

**FLOOR & ROOF - N3**



**Kerto<sup>®</sup> LVL E13.2**  
S-beam

**FAST, LIGHT, GREEN**



## Growth through premier brands and innovation

Since establishment in 1987 in Five Dock, NSW, Independent Timber Importers has been on a mission to redefine the timber industry wholesale/distribution landscape. ITI has worked closely with industry suppliers, customers and associations to promote the strength, beauty and environmental benefits of using timber. At the same time ITI redefined the role of the wholesaler with its distribution and service models. With its large investments in distribution centres, product development, people and service standards; in early 2002 ITI dropped the name Independent Timber Importers and replaced this with ITI and introducing the new logo with the “Innovative Timber Ideas” phrase which more accurately describes the attitude of the company.

Today ITI consists of 9 distribution sites across Australia with over 130,000m<sup>2</sup> of undercover storage, a state of the art re-manufacturing, treating and priming plant in Chile, an office in Indonesia, 3 distribution locations in New Zealand and growing sales in the USA.

True to its name, the success of ITI lies in its commitment to innovation in both service and product development. This commitment has led to premier brands such as Design Pine, EziTrim Plus and Spec Beam along with the distribution of market leading products such as Pacific Woodtech, Metsa Wood, Weathertex and Modwood. ITI has also led the way with service standards winning countless industry awards for its service.

## ITI Engineered Wood Products

ITI source Engineered Wood Products from leading manufacturers to ensure the needs of building designers through to the end users are met with the best available product.

ITI Engineered Wood Products offering is comprised of 3 major products with each intended on complimenting the next. Laminated Veneer Lumber (LVL), I-Joists and Glue Laminated Timber Beams (GL). These products along with innovated construction details and dedicated support staff form an innovative platform which set ITI Engineered Wood Products apart from the rest.



## Single Member Design Software

Available from ITI Australia is ITI Design Spec. A single member design software developed to assist industry professionals with the specification of ITI's vast range of structural timber products. Free licences are available to suit builders, timber merchants, frame & truss professionals and engineers. Head to [www.itiaustralia.com.au](http://www.itiaustralia.com.au) to download for free.

Metsä Kerto® LVL S-beam E13.2 is a laminated veneer lumber product used in all types of construction projects, from new buildings to renovation and repair. Kerto LVL is light, strong and dimensionally stable. Kerto LVL derives its high strength

from the homogeneous bonded structure.

Kerto LVL is produced from 3 mm thick, rotary-peeled softwood veneers that are glued together to form a continuous billet. The billet is cut to length and sawn into a wide range of LVL beams.

Raw wood material comes from the sustainably managed and PEFC-certified forests of Metsä Group's Finnish forest owner members, ensuring that the origin of the raw material is traceable.

Widths	Depths (mm)										
36 <sup>(1)</sup>	90	130	150	170	200	240	300	-	-	-	-
45	90	130	150	170	200	240	300	360	400	-	-
63	90	130	150	170	200	240	300	360	400	450 <sup>(2)</sup>	-
75	-	-	150 <sup>(4)</sup>	-	-	240 <sup>(5)</sup>	300	-	400	-	525 <sup>(3)</sup>

<sup>(1)</sup> Not stocked in Melbourne

<sup>(2)</sup> Stock available ex Adelaide or Melbourne

<sup>(3)</sup> Stock available ex Adelaide

<sup>(4)</sup> Stock available ex Sydney

<sup>(5)</sup> Stock available ex Brisbane or Sydney

Properties (MPa)	E	G	F <sub>b</sub> '	F <sub>c</sub> '	F <sub>t</sub> '	F <sub>s</sub> '	F <sub>p</sub> '	Weight kg/m <sup>3</sup>	Strength Group
Edge	13,200	660	42.0 <sup>(5)</sup>	33.0	35.0 <sup>(6)</sup>	4.2	10.0	550	SD5
Face			50.0						

<sup>(5)</sup> Value based on a 300mm deep section on edge. Use  $42.0 \times (300/\text{Depth})^{0.15}$

<sup>(6)</sup> Value based on a 150mm deep section on edge. Use  $35.0 \times (150/\text{Depth})^{0.15}$  for sections over 150mm deep

Joint Group	Nails - Face & Edge		Screws - Face & Edge		Bolts - Face	
	Lateral	Withdrawal	Lateral	Withdrawal	Perpendicular	Parallel
	JD4	JD4	JD4	JD4	JD4	JD4

It is a requirement of the Australian standard for manufacturing Laminated Veneer Lumber that an external A bond be achieved between the veneers by using a phenolic type adhesive.

Formaldehyde Emissions			
Emissions Class	E <sub>0</sub>	Maximum Emission	<0.5 mg/L

### KERTO® LVL WEATHERGUARD®

#### Protection against weather during construction

Kerto WeatherGuard® is a hydrophobic surface treatment applied to the Kerto-S® Beam LVL E13.2. The transparent special surface treatment provides temporary protection for the product against rain during the construction period. Thus it significantly reduces swelling and other unwanted effects of moisture. The treatment does not affect the strength properties of the product.

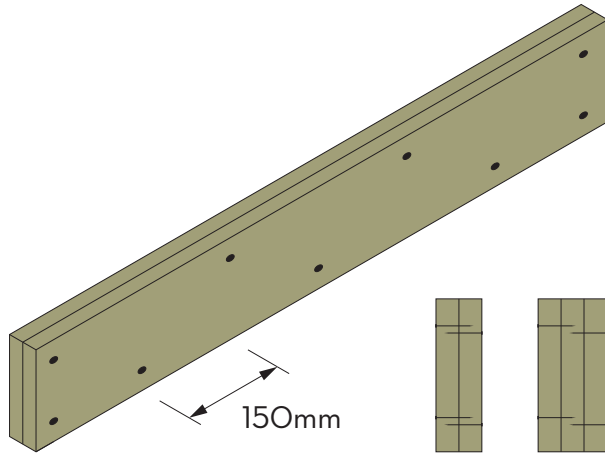
#### Kerto® LVL WeatherGuard performance

- The strength and stiffness properties are as good as those of an unprotected Kerto® LVL.
- Applied to all sides and edges of members 150mm deep and over. Applied to faces only of members under 150mm deep
- Kerto® LVL WeatherGuard treatment does not contain any formaldehyde.
- Kerto® LVL WeatherGuard does not contain any biocides (chemical agents against harmful organisms)
- Kerto® LVL WeatherGuard can be disposed like standard LVL as it contains nothing classified as hazardous waste.
- The treatment does not affect the reaction and resistance to fire, slip resistance or corrosion of the fasteners compared to unprotected Kerto® LVL.



# LAMINATING MULTIPLE LVLS

## Nail Lamination of 2 & 3 Ply Members



### Nail Lamination - 2-Ply & 3-Ply Members

Minimum Nail Sizes

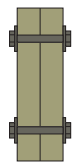
45mm Members - 2.80x75mm

63mm Members - 2.80x100mm

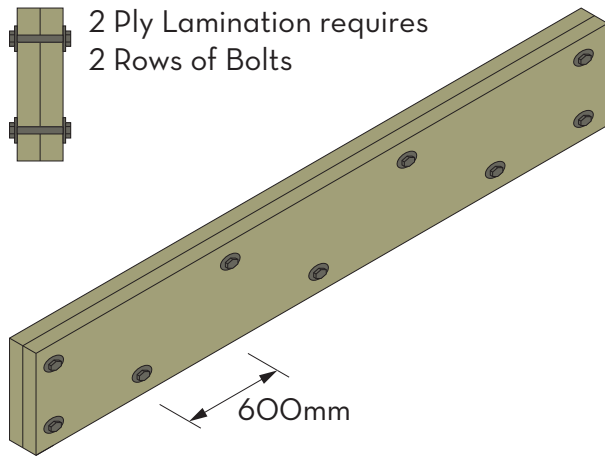
### NAIL LAMINATION NOTES:

1. Minimum 2 Rows for Depths up to 305mm
2. Minimum 3 Rows for Depths up to 450mm
3. Drive opposing nail pattern to opposite side of member
4. Nails to penetrate second member by at least 50%
5. First nails to be located approx. 135mm from the edge
6. Additional nails added under point loads and over supports
7. Repeat nailing to nailing pattern to each lamination

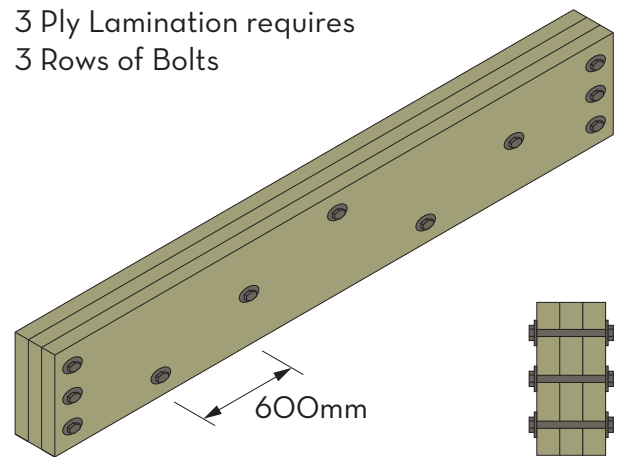
## Bolt Lamination of 2 & 3 Ply Members



2 Ply Lamination requires  
2 Rows of Bolts



3 Ply Lamination requires  
3 Rows of Bolts

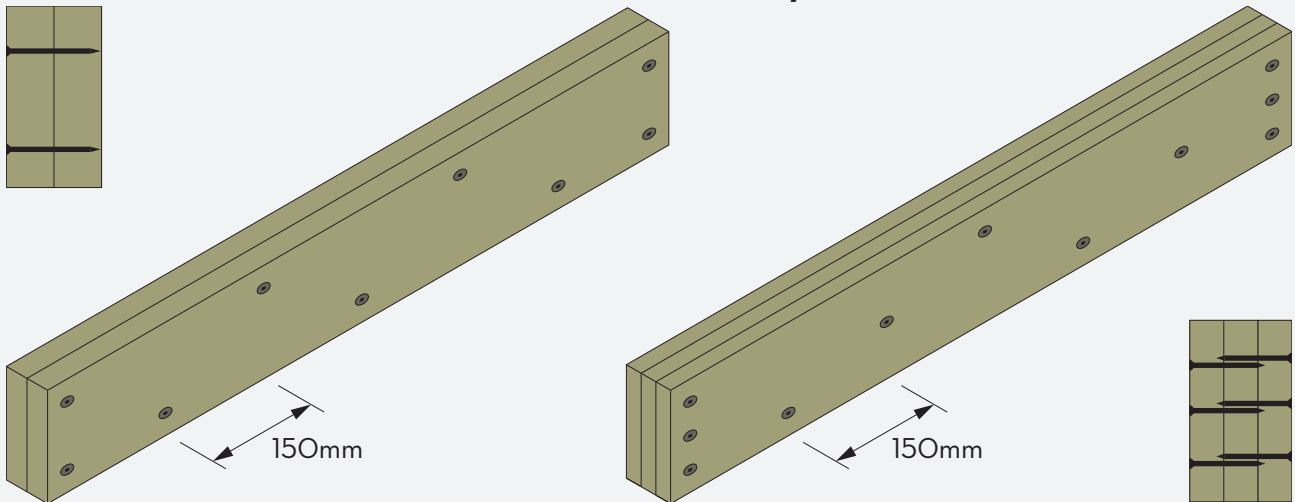


### BOLT LAMINATION NOTES:

1. M12 (8.8/S) bolts with 55mm washers at 600mm centres staggered in 2 rows for 2 ply beams
2. M12 (8.8/S) bolts with 55mm washers at 600mm centres staggered in 3 rows for 3 ply beams
3. Minimum 60mm edge clearance required
4. Ensure pre-camber of Glue Laminated Beams is set in the upward direction
5. Apply an additional 2 or 3 M12 bolts directly under any point loads
6. Bolt members together prior to applying loads

# SCREW CONNECTION

## Screw Lamination of 2 & 3 Ply Members



2 Ply Lamination			3 Ply Lamination			
Configuration		Screw Length	Configuration			Screw Length
36mm	36mm	Not Permitted	36mm	36mm	36mm	Not Permitted
45mm	45mm	Not Permitted	45mm	45mm	45mm	100mm
63mm	45mm	100mm <sup>(1)</sup>	63mm	45mm	45mm	100mm <sup>(2)</sup>
63mm	63mm	125mm	63mm	63mm	63mm	125mm

<sup>(1)</sup> Screws to be driven through the face of the 45mm member

<sup>(2)</sup> 63mm member to be positioned in the centre. Screws driven from either side through the face of 45mm members

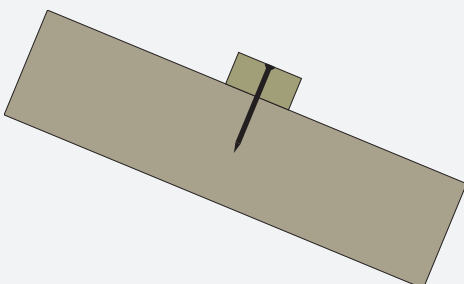
### SCREW LAMINATION NOTES:

1. Detail applicable to a 14g Bugle Head Batten Screw
2. Not acceptable for 36mm members in any configuration or 2 ply 45mm members
3. Drive opposing screw pattern to opposite side of member for 3 ply configurations
4. Not acceptable for members less than 200mm in depth
5. 2 Rows for 2 ply configurations
6. 3 Rows for 3 ply configurations
7. Refer to table for minimum edge and end distance requirements
8. Minimum of 45mm embedment into second member required
9. Suitable for both face and top loaded members

Minimum Distances - 14g Screws	
End	65mm
Edge	35mm
Between	65mm

## Roof Batten to Rafter Connections

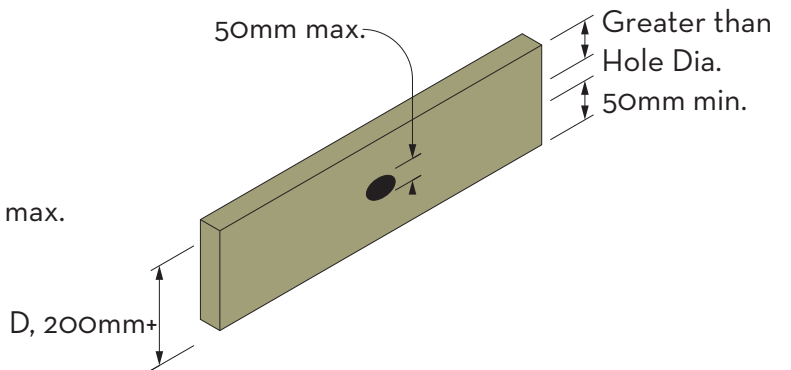
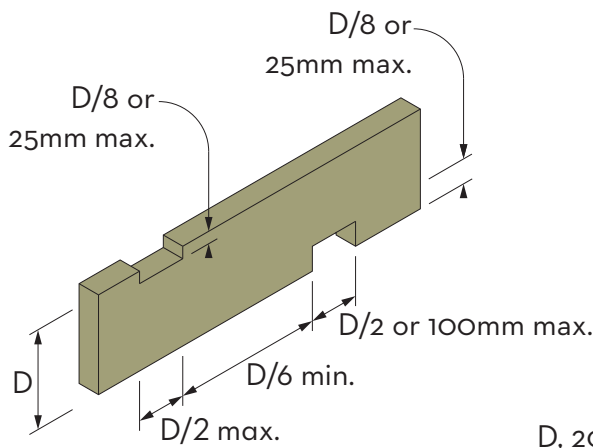
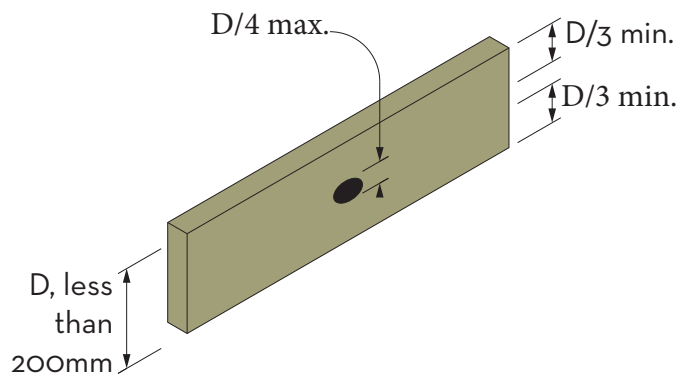
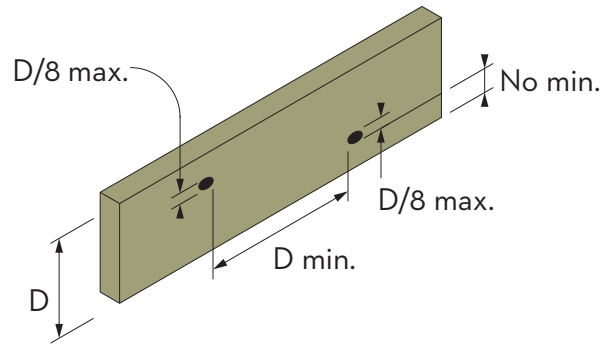
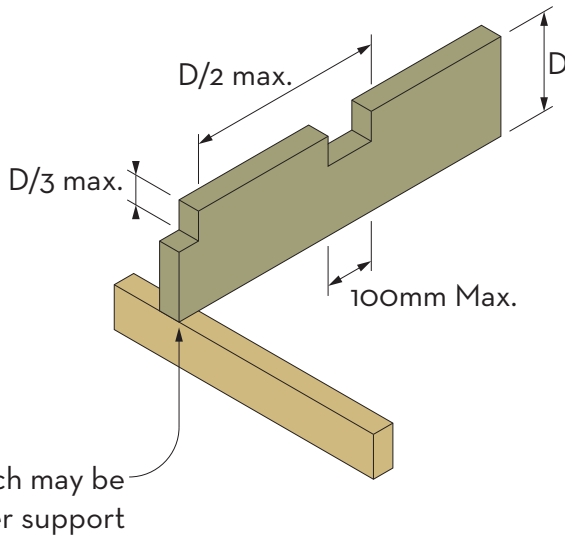
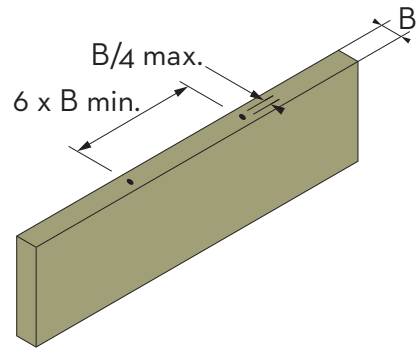
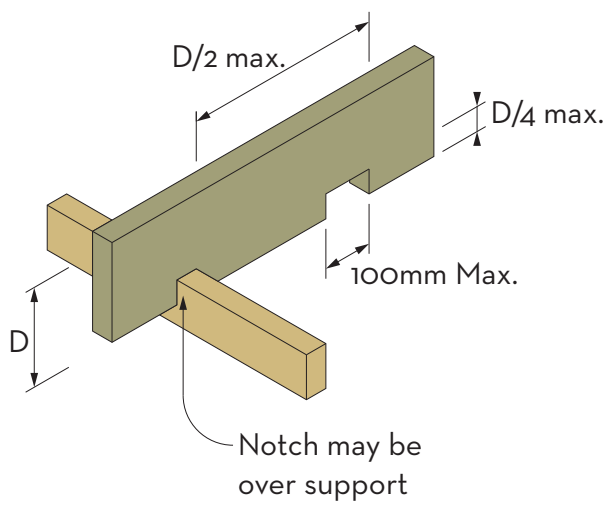
14g Batten Screw Length Requirements for Sheet Metal Roof - Battens at 900mm centres Maximum												
Rafter or Truss Centres (mm)	N2						N3					
	General			Edges			General			Edges		
	Uplift	Batten Width		Uplift	Batten Width		Uplift	Batten Width		Uplift	Batten Width	
		36mm	45mm		36mm	45mm		36mm	45mm		36mm	45mm
600	0.53	75	100	1.0	75	100	0.85	75	100	1.5	75	100
900	0.79	75	100	1.5	75	100	1.2	75	100	2.3	75	100
1800	1.58	75	100	3.0	75	100	2.4	75	100	4.6	100	100
2400	2.12	75	100	4.0	75	100	3.4	75	100	6.0	100	100



We recommend:



# HOLES & NOTCHES IN LVL

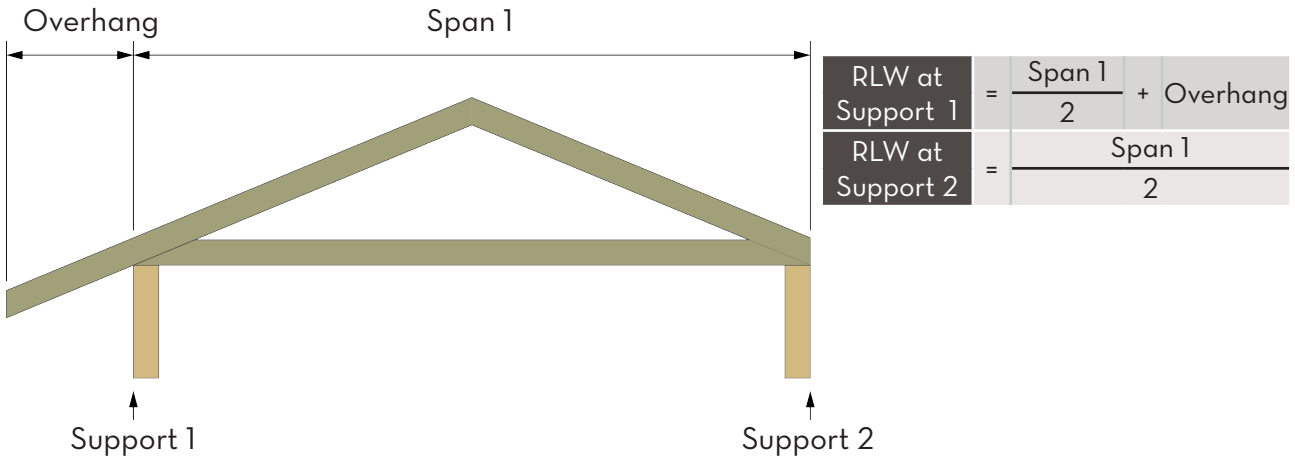


**Notes:**

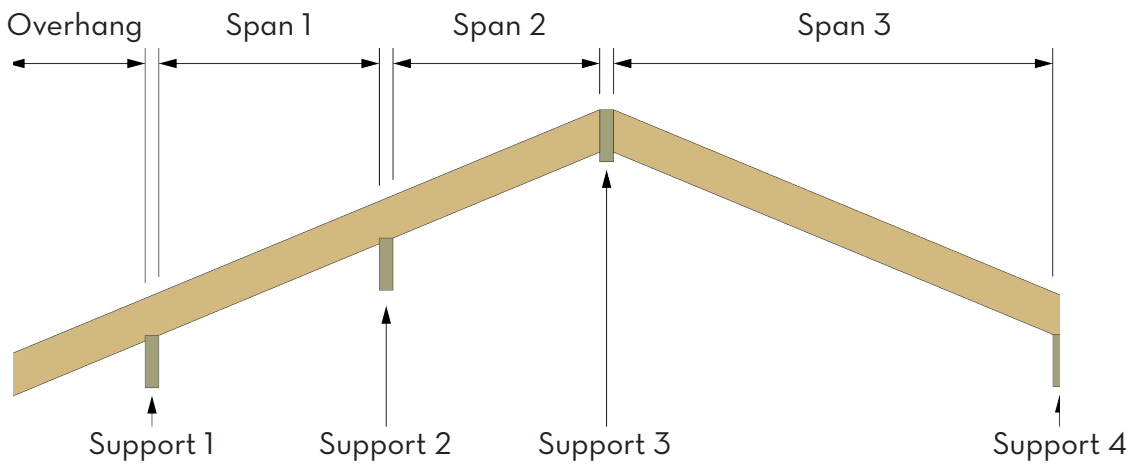
1. No more than 2 holes are permitted within an 1800mm length
2. For more information refer to Section 4.1.6 of AS 1684.

# ROOF LOADINGS & DEFINITIONS

## Determining Roof Load Width (RLW) at Supports - Trussed Roof

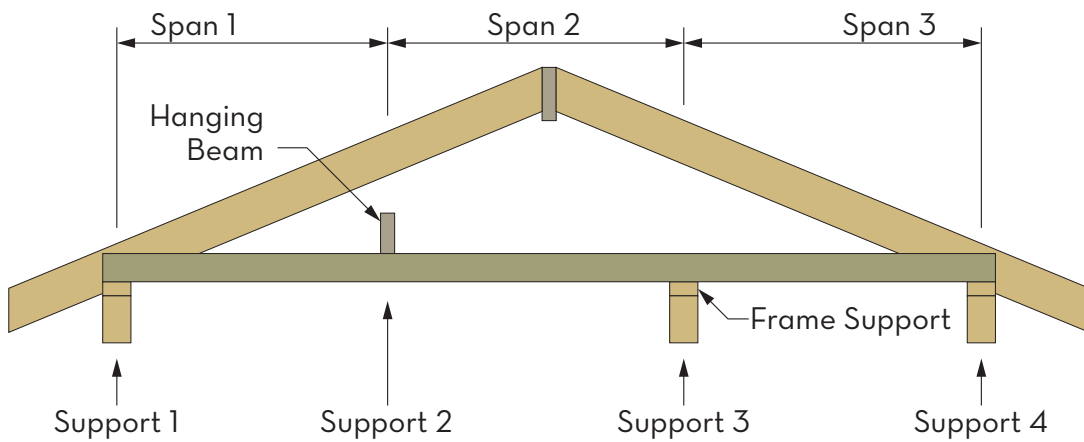


## Determining Roof Load Width (RLW) at Supports - Pitched Roof



<table border="1" style="width: 100%;"> <tr> <td>RLW at Support 1</td> <td>=</td> <td><math>\frac{\text{Span 1}}{2} + \text{Overhang}</math></td> </tr> <tr> <td>RLW at Support 2</td> <td>=</td> <td><math>\frac{(\text{Span 1} + \text{Span 2})}{2}</math></td> </tr> </table>	RLW at Support 1	=	$\frac{\text{Span 1}}{2} + \text{Overhang}$	RLW at Support 2	=	$\frac{(\text{Span 1} + \text{Span 2})}{2}$	<table border="1" style="width: 100%;"> <tr> <td>RLW at Support 1</td> <td>=</td> <td><math>\frac{\text{Span 1}}{2} + \text{Overhang}</math></td> </tr> <tr> <td>RLW at Support 2</td> <td>=</td> <td><math>\frac{(\text{Span 1} + \text{Span 2})}{2}</math></td> </tr> </table>	RLW at Support 1	=	$\frac{\text{Span 1}}{2} + \text{Overhang}$	RLW at Support 2	=	$\frac{(\text{Span 1} + \text{Span 2})}{2}$
RLW at Support 1	=	$\frac{\text{Span 1}}{2} + \text{Overhang}$											
RLW at Support 2	=	$\frac{(\text{Span 1} + \text{Span 2})}{2}$											
RLW at Support 1	=	$\frac{\text{Span 1}}{2} + \text{Overhang}$											
RLW at Support 2	=	$\frac{(\text{Span 1} + \text{Span 2})}{2}$											

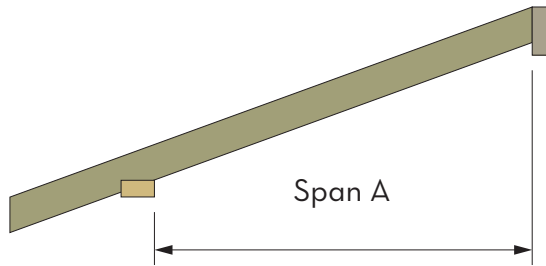
## Determining Ceiling Load Width (CLW) at Supports



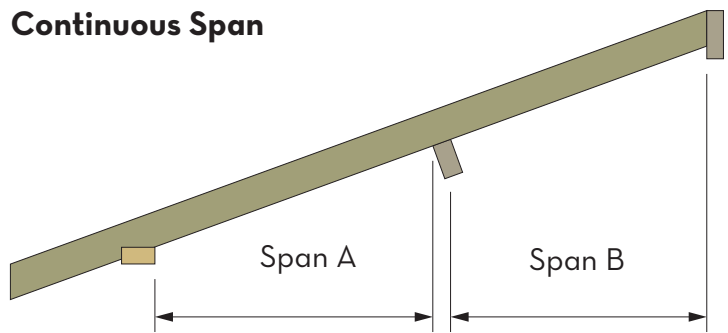
<table border="1" style="width: 100%;"> <tr> <td>CLW at Support 1</td> <td>=</td> <td><math>\frac{\text{Span 1}}{2}</math></td> </tr> <tr> <td>CLW at Support 2</td> <td>=</td> <td><math>\frac{(\text{Span 1} + \text{Span 2})}{2}</math></td> </tr> </table>	CLW at Support 1	=	$\frac{\text{Span 1}}{2}$	CLW at Support 2	=	$\frac{(\text{Span 1} + \text{Span 2})}{2}$	<table border="1" style="width: 100%;"> <tr> <td>CLW at Support 3</td> <td>=</td> <td><math>\frac{(\text{Span 2} + \text{Span 3})}{2}</math></td> </tr> <tr> <td>CLW at Support 4</td> <td>=</td> <td><math>\frac{\text{Span 3}}{2}</math></td> </tr> </table>	CLW at Support 3	=	$\frac{(\text{Span 2} + \text{Span 3})}{2}$	CLW at Support 4	=	$\frac{\text{Span 3}}{2}$
CLW at Support 1	=	$\frac{\text{Span 1}}{2}$											
CLW at Support 2	=	$\frac{(\text{Span 1} + \text{Span 2})}{2}$											
CLW at Support 3	=	$\frac{(\text{Span 2} + \text{Span 3})}{2}$											
CLW at Support 4	=	$\frac{\text{Span 3}}{2}$											

## Rafter & Beam Span Types

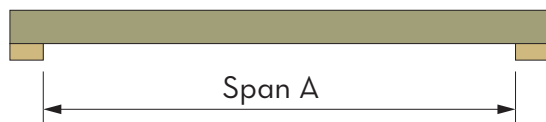
### Single Span



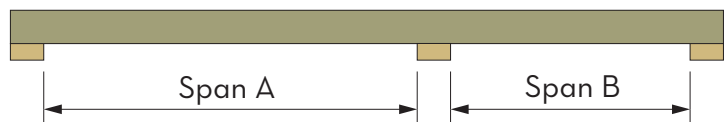
### Continuous Span



### Single Span

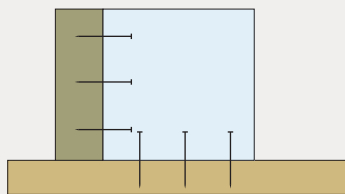


### Continuous Span

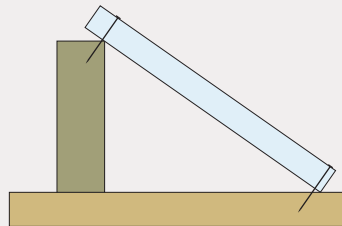


A continuous span only applies when the smaller of the spans is no less than half the larger span. Where this does not apply; both spans are to be treated as single spans or further design analysis is required. Measure spans between internal faces of the supports.

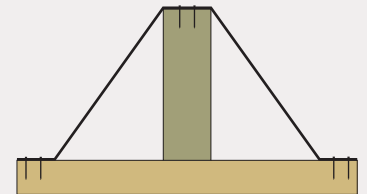
### Lateral restraint to Counter, Hanging and Strutting Beams



(a) Block skew nailed to beam and support with 3/75mm framing nails to each member

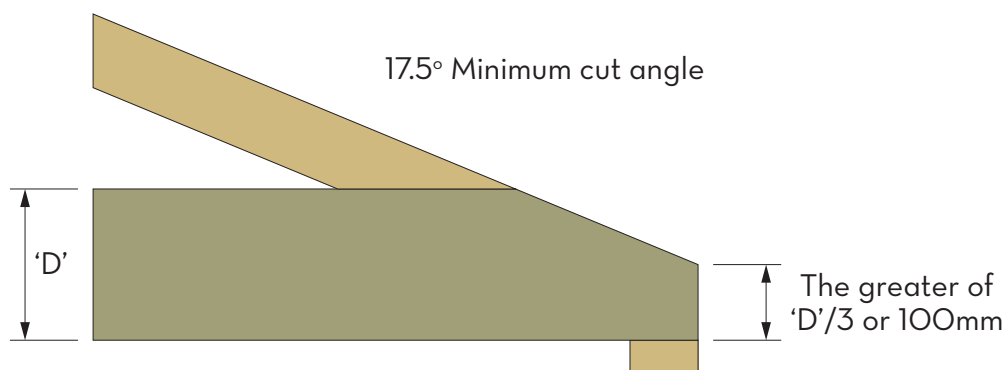


(b) Minimum 35x32mm tie nailed to the top of the beam and to the support with 2/75mm framing nails at each end



(c) G.I. Strap looped over beam with 2/30x2.8mm nails at either end and into the beam

### Rafter / Taper Cut to Counter, Hanging and Strutting Beams



Roof beam ends may be taper cut to avoid interference with roof coverings. It may be necessary to cantilever roof battens and butt into the side of these members. This detail may be used for Counter, Hanging, Strutting Beams as well as combination Strutting / Counter and Strutting / Hanging Beams.



# FLOOR LOADINGS & DEFINITIONS

## Domestic Floor Loads

Domestic Floor Loadings per AS 1170.1 Table 3.1			Floor Sheet Type		
Specific uses Self-contained Dwellings	Uniform Distributed Actions	Concentrated Actions	Centres	Particle Board	OxyMag Wet Area
General areas	1.5 kPa	1.8 kN	450mm	19mm	16mm
			600mm	22mm	19mm
Balconies (<1m off ground)	1.5 kPa	1.8 kN	450mm	-	16mm
Balconies (>1m off ground)	2.0 kPa	1.8 kN	450mm	-	19mm
Stairs and landings	2.0 kPa	2.7 kN	450mm	19mm	-

## Floor Framing Deflection

Floor Framing Limits on Deflection per AS1720.3		
Load	Single or Continuous Spans	Overhang
Dead Load	Span / 300 or 15mm Max	Cantilever / 150 or 6mm Max.
Floor Live Load	Span / 360 or 9mm Max	Cantilever / 180
Dynamic (1kN)	2mm	-

Examples:

Maximum Dead Load Deflection on a 6000mm span is 15mm as  $6000/300=20\text{mm}$  which exceeds the 15mm limit.

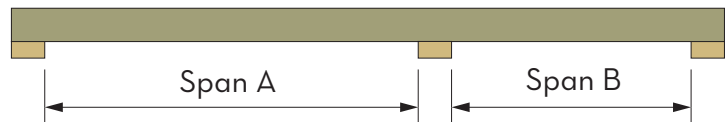
Maximum Floor Live Load Deflection on a 3000mm span is 8.3mm as  $3000/360=8.3\text{mm}$  which is below the 9mm limit.

## Bearer & Joist Span Types

### Single Span

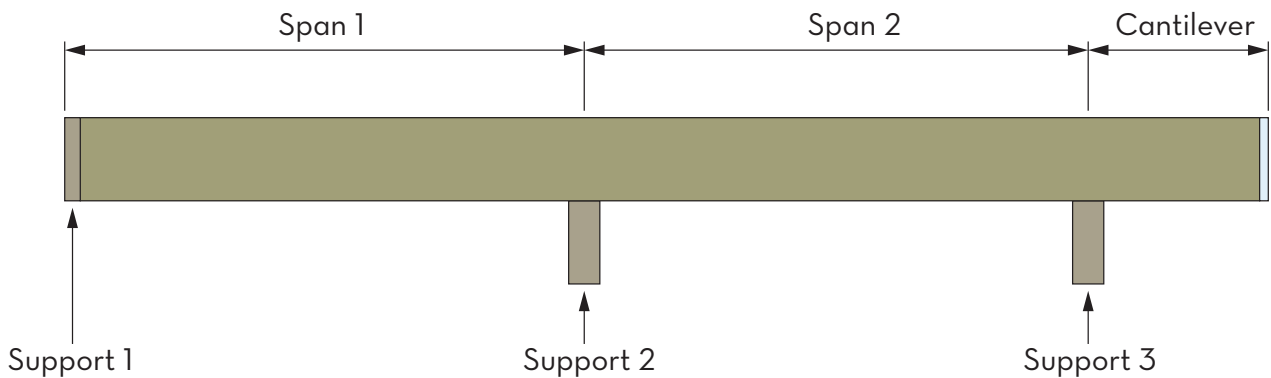


### Continuous Span



A continuous span only applies when the smaller of the spans is no less than half the larger span. Where this does not apply; both spans are to be treated as singles spans or further design analysis is required. Measure spans between internal faces of the supports.

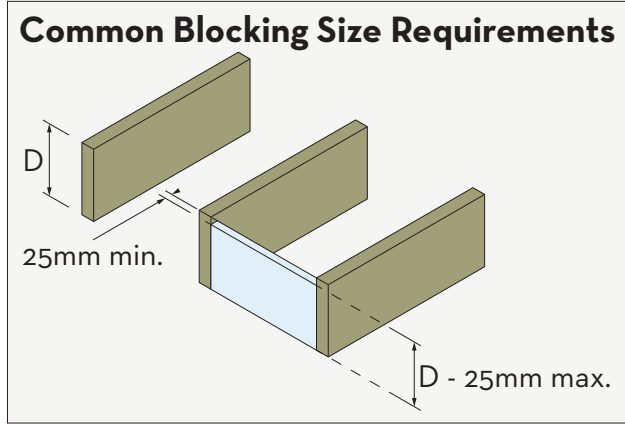
## Determining Floor Load Width (FLW) at Supports



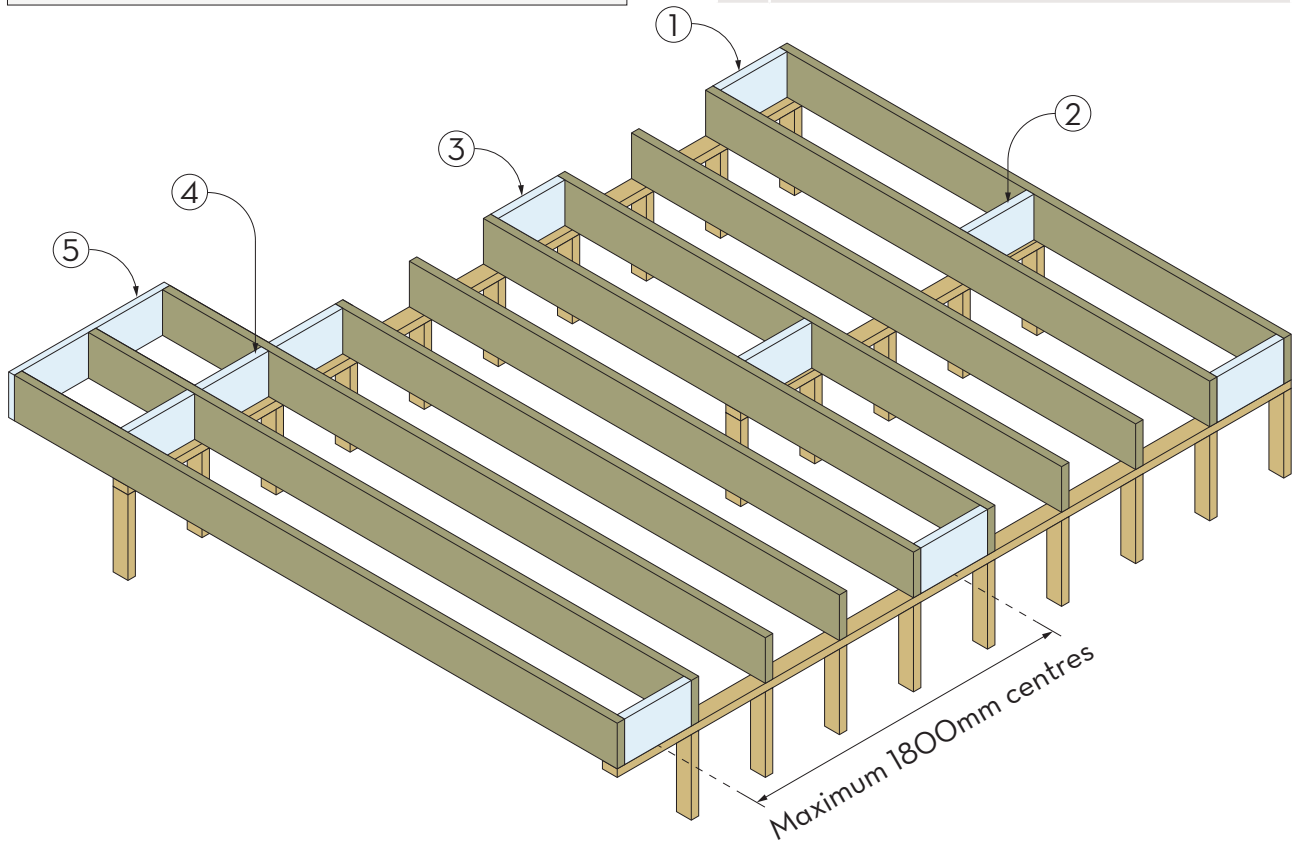
FLW at Support 1	=	$\frac{\text{Span 1}}{2}$
FLW at Support 2	=	$\frac{\text{Span 1} + \text{Span 2}}{2}$
FLW at Support 3	=	$\frac{\text{Span 2}}{2} + \text{Cantilever}$

# FLOOR JOISTS & BLOCKING

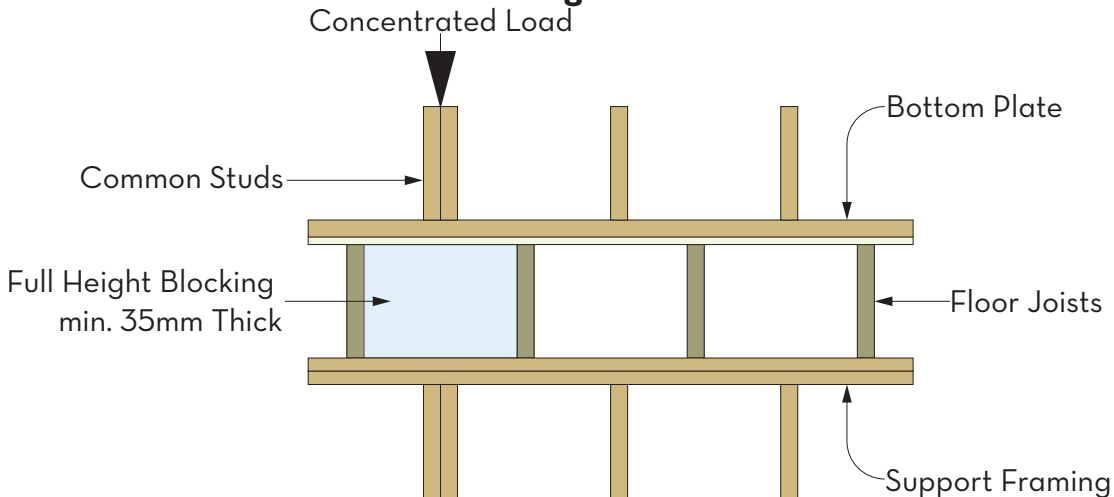
Floor joists are members which run parallel in series designed to support floor loads. The spacing of floor joists shall be such that it meets the requirements of the supported flooring / floor sheet.



Blocking Type	
1	Intermittent blocking over external support at start / end of joist run
2	Intermittent blocking over internal support at start / end of joist run
3	Intermittent blocking over external support at 1800mm centres
4	Continuous Blocking to cantilevered joists
5	Rimboard / Fascia Beam to ends of cantilevered joist



### Blocking to Concentrated Loads



Blocking is required to provide resistance to lateral loads applied to the floor diaphragm, transfer concentrated loads down into the support structure. Unlike Common Blocking; Concentrated Load Blocking needs to be full height and a minimum of 35mm thick.

Span (m)	Span Type	Floor Joist Centres (mm)			
		300	360	450	600
1.5	Single	90x45	90x45	90x45	90x45
	Continuous	90x45	90x45	90x45	90x45
	Single	90x63	90x63	90x63	90x63
	Continuous	90x63	90x63	90x63	90x63
2.0	Single	90x45	130x45	130x45	130x45
	Continuous	90x45	90x45	90x45	130x45
	Single	90x63	90x63	90x63	130x63
	Continuous	90x63	90x63	90x63	90x63
2.5	Single	130x45	130x45	130x45	130x45
	Continuous	90x45	130x45	130x45	130x45
	Single	90x63	130x63	130x63	130x63
	Continuous	90x63	90x63	130x63	130x63
3.0	Single	130x45	130x45	150x45	170x45
	Continuous	130x45	130x45	130x45	150x45
	Single	130x63	130x63	130x63	150x63
	Continuous	90x63	130x63	130x63	130x63
3.5	Single	150x45	150x45	170x45	200x45
	Continuous	130x45	130x45	150x45	150x45
	Single	130x63	150x63	150x63	170x63
	Continuous	130x63	130x63	130x63	150x63
4.0	Single	150x45	170x45	200x45	200x45
	Continuous	150x45	150x45	170x45	170x45
	Single	150x63	150x63	170x63	200x63
	Continuous	130x63	130x63	150x63	150x63
4.5	Single	200x45	200x45	240x45	240x45
	Continuous	170x45	170x45	200x45	200x45
	Single	170x63	170x63	200x63	200x63
	Continuous	150x63	150x63	170x63	200x63
5.0	Single	240x45	240x45	240x45	300x45
	Continuous	200x45	200x45	240x45	240x45
	Single	200x63	200x63	240x63	240x63
	Continuous	170x63	170x63	200x63	240x63
5.5	Single	240x45	300x45	300x45	300x45
	Continuous	240x45	240x45	240x45	300x45
	Single	240x63	240x63	240x63	300x63
	Continuous	200x63	200x63	240x63	240x63
6.0	Single	240x63	300x63	300x63	300x63
	Continuous	240x45	300x45	300x45	300x45
	Single	240x63	300x63	300x63	300x63
	Continuous	240x63	240x63	240x63	300x63
6.5	Single	300x45	360x45	360x45	360x45
	Continuous	300x45	300x45	300x45	360x45
	Single	300x63	300x63	300x63	360x63
	Continuous	240x63	240x63	300x63	300x63

Refer to page 25 for specification notes

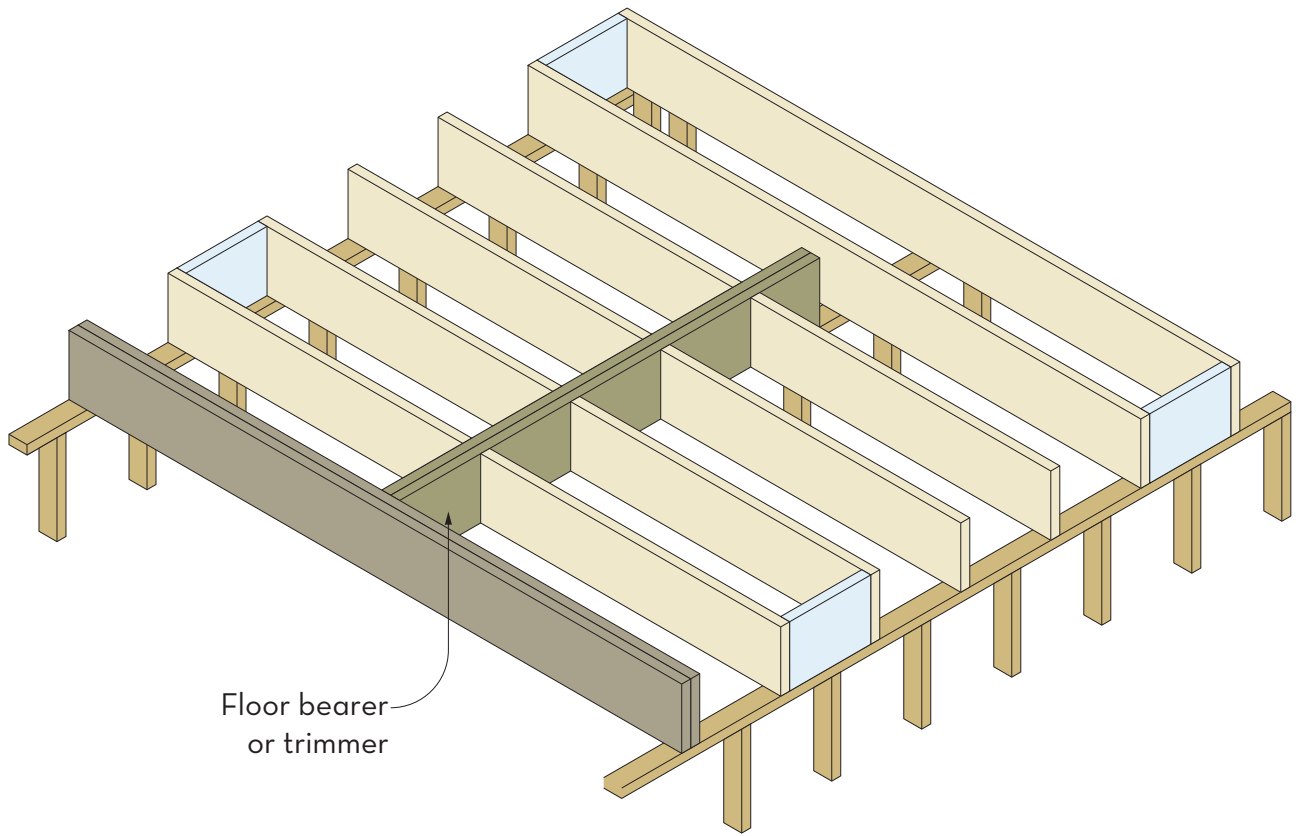
Span (m)	Span Type	Floor Joist Centres (mm)			
		300	360	450	600
1.5	Single	90x45	90x45	90x45	90x45
	Continuous	90x45	90x45	90x45	90x45
	Single	90x63	90x63	90x63	90x63
	Continuous	90x63	90x63	90x63	90x63
2.0	Single	90x45	90x45	130x45	130x45
	Continuous	90x45	90x45	90x45	90x45
	Single	90x63	90x63	90x63	130x63
	Continuous	90x63	90x63	90x63	90x63
2.5	Single	130x45	130x45	130x45	130x45
	Continuous	90x45	90x45	130x45	130x45
	Single	130x63	130x63	130x63	130x63
	Continuous	90x63	90x63	90x63	90x63
3.0	Single	130x45	150x45	150x45	170x45
	Continuous	130x45	130x45	130x45	130x45
	Single	130x63	130x63	130x63	150x63
	Continuous	90x63	90x63	130x63	130x63
3.5	Single	150x45	170x45	170x45	200x45
	Continuous	130x45	130x45	130x45	150x45
	Single	150x63	150x63	150x63	170x63
	Continuous	130x63	130x63	130x63	130x63
4.0	Single	170x45	200x45	200x45	240x45
	Continuous	150x45	150x45	170x45	170x45
	Single	170x63	170x63	200x63	200x63
	Continuous	130x63	130x63	150x63	150x63
4.5	Single	200x45	240x45	240x45	240x45
	Continuous	170x45	170x45	200x45	200x45
	Single	200x63	200x63	200x63	240x63
	Continuous	150x63	150x63	170x63	200x63
5.0	Single	240x45	240x45	300x45	300x45
	Continuous	200x45	200x45	240x45	240x45
	Single	200x63	240x63	240x63	300x63
	Continuous	170x63	170x63	200x63	240x63
5.5	Single	300x45	300x45	300x45	360x45
	Continuous	240x45	240x45	240x45	300x45
	Single	240x63	240x63	300x63	300x63
	Continuous	200x63	200x63	240x63	240x63
6.0	Single	300x63	300x63	300x63	360x63
	Continuous	240x45	300x45	300x45	300x45
	Single	300x63	300x63	300x63	360x63
	Continuous	240x63	240x63	240x63	300x63
6.5	Single	360x45	360x45	360x45	400x45
	Continuous	300x45	300x45	300x45	360x45
	Single	300x63	360x63	360x63	360x63
	Continuous	240x63	240x63	300x63	300x63

 1.5 kPa + 1.8 kN with Heavy Flooring (75 kg/m<sup>2</sup>) + 10mm Plaster Ceiling

Span (m)	Span Type	Floor Joist Centres (mm)			
		300	360	450	600
1.5	Single	90x45	90x45	90x45	90x45
	Continuous	90x45	90x45	90x45	90x45
	Single	90x63	90x63	90x63	90x63
	Continuous	90x63	90x63	90x63	90x63
2.0	Single	90x45	130x45	130x45	130x45
	Continuous	90x45	90x45	90x45	90x45
	Single	90x63	90x63	90x63	130x63
	Continuous	90x63	90x63	90x63	90x63
2.5	Single	130x45	130x45	130x45	150x45
	Continuous	90x45	90x45	130x45	130x45
	Single	130x63	130x63	130x63	130x63
	Continuous	90x63	90x63	90x63	90x63
3.0	Single	130x45	150x45	150x45	170x45
	Continuous	130x45	130x45	130x45	130x45
	Single	130x63	130x63	150x63	150x63
	Continuous	90x63	130x63	130x63	130x63
3.5	Single	170x45	170x45	200x45	200x45
	Continuous	130x45	130x45	130x45	150x45
	Single	150x63	150x63	170x63	200x63
	Continuous	130x63	130x63	130x63	130x63
4.0	Single	200x45	200x45	200x45	240x45
	Continuous	130x45	150x45	150x45	170x45
	Single	170x63	170x63	200x63	200x63
	Continuous	130x63	130x63	150x63	150x63
4.5	Single	200x45	240x45	240x45	300x45
	Continuous	170x45	170x45	200x45	200x45
	Single	200x63	200x63	240x63	240x63
	Continuous	150x63	150x63	170x63	200x63
5.0	Single	240x45	300x45	300x45	300x45
	Continuous	200x45	200x45	200x45	240x45
	Single	240x63	240x63	240x63	300x63
	Continuous	170x63	170x63	200x63	200x63
5.5	Single	300x45	300x45	300x45	360x45
	Continuous	200x45	240x45	240x45	-
	Single	240x63	300x63	300x63	300x63
	Continuous	200x63	200x63	240x63	240x63
6.0	Single	300x63	300x63	300x63	360x63
	Continuous	240x45	240x45	300x45	-
	Single	300x63	300x63	300x63	360x63
	Continuous	200x63	240x63	240x63	300x63
6.5	Single	360x45	360x45	400x45	-
	Continuous	300x45	300x45	300x45	-
	Single	300x63	360x63	360x63	400x63
	Continuous	240x63	240x63	300x63	300x63

Refer to page 25 for specification notes

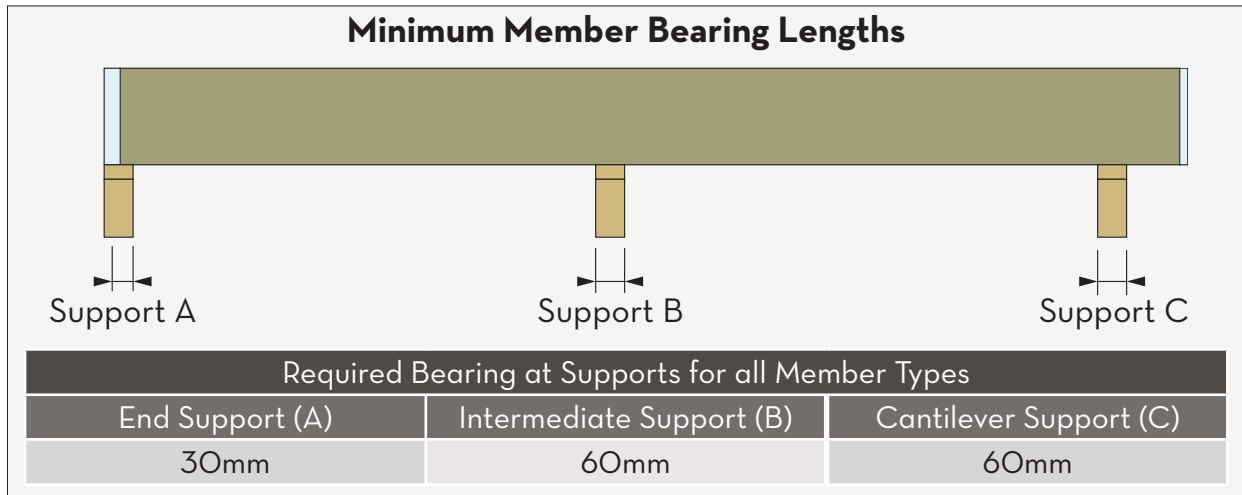
# FLOOR BEARERS / TRIMMERS



Floor Bearers / Trimmers are members which run perpendicular to, and support Floor Joists. Floor Joists can be supported on the top or into the face of floor bearers via a joist hanger. Where Floor Joists run continuously over a floor bearer or cantilever off a bearer; the bearer is required to be a minimum of 60mm wide.

Wind Classification	Joists to Bearer / Support
	Skew Nailed
N2	2/75x3.05 Nails <sup>(1)</sup>
N3	
C2	
C3	

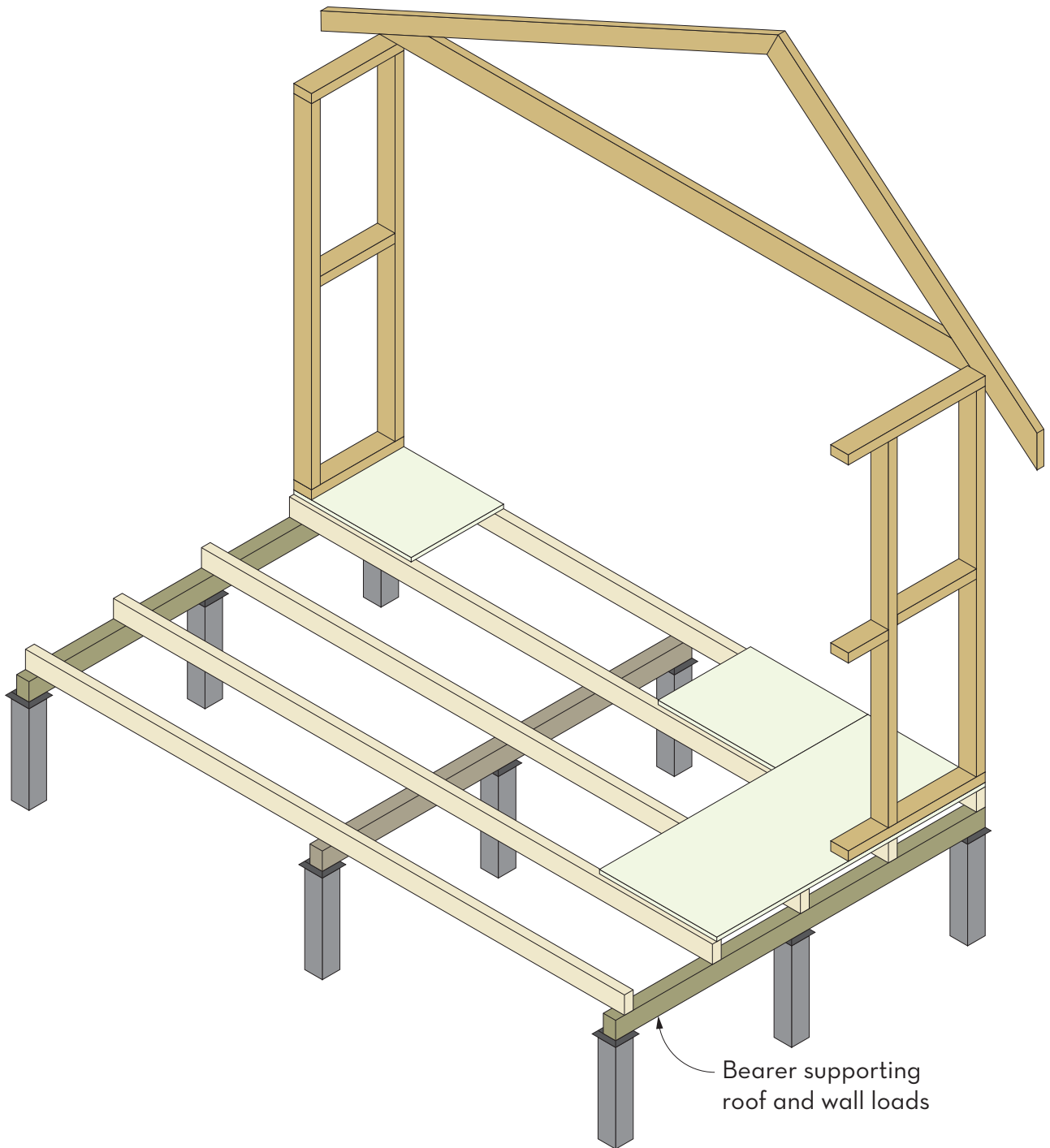
<sup>(1)</sup> Where additional uplift is not generated through abnormal span conditions or imposed loads



	Span (m)	Span Type	Section Size (mm)				
			Floor Load Width (m)				
			1.0	2.0	3.0	4.0	5.0
1.5 kPa + 1.8 kN with Particle Board Flooring + 10mm Plaster Ceiling (42 kg/m <sup>2</sup> )	1.5	Single	90x45	130x45	130x45	150x45	150x45
		Continuous	90x45	90x45	130x45	130x45	130x63
	2.0	Single	130x45	150x45	170x45	200x45	200x45
		Continuous	130x45	130x45	150x45	150x63	150x63
	2.5	Single	150x45	200x45	200x45	240x45	240x63
		Continuous	150x45	150x45	150x63	2/170x45	2/170x45
	3.0	Single	200x45	240x45	240x63	240x63	2/240x45
		Continuous	170x45	200x45	200x63	-	-
	3.5	Single	200x63	240x63	2/240x45	300x63	2/300x45
		Continuous	200x45	200x63	2/240x45	-	-
	4.0	Single	240x45	300x45	300x63	2/300x45	-
		Continuous	200x63	240x63	2/240x45	-	-
	4.5	Single	300x45	360x45	360x63	2/360x45	-
		Continuous	240x45	2/240x45	-	-	-
5.0	Single	300x63	400x45	2/360x45	2/400x45	-	
	Continuous	300x45	300x63	-	-	-	
1.5 kPa + 1.8 kN with Heavy Flooring + 10mm Plaster Ceiling (87 kg/m <sup>2</sup> )	1.5	Single	90x63	130x45	150x45	150x45	170x45
		Continuous	90x45	90x45	130x45	130x45	130x63
	2.0	Single	130x45	170x45	200x45	200x45	200x63
		Continuous	130x45	130x45	130x63	150x63	-
	2.5	Single	170x45	200x45	240x45	240x63	240x63
		Continuous	150x45	150x45	170x63	2/170x45	-
	3.0	Single	200x45	240x45	2/240x45	2/240x45	2/300x45
		Continuous	170x45	170x63	2/170x45	-	-
	3.5	Single	240x45	300x45	300x63	2/300x45	2/300x45
		Continuous	200x45	200x63	2/240x45	-	-
	4.0	Single	300x45	360x45	360x63	2/360x45	-
		Continuous	200x63	240x63	2/240x45	-	-
	4.5	Single	300x63	360x63	2/360x45	-	-
		Continuous	240x45	2/240x45	-	-	-
5.0	Single	360x45	400x63	-	-	-	
	Continuous	300x45	2/300x45	-	-	-	
2.0 kPa + 1.8 kN with Heavy Flooring + 10mm Plaster Ceiling (87 kg/m <sup>2</sup> )	1.5	Single	90x63	130x45	150x45	170x45	150x63
		Continuous	90x45	90x63	130x45	130x63	2/130x45
	2.0	Single	130x45	170x45	200x45	200x63	200x63
		Continuous	130x45	130x45	150x63	2/130x45	-
	2.5	Single	170x45	240x45	240x45	240x63	2/240x45
		Continuous	150x45	150x63	2/170x45	-	-
	3.0	Single	200x45	240x63	2/240x45	-	-
		Continuous	170x45	170x63	2/170x45	-	-
	3.5	Single	240x45	300x45	2/300x45	2/300x45	-
		Continuous	200x45	2/170x45	-	-	-
	4.0	Single	300x45	2/300x45	2/360x45	-	-
		Continuous	200x63	2/240x45	-	-	-
	4.5	Single	360x45	360x63	2/400x45	-	-
		Continuous	240x45	2/240x45	-	-	-
5.0	Single	400x45	2/400x45	-	-	-	
	Continuous	240x63	-	-	-	-	

Refer to page 25 for specification notes

# FLOOR BEARERS SUPPORTING ROOF LOADS



Where Bearers are required to support roof and wall loads additional dead loads need to be applied to the members. Common loads can be found in the following 2 tables.

Common Wall Framing Types and Weights

Roof Covering	Total Roof Weight
Sheet Metal Roofing	20 kg/m <sup>2</sup>
Concrete Tiles	60 kg/m <sup>2</sup>

Common Wall Framing Types and Weights

Wall Structure	External Cladding	Internal Lining	Total Wall Weight
90mm Pine Framing (7 kg/m <sup>2</sup> )	Brick Veneer	10mm Plaster (12 kg/m <sup>2</sup> )	19 kg/m <sup>2</sup>
	9.0mm Fibre Cement		35 kg/m <sup>2</sup>
	9.5mm Weathertex		30 kg/m <sup>2</sup>
	7.5mm Fibre Cement + Render		45 kg/m <sup>2</sup>
	75mm Foam Board + Render		35 kg/m <sup>2</sup>

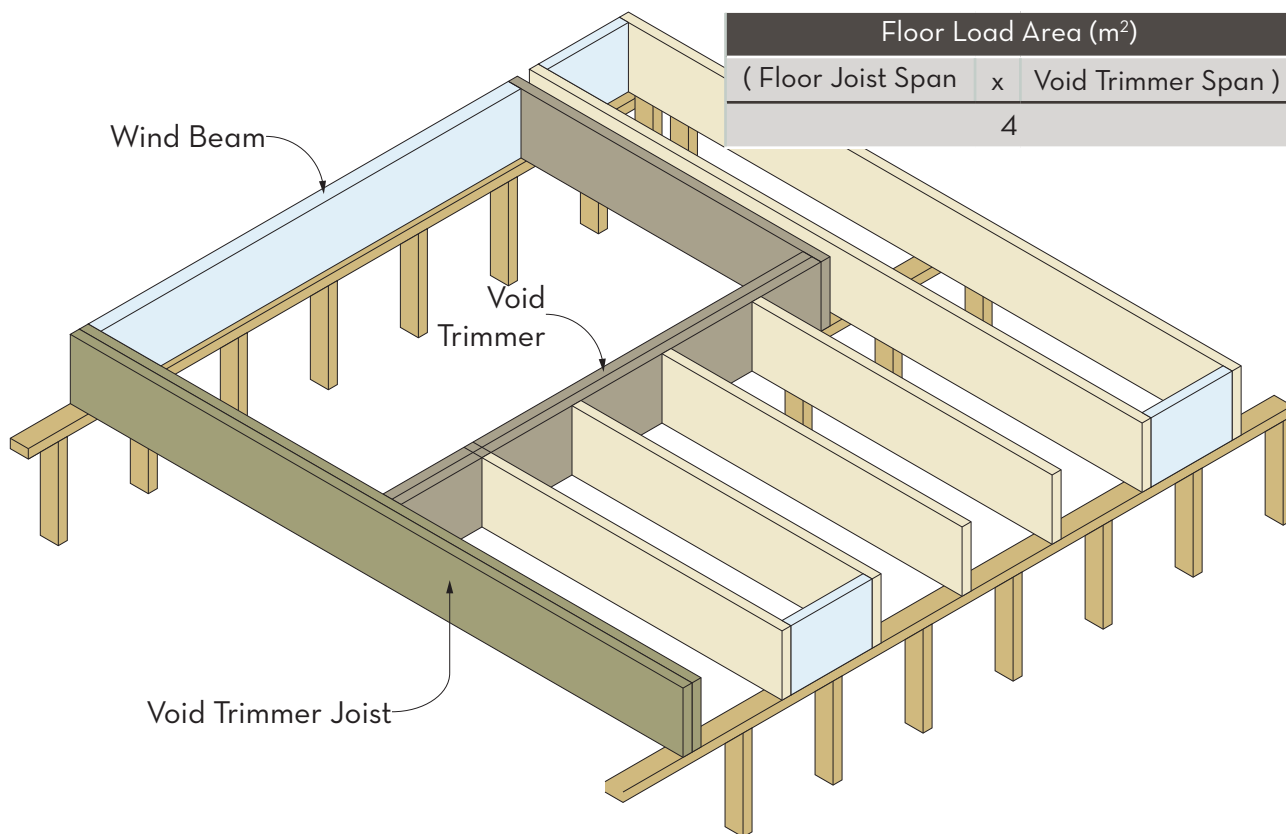


Floor Load Width (m)	Span (m)	Span Type	Roof Load Width (m)			
			1.5	3.0	4.5	6.0
1.5	1.5	Single	130x45	130x45	150x45	150x45
		Continuous	90x45	90x45	90x63	130x45
	2.0	Single	170x45	170x45	200x45	200x45
		Continuous	130x45	130x45	130x45	150x45
	2.5	Single	200x45	240x45	240x45	240x45
		Continuous	150x45	150x45	170x45	170x63
	3.0	Single	240x45	240x63	300x45	300x45
		Continuous	170x45	170x63	200x63	200x63
	3.5	Single	300x45	300x45	360x45	300x63
		Continuous	200x45	200x63	2/240x45	2/240x45
	4.0	Single	360x45	360x45	360x63	360x63
		Continuous	240x63	240x63	2/240x45	2/240x45
	4.5	Single	400x45	400x45	400x63	2/360x45
		Continuous	2/240x45	2/240x45	2/300x45	-
	5.0	Single	400x63	450x63	450x63	-
		Continuous	2/300x45	2/300x45	2/300x45	-
3.0	1.5	Single	150x45	150x45	150x45	170x45
		Continuous	130x45	130x45	130x45	130x45
	2.0	Single	200x45	200x45	200x45	240x45
		Continuous	150x45	130x63	130x63	150x63
	2.5	Single	240x45	240x45	240x63	240x63
		Continuous	150x63	170x63	2/170x45	2/170x45
	3.0	Single	240x63	2/240x45	300x63	300x63
		Continuous	2/170x45	2/170x45	-	-
	3.5	Single	300x63	300x63	2/300x45	2/300x45
		Continuous	2/240x45	-	-	-
	4.0	Single	360x63	2/360x45	2/360x45	2/360x45
		Continuous	2/240x45	-	-	-
	4.5	Single	2/360x45	2/360x45	2/400x45	2/400x45
		Continuous	-	-	-	-
	5.0	Single	2/400x45	-	-	-
		Continuous	-	-	-	-
4.5	1.5	Single	150x45	170x45	170x45	170x45
		Continuous	130x63	130x63	130x63	130x63
	2.0	Single	200x45	200x63	200x63	200x63
		Continuous	150x63	2/130x45	2/130x45	-
	2.5	Single	240x63	240x63	240x63	2/240x45
		Continuous	2/170x45	2/170x45	-	-
	3.0	Single	2/240x45	2/300x45	2/300x45	2/300x45
		Continuous	-	-	-	-
	3.5	Single	2/300x45	2/300x45	2/300x45	-
		Continuous	-	-	-	-
	4.0	Single	2/360x45	-	-	-
		Continuous	-	-	-	-

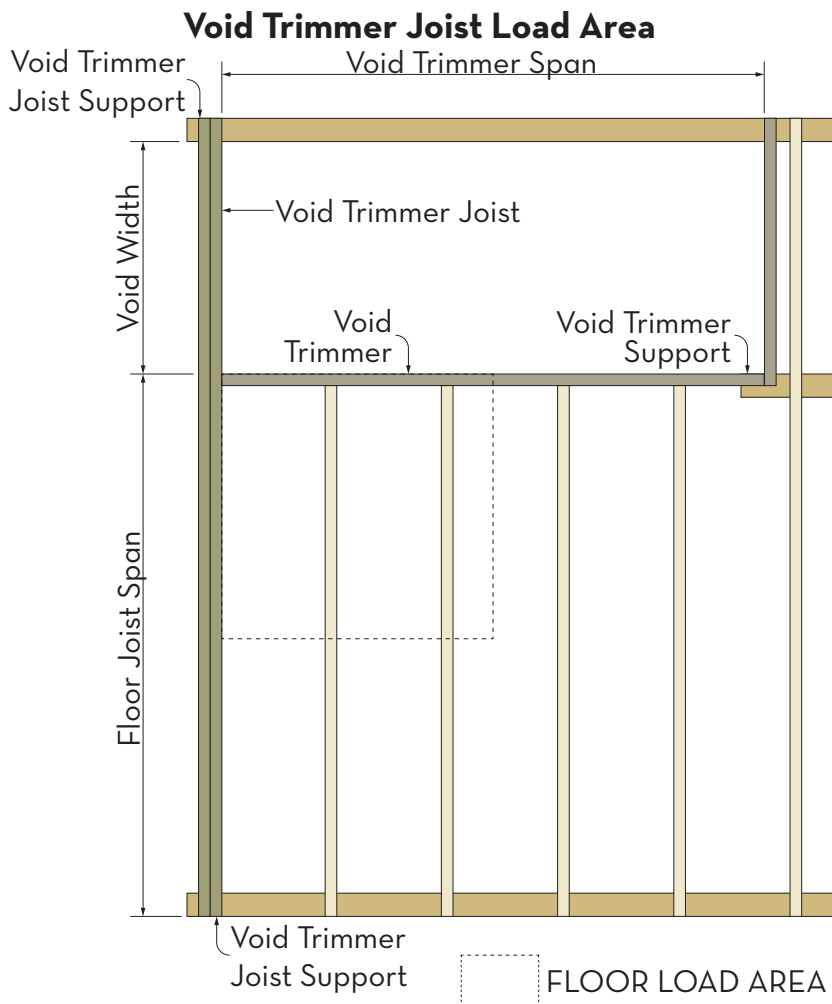
1.5 kPa + 1.8 kN with Particle Board Flooring + 10mm Plaster Ceiling (42 kg/m<sup>2</sup>)Concrete Tile Roof + 10mm Plaster (72 kg/m<sup>2</sup>)Wall Height up to 2.740m with Brick Veneer (19 kg/m<sup>2</sup>)

Floor Load Width (m)	Span (m)	Span Type	Roof Load Width (m)				
			1.5	3.0	4.5	6.0	
1.5	1.5	Single	130x45	150x45	150x45	170x45	
		Continuous	90x63	130x45	130x45	130x45	
	2.0	Single	170x45	200x45	200x45	240x45	
		Continuous	130x45	150x45	150x63	150x63	
	2.5	Single	240x45	240x45	240x63	240x63	
		Continuous	170x45	170x63	170x63	2/170x45	
	3.0	Single	240x63	300x45	300x63	300x63	
		Continuous	170x63	200x63	-	-	
	3.5	Single	300x45	300x63	2/300x45	2/300x45	
		Continuous	200x63	2/240x45	-	-	
	4.0	Single	360x45	360x63	2/360x45	2/360x45	
		Continuous	240x63	2/240x45	-	-	
	4.5	Single	400x45	400x63	2/400x45	-	
		Continuous	2/240x45	-	-	-	
	5.0	Single	450x63	-	-	-	
		Continuous	2/300x45	-	-	-	
3.0	1.5	Single	150x45	170x45	170x45	200x45	
		Continuous	130x45	130x45	130x63	130x63	
	2.0	Single	200x45	240x45	200x63	240x63	
		Continuous	130x63	150x63	150x63	-	
	2.5	Single	240x45	240x63	2/240x45	2/240x45	
		Continuous	170x63	2/170x45	2/170x45	-	
	3.0	Single	2/240x45	300x63	2/300x45	2/300x45	
		Continuous	2/170x45	-	-	-	
	3.5	Single	300x63	2/300x45	2/360x45	-	
		Continuous	-	-	-	-	
	4.0	Single	2/360x45	2/360x45	2/360x45	-	
		Continuous	-	-	-	-	
	4.5	Single	2/400x45	2/400x45	-	-	
		Continuous	-	-	-	-	
	4.5	1.5	Single	170x45	170x45	170x63	170x63
			Continuous	130x63	130x63	130x63	2/130x45
2.0		Single	200x63	200x63	240x63	2/240x45	
		Continuous	2/130x45	-	-	-	
2.5		Single	240x63	2/240x45	2/240x45	-	
		Continuous	2/170x45	-	-	-	
3.0		Single	2/300x45	2/300x45	2/300x45	-	
		Continuous	-	-	-	-	
3.5		Single	2/300x45	-	-	-	
		Continuous	-	-	-	-	

# VOID TRIMMER JOISTS



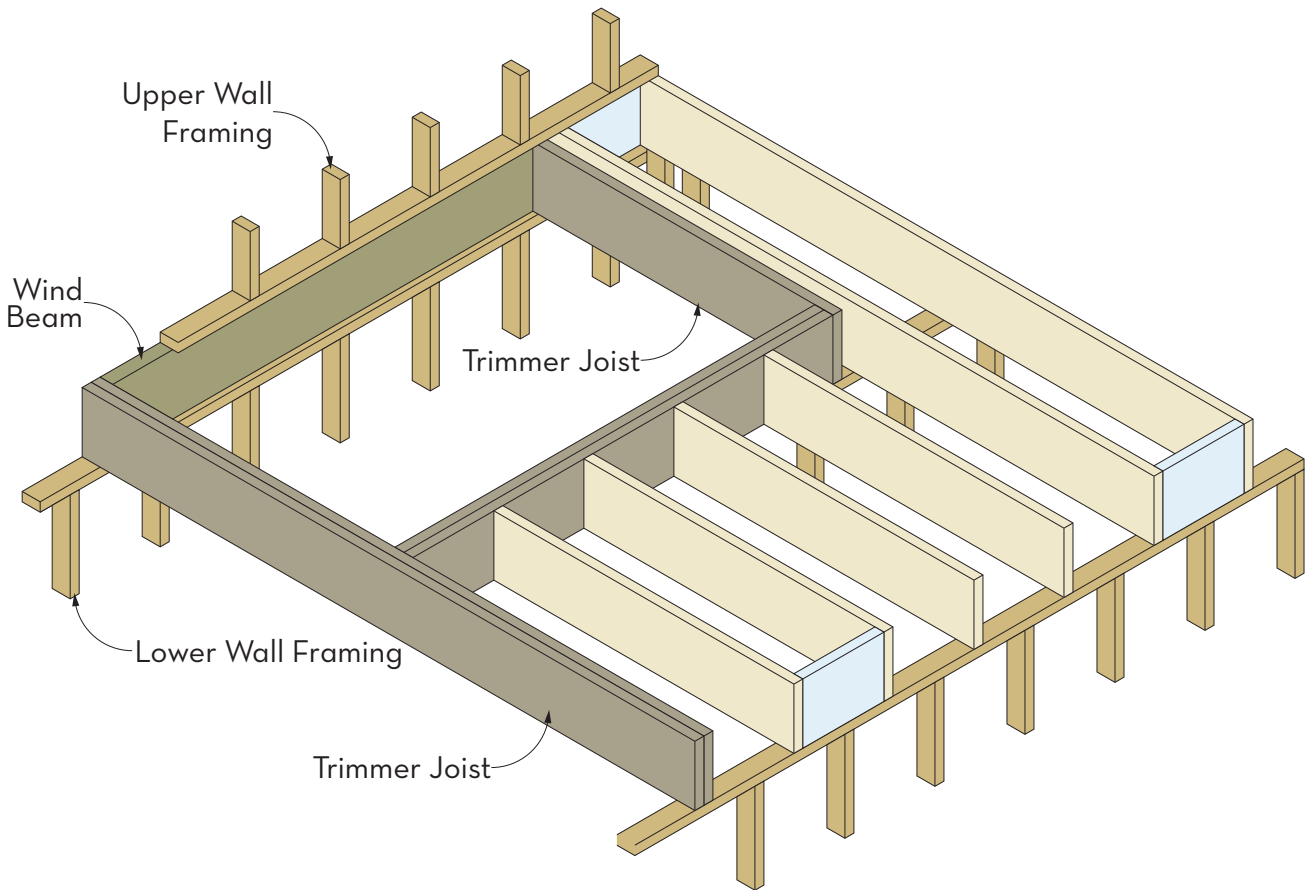
Void Trimmer Joists are members which run parallel to the floor joists and support 1 or 2 trimmers to frame out a void area. Void Trimmers connect to Void Trimmer Joists via a proprietary joist hanger or a designed screwed connection. It is not recommended to use cleats as bolts may protrude into the void causing issues with the plaster board lining.



	No. of Trimmers	Trimmer Span (m)	Floor Load Area (m <sup>2</sup> )				
			1.0	1.5	2.0	2.5	3.0
1.5 kPa + 1.8 kN Particle Board Flooring + 10mm Plaster Ceiling (42 kg/m <sup>2</sup> )	1	2.0	150x45	150x45	170x45	170x45	200x45
		2.5	170x45	200x45	200x45	240x45	240x45
		3.0	200x45	200x45	240x45	240x45	300x45
		3.5	240x45	240x45	300x45	300x45	300x45
		4.0	240x45	300x45	300x45	300x45	360x45
		4.5	300x45	300x45	360x45	360x45	360x45
		5.0	300x45	360x45	360x45	400x45	400x45
		5.5	360x45	360x45	400x45	400x63	400x63
	6.0	400x45	400x45	400x63	400x63	2/400x45	
	2	2.0	130x45	150x45	170x45	170x45	200x45
		2.5	170x45	200x45	200x45	200x45	240x45
		3.0	200x45	200x45	240x45	240x45	300x45
		3.5	240x45	240x45	300x45	300x45	300x45
		4.0	240x45	300x45	300x45	300x45	360x45
		4.5	300x45	300x45	360x45	360x45	360x45
		5.0	360x45	400x45	400x63	400x63	2/400x45
5.5		400x45	400x63	2/400x45	2/400x45	-	
1.5 kPa + 1.8 kN Heavy Flooring + 10mm Plaster Ceiling (87 kg/m <sup>2</sup> )	1	2.0	150x45	170x45	200x45	200x45	240x45
		2.5	200x45	200x45	240x45	240x45	240x45
		3.0	240x45	240x45	300x45	300x45	300x45
		3.5	240x45	300x45	300x45	300x45	360x45
		4.0	300x45	300x45	300x45	360x45	360x45
		4.5	300x45	360x45	360x45	360x45	400x45
		5.0	360x45	360x45	400x45	400x45	400x63
		5.5	360x45	400x45	400x63	400x63	2/400x45
	6.0	400x45	400x63	2/400x45	2/400x45	2/400x45	
	2	2.0	170x45	200x45	240x45	240x45	240x45
		2.5	240x45	240x45	300x45	300x45	300x45
		3.0	240x45	300x45	300x45	360x45	360x45
		3.5	300x45	300x45	360x45	360x45	400x45
		4.0	300x45	360x45	360x45	400x45	400x63
		4.5	360x45	400x45	400x45	400x63	400x63
		5.0	400x45	400x63	400x63	2/400x45	2/400x45
5.5		400x63	2/400x45	2/400x45	-	-	

#### Design Notes:

1. Minimum Void width assumed as 1.0m
2. Single Void Trimmer assumes the void opening to be positioned at one end of the Trimmer Joists span
3. Double Void Trimmer assumes the void opening to be positioned centrally in the Trimmer Joists Span.
4. Combine the supported Floor Load Area of both Void Trimmers to determine the correct loads per the above table



Wind Beams are horizontal members positioned in between the upper and lower wall frames where there is no floor framing, such as stair voids. The purpose of Wind Beams is to transfer the horizontal wall loads, directly or indirectly, back to the braced walls.

Vertical roof and wall loads above the Wind Beam are assumed to be transferred directly to the lower wall framing. Wind Beam designs do not consider these loads.

Allowable Horizontal Deflection of Wind Beams is the less of  $\text{Span}/200$  or 15mm. This may result in damage to brittle claddings or wall linings during extreme weather events.

Bottom Plate of Upper Frame and Top / Ribbon Plate of Lower Frame to be fixed to the Wind Beam at a maximum of 600mm centres.

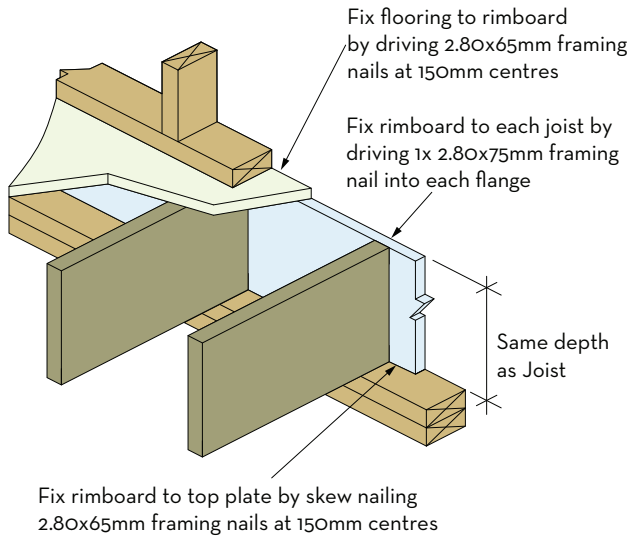
Wind Classification	Maximum Design Gust Wind Speed		
	Permissible Stress $V_p$	Servicability Limit State $V_s$	Ultimate Limit State $V_u$
N2	W22N	26	40
N3	W41N	32	50
C2	W50C	39	61
C3	W60C	47	74

	Frame Height		Wind Cat.	Beam Width			
	Lower	Upper		45mm	63mm	75mm	
240mm Beam Height	2440	2440	N2	2000	2800	3400	
			N3	1700	2500	2900	
		2590	N2	2000	2800	3300	
			N3	1700	2400	2900	
		2740	N2	2000	2800	3300	
			N3	1700	2400	2900	
		2590	2440	N2	2000	2800	3300
				N3	1700	2400	2900
	2590		N2	2000	2800	3300	
			N3	1700	2400	2900	
	2740		N2	1900	2700	3300	
			N3	1700	2400	2900	
	2740	2440	N2	2000	2800	3300	
			N3	1700	2400	2900	
		2590	N2	1900	2800	3300	
			N3	1700	2400	2900	
		2740	N2	1900	2700	3300	
			N3	1700	2400	2800	
		3050	2440	N2	1900	2700	3300
				N3	1700	2400	2800
2590	N2		1900	2700	3200		
	N3		1700	2300	2800		
2740	N2		1900	2700	3200		
	N3		1600	2300	2800		
300mm Beam Height	2440	2440	N2	2100	3000	3600	
			N3	1900	2600	3100	
		2590	N2	2100	3000	3600	
			N3	1800	2600	3100	
		2740	N2	2100	2900	3500	
			N3	1800	2600	3100	
		2590	2440	N2	2100	3000	3600
				N3	1800	2600	3100
	2590		N2	2100	2900	3500	
			N3	1800	2600	3100	
	2740		N2	2100	2900	3500	
			N3	1800	2600	3100	
	2740	2440	N2	2100	2900	3500	
			N3	1800	2600	3100	
		2590	N2	2100	2900	3500	
			N3	1800	2600	3100	
		2740	N2	2100	2900	3500	
			N3	1800	2500	3000	
		3050	2440	N2	2100	2900	3500
				N3	1800	2500	3000
2590	N2		2100	2900	3500		
	N3		1800	2500	3000		
2740	N2		2000	2900	3400		
	N3		1800	2500	3000		

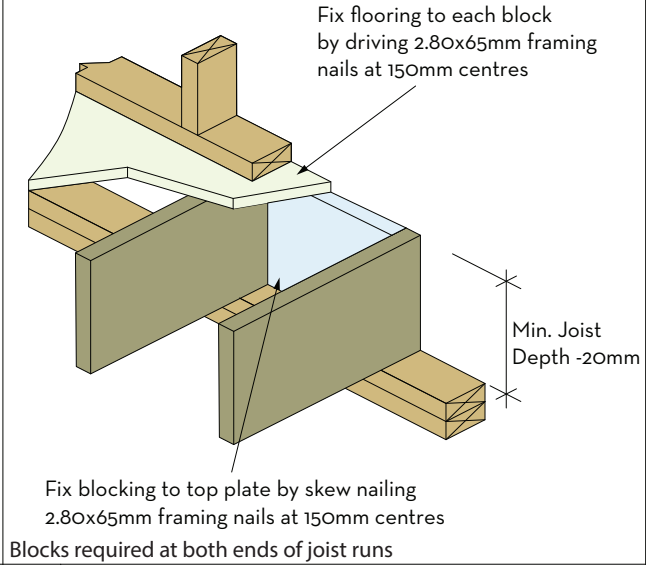
	Frame Height		Wind Cat.	Beam Width			
	Lower	Upper		45mm	63mm	75mm	
360mm Beam Height	2440	2440	N2	2300	3200	-	
			N3	2000	2800	-	
		2590	2590	N2	2200	3200	-
				N3	2000	2800	-
		2740	2740	N2	2200	3100	-
				N3	1900	2700	-
	2590	2440	N2	2200	3200	-	
			N3	2000	2800	-	
		2590	2590	N2	2200	3100	-
				N3	1900	2700	-
		2740	2740	N2	2200	3100	-
				N3	1900	2700	-
	2740	2440	N2	2200	3100	-	
			N3	1900	2700	-	
		2590	2590	N2	2200	3100	-
				N3	1900	2700	-
		2740	2740	N2	2200	3100	-
				N3	1900	2700	-
	3050	2440	N2	2200	3100	-	
			N3	1900	2700	-	
2590		2590	N2	2200	3100	-	
			N3	1900	2700	-	
2740		2740	N2	2100	3000	-	
			N3	1900	2600	-	
400mm Beam Height	2440	2440	N2	2300	3300	3900	
			N3	2000	2900	3400	
		2590	2590	N2	2300	3300	3900
				N3	2000	2800	3400
		2740	2740	N2	2300	3200	3900
				N3	2000	2800	3400
	2590	2440	N2	2200	3300	3900	
			N3	2000	2800	3400	
		2590	2590	N2	2300	3200	3900
				N3	2000	2800	3400
		2740	2740	N2	2300	3200	3800
				N3	2000	2800	3300
	2740	2440	N2	2300	3200	3900	
			N3	2000	2800	3400	
		2590	2590	N2	2300	3200	3800
				N3	2000	2800	3300
		2740	2740	N2	2300	3200	3800
				N3	2000	2800	3300
	3050	2440	N2	2300	3200	3800	
			N3	2000	2800	3300	
		2590	2590	N2	2200	3100	3700
				N3	1900	2700	3300
		2740	2740	N2	2200	3100	3700
				N3	1900	2700	3200

Refer to page 25 for specification notes

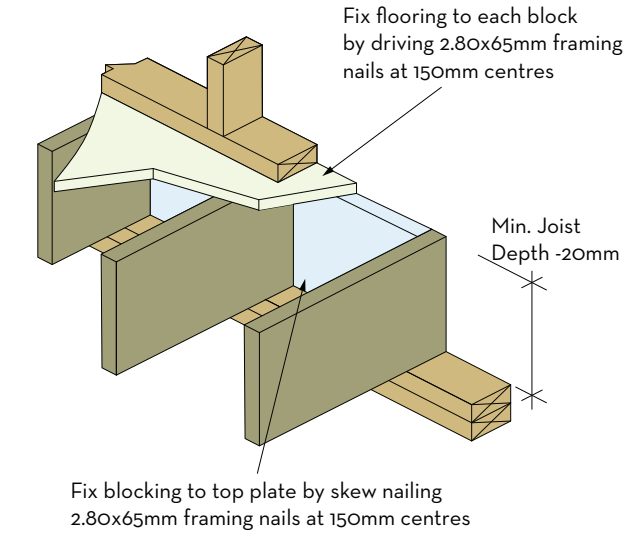
**A2 LVL OR PLYWOOD RIMBOARD**



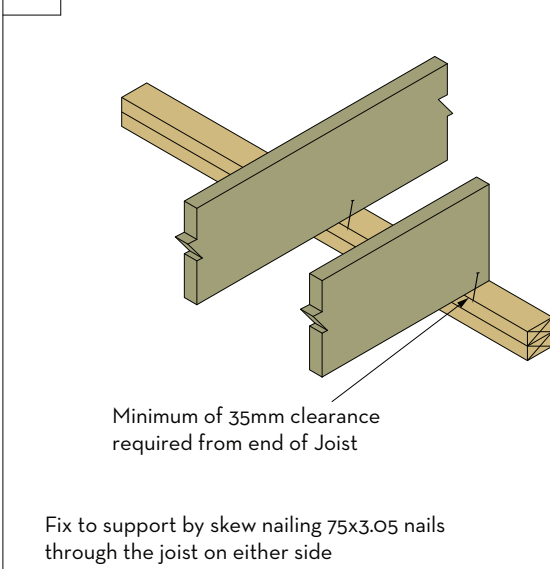
**A4 BLOCKING OVER SUPPORT  
1 BLOCK AT 1800MM CENTRES**



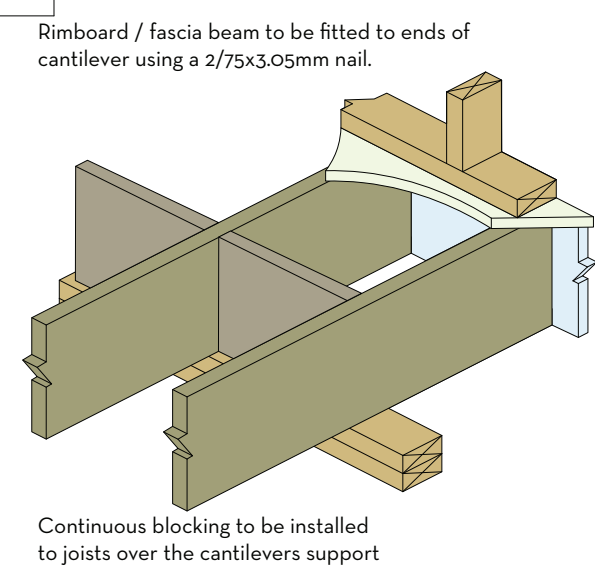
**A6 CONTINUOUS BLOCKING  
OVER SUPPORTS**



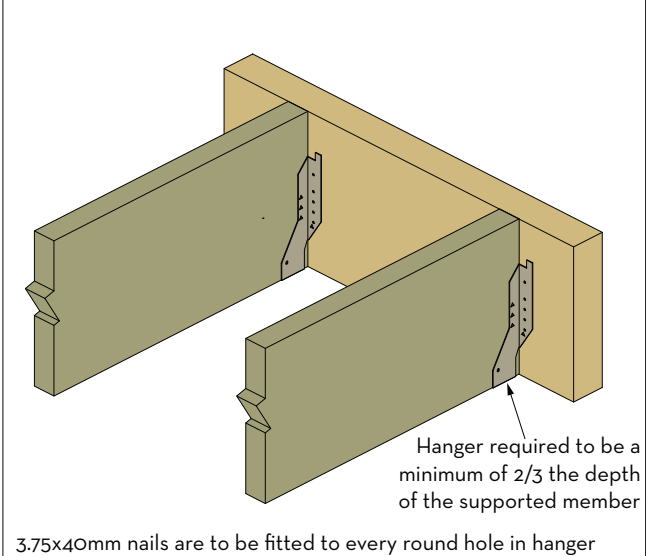
**B2 SUPPORT NAILING**



**C2 STANDARD CANTILEVER**



**E1 FACE MOUNT HANGER  
JOIST TO TIMBER CONNECTION**



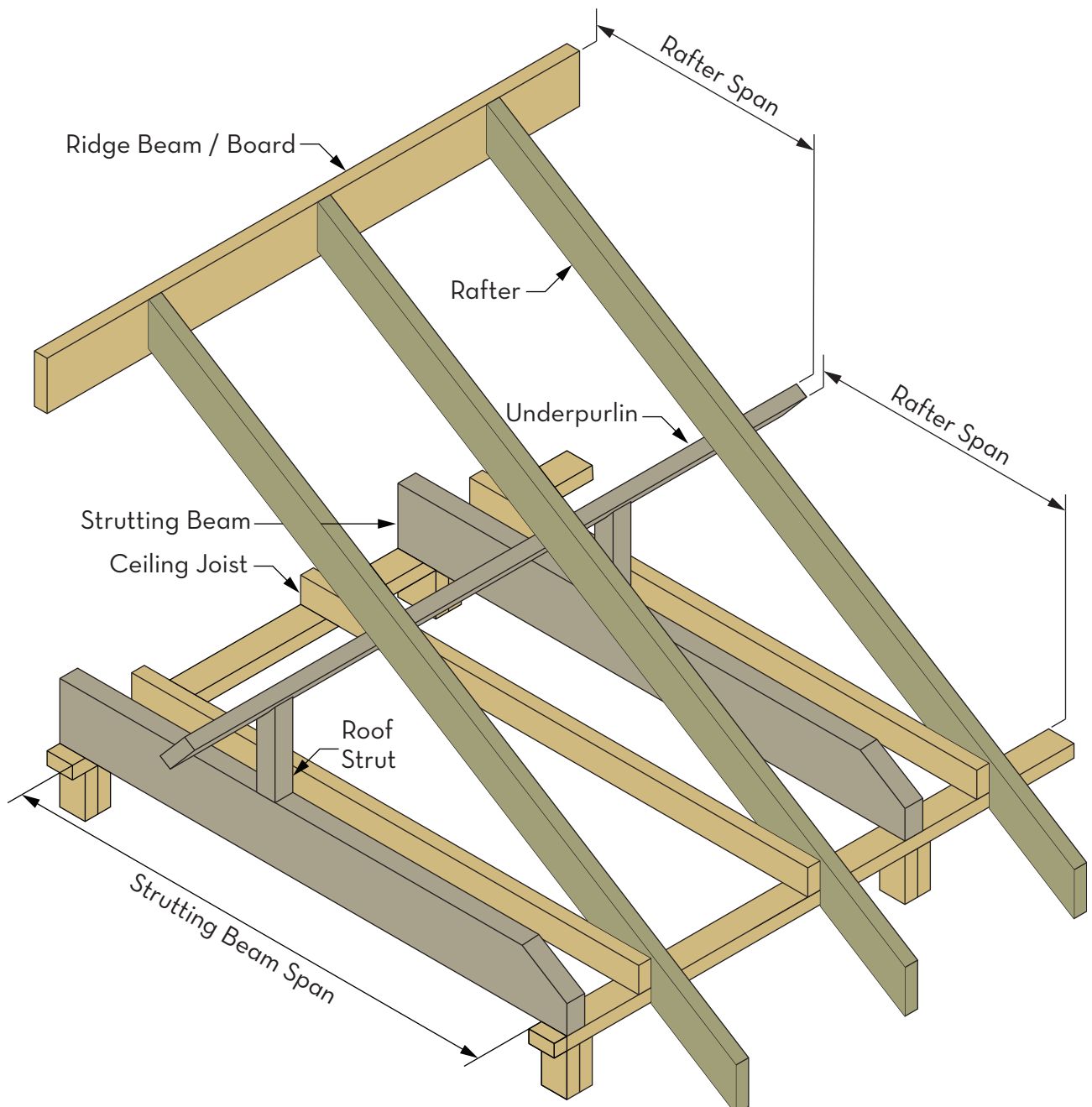


## Guide Notes - Floor Framing

1. Refer to page 3 of this guide to check product availability in your area
2. Refer to page 9 of this guide for span and span type definitions
3. Floor joist centres should be selected as such to obtain adequate support for flooring / floor sheeting
4. Refer to page 9 for common floor covering types and their required joist centres
5. Floor framing members are to be installed per AS1684.2, AS1684.3 and good building practice
6. Flooring to be installed per AS1684.2 and AS1684.3. Particle board flooring to be installed per AS1860.2
7. Member size specified based on serviceability criteria outlined in AS170.3 Tables 4.1.3.4 & 4.2.3.5
8. Members shown in darker shaded cells analysed using Category 2 conditions
9. Floor Trimmer / Bearer details shown are based on the floor joists supported continuously over
10. Where members are supporting roof loads a maximum roof pitch of 35 degrees has been accounted for in calculations
11. Where members are supporting roof loads an N3 wind load has been applied
12. Void Trimmer Joists Minimum Void width assumed as 1.0m
13. Single Void Trimmer assumes the void opening to be positioned at one end of the Trimmer Joists span
14. Floor Trimmer Joist supporting 2 Void Trimmers assumes the void opening to be positioned centrally in the Trimmer Joists Span.
15. Combine the supported Floor Load Area of both Void Trimmers to determine the correct loads per the table on page 26
16. Member sizes nominated are based on the product being fully protected from moisture and maintains an average moisture content of 15% or less, over a period of 12 months i.e.  $K_4 = 1.0$  per AS1720.1 clause 2.4.2.3.
17. Member sizes nominated are based on construction in coastal areas south of latitude  $25^\circ$  and south of latitude  $16^\circ$  in all other areas i.e.  $k_6 = 1.0$  per AS1720.1 clause 2.4.3
18. Information in the guide is to be used for Metsa Kerto S-beam LVL only

Refer to page 45 for Product Storage & Handling requirements

# ROOF RAFTERS



Rafters are members positioned parallel to each other designed to support and fix the roof covering. Rafters may also be designed to support the ceiling for cathedral type roofs.

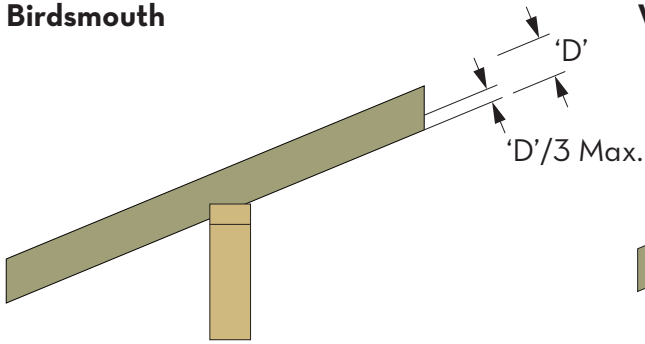
Considerations for rafter centres should include; performance of the rafter, the span of roof battens and the plasterboard or ceiling joists.

Rafters are to be fixed and tied-down at all supports to accommodate any uplift generated by wind loads. Rafters are to be supplied in a single length or joined over a support.

Roof Types and Weights	
Roof Covering	Total Roof Weight
Sheet Metal Roofing	20 kg/m <sup>2</sup>
Concrete Tiles	60 kg/m <sup>2</sup>
Terra Cotta Tiles	70 kg/m <sup>2</sup>

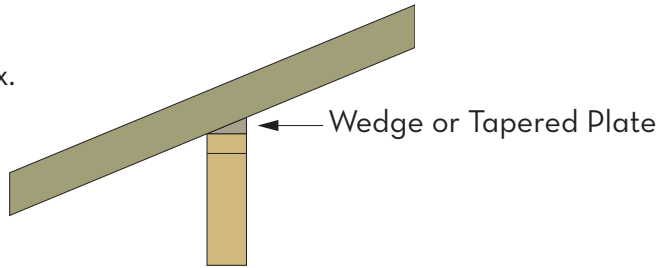
## Rafter Support Types

### Birdsmouth



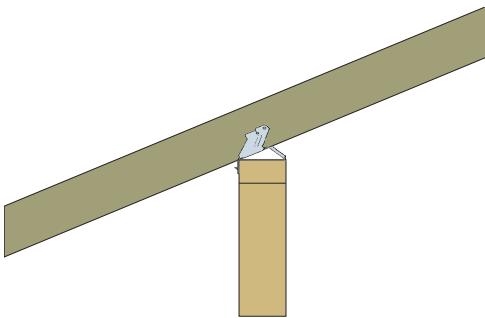
Maximum allowable birds-mouth to be no greater than 1/3 the rafter depth

### Wedge or Tapered Plate



Edges to be fixed down to the support without any splitting. Tie-down the rafters directly to supports

### Simpson Strong-Tie VPA Connector

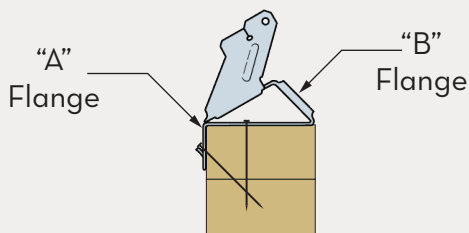


VPA25 - Supporting 45mm Spec Beam Rafter			
Fixings		Max. Loads	
To Support	8x 75x3.75 Nails	Uplift	Dead
To Supported Member	2x 40x3.75 Nails	1.58 kN	2.88 kN

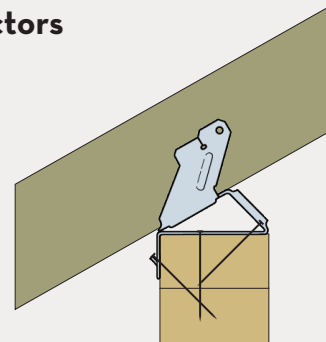
Simpson Strong-Tie VPA connector with additional tie-down to rafters as required. 1.58 kN maximum tie-down supplied by VPA connector.

Capacities shown apply to the VPA being fixed to a plate with a minimum joint group of JD4 using all connections as indicated in the table above.

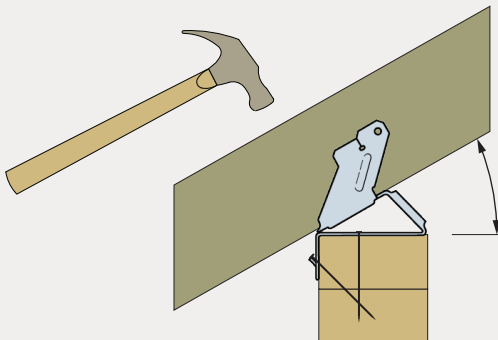
### Installation of VPA Connectors



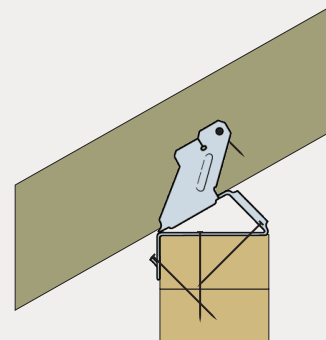
Step 1: Install top and face 3.75x75 nails in the "A" flange to outside wall top plate



Step 2: Seat rafter with a hammer, adjusting the "B" flange to the required pitch



Step 3: Install "B" flange 3.75x75 nails in the round nail holes, locking the pitch



Step 4: Install 3.75x30 nails into face of rafter both sides

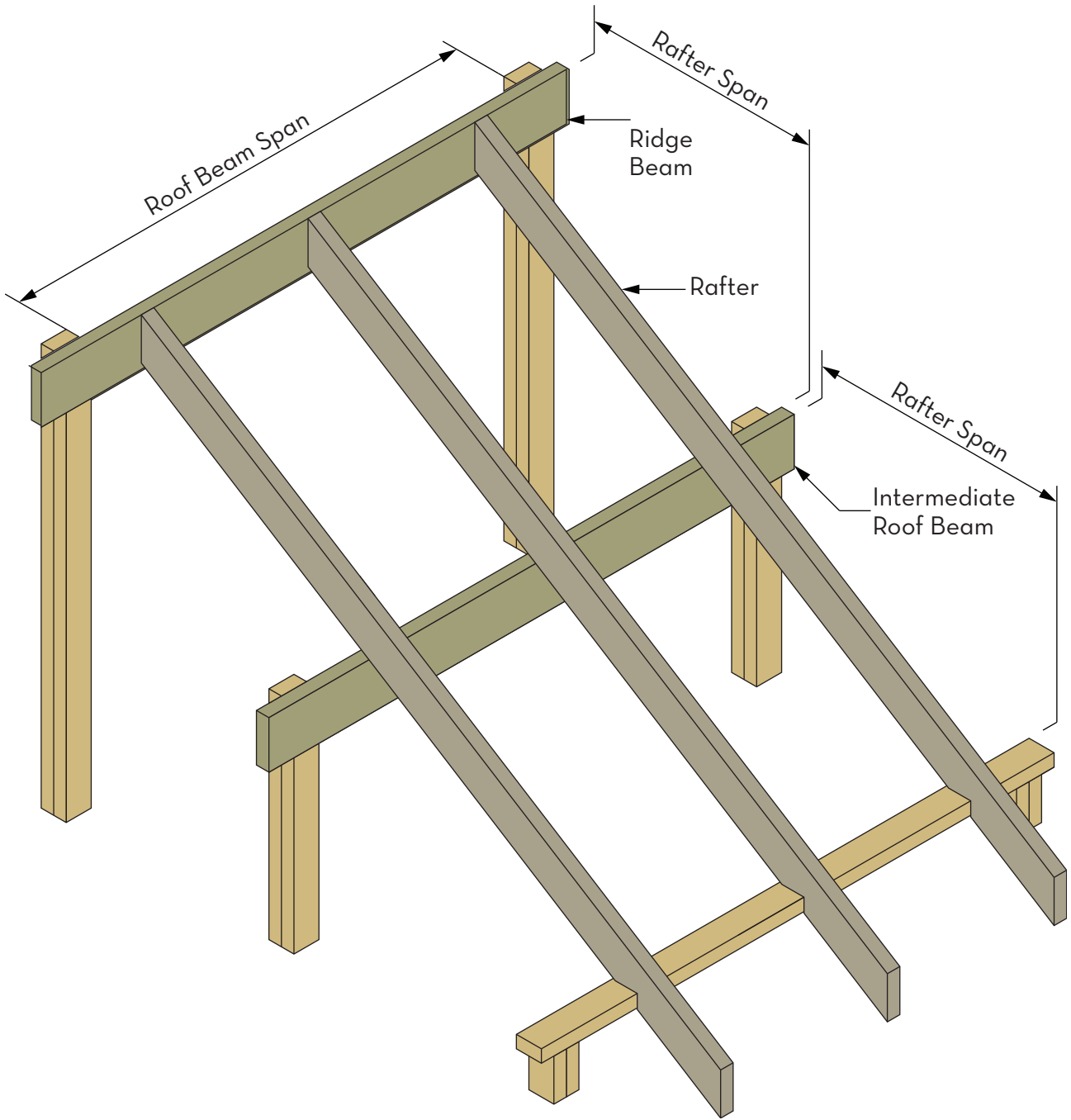
	Span (m)	Span Type	Section Depth (mm)			
			Rafter Centres (mm)			
			300	450	600	900
N3 Wind Category Sheet Metal Roofing with 10mm Plaster Board Ceiling <35°	2.5	Single	90x45	90x45	130x45	130x45
		Continuous	90x45	90x45	90x45	90x45
	3.0	Single	90x45	130x45	130x45	130x45
		Continuous	90x45	90x45	90x45	130x45
	3.5	Single	130x45	130x45	130x45	150x45
		Continuous	90x45	90x45	130x45	130x45
	4.0	Single	130x45	150x45	150x45	170x45
		Continuous	90x45	130x45	130x45	130x45
	4.5	Single	150x45	170x45	170x45	200x45
		Continuous	130x45	130x45	130x45	150x45
	5.0	Single	170x45	200x45	200x45	240x45
		Continuous	130x45	130x45	150x45	170x45
	5.5	Single	200x45	240x45	240x45	300x45
		Continuous	130x45	150x45	170x45	200x45
	6.0	Single	240x45	240x45	300x45	300x45
		Continuous	150x45	170x45	200x45	200x45
	6.5	Single	240x45	300x45	300x45	360x45
		Continuous	170x45	200x45	200x45	240x45
7.0	Single	240x63	300x63	300x63	360x63	
	Continuous	200x45	240x45	240x45	300x45	
7.5	Single	300x45	360x45	360x45	400x45	
	Continuous	240x45	240x45	300x45	300x45	
N3 Wind Category Concrete Roof Tiles with 10mm Plaster Board Ceiling <35°	2.5	Single	130x45	130x45	130x45	150x45
		Continuous	90x45	90x45	90x45	130x45
	3.0	Single	130x45	130x45	150x45	170x45
		Continuous	90x45	130x45	130x45	130x45
	3.5	Single	150x45	170x45	170x45	200x45
		Continuous	130x45	130x45	130x45	150x45
	4.0	Single	170x45	200x45	200x45	240x45
		Continuous	130x45	130x45	150x45	170x45
	4.5	Single	200x45	200x45	240x45	300x45
		Continuous	130x45	150x45	170x45	200x45
	5.0	Single	200x45	240x45	300x45	300x45
		Continuous	150x45	170x45	200x45	200x45
	5.5	Single	240x45	300x45	300x45	360x45
		Continuous	170x45	200x45	240x45	240x45
	6.0	Single	300x45	300x45	360x45	360x45
		Continuous	200x45	240x45	240x45	300x45
	6.5	Single	300x45	360x45	360x45	400x45
		Continuous	240x45	240x45	300x45	300x45
7.0	Single	300x63	360x63	360x63	400x63	
	Continuous	240x45	300x45	300x45	360x45	
7.5	Single	360x45	400x45	-	-	
	Continuous	300x45	300x45	-	360x45	

Span (m)	Span Type	Section Depth (mm)			
		Rafter Centres (mm)			
		300	450	600	900
2.5	Single	130x45	130x45	130x45	150x45
	Continuous	90x45	90x45	90x45	130x45
3.0	Single	130x45	150x45	150x45	170x45
	Continuous	90x45	130x45	130x45	130x45
3.5	Single	150x45	170x45	200x45	200x45
	Continuous	130x45	130x45	130x45	150x45
4.0	Single	170x45	200x45	200x45	240x45
	Continuous	130x45	150x45	150x45	170x45
4.5	Single	200x45	240x45	240x45	300x45
	Continuous	150x45	150x45	170x45	200x45
5.0	Single	240x45	240x45	300x45	300x45
	Continuous	150x45	170x45	200x45	240x45
5.5	Single	240x45	300x45	300x45	360x45
	Continuous	170x45	200x45	240x45	240x45
6.0	Single	300x45	300x45	360x45	400x45
	Continuous	200x45	240x45	240x45	300x45
6.5	Single	300x45	360x45	400x45	-
	Continuous	240x45	300x45	300x45	300x45
7.0	Single	360x63	360x63	400x63	450x63
	Continuous	240x45	300x45	300x45	360x45
7.5	Single	400x45	-	-	-
	Continuous	300x45	300x45	-	-

N3 Wind Category

Terra Cotta Roof Tiles with 10mm Plaster Board Ceiling &lt;math&gt;\le 35^\circ&lt;/math&gt;

# ROOF BEAMS



Roof Beams are members designed to support Rafters. Rafters may be supported by butting into the face of Roof Beams or supported over Roof Beams. Roof Beams can be designed to transfer either just roof or roof and ceiling loads supported by the rafters.

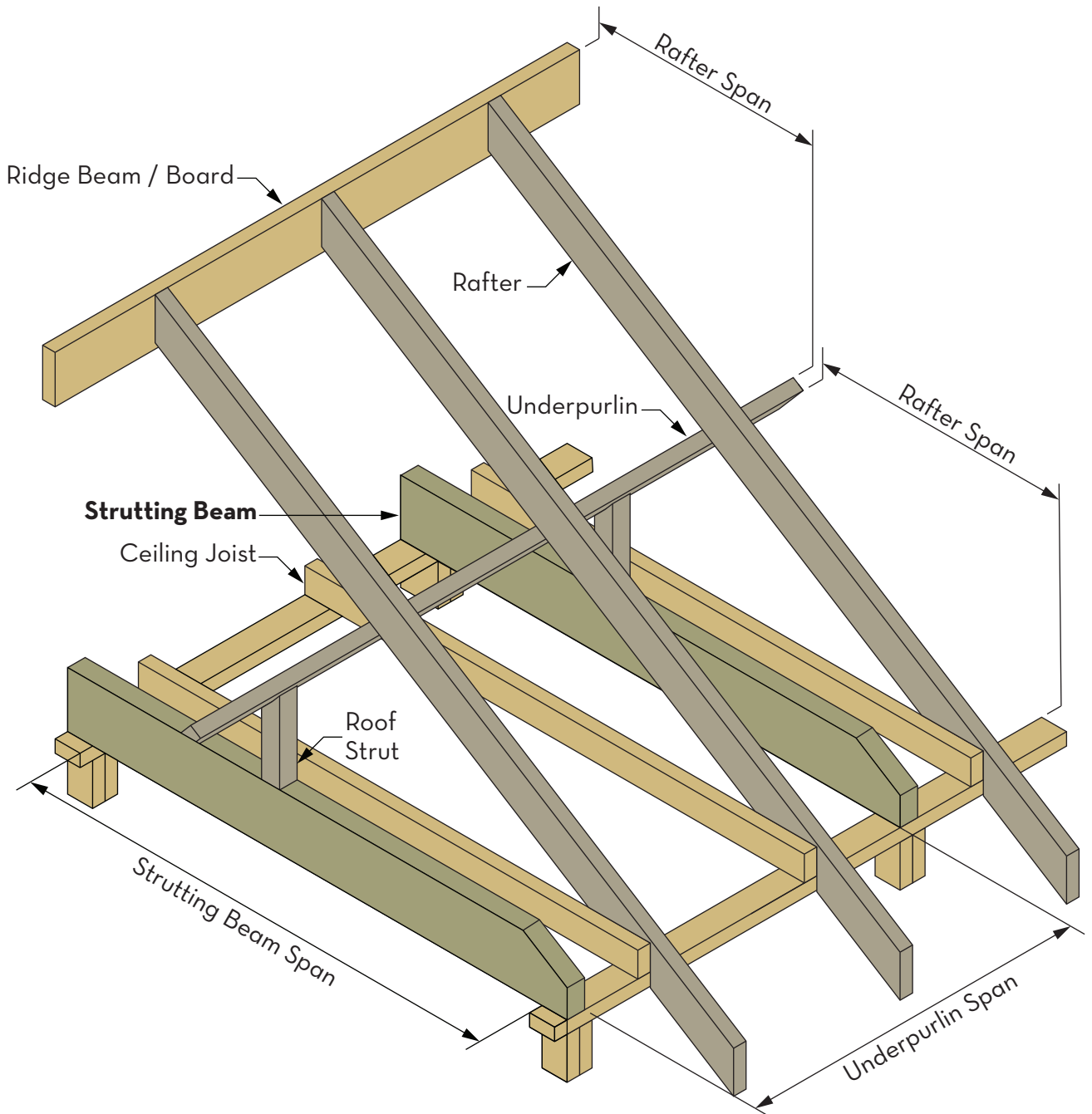
Care should be taken to ensure the correct supports are applied to each Roof Beam support and that sufficient tie-downs have been applied. Refer to Australian Standard AS1684 for more information.

Required Bearing at Roof Beam Supports			
End Support		Intermediate Support	
Length	30mm	Length	60mm
Width	Width of Beam	Width	Width of Beam

	Span (m)	Span Type	Section Size (mm)				
			Roof Load Width (m)				
			2.0	3.0	4.0	5.0	6.0
N3 Wind Category - Sheet Metal Roofing with 10mm Plaster Board Ceiling <35°	1.5	Single	90x45	90x45	130x45	130x45	130x45
		Continuous	90x45	90x45	90x45	90x45	90x45
	2.0	Single	2/90x45	130x45	150x45	150x45	170x45
		Continuous	90x45	90x45	90x63	130x45	130x45
	2.5	Single	130x45	170x45	170x45	200x45	200x45
		Continuous	90x63	130x45	130x45	130x63	150x63
	3.0	Single	170x45	200x45	200x63	240x45	240x63
		Continuous	130x45	150x45	150x45	150x63	2/170x45
	3.5	Single	200x45	240x45	240x45	240x63	2/240x45
		Continuous	150x45	170x45	170x63	170x63	2/170x45
	4.0	Single	200x63	240x63	300x45	2/240x45	2/300x45
		Continuous	170x45	170x63	200x63	-	-
	4.5	Single	240x45	300x45	300x63	300x63	2/300x45
		Continuous	170x63	200x45	2/240x45	-	-
5.0	Single	240x63	360x45	360x63	2/300x45	2/360x45	
	Continuous	200x45	200x63	2/240x45	-	-	
N3 Wind Category - Concrete Roof Tiles with 10mm Plaster Board Ceiling <35°	1.5	Single	130x45	130x45	130x45	150x45	150x45
		Continuous	90x45	90x45	90x63	2/90x45	2/90x45
	2.0	Single	150x45	170x45	170x45	200x45	200x63
		Continuous	90x63	130x45	130x45	130x63	2/130x45
	2.5	Single	170x45	200x45	240x45	240x63	2/240x45
		Continuous	130x45	150x45	150x63	2/170x45	-
	3.0	Single	200x45	240x45	240x63	2/240x45	2/240x45
		Continuous	150x45	170x63	2/170x45	2/170x45	-
	3.5	Single	240x45	240x63	300x63	2/300x45	-
		Continuous	170x63	200x63	-	-	-
	4.0	Single	240x63	300x63	2/300x45	2/300x45	-
		Continuous	200x45	2/240x45	-	-	-
	4.5	Single	300x45	2/300x45	2/360x45	-	-
		Continuous	200x63	2/240x45	-	-	-
5.0	Single	360x45	360x63	2/360x45	-	-	
	Continuous	240x63	2/240x45	-	-	-	
N3 Wind Category - Terra Cotta Roof Tiles with 10mm Plaster Board Ceiling <35°	1.5	Single	130x45	130x45	150x45	150x45	170x45
		Continuous	90x45	90x45	90x63	2/90x45	2/90x45
	2.0	Single	150x45	170x45	200x45	200x63	200x63
		Continuous	2/90x45	130x45	130x63	130x63	2/130x45
	2.5	Single	200x45	200x45	200x63	2/240x45	2/240x45
		Continuous	130x45	150x45	150x63	-	-
	3.0	Single	240x45	240x45	240x63	2/240x45	-
		Continuous	170x45	170x63	2/170x45	-	-
	3.5	Single	240x63	2/240x45	2/300x45	-	-
		Continuous	170x63	2/170x45	-	-	-
	4.0	Single	300x45	300x63	2/300x45	-	-
		Continuous	200x63	-	-	-	-
	4.5	Single	300x63	2/300x45	-	-	-
		Continuous	240x63	-	-	-	-
5.0	Single	2/300x45	-	-	-	-	
	Continuous	240x63	-	-	-	-	

Refer to page 45 for specification notes

# STRUTTING BEAMS



Strutting beams run parallel to ceiling joists and are design to take a point load from a Roof Strut supporting an Underpurlin. The supported Underpurlin will be supporting overlying Rafters. The span of the Strutting Beams shown in the span table have been determined by supporting the Underpurlin in the worst case scenario.

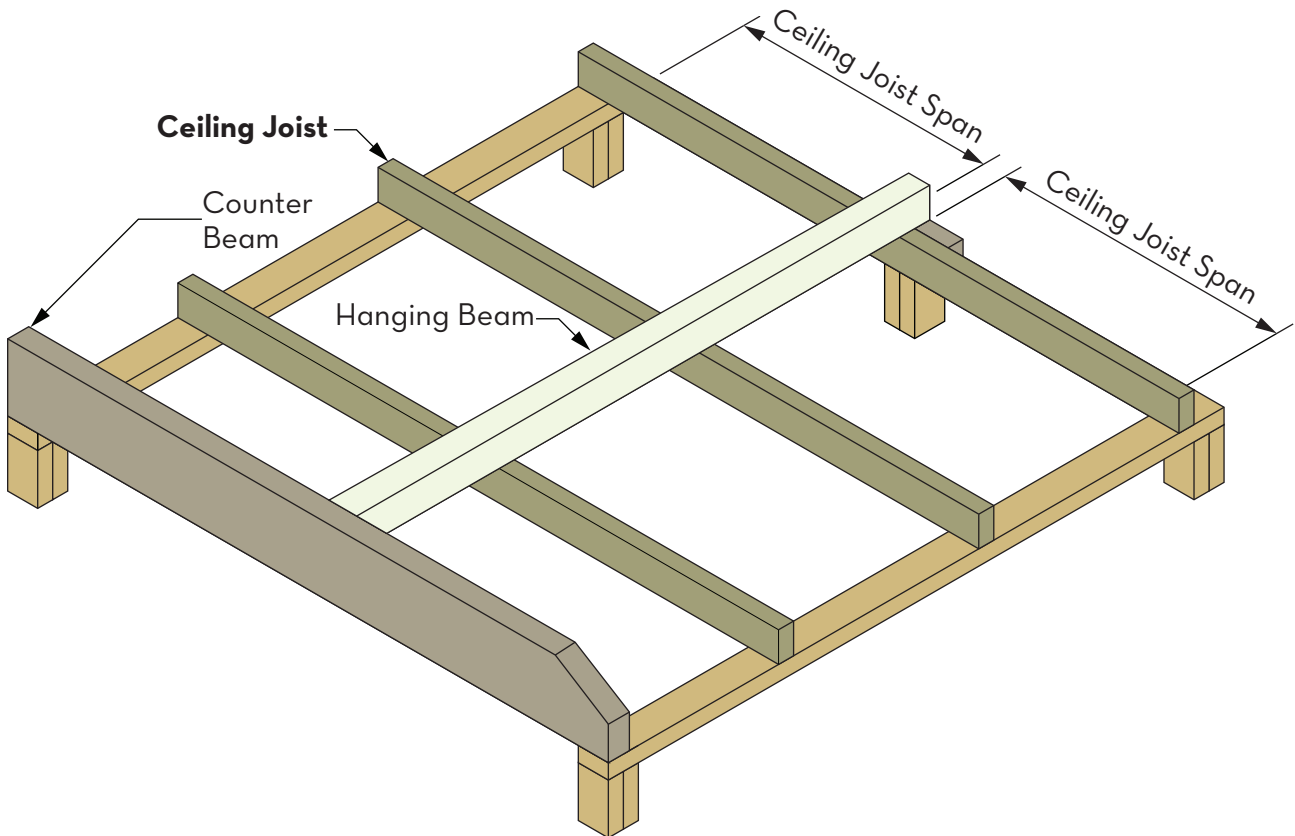
Strutting Beams support roof loads only via the Roof Strut. Where a point load is applied by a Hanging Beam these must be designed as a Strutting Hanging Beam. It is not recommended to fix the underlying plaster board ceiling to the Strutting Beam as this may result in a 'shadow line' being created through a variation in deflection between the Strutting Beam and the Ceiling Joists.





	Strutting Beam Span (m)	Span Type	Section Depth (mm)				
			Roof Load Area (m <sup>2</sup> )				
			2.0	4.0	6.0	8.0	10.0
N3 Wind Category Sheet Metal Roofing with 10mm Plaster Board Ceiling <35°	2.0	Single	90x63	130x63	130x63	130x63	150x63
	2.5	Single	90x63	130x63	130x63	150x63	170x63
	3.0	Single	130x63	130x63	150x63	170x63	200x63
	3.5	Single	130x63	150x63	170x63	200x63	240x63
	4.0	Single	130x63	150x63	170x63	240x63	300x63
	4.5	Single	150x63	170x63	200x63	300x63	360x63
	5.0	Single	150x63	200x63	240x63	300x63	400x63
	5.5	Single	170x63	200x63	300x63	400x63	-
	6.0	Single	170x63	240x63	360x63	-	-
N3 Wind Category Concrete Roof Tiles with 10mm Plaster Board Ceiling <35°	2.0	Single	130x63	150x63	170x63	170x63	200x63
	2.5	Single	130x63	170x63	200x63	200x63	240x63
	3.0	Single	150x63	200x63	200x63	240x63	240x63
	3.5	Single	170x63	200x63	240x63	240x63	300x63
	4.0	Single	170x63	240x63	240x63	300x63	400x63
	4.5	Single	200x63	240x63	300x63	400x63	-
	5.0	Single	200x63	300x63	360x63	-	-
	5.5	Single	240x63	300x63	-	-	-
	6.0	Single	240x63	360x63			
N3 Wind Category Terra Cotta Roof Tiles with 10mm Plaster Board Ceiling <35°	2.0	Single	130x63	150x63	170x63	200x63	200x63
	2.5	Single	130x63	170x63	200x63	240x63	240x63
	3.0	Single	150x63	200x63	240x63	240x63	300x63
	3.5	Single	170x63	200x63	240x63	300x63	360x63
	4.0	Single	200x63	240x63	300x63	360x63	450x63
	4.5	Single	200x63	240x63	360x63	-	-
	5.0	Single	240x63	300x63	450x63	-	-
	5.5	Single	240x63	360x63	-	-	-

# CEILING JOISTS



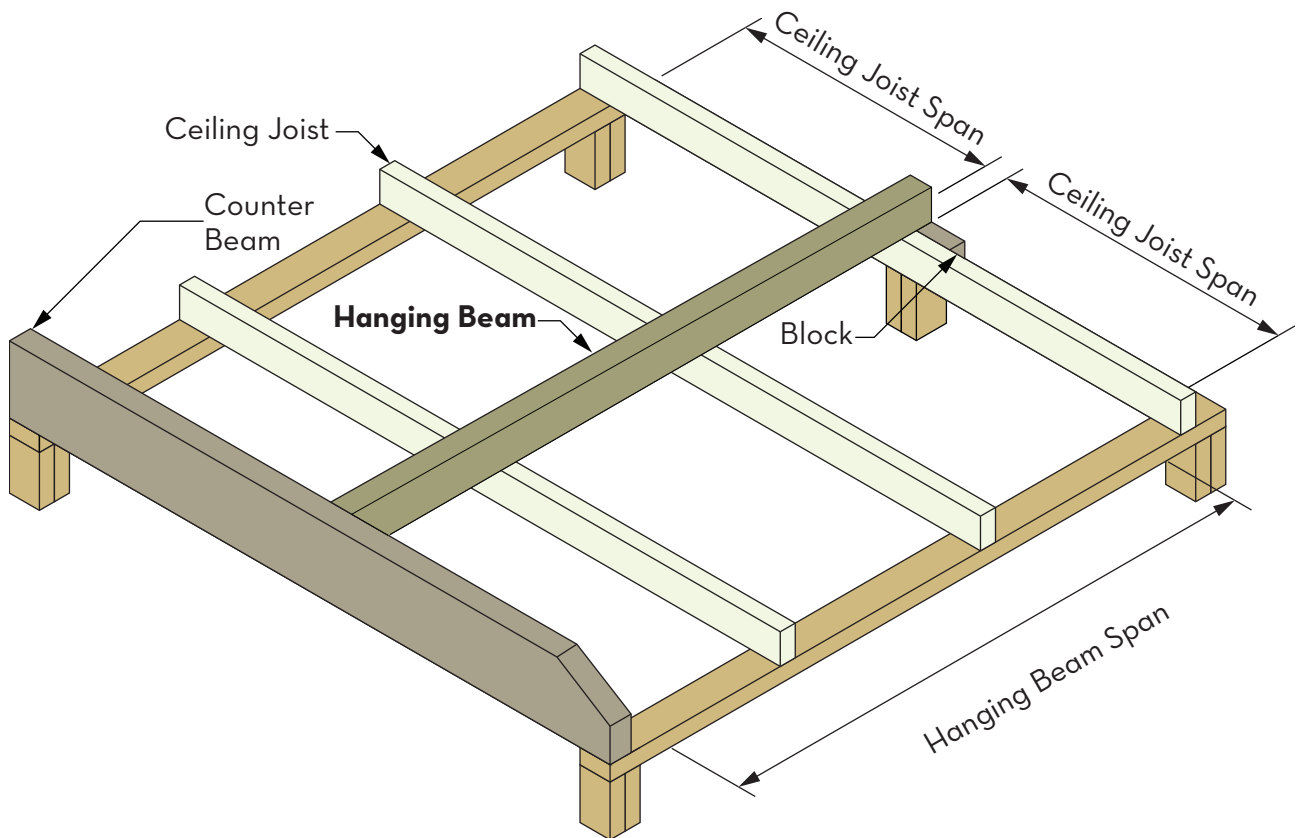
Ceiling Joists are members which support the ceiling lining only. Ceiling Joist spacing shall be governed by the maximum allowable span of the supported ceiling lining.

Ceiling Joists may free span between internal supports or be supported intermediately by Hanging Beams (see page 36). Ceiling Joists are to be fixed to Hanging Beams via either 35x32mm timber cleats / droppers with 2/ 75x3.15 framing nails to each member, 25x1.6mm galvanized strap, ceiling joist hangers or Simpson Strong-Tie TCP clips.

Ceiling Joist Span (m)	Span Type	Section Depth (m)		
		Ceiling Joist Centres (mm)		
		300	450	600
3.0	Single	90x45	90x45	90x45
	Continuous	90x45	90x45	90x45
3.5	Single	90x45	90x45	130x45
	Continuous	90x45	90x45	90x45
4.0	Single	130x45	130x45	130x45
	Continuous	90x45	90x45	90x45
4.5	Single	130x45	130x45	130x45
	Continuous	90x45	90x45	90x45
5.0	Single	130x45	150x45	150x45
	Continuous	90x45	130x45	130x45
5.5	Single	150x45	170x45	170x45
	Continuous	130x45	130x45	130x45
6.0	Single	170x45	200x45	200x45
	Continuous	130x45	130x45	150x45
6.5	Single	200x45	200x45	240x45
	Continuous	130x45	150x45	150x45
7.0	Single	200x63	240x63	240x63
	Continuous	150x45	170x45	170x45
7.5	Single	240x45	300x45	300x45
	Continuous	170x45	200x45	200x45

N3 Wind Category - 10mm Plaster Ceiling

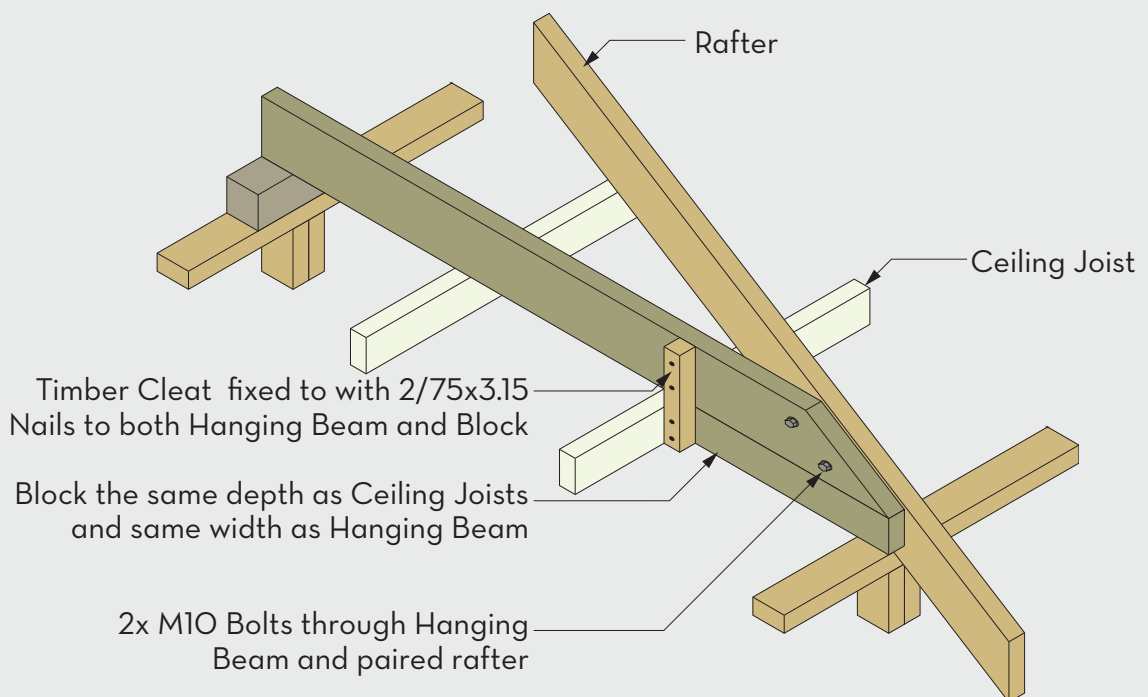
# HANGING BEAMS



Hanging Beams are designed to support loads transferred via the ceiling joists only. Hanging Beams are generally positioned perpendicular to the Ceiling Joists which are then hung from the underside of the member.

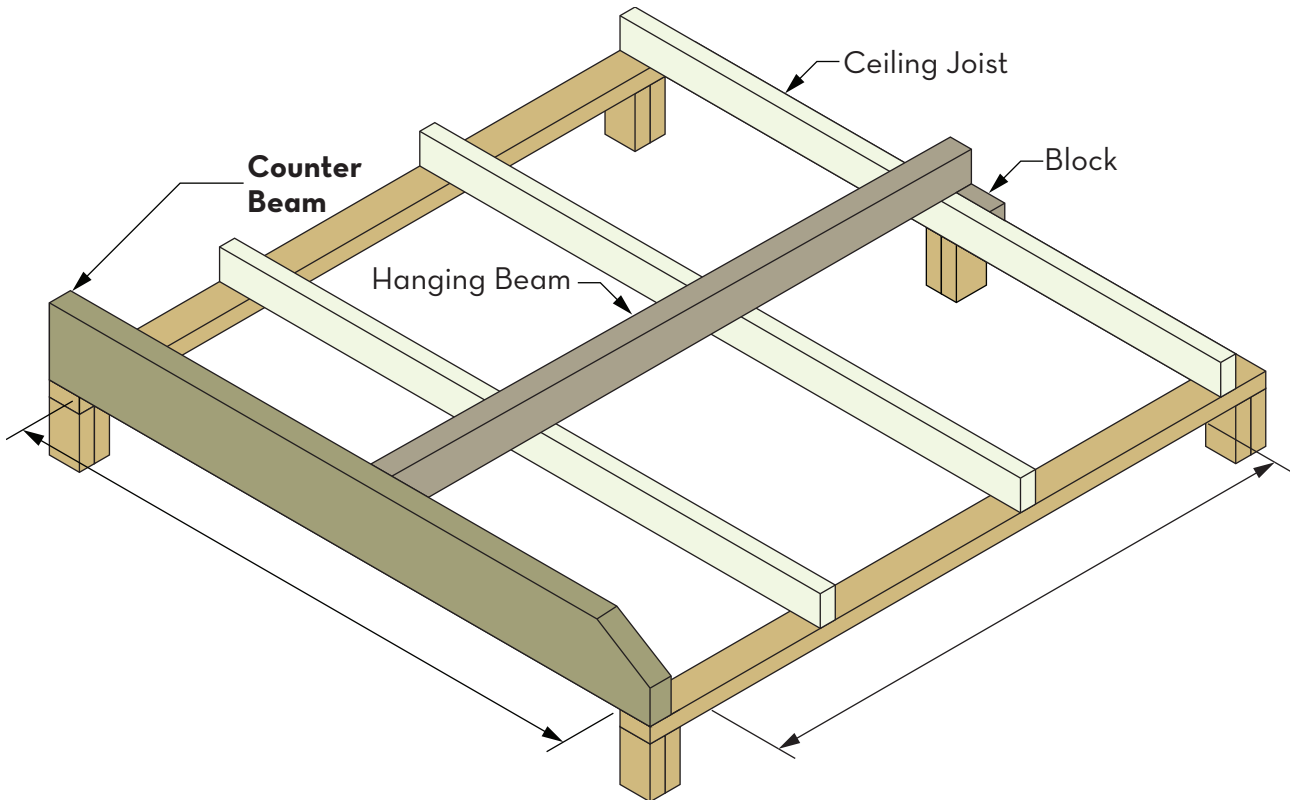
Where Hanging Beams are supported by external walls which also support Rafters; provisions are required to the end of the member to prevent extrusion through the roof covering. A pre-manufactured Splayed Beam or Jack Trimmer Joist will be required.

## Support of Hanging Beam with Jack Trimmer Joist



Hanging Beam Span (m)	Span Type	Section Depth (mm)				
		Ceiling Load Width (m)				
		2.0	2.5	3.0	3.5	
10mm Plaster Ceiling	2.5	Single	130x45	130x45	130x45	130x45
	3.0	Single	130x45	130x45	150x45	150x45
	3.5	Single	150x45	150x45	170x45	170x45
	4.0	Single	170x45	200x45	200x45	200x45
	4.5	Single	200x45	240x45	240x45	240x45
	5.0	Single	240x45	240x45	300x45	300x45
	5.5	Single	300x45	300x45	300x45	360x45
	6.0	Single	300x45	360x45	360x45	360x45
	6.5	Single	360x45	360x45	400x45	400x45
	7.0	Single	360x63	360x63	400x63	400x63

## COUNTER BEAMS

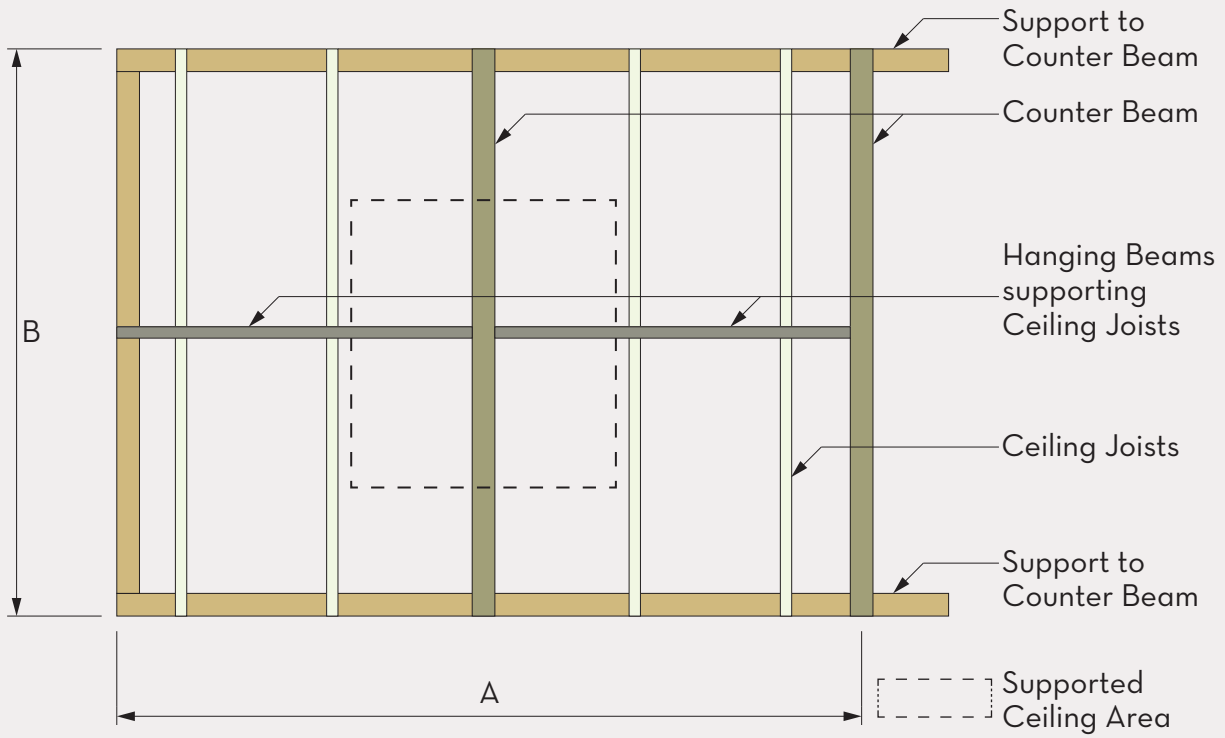


Counter Beams run parallel to Ceiling Joists and are design to support Hanging Beams. The supported Hanging Beam will be supporting underlying ceiling joists. The spans published for Counter Beams have been determined by supporting the Hanging Beam in the worst case scenario.

Counter Beams support ceiling loads only. Where a point load is applied by a roof strut onto either the Counter Beam or the Hanging Beam these must be designed as a Counter Strutting Beam or Hanging Strutting Beam respectively.

Refer to page 45 for specification notes

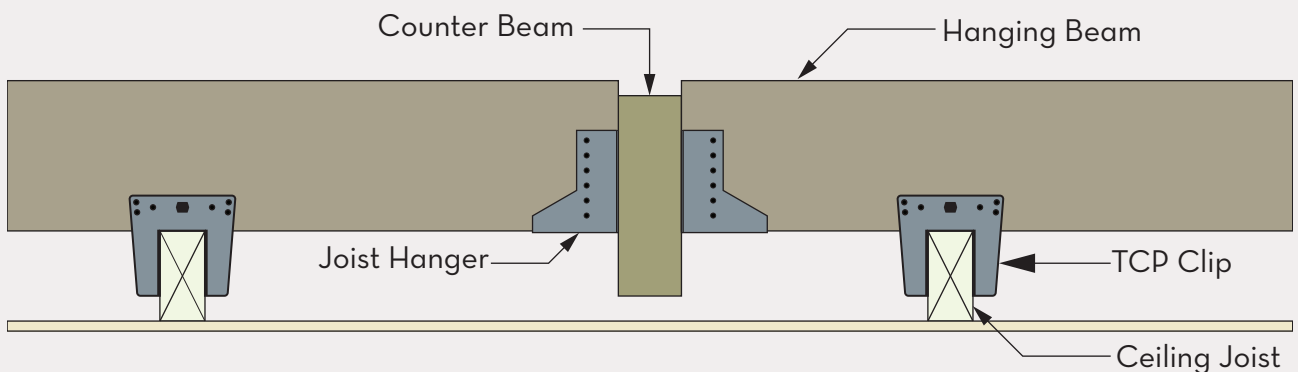
### Determining Ceiling Area supported by Counter Beam

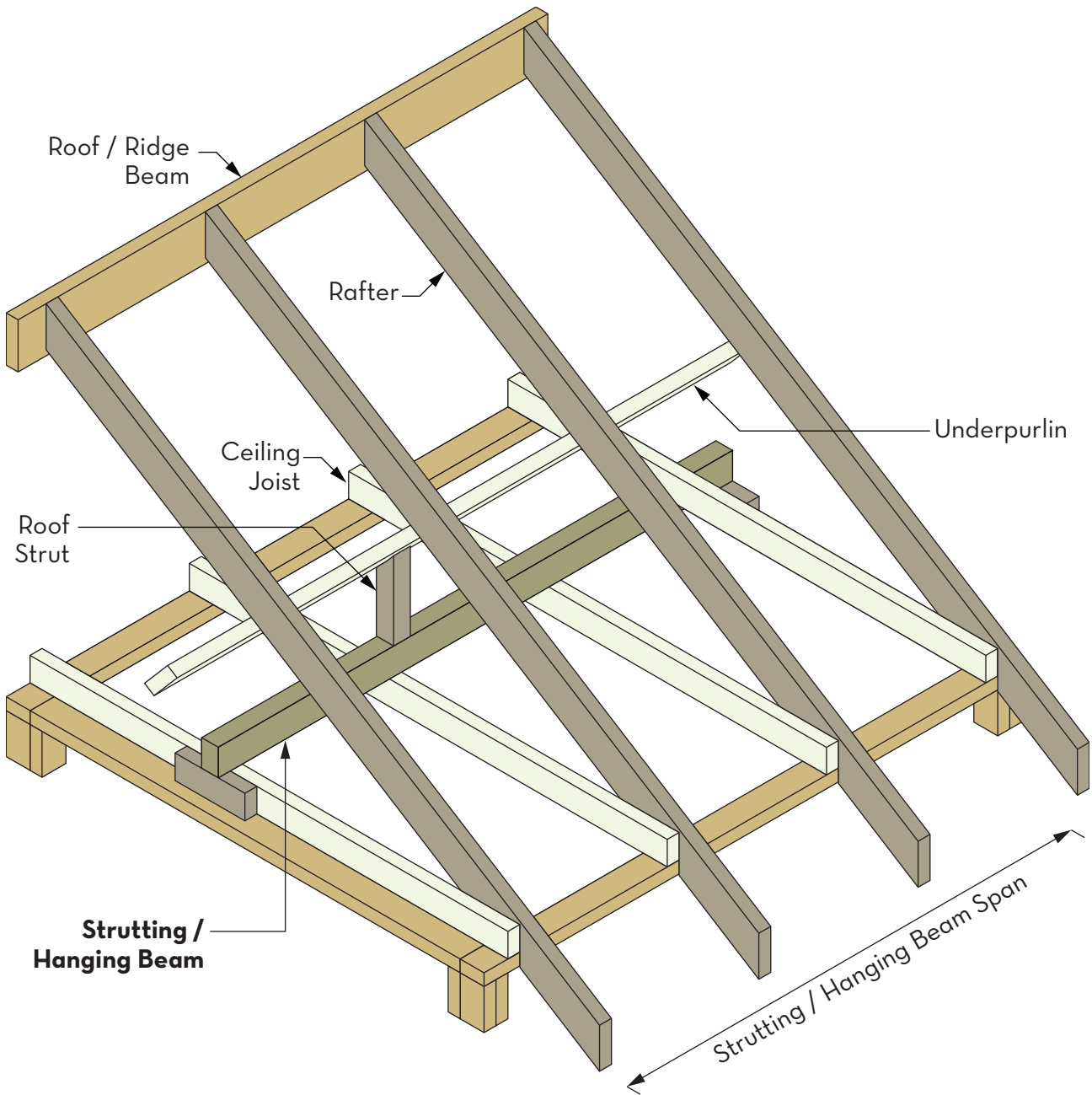


Supported Ceiling Area =  $\frac{A}{2} \times \frac{B}{2}$

Counter Beam Span (m)	Span Type	Section Depth (mm)				
		Ceiling Load Area (m <sup>2</sup> )				
		3.0	4.5	6.0	7.5	
10mm Plaster Ceiling	2.5	Single	130x45	130x45	130x45	130x45
	3.0	Single	130x45	130x45	130x45	150x45
	3.5	Single	130x45	150x45	150x45	150x45
	4.0	Single	150x45	150x45	170x45	170x45
	4.5	Single	170x45	170x45	200x45	200x45
	5.0	Single	170x45	200x45	200x45	240x45
	5.5	Single	200x45	240x45	240x45	240x45
	6.0	Single	240x45	240x45	300x45	300x45
	6.5	Single	240x45	300x45	300x45	300x45
	7.0	Single	240x63	300x63	300x63	300x63

### Recommended Hanging Beam to Counter Beam Connection





Strutting / Hanging Beams are Hanging Beams which support an additional load applied by a Roof Strut carrying an Underpurlin.

Two elements need to be considered when selecting the correct member size. The first is the Ceiling Load Width. Information on determining this can be found on page 7 of this guide. The second is the point load applied to the member from the Underpurlin's transferred via the Roof Strut. Information on determining this point load can be found on page 9.

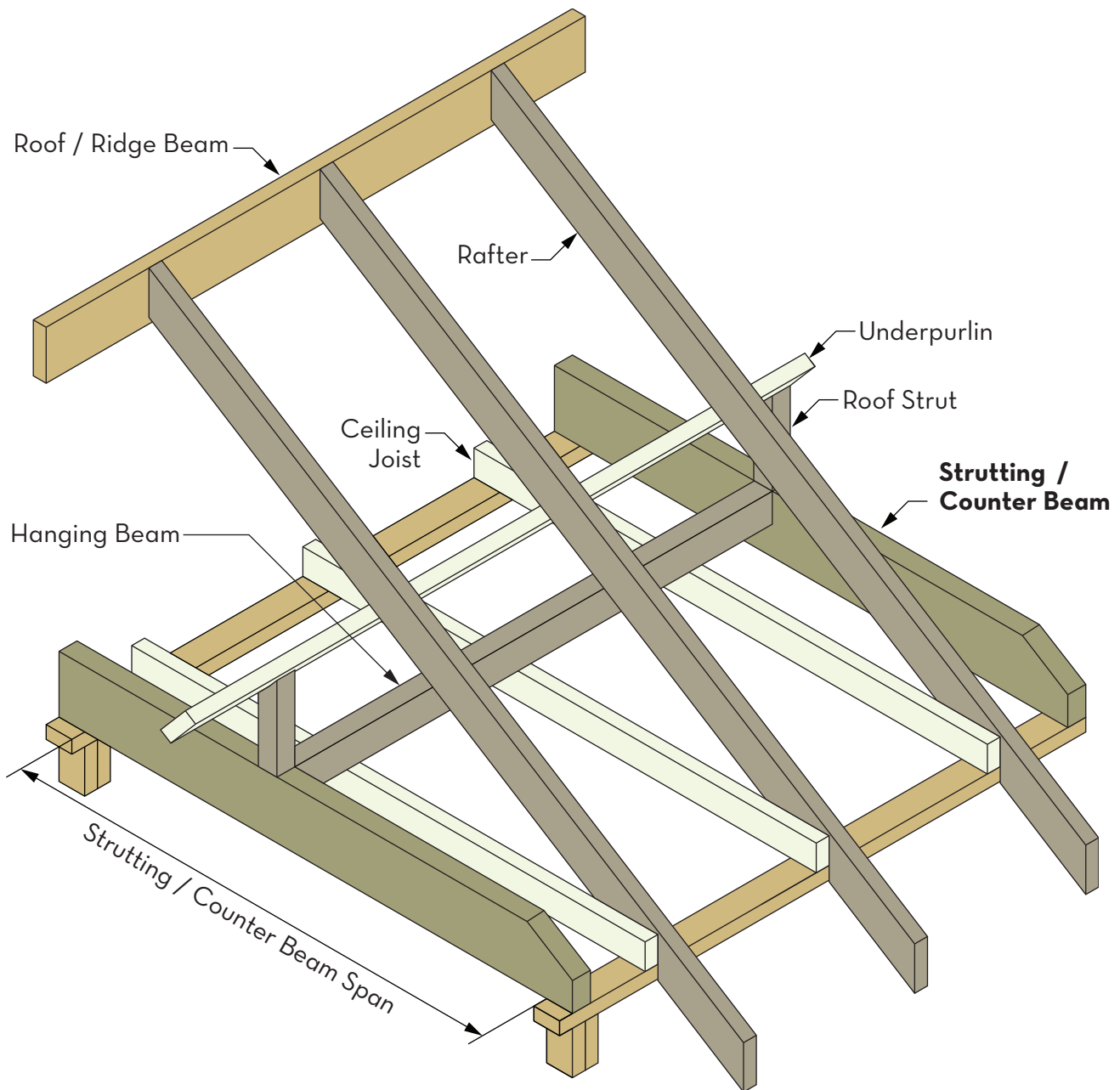
The span of the Strutting / Hanging Beams shown in the span table has been determined by locating the point load from the supporting Underpurlin in the worst case scenario.

For more information on Strutting / Hanging Beams refer to Australian Standard AS1684.

	Ceiling Load Width (m)	Beam Span (m)	Span Type	Section Depth (mm)			
				Roof Load Area (m <sup>2</sup> )			
				2.0	3.0	4.0	
N3 Wind Category	Sheet Metal Roofing with 10mm Plaster Board Ceiling <35°	2.0	2.5	Single	130x63	130x63	130x63
			3.0	Single	130x63	130x63	150x63
			3.5	Single	150x63	150x63	170x63
			4.0	Single	170x63	170x63	200x63
			4.5	Single	200x63	200x63	240x63
			5.0	Single	240x63	240x63	240x63
			5.5	Single	240x63	300x63	300x63
		3.0	2.5	Single	130x63	130x63	130x63
			3.0	Single	130x63	150x63	150x63
			3.5	Single	150x63	170x63	170x63
			4.0	Single	200x63	200x63	200x63
			4.5	Single	200x63	240x63	240x63
			5.0	Single	240x63	240x63	300x63
			5.5	Single	300x63	300x63	300x63
N3 Wind Category	Concrete Tiles with 10mm Plaster Board Ceiling <35°	2.0	2.5	Single	150x63	150x63	170x63
			3.0	Single	150x63	170x63	200x63
			3.5	Single	170x63	200x63	240x63
			4.0	Single	200x63	240x63	240x63
			4.5	Single	240x63	300x63	300x63
			5.0	Single	300x63	300x63	300x63
			5.5	Single	300x63	360x63	360x63
		3.0	2.5	Single	150x63	150x63	170x63
			3.0	Single	170x63	200x63	200x63
			3.5	Single	200x63	200x63	240x63
			4.0	Single	240x63	240x63	240x63
			4.5	Single	240x63	300x63	300x63
			5.0	Single	300x63	300x63	360x63
			5.5	Single	300x63	360x63	360x63
N3 Wind Category	Terra Cotta Tiles with 10mm Plaster Board Ceiling <35°	2.0	2.5	Single	150x63	170x63	170x63
			3.0	Single	170x63	200x63	200x63
			3.5	Single	200x63	200x63	240x63
			4.0	Single	240x63	240x63	300x63
			4.5	Single	240x63	300x63	300x63
			5.0	Single	300x63	300x63	360x63
			5.5	Single	300x63	360x63	360x63
		3.0	2.5	Single	150x63	170x63	170x63
			3.0	Single	170x63	200x63	200x63
			3.5	Single	200x63	200x63	240x63
			4.0	Single	240x63	240x63	300x63
			4.5	Single	240x63	300x63	300x63
			5.0	Single	300x63	300x63	360x63
			5.5	Single	360x63	360x63	360x63

Refer to page 45 for specification notes





Strutting / Counter Beams are Counter Beams which support an additional load applied by a Roof Strut carrying an Underpurlin.

Two elements need to be considered when selecting the correct member size. The first is the point load from the Hanging Beam. Information on determining this can be found on page 38 of this guide. The second is the point load applied to the member from the Underpurlins transferred via the Roof Strut. Information on determining this point load can be found on page 33.

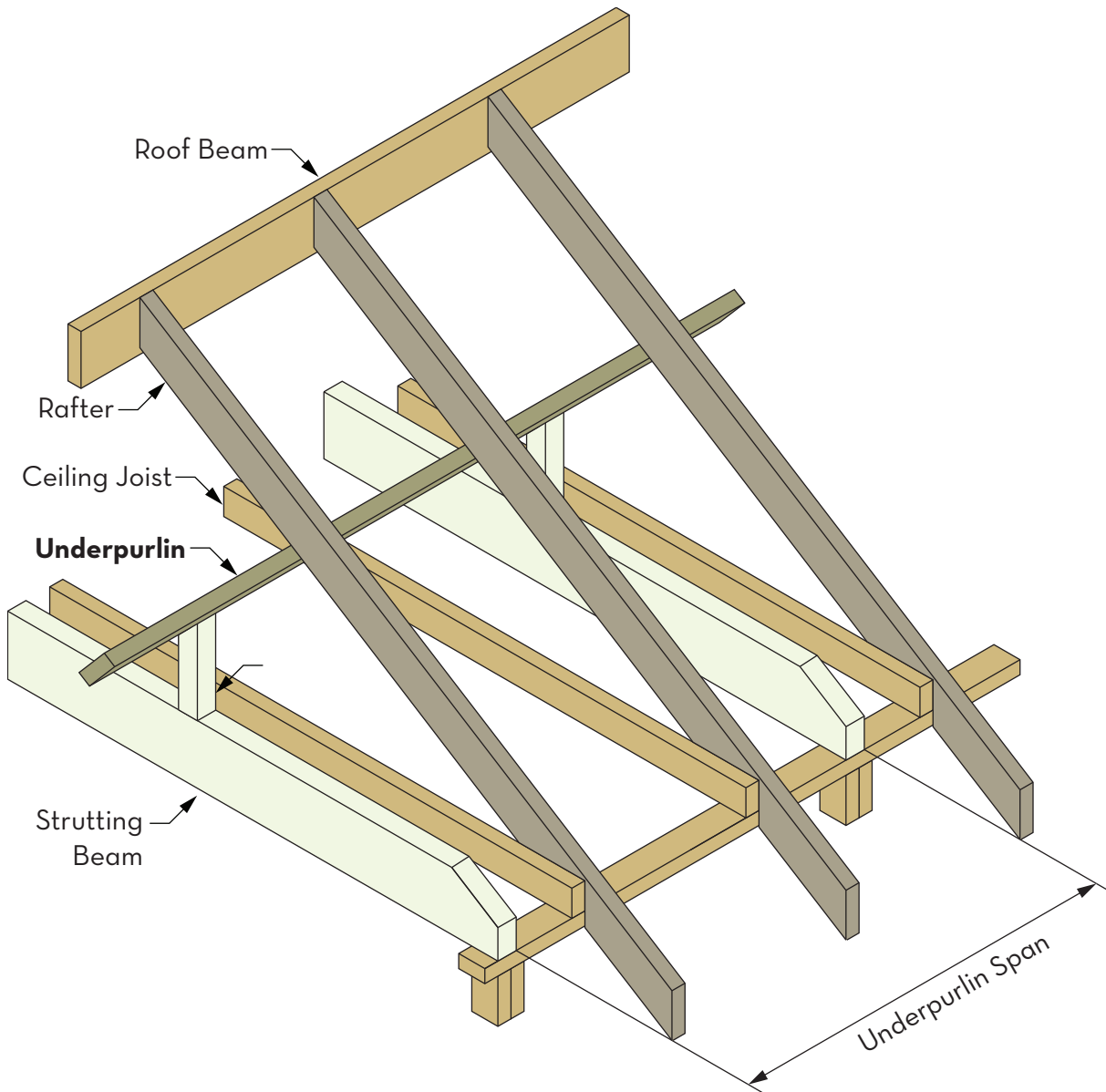
Alternatively the Strutting / Counter Beam span table can be used to nominate the section size of a Counter Beam supporting a Strutting / Hanging Beam. Design elements remain as a point load of ceiling and roof loads.

The span of the Strutting / Counter Beams shown in the span table has been determined by locating the point load from the supporting Underpurlin in the worst case scenario.

For more information on Strutting / Hanging Beams refer to Australian Standard AS1684.

	Ceiling Load Area (m <sup>2</sup> )	Beam Span (m)	Span Type	Section Depth (mm)			
				Roof Load Area (m <sup>2</sup> )			
				2.0	3.0	4.0	
N3 Wind Category	Sheet Metal Roofing with 10mm Plaster Board Ceiling <35°	6.0	2.5	Single	130x63	130x63	130x63
			3.0	Single	150x63	150x63	150x63
			3.5	Single	170x63	170x63	170x63
			4.0	Single	200x63	200x63	200x63
			4.5	Single	200x63	240x63	240x63
			5.0	Single	240x63	240x63	240x63
			5.5	Single	300x63	300x63	300x63
		9.0	2.5	Single	150x63	150x63	150x63
			3.0	Single	170x63	170x63	170x63
			3.5	Single	200x63	200x63	200x63
			4.0	Single	200x63	200x63	200x63
			4.5	Single	240x63	240x63	240x63
			5.0	Single	240x63	300x63	300x63
			5.5	Single	300x63	300x63	300x63
N3 Wind Category	Concrete Tiles with 10mm Plaster Board Ceiling <35°	6.0	2.5	Single	150x63	170x63	170x63
			3.0	Single	170x63	200x63	200x63
			3.5	Single	200x63	200x63	240x63
			4.0	Single	240x63	240x63	240x63
			4.5	Single	240x63	300x63	300x63
			5.0	Single	300x63	300x63	300x63
			5.5	Single	300x63	360x63	360x63
		9.0	2.5	Single	150x63	170x63	170x63
			3.0	Single	170x63	200x63	200x63
			3.5	Single	200x63	240x63	240x63
			4.0	Single	240x63	240x63	300x63
			4.5	Single	300x63	300x63	300x63
			5.0	Single	300x63	300x63	360x63
			5.5	Single	300x63	360x63	360x63
N3 Wind Category	Terra Cotta Tiles with 10mm Plaster Board Ceiling <35°	6.0	2.5	Single	150x63	170x63	200x63
			3.0	Single	170x63	200x63	200x63
			3.5	Single	200x63	240x63	240x63
			4.0	Single	240x63	240x63	300x63
			4.5	Single	240x63	300x63	300x63
			5.0	Single	300x63	300x63	360x63
			5.5	Single	300x63	360x63	360x63
		9.0	2.5	Single	170x63	170x63	200x63
			3.0	Single	200x63	200x63	200x63
			3.5	Single	200x63	240x63	240x63
			4.0	Single	240x63	240x63	300x63
			4.5	Single	300x63	300x63	300x63
			5.0	Single	300x63	300x63	360x63
			5.5	Single	360x63	360x63	360x63

Refer to page 45 for specification notes

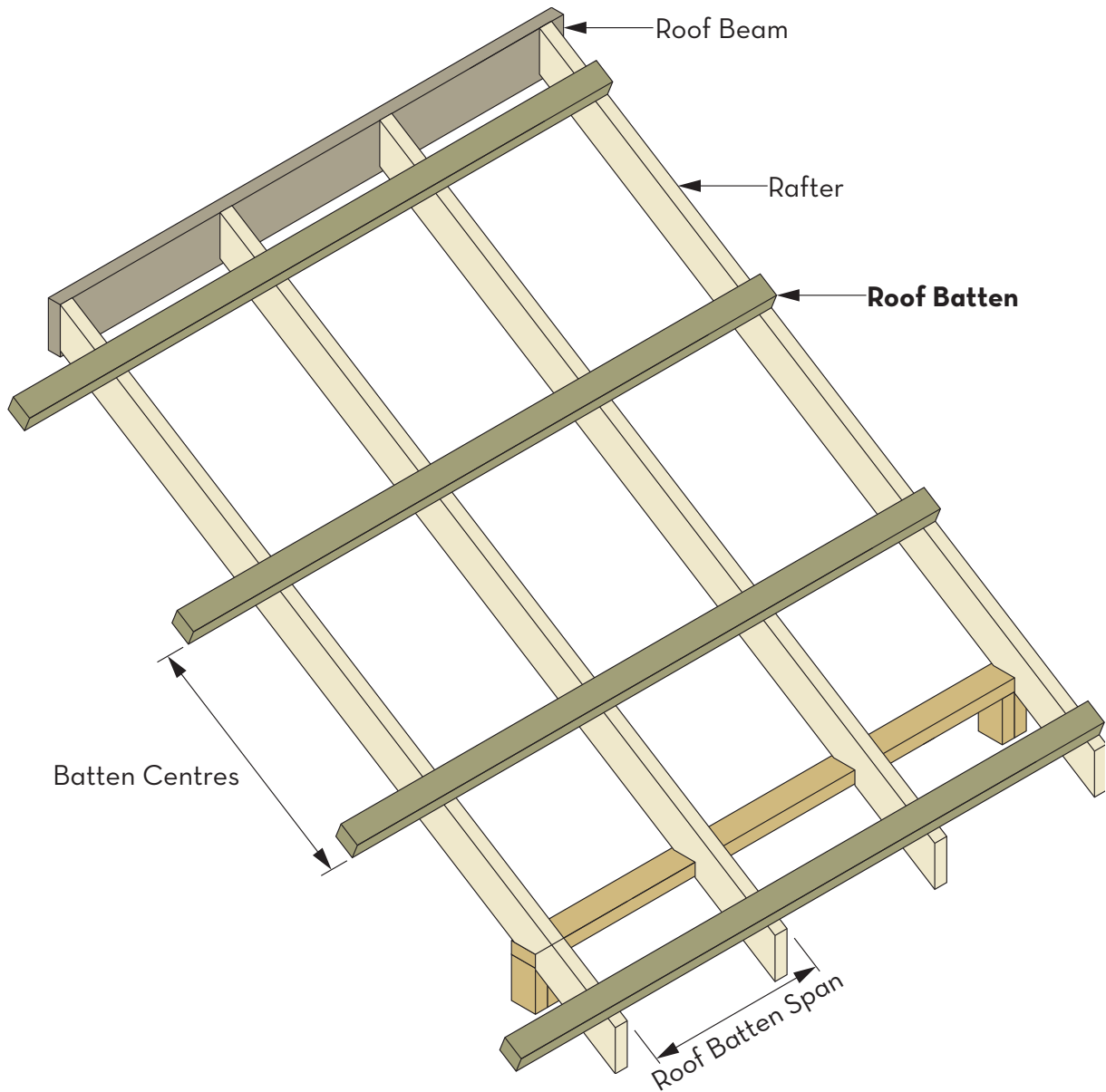


Underpurlins are compact, lightweight intermediate roof members used to support rafters while being concealed in the roof cavity. Underpurlins bear down onto Strutting Beams or other supports via Roof Struts. Underpurlin's span tables accommodate loads from the rafters and roof covering only. No ceiling loads are accounted for.

90x63 Metsa Kerto S-beam E13.2 - N3 - Maximum Span (mm)							
Roofing Type <35 Degrees	Span Type	Roof Load Width (mm)					
		1200	1800	2400	3000	3600	4200
Sheet Metal (20 kg/m <sup>2</sup> )	Single	2300	2000	1800	1600	1500	1400
	Continuous	3100	2700	2400	2200	2100	1900
Concrete Tile (60 kg/m <sup>2</sup> )	Single	1800	1500	1400	1300	1200	1100
	Continuous	2400	2100	1900	1700	1600	1500
Terracotta Tile (70 kg/m <sup>2</sup> )	Single	1700	1500	1300	1200	1100	1100
	Continuous	2300	2000	1800	1700	1600	1500

Refer to page 45 for specification notes

# ROOF BATTENS



Roof Battens are members which span over and across rafters. They are designed to support the roof covering only. Roof Battens are installed on the flat and are to span across a minimum of 3 rafters.

Roofing Type <math><35^\circ</math>	Centres (mm)	Section Size (mm)	N3	
			Span (mm)	Cantilever (mm)
Sheet Metal (20 kg/m <sup>2</sup> ) 0.42 BMT	900	36x90	1700	600
		45x90	2200	750
Concrete Tile (60 kg/m <sup>2</sup> )	330	36x90	1800	550
		45x90	2400	750
Terracotta Tile (70 kg/m <sup>2</sup> )	310	36x90	1800	550
		45x90	2300	700

Roof Batten Cantilever to be the lesser of the Cantilever value shown above and half the actual Roof Batten Span.

## Guide Notes - Roof Framing

1. Refer to page 3 of this guide to check product availability in your area
2. Refer to page 8 of this guide for span and span type definitions
3. Rafter and Ceiling joist spacings / centres should be selected as such to obtain adequate support for Roof batten or Ceiling Material respectively. Refer to product manufacturer for details
4. Always confirm the required roof batten centres against the roofing manufacturers recommendations
5. Refer to page 26 for common roof covering types and their weights
6. Roof framing members to be installed per AS1684.2 and good building practice
7. Member sizes specified based on serviceability criteria outlined in the tables in AS170.3 Section 2
8. Beam details shown are based on the Rafter being supported continuously over
9. Where members are supporting roof loads a maximum roof pitch of 35 degrees has been accounted for in calculations
10. Member sizes nominated are based on the product being fully protected from moisture and maintains an average moisture content of 15% or less over a period of 12 months i.e.  $K4 = 1.0$  per AS1720.1 clause 2.4.2.3.
11. Member sizes nominated are based on construction in coastal areas south of latitude  $25^{\circ}$  and south of latitude  $16^{\circ}$  in all other areas i.e.  $k6 = 1.0$  per AS1720.1 clause 2.4.3
12. Information in the guide is to be used for Metsa Kerto S-beam LVL only

## Product Handling & Storage

Kerto® products - like all other engineered wood products - must be handled and stored properly and carefully. Incorrect handling and storage may introduce defects on product's surfaces, edges or corners. Furthermore, the dimensional stability of the product may suffer.

### Transport

While transporting or storing the product, increased moisture caused by rain or splashing must be avoided. If Kerto products are moved with a forklift truck, wide enough forks must be used in order to avoid damaging the product. When lifting several packs at a time, the distance between forks must be wide enough to ensure safe lifting. Surface-treated products should be delivered direct to site without additional, unnecessary off-loading during delivery.

### Storage

Kerto products must be stored under cover. When storing the products temporarily on site, a solid, straight and dry platform should be used. The height of ground bearers must be at least 300 mm. To avoid twisting of the product, the bearers between packs must be aligned vertically with the ground bearing timbers.

The plastic wrapping of each pack must be cut open from underneath to enable moisture to evaporate from the bundles. If the products are stored on site for longer than one week, the bundles must be covered with an additional protective covering. Conditions of the products and protective cover must be monitored regularly during storage.

### Handling

Kerto product packs may be unloaded on site with either a forklift or a crane. Approved webbing slings must be used if unloading with crane. It is forbidden to use chains or wires.

If unloading is done manually, the pack is opened and the products are carried one-by-one. While cutting the banding, beware of band's ends. Kerto products should not be dragged or dropped.

Kerto is a light-weight material and is easy to shape, which means notable time and cost savings in construction. Kerto products can be processed with conventional wood working and power tools. There is no need for separate specialist tools.

Surface-treated products should be unloaded individually. If needed, a cellular plastic padding that does not stain, should be used under the webbing slings.

Simpson Strong-Tie is one of the largest suppliers of structural building products in the world, including timber connectors, fasteners, fastening systems, anchors and lateral-force resisting systems. The company is known for its commitment to product development, engineering, testing and training as well as providing customers with quality

products and exceptional service. Today, Simpson Strong-Tie has more than 3,100 employees and more than 50 factories, offices and warehouses all around the globe.

Simpson Strong-Tie began manufacturing engineered structural connectors for timber-framed construction in 1956 in California, USA. Nearly 40 years later, the company entered the anchoring industry, and the product line has expanded to include many anchoring, crack-injection repair and masonry adhesives, and a full line of powder-actuated tools and fasteners.

Simpson Strong-Tie Beam to Beam Hangers							
Depth Range	Product Code		Size			38x3.75mm Nails	
	ITI (EA)	SS-T	Height	Width	Bearing	Beam	Joist
90	LUSO77xO46FB	LUS46/77	77	46	45	4	2 <sup>3</sup>
120-170	LUS118xO46FB	LUS46/118	118	46	45	4	4 <sup>3</sup>
170-240	LUS166xO46FB	LUS46/166	166	46	45	6	6 <sup>3</sup>
240-360	240xO46FB	HU9	237	46	64	24	10
290-400	290xO46FB	HU11	281	46	64	30	10
130-200	130xO63FB	HU36	132	64	64	8	4
240-300	225xO63FB	HU310	167	64	64	14	6
300-400	280xO63FB	HU312	275	64	64	16	6
170-200	155xO90FB	HU48	155	90	64	14	6
240-300	210xO90FB	HU410	212	90	64	18	10
300-400	300xO90FB	HU414	303	90	64	24	12

#### NOTES

- Hangers to be a minimum of 2/3 the depth of the I-Joists.
- Nails are required to be installed to all pre-determined holes in I-Joist hangers.
- Minimum of 65x3.75mm nails to be used into the supported member use using LUS type hangers
- Refer to ITI Spec Sheet 2 for product capacities

## DUNNINGS

Dunnings understands the needs of truss and trade businesses. Through experience, expertise and local manufacturing capability, Dunnings supply products that meet or exceed all relevant Australian standards.

Dunnings engineering capability is fully supported by a large in-house Australian engineering team. Dunnings supply the fixing and load capacities for their whole range of timber connectors and builders' hardware through their Engineering Data Book.

Manufacturing since 1951, the business is Australian owned and operated and continues to manufacture here in Australia.

We offer a comprehensive range of Australian-made timber connectors and builders hardware, as well as products sourced globally.

Dunnings Beam to Beam Hangers							
Depth Range	Product Code		Size			30x2.8mm Nails	
	ITI (EA)	Dunnings	Height	Width	Bearing	Beam	Joist
90-130	90xO45FB	BJS90x45	90	45	47	8	6
120-170	120xO45FB	BJS120x45	120	45	47	8	6
140-200	140xO45FB	BJS140x45	140	45	47	8	6

Dunnings Cleats							
Depth Range	Product Code		Size			Fixings	
	ITI (EA)	Dunnings	Height	Width	Thickness	Type	Qty
-	LVSIA	BALVSIA	75	50	5	14gx30 Screws	10
>250	250x250EA	BAEM250	100	100	6	M12 Bolts	6
>290	290x290EA	BEA288M163	125	125	8	M16 Bolts	6

ITI Australia has a reputation of providing customers with a diverse range of products. By stocking a wide range of structural, outdoor and decorative building products ITI can add value without overheads to our loyal customer base. Some other products on offer include the following.



ITI Spec Frame is a radiata pine LVL with a similar grade to MGP12 pine but with off the benefits of being a engineer wood product. Developed for use in lightweight timber construction Spec Frame is perfect for lintels, rafters and floor trimming beams. A select range of Spec Frame LVL in a 35mm thickness can also be found as an approved product in all propriety roof truss manufacturing software programs.



ITI Spec Joists, proudly manufactured by Pacific Woodtech in Washington State USA, is a wood I-Beam product developed for use as floor joists and rafters. It is light weight, easy to install and priced economically. ITI offer an internal design service to assist customers with the specification of this product. Please contact your nearest ITI office for details.



Design Pine is a range of exterior structural and decorative timber products coated with a genuine primer. Impregnated with a preservative to prevent the onset of decay and resist insect attack in all above ground applications, Design Pine is finger jointed and / or laminated for increased dimensional stability to give a reliable product for years to come. Don't be fooled by blue imitations, ask for Design Pine by name.



EziTrimPlus is a range of elite primed internal mouldings manufactured from sustainable plantation grown Radiata Pine. The Radiata Pine has been milled, kiln dried and docked to remove all knots and visible imperfections. This is then finger-jointed to produce a product which has no defects whilst also having the superior finish that you have come to expect from the EziTrim Brand.



ProLam is a range of finger jointed and laminated merbau products for use in external structural and decorative applications. ProLam merbau offers a dimensionally stable and high strength building product which has been developed specifically for the outdoors. ProLam is beautiful, durable and strong.



Need exterior grade performance from a sustainable source? Experience the Extreme Timber range. Extreme Timber provides you with the products which have been missing from the traditional outdoor softwood range. The range includes Extreme Post and Extreme Beam. Extreme Post is a pine post with hazard class 4 treatment making it capable of being installed directly into the ground. Extreme Beam is glue laminated GL8 grade beams in the same widths as traditional treated pine. Extreme beam offers additional flexibility for treated pine outdoor structure design.



The worlds first treated pine product that exceeds BAL-40 requirements as set out in the Australian Standard AS3959-2018. Currently available in 45mm structural MGPI0, decking and screening, FLAMEfixx dFx® products also offer protection against fungal decay and insect (termite) attack to hazard level 3 (H3).



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## ITI LOCATIONS:

### ITI TECHNICAL SUPPORT CENTRE

68-80 Kirkham Road West,  
Keysborough, Victoria 3173  
E || [ewp@iti.net.au](mailto:ewp@iti.net.au)  
P || 03 9392 8400

### ITI QUEENSLAND (BRISBANE)

63 Creek Street,  
Bundamba, Queensland 4034  
P || 07 3436 8400  
E || [ewpqld@iti.net.au](mailto:ewpqld@iti.net.au)

### ITI NEW SOUTH WALES (SYDNEY)

59 Dunheved Circuit,  
St Marys, New South Wales 2760  
P || 02 8805 5000  
E || [ewpnsw@iti.net.au](mailto:ewpnsw@iti.net.au)

### ITI SOUTH AUSTRALIA (ADELAIDE)

82-94 Grand Trunkway,  
Gillman, South Australia 5013  
P || 08 8447 0400  
E || [ewpsa@iti.net.au](mailto:ewpsa@iti.net.au)

### JOHN COOK & SONS (SYDNEY)

116 Links Road,  
St Marys, New South Wales 2760  
P || 02 9833 0355  
E || [ewp@johncook.net.au](mailto:ewp@johncook.net.au)

### ITI VICTORIA (MELBOURNE)

68-80 Kirkham Road West,  
Keysborough, Victoria 3173  
E || [ewpvic@iti.net.au](mailto:ewpvic@iti.net.au)  
P || 03 9394 8400

### ITI QUEENSLAND (TOWNSVILLE)

46-50 Perkins Street West  
Railway Estate  
P || 07 4724 5509  
E || [ewpqld@iti.net.au](mailto:ewpqld@iti.net.au)

### ITI NEW SOUTH WALES (NEWCASTLE)

19 Nelson Road,  
Cardiff, New South Wales 2285  
P || 02 4953 7666  
E || [ewpnsw@iti.net.au](mailto:ewpnsw@iti.net.au)

### ITI WESTERN AUSTRALIA (PERTH)

102-108 Bannister Road,  
Canning Vale, Western Australia 6155  
P || 08 9256 5700  
E || [ewpwa@iti.net.au](mailto:ewpwa@iti.net.au)