Version 1

SAFE LOAD TABLES
MAY 2012

ETH MAGNA GLULAM™

KWILA / MERBAU GL17S ENGINEERED MAGNA BEAMS
KWILA / MERBAU GL13S ENGINEERED MAGNA POSTS

Contents

MAGNA Finger Jointed Laminated Merbau/Kwila products are manufactured to perform in applications where a combination of both **Structural and Visual** characteristics are required.

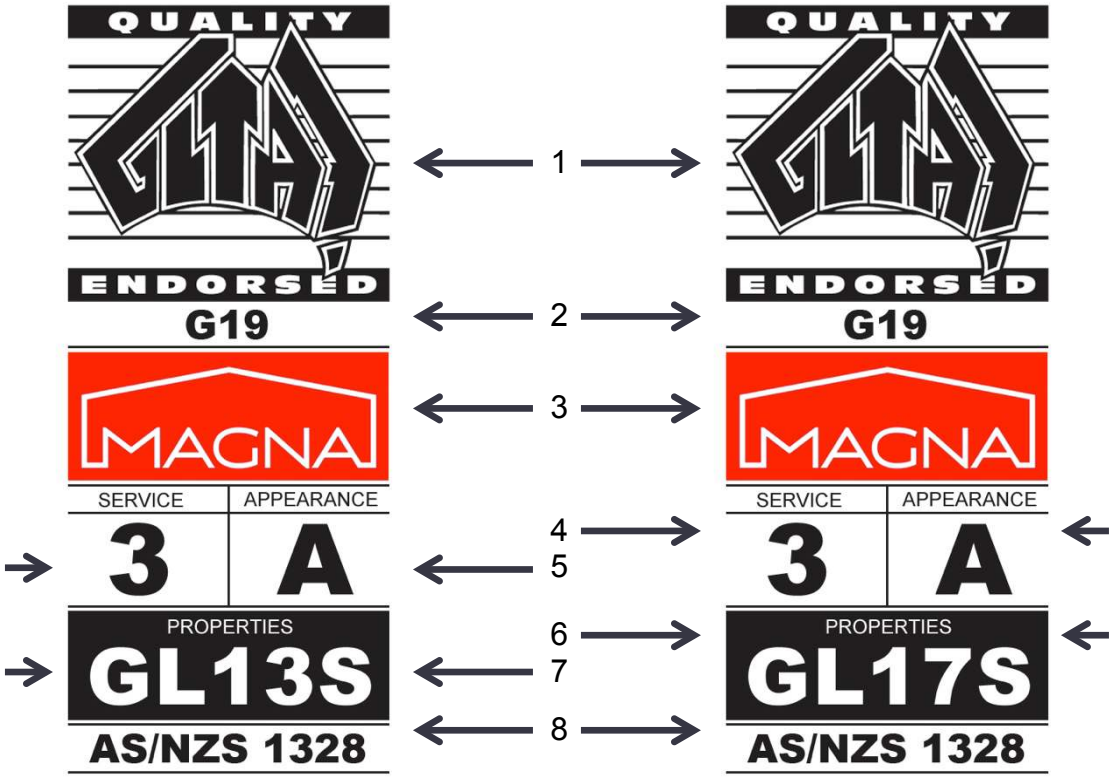
MAGNA Specifications.

Manufacturer	:	CV Kharisma Duta Utama located in Gresik, Surabaya, Indonesia.
Marketed by	:	ETH Enterprise Pte Ltd, Singapore and their agent in Australia, Simpson Woodstock Pty Ltd.
Species common names	:	Merbau, Kwila
Botanical species names	:	Intsia palembancica, Intsia bijuga.
Origin	:	Legal forest concessions in Indonesian province of Irian.
Manufacturing standards	:	Made in accordance with AS5068-2006 & AS/NZS1328.1&2 1998. Manufacturing process is audited by Monash University Engineering Department on behalf of the Glue Laminated Timber Association of Australia of which Kharisma Duta Utama is accredited member number G19.
Glue standard	:	Resorcinol Formaldehyde glue is used in all joints.
Durability	:	When free of sapwood Merbau/Kwila has a natural above ground-durability of Class 1 (life expectancy over 40 years) or in-ground durability of Class 3 (life expectancy 5 – 15 years). Using phenolic glue throughout MAGNA products are suitable for Service Class 3 areas where structural members are fully exposed.
Warranty	:	A minimum 15 year Manufacturer's Product Warranty is provided and a copy is included in this document. The warranty covers above-ground use only.
Strength testing	:	Daily strength testing is carried out on site and quarterly strength testing is carried out by Monash University as part of the GLTAA quality assurance programme. Analysis of the initial strength testing data was carried out by HR Design Group and a copy of their engineering certificate is included in this document. The minimum strength categories for beams is GL17 and for posts is GL13

Safe Load Tables	:	19 span tables prepared by HR Design Group have been included in this document.
Appearance	:	'A' grade smooth surfaces for clear or painted finishes with arissed edges. Magna beams & posts are made by using a comparatively small number of component lamina and this enhances their appearance.
Bushfire resistance	:	Merbau/Kwila is one of 7 bushfire resisting timbers listed in AS3959. It is suitable for BAL 29 applications.
Termite resistance	:	Merbau/Kwila is resistant to termite attack.
Post sizes	:	70 x 70, 90 x 90, 100 x 100, 140 x 140 and 190 x 190 with 6mm arissed edges. In addition 95 x 95 and 120 x 120 with 3mm arissed edges are made for the West Australian market. Tolerance is +1mm -0.5mm.
Beam sizes	:	42 x 90/120/140/165/190/240/290mm, 65 x 140/190/240/290mm, 80 x 140/190/240/290mm. Other sizes can be manufactured to order. Tolerance is +1mm -0.5mm.
Lengths	:	2.4m to 6.0m in 0.3m increments. 6.3m to 7.8m lengths will be available by October 2012. Tolerance +20mm – nil.
Stability	:	Merbau/Kwila has very low rates of shrinkage and this makes it one of the world's most stable timbers. Laminating further improves the stability making for exceptionally straight posts and beams. As a guide the maximum spring and bow in MAGNA beams and posts will be less than half the maximum permissible bow and spring for solid Hardwoods listed in table C1 of AS 2082-2007.
Surface checking	:	Compared to other hardwoods Merbau/Kwila has a very low tendency to surface check. A small amount of splitting along gluelines can occur as a result of moisture in lamina achieving equilibrium and this is not a sign of delamination. If they are not painted MAGNA beams and posts must be regularly coated with a quality penetrating oil to protect gluelines and to minimize surface checking.

QUALITY ASSURANCE LABELS

A Quality Assurance label is attached to each piece. The significance of each part of the label is described below.



1. GLTAA Quality Mark.
2. Producers GLTAA Accreditation Number.
3. MAGNA Brand Name.
4. Service Class 3.

   Denotes suitability for fully exposes areas with EMC above 20%.
5. Appearance Grade A.

   Denotes suitability for a clear finish.
6. Mechanical properties grade tested according to AS/NZS 1328
7. Symbol for straight glulam (S) or pre-cambered glulam (C)
8. Denotes the Australian / NZ Standard used to manufacture and test the product.

HR DESIGN GROUP PTY LTD
ABN 14 015 519 720

HR Design Group Pty Ltd

ABN: 14 015 519 720

31 August 2011
File: 11-0272

Ref: Certification for Merbau and Kwila Glued Laminated Beams, manufactured by ETH Enterprise Pte Ltd and distributed here in Australia

The final design values that we recommend for the Australian market are listed in the tables below, based on the two grades that we have pre-qualified, GL13 and GL17. We have also carried out all designs for the span tables for their use in Australia, and we have checked the literature to which this letter is attached.

These Merbau and Kwila beams are manufactured as suitable for use in Service Classes, 1, 2 and 3 in accordance with AS/NZS 1328 – 1998, and therefore can be used in exterior locations above and not in contact with the ground.

Grade	Bending f'_b	Tension f'_t	Compression Parallel to Grain f'_c	Beam Shear f'_s	Elasticity Parallel to grain E	Modulus of Rigidity for Beams G	Bearing Perpendicular to Grain f'_p
GL17	40	20	33	4.2	16700	1110	23
GL13	33	16	26	4.2	13300	900	23

Standards used in the development of the Span Table Guide are:

AS1720.1-2010 Timber Design Code
AS/NZS 1170 series – Loading Codes
AS 1684.2, .3 – 2010 Residential Timber-framed Construction
AS 4055-2006 Wind Loads for Housing

Therefore, I am satisfied that the characteristic values, with all products included in this guide, and the items installed and connected in accordance with the requirements laid out throughout this guide, will comply with the requirements of the Building Code of Australia, and Australian building practice.

Should you require any further information, or confirmation of any of the above matters, please do not hesitate to contact me at any time.

Yours faithfully,
HUNT ROBINSON Pty Ltd

Stephen John Hunt ***BEng (Civil), CPEng***
(MIEAust #368737), (RPEQ #3731), NPER

Directors:
Stephen Hunt
Janette Hunt

Engineering:
Craig Doherty
Benjamin Winning
JakeKerswill
Anthony Coughlan

Building Design:
Brad Hunt
James Overitt

Software:
James Overitt

Administration:
Carolyn Foot
Leisa Skehan

Reply to: -
PO Box 103,
Buddina, Q, 4575.

Office at: -
4/40 Technology Dr,
Warana, Q, 4575.
Telephone:
(07) 5493 2677
Facsimile:
(07) 5493 1816

Email: -
engineers@
hrdesigngroupcom.au

Web site: -
www.hrdesigngroupcom.au

ETH MAGNA GLULAM™

Product Warranty

CV Kharisma Duta Utama, warrants that its MAGNA engineered hardwood products are free of significant defects in manufacture and material and they will perform satisfactorily according to the published safe load tables for a minimum of 15 years provided that they are handled and maintained according to published instructions.

Manufacturer :
CV Kharisma Duta Utama
Jl. Mayjen Sungkono No. 53, Prambangan,
Kebomas, Gresik 61124, Indonesia

Marketed by :
ETH Enterprise Pte Ltd,
14 Gul Lane,
Singapore 629412

QUALITY
ENDORSED
G19

PRODUCT WARRANTY

Product Warranty

CV Kharisma Duta Utama of Jl. Mayjen Sungkono No. 53, Prambangan, Kebomas, Gresik 61124 Indonesia (phone 62 31 3972903) ("the Manufacturer"). The Manufacturer warrants with the buyer ("the Buyer") the quality of glue laminated timber products ("Products") in accordance with AS/NZS1328.1:1998 and subject to the following conditions:

1. Such warranty shall be to repair or replace any Products or part of Products which have been manufactured by the Manufacturer and which within fifteen (15) years after the date of delivery ("the Warranty Period") be defective either because of faulty manufacturing or workmanship or the use of defective material on the Manufacturer's part. This warranty is in addition to other rights and remedies under Australian Consumer Law.

2 No liability on the Manufacturer's part shall arise hereunder unless within fourteen days (14) after discovery of the defect the Buyer submits to the Manufacturer via its Distributor, written notice includes pictures describing and showing the alleged defect and such notice is received by the Manufacturer within the Warranty Period. A defect in workmanship or material of any part of the Products shall not alone condemn the entire Products installed and the Manufacturer is only required to repair or replace those parts of the Products that are defective.

3. The Manufacturer shall be entitled by its workmen, servants or agents to enter on the Buyers' premises to inspect the alleged defective Products.

4. The cost of the inspection and labour associated with the removal and replacement of any defective Products (including the cost of travel and accommodation) shall be the responsibility of and at the expense of the Buyer until it is verified by the Manufacturer to be a warranty claim at which time these expenses shall be the responsibility of and at the expense of the Manufacturer.

5. Any liability on the Manufacturer's part shall be conditional on the Products having been handled, stored and installed in accordance with The Glued Laminated Timber Association of Australia ("the GLTAA") by competent experienced trades people and having since the date of delivery/installation been properly used, maintained and serviced in accordance with the GLTAA and properly used for the purpose intended and no repairs, alterations or modifications thereon having been carried out to the Products without the Manufacturer's prior written consent.

6. The warranty shall not cover any defect or damage which may be caused or partly caused by or arise through any or all of the following:

   (a) Normal wear and tear during the Warranty Period; or,
   (b) Inadequate or improper maintenance or care of the Products; or,
   (c) Products that have been installed in an inappropriate or un-tradesman-like manner or installed by un-tradesman-like installers or persons unskilled and/or unqualified in the installation of the Products; or,
   (d) Natural disasters including but not limited to fire, floods, lightening, earthquakes, hail or hurricane; or,
   (e) Acts of negligence, accidents or misuse, including but not limited to, vandalism, civil disobedience, or acts or war; or,
   (f) Acids or harmful chemicals and the like being brought into contact with the Products; or,
   (g) Discolouration or change in appearance of the Products due to natural or extreme conditions including but not limited to ultraviolet damage and other weather exposure; or,
   (h) Failure to properly maintain the Products; or
   (i) Structural and/or design modifications after installation of the Products without the Manufacturer's prior written consent (or the written approval from a qualified structural engineer); or
   (j) Additional loads to which the Products are subjected without the Manufacturer's prior written consent (or the written approval from a qualified structural engineer) and/or use of the Products not in accordance with the structural design specifications and/or technical support data of the Products as provided by the Manufacturer; or,
   (k) Long term exposure of the Products to moisture which causes the Equilibrium Moisture Content ("ËMC") of the Products or part of the Products to increase over 25% for prolonged periods; or
   (l) Any departure from and/or use outside of the structural design specifications and/or technical support data of the Products as provided by the Manufacturer; or
   (m) Any products or services supplied or provided by a supplier or manufacturer other than the Manufacturer; or
   (n) Any misuse or abuse of structures, fittings or attachments connected to or contained within the structure hosting the Products.

7. If the Buyer is a Consumer (as defined by Section 3 of the Competition and Consumer Act 2010) the Products come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the Products repaired or replaced if the Products fail to be of acceptable quality and the failure does not amount to a major failure.

8. In the event that the Manufacturer is liable to the Buyer under this warranty for any warranty so given, the Manufacturer's liability is limited to repairing or replacing the Products or part of the Products that do not comply with such warranty and in no case shall the Manufacturer be liable for consequential loss or costs any greater than the price of the Products (or part thereof) that does not comply.

9. The decision to repair or replace Products (or part of the Products) under this Warranty is the sole discretion of the Manufacturer.

10. The Buyer does not reply on any representation, warranty or other term made by or on behalf of the Manufacturer which is not set out in this warranty and the Manufacturer is not liable for any damage, economic loss or loss of profits whether direct, indirect, general, special or consequential arising out of a breach of an implied or expressed term or suffered as a result for negligence of the Manufacturer or its employers or agents, apart from liability as set out in this warranty.

11. The Buyer cannot assign this warranty without the prior written approval of the Manufacturer.

12. All terms which would otherwise be implied are excluded (in the case of any terms that would be implied or incorporated by statute, any such terms are excluded to the extent that they are able to be excluded) except if stated in this warranty.

Installation Guide

All laminated *Magna* Kwila products including GL17S Beams and GL13 Posts 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 *Magna* beams, posts and handrails should be stored on evenly supported blocks or dunnage at least 100mm above ground allowing for good drainage and ventilation
2. All *Magna* beams, posts and handrails should be kept dry by securely covering with a suitable weather proof plastic or tarpaulin
3. All *Magna* 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

Design

1. Joint detailing, where possible, should follow the below principles;
   - Horizontal contact areas should be keep 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 thermal expansion and contraction in the joint design
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 and posts 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 beam will not occur
5. The use of building overhangs, like eaves and/or other structures which protect the posts and/or beams 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. GL17S joists and bearers in weather exposed applications should be installed with drip edges and end capping as per the below diagrams 1 and 2, columns and posts should also have appropriate drainage as per diagram 3. Exposed ends of GL13 posts must also have capping installed to prevent splitting on the end grain
8. Holes in GL17S 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 GL17S 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
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

Coating

1. 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
2. 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 – Kwila is naturally fire resistant and is suitable for use in fire rated buildings. Extensive fire test data also shows that large end section timber beams 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 beams, hence it maintains structural load support for measurable periods of time as the fire progresses. The glue used in the construction on the *Magna* Beams is also resistant to fire, the gluelines will remain unaffected in the un-charred portion of the laminated beam.
2. Termite Resistance - Kwila is also naturally termite resistant, generally no additional chemical treatment is required.
3. Extreme Weather Areas – GL17S and GL13 products 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. 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 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” available at www.pacificwood.com.au

Diagram 1

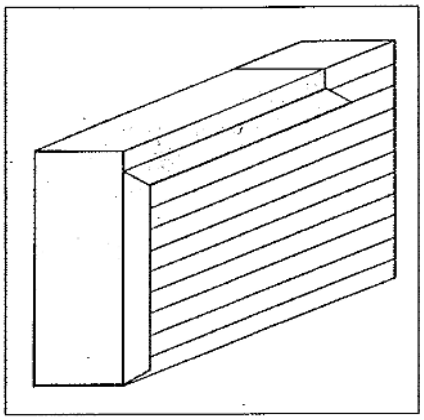


Diagram No. 1 - Illustration of Typical End

Diagram 2

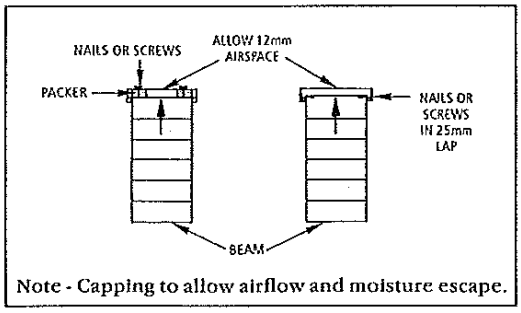


Diagram No. 2 - Capping Details

Diagram 3

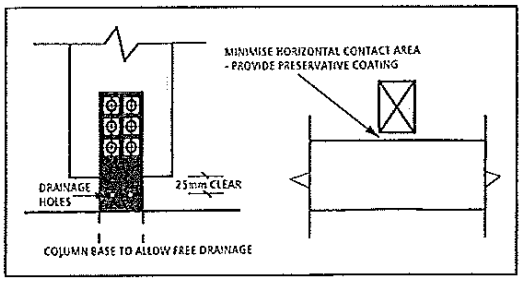


Diagram No. 3 - Detailing to avoid moisture traps

Diagram 4

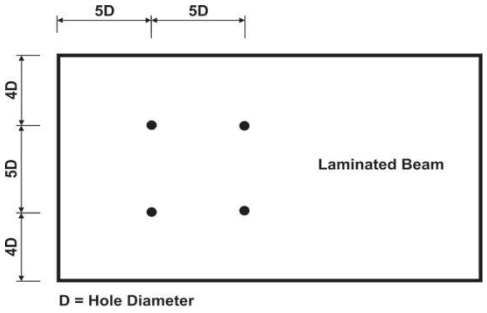


Diagram 4 - Horizontal Holes for Fixing

Diagram 5

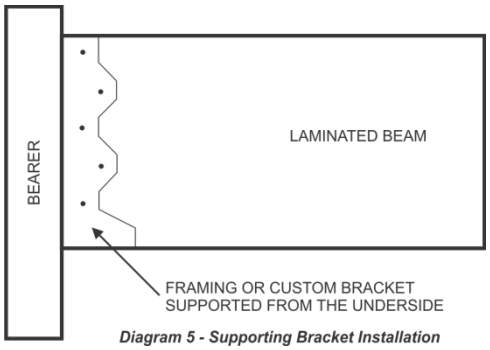


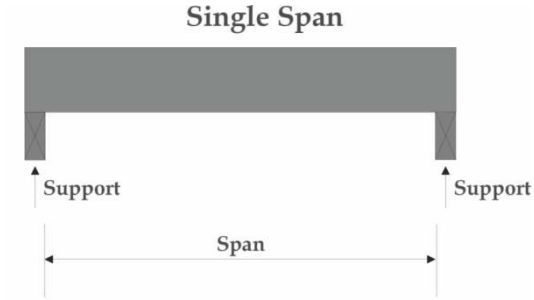
Diagram 5 - Supporting Bracket Installation

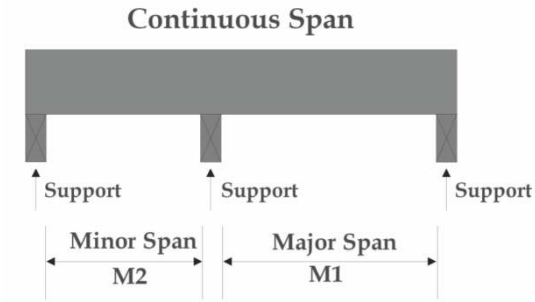
References/Further Information

- 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
- Standards Australia and Standards New Zealand, AS/NZS 1328.2 *Glued Laminated Structural Timber – Part 1 Performance requirements and minimum production requirements*. SAI Global
- Glulam Repair Protocol – Wood Addiction 2010*

Glued Laminated Timber Association of Australia

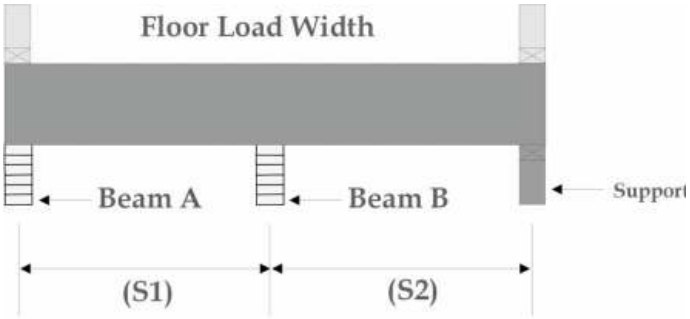
Determination of Load Widths





A beam is considered continuous if the major span is less than or equal to the minor span x 1.25.

M1 <= M2 x 1.25



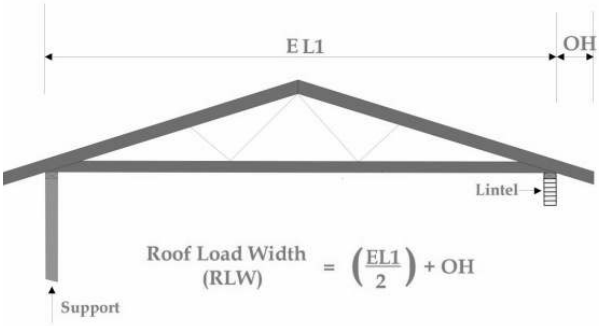
Beam A

$$\text{Floor Load Width (FLW)} = \left(\frac{S1}{2}\right)$$

Beam B

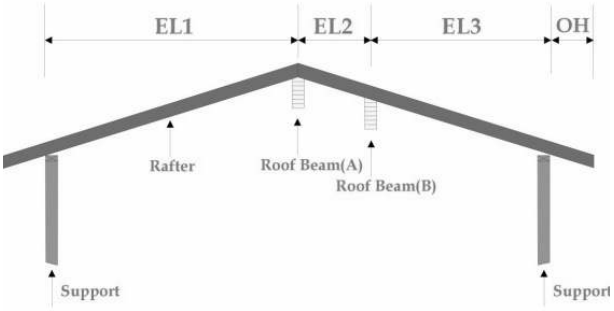
$$\text{Floor Load Width (FLW)} = \left(\frac{S1+S2}{2}\right)$$

Diagram 1



$$\text{Roof Load Width (RLW)} = \left(\frac{EL1}{2}\right) + OH$$

Diagram 2



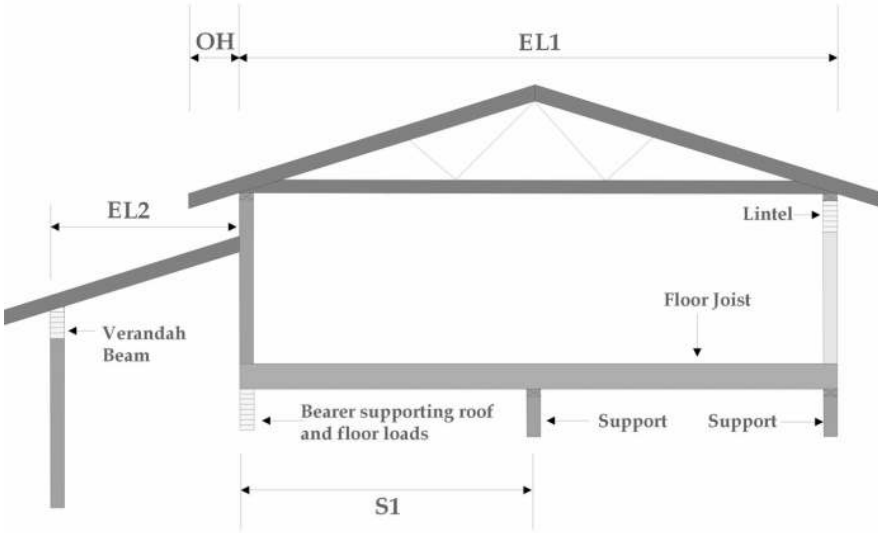
Beam A

$$\text{Roof Load Width (RLW)} = \left(\frac{EL1+EL2}{2}\right)$$

Beam B

$$\text{Roof Load Width (RLW)} = \left(\frac{EL2+EL3}{2}\right)$$

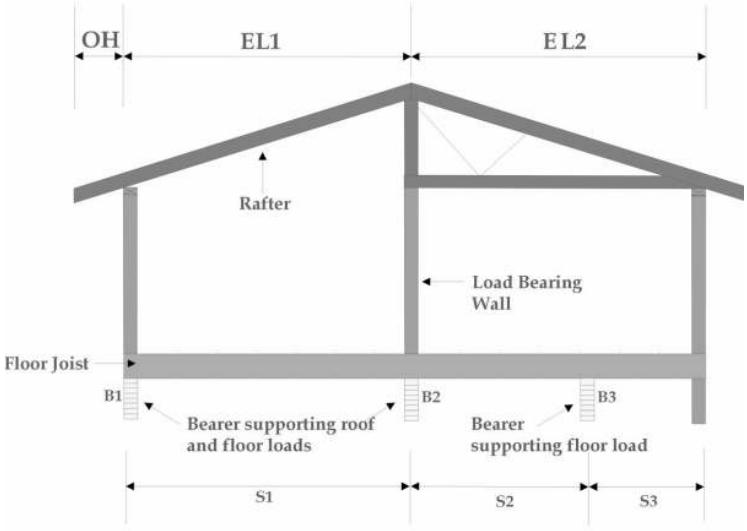
Diagram 3



$$\text{Roof Load Width (RLW)} = \left(\frac{EL1+EL2}{2}\right) + OH$$

$$\text{Floor Load Width (FLW)} = \frac{S1}{2}$$

Diagram 4



Bearer B1

$$\text{Roof Load Width (RLW)} = \frac{EL1}{2} + OH \qquad \text{Floor Load Width (FLW)} = \frac{S1}{2}$$

Bearer B2

$$\text{Roof Load Width (RLW)} = \left(\frac{EL1+EL2}{2}\right) \qquad \text{Floor Load Width (FLW)} = \left(\frac{S1+S2}{2}\right)$$

Bearer B3

$$\text{Floor Load Width (FLW)} = \left(\frac{S2+S3}{2}\right)$$

GL17S Verandah Beams – Sheet/Tile N3

Size (mm)	Supporting Sheet Roofing + Ceiling – Roof Load Width (mm)							
	Single Span Verandah Beams				Continuous Span Verandah Beams			
	600	1200	1800	2400	600	1200	1800	2400
140x42	4.0	3.2	2.8	2.5	4.9	4.3	3.8	3.5
190x42	5.0	4.3	3.8	3.4	6.3	5.4	4.8	4.5
240x42	5.9	5.0	4.6	4.2	7.4	6.4	5.8	5.4
290x42	6.7	5.8	5.3	4.9	8.4	7.3	6.6	6.2
140x65	4.4	3.7	3.2	2.9	5.5	4.7	4.3	4.0
190x65	5.4	4.7	4.3	4.0	6.8	5.9	5.4	5.0
240x65	6.4	5.5	5.1	4.7	8.0	7.0	6.4	5.9
290x65	7.2	6.3	5.8	5.4	9.1	8.0	7.3	6.8
240x80	6.6	5.8	5.3	4.9	8.3	7.3	6.7	6.2
	Supporting Tiled Roof + Ceiling – Roof Load Width (mm)							
	Single Span Verandah Beams				Continuous Span Verandah Beams			
	600	1200	600	1200	600	1200	600	1200
140x42	3.2	2.5	2.2	2.0	4.2	3.4	3.0	2.6
190x42	4.2	3.4	3.0	2.7	5.3	4.5	4.0	3.5
240x42	5.0	4.2	3.8	3.4	6.3	5.3	4.8	4.4
290x42	5.7	4.9	4.4	4.1	7.2	6.1	5.5	5.0
140x65	3.6	2.9	2.5	2.3	4.7	3.9	3.4	3.1
190x65	4.6	3.9	3.4	3.1	5.8	5.0	4.5	4.2
240x65	5.5	4.7	4.2	3.9	6.9	5.9	5.3	5.0
290x65	6.3	5.4	4.9	4.5	7.9	6.8	6.1	5.7
240x80	5.7	4.9	4.4	4.1	7.2	6.2	5.6	5.2

Span values are in metres

Loading Data:

Dead Load of roof: Sheet roof + ceiling, maximum 40 kg/m_2, Tiled roof + ceiling, maximum 90 kg/m_2

(Covers standard residential roof materials, for roof pitch maximum 35deg)

Wind Load taken as N3 in accordance with AS 4055 Wind Loads for Housing

ETH LAM GL beams are manufactured straight, without any camber built into the beams.

Deck Joist design criteria in accordance with methods presented in AS1684.1-1999, and structural timber design in accordance with AS1720.1-2010.

Notes:

1) Minimum bearing lengths for support of verandah beams: 45mm on end supports, and 65mm internal supports.

2) The span value shown is the distance between centrelines of supports.

3) For continuous spans, the adjacent beam spans may be different, but look up the larger of the spans, and the shorter span must be more than 50% of the larger span. If this rule is not met, then consider the verandah beams are simply supported, and look up the larger span in the single span table.

4) Deflection criteria: for dead load, the lesser of Span/400, or 10mm, and for Roof Live Loads, Span/250.

5) For deck joists the lateral restraint is assumed to be achieved via the fixing of flooring direct to the top edge. No restraint of the bottom edge of the joist is assumed.

6) Where there are conflicts in design between loading codes (AS/NZS1170 series), timber code (AS1720.1-2010) and AS1684.1-1999, the loading codes and timber codes take preference.

The above span table values have been designed in accordance with the following codes:

· AS1720.1-2010 Timber Design Code

· AS1170.0, .1, .2-2002 Loading Codes for Limit State design, Live Loads, and Wind Loads respectively.

· AS1684.1-1999 Design Criteria for Residential Timber Framing.

GL17S Verandah Beams – Sheet/Tile C2

Size (mm)	Supporting Sheet Roofing + Ceiling – Roof Load Width (mm)							
	Single Span Verandah Beams				Continuous Span Verandah Beams			
	600	1200	1800	2400	600	1200	1800	2400
140x42	4.0	3.2	2.8	2.5	4.9	3.9	3.2	2.7
190x42	5.0	4.3	3.8	3.4	6.3	5.3	4.3	3.7
240x42	5.9	5.0	4.6	4.2	7.4	6.4	5.4	4.6
290x42	6.7	5.8	5.3	4.9	8.4	7.3	6.3	5.5
140x65	4.4	3.7	3.2	2.9	5.5	4.7	4.0	3.4
190x65	5.4	4.7	4.3	4.0	6.8	5.9	5.4	4.7
240x65	6.4	5.5	5.1	4.7	8.0	7.0	6.4	5.9
290x65	7.2	6.3	5.8	5.4	9.1	8.0	7.3	6.8
240x80	6.6	5.8	5.3	4.9	8.3	7.3	6.7	6.2
	Supporting Tiled Roof + Ceiling – Roof Load Width (mm)							
	Single Span Verandah Beams				Continuous Span Verandah Beams			
	600	1200	600	1200	600	1200	600	1200
140x42	3.2	2.5	2.2	2.0	4.2	3.4	3.0	2.6
190x42	4.2	3.4	3.0	2.7	5.3	4.5	4.0	3.5
240x42	5.0	4.2	3.8	3.4	6.3	5.3	4.8	4.4
290x42	5.7	4.9	4.4	4.1	7.2	6.1	5.5	5.0
140x65	3.6	2.9	2.5	23	4.7	3.9	3.4	3.1
190x65	4.6	3.9	3.4	3.1	5.8	5.0	4.5	4.2
240x65	5.5	4.7	4.2	3.9	6.9	5.9	5.3	5.0
290x65	6.3	5.4	4.9	4.5	7.9	6.8	6.1	5.7
240x80	5.7	4.9	4.4	4.1	7.2	6.2	5.6	5.2

Span values are in metres

Loading Data:

Dead Load of roof: Sheet roof + ceiling, maximum 40 kg/m_2, Tiled roof + ceiling, maximum 90 kg/m_2
(Covers standard residential roof materials, for roof pitch maximum 35deg)
Wind Load taken as C2 in accordance with AS 4055 Wind Loads for Housing
ETH LAM GL beams are manufactured straight, without any camber built into the beams.
Deck Joist design criteria in accordance with methods presented in AS1684.1-1999, and structural timber design in accordance with AS1720.1-2010.
Notes:

1) Minimum bearing lengths for support of verandah beams: 45mm on end supports, and 65mm internal supports.
2) The span value shown is the distance between centrelines of supports.
3) For continuous spans, the adjacent beam spans may be different, but look up the larger of the spans, and the shorter span must be more than 50% of the larger span. If this rule is not met, then consider the verandah beams are simply supported, and look up the larger span in the single span table.
4) Deflection criteria: for dead load, the lesser of Span/400, or 10mm, and for Roof Live Loads, Span/250.
5) For deck joists the lateral restraint is assumed to be achieved via the fixing of flooring direct to the top edge. No restraint of the bottom edge of the joist is assumed.
6) Where there are conflicts in design between loading codes (AS/NZS1170 series), timber code (AS1720.1-2010) and AS1684.1-1999, the loading codes and timber codes take preference.

The above span table values have been designed in accordance with the following codes:

· AS1720.1-2010 Timber Design Code
· AS1170.0, .1, .2-2002 Loading Codes for Limit State design, Live Loads, and Wind Loads respectively.
· AS1684.1-1999 Design Criteria for Residential Timber Framing.

GL17S Verandah Beams – Light Sheet Roof N2

Size (mm)	Single Spans					
	Supporting Light Sheet Roofing Only – Roof Load Width (mm)					
	600	1200	1800	2400	3000	3600
140x42	4.4	4.4	4.0	3.7	3.4	3.1
190x42	5.9	5.5	5.0	4.6	4.3	4.1
240x42	7.3	6.5	5.9	5.5	5.1	4.8
290x42	8.2	7.3	6.7	6.2	5.9	5.5
140x65	5.0	4.8	4.4	4.1	3.8	3.6
190x65	6.6	5.9	5.4	5.1	4.7	4.5
240x65	7.6	6.9	6.4	6.0	5.6	5.3
290x65	8.5	7.8	7.3	6.8	6.4	6.1
240x80	7.8	7.1	6.6	6.2	5.8	5.6

Size (mm)	Continuous Spans					
	Supporting Light Sheet Roofing Only – Roof Load Width (mm)					
	600	1200	1800	2400	3000	3600
140x42	4.9	4.9	4.8	4.1	3.7	3.4
190x42	6.6	6.6	6.3	5.7	5.1	4.6
240x42	8.4	8.1	7.4	6.9	6.3	5.8
290x42	10.1	9.2	8.5	7.9	7.4	6.8
140x65	5.6	5.6	5.5	5.1	4.6	4.3
190x65	7.7	7.5	6.9	6.4	6.0	5.7
240x65	9.6	8.7	8.0	7.5	7.1	6.7
290x65	10.8	9.8	9.1	8.6	8.1	7.7
240x80	9.8	9.0	8.3	7.8	7.4	7.0

Span values are in metres

Loading Data:

Dead Load of roof: Sheet roof with no ceiling, maximum 15 kg/m^2.
(Covers standard residential roof materials, for roof pitch maximum 35deg)
Wind Load taken as N2 in accordance with AS 4055 Wind Loads for Housing
ETH LAM GL beams are manufactured straight, without any camber built into the beams.
Verandah beam deflection criteria in accordance with methods presented in AS1684.1-1999, and structural timber design in accordance with AS1720.1-2010.

Notes:

1) Minimum bearing lengths for support of verandah beams: 45mm on end supports, and 65mm internal supports.
2) The span value shown is the distance between centrelines of supports.
3) For continuous spans, the adjacent beam spans may be different, but look up the larger of the spans, and the shorter span must be more than 50% of the larger span. If this rule is not met, then consider the verandah beams are simply supported, and look up the larger span in the single span table.
4) Deflection criteria: for dead load, the lesser of Span/360, or 10mm, and for Roof Live Loads, Span/250.
5) Where there are conflicts in design between loading codes (AS/NZS1170 series), timber code (AS1720.1-2010) and AS1684.1-1999, the loading codes and timber codes take preference.

The above span table values have been designed in accordance with the following codes:

· AS1720.1-2010 Timber Design Code
· AS1170.0, .1, .2-2002 Loading Codes for Limit State design, Live Loads, and Wind Loads respectively.
· AS1684.1-1999 Design Criteria for Residential Timber Framing.

GL17S Verandah Beams – Light Sheet Roof C2

Size (mm)	Single Spans					
	Supporting Light Sheet Roofing Only – Roof Load Width (mm)					
	600	1200	1800	2400	3000	3600
140x42	4.4	3.6	3.0	2.6	2.3	2.1
190x42	5.9	4.9	4.1	3.5	3.1	2.9
240x42	7.3	6.2	5.0	4.4	4.0	3.6
290x42	8.2	7.3	6.0	5.1	4.6	4.3
140x65	5.0	4.1	3.6	3.2	2.9	2.6
190x65	6.6	5.6	4.9	4.4	3.9	3.6
240x65	7.6	6.9	6.2	5.6	5.0	4.6
290x65	8.5	7.8	7.3	6.8	6.1	5.5
240x80	7.8	7.1	6.6	6.1	5.6	5.1

Size (mm)	Continuous Spans					
	Supporting Light Sheet Roofing Only – Roof Load Width (mm)					
	600	1200	1800	2400	3000	3600
140x42	4.9	3.7	3.0	2.6	2.3	2.1
190x42	6.6	5.0	4.1	3.5	3.1	2.9
240x42	8.4	6.2	5.0	4.4	4.0	3.6
290x42	10.1	7.3	6.0	5.1	4.6	4.4
140x65	5.6	4.6	3.7	3.2	2.9	2.6
190x65	7.7	6.3	5.1	4.4	3.9	3.6
240x65	9.6	7.9	6.5	5.6	5.0	4.6
290x65	10.8	9.6	7.8	6.8	6.1	5.5
240x80	9.8	8.9	7.2	6.2	5.6	5.1

Span values are in metres

Loading Data:

Dead Load of roof: Sheet roof with no ceiling, maximum 15 kg/m_2.
(Covers standard residential roof materials, for roof pitch maximum 35deg)
Wind Load taken as C2 in accordance with AS 4055 Wind Loads for Housing
ETH LAM GL beams are manufactured straight, without any camber built into the beams.
Verandah beam deflection criteria in accordance with methods presented in AS1684.1-1999, and structural timber design in accordance with AS1720.1-2010.

Notes:

1) Minimum bearing lengths for support of verandah beams: 45mm on end supports, and 65mm internal supports.
2) The span value shown is the distance between centrelines of supports.
3) For continuous spans, the adjacent beam spans may be different, but look up the larger of the spans, and the shorter span must be more than 50% of the larger span. If this rule is not met, then consider the verandah beams are simply supported, and look up the larger span in the single span table.
4) Deflection criteria: for dead load, the lesser of Span/360, or 10mm, and for Roof Live Loads, Span/250.
5) Where there are conflicts in design between loading codes (AS/NZS1170 series), timber code (AS1720.1-2010) and AS1684.1-1999, the loading codes and timber codes take preference.

The above span table values have been designed in accordance with the following codes:

· AS1720.1-2010 Timber Design Code
· AS1170.0, .1, .2-2002 Loading Codes for Limit State design, Live Loads, and Wind Loads respectively.
· AS1684.1-1999 Design Criteria for Residential Timber Framing.

GL17S Deck Bearers

Size (mm)	Single Spans							
	Deck Bearers – Deck Load Width (mm)							
	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
140x42	2.5	1.9	1.6	1.3	1.2	1.1	1.0	0.9
190x42	3.3	2.6	2.1	1.8	1.6	1.5	1.4	1.3
240x42	4.1	3.3	2.7	2.3	2.1	1.9	1.7	1.6
290x42	4.7	3.9	3.3	2.8	2.5	2.3	2.1	2.0
140x65	2.8	2.3	2.0	1.7	1.5	1.4	1.2	1.2
190x65	3.8	3.1	2.7	2.3	2.0	1.9	1.7	1.6
240x65	4.5	3.8	3.4	2.9	2.6	2.3	2.2	2.0
290x65	5.2	4.4	3.9	3.5	3.1	2.8	2.6	2.4
240x80	4.7	4.0	3.6	3.2	2.9	2.6	2.4	2.2
Size (mm)	Continuous Spans							
	Deck Bearers – Deck Load Width (mm)							
	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
140x42	2.7	1.9	1.6	1.3	1.2	1.0	0.9	0.0
190x42	3.7	2.6	2.1	1.8	1.6	1.4	1.3	1.2
240x42	4.7	3.3	2.7	2.3	2.1	1.8	1.6	1.5
290x42	5.6	4.0	3.3	2.8	2.5	2.1	1.8	1.5
140x65	3.2	2.4	2.0	1.7	1.5	1.4	1.2	1.2
190x65	4.3	3.3	2.7	2.3	2.0	1.9	1.7	1.6
240x65	5.4	4.1	3.4	2.9	2.6	2.3	2.2	2.0
290x65	6.3	5.0	4.1	3.5	3.1	2.8	2.6	2.4
240x80	5.7	4.6	3.7	3.2	2.9	2.6	2.4	2.2

Span values are in metres

Member must have a minimum bearing length of 85mm at the supports.

Member must have a minimum bearing length of 115mm at the supports.

Loading Data:

Dead Load of Deck maximum 40 kg/m2

(Covers standard residential floor materials, including plasterboard ceiling below)

Live Load for decks & verandahs over 1m above ground level 2.0kPa (with a check on a concentrated live load of 1.8kN anywhere)

ETH LAM GL beams are manufactured straight, without any camber built into the beams.

Bearer design criteria in accordance with methods presented in AS1684.1-1999, and structural timber design in accordance with AS1720.1-2010.

Notes:

1) Minimum bearing lengths for support of bearers: 45mm on end spans, and 60mm internal spans. Shaded areas in the tables represent areas where longer bearing lengths may be required to achieve the span values shown.

2) The span value shown is the distance between centrelines of supports.

3) For continuous spans, the adjacent bearer spans may be different, but look up the larger of the spans, and the shorter span must be more than 50% of the larger span. If this rule is not met, then consider the bearers are simply supported, and look up the larger span in the single span table.

4) Deflection criteria: for permanent load combinations, the lesser of Span/300, or 12mm, and for Floor Live Loads, the lesser of Span/360, or 9mm.

5) For bearers the lateral restraint is assumed to be a maximum of 600mm.

6) Where there are conflicts in design between loading codes (AS/NZS1170 series), timber code (AS1720.1-2010) and AS1684.1-1999, the loading codes and timber codes take preference.

7) Floor dynamic load checks are not generally applicable to bearers, but these tables have been checked for these loads to ensure stable performance of these bearers.

8) These deck joist designs assume the joists are initially seasoned, but may be wet in service, with an average moisture content less than 20%

The above span table values have been designed in accordance with the following codes:

· AS1720.1-2010 Timber Design Code

· AS1170.0, .1, .2-2002 Loading Codes for Limit State design, Live Loads, and Wind Loads respectively.

· AS1684.1-1999 Design Criteria for Residential Timber Framing (secondary code if in conflict with the above).

GL17S Deck Joists

Size (mm)	Single Span Deck Joists – Joist Spacing (mm)				
	300	400	450	480	600
140x42	3.6	3.2	3.1	3.0	2.9
190x42	4.8	4.5	4.3	4.3	4.0
240x42	5.7	5.3	5.2	5.1	4.9
290x42	6.5	6.1	5.9	5.9	5.6
140x65	4.1	3.8	3.6	3.6	3.4
190x65	5.2	4.9	4.8	4.8	4.5
240x65	6.2	5.8	5.7	5.6	5.4
290x65	7.0	6.7	6.5	6.4	6.1
Size (mm)	Continuous Span Deck Joists – Joist Spacing (mm)				
	300	400	450	480	600
140x42	4.4	4.1	3.7	3.6	3.4
190x42	5.5	5.1	5.0	4.9	4.6
240x42	6.6	6.1	5.9	5.8	5.5
290x42	7.6	7.1	6.9	6.7	6.4
140x65	4.9	4.5	4.4	4.3	4.1
190x65	6.2	5.7	5.6	5.5	5.2
240x65	7.4	6.8	6.6	6.5	6.2
290x65	8.5	7.9	7.7	7.5	7.1

Span values are in metres

Loading Data:

Dead Load of floor maximum 40 kg/m_2

(Covers standard residential deck materials, including possible plasterboard ceiling below)

Live Load for decks & verandahs over 1m above ground level 2.0kPa (with a check on a concentrated live load of 1.8kN anywhere)

ETH LAM GL beams are manufactured straight, without any camber built into the beams.

Deck Joist design criteria in accordance with methods presented in AS1684.1-1999, and structural timber design in accordance with AS1720.1-2010.

Notes:

1) Minimum bearing lengths for support of deck joists: 30mm on end supports, and 45mm internal supports.

2) The span value shown is the distance between centrelines of supports.

3) For continuous spans, the adjacent deck joist spans may be different, but look up the larger of the spans, and the shorter span must be more than 50% of the larger span. If this rule is not met, then consider the deck joists are simply supported, and look up the larger span in the single span table.

4) Deflection criteria: for permanent load combinations, the lesser of Span/300, or 12mm, and for Floor Live Loads, the lesser of Span/360, or 9mm.

5) For deck joists the lateral restraint is assumed to be achieved via the fixing of flooring direct to the top edge. No restraint of the bottom edge of the joist is assumed.

6) Where there are conflicts in design between loading codes (AS/NZS1170 series), timber code (AS1720.1-2010) and AS1684.1-1999, the loading codes and timber codes take preference.

7) Floor dynamic load check is made for a 1kN concentrated load to ensure less than 2mm deflection.

8) These deck joist designs assume the joists are initially seasoned, but may be wet in service, with an average moisture content less than 20%.

The above span table values have been designed in accordance with the following codes:

· AS1720.1-2010 Timber Design Code

· AS1170.0, .1, .2-2002 Loading Codes for Limit State design, Live Loads, and Wind Loads respectively.

· AS1684.1-1999 Design Criteria for Residential Timber Framing.

GL17S Floor Bearers

Size (mm)	Single Span Floor Bearers – Floor Load Width (m)							
	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
140x42	2.8	2.2	1.9	1.7	1.5	1.3	1.2	1.1
190x42	3.7	3.0	2.6	2.3	2.0	1.8	1.8	1.6
240x42	4.4	3.7	3.3	2.9	2.5	2.3	2.1	2.0
290x42	5.0	4.2	3.8	3.5	3.1	2.8	2.6	2.4
140x65	3.2	2.6	2.2	2.0	1.8	1.7	1.5	1.4
190x65	4.1	3.4	3.1	2.8	2.5	2.3	2.1	1.9
240x65	4.9	4.1	3.7	3.4	3.2	2.9	2.6	2.5
290x65	5.6	4.7	4.3	4.0	3.7	3.5	3.2	3.0
240x80	5.1	4.3	3.9	3.6	3.4	3.2	2.9	2.7
Size (mm)	Continuous Span Floor Bearers – Floor Load Width (m)							
	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
140x42	3.2	2.4	1.9	1.7	1.5	1.3	1.2	1.1
190x42	4.0	3.2	2.6	2.3	2.0	1.8	1.7	1.5
240x42	4.8	4.0	3.3	2.9	2.5	2.3	2.1	2.0
290x42	5.5	4.6	4.0	3.5	3.1	2.8	2.6	2.3
140x65	3.5	2.9	2.4	2.1	1.8	1.7	1.5	1.4
190x65	4.5	3.7	3.3	2.8	2.5	2.3	2.1	1.9
240x65	5.3	4.5	4.0	3.6	3.2	2.9	2.6	2.5
290x65	6.2	5.2	4.7	4.3	3.8	3.5	3.2	3.0
240x80	5.6	4.7	4.3	4.0	3.5	3.2	2.9	2.7

Span values are in metres

Member must have a minimum bearing length of 65mm at the supports.
Member must have a minimum bearing length of 85mm at the supports.
Member must have a minimum bearing length of 115mm at the supports.

Loading Data:

Dead Load of floor maximum 40 kg/m2 (Covers standard residential floor materials, including plasterboard ceiling below). Live Load for residential loads 1.5kPa (with a check on a concentrated live load of 1.8kN anywhere). ETH LAM GL beams are manufactured straight, without any camber built into the beams.

Bearer design criteria in accordance with methods presented in AS1684.1-1999, and structural timber design in accordance with AS1720.1-2010.

Notes:

1) Minimum bearing lengths for support of bearers: 45mm on end spans, and 60mm internal spans. Shaded areas in the tables represent areas where longer bearing lengths may be required to achieve the span values shown.

2) The span value shown is the distance between centrelines of supports.

3) For continuous spans, the adjacent bearer spans may be different, but look up the larger of the spans, and the shorter span must be more than 50% of the larger span. If this rule is not met, then consider the bearers are simply supported, and look up the larger span in the single span table.

4) Deflection criteria: for permanent load combinations, the lesser of Span/300, or 12mm, and for Floor Live Loads, the lesser of Span/360, or 9mm.

5) For bearers the lateral restraint is assumed to be a maximum of 600mm.

6) Where there are conflicts in design between loading codes (AS/NZS1170 series), timber code (AS1720.1-2010) and AS1684.1-1999, the loading codes and timber codes take preference.

7) Floor dynamic load checks are not generally applicable to bearers, but these tables have been checked for these loads to ensure stable performance of these bearers.

The above span table values have been designed in accordance with the following codes:

· AS1720.1-2010 Timber Design Code

· AS1170.0, .1, .2-2002 Loading Codes for Limit State design, Live Loads, and Wind Loads respectively.

· AS1684.1-1999 Design Criteria for Residential Timber Framing (secondary code if in conflict with the above).

GL17S Floor Joists

Size (mm)	Single Span Floor Joists – Joist Spacing (mm)				
	300	400	450	480	600
140x42	3.9	3.2	3.1	3.0	2.9
190x42	5.0	4.6	4.4	4.3	4.1
240x42	5.9	5.5	5.3	5.3	5.0
290x42	6.8	6.3	6.2	6.1	5.7
140x65	4.4	3.9	3.6	3.6	3.4
190x65	5.5	5.1	5.0	4.9	4.6
240x65	6.6	6.1	6.0	5.9	5.5
290x65	7.6	7.1	6.9	6.8	6.4
Size (mm)	Continuous Span Floor Joists – Joist Spacing (mm)				
	300	400	450	480	600
140x42	4.3	4.0	3.7	3.6	3.4
190x42	5.4	5.0	4.9	4.8	4.6
240x42	6.5	6.0	5.8	5.7	5.4
290x42	7.5	6.9	6.7	6.6	6.3
140x65	4.8	4.5	4.3	4.3	4.0
190x65	6.1	5.6	5.5	5.4	5.1
240x65	7.2	6.7	6.5	6.4	6.1
290x65	8.3	7.8	7.5	7.4	7.0

Span values are in metres

Loading Data:

Dead Load of floor maximum 40 kg/m_2

(Covers standard residential floor materials, including plasterboard ceiling below)

Live Load for residential loads 1.5kPa (with a check on a concentrated live load of 1.8kN anywhere)

ETH LAM GL 17 beams are manufactured straight, without any camber built into the beams.

Floor Joist design criteria in accordance with methods presented in AS1684.1-1999, and structural timber design in accordance with AS1720.1-2010.

Notes:

1) Minimum bearing lengths for support of floor joists: 30mm on end supports, and 45mm internal supports.

2) The span value shown is the distance between centrelines of supports.

3) For continuous spans, the adjacent floor joist spans may be different, but look up the larger of the spans, and the shorter span must be more than 50% of the larger span. If this rule is not met, then consider the floor joists are simply supported, and look up the larger span in the single span table.

4) Deflection criteria: for permanent load combinations, the lesser of Span/300, or 12mm, and for Floor Live Loads, the lesser of Span/360, or 9mm.

5) For floor joists the lateral restraint is assumed to be achieved via the fixing of flooring direct to the top edge. No restraint of the bottom edge of the joist is assumed.

6) Where there are conflicts in design between loading codes (AS/NZS1170 series), timber code (AS1720.1-2010) and AS1684.1-1999, the loading codes and timber codes take preference.

7) Floor dynamic load check is made for a 1kN concentrated load to ensure less than 2mm deflection.

8) These floor joist designs assume the joists are seasoned, and remain dry in service.

The above span table values have been designed in accordance with the following codes:

· AS1720.1-2010 Timber Design Code

· AS1170.0, .1, .2-2002 Loading Codes for Limit State design, Live Loads, and Wind Loads respectively.

· AS1684.1-1999 Design Criteria for Residential Timber Framing (secondary code if in conflict with the above).

GL17S Rafters – Sheet/Tile N3

Size (mm)	Rafters carrying Sheet Roofing + Ceiling – Rafter Spacing (mm)					
	Single Span Rafters			Continuous Span Rafters		
	300	600	900	300	600	900
140x42	4.7	3.9	3.5	6.1	5.3	4.7
190x42	6.0	5.2	4.7	7.5	6.6	6.1
240x42	7.0	6.2	5.7	8.8	7.8	7.2
290x42	7.9	7.1	6.5	10.0	8.9	8.2
140x65	5.2	4.4	3.9	6.6	5.8	5.4
190x65	6.4	5.7	5.3	8.1	7.2	6.7
240x65	7.4	6.7	6.2	9.4	8.4	7.9
290x65	8.4	7.6	7.1	10.5	9.6	8.9
240x80	7.6	6.9	6.5	9.6	8.7	8.2
Size (mm)	Rafters carrying Concrete or Terracotta Tiles + Ceiling – Rafter Spacing (mm)					
	Single Span Rafters			Continuous Span Rafters		
	300	600	900	300	600	900
140x42	3.8	3.1	2.7	5.1	4.2	3.7
190x42	5.1	4.1	3.6	6.5	5.6	5.0
240x42	6.1	5.2	4.6	7.6	6.6	6.0
290x42	6.9	6.0	5.5	8.7	7.6	6.9
140x65	4.3	3.5	3.1	5.7	4.8	4.2
190x65	5.6	4.7	4.2	7.1	6.1	5.6
240x65	6.6	5.8	5.2	8.3	7.2	6.6
290x65	7.5	6.6	6.0	9.4	8.3	7.6
240x80	6.8	6.0	5.5	8.6	7.6	6.9

Span values are in metres

Loading Data:

Dead Load of roof: Sheet roof + ceiling, maximum 40 kg/m_2, Tiled roof + ceiling, maximum 90 kg/m_2
(Covers standard residential roof materials, for roof pitch maximum 35deg)
Wind Load taken as N3 in accordance with AS 4055 Wind Loads for Housing
ETH LAM GL beams are manufactured straight, without any camber built into the beams.
Deck Joist design criteria in accordance with methods presented in AS1684.1-1999, and structural timber design in accordance with AS1720.1-2010.

Notes:
1) Minimum bearing lengths for support of rafters: 35mm on end supports, and 45mm internal supports.
2) The span value shown is the distance between centrelines of supports.
3) For continuous spans, the adjacent rafter spans may be different, but look up the larger of the spans, and the shorter span must be more than 50% of the larger span. If this rule is not met, then consider the rafters are simply supported, and look up the larger span in the single span table.
4) Deflection criteria: for dead load, the lesser of Span/300, or 20mm, and for Roof Live Loads, Span/250.
5) For deck joists the lateral restraint is assumed to be achieved via the fixing of flooring direct to the top edge. No restraint of the bottom edge of the joist is assumed.
6) Where there are conflicts in design between loading codes (AS/NZS1170 series), timber code (AS1720.1-2010) and AS1684.1-1999, the loading codes and timber codes take preference.

The above span table values have been designed in accordance with the following codes:
· AS1720.1-2010 Timber Design Code
· AS1170.0, .1, .2-2002 Loading Codes for Limit State design, Live Loads, and Wind Loads respectively.
· AS1684.1-1999 Design Criteria for Residential Timber Framing.

GL17S Rafters – Sheet/Tile C2

Size (mm)	Rafters carrying Sheet Roofing + Ceiling – Rafter Spacing (mm)					
	Single Span Rafters			Continuous Span Rafters		
	300	600	900	300	600	900
140x42	4.7	3.8	3.1	5.5	3.8	3.1
190x42	6.0	5.2	4.3	7.5	5.3	4.3
240x42	7.0	6.2	5.3	8.8	6.5	5.3
290x42	7.9	7.1	6.2	10.0	7.7	6.3
140x65	5.2	4.4	3.9	6.6	4.8	3.9
190x65	6.4	5.7	5.3	8.1	6.6	5.3
240x65	7.4	6.7	6.2	9.4	8.4	6.8
290x65	8.4	7.6	7.1	10.5	9.6	8.2
240x80	7.6	6.9	6.5	9.6	8.7	7.6
Size (mm)	Rafters carrying Concrete or Terracotta Tiles + Ceiling – Rafter Spacing (mm)					
	Single Span Rafters			Continuous Span Rafters		
	300	600	900	300	600	900
140x42	3.8	3.1	2.7	5.1	4.1	3.3
190x42	5.1	4.1	3.6	6.5	5.6	4.6
240x42	6.1	5.2	4.6	7.6	6.6	5.8
290x42	6.9	6.0	5.5	8.7	7.6	6.9
140x65	4.3	3.5	3.1	5.7	4.8	4.2
190x65	5.6	4.7	4.2	7.1	6.1	5.6
240x65	6.6	5.8	5.2	8.3	7.2	6.6
290x65	7.5	6.6	6.0	9.4	8.3	7.6
240x80	6.8	6.0	5.5	8.6	7.6	6.9

Span values are in metres

Loading Data:

Dead Load of roof: Sheet roof + ceiling, maximum 40 kg/m_2, Tiled roof + ceiling, maximum 90 kg/m_2
(Covers standard residential roof materials, for roof pitch maximum 35deg)
Wind Load taken as C2 in accordance with AS 4055 Wind Loads for Housing
ETH LAM GL beams are manufactured straight, without any camber built into the beams.
Deck Joist design criteria in accordance with methods presented in AS1684.1-1999, and structural timber design in accordance with AS1720.1-2010.

Notes:
1) Minimum bearing lengths for support of rafters: 35mm on end supports, and 45mm internal supports.
2) The span value shown is the distance between centrelines of supports.
3) For continuous spans, the adjacent rafter spans may be different, but look up the larger of the spans, and the shorter span must be more than 50% of the larger span. If this rule is not met, then consider the rafters are simply supported, and look up the larger span in the single span table.
4) Deflection criteria: for dead load, the lesser of Span/300, or 20mm, and for Roof Live Loads, Span/250.
5) For deck joists the lateral restraint is assumed to be achieved via the fixing of flooring direct to the top edge. No restraint of the bottom edge of the joist is assumed.
6) Where there are conflicts in design between loading codes (AS/NZS1170 series), timber code (AS1720.1-2010) and AS1684.1-1999, the loading codes and timber codes take preference.

The above span table values have been designed in accordance with the following codes:
· AS1720.1-2010 Timber Design Code
· AS1170.0, .1, .2-2002 Loading Codes for Limit State design, Live Loads, and Wind Loads respectively.
· AS1684.1-1999 Design Criteria for Residential Timber Framing.

GL17S Rafters – Light Sheet Roof N2/C2

Size (mm)	Light Sheet Roof N2 – Rafter Spacing (mm)					
	Single Span Rafters			Continuous Span Rafters		
	300	600	900	300	600	900
140x42	6.4	5.9	5.3	8.0	7.4	6.3
190x42	7.7	7.1	6.7	9.6	9.0	8.5
240x42	8.8	8.2	7.8	11.0	10.4	9.9
290x42	9.8	9.2	8.8	12.3	11.6	11.1
140x65	6.6	6.2	5.9	8.4	7.8	7.4
190x65	7.9	7.5	7.2	10.0	9.4	9.0
240x65	9.0	8.6	8.3	11.3	10.8	10.4
290x65	10.0	9.6	9.3	12.6	12.1	11.7
240x80	9.1	8.7	8.4	11.5	11.0	10.6
Size (mm)	Light Sheet Roof C2 – Rafter Spacing (mm)					
	Single Span Rafters			Continuous Span Rafters		
	300	600	900	300	600	900
140x42	5.8	4.0	3.3	5.8	4.0	3.3
190x42	7.7	5.5	4.5	7.9	5.5	4.5
240x42	8.8	6.8	5.5	9.8	6.8	5.5
290x42	9.8	8.1	6.5	11.6	8.1	6.5
140x65	6.6	5.0	4.1	7.3	5.0	4.1
190x65	7.9	6.9	5.6	10.0	6.9	5.6
240x65	9.0	8.6	7.1	11.3	8.8	7.1
290x65	10.0	9.6	8.6	12.6	10.7	8.6
240x80	9.1	8.7	7.9	11.5	9.8	7.9

Span values are in metres

Loading Data:

Dead Load of roof: Light Sheet Roof with no ceiling, maximum 20 kg/m^2
(Covers standard light sheet roofing materials, for roof pitch maximum 35deg)
Wind Load taken as N2/C2 in accordance with AS 4055 Wind Loads for Housing
ETH LAM GL beams are manufactured straight, without any camber built into the beams.

Notes:

1) Minimum bearing lengths for support of rafters: 35mm on end supports, and 45mm internal supports.
2) The span value shown is the distance between centrelines of supports.
3) For continuous spans, the adjacent rafter spans may be different, but look up the larger of the spans, and the shorter span must be more than 50% of the larger span. If this rule is not met, then consider the rafters are simply supported, and look up the larger span in the single span table.
4) Deflection criteria: for dead load, the lesser of Span/300, or 20mm, and for Roof Live Loads, Span/250.
5) Where there are conflicts in design between loading codes (AS/NZS1170 series), timber code (AS1720.1-2010) and AS1684.1-1999, the loading codes and timber codes take preference.

The above span table values have been designed in accordance with the following codes:

· AS1720.1-2010 Timber Design Code
· AS1170.0, .1, .2-2002 Loading Codes for Limit State design, Live Loads, and Wind Loads respectively.
· AS1684.1-1999 Design Criteria for Residential Timber Framing.

GL17S Roof Beams – Sheet N3

Size (mm)	Sheet Roof Single Span - Roof load Width (m)							
	1	2	3	4	5	6	7	8
140x42	4.0	3.2	2.7	2.5	2.2	2.1	1.9	1.8
190x42	5.4	4.3	3.7	3.3	3.1	2.8	2.6	2.5
240x42	6.6	5.4	4.7	4.2	3.9	3.6	3.3	3.2
290x42	7.5	6.4	5.7	5.1	4.7	4.3	4.1	3.8
140x65	4.6	3.7	3.2	2.8	2.6	2.4	2.2	2.1
190x65	6.1	4.9	4.3	3.8	3.5	3.3	3.1	2.9
240x65	7.2	6.1	5.4	4.8	4.4	4.1	3.9	3.7
290x65	8.2	7.0	6.3	5.8	5.4	5.0	4.7	4.4
240x80	7.4	6.4	5.7	5.2	4.7	4.4	4.1	3.9
Size (mm)	Sheet Roof Continuous Span - Roof load Width (m)							
	1	2	3	4	5	6	7	8
140x42	5.5	3.9	3.2	2.7	2.4	2.2	2.0	1.8
190x42	7.0	5.3	4.3	3.7	3.3	2.9	2.7	2.5
240x42	8.3	6.5	5.3	4.5	4.1	3.7	3.4	3.2
290x42	9.4	7.6	6.2	5.3	4.7	4.3	4.0	3.7
140x65	6.2	4.8	3.9	3.4	3.0	2.7	2.5	2.3
190x65	7.7	6.5	5.3	4.6	4.1	3.7	3.4	3.1
240x65	9.0	7.7	6.7	5.8	5.1	4.6	4.3	3.9
290x65	10.3	8.8	8.0	7.0	6.2	5.6	5.1	4.8
240x80	9.4	8.1	7.3	6.4	5.7	5.1	4.7	4.4

Span values are in metres

Loading Data:

Dead Load of roof and ceiling maximum 40 kg/m2 for sheet roof with ceiling.
(Covers standard up to metal sheet roofing, plasterboard ceiling below, roof trusses or raftered roof)
Roof Live Load of 0.25kPa. Wind design for up to N3 wind area, in accordance with AS4055-2006 – Wind Loads for Housing. ETH LAM GL 17 beams are manufactured straight, without any camber built into the beams. Roof Beam design criteria in accordance with methods presented in AS1684.1-1999, and structural timber design in accordance with AS1720.1-2010.

Notes:
1) Minimum bearing lengths for support of roof beams: 45mm on end spans, and 65mm internal spans.
2) The span value shown is the distance between centrelines of supports.
3) For continuous spans, the adjacent roof beam spans may be different, but look up the larger of the spans, and the shorter span must be more than 50% of the larger span. If this rule is not met, then consider the roof beams are simply supported, and look up the larger span in the single span table.
4) Deflection criteria: for permanent load combinations, the lesser of Span/300, or 20mm, and for Roof Live Loads, the lesser of Span/250.
5) For roof beams the lateral restraint is assumed to be a supported rafter or truss spacing at 900mm centres. The roof beam spans are suitable for unrestrained bottom edges.
6) Where there are conflicts in design between loading codes (AS/NZS1170 series), timber code (AS1720.1-2010) and AS1684.1-1999, the loading codes and timber codes take preference.

GL17S Roof Beams – Tile N3

Size (mm)	Tile Roof Single Span - Roof load Width (m)							
	1	2	3	4	5	6	7	8
140x42	3.0	2.4	2.1	1.9	1.7	1.6	1.5	1.4
190x42	4.1	3.3	2.8	2.6	2.4	2.2	2.1	1.9
240x42	5.2	4.1	3.6	3.2	3.0	2.8	2.6	2.4
290x42	6.2	5.0	4.3	3.9	3.6	3.3	3.0	2.8
140x65	3.5	2.8	2.4	2.2	2.0	1.9	1.8	1.7
190x65	4.7	3.8	3.3	3.0	2.7	2.5	2.4	2.3
240x65	5.9	4.7	4.1	3.7	3.4	3.2	3.0	2.9
290x65	6.8	5.7	5.0	4.5	4.2	3.9	3.7	3.5
240x80	6.2	5.1	4.4	4.0	3.7	3.4	3.3	3.1
Size (mm)	Tile Roof Continuous Span - Roof load Width (m)							
	1	2	3	4	5	6	7	8
140x42	4.1	3.0	2.4	2.1	1.8	1.6	1.5	1.4
190x42	5.6	4.1	3.3	2.8	2.5	2.2	2.1	1.9
240x42	6.8	4.9	4.1	3.5	3.1	2.8	2.6	2.4
290x42	7.8	5.7	4.6	4.0	3.6	3.3	3.0	2.8
140x65	4.8	3.7	3.0	2.6	2.3	2.0	1.9	1.7
190x65	6.3	5.0	4.1	3.5	3.1	2.8	2.6	2.4
240x65	7.5	6.3	5.1	4.4	3.9	3.5	3.2	3.0
290x65	8.6	73	6.2	5.3	4.7	4.3	3.9	3.6
240x80	7.8	6.6	5.7	4.9	4.3	3.9	3.6	3.3

Span values are in metres

Member must have a minimum bearing length of 85mm at the supports.

Member must have a minimum bearing length of 115mm at the supports.

Loading Data:

Dead Load of roof and ceiling maximum 90 kg/m2 for tiled roof with ceiling.
(Covers standard up to terra-cotta roof tiles, plasterboard ceiling below, roof trusses or raftered roof)
Roof Live Load of 0.25kPa.
Wind design for up to N3 wind area, in accordance with AS4055-2006 – Wind Loads for Housing.
ETH LAM GL 17 beams are manufactured straight, without any camber built into the beams.
Roof Beam design criteria in accordance with methods presented in AS1684.1-1999, and structural timber design in accordance with AS1720.1-2010.

Notes:

1) Minimum bearing lengths for support of roof beams: 45mm on end spans, and 65mm internal spans.
2) The span value shown is the distance between centrelines of supports.
3) For continuous spans, the adjacent roof beam spans may be different, but look up the larger of the spans, and the shorter span must be more than 50% of the larger span. If this rule is not met, then consider the roof beams are simply supported, and look up the larger span in the single span table.
4) Deflection criteria: for permanent load combinations, the lesser of Span/300, or 20mm, and for Roof Live Loads, the lesser of Span/250.
5) For roof beams the lateral restraint is assumed to be a supported rafter or truss spacing at 900mm centres. The roof beam spans are suitable for unrestrained bottom edges.
6) Where there are conflicts in design between loading codes (AS/NZS1170 series), timber code (AS1720.1-2010) and AS1684.1-1999, the loading codes and timber codes take preference.

GL17S Lintels – Sheet/Tile N3

Size (mm)	Sheet Roof Lintels - Roof load Width (m)							
	1	2	3	4	5	6	7	8
140x42	3.6	3.0	2.6	2.3	2.1	2.0	1.8	1.7
190x42	4.4	3.7	3.4	3.1	2.9	2.7	2.5	2.3
240x42	5.3	4.5	4.0	3.7	3.5	3.3	3.1	2.9
290x42	6.0	5.1	4.6	4.3	4.0	3.8	3.6	3.4
140x65	3.9	3.3	3.0	2.7	2.4	2.3	2.1	2.0
190x65	4.9	4.1	3.7	3.4	3.2	3.1	2.9	2.7
240x65	5.8	4.9	4.4	4.1	3.8	3.6	3.5	3.3
290x65	6.6	5.6	5.1	4.7	4.4	4.2	4.0	3.8
240x80	6.0	5.2	4.7	4.3	4.0	3.8	3.7	3.5
Size (mm)	Tile Roof Lintels - Roof load Width (m)							
	1	2	3	4	5	6	7	8
140x42	2.9	2.3	2.0	1.8	1.6	1.5	1.4	1.3
190x42	3.7	3.1	2.8	2.5	2.3	2.0	1.9	1.7
240x42	4.4	3.7	3.3	3.1	2.9	2.6	2.4	2.2
290x42	5.1	4.3	3.9	3.6	3.4	3.1	2.9	2.6
140x65	3.3	2.7	2.3	2.1	1.9	1.8	1.7	1.6
190x65	4.1	3.5	3.1	2.9	2.6	2.5	2.3	2.1
240x65	4.9	4.1	3.7	3.4	3.2	3.1	2.9	2.7
290x65	5.6	4.7	4.3	4.0	3.7	3.6	3.4	3.3
240x80	5.1	4.3	3.9	3.6	3.4	3.2	3.1	3.0

Span values are in metres

Loading Data:

Dead Load of roof and ceiling maximum 90 kg/m2 for tiled roofs, and 40kg/m2 for sheet roofs.
(Covers standard up to terra-cotta roof tiles, plasterboard ceiling below, roof trusses or raftered roof)
Roof Live Load of 0.25kPa.
Wind design for up to N3 wind area, in accordance with AS4055-2006 – Wind Loads for Housing.
ETH LAM GL 17 beams are manufactured straight, without any camber built into the beams.
Lintel design criteria in accordance with methods presented in AS1684.1-1999, and structural timber design in accordance with AS1720.1-2010.
All lintels are designed for single span only.

Notes:

1) Minimum bearing lengths for support of lintels: 35mm on trimmer studs. Size and width of trimmer and jamb studs is subject to loadings outside the scope of this table.
2) The span value shown is the distance between centrelines of supports.
3) Deflection criteria: for permanent load combinations, the lesser of Span/300, or 10mm, and for Roof Live Loads, the lesser of Span/250, or 15mm.
4) For lintels the lateral restraint is assumed to be a maximum of 600mm.
5) Where there are conflicts in design between loading codes (AS/NZS1170 series), timber code (AS1720.1-2010) and AS1684.1-1999, the loading codes and timber code take preference.
6) Maximum roof pitch applicable for these tables, 25 degrees.

GL17S Lower Story Lintels – Sheet N3

Size (mm)	Lower Story Lintels supporting Sheet Roof + Ceiling, Wall Frames and Floor – Floor Load Width (m)											
	0.6				1.2				1.8			
	Roof Load Width (m)				Roof Load Width (m)				Roof Load Width (m)			
	2.0	4.0	6.0	8.0	5.0	6.0	7.0	8.0	2.0	4.0	6.0	8.0
140x42	2.3	2.0	1.8	1.6	2.1	1.9	1.7	1.6	1.9	1.8	1.6	1.5
190x42	3.1	2.7	2.4	2.2	2.8	2.5	2.3	2.1	2.6	2.4	2.2	2.1
240x42	3.7	3.3	3.1	2.8	3.4	3.2	2.9	2.7	3.2	3.0	2.8	2.6
290x42	4.2	3.8	3.5	3.3	3.9	3.6	3.4	3.2	3.7	3.5	3.3	3.1
140x65	2.6	2.3	2.1	1.9	2.4	2.2	2.0	1.8	2.2	2.0	1.9	1.8
190x65	3.4	3.1	2.8	2.6	3.2	2.9	2.7	2.5	3.0	2.8	2.6	2.4
240x65	4.1	3.7	3.4	3.2	3.8	3.5	3.3	3.1	3.6	3.4	3.2	3.0
290x65	4.7	4.2	3.9	3.7	4.4	4.1	3.8	3.6	4.2	3.9	3.7	3.5
240x80	4.3	3.9	3.6	3.4	4.0	3.7	3.5	3.3	3.8	3.6	3.4	3.2
Size (mm)	Lower Story Lintels supporting Sheet Roof + Ceiling, Wall Frames and Floor – Floor Load Width (m)											
	2.4				3.0				3.6			
	Roof Load Width (m)				Roof Load Width (m)				Roof Load Width (m)			
	2.0	4.0	6.0	8.0	5.0	6.0	7.0	8.0	2.0	4.0	6.0	8.0
140x42	1.8	1.7	1.6	1.5	1.7	1.6	1.5	1.4	1.6	1.5	1.4	1.4
190x42	2.5	2.3	2.1	2.0	2.3	2.2	2.1	1.9	2.2	2.1	2.0	1.9
240x42	3.1	2.9	2.7	2.5	3.0	2.8	2.6	2.5	2.8	2.6	2.5	2.4
290x42	3.6	3.4	3.2	3.1	3.4	3.3	3.1	3.0	3.3	3.2	3.0	2.9
140x65	2.1	2.0	1.8	1.7	2.0	1.9	1.8	1.7	1.9	1.8	1.7	1.6
190x65	2.9	2.7	2.5	2.3	2.7	2.5	2.4	2.3	2.6	2.5	2.3	2.2
240x65	3.4	3.3	3.1	3.0	3.3	3.2	3.0	2.9	3.2	3.1	2.9	2.8
290x65	4.0	3.8	3.6	3.4	3.8	3.6	3.5	3.3	3.7	3.5	3.4	3.3
240x80	3.6	3.4	3.3	3.1	3.5	3.3	3.2	3.0	3.4	3.2	3.1	3.0

Span values are in metres

Member must have a minimum bearing length of 85mm at the supports.

Loading Data:

Dead Load of roof: Sheet roof + ceiling, maximum 40 kg/m2, Tiled roof + ceiling, maximum 90 kg/m2
(Covers standard residential roof materials, for roof pitch maximum 35deg)
Wind Load taken as N3 in accordance with AS 4055 Wind Loads for Housing
ETH LAM GL beams are manufactured straight, without any camber built into the beams.
Deck Joist design criteria in accordance with methods presented in AS1684.1-1999, and structural timber design in accordance with AS1720.1-2010.

Notes:
1) Minimum bearing lengths for support of lintels: 35mm on end supports, and 45mm internal supports.
2) The span value shown is the distance between centrelines of supports.
3) Deflection criteria: for dead load, the lesser of Span/300, or 10mm, and for Roof Live Loads, Span/250, or 10mm.
4) For lintels the lateral restraint is assumed to be achieved via the fixing of joists or rafters direct to the top plate of the wall. No restraint of the bottom edge of the lintel is assumed.
5) Where there are conflicts in design between loading codes (AS/NZS1170 series), timber code (AS1720.1-2010) and AS1684.1-1999, the loading codes and timber codes take preference.

The above span table values have been designed in accordance with the following codes:
· AS1720.1-2010 Timber Design Code
· AS1170.0, .1, .2-2002 Loading Codes for Limit State design, Live Loads, and Wind Loads respectively.
· AS1684.1-1999 Design Criteria for Residential Timber Framing.

GL17S Lower Story Lintels –Tile N3

Size (mm)	Lower Story Lintels supporting Tiled Roof + Ceiling, Wall Frames and Floor – Floor Load Width (m)											
	0.6				1.2				1.8			
	Roof Load Width (m)				Roof Load Width (m)				Roof Load Width (m)			
	2.0	4.0	6.0	8.0	5.0	6.0	7.0	8.0	2.0	4.0	6.0	8.0
140x42	2.0	1.7	1.5	1.3	1.9	1.6	1.4	1.3	1.8	1.5	1.4	1.2
190x42	2.7	2.3	2.0	1.8	2.5	2.2	2.0	1.7	2.4	2.1	1.9	1.7
240x42	3.3	2.9	2.6	2.2	3.2	2.8	2.5	2.2	3.0	2.7	2.4	2.2
290x42	3.8	3.4	3.1	2.7	3.6	3.3	3.0	2.7	3.5	3.2	3.0	2.6
140x65	2.3	1.9	1.7	1.6	2.2	1.9	1.7	1.5	2.0	1.8	1.6	1.5
190x65	3.1	2.6	2.4	2.1	2.9	2.5	2.3	2.1	2.8	2.5	2.2	2.1
240x65	3.7	3.2	3.0	2.7	3.5	3.2	2.9	2.7	3.4	3.1	2.8	2.6
290x65	4.2	3.7	3.4	3.2	4.1	3.6	3.4	3.1	3.9	3.5	3.3	3.1
240x80	3.9	3.4	3.1	2.9	3.7	3.3	3.1	2.8	3.6	3.2	3.0	2.8
Size (mm)	Lower Story Lintels supporting Tiled Roof + Ceiling, Wall Frames and Floor – Floor Load Width (m)											
	2.4				3.0				3.6			
	Roof Load Width (m)				Roof Load Width (m)				Roof Load Width (m)			
	2.0	4.0	6.0	8.0	5.0	6.0	7.0	8.0	2.0	4.0	6.0	8.0
140x42	1.7	1.5	1.3	1.2	1.6	1.4	1.3	1.2	1.5	1.4	1.2	1.1
190x42	2.3	2.0	1.8	1.6	2.2	2.0	1.8	1.6	2.1	1.9	1.7	1.5
240x42	2.9	2.6	2.3	2.1	2.8	2.5	2.2	2.0	2.6	2.4	2.2	2.0
290x42	3.4	3.1	2.8	2.5	3.3	3.0	2.7	2.5	3.2	2.9	2.6	2.4
140x65	1.9	1.7	1.6	1.5	1.9	1.7	1.5	1.4	1.8	1.6	1.5	1.4
190x65	2.7	2.4	2.2	2.0	2.5	2.3	2.1	2.0	2.4	2.2	2.1	1.9
240x65	3.3	3.0	2.7	2.6	3.2	2.9	2.7	2.5	3.1	2.8	2.6	2.5
290x65	3.8	3.5	3.2	3.1	3.6	3.4	3.2	3.0	3.5	3.3	3.1	3.0
240x80	3.4	3.2	2.9	2.7	3.3	3.1	3.9	2.7	3.2	3.0	2.8	2.6

Span values are in metres

Member must have a minimum bearing length of 85mm at the supports.

Member must have a minimum bearing length of 115mm at the supports.

Loading Data:

Dead Load of roof: Sheet roof + ceiling, maximum 40 kg/m2, Tiled roof + ceiling, maximum 90 kg/m2
(Covers standard residential roof materials, for roof pitch maximum 35deg)
Wind Load taken as N3 in accordance with AS 4055 Wind Loads for Housing
ETH LAM GL beams are manufactured straight, without any camber built into the beams.
Deck Joist design criteria in accordance with methods presented in AS1684.1-1999, and structural timber design in accordance with AS1720.1-2010.

Notes:
1) Minimum bearing lengths for support of lintels: 35mm on end supports, and 45mm internal supports.
2) The span value shown is the distance between centrelines of supports.
3) Deflection criteria: for dead load, the lesser of Span/300, or 10mm, and for Roof Live Loads, Span/250, or 10mm.
4) For lintels the lateral restraint is assumed to be achieved via the fixing of joists or rafters direct to the top plate of the wall. No restraint of the bottom edge of the lintel is assumed.
5) Where there are conflicts in design between loading codes (AS/NZS1170 series), timber code (AS1720.1-2010) and AS1684.1-1999, the loading codes and timber codes take preference.

The above span table values have been designed in accordance with the following codes:
· AS1720.1-2010 Timber Design Code
· AS1170.0, .1, .2-2002 Loading Codes for Limit State design, Live Loads, and Wind Loads respectively.
· AS1684.1-1999 Design Criteria for Residential Timber Framing.

GL17S Upper Story Lintels – Sheet/Tile N3

Size (mm)	Sheet Roof Lintels - Roof load Width (m)							
	1	2	3	4	5	6	7	8
140x42	4.0	3.2	2.8	2.5	4.9	4.3	3.8	3.5
190x42	5.0	4.3	3.8	3.4	6.3	5.4	4.8	4.5
240x42	5.9	5.0	4.6	4.2	7.4	6.4	5.8	5.4
290x42	6.7	5.8	5.3	4.9	8.4	7.3	6.6	6.2
140x65	4.4	3.7	3.2	2.9	5.5	4.7	4.3	4.0
190x65	5.4	4.7	4.3	4.0	6.8	5.9	5.4	5.0
240x65	6.4	5.5	5.1	4.7	8.0	7.0	6.4	5.9
290x65	7.2	6.3	5.8	5.4	9.1	8.0	7.3	6.8
240x80	6.6	5.8	5.3	4.9	8.3	7.3	6.7	6.2
Size (mm)	Tile Roof Lintels - Roof load Width (m)							
	1	2	3	4	5	6	7	8
140x42	3.0	2.4	2.1	1.9	1.7	1.6	1.5	1.4
190x42	3.7	3.1	2.8	2.6	2.4	2.2	2.1	2.0
240x42	4.4	3.8	3.4	3.2	3.0	2.8	2.7	2.5
290x42	5.1	4.3	3.9	3.6	3.5	3.3	3.2	3.0
140x65	3.3	2.7	2.4	2.2	2.0	1.9	1.8	1.7
190x65	4.1	3.5	3.2	3.0	2.7	2.6	2.5	2.3
240x65	4.9	4.2	3.8	3.5	3.3	3.2	3.1	3.0
290x65	5.6	4.8	4.4	4.1	3.8	3.7	3.5	3.4
240x80	5.1	4.4	4.0	3.7	3.5	3.4	3.2	3.1

Span values are in metres

Loading Data:

Dead Load of roof: Sheet roof + ceiling, maximum 40 kg/m_2, Tiled roof + ceiling, maximum 90 kg/m_2
(Covers standard residential roof materials, for roof pitch maximum 35deg)
Wind Load taken as N3 in accordance with AS 4055 Wind Loads for Housing
ETH LAM GL beams are manufactured straight, without any camber built into the beams.
Deck Joist design criteria in accordance with methods presented in AS1684.1-1999, and structural timber design in accordance with AS1720.1-2010.

Notes:
1) Minimum bearing lengths for support of lintels: 35mm on end supports, and 45mm internal supports.
2) The span value shown is the distance between centrelines of supports.
3) Deflection criteria: for dead load, the lesser of Span/300, or 10mm, and for Roof Live Loads, Span/250, or 10mm.
4) For lintels the lateral restraint is assumed to be achieved via the fixing of trusses or rafters direct to the top plate of the wall. No restraint of the bottom edge of the lintel is assumed.
5) Where there are conflicts in design between loading codes (AS/NZS1170 series), timber code (AS1720.1-2010) and AS1684.1-1999, the loading codes and timber codes take preference.

The above span table values have been designed in accordance with the following codes:
· AS1720.1-2010 Timber Design Code
· AS1170.0, .1, .2-2002 Loading Codes for Limit State design, Live Loads, and Wind Loads respectively.
· AS1684.1-1999 Design Criteria for Residential Timber Framing.

GL13 Verandah Posts Sheet Roof N3/C2

Size (mm)	Verandah Posts Sheet Roof and Ceiling – Roof Load Area up to 3.0m2						
	Floor Area Supported (m2)						
	0.0	1.0	2.0	3.0	4.0	6.0	8.0
90x90	5.0	5.0	4.0	3.3	2.9	2.4	2.0
100x100	5.0	5.0	4.8	4.1	3.6	2.9	2.5
115x115	5.0	5.0	5.0	5.0	4.7	3.9	3.4
140x140	5.0	5.0	5.0	5.0	5.0	5.0	5.0
190x190							
	Verandah Posts Sheet Roof and Ceiling – Roof Load Area up to 6.0m2						
	Floor Area Supported (m2)						
	0.0	1.0	2.0	3.0	4.0	6.0	8.0
90x90	5.0	4.9	3.9	3.2	2.8	2.3	2.0
100x100	5.0	5.0	4.8	4.0	3.5	2.9	2.5
115x115	5.0	5.0	5.0	5.0	4.7	3.9	3.4
140x140	5.0	5.0	5.0	5.0	5.0	5.0	5.0
190x190							
	Verandah Posts Sheet Roof and Ceiling – Roof Load Area up to 9.0m2						
	Floor Area Supported (m2)						
	0.0	1.0	2.0	3.0	4.0	6.0	8.0
90x90	5.0	4.3	3.8	3.2	2.8	2.3	2.0
100x100	5.0	5.0	4.6	3.9	3.5	2.9	2.5
115x115	5.0	5.0	5.0	5.0	4.6	3.8	3.3
140x140	5.0	5.0	5.0	5.0	5.0	5.0	5.0
190x190							

Post height values are in metres

Loading Data:

Dead Load of roof: Sheet roof + ceiling, maximum 40 kg/m_2, Tiled roof + ceiling, maximum 90 kg/m_2
(Covers standard residential roof materials, for roof pitch maximum 35deg)
Wind Load taken as N3/C2 in accordance with AS 4055 Wind Loads for Housing
ETH LAM GL beams are manufactured straight, without any camber built into the beams.
Deck Joist design criteria in accordance with methods presented in AS1684.1-1999, and structural timber design in accordance with AS1720.1-2010.
Verandah Posts are designed for axial loads only, and do not take lateral loads, other than supporting standard handrails for the upper deck versions. Therefore these posts cannot be used to support any wall fames, or sheeting material that would impose a lateral load through wind pressure on the panels.

Notes:
1) Verandah posts to be supported in steel base supports with min. M12 bolts, and must not be in contact with the ground, as per standard post bracket supports in AS1684.
2) The height value shown is the distance between support and either verandah beam or deck bearers. For 2 level posts, supporting deck and roof, look up the larger of the 2 clear distances as the value from the tables.
3) For posts, lateral restraint is assumed to be achieved only from roof beams or floor beams.
4) Where there are conflicts in design between loading codes (AS/NZS1170 series), timber code (AS1720.1-2010) and AS1684.1-1999, the loading codes and timber codes take preference.

The above span table values have been designed in accordance with the following codes:
· AS1720.1-2010 Timber Design Code
· AS1170.0, .1, .2-2002 Loading Codes for Limit State design, Live Loads, and Wind Loads respectively.
· AS1684.1-1999 Design Criteria for Residential Timber Framing.

GL13 Verandah Posts Tiled Roof N3/C2

Size (mm)	Verandah Posts Tiled Roof and Ceiling – Roof Load Area up to 3.0m2						
	Floor Area Supported (m2)						
	0.0	1.0	2.0	3.0	4.0	6.0	8.0
90x90	5.0	4.7	3.7	3.1	2.8	2.3	2.0
100x100	5.0	5.0	4.6	3.9	3.4	2.9	2.5
115x115	5.0	5.0	5.0	5.0	4.6	3.8	3.3
140x140	5.0	5.0	5.0	5.0	5.0	5.0	4.9
190x190	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Verandah Posts Tiled Roof and Ceiling – Roof Load Area up to 6.0m2						
	Floor Area Supported (m2)						
	0.0	1.0	2.0	3.0	4.0	6.0	8.0
90x90	5.0	4.1	3.4	3.0	2.7	2.2	1.9
100x100	5.0	5.0	4.2	3.7	3.3	2.8	2.4
115x115	5.0	5.0	5.0	4.9	4.4	3.7	3.2
140x140	5.0	5.0	5.0	5.0	5.0	5.0	4.8
190x190	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Verandah Posts Tiled Roof and Ceiling – Roof Load Area up to 9.0m2						
	Floor Area Supported (m2)						
	0.0	1.0	2.0	3.0	4.0	6.0	8.0
90x90	4.3	3.8	3.2	2.8	2.5	2.2	1.9
100x100	5.0	4.6	3.9	3.5	3.1	2.7	2.4
115x115	5.0	5.0	5.0	4.6	4.2	3.6	3.2
140x140	5.0	5.0	5.0	5.0	5.0	5.0	4.7
190x190	5.0	5.0	5.0	5.0	5.0	5.0	5.0

Post height values are in metres

Loading Data:

Dead Load of roof: Sheet roof + ceiling, maximum 40 kg/m$_2$, Tiled roof + ceiling, maximum 90 kg/m$_2$
(Covers standard residential roof materials, for roof pitch maximum 35deg)
Wind Load taken as N3/C2 in accordance with AS 4055 Wind Loads for Housing
ETH LAM GL beams are manufactured straight, without any camber built into the beams.
Deck Joist design criteria in accordance with methods presented in AS1684.1-1999, and structural timber design in accordance with AS1720.1-2010.
Verandah Posts are designed for axial loads only, and do not take lateral loads, other than supporting standard handrails for the upper deck versions. Therefore these posts cannot be used to support any wall fames, or sheeting material that would impose a lateral load through wind pressure on the panels.

Notes:
1) Verandah posts to be supported in steel base supports with min. M12 bolts, and must not be in contact with the ground, as per standard post bracket supports in AS1684.
2) The height value shown is the distance between support and either verandah beam or deck bearers. For 2 level posts, supporting deck and roof, look up the larger of the 2 clear distances as the value from the tables.
3) For posts, lateral restraint is assumed to be achieved only from roof beams or floor beams.
4) Where there are conflicts in design between loading codes (AS/NZS1170 series), timber code (AS1720.1-2010) and AS1684.1-1999, the loading codes and timber codes take preference.

The above span table values have been designed in accordance with the following codes:
· AS1720.1-2010 Timber Design Code
· AS1170.0, .1, .2-2002 Loading Codes for Limit State design, Live Loads, and Wind Loads respectively.
· AS1684.1-1999 Design Criteria for Residential Timber Framing.

ETH ENTERPRISE PTE LTD
14 Gul Lane
Singapore 629412