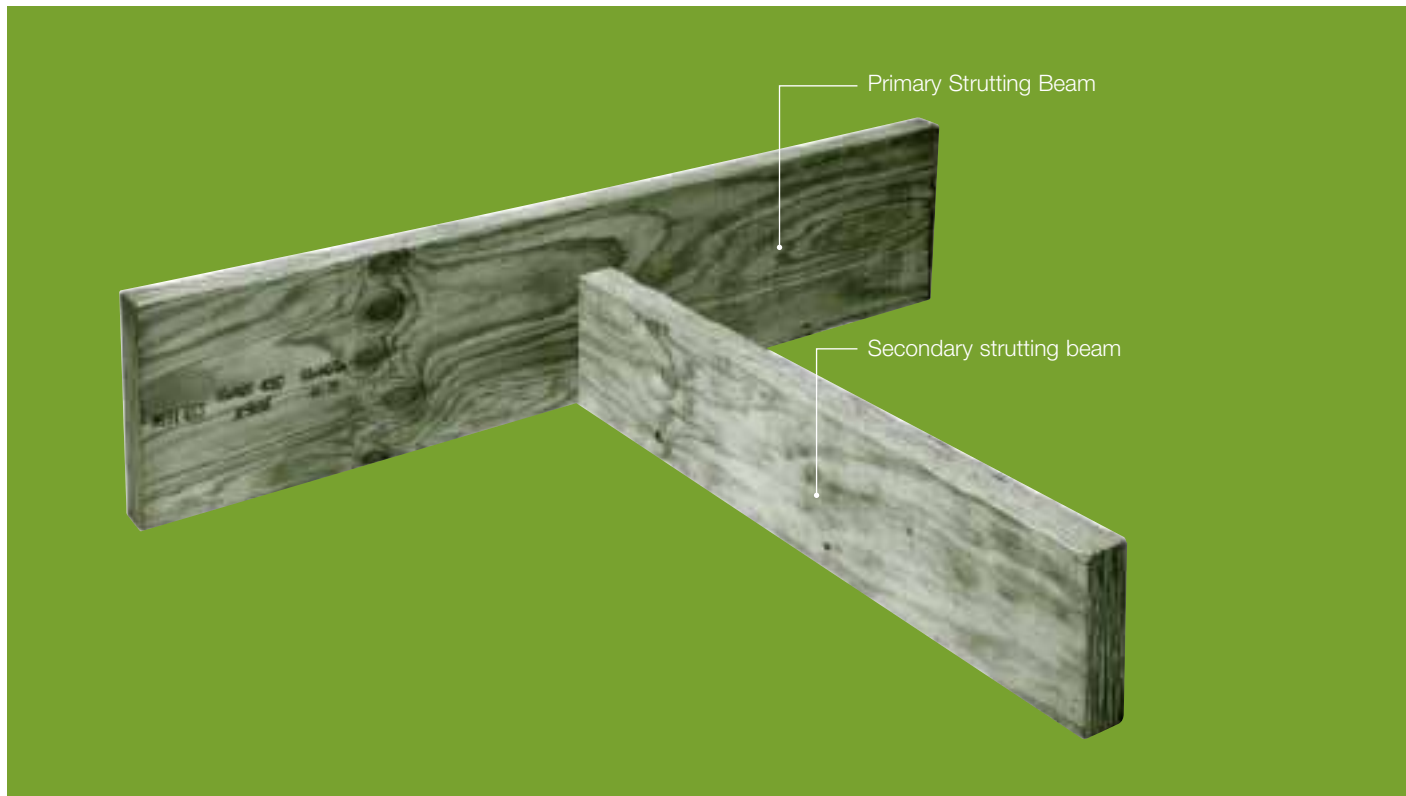




e-beam² 
steel beam substitution

Introduction to e-beam²

If you have worked with Wesbeam LVL products before, you know how light, easy and fast they are to use. What you might not realise is it is now possible to completely replace steel strutting beams with Wesbeam LVL. To help you select and install the right e-beams for the job, we've created the e-beam² roof beam system.



e-beam² makes design, specification and installation a cinch by including:

- Easy to use span tables in a format familiar to specifiers of steel beams.
- A simple 3 step system that enables specifiers to design e-beam, e-splay or timber secondary beams connected to e-beam or e-splay primary beams.
- Fully engineered e-splay when beams require splaying to a point.
- Carpenter friendly connection details that enable quick beam-to-beam connection.

Three Simple Steps to Selecting Primary and Secondary Beam

With the e-beam² specification system, it takes just 3 quick steps to select the right beams for any job.

Step 1

Calculate the Width Of Roof (WOR) applied to the roof beam using the method illustrated on page 33.

Step 2

Is the roofing material metal sheet or tile?

Step 3

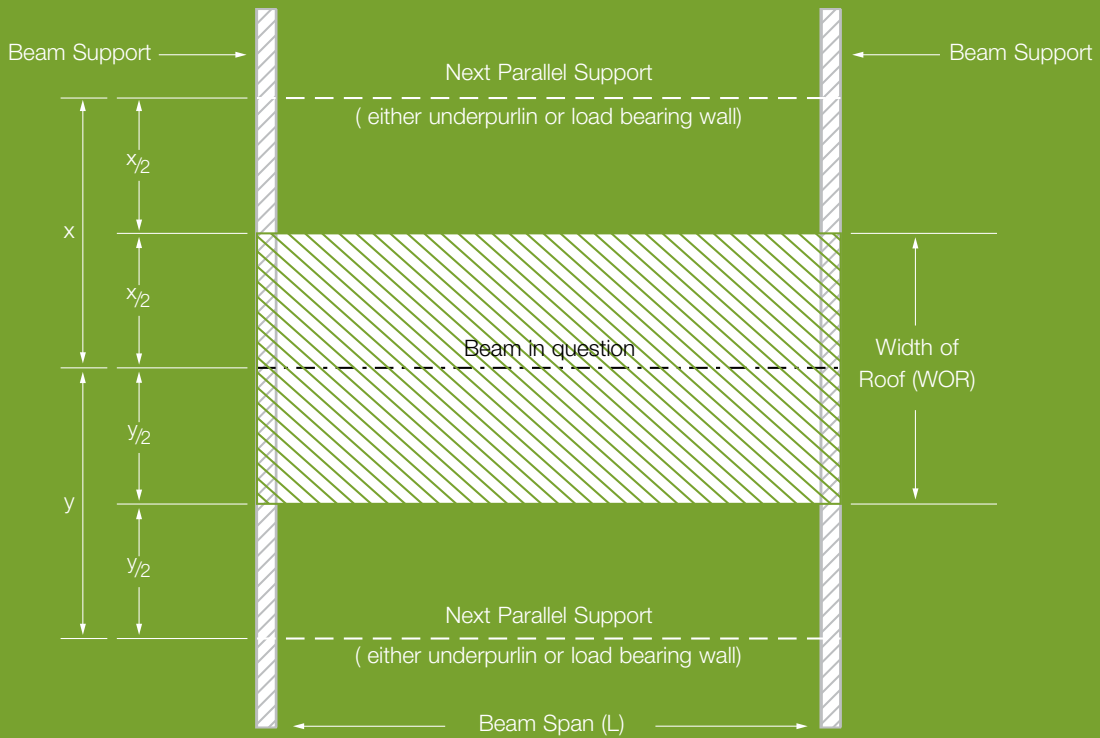
Does the beam require a splay cut greater than 2/3's of its depth?

No: use the e-beam tables on pages 34 and 35.

Yes: use the e-splay tables on pages 36 and 37 for single splay or pages 38 and 39 for double splay.

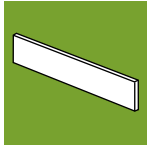
Determining the Width of Roof

The Width of Roof (WOR) is measured perpendicular to the Beam in question being $x/2 + y/2$.



Notes:

1. All roof and ceiling members (ceiling joists, hanging beams, rafters, underpurlins) running parallel to the beam in question are to be supported in line with the beam support.
2. All roof and ceiling members (ceiling joists, hanging beams, rafters, underpurlins) running perpendicular to the beam in question are to be supported in line with the next parallel support.
3. All spans and distances are measured on plan (horizontal plane).
4. Roof pitch has been allowed in the calculation of beams in these tables. Maximum roof pitch is 35°.



e-beam² Strutting Beams Sheet Roof

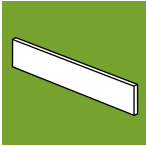
Wind Classification N3

Limits on deflection
Dead load: span/300 or 20mm max.
Live load: span/250 or 20mm max.

Strutting beam,
Strutting counter beam, or
Strutting/Hanging beam

e-beam ² Strutting Beams – Sheet Roof								
Max Beam Span (mm)	WOR = Width of Roof (mm)							
	1500	2000	2500	3000	3500	4000	4500	5000
3000	150x45	170x45	170x45	200x45	200x45	200x45	200x45	240x45
	130x63	150x63	150x63	170x63	170x63	170x63	200x63	200x63
3300	170x45	170x45	200x45	200x45	200x45	240x45	240x45	240x45
	150x63	150x63	170x63	170x63	200x63	200x63	200x63	240x63
3600	170x45	200x45	200x45	240x45	240x45	240x45	240x45	300x45
	150x63	170x63	200x63	200x63	200x63	240x63	240x63	240x63
3900	200x45	240x45	240x45	240x45	300x45	300x45	300x45	300x45
	170x63	200x63	200x63	240x63	240x63	240x63	240x63	300x63
4200	240x45	240x45	300x45	300x45	300x45	300x45	300x45	360x45
	200x63	240x63	240x63	240x63	300x63	300x63	300x63	300x63
4500	240x45	300x45	300x45	300x45	300x45	360x45	360x45	360x45
	240x63	240x63	240x63	300x63	300x63	300x63	300x63	300x63
4800	300x45	300x45	300x45	360x45	360x45	360x45	360x45	360x63
	240x63	300x63	300x63	300x63	300x63	360x63	360x63	400x75
5100	300x45	300x45	360x45	360x45	360x45	360x63	360x63	360x63
	300x63	300x63	300x63	300x63	360x63	400x75	NS	NS
5400	300x45	360x45	360x45	360x45	360x63	360x63	450x63	450x63
	300x63	300x63	360x63	360x63	NS	NS	NS	NS
5700	360x45	360x45	360x63	360x63	450x63	450x63	450x63	NS
	300x63	360x63	NS	NS	NS	NS	NS	NS
6000	360x45	360x63	360x63	450x63	450x63	NS	NS	NS
	360x63	400x75	NS	NS	NS	NS	NS	NS
6300	360x45	360x63	450x63	NS	NS	NS	NS	NS
	360x63	400x75	NS	NS	NS	NS	NS	NS
6600	360x63	450x63	NS	NS	NS	NS	NS	NS
	NS	NS	NS	NS	NS	NS	NS	NS
6900	450x63	NS	NS	NS	NS	NS	NS	NS
	NS	NS	NS	NS	NS	NS	NS	NS
7200	450x63	NS	NS	NS	NS	NS	NS	NS
	NS	NS	NS	NS	NS	NS	NS	NS

1. All sections with span to depth ration exceeding 3 must be restrained against roll over at supports and at each strutting point. Connection between Primary and Secondary beams, and hanging and counter beams are assumed to provide this required restraint at connection.
2. Bearing length at support to be not be less than 70 mm.
3. Beam ends may be chamfer cut to a minimum of 90mm or D/3, whichever is greater.
4. NS signifies section size unlikely to be suitable.



e-beam² Strutting Beams Tile Roof

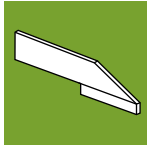
Wind Classification N3

Limits on deflection
Dead load: span/300 or 20mm max.
Live load: span/250 or 20mm max.

Strutting beam,
Strutting counter beam, or
Strutting/Hanging beam

e-beam ² Strutting Beams – Tile Roof								
Max Beam Span (mm)	WOR = Width of Roof (mm)							
	1500	2000	2500	3000	3500	4000	4500	5000
3000	200x45	200x45	240x45	240x45	240x45	300x45	300x45	300x45
	170x63	200x63	200x63	240x63	240x63	240x63	240x63	240x63
3300	200x45	240x45	240x45	300x45	300x45	300x45	300x45	300x45
	200x63	200x63	240x63	240x63	240x63	300x63	300x63	300x63
3600	240x45	240x45	300x45	300x45	300x45	300x45	360x45	360x45
	200x63	240x63	240x63	300x63	300x63	300x63	300x63	300x63
3900	240x45	300x45	300x45	300x45	360x45	360x45	360x45	360x45
	240x63	240x63	300x63	300x63	300x63	300x63	360x63	360x63
4200	300x45	300x45	360x45	360x45	360x45	360x63	360x63	360x63
	240x63	300x63	300x63	300x63	360x63	300x75	400x75	400x75
4500	300x45	360x45	360x45	360x63	360x63	360x63	450x63	450x63
	300x63	300x63	360x63	400x63	450x63	450x63	450x63	450x63
4800	360x45	360x45	360x63	360x63	450x63	450x63	NS	NS
	300x63	360x63	NS	NS	NS	NS	NS	NS
5100	360x45	360x63	450x63	450x63	NS	NS	NS	NS
	360x63	NS	NS	NS	NS	NS	NS	NS
5400	360x63	450x63	450x63	NS	NS	NS	NS	NS
	NS	NS	NS	NS	NS	NS	NS	NS
5700	450x63	450x63	NS	NS	NS	NS	NS	NS
	NS	NS	NS	NS	NS	NS	NS	NS
6000	450x63	NS	NS	NS	NS	NS	NS	NS
	NS	NS	NS	NS	NS	NS	NS	NS

1. All sections with span to depth ration exceeding 3 must be restrained against roll over at supports and at each strutting point. Connection between Primary and Secondary beams, and hanging and counter beams are assumed to provide this required restraint at connection.
2. Bearing length at support to be not be less than 70 mm.
3. Beam ends may be chamfer cut to a minimum of 90mm or D/3, whichever is greater.
4. NS signifies section size unlikely to be suitable.



e-beam² – Single Splayed Strutting Beams Sheet Roof

Wind Classification N3

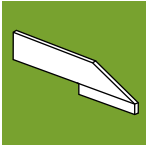
Limits on deflection
Dead load: span/300 or 20mm max.
Live load: span/250 or 20mm max.

Strutting beam,
Strutting counter beam, or
Strutting/Hanging beam

e-beam ² – Single Splayed Strutting Beams – Sheet Roof								
Max Beam Span (mm)	WOR = Width of Roof (mm)							
	1500	2000	2500	3000	3500	4000	4500	5000
3000	150x45	170x45	170x45	200x45	200x45	200x45	200x45	240x45
	130x63	150x63	150x63	170x63	170x63	200x63	200x63	200x63
3300	170x45	170x45	200x45	200x45	240x45	240x45	240x45	240x45
	150x63	170x63	170x63	200x63	200x63	200x63	200x63	240x63
3600	170x45	200x45	200x45	240x45	240x45	240x45	240x45	300x45
	170x63	170x63	200x63	200x63	200x63	240x63	240x63	240x63
3900	200x45	240x45	240x45	240x45	300x45	300x45	300x45	300x45
	170x63	200x63	200x63	240x63	240x63	240x63	240x63	300x63
4200	240x45	240x45	300x45	300x45	300x45	300x45	300x45	360x45
	200x63	240x63	240x63	240x63	300x63	300x63	300x63	300x63
4500	240x45	300x45	300x45	300x45	360x45	360x45	360x45	360x45
	240x63	240x63	300x63	300x63	300x63	300x63	300x63	360x63
4800	300x45	300x45	300x45	360x45	360x45	360x45	360x45	360x63
	240x63	300x63	300x63	300x63	300x63	360x63	360x63	NS
5100	300x45	300x45	360x45	360x45	360x45	360x63	360x63	360x63
	300x63	300x63	300x63	360x63	360x63	NS	NS	NS
5400	300x45	360x45	360x45	360x63	360x63	450x63	450x63	450x63
	300x63	300x63	360x63	NS	NS	NS	NS	NS
5700	360x45	360x45	360x63	360x63	450x63	450x63	NS	NNS
	300x63	360x63	NS	NS	NS	NS	NS	NS
6000	360x45	360x63	450x63	450x63	NS	NS	NS	NS
	360x63	NS	NS	NS	NS	NS	NS	NS
6300	360x63	450x63	450x63	NS	NS	NS	NS	NS
	NS	NS	NS	NS	NS	NS	NS	NS
6600	360x63	450x63	NS	NS	NS	NS	NS	NS
	NS	NS	NS	NS	NS	NS	NS	NS
6900	450x63	450x75	NS	NS	NS	NS	NS	NS

1. All sections with span to depth ration exceeding 3 must be restrained against roll over at supports and at each strutting point. Connection between Primary and Secondary beams, and hanging and counter beams are assumed to provide this required restraint at connection.
2. Bearing length at support to be not be less than 70 mm.
3. Beam ends may be chamfer cut to a minimum of 90mm or D/3, whichever is greater.
4. NS signifies section size unlikely to be suitable.





e-beam² – Single Splayed Strutting Beams

Tile Roof

Wind Classification N3

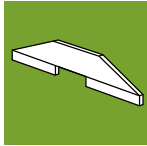
Limits on deflection
 Dead load: span/300 or 20mm max.
 Live load: span/250 or 20mm max.

Strutting beam,
 Strutting counter beam, or
 Strutting/Hanging beam

e-beam ² – Single Splayed Strutting Beams – Tile Roof								
Max Beam Span (mm)	WOR = Width of Roof (mm)							
	1500	2000	2500	3000	3500	4000	4500	5000
3000	200x45	200x45	240x45	240x45	240x45	300x45	300x45	300x45
	170x63	200x63	200x63	240x63	240x63	240x63	240x63	300x63
3300	200x45	240x45	240x45	300x45	300x45	300x45	300x45	300x45
	200x63	200x63	240x63	240x63	240x63	300x63	300x63	300x63
3600	240x45	240x45	300x45	300x45	300x45	360x45	360x45	360x45
	200x63	240x63	240x63	300x63	300x63	300x63	300x63	300x63
3900	300x45	300x45	300x45	360x45	360x45	360x45	360x45	360x63
	240x63	240x63	300x63	300x63	300x63	360x63	360x63	NS
4200	300x45	300x45	360x45	360x45	360x45	360x63	360x63	360x63
	300x63	300x63	300x63	360x63	360x63	NS	NS	NS
4500	300x45	360x45	360x45	360x63	360x63	400x63	400x63	400x63
	300x63	300x63	360x63	NS	NS	NS	NS	NS
4800	360x45	360x45	360x63	400x63	400x63	NS	NS	NS
	300x63	360x63	400x63	450x63	450x63	NS	NS	NS
5100	360x45	360x63	400x63	400x63	NS	NS	NS	NS
	360x63	NS	NS	NS	NS	NS	NS	NS
5400	360x63	400x63	NS	NS	NS	NS	NS	NS
	NS	NS	NS	NS	NS	NS	NS	NS
5700	400x63	NS	NS	NS	NS	NS	NS	NS
	NS	NS	NS	NS	NS	NS	NS	NS
6000	400x63	NS	NS	NS	NS	NS	NS	NS

1. All sections with span to depth ration exceeding 3 must be restrained against roll over at supports and at each strutting point. Connection between Primary and Secondary beams, and hanging and counter beams are assumed to provide this required restraint at connection.
2. Bearing length at support to be not be less than 70 mm.
3. Beam ends may be chamfer cut to a minimum of 90mm or D/3, whichever is greater.
4. NS signifies section size unlikely to be suitable.





e-beam² – Double Splayed Strutting Beams

Sheet Roof

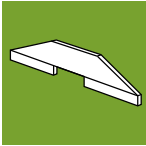
Wind Classification N3

Limits on deflection
 Dead load: span/300 or 20mm max.
 Live load: span/250 or 20mm max.

Strutting beam,
 Strutting counter beam, or
 Strutting/Hanging beam

e-beam ² – Double Splayed Strutting Beams – Sheet Roof								
Max Beam Span (mm)	WOR = Width of Roof (mm)							
	1500	2000	2500	3000	3500	4000	4500	5000
3000	150x45	170x45	170x45	200x45	200x45	200x45	240x45	240x45
	130x63	150x63	150x63	170x63	170x63	200x63	200x63	200x63
3300	170x45	200x45	200x45	200x45	240x45	240x45	240x45	240x45
	150x63	170x63	170x63	200x63	200x63	200x63	200x63	240x63
3600	200x45	200x45	240x45	240x45	240x45	240x45	300x45	300x45
	170x63	170x63	200x63	200x63	240x63	240x63	240x63	240x63
3900	200x45	240x45	240x45	240x45	300x45	300x45	300x45	300x45
	200x63	200x63	240x63	240x63	240x63	240x63	300x63	300x63
4200	240x45	240x45	300x45	300x45	300x45	300x45	360x45	360x45
	200x63	240x63	240x63	240x63	300x63	300x63	300x63	300x63
4500	240x45	300x45	300x45	300x45	360x45	360x45	360x45	360x45
	240x63	240x63	300x63	300x63	300x63	300x63	360x63	360x63
4800	300x45	300x45	360x45	360x45	360x45	360x45	360x63	360x63
	240x63	300x63	300x63	300x63	360x63	360x63	NS	NS
5100	300x45	360x45	360x45	360x45	360x63	360x63	360x63	400x63
	300x63	300x63	300x63	360x63	NS	NS	NS	NS
5400	360x45	360x45	360x45	360x63	360x63	400x63	400x63	400x63
	300x63	360x63	360x63	NS	NS	NS	NS	NS
5700	360x45	360x45	360x63	400x63	400x63	NS	NS	NS
	300x63	360x63	NS	NS	NS	NS	NS	NS
6000	360x45	360x63	400x63	400x63	NS	NS	NS	NS
	360x63	NS	NS	NS	NS	NS	NS	NS
6300	360x63	400x63	400x63	NS	NS	NS	NS	NS
	NS	NS	NS	NS	NS	NS	NS	NS
6600	400x63	400x63	NS	NS	NS	NS	NS	NS
	NS	NS	NS	NS	NS	NS	NS	NS
6900	400x63	NS	NS	NS	NS	NS	NS	NS
	NS	NS	NS	NS	NS	NS	NS	NS

1. All sections with span to depth ration exceeding 3 must be restrained against roll over at supports and at each strutting point. Connection between Primary and Secondary beams, and hanging and counter beams are assumed to provide this required restraint at connection.
2. Bearing length at support to be not be less than 70 mm.
3. Beam ends may be chamfer cut to a minimum of 90mm or D/3, whichever is greater.
4. NS signifies section size unlikely to be suitable.



e-beam² – Double Splayed Strutting Beams Tile Roof

Wind Classification N3

Limits on deflection
Dead load: span/300 or 20mm max.
Live load: span/250 or 20mm max.

Strutting beam,
Strutting counter beam, or
Strutting/Hanging beam

e-beam2 – Double Splayed Strutting Beams – Tile Roof								
Max Beam Span (mm)	WOR = Width of Roof (mm)							
	1500	2000	2500	3000	3500	4000	4500	5000
3000	200x45	245x45	245x45	245x45	300x45	300x45	300x45	300x45
	170x63	200x63	200x63	245x63	245x63	245x63	245x63	300x63
3300	245x45	245x45	245x45	300x45	300x45	300x45	300x45	360x45
	200x63	200x63	245x63	245x63	245x63	300x63	300x63	300x63
3600	245x45	300x45	300x45	300x45	300x45	360x45	360x45	360x45
	200x63	245x63	245x63	300x63	300x63	300x63	300x63	300x63
3900	300x45	300x45	300x45	360x45	360x45	360x45	360x45	360x63
	245x63	300x63	300x63	300x63	300x63	360x63	360x63	NS
4200	300x45	360x45	360x45	360x45	360x63	360x63	360x63	450x63
	300x63	300x63	300x63	360x63	NS	NS	NS	NS
4500	360x45	360x45	360x45	360x63	360x63	450x63	450x63	NS
	300x63	360x63	360x63	NS	NS	NS	NS	NS
4800	360x45	360x63	360x63	450x63	450x63	NS	NS	NS
	300x63	NS	NS	NS	NS	NS	NS	NS
5100	360x63	360x63	450x63	NS	NS	NS	NS	NS
	NS	NS	NS	NS	NS	NS	NS	NS
5400	360x63	450x63	NS	NS	NS	NS	NS	NS
	NS	NS	NS	NS	NS	NS	NS	NS
5700	450x63	NS	NS	NS	NS	NS	NS	NS

1. All sections with span to depth ration exceeding 3 must be restrained against roll over at supports and at each strutting point. Connection between Primary and Secondary beams, and hanging and counter beams are assumed to provide this required restraint at connection.
2. Bearing length at support to be not be less than 70 mm.
3. Beam ends may be chamfer cut to a minimum of 90mm or D/3, whichever is greater.
4. NS signifies section size unlikely to be suitable.

Wesbeam e-beam² connection details are WA specific

At Wesbeam, we are so committed to stick roof construction in WA that we have engineered a range of LVL strutting beam connection details specifically for local conditions. In tandem with MiTek, we've developed a split hanger connection for 90° connections. We've also collaborated with WA specifiers and carpenters to develop e-ledger, a metal bracket for strutting beam connections between 45° and 90°. By using a MiTek split hanger or a Wesbeam e-ledger a fully engineered connection detail is assured for all load conditions in the e-beam² tables.

Split Hanger

For secondary strutting beams connecting at 90° to the primary strutting beams, Wesbeam recommends the use of the MiTek 140mm split hanger.



- Use nails to temporarily secure the secondary beam to the primary beam.



- Screw fix the 140mm MiTek split hanger into position using 6 MiTek MS 1430 hex head screws per leg.



MiTek MS 1430 hex head

e-ledger®

Wesbeam's e-ledger® eliminates the need to notch secondary LVL strutting beams when connecting two LVL strutting beams at angles other than 90°.

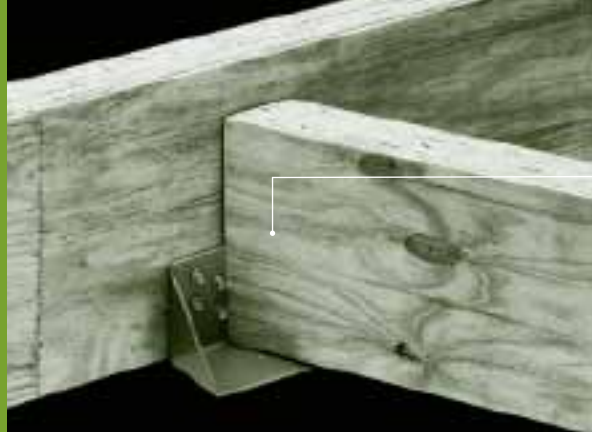
This is a major advance for specifiers as the current practice of notching the secondary beam into a pine ledger significantly reduces the maximum load capacity of the connection.

e-ledger® provides an easy to install solution for all load conditions contained in the e-beam² tables.

*e-ledger is a registered trademark of Wesbeam.

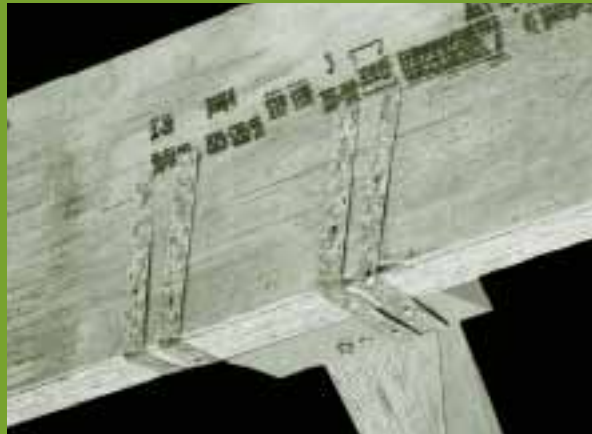
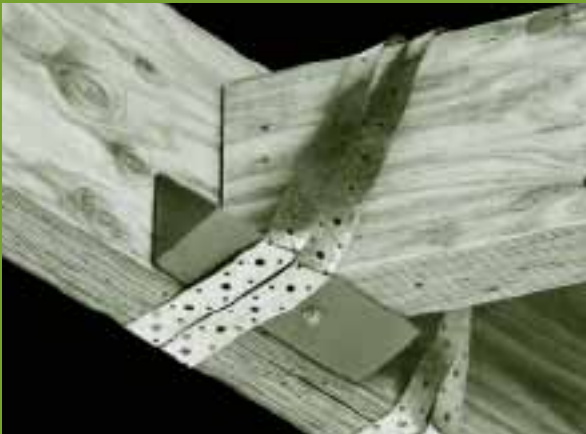


- Fix the e-ledger to the primary beam using 8/No.14, type 17, 50mm long hex head screws.



Mitre cut the secondary beam for flush mounting to primary beam.

- Locate the secondary beam on the e-ledger and fix with 1/No.14, type 17, 50mm long hex head screw through one of the three holes located on the bottom face of the e-ledger.
- To prevent the secondary beam from rolling fix the secondary beam to the primary beam using 2/3.15mm Ø nails located either side of the top of the secondary beam.



- Fix the secondary beam to the e-ledger using 2/30 x 0.8 G.I. looped strap with 4/3.15mm Ø nails to each of the four ends.



No.14 type17 50mm hex head