

NEWS



On our way to net zero

Dear Readers,

Another extraordinary year is behind us. We are very thankful to have been able to navigate the past few months successfully despite turbulent world affairs and timber markets. We owe this, first and foremost, to our loyal customers, but also to the hard work of all our team members and the good fortune to be working in a growth sector. Many factors indicate that timber construction and wood as a building material and energy source will continue to flourish. So I am delighted to present to you here some of the ways we work with timber as a raw material.

On our way to net zero

Sustainability has been central to our operations here at the Lehmann Group for many years. A closed timber life cycle, the shortest possible transport routes, and full utilisation of the roundwood logs we receive are daily practices at Erlenhof. We want to go even further and step up our active efforts to reduce carbon, for example, with new semi-finished products, building concepts, and services that deliver additional value for our clients or by optimising our internal work and production processes and logistics. In terms of energy, we are now already well on the way to net zero. Our biomass power plant at Erlenhof produces 7,000 MWh of power, which covers 52% of our operational power needs. We are already generating 43,000 MWh a year via fully-renewable sources – all the thermal energy we require to dry sawn timber, produce pellets and heat buildings. Yet our waste timber doesn't just go to the power plant to be burned. We also use it to produce 37,000 tonnes of pellets a year, which equates to around 10% of the Swiss pellet market. In doing so, we supply around 10,000 Swiss households with renewable heating fuel.

Growing demand for pellets

The demand for pellets for heating purposes has always been on the rise. The movement towards replacing fossil fuels and the high cost of oil and gas have further fuelled demand this past year. The crisis in Ukraine has also highlighted to private homeowners, investors, and increasingly also to commercial and industrial operations how heavily Switzerland depends on foreign energy producers and suppliers. The demand for alternative energy sources will therefore continue to grow. This requires us to adapt our production of pellets from Swiss timber to the growing market and to invest further in the expansion of our capacities.

Investments in sustainability

We also want to do more for climate protection through investment in the development and production of semi-finished products with as few resources as possible, in the circularity of our timber construction solutions, and in innovative building systems. At the same time, we are committed to minimising our space requirements in-house as well. Our high-bay warehouse



is a current example of this commitment. We are also working at full speed to enhance our equipment and processes in order to optimise our energy requirements and use of raw materials.

Thoughtful sustainability

Something else we have been working on is how to reasonably measure and document these contributions to climate protection without additional administrative effort or adverse effects on operations that are already running sustainably. Around the world and across Switzerland, countless regulatory frameworks, instruments and incentives are now being set up to measure attainment of set climate objectives. Yet market interventions can also commonly result in distortions, which need to be borne in mind. A few undesirable developments have already been observed in the context of climate instruments, for example, in the way that the forestry sector and timber value chain are

We are committed to continually optimising how we use our valuable raw material.

viewed separately by climate instruments. In terms of the overall impact of contributions made by sequestration*, storage, and substitution across the whole forestry and timber industry value chain, this could lead to potential issues. Individual groups, for instance, are working to protect forests against active management in order to achieve, in their view, the best consequences for the climate – in other words, the largest carbon sink effect. This poses a threat to the

timber industry and to the entire timber value chain that should not be underestimated. The supposition it relies on is both too short-term in its focus and incorrect in terms of overall impact. A well-utilised forest has the very best long-term effect on the climate!

Immerse yourself in the many ways we make an impact

In this edition of NEWS, we shine a light on specific issues in forestry and the construction industry relating to climate change. And as always, we also present a

The potential of timber as a locally-sourced raw material is far from being exhausted.

selection of timber construction and silo projects we have carried out over the past year. We have once again been able to demonstrate the versatility of our chosen material in a range of building projects. Depending on the focus of each, we are confident that all requirements were met with technological, aesthetic, and financial excellence.

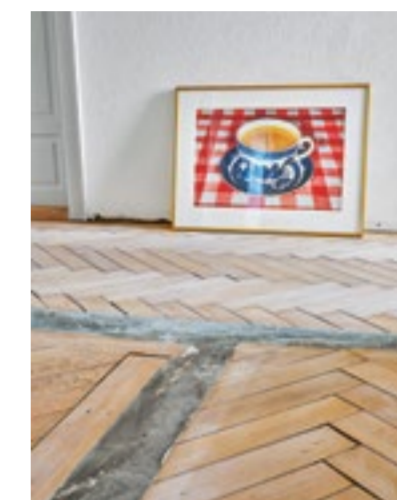
Timber is gaining in recognition – which is a good thing. Yet there are still many unresolved issues that we should be addressing as a society and as a company. We are delighted to be part of this movement and to be using our expertise to make a positive contribution to the development of the entire timber life cycle.

Immerse yourself in the world of the Lehmann Group and find out more about our sustainable timber life cycle and our exciting building projects.

We hope it's an inspiring read.

Katharina Lehmann
CEO Lehmann Group |
Delegate for the Board of Directors

What you can look forward to in this edition of NEWS:



Practical solutions facilitate sustainable construction. Examples include the design for disassembly of a multi-use building in Duden or the conversion of a block of flats in Rorschach for reuse.

Discover this and more in the Timber Construction issue

There's a lot happening in the world of forests and timber. How is climate change impacting forest management? What is happening in the timber market? And what potential does wood really have as an energy source?



Discover this and more in the Wood Processing issue



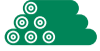
Silo construction always reaches great heights. But aspects of silo construction other than capacity can also contribute to efficient winter services. We interview a silo operator and present some facilities in Switzerland, Germany and Austria.


Discover this and more in the Silo Construction issue


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Photo © Annie Spratt (unsplash.com)

*Sequestration = carbon capture and storage

 In 2021, we produced 7,000 MWh of power and 43,000 MWh of process heat in our in-house wood power plant.


 A total of 703 room modules were produced in 2021 in our two factories in Switzerland and Germany.

 Our service and maintenance team looked after and monitored 455 timber silos and 121 pneumatic facilities in 2021.

TIMBER IS WHAT DRIVES US - EVEN TO YOU!

Our first electric vehicle for client and site visits has been on the go since late last year. We also saved around 144 tonnes of CO₂ in 2021 with our eight electrically-powered side loaders.



 In 2021, our assembly specialists worked on building sites in Switzerland and Germany, Austria, Luxembourg, Denmark, South Korea, Saudi Arabia and India.



Investment continues

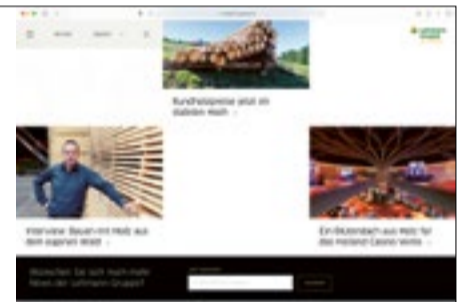
Building work continues apace in and around our Swiss operations base at Erlenhof. The new stream course for the Loobach waterway has been excavated and is now awaiting water, which is definitively set to flow in May. This will improve flood prevention for our operations. The stretch of water and the biodiversity it contains are also of significant environmental benefit, and it secures more space for our wide range of timber-related activities as well. Erlenhof is not only a major draw for architects and people interested in timber from around the world – it's also a place of work for more than 350 employees.

We are really feeling the increased demand for timber structures and timber construction expertise, not least at our branch offices in Germany and Luxembourg. Our sales and development teams in Luxembourg and in the German town of Grafschaft near Bonn have grown considerably over the first year since starting up. We are also continuing to invest in optimising facilities at our German production sites.

DIGITALLY INFORMED

If you would like to stay updated about the latest projects and developments across our different divisions throughout the year, please register online for our e-newsletter.

lehmann-gruppe.ch/en



RECOGNITION FOR LEHMANN HOLZWERK

Lehmann Holzwerk was presented with not one but two awards in the course of 2021. One for voluntary participation in the programme run by the Energy Agency of the Swiss Private Sector (EnAW); and again for our commitment to climate protection. A further milestone achieved this year was certification for our building product: construction timber sorted by strength for load-bearing purposes with a rectangular cross section for buildings and bridges. This makes us the first firm in Switzerland to produce and supply high-strength sawn timber (T18, T21, T22 and T26). The certificate of conformity for the product was issued by the CE certifying body Holzforschung Austria.

TIMBER CONSTRUCTION ENGINEERING



Blumer-Lehmann AG

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No. 14 2022

Room for innovation

More on page 9 about the coworking space
that was once a fire station



Building today for tomorrow

As the effects of climate change become noticeable, sustainable construction is growing in importance. Use of limited resources demands foresight as well as new solutions and construction methods. It also brings timber to the forefront as a future-proof construction material.

Building sustainably begins with the idea for a building and includes its construction and materials. Life cycle utilisation of buildings should be core to considerations from the outset and also provide solutions for 'afterwards'. How flexibly can a building be adapted to changing requirements for use over time? What happens to the structure when it has outlived its use? Can a building perhaps even be moved to a different interim location and fulfil other requirements there? The thinking done at this stage determines which materials come into consideration for the building and its construction. Anyone who plans sustainably will find solutions in timber as a construction material for this kind of building. Using this renewable building material reduces energy requirements over the entire life cycle of a building – in other words, for manufacture,

lute paradigm shift in terms of aesthetic appreciation. Where naturally aged wood used to be deemed unattractive, we now think of features such as a weathered facade as authentic.

Timber has future relevance

Material cycles, reusability, recycling potential – in sustainability terms, timber performs well in many areas. Construction that uses timber as a renewable natural material and carbon store ensures the building has a good life cycle assessment. This building material also fulfils today's construction requirements with tried and tested properties and modern timber materials. In addition, timber wins the financial argument hands down and is highly versatile: the use of digital planning and high levels of factory prefabrication of structural elements or components increases productivity and ensures consistently high quality. And there's more: by planning ahead, a building can even become mobile as necessary.

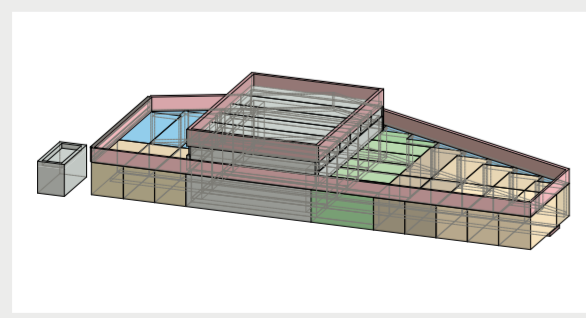
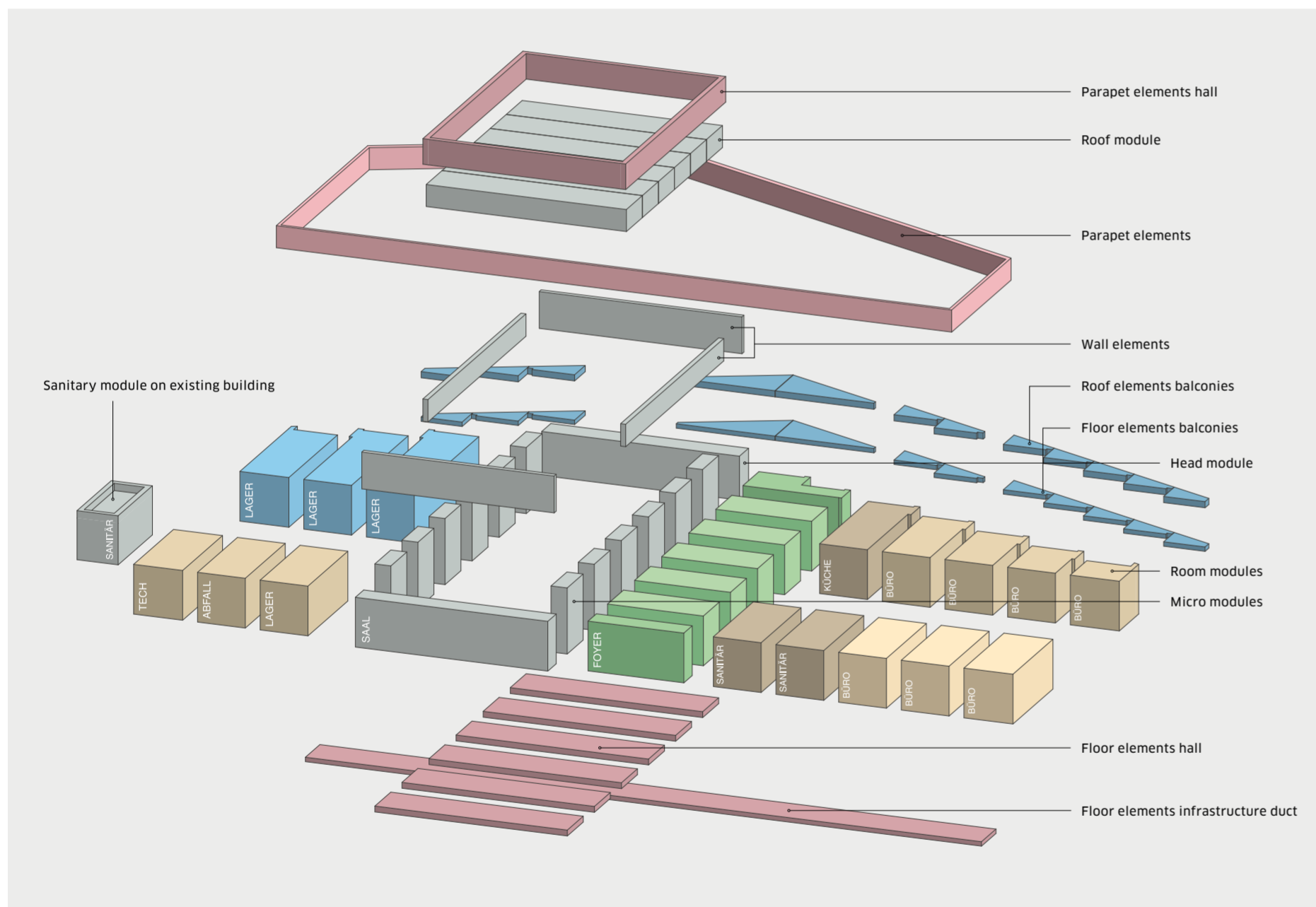
Expand and repurpose existing structures

For conversions, extensions and renovations – for example, where statics set limits – another benefit of timber often shapes the design: its low weight. Timber designs open up new possibilities for annexes, extra storeys, and building extensions. This creates more, higher-quality utility, work and living spaces not only in residential buildings, but also in large-scale industrial buildings, commercial structures, or office spaces. Particularly in urban areas where space for new buildings is scarce, short construction times can densify gaps and wasteland for a range of uses.

Building with timber ensures a building has a good life cycle assessment.

In sustainability terms, timber performs well in many areas.

transport, assembly, and disposal or further use. Additionally, much has changed when it comes to fire safety, the ageing process, and structural wood protection in timber construction. Innovative timber materials open up new possibilities. And there has been an abso-



An exemplary 'design for disassembly'

In Dudelange in Luxembourg, FAT Architects have designed a sustainable multi-use building following the principles of 'design for disassembly' and 'cradle to cradle'. Made from timber modules and prefabricated timber elements, the building was planned for use in two locations from

the outset. The structure in the centre of town will serve local club and association life for around eight years. It will then be disassembled without a trace and reinstalled in the 'NeiSchmelz' district.

More information on this multi-use building on page 16

© Plans: FAT Architects SARL

Vocabulary of sustainable construction

THE CONCEPT OF DESIGN FOR DISASSEMBLY

... is a building design process that takes into consideration the entire life cycle of a building, including future changes and disassembly. This makes it easier to recover systems, components and materials and ensures that the building is recycled as efficiently as possible when its service life comes to an end.

CRADLE TO CRADLE

... is the principle of full recycling and takes its lead from the cycles of nature. The aim is to reuse or recycle all construction materials so that no waste remains.

EMBODIED ENERGY

... refers to the primary energy required to construct a building. This includes the energy needed to acquire materials, produce and process components as well as to transport people, machines and materials to the construction site, to install the components, and ultimately to dispose of them.

FUTURE-PROOF BUILDING CONCEPTS

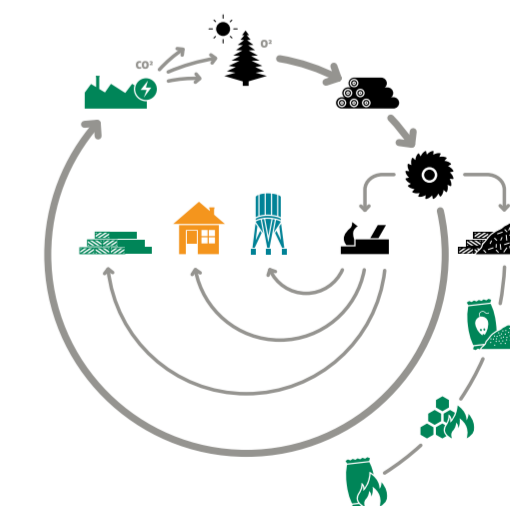
... consider tomorrow as well. Planners have a special responsibility to create enjoyable and high-quality spaces that meet the needs of people and the environment and that last for a long time. This is why sustainable construction calls for holistic approaches to building that favour resource-conserving and environmentally friendly materials and take into account the entire service life of a building, even beyond its disassembly. In doing so, sustainable construction puts the spotlight more and more on timber construction.

SUSTAINABILITY

... is much more than the energy efficiency of a building. The term originally comes from forestry and has always been closely linked to timber construction: cutting down only as many trees as will regrow ensures that the forest remains available for future use and retains its value over time. The term now denotes the lasting and future-proof development of economic, ecological and social dimensions of human existence.

IN A CIRCULAR ECONOMY

... products and materials are kept in circulation and are used for as long and as fully as possible; this spans the production of raw materials, the design and the manufacture of a product, which is used for as long as possible before being recycled.



Cascading use of timber as a raw material, as demonstrated by the Lehmann Group. To find out more, go to lehmann-gruppe.ch/fascination-of-wood

Like a construction kit with reusable materials

‘Instead of demolishing and starting again from scratch, we build on what is already there.’ So goes one of the principles of Baubüro in situ, who designed the sustainable conversion of an apartment building in Rorschach dating back to 1914. Blumer Lehmann carried out this sustainable conversion as joint general contractor in constructive collaboration with all parties involved in the build. The unusual and ambitious element here was that existing, overlaid, or now unused materials and features were harnessed to create new accents.

Meret Hodel, an architect at Baubüro in situ who was involved in the conversion of this apartment building in Rorschach, tells us about its resource-conserving design.

Meret Hodel, what conditions need to be met for a conversion where materials and components are reused?

MERET HODEL It’s important that the client and other parties to the project are motivated and ready to get involved in the process. In this project, it was lucky that the clients actively approached us and were excited about getting involved in the planning process. Everyone needs to be open to ideas and look for solutions together. Additionally, it helps when a building dates back to a construction period that used high-quality materials and features.

How important are materials for conversion projects?

Materials are the substance we work with and hence dictate what we are able to do. The material has to serve in some way – it needs to be resilient, so it can be changed and transformed. High-quality, pure materials can be revived and composed. And of course even better if they are mechanically fixed rather than glued or concreted in. For any structural elements that we need to produce afresh and can’t create from existing material, we use biobased materials such as timber. It regrows, is straightforward to process, and is – where needed – easy to dismantle later.

How is a reuse conversion planned and implemented?

We prioritise the process. This includes how we handle the existing building, the place, the people, and the suggestions they bring to us. The way we approach it is to first try to grasp the potential of a building and identify its qualities. For the Rorschach conversion, we wanted to retain the varied floor plan situation. We then move from overall qualities into the details and continue to define what can be accentuated and augmented. This might be well-preserved windows or attractive parquet flooring. We look at what is there like it’s a construction kit and decide what we will reuse where.

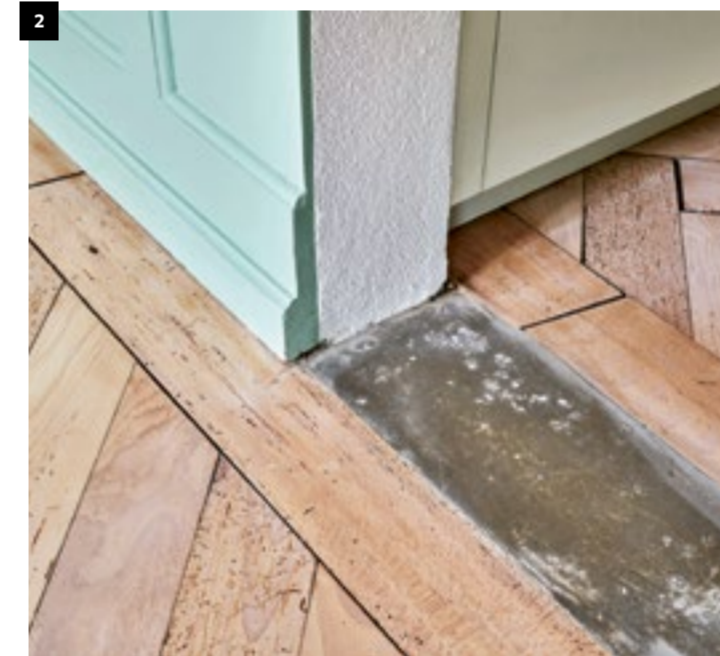


Is it worth it, financially and in terms of effort, to reuse materials and components?

There’s a comparison we like to use: building with reuse is a bit like bioproducts. It shows that we can build with reused and recycled materials and it represents a sustainable approach to construction. It is, however, not cheaper. To achieve this, we need to further define the processes and grow our network with professional tradespeople and businesses to help things flow more seamlessly. However, sustainability

When you work with the existing structure, you save a lot of grey energy and you always end up with a better energy footprint than with a new build.

is something people are tackling in all areas nowadays. And in construction, the leverage effect of this is enormous. Building contractors and investors are well aware of this. Added to this is that many people no longer want to live and work in bog standard buildings. Instead they want unique buildings that have a story to tell.



What were the challenges in the Rorschach project?

The cap on cost was set from the start and created a fixed framework. And then there were a few surprises, as there are for every conversion: an example being the unstable masonry in the cellar. For this and for other tricky areas, we needed to work together to find affordable solutions. Ultimately the conversion was a success and the clients are very happy. Nevertheless, in process-driven architecture it’s important to meticulously define the interfaces between client, planner and contractor and to organise these clearly in the planning and construction process.

→ To find out more about this recycling conversion project, go to: blumer-lehmann.ch/recycled-apartment-building

- 1-2 Traces of the past are retained and are signs of the house’s history.
- 3 The kitchen is opened up to connect with the living space.
- 4 The three-family dwelling built in 1914 was given an arcade and an open stairwell.



- 1 The new Carmennahütte with self-service restaurant and herders' dwelling.
- 2 The herders' dwelling provides accommodation for people working there in the summer.
- 3 Functional and flexible: the dining area of the self-service restaurant in solid timber.
- 4 At one with its surroundings in construction, material and form.

Swift construction on the Carmenna alpine pass

The Carmenna alpine pass in Arosa and the Carmennahütte started to be used for tourism in the winter of 1970/71. Around ten years later, this was joined by summer tourism that ran parallel to alpine farming with 120 cows. An ever-increasing footfall from restaurant visitors meant the Carmennahütte had to be constantly extended and expanded. The co-existence of alpine farming and tourism was an ongoing source of challenge. The new Carmennahütte is built in timber with a self-service restaurant and herders' dwelling, and finally offers enough space for visitors and workers on the mountain.

Until recently, the Carmenna alpine pass was the only mountain in Chur without proper accommodations for the people working there. This all changed with the new building that was finished in the autumn of 2021. The standalone timber structure has a single-storey section for the self-service restaurant and a two-storey section for the herders' dwelling. Nestled gently into the slope, the building dovetails perfectly with the existing structure as well as the surrounding scenery. Blumer Lehmann was responsible for planning and executing the timber build on behalf of the client, Bürgergemeinde Chur. Consistent use of cross-laminated timber (CLT) and high levels of factory pre-fabrication kept construction time on the Carmenna alpine pass at 2,000 MASL to a minimum.

Flexible interiors with exposed timber

The surfaces of the CLT panels were left exposed for the walls, ceilings and roof. They give the new building a cosy yet modern appearance. The interior of the self-service area was also fitted out in solid timber. To use it as a hall, it can easily be separated from the self-service counter with shutters.

Sophisticated architectural concept

The building was designed by architecture firm Studio O in Chur. Their 'Eugenia' project proposal impressed the jury in the initial stages. The evaluation criteria were defined in detail. Core to the appraisal were the requirements for later use, the architectural concept of embedding the structure into the landscape, environmental aspects, use of materials, and the schedule given for completing the building.

Sophisticated layout concept for a range of users.

From an alpine farming point of view, the new building means processes are now ideally set up and the private area of the alpine accommodation is well separated from the self-service area. This will make farming on the mountain much easier in the summer, and the people working there will enjoy the modern yet cosy living quarters built in timber.

→ For more information on this building, go to: blumer-lehmann.ch/carmenna-restaurant

THE CHUR ALPS

Since the early modern period, Chur has had access to extensive alpine landscapes in Maladers and Haldenstein, at the far end of the Schanfigg valley and Oberhalbstein. Some of these still belong to the civic community of Bürgergemeinde Chur. However, since 1874 the political municipality of Chur has been overseer of these alps. The department responsible for forests and alpine areas within the local administration takes care of their proper management. They are advised and supported in specific issues by an alpine committee. During the alpine season, from around mid-June to mid-September, roughly 18-20 people work on the various alps.





Wattwil sports facility in Toggenburg timber

The new triple sports hall has space for 1,200 spectators and will be the flagship for the new Rietwis sports facility in Wattwil. In this unparalleled lighthouse project in the canton of St.Gallen, timber plays a central role both in the appearance as well as the structure. The sports facility is scheduled to open in the autumn of 2022.

As the ARGE consortium together with Abderhalden Holzbau AG and Bleiker Holzbau AG, Blumer Lehmann was awarded the contract in a public tender process to plan and implement the new sports hall and its associated multipurpose 'Flexzone'. ARGE also carried out the interior and exterior timber cladding on both buildings.

Local, functional and very aesthetic

The sports facility was designed by Cukrowicz Nachbar Architekten ZT GmbH in Bregenz. Ghisleni Partner AG were responsible for overall management of the build. The cuboid sports hall is reminiscent of a container with a lid and is recessed into the ground to make it restrained in both size and design. In the upper part of the hall area, windows run all the way round to open up the hall and allow views both in and out. The entire roof construction on top of this – the 'container lid' – is clad in a filigree vertical, natural facade in silver fir.

Native wood from Toggenburg

At the eleventh hour of construction it turned out more of our timber expertise was required than was initially thought. A change in parameters made by the client just after the contract was awarded meant that the building needed to be certified with the HSH label for Swiss wood. As a result, the wood for the Flexzone support structure as well as the external and internal wall claddings now needed to be sourced from forests in Toggenburg and be cut in local sawmills.

This required our project team to act quickly and carry out precise planning to acquire the necessary amounts of timber in the right grades. By working together with Toggenburg foresters and the sawmills involved, they were able to ensure right at the start of the project that enough wood in the necessary lengths and grades was cut and processed before the logging season in winter was out. The effort expended by all involved made it work: the Toggenburg timber was ready for use in time for production to start.

→ For more information on this building, go to: blumer-lehmann.ch/sportshall-wattwil

Soothing hospital design in Münsterlingen

From the autumn of 2022, the newly constructed 'Haus T' at Münsterlingen hospital will provide three psychiatric care wards with twin and single rooms. The ingenious new building in a timber design has flexible spaces and offers comfortable rooms with the soothing atmosphere created by exposed timber.

The outward design of the four-storey 'Haus T' deliberately departs from the typical appearance of hospital buildings. The timber facade in particular with its diamond-shaped adornments is a powerful aspect of the building's autonomous character.

A timber construction design was already stipulated as a criterion of the competition, as the foundation of an economically and environmentally optimised project. It also means the building project leads the way in continuing the Thurgau tradition of building in timber. We were brought on board as an exclusive partner for timber construction by the full-service contractor Frutiger AG and were already able to contribute our timber construction expertise in the planning processes.

The ground floor and central building core with stairwell and lift are built in solid construction. Another three floors built in timber mean the new building delivers the flexibility of use required. Very little effort is needed to convert the spaces for use by other specialisms such as acute or geriatric psychiatry.



The modern and sophisticated timber structure links into the timber construction tradition in Thurgau. Patients will feel at ease in the newly built 'Haus T'.

→ For more information on this building, go to: blumer-lehmann.ch/sportshall-wattwil

New ideas in an old fire station

On behalf of general contractor HRS Zürich, we transformed the fire station on the site of Switzerland Innovation Park Zurich into the coworking space 'Büro Züri Innovationspark'. In this space, the Zürcher Kantonalbank offers startups, spin-offs and young enterprise modern workspaces and infrastructure to develop their ideas and visions.

A model of sustainability both in its construction and operation, the project – designed by Dario Wohler Architekten – fulfils the sustainable development goals of the Innovation Park situated on what was once an airfield.

Extraordinary timber girders as underpinning idea

Use of timber construction for the conversion was established from the outset, and very early on we introduced what was literally an underpinning idea – a striking timber girder structure. This creates a harmonious connection between the supporting framework,

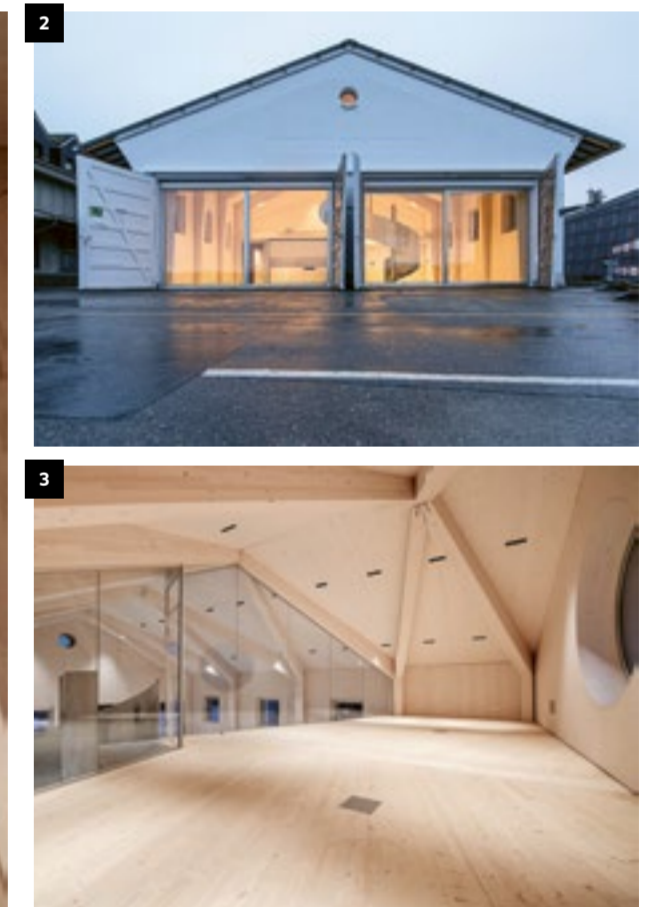
ceiling and walls made of visible timber with floors in exposed concrete. The attractive roof girder structure as supporting framework together with the roof elements, outer walls and built-in suspended ceiling were constructed as a standalone building within the existing outer walls. This unusual solution also fit with the client's request for an exceptional building.

Innovation thrives in a snug environment

A total of 170 m² of office space with 16 workspaces, meeting and workshop rooms, a kitchen, social area and storage space are available to up to six young

enterprises for at least a year. Alongside the infrastructure, they can also take advantage of services to help with formation issues and startup development as well as other expertise. Pioneering ideas are the order of the day. The comfortable indoor conditions with lots of exposed and perceptible timber are sure to create an inspiring working environment and – who knows? – may help an idea or two take flight.

→ For more information on this building, go to: blumer-lehmann.ch/firestation-duebendorf



- 1 The exposed timber girder structure was the starting point for the architectural design.
- 2 The outside of the former fire station building was retained. A standalone timber structure was built inside it.
- 3 A workshop space with timber interior is ideal for brainstorming.



A north star points the way

The new 'Nordstern' (north star) on the Krombach site in Herisau will shine out like a guiding light and welcome visitors through open doors. As part of a single-stage general contractor competition, Blumer Lehmann was awarded the contract to execute the visitor and treatment centre BTZ for the psychiatric centre Psychiatrisches Zentrum Appenzell Ausserrhoden. Construction is due to begin in March 2023.

The design, created together with our planning partner Ruprecht Architekten in Zurich, picks up the building style that is widespread in Appenzell. Domestic revival style elements, such as protective roofs, attention to detail and subtle ornamentation at the building entrance, are incorporated playfully and re-interpreted in a modern style.

Swift construction with low emissions

The client, Spitalverbund Appenzell Ausserrhoden SVAR, set a range of requirements for the building. The aim was for a project optimised in terms of architecture, urban planning, operation, economy and environment, and that can be executed within the given cost and time restraints. Apart from the stairwell and basement level made from concrete, and the ceilings with their wood-concrete composite units, the entire

support structure will be built in timber. This construction approach, with high levels of factory prefabrication of the timber units, allows for quick execution with minimal noise and polluting emissions on site.

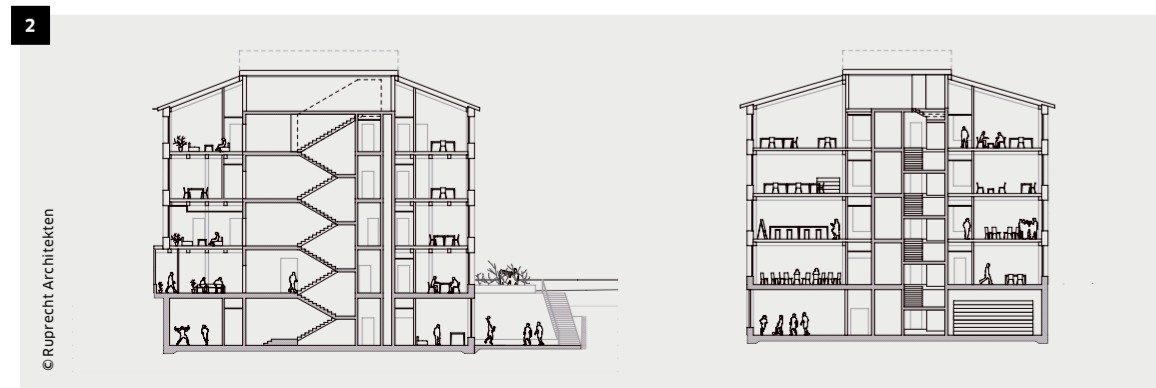
Soothing impact of timber as a construction material

The fact that timber has a soothing effect on body and soul has long been established. The Nordstern project has a particular focus on working with formaldehyde-free timber products. Good acoustics and comfortable daylight levels also add to the comforts of its spaces.

Sustainable utilisation concept

Reducing the amount of space and materials needed for comparable use gives the building a smaller ecological footprint. This was something we paid attention to when planning Nordstern. Additionally, the simple yet efficient support structure and facade design allow the building to be used flexibly. Components with average service life such as non-load-bearing walls, windows, and interior finishings are installed with detachable mechanical connections. This allows these components to later be removed, replaced or reused.

In this way, our planning team were already thinking about many aspects of sustainability at the project conception stage for Nordstern, thus making the compact timber structure into a guiding light, waymarker, and emblem of easy orientation in turbulent times for the people who are recovering at BTZ Herisau, visiting the centre or working there.



- 1 The compact timber structure integrates soothingly into the existing psychiatric clinic facility in Herisau.
- 2 The different floors are accessed via a stairwell in the concrete core. The reception and day unit are located on the ground floor. The upper floors house specialist treatment rooms and care services as well as office spaces.



FARMHOUSE REINTERPRETED IN MODERN STYLE

Using the original architectural style as inspiration, we were tasked with creating a modern apartment building in Herisau on the site of a former farmhouse. The design was closely coordinated with the authorities and townscape protection guidelines. One of the requirements of the client, the J. Frischknecht Stiftung, was to design accessible apartment layouts to allow them to be used for supported living. We were responsible for the architecture, site management and implementation of the new replacement building.

blumer-lehmann.ch/apartment-building-tuefi



TIMBER, CONCRETE AND GLASS, MASTERFULLY COMBINED

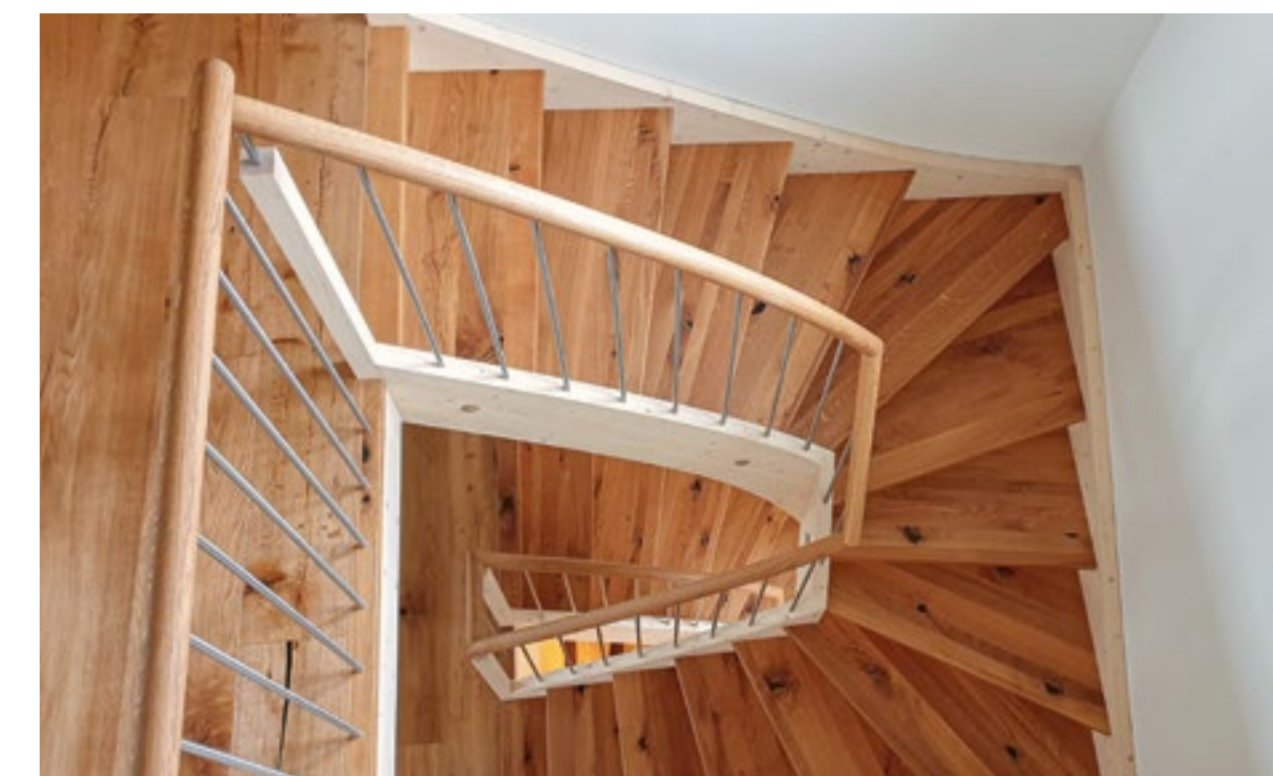
A cuboid timber structure with exposed concrete and glass frontages was created after designs by K & L Architekten in St. Gallen. The full-height windows allow natural light to stream into the living spaces and afford unrestricted views over the Alpstein mountains. The large glass frontages, however, also represented one of the project's structural challenges for our planners. The sleek look of the building is emphasised by the simple varnished spruce formwork. On the upper floor, a projecting covered balcony ensures plenty of shade.

blumer-lehmann.ch/single-family-home-timber-concrete

NEW BUILDING IN THE APPENZELL STYLE

A new two-storey replacement building with loft storey was created in the original Appenzell style in Stein in the canton of Appenzell Outer-Rhodes. The client decided against renovating the existing 100-year-old house given that this would not have improved the building in a few significant aspects, for example in terms of energy efficiency and comfort. Our timber construction specialists were responsible for implementation planning, production and assembly of the new building as well as for site management and coordinating the external tradespeople involved. The morticed spruce facade on the southern side and the shingle facade on the remaining sides of the building were crafted and installed by our partner firms, Blumer Schreinerei and K+F Bedachungen.

A core element of the interior finish is the eye-catching custom-built winding staircase. The half-turn stairs over three floors, with treads and banisters made from rustic oiled oak plus strings and newels in UV-treated spruce, were made by our staircase construction specialists in Roland Aichele's team.



Today accommodation for tunnellers, tomorrow a youth hostel

'A building project that thinks ahead.' This is how Swiss Property AG describes its 'Breiti' housing complex in Göschenen. The description says it all. The buildings will be changed over the coming years to fulfil different requirements. What is now accommodation for workers building the Gotthard tunnel may later become a youth hostel or residential building with family apartments.

In early 2022, the first of over a hundred tunnel workers moved into their rooms in Dammastock, the largest of the Breiti complex's three residential buildings in Göschenen. They will be working for several years in and on the Gotthard tunnel, building the second road tunnel tube. The Dammastock modular timber structure will give them a place to live and relax during this time. Anyone working on a building site in the mountain surrounded by noise and dust will appreciate a cosy living space even more, which is why the client and owner Swiss Property AG was sure from the start that the staff quarters on the Gotthard northern portal should be built with timber. Together with the engi-

neers at Pirmin Jung AG, they explored from the outset what would happen to the housing complex when construction of the Gotthard tunnel is one day complete.

Planned and built with an eye to the future

Blumer Lehmann was responsible for carrying out Dammastock, the largest of the three residential buildings, as general contractor. The building is not just flexible but also mobile. The modular timber structure consists of 135 modules spread over five floors and provides 102 single rooms, each with a floor area of

14 m². In 2028, Dammastock will be partly dismantled and serve as living space in other ways, for example for families, for another four years. Following this – in around 2032 – the remaining timber modules will also be dismantled and be put to new use elsewhere.

Blumer Lehmann planned ahead: they put structural provisions in place to ensure the modular timber building in Göschenen fulfils the high requirements of an apartment building from the outset. Hence why the modules can be arranged as necessary as a building with one or more floors. Additional screeds and impact sound insulation are already integrated for a higher standard of living.

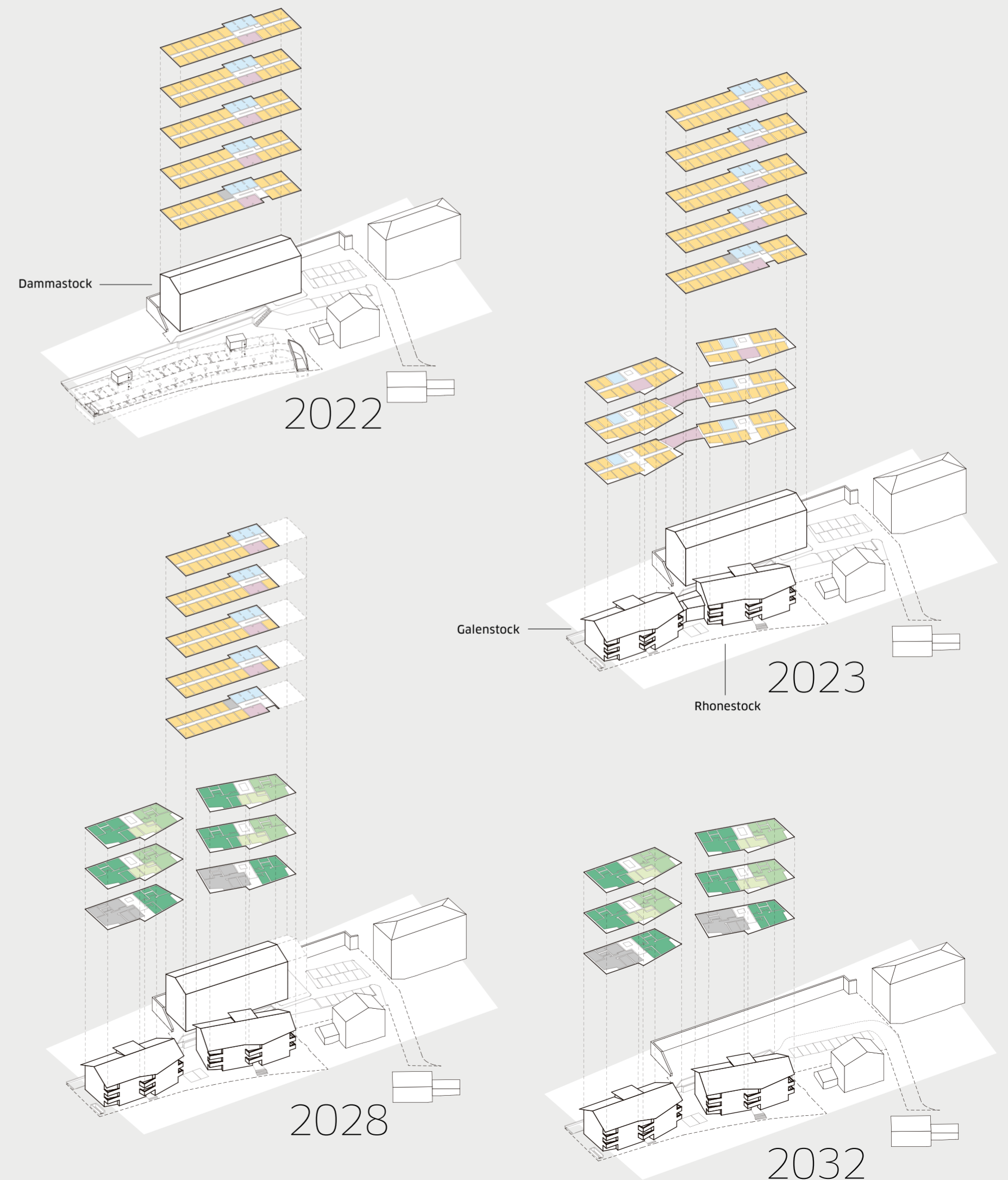
Both of the other two buildings, Galenstock and Rhonestock, are designed as hybrid constructions with prefabricated timber units combined with a concrete core. In a few years they will be repurposed as family apartments and their layouts adapted as necessary.

→ For more information on this building, go to: blumer-lehmann.ch/staff-accommodation-breiti-goeschenen



Thanks to their highly efficient timber design, all three buildings will be completed and put to use within a short space of time. The second phase begins in 2028: Galenstock and Rhonestock will be repurposed and four years later Dammastock will be dismantled.

- Bathroom units
- Recreation
- Rooms
- Utility space / infrastructure
- Living



New Modular-W school buildings

The city of Winterthur is growing and the number of primary school children has risen accordingly. Around 80 additional classes are in need of space. The need is also growing for suitable spaces to house an increase in group lessons and before- and after-school care. The city is focusing on two approaches to solve this: on the one hand, it is expanding existing facilities, and on the other, modular buildings are being used where the need for temporary space arises.

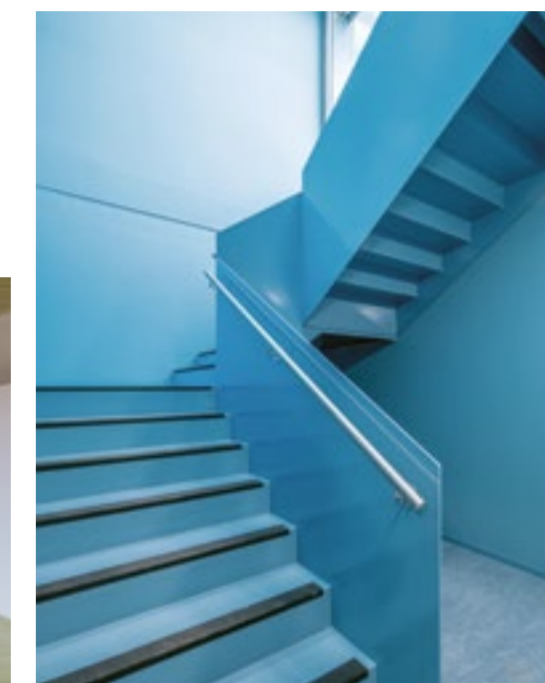
Together with our architectural partner Bauart Architekten und Planer AG, we came out top in the city of Winterthur's general contractor competition with our proposal for implementing the second generation of Modular-W modular timber structures. The modular buildings are planned for six locations. The first two are already standing at Langwiesen School and the school on Wülflingerstrasse.

Optimised layout concept

With their optimised dimensions, the second-generation room modules can now be arranged lengthways and across and can be stacked on top of one another up to three storeys high. With this they offer greater variability in layout design and therefore better solutions for each individual location. The modules are simple to dismantle and rebuild somewhere else. This allows extra storeys to be added later on in a second stage.

The modular buildings are clad in a pre-greyed spruce/fir facade that is structured vertically using lesenes. The square windows allow light to flood the rooms. Darker colours dominate the interior of the Modular-W buildings.

→ For more information on this building, go to: blumer-lehmann.ch/school-building-modular-w



TEMPORARY STRUCTURE FOR STRICKHOF WÄDENSWIL CENTRE OF EXCELLENCE

Last summer, a two-storey modular structure was completed as a temporary college building for students of food technology and horticulture. In this building, 108 timber modules house classrooms and group spaces, labs and areas for recreation and catering. Architectural art and greenery on the facade through climbing plants add a consistent feel to the overall design. Blumer Lehmann carried out the construction as full-service contractor.

→ blumer-lehmann.ch/centre-of-excellence-strickhof



SECOND TEMPORARY SCHOOL BUILDING FOR THE CITY OF LUCERNE

This modular timber building will be in use for around two years while the St. Karli school building in Lucerne is being renovated. The three-storey structure provides space for 12 classrooms, three subject-specific rooms, staff rooms and infrastructure spaces. As with the temporary building in Grenzhof in Lucerne, the building was also designed by GKS Architekten Generalplaner AG. We were responsible for implementation in the role of full-service contractor. The plan is for the modular timber structure to be moved up to six times. Its next post will be in 2023 in the Lucerne district of Dorf.

→ blumer-lehmann.ch/temporary-school-building-st-karli

TEMPORARY OFFICES FOR UNIL AND EPFL

We were responsible as full-service contractor for implementing the temporary building for staff at the University and EPFL in Lausanne from the concrete foundations upwards. Blumer Lehmann now also leases out the two-storey temporary office building in a modular timber design. The workspaces are spread across five single offices, 10 communal offices and three open-plan offices. The temporary structure also features kitchens, a social area and other function rooms. The building meets Minergie ECO standards in line with UNIL requirements.

→ blumer-lehmann.ch/university-lausanne



Our new modular buildings in Germany and Luxembourg

Timber construction expertise is in demand in Germany



CONVERTIBLE EXTENSION BUILDING FOR FUCHSHOFSCHULE SCHOOL IN SCHORNDORF (DE)

Sustainability is also a core consideration in Schorndorf for construction of a modular school extension on the site of the Fuchshofschule. Thanks to its high-quality, the two-storey modular timber structure will be in use for a long time. Depending on what is needed, the school building is easy to extend, adapt or move. Two high-grade prefabricated module sizes adopt the idea of the existing school pavilion of the Variel model built in the 1960s by architect Fritz Stucky. Blumer Lehmann won the public competition for implementing the school building together with our planning partner Bauart Architekten und Planer. As full-service contractor, we are responsible for all construction services such as planning, production and assembly. Manufacture is carried out in full at our German production plant in Grossenlöder.

→ blumer-lehmann.ch/school-building-schorndorf



© Bauart Architekten und Planer AG

New green school building in Dresden Seidnitz (DE)

On the grounds of the former adult education centre, a flexible new school building is being created to provide space for a primary and secondary school as required. Planned as a modular timber/prefabricated structure following designs by Peter Zirkel architects, the timber modules and prefabricated elements will – come rain or shine – be made in our German factory in Grossenlöder. A total of 112 timber modules combined with classic prefabricated timber construction will later create two three-storey school structures. The decision-makers deliberately opted for timber to build with because of its carbon storage capacity. Together

with a green roof and timber facade partly covered in trellises for climbing plants, the building helps improve climatic urban conditions in the district.

→ For more information on this building, go to: blumer-lehmann.ch/school-building-dresden-seidnitz



EXTENSION BUILDINGS FOR THE ÉCOLE INTERNATIONALE MONDORF-LES-BAINS (LU)

Implementing our first public modular construction for the Luxembourg market challenged our team in a variety of ways. On the one hand, the development and detail planning of the timber modules had to stand up to strict official requirements. On the other hand, the schedule for production and assembly of the modules was very ambitious. The international school took up residence in the extension building on time, ready for school to restart after the 2021 summer holidays. The two-storey modular timber structure houses a large dining hall, a music hall, as well as classrooms and meeting rooms. The additional two-storey extension building with its 48 modules was occupied in the spring of 2022.

→ blumer-lehmann.ch/school-extension-mondorf

Mobile multi-use building in Dudelange (LU)

Another milestone in the nascent history of Blumer Lehmann Luxembourg was reached when we won a public tender for a modular multi-use building in Dudelange. The interdisciplinary planning team around the architects at FAT Architects SARL in Moutfort developed a building that can be dismantled, transported and rebuilt, and has a strong focus on sustainable construction design and use of materials. This was because it was clear from the start that the building will be moved to a different location after eight years. The building is made up of two complexes: an

infrastructure section made of timber modules with office and storage spaces, plus a same-sized multistorey and multi-use space made with prefabricated timber elements. The external look of the building was designed around the overlap of the two plot geometries in the two locations: the first on the Route de Bettembourg near the city centre, and the later one in the district of 'NeiSchmelz', following the move.

→ For more information on this building, go to: blumer-lehmann.ch/multipurpose-building-dudelange



© FAT Architects SARL

Roughly a year ago, Alexander Holl and Dieter Zinkand launched the German business arm of Blumer Lehmann, Timber Construction and Engineering, with a sales and planning office in Grafschaft near Bonn and a production facility in Grossenlöder near Fulda. This produces modular timber and element-based structures. Initial projects are complete, with more in the works. The team is also growing, and the first partnerships with local businesses have already been set up for fitting out the timber modules.

Alexander Holl, who is responsible for sales and planning, sees his role in setting up the timber construction company in Germany as that of a trailblazer: 'Modular timber construction is not yet as established in the German market as it is in Switzerland,' he explains. 'The fact that modular structures can also be made of timber is not that widely known.' The production of prefabricated houses is more common here. So the first task was to create an awareness of the merits of modular timber construction; for example, production in a factory regardless of the weather, and the fast and flexible building process with short construction times, and therefore less construction noise. The young German branch office delivers its expertise to the market in three service areas: modular construction, classic prefabricated timber construction, and timber systems building, which involves shell construction with a solid envelope using standardised solutions. The planning team around Alexander Holl has now grown to six staff members. 'We are delighted that we have managed in just a short time to attract young and motivated team members for our operation in Grafschaft.'

From Grossenlöder in all directions

'The production facility in Grossenlöder, in the state of Hesse, is ideally located for projects in Germany. We reach all the way up to the far north,' says Head of Production Dieter Zinkand and adds, 'Our affiliated firm in Luxembourg and our parent company in Gossau are also both within easy reach.' Together with his

nine-person team, he has already produced the 112 timber modules for the new three-storey school building using modular timber and prefabricated construction in Dresden, designed by Dresden architectural firm Peter Zirkel. In addition, the German team is building another 30 timber modules for an extension to a school complex in Schorndorf. The project was developed and won in a two-stage full-service contractor process together with Swiss architects Bauart. 'The project is a successful fusion of architecture, modular construction, and the right technical solutions,' remarks Dieter Zinkand.

Partnership network in the making

Following its launch a year ago and the challenge of finding an assembly hall big enough, Alexander Holl and Dieter Zinkand are now very happy with the development of the German location and are continuing to drive it forward. With some staffing support from the parent company in the early days and a long-term apprenticeship plan, they and their new staff members have grown into a capable team.

Partnerships have been set up with companies from the Fulda area and have contributed to the successful setup of the German production location. These partnerships assist in prefabrication and with fitting out the timber elements and modules with the necessary heating, ventilation, electric and sanitary installations as well as the finished wall, floor and ceiling surfaces. 'We are able to take away the worry for our customers of having to pull together the trades-

people they need for their building projects themselves,' says Dieter Zinkand. He also identifies a crucial advantage in working together with the central purchasing department based in Switzerland. This made it possible to obtain large volumes of timber materials on time even during the difficult delivery situation last year.

More specialists needed

Over the coming years there will almost certainly be an increase in demand for modular timber buildings and timber construction – not least because of the increasing urgency of climate issues and new regulations in federal states and cities. Alexander Holl and Dieter Zinkand are therefore on the lookout for more specialists to support sales, timber construction planning, production, and assembly. Please visit our website for more information on current vacancies.

→ Our current vacancies: blumer-lehmann.ch/jobs

TIMBER EXPERTISE AT BLUMER LEHMANN, MADE IN GERMANY

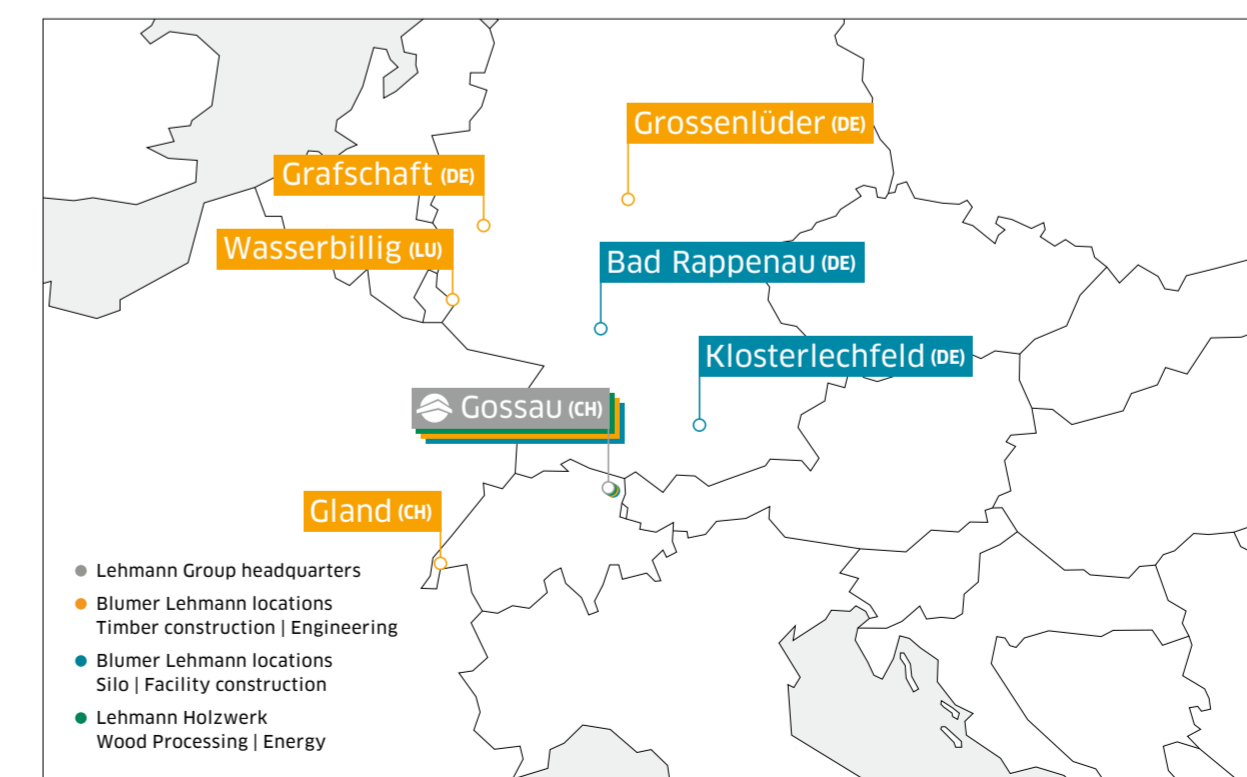
The Blumer Lehmann branch office in Germany offers the full range of timber construction expertise for innovative timber structures: their services range from consultation, planning and project management to production and assembly.



Alexander Holl is responsible for project development and sales. A trained carpenter, timber construction engineer and specialist planner for statics as well as noise, fire and thermal insulation, he already worked for Blumer-Lehmann AG in Gossau as Project Manager from 2011 to 2017.



Dieter Zinkand heads up modular construction production in the assembly plant in Germany. A qualified wood engineer, he also worked at the parent company in Switzerland from 2012 to 2019 as Head of Production and member of the Executive Board at Blumer-Lehmann AG.



Joint development of a building early on makes sense

Timber builds are on the up and not just for environmental reasons. Our customers and clients are increasingly recognising the advantages of planning and developing individual building projects or even a reusable construction solution early on together with the production company. We asked Lukas Osterwalder, Area Manager for Modular Construction, what cooperation with the customer looks like in a timber construction project.



Lukas, what trends are you seeing at the moment in construction and in the demand for modular and traditional timber buildings?

LUKAS OSTERWALDER In Switzerland, and above all in Germany, there is brisk demand for construction services, in particular for timber buildings. At the same time, we are recognising that we don't just have to focus more on the procurement of building materials, but also on the availability of planning and construction capacities, more specifically qualified workers. This is resulting in new ways of working together and new production processes, involving early planning or even development of a reusable construction solution with a high level of factory prefabrica-

tion of building projects. This increases planning and cost security for our customers and clients and enables short construction times on the building site.

What benefits do you see in this kind of early-stage collaborative development of a building project?

The earlier contact is established or a building project is planned and developed together, the greater the potential for optimisation and the higher the purchasing security. It also allows timber structures to be better adapted to client requirements as well as to the manufacturing options offered by the producer later on. The effort put into planning is also minimised once a joint project development has been set up as a basis for the work. In our two divisions, Modular Construction and Timber Construction Excellence (conventional timber construction) we often go that one step further. We develop construction systems and detailed solutions customised to the client, which can then be adapted to a range of uses such as school buildings, apartments or offices as well as for use across several locations. It's where our many years of experience and our ideas can feed into a systematic project development. This results in collaborative and transparent partnership models for creating timber structures. It also means more security for the client, for example in terms of costs, the quality of the structure, organisa-

tion of interfaces between the agencies involved in construction or in terms of keeping within construction schedules.

Can you illustrate this for us with a specific building project?

A good example of this is the Modular-Z school buildings that we have been developing and implementing as temporary school structures for the city of Zurich for more than 20 years. Another example is the collaboration with a large Swiss bank, where we developed a standard model for a temporary building that provided high-quality and secure office and cashier space while the existing bank building was being converted. A high level of prefabrication means the timber modules are quick to install and fit out in full on site. And the specified standard for fittings can, once developed, be implemented many times over. We designed a range of layout configurations in this partnership that can be used for different locations and requirements.

Where do you see potential applications for systematised buildings?

For this approach we see much more potential in the systematic planning of schools, office buildings, hotels and residential buildings, as well as care spaces. It's best when the client approaches us as early as possible with their idea for systematisation. We can then contribute our expertise in project development, overall and timber construction planning, for structural, construction physics and acoustic calculations and in fire safety matters. This allows us to optimise building solutions – for planning as well as later in production. A win-win for the client as well as for us as the production firm.



ZM10 school pavilion, Sihlweid Zurich

EDGE OFFICE BUILDING IN SÜDKREUZ, BERLIN

Germany's largest timber hybrid building has been created in the heart of Berlin, designed by Tchoban Voss Architekten and based on the CREE building system. Blumer Lehmann was responsible for planning and executing the timber cladding for the four tree-like steel supports, which create a special eye-catching feature in the atrium of the building and use floating stairs to connect cosy seating areas high up in the air. The claddings were made from laminated spruce timber and three-ply panels. The attractive building complex will house the headquarters of the energy company Vattenfall and provide space for 1,600 workers. The client placed great value on a sustainable building concept. So the decision to build with timber was no coincidence.

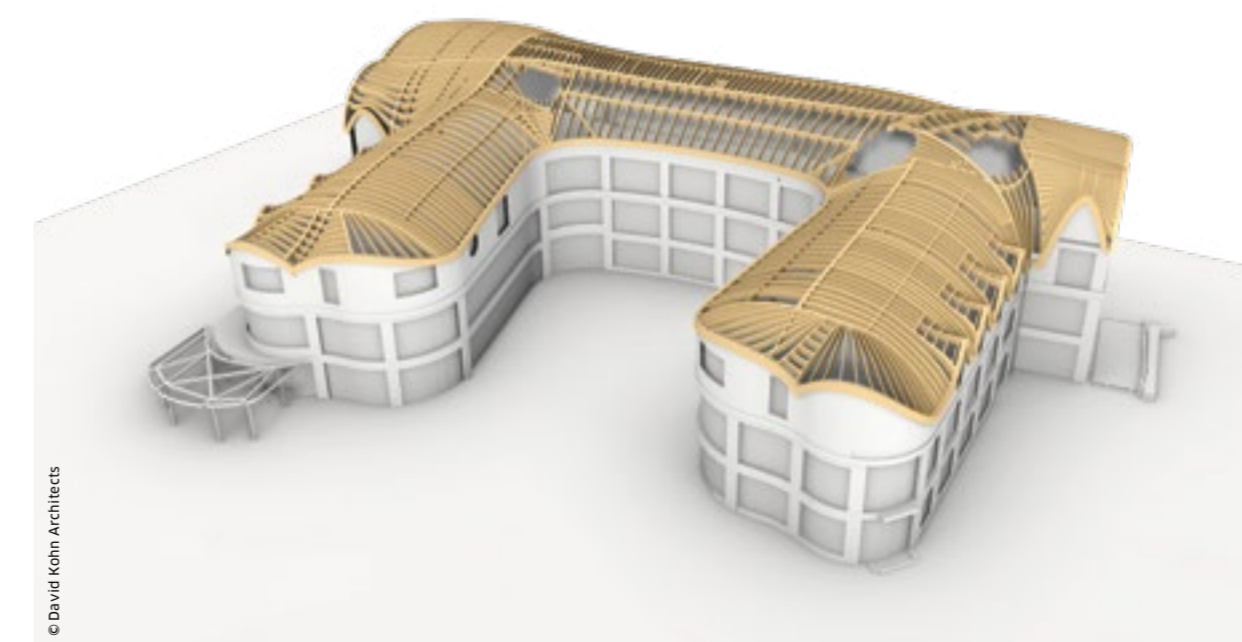
Compared to conventional reinforced concrete construction, this will save up to 80% of carbon emissions. The aim is also for the building to support staff well-being thanks to its exposed and fragrant timber. The office building has already been awarded the DGNB Platinum label for sustainable construction. A further objective is also to achieve the WELL Core label. This rating system aims to harness the design of buildings and interiors to positively impact on the comfort, health and wellbeing of users.

↳ blumer-lehmann.ch/edge-office-berlin



COMPLEX TIMBER CONSTRUCTION SOLUTION FOR FREE FORM ROOF

With the 'Gradel Quadrangles' in New College, high-quality spaces for accommodating 99 students as well as for recreational, study and teaching rooms are being created in the heart of British university city Oxford. On behalf of the general contractor Sir Robert McAlpine, Blumer Lehmann is responsible for the planning, production and assembly of the U-shaped Free Form roof. A custom timber construction solution is being used that involves a combination of Kerto LVL panels for the supporting structure, curved edge beams made from laminated timber and timber frame elements for the walls as well as OSB panels for the roof sheathing.



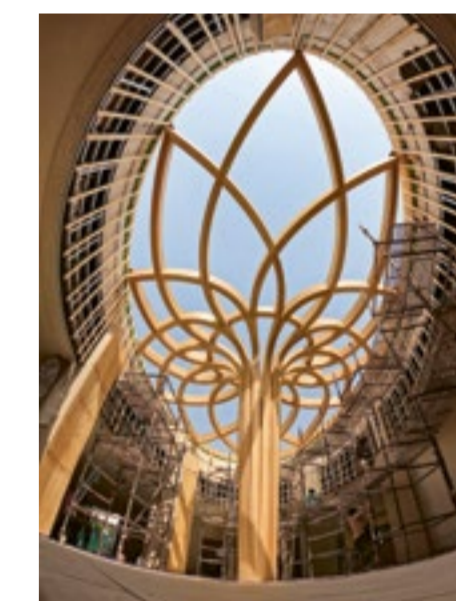
© David Kohn Architects



CONSTRUCTION WORKS IN KOREA TAKE SHAPE

The 5,300 m² Free Form roof as well as the projecting roof for the Hillmaru Country Club in Pocheon, South Korea, have now been built. This involved a great deal of hands-on work by our assembly specialists. The structure could only be assembled successfully on the basis of detailed planning and production carried out beforehand, as well as the meticulous labelling of components before they were loaded into the freight container for shipping to South Korea. In the end, everything needed to fit together on site and, above all, no component could go missing.

↳ For more on the project, go to: blumer-lehmann.ch/free-form-timber-roof-pocheon



SUNFLOWER SCULPTURE, NEW DELHI

This Free Form sculpture has also been created in an atrium, this time in a private dwelling in India. The design by our architect Ursula Frick incorporates an Indian motif and is reminiscent of the structure of an elliptical sunflower. The timber structure sits under customised glass elements. The support structure was made from steam-bent laminated timber supports in ash. The Winkler firm of timber bending specialists crafted the components into the right shape. Our partners at Burgbacher Holztechnologie were responsible for laminating the components. Ash wood has the advantage that even in larger radii, it is easy to bend. Completion is planned for early summer.

↳ blumer-lehmann.ch/sunflower-india

Future and science in the Wisdome

A total of 465 cross joints and 1,740 shear force dowels plus many highly complex connection elements hold the contoured roof shape of the Wisdome Stockholm together. Many of these connections are one of a kind. Together with other complex areas, they make the engineering of the building a challenge. The timber structure for the Museum of Technology in Stockholm is already listed as one of the ten most important buildings in Sweden. A milestone for project partner and timber supplier Stora Enso.

In the architectural competition for the experiential science arena 'Wisdome' in the Swedish National Museum of Science and Technology, the design by Elding Oscarson Architects and construction engineer Florian Kosche won out. A groundbreaking design for a spectacular building in spruce laminated veneer lumber (LVL) was created in line with competition requirements. But then the question arose: how can a structure with a vaulted Free Form roof and highly complex architectural geometry be constructed using a flat material?

A mockup establishes trust

By the time Martin Looser-Frey, who is Free Form Division Manager and responsible for international sales at Blumer Lehmann, had initial discussions with the architect and the client, the project was already underway. The design of the supporting structure, however, deviated in large part from the architectural design. 'It was then our job to develop a concept for the supporting structure which would allow the chosen architectural design to be implemented. A gridlike support structure ultimately led us to a solution. It consists of beams that are connected with interlocking dowel joints – and using cutting-edge planning

In particular, building the model for the roof structure gave us the insights we needed for our suggested solution.

tools – to form a double-curved grid. This allowed us to instill confidence in the client,' says Looser-Frey, looking back. 'Together with the client and their partners, we then started on project development. The core elements here were two mockups. In particular, building the model for the roof structure gave us the insights we needed for our suggested solution. Just as important was also that in building the mockup, we were

able to instill confidence in the client that we had developed a buildable solution.' As with previous Free Form projects, the engineers at SJB Kempter Fitze in common with Hermann Blumer, the parametric planners at Design-to-Production, as well as our own experts, formed a team of absolute specialists. Challenging projects such as this can only be carried out successfully with their accumulated expertise and an integrated plan covering geometry, statics, production, logistics and assembly.

Pioneering project for climate friendly construction

Wisdome is a national initiative based on a collaboration among Sweden's leading science centres, who set up domed arenas and interactive learning environments at each of their locations. Through digital visualisation technology, visitors to the domed structures are given a better understanding of complex interrelationships and phenomena typical of the time. A partner to the Wisdome project in Stockholm is Stora Enso, one of the world's largest forestry firms with headquarters in Sweden and Finland, who also supplied all the timber construction material for this pioneering building project. From the perspective of Stora Enso, Wisdome Stockholm represents not only a showpiece for sustainable and climate-friendly construction. The aim of the experiential arena is also to push the limits of construction with timber as a climate-friendly building material. Stora Enso supplied the cross-laminated timber (CLT) for the dome structure as well as the LVL for the main roof.

The extraordinary timber structure of Wisdome Stockholm with its vaulted roof in Free Form design covers an area of 1,325 m² and will house a hemispherical dome structure with a 3D cinema. The main roof surface will span a surface area of 25 m by 48 m, contoured and unsupported.

Keyed beams create the roof support structure

The approach to construction employed for this project has been used in timber construction since time immemorial. All connections are created using dowels and peg connections. Joined together in grid form, the beams are able to span the main roof. The integrated



WISDOME STOCKHOLM

In Wisdome Stockholm, tricky and complex issues are brought to life through cutting edge visualisation technology. This opens up new perspectives on important topics and makes complicated questions easier to understand. Wisdome Stockholm is a meeting place for academics, schools, businesses, and inquisitive museum visitors of every age.

↳ tekniskamuseet.se/en/discover/exhibitions/wisdome/

dowels deflect the shear forces that arise in the structure. Planning and production of the beams calls for ultimate precision work. This is because, once bent, the holes for the connections – milled into the flat panel strips – must fit exactly.

Bending and milling done a bit differently

The timber construction engineers opted for a construction method that is rather unusual for Free Form geometries. In doing so, they managed to unite the aesthetic ideas of the architects with the properties of LVL. When building the main roof, only the bottom layer is stuck together in advance in the desired curvature and delivered to the construction site as a finished component. This layer then serves as a scaffold and structural aid for the complex assembly process. The remaining four beam layers are only bent and doweled during assembly on site. This method is very different from the usual method of constructing Free Form structures with all laminated timber beams bent and milled in the factory.

A dome inside the building

The actual dome of the Wisdome structure is located inside the building. The components for the dome are produced in the Stora Enso factory in Sweden, in accordance with the engineering and detail planning by Blumer Lehmann and all in CLT. The 21.5 m diameter

domed structure will house a 3D cinema with a hemispherical screen for Wisdome project screenings, as well as visitor stands with seating and technical rooms.

Opening in spring 2023

On 1 May 2021, the project team started planning the concept. In early 2022, implementation planning followed. Production and transport of the prefabricated timber components are planned for the summer so that the dome can be assembled beginning in July 2022 and assembly of the main roof can begin in September. The plan is for the innovative structure to open its doors in spring 2023.

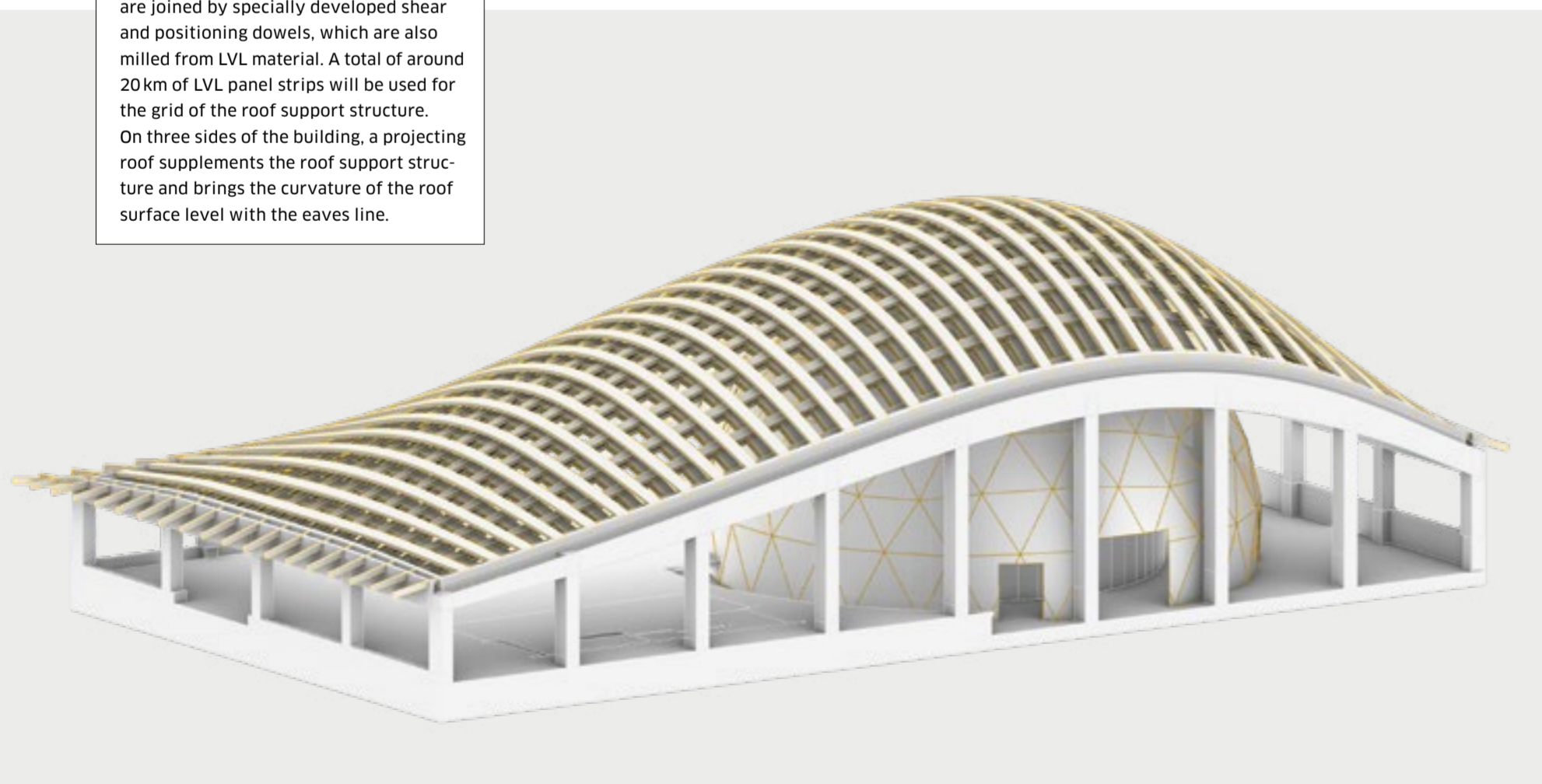
→ For more information on this building, go to: blumer-lehmann.ch/timber-construction-wisdome



The mockup established trust. For the client, the suppliers and within our own project and assembly teams. Well visible: the five layers of beams, each consisting of five LVL lamellas. The shear connectors that join the layers of beams can also be seen.

IN DETAIL: THE ROOF SUPPORT STRUCTURE

A grid made up of crisscrossing beams forms the roof support structure: three layers of transverse beams and two layers of beams longitudinal to the building. A total of 25 LVL layers are created in this way: five layers of beams, each formed of five lamellas of LVL panels. The beams are joined by specially developed shear and positioning dowels, which are also milled from LVL material. A total of around 20 km of LVL panel strips will be used for the grid of the roof support structure. On three sides of the building, a projecting roof supplements the roof support structure and brings the curvature of the roof surface level with the eaves line.



Developing a solution using a 1:1 model



One of the most defining experiences for me was being involved in the first Free Form timber construction that Blumer Lehmann carried out in 2008, the Haesley Nine Bridges Golf Club House, from digital planning to preparatory work to production. The icing on the cake was that I was even there for the assembly in South Korea. Using timber – a high-tech material – and crafting components with the help of highly complex, digital processes and exploring and developing technologies as a team, this all made a massive impact on me.

I was hugely motivated when I switched back to Free Form in 2018 after almost 10 years of working in project and construction management in our GC/FSC

Using timber – a high-tech material – and crafting components with the help of highly complex, digital processes and exploring and developing technologies as a team, this all made a massive impact on me.

In the Wisdome Stockholm project, the greatest challenge was to develop a solution to plan and execute the building in line with the architect's design. Building a mockup helped not only to find a solution but also established the necessary trust. Martin Looser-Frey, Division Manager Free Form, explains how.

the structures; our extensive portfolio includes all these services.

The modern timber buildings are planned in 3D. What tools do you have to do this and how do you approach communication with project partners?

The planning process is done using the CAD program and, as mentioned before, uses a joint 3D model that is accessible to everyone involved in a project around the world. We organise the administrative communications within the project via Microsoft Teams. We use this for storing shared files via the data platform as well as for communication on various topics in different groups and channels. This allows all project communication to be organised around topics and competencies.

Martin, how is it possible to assess early on in the project phase whether a building can even be built?

MARTIN LOOSER-FREY Often for complex Free Form geometries this is done with a mockup, in other words a 1:1 model of a building section. In this project, this was also key to instilling confidence in the client and material supplier Stora Enso that we were able to execute the project as planned.

What did the remaining project development look like for Wisdome Stockholm?

We quickly realised that the structure of Wisdome Stockholm is highly complex and not easy to achieve. So we gauged the engineering and building geometry and recognised that the calculations and planning for the geometry and statics alone would already be very labour intensive before we'd even got to starting production. In-person discussions with our engineer David Riggerbach, the client, and project partners allowed us to clear up critical areas in the project implementation and decide how to approach a virtually impossible cost estimate.

The Blumer Lehmann team is often contacted in the development phases of complex timber construction projects. What specific expertise do you have to support your clients in particular?

Our expertise becomes very important, particularly in development and consultation. Because we can show plausibly that we can implement the project – in which the client is investing a lot of money – the way they would like it. We establish this trust not least with our reference projects and with our broad range of expertise. This starts with our expertise in wood as a construction material, encompasses development and planning, and continues on beyond export, logistics and transport. We produce, install and maintain

What role and which tasks do you assume in the development process and in implementing projects overall? For which tasks do you bring in partner firms?

As a rule, our sales team takes the lead at the start of a project. At this point already we have to think hard about how a building can be constructed, as this is the only way we can put together a quote. So in this way, a large part of the development process takes place at a very early stage. Later on, our specialists, the timber construction technicians and engineers, together with the architect and client, develop the building in greater detail. Depending on the project, we also bring in third-party planning partners from our network. Especially for Free Form projects, it is very important that the different disciplines can communicate with each other freely and on a level. This is the only way we can achieve optimal results.

Martin, you've now held a range of positions within the company. What is the most exciting thing for you about Free Form timber construction?

As a carpenter by trade, I am fascinated by all the possible types of timber construction and I've had the privilege over the past few years to make myself useful and continue my training in many areas of the business.

A vast project with new levels of complexity

The scope of the tourism development ‘The Red Sea Project’ is vast. As is our contract to plan and produce more than 170 beach and water villas for hotel complexes 11 and 12. Jephtha Schaffner, project lead for this vast timber construction project, and head supervisor Patrick Rohner, are encountering new challenges in the Red Sea project and finding reliable solutions.

‘We are very adept when it comes to round geometries,’ says Jephtha Schaffner, who works in international sales and project development for complex Free Form structures. For construction of the ‘Red Sea Project’, he is responsible for the development, detail planning and production of the structural elements for Hotels 11 and 12. This encompasses a total of 178 one to four room villas on land and on water, as well as restaurants, special-purpose buildings and an Arrival Hub.

New levels of complexity

Many of the components and formwork elements for the buildings are contoured, with single as well as double curvatures. ‘The parametric planning, prefabrication of the right components and logistical organisation are all part of our core competencies, and this project allows us to really show them off,’ explains Jephtha Schaffner.

However, the production team had a few tricky issues to solve to make sure all the intricately manufactured timber elements arrived on time at the Red Sea construction site. ‘The design of the buildings is very ambitious and very complex. At first glance, the planning documents show lots of curves and not much

The design of the structures is very ambitious.

that is straight. This, combined with the number of buildings, meant whole new levels of complexity,’ Jephtha Schaffner says, looking back. Once the contract had been assigned in early 2021, the interdisciplinary project team worked together with the structural engineers at SJB Kempter Fitze to develop a construction solution in just five months. ‘That was followed by production of the components, in which we processed 10,000 m³ of timber and timber materials. We had never had to manage a volume of this magnitude in our factory before. We resolved any constraints by bringing in additional support through temporary staff, setting up our own infrastructure in a previously empty shed, a new container loading unit

and working in partnership with other firms,’ adds Schaffner.

Step-by-step assembly

The scope of services covers not only production and logistics for all components, but also supervising construction of the villas on the Red Sea. The last of a total of 800 containers reached the building site in May. ‘This volume of material makes organisation and accurate documentation incredibly important,’ says Site Supervisor Patrick Rohner. ‘Some of the containers are sitting on sites that are 30 km away. This makes meticulous materials lists absolutely crucial for day-to-day work.’

Patrick Rohner has long become accustomed to the vast dimensions. He has been working on the construction site in the desert since mid-July 2021 and heads up the assembly crew together with our 15-person supervisory team. For construction of the two hotel complexes, both executed by local firms, the supervisory team developed a solid system. This sees several villas being built in parallel along clearly defined stages. Every assembly team completes one single step for each villa; this could be laying sill plates, installing walls, assembling rafters or one of the many other tasks involved in the assembly process. This approach makes it easier for workers with little experience of timber construction to concentrate on the task at hand and allows assembly to progress quickly.



The camp that houses the Blumer Lehmann team is designed to accommodate 14,000 workers. The teams travel to their workplace by boat; it leaves at 7 o'clock in the morning, takes an hour to reach the islands, and returns at 4 o'clock in the afternoon. The team's routine in the camp is six days of working and a 'weekend' on Fridays.

TIMBER CONSTRUCTION FROM GOSSAU ON A RED SEA ISLAND

For their work on the Red Sea, our team once again draws on its huge experience working abroad. This included becoming thoroughly acquainted with the country and its people beforehand and being aware of cultural differences. This also helps communication across language barriers. An example is how our timber specialists demonstrate hands-on to the assembly teams from India, Pakistan, Bangladesh and China how to do something. Day-to-day working on the islands in the Red Sea illustrates how important solution-focused thinking, a structured approach, and clear communication are, in addition to high flexibility and openness. Particularly because in the desert region, where steel, concrete and glass are usually used for building, timber construction know-how has to be taught from scratch.

Working on an island in the Red Sea

Day-to-day work in such a remote location required our team to adapt and to rethink their approach a fair deal. On the one hand, the warm climate requires special measures in the summer, such as rest periods over lunch or night shifts. On the other hand, the uninterrupted good weather also makes construction easier. For instance, the villas don't need to be protected against the rain during construction. ‘A huge benefit,’ remarks Rohner, and adds, ‘Over the last five months it has only rained once and that was for about 15 minutes.’



THE RED SEA PROJECT

The aim of the vast tourism project on the Red Sea is to encourage regenerative tourism. The project focuses on sustainable infrastructure with off-grid renewable energies, water protection, and reuse. ‘The Red Sea Project’ is due to be completed by 2030, with 8,000 hotel rooms across an area of 28,000 km². Two of the 50 hotels planned across more than 90 islands are being created on the Ummahat islands: Ummahat Hotel 11, known as Hotel 11 for short, designed by Japanese architect Kengo Kuma, consisting of 90 villas and nine

special-purpose buildings. And Ummahat Hotel 12, with 82 villas, an Arrival Hub, restaurants, a bar, a gym and additional buildings, designed by the architects at Foster + Partners. We were later also assigned the golf clubhouse on Shura Island, designed by the same architects.

blumer-lehmann.ch/free-form-hotel-11
blumer-lehmann.ch/free-form-hotel-12

- 1 Assembly of the beach villas for Hotel 12, designed by Foster + Partners.
- 2 Assembly of the beach villas for Hotel 11, Kengo Kuma Associates.

Internships as springboard

Two different career paths in timber construction at Blumer Lehmann. Both started with student internships at Erlenhof. Site Supervisor Lukas Noser and Project Manager Daniel Ehrbar tell us about their career trajectories and what their jobs entail.

'Residential building projects are becoming more and more ambitious'

Following on from a carpentry apprenticeship, Daniel Ehrbar then decided on further training at the Higher Technical School of Wood in Biel. He completed both his internships at Blumer Lehmann and later returned to Erlenhof as a qualified timber construction technician. After more than ten years of highly diverse residential building projects, he now specialises in construction physics.

Right from the start, Daniel Ehrbar was fascinated by the variety of the projects. In his internship he already experienced this enormous spectrum in his own tasks, from a simple carport to the Tamedia headquarters in the city of Zurich.

Career path in timber

He was already set on a career in timber, likewise carpentry. After completing his studies in Biel, he joined the project management team at Blumer Lehmann and devoted himself to residential building projects. For this, he draws not only on what he learned in his studies; his quick perception, team skills and carpentry expertise are also just as valuable for his work. 'And sometimes in negotiations you also need broad shoulders, for example, when it comes to cost,' says Daniel Ehrbar.



Daniel Ehrbar, Project Manager, Timber Construction

A wide and varied spectrum of tasks

In his range of tasks as project manager over the course of a timber construction project, many aspects can all seem to be relevant and urgent at the same time. 'That is one of the big challenges of our job. Which is why we need to work proactively. As project managers, we are the interface that connects everyone involved in a project,' Daniel Ehrbar says. Depending on the project, the process for him usually begins in consulting with the clients or architects. A lot of time is taken over detailed implementation planning, which is now usually done with a 3D model. There are also many other tasks, such as ordering materials, cost control, construction planning and preparing machine data, and organising building site logistics, as well as quality control on the construction site. The crowning finale – and always the highlight of a project for Ehrbar – is the topping out ceremony for the building shell. And then the next project is already lined up, which could call for new and different solutions. 'That's good,' Ehrbar thinks, and adds: 'Although structures and foundations are important in our work, being able to develop and enhance new approaches is something I enjoy.'



Lukas Noser, Project and Site Manager GC

al contracting, GC,' says Noser and explains: 'My works management course provided me with broad-ranging, general training. Then a job became available in the GC department at Blumer Lehmann, and I realised that I am much better suited to work on the building site and working together with other people than to a desk job focused only on planning.'

Working together as the key to successful projects

Alongside his work as a GC project and construction manager, Lukas Noser also devotes his time to digitalisation within the company. More specifically, this addresses communication within a project or shared access to the latest planning data for everyone involved in a project. As it is, Lukas Noser always sees good teamwork as an important aspect that contributes to the success of a project: 'When everyone pulls together from beginning to end, then even larger projects can be well managed and much can be achieved.'

'Digitalisation is an important area for me'

'I was a complete beginner when I started at Blumer Lehmann. Now I am already one of the experienced members of our department.' As a Project Manager and GC Site Manager with special training in fire safety, Lukas Noser is now responsible for large projects such as the staff accommodation in Göschenen. Within the company, he is part of the core BIM team driving digitalisation forward.

A previous career path brought Lukas Noser to Erlenhof in 2013. Originally from the Rhine Valley, he had by this point already completed two apprenticeships in the construction industry – as a draughtsman and as a carpenter – and had gained initial work experience at a carpentry firm. He was also by then a full-time student at Bauschule, a technical construction college in Aarau, and two semesters closer to his next professional goal – a qualification as a technician in works management for timber construction. This involved a total of six semesters at Bauschule, two semesters of which he spent as an intern at Erlenhof. 'That's how I ended up in site management for gener-

→ For more information on our vocational training, go to: lehmann-gruppe.ch/careers

Your contacts for timber construction projects

We love being inspired by ideas and driven by challenges. That is why we find ample motivation for intelligent solutions and approaches in every new customer project.

As experienced timber specialists, we are familiar with a wide range of applications in timber construction. And we are always eager to discover new ways of thinking and to expand our range of possibili-

ties. Your vision is in safe hands with us. We will support you through every stage of your project from the initial idea to key handover. Need some inspiration? In the reference projects on our new website, you can find a wide variety of ideas that have become a reality.

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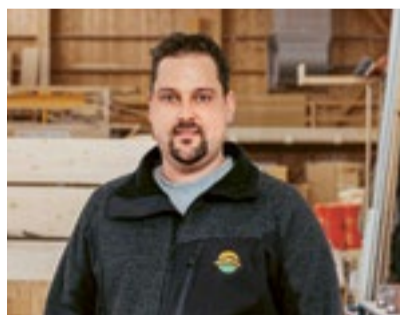
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WOOD PROCESSING ENERGY



Lehmann Holzwerk AG

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What is
sustainable
forest
management?

Find out about this and more in our interview
with Jürgen Blaser, an expert in forestry
and climate change.

Should we protect or utilise forests?

Jürgen Blaser has been working on forest conservation and sustainable forest management for more than 40 years. He explains the challenges posed to forests around the world by climate change and how environmentally friendly forestry can support forests sustainably.

Protect or utilise? In terms of forestry, utilisation or biodiversity, this has always been a hot topic. What is your position on this?

JÜRGEN BLASER There's a quick answer to this question: not 'protect or utilise', but 'protect and utilise'. My approach has been shaped by the classic forestry teachings of Professor Leibundgut, who taught for decades at ETH Zurich. He gave us students an understanding of close-to-nature forestry, based on a sustainable use of wood with an eye to all the protective functions a forest holds. I have continued to champion this teaching throughout what has now been more than 40 years working in international forestry. Often this means I run counter to the mainstream, which advocates a strict division between absolute protection or intensive use, as is the case in many countries. However, the current international definition of sustainable forest management, as developed by the FAO, the UN Food and Agriculture Organization, and the International Tropical Timber Organization ITTO, is now based around Leibundgut's integrated approach of protection and utilisation of close-to-nature forest management. This sees natural forests in particular, which make up around 90% of all forests on the planet, being managed sustainably, including those forests that are fully protected. The remaining 10% are made up of reforestation and tree plantations, which play an important role in a holistic strategy, not least to cover the global demand for cellulose, fibres and other wood-based materials.

How have issues around the use of wood been impacted by climate change?

An increased carbon concentration in the atmosphere and an already observable lengthening of the vegetation period, particularly in the Nordic forests, is encouraging more trees to grow. On the other hand, the effects of climate change, like heatwaves in summer, water shortages, increased storms, insect infestation and other events, have a direct impact on the health of forests and on the rising rate of forest fires and other damaging occurrences. In Switzerland and Central Europe, beetle infestation in spruce or drought stress in beech trees are the most common consequences impacting on the utilisation of wood. Which is why there is a specific need for risk analyses in forestry planning. Events such as these mean that over the next 30–50 years we can expect that wood will need to be utilised more across the globe. This may however lead to a longer-term shortage of specific wood types, with a large proportion of mature forests having been exploited and replaced by young trees.

What is clear is that in this climate change era, wood utilisation will be of central importance to sustainable forest management.

What is environmental forestry – in Switzerland and around the world?

In both strategies espoused by global climate policies, forests play an important role; in mitigating climate change and adapting to it. Forests are the only carbon sink on which humans have a direct influence: when new forested areas are created or the productivity of a forest is encouraged, they store additional carbon and become a carbon sink. Whereas when a forest degrades or the land is repurposed, significant amounts of carbon are released into the atmosphere and the forest becomes a carbon source. The result is

What is clear is that in a climate change era, wood utilisation will be of central importance to sustainable forest management.

that adaptive measures in forests also always contribute to mitigation strategies and that mitigation measures – when correctly planned and implemented – contribute to adaptive strategies. This is the same for every forest around the world.

The big difference between Swiss forests and tropical forests is that the integrity of the area and wood reserves of Swiss forests is safeguarded, while in many tropical countries, forests are degrading or being completely repurposed, usually into agricultural land. Yet in Switzerland, potential for mitigation is limited because its forests only have a certain amount of space available and so can only produce a certain amount of biomass; trees can only grow so high. In tropical regions the focus is on retaining forest sinks at all, in other words preventing deforestation, alongside the potential for restoring degraded forests and reforestation. Environmentally friendly forestry in Switzerland is therefore primarily concerned with adaptive measures, in particular to step up reinforcement of the resilience of forests. Only healthy and resilient trees

and forests will be able to sustain the forests sinks in the long term. In terms of climate strategy, global sustainable forestry consists of a combination of mitigation and adaptive measures.

In your view, what would the ideal development and collaboration of forest, forestry and the timber industry in Switzerland look like?

Sustainable utilisation of timber as a raw material and the use of timber products are on the up. Yet up to now neither the Swiss forestry nor timber industry has benefited from this. Existing potential for utilising wood is being exhausted by a handful of forestry companies. Seen overall, we are looking at an underutilisation of wood potential and at the obsolescence of forests. This poses a longer-term risk for forests and their resources, also due to the effects of climate change. The reasons for this are manifold but the costs of management are for many forest owners doubtless too high. The Swiss timber industry is also facing aggravated production conditions, which undermines its competitive position compared with other countries. Nevertheless, the potential for forestry and the timber industry is palpable. And forestry and the timber industry are sectors that can have a bright future, including in Switzerland.

Building with timber is on the rise around the world. What opportunities does this development hold for Swiss forests? And what challenges need to be overcome in Switzerland and internationally?

Building with timber is an opportunity, for Swiss forests as well. Timber is appreciating in value and is in demand. Yet the challenges for timber harvested from Swiss forests remain. Swiss wood is more expensive than wood from abroad. Which is why in Switzerland it is necessary to create the right structures and improve the political framework for Swiss wood. Part of this should also be an additional focus, over and above forest management, on the efficient use of wood as a limited resource; for example on recycling and cascading use.

From a global perspective, the increased demand for and value of structural timber is fundamentally positive and can encourage forest retention. In contrast to the situation in Switzerland, however, overexploitation of forests and wood as resources is already a reality in many countries around the world. Confronting this state of affairs calls for powerful forestry legislation and scrupulous controls. However, this is often not the case. Unfair competition from sources of non-sustainable wood utilisation is one of the great challenges for legal, sustainable forest management in the global trade of timber and timber products.

What concrete measures do Swiss forests need in order to continue performing as required in the future? How can we protect forests and at the same time use them sensibly?

The core task for Swiss forests is to reduce the vulnerability of forest ecosystems. Improving the resilience of trees and forests needs to happen via proactive adaptive measures such as in the choice of tree species. For example, the well-naturalised Douglas fir can be mixed into the deciduous forests of the Central Plateau in place of spruce, or suitable provenances (origins of tree species) can be selected or forestry plan-

tions, biodiversity and leisure opportunities offered by forests. In future, these will assume a core role in the management of Swiss forests.

What can consumers do today to help the positive development of forests in Switzerland and around the world?

It's important for consumers to recognise and understand a forest in its entirety with all its functions as a protective and utilisable forest. The use of wood in particular is still looked on with too much scepticism in Switzerland. On top of this, not enough is known about sustainability factors such as the part wood plays as a substitute. For example, of all construction materials, timber has the smallest ecological footprint. As part of a building structure, timber makes a significant contribution to carbon capture.

And as with other products, for example in the food industry, consumers can look out for the label of origin 'Schweizer Holz' (Swiss wood) on timber products. This is a crucial concern for many people opting for wood. Swiss wood is a sustainable product in and of itself. On an international level, it would be important to give customers clear information on the legality and origin of wood and to give them an understanding of the merits of certified wood. It is absolutely key here to ensure trust in these labels.

And as with other products, consumers can look out for the label of origin 'Schweizer Holz' (Swiss wood) on timber products.

ning with shorter turnover times can be implemented. Increased use of wood as a renewable material is an important part of this. New technologies and timber products that can also make use of wood with smaller dimensions, such as cross laminated timber using rods, will certainly become more important in timber construction and will impact on forestry considerations. Establishing new value chains for manufacturing textiles or using biorefineries may also represent new possible applications. Foresters in Switzerland are therefore under increasing pressure to integrate innovative elements and new applications for wood in their forestry considerations. These need to include integrated measures for retaining the protective func-



Jürgen Blaser is Emeritus Professor for International Forestry and Climate Change at the School of Agricultural, Forest and Food Sciences (HAFL) at the Bern University of Applied Sciences (BFH). He has worked for more than 40 years in programmes and projects focusing on forest conservation and sustainable forest management, with a specialism in tropical and boreal forests. His roles have also included President of the International Tropical Timber Organization (ITTO), Senior Forester at the World Bank, Board Member for the Center of International Forestry Research (CIFOR) and global forestry consultant for Swiss development assistance. Jürgen Blaser is a Member of the Board of Directors at Precious Woods.



The timber industry is changing

The price of wood has been rising since early 2021. Wood is in great demand – around the world as well as in Switzerland. The high prices for round timber allow the forestry industry to use forests profitably. This raises the chances that wood as a raw material will continue to be reforested sustainably in the future and remain available.

What is happening at the moment on the timber market? Following years of revenues at record lows, the prices for sawn timber rose again in 2021 to a new peak and turned the timber market on its head. The global rise in demand for timber and timber structures, a shortage of timber especially in the USA, China and Europe as well as the impacts of Covid with its boom in DIY are some of the reasons for the massive price rise.

An opportunity for timber as a raw material

What does the situation look like now? 'Prices in mass production for lower-quality wood processed as sawn timber by the packaging industry and laminating facilities have in the meantime gone down again. In all other areas, the price of wood has plateaued at a high level,' says Urban Jung, CEO of Lehmann Holzwerk AG, looking back on timber market conditions in late 2021. 'The outbreak of war in Ukraine, however, spelled another rise in wood prices.' It spelled the absence of cheap timber supplies from Ukraine, which make up around 15% of European raw material supplies. There is also no longer a supply of storm-damaged timber from Swiss forests, which has now been used up and needs to be replaced by expensive green wood. The prices for waste timber and pellets are also higher than ever. Urban Jung recognises in this situation first and foremost a huge opportunity for forests and the timber industry: 'The rise in prices allows the forestry and timber industry to use Swiss forests profitably and as a result they are able to reforest the sup-

The rise in prices allows the forestry and timber industry to use Swiss forests profitably and as a result they are able to reforest the supply of raw material and keep forests fit and healthy for the future.

ply of raw material and keep forests fit and healthy for the future.' Ideally the prices for wood will plateau in the longer term at a level that benefits the whole timber value chain: forestry, the timber industry and timber construction. And of course wood as a sustainable raw material itself. He also recognises that regionality is once again gaining in appreciation. This is a boost for work in Switzerland and of course for Swiss wood as a renewable raw material.

Expanded product range and storage capacities

The difficulties in sourcing wood internationally is making a regional timber industry more attractive. This explains why turmoil on the timber market offers new possibilities for Lehmann Holzwerk as well. Urban Jung talks about developing value creation even more and adapting the product range. 'With the huge demand for timber and thanks to our synergy of timber expertise from the variety of outlooks at Erlenhof, we are in a position to develop and apply new products.' In addition to this, Lehmann Holzwerk is also taking further measures to ensure customers can rely on getting the products they need. A new high-bay warehouse at Erlenhof will already be put to use from July 2022. The new large-scale and in part underground storage possibilities optimise logistics between the sawmill and further processing and allow more products to be stored in greater quantities. This will compensate better for future fluctuations on the

timber market and allow supplies to reach customers reliably and quickly.

New career for timber industry specialists

Vocational training in the timber industry is also changing. The newly created EFZ apprenticeship for timber industry specialists primes young people starting out in their career rigorously for the various tasks required of such an important link in the timber value chain. From summer 2022, the first apprentices will start a three-year training that will equip them for a career in the timber industry.

→ For more on the new occupation and to hear fascinating perspectives from timber industry specialists, visit go-big.ch



The new high-bay warehouse offers additional storage possibilities and optimises logistics as well as further processing of sawn timber.



Finger-jointed facade, knotless

Finger jointing: improved timber in all lengths

Improving timber quality – can it be done? Of course! Our finger-jointing line cuts any flaws in appearance or quality out of the timber in a fully automatic process and then puts the pieces back together again. The results are finger-jointed timber products of high quality and in the lengths required.

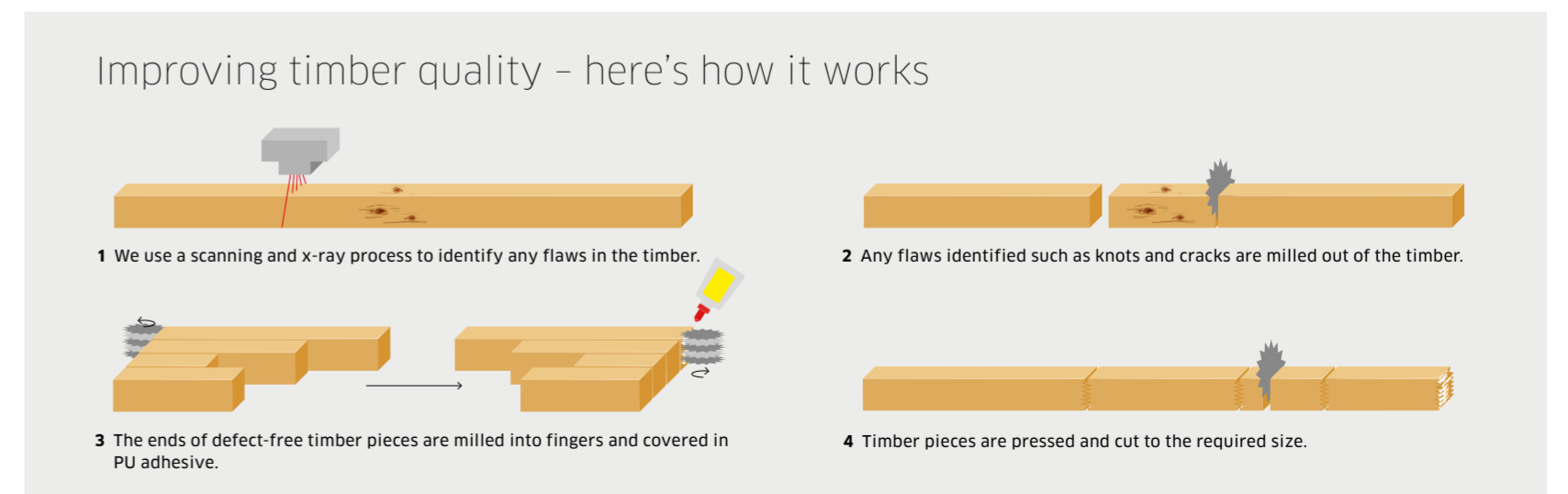
Finger-jointed timber is able to withstand loads, keeps its shape – and is nicer to look at. This is because the sorting process scans sawn raw timber for flaws such as troublesome knots or cracks that impair stability. We remove these flaws with our modern finger-jointing line by cutting out the unwanted part of the wood and then gluing the two pieces of wood back together using formaldehyde-free PU adhesive. This involves slotting together the two ends of the wood sections

that have been notched into fingers. We use the finger-jointed timber pieces to produce cladding and slat ranges up to 6 m in length, which in turn form the basis of our facade, wall, ceiling and floor covering products. And there's more: we can manufacture the finger-jointed slats, cladding and rough-planed timber in all standard lengths or to precise bespoke measurements. And of course using Swiss wood.

FINGER-JOINTED PRODUCTS MADE FROM SWISS WOOD

Our diverse range of products includes finger-jointed slats, rough-planed timber, flooring, facade solutions and a variety of claddings. Our finger-jointed products are available in industrial grade as well as appearance grades N1, N2 and in rift/quarter sawn.

→ lehmann-holz.ch/en



Clean energy from waste timber

Working in closed cycles is one of our main pillars of sustainability. In times when energy resources are running low and climate issues are pressing, waste timber utilisation becomes even more important. It's where small pellets make a big impact.

Around 35 truckloads of logs, known as round timber, arrive at our sawmill every day from within a maximum 100 km radius. Anything left over after sawn timber and other timber products have been cut is turned into other goods, including pellets. 'We have been making pellets at Erlenhof for around 20 years. At the beginning this was thanks to an initiative by Beniwod AG. Now we produce more than 37,000 tonnes of pellets every year, which equates to around 10 % of Swiss consumption,' explains Urban Jung, CEO of Lehmann Holzwerk.

Why energy from timber?

It's no wonder that an increasing number of businesses and individuals are relying on wood as a fuel. As a renewable energy source, wood presents a sustainable alternative to oil and gas. Particularly now given the difficult raw material situation, pellets made locally are proving to be crisis-proof. This is because energy wood – in other words crooked or thin logs, storm and beetle-damaged timber, waste timber from timber processing – is plentiful in Swiss forests and sawmills. Twice as much wood regrows every year than the amount used. Figures from the Federal Energy Office show that Swiss forests could even provide roughly another 2.3 million cubic metres of energy wood per year. By 2050, native wood could cover around 20 per cent of heating requirements in Switzerland; that's double what it is today. This would also fuel forestry management and ensure that forests remain healthy and full of life in the future.

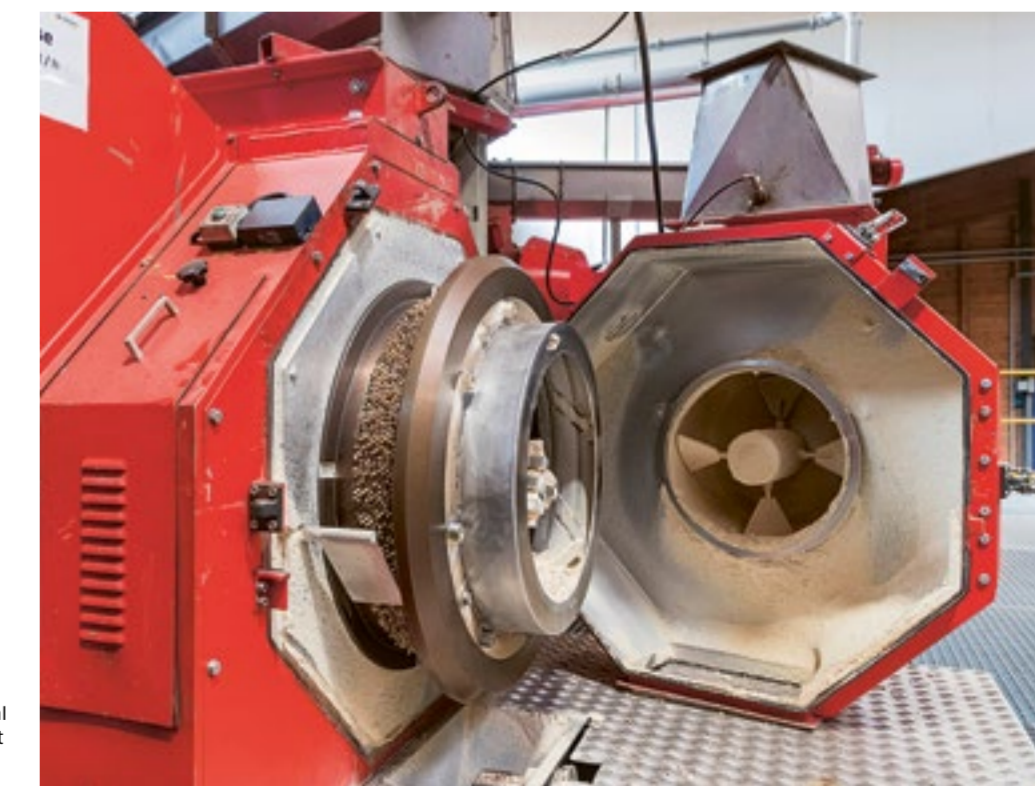
Renewable heating energy in practical form

A very handy form of carbon-neutral wood fuel is cylindrical, barely four centimetres long and is easy to use in automatic heating systems: the pellet. At Erlenhof, we produce this mini wood fuel from our waste timber – wood chips and shavings – left over from round timber processing and further processing. Although pellet production involves several stages, it uses much less energy than one would think. The embodied energy that goes into pellets is no higher than 10 %. A compact and pressed form makes pellets around twice as dense as logs, depending on the type of wood, and means they don't generate much ash when burnt. Overall, they are real bundles of energy: 2 kg of wood pellets delivers 10 kWh, as much energy as 1 l of heating oil or 1 m³ of natural gas, though they score points with a life cycle assessment benefiting climate and environment.

→ For more information on our efficient wood pellets, go to: lehmann-holz.ch/wood-pellets

FROM WASTE TIMBER TO PELLET IN NINE STATIONS

The waste timber from round timber processing is first dried in a belt dryer using the waste heat from our wood power plant, before it is stored temporarily in our dry chip silo. The metal and heavy goods separator then removes foreign objects such as stones and metal. The chips are crushed further in a hammer mill before being dampened slightly in a conditioner and a little corn starch is added, around 0.2-0.4 %, to make pressing easier later on. From here the wood pulp is moved to a ripening bin and finally into the pellet press where rollers push the material through holes in the die. This also makes the lignin in the wood fluid, which acts as an adhesive to bind the pellets. The pellets are cooled and hardened in a cooler to less than 40 degrees and then in a final stage are blown through a pipe into storage silos.



In the pellet press, rollers push the material through holes in the die. The frictional heat makes the lignin in the wood fluid and this acts as an adhesive to create solid pellets.

Your contact for sawn timber products, pellets and energy

We in the timber processing team work with in-depth expertise and dedication to process our local raw material, wood, into high-quality products: sawn timber, slats, construction timber, terrace railing, facades, planed products, structured wood and pellets, briquettes and litter for small animals. We are fascinated with finding the right balance in wood processing, both within the sustainable wood cycle and between

craftsmanship and industry. We always consciously look at the bigger picture and go the extra mile in developing new products and fulfilling individual customer requirements. You can find out more about our products and services on our website.



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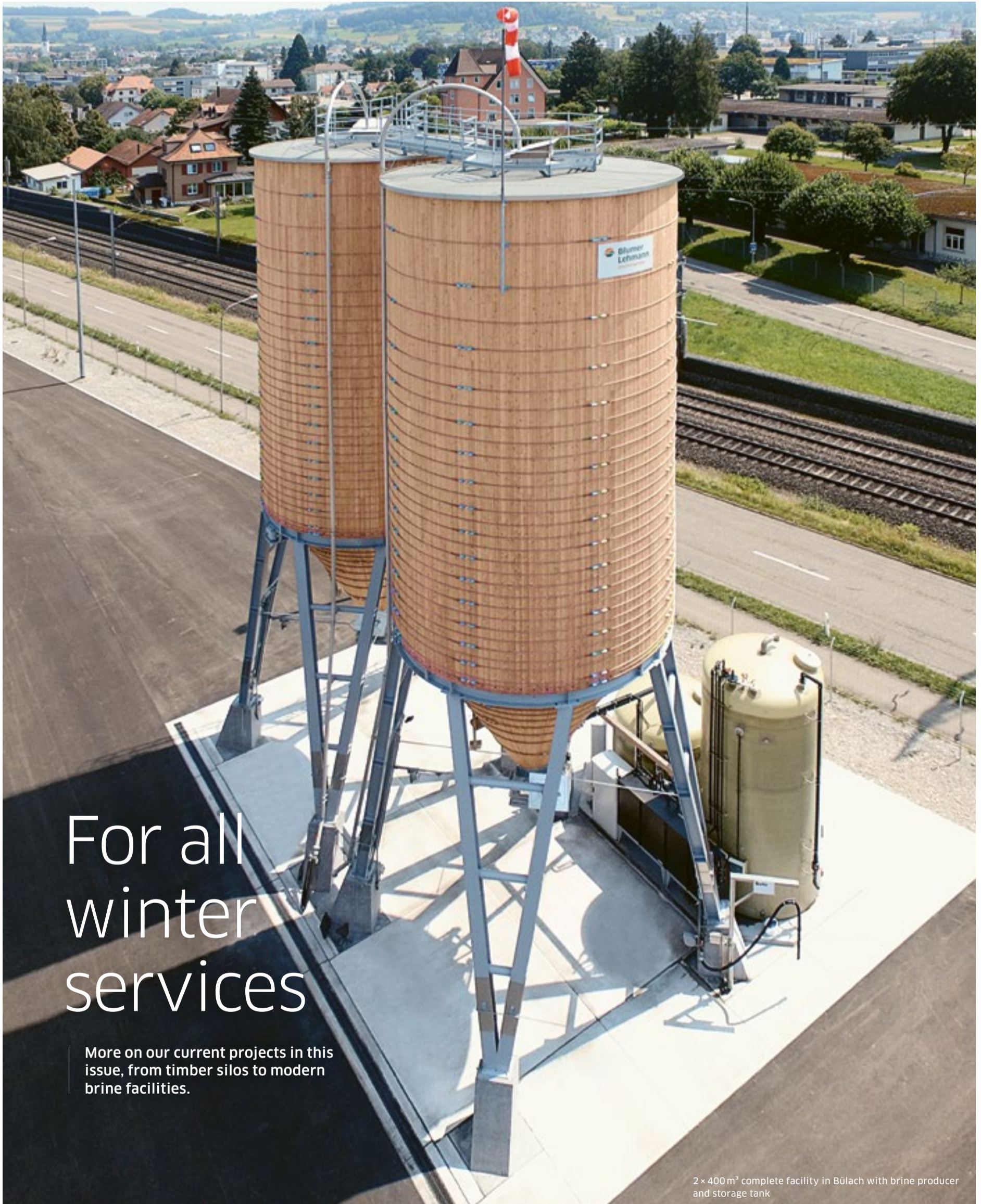
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SILO FACILITIES ENGINEERING



BL Silobau AG

NEWS
No. 14 2022



For all
winter
services

More on our current projects in this issue, from timber silos to modern brine facilities.

2 x 400 m³ complete facility in Bülach with brine producer and storage tank

Modular silos – form and function combined

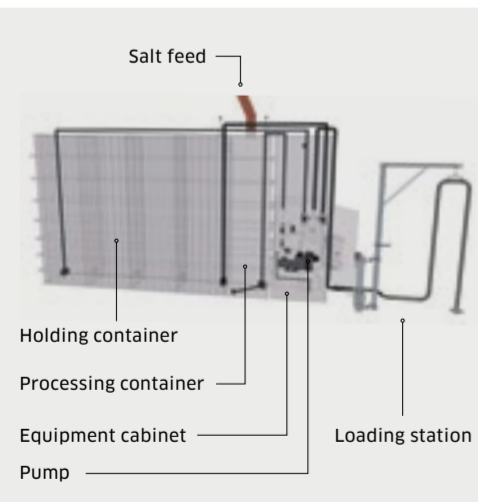
Our client, the canton of Aargau, was clear from the outset: for the silo structure in Wohlen, they wanted the focus to be not just on the efficiency of the facility, but also its appearance. The resulting modular silo shows that form and function can absolutely be combined. With its pre-greyed larch facade, the silo structure blends in seamlessly with the existing maintenance depot buildings.

HOW OUR 'BASIC' BRINE MIXING FACILITY WORKS

The facility, developed by Blumer Lehmann, has a compact design that allows it to be placed between silo structures. It produces brine fully automatically. The facility consists of a processing container for producing the brine, a holding container for storing the brine, and an equipment cabinet with the pump and controls. The salt is taken from the silo out of an opening in the roof via a downpipe into the processing container. A dosing system and a level switch keep material quantities at the right levels.

The pump revolves to dissolve the salt in water via a flow-through process, creating a highly saturated brine. Concentration levels are monitored continually. The concentrate is then pumped into the holding container while water is added. The holding container has both a level gauge and an overflow safety feature. The production process runs fully automatically until the container is full.

When a gritting vehicle is connected to the facility, the controls suspend the production process. In the process of filling the vehicle, the brine is diluted (20-22%) to prepare it for use. This value can be set digitally and monitored electronically. The limiting device on the gritting vehicle tank automatically turns the feed pump off when the tank is full.



The new maintenance depot for cantonal use was built in Wohlen back in 2016. The result is a modern and user-friendly operations and administrative building. This hybrid construction is a skilful union of diverse construction materials. Swiss timber plays a key role in the construction and defines the external appearance of the structure. This takes the form of a timber facade with vertical and horizontal reinforcements, known as lesenes and cornices, made from varnished silver fir.

Efficient winter services thanks to new modular silo

Around four years later, the canton of Aargau tendered for construction of a silo facility. As an addition to the maintenance depot, the aim was for it to blend in with the existing structures. Our planning team designed a suitable formwork for both silos, each with a capacity of 300 m³ – made with a pre-greyed larch

facade. This solution won over the client. Our team was then tasked with the detail planning, production and assembly of the entire facility.

With the new silo facility, the canton has removed the need for the previous indoor flat store and, now that the salt is stored vertically, has freed up space on the site. The modular silo with its two containers also makes for more efficient management during winter operations. Simply filling the vehicles alone is considerably easier and faster than before. In addition to this, each silo features an automatic weight and removal measurement system that provides information on salt levels in the silo.

Winter services: salt or brine?

Alongside the traditional silo facility, the Wohlen site has also been equipped with a 'Basic' brine mixing facility, a stationary return conveyor and a brine storage tank. The brine mixing facility was built with a double wall and contains four storage chambers for the brine.

→ To find out more about the modular silo in Wohlen, go to: blumer-lehmann.ch/modular-timber-silos-wohlen

To find out more about the brine mixing facility, go to: blumer-lehmann.ch/basic-brine-mixing-facility



PRACTICAL SMALL SILO FOR THE TAVANNES MUNICIPALITY

Away from bagged goods to a small and practical silo. This move was made by those responsible for winter services in Tavannes, in the canton of Jura, in time for the 2021/2022 winter season. The small silo, made from larch wood with a capacity of 30 m³, has since made maintaining the road network much easier. Setting up professional winter services brings with it many benefits, for example, improved occupational safety and quality for workers, sustainable management with no plastic waste, and efficient loading of gritting vehicles. It also facilitates precise monitoring and management of salt levels.

→ blumer-lehmann.ch/small-silo-tavannes-be

GREATER SALT CAPACITY FOR TOGGENBURG

In the canton of St. Gallen, we replaced two existing silos for the Wattwil Road Maintenance Department. In the process, we expanded the two pressure-treated spruce/fir silos to increase salt storage capacity by a 120 m³ to achieve a total capacity of 160 m³ per silo. Replacing the silos also optimised the clearance height and width – by adapting the cuboid steel base, which was built on the existing reinforced foundations.

→ For more insights into the project, visit: blumer-lehmann.ch/wooden-salt-silo-wattwil



Wetzikon: a silo coloured by history

In the autumn of 2021, a new structure for the maintenance depot serving the municipal utilities and maintenance services in the city of Wetzikon was completed. We were in charge of planning, production and assembly of the round timber silo with a capacity of 100 m³. In keeping with the new structure with its dark timber facade, the spruce on the silo was also treated with a dark timber-preserving varnish. In doing so, the black facade picks up the history of the site, a place where gas used to be generated from coal.

→ To find out more about the project, go to: blumer-lehmann.ch/round-wooden-silo-wetzikon



FOUR TIMBER SILOS FOR THE STATE OF TYROL

In 2021, we built four timber silos in one go for the Austrian state of Tyrol with capacities ranging from 250 to 350 m³. All four facilities, which are in Haiming, Reutte, Zirl and Zams, were built as replacements for round silos which had outlived their use. They are all built from spruce and fir and feature additional equipment such as roof platforms and ladders. Once the silos had been planned by our experts and produced in our factory in Gossau, our team then also took on assembly of the facilities.

Full replacement of existing silo facility



The civil engineering office for the canton of Thurgau carried out a full upgrade of their winter services hub in the Scheidweg maintenance depot in Frauenfeld in time for the 2021/2022 winter season. This replaced six ageing salt silos dating back to 1992, as well as their steel substructures. As part of the rebuild, the clearance height for loading the salt was optimised and adapted to today's standards.

Six silos made from larch wood, each with a 200 m³ capacity, now serve the canton and town of Thurgau for their winter services work. The capacity of these silos means enough salt can be bought in for an entire season's winter services work. Area unit VI, which covers Swiss Federal National Road Area VI, which also used to get its salt here, has now been fully linked to the Müllheim maintenance depot.

Optimising clearance height

The six silos are built on a cuboid, galvanised duplex steel base supported by existing and adapted foundations. This allowed the height of the steel structure and, with it, the clearance height under the silos, to be optimised at the same time.

We asked Daniel Goldinger, head of the Vehicles and Machinery Department at the Canton of Thurgau, how the facility is faring in everyday operations.



Daniel Goldinger, Head of Department for Vehicles and Machinery, canton of Thurgau

Mr Goldinger, what were your requirements for the replacement silo facility? Did the new silos meet your expectations in the first season?

DANIEL GOLDINGER The new silos needed to allow vehicles to be loaded smoothly while also making it easy to manage and assess salt supplies. Both these requirements were met; loading vehicles from small tractors to large eight-wheeler trucks is now a seamless process, and evaluating data for the gritting material collected is easy and manageable.

How does it work when a canton and town share the same maintenance depot and salt storage? Are there specific amounts that each is allowed to take? How do you monitor how much is taken?

One of the six silos is rented out to the town. Management of materials for this rented silo is handled separately. We were able to programme the salt manager to suit these requirements as well as recipients' specific entitlements.

How much salt do you need for a season?

How do the different depots around the canton coordinate their work?

The average salt requirement for the canton of Thurgau is around 2,500 tonnes. Each depot works independently according to operational requirements.

Are there large seasonal fluctuations in the amounts used? What are the challenges?

Fluctuations can be huge. In the last 15 years, the lowest usage was 937 tonnes and the highest 4,703 tonnes of salt in one winter. However, thanks to the Rheinsalinen saltworks storage expansion, the supply capacity is good. The challenge lies in making sure there is always enough salt/brine available on site.

How have winter services developed overall in the last 10 years? And what do you think winter services will look like in the year 2050?

With traffic always getting heavier and now virtually uninterrupted, it's hard to get snow and ice off the roads before it gets compacted. And we're seeing an increasing amount of heavy localised precipitation, which makes our work harder. How global warming and mobility will develop by 2050 and the impact it will have on winter services, I can't say.

Does Frauenfeld only use salt or does it use brine as well? What's the reasoning behind your approach?

We use brine and salt across the whole canton. Brine is cheaper, so supplementing with it saves us money. In addition, wetting the salt also improves its properties. Pre-wetted salt doesn't blow away as easily, for example, because it sticks to the roads better. The spread pattern is also more even, which allows it to be used in a more targeted way.

Looking back, how happy were you with your collaboration with Blumer Lehmann?

We were very happy. From planning to execution, everything worked perfectly. The collaboration was efficient and targeted. The six previous silos were demolished in April, and by the end of July, the new silos were already operable.



The six silos are built on a cuboid, galvanised duplex steel base supported by existing and adapted foundations.

Modern brine facility in Mainz

As part of a standard tender process, Blumer Lehmann was awarded the contract to build a new replacement structure for a brine facility in Mainz. The client is Landesbetrieb Mobilität Rheinland-Pfalz, the Rhineland-Palatinate Federal State Office for Mobility. Alongside all the standard components, our team also integrated two special features for this brine facility: a transparent heating cabinet for the water lines and a fully automated desludging system for purifying rock salt.

Our German and Swiss team carried out all the planning and full implementation for this facility. It consists of a glass fibre reinforced GRP tank, a 100 m³ silo for storing salt, and a 50 m³ brine storage tank. The Quanto 24 brine mixing facility developed by Blumer Lehmann is used for brine production. A central control and monitoring unit also forms part of the facility. This regulates the automated filling and emptying of gritting vehicles and can be stopped and started at the push of a button at each loading station. A 15-inch screen helps monitor the production and removal of the brine and uses simplified visualisations to show the processes. Two loading pump stations are installed for removing the brine.

Complete facility with special features

Two characteristics were incorporated in the construction of this complete facility. On the client's request, the freshwater supply line goes through a heatable casing to stop it from freezing. Our planners opted for a transparent box so that the operator is also able to inspect the lines at any time. The second special feature

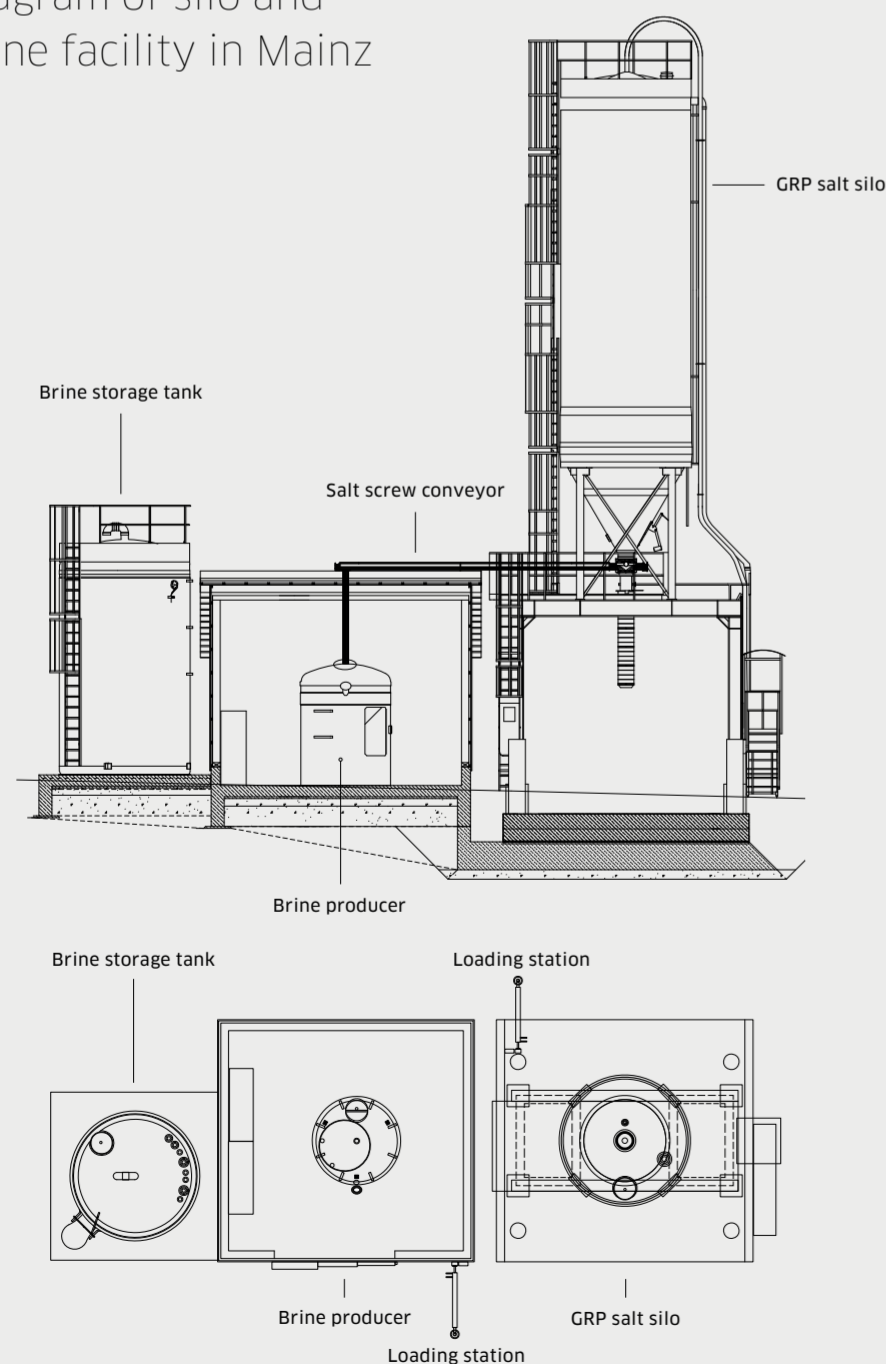
A special feature is the integrated desludging system for brine recovery.

is the integrated desludging system for brine recovery. It removes residue from the rock salt and filters the brine into a separate catch tank. Using a pump, the clean brine is then returned to the cycle.

Martin Bischof, who is responsible for project planning, takes a look back: "The project was handled very efficiently. In May 2021 we started planning the facility, in January of this year we were already able to install it, and our work is now done, apart from some smaller spot corrections. Our service and maintenance team will now take over contact with the client. They will be inspecting the facility twice a year from the first year of operation."

→ To find out more about the brine facility in Mainz, go to: blumer-lehmann.ch/silo-brine-plant-mainz

Diagram of silo and brine facility in Mainz



- 1 Silo and brine facility in Mainz
- 2 Salt screw conveyor
- 3 Heated cabinet at silo and brine facility
- 4 Interior view of brine producer with integrated desludging system for brine recovery

Your contact for silos and winter services facilities

For us, individual requirements mean fascinating challenges. Do you need made-to-measure dimensions and capacities or the integration of existing buildings? Do you have special requirements in terms of appearance or functionality? For more than 35 years, we have been developing individual complete solutions for silos and winter services facilities at home and abroad. Regardless of the size of the facility, whether your vision includes round or square timber silos or whether you are planning a complete concept

or an architecturally extraordinary grit facility, our team will strive to produce just the right facility for your requirements. They know how to optimise work procedures and how to get road salt on the road as quickly as possible. On our website, we show you further reference projects of all shapes and sizes in Switzerland and many other countries across Europe that are ensuring safe roads in snow and ice.



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