

# LVL8 H1.2 GENERAL FRAMING

**Eco  
Friendly**

Revolutionary  
H1.2 Treatment  
Azotek™ by Zelam



**NelsonPine**  
Laminated Veneer Lumber **LVL 8**

Mill 919 A-Band Eo  
AS/NZS 4357 0  
AS/NZS 1604 4  
NZS 3640 A5

916 66 H1.2 G/F

Triadimefon  
Cyproconazole  
& Bifenthrin  
SEP-13

## Introduction to NelsonPine LVL8 H1.2

NelsonPine LVL is an engineered wood composite made from rotary peeled veneers, laid up with parallel grain orientation. One of the main features of LVL is to disperse or remove strength-reducing characteristics of wood. NelsonPine LVL is an engineered, highly predictable, uniform lumber product, because natural defects such as knots, slope of grain and splits have been dispersed throughout the veneer assembly or have been removed altogether. In addition to this, the veneer sheets are placed in a specific sequence and location within the product to maximise the potential of the stiffer and stronger veneer grades. This can be considered as an engineered configuration of the veneers. NelsonPine LVL is dimensionally stable, resists warping and twisting and is machined to consistently uniform sizes.

### NelsonPine LVL8 H1.2 Framing for use in Timber Framed Construction in New Zealand

NelsonPine LVL8 H1.2 is suitable to be substituted in place of No. 1 Framing, SG6 and SG8 sawn timber as ordinary timber in timber framed buildings within New Zealand as per NZS 3604 (clause 2.3.9) Timber Framed Buildings, as an acceptable solution. NelsonPine LVL8 H1.2 will meet the structural and durability requirements of the NZ Building Codes Clauses B1 and B2 when installed correctly in accordance with NZS 3604 and NZS 3602.

### Application and Design Software

The span tables and technical information in this guide are intended to be used by designers to select the appropriate NelsonPine LVL8 for use in the framing of houses and similar buildings in conjunction and within the scope of NZS 3604.

These span tables are supported by NelsonPine Design software which can provide additional design information including the determination of reaction loads. It is available for download free of charge by visiting:



<http://www.nelsonpine.co.nz/NelsonPineDesign/NPDv1-Install.zip>

### Product Specification

Actual Size:	Framing	90x45, 140x45
	Beams	190x45, 240x45, 290x45
Timber Species:	Radiata Pine	
Adhesive:	Phenolic adhesive producing a Type A marine bond (AS/NZS 2098)	
Formaldehyde Emission Class:	E0 (Table 1 AS/NZS 4357)	
Branding:	NelsonPine LVL8 H1.2 ink jet branding on face	
Treatment:	H1.2 Azotek glueline and face spray treatment (full penetration) as per NZS 3640 and an acceptable solution as per amendment 8 B2/AS1 of the NZ Building Code. The audited Azotek treatment process uses a combination of fungicides and insecticides added to the glueline during manufacture to deliver precisely controlled actives throughout the veneer layup. The process contains no solvents and can be confidently used where H1.2 Boron timber is used. NelsonPine LVL8 H1.2 can be cut, notched or drilled without any requirement for re-sealing or re-treating the exposed cut surfaces. The actives in the treatment are non corrosive to common timber fasteners.	
Weather exposure:	Exposure of NelsonPine LVL to the weather for a limited time when framed into a structure is acceptable and will not result in any structural damage. However, should NelsonPine LVL be wet on installation it should be allowed to dry out prior to covering and lining. If the beam is horizontal then it should also be propped while drying.	
Storage and Handling:	LVL expands in thickness and depth when allowed to get wet. To ensure the full benefits of NelsonPine LVL as a dry, straight and true material are available at the time of installation, the following recommendations regarding storage are made: <ol style="list-style-type: none"><li>1. Stack on evenly spaced level bearers to keep flat and straight</li><li>2. Stack well clear of the ground for good ventilation</li><li>3. Store under cover to keep dry prior to installation</li><li>4. Take care to re-wrap remaining material after opening</li></ol>	

# NelsonPine LVL8 H1.2 Characteristic Properties

## NelsonPine LVL8 H1.2 Limit State Design Characteristic Values

Property		Edge (MPa)	Flat (MPa)
Modulus of Elasticity	MoE	8000	8000
Bending	f'b	30.0	30.0
Tension parallel to grain	f't	20.0	20.0
Compression parallel to grain	f'c	30.0	30.0
Compression perpendicular to grain	f'p	7.0	–
Shear	f's	5.0	3.0

## Joint Groups

Grade	Nails and screws in lateral load		Nails and screws in withdrawal	
	Edge	Face	Edge	Face
LVL8	J5	J5	J5	J5

Fasteners in the Face = fasteners that penetrate the face perpendicular to the grain

Fasteners in the Edge = fasteners that penetrate the edge parallel to the glue lines

For structures that require specific design of joints, this table is to be read in conjunction with NZS3603 Section 4, Joints.

## Design Considerations of Span Tables

These span tables have been taken from the designed produced by NelsonPine Design software which complies with the requirements of the following standards:

AS/NZS 1170 Structural Design Actions and NZS3603 Timber Structures.

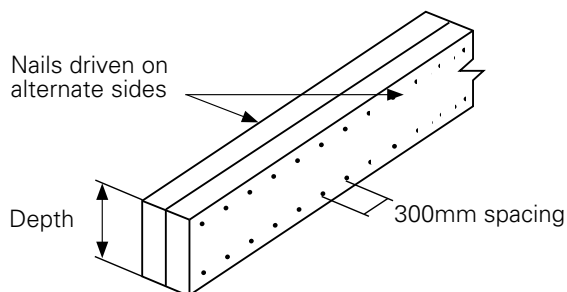
Floor loading includes an allowance for a floor mass of 40kg/m<sup>2</sup> and a live load of up to 1.5kPa/1.8kN. The Dynamic serviceability limits are applied to floor joists are the standard 1kN point load for 2mm deflection as per AS 1684 Residential Timber Framed Construction.

Note that Design Deflection Limits may vary slightly from NZS3604 based on experience with insitu LVL performance.

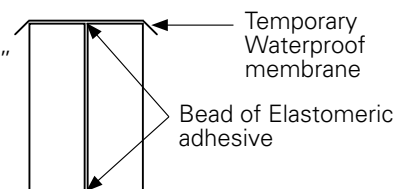
All tables include an allowance for a ground snow load of 1.0kPa.

## Nail Laminated Double Member

The edges of the individual sections must be carefully aligned to each other so that the composite beam is flat, allowing the applied loads to be equally shared. Use 3.3x90mm nails for laminating 45mm thick LVL.



Recommended "during construction" protection from weather for multiple LVLs

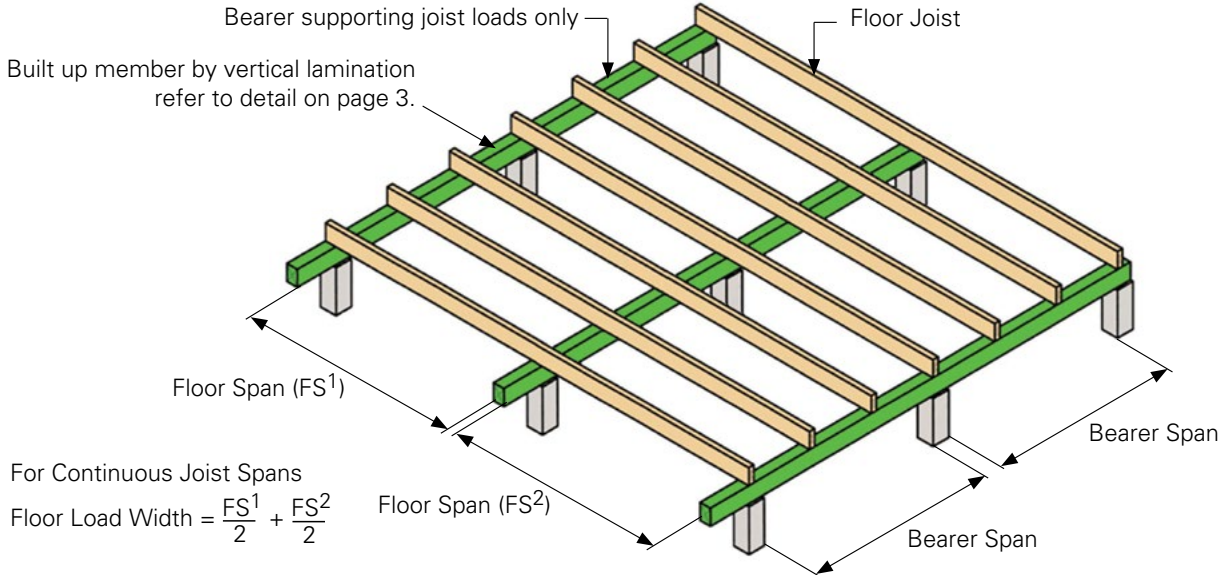


# Floor Bearers

## Design Deflection Limits

Dead Load - Span/300 or 12mm max

Live Load - Span/360 or 9mm max



## Floor Bearers - 40kg/m<sup>2</sup> - 1.5kPa Floor Load

Size (mm)	Floor Load Width (mm)							
	1200	1500	1800	2100	2400	3000	4000	5000
	Maximum Continuous Span (m)							
2/90x45	1.70	1.60	1.50	1.40	1.35	1.25	1.10	1.00
2/140x45	2.70	2.50	2.35	2.25	2.15	1.95	1.80	1.60
2/190x45	3.55	3.35	3.20	3.10	2.95	2.70	2.40*	2.15#
2/240x45	4.25	4.05	3.85	3.70	3.60	3.40*	3.00#	2.65#
2/290x45	4.95	4.65	4.45	4.30	4.15#	3.90#	3.45#	3.05#

Bearer span tables allow for a minimum end bearing length of 45mm and a minimum intermediate bearing length of 65mm.

\* Indicates minimum of 85mm bearing length at the internal support.

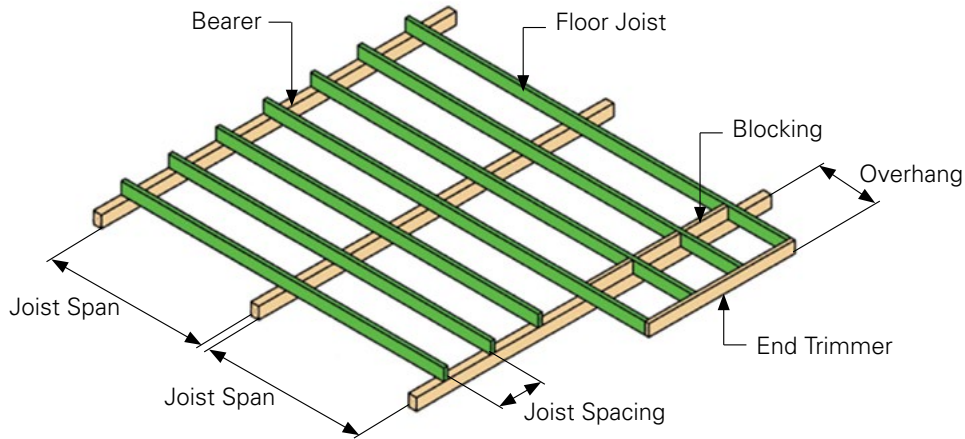
# Indicates minimum of 115mm bearing length at the internal support.



# Floor Joists

## Design Deflection Limits

Dead Load - Span/300 or 15mm max  
 Live Load - Span/360 or 9mm max  
 Dynamic Criteria - 1kN Point Load 2mm max



## Floor Joists - 40kg/m<sup>2</sup> - 1.5kPa Floor Load

Size (mm)	Joist Spacing (mm)		
	400	450	600
	Maximum Single Span (m)		
90x45	1.45	1.40	1.35
140x45	2.40	2.30	2.20
190x45	3.35	3.25	3.15
240x45	4.40	4.25	4.10
290x45	5.30	5.15	4.80

Size (mm)	Joist Spacing (mm)		
	400	450	600
	Maximum Continuous Span (m)		
90x45	1.65	1.60	1.50
140x45	2.70	2.60	2.50
190x45	3.80	3.70	3.55
240x45	5.00	4.80	4.55
290x45	5.80	5.65	5.25

## Holes in Floor Joists

Holes in uniformly loaded floor joists (excluding overhangs) are to be in accordance with the recommendations in NZS 3604 clause 7.1.7. Holes drilled in floor joists other than cantilevered joists shall be:

1. Within the middle third of the depth of the joist.
2. Not more than 3 times the depth of the joist from the face of the support.
3. Not larger in diameter than one-fifth the depth of the joist or 32mm, whichever is the lesser.
4. At minimum spacing measured along the joist between the edges of the holes of not less than the depth of the joist.
5. If holes are required in floor joists outside the scope of NZS 3604, specific engineering design will be required.

## Joist Blocking

Floor joists with a span over 2.5m and a depth of 4 or more times their thickness shall be laterally supported by continuous blocking or strutting at mid-span as per NZS 3604 clause 7.1.2.

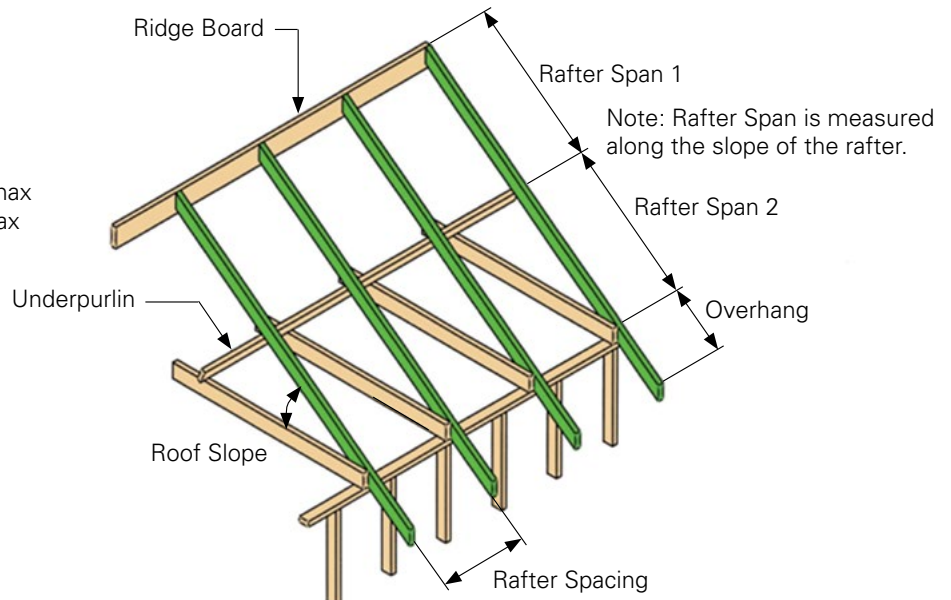
## Continuous Spans

For any member to be considered continuous it shall span at least 2 adjacent spans such that the major span is greater than or equal to or greater than 0.6 x minor span.

# Rafters

## Design Deflection Limits

Dead Load - Span/300 or 20mm max  
 Live Load - Span/250 or 20mm max  
 Wind Load - Span/200



### Rafters - Light Sheet Roof with ceiling 40kg/m<sup>2</sup>, 1.0kPa Snow, Very High Wind Exposure

Size (mm)	Rafter Spacing (mm)		
	600	900	1200
Maximum Single Span (m)			
90x45	2.15	1.85	1.70
140x45	3.35	2.95	2.70
190x45	4.50	4.00	3.65
240x45	5.65	5.05	4.60
290x45	6.50	6.00	5.55

Size (mm)	Rafter Spacing (mm)		
	600	900	1200
Maximum Continuous Span (m)			
90x45	2.95	2.60	2.35
140x45	4.55	4.05	3.70
190x45	6.10	5.45	5.00
240x45	7.20	6.60	6.20
290x45	8.25	7.60	7.10

### Rafters - Heavy Tile Roof with ceiling 90kg/m<sup>2</sup>, 1.0kPa Snow, Very High Wind Exposure

Size (mm)	Rafter Spacing (mm)		
	600	900	1200
Maximum Single Span (m)			
90x45	1.65	1.40	1.30
140x45	2.60	2.25	2.05
190x45	3.50	3.10	2.80
240x45	4.45	3.90	3.55
290x45	5.35	4.75	4.30

Size (mm)	Rafter Spacing (mm)		
	600	900	1200
Maximum Continuous Span (m)			
90x45	2.25	1.95	1.80
140x45	3.55	3.10	2.80
190x45	4.80	4.25	3.85
240x45	6.05	5.35	4.90
290x45	6.95	6.30	5.90*

\* Member must have a minimum 65mm bearing at internal support

### Uplift Fixing Type as per 3604 at both ends of rafter

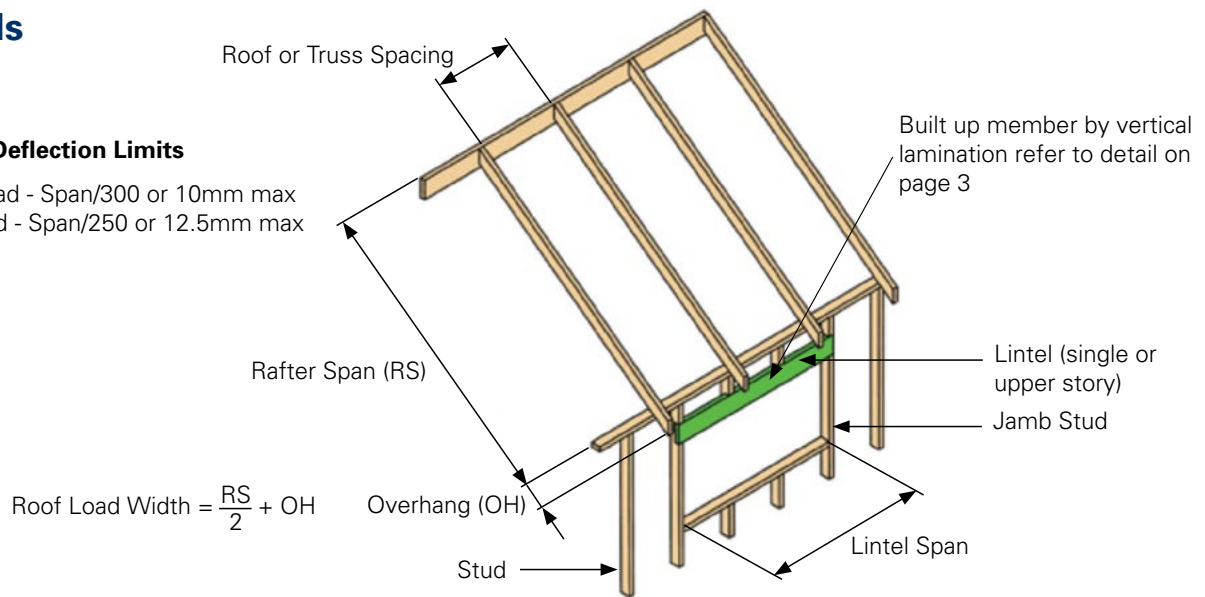
Fixing type	Description	Alternative fixing capacity
E	2/90x3.15mm skew nails + 2 wire dogs	4.7kN
F	2/90x3.15mm skew nails + 1 strap fixing	7.0kN

Fixing Types for rafters running continuously shall have double the fixing capacity given in this table at the internal supports.

# Lintels

## Design Deflection Limits

Dead Load - Span/300 or 10mm max  
 Live Load - Span/250 or 12.5mm max



### Upper Lintels - Light Sheet Roof with ceiling 40kg/m<sup>2</sup>, 1.0kPa Ground Snow, Very High Wind Exposure

Size (mm)	Roof Load Width (mm)					
	1800	2100	2400	3000	4000	5000
2/90x45	1.90	1.75	1.65	1.50	1.35	1.20
2/140x45	2.85	2.70	2.55	2.35	2.15	2.00
2/190x45	3.60	3.45	3.35	3.15	2.90	2.65
2/240x45	4.30	4.15	4.00	3.75	3.45	3.25
2/290x45	4.95	4.75	4.60	4.35	4.00	3.75

### Upper Lintels - Heavy Tile Roof with ceiling 90kg/m<sup>2</sup>, 1.0kPa Ground Snow, Very High Wind Exposure

Size (mm)	Roof Load Width (mm)					
	1800	2100	2400	3000	4000	5000
2/90x45	1.40	1.35	1.30	1.20	1.05	0.95
2/140x45	2.20	2.10	2.00	1.85	1.65	1.55
2/190x45	3.00	2.90	2.75	2.55	2.30	2.10
2/240x45	3.60	3.45	3.35	3.15	2.90	2.70
2/290x45	4.15	4.00	3.85	3.65	3.40	3.20

### Minimum Bearing Lengths as per NZS 3604

Lintel width (mm)	Minimum bearing length
90-140	Checked in 15-20mm
190-240	35mm with double stud or Jack stud
290	45mm with double stud or Jack stud

### Uplift Fixing as per NZS 3604 - Lintel to Trimming Stud

Uplift fixing not required - hand driven	4 skewed 75x3.15mm or 2/100x3.75mm end nailed
Uplift fixing not required - power driven	3/90x3.15mm end nailed
Uplift fixing required - hand driven	25x1mm strap with 6/30x2.5mm nails into both lintel and stud with equivalent to floor framing
Uplift fixing required - alternative	7.5kN Tension capacity with equivalent connection to floor framing



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**Nelson Pine Industries Ltd**

Lower Queen Street  
Richmond  
Nelson  
New Zealand  
PO Box 3049  
Richmond, Nelson 7050  
T: +64 3 543 8800  
F: +64 3 543 8890  
E: [LVL@nelsonpine.co.nz](mailto:LVL@nelsonpine.co.nz)  
[www.nelsonpine.co.nz](http://www.nelsonpine.co.nz)



The mark of responsible forestry



**Plantation Grown.** All veneers used in the manufacture of Nelson Pine LVL are peeled from sustainable plantation grown Pinus Radiata logs.

