

## FRAMING SOLUTIONS



### PRODUCTS

NP FRAME LVL 8

NP FRAME LVL 11

NP FRAME LVL 13

NP LVL P11

### APPLICATIONS

FLOOR BEARERS

FLOOR JOISTS

STUD FRAMES

LINTELS

RAFTERS



## NP Frame LVL 8

WIDTH (MM)	THICKNESS (MM)
90	45
140	45
190	45
240	45
290	45
300	45



## NP Frame LVL 11

WIDTH (MM)	THICKNESS (MM)	
90	45	-
140	45	-
150	45	90
190	45	-
200	45	90
240	45	90
300	45	90
360	45	90
400	45	90
460	45	90
610	45	90

LVL11 90mm is available as a special-order product and is subject to minimum order quantities. For standard supply orders of 90mm product please refer to NP LVL P11



## NP Frame LVL 13

WIDTH (MM)	THICKNESS (MM)	
150	45	63
200	45	63
240	45	63
300	45	63
360	45	63
400	45	63
460	45	63
610	45	63



## NP LVL P11

WIDTH (MM)	THICKNESS (MM)
150	90
200	90
240	90
300	90
360	90
400	90
610	90



## NP Frame LVL 8

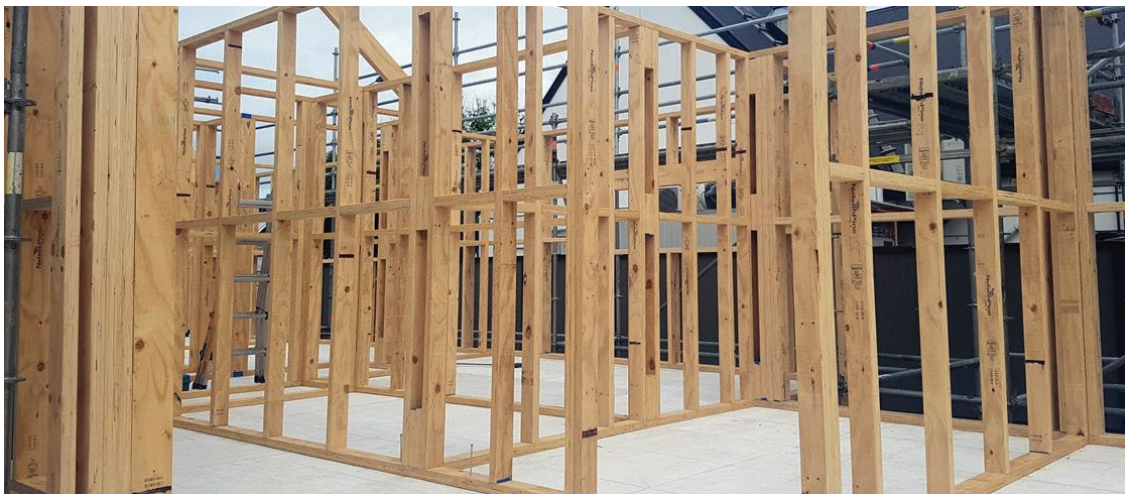
NP Frame LVL 8 is commonly utilised within frame and truss manufacturing. It is straight, and available in a limited range of smaller sectional sizes with the advantage of long length offerings.

**NP FRAME LVL 8 LIMIT STATE DESIGN CHARACTERISTIC VALUES (TABLE 1)**

PROPERTY		EDGE (MPa)	FLAT (MPa)
Modulus of Elasticity	MoE	8000	8000
Modulus of Rigidity	G	400	400
Bending Strength <sup>1</sup>	f'b	30.0	30.0
Tension Parallel to Grain <sup>2</sup>	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

<sup>1</sup> For 95mm in depth. Refer to Table 9 for adjustment factor above 95mm depth.

<sup>2</sup> For 150mm in depth. Refer to Table 9 for adjustment factor above 150mm depth.



## NP LVL P11

NelsonPine LVL P11 is an H1.2 treated engineered wood product consisting of radiata pine veneers laminated together to produce structural framing materials. Feedstock is structural 45mm NelsonPine LVL subsequently secondary bonded into thicker product using Polyurethane ( PUR) adhesive in accordance with AS/NZS 1328.1.

NelsonPine LVL P11 is intended for use as internal framing structural components such as, joists, rafters, beams, lintels and columns.

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### NP LVL P11 LIMIT STATE DESIGN CHARACTERISTIC VALUES (TABLE 2A)

PROPERTY		EDGE (MPa)	FLAT (MPa)
Modulus of Elasticity	MoE	11000	11000
Modulus of Rigidity	G	550	550
Bending Strength <sup>1</sup>	f'b	38.0	38.0
Tension Parallel to Grain <sup>2</sup>	f't	26.0	26.0
Compression Parallel to Grain	f'c	38.0	38.0
Compression Perpendicular to Grain	f'p	10.0	10.0
Shear	f's	5.0	3.0

<sup>1</sup> For 95mm in depth. Refer to Table 9 for adjustment factor above 95mm depth.

<sup>2</sup> For 150mm in depth. Refer to Table 9 for adjustment factor above 150mm depth.

### NP LVL P11 SECTION SIZES AND DESIGN PROPERTIES (TABLE 3A)

SECTION SIZE (mm)	MASS (kg/m)	I <sub>xx</sub> (10 <sup>6</sup> mm <sup>4</sup> )	EI <sub>xx</sub> (10 <sup>9</sup> Nmm <sup>2</sup> )	Z <sub>xx</sub> (10 <sup>3</sup> mm <sup>3</sup> )	Øf'bZ <sub>xx</sub> (kNm) <sup>*</sup>
150 x 90	7.7	25.3	278	338	10.7
200 x 90	10.3	60.0	660	600	18.1
240 x 90	12.3	103.7	1140	864	25.3
300 x 90	15.4	202.5	2228	1350	38.1
360 x 90	18.5	349.9	3849	1944	53.2
400 x 90	20.5	480	5280	2400	64.6
610 x 90	31.3	1702.4	18726	5582	139.9

#Ø =0.9 for Category 2 applications (refer to Table 6. Strength Reduction Factors) Calculation includes the k<sub>24</sub> Size Factor.

## NP Frame LVL 11

NP Frame LVL 11 is a multi-purpose structural LVL product and can be used in a range of applications from stud framing to structural applications. It is straight, and available in a wide range of sectional sizes with the advantage of long length offerings.

**NP FRAME LVL 11 LIMIT STATE DESIGN CHARACTERISTIC VALUES (TABLE 2B)**

PROPERTY		EDGE (MPa)	FLAT (MPa)
Modulus of Elasticity	MoE	11000	11000
Modulus of Rigidity	G	550	550
Bending Strength <sup>1</sup>	f'b	38.0	38.0
Tension Parallel to Grain <sup>2</sup>	f't	26.0	26.0
Compression Parallel to Grain	f'c	38.0	38.0
Compression Perpendicular to Grain	f'p	10.0	10.0
Shear	f's	5.0	3.0

<sup>1</sup> For 95mm in depth. Refer to Table 9 for adjustment factor above 95mm depth.

<sup>2</sup> For 150mm in depth. Refer to Table 9 for adjustment factor above 150mm depth.

**NP FRAME LVL 11 SECTION SIZES AND DESIGN PROPERTIES (TABLE 3B)**

SECTION SIZE (mm)	MASS (kg/m)	I <sub>xx</sub> (10 <sup>4</sup> mm <sup>4</sup> )	EI <sub>xx</sub> (10 <sup>9</sup> Nmm <sup>2</sup> )	Z <sub>xx</sub> (10 <sup>3</sup> mm <sup>3</sup> )	Øf'bZ <sub>xx</sub> (kNm) <sup>#</sup>
90 x 45	2.3	2.7	30	61	2.1
140 x 45	3.6	10.3	113	147	4.7
150 x 45	3.8	12.7	139	169	5.3
190 x 45	4.9	25.7	283	271	8.2
200 x 45	5.1	30.0	330	300	9.1
240 x 45	6.2	51.8	570	432	12.7
300 x 45	7.7	101.3	1114	675	19.1
360 x 45	9.2	175.0	1925	972	26.6
400 x 45	10.3	240.0	2640	1200	32.3
460 x 45	11.8	365.0	4015	1587	41.7
610 x 45	15.6	851.2	9363	2791	70.0
150 x 90	7.7	25.3	278	338	10.7
200 x 90	10.3	60.0	660	600	18.1
240 x 90	12.3	103.7	1140	864	25.3
300 x 90	15.4	202.5	2228	1350	38.1
360 x 90	18.5	349.9	3849	1944	53.2
400 x 90	20.5	480.0	5280	2400	64.6
460 x 90	23.6	730.0	8030	3174	83.4
610 x 90	31.3	1702.4	18726	5582	139.9

LVL11 90mm is available as a special-order product and is subject to minimum order quantities. For standard supply orders of 90mm product please refer to NP LVL P11

#Ø = 0.9 for Category 2 applications (refer to Table 6. Strength Reduction Factors) Calculation includes the k<sub>24</sub> Size Factor.

## NP Frame LVL 13

NP Frame LVL 13 is a high-strength structural LVL product and is best used for long spans and high strength situations. It is straight, and available in a wide range of larger sectional sizes with the advantage of long length offerings.

**NP FRAME LVL 13 LIMIT STATE DESIGN CHARACTERISTIC VALUES (TABLE 4)**

PROPERTY		EDGE (MPa)	FLAT (MPa)
Modulus of Elasticity	MoE	13200	13200
Modulus of Rigidity	G	660	660
Bending Strength <sup>1</sup>	f'b	48.0	48.0
Tension Parallel to Grain <sup>2</sup>	f't	33.0	33.0
Compression Parallel to Grain	f'c	38.0	38.0
Compression Perpendicular to Grain	f'p	10.0	12.0
Shear	f's	5.3	3.0

<sup>1</sup> For 95mm in depth. Refer to Table 9 for adjustment factor above 95mm depth.

<sup>2</sup> For 150mm in depth. Refer to Table 9 for adjustment factor above 150mm depth.

**NP FRAME LVL 13 SECTION SIZES AND DESIGN PROPERTIES (TABLE 5)**

SECTION SIZE (mm)	MASS (kg/m)	I <sub>xx</sub> (10 <sup>6</sup> mm <sup>4</sup> )	EI <sub>xx</sub> (10 <sup>9</sup> Nmm <sup>2</sup> )	Z <sub>xx</sub> (10 <sup>3</sup> mm <sup>3</sup> )	Øf'bZ <sub>xx</sub> (kNm) <sup>#</sup>
150 x 45	3.8	12.7	167	169	6.8
200 x 45	5.1	30.0	396	300	11.4
240 x 45	6.2	51.8	684	432	16.0
300 x 45	7.7	101.3	1337	675	24.1
360 x 45	9.2	175.0	2309	972	33.6
400 x 45	10.3	240.0	3168	1200	40.8
460 x 45	12.3	365.0	4818	1587	52.7
610 x 45	16.3	851.2	11236	2791	88.4
150 x 63	5.4	17.7	234	236	9.5
170 x 63	6.4	25.8	340	303	11.9
200 x 63	7.2	42.0	554	420	16.0
240 x 63	8.6	72.6	958	605	22.4
300 x 63	10.8	141.8	1871	945	33.7
360 x 63	12.9	244.9	3233	1361	47.1
400 x 63	14.4	336.0	4435	1680	57.1
460 x 63	17.2	511.0	6745	2222	73.8
610 x 63	22.9	1191.7	15730	3907	123.7

#Ø = 0.9 for Category 2 applications (refer to Table 6. Strength Reduction Factors) Calculation includes the k<sub>24</sub> Size Factor.

## Structural Reliability

Structural properties for NP Frame LVL 8, 11 and 13 have been determined by testing in accordance with the requirements of AS/NZS 4357.0:2005 Structural Laminated Veneer Lumber. Characteristic stress are calculated in accordance with AS/NZS 4063.2:2010. NelsonPine LVL characteristic stresses comply with

the New Zealand building code through clause C2.3 in NZS 3603:1993. The modulus of elasticity is an average value which includes an allowance for shear deformation. Because of the low variability a lower bound MoE is not required.

## Design Considerations for Span Tables

### Design Loads and Limits

#### DEAD LOADS

The roof masses given below and used in the design span tables include for standard types of cladding and ceiling linings and for rafters.

ROOFS	FLOORS
Light Sheet Roof - with ceiling = 40kg/m <sup>2</sup>	Particle Board = 30kg/m <sup>2</sup>
Terracotta Tile Roof - with ceiling = 90kg/m	Particle Board - with underfloor ceiling = 42kg/m <sup>2</sup>

#### WIND LOADS

Data determined from NP Design software apply only to Low, Medium, High and Very High wind zones, determined in accordance with clause 5.2.1 of NZS 3604:2011. The design wind speeds considered for these areas are shown below:

WIND ZONE	MAXIMUM DESIGN WIND SPEED (M/S)	
	ULTIMATE LIMIT STATE	SERVICEABILITY LIMIT STATE
Low	32	26
Medium	37	30
High	44	35
Very High	50	40

#### LIVE LOADS

The live loads considered in the tables are those used in NZS 3604:2011; Timber Framed Buildings. Some examples are given below:

- Roof Live Load: 0.25kPa Distributed load, 1.0kN Concentrated load (for strength checks only).
- Floor Live Load: 1.5kPa, 2.0kPa, 3.0kPa Distributed load (for floor joists), 1.5kPa Distributed load (for bearers and lintels), 1.0kN Concentrated load.
- Ceiling Live Load: 1.0kN Concentrated load (for strength checks only).

## SNOW LOADS

In accordance with NZS 3604:2011, snow loads up to 0.9kPa have been considered in the preparation of these tables. Therefore, these tables apply to all areas with snow loading up to 0.9kPa. Reference

should be made to Figure 15.1 of NZS 3604:2011; Timber Framed Buildings to determine the geographical areas covered by these design span tables.

## Using Double Section Members

The use of double section members (except pole bearers) relies on the effective load transfer between members in order to ensure that the two beams act together as a single member.

As a minimum requirement, double members should be nailed together with 2.80Ø nails, one from each side at 200mm centres along the length of the member. The nails should be staggered over the depth of the beam and their lengths should be sufficient to penetrate more than 90% of the combined member thickness. The top and bottom faces of the individual members must be carefully aligned to ensure that the applied loads are equally shared between the two members.

Where a double member is supporting another at right angles to its span, the minimum requirement for nailing will not be sufficient to transfer the loads in the immediate area of the beam connection. Here, suitable proprietary fixings can be used provided nailing to the combined members is with nails of suitable length to penetrate more than 90% of its combined thickness.

## Minimum Bearing Lengths

The span lengths provided in the tables are generally governed by limiting deflections and bending moments. In order to achieve these spans, the bearing length at the supports must be provided where specified in the tables. For continuous spans, the bearing lengths given with each table are for the internal supports. For the end supports, the minimum bearing requirements specified for single span members should not be satisfied. Similarly, where an overhang is required, at the support between the overhang and the adjacent back span the minimum bearing lengths for the continuous span members should be adopted.

## Continuous Spans

For a member to be considered 'continuous' it shall span at least 2 adjacent spans such that 1 is greater than or equal to 0.75 x Span 2.

The major span is taken from the continuous span table e.g if span 2 = 6.0 then span 1 is greater or equal to 4.5m Otherwise each span is to be considered 'single'.

## Span Charts

Standard span charts for floor bearers, floor joists, lintels, rafters, and stud framing are available on the NelsonPine Industries Limited website.

For project-specific applications, detailed design and engineering calculations can be completed using Hyne Design software to ensure compliance with the requirements of each individual project

<https://www.nelsonpine.co.nz/product/>

<https://www.nelsonpine.co.nz/product/lvl-design-tool-hyne/>

# Structural Design Information

## DESIGN STANDARDS

Design loads are to be determined in accordance with AS/NZS 1170:2002. Although design data for NelsonPine LVL is not specifically given in NZS 3603:1993, the general principles can be used, complying with the New Zealand Building Code through Clauses 2.3 and C2.3 of NZS 3603. For specific design in Australia this section is to be read in conjunction with AS1720.1

## STRENGTH MODIFICATION FACTORS

Because of the low variability in properties of NelsonPine LVL, a number of the k factors do not apply or are different from those in NZS 3603. The strength modification factors for NelsonPine LVL are:

### 1. STRENGTH REDUCTION FACTOR

The strength reduction factor for calculating the design of structural members should be taken from Table 6.

**TABLE 6. STRENGTH REDUCTION FACTORS**

Table extracted from Table 2.1 AS1720.1-2010

	CATEGORY 1	CATEGORY 2	CATEGORY 3
Structural Timber Material	Structural members for houses for which failure would be unlikely to affect an area* greater than 25m <sup>2</sup> : OR secondary members in structures other than houses	Primary structural members in structures other than houses: OR elements in houses for which failure would be likely to affect an area* greater than 25m <sup>3</sup>	Primary structural members in structures intended to fulfill an essential service or post disaster function
Structural LVL - AS/NZS 4357.0	0.95	0.90	0.80

### 2. DURATION OF LOAD FACTORS

Duration of load factors  $k_1$  for strength and  $k_2$  for stiffness should be the same as for solid timber in Tables 2.4 and 2.5 of NZS 3603. NelsonPine LVL is a solid veneer product and has similar load duration properties to timber. It is manufactured in the dry condition so will behave like kiln dried solid sawn timber, except that moisture change will be slower because the glue lines provide a barrier to moisture movement.

### 3. BEARING AREA FACTOR

The bearing area  $k_3$  is per NZS 3603.

### 4. LOAD SHARING FACTOR

Because NelsonPine LVL is much less variable than sawn lumber, the load sharing and lamination relationships in NZS 3603 do not apply. Hence,  $k_4 = k_5 = k_6 = 1.0$ .

### 5. MOISTURE CONTENT FACTOR

For use of NelsonPine LVL in dry conditions, no modification is required. Where NelsonPine LVL is subject to humid conditions such that the average moisture content would exceed 16% over a 12 month period, the moisture content factor  $k_{14}$  in Table 7 should be used for strength calculations. A moisture content exceeding 20% may be subject to a decay hazard, requiring chemical treatment of the NelsonPine LVL or detailing to avoid the high moisture content. NelsonPine LVL responds to moisture a similar way as solid wood, albeit slower as the gluelines inhibit moisture uptake.

TABLE 7. MOISTURE CONTENT FACTOR  $K_{14}$

PROPERTY	<16%	MOISTURE CONTENT 16-25%	>25%
Bending & Compression	1.0	1.53 - 0.033 MC	0.7
Tension & Shear	1.0	1.35 - 0.022 MC	0.8
MoE	1.0	1.35 - 0.022 MC	0.8

6. STABILITY FACTOR

The stability factor  $k_8$  is per NZS 3603.

7. FACE GRAIN ORIENTATION (CURVED OR TAPERED EDGES)

LVL is made from parallel laminated veneer. It is very strong parallel to the grain, but stresses perpendicular to the grain should be avoided, just as in solid timber. Wide sections must be handled carefully.

When a design includes principal stresses parallel to edges which have been cut sloped or curved to the longitudinal grain direction (Figure 1), the grain orientation factor  $k_6$  for strength given in Table 8 should be used to evaluate strength reduction at

the extreme fibre edges. Examples where this might be considered are at the point of highest bending moment in a sloping rafter or column edge, such as at a knee or apex joint in a portal frame. Steep grain slopes should be avoided if possible in tension zones because the strength reduction is severe.

To determine bending deflections  $k_{16}$ , the stiffness of sloping sections can be evaluated by integrating (summing) a number of small lengths of changing section depth.

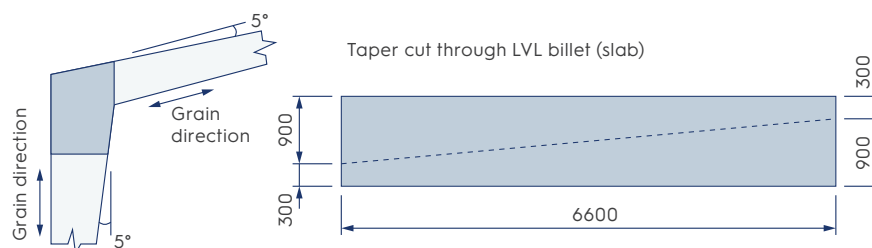
TABLE 8. GRAIN ORIENTATION FACTOR  $K_{15}$  AND  $K_{16}$  FOR CUT EDGES

ANGLE OF CUT EDGE (°)	0	3	5	10	15	20	30	45
Edge in Tension	1.00	0.92	0.80	0.50	0.31	0.21	0.11	0.06
Edge in Compression	1.00	0.97	0.93	0.79	0.65	0.55	0.42	0.32

FIGURE 1. AN EXAMPLE OF DESIGN FOR SLOPING GRAIN IN NELSONPINE LVL

The taper cut rafter has taper cut through LVL billet (slab) high tensile stress at 5° cut, so use  $k_{15} = 0.8$ .

The column cut from the same slab has cut edge in compression, so use  $k_{15} = 0.93$ .



### 8. SIZE EFFECT FACTOR

A size factor shall be applied to the characteristic strength of NelsonPine LVL in bending and tension parallel to grain as per Table 9. For beams in bending less than 95mm in depth there is no adjustment. For beams deeper than 95mm in bending multiply the

characteristic bending strength by  $(95/d)^{0.167}$ . For beams in tension less than 150mm in depth there is no adjustment. For beams deeper than 150mm multiply the characteristic tension strength by  $(150/d)^{0.167}$ .

**TABLE 9. SIZE FACTOR  $K_{24}$  FOR BENDING AND TENSION STRENGTH**

	DEPTH OF LVL MEMBER (MM)									
	95	150	200	240	300	360	400	460	610	1220
Bending	1.00	0.97	0.88	0.86	0.83	0.80	0.79	0.77	0.73	0.65
Tension	1.00	1.00	0.95	0.92	0.89	0.86	0.85	0.83	0.79	0.70

For shear and compression the size factor = 1.0

For tension perpendicular to grain, refer to AS 1720.1

### 9. JOINT GROUP

The Joint Strength Group for NelsonPine LVL depends on the orientation and type of fasteners as per Table 10. For structures that require specific design of joints, this table is to be read in conjunction with NZS3603 Section 4, Joints.

**TABLE 10. CLASSIFICATION OF NELSONPINE LVL FOR JOINT DESIGN**

GRADE	NAILS & SCREWS IN LATERAL LOAD		NAILS & SCREWS IN WITHDRAWAL		SELF DRILLING SCREWS IN LATERAL LOAD (E.G. TYPE 17)		SELF DRILLING SCREWS IN WITHDRAWAL (E.G. TYPE 17)		BOLTS & COACH SCREWS IN LATERAL LOAD DRILLED INTO FACE	
	Edge	Face	Edge	Edge	Edge	Edge	Edge	Edge	Edge	Edge
LVL 13	J5	J4	J5	J4	J4	J4	J4/5	J4/5	J3	J2
LVL 11 & P11	J5	J4	J5	J4	J4	J4	J4/5	J4/5	J3	J2
LVL 8	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 tension perpendicular to grain, refer to AS 1720.1

### 10. FIRE RESISTANCE

Large NelsonPine LVL members have excellent fire resistance on account of the slow and predictable charring rate when exposed to severe fires. The phenol formaldehyde adhesive used in the manufacture of NelsonPine LVL remains inert during fire exposure. NelsonPine LVL can be designed for fire resistance in the same way as glulam. From studies completed at the University of Canterbury, the design charring rate of NelsonPine LVL in the standard fire test has been shown to be 0.72mm/min.

NelsonPine LVL P11 is 45mm NelsonPine LVL re-laminated with Polyurethane (PUR) adhesive. NelsonPine LVL P11 may be used in: Detached residential housing design using NZS3604 or Multi unit residential dwellings where NelsonPine LVL P11 is Surrounded by Plasterboard or Equivalent fire system providing the required fire rating between fire cells.

### 11. CORROSION

Resistance Radiata Pine is relatively inert chemically and under normal conditions, unlike other structural materials it is not subject to chemical change or deterioration. NelsonPine LVL is resistant to most acids, rust and other corrosive situations including hide curing complexes, fertiliser storage and swimming pools.

**MOISTURE CONTENT OF NELSONPINE LVL**

When exposed to moisture during construction NelsonPine LVL may swell due to the uptake of moisture, as will sawn timber.

The width of product (90 or 140 mm) will exhibit reversible swell, returning to its original width once the moisture content has reduced to original,

however the thickness (45mm) exhibits some irreversible swell due to the slight compression in the hot press during the manufacturing process. The amount of compression released will depend on the highest moisture content that the LVL reaches.

**TABLE 11. DIMENSIONAL SWELL: APPROXIMATE DIMENSION OF FRAMING AT A GIVEN MOISTURE CONTENT**

MOISTURE CONTENT %	THICKNESS (MM)	WIDTH (MM)	WIDTH (MM)	LENGTH (MM)
10%	44.8	90.0	140.0	2400.0
14%	45.7	90.7	141.1	2400.1
20%	46.5	91.8	142.9	2400.3
29%	47.2	93.5	145.4	2400.8

**MOISTURE CONTENT MEASUREMENT IN NELSONPINE LVL (DEVELOPED BY SCION RESEARCH INSTITUTE)**

Using a resistance type moisture meter:

1. It is recommended that a resistance type moisture meter with a sliding hammer type electrode is used to test the moisture content of framing.
2. The resistance moisture meter should be calibrated to AS/NZS 1080.1
3. Drive the sliding hammer electrode into the stud, with the probes driven to 1/3 of the depth of the timber being measured (15 mm for 45 mm thick NelsonPine LVL).
4. Take the measurement, and record the measurement and the location of the stud.
5. Test studs approximately mid-height, with the probes parallel to the grain into the inner side of the studs.
6. Repeat from step 3 by testing ten studs throughout the house.
7. After testing ten studs, use Table 12 to convert the moisture meter readings.
8. Acceptable moisture content for closing in a building is typically when nine out of ten corrected measurements are less than or equal to 20% (33% uncorrected reading).
9. In practice, this means 9 out of 10 unconverted meter readings must be 33 or less.

**TABLE 12. CONVERSION OF RESISTANCE MOISTURE METER READINGS TO TRUE MOISTURE CONTENT FOR NELSONPINE LVL**

IF A RESISTANCE TYPE MOISTURE METER READS:																													
8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34			
CORRECTED MOISTURE CONTENT (%) IS:																													
6	6	7	8	8	9	10	10	11	11	12	13	13	14	14	15	15	16	16	17	17	18	18	19	19	20	20			

## Additional Information

NelsonPine LVL is a sustainably-grown plantation radiata pine engineered wood composite manufactured from rotary peeled veneers, laid up and bonded with parallel grain orientation.

Cross banded NelsonPine LVL includes veneer layers at perpendicular grain orientation to the primary grain direction.

The primary benefits of NelsonPine LVL over sawn timber are:

- Stiffness and visual grade sorting of the veneers allows placement of specific veneer qualities at specific positions in the LVL to optimise visual and structural properties and minimise structural variability.
- The randomisation and dispersion of strength reducing characteristics, such as knots and holes, throughout the veneer layer assembly results in more uniform structural properties.
- LVL is straighter than sawn timber as the LVL cross section is composed of multiple laminates, so does not have concentrated grain disturbances inherent in sawn timber.
- LVL is produced with the capability of longer lengths and wider sectional sizes.

### PRODUCT CERTIFICATION

NelsonPine LVL is certified to AS/NZS 4357.0:2005 Structural Laminated Veneer Lumber by the Engineered Wood Products Association of Australasia (EWPA), a JAS/ANZ accredited certification body. EWPA's certification with JAS/ANZ is a Type 5 Certification Scheme under the globally recognised standard ISO/IEC 17067:2013 Conformity assessment – Fundamentals of Product Certification and Guidelines for Product Certification Schemes.

The EWPA's Type 5 certification scheme goes further than the requirements of ISO 17067:2013. It includes ongoing inspection and testing of product in the factory and in the market, as well as auditing of the manufacturing process and management systems. In turn, an independent panel of industry experts' reviews EWPA's systems and certification activities. This puts the EWPA certification scheme among the most comprehensive in the building products industry.

Nelson Pine Industries operates a continuous process control system in accordance with the requirements of AS/NZS 4357.0:2005 and the EWPA Product Certification Scheme. Structural properties published for NelsonPine LVL are determined by independent third-party testing in accordance with the requirements of AS/NZS 4357.0:2005 Structural Laminated Veneer Lumber.

NelsonPine LVL is certified to ISO 9001:2015 Quality Management System by Telarc, New Zealand's leading management systems assessment and certification body under JAS-ANZ accreditation.

LVL is manufactured under a fully quality controlled process.

### PRODUCT SPECIFICATION

Veneer Thickness - Nominal 3.6mm

Species - Radiata Pine

Joints - Scarf/overlap/butt

### MOISTURE CONTENT

8-15% at time of dispatch

### ADHESIVE

NelsonPine LVL8, LVL11, LVL13 Phenolic producing a Type A Bond in accordance with AS/NZS 2754.1

NelsonPine LVL P11 is 45mm Phenolic NelsonPine LVL re-laminated with Polyurethane (PUR) adhesive in accordance with AS/NZS1328.1

### DIMENSIONAL TOLERANCES

Length -0mm, +15mm

Depth -2mm, +2mm

Spring <(L/1000)

### STORAGE AND HANDLING

NelsonPine LVL expands in thickness and depth if 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:

1. NelsonPine LVL is kept dry during storage and transport.
2. Stored under a ventilated cover.
3. Stacked clear of the ground on bearers at least every two metres.
4. Bearers to be placed vertically in line to support NelsonPine LVL evenly.
5. Avoid mechanical damage during handling.

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