

# Timber and Technology

Residential structures  
Think first - then choose wood!



**Timbatec**  
Timber and Technology

**Residential structures in timber  
– the logical choice?**

**Dear readers, dear clients, dear timber  
and timber-construction enthusiasts**

Do you sometimes feel you can hardly bear hearing the word “sustainability” any longer? It seems that by now almost everything is described as sustainable or good for our environment. The same applies to timber buildings: the sustainability argument has increasingly lost its bite. The same goes for construction with reinforced concrete: depending on the proof provided, this method is today presented as maximally sustainable - at least when it points to a cement-reduced approach. Whether these balances and proofs truly reflect reality is open to question.

So let us leave sustainability aside. That is not what this magazine is about—at least not directly. There are several reasons why timber is the logical choice, especially for residential

structures of any size: it is cost-effective, economical, retains its value, is flexible, is safe in the event of a fire and offers excellent acoustic performance and summer thermal comfort. It also requires less heating energy.

You do not believe me? No matter—depending on the starting scenario, you may well be right and my statements above may not apply. Then let us think about baseline scenarios for liveable, value-retaining and future-oriented living space. With this magazine, we would like to offer a few impulses and consider common preconceptions from a different, 180-degree-rotated perspective.

Allow me a thought experiment: suppose tomorrow we no longer had fossil energy sources at our disposal. Which construction method could still be realised without major restrictions?

What would it take for timber-built living space to be more affordable, more flexible, higher in quality, longer-lasting and more attractive? If we think this approach through to the end, could it be that what emerges comes closest to our own ideal values? Then it really would be true: for residential buildings, timber is the logical choice!

I wish you inspiring reading and look forward to the conclusions you draw.



**Andreas Burgherr**  
Executive Board  
chairman,  
Timbatec Holzbau-  
ingenieure  
Schweiz AG

**Cover image**  
With five residential buildings and a total of 164 rental apartments, “im Zelg” in Uster is a family-friendly residential quarter realised in ecological timber construction. The aesthetic and structural properties of timber increase demand on the housing market. Timber construction scores across the board in this project with its user benefits.

© Beat Brechbuehl Fotografie

# Timbatec offers the all-round package

A building is more capable and economical when it is considered comprehensively. For the planning of timber buildings, it is best to involve a timber structural engineer who brings competencies beyond pure structural design. Timbatec offers full-service planning and accompanies you through to execution. And if no suitable solutions yet exist for your project, we will gladly develop them.



**Structural engineering and design**



**Fire safety**



**Building physics**



**Product development**

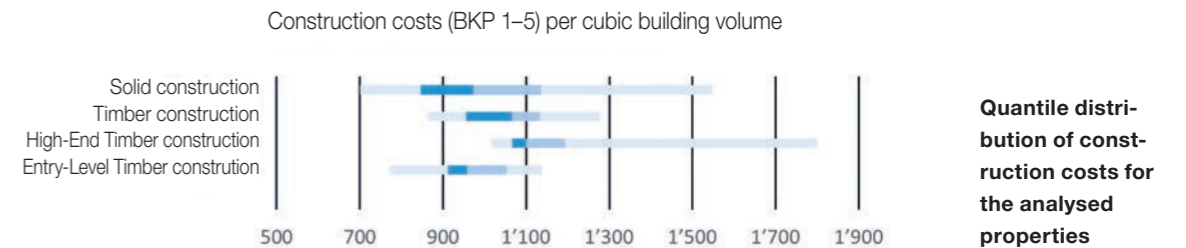


**Building management**

Guest contribution by Dr Julia Selberherr, Partner at Wüest Partner AG, Zurich

# Timber structures are economical

«Timber can convince with competitive construction costs, in particular through low embodied emissions. Embodied emissions are not yet monetarily valued by the market today, but are becoming increasingly relevant. Timber construction could therefore gain even more importance for investors in the future.»



On behalf of Lignum, the Swiss timber sector, and the Federal Office for the Environment (FOEN), Wüest Partner analysed 35 timber buildings (25 multi-family residential buildings, 10 office buildings) and compared them with their respective mineral-based twins in terms of costs and ecological indicators. The study shows that choosing timber as the primary material is mostly associated with very sustainable buildings ecologically and represents an economically attractive alternative to conventional construction:

- Competitive construction costs: besides the high-end segment, cost-efficient timber buildings are also feasible.
- Significant reduction in embodied emissions: new timber buildings, on average, save almost 24% of greenhouse gas emissions compared to conventional construction.

The advantage of shortened construction time and the resultant earlier revenues is not considered in the evaluation and has a positive effect in a market valuation. Another advantage of timber construction is that interior fittings can be more cost-effective if the timber structure is left exposed.

Full evaluation at: [www.bauenmitholz.info](http://www.bauenmitholz.info)



**Dr. Julia Selberherr**  
Partner at Wüest  
Partner AG, Zürich

«With its low carbon emissions, wood is proving its worth and becoming increasingly attractive to investors.»

Wüest Partner organises the “City in Timber” series for real-estate investors, where Swiss and international experts present successfully realised projects and show how the potentials of building with timber can be harnessed.

[www.wuestpartner.com/ch-de/wuest-academy/stadt-aus-holz](http://www.wuestpartner.com/ch-de/wuest-academy/stadt-aus-holz)



Attractive in design. Powerful in capacity. Flexible in architecture.

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# Timber structures are highly flexible

Light in weight, strong in performance. With intelligent planning, timber construction creates freedom in architectural design in residential construction, in high-rise buildings and for urban densification through rooftop extensions.



Photo: z/yg Timber Structures 3.0 AG | sary hilliker himeida\_design

**Flexible spatial and façade design is enabled by the chosen structural system.**

**The TS3 floor-slab technology provides planar load-bearing action.**

**Multi-family residential building Fasanenhof, Frenkendorf (2021)**

**Architecture**  
Scherer Architekten AG,  
Liestal

## Timber construction is attractive

for architects, planners, clients and investors. It enables boundless architectural articulation and flexible use. Through intelligent engineering, timber can realise its full potential. Timber increases performance and creates freedom in architecture and use when, from the outset,

- design and structural concept,
- execution and workshop planning, and
- digital planning methods are integrated.

## Timber construction is high-performing,

when it is thought through consistently to the end. Its low self-weight—up to 80% lighter than concrete/reinforced concrete—enables urban densification while utilising the existing structure. Existing load-bearing structures can be reused and grids adopted or reorganised using beams, diaphragms and composite action. Timber also convinces in seismic design: lower masses mean lower seismic forces and thus greater safety and robustness.



Photo: Timbatec | nissandmeier.com

## Armin Schawalder

Head of Office St. Gallen  
Timbatec Holzbauingenieure  
Schweiz AG

«Timber is the material for residential structures: natural, high-performance and flexible. I enjoy working with it every day—and I always find the right structural solution.»

**Timber construction offers maximum flexibility** and allows for architectural freedom without compromising on structural integrity or building physics during the design phase. Innovation and expertise deliver the following advantages:

- Planar load-bearing without strict primary and secondary beams thanks to CLT slabs and TS3 technology

- Cantilevers or recessed loggias without constructive thermal bridges
- Flexible geometries with irregularities can be mastered through clever structural systems

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Professional planning + quality assurance = perfect sound insulation

# Timber construction ensures quiet neighbours

Good sound insulation is now standard practice in multi-storey timber houses. Thanks to precisely tuned, multi-layered assemblies; carefully planned details; consistent site inspections during critical stages; and final measurements that reliably verify acoustic quality, timber construction ensures peace and quiet for neighbours.



Photo: Damian Perffet, Bern

**The new building of 22 rental flats near the station in Niederscherli was built using timber construction methods to the Minergie-P standard.**

Good sound insulation is now standard in timber construction, eliminating the need for concrete or brick. The acoustic properties of timber components have been extensively researched. Thanks to well-founded design principles, verified component databases and prediction tools, we can accurately calculate airborne and impact sound insulation.

The first step is to define the sound insulation requirements jointly with the client and the architectural team. Ideally, these requirements should be set out in a binding usage agreement. In close consultation with the timber construction engineer, multi-layered component structures that are suitable from a building physics perspective are developed. The acoustic requirements of these structures are documented in a catalogue, which makes noise manageable and controllable.

Particular attention must be paid to the connections. Leakage transmission significantly impacts the overall effect. For this reason, the acoustic impact of design details should be assessed at every stage of the project. Thorough planning in advance, combined with



Photo: Liliane Holdener Fotografie

**Measurements on the impact-sound test rig provide dependable predictions.**

## Building owner

PAT-BVG Personalvorsorgestiftung der Ärzte und Tierärzte, Bern

## Architecture

W2H Architekten AG, Bern

## Timber construction

Stuberholz AG, Schüpfen

rigorous quality assurance during construction, is essential for the project's success. Project-specific control plans with clear focal points for site management are very helpful for executing the work. The implementation is checked on site through a series of structural inspections, particularly in the case of multi-layered component floors, as these play a key role in how impact sound is perceived.

Building acoustics measurements are carried out upon completion where possible. The results are incorporated into our measurement database. This contributes to our internal knowledge on a project-by-project basis, helping us to further develop material-efficient structures and cost-effective systems that reliably meet the high standards required in residential construction. Ultimately, it is the quality that matters, not the building material, and this is what matters to the residents.



Photo: Timbatec | nissandmeier.com

## Simon Hess

Head of Building Physics, Timbatec Holzbauingenieure Schweiz AG

«Good acoustic solutions depend on planning and quality assurance rather than the material used.»

# Timber is safe in fire

Timber construction is safe—particularly safe in fire—because the fire behaviour of timber is predictable, load-bearing capacity is maintained for a long time in the event of fire, and protection is provided constructively. Timber burns in a controlled manner; the charred surface insulates and protects. Timber can remain visible without compromising safety requirements.



**In the six-storey residential and commercial development “sue+til” in Wintertur-Neuhegi, 307 residential units were safely realised in timber construction.**

**Building owner**  
Allianz Suisse, Zürich

**Architecture**  
weberbrunner architekten ag, Zürich

**Timber engineer and fire safety**  
Timbatec Holzbauingenieure (Schweiz) AG, Zürich

**GU/TU - Timber construction**  
Implenia Schweiz AG, Dietlikon



**Harald Brühlhart**  
Head of Prevention  
– Fire-safety expert,  
KGV (Fribourg)

In the firefighting community, there is a well-known saying that is often used to challenge a common prejudice: 'Timber burns safely.' Firefighters do not mean that timber does not burn; rather, they are referring to the fact that, in a fire, timber exhibits behaviour that is more predictable and manageable than many assume. Timber has a predictable charring rate and forms a protective char layer that slows further burning. This char layer can be calculated based on fire development and protects the load-bearing timber core from collapse or for a defined period.

In contrast, if unprotected, steel loses its load-bearing capacity very quickly and can collapse suddenly and uncontrolled. This makes load-bearing structures predictable and gives emergency services more time and control in an incident. In short, fire service professionals do not view timber as a 'ticking time bomb', but as a material whose fire behaviour can be accurately assessed, offering advantages in operations because you know what to expect.

«The char layer protects the load-bearing core and ensures the fire-resistance.»



**Illustration of the char layer on a fire test beam**

**Key points in planning**

- Simple escape-route concepts
- Service shafts aligned vertically
- No voids within building elements
- Review specialist-designer concepts
- Steel connections in timber protected

**Key points in execution**

- Check service routing and penetrations
- Verify correct detailing for fire-compartment-forming elements
- Verify escape routes

# The material timber: a versatile multi-talent

For us, quality in timber construction means more than precision. It emerges from the interplay of careful planning, craftsmanship, and a genuine passion for timber construction. With innovative solutions, techniques and planning, we create durable timber buildings with character.



Photo: Timbatec | infissandmeier.com



Photo: Andreas Busslinger busslinger-photography



Photo: Andreas Busslinger busslinger-photography

**Timber can do climate**

CO<sub>2</sub> is stored, not emitted. On average, one cubic metre of timber stores about one tonne of CO<sub>2</sub> and replaces emission-intensive materials. The material itself becomes part of the climate strategy. The Zelgstrasse project in Uster (cover) stores 6,197 tonnes of bound CO<sub>2</sub>.

**Timber is local**

the material grows on our doorstep—and in greater quantity than is currently used. This enables regional value creation, short routes and secure availability.

**Timber is fast and accelerates design**

prefabrication enables precise workflows and short assembly times. Good planning becomes immediately visible on site.

**Timber is light**

little weight—high load-bearing capacity; ideal for rooftop extensions, refurbishments and demanding existing structures in densified contexts. Lightweight structures open up new scope.

**Timber creates atmosphere**

the natural origin of timber is directly reflected in perception. The material can provide different functions—even without additional layers. Rooms feel better. Warm surfaces and moisture buffering improve the living and indoor climate.

**Timber is versatile**

one system, countless scales—from residential buildings to the city in timber.

**Timber is precise**

digital planning and industrial prefabrication replace on-site tolerances.

**Timber is an active energy saver**

timber surfaces buffer heat and moisture, stabilising indoor temperature and reducing heating-energy demand. For each degree Celsius reduction in room temperature, heating-energy demand drops by 6%.

**Timber is not a statement—it is a conscious decision and stance towards construction.**

Timber changes not only structures but also design logics. The material may require early decisions, but it rewards consistency in their application and makes quality clearly measurable. This is not simply a trend, but a deliberate choice for a structural transformation in construction.

**Residential structures? Think first—then choose wood!**

# End-Goal Driven Timber Construction

«If you start from the beginning, you'll get somewhere. If you think about the end result, you'll achieve your goal.»

**Stefan Zöllig**

Founder and Owner  
Timbgroup  
Holding AG



Photo: zlg Timbgroup Holding AG, Thun

In the Timbgroup we combine competence, innovation and execution power, united by a common goal: to increase timber's market share in the construction industry. Timber construction is not an alternative for us, but the method that makes sense. It is the benchmark for all other materials!

**TS3**  
Timber Structures 3.0



**Timber broadens the senses**

think in concrete, build with timber. Flat floor slabs, point-supported, long-spanning, without beams—for open floor plans and flexibility of use—TS3 makes it possible.



[www.ts3.biz](http://www.ts3.biz)

**TIMBER FINANCE**  
SHAPING THE CARBON SINK, BUILT ENVIRONMENT



**Timber creates value**

more value with timber—store CO<sub>2</sub>, secure financing, build capital. Timber Finance shows how.



[www.timberfinance.ch](http://www.timberfinance.ch)

**Scrimber CSC**  
Carbon Sink Concrete



**Timber endures—even in climate change**

resources are changing. Scrimber turns even thinning material into a high-performance engineered wood product for timber structures.



[www.scrimber.com](http://www.scrimber.com)

**Timbase**  
Timber Basements



**Timber to 100%**

even the basement in timber—Timbase realises innovative timber basements, providing more living space below ground.



[www.timbbase.com](http://www.timbbase.com)

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**Timbatec**  
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