

ENGINEERED FORMWORK AND SCAFFOLDING SOLUTIONS

SPECIFICATIONS

DESIGN GUIDES

SPAN TABLES

for

NP FORM LVL11
Formwork Beams

BOXXA
Formboards for
concrete boxing

NP PLANK
LVL Scaffold Planks



Introduction

NelsonPine LVL is an engineered composite made from rotary peeled veneers, laid up with parallel grain orientation unless it is crossbanded. One of the main features of LVL is the 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 removed altogether. In addition to this, the veneer sheets are placed in a specific sequence and location within the product to maximise the potential to the stiffer and stronger veneers. The average of most strength characteristics is higher and the variation significantly lower when compared to traditional timber products.

STRUCTURAL RELIABILITY

The structural properties for NelsonPine LVL have been determined by testing in accordance with the requirements of AS/NZS 4357.0:2005 Structural Laminated Veneer Lumber.

The Engineered Wood Products Association of Australasia (EWPAA) is engaged to independently audit that NelsonPine 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

Phenolic (AS 2754.1) producing an Type A (marine) (AS/NZS 2098.2)

Dimensional Tolerances

Length	-0mm, +15mm
Depth	-2mm, +2mm
Spring	<(L/1000)

STORAGE AND HANDLING

NelsonPine 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:

1. NelsonPine LVL is kept dry during storage and transport
2. Stored under a ventilated cover with fillets placed between each layer
3. Stacked clear of the ground on at least three evenly spaced bearers
4. Bearers and fillets to be placed vertically in line and support NelsonPine LVL evenly and flat
5. Avoid mechanical damage during handling
6. Re-seal cut edges with a water repellent paint

NP FORM LVL11 (Orange)

NP FORM is manufactured from NelsonPine LVL and is intended for use as concrete formwork, joists, bearers, Walers, Soldiers and Supports. NP FORM is strong, light, straight and uniform which will reduce forming costs and improve the quality of concrete finish.

NP FORM has chamfered edges for ease of handling and a water repellent paint finish.

NP FORM LVL11 Section Properties

Depth x Width (mm)	Mass (kg/m)	Rigidity EI (x10 ⁹ Nmm ²)	Design Capacity	
			Øm (kNm)	Øv (kNm)
95 x 47	2.5	36.9	2.3	13.0
95 x 65	3.5	51.1	3.2	18.0
130 x 65	4.8	130.9	6.1	24.6
150 x 77	6.6	238.2	9.6	33.6

1. Design capacities calculated for $\phi = 0.9$ for short duration loads, $K_1 = 0.97$.
2. Members are assumed to be laterally restrained
3. Capacities apply of on-edge orientation of the section

Application of Capacity Tables

The capacity tables and standard designs in this brochure have been prepared in accordance with the following standards:

AS3610:2005 Formwork for Concrete

AS1720.1:2010 Timber Structures

Notes for joist and bearer tables

1. The design loads for the joist and bearer tables include a 4kPa allowance for stacked materials in accordance with AS3610. Where this allowance can be reduced, the spans given above maybe increased with advise from the formwork designer.
2. The deflections of the joists and bearers have been limited to those required for a Class 3 finish (the greater of span/270 and 3mm). Since the finish quality is dependant on a number of other factors including formface quality, support deformations and the accuracy of the set up, a class 3 finish cannot be guaranteed.
3. For multiple spans, the design has assumed the most conservative of 3 and 2 spans and that all spans are of equal length and equally loaded.
4. The design has assumed that the joists are continually restrained by the sheeting and the bearers are restrained by the joists.
5. To satisfy the bearing requirements of the timber, the thickness of the bearer must be equal to or greater than the thickness of the joists it is supporting.
6. Spans values maybe interpolated for intermediate slab thicknesses.

Joist table for slab soffit formwork

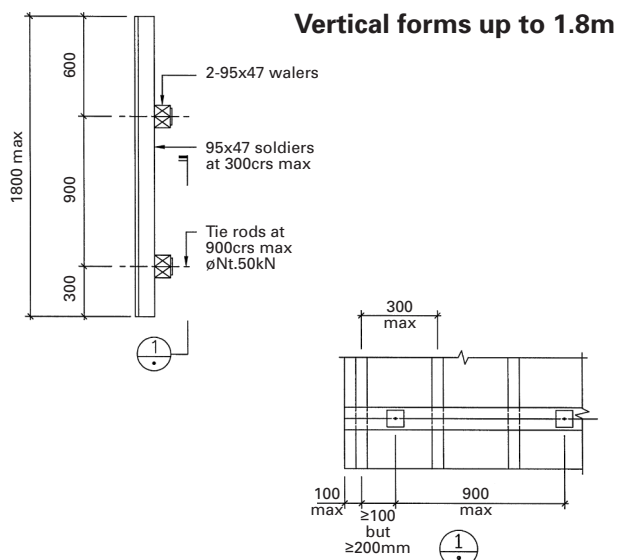
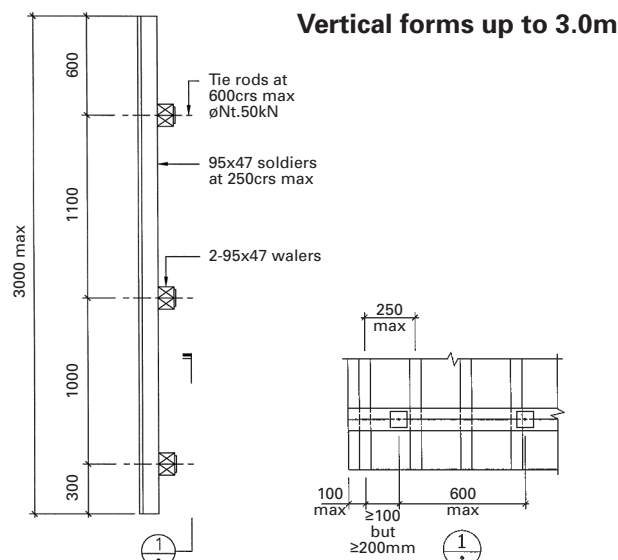
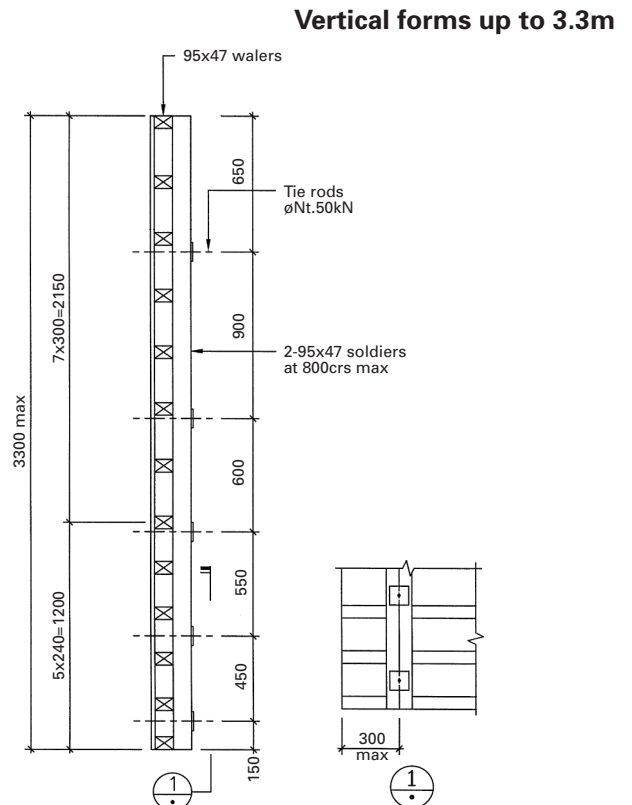
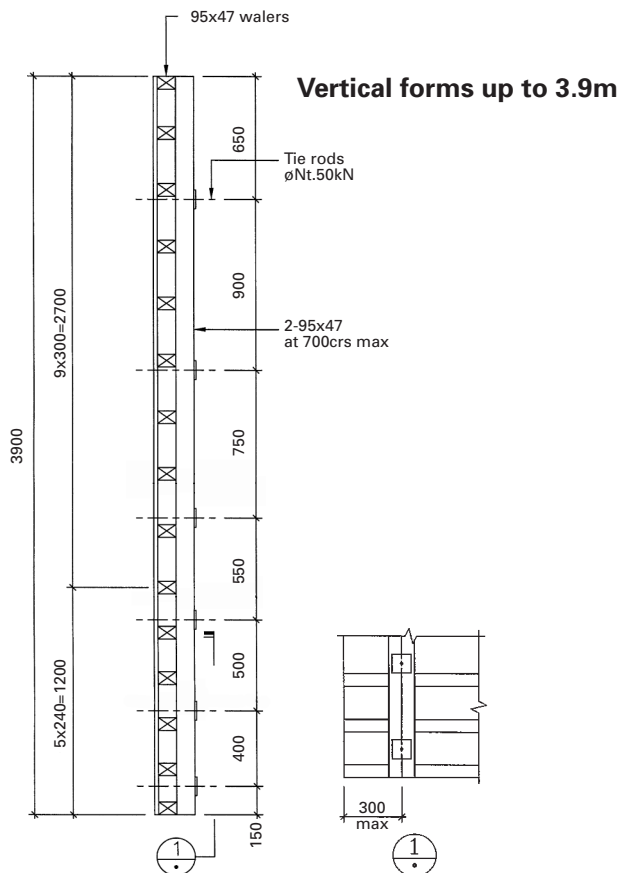
Joist Spacing (mm)		Maximum Single Span (m)						Maximum Multiple Span (m)					
Slab thickness	Section Size	225	300	400	450	480	600	225	300	400	450	480	600
100	95x47	1.9	1.7	1.5	1.5	1.4	1.3	2.3	2.1	1.9	1.8	1.8	1.7
	95x65	2.1	1.9	1.7	1.7	1.6	1.5	2.6	2.4	2.1	2.1	2.0	1.9
	130x65	2.9	2.6	2.4	2.3	2.2	2.1	3.6	3.2	2.9	2.8	2.8	2.6
	150x77	3.5	3.2	2.9	2.8	2.7	2.5	4.3	4.0	3.6	3.5	3.4	3.1
150	95x47	1.8	1.6	1.5	1.4	1.4	1.3	2.2	2.0	1.8	1.7	1.7	1.6
	95x65	2.0	1.8	1.6	1.6	1.5	1.4	2.5	2.2	2.0	1.9	1.9	1.8
	130x65	2.7	2.5	2.2	2.1	2.1	1.9	3.4	3.1	2.8	2.7	2.6	2.4
	150x77	3.3	3.0	2.7	2.6	2.6	2.4	4.1	3.7	3.4	3.3	3.2	3.0
200	95x47	1.7	1.5	1.4	1.3	1.3	1.2	2.1	1.9	1.7	1.6	1.6	1.5
	95x65	1.9	1.7	1.5	1.5	1.4	1.3	2.3	2.1	1.9	1.8	1.8	1.7
	130x65	2.6	2.3	2.1	2.0	2.0	1.8	3.2	2.9	2.6	2.5	2.5	2.3
	150x77	3.1	2.8	2.6	2.5	2.4	2.3	3.9	3.5	3.2	3.1	3.0	2.8
300	95x47	1.5	1.4	1.3	1.2	1.2	1.1	1.9	1.7	1.6	1.5	1.5	1.4
	95x65	1.7	1.6	1.4	1.4	1.3	1.2	2.1	1.9	1.8	1.7	1.7	1.5
	130x65	2.4	2.1	1.9	1.9	1.8	1.7	2.9	2.7	2.4	2.3	2.3	2.1
	150x77	2.9	2.6	2.4	2.3	2.2	2.1	3.6	3.3	3.0	2.9	2.8	2.6
400	95x47	1.4	1.3	1.2	1.1	1.1	1.0	1.8	1.6	1.5	1.4	1.4	1.3
	95x65	1.6	1.5	1.3	1.3	1.2	1.1	2.0	1.8	1.6	1.6	1.5	1.4
	130x65	2.2	2.0	1.8	1.7	1.7	1.6	2.8	2.5	2.3	2.2	2.1	2.0
	150x77	2.7	2.5	2.2	2.1	2.1	1.9	3.4	3.1	2.8	2.7	2.6	2.4
600	95x47	1.3	1.2	1.1	1.0	1.0	0.9	1.6	1.5	1.3	1.3	1.2	1.1
	95x65	1.4	1.3	1.2	1.1	1.1	1.0	1.8	1.6	1.5	1.4	1.4	1.3
	130x65	2.0	1.8	1.6	1.6	1.5	1.4	2.5	2.3	2.1	2.0	1.9	1.8
	150x77	2.4	2.2	2.0	1.9	1.9	1.8	3.0	2.8	2.5	2.4	2.4	2.2
1000	95x47	1.1	1.0	0.9	0.9	0.9	0.8	1.4	1.3	1.1	1.0	1.0	0.9
	95x65	1.3	1.1	1.0	1.0	1.0	0.9	1.6	1.4	1.3	1.2	1.2	1.0
	130x65	1.7	1.6	1.4	1.4	1.3	1.2	2.2	2.0	1.8	1.7	1.6	1.4
	150x77	2.1	1.9	1.7	1.7	1.6	1.5	2.6	2.4	2.2	2.1	2.0	1.8

Bearer table for slab soffit formwork

Bearer Spacing (m)		Maximum Single Span (m)						Maximum Multiple Span (m)					
Slab thickness	Section Size	0.9	1.2	1.5	1.8	2.1	2.4	0.9	1.2	1.5	1.8	2.1	2.4
100	95x65	1.3	1.2	1.1	1.0	1.0	0.9	1.6	1.5	1.3	1.2	1.1	1.0
	130x65	1.8	1.6	1.5	1.4	1.3	1.3	2.2	2.0	1.8	1.6	1.5	1.4
	150x77	2.2	2.0	1.8	1.7	1.6	1.6	2.7	2.5	2.3	2.1	1.9	1.8
150	95x65	1.2	1.1	1.0	1.0	0.9	0.9	1.5	1.4	1.2	1.1	1.0	1.0
	130x65	1.7	1.5	1.4	1.3	1.3	1.2	2.1	1.9	1.7	1.5	1.4	1.3
	150x77	2.1	1.9	1.7	1.6	1.6	1.5	2.6	2.3	2.1	1.9	1.8	1.7
200	130x65	1.6	1.4	1.3	1.3	1.2	1.1	2.0	1.7	1.6	1.4	1.3	1.2
	150x77	2.0	1.8	1.6	1.5	1.5	1.4	2.4	2.2	2.0	1.8	1.7	1.5
300	130x65	1.5	1.3	1.2	1.2	1.1	1.0	1.8	1.6	1.4	1.3	1.2	1.0
	150x77	1.8	1.6	1.5	1.4	1.4	1.3	2.2	2.0	1.8	1.6	1.5	1.4
400	130x65	1.4	1.2	1.2	1.1	1.0	1.0	1.7	1.4	1.3	1.1	1.0	0.8
	150x77	1.7	1.5	1.4	1.3	1.3	1.2	2.1	1.8	1.6	1.5	1.3	1.2
600	130x65	1.2	1.1	1.0	1.0	0.9	0.8	1.4	1.2	1.0	0.8	0.7	0.6
	150x77	1.5	1.4	1.3	1.2	1.1	1.1	1.8	1.6	1.4	1.2	1.0	0.9
1000	130x65	1.1	1.0	0.9	0.7	0.6	0.5	1.1	0.8	0.6	0.5	0.4	0.4
	150x77	1.3	1.2	1.1	1.0	0.8	0.7	1.5	1.1	0.9	0.7	0.6	0.5

Notes for vertical forms

1. The design of the vertical forms is based on a hydrostatic pressure distribution.
2. Deflections of the soldiers and walers have been limited to the greater of span/270 and 3mm as required for a class 3 finish. Since the finish quality is dependant on a number of factors including the formface used and the accuracy of the set up, a class 3 finish cannot be guaranteed.
3. Tie bolt holes are not to be bored through any of the soldier or waler members.
4. The maximum distance from the top of the form to the nearest tie rod must be a maximum of 650mm.
5. The forms are not suitable for grout injected concrete, concrete pumped from below, deep re-vibration or external vibration of the concrete.



* Minimum distance between tie-rod and soldier is ≥100 but ≤200mm.

* Minimum distance between tie-rod and soldier is ≥100 but ≤200mm.



BOXXA is made from cross banded NelsonPine LVL (Laminated Veneer Lumber) giving extra strength, stability and longevity to make boxing for formwork, precasting and everyday concrete projects easier, quicker and more economical. Crossbanding LVL makes the product resistant to cupping and swelling width wise when used in concrete boxing type applications.

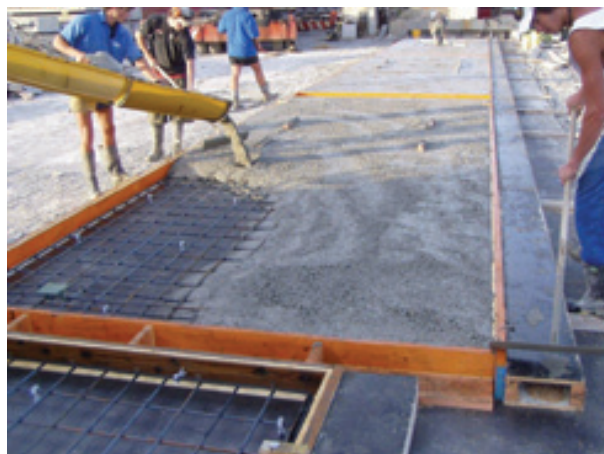
- Longer life than ordinary timber boxing
- Easier to handle, strong, straight and consistent
- Special paint surface for easier concrete release and moisture resistance.
- Specifically designed for stability, longevity and strength

Finish

Painted with a moisture resistant, high wax content paint.

Section Sizes

1. 100x36
2. 120x36
3. 150x36
4. 200x36
5. 240x36
6. 300x36



NP PLANK

LVL SCAFFOLD PLANK

NP PLANK is manufactured from NelsonPine LVL. The structural reliability of NelsonPine LVL makes it the perfect solution for a safe, lightweight scaffold plank. Each NP PLANK is made from many layers of thin veneer, which increases the uniformity and strength of the product.

Section size

39x230mm

Unit weight

5.4kg/m

Finish

Rounded edges and painted ends.

Permanent edge branding: NP PLANK, PROOF TESTED SCAFFOLD PLANK, EWPA MILL 919, AS1577, WLL210kg, MAX SPAN 1.8m, Manufacturing reference number

Strength and stiffness verification: Every NP PLANK is individually proof tested to verify that it conforms to AS1577 requirements before being branded as a scaffold plank. Modulus of rupture and Modulus of elasticity are frequently tested throughout the LVL product runs in accordance with the requirements of the Engineered Wood Products Association of Australasia (EWPA). NP PLANK is engineered in accordance with AS/NZS 4357 Structural Laminated Veneer Lumber and AS1577 Scaffold Planks.

Maximum Spans/Bay as specified in AS/NZS1576.1.

Duty Live Loads	Maximum Span (m)	Maximum Working Loads/Bay (kN)
Light Duty	2.4	2.2kN (inc 1.0kN Max Point Load)
Medium Duty	2.0	4.4kN (inc 1.5kN Max Point Load)
Heavy Duty	1.8	6.6kN (inc 2.0kN Max Point Load)

1 kN is approximately 100kg.

BEST USE PRACTICES.

Avoid Damaging Scaffold Planks

- Do not use planks over greater spans than those recommended by these tables
- Do not drop or throw scaffold planks from excessive heights.
- Do not overload scaffold planks. If planks are overloaded then they must be removed and tested before reuse.
- Do not drive vehicles over scaffold planks
- Notching and shallow cuts in planks reduce strength.
- Take precautions against slag burns from gas cutting and welding.

Chemical effects

- The phenol resin used to bond NP PLANK veneers is highly resistant to the attack of chemicals. The radiata Pine veneers, however are susceptible to concentrated chemical attack. The risk of damage is related to the concentration and temperature of the chemical solution. NP PLANK will largely be unaffected by exposure to moderate strength acids and alkalis (pH range 3-9). Strong concentrations of acids and alkalis will however affect lignin which binds the wood fibres. Planks used in these conditions should be regularly evaluated before reuse.

Decay

- Under normal service conditions, planks subjected to wetting and drying cycles will not decay.
- Typically decay is caused by improper storage practices.
- Decay can effect the structural performance of planks and any plank found with decay should be removed from service, allowed to dry and then evaluated before reuse.

Inspection

- Regular inspection is strongly recommended. Any plank that shows signs of misuse or is suspect of damage should be withdrawn from use pending evaluation of performance.



Plantation Grown

All veneers used in the manufacture of NelsonPine LVL are peeled from sustainable plantation grown Pinus Radiata logs grown in the Nelson district forests.



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