



T-PAC LUMBER PTY LTD

(A.B.N. 49114816670)

PH: 07 3203 2233

Email: sales@t-pac.com.au

Fax: 07 3203 2344



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'PRIMELAM' Laminated Timber Products Installation Guide

'PRIMELAM' Laminated timber products are manufactured to perform in applications where a combination of both **Structural** and **Visual** characteristics are required. All 'PRIMELAM' Laminated timber products are manufactured to Australian Standard (AS1328.1) and are Quality Endorsed by the GLTAA (Glued Laminated Timber Association of Australia) using a third party audit process managed by Monash University. 'PRIMELAM' Laminated timber products are made exclusively with selected Kiln Dried (Moisture content less than 15%) Merbau (*Instia* spp) and Pacific jarrah (*Manilkara* spp). These timbers have a natural above ground durability rating of 1 (Effective life expectancy of 40 years+). In addition, Merbau is also rated bushfire resistant as well as termite resistant. Fire resistance levels (FRL's) for both species can be determined from AS 1720.4.

'PRIMELAM' Laminated timber products use Resorcinol adhesives which are durable, heat proof, waterproof and chemical and fungal resistant. All Laminated 'PRIMELAM' timber products including GL17S & GL18S Beams, GL13 & GL18 Posts and GL13 & GL18 Handrail products must be used in **above ground applications** and as with all timber products their performance in weather exposed applications is reliant on all parties including the specifiers, builders and homeowners following the recommendations outlined below;

On Site Handling

1. All 'PRIMELAM' beams, posts and handrails should be stored on evenly supported blocks of dry and clean dunnage at least 100mm above ground allowing for good drainage and ventilation.
2. All 'PRIMELAM' beams, posts and handrails should be kept dry by securely covering with a suitable weather proof plastic or tarpaulin.
3. All 'PRIMELAM' beams, posts and handrails should be handled with care to ensure that the dressed finished surfaces are not damaged also, they should not be *dropped, jarred or dragged* as this may adversely affect their performance. All 'PRIMELAM' Laminated Timber Products are supplied with machined dressed surfaces, final sanding may be required to remove any minor machining marks as well as any marks or blemishes present as a result of transport or by on-site handling.

Design

1. Joint detailing, where possible, should follow the below principles;
 - Horizontal contact areas should be kept to a minimum in favour of self-draining vertical surfaces
 - Use only compatible fasteners that have adequate corrosion resistance and do not cause splitting when installed (eg stainless steel or hot dipped galvanized steel).
 - Wherever possible joint surfaces should be ventilated using spacers.
 - Ensure that all joints have adequate drainage for any moisture that enters, so that moisture is not trapped in the joint.
 - Make allowance for any expansion and contraction in the joint design due to moisture or temperature change.
2. The use of damp proof membranes is highly recommended where the product is in contact with porous materials like masonry and/or concrete.
3. The use of rounded or arrised edges on all posts and beams is recommended, this reduces the chance of any coating failures on sharp square edges.
4. All beams, posts and handrails should be installed with allowances for adequate ventilation and should be installed so that the moisture content within the product does not exceed 15% so that moisture gradients across the product will not occur.
5. The use of building overhangs, like eaves and/or other structures which protect the posts, beams or handrails from direct sun exposure and high levels of moisture movement is highly recommended.
6. Shielding of the products in weather exposed applications is highly recommended by using metal, plastic or fibro to protect the products and keep them in a dry unstressed condition.
7. 'PRIMELAM' laminated timber joists and bearers in weather exposed applications should be installed with drip edges and end capping as per the below diagrams 1 & 2, 'PRIMELAM' laminated timber columns, posts and handrails should also have appropriate drainage as per diagram 3. All Stirrups and fixings used must also comply with Australian Standards. Exposed ends of 'PRIMELAM' laminated timber posts must also have capping installed to prevent checking and/or splitting on the end grain.
8. Holes in 'PRIMELAM' laminated timber beams for services should follow the below guidelines;
 - Horizontal holes for fixing should follow the guidelines as per diagram 4
 - Holes should not be greater than 25mm diameter. If a hole is required with a diameter larger than 25mm, advice from a suitably qualified structural engineer is required
 - Service Holes should be restricted to the middle third of the beam span (Holes should not be greater than 25mm diameter)
 - Service Holes should be restricted to the middle third of the beam depth (Holes should not be greater than 25mm diameter)
 - If holes are required in any other area of the beam (eg near end supports) then advice from a suitably qualified structural engineer is required
 - Vertical holes for plumbing or electrical services are not recommended, advice from a suitably qualified structural engineer is required
9. Notches/Birds Mouthing can seriously reduce the strength of a laminated timber beam, particularly if located in the tension zone. Notches/Birds Mouthing is not recommended, advice from a suitably qualified structural engineer is required.
10. Beams should always be supported from the underside of the member, if installed butting up to the supporting structure then suitable framing brackets or custom made brackets should be used for all connections as per diagram 5. All framing or custom brackets must comply with Australian Standards.
11. Allowance should be made on site that **ALL** surfaces of Beams, Posts and Handrails (including the end grain and any concealed joints) be primed/sealed and/or coated prior to installation. Final sanding on site may be required prior to the application of any coatings.

Coating

1. All 'PRIMELAM' Laminated Timber Products are supplied with machined dressed surfaces, final sanding may be required to remove any minor machining marks as well as any marks or blemishes present as a result of transport or by on-site handling.
2. For both painting and oiling/staining, the use of **pale finishing colours is strongly recommended** for timber exposed to direct sun to reduce the effects of high temperatures occurring in the timber.
3. Painting – One coat of quality oil based primer is to be applied to all surfaces **prior** to the installation of the product
 - Acrylic – Exterior Solid Colour Acrylic Finish. One coat of oil based primer post installation followed by two coats of the exterior acrylic finish or otherwise as per the paint manufacturers recommendations.
 - Oil Based – Exterior Solid Colour Oil Based Finish. One coat of oil based primer post installation followed by one coat of oil based undercoat followed by two coats of the exterior oil based finish or otherwise as per the paint manufacturers recommendations.
4. Oiling/Staining - One coat of quality penetrating oil is to be applied to all surfaces **prior** to the installation of the product.

Following installation 2 further coats of penetrating oil are required or otherwise as per the oil manufacturers recommendations Further to the initial coating an **ongoing inspection and maintenance programme** is essential. The inspections should focus on the level of exposure, all joints, fasteners, horizontal surfaces and end grain, as well as following any paint and/or oil manufacturers recommendations.

Additional Information

1. **Fire Resistance** – Merbau is bushfire resistant in accordance with AS3959. Both merbau and Pacific jarrah have densities > 750 kg/m³ and may be used for construction in bushfire prone areas in accordance with AS 3959. Extensive fire testing also shows that large end section timber beams and posts perform well in fire situations due to the formation of a protective layer of char. This charred area inhibits the effects of the fire on the inner portion of the timber member, hence it maintains structural load support for measurable periods of time as the fire progresses. The glue used in the construction of all 'PRIMELAM' Laminated Timber products is also resistant to fire, the glue lines will remain unaffected in the un-charred portion of the laminated members. FRL's can be determined from AS 1720.4.
2. **Termite Resistance** – Merbau is naturally termite resistant, generally no additional chemical treatment is required. Where required, Pacific jarrah can be treated to H2 level in accordance with AS/NZS 1604.5 to render it termite resistant.
3. **Extreme Weather Areas** – 'PRIMELAM' laminated timber posts, beams and handrails are **NOT** suitable for external applications in extreme weather areas such as Ski Resorts and Dry Desert Areas.
4. **Stainless Steel Wire Balustrade** – Where stainless steel wire balustrade is to be installed the following guidelines **MUST** be adhered too or all product guarantees will be void. Screw type fixings are **not** to be used, all fixings must be a **bolt through** type similar to the "Otter" Ezy Fix Balustrade System. For further information please contact your sales representative or hardware supplier.
5. **Surface Checking** – Surface Checking is where the timber fibres separate, normally across the growth rings, as a result of natural changes and variations in moisture content. Surface Checks are often confused with delamination, where a glue bond has not fixed correctly, and the presence of wood fibre separation in the opening is a key distinguishing feature of checking. Opening as a result of the adhesive not bonding correctly generally appear as smooth surfaces possibly with the presence of dark and glossy adhesive residue. In general, surface checks have negligible effect on the strength of the laminated product, however the reason for the checking should be determined and mitigation and remediation procedures put into effect. For further information on remediation please refer to "Glulam Repair Protocol – Wood Addiction 2010".

Diagram 1

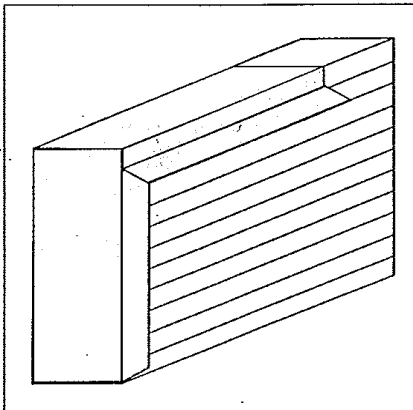


Diagram No. 1 - Illustration of Typical End

Diagram 2

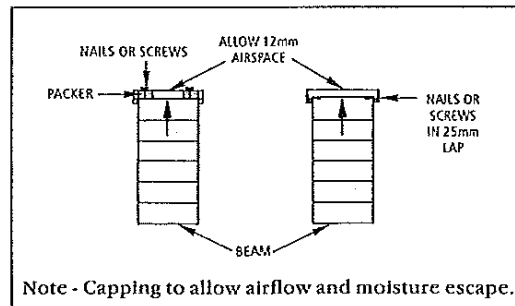


Diagram No. 2 - Capping Details

Diagram 3

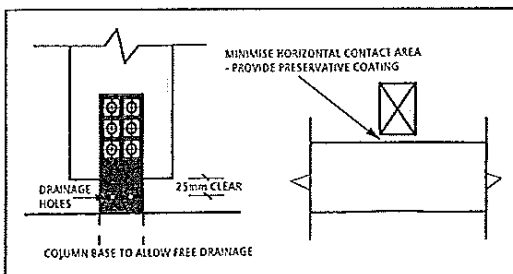
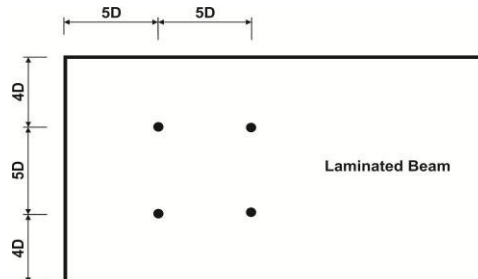


Diagram No. 3 - Detailing to avoid moisture traps

Diagram 4



D = Hole Diameter

Diagram 4 - Horizontal Holes for Fixing

Diagram 5

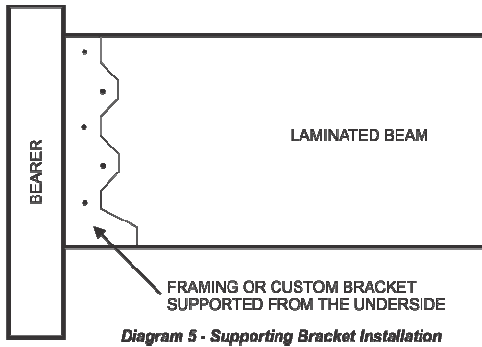


Diagram 5 - Supporting Bracket Installation

References/Further Information

- GLTAA – Technical Data Sheet 1 – Handling/On-site Protection
- GLTAA – Technical Data Sheet 2 – Exposed Applications
- GLTAA – Technical Data Sheet 3 – Uniform Design Criteria
- GLTAA – Technical Data Sheet 4 – History of GL Grades
- GLTAA – Technical Data Sheet 5 – Epoxy Injection
- GLTAA – Technical Data Sheet 6 – Service Class 3 Applications
- Wood Solutions Design Guide 04 – Building with Timber in Bushfire-prone
- Standards Australia and Standards New Zealand, AS/NZS 1328, AS 3958
- Glulam Repair Protocol – Wood Addiction 2010*

