combination of glulam arches with a span of up to 30 metres, laminated plywood (a cross between LVL and CLT) and an airy wooden lattice, all made from durable Douglas fir felled within a 300 km radius. The bearing Y-shaped columns, on the other hand, are made of steel filled with concrete so they can be left untreated and still be fire-resistant.

»On top of them rests a half-metre-thick layer of rubber that allows the wooden roof to move in relation to the ground in the event of an earthquake,« explains Samuel Dicke, Client Development Manager for the project at timber construction company Timberlab.

In all, the undulating wooden roof covers an area of 37,000 square metres, equivalent to more than five full-size football pitches. Despite this, no more than 34 pillars have been used – compared with the 600 pillars previously in place in the smaller original airport. This has allowed great flexibility in how the space can be used and changed over time. The design also made it easier to assemble the prefabricated parts, which was quite a challenge in itself.

»Airports often have quite large areas of land at their disposal, so we were able to create a production facility on site and build to scale less than a kilometre away. Everything was then divided into 18 modules, which we put in place one by one,« says Nat Slayton.

This had multiple advantages. Since all the work on the airport site had to be done alongside regular operations, they had to make use of the 3–4 hours a night when no planes were landing or taking off. The proximity made it possible to move one module at a time and get it in place within that »



#### Skylights

Mass plywood

Glulam beams

3 x 6 inch timber lattice

Curved timber lattice





» window. Working so much just outside the airport perimeter also saved a lot of time, as everyone working on the construction would otherwise have spent much of their time going through security checkpoints.

»We placed a huge emphasis on safety, and this process turned out to be a safer way of working. In fact, we didn't have a single incident the whole time, « states Nat.

THE NEW AIRPORT also has many sustainability benefits. Despite having twice the capacity of its predecessor, its energy use has been halved. This is due to both the choice of materials, including more efficient insulation, and a new groundsource heating system based on water pumped around in a loop. In addition, with such large skylights, daylight provides around 60 percent of the light needed.

»We've also tried to use wood in as many of the interior details under the roof as possible. The shop and restaurant counters, for example, are made of wood from local companies. For the flooring, we contacted a family business that produces oak parquet on a small scale. The oak trees around here are more like bushes and were generally considered useless, until someone realised that they could be sawn into small pieces and turned into parquet. We asked this company if they would be willing to make a lot more for us, so they built a plant and hired new people. Since then, they've continued to sell their products on the general market, and it's been quite a success,« adds Nat.

Despite the many challenges along the way, Nat feels that the project has gone very well.

»The biggest challenge lay in drawing up the plan that made all this happen, because there is a lot of work behind it. But we've been fortunate to work with extremely talented people across North America. And the owners have really

**Portland Airport (PDX)** PORTLAND, USA ARCHITECT ZGF CLIENT Port of Portland TIMBER STRUCTURAL ENGINEERING Timberlab COST USD 2 billion AREA 37,000 SQM w zgf.com

given us time to test things out and think things through - it's not often we get the opportunity to spend so much time on the preparation,« he says. When the new airport opened at the end of August this year, it was welcomed with open arms by staff, passengers and the wider public. »I went there the day after the opening and I asked the taxi

What is unusual about Portland Airport is that so many areas are open to the public - you can even watch the planes take off and land through the large glass panels in the entrance hall. There are also many areas where you can sit down if you want to stop for a while or wait for someone to land – not least the large stand-like staircase in the centre. »We've already noticed many people arriving earlier and have even seen videos of people dancing on the stairs,« says

driver what he thought of it. He told me he had already driven three people there who just wanted to see what it looked like,« says Samuel Dicke.

Nat Slayton.

# Det enda element som skyddar dig från andra

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Rendering of the timber frame structure.

n just a few years, the Hyllie district of Malmö has gone from fertile, almost undeveloped farmland to a vibrant and diverse neighbourhood with strong climate credentials.

This pioneering urban development project is in line with the ambitious goals of the City of Malmö's environmental programme, and several companies have their head offices here. One of the reasons is the neighbourhood's excellent transport links, with trains whisking you to Copenhagen in just over 20 minutes and central Malmö in just a few minutes.

In 2017, Wingårdhs and Granitor Properties won the land allocation competition for the approximately 12,000 square metre triangular site between the Emporia shopping centre and the railway line. Wingårdhs has now designed seven properties in this neighbourhood – called the Embassy of Sharing – all of which, despite their different concepts and functions, are united by a new, untraditional approach to social sustainability, circularity and the sharing economy. Everything from the geothermal heating system to common spaces, ideas and services are to be shared here. Fyrtornet, meaning Lighthouse, is the first of the properties to be completed, in a close collaboration between Granitor Properties, Wingårdhs, Binderholz and Byggnadsfirman Otto Magnusson.

Much of the design has been about emphasising that Fyrtornet is a wooden building, both internally, with all the exposed wood, and on the exterior with its cedar shingle cladding. The timber frame is visible on the inside of the glass façade, and the wooden details also feature prominently at ground level.

»We've taken great care with the design of the lower floors where the building meets the street. The ground floor has a wide, square spiral staircase whose solid wooden steps allow visitors to experience wood up close. The sense of wood is »





» also emphasised higher up in the building, not least in the kitchen area for the offices, where we've installed a glass panel as a splashback to expose the underlying CLT wall,« explains Gustaf Wennerberg, lead architect at Wingårdhs.

THE EXTENSIVE TIMBER structure, combined with innovative technical solutions, make the Fyrtornet office block a prime example of large-scale architecture with a small-scale carbon footprint. It is one of the first buildings in Malmö to come in below the limits set out in the Local Roadmap for a Climate Neutral Building & Construction Industry in Malmö 2030 (LFM30), in line with the Paris Agreement's goal of net zero carbon emissions by 2030.

»With Fyrtornet, we've demonstrated that we can absolutely build in wood on a large scale at our latitudes. We're paving the way for wood construction and showing that it is possible to think big and sustainably even in Malmö,« says Gustaf Wennerberg.

Fyrtornet's physical footprint is relatively small so as not to block the flow into the Embassy of Sharing. Instead, the building cantilevers out on the next level up. This is occupied by the new local library which, with its elevated position, will shine out over the square like a lantern. The floors above are offices and taper upwards to open up the view and let in the sun without casting a shadow over the square. At the top of the building, there is a small fan room and a meeting room built with sandwich panels. As this is a product that requires a lot of energy to produce, the panels from a demolished industrial building have been reused instead of them being made from scratch.

The stepped upward design forms large conservatories, enclosed by a double-glazed façade that has 600 square metres of photovoltaic cells laminated into the outer glass. When hit by the sun's rays, they create a dotted pattern that

#### Architect Gustaf Wennerberg **»THIS STRUCTURE HAS PROVEN TO PROVIDE VERY EFFICIENT FLOORPLANS**«

casts shadows on the terraces. Heating is provided by geothermal energy and, as part of the Embassy of Sharing's geo-energy sharing system, excess heat and cold is harnessed and stored for when and where it is needed.

»The original competition brief expressed a desire to bring greenery into the whole area. Thanks to the double-glazed façade, we've been able to create unique terraces with a Mediterranean climate. The idea is that the tenants will be able to use these green spaces both for relaxation and as spaces for growing plants,« says Gustaf Wennerberg.

The entire glass façade rests on a wooden gutter, which absorbs the weight of the facade and also acts as a snow guard. This architectural detail draws inspiration from traditional wooden structures and involved collaboration across several disciplines.

Granitor realised early on that the project would require strong partners, not least to tackle the structural stabilisation of the 11-storey building. The main challenge lay in the irregularity of the individual floors, with the ground floor covering a smaller area than the floor above. The horizontal and vertical loads from the upper floors down to the recessed ground floor therefore needed to be transferred through the timber structure. Granitor initiated a collaboration with the engineering consultancy firm TK Botnia, now Tyréns, which has experience in designing and planning advanced timber structures. Wind tunnel studies were carried out to analyse »



### Meet the architect Gustaf Wennerberg »Wood influences the architectural design«

# **SШISSPEARL**

Gustaf Wennerberg sees wood as a material with huge potential. both for the climate and for the architectural experience.

WOOD HAS a permanent place in Gustaf Wennerberg's toolbox and is a material he returns to time and time again.

»Wood is the building material of the future, and as sustainability becomes increasingly important in construction projects, wood, with its low carbon footprint, has a crucial role to play. I'm convinced that wood is the best and most effective way to reduce the carbon footprint of a building,« says Gustaf Wennerberg.

Working with wood has deepened his understanding of the material's properties and how it affects the architectural design on several levels. In particular, he describes the sensory qualities that wood offers, which are difficult to achieve with other materials.

»I try to make wood a prominent feature in the design so that the materiality can be experienced with all the senses. Wood creates a sense of

presence and warmth that is difficult to achieve with steel and concrete. It's fun to see people stopping at Fyrtornet and touching the wooden façade. A building doesn't get much more sensuous than that, « says Gustaf Wennerberg.

He also emphasises wood's ability to promote collaboration between different engineering disciplines. The flexibility of the material makes it easier to integrate solutions that might otherwise be difficult to implement.

»Wood offers an opportunity to improve building processes by involving other specialists more effectively. Wood construction has definitely been a driver of new working practices, where multiple actors are involved early in the process.«

According to Gustaf, the future of wood construction involves both technical and artistic challenges that could inspire the industry to think in new wavs.

»If we succeed in promoting different building methods and getting more people to think more sustainably through our wood projects, we'll have contributed something that goes beyond the individual building.«



» how the building would be affected by the local wind conditions. The options considered included using concrete for the top two floors, or alternatively installing a 35 tonne steel pendulum for vibration damping. But having to add large amounts of concrete or steel to make the wooden structure work went against the fundamental idea and the sustainability goals of the project.

After discussions with several frame suppliers, the Austrian company Binderholz was chosen to supply the frame, as they were able to construct it with no concrete and a minimal amount of steel. The foundations and basement were cast using concrete with improved climate performance. The frame is made up of around 97 percent wood, which was delivered by train from Austria. Steel is only used in the nodes and in some load-bearing elements.

The relatively small frame module dimensions of 4.8 x 4.8 metre are a positive feature of the interior, both on the public ground floor and in the office spaces higher up in the building.

»This structure has proven to provide very efficient floorplans, despite the short spans. The building has rigid nodes and beams that bear loads in both directions. The diagonal braces running through the building contribute to its rigidity, without the need to add structural elements in other materials. We were also able to build the lift shaft and stairwell in wood,« says Gustaf Wennerberg.

The matter of the installations was another challenge for which the frame supplier had a solution. They developed a timber beam with a bracketing function that was integrated into the floor system and through which the installations could be fed. The solution is interesting on many fronts, not least because it makes it possible to create the same floor height with wood as would be achieved concrete, while maintaining the desired ceiling height of, in this case, three metres.

Moisture management was another key issue for the project, especially as the site made it impossible to put up a temporary shelter. However, the project demonstrates how

#### Fyrtornet MALMÖ, SWEDEN

**ARCHITECT** Wingårdhs **CLIENT** Granitor Properties STRUCTURAL ENGINEER TK Botnia (now Tyréns) FRAME SUPPLIER Binderholz AREA 7,900 SQM **CERTIFICATION** Miljöbyggnad Gold wingardhs.se

weather protection can be approached in different ways. Here, the strategy was to work closely with moisture specialists and to conduct regular moisture inspections. The floor slabs were delivered covered, the columns came with a moisture-resistant wax treatment and all the joints were taped over as soon as the elements had been installed. The straight external walls were built on site in a »field factory« and served as part of the damp proofing, since they were lifted on in parallel with the assembly of the frame. They are covered with 2-6 millimetre thick cedar shingles that have been fireproofed and painted in a shade similar to the classic Falun red

»We discussed the choice of colour over the course of the project and concluded that red was a good option because it provides a certain warmth and materiality. It's also fun that the first thing you see when you arrive in Sweden by train from Copenhagen is a tall, red timber building,« says Gustaf Wennerberg.

Cleantech company 1komma5grad has recently moved into Fyrtornet and describes it as the ideal location for their Nordic headquarters.

»We're trying to achieve a carbon-neutral future and to integrate sustainability into everything we do. Fyrtornet reflects our values while also offering a working environment that promotes collaboration and creativity,« comments CEO Gunnar Jönsson.



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# **IMPRESSIVE PAVILION WITH RESOURCE-EFFICIENT COLUMNS, A GREEN ROOF AND INGENIOUS SOLUTIONS** THAT BLEND IN WITH NATURE

техт Johan Bentzel рното Charly Broyez

in the 1980s by Swiss architect Bernard attracting 12 million visitors every year.

cafés and restaurants.

The latest addition to the park is Le Pavillon Jardins, which opened earlier this year and was built to house the teams responsible for running the park and its facilities. Despite its impressive 3,000 square metres, the two-storey building blends naturally into its verdant surroundings. Wood is the



Facade

a Villette in northern Paris was long the site of the city's abattoirs and meat markets, until they closed down half a century ago. Today, the 55-hectare site is the French capital's largest park, designed Tschumi. With its splendid, idyllic setting, it combines excellent recreational and sporting facilities with a diverse cultural programme, A notable feature of the park is the 26 distinctive red buildings called »Folies«, all of them designed by Tschumi and put to various uses. Some are exhibition spaces, others

dominant building material in a structure framed by a grid-like pattern of primary and secondary beams with an overhanging roof. Slender, four-part columns support the structure both internally and externally.

The site was previously occupied by the Cité Jardin, nine supposedly temporary buildings from 1982. After more than 40 years of use, they were in a serious state of disrepair. The park administration therefore wanted new, more efficient workspaces that would also free up more parkland for the public.

The contract was awarded to the architectural firm Atelier du Pont, founded in Paris in 1997 by Anne-Cécile Comar and Philippe Croisier. They say they were given a relatively free hand to develop the project from scratch, including the interior design, furniture and signage.

»The main idea was to create a pavilion that would be part of the narrative of the Parc de la Villette and its Folies, and that »

#### Architect Anne-Cécile Comar »THE CHALLENGE HAS BEEN TO PRESERVE THE CHARM AND POETRY OF THE PLACE«

» would be totally immersed in the nature and landscape outside. The building sits in a natural setting that has been allowed to grow freely for the past 40 years in the heart of Paris. The biggest challenge has been to preserve the charm and poetry of the place,« explains Anne-Cécile Comar.



Le Pavillon Jardins' two floors revolve around a large central atrium, designed to facilitate encounters and collaborations across professional boundaries. The atrium also acts as a thermal regulator and allows natural light to shine through the structure, which offers panoramic views of the park's abundant vegetation.

**INSIDE THE BUILDING**, there are a variety of workspaces – meeting rooms, collaborative and project spaces, plus individual, collective and open-plan offices – adapted for mobile or office-based and internal or external work groups. This smart micro-architecture, partly composed of movable units on wheels, creates mini-lounges within the pavilion.

The building also has numerous communal areas for relaxation and socialising, including a café, break areas, terraces and a gym.

»The new workplace has been designed as a base camp for 155 workstations within an area of 3,000 square metres, while 5,000 square metres of green space has been restored to the public park,« says Philippe Croisier.

The architectural firm has very consciously followed in Tschumi's footsteps and upheld his intentions. This means, for example, that the height of Le Pavillon Jardins has not been allowed to exceed that of the aforementioned Folies, i.e. eight metres. Flexibility was a guiding principle in the design, and the solution to achieving this while supporting the necessary weight of the floors was to have two interconnected structures. A concrete frame at the base provides strength and mass, while the timber frame around it was chosen for its lightness and low carbon footprint.

»The two interconnected concrete and wooden structures have a 12-metre span, freeing up indoor space. In the future, this flexible building can be adapted for any of the uses for which it's intended,« says Anne-Cécile Comar.

Since the basic concept was to allow the architecture to blend in with the surrounding »







Using the four-part columns made it possible to avoid a single solid column, which creates an airier feel as the light changes with the movement of the sun.

» landscape, wood was a natural choice as the main building material. Wood has a direct connection to nature, as well as the right properties for use in highly sensitive locations.

LE PAVILLON JARDINS has a roof structure of primary and secondary glulam beams in Douglas fir from the Massif Central in France. The façade elements, including the external cladding, are made of larch finished with a grey impregnating oil.

Larch, birch, ash, spruce, oak and poplar also feature inside the building, in its joinery, micro-architecture and customised interior fittings. The staircase is clad with Douglas fir and oak. Most of the wood is sourced from Europe and is largely PEFC certified.

The slender four-part columns supporting the glulam structure are made up of four timber posts joined together in a meticulously designed system. This avoided the need for a single, more robust column, while also lightening the visual impact and being more resource efficient. Combined with the roof system and the photovoltaic roof, the divided columns create a forest-like feel inside the building, which changes with the movement of the sun. This also enhances the sense of

being surrounded by natural elements. »Having wood inside the building creates warm and tranquil spaces. It's a really lovely atmosphere to work in,« emphasises Philippe Croisier.

The project has followed the Paris Climate Plan, and the proportion of bio-based materials far exceeds the threshold for level three of the »Bâtiment biosourcé« quality label used in French building legislation.

In order to preserve and enhance the site's natural heritage and biodiversity and avoid disturbing the wildlife, the project adopted a specific timetable adapted to the cycles of nature, especially during the demolition phases. In addition, 4.4 tonnes of material from the old buildings were reused or recycled.

The design is based around low-tech features: no air conditioning, only natural ventilation, triple-glazed façades, projection blinds, climatic wells and roof overhangs surrounding the bioclimatic central atrium.

A key feature is the vegetation-clad roof that frames the central glazed section with its integrated photovoltaic cells. The green roof is a major contributor to the building's ability to blend in with nature. In summer, it becomes a lush meadow studded with

#### Le Pavillon Jardins PARIS, FRANCE

ARCHITECT Atelier du Pont CLIENT Etablissement public du parc et de la grande Halle de la Villette **STRUCTURAL ENGINEER** Briand Construction Bois

**PROJECT COST EUR 8.4 million** AREA 3,000 SQM

**ENERGY/CERTIFICATIONS** Complies with the Paris Climate Plan, level three of »Bâtiment biosourcé«, labelled E3C1. w atelierdupont.fr

grasses, lichens, legumes, native meadow perennials, repeat-flowering bulbs, annuals and biennial flowers.

It is beautiful but also functional, as the plants manage rainwater, limit heat islands and promote biodiversity.

»We've been designing office space based on the same low-tech principle for years now. We've even explored it for our own office. These solutions work really well and make it possible to avoid technical systems that are particularly costly in both economic and environmental terms.« concludes Anne-Cécile Comar.







### that binds the spaces together.

# Natural interactions when architecture preserves history

The old heritage museum in Bezau, Austria, is where the old meets the new. A thoughtful extension makes the museum ready to step into the future, with the traditional architecture ever present.

техт Johanna Lundeberg рното Dominic Kummer

**DARK WALLS WHERE** the patina has slowly built up over centuries. Sturdy wooden floors that have supported countless feet for just as long. And right alongside, pale walls and floors of locally-grown spruce contrast with the original building in a modern, yet understated, way. Museum Bezau is a meeting of

two architectural worlds in wood. Dark and light, high and low, old and new, all in a thoughtful flow where the contrasts create a dialogue that binds the parts into a single whole, rather than setting them in opposition. The original building has stood here since the 18th century, and parts of it were renovated almost 40 years ago. Now the rear wall has been demolished and more rooms added to allow the local museum housed here to expand its exhibitions.

»The new concept is based on constant movement between the different rooms, and our main goal in the design process was to establish a good connection between old and new, to add a new layer. Our aim was not to create stark contrasts, but rather to make them complement each other. The old part

has its own character, which is actually quite original to the region. The new part, on the other hand, takes the traditional elements and gives them a more contemporary twist,« explains Sven Matt, architect at Innauer Matt Architekten, which is based in the same town and was responsible for the extension.

WHILE THE HISTORICAL section occupies less floor space, its shape and flow are designed to keep it as the main character in the building. The extension is intended to complement the museum, not take over, and it does so with a form that embraces unexpected, yet natural, interactions. The low ceilings - in many places no higher than 1.70 metres, sometimes even lower - in the older section create nooks and crannies, spark thoughts

Interior

and make history a real presence. This could be a dark and suffocating experience, if it weren't for the connection with the new section, whose space and light instead create a gentle flow between the rooms, with long sight lines leading visitors through the different rooms and their exhibitions, complemented by bespoke shelving and window screens.

With the old building ever-present, the ceiling height in the new one is airy and generous, although in several places it is no higher than 2.15 metres – requested by the local authorities to blend in with the original. The architects of the three-storey extension have instead experimented with angles and light, opening the building up in several places from the ground and mezzanine »



» floors to the pitched roof to create extra space.

»Connecting the levels between the old and the new was quite a challenge. But it also gives a pleasing spatial experience. As you walk between the rooms, you know that in one part of the building you have really low and dark rooms, and as you enter the new section where, by today's standards, you initially still have a relatively low ceiling height. But then it's complemented by double-height rooms where volume and lightness rule. There's an interesting exchange between these two kinds of spaces,« says Sven Matt.

Wood is the material used throughout – a deliberate choice in the new part as a way to connect the different eras via a new layer.

#### Architect Sven Matt »AN IMPORTANT ASPECT IS THAT YOU CAN SEE CLEAR MARKERS OF LOCAL CRAFTSMANSHIP«

But while the old section has dark rooms and rough, exposed beams, the new part is whitewashed. This is a traditional technique, based on white limewash, which has been used in the region for a long time, especially on old barns.

»White walls are common in museums as a means of creating more light-filled spaces, and we wanted to use the traditional technique to add a touch of local flavour,« says Sven Matt.

However, it was not a foregone conclusion.

 The low ceilings of the older part meet the different levels of the new part, creating an exciting dialogue between the spaces.
The roof shingles are original, albeit patched and repaired in places.

3. Plan.

4-5. The small decorative holes around the windows contribute to the natural ventilation of the building. On the inside, ventilation windows can be opened when needed. It is usual in the region to leave the wood untreated, and it was only after a long discussion that they agreed on the white interior walls, while leaving the façade untreated.

»These really bright rooms genuinely add to the experience of transitioning between the old and the new. I also like how permeable the limewash is, so you can still feel and see the wood, the rough surface and the knots. It still has a natural feel that adds to the character.

Since the museum showcases local traditions, it was also important to include the local perspective. Both the spruce used in the walls and floors and the ash used for furniture and other fittings come from the region, and local craftsmen built the building.

»I think it's an essential aspect of the

building, that in both the new section and the previously remodelled parts you can see clear markers of local craftsmanship,« says Sven Matt.

Even the ceiling beams, fixed to each other with dowels, are locally made and one reason why CLT was not chosen. The entire museum is naturally ventilated, and on hot summer days, the skylights can be opened to increase the flow of air. In addition, the exterior window surrounds are decorated with small drilled holes that help with ventilation while also creating a pattern. The original building is listed, but as the rear of the building had no restrictions, it

The original building is listed, but as the rear of the building had no restrictions, it was relatively easy to place the extension there. However, the design of the older windows and their shutters has been taken into

#### Museum Bezau BEZAU, AUSTRIA

ARCHITECT INNAUER MATT Architekten STRUCTURAL ENGINEER MERZ Kley Partner AREA 273 sqm including basement wi innauer-matt.com

account and the new ones have been designed in the same way, to ensure a cohesive look.

»It's quite typical of the region to traditionally have a front part for living and a rear part as a barn, and the extension recreates that typology, albeit for other purposes,« says Sven Matt.<sup>①</sup>



# »WE'LL NEED TO COMBINE NEW CONSTRUCTION WITH REUSE«

Climate change has become an increasingly pressing issue in all industries. For Petra Videstorm, Group Manager for Construction at Martinsons, this has meant changing the way we look at what we build and how we utilise our resources. Working processes need to change and we need to learn how to lay the foundations for the future.

#### What led you to work in the wood industry?

For me, there was never any other option than to work with wood after my studies, and it all began with the environment. However, when I look back at the subjects we focused on just over a decade ago, it was more about practical solutions to do with moisture, sound and fire, 3D modelling and industrial construction. Over the years, the environmental debate has sparked into life and become the hottest topic of conversation, and I want to be involved. In another ten years, I want to be able to look back and feel that I took responsibility and that I can be proud of the work I put in to achieve a more sustainable future.

#### Using what already exists – what does that mean?

Put briefly, it describes how we can achieve our climate goals to think about how we can optimise the use of materials while meeting our needs today as well as the unpredictable using various calculation models and known conditions. needs that will exist in the future. I see three main areas that You recently trialled the production of a clickable floor are more or less intertwined: refitting, reuse of building masystem. Is this all part of the same mindset? terials and new construction. Too many existing buildings are Yes, it's an important part of this development. As part of a currently being demolished to make way for new develop-Bioinnovation project with Moditri, we've developed a soluments, but we need to think about how we can preserve and tion that eliminates many work steps while also allowing for adapt them to current needs, using the knowledge we have dismantling, because the connection between the CLT boards today. And where we have no choice but to opt for a newis a »click system« with no need for screws. This is a sustainable solution, in terms of both the climate and the reusability build, we need to plan in how we'll be able to adapt the building in the future while maintaining the structure, and how of the wood material in the future. Sustainable solutions we'll be able to reuse the materials and create new structures come from embracing each other's ideas and having the through demountability. courage to change and develop.

To move in this direction, we need to change – to adapt There is, of course, a problem with reuse in terms of our working practices and learn how to create the conditions potentially reduced sales. What is your take on that? under which changes can be made to buildings in the future. It's about finding a balance between reuse and new production. We're seeing growing interest in wood construction With knowledge of what information is needed during the alongside a need to build more housing in particular, and as design phase to ensure a good end product, we can also identify what information we need to send into the future. things stand today, the forest would be unable to meet this What are the challenges of embracing this mindset? demand based entirely on newly produced wood products. So, Many people might see changing our mindset as a big leap, if we are to replace fossil materials, we'll need to combine and it's in our nature to react negatively to the unknown. The reuse and new production in the future. Once we do that, we'll key is to find a suitable balance in this work moving forward, have our definition of the words circular and sustainability.





Martinson's new »clickable« floor system.

and in these conversations I usually liken the situation to a ball pit where all the balls have to be collected in a sack. It's impossible to pick up and move all the balls at once, but if I take a few at a time, the sack will eventually fill up, but in a more controlled way.

In terms of demountability, historically, humans have been working on this for over 3,000 years by means of various crafts for building wooden boats and houses. Of course, it's unrealistic to think that we'll be able to adopt these practices wholesale, because we don't build on such a small scale these days, but we can draw inspiration from what history has to teach us. Right now, detailed work on different connections is something we need to focus on, but we also need to think about how we can optimise the use of materials using various calculation models and known conditions. **You recently trialled the production of a clickable floor system. Is this all part of the same mindset?** 



# Reinstated details in Feskekörka

Feskekörka, so symbolic of Gothenburg, has been carefully restored. The layers from previous refits have now been chiselled away to reveal the original, complex roof structure.

техт Stina Hagelqvist рното Viktor Göthe

OF ALL GOTHENBURG'S iconic buildings, Feskekörka is probably the one that stands out the most. Its position in the cityscape, the design of the exterior with its large roof and dominant gable ends, the original dormers along the sides with their gables and pointed windows, and the spaciousness and light of the interior have cemented the fish market's importance to the city, alongside sales of fish, of course

A recently completed restoration, led by White Arkitekter, has returned light and space to the building after years of neglect. Since its completion in 1874, the building had been redesigned beyond recognition to meet hygiene standards and increase retail space, while also updating the technical installations. During the restoration, layers of paint and concrete reinforcements were removed to expose the intricate wooden structure beneath

The building, designed by Gothenburg architect Victor von Gegerfelt, looks like an ordinary brick building with a pitched roof. but the timber roof structure is on the more

unusual side. Very much the architect's personalised take on the roof truss, the so-called stave triangle system developed by von Gegerfelt contributes to Feskekörka's architectural and historical value. Feskekörka has been a listed building since 2013, and the stave triangle system is designated as a structure of special historical interest that must not be disturbed in any way.

The structure has two types of roof truss, which rest on the frame's stone buttresses. The first has outer spars from the wall plate to the ridge, underpinned by rafters and cross-braces above the collar beams. The other, which sits over the side dormers, has triangular spars and inner rafters. The collar beam is extended and acts as a ridge for the dormers. While all the surfaces above the ceiling are hewn or sawn, all the visible structural elements are planed for painting. The renovation work revealed that the structural timber was in relatively good condition despite mould growth, but needed to be repaired where rot had occurred at the junction between the wooden structure and later concrete reinforcements.

The stave triangle system defines the architectural form of the building, with the triangle as a recurring element in the exterior and interior of the building - not least in the dominant gables on the ends and sides, the volumes of the interior, the shape of the windows and the roof structure itself. This is a masterpiece of craftsmanship, bordering on

industrial construction using sawn timber, planed all round.

The restoration has been carried out using historical methods, in accordance with the preservation rules applicable to listed buildings. The post framework has been patched and repaired using traditional carpentry methods, with new bolts and threaded rods based on the original models and new timber. Well, kind of new – it turned out that the timber used comes from 180-year-old pines and is thus older than the building itself. In this case, the good age is an advantage because it ensures a large proportion of heartwood. The timber came from a sawmill owner who was going to cut down some old trees and contacted one of the carpenters involved. Existing building elements were used as the basis for making the new ones on site.

The structure is now exposed and the triangular system highlighted with a slightly darker colour compared to the ceiling and walls. Feskekörka's roof is an expressive example of how a timber structure can elevate a design, both physically, spatially and architecturally, and how the architects of the late 19th century worked within the engineering parameters of the time, combining form and function. The roof also demonstrates how wood was well suited to innovative designs at the end of the 19th century and could be used for the most modern buildings of the time.

Stina Hagelqvist works as a building antiquarian and architectural historian at Tvréns

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# Five ways to reduce the climate impact

The construction sector has a major impact on the climate. But is building with wood enough to reduce the carbon footprint of buildings? In Copenhagen, a prototype for a future neighbourhood of singlefamily homes has been built, showing that it is not only the choice of materials that matters, but also how we think about residents' needs.

техт David Valldeby рното Adam Mørk

OVER A PERIOD of several years, Velux, a manufacturer of rooflights, has conducted studies with the architectural firm Effekt on how to reduce the climate impact of construction. At the 2023 World Congress of Architects in Copenhagen, they presented the results of their research by erecting seven prototype buildings, Living Places, in Jernbanebyn. The former industrial area, located next to the railway, is set to become a mixed neighbourhood with housing and offices in the future. While the buildings served as an exhibition. this summer the two residential buildings were occupied by temporary guests - a popular initiative that also made it possible to collect concrete data on the functioning of the indoor environment.

Prior to construction, a working process called transformative partnering was developed. This brought together all the stakeholders, from the client, architect and designer to consultants, contractors and residents - and everyone involved got to contribute to the project without any preconditions. The ideas and knowledge that emerged became part of the design and the prototype. The average Danish single-family house has a climate impact of 11.1 kilograms of carbon dioxide equivalents per square metre per year. In the prototype, the group was able to reduce that figure to 3.85 kilograms. To achieve this, they identified and implemented five principles

The first was to reduce the impact of the construction on health. The project focused on using materials that emit as little volatile organic compounds (vocs) as possible. A mix of direct, diffuse and indirect daylight was used to cut the need for lighting and help the body follow its natural circadian rhythm. Mechanical ventilation was also combined with larger openings between floors to ensure good airflow, which required carefully calculated sound insulation. To create a clear connection with nature, the outdoor environment needs to be designed to encourage residents to go outside, for example through patio doors next to green spaces. The idea is to create opportunities for mental recovery from stress and exhaustion, resulting, for

example, in a mix of fewer closed spaces and more communal areas on each floor. And compared to the class 3 that the standard Danish house achieves for the indoor environment, the houses in Living Places achieve class 1 (referring to factors such as daylight, ventilation and noise).

The next principle is about sharing things such as outdoor spaces and gardens. Removing fences and hedges provides better conditions for contact between neighbours, which in turn contributes to a sense of community, while reducing the individual's carbon footprint and space requirements. This can significantly increase population density, which is important in many countries. According to the studies, it also brings additional benefits such as improved well-being, less food waste and reduced care needs.

Construction also needs to be simplified through prefabrication and standard modules. Where ground conditions allow, the foundations are built using ground screws. Lightweight building elements are used - either in a post-beam structure or as CLT-based wall units. Standardisation makes it easier to repair and reuse components, but also to replace parts with new building components. The principle of simplicity also applies to the separation of technical and building systems, which makes it easier to install, repair and maintain the technology. Solar panels with battery storage, smart water solutions and energy-saving methods are also used.

**ONE OF THE** more important principles is adaptability. Anything from student flats to apartment blocks can be built using the same construction system. The components are the same, it is just the number of parts that varies. The idea is that it should be possible to scale both up and down, i.e. buildings should be divisible and easily moved to other locations if desired. But it should also be possible to expand them over time. The scalability and simplicity of the model also makes it suitable for use in extending existing buildings upwards, known as timber on top. Living Places' design highlights the strength of the idea, where the simple forms





of narrow, tall buildings with pitched roofs that stretch down over two floors create the feel of a modest house despite a living area of 147 square metres. The decked area from the bike park and service buildings to the homes, greenhouse and communal areas ties the site together in a cohesive whole. In this particular case, the prototype is partly built on top of old railway tracks, which also reflects the notion that the system should be easy to build. The atmosphere inside the buildings, with good air, pleasant light and as much exposed wood as possible, creates a cosy feeling. At the same time, the combination of the ventilation solution, with the three-storey house open to the roof ridge, and the private spaces and seating alcove with a view of the greenery outside, makes the house feel both generous and intimate.

If the project were to be planned today, the carbon footprint could be reduced by a further 30–40 percent, thanks to newly developed industrial wood products that allow for prefabrication and stimulate a good indoor environment.



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via terraces in different directions

# Outdoor contact on three levels

A surprising inspiration and a refined material. The three-storey waterfront home stands out in several ways, with the tricky plot also helping to define its shape.

техт Johanna Lundeberg рното Johan Dehlin

AT FIRST GLANCE, you might think it was an office block. The repetitive windows and the façade design in white-stained pine are much more reminiscent of a typical office than of a private home in Sweden.

»This project is really about two things. Firstly, the fact that we've taken the typology of the office block and applied it to a home. Secondly, the material – being consistent and doing something with pine, an often misused material that changes character here and becomes attractive.«

So says Erik Kolman Janouch, architect at Kolman Boye, who designed the house in Nacka outside Stockholm. All sides of the façade have a strict form and are almost identical. He concedes that of course a large panoramic window could have been added to the

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top floor, but then the look would not have been as strong.

»The inspiration for the shape came from city office blocks and buildings, which are built tall because of a lack of space. They tend to have very large façades, and they are often completely repetitive because the same type of function lies behind all parts of the façade.«

HERE TOO, IN a ravine next to the water, the site conditions have played a role. When the time came to replace a small, dilapidated holiday home, the decision was made to build upwards and allow the three storeys to rise up the cliff. The design also made use of the existing terracing, a historical relic that helped to inspire the project and thus link the house to the natural site and the adjacent cliff. But the setting was initially not particularly inspiring. The plot sat deep in the hollow, facing completely the wrong direction. It felt damp and dark, and the conditions were quite complicated.

»The house needed to be raised a bit so that the owners wouldn't have to spend their »





» days completely in the shade. We rarely blast away rock, but we did so here to make better use of the average ground level and thus take the building higher to accommodate three floors,« says Erik Kolman Janouch.

At the time, there were no other buildings around the house to take into account. Today, one of the two neighbouring plots just below has been developed and the other is at the planning stage, which has made the height of the house extra important in order to maintain the view from the third floor and avoid being overlooked. Where once there was just a footpath, a road now reaches right up to the boundary of the plot, where the steps begin.

But it is not just the simple office design that stands out. The material - pine throughout – is a tale in itself.

»The material, and its consistent use, makes the house notable. It's a way of showing how to push the boundaries of what can be achieved.«

Pine is both a widely used and reviled material in Swedish homes. Although it has several advantages, such as being a cheap wood and not needing to be imported, it

often brings to mind the yellowed and heavily varnished walls of the rumpus room. This creates a problem for anyone wanting to use this kind of wood for an entire house, admits Erik

»With many projects, the problem is that you have too many different materials. You think you're making it stronger, that you're adding something, but too many materials make it weaker. Every time you add a material, you have to ask yourself what it brings to the project. We tend to work with a limited number of materials and colour schemes on every project, but here it felt like it would be too much to have pine everywhere.«

A FEW YEARS ago, Kolman Boye Arkitekter was involved in a project to enhance the appearance of American cherry wood by gently staining it and giving it a waxed finish to bring out the colours without making it deep red and glossy. Based on the lessons they had learned, they decided to refine the material for this project: all the visible pine would be knot-free.

»We've worked a lot with Douglas fir. which is much more knot-free, so we had the

- 1. Removing all visible knots has allowed the interior to make extensive use of white-stained pine, for a warm and discreet
- 2. The site conditions helped to shape the design. For example, the house needed several storeys to avoid being completely in the shade
- 3. The repetitive design language is more reminiscent of an office block than a dwelling, and the uniform material use also carries through to the interior.

idea that we could experiment with ordinary pine and saw off the knots,« says Erik Kolman Janouch.

The offcuts were then used in places where they were not visible, i.e. inside the structural elements, including in the CLT. Whatever was left over from this project has since been used

in other buildings. It took time, as Erik will be the first to admit, but the result was as good as he expected.

»It turned out very well indeed. I don't know if it's economically viable to do this, but it does show that you can take a material and develop it into something that is very different from what you had originally. And that's something we'll take into future projects – that this transformation is both fun and exciting.«

Erik Kolman Janouch believes that going knotless was the key to using pine, as otherwise the now elegant house would have turned into one giant rumpus room.

»You enter through a façade of pine. Then you're greeted by pine inside, in the staircase, on the walls, in the doors, even the bathroom cabinets are made of pine.

Everything is done in the same way. We couldn't have created this shape and this volume if we hadn't upgraded all the pine, because it would have looked crazy. The focus would have been on the knots rather than what looks interesting and beautiful.« Instead, they have been able to stay consistent and minimalist in terms of the number of materials. The interior basically uses only three materials: pine, glass and poured resin flooring that discreetly breaks up the wood. The pine has been stained white, both

inside and out, to maintain its subtle appearance.

**FROM THE UPPER** floor, the view extends in all directions, without being overlooked. The social areas, such as the living room with its fireplace and the kitchen, are all up here, while the bedrooms and other private areas are downstairs. The light entering from four directions and the skylight creates a welcoming, open space. When it comes to the interior, Erik Kolman Janouch is most pleased with the staircase that runs between the floors. The railing is made of two layers of pine planks that transition into a cupped

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ARCHITECT Kolman Boye Arkitekter STRUCTURAL ENGINEER Algeba Byggkonsulter **CLIENT** Private AREA 180 SOM COST SEK 10 million w kolmanboye.se

handrail. On each level, the opening from the staircase is V-shaped, and the very top features a lantern, as deep and wide as the staircase, which draws light down into the stairwell. The opening in the floor is slightly smaller here, so you can get round the staircase at the top by the kitchen's tall cupboards. The staircase has an elegant, curved shape at this point to avoid people hitting their head on the floor.

»Alongside the unusual shape for a private residence, the consistency of the materials used is what makes the house stand out. I think the clients were quite surprised, because they didn't get the standard house they might have expected.«①

In Praise of Shadows Architecture A Line of Thought



PARK BOOKS

In Praise of Shadows Architecture - A Line of Thought Edited by Fredric Benesch, Katarina Lundeberg Park Books (Eng) 978-3-03860-380-1

Architectural practice In Praise of Shadows describes the background to the title of their book A Line of Thought like this: »A thought or idea never develops into a project in a straight line. For us, architectural knowledge is not just generated in the studio; it must be gained in dialogue with actual materials and building techniques on site, and it is important for us to maintain the idea from concept to realisation, so that it remains legible once the project is built.« And when reading through the projects, the clear idea is apparent, in each project, but also in the four chapters that the book is divided into.

The preface »Encompass Darkness«, written by Elisabet Yanagasawa, also draws a strong connection with a Japanese aesthetic that can be read not only in the architects' stripped-down lines, but also in their relationship to



materials and material transitions. Throughout, we come across well-chosen photos, appealing details and, where appropriate, illustrative drawings. The texts describe in detail the considerations and decisions on which the architecture was based – about the materiality of the site, the materials themselves and how the ma-

terials in turn interact with their surroundings. A Line of Thought is printed on a very soft, fine paper that matches the studio's work, but it also creates a minor problem. In smaller images, the structure of the material dissolves into a slightly indistinct graininess. v park-books.com



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