MULTIPLE SECTION LVL MEMBERS

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Introduction

Laminated Veneer Lumber (LVL) is widely used in residential housing from bearers and joists through to roof framing elements. This wide spread market acceptance has been due to their uniformity of engineering properties, large end section sizes, high strength to weight ratio and their ready availability in longer lengths.

Where multiple section LVL members are specified in the Wesbeam Span Tables or e-house software, the members need to be securely fastened together. The method of fastener can be either

- Nail fasteners
- Type 17 Tek screw fasteners, or
- Bolt fasteners

Wesbeam Products

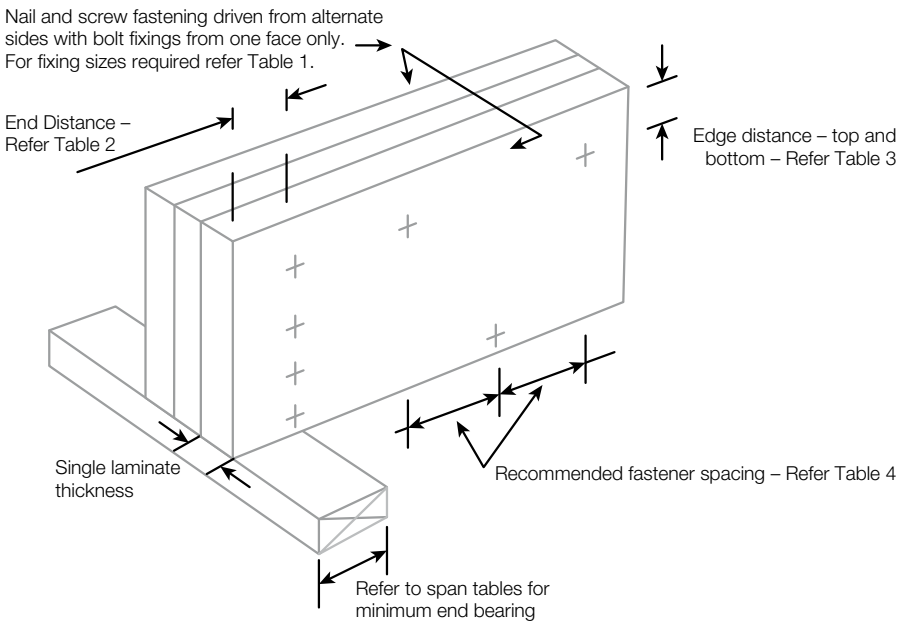
Using LVL as multiple section members requires an understanding of these products and the means of "laminating" the individual members together and installing them in residential housing applications.

e-beam LVL

Wesbeam's laminated veneer lumber (LVL and e-joists), can be used in all structural applications where traditional sawn timber has been used. Being engineered timber products, LVL and e-joists are manufactured to meet the specific needs of the residential building industry and are available as both untreated as well as treated products to enhance their durability.

Assembly of Multiple Section LVL Members

Figure 1 – Multiple Section Details



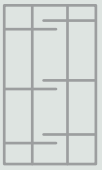
Multiple Section LVL Members – Possible Configurations

Figure 2: Suggested Configurations

2 members – same thickness

3 members – same thickness

2 members – varying thickness



3 members – 2 members same & 1 member varying thickness

Table 1 – Recommended Fastener Sizes

Single Laminate Thickness (mm)	Fastener Type					
	Nails		Type 17 Tek Screws		Bolts	
	Min. Dia. (mm)	Min. Length (mm)	Screw No.	Min. Length (mm)	Min. Dia. (mm)	Min. Length (mm)
35	2.87	75	No.10	75	M10	100
45	3.05	90	No.12	75	M12	125
63	3.33	100	No.14	100	M12	150

NS – Nail fastener not suitable for 75mm thick members

Table 2 – Recommended Fastener End Distances

Fastener Type					
Nails		Type 17 Tek Screws		Bolts	
Nail Dia. (mm)	End Distance (mm)	Screw No.	End Distance (mm)	Bolt Dia. (mm)	End Distance (mm)
2.87	60	No.10	50	M10	50
3.05	65	No.12	60	M12	60
3.33	70	No.14	65	M12	60

Table 3 – Recommended Fastener Edge Distances

Fastener Type					
Nails		Type 17 Tek Screws		Bolts	
Nail Dia. (mm)	Edge Distance (mm)	Screw No.	Edge Distance (mm)	Bolt Dia. (mm)	Edge Distance (mm)
2.87	20	No.10	30	M10	50
3.05	20	No.12	30	M12	60
3.33	20	No.14	35	M12	60

Table 4 – Recommended Spacing of Fasteners along Beams

Fastener Type					
Nails		Type 17 Tek Screws		Bolts	
Nail Dia. (mm)	Spacing (mm)	Screw No.	Spacing (mm)	Bolt Dia. (mm)	Spacing (mm)
2.87	150	No.10	200	M10	300
3.05	150	No.12	200	M12	450
3.33	200	No.14	300	M12	600

Fasteners Required at Supports

To ensure that multiple section members act as one beam for structural design purposes the recommended number of fasteners at supports is shown in Figure 3 and Table 5. Where a secondary beam is faced fixed to a multiple section primary beam the number of fasteners required is shown in Figure 4 and Table 6.

Figure 3 – Fasteners at Supports

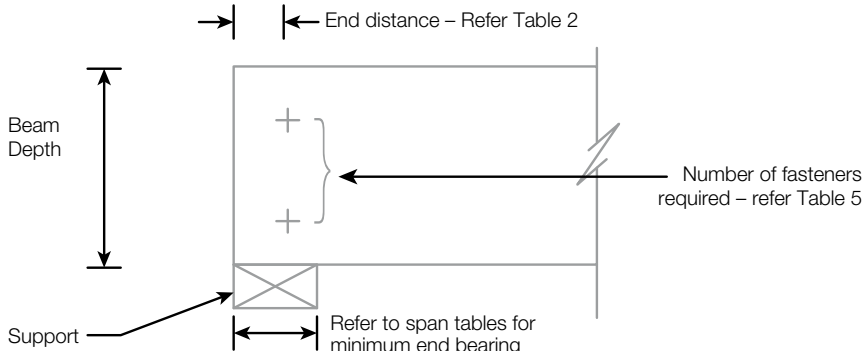


Table 5 – Recommended Number of Fasteners required at Supports

Beam Depth (mm)	Number of Fasteners Required		
	Nails	Type 17 Tek Screws	Bolts
90 – 150	2	2	1
200 – 240	4	3	2
300	5	4	3
360	6	4	3
400	6	4	3

Fasteners Required at Beam to Beam Connection

Figure 4 – Fasteners Required in the Multiple Section Primary Beam to Support the Secondary Beam

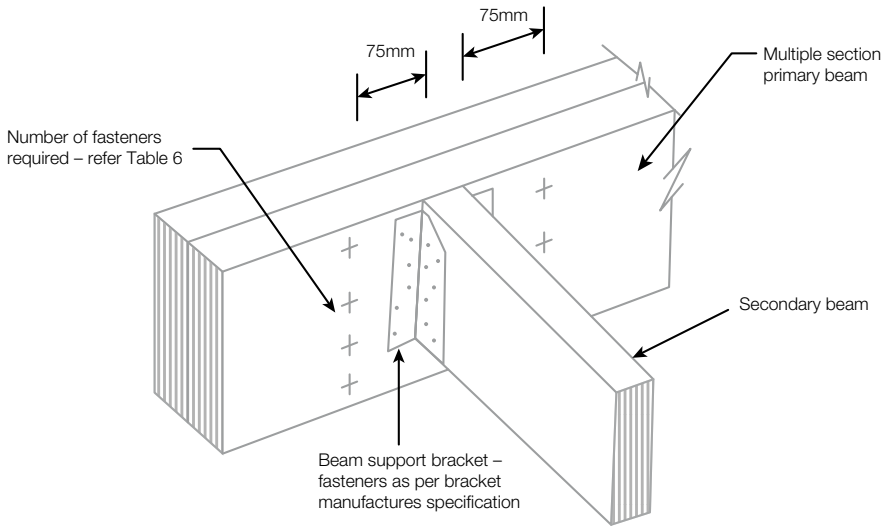


Table 6 – Recommended Fasteners Required for Fixing Multiple Section Primary Beams Together that Support Secondary Beams

Beam Depth (mm)	Number of Fasteners Required each Side of the Secondary Beam		
	Nails	Type 17 Tek Screws	Bolts
90 – 150	3	2	1
200 – 240	5	3	2
300	6	4	3
360	8	4	3
400	8	4	3

Fabrication of Multiple Section Members

Care should be taken when fabricating multiple section members to ensure that the individual laminates do not cup or warp before or after fabrication. Individual members should be dry and not cupped or bowed before fabrication. Moisture entry between laminations should be minimised or prevented after fabrication as the members may cup or warp thereby reducing the fastener efficiency.

Fabricated multiple section members should be stored under cover and above ground on supports spaced not greater than 1800mm.

Notes on the Installation of Fasteners

1. Exposed ends of nails should be clenched over.
2. When using Type 17 or Bugle Batten wood screws it is recommended that the multiple section members be tightly clamped together. This will prevent the face of the 2nd or 3rd LVL member being pushed away while installing the screw.
3. Where a flush finish is required to the member a Bugle Batten screw fastener is recommended.
4. Type 17 screws with Hex heads are only suitable for joining 2 members together. Multiple section members comprising 3 members should use Bugle Batten screw fasteners for internal lamina.
5. Holes drilled for the installation of bolt fasteners should be the same dia. as the bolt shank dia. but not more than 1mm greater than the bolt shank dia. eg for 12mm bolts the max drill hole should be ≤13mm.
6. Where bolt fasteners are utilised to join multiple section members together the ends of the bolts are to be finished with 3mm thick flat steel washers.

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