SmartLam GL19S

(Straight)

Design Guide

SMARTFRAME®

POWERED BY INNOVATION

Edition 1 2022

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SmartFrame Product Warranty*

Tilling Timber warrants that its SmartFrame Engineered Wood products will be free from manufacturing defects in workmanship and material.

In addition, provided the product is correctly installed and used, Tilling Timber warrants the adequacy of its design for the normal and expected life of the structure.

This warranty is backed by the full resources of Tilling Timber and by underwritten product liability insurance.

Tilling Timber Pty Ltd
31-45 Orchard Street
Kilsyth Vic 3137
Ph: +61 (0)3 9725 0222 Fax: +61 (0)3 9725 6569
Email: techsupport@tilling.com.au

Scope of this publication

This Design Guide and Load Tables assist in the selection of SmartLam GL19S for some of the common structural arrangements met in domestic construction.

Other than the limited examples uniquely associated with GLT shown, methods of developing lateral restraint and providing adequate support, adequate anchorage against wind uplift, and overall structural stability are outside the scope of this publication.

Information on the above matters can be obtained from AS 1684 Residential timber-framed construction or from a structural engineer experienced in timber construction.

Tilling Timber Pty Ltd have structural engineers within the SmartFrame Design Centre who can be contacted for advice on matters concerning the use of its SmartFrame engineered timber products in timber construction via the technical support Helpline on 1300 668 690 or e-mail at techsupport@tilling.com.au

Substitution of other products

All load tables in this document are designed using the unique characteristic properties of SmartLam GL19S manufactured to AS/NZS 1328 by quality producers 3r^{d} party audited by the GLTAA, exclusively distributed by Tilling Timber Pty Ltd.

Copyright

Certification

As a professional engineer, qualified and experienced in timber engineering, I certify that the use of the SmartLam GL19S members as shown in these tables, and installed in accordance with the provisions of this Design Guide, complies to the Building Code of Australia. These Span Tables have been prepared in accordance with standard engineering principles, the relevant test reports and Australian standards, ie:

- AS 1720.3 Timber structures Part 3: Design criteria for timber framed residential buildings
- AS 1720.1 Timber structures - design methods
- AS 4055 Wind loads for houses
- AS/NZS 4063 Characterisation of structural timber
- AS/NZS 1328 Glue laminated structural timber - performance requirements and minimum production requirements.

CRAIG KAY RPEng (Civil), BDC0730, PE0001869, RPEQ 5100, CC5635C, NER
National Product Engineer

SmartLam® GL19S

Introduction

SmartLam GL19S beams are manufactured for Tilling Timber by 3rd party audited quality GLT manufacturers to AS/NZS 1328. SmartLam GL19S GLT beams are engineered timber products with high strength, dimensional stability, great load carrying capacity and superior fire resistance.

All timber used for laminating is carefully selected from production and graded according to specification. After trimming to the desired size, all stock is kiln dried to 12% average moisture content, to ensure efficient bonding in the gluing operations. The laminations are finger jointed by machine, with glue being cured by cold press system and controlled temperature.

Benefits of SmartLam GL19S

Cost Effectiveness - SmartLam GL19S beams high strength to weight ratio allows you to design for maximum loads over large spans with the smallest possible end sections.

Product Quality - All SmartLam GL19S beams are manufactured in accordance with AS/NZS 1328 Glue Laminated Structural Timber and the Glued Laminated Timber Association (GLTAA) Industry standard GLTAA-4-91.

Fire safety - Extensive fire test data shows that large end section timber performs well in fire situations due to the formation of a protective layer of char which usually occurs at a temperature around 250° C. This charred area inhibits the effects of the fire on the inner portion of the timber component, hence it maintains structural load support for measurable periods of time as the fire progresses.

Conversely, steel loses its strength rapidly as the temperature is raised. At about 550°C, it has lost about 50% of its original bending strength, and by 750°C it has lost 90%. Timber does not loose strength in the same way, with the loss of section size through charring the major reason for any strength reduction.

Fast easy erection - Timber is a user friendly building material, requiring no special tools other than those a normal builder would use, and with SmartLam GL19S beams, installation is fast, easy and efficient.

Environmental responsibility - SmartLam GL19S beams are made from timber from sustainable managed forests under the FSC Certification scheme SGSHK-COC-450019, License Code FSC-C129865.

Low maintenance - In most applications, SmartLam GL19S beams will require little or no maintenance other than that which you would ordinarily carry out to any structural material.

Natural beauty - The natural beauty of timber is desired and highly appropriate in many architectural applications. Appearance Grade B SmartLam GL19S beams allow you to build timber's natural warmth and beauty into your designs.

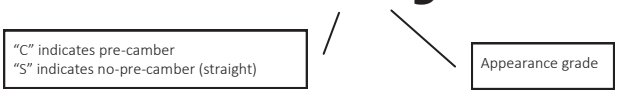
Ordering SmartLam GL19S

Stock SmartLam GL19S GLT is supplied straight (no precamber) and Appearance Grade B.

AS/NZS 1328.2 defines 3 appearance grades:

- Appearance Grade A - Sanded with any voids filled - intended for applications where appearance is important and clear or painted finishes are used
- Appearance Grade B - intended for applications where appearance is important but where a planed finish is acceptable
- Appearance Grade C - intended for applications where appearance is unimportant

SmartLam GL19S B grade



Protection and handling

Care should be taken during delivery to avoid marking and to avoid damage. Unloading of trucks should be done by hand or with a crane, do not drop or dump members. During unloading with lifting equipment, use fabric or plastic belts or other slings which will not mark the wood. If chains or cables are used, provide protective blocking or padding. Guard against soiling, dirt, footprints, abrasions, or injury to sharp edges or corners.

Installation

Preparatory work

Carefully unload and handle the laminated members at job site to prevent surface marking and damage. If laminated timber is to be stored before erection, place it on blocks well off the ground with individual members separated by strips so that air may circulate around all four sides. The top and the sides of storage pile shall be covered with moisture resistant covering. Wrapping shall be left intact, but individual wrappings shall be slit or punctured on the lower side to permit the drainage of water that may have accumulated. Before erection, the assembly should be checked for any damage from water or handling, prescribed camber, and accuracy of anchorage connections.

Laminated beams can be nailed into place in the same way as solid timber beams. Alternatively, a range of plates are available for end fixing. For larger beams, special purpose, engineer designed end fixing should be used.

Deflection

All structural members deflect downwards when dead loads are applied, and therefore it is important to allow for this deflection structurally and/or aesthetically in the selection of the beam sizes. The "Deflection Limits" table on page 10 details deflection limits for various applications.

Verticality

SmartLam GL19S members must not be installed out of plumb more than height/500.

Holes for services

Horizontal Holes - Like notches, holes in a GLT beam remove wood fibre, reduce the net area of the beam at the hole location, and introduce stress concentrations. For this reason, horizontal holes in GLT beams are limited in size and location to maintain the structural integrity of the beam. The diagram on the next page shows the zones of a uniformly loaded, simply supported beam where field drilling of holes may be considered.

Field drilled horizontal holes should be for access only and should not be used as attachment points for brackets or other load bearing hardware unless specifically designed as such by the Engineer/ Designer.

Regardless of the hole location, the net section of the beam remaining should be checked for flexure and horizontal shear.

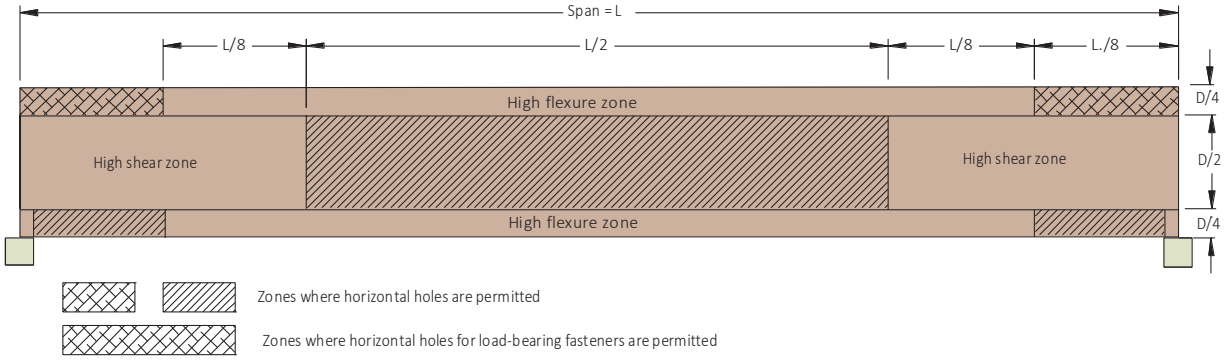
Vertical holes - As a rule of thumb, vertical holes drilled through the depth of a GLT beam cause a reduction in capacity at that loca-

Installation (cont'd)

tion directly proportional to the ratio of 1½ times the diameter of the hole. For example, a 25 mm hole drilled in a 150 mm wide beam would reduce the capacity of the beam at that section by ¼. For this reason, where it is necessary to drill vertical holes through a GLT member, the holes should be positioned in areas of the member that are stressed to less than 50% of the design in bending.

Holes for support of heavy equipment - Heavy equipment or piping suspended from GLT should be attached so that the load is applied to the top of the member to avoid tension perpendicular to the grain stresses. Any horizontal holes required for support of significant weight, such as suspended heating and cooling units or main water lines, must be located above the neutral axis of the member and in a zone stressed to less than 50% of the design flexural stresses.

Zones where horizontal holes are permitted in a uniformly loaded simply supported beam



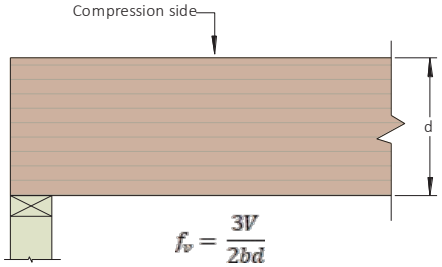
Notches

Notching of bending members should be avoided whenever possible, especially on the tension side of a member.

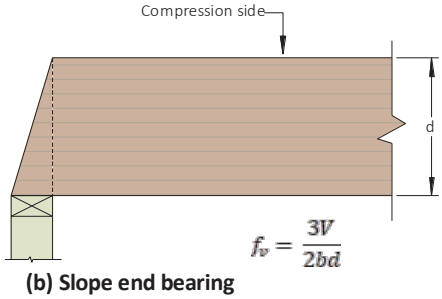
Tension-side notching of GLT beams is not permitted except at end bearings and then only under specific conditions. The notching of a bending member on the tension side results in a decrease in strength caused by stress concentrations which develop around the notch, as well as a reduction of the area resisting the bending and shear forces. Such notches induce perpendicular-to- grain tension stresses which, in conjunction with horizontal shear forces, can cause splitting along the grain, typically starting at the inside corner of the notch.

Where GLT members are notched at the ends for bearing over a support, the notch depth shall not exceed 1/10 of the beam depth. Figure (e) is provided to assist in evaluating the associated reductions to beam strength due to notching on the tension side.

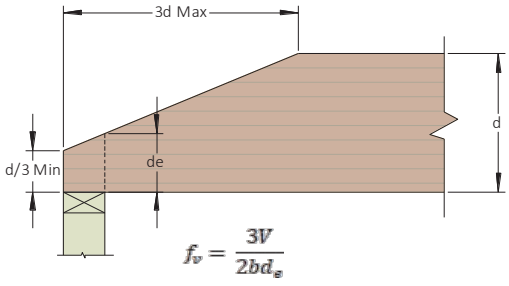
For notches on the compression side, a less severe condition exists and equations for the analysis of the effects of these notches are also given in Figure (a) to (d) The equations given are empirical in nature and were developed for the conditions shown.



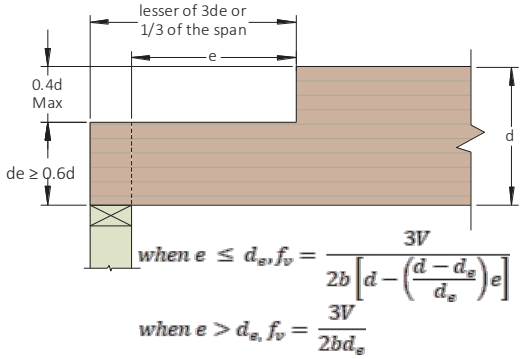
(a) Square end bearing



(b) Slope end bearing



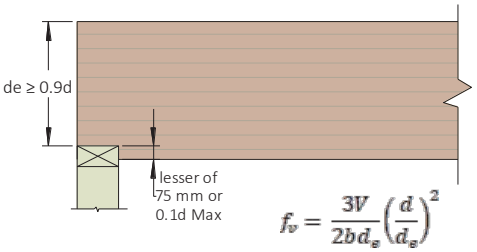
(c) Taper cut end bearing



(d) Compression-side notch

Where:

f_v = shear stress (MPa)
V = shear force at notch location (kN)
b = width of LVL beam (mm)
d = depth of LVL beam (mm)
d_e = effective depth as shown (mm)
e = length of notch as shown (mm)



(e) Tension-side notch

As this guideline is limited to single span, simply supported beams, the notches shown in Figure (b) and (c) occur in areas of high shear and effectively zero moment. For this reason, the design equations given are shear equations. In situations where compression side notches extend into areas of significant moment, the bending capacity of the beam should also be checked using the remaining section of the beam and the appropriate allowable

Installation (cont'd)

stresses for those laminations remaining at the notch location.

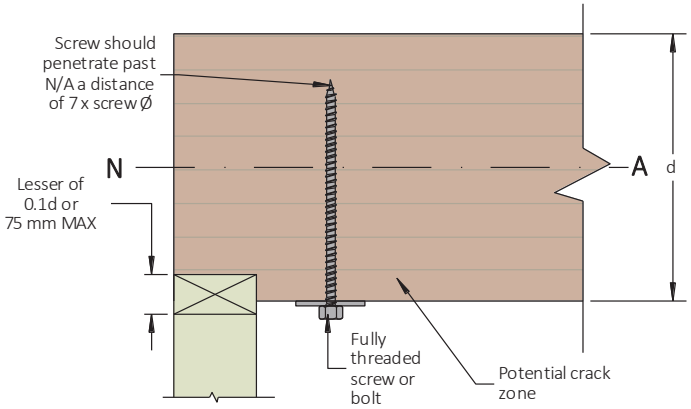
When it becomes necessary to cut a small notch in the top of a GLT beam (in the compression zone) to provide passage for small diameter pipe or conduit, this cut should be made in areas of the beam stressed to less than 50% of the design bending stress. The net section in these areas should be checked for shear and bending stresses to ensure adequate performance.

All field notches should be accurately cut. Avoid over-cutting at the root of the notch. Drilling a pilot hole in the member at the interior corner location of a notch as a stop point for the saw blade provides both a rounded corner and minimizes over-cutting at the corner.

Stress concentrations due to notches can be reduced by using a gradually tapered notch configuration in lieu of a square-cornered notch. Rounding the square corner of a notch with a radius of approximately 12 mm is also recommended to reduce stress concentrations in these areas.

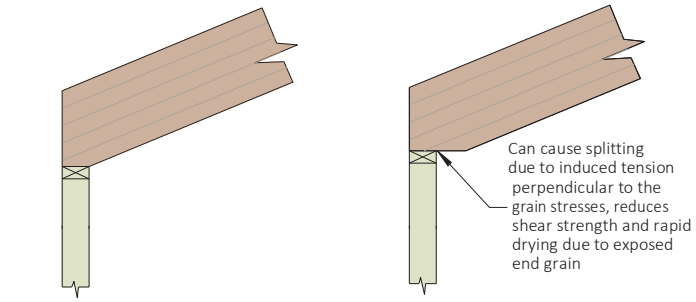
For square-cornered notches occurring at the ends of beams on the tension side, the designer may consider the use of reinforcement, such as full-threaded lag screws, to resist the tendency to split at the notch (See diagram below). A number of design methodologies exist for sizing such screws.
The design methodology selected and subsequent fabrication details are the responsibility of the project designer/engineer .If lag screws are used, lead holes shall be predrilled in accordance with accepted practice. This procedure can also be used as a field remedy to minimize further propagation of an existing crack.

Further information about the use of screw reinforcement can be obtained by contacting the technical support Helpline on 1300 668 690 or e-mail at techsupport@tilling.com.



Birdsmouthing

Figure 3 - Birds mouthing details for SmartLam GL19S



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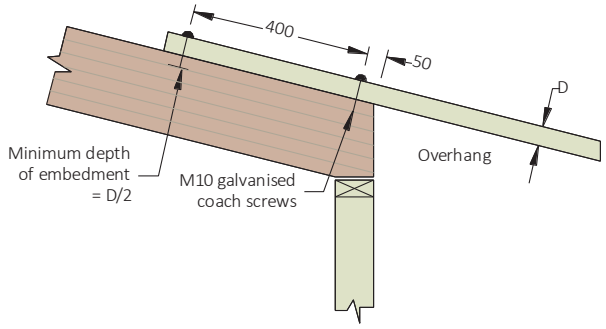
Eaves overhang

Figure 4 - Eaves over hang details for SmartLam GL19S



Note: Refer to AS 1684 Residential timber-framed construction code for overhang member size.

Allowable Eaves overhangs

1. Non Cyclonic Areas

Beams for flat or similar roofs - Not Birds mouthed: Eaves overhang shall not exceed 40% of the actual beam span.

Beams with conventional pitched roofs - Birds mouthed to one third their depth:

I. Sheet roof - 20% of actual beam span

II. Tiled roof - 30% of actual beam span

2. Cyclonic Areas

Recommendations as per above, but reduced as follows:

Non Birds mouthed:

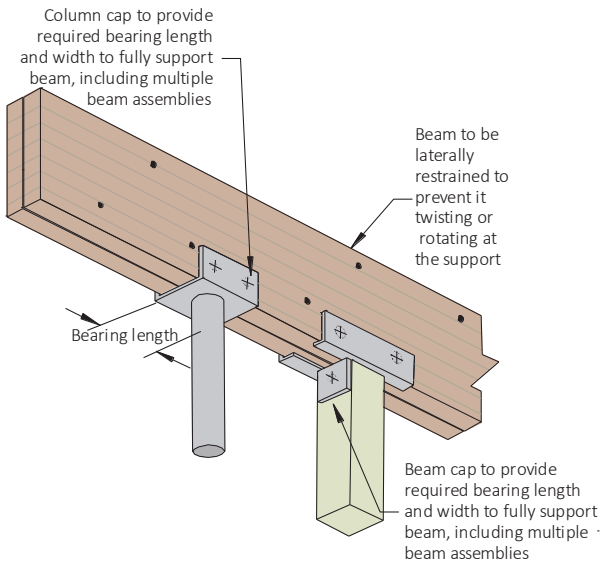
- 25% of actual beam span

Birdsmouthed:

- Sheet roof - 10% of actual beam span

- Tiled roof - 20% of actual beam span

Steel and Timber fixing to SmartLam GL19S



Installation (cont'd)

Multiple SmartLam GL19S section beams

Vertical laminations may be achieved by adopting the principle described in clause 2.3 of AS 1684, however, due to the thickness of SmartLam GL19S, nails are NOT suitable for combining SmartLam GL19S beams.

Experience with GLT beams indicates that multiple member laminations individual components may cup as a result of the ingress of moisture between laminates during construction. The suggested method of vertical lamination shown below provides a greater level of fixity between individual components, and combined with the use of a temporary waterproof membrane and an elastomeric adhesive prevents moisture penetration between the laminates.

Maximum floor load width tables for multiple member laminations of SmartLam GL19S:

1. Type 17 screw lamination
2. Bolt lamination

are shown below.

1. Type 17 screws

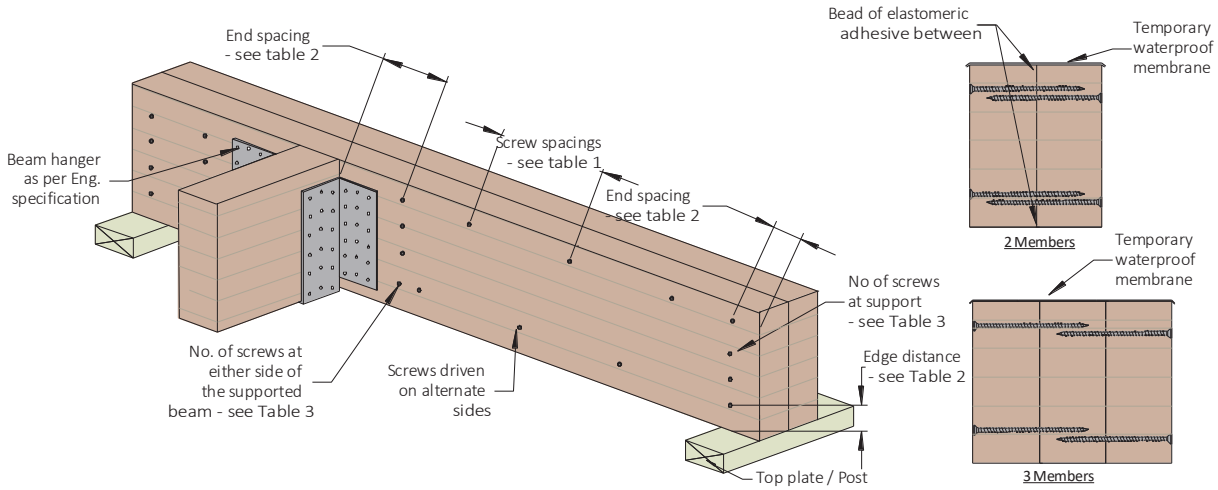


Table 1

Side (non-symmetrically) and top loaded beam				
Section width	**Type 17 screw size**	**No of screw rows (both sides)**	**Screw spacing (mm)**	**Max. floor joist span supported by outer member (mm)****
2/75 & 3/75	14g x 100	2 or 3*	300	7700
2/60 & 3/60	14g x 125	2 or 3*	300	6000
* for beam depths ≥ 300 mm, use 3 rows of screws				
** Floor loads G = 1.25 kPa, Q = 2.0 kPa				

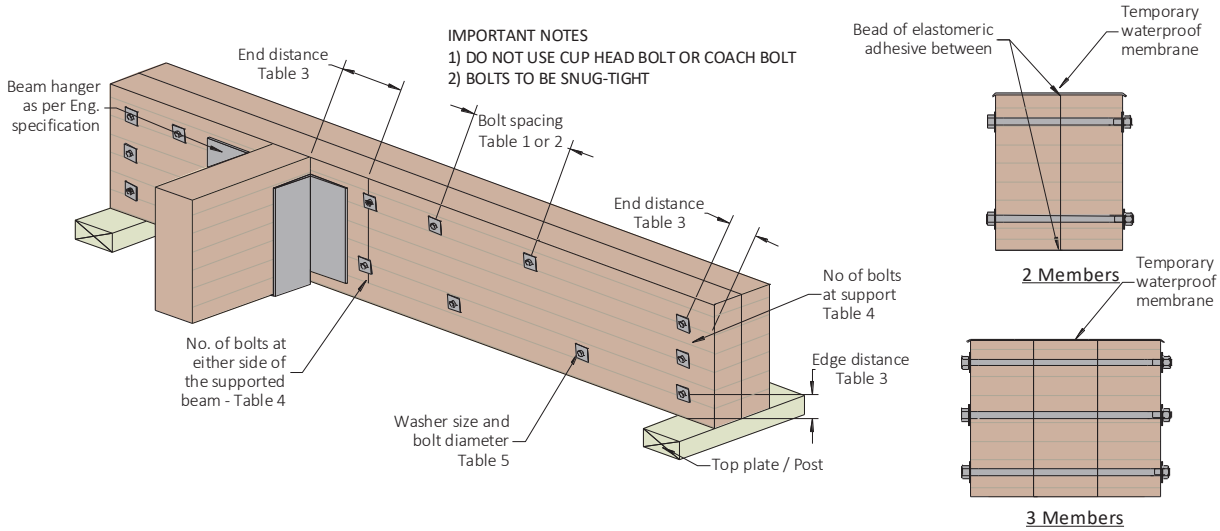
Table 2

Type 17 screw size	Min. edge distance (mm)	Min. end distance (mm)	Min. distance between screws (across the grain) (mm)
14g	40	70	30

Table 3

Beam depth (mm)	Min. number of screws required	
	At support	At either side of supported beam
90 –240	3	3
> 240	4	4

2. Bolts



Installation (cont'd)

2. Bolts (Cont'd)

Table 1

Top (symmetrically) loaded beam - M12 Hex head bolt	
Beam depth ≤ 300 mm	**Beam depth > 300 mm**
2 rows of bolts at 600 mm ctrs	3 rows of bolts at 600 mm ctrs

Table 2

Side (Non symmetrically) loaded beam - M12 Hex head bolt		
Maximum floor joist span supported by the beam mm*		
2 rows at 600 mm ctrs	2 rows at 300 mm ctrs	3 rows at 600 mm ctrs
11,00 mm	>12	>12

* based upon floor loads of G: 1.25 kPa Q: 2.0 kPa

Table 3

Bolt size	Min. edge distance	Min. end distance	Min. distance between bolts (across grain)
M12 Hex head	60 mm	60 mm	60 mm

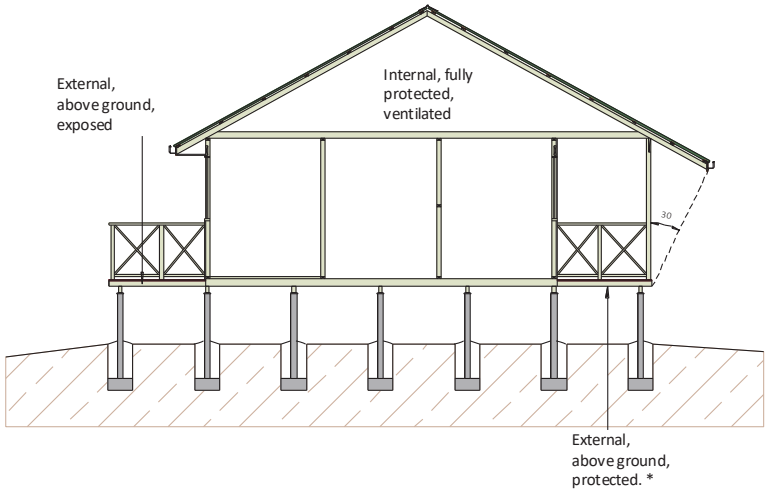
Table 4

Beam depth (mm)	Min. number of bolts required	
	At support	At either side of supported beam
90 –150	1	1
160—240	2	2
> 240	3	3

Table 5

Bolt diameter (mm)	Washer dimensions		
	Thick-ness (mm)	Min. diameter of round washers (mm)	Min. side length of square washers (mm)
M12	3	55	50

SmartLam durability and weather exposure



AS 1684 definitions of exposure zones within a structure

* External timbers are regarded as protected in AS 1684 if they are covered by a roof projection (or similar) at 30° to the vertical and they are well detailed and maintained (painted and kept well ventilated).

SmartLam GL19S's are manufactured from kiln dried timber (MC less than 15%), and therefore need to be protected from moisture cycling that can occur from:

- Exposure to direct sun and rain (including during construction)
- Contact or close exposure with moisture laden porous material (e.g. Concrete blocks)
- Exposure to extreme environments such as dry heating systems (e.g. slow combustion wood heaters), air conditioning, large north or west facing windows or moisture laden environments such as pool enclosures.

SmartLam GL19S protection methods

During Construction (pre-water proof roof)

SmartLam GL19S's are supplied WITHOUT any short term construction sealer. However if SmartLam GL19S is expected to be exposed for an extended period or become wet, it is recommended that the beam be sealed with a construction sealer that is compatible with the final paint or varnish finish, or wrapped in plastic to provide protection (plastic must allow for drainage and air circulation to breath).

Examples:

i. If the SmartLam GL19S is installed inside a building without direct exposure to air-conditioning such as in wall cavity, NO protection to the beam is required.

ii. If the SmartLam GL19S is installed inside a building with direct exposure to air conditioning or dry heat then a sealer is required.

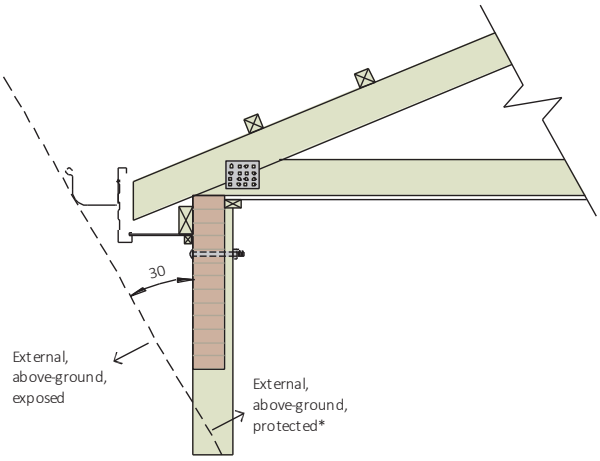
iii. If the SmartLam GL19S is under the eaves and protected from direct rain and sun, it is recommended that the construction sealer be lightly sanded and a finish coat of compatible premium quality paint be applied. (In accordance with paint manufacturer's specifications).

iv. It is NOT recommended that ANY SmartLam GL 19 be used in **external, above ground, exposed** applications.

SmartLam durability and weather exposure (Cont'd)

Covered alfresco beams

Alfresco beams constructed to comply with the diagram below are technically classified in AS 1684 as ***External, above-ground, protected.*** (see previous page)



* member must also be well detailed and maintained (painted or stained and kept well ventilated)

SmartLam GLT used in protected exterior applications must be:

I. Correctly detailed by fully enclosing member with a mechanical barrier such a cement sheet if it is likely to get wet or experiences direct sun

II. Mechanical barrier correctly painted with a premium quality protective finish (e.g. light coloured pigmented external paint system) to prevent moisture infiltration.

It is important that an inspection and maintenance programme, based on exposure level and the paint manufacturer's recommendations be prepared.

Painting SmartLam GL19S

General

To provide the longest service life of the SmartLam GL19S, it is recommended the SmartLam GL19S's are painted with an exterior paint with a Light Reflectance Value (LRV) greater than 30%. Heat reduction exterior paints should be used where the desired colour is dark or has a LRV of less than 30%. The heat reflective paints colours should be limited to a Total Solar Reflectance (TSR) value greater than 29%.

Any paint or stain must be recommended by the manufacturer as being suitable for the proposed application and must be applied in a manner in strict compliance to the manufacturer's recommendations.

1. The wood must be dry and clean prior to applying any finish coating. If initial cleaning of the treated wood is needed, it is recommended that the project be cleaned with a deck cleaning product and allowed to fully dry

2. At this time, a clear water repellent can be added to the project. If applied, allow 8 weeks prior to the application of a semi-transparent stain or paint

Users must always conduct their own tests on coatings in inconspicuous areas of the project to determine acceptability of colour, adhesion and appearance.

Design & Construction detailing tips

i. The use of building overhangs and other structures which protect the beams from excessive moisture movement and sun exposure.

ii. Shielding of the beam from free moisture or direct sun. The use of metal, fibro or plastic shields on the exposed faces or ends of beams is highly recommended to help maintain the beam in an unstressed dry condition.

iii. All beams should be provided with adequate ventilation so that moisture content within beams will not exceed 15% and moisture gradients across the beam will not occur.

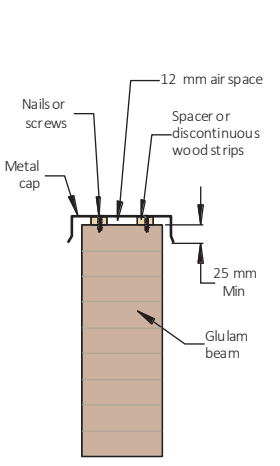
iv. The use of arrised or round edges on beams to reduce the likelihood of coating failures on sharp edges.

v. The use of drip edges or other devices which provide a path for free moisture flow away from the timber beam. Refer to detail below opposite.

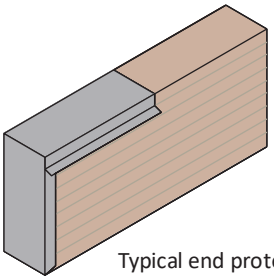
vi. Joint detailing should, wherever possible, comply with the following:

- Keep horizontal contact areas to a minimum, In favour of self draining vertical surfaces.
- Ventilate joint surfaces by using spacers, wherever possible.
- Always use compatible fasteners which have adequate corrosion protection and do not cause splitting during installation e.g. Hot dipped galvanic coatings or stainless steel.
- Ensure any moisture entering a joint is not trapped but can adequately drain away from the joint.

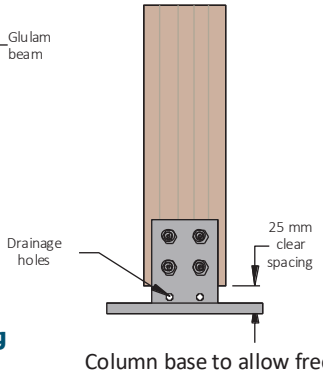
vii. Allow for thermal expansion/contraction in the joint design.



Capping details



Typical end protection



Column base to allow free drainage

Beam and column detailing

SmartLam GL19S and fire

Fire resistance

The Fire Resistance Level (FRL) is the performance criteria for fire resistance, i.e. the grading periods (in minutes) for the following criteria as specified in the BCA:

a. Structural adequacy: (the duration for which the elements can carry its designated load)

b. Integrity: (the duration for which the element can maintain its integrity to prevent the spread of fire to/ from the compartment)

and

c. Insulation: (the duration for which the element is insulating the adjacent space from excessive temperature rise)

and is expressed in that order e.g. 30/30/30. The method for determining the structural component of the Fire Resistance Period for timber (including LVL and GLT) is described in AS /NZS 1720.4 - 2019 Timber Structures Part 4: Fire resistance of timber elements.

$$c = 0.4 + \left(\frac{280}{\delta}\right)^2$$

where:

c = notional charring rate, in mm per minute

d = timber density of SmartLam GL19 S- ~ 900 kg/m^3

The effective depth of charring (d_c) after a period of time (t) shall be calculated in accordance with Clause 2.6.1 for surfaces exposed to fire and in accordance with Clause 2.6.2 for surfaces behind fire - resistant protective insulation.

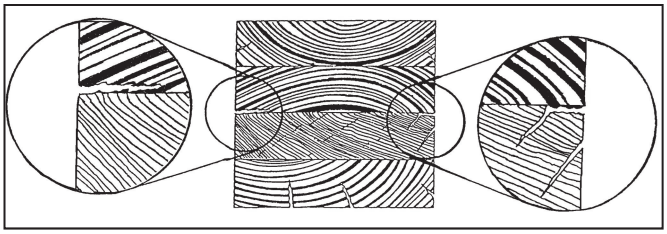
Further information about using SmartFrame product in fire rated applications can be obtained by contacting the Techsupport Helpline on 1300 668 690 or email techsupport@tilling.com.au.

Checking in SmartLam GL 19C

One of the advantages of glued laminated timber construction is that while seasoning checks may occur for the same reasons that they do in sawn members, checking in glued laminated timber will generally occur to a much lesser degree because of careful control of the moisture content of timber used for laminating. Checks in wood are separations along the fibres normally occurring across the rings of annual growth resulting from stresses developed during changes in moisture content. Checks in glued laminate timber may appear as openings parallel to the grain on the sides of members.

As wood loses moisture to the surrounding atmosphere, the outer fibres of the member lose moisture at a more rapid rate than do the inner fibres. As outer fibres try to shrink, they are restrained by the inner portion of the member that has higher moisture content. The more rapid the rate of drying, the greater will be the differential in shrinkage between the outer and inner fibres resulting in higher shrinkage stresses.

These resultant stresses perpendicular to the grain of the wood can cause characteristic wood seasoning checks. The influence of checks on the structural performance of glued laminated timber members is generally minor. Checking can be minimized by careful installation practices that avoid prolonged exposure of the members during construction.



Identification of checking

Checks occur as transverse separations or openings that are nearly parallel to the grain direction in glued laminated timber and generally follow the grain direction around knots and along sloping grain. Differences in the shrinkage rate of individual laminations used is glued laminated timber tend to concentrate shrinkage stresses at or near glue lines, resulting in checks.

Checks are often confused with delamination that occurs when the glue bond is not adequate. The presence of wood fibre separation in these openings is the key distinguishing characteristic of seasoning checks. Openings due to inadequate adhesive bonding may appear as smooth wood surface separations, possibly darkened by the adhesive film, or as glossy surface areas of adhesive with an absence of torn wood fibres.

Checking often occurs along the first glue line adjacent to the outer lamination that may dry more rapidly because a larger surface area of that lamination is exposed to the air. This condition is sometimes aggravated when the outer lamination tends to cup, creating tension perpendicular to grain stresses along or near the first glue line.

Significance of checking

In general, checks have little effect on the strength of glued laminated members. Glued laminated members are made from laminations that are thin enough to season readily in kiln drying schedules without developing checks. Checks usually appear on the wide faces of the timber and do not materially affect the shear strength of the laminations. In cases where members are designed for loading parallel to the wide face of the laminations, checks may affect the shear strength of the beam their effect may be evaluated in the same manner as for sawn timber. Seasoning checks in bending members affect only the horizontal shear capacity.

In establishing allowable horizontal shear values, normal checking due to seasoning has been considered.

Checks are usually not of structural importance unless they are significant in depth, occur in the mid-height of the member near the supports, and the design of the member is governed by shear. If these conditions exist, the reduction in shear strength is directly proportional to the ratio of the depth of checks to the width of the bending member. Checks in columns are not of structural importance unless the check develops into a split, thereby increasing the l/d ratio of the column.

Additional information

While checking is not considered to be of structural significance, the reason for the checking and the means by which further checking may be minimized should be determined.

If there is concern regarding structural adequacy, advice can be obtained from engineers from the SmartFrame Design Centre or a structural engineer experienced and qualified in glued laminated timber technology should evaluate the significance of the checking.

The SmartFrame Technical Note - “Evaluation of Checking in Glued Laminated Timber (GLT)” gives detailed analysis of the modification to structural capacity as a result of severe checking.

Designing with SmartLam GL19S

The design information contained within this Design Guide is for the properties of SmartLam GL19S only. Other manufacturers' LVL may have different properties and therefore cannot be designed using this information.

1. Product Specification

Lamella:	Thickness:	25-45 mm
	Species:	Keruing
	Strength Group	SD3
	Joints:	Finger joint
Dimensional tolerances:	Length:	± 10 mm
	Depth:	≤ 100 mm ± 1 mm ≥ 100 ≤ 302 mm ± 3 mm ≥ 301 ≤ 600 mm ± 4 mm ≥ 601 ± 6 mm
	Thickness:	- 0, +4 mm at 12% moisture content
Adhesive:	Complies with AS/NZS 4364:2010	
Treatment: options:	Seek current treatment options before order ordering	

2. Limit State Design Characteristic Properties

Timber Strength Properties:(1)			
Bending	f'_b	45	MPa
Tension Parallel to grain	f'_t	25	MPa
Tension Perpendicular to grain	f'_{tp}	0.6	MPa
Compression Parallel to grain	f'_c	45	MPa
Compression Perpendicular to grain - Edge	f'_p	17	MPa
Shear	f'_s	5.0	MPa
Average Elastic Modulus	E	19,000	MPa
Average Modulus of Rigidity	G	1267	MPa
Average Density		900	kg/m^3
Moisture Content		12-15%	

(1) Dry conditions

3. Strength reduction factor

The strength reduction factor for calculating the design capacities of structural members shall be taken from the table below, referenced from AS 1720.1 –2010

Application of SmartLam GL19S as a structural member		
Category 1	**Category 2**	**Category 3**
Structural members for houses for which failure would be unlikely to affect an area greater than 25 m^2; OR secondary members in structures other than houses	**Primary structural members in structures other than houses; OR elements in houses for which failure would be likely to affect an area* greater than 25 m^2**	**Primary structural members in structures intended to fulfil essential services or post disaster function**
Strength reduction factor Ø *		
0.95	0.85	0.75

* AS 1720.1:2010 Table 2.1

4. Duration of load

The duration of load factor k_1 for strength is defined within clause

Duration	**Service class / exposure classification**		
	1, 2	**3**	**Severe/ Adverse**
Short term <= 1 Day	1.0	1.0	1.0
Long term > 12 months	1.5	2.0	3.0*

Notes:

1. * Any beams to be used in service class 3 are outside the scope of these span tables, therefore specialist design advice should be sought from an engineer.
2. In general, the size of this beam can conservatively be obtained by the following method:
   i. Obtain the beam size for service class 1 & 2
   ii. Obtain the EI_{xx} from the "Section Properties" table for this beam
   iii. Obtain from the "Section Properties" table a beam size with an EI_{xx} => 2/1.5 x EI_{xx} of the original beam
   iv. Follow the recommendations for SmartLam durability and weather exposure on page 6
3. Service Classes 1,2 & 3 are defined in AS 1328

5. Partial seasoning factor

SmartLam GL19S is a seasoned timber product, generally k_4 equals 1. Where the GLT is subjected to conditions in which the average moisture content for a 12 month period is expected to exceed 15%, the characteristic capacity shall be decreased. The value of k_4 shall be the greater of:

a. $k_4 = 1 - 0.3\frac{EMC - 15}{10}$;

b. $k_4 = 0.7$

Where EMC is the highest value of the annual moisture content (percent) that the timber will attain in service.

6. Length and position of bearing

The k_7 bearing factor is defined is clause 2.4.4 of AS 1720.1

7. Load sharing

Because of the reduced variability of strength values of GLT compared to solid timber , the load sharing factor k_9 = 1.0 as defined in clause 7.4.3 of AS 1720.1

8. Stability

The stability factor k_{12} is defined within section 7 of AS 1720.1 beams. The methods for calculating k_{12} for solid wood in section 3 of AS 1720.1 shall generally apply except that the material constant (ρ_b or ρ_c) for beams and column shall be as given in Tables 7.2(A) and 7.2(B)

9. Temperature

For covered timber structures under ambient conditions, no modification for strength need be made for the effect of temperature (i.e., k_6 equals 1.0) except that where seasoned timber is used in structures erected in coastal regions of Queensland north of latitude 25°S, and all other regions of Australia north of latitude 16°S, the strength shall be modified by a factor k_6 of 0.9.

SmartLam GL19S Beam Properties

Nominal Size DxB mm	Beam mass kg/m	Nominal section area 10^3 mm^2	Major axis			Minor Axis	
			Zxx 10^3 mm^2	Ixx 10^6 mm^4	EIxx 10^9 Nmm^2	Zyy 10^3 mm^2	Iyy 10^6 mm^4
200 x 50	9.0	10.0	333	33	557	83.3	2.1
250 x 50	11.3	12.5	521	65	1087	104.2	2.6
200 x 60	10.8	12.0	400	40	668	120.0	3.6
265 x 60	14.3	15.9	702	93	1554	159.0	4.8
300 x 60	16.2	18.0	900	135	2255	180.0	5.4
330 x 60	17.8	19.8	1089	180	3001	198.0	5.9
200 x 80	14.4	16.0	533	53	891	213.3	8.5
265 x 80	19.1	21.2	936	124	2072	282.7	11.3
300 x 80	21.6	24.0	1200	180	3006	320.0	12.8

SmartLam GL19S Design /Effective span

Normal structural analysis uses the centreline representation of the member. The term "span" can be defined in a number of ways and these are defined as follows:

Clear span. This is the distance between the faces of any support. It is generally the one easiest to measure and read from the drawings

Nominal span/centre-line span. This is the distance between the centre of the supports. This span is used to determine bending moments and deflections for continuous spaning members

Design span/Effective span. This is the span used for single span members to determine the bending moment, the slenderness of bending members and the deflections. In NZS 3603 this is the dimension referred to as "L", and is defined below.

Design span/Effective span is the distance between -

- The centre of the bearing at each end of a beam where the bearing lengths have NOT been conservatively sized
- The centre of notional bearing that have been sized appropriately, where the size of the bearing IS conservative.

Diagram (a) shows beam where bearings have been designed appropriately. The effective span is taken as the distance between the centre of each bearing area

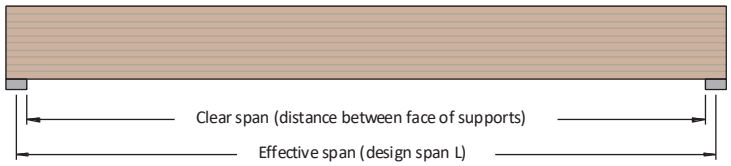
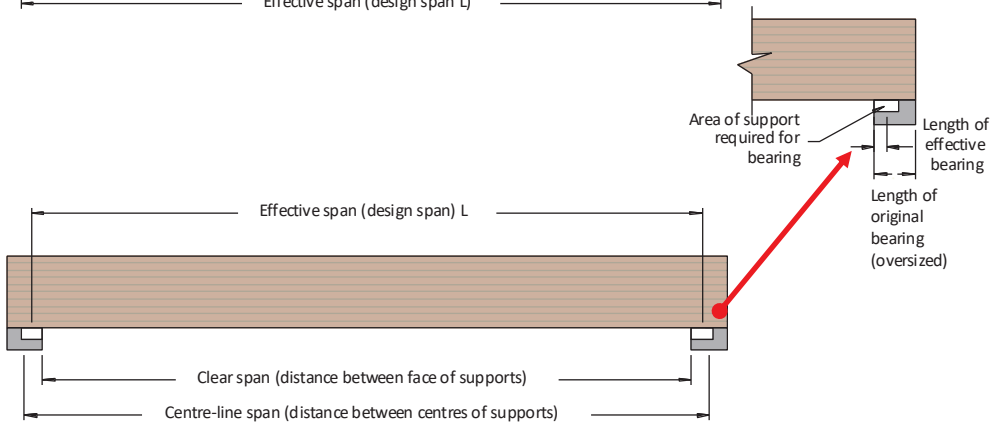


Diagram (b) shows beam where bearings at each end have been oversized. (This is frequently the case for beams that bear onto brickwork or concrete walls where the thickness of the wall is in excess of the area required to give the beam bearing capacity). To find the correct effective span:

1. Calculate the minimum bearing required to carry the loads satisfactorily
2. Add minimum bearing length to "clear span" distance



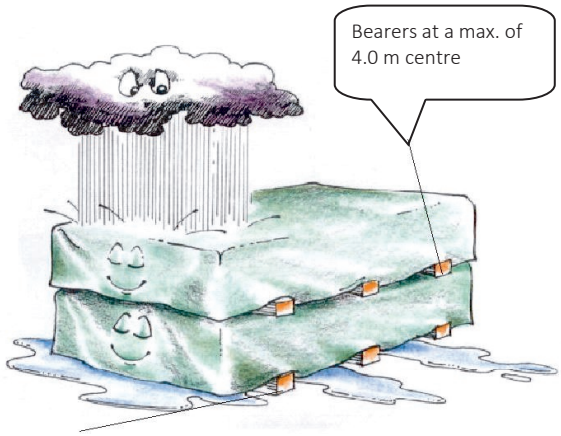
span difference	effective span	resultant span description
10% Max	main span	continuous
10 – 30%	1.1 x main span	continuous
Above 30% difference	main span	single

$$\text{span difference} = \frac{(\text{major span} - \text{minor span})}{(\text{major span} + \text{minor span})} \times 100$$

The span to use in the case of unequal continuous spans is the "resultant span description " as shown in the table above.
(Note: It is recommended for the most accurate designs, that the SmartFrame software be used.)

Storage and handling of SmartLam GL 19

1. Store SmartLam GL19S's flat on a hard, dry surface
2. If surface isn't paved, the ground should be covered with a polythene film
3. Keep covered with waterproof material that allows bundles to "breathe"
4. Use bearers (bolsters) between the ground and the first bundle (4 metre max spacing)
5. Use 100 x 50 timber flat between bundles at same spacing as bolsters
6. Take great care to rewrap remaining material after opening bundles
7. Timber "grows" in thickness and depth when allowed to get wet....KEEP DRY!
8. Timber products with high MC has short term reduction in Characteristic Strengths .... KEEP DRY!
9. Under NO circumstances is stored SmartLam GL19S to be in contact with the ground.



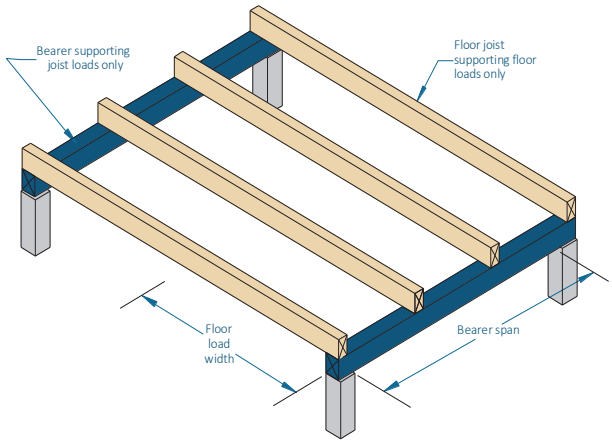
Use bearers to keep stacked material away from damp surfaces. Align bearer vertically

Span tables for SmartLam GL 19

LISTS OR TABLES AND CHARTS

Floor bearers supporting floor loads only

Floor mass - 40 kg/m^2



EXAMPLE:

single span bearer = 4000 mm
floor load width = 4000 mm

Enter single span table at 4200 mm in floor load width column, read down to a span equal to or greater than 4000 mm

ADOPT:

SmartLam GL19S - 330x60 mm

Loadings: Permanent - self weight + 40 kg/m^2 + 0.6 kPa of the live load, live load - 1.5 kPa or floor point load of 1.8 kN

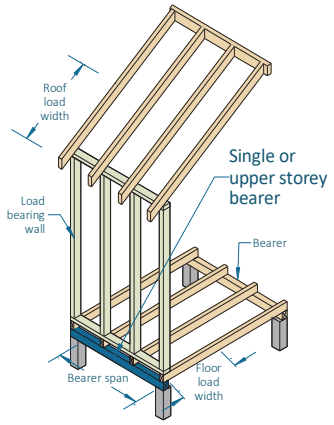
Floor load width (mm)	1200	1800	2400	3000	3600	4200	4800	5400	6000	6600
Member Size DxB (mm)	Maximum recommended bearer span (mm)									
	Single span									
200x50	3600	3200	2900	2600	2500	2300	2200	2100	2000	1900
250x50	4200	3800	3600	3300	3100	2900	2800	2600	2400	2300
200x60	3800	3300	3000	2800	2600	2500	2400	2300	2100	2000
265x60	4600	4200	3900	3700	3500	3300	3200	3000	2800	2700
300x60	5100	4600	4300	4000	3900	3700	3600	3400	3200	3100
330x60	5400	4900	4600	4300	4100	4000	3800	3700	3600	3400
200x80	4000	3600	3300	3100	2900	2700	2600	2500	2400	2300
265x80	4900	4500	4200	3900	3800	3600	3500	3300	3200	3100
300x80	5400	4900	4600	4300	4100	4000	3800	3700	3600	3500
330x80	5800	5300	4900	4600	4400	4300	4100	4000	3900	3800
Continuous span										
200x50	4500	3700	3200	2800	2600	2400	2200	2100	2000	1900
250x50	5300	4600	3900	3500	3200	3000	2800	2600	2400	2300_{5}
200x60	4700	4000	3500	3100	2800	2600	2400	2300	2100	2000
265x60	5800	5300	4600	4100	3700	3400	3200	3000	2800	2700
300x60	6400	5800	5200	4600	4200	3900	3600	3400_{5}	3200_{10}	3100_{15}
330x60	6800	6200	5700	5100	4600	4300	4000_{5}	3800_{15}	3600_{20}	3400_{25}
200x80	5100	4600	4000	3600	3200	3000	2800	2600	2500	2400
265x80	6200	5600	5300	4700	4300	4000	3700	3500	3300	3100
300x80	6800	6200	5800	5300	4800	4500	4200	3900	3700	3500

NOTES:

1. D = member depth, B = member breadth, NS = not suitable.
2. End bearing lengths = 70 mm at end supports and 90 mm at internal supports for continuous members. Subscript values indicate the minimum additional bearing length where required to be greater than 70 mm at end supports and 90 mm at internal supports.
3. Restraint value for slenderness calculations is 600 mm. (floor joist centres at 600 mm max)
4. Not all sizes of SmartLam GL19S in this table are stocked in each state. Please check with your supplier before ordering

Floor bearers supporting single storey load bearing wall - sheet and tiled roof Single and Continuous span

Floor mass - 40 kg/m^2



EXAMPLE:

Sheet roof - 40 kg/m^2
floor load width = 2000 mm
roof load width = 1950 mm
bearer span = 3000 mm (single span)

Enter single span table at 2400 mm in floor load width column, 4500 roof load width column, read down to a span equal to or greater than 3000 mm in the 40 kg/m^2 row

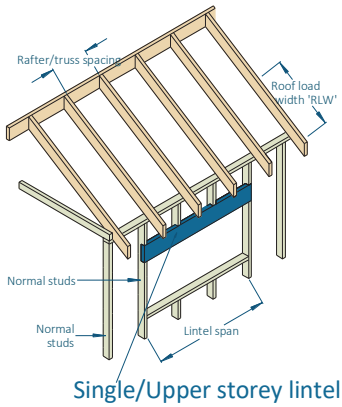
ADOPT:
SmartLam GL19 S - 250 x 50

Floor load width (mm)		1200			2400			4800		
Roof load width (mm)		1500	4500	7500	1500	4500	7500	1500	4500	7500
Member size DxB (mm)	Roof mass (kg/m^2)	Maximum recommended bearer span (mm)								
		Single span								
200x50	40	2900	2600	2400	2600	2400	2200	2100	2000	1900
	90	2700	2200	2000	2400	2100	1900	2000	1800	1700
250x50	40	3600	3200	3000	3200	3000	2800	2600	2500	2400
	90	3400	2800	2500	3100	2600	2400	2500	2300	2100
200x60	40	3100	2700	2500	2800	2500	2300	2300	2200	2100
	90	2900	2400	2100	2600	2200	2000	2200	2000	1900
265x60	40	4000	3600	3300	3600	3300	3100	3000	2900	2800
	90	3700	3100	2800	3400	3000	2700	2900	2700	2500
300x60	40	4300	4000	3700	4000	3700	3500	3400	3300	3100
	90	4100	3600	3200	3800	3400	3000	3300	3000	2800
330x60	40	4700	4300	4000	4300	4000	3800	3700	3600	3400
	90	4400	3800	3500	4100	3700	3300	3600	3300	3100
200x80	40	3400	3000	2800	3000	2800	2600	2600	2400	2300
	90	3100	2600	2300	2900	2500	2200	2500	2200	2000
265x80	40	4200	3900	3600	3900	3600	3400	3400	3200	3100
	90	4000	3500	3100	3700	3300	2900	3300	2900	2700
300x80	40	4700	4300	4000	4300	4000	3800	3800	3600	3500
	90	4400	3800	3500	4100	3700	3300	3700	3300	3100
330x80	40	5000	4600	4300	4600	4300	4100	4000	3900	3700
	90	4700	4100	3800	4400	3900	3600	3900	3600	3400
		Continuous span								
200x50	40	3600	3100	2700	2800	2600	2400	2100	2000	1900
	90	3300	2500	2100	2600	2300	1900	2000	1800	1700
250x50	40	4300	3900	3400	3500	3200	3000	2600	2500	2400_{5}
	90	4100	3100	2600	3300	2800	2400	2500	2300_{5}	2100_{15}
200x60	40	3800	3400	3000	3100	2800	2600	2300	2200	2100
	90	3600	2700	2300	2900	2500	2100	2200	2000	1900
265x60	40	4700	4300	4000	4000	3700	3500	3000	2900	2800
	90	4400	3600	3000	3800	3300	2800	2900	2700_{5}	2500_{10}
300x60	40	5100	4800	4500	4600	4200	4000	3400_{5}	3300_{10}	3100_{15}
	90	4900	4100	3400_{5}	4400	3700	3200_{10}	3300_{5}	3000_{15}	2800_{25}
330x60	40	5500	5100	4800	4900	4700	4400	3700_{15}	3600_{20}	3400_{25}
	90	5200	4500	3700_{15}	4800	4100_{5}	3500_{20}	3600_{15}	3300_{30}	3100_{40}
200x80	40	4000	3800	3500	3500	3300	3100	2600	2500	2400
	90	3900	3200	2600	3400	2900	2500	2500	2300	2100
265x80	40	5000	4700	4400	4500	4300	4000	3500	3300	3200
	90	4800	4200	3500	4300	3800	3300	3400	3100	2900
300x80	40	5500	5100	4800	4900	4700	4500	3900	3800	3600
	90	5200	4700	3900	4800	4300	3700	3800	3500	3200_{10}

NOTES:

1. D = member depth, B = member breadth, NS = not suitable.
2. The above table was based on a total ground floor mass of 40 (kg/m^2), total wall mass of 37 kg/m^2, floor live load of 1.5 kPa, floor point load of 1.8 kN.
3. The above table was based on a wall height of 2700.
4. End bearing lengths = 70 mm at end supports and 90 mm at internal supports for continuous members. Subscript values indicate the minimum additional bearing length where required to be greater than 70 mm at end supports and 90 mm at internal supports.
5. Restraint value for slenderness calculations is 600 mm.
6. Not all sizes of SmartLam GL 19S in this table are stocked in each state. Please check with your supplier before ordering.

Single span lintels in single/upper storey walls AS 4055 classification N1, N2 and N3



Single/Upper storey lintel

EXAMPLE:

wind speed = N3
sheet roof - 40 kg/m^2
roof load width = 3900 mm
rafter/truss spacing = 600 mm
lintel span = 3500 mm

Enter span table at 4500 roof load width column, rafter/truss spacing 600 mm, and read down to a span equal to or greater than 3500 mm in the 40 kg/m^2 row

ADOPT:

SmartLam GL19S - 250 x 50

Roof load width (mm)		1500		3000		4500		6000		7500	
Rafter/Truss spacing (mm)		600	1200	600	1200	600	1200	600	1200	600	1200
Member size DxB (mm)	Roof mass (kg/m^2)	Maximum recommended Lintel span (mm)									
		Single span									
200x50	40	4200	4200	3600	3500	3200	3200	2900	2800	2600	2500
	90	3500	3400	2900	2900	2600	2600	2300	2300	2100	2100
250x50	40	4900	4900	4200	4200	3800	3800	3600	3500	3300	3100
	90	4100	4100	3500	3400	3100	3100	2900	2900	2700	2700
200x60	40	4300	4300	3700	3700	3400	3300	3100	3100	2800	2800
	90	3600	3600	3100	3000	2700	2700	2500	2500	2300	2300
265x60	40	5300	5300	4600	4600	4200	4200	3900	3900	3700	3700
	90	4500	4400	3800	3800	3400	3400	3200	3200	3000	3000
300x60	40	5800	5800	5000	5000	4600	4500	4300	4300	4000	4000
	90	4900	4900	4100	4100	3800	3700	3500	3500	3300	3300
330x60	40	6200	6200	5400	5400	4900	4900	4600	4600	4300	4300
	90	5200	5200	4500	4400	4000	4000	3800	3700	3600	3500
200x80	40	4600	4600	4000	4000	3600	3600	3400	3300	3200	3200
	90	3900	3800	3300	3300	3000	3000	2700	2700	2500	2600
265x80	40	5600	5600	4900	4900	4500	4400	4200	4200	3900	3900
	90	4800	4700	4000	4000	3700	3600	3400	3400	3200	3200
300x80	40	6100	6100	5300	5300	4900	4900	4600	4500	4300	4300
	90	5200	5200	4400	4400	4000	4000	3800	3700	3600	3500

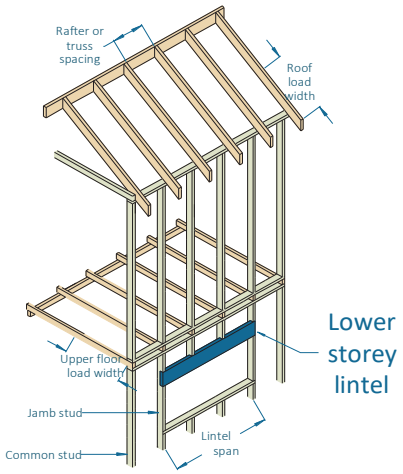
Single span lintels in single/upper storey walls AS 4055 classification C1, C2 and C3

Roof load width (mm)		1500		3000		4500		6000		7500	
Rafter/truss spacing (mm)		600	1200	600	1200	600	1200	600	1200	600	1200
Member size DxB (mm)	Roof mass (kg/m^2)	Maximum recommended Lintel span (mm)									
		Single span									
200x50	40	3900	3700	2700	2600	2200	2100	1800	1500	1600	NS
	90	3500	3400	2800	2800	2300	2200	1900	1600	1700	1100
250x50	40	4900	4800	3400	3200	2700	2700	2400	2300	2100	1600
	90	4100	4100	3500	3400	2900	2800	2500	2400	2200	1800
200x60	40	4200	4100	2900	2800	2400	2300	2000	1800	1800	1400
	90	3600	3600	3100	3000	2500	2400	2200	2100	1900	1600
265x60	40	5300	5300	4000	3800	3200	3100	2700	2700	2500	2400
	90	4500	4400	3800	3800	3400	3200	2900	2800	2600	2500
300x60	40	5800	5800	4500	4400	3700	3500	3100	3000	2800	2700
	90	4900	4900	4100	4100	3800	3700	3300	3200	2900	2800
330x60	40	6200	6200	5000	4900	4000	3900	3500	3300	3100	3000
	90	5200	5200	4500	4400	4000	4000	3700	3500	3300	3100
200x80	40	4600	4600	3500	3300	2800	2700	2400	2300	2100	2000
	90	3900	3800	3300	3300	2900	2800	2500	2400	2300	2200
265x80	40	5600	5600	4600	4600	3700	3600	3200	3100	2800	2800
	90	4800	4700	4000	4000	3700	3600	3400	3200	3000	2900
300x80	40	6100	6100	5200	5200	4200	4100	3700	3500	3200	3100
	90	5200	5200	4400	4400	4000	4000	3800	3700	3400	3300

NOTES:

1. D = member depth, B = member breadth, NS = not suitable.
2. Minimum bearing length = 70 mm at end supports. Subscript values indicate the minimum additional bearing length where required to be greater than 70 mm.
3. Restraint value for slenderness calculations is 600 mm.
4. Not all sizes of SmartLam GL19S in this table are stocked in each state. Please check with your supplier before ordering.

Single span lintels in lower storey walls
AS 4055 classification N1, N2, N3 & C1



EXAMPLE:

wind speed = N3
sheet roof - 40 kg/m^2
rafter/truss spacing = 600 mm
lintel span = 3500 mm
roof load width = 3900 mm
floor load width = 1200 mm
Enter span table at 4500 roof load width column, floor load width 1200 mm, and read down to a span equal to or greater than 3500 mm in 40 kg/m^2 row

ADOPT:

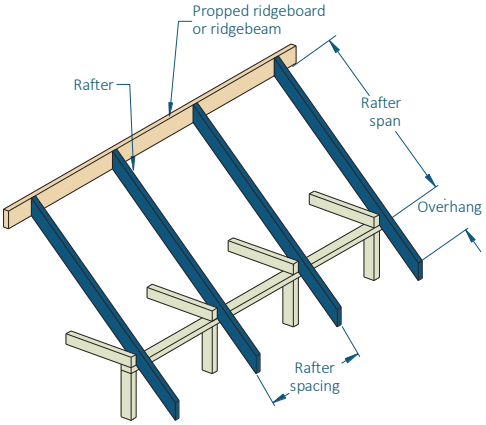
SmartLam GL19S - 300 x 60

Roof load width (mm)		1500			3000			4500			6000		
Floor load width (mm)		1200	2400	3600	1200	2400	3600	1200	2400	3600	1200	2400	3600
Member size DxB (mm)	Roof mass (kg/m^2)	Maximum recommended Lintel span (mm)											
		Single span											
200x50	40	2700	2500	2300	2600	2400	2200	2500	2300	2100	2400	2200	2100
	90	2600	2400	2200	2300	2200	2100	2200	2000	1900	2000	1900	1800
250x50	40	3200	3000	2800	3100	2900	2700	3000	2800	2700	2900	2700	2600
	90	3100	2900	2700	2900	2700	2600	2700	2600	2400	2600	2400	2300
200x60	40	2900	2600	2400	2700	2500	2300	2600	2400	2300	2500	2400	2200
	90	2700	2500	2300	2500	2300	2200	2300	2200	2100	2200	2100	2000
265x60	40	3500	3300	3100	3400	3200	3000	3300	3100	2900	3200	3000	2900
	90	3400	3100	3000	3100	3000	2800	3000	2800	2700	2800	2700	2600
300x60	40	3900	3600	3400	3700	3500	3300	3600	3400	3200	3500	3300	3200
	90	3700	3500	3300	3400	3300	3100	3200	3100	3000	3100	3000	2900
330x60	40	4200	3900	3600	4000	3700	3500	3900	3600	3500	3700	3500	3400
	90	4000	3700	3500	3700	3500	3400	3500	3300	3200	3300	3200	3100
200x80	40	3100	2800	2700	2900	2800	2600	2800	2700	2500	2700	2600	2400
	90	2900	2700	2600	2700	2600	2400	2500	2400	2300	2400	2300	2200
265x80	40	3800	3500	3300	3600	3400	3200	3500	3300	3100	3400	3200	3100
	90	3600	3400	3200	3400	3200	3100	3200	3000	2900	3000	2900	2800
300x80	40	4200	3900	3600	4000	3700	3500	3800	3600	3500	3700	3500	3400
	90	3900	3700	3500	3700	3500	3400	3500	3300	3200	3300	3200	3100

NOTES:

1. D = member depth, B = member breadth, NS = not suitable.
2. Total Upper floor mass of 40 kg/m^2, floor live load of 1.5 kPa, floor point load of 1.8 kN
3. Minimum bearing length = 35 mm at end supports. Subscript values indicate the minimum additional bearing length where required to be greater than 35 mm.
4. Restraint value for slenderness calculations is 600 mm.
5. Not all sizes of SmartLam GL19S in this table are stocked in each state. Please check with your supplier before ordering

Single/continuous span roof rafter - AS 4055 classification N1, N2 AND N3 - with ceiling attached



Maximum Birdsmouth = 30% of rafter depth

EXAMPLE:

wind speed = N3
sheet roof - 40 kg/m^2
rafter/truss spacing = 600 mm
rafter span = 5000 mm

Enter span table at rafter spacing of 600 mm, and read down to a span equal to or greater than 5000 mm in 40 kg/m^2 row

ADOPT:

SmartLam GL19S - 200 x 50

Rafter spacing (mm)		450	600	900	1200	450	600	900	1200
Member size DxB (mm)	Roof mass (kg/m^2)	Maximum recommended Rafter span (mm)							
		Single span				Continuous span			
200x50	30	6600	6300	5800	5400	8300	7900	7400	7000
	40	6300	6000	5400	5000	8000	7500	7000	6600
	75	5500	5100	4500	4200	7100	6700	6100	5700
	90	5300	4800	4300	3900	6800	6400	5800	5300
250x50	30	7600	7300	6800	6500	9600	9200	8600	8200
	40	7300	7000	6500	6100	9200	8800	8200	7700
	75	6600	6200	5600	5200	8300	7800	7200	6700
	90	6300	6000	5300	4900	8000	7500	6900	6500
200x60	30	6800	6500	6100	5700	8600	8200	7600	7200
	40	6500	6200	5700	5300	8200	7800	7200	6800
	75	5800	5400	4800	4400	7300	6900	6400	6000
	90	5500	5100	4500	4200	7100	6700	6100	5700
265x60	30	8100	7800	7300	7000	10200	9800	9200	8800
	40	7800	7500	7000	6600	9900	9400	8800	8300
	75	7100	6700	6200	5800	8900	8400	7800	7300
	90	6800	6500	5900	5500	8600	8100	7500	7000
300x60	30	8800	8500	8000	7600	11100	10600	10000	9600
	40	8500	8100	7600	7200	10700	10200	9500	9100
	75	7700	7300	6800	6300	9700	9200	8500	8000
	90	7400	7100	6500	6100	9400	8900	8200	7700
330x60	30	9300	9000	8500	8100	11700	11300	10700	10200
	40	9000	8600	8100	7700	11300	10900	10200	9700
	75	8200	7800	7200	6800	10300	9800	9100	8500
	90	7900	7500	7000	6500	10000	9500	8800	8200
200x80	30	7100	6800	6400	6100	8900	8500	8000	7600
	40	6800	6500	6100	5700	8600	8200	7600	7200
	75	6200	5800	5200	4800	7700	7300	6800	6400
	90	5900	5500	4900	4500	7500	7100	6500	6100
265x80	30	8400	8100	7700	7300	10600	10200	9700	9200
	40	8100	7800	7300	7000	10200	9800	9200	8800
	75	7400	7100	6600	6200	9400	8900	8300	7800
	90	7200	6800	6300	5900	9100	8600	8000	7500
300x80	30	9000	8800	8300	8000	11400	11000	10500	10000
	40	8800	8500	8000	7600	11100	10600	10000	9600
	75	8100	7700	7200	6700	10200	9700	9000	8500
	90	7800	7400	6900	6500	9900	9400	8700	8200

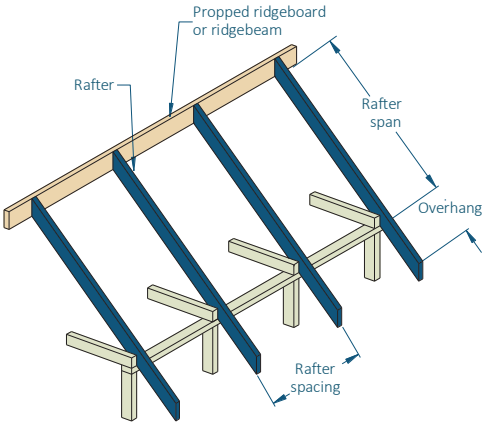
Single/continuous span roof rafter AS 4055 classification C1, C2 and C3 - with ceiling attached

Rafter spacing mm)		450	600	900	1200	450	600	900	1200
Member size DxB (mm)	Roof mass (kg/m^2)	Maximum recommended Rafter span (mm)							
		Single span				Continuous span			
200x50	30	6600	6300	5400	4600	7900	6800	5400	4600
	40	6300	6000	5400	4600	8000	6800	5500	4600
	75	5500	5100	4500	4200	7100	6700	5700	4800
	90	5300	4800	4300	3900	6800	6400	5700	4800
250x50	30	7600	7300	6800	5800	9600	8500	6800	5800
	40	7300	7000	6500	5900	9200	8600	6900	5900
	75	6600	6200	5600	5200	8300	7800	7200	6100
	90	6300	6000	5300	4900	8000	7500	6900	6100_5
200x60	30	6800	6500	6000	5000	8600	7500	6000	5000
	40	6500	6200	5700	5100	8200	7500	6000	5100
	75	5800	5400	4800	4400	7300	6900	6300	5300
	90	5500	5100	4500	4200	7100	6700	6100	5300
265x60	30	8100	7800	7300	6800	10200	9800	8000	6800
	40	7800	7500	7000	6600	9900	9400	8100	6900
	75	7100	6700	6200	5800	8900	8400	7800	7200
	90	6800	6500	5900	5500	8600	8100	7500	7000
300x60	30	8800	8500	8000	7600	11100	10600	9100	7800
	40	8500	8100	7600	7200	10700	10200	9200	7800
	75	7700	7300	6800	6300	9700	9200	8500	8000_5
	90	7400	7100	6500	6100	9400	8900	8200	7700_5
330x60	30	9300	9000	8500	8100	11700	11300	10000	8600
	40	9000	8600	8100	7700	11300	10900	10200	8700_5
	75	8200	7800	7200	6800	10300	9800	9100	8500_{10}
	90	7900	7500	7000	6500	10000	9500	8800	8200_{10}
200x80	30	7100	6800	6400	5900	8900	8500	6900	5900
	40	6800	6500	6100	5700	8600	8200	7000	6000
	75	6200	5800	5200	4800	7700	7300	6800	6200
	90	5900	5500	4900	4500	7500	7100	6500	6100
265x80	30	8400	8100	7700	7300	10600	10200	9300	7900
	40	8100	7800	7300	7000	10200	9800	9200	8000
	75	7400	7100	6600	6200	9400	8900	8300	7800
	90	7200	6800	6300	5900	9100	8600	8000	7500
300x80	30	9000	8800	8300	8000	11400	11000	10500	9000
	40	8800	8500	8000	7600	11100	10600	10000	9100
	75	8100	7700	7200	6700	10200	9700	9000	8500
	90	7800	7400	6900	6500	9900	9400	8700	8200

NOTES:

1. D = member depth, B = member breadth, NS = not suitable.
2. The above table was based on a batten spacing of 900 mm
3. Maximum birds mouth depth = 30 % of rafter depth
4. End bearing lengths = 45 mm at end supports and 45 mm at internal supports for continuous members. Subscript values Indicate the minimum additional bearing length where required to be greater than 45 mm at end supports and 45 mm at internal supports
5. Construction loads shall not be applied to overhangs until a 190 x 19 (minimum) timber fascia or other fascia of equivalent stiffness is rigidly and permanently attached to the end of rafter overhangs
6. Rafter spacing up to 1200 mm
7. Not all sizes of SmartLam GL19S in this table are stocked in each state. Please check with your supplier before ordering

Single/continuous span roof rafter- AS 4055 classification N1, N2 and N3 - without ceiling attached



Maximum Birdsmouth = 30% of rafter depth

EXAMPLE:

wind speed = N3
sheet roof - 40 kg/m^2
rafter/truss spacing = 600 mm
rafter span = 5000 mm

Enter span table at rafter spacing of 600 mm, and read down to a span equal to or greater than 5000 mm in 40 kg/m^2 row

ADOPT:

SmartLam GL19S - 200 x 50

Rafter spacing (mm)		450	600	900	1200	450	600	900	1200
Member size DxB (mm)	Roof mass (kg/m^2)	Maximum recommended Rafter span (mm)							
		Single span				Continuous span			
200x50	10	7600	7300	7000	6300	9500	9200	8000	6800
	20	7000	6700	6300	6000	8800	8500	7900	7000
	40	6300	6000	5400	5000	8000	7500	7000	6600
	60	5800	5400	4800	4400	7400	7000	6400	6000
250x50	10	8600	8400	8000	7800	10800	10600	10100	8600
	20	8000	7800	7300	7000	10100	9800	9200	8800
	40	7300	7000	6500	6100	9200	8800	8200	7700
	60	6900	6500	6000	5500	8600	8200	7500	7100
200x60	10	7700	7500	7200	6700	9600	9400	8900	7500
	20	7200	6900	6500	6200	9000	8700	8200	7700
	40	6500	6200	5700	5300	8200	7800	7200	6800
	60	6100	5700	5100	4700	7700	7200	6700	6300
265x60	10	9000	8800	8500	8200	11300	11100	10700	10100
	20	8500	8200	7800	7500	10700	10400	9800	9400
	40	7800	7500	7000	6600	9900	9400	8800	8300
	60	7400	7000	6500	6100	9300	8800	8200	7700
300x60	10	9600	9500	9100	8900	12000	11900	11500	11200
	20	9200	8900	8500	8100	11500	11200	10600	10200
	40	8500	8100	7600	7200	10700	10200	9500	9100
	60	8000	7600	7000	6700	10100	9600	8900	8400
330x60	10	10100	10000	9700	9400	12000	12000	12000	11900
	20	9700	9400	9000	8600	12000	11900	11300	10900
	40	9000	8600	8100	7700	11300	10900	10200	9700
	60	8500	8100	7500	7100	10700	10200	9500	8900
200x80	10	7800	7700	7400	7200	9800	9600	9300	8800
	20	7400	7200	6800	6500	9300	9000	8500	8200
	40	6800	6500	6100	5700	8600	8200	7600	7200
	60	6400	6100	5500	5100	8000	7600	7100	6700
265x80	10	9100	9000	8700	8500	11500	11300	11000	10700
	20	8700	8500	8100	7800	11000	10700	10200	9800
	40	8100	7800	7300	7000	10200	9800	9200	8800
	60	7700	7300	6800	6500	9700	9200	8600	8100
300x80	10	9800	9600	9400	9200	12000	12000	11800	11500
	20	9400	9200	8800	8500	11800	11500	11000	10600
	40	8800	8500	8000	7600	11100	10600	10000	9600
	60	8300	8000	7400	7100	10500	10000	9400	8900

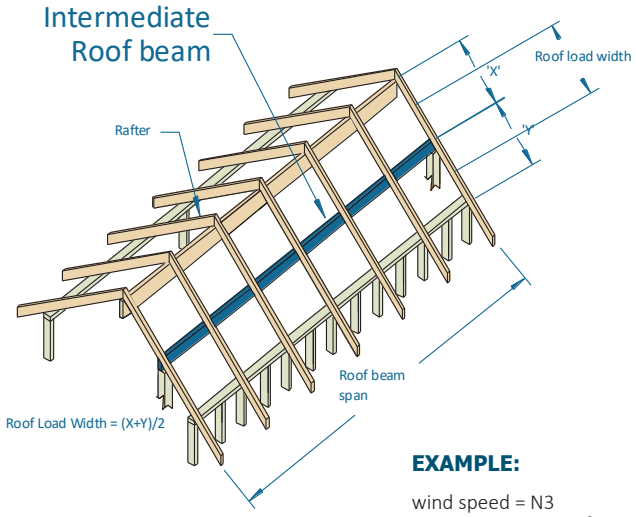
Single/continuous span roof rafter AS 4055 classification C1, C2 and C3 - without ceiling attached

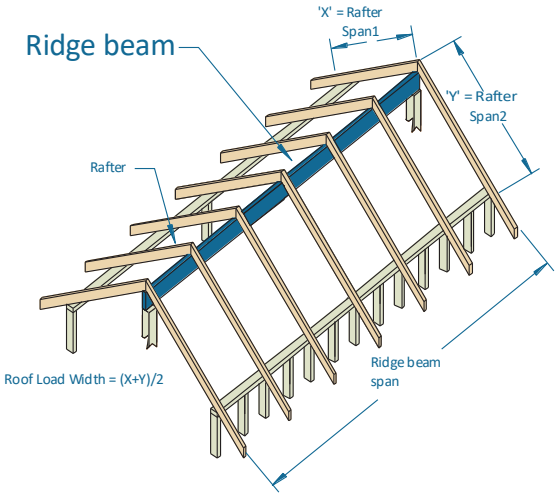
Rafter spacing (mm)		450	600	900	1200	450	600	900	1200
Member size DxB (mm)	Roof mass (kg/m^2)	Maximum recommended Rafter span (mm)							
		Single span				Continuous span			
200x50	10	7600	6600	5300	4500	7800	6600	5300	4500
	20	7000	6700	5400	4500	7800	6700	5400	4500
	40	6300	6000	5400	4600	8000	6800	5500	4600
	60	5800	5400	4800	4400	7400	7000	5600	4700
250x50	10	8600	8400	6700	5700	9800	8400	6700	5700
	20	8100	7800	6800	5700	9900	8400	6800	5700
	40	7300	7000	6500	5900	9200	8600	6900	5900
	60	6800	6500	6000	5500	8600	8200	7100	6000
200x60	10	7700	7300	5800	4900	8500	7300	5800	4900
	20	7200	6900	5900	5000	8600	7400	5900	5000
	40	6500	6200	5700	5100	8200	7500	6000	5100
	60	6100	5700	5100	4700	7700	7200	6200	5200
265x60	10	9000	8800	7800	6700	11300	9800	7800	6700
	20	8500	8200	7800	6700	10700	9900	7900	6700
	40	7800	7500	7000	6600	9900	9400	8100	6900
	60	7400	7000	6500	6100	9300	8800	8200	7000
300x60	10	9600	9500	8900	7600	12000	11100	8900	7600
	20	9100	8900	8500	7700	11500	11200	9000	7700
	40	8500	8100	7600	7200	10700	10200	9200	7800
	60	8000	7600	7000	6700	10100	9600	8900	8000_5
330x60	10	10200	10000	9700	8400	12000	12000	9800	8400
	20	9700	9400	9000	8500	12000	11900	9900	8500
	40	9000	8600	8100	7700	11300	10900	10200	8700_5
	60	8500	8100	7500	7100	10700	10200	9500	8800_{10}
200x80	10	7800	7700	6800	5800	9800	8500	6800	5800
	20	7400	7200	6800	5800	9300	8600	6900	5800
	40	6800	6500	6100	5700	8600	8200	7000	6000
	60	6400	6100	5500	5100	8000	7600	7100	6100
265x80	10	9100	9000	8700	7800	11500	11300	9100	7800
	20	8700	8500	8100	7800	11000	10700	9200	7800
	40	8100	7800	7300	7000	10200	9800	9200	8000
	60	7700	7300	6800	6500	9700	9200	8600	8100
300x80	10	9800	9600	9400	8800	12000	12000	10400	8800
	20	9400	9200	8800	8500	11800	11500	10500	8900
	40	8800	8500	8000	7600	11100	10600	10000	9100
	60	8300	8000	7400	7100	10500	10000	9400	8900

NOTES:

1. D = member depth, B = member breadth, NS = not suitable.
2. The above table was based on a batten spacing of 900 mm
3. Maximum birds mouth depth = 30 % of rafter depth
4. End bearing lengths = 45 mm at end supports and 45 mm at internal supports for continuous members. Subscript values Indicate the minimum additional bearing length where required to be greater than 45 mm at end supports and 45 mm at internal supports
5. Construction loads shall not be applied to overhangs until a 190 x 19 (minimum) timber fascia or other fascia of equivalent stiffness is rigidly and permanently attached to the end of rafter overhangs
6. Rafter spacing up to 1200 mm
7. Not all sizes of SmartLam GL19S in this table are stocked in each state. Please check with your supplier before ordering

Ridge/intermediate roof beam
AS 4055 classification N1, N2 and N3





EXAMPLE:

wind speed = N3
sheet roof - 40 kg/m^2
beam span = 4500 mm
X = 2000 mm Y = 3000 mm
roof load width = (X+Y)/2 = 2500 mm
Enter single span table at 3000 roof load width with column And read down to span equal to or greater than 4500 mm in 40 kg/m^2 row

ADOPT: SmartLam GL19S - 250 x 50

Roof load width (mm)		1500	3000	4500	6000	7500	1500	3000	4500	6000	7500
Member size DxB (mm)	Roof mass (kg/m^2)	Maximum recommended Ridge /Intermediate beam span (mm)									
		Single span						Continuous span			
200x50	40	4300	3600	3200	2700	2500	5700	4200	3500	2800	2500
	90	3400	2900	2500	2100	2000	4600	3500	2900	2300	2100
250x50	40	5400	4500	4000	3400	3100	7000	5200	4400	3500	3200
	90	4300	3600	3200	2700	2500	5800	4300	3600	2800_{10}	2600_{15}
200x60	40	4600	3900	3400	2800	2700	6200	4600	3900	3000	2800
	90	3600	3000	2700	2300	2100	4900	3800	3200	2500	2300
265x60	40	6000	5100	4500	3800	3500	7500	6100	5100	4000	3700
	90	4800	4000	3600	3000	2900	6400	5000	4200	3300_{5}	3000_{10}
300x60	40	6500	5700	5100	4300	4000	8200	7000	5800	4600	4200_{5}
	90	5400	4600	4100	3400	3200	7000	5700	4800	3700_{15}	3400_{25}
330x60	40	7000	6200	5600	4700	4400	8800	7700	6300	5000_{5}	4600_{15}
	90	5900	5000	4500	3800	3600	7400	6200	5200_{5}	4100_{25}	3700_{35}
200x80	40	5000	4200	3700	3100	2900	6600	5300	4500	3500	3200
	90	4000	3300	3000	2500	2400	5400	4400	3700	2900	2600
265x80	40	6400	5500	4900	4100	3900	8000	7100	5900	4600	4200
	90	5200	4400	3900	3300	3100	6800	5700	4800	3800	3500
300x80	40	6900	6200	5600	4700	4400	8700	7800	6600	5200	4800
	90	5900	5000	4500	3800	3600	7400	6500	5500	4300_{5}	3900_{10}

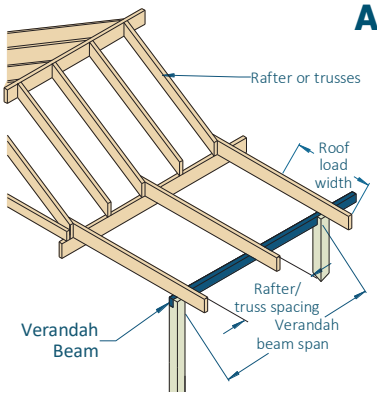
Ridge/intermediate roof beam
AS 4055 classification C1, C2 and C3

Roof load width (mm)		1500	3000	4500	6000	7500	1500	3000	4500	6000	7500
Member size DxB (mm)	Roof mass (kg/m^2)	Maximum recommended Ridge /Intermediate beam span (mm)									
		Single span						Continuous span			
200x50	40	3600	2800	2300	1900	1700	3600	2800	2300	1900	1700
	90	3400	2900	2400	1900	1700	3700	2900	2400	1900_{5}	1700_{10}
250x50	40	4600	3500	2900	2300	2100	4600	3500	2900	2300_{5}	2100_{15}
	90	4300	3600	3000	2400	2200	4800	3600	3000_{5}	2400_{25}	2200_{30}
200x60	40	4000	3000	2500	2000	1900	4000	3000	2500	2000	1900
	90	3600	3000	2600	2100	1900	4100	3100	2600	2100	1900_{5}
265x60	40	5400	4000	3400	2700	2500	5400	4000	3400	2700_{5}	2500_{10}
	90	4800	4000	3500	2800	2500	5600	4100	3500	2800_{20}	2500_{30}
300x60	40	6200	4500	3800	3100	2800	6200	4500	3800	3100_{15}	2800_{25}
	90	5400	4600	4000	3100	2900	6400	4700	4000_{10}	3100_{30}	2900_{45}
330x60	40	6900	5000	4200	3400	3100	6900	5000	4200_{5}	3400_{25}	3100_{35}
	90	5900	5000	4300	3500	3200	7000	5200_{5}	4300_{20}	3500_{45}	3200_{55}
200x80	40	4700	3500	3000	2400	2200	4700	3500	3000	2400	2200
	90	4000	3300	3000	2400	2200	4800	3600	3000	2400	2200
265x80	40	6300	4600	3900	3100	2900	6300	4600	3900	3100	2900
	90	5200	4400	3900	3200	2900	6500	4800	4000	3200_{5}	2900_{15}
300x80	40	6900	5300	4400	3600	3300	7200	5300	4400	3600_{5}	3300_{10}
	90	5900	5000	4500	3600	3300	7400	5400	4600	3600_{20}	3300_{25}

NOTES:

1. D = member depth, B = member breadth, NS = not suitable
2. End bearing lengths = 70 mm at end supports and 90 mm at internal supports for continuous members. Subscript values indicate the minimum additional bearing length where required to be greater than 70 mm at end supports and 90 mm at internal supports
3. Rafter spacing up to 1200 mm
4. Not all sizes of SmartLam GL19S in this table are stocked in each state. Please check with your supplier before ordering

Single span verandah beam
AS 4055 classification N1, N2 and N3



EXAMPLE:

wind speed = N3
sheet roof - 40 kg/m^2
rafter/truss spacing = 600 mm
verandah span = 3500 mm (single span)
roof load width = 3900 mm

Enter span table at 4500 roof load width column, rafter spacing of 600 mm, and read down to a span equal to or greater than 3500 mm in 40 kg/m^2 row

ADOPT:

SmartLam GL19S - 265 x 60

Roof load width (mm)		1500		3000		4500		6000		7500	
Rafter/truss spacing (mm)		600	1200	600	1200	600	1200	600	1200	600	1200
Member size DxB (mm)	Roof mass (kg/m^2)	Maximum recommended Verandah beam span (mm)									
		Single span									
200x50	40	4200	4200	3400	3200	2700	2700	2400	2200	2100	1900
	90	3300	3300	2600	2700	2300	2300	2100	2000	1900	1600
250x50	40	4900	4900	4200	4100	3400	3300	2900	2800	2600	2600
	90	4100	4100	3300	3300	2900	2900	2600	2700	2400	2400
200x60	40	4300	4300	3600	3500	3000	2900	2600	2500	2300	2200
	90	3500	3500	2800	2800	2400	2500	2200	2200	2100	2000
265x60	40	5300	5300	4600	4500	4000	3900	3500	3300	3100	2900
	90	4400	4400	3700	3700	3300	3200	3000	2900	2700	2800
300x60	40	5800	5800	5000	5000	4500	4500	3900	3800	3500	3300
	90	4900	4900	4100	4100	3700	3600	3400	3300	3100	3100
330x60	40	6200	6200	5400	5400	4900	4900	4300	4200	3900	3700
	90	5200	5200	4400	4400	4000	4000	3700	3600	3500	3400
200x80	40	4600	4600	4000	3900	3500	3300	3000	2900	2700	2600
	90	3800	3800	3100	3100	2700	2700	2400	2500	2300	2200
265x80	40	5600	5600	4900	4900	4400	4400	4000	3900	3600	3400
	90	4700	4700	4000	4000	3600	3500	3300	3200	3000	3000
300x80	40	6100	6100	5300	5300	4900	4900	4500	4500	4000	3900
	90	5200	5200	4400	4400	4000	4000	3700	3600	3400	3400

Continuous span Verandah beam
AS 4055 Classification N1, N2, N3 & N4

Roof load width (mm)		1500		3000		4500		6000		7500	
Rafter/truss spacing (mm)		600	1200	600	1200	600	1200	600	1200	600	1200
Member size DxB (mm)	Roof mass (kg/m^2)	Maximum recommended verandah span (mm)									
		Continuous span									
200x50	40	4800	4800	3400	3300	2800	2800	2300	2200	2100	1600
	90	4300	4300	3200	3100	2600	2600	2200	1700	1700	1500
250x50	40	6000	6000	4200	4200	3500	3400	3000	3000	2700_{5}	2700_{10}
	90	5100	5100	4000	3900	3200	3200	2800_{10}	2800_{10}	2500_{20}	2500_{15}
200x60	40	5300	5300	3700	3600	3000	3000	2600	2700	2300	2100
	90	4500	4500	3500	3400	2800	2800	2400	2400	2200	1700
265x60	40	6600	6600	4900	4900	4000	4000	3500	3400	3100_{5}	3100_{5}
	90	5600	5600	4600	4500	3700	3700	3300_{5}	3100_{5}	2900_{15}	2900_{15}
300x60	40	7100	7200	5600	5600	4600	4500	3900_{5}	3900_{5}	3500_{15}	3300_{10}
	90	6100	6100	5200	5200	4200_{5}	4200_{5}	3700_{15}	3600_{15}	3300_{25}	3200_{25}
330x60	40	7500	7700	6200	6100	5000	5000	4300_{15}	4300_{10}	3900_{25}	3800_{20}
	90	6500	6500	5600	5600	4700_{15}	4600_{10}	4000_{25}	4000_{25}	3600_{40}	3300_{30}
200x80	40	5800	5800	4300	4300	3500	3400	3000	3000	2700	2700
	90	4800	4800	4000	4000	3300	3200	2800	2800	2500	2600
265x80	40	6900	7000	5700	5700	4700	4600	4000	4000	3600	3500
	90	5900	5900	5000	5100	4300	4300	3700	3700	34005	3300
300x80	40	7400	7600	6500	6500	5300	5300	4600	4500	4100	4100_{5}
	90	6500	6500	5500	5600	4900	4900	42005	4200_{5}	3800_{15}	3700_{10}
330x80	40	7800	8200	7000	7100	5800	5800	5000	5000	4500_{10}	4500_{10}
	90	6800	6900	5900	6000	5400	5400	4700_{15}	4600_{10}	4200_{25}	4200_{25}

Single span verandah beam
AS 4055 classification C1, C2 and C3

Roof load width (mm)		1500		3000		4500		6000		7500	
Rafter/truss spacing (mm)		600	1200	600	1200	600	1200	600	1200	600	1200
Member size DxB (mm)	Roof mass (kg/m^2)	Maximum recommended Verandah beam span (mm)									
		Continuous span									
200x50	40	3900	3700	2700	2600	2200	2100	1800	1500	1600	NS
	90	3300	3300	2600	2700	2200	2100	1900	1500	1600	NS
250x50	40	4900	4800	3400	3200	2700	2700	2400	2300	2100	1600
	90	4100	4100	3300	3300	2800	2700	2400	2300	2100	1700
200x60	40	4200	4100	2900	2800	2400	2300	2000	1800	1800	1400
	90	3500	3500	2800	2800	2400	2300	2100	1900	1800	1500
265x60	40	5300	5300	4000	3800	3200	3100	2800	2700	2500	2400
	90	4400	4400	3700	3700	3200	3100	2800	2700	2500	2400
300x60	40	5800	5800	4500	4400	3700	3500	3100	3000	2800	2700
	90	4900	4900	4100	4100	3700	3500	3200	3000	2800	2700
330x60	40	6200	6200	5000	4900	4000	3900	3500	3300	3100	3000
	90	5200	5200	4400	4400	4000	3900	3500	3400	3100	3000
200x80	40	4600	4600	3500	3300	2800	2700	2400	2300	2100	2000
	90	3800	3800	3100	3100	2700	2700	2400	2300	2200	2100
265x80	40	5600	5600	4600	4600	3700	3600	3200	3100	2800	2800
	90	4700	4700	4000	4000	3600	3500	3200	3100	2900	2800
300x80	40	6100	6100	5200	5200	4200	4100	3700	3500	3200	3100
	90	5200	5200	4400	4400	4000	4000	3700	3500	3300	3100
330x80	40	6500	6500	5700	5600	4700	4700	4000	3900	3600	3400
	90	5600	5500	4800	4700	4300	4300	4000	3900	3600	3500

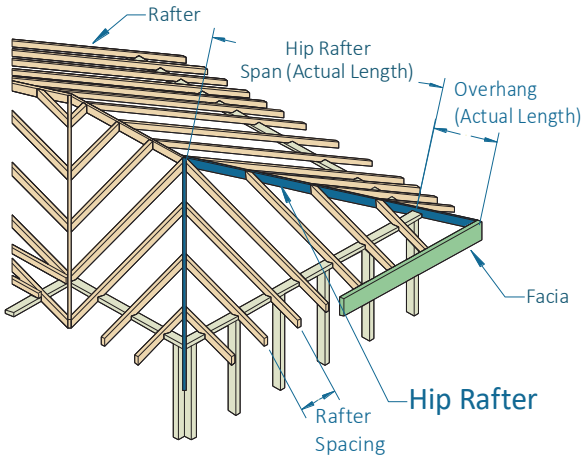
Continuous span Verandah beam
AS 4055 Classification C1, C2 & C3

Roof load width (mm)		1500		3000		4500		6000		7500	
Rafter/truss spacing (mm)		600	1200	600	1200	600	1200	600	1200	600	1200
Member size DxB (mm)	Roof mass (kg/m^2)	Maximum recommended verandah span (mm)									
		Continuous span									
200x50	40	3900	3800	2700	2700	2200	1700	1600	1400	1500	NS
	90	3900	3900	2800	2800	2200	2000	1700	1400	1500	1000
250x50	40	4900	4900	3400	3300	2800	2800	2300	1900	1900_{5}	1900_{5}
	90	4900	4900	3500	3400	2800_{10}	2800_{10}	2400_{20}	1900	1900_{20}	1900_{20}
200x60	40	4300	4200	3000	3000	2400	2400	2100	1600	1600	1300
	90	4300	4200	3000	3000	2500	2600	2100	1600	1600	1400
265x60	40	5700	5600	4000	4000	3200	3100	2800_{5}	2800_{5}	2400_{10}	1900
	90	5600	5600	4000	4000	3300_{5}	3200	2800_{15}	2800_{20}	2500_{25}	2500_{25}
300x60	40	6400	6400	4500	4500	3700	3600	3200_{15}	3200_{15}	2600_{20}	2800_{25}
	90	6100	6100	4500	4500	3700_{15}	3600_{15}	3200_{30}	3200_{30}	2600_{35}	2900_{45}
330x60	40	7100	7000	5000	5000	4000_{10}	4000_{10}	3500_{20}	3300_{20}	3100_{35}	3000_{30}
	90	6500	6500	5000_{5}	5000_{5}	410025	4100_{25}	3600_{40}	3300_{35}	3200_{55}	3000_{50}
200x80	40	4900	5000	3500	3400	2800	2800	2400	2400	2200	1700
	90	4800	4800	3500	3400	2800	2800	2500	2600	2200	1700
265x80	40	6600	6600	4600	4600	3700	3700	3200	3100	2900	2900
	90	5900	5900	4600	4600	3800	3700	3300_{5}	3200	2900_{15}	2900_{15}
300x80	40	7400	7500	5200	5200	4200	4200	3700	3600	3300_{10}	3200_{10}
	90	6500	6500	5200	5200	4300_{5}	4300_{5}	3700_{15}	3600_{15}	3300_{25}	3200_{25}

NOTES:

1. D = member depth, B = member breadth, NS = not suitable.
2. End bearing lengths = 70 mm at end supports and 70 mm at internal supports for continuous members. Subscript values indicate the minimum additional bearing length where required to be greater than 70 mm at end supports and 70 mm at internal supports.
3. Restraint value for slenderness calculations is 1200 mm
4. Not all sizes of SmartLam GL19S in this table are stocked in each state. Please check with your supplier before ordering

Hip rafter - sheet and tile roof
AS 4055 wind classification N1, N2, N3, C1, C2 & C3



EXAMPLE:

wind speed = N3
roof load = 40 kg/m^2 (sheet roof)
hip rafter span = 4500 mm (single span)
rafter spacing = 600 mm

Enter column at (N1,N2 & N3) wind speed, 600 mm rafter spacing and read down to span equal to or greater than 4500 mm for a 40 kg/m^2 roof load

ADOPT:

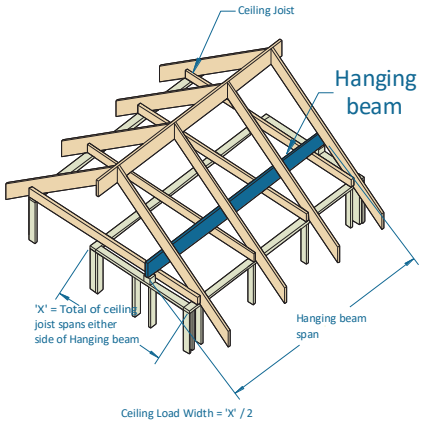
SmartLam GL19S — 250x50

Wind Speed		N1, N2 & N3				C1, C2 & C3			
Rafter spacing (mm)		600		1200		600		1200	
		Maximum Rafter span + overhang span (mm)				Maximum Rafter span + overhang span (mm)			
Member size DxB (mm)	Roof & ceiling mass (kg/m^2)	Span	Overhang	Span	Overhang	Span	Overhang	Span	Overhang
		Single span				Single span			
200x50	40	4000	650	4000	550	3700	650	3700	550
	90	3500	550	3500	450	3500	550	3500	450
250x50	40	4600	850	4600	750	4200	800	4200	750
	90	4000	700	4000	600	4000	700	4000	600
200x60	40	4100	750	4100	650	3800	750	3800	650
	90	3600	650	3600	550	3600	650	3600	550
265x60	40	4900	900	4900	950	4500	900	4500	900
	90	4300	850	4300	750	4300	850	4300	750
300x60	40	5300	1050	5300	1050	4900	900	4900	900
	90	4600	900	4600	850	4600	900	4600	850
330x60	40	5600	1100	5600	1100	5200	1000	5200	1000
	90	4900	900	4900	900	4900	900	4900	900
200x80	40	4400	800	4400	850	4100	800	4100	800
	90	3800	750	3800	650	3800	750	3800	650
265x80	40	5200	1000	5200	1000	4800	950	4800	950
	90	4500	900	4500	900	4500	900	4500	900
300x80	40	5600	1100	5600	1100	5200	1000	5200	1000
	90	4900	900	4900	900	4900	900	4900	900

NOTES:

1. D = member depth, B = member breadth, NS = not suitable.
2. The above table was based on a batten spacing of 900 mm
3. Minimum backspan = 200% of overhang
4. Maximum birds mouth depth = 30% of depth
5. End bearing length = 35 at end supports and 35 mm. Subscript values indicate the minimum additional bearing length where required to be greater than 35 mm at end support
6. Construction loads shall not be applied to overhangs until a 190 x 19 mm (min) timber fascia or other fascia of equivalent stiffness is rigidly and permanently attached to the end of rafter overhangs
7. Not all sizes of SmartLam GL19S in this table are stocked in each state. Please check with your supplier before ordering

Hanging beam supporting ceiling loads only
AS 4055 Classification N1, N2, N3 & N4



ceiling mass - 20 kg/m^2

EXAMPLE:

Wind speed = N3
X = 5000 mm
Ceiling load width = X/2 = 5000/2 = 2500 mm
Hanging beam span = 4200 mm

Enter column at 3000 mm ceiling load width & read down to a span greater than or equal to 4200 mm

ADOPT:

SmartLam GL19S - 200 x 60

Ceiling load width (mm)	1800	2400	3000	3600	4200	4800
Member size DxB (mm)	**Maximum recommended Hanging beam span (mm)**					
200x50	4900	4500	4300	4000	3900	3700
250x50	5700	5300	5000	4800	4600	4400
200x60	5000	4700	4400	4200	4000	3900
265x60	6100	5700	5400	5200	5000	4800
300x60	6700	6300	5900	5700	5400	5200
360x60	7500	7100	6700	6500	6200	6000
200x80	5300	5000	4700	4500	4300	4100
250x80	6200	5800	5500	5300	5100	4900
265x80	6500	6100	5800	5500	5300	5100
300x80	7000	6600	6300	6000	5800	5600

Hanging beam supporting ceiling loads only
AS 4055 Classification C1, C2 & C3

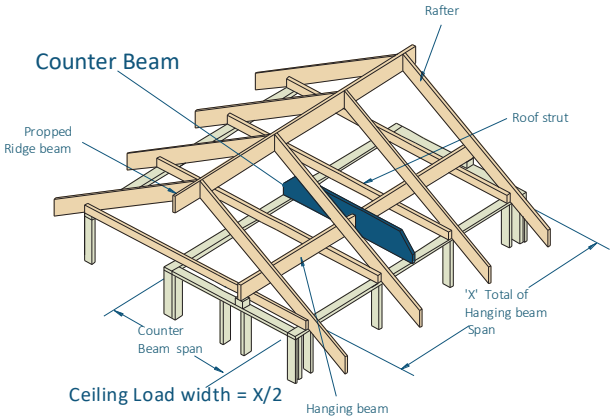
Ceiling load width (mm)	1800	2400	3000	3600	4200	4800
Member size (DxB (mm)	**Maximum recommended Hanging beam span (mm)**					
200x50	4900	4500	4100	3700	3400	3200
250x50	5700	5300	5000	4600	4300	4000
200x60	5000	4700	4400	4100	3700	3500
265x60	6100	5700	5400	5200	5000	4600
300x60	6700	6300	5900	5700	5400	5200
360x60	7500	7100	6700	6500	6200	6000
200x80	5300	5000	4700	4500	4300	4000
250x80	6200	5800	5500	5300	5100	4900
265x80	6400	6100	5800	5500	5300	5100
300x80	7000	6600	6300	6000	5800	5600

NOTES:

1. D = member depth, B = member breadth, NS = not suitable
2. The above table was based on a maximum ceiling mass of 20 kg/m^2
3. Minimum bearing length = 70 mm at end supports
4. Restraint value for slenderness calculations is 1500 mm
5. Not all sizes of SmartLam GL 19S in this table are stocked in each state. Please check with your supplier before ordering.

Counter beam supporting hanging beam
AS 4055 Classification N1, N2, N3 & N4

Ceiling mass - 20 kg/m^2



EXAMPLE:

wind speed = N3
total of hanging beam SPAN = 6400 mm
ceiling load width = 'X' / 2 = 6400 / 2 = 3200 mm
counter beam span = 4500 mm

Enter column at 3600 mm ceiling load width and read down to a span greater than or equal to 4500 mm

ADOPT:

SmartLam GL19S - 200 x 50

Ceiling load width (mm)	600	1800	2400	3000	3600	4200	4800	5400	6600
Member size DxB (mm)	Maximum recommended Counter beam span (mm)								
200x50	6600	5600	5300	5000	4800	4700	4500	4400	4100
250x50	7600	6500	6100	5900	5700	5500	5300	5200	5000
200x60	6800	5800	5400	5200	5000	4800	4700	4600	4400
265x60	8000	6900	6600	6300	6100	5900	5800	5600	5400
300x60	8600	7500	7200	6900	6700	6500	6300	6200	5900
330x60	9100	8000	7700	7400	7100	6900	6700	6600	6300
200x80	7000	6000	5800	5500	5300	5200	5000	4900	4700
265x80	8200	7300	6900	6700	6500	6300	6100	6000	5700
300x80	8800	7900	7600	7300	7100	6900	6700	6500	6300

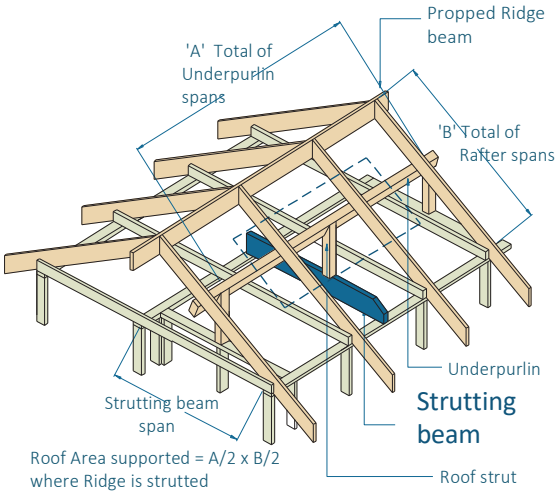
Counter beam supporting Hanging beam
AS 4055 Classification C1, C2 and C3

Ceiling load width (mm)	600	1800	2400	3000	3600	4200	4800	5400	6600
Member size DxB (mm)	Maximum recommended Counter beam span (mm)								
200x50	6600	5300	4600	4100	3800	3500	3300	3100	2800
250x50	7600	6500	5700	5100	4700	4400	4100	3800	3500
200x60	6800	5800	5000	4500	4100	3800	3600	3400	3000
265x60	8100	7000	6600	6000	5400	5000	4700	4500	4000
300x60	8700	7500	7200	6700	6200	5700	5300	5000	4600
330x60	9200	8000	7700	7400	6800	6300	5900	5500	5000
200x80	7000	6000	5800	5200	4700	4400	4100	3900	3500
265x80	8300	7300	6900	6700	6300	5800	5400	5100	4700
300x80	8900	7900	7600	7300	7100	6600	6200	5800	5300
330x80	9400	8400	8100	7800	7500	7200	6800	6400	5800

NOTES:

1. D = member depth, B = member breadth, NS = not suitable
2. The above table was based on a maximum ceiling mass of 20 kg/m^2
3. Minimum bearing length = 70 mm at end supports
4. Not all sizes of SmartLam GL 19S in this table are stocked in each state. Please check with your supplier before ordering.

Strutting beam supporting Underpurlins
AS 4055 Classification N1, N2, N3 & N4



EXAMPLE:
wind speed = N3
sheet roof = 20 kg/m^2
total of underpurlin span 'A'= 5000 mm
total of rafter span 'B' = 4200 mm
roof area supported = (A/2) x (B/2)
= (5000/2) x (4200/2)
= 5250000 mm^2 **(convert to m^2)**
= 5250000/1000000 = 5.25 m^2
strutting beam span = 4500 mm

Enter column at 6m^2 roof area supported and read down to a span greater than or equal to 4500 mm in the 20 kg/m^2 row.

ADOPT: **SmartLam GL 19S** - 200 x 50

Roof area supported (m^2)		2	4	6	8	10	12
Member size DxB (mm)	Roof mass (kg/m^2)	Maximum recommended Strutting beam span (mm)					
200x50	20	6700	5750	4950	4300	3400	2850
	60	5400	4100	3400	3000	2700	2450
250x50	20	8000	7050	6400	5950	5350	4450
	60	6800	5600	4700	4100	3700	3400
200x60	20	6950	6100	5350	4750	4100	3400
	60	5800	4450	3700	3250	2900	2700
250x60	20	8150	7300	6700	6250	5850	5350
	60	7100	6000	5100	4500	4050	3700
265x60	20	8500	7650	7050	6600	6200	5900
	60	7400	6300	5550	4850	4400	4050
300x60	20	9250	8450	7800	7300	6950	6600
	60	8200	7050	6350	5800	5250	4850
330x60	20	9900	9050	8450	7950	7550	7200
	60	8800	7650	6900	6400	5950	5550
200x80	20	7300	6500	5900	5350	4900	4550
	60	6250	5000	4250	3700	3350	3050
250x80	20	8450	7700	7150	6700	6350	6050
	60	7500	6450	5750	5100	4600	4250
265x80	20	8800	8050	7500	7050	6700	6400
	60	7850	6800	6100	5550	5000	4650
300x80	20	9550	8800	8250	7800	7450	7100
	60	8600	7550	6850	6350	5950	5500

Strutting beam supporting underpurlins
AS 4055 Classification C1, C2 & C3

Roof area supported (m^2)		2	4	6	8	10	12
Member size DxB (mm)	Roof mass (kg/m^2)	Maximum recommended Strutting beam span (mm)					
200x50	20	6700	3800	2500	1850	1500	NS
	60	5400	4100	2700	2050	1600	1200
250x50	20	7950	5900	3900	2950	2350	1950
	60	6800	5600	4300	3150	2550	2100
200x60	20	6950	4550	3000	2250	1800	1500
	60	5800	4450	3250	2450	1950	1600
265x60	20	8550	7650	5300	3950	3150	2600
	60	7450	6300	5550	4300	3450	2850

Strutting beam supporting underpurlins
AS 4055 Classification C1, C2 & C3 (Cont'd)

Roof area supported (m^2)		2	4	6	8	10	12
Member size DxB (mm)	Roof mass (kg/m^2)	Maximum recommended Strutting beam span (mm)					
300x60	20	9250	8450	6850	5050	4050	3350
	60	8200	7050	6350	5550	4400	3650
330x60	20	9850	9050	8300	6150	4900	4100
	60	8800	7650	6900	6400	5350	4450
200x80	20	7250	6100	4000	3000	2400	2000
	60	6250	5000	4250	3250	2600	2150
250x80	20	8500	7700	6350	4700	3750	3100
	60	7500	6450	5750	5100	4100	3400
265x80	20	8800	8050	7150	5300	4200	3500
	60	7850	6800	6100	5550	4600	3800
300x80	20	9500	8800	8250	6850	5450	4500
	60	8600	7550	6850	6350	5900	4900

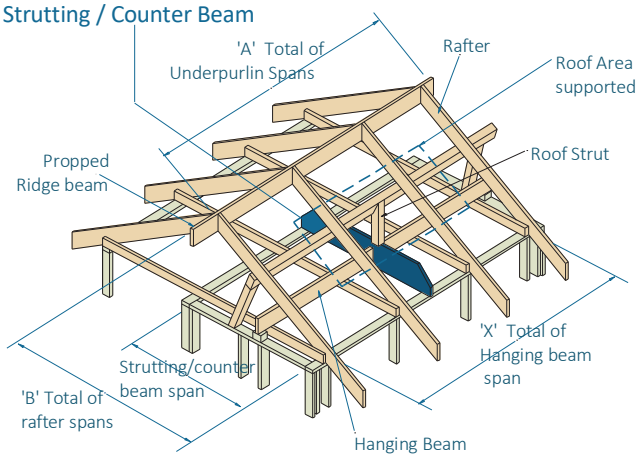
NOTES:

1. D = member depth, B = member breadth, NS = not suitable.
2. Minimum bearing length = 70 mm at end supports.
3. Restraint value for slenderness calculations is 1500 mm
4. Not all sizes of SmartLam GL 19S in this table are stocked in each state. Please check with your supplier before ordering.

Strutting/counter beam supporting underpurlins & hanging beam
AS 4055 Classification N1, N2, N3 & N4

Ceiling mass - 20 kg/m^2

Strutting / Counter Beam



Roof Area supported = A/2xB/2 Counter/Strutting beam spacing = X/2

EXAMPLE:
wind speed = N3
sheet roof = 40 kg/m^2
total of underpurlin span 'A'= 5000 mm
total of rafter span 'B' = 4200 mm
roof area supported = (A/2) x (B/2)
= (5000/2) x (4200/2)
= 5250000 mm^2 **(convert to m^2)**
= 5250000/1000000 = 5.25 m^2
total of hanging beam span 'X' = 4500 mm
effective beam spacing = 'X' / 2 = 4500 / 2 = 2250 mm
strutting/counter beam span = 4500 mm

Enter column at 3600 mm effective beam spacing, 6m^2 roof area supported and read down to a span greater than or equal to 4500 mm

ADOPT: **SmartLam GL19S** - 265 x 60

Effective beam spacing (mm)		1800						3600					
Roof area supported (m^2)		2	4	6	8	10	12	2	4	6	8	10	12
Member size (DxB (mm)	Roof mass (kg/m^2)	Maximum recommended Strutting/Counter beam span (mm)											
200x50	40	4300	3900	3600	3200	3000	2700	3900	3600	3300	3000	2800	2600
	90	3900	3200	2700	2400	2200	1900	3600	3000	2600	2300	2100	1900
250x50	40	5200	4700	4400	4100	3900	3700	4700	4400	4100	3900	3700	3600
	90	4700	4100	3700	3300	3000	2800	4400	3900	3600	3200	2900	2700
200x60	40	4500	4100	3800	3500	3200	3000	4100	3800	3600	3300	3100	2900
	90	4100	3500	3000	2600	2400	2200	3800	3300	2900	2600	2300	2100
265x60	40	5600	5200	4800	4500	4300	4100	5100	4800	4500	4300	4100	4000
	90	5200	4500	4100	3800	3600	3300	4800	4300	4000	3700	3500	3200
300x60	40	6200	5700	5400	5100	4800	4600	5600	5300	5000	4800	4600	4400
	90	5700	5100	4600	4300	4000	3800	5300	4800	4400	4200	3900	3700
330x60	40	6600	6200	5800	5500	5300	5000	6000	5700	5400	5200	5000	4800
	90	6200	5500	5000	4700	4400	4200	5700	5200	4800	4500	4300	4100
200x80	40	4900	4400	4100	3800	3600	3400	4400	4100	3900	3700	3500	3300
	90	4400	3800	3400	3000	2700	2500	4100	3700	3200	2900	2700	2500
265x80	40	6000	5600	5200	4900	4700	4500	5500	5100	4900	4700	4500	4300
	90	5600	4900	4500	4200	3900	3700	5100	4700	4300	4000	3800	3600
300x80	40	6600	6100	5800	5500	5200	5000	6000	5700	5400	5200	5000	4800
	90	6100	5500	5000	4700	4400	4200	5700	5200	4800	4500	4300	4100

Strutting/counter beam supporting underpurlins & hanging beam
AS 4055 Classification C1, C2 & C3

Effective beam spacing (mm)		1800						3600					
Roof area supported (m^2)		2	4	6	8	10	12	2	4	6	8	10	12
Member size (DxB (mm)	Roof mass (kg/m^2)	Maximum recommended Strutting/Counter beam span (mm)											
200x50	40	4300	3900	2600	1900	1500	1300	3900	3600	2700	2000	1500	1300
	90	3900	3200	2700	2000	1600	1300	3600	3000	2600	2000	1600	1300
250x50	40	5200	4700	4200	3100	2400	2000	4700	4400	4100	3200	2500	2000
	90	4700	4100	3700	3100	2500	2100	4400	3900	3600	3100	2500	2100

Strutting/counter beam supporting underpurlins & hanging beam AS 4055 Classification C1, C2 & C3 (Cont'd)

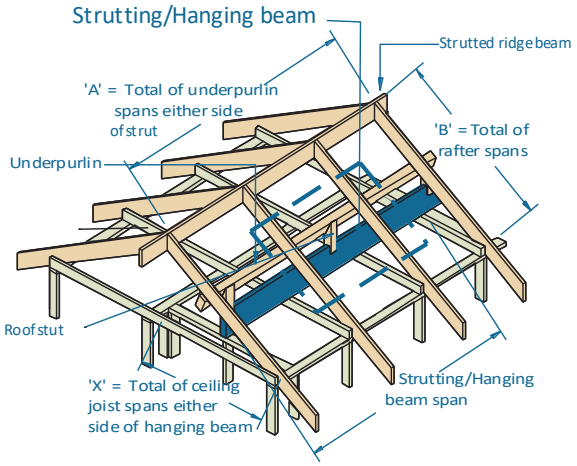
Effective beam spacing (mm)		1800						3600					
Roof area supported (m^2)		2	4	6	8	10	12	2	4	6	8	10	12
Member size (DxB (mm)	Roof mass (kg/m^2)	Maximum recommended Strutting/Counter beam span (mm)											
200x60	40	4500	4100	3200	2400	1900	1500	4100	3800	3300	2400	1900	1500
	90	4100	3500	3000	2400	1900	1600	3800	3300	2900	2400	1900	1600
250x60	40	5400	4900	4600	3700	3000	2400	4900	4600	4300	3800	3000	2500
	90	4900	4300	3900	3600	3000	2500	4600	4100	3800	3500	3000	2500
300x60	40	6200	5700	5400	5100	4300	3600	5600	5300	5000	4800	4400	3600
	90	5700	5100	4600	4300	4000	3600	5300	4800	4400	4200	3900	3600
330x60	40	6600	6200	5800	5500	5200	4300	6000	5700	5400	5200	5000	4400
	90	6200	5500	5000	4700	4400	4200	5700	5200	4800	4500	4300	4100
200x80	40	4900	4400	4100	3200	2500	2100	4400	4100	3900	3200	2500	2100
	90	4400	3800	3400	3000	2600	2200	4100	3700	3200	2900	2500	2100
265x80	40	6000	5600	5200	4900	4500	3700	5400	5100	4900	4700	4500	3800
	90	5600	4900	4500	4200	3900	3700	5100	4700	4300	4000	3800	3600
300x80	40	6600	6100	5800	5500	5200	4800	6000	5700	5400	5200	5000	4800
	90	6100	5500	5000	4700	4400	4200	5700	5200	4800	4500	4300	4100

NOTES:

1. D = member depth, B = member breadth, NS = not suitable.
2. Minimum bearing length = 70 mm at end supports
3. The above table was based on a maximum ceiling mass of 20 kg/m^2
4. Restraint value for slenderness calculations is 1500 mm
5. Not all sizes of SmartLam GL 1S in this table are stocked in each state. Please check with your supplier before ordering.

Strutting/hanging beam
AS 4055 classification N1, N2, N3 & N4

Ceiling mass - 20 kg/m^2



Roof Area Supported =A/2 x B/2 Ceiling Load width = X/2

EXAMPLE:
wind speed = N3
sheet roof = 20 kg/m^2
A = 5000 mm, B = 4200 mm
roof area supported = (A/2) x (B/2)
= (5000/2) x (4200/2)
= 5250000 mm^2 **(convert to m^2)**
= 5250000/1000000 = 5.25 m^2
strutting/hanging beam span = 4200 mm
ceiling joist span ('X') = 4400 mm
ceiling load width = ['X' / 2) = 4400/2 = 2200 mm

Enter column at 3600 mm ceiling load width, 6 m^2 roof area supported and read down to a span greater than or equal to 4200 mm in the 20 kg/m^2 row.

ADOPT: **SmartLam GL19S** - 250 x 50

Ceiling load width (mm)		1800						3600					
Roof area supported (m^2)		2	4	6	8	10	12	2	4	6	8	10	12
Member size (DxB (mm)	Roof mass (kg/m^2)	Maximum recommended Strutting/Hanging beam span (mm)											
200x50	20	4500	4100	3900	3700	3500	3200	3800	3700	3500	3300	3100	3000
	60	4100	3600	3100	2800	2500	2300	3600	3200	2900	2600	2400	2200
250x50	20	5300	5000	4700	4500	4300	4100	4600	4400	4200	4100	4000	3800
	60	4900	4400	4000	3700	3500	3200	4300	4000	3700	3500	3300	3100
200x60	20	4700	4300	4100	3900	3700	3600	4000	3800	3700	3500	3400	3200
	60	4300	3800	3400	3000	2800	2600	3800	3400	3100	2800	2600	2400
265x60	20	5800	5400	5200	5000	4800	4600	5000	4800	4600	4500	4400	4200
	60	5400	4800	4400	4100	3900	3700	4700	4400	4100	3900	3700	3600
300x60	20	6300	6000	5700	5500	5300	5100	5500	5300	5100	5000	4800	4700
	60	5900	5400	5000	4700	4400	4200	5200	4900	4600	4400	4200	4000
330x60	20	6800	6500	6200	6000	5800	5600	5800	5700	5500	5400	5200	5100
	60	6400	5800	5400	5100	4800	4600	5600	5300	5000	4800	4600	4400
200x80	20	5000	4700	4400	4200	4000	3900	4300	4100	4000	3800	3700	3600
	60	4600	4100	3700	3400	3200	2900	4100	3800	3500	3200	3000	2800
265x80	20	6100	5800	5600	5300	5100	5000	5300	5100	5000	4800	4700	4600
	60	5700	5200	4800	4500	4300	4100	5100	4800	4500	4300	4100	3900
300x80	20	6700	6400	6100	5900	5700	5500	5800	5700	5500	5400	5200	5100
	60	6300	5800	5400	5100	4800	4600	5600	5300	5000	4700	4500	4400

Strutting/Hanging beam
AS 4055 classification C1, C2 & C3

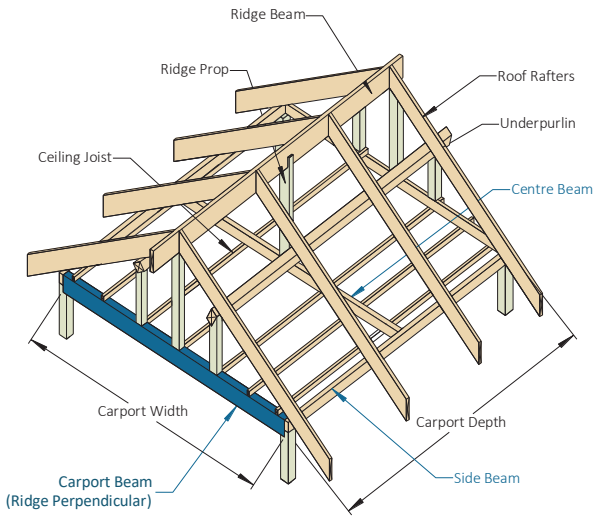
Ceiling load width (mm)		1800						3600					
Roof area supported (m^2)		2	4	6	8	10	12	2	4	6	8	10	12
Member size (DxB (mm)	Roof mass (kg/m^2)	Maximum recommended Strutting/Hanging beam span (mm)											
200x50	20	4100	4000	3300	2500	2000	1700	2900	2900	3000	2500	2000	1700
	60	4100	3600	2900	2200	1800	1400	2900	3000	2800	2200	1700	1400
250x50	20	5100	5000	4600	3900	3200	2700	3600	3600	3700	3700	3100	2600
	60	4900	4400	4000	3400	2800	2300	3700	3700	3700	3300	2700	2300
330x50	20	6500	6200	5900	5700	5400	4600	4800	4800	4800	4900	4900	4400
	60	6100	5500	5100	4800	4600	4000	4800	4900	4800	4500	4300	3900
200x60	20	4500	4300	3600	3000	2400	2000	3200	3200	3200	2900	2400	2000
	60	4300	3800	3400	2600	2100	1800	3200	3300	3100	2600	2100	1800
250x60	20	5500	5200	4900	4400	3800	3200	4000	4000	4000	4100	3700	3100
	60	5100	4600	4200	3900	3300	2800	4000	4100	3900	3700	3200	2700
300x60	20	6300	6000	5700	5500	5200	4500	4700	4800	4800	4800	4800	4400
	60	5900	5400	5000	4700	4400	4000	4800	4900	4600	4400	4200	3900
330x60	20	6800	6500	6200	6000	5800	5400	5200	5200	5300	5300	5200	5100
	60	6400	5800	5400	5100	4800	4600	5300	5300	5000	4800	4600	4400
200x80	20	5000	4700	4200	3600	3200	2700	3700	3700	3700	3600	3100	2700
	60	4600	4100	3700	3400	2800	2400	3700	3800	3500	3200	2800	2300
265x80	20	6100	5800	5600	5300	4900	4500	4800	4900	4900	4800	4700	4500
	60	5700	5200	4800	4500	4300	4100	4900	4800	4500	4300	4100	3900
300x80	20	6700	6400	6100	5900	5700	5400	5500	5500	5500	5400	5200	5100
	60	6300	5800	5400	5100	4800	4600	5500	5300	5000	4700	4500	4400

NOTES:

1. D = member depth, B = member breadth, NS = not suitable.
2. The above table was based on a maximum ceiling mass of 20 kg/m^2
3. Minimum bearing length = 70 mm at end supports
4. Restraint value for slenderness calculations is 1500 mm
5. Not all sizes of SmartLam GL 19S in this table are stocked in each state. Please check with your supplier before ordering

Carport beam - Ridge perpendicular

Ceiling mass - 20 kg/m^2



EXAMPLE:

wind speed = N3
sheet roof - 20 kg/m^2
Carport side depth 5300 mm
Carport beam span 4800 mm

Enter span table at carport depth of 5400 mm, and read down to a span equal to or greater than 4800 mm for a 20 kg/m^2 roof

ADOPT:

SmartLam GL19S - 250 x 50

AS 4055 classification N1, N2, N3 and N4

Member size DxB (mm)	Roof mass (kg/m^2)	Carport depth (side)				
		5200	5400	5600	5800	6000
		Maximum recommended carport beam span (mm)				
200x50	20	4700	4600	4600	4500	4500
	70	3900	3900	3800	3800	3800
250x50	20	5500	5400	5400	5300	5300
	70	4600	4600	4500	4500	4500
200x60	20	4800	4800	4800	4700	4700
	70	4100	4000	4000	4000	3900
265x60	20	5900	5800	5800	5800	5700
	70	5000	5000	4900	4900	4800
300x60	20	6400	6400	6300	6300	6200
	70	5500	5400	5400	5300	5300
330x60	20	6900	6800	6800	6700	6700
	70	5800	5800	5800	5700	5700
200x80	20	5100	5100	5100	5000	5000
	70	4300	4300	4300	4200	4200
265x80	20	6200	6200	6100	6100	6100
	70	5300	5300	5200	5200	5200
300x80	20	6800	6700	6700	6600	6600
	70	5800	5800	5700	5700	5600

AS 4055 classification C1, C2 and C3

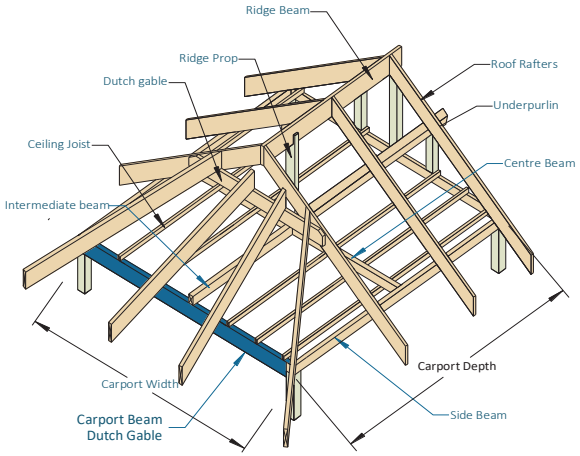
Member size DxB (mm)	Roof mass (kg/m^2)	Carport Depth (side)				
		5200	5400	5600	5800	6000
		Maximum recommended carport beam span (mm)				
200x50	20	4700	4600	4600	4500	4500
	70	3900	3900	3800	3800	3800
250x50	20	5500	5400	5400	5300	5300
	70	4600	4600	4500	4500	4500
200x60	20	4800	4800	4800	4700	4700
	70	4100	4000	4000	4000	3900
265x60	20	5900	5800	5800	5800	5700
	70	5000	5000	4900	4900	4800
300x60	20	6400	6400	6300	6300	6200
	70	5500	5400	5400	5300	5300
330x60	20	6900	6800	6800	6700	6700
	70	5800	5800	5800	5700	5700
200x80	20	5100	5100	5100	5000	5000
	70	4300	4300	4300	4200	4200
265x80	20	6200	6200	6100	6100	6100
	70	5300	5300	5200	5200	5200
300x80	20	6800	6700	6700	6600	6600
	70	5800	5800	5700	5700	5600

NOTES:

1. D = member depth, B = member breadth, NS = not suitable.
2. The above table was based on a maximum ceiling mass of 20 kg/m^2
3. Minimum bearing length = 70 mm at end supports
4. Not all sizes of SmartLam GL 19S in this table are stocked in each state. Please check with your supplier before ordering

Carport beam - Hip and Dutch Gable over opening
AS 4055 classification N1, N2, N3 and N4

Ceiling mass - 20 kg/m^2



EXAMPLE:

wind speed = N3
sheet roof - 20 kg/m^2
Carport side depth 5300 mm
Carport beam span 4800 mm

Enter span table at carport depth of 5400 mm, and read down to a span equal to or greater than 4800 mm for a 20 kg/m^2 roof

ADOPT:

SmartLam GL19S - 250 x 50

AS 4055 classification N1, N2, N3 and N4

Member size DxB (mm)	Roof mass (kg/m^2)	Carport Depth (side)				
		5200	5400	5600	5800	6000
		Maximum recommended carport beam span (mm)				
200x50	20	4700	4600	4600	4500	4500
	70	3900	3900	3800	3800	3800
250x50	20	5500	5400	5400	5300	5300
	70	4600	4600	4500	4500	4500
200x60	20	4800	4800	4800	4700	4700
	70	4100	4000	4000	4000	3900
265x60	20	5900	5800	5800	5800	5700
	70	5000	5000	4900	4900	4800
300x60	20	6400	6400	6300	6300	6200
	70	5500	5400	5400	5300	5300
330x60	20	6900	6800	6800	6700	6700
	70	5800	5800	5800	5700	5700
200x80	20	5100	5100	5100	5000	5000
	70	4300	4300	4300	4200	4200
265x80	20	6200	6200	6100	6100	6100
	70	5300	5300	5200	5200	5200
300x80	20	6800	6700	6700	6600	6600
	70	5800	5800	5700	5700	5600

AS 4055 classification C1, C2 and C3

Member size DxB (mm)	Roof mass (kg/m^2)	Carport Depth (side)				
		5200	5400	5600	5800	6000
		Maximum recommended carport beam span (mm)				
200x50	20	4700	4600	4600	4500	4500
	70	3900	3900	3800	3800	3800
250x50	20	5500	5400	5400	5300	5300
	70	4600	4600	4500	4500	4500
200x60	20	4800	4800	4800	4700	4700
	70	4100	4000	4000	4000	3900
265x60	20	5900	5800	5800	5800	5700
	70	5000	5000	4900	4900	4800
300x60	20	6400	6400	6300	6300	6200
	70	5500	5400	5400	5300	5300
330x60	20	6900	6800	6800	6700	6700
	70	5800	5800	5800	5700	5700
200x80	20	5100	5100	5100	5000	5000
	70	4300	4300	4300	4200	4200
265x80	20	6200	6200	6100	6100	6100
	70	5300	5300	5200	5200	5200
300x80	20	6800	6700	6700	6600	6600
	70	5800	5800	5700	5700	5600

NOTES:

1. D = member depth, B = member breadth, NS = not suitable.
2. The above table was based on a maximum ceiling mass of 20 kg/m^2
3. Minimum bearing length = 70 mm at end supports
4. Not all sizes of SmartLam GL 19S in this table are stocked in each state. Please check with your supplier before ordering.

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