

The cutting edge
of engineered timber.





What's next?
We make
what's next.

Cusp is about transformation, modernity and a determination to drive change.

Change that is in perpetual motion: improving the built environment while continuously protecting the natural one.

With the world's first plantation hardwood CLT.

Structurally superior to all its rivals, our hardwood CLT delivers longer spans and leaner wall structures. This creates more structurally efficient buildings with more space internally for living.

Utilising the vast plantation hardwood resources available in Tasmania, we have developed a class leading Mass Timber element.



It's the future of construction... and so are we.

Our appetite for smarter solutions means we are forever on future's cusp. As it moves relentlessly forward, so do we. Cusp is about transition through innovation – from good to great; from possibility to reality. It's where amazing things happen to enhance built environments and the lives of people who learn, live and work within them. When a project ends you won't find us sitting back admiring a job well done. Instead, we push on, with fresh thinking and open minds, ready for what's next and more often than not, coming up with a solution.

The result is building solutions at the leading edge, with impeccable sustainability credentials.

Ron Goldschlager
Founder



Improving the built environment, while continually protecting the natural one.

Our plantation hardwood Engineered Timber Products born from a fundamental belief that it is our obligation to extract the best possible value from the natural resources entrusted to us. We have taken a resource currently utilised for export woodchips and turned it into cross laminated and glue laminated timber for the Australian built environment.

A determination to drive change.

Cusp is about transformation, sustainability and a determination to drive change. Change that impacts positively on the environment, society, the economy, design, architecture and construction. Change that is in perpetual motion: improving the built environment while continually protecting the natural one.

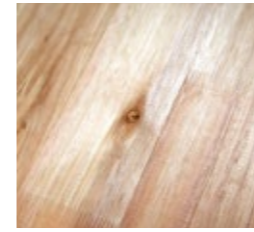
We use intelligence, technology and innovation to discover better ways to create strikingly beautiful, effortlessly useful buildings and spaces. We also understand what matters in the wider world and how we can make a positive contribution to its future.



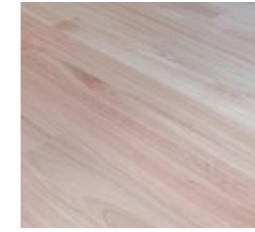
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Tasmanian Plantation Oak



Grandis Plantation Oak



Australian Manufactured European Spruce

1. Plantation
2. The testing lab
3. Quality Assurance samples
4. European Spruce
5. Tasmanian Plantation Oak

Tasmanian Plantation Oak

Tasmanian Plantation Oak is an Australian Eucalypt that is grown, harvested and manufactured in Tasmania. It is aesthetically beautiful: blonde with an Australian grain, that finishes with a lustrous sheen.

Australian Manufactured European Spruce

European Spruce is a softwood that is white to pale yellow in colour with a fine texture with small tight knots. European Spruce is sourced from sustainably managed forests in Europe and manufactured into CLT and GLT in Tasmania.

Grandis Plantation Oak

Grandis Plantation Oak is a Eucalypt sourced from fast rotation sustainably managed plantations in Uruguay. It is shipped to Tasmania as a sawn product. Grandis Plantation Oak, otherwise known as Rose Gum, is one of the most productive plantation Eucalypts. It is a blond hardwood with pink tones and straight grain. View the plantation and production processes: <https://youtu.be/cpWGY9eFT60>

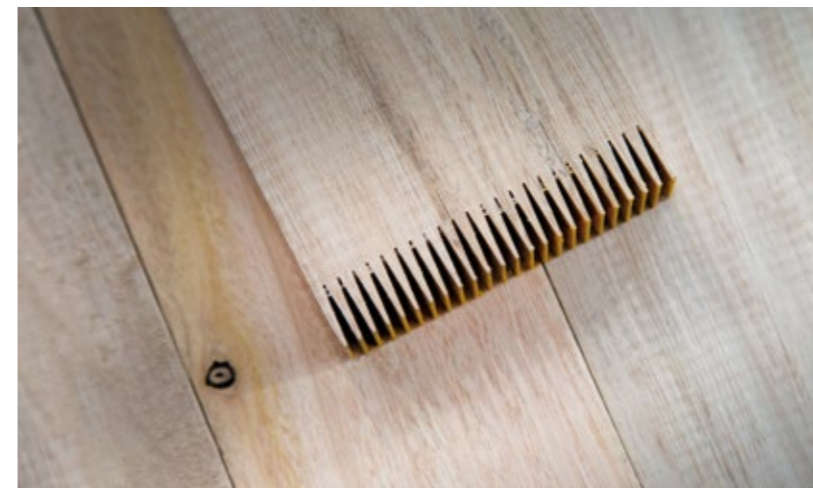
The provenance of our timber

Our timber is all sourced from certified plantations. Our signature species, Tasmanian Plantation Oak is grown in one of the world's most productive and fertile forestry environments. Tasmanian Plantation Oak grows quickly. Harvestable in short 15-year rotations, compared to 25-30 years for softwood plantations, Tasmanian Plantation Oak provides a unique set of opportunities.

Faster growing trees means faster absorption of carbon, and faster rotations mean more building stock more often to lock that carbon up into the built environment. With a global shortage of timber and demand expected to quadruple by 2050 – it is the future of construction.



4



5

Cross Laminated Timber

Cross laminated timber (CLT) is a wood panel product made from gluing together layers of solid sawn timber. Each layer is oriented perpendicular to the previous layer to achieve better structural rigidity.

Species: Tasmanian Plantation Oak; European Spruce.

Glue Laminated Timber

Glulam removes the barriers of size, strength variation, and shape normally associated with the availability of sawn timber.

Species: Tasmanian Plantation Oak; European Spruce.

Industrial Panels (non-structural)

A lightweight, thick, edge-glued wall panel.

Thicknesses: 19mm-25mm.

Species: Grandis Plantation Oak; Tasmanian Plantation Oak.

Aesthetic Grades: Architectural (low feature) or Industrial. Tasmanian Plantation Oak.

Sawn timber

Species: Grandis Plantation Oak.

Density: 650kg/m³
Janka Rating: 7.3



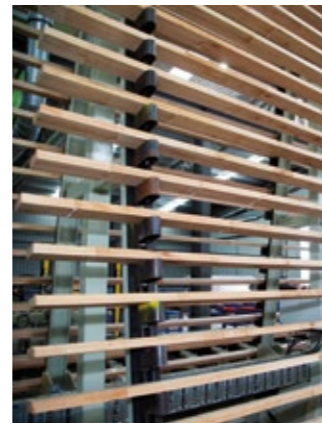
1

1. Cross Laminated Timber
2. Tasmanian Plantation Oak
3. Sawn timber ready for laminating

2



3



Stay ahead of today.

Cusp has the greatest manufacturing capability in Australia to provide hybrid mass timber building solutions. One of the major advantages of using mass timber building solutions on your project is the ability to build the timber structure with speed and absolute precision. As part of the design and manufacturing process all panels will be manufactured to millimetre precision with all service penetrations pre-cut in the factory to save time and cost on site.

To maximise the benefits of Cusp's manufacturing capabilities and engineering expertise, engage with us early in the design process. This will ensure all aspects of the design can be considered and optimized at the beginning to maximize cost savings and constructability for the project.

An ecosystem's approach

Cusp are challenging the existing supply chain in an effort to minimise waste and maximise value. Existing timber industry supply chains are full of waste. Early intervention with projects can remove wasted energy, wasted fibre, and wasted money. A whole life cycle approach can maximise carbon storage in the building and minimise carbon expenditure through transport miles. The resulting building, through intelligent design, can be more energy efficient during its tenure and recyclable at the end.



Request a sample.
1300 792 519

Why build with Mass Timber?



Timber is natural, beautiful and warm.



Sustainably produced timber is a better environmental choice - it stores carbon.



Pre-fabrication - has advantages in quality and saves time on site.



Efficiency - minimises waste of materials.



More net usable area due to leaner wall structures.



Stable and lightweight.



Comfort and air quality - wood contributes to a pleasant room climate.



Wellness - buildings of solid timber have positive effects on health.

PRODUCT CERTIFIED

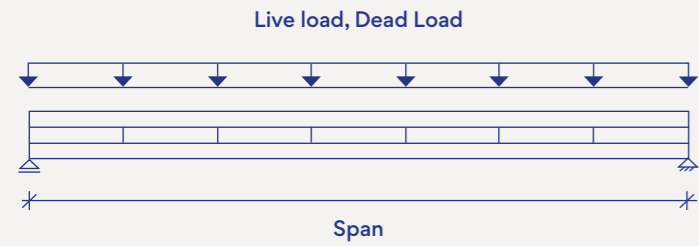
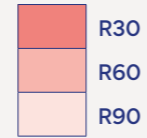


Product Certification

Our CLT, GLT and Industrial Panels are certified by the Engineered Wood Products Association of Australasia (EWPAA) Product Certification Scheme. The EWPAA certification scheme focuses on ensuring product quality through onsite inspections of the manufacturing process, verification that internal test methods and results meet the relevant product standards and independent testing of the manufacturers product by an accredited laboratory.

CLT Single-Span Tasmanian Plantation Oak (Eucalyptus Nitens)

Fire Protection Level



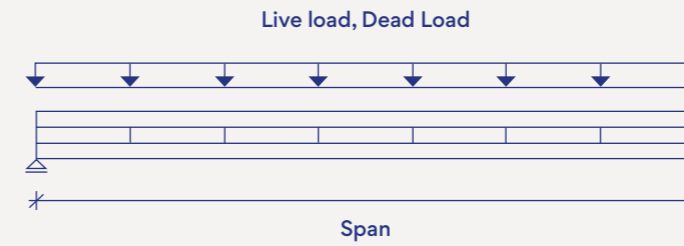
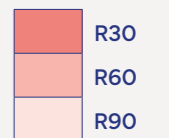
Single-Span CLT (without vibration requirements)

Load [kN/m ²] DL LL		Span [meters]								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
		Deflection								
		l/300	l/300	l/300	l/300	l/300	l/300	l/300	l/300	l/300
1.0	2.0	100	110	120	150	170	190	190	220	230
1.5	2.0	100	110	125	150	170	190	210	225	250
2.0	2.0	100	120	140	160	190	190	220	240	260
2.0	2.5	100	120	150	170	190	200	220	250	270
2.0	3.0	110	120	150	170	190	210	230	250	
2.0	3.5	110	125	150	170	190	220	230	260	
2.0	4.0	110	140	160	175	200	220	250	270	
2.5	2.0	100	120	150	170	190	210	225	250	270
2.5	2.5	110	125	150	170	190	210	230	260	270
2.5	3.0	110	125	160	175	190	220	240	260	
2.5	3.5	110	140	160	190	200	220	250	270	
2.5	4.0	110	140	170	190	210	225	250		

This table is to be used for a preliminary design only and does not replace the need for a qualified engineer to conduct a full static calculation to confirm CLT sizing.

CLT Single-Span Double Top & Double Bottom Tasmanian Plantation Oak (Eucalyptus Nitens)

Fire Protection Level



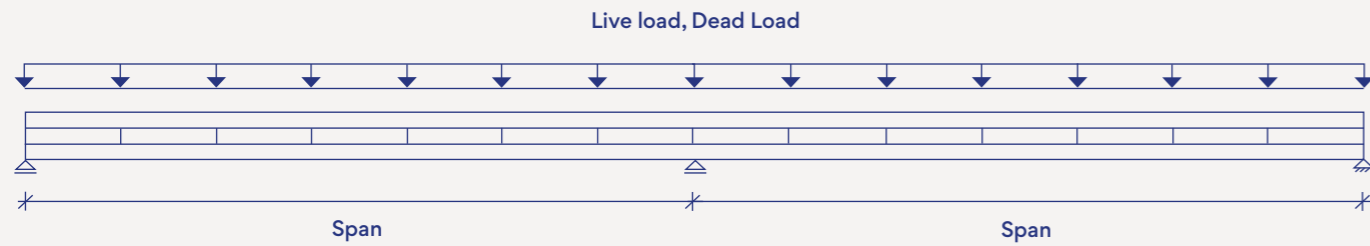
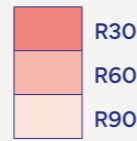
Single-Span CLT (without vibration requirements)
Double Top & Double Bottom

Load [kN/m ²] DL LL		Span [meters]								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
		Deflection								
		l/300	l/300	l/300	l/300	l/300	l/300	l/300	l/300	l/300
1.0	2.0	100	100	110	125	150	160	175	200	210
1.5	2.0	100	100	120	140	150	170	190	210	225
2.0	2.0	100	110	120	140	160	175	200	210	240
2.0	2.5	100	110	125	150	160	190	200	220	240
2.0	3.0	100	110	140	150	170	190	210	225	250
2.0	3.5	100	120	140	160	170	200	210	240	260
2.0	4.0	100	120	140	160	175	200	220	240	260
2.5	2.0	100	110	125	150	170	190	200	225	250
2.5	2.5	100	120	140	150	170	190	210	230	250
2.5	3.0	100	120	140	160	175	200	210	240	260
2.5	3.5	100	120	140	160	190	200	220	240	270
2.5	4.0	110	120	150	160	190	200	225	250	270

This table is to be used for a preliminary design only and does not replace the need for a qualified engineer to conduct a full static calculation to confirm CLT sizing.

CLT Double-Span Tasmanian Plantation Oak (Eucalyptus Nitens)

Fire Protection Level



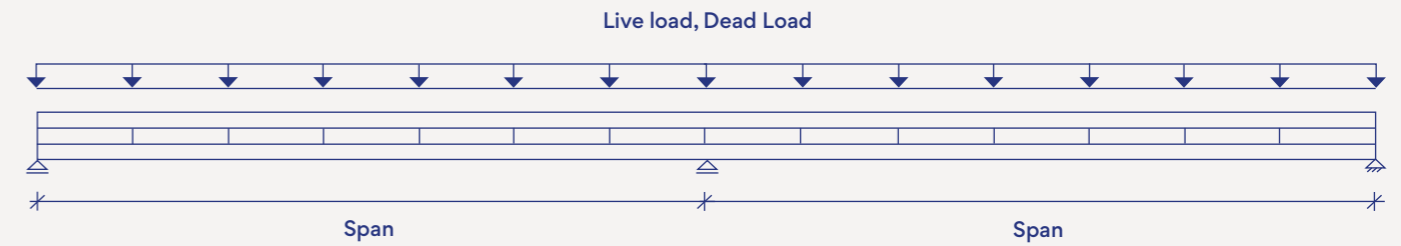
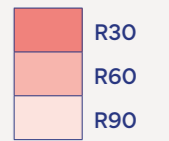
Double-Span CLT (without vibration requirements)

Load [kN/m ²] DL LL		Span [meters]								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
		Deflection								
		l/300	l/300	l/300	l/300	l/300	l/300	l/300	l/300	l/300
1.0	2.0	75	75	100	100	110	125	150	160	170
1.5	2.0	75	100	100	110	125	140	150	170	190
2.0	2.0	75	100	100	120	140	150	170	190	200
2.0	2.5	75	100	110	125	140	150	170	190	220
2.0	3.0	100	100	120	140	150	170	190	210	225
2.0	3.5	100	100	120	140	150	175	190	220	230
2.0	4.0	100	110	125	140	170	190	210	225	250
2.5	2.0	75	100	110	125	140	160	170	190	220
2.5	2.5	100	100	110	140	150	170	190	210	220
2.5	3.0	100	100	120	140	160	170	190	220	230
2.5	3.5	100	110	125	140	170	190	210	225	250
2.5	4.0	100	110	140	150	170	190	220	230	260

This table is to be used for a preliminary design only and does not replace the need for a qualified engineer to conduct a full static calculation to confirm CLT sizing.

CLT Double-Span Double Top & Double Bottom Tasmanian Plantation Oak (Eucalyptus Nitens)

Fire Protection Level



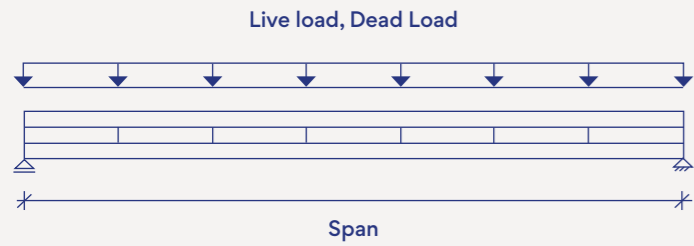
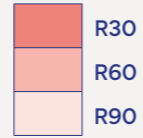
Double-Span CLT (without vibration requirements)
Double Top & Double Bottom

Load [kN/m ²] DL LL		Span [meters]								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
		Deflection								
		l/300	l/300	l/300	l/300	l/300	l/300	l/300	l/300	l/300
1.0	2.0	100	100	100	100	110	120	140	150	170
1.5	2.0	100	100	100	110	120	140	150	160	190
2.0	2.0	100	100	100	110	125	150	160	175	200
2.0	2.5	100	100	110	120	140	160	175	190	210
2.0	3.0	100	100	110	125	150	170	190	210	225
2.0	3.5	100	100	120	140	160	175	200	210	240
2.0	4.0	100	110	120	150	160	190	210	230	260
2.5	2.0	100	100	110	120	140	150	170	190	210
2.5	2.5	100	100	110	125	150	170	190	200	225
2.5	3.0	100	100	120	140	160	175	200	210	240
2.5	3.5	100	110	120	150	160	190	210	230	260
2.5	4.0	100	110	140	150	175	200	210	240	270

This table is to be used for a preliminary design only and does not replace the need for a qualified engineer to conduct a full static calculation to confirm CLT sizing.

CLT Single-Span European Spruce

Fire Protection Level



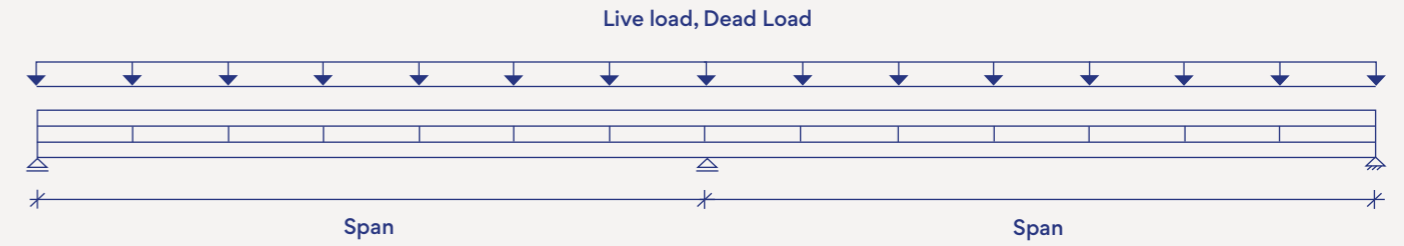
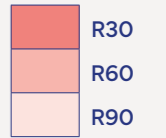
Single-Span CLT (without vibration requirements)

Load [kN/m ²] DL LL		Span [meters]								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
		Deflection								
		l/300	l/300	l/300	l/300	l/300	l/300	l/300	l/300	l/300
1.0	2.0	100	100	120	140	160	180	200	220	240
1.5	2.0	100	120	120	140	160	180	200	240	260
2.0	2.0	100	120	140	160	180	200	220	240	260
2.0	2.5	100	120	140	160	180	200	220	260	280
2.0	3.0	100	120	140	160	180	200	220	260	280
2.0	3.5	100	120	140	160	180	220	240	260	280
2.0	4.0	120	140	160	180	200	220	240	260	300
2.5	2.0	120	120	140	160	180	220	220	260	280
2.5	2.5	120	120	140	160	180	220	220	260	280
2.5	3.0	120	120	140	160	200	220	240	260	280
2.5	3.5	120	140	160	180	200	220	240	260	300
2.5	4.0	120	140	160	180	200	220	240	280	300

This table is to be used for a preliminary design only and does not replace the need for a qualified engineer to conduct a full static calculation to confirm CLT sizing.

CLT Double-Span European Spruce

Fire Protection Level



Double-Span CLT (without vibration requirements)

Load [kN/m ²] DL LL		Span [meters]								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
		Deflection								
		l/300	l/300	l/300	l/300	l/300	l/300	l/300	l/300	l/300
1.0	2.0	80	80	100	100	100	140	140	160	160
1.5	2.0	80	100	100	120	120	140	160	160	180
2.0	2.0	80	100	100	120	120	160	160	180	200
2.0	2.5	80	100	120	120	120	160	180	200	200
2.0	3.0	100	100	120	140	140	160	200	220	240
2.0	3.5	100	100	120	140	140	180	200	240	240
2.0	4.0	100	120	120	160	160	200	200	240	240
2.5	2.0	80	100	120	120	120	160	160	200	240
2.5	2.5	100	100	120	140	140	180	200	220	240
2.5	3.0	100	100	120	140	140	180	200	240	240
2.5	3.5	100	120	120	140	140	200	240	260	240
2.5	4.0	100	120	140	160	160	200	220	240	260

This table is to be used for a preliminary design only and does not replace the need for a qualified engineer to conduct a full static calculation to confirm CLT sizing.

Mechanical properties of the cross laminated timber elements

This table is to be used for a preliminary design only and does not replace the need for a qualified engineer to conduct a full static calculation to confirm CLT sizing.

The following values for mechanical properties shall be used when design calculations are made according to the principles given in span tables.

1.1 Plantation Oak

Mechanical properties [MPa]			
Bending strength	$f_{m,k}$	[N/mm ²]	24.0
Compression strength	$f_{c,0,k}$	[N/mm ²]	25.0
Rolling shear strength of the boards	$f_{rs,k}$	[N/mm ²]	2.0
Shear strength parallel to the grain of the boards	$f_{v,k}$	[N/mm ²]	5.0
Modulus of elasticity parallel to the grain of the boards	$E_{0,k}$	[N/mm ²]	13000
Modulus of elasticity perpendicular to the grain of the boards	$E_{90,k}$	[N/mm ²]	433
Shear modulus parallel to the grain of the boards	G_k	[N/mm ²]	760
Rolling shear modulus of the boards	$G_{rs,k}$	[N/mm ²]	53

1.2 European Spruce

Mechanical properties [MPa]			
Bending strength	$f_{m,k}$	[N/mm ²]	24.0
Compression strength	$f_{c,0,k}$	[N/mm ²]	24.0
Rolling shear strength of the boards	$f_{rs,k}$	[N/mm ²]	1.2
Shear strength parallel to the grain of the boards	$f_{v,k}$	[N/mm ²]	4.0
Modulus of elasticity parallel to the grain of the boards	$E_{0,k}$	[N/mm ²]	12000
Modulus of elasticity perpendicular to the grain of the boards	$E_{90,k}$	[N/mm ²]	390
Shear modulus parallel to the grain of the boards	G_k	[N/mm ²]	650
Rolling shear modulus of the boards	$G_{rs,k}$	[N/mm ²]	50

2.0 Design Values

For the determination of the design values of the strength properties the following capacity and load factors are used.

2.1 Material Properties

The following material related partial factor and modification factors where used:

$$f_d = \frac{k_{mod} f_k}{\gamma_M}, \text{ where } \gamma_M = 1,3 \text{ and } k_{mod} = 0,8$$

2.2 Design Loads

For the Ultimate Limit State (ULS), the design loads are calculated as follows:

$$\gamma_G G_k + \gamma_Q Q_k, \text{ where } \gamma_G = 1,35 \text{ and } \gamma_Q = 1,5$$

For the Serviceability limit state (SLS) the design loads are calculated as follows:

$$\gamma_G G_k + \gamma_Q Q_k, \text{ where } \gamma_G = 1,0 \text{ and } \gamma_Q = 1,0$$

The creep factor considered to calculate long term deflections is $k_{def} = 0,6$

$$W_{fin,G} = W_{inst,G}(1+k_{def}) \text{ deflection for the permanent action } G$$

$$W_{fin,Q1} = W_{inst,Q1}(1+\psi_{2,i}k_{def}) \text{ deflection for the leading variable action } Q_1$$

$$\psi_{2,i} \approx 0,3 \text{ office and residential}$$

3.0 Design Criteria

The self weight of the panels is included in the tables. Additional permanent loads are to be considered as applied dead load G.

For the ultimate limit state the bending, parallel shear and rolling shear capacity are considered.

For the serviceability limit state the maximum deflection, and the following limits were considered:

Short term dead load	l/200
Short term live load	l/360
Long term load	l/300 and 25mm

Our design solutions think outside the box.

Cusp has a collaborative working relationship with Timber Design Studio, which allows us full access to internationally experienced and world class Mass Timber engineering and design capability.

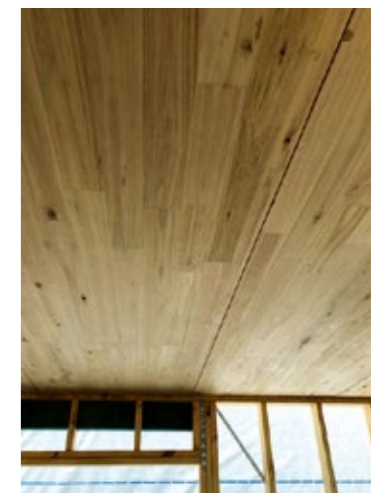
Unlike other Mass Timber suppliers, we offer this as an independent service – outside of our organisation. Timber Design Studio will never try and maximise the amount of product that goes into a project. Their team push the limits with innovative designs and construction methodologies to deliver a design which not only meets the architectural and structural requirements on the project but is also ready for fabrication and installation on site.

We recommend Timber Design Studio because we want to see our product in Australia's most innovative and beautiful projects. And they have worked with us from the beginning, so no-one knows our products better.

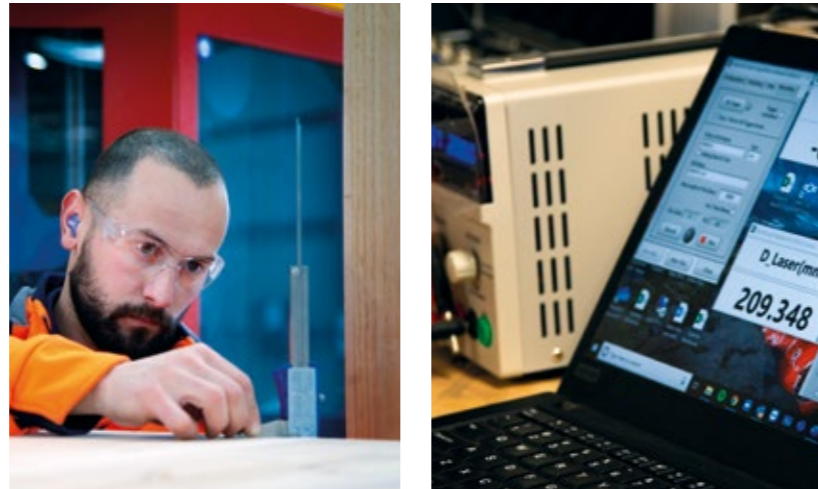
The team at Timber Design Studio are currently working on some of the largest timber projects across Europe and Australia.



Cusp offers engineering and design support to develop and deliver your project.



We're always working on what's next, because the world needs smarter solutions.



We strive to always be on the cutting edge.

So, we're currently pushing on with fresh, big picture thinking. As such, the technical properties outlined in this brochure represents the minimum capability of our products, correct at time of printing. For the latest, always consult our website or our team.

Contact us early in your project to see what is currently, or soon to be, possible. Or to work on what's next together.

Have you got an idea for the future of construction?

Tell us. www.cusp.com.au/whatsnext



What are we currently working on?

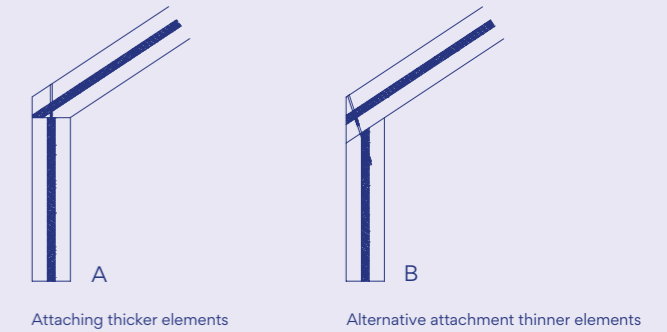


Cusp Bioenergy

To truly maximise the value from our plantation resources, the carbon sequestered in every part of the tree should be used. We are exploring how the residues from plantation forests can be used to create bioenergy.

CLT Standard Connection Details

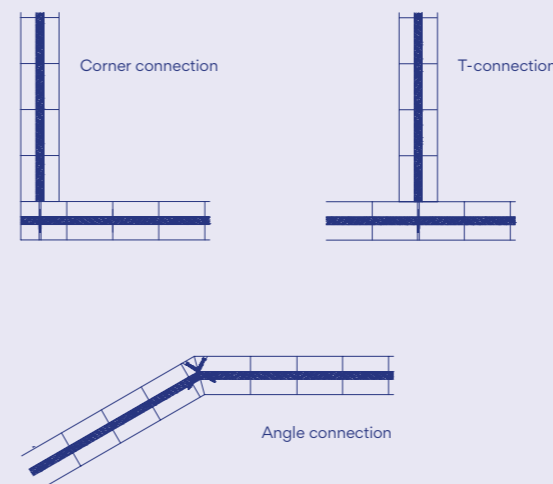
Roof to wall connection - Vertical Section



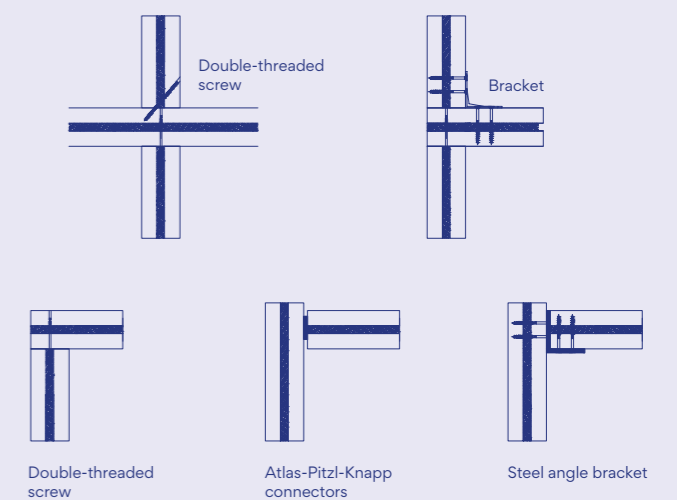
Roof ridge connection



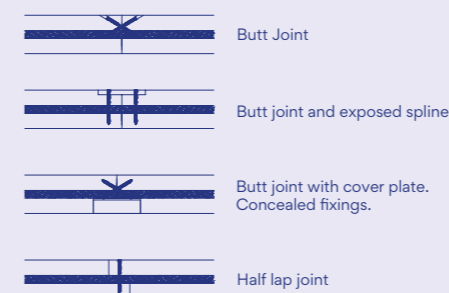
Fastening interior walls - Horizontal Section



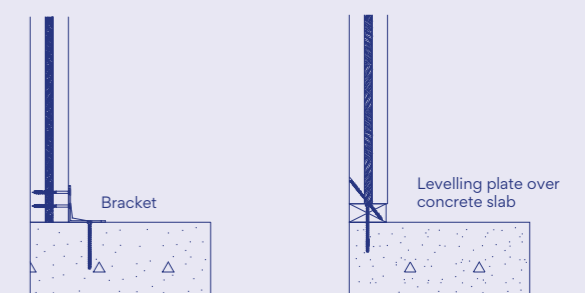
Wall to floor - Vertical Section



Element joints - walls & floors



Wall to concrete slab



Speak to an expert:
1300 792 519
www.cusp.com.au



PRODUCT CERTIFIED

