CROSS LAMINATED TIMBER

The construction material of the 21st century

SUSTAINABLE BUILDING RESOURCES

LINKING TOMORROWS NEEDS WITH TRADITIONAL CRAFTSMANSHIP

www.crosslamtimber.com.au
SBR mass timber elements are made of large format solid timber boards or beams. Components are made of spruce cross-laminated timber panels or glue laminated beams. Large solid timber building components can be produced with dimensions of up to 4.80 m x 20 m with thicknesses between 50 and 300 mm.

The cross-laminated timber panels are glued with a durable adhesive bond ensuring that building components are dimensionally stable and resistant to warping.

The very simple physical building constructions ensure the most economical usage in all areas of the building trade – whether it be standardised panels and beams or ceilings, roofing or walls or a precisely pre-fabricated, ready-to-fit construction kit for entire buildings.

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CLT/GLULAM building System

YOUR CONNECTION TO NATURE

Timber has not only environmental benefits, but excellent physical and building biological properties. The warm and friendly radiance of exposed timber adds to the excellent indoor climate of a timber building. Structural design and construction elements in mass timber offer designers great freedom for unusual architecture.

Combine your architectural ideas with sustainable building:

Choose a building material with ecological attributes.

Environmental responsibility and the desire for natural living have given natural building materials new meaning. Reduction of CO₂ emissions, waste prevention and resource conservation are today the most important environmental considerations worldwide.

Timber, particularly Glulam and Cross Laminated Timber (CLT) is a technically mature and proven building material, which has properties that make it stand out as a particularly environmentally friendly building product. Timber is a renewable building material that has been grown sustainably for more than a hundred years.

Timber use - is to protect the environment!

The construction material timber is growing by itself, the actual producer, the tree needs nothing more than solar energy and water. And along the way it filters harmful carbon dioxide from the air and releases vital oxygen into the atmosphere.

The energy consumption for the production of one cubic meter of ready-to-install timber components is 8 kWh. To produce a comparable amount of concrete you need five times, or steel components, roughly twenty times the energy spent for the timber component. Timber is the building material with the lowest energy consumption at all.

Timber carefully sourced and processed connects your imagination with nature to an extraordinary living experience.
Design

Timber buildings taking off in a new dimension.

Cross-laminated renewable timber panels & glulam beams in their flexibility and adaptability have given architects and engineers new options in timber construction which have never been available before

- Outstanding technical & engineering properties
- Large dimensions and free spans /cantilevers possible (Length up to 20 m, width up to 4.2 meters.)
- High dimensional stability and strength due to cross lamination.
- 99.4% renewable timber, 0.6% formaldehyde free glue
- No toxic chemicals in particular Formaldehyde used.
- Insulates and is load bearing at the same time.
- Simple planning and building. All aspects are easily completed using laminated timber elements.
- Housing, forward looking industrial buildings, even bridges – with solid wood elements you can realize your dream.
- Solid wood elements can be used extremely flexible and combine very well with other building materials.
- Spectacular and economic projects are possible due to the available dimensions and load bearing capabilities.
- Sustainable & carbon neutral building design is made easy through the positive lifetime energy outcome of CLT & GLULAM

Wood as a building material has come back in a big way.
The mass timber building system allows architects to realize their vision
Construction

Mass timber construction sites are different:

- Prefabrication: cost-effective construction through possible prefabrication of the entire wall, including insulation, installation and façade through the timber construction company.
- The fast, straightforward assembly of the elements opens up completely new horizons in construction time.
- Clean building sites: No wet trades or mess to deal with.
- Dry installation, immediate structural integrity.
- Easy built: Mass timber trained carpenters with few hand tools can erect the complete structure.
- Minimal preparations of site.
- Timely delivery of elements as needed, no on-site storage necessary.
- Glulam timber is a high-performance building material for timber construction: it excels in its favourable weight to load-bearing ratio, its flexibility to create almost any shape, its high resistance to fire, and its positive CO₂ balance.

Modern timber construction demands precision, speed and reliability. The quality of a jointed component depends largely on the exact fit and tolerance of this component within a series. Only CNC designed and manufactured joinery work is able to continuously guarantee the required precision and accuracy. For this reason SBR Elements are precision machined on computer-controlled joinery systems that can be efficiently and flexibly applied according to individual requirements.

Carpenters, contractors and builders look for timber construction solutions from a single-source supplier.
We respond to this request by offering the most efficient system for special building components in Australia and New Zealand.
CLT building sites

All pictures in this publication are either taken by SBR or courtesy of our partners overseas.
Living with timber

- 99.4% Nontoxic natural material with 0.6% formaldehyde-free adhesives.
- Healthy indoor climate – solid wood regulates the room climate and filters toxins from the air.
- Sustainable manufacturing processes results in an optimum CO₂ and energy scorecard.
- Excellent insulation and heat storage capacity.
- High fire resistance.
- Excellent sound insulation.

Choosing to live in a mass timber building delivers not only best outcomes for the environment but an optimal indoor climate and toxin free atmosphere for healthy living.
All pictures in this publication are either taken by SBR or courtesy of our partners overseas.
Part 2

Estimating, planning and fabrication

1. Building estimate.

If you are in the early planning stages and would like to explore the possibility of using the mass timber building system:

You:
- Supply a complete concept plan in CAD (.DWG or .DXF)
- List R ratings, fire ratings and noise reduction required.

We:
- Supply you with a first budget estimate and initial 3D pre-sizing of elements required. Charges apply.

2. Building design and engineering

Please note: The following services will be charged for at an hourly rate plus cost. The amount charged will be reimbursed if a final order of the components is made.

If our budget estimate is within your budget:

We can:
- Translate your concept into an optimized CLT/GLULAM structure.
- Work closely with you to finalize the design.
- We can supply the specialized timber engineering or work with your chosen engineer.
- We build a 3D CAD model for all CLT/Glulam elements and their fixings for easy CNC communication.

You:
- Work closely with us to develop the best design for the project.
- Sign off the final 3D plan.
3. Building approval

You:

- Submit the development application.
- Work closely with us to obtain building rules consent (CC).

We:

- Help you with engineering and technical documentation necessary to achieve approval.
- Select with you the most suitable supplier.

4. Final Plans & shop drawings  With the building approval at hand:

We in close contact with you:

- Finalize the 3D model to take into account council amendments.
- Supply you with complete construction drawings.
- Communicate with you promptly if any questions arise.
- Get final quote from chosen supplier.
- Supply documentation for organization of the site.

You in close contact with us:

- Approve all dimensioning and plans developed by us in communication with you.
- Start to organize the site with your builder.

5. Manufacturing and delivery of the Elements.

After final approval of plans and payment of an agreed deposit:

We:

- Organize precise manufacture of the elements according to plan.
- Deliver the Elements as needed to the building site.

You:

- Organize with your builder the foundations and prepare the site for the CLT / GLULAM elements.
6. Construction

You:

- Supply a builder

We:

- Supply technical on-site advice during the build to guarantee smooth construction.
- For bigger and more complex projects we can supply complete management and construction crews for the CLT/Glulam part of the construction in conjunction with your general builder.
MASS TIMBER BUILDING AND CARBON FOOTPRINT

The following environmental data has been calculated based on existing European ‘Environmental Product Declarations’ for cross laminated timber, glulam, timber fibre insulation, and other building materials. The graphs are for illustration only and not scientific publications.

1. Stored Carbon

- Our timber is sourced from PEFC certified forests and is a renewable resource.
- Timber stores carbon (CO$_2$) for its lifetime.
- The longer the lifecycle of a timber building the greater the impact on the carbon balance.
- With long lasting easy maintained and refurbished timber buildings we can reduce the environmental impact of a building considerably.
- As the building lives longer than the timber used needs to regrow the Life Cycle Analysis of CLT and Glulam can be visualised in the following Graph:

![CO$_2$ BALANCE OF CLT/GLULAM](image)

We can achieve a negative carbon footprint with a timber building.

Life Cycle Analysis of other building materials:

- Only timber and engineered timber elements can help reduce the carbon footprint.

![Graph](image)

Please be aware that for visual clarity of this graphs we multiplied the CO$_2$ emissions by 10.
2. Lower operational Carbon

A) Thermal stability

- Timber buildings have a very stable indoor climate due to the high heat storage capacity of wood.
- The mass timber system using timber panels and timber fibre insulation creates one of the most stable indoor environments.
- Stable indoor climate means little if any air-conditioning is necessary for a comfortable living environment.
- The following chart compares the ability of selected building materials to produce stable indoor temperatures:

A high percentage of building materials is imported into Australia. Until “Environmental Product Declarations” for most relevant building materials used in Australia are available the transport component of CO₂ emissions of different materials con not be compared. For clarity they have not been included into the above graphs.
B) Moisture regulation

- Wood has the ability to absorb humidity and release it.
- Wood / wood fibreboards can absorb and release up to 20% of their weight in humidity without a reduction in their structural & insulation performance.
- 1m² of ø100 mm timber can absorb 5 l of water by raising the moisture content by just 10%.

Wood is extremely effective at lowering excessive humidity in the air. When the air is dry, timber releases the absorbed moisture into the room. Thanks to its humidity regulating function, mass wood elements create a stable, comfortable living environment.
Available brochures:

- **CROSS LAMINATED TIMBER**
  - Construction material of the 21st century
- **SUSTAINABLE BUILDING RESOURCES**
- **CROSS LAMINATED TIMBER CONSTRUCTION DETAIL**
  - Sections & Performance
- **SUSTAINABLE BUILDING RESOURCES**
- **CROSS LAMINATED TIMBER TECHNICAL DETAIL**
- **SUSTAINABLE BUILDING RESOURCES**
- **CROSS LAMINATED TIMBER ACOUSTIC ELEMENTS**

Sustainable Building Resources Pty Ltd
Po Box 35  Macclesfield 5153  South Australia
Phone : ++61 (0) 8 83889033
Fax: ++61 (0) 8 83889048
Email: sbresources@internode.on.net

www.crosslamtimber.com.au
www.glulam.com.au
www.passivhausaustralia.com.au

PLEASE NOTE:

ALL technical information and illustrations in this brochure are collated from publications of our suppliers and “Environment Product Declarations” of building material manufacturers. Information provided may be superseded by new insights from time to time and be no longer valid. All information are examples only and must be verified as relevant for each project by a qualified engineer. Sustainable Building Resources Pty Ltd may not be held responsible in any way. This includes printing errors.