

woodspan

PLT PANELS

DESIGN AND INSTALL GUIDE



JOIN THE BUILDING REVOLUTION

FUTURE FOCUSED TIMBER

We've made it easy to construct a more sustainable building. Customised specifically for your project, Woodspan PLT panels are manufactured offsite and delivered to you, ready-to-go. This cuts down installation time, labour costs and onsite headaches.

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BACKED BY THE INDUSTRY'S BEST

**WE'VE MADE IT EASY
TO CONSTRUCT A MORE
SUSTAINABLE BUILDING.**

Part of Taranakipine™, an experienced and trusted manufacturer of engineered timber products including glulam for over 35 years, our team is focused on providing sustainable, high quality product solutions to the building industry.

Our team is passionate about delivering a quality mass timber solution on time and to schedule, creating long standing, trusted relationships with our customers.

woodspan

 Taranakipine™

THE WOODSPAN MANUFACTURING PROCESS



CNC PROCESSING

At Woodspan we fabricate our PLT panels and glulam beams using the most advanced CNC processing technology available worldwide. Installed in 2019, our Hundegger Robot Drive has two processing spindles; an 800mm diameter 5-axis saw and a 6-axis robot head that can access all six sides of the timber component without having to turn the panel or beam over, greatly increasing production efficiency. The CNC machine is driven by CAMBIUM software developed specifically by Hundegger to aid DFMA (Design for Manufacture & Assembly) principles.

Our machine can process laminated timber cross-sections 300mm high, 1250mm wide and up to 10 metres long. With this capability we can process a standard Woodspan PLT floor panel from start to finish in approximately six minutes, to extremely precise dimensional accuracies.

For our customers there are two key benefits – reducing construction time at the building site due to short installation time, and improved building component quality due to the accuracy of controlled offsite manufacturing.

GENERAL

Purpose

This guide will help to correctly specify and install Woodspan PLT panels.

Important Documents

This guide must be read in conjunction with these documents:

- › Woodspan PLT Panels pass™ www.thebuildingbusiness.co.nz/pass/woodspan,
- › Woodspan PLT Panels standard connection details www.woodspan.co.nz/resources/cad-drawings/,
- › Wood Solutions Floor Diaphragms in Timber Buildings Guide www.woodsolutions.com.au/publications.

Skills Required

This guide is suitable for use by licensed building practitioners (or deemed practitioners) licensed to the applicable class.

For More Help

Technical assistance is available at info@woodspan.co.nz.

While all reasonable efforts have been made to ensure the accuracy of information provided, this document is a guide only. It may be subject to change.

For Our Warranty

Refer to www.woodspan.co.nz.

THE WOODSPAN PLT PANEL

Description

Woodspan PLT (parallel laminated timber) panels are an engineered mass timber product suitable for use as prefabricated floor and roof panels. Manufactured from New Zealand grown

Radiata pine, the lamina are finger jointed or solid, treated and then laminated to create large panels where the grain runs parallel to the panel span direction.

Certifications & approvals held by Taranakipine™

- › Grade Right NZ Ltd Member Certificate Producer Grade Verified Structural Timber, valid until 31/03/2026.
- › Grade Right NZ Ltd Member of Treat Right Programme, valid until 31/03/2026.
- › Grade Right Ltd Member of Grade Right Verified Engineered Wood Products QA Programme, valid until 31/03/2026.



www.graderight.co.nz

- › FSC® Single Chain of Custody and Controlled Wood NC-COC-005483, NC-CW-005483.
*FSC® Certified products available on request

FSC-C006125



Scope & limitations

For scope and limitations refer to: Woodspan Parallel Laminated pass™ www.thebuildingbusiness.co.nz/pass/woodspan



Woodspan PLT Panel Physical Characteristics

- › Timber species: NZ grown Pinus Radiata,
- › Maximum panel size (finger jointed) 7200mm × 890mm,
- › Maximum panel size (whole timber) 5900mm x 890mm,
- › Panel depths: 90mm, 117mm, and 140mm,
- › Panel type: Finger jointed (FJ) or Whole Timber (WT),
- › Adhesive: Purbond clear polyurethane adhesive, Type 1 for all service classes,
- › Treatment levels: Untreated, or preservative treated to hazard class H3.1 or H3.2,
- › Surface protection: Factory-applied water-based surface sealer,
- › Moisture content: 8-14% (ex-factory),
- › Joint strength group: J5,
- › Panel Mass (Average Density = 450kg/m³):
 - WS8 - 90mm PLT = 40.5kg/m²,
 - WS8 - 117mm PLT = 54kg/m²,
 - WS8 - 140mm PLT = 63kg/m²,
- › Panel Tolerances (ex-factory):
 - Width = +/-3.0mm,
 - Depth WS8-90mm; +/-1.0mm,
 - Depth WS8-117mm; +/-1.0mm,
 - Depth WS8-140mm; +/-1.0mm,
 - Length; -0, +/-2.0mm,
- › Appearance grades; visual and non-visual.

Property		WS8 (MPa)	WS10 (MPa) ¹
Modulus of elasticity (average)	MoE	8000	10000
Bending strength ^{2,3}	F'b	14.0	20.0
Compression parallel ^{2,3}	F'c	18.0	20.0
Compression strength (perp to grain) ^{1,3}	F'p	8.9	8.9
Tension strength ^{1,3}	F't	6.0	8.0
Shear strength ^{1,3}	F's	3.8	3.8

PLT Panel Weight Guide

PLT length (all panels 890mm wide)	WS8 – 90mm	WS8 – 117mm	WS8 – 140mm
3500mm	127kg	169kg	197kg
5000mm	181kg	241kg	281kg
7200mm	260kg	346kg	404kg

1 WS10 Available on special request from Woodspan

2 Use $\phi = 0.8$ Material Strength Reduction Factor

3 Bending, tension, compression and shear strength parallel to grain is to be multiplied by $K6 = 1.33$ (as per NZS3603).

DESIGN

Woodspan PLT panels can be used as floor, roof and fire rated structures in buildings including as diaphragms.

6

The following describes the steps necessary to successfully design and specify a Woodspan PLT panel. Also supplied are tools that will assist in these design steps; span tables, penetration details, passive fire penetration details and fixing options.

DESIGN STEPS

1 SELECT FLOOR OR ROOF

Woodspan PLT panels can be used as floor and roof structures in buildings, including diaphragms.

2 DETERMINE LOADS

Determine the loads that apply to the building for:

- › Roof loads: wind, snow, weight of roof, seismic, dead and live loads,
- › Floor loads; dead & live loads, diaphragm loads (if relevant).

3 ESTABLISH FIRE REQUIREMENTS

Fire resistance ratings (FRR) on Woodspan PLT floor panels have been established through independent, full scale loadbearing fire testing to test method AS 1530.4:2014.

Woodspan PLT floor assemblies achieve FRR 30/30/30 and FRR 60/60/60 without any additional protective linings. Test results are available on request.

Further information about mass timber fire performance and fire design is covered by WPMA/NZ Wood Design Guides.

www.wpma.org.nz/timber-design-guides

4 SELECT PANEL SPAN

Use the span tables provided by Woodspan to determine panel thickness and maximum span where the PLT panels are to be used as floors, roofs or in fire resistance rated floor assemblies.

[Floor Span Tables](#) Page 10

[Roof Span Tables](#) Page 11

[Fire Span Tables](#) Page 12

5 SPECIFY FIXINGS

Woodspan provides recommended fixings for ductile connections.

- › Use self-tapping screws for lap-joint panel-panel fixing and for panels-support element fixing,
- › Use self-tapping screws or nails for top-spline panel-panel fixing,
- › Where connection requires shear capacity, the connection and fixings must be specifically engineered.

[Panel to Panel Joint \(Top Spline\)](#) Page 14

[Panel to Panel Joint \(Lap Joint\)](#) Page 14

[Panel to Beams or Supporting Members](#) Page 15

[Fire Rated Panel to Panel Joint \(Top Spline\)](#) Page 15

6 PENETRATIONS

When penetrations through a Woodspan PLT panel are required it is necessary to consider the impact on structure and fire protection.

Maintain Structural Integrity

The following must be applied to ensure the continuing structural performance of the panel:

- Refer to [page 16](#) for guidance around un-reinforced penetrations through a Woodspan PLT Panel,
- For penetrations outside of the scope as shown on [page 16](#) please contact Woodspan for further information.

Ensure Passive Fire Protection

Where a penetration requires passive fire protection Woodspan provides details that have been independently tested to test method AS 1530.4:2014 and should therefore be used. The details rely on a range of RyanFire fire stopping solutions that meet FRR -/30/30 and FRR -/60/60 requirements. Refer to www.woodspan.co.nz/technical

The details cover penetration seals to

- Metal pipes,
- Mixed combustible services,
- Combustible and non-combustible pipes,
- Combustible PEX and Kelox pipes.

7 IDENTIFY & SELECT RELEVANT DETAILS

To assist with specification of Woodspan PLT Panels, the following typical details are supplied:

- Roof,
- Floor to wall,
- Mid-floor,
- Mid-span floor supported,
- Panel to panel connections,
- Fire rated panel-panel joint connections.

These can be found at www.woodspan.co.nz/cad-resources

8 CONSIDER OTHER STRUCTURAL DESIGN ELEMENTS

Diaphragms

Woodspan PLT Panels may be used as a floor or roof diaphragm, transferring loads to bracing elements and creating a cohesive structure. Continuous support must be provided around the perimeter of the panels. All elements, including fixings must be specifically engineered to AS/NZS1170:2002¹.

For diaphragm design within the scope of NZS 3604:2011, a minimum ply spline depth of 17mm is required. Where the project falls outside the scope of NZS 3604:2011 the spline depth must be specifically engineered.

Dynamics

8hz is the recommended natural frequency for a Woodspan PLT floor panel for dynamics performance calculation. The Woodspan PLT design is based on FP Innovations design methodology for CLT².

9 CONSIDER OTHER BUILDING CODE REQUIREMENTS

Internal Linings Fire Performance

Woodspan PLT Panels meet material group number 3. To achieve a lower material group number additional protection such as a plasterboard lining or coating with an intumescent paint system is required.

Thermal Performance

Check thermal performance.

R values [m²K/W] for typical panel thicknesses (raw panel values) are:

- 90mm PLT: $R_{PLT\ 90} = 0.75$
- 117mm PLT: $R_{PLT\ 117} = 0.98$
- 140mm PLT: $R_{PLT\ 140} = 1.17$.

Refer Appendix C for formula for calculating thermal resistance properties.

¹ Where a standard is referenced it is to be read as amended by the applicable acceptable solution or verification method.

² Lignum Engineering compared the performance of CLT and PLT and concluded that reliance on the FP Innovations design methodology was applicable in respect of Woodspan PLT.

Acoustic Performance

Check acoustic performance.

Contact Woodspan for indicative STC & IIC configurations for inter-tenancy floors.

Where a higher level of acoustic performance is required, an Acoustic Engineer should be engaged.

10 SELECT VISUAL GRADE REQUIRED

Panels are available in visual and non-visual appearance grades.

Non-visual appearance grade panels are intended for use where appearance is of no consideration; blemishes, knots and knot holes are permitted.

Woodspan PLT floor panels are primarily used as a structural member, and are not recommended as an exposed finished floor. PLT is made from NZ radiata pine which is a soft wood and will wear faster than hardwood floors, additionally the expansion gap between panels is unlikely to remain perfectly consistent throughout the seasons. Using PLT as an exposed ceiling with a durable finish or stain is typically suitable, as small expansion gap movement is unlikely to be noticed. See <https://woodspan.co.nz/resources/plt-grades/> for a more indepth explanation of various grades available.

11 SUSTAINABILITY

Assess Sustainability & Environmental Impact

Choosing Woodspan in design and construction can help tackle climate change. The combination of carbon sequestration in growing trees and the long-term carbon storage in wood products represents a significant net sink and store of carbon and can significantly reduce the environmental impact of construction.

The environmental impact of the production of Woodspan has been assessed independently and is available in the form of a New Zealand industry average Environmental Product Declaration (EPD), this can be found at www.woodspan.co.nz/technical

The production of Woodspan has a negative GWP (global warming potential) of **-596kg CO² eq/m³**. The incredible advantage of timbers ability to sequester CO₂ and store it as carbon offsets other impacts of production. This compares favourably to average concrete production which is **+350kg CO² eq/m³**; an almost 1 tonne/m³ difference in CO₂ released in the atmosphere.

12 CONFIRM ALL DESIGN REQUIREMENTS ARE MET

Confirm the chosen panel configuration meets all relevant design requirements.

13 CHECK DOCUMENTATION

Ensure the building consent plans and specifications clearly define:

- > Thickness of panel,
- > Fixings; type and placement,
- > Relevant details.

The installer will be relying on these, and the Woodspan shop drawings, to correctly install the Woodspan PLT panels.

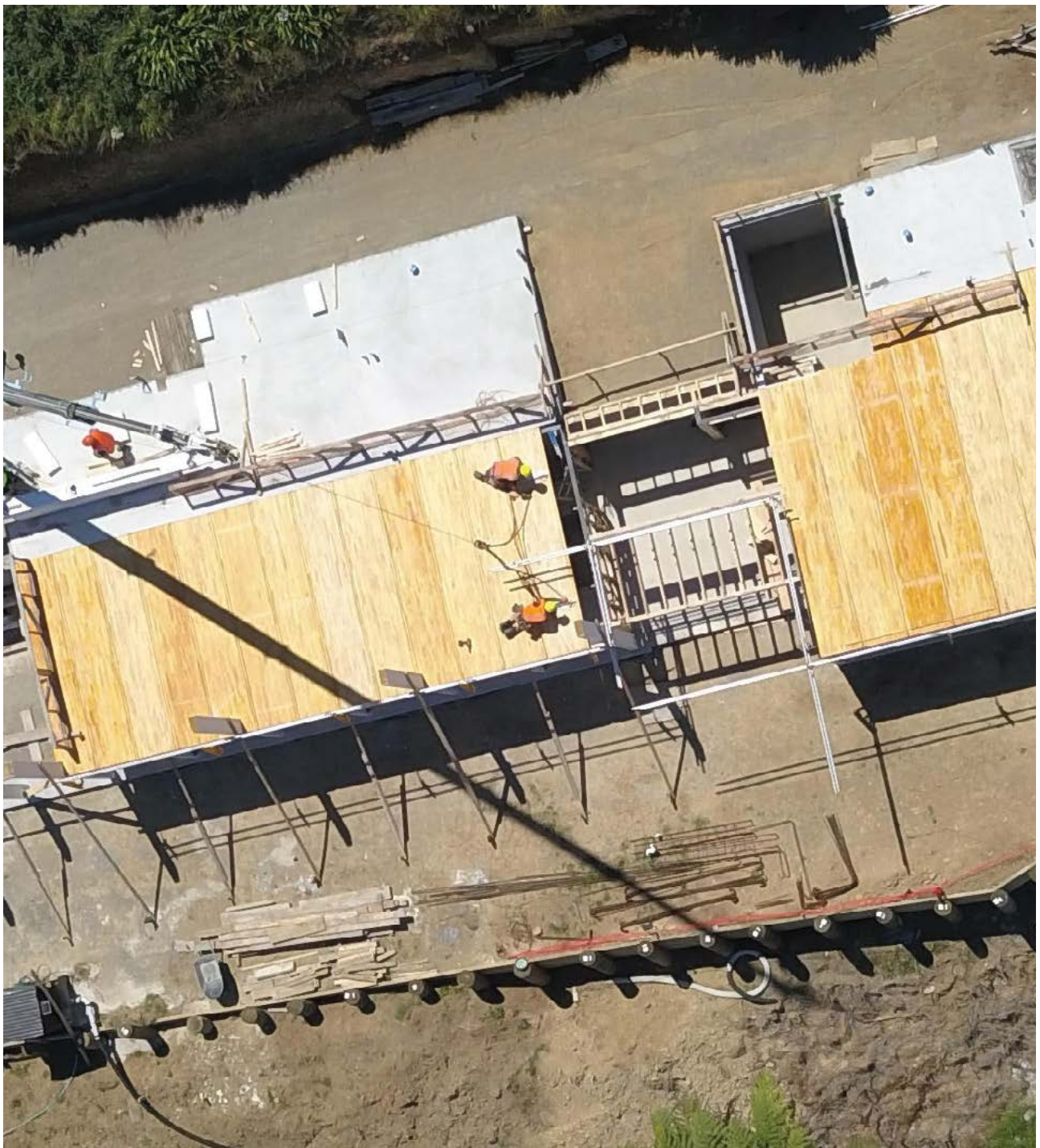
DESIGN TOOLS

1 SPAN TABLES

Woodspan PLT panels can be used as floor and roof structures in buildings, including diaphragms.

Notes

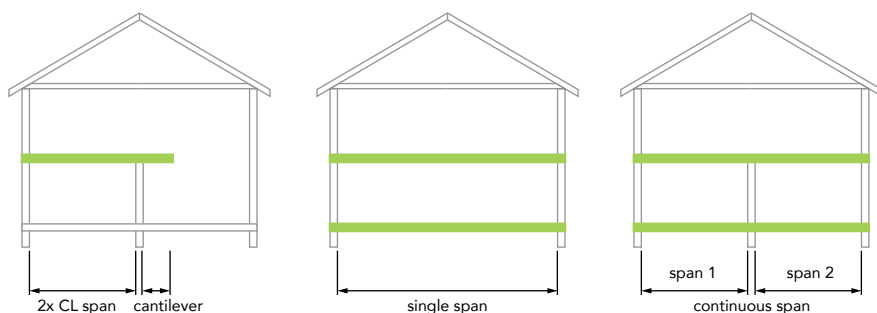
- › All dimensions shown in mm,
- › Continuous spans over two unequal spans must have the lesser span greater than 0.6 of the longer span,
- › The back span for all cantilevers should be at least 2 times the cantilever length.



Floor Panels

Design Deflection limits:

- Long term loads – Span/400,
- Cantilever – Span/1000,
- Dynamic Criteria – FP Innovations methodology.



Single Span

Dead load (kPa) plus self-weight		0.23		0.53		Cantilever
Live load (kPa)		1.5	3.0	1.5	3.0	3.0
Panel	Depth (mm)	Single Max Span (mm)				
WS8 – 90	90	3110	2910	3090	2770	1090
WS8 – 117	117	3790	3700	3790	3530	1380
WS8 – 140	140	4340	4340	4340	4160	1610

Continuous Span

Dead load (kPa) plus self-weight		0.23		0.53		Cantilever
Live load (kPa)		1.5	3.0	1.5	3.0	3.0
Panel	Depth (mm)	Continuous Max Span (mm)				
WS8 – 90	90	3380	3380	3380	3380	1090
WS8 – 117	120	4130	4130	4130	4130	1380
WS8 – 140	140	4730	4730	4730	4730	1610

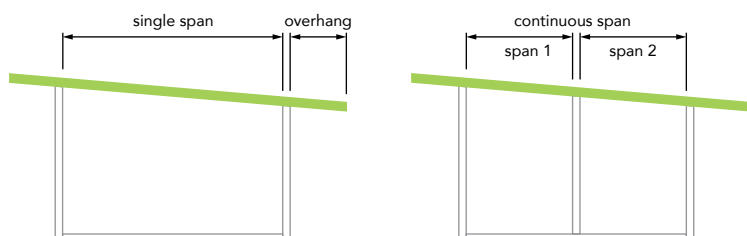
Notes

- Maximum length of finger jointed panel is 7200mm, maximum length of whole timber panel is 5900mm,
- A long-term creep factor $K2=2.0$ has been used,
- Table is designed for 1.5kPa (residential) and 3.0kPa (commercial) live load,
- Floor Tile loads are an additional 0.3kPa long term dead load,
- Table allows for the dead load from the panel, as well as 0.23kPa super-imposed dead load (allowance for ceiling and light partition non-loadbearing walls),
- No allowance has been made for load bearing walls on the cantilever.

Roof Panels

Design Deflection limits:

- Dead Load – Span/400,
- Overhang – Span/1600,
- Snow Load – Span/300.



Single Span		Light Roof Load (0.25kPa)		Heavy Roof (0.73kPa)		Overhang Eave	
		0	1.0	0	1.0	0	1.0
Snow load (kPa)		0	1.0	0	1.0	0	1.0
Panel	Depth (mm)	Single Max Span (mm)					
WS8 – 90	90	4040	3380	3400	3400	1000	920
WS8 – 117	117	4960	4850	4260	4260	1260	1160
WS8 – 140	140	5680	5630	4960	4960	1470	1360

Continuous Span		Light Roof Load (0.25kPa)		Heavy Roof (0.73kPa)		Overhang Eave	
		0	1.0	0	1.0	0	1.0
Snow load (kPa)		0	1.0	0	1.0	0	1.0
Panel	Depth (mm)	Continuous Max Span (mm)					
WS8 – 90	90	5420	5200	4560	4560	1000	920
WS8 – 117	117	*	*	*	*	1260	1160
WS8 – 140	140	*	*	*	*	1470	1360

* Not applicable due to max panel length.

Notes

- Maximum length of finger jointed panel is 7200mm, maximum length of whole timber panel is 5900mm,
- Table allows for the dead load from the panel, as well as 0.25kPa light roof and ceiling, or 0.73kPa heavy roof and ceiling,
- Table is based on 1kPa design snow load on the roof,
- All roof panels allow for Very High wind zone (to NZS3604:2011),
- Roof span is plan span. Roof pitch to be between 5 and 30 degrees.

Floor Fire Span Tables

FRR 30/30/30 & FRR 60/60/60

Dead load (kPa) plus self-weight		0.23		0.53	
Live load (kPa)		1.5	3.0	1.5	3.0
Panel	Depth (mm)	Maximum Span (mm)			
WS8 – 90	90	3110	2910	3090	2770
WS8 – 117	117	3790	3700	3790	3530
WS8 – 140	140	4340	4340	4340	4160

Notes

- Fire resistance ratings on Woodspan PLT Floor panels have been established through independent, full scale, loadbearing fire testing to AS1530.4:2014,
- To achieve tested FRR rating, fire rated panel joints (top-spline) must be used.

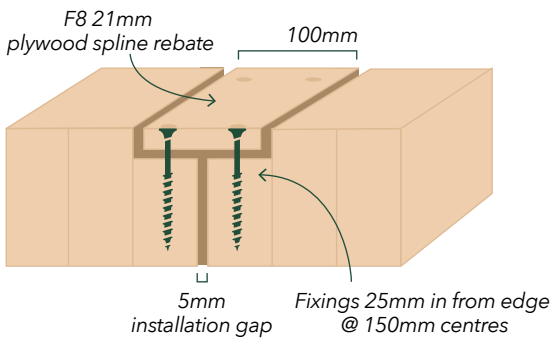
For more details see page 15

2 FIXINGS

Recommended fixings for ductile construction. Suitability of fixings must be confirmed by a qualified structural engineer.

Panel to Panel Joint (Top Spline)

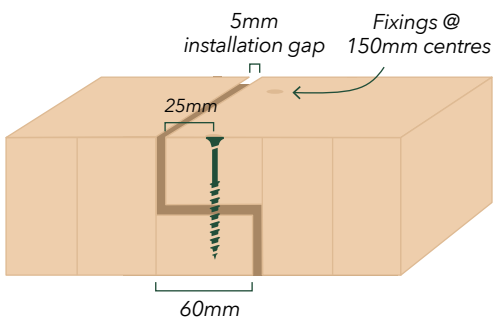
Panel	Panel to Panel Plywood (Diaphragm only) (mm)	Screw Type Options				Spacing (mm)	Min Edge Distance (mm)
		Simpson Strong-Tie QD (mm)	Rothoblaas HBS (mm)	Eurotec Paneltwistec AG (mm)	FH Nail		
WS8 – 90	21 x 100 F8	4.8 x 50	5 x 50	5 x 50	60 x 2.8	150	25
WS8 – 117	21 x 100 F8	4.8 x 50	5 x 50	5 x 50	60 x 2.8	150	25
WS8 – 140	21 x 100 F8	4.8 x 50	5 x 50	5 x 50	60 x 2.8	150	25



14

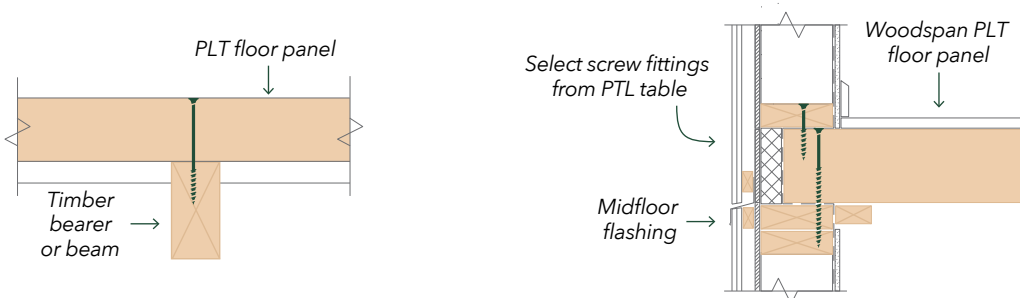
Panel to Panel Joint (Lap Joint)

Panel	Screw Type Options			Spacing (mm)	Min Edge Distance (mm)
	Simpson Strong-Tie SDWS (mm)	Rothoblaas HBS (mm)	Eurotec Paneltwistec AG (mm)		
WS8 – 90	5.6 x 76	5 x 80	5 x 80	150	25
WS8 – 117	5.6 x 102	5 x 100	5 x 100	150	25
WS8 – 140	5.6 x 127	5 x 120	5 x 120	150	25



Panel to Beams or Supporting Members

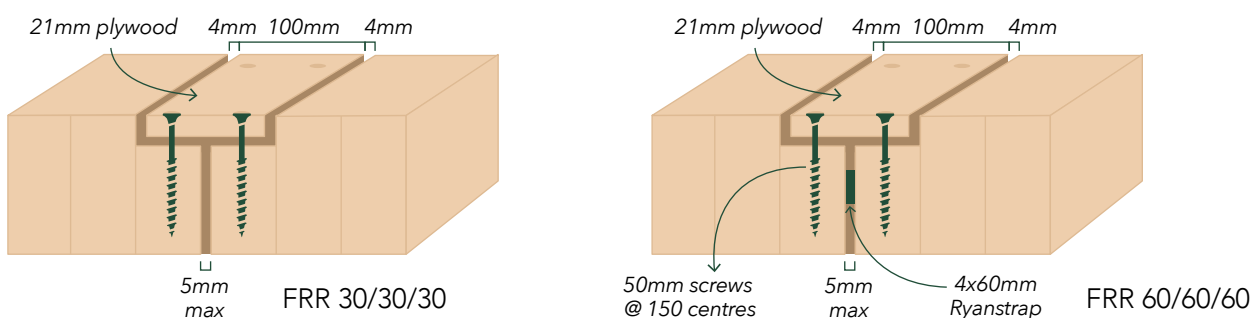
Panel	Screw Type Options				Spacing (mm)	Min Edge Distance (mm)
	Simpson Strong-Tie ESCRC (mm)	Rothoblaas VGS EVO (mm)	Spax Delta Seal (mm)	Eurotec KonstruX ST (mm)		
WS8 – 90	8 x 180	8 x 180	8 x 180	8 x 195	150	25
WS8 – 117	8 x 220	8 x 220	8 x 220	8 x 220	150	25
WS8 – 140	8 x 240	8 x 240	8 x 240	8 x 245	150	25



Fire Rated Panel to Panel Joint (Top Spline)

Note these fixings apply to both FRR 30/30/30 and FRR 60/60/60.
Contact Woodspan for information relating to fire rated lap joints.

Panel	Panel to Panel Plywood (mm)	Screw Type Options			Spacing (mm)	Min Edge Distance (mm)
		Simpson Strong-Tie QD (mm)	Rothoblaas HBS (mm)	Eurotec Paneltwistec AG (mm)		
WS8 – 90	21 x 100 F8	4.8 x 50	5 x 50	5 x 50	150	25
WS8 – 117	21 x 100 F8	4.8 x 50	5 x 50	5 x 50	150	25
WS8 – 140	21 x 100 F8	4.8 x 50	5 x 50	5 x 50	150	25



3 Penetrations

Simplified un-reinforced penetration.

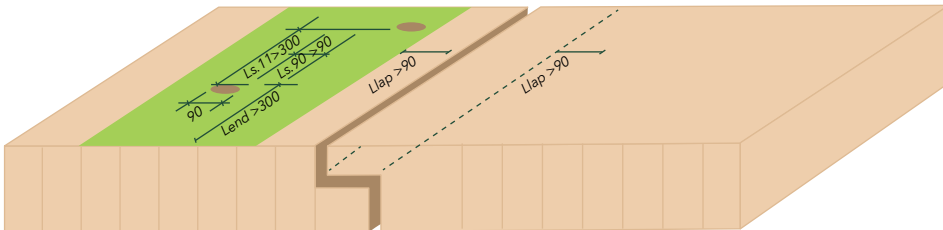
- No penetration allowed in vicinity or below load bearing walls nor directly through panel joint,
- When using more than 2 openings across the panel and more than 2 penetrations within the whole panel – confirm increased stresses within the panel with the designer,
- Allow spacing between the penetrations of $L_{s,II} > 300\text{mm}$ and $L_{s,90} > 90\text{mm}$,
- Allow 90mm distance to panel joints $L_{lap} > 90\text{mm}$,
- Minimum distance to load bearing walls/ ends / and intermediate supports $L_{end} > 300\text{mm}$,
- For penetrations outside this scope, please contact Woodspan for further information.

Tested Passive Fire Assemblies

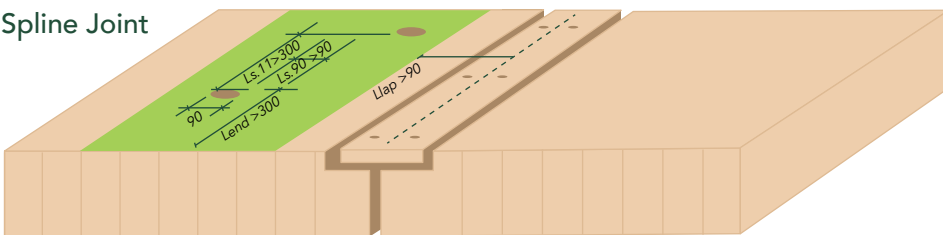
For passive fire assemblies refer to www.woodspan.co.nz/technical

General Penetration Details

Lap Joint

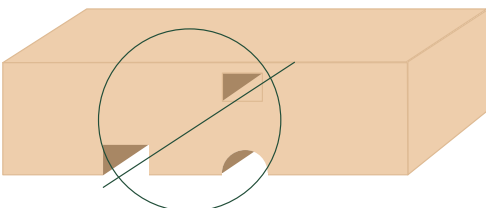


Spline Joint



Holes & Notches

Do not cut, notch or drill



INSTALLATION

PRE INSTALLATION

1 HEALTH & SAFETY

Take all necessary steps to ensure your safety and the safety of others:

- › Check weight of Woodspan panel and lifting capacity of Hiab/crane,
- › Ensure adequate ventilation or mechanical dust extraction when cutting or drilling,
- › Ensure the timber is well supported when cutting and nailing,
- › Wear appropriate safety equipment, clothing and footwear,
- › Use all tools in accordance with relevant instruction manuals,
- › Plan and monitor a safe approach for working at height; select and use the right equipment,
- › Clear the work area of any obstructions before work starts.

For further information refer to:

- › WorkSafe July 2018. Small Construction Sites, The Absolutely Essential Health and Safety Toolkit,
- › WorkSafe December 2016. Health and Safety at Work, Quick Reference Guide.

These documents are available at www.worksafe.govt.nz.

2 DELIVERY & STORAGE

Delivery

Woodspan plans the panel delivery sequence to suit the on-site lifting program.

Panels are dispatched pre-coated with a temporary moisture resistant coating, wrapped in moisture-proof packaging and have an equilibrium moisture content (EMC) of 8-14%. They are delivered flat-packed with; assembly plans, lifting brackets and plywood spline (if required) to suit the specified jointing system.

Storage

The panels should be stored in a dry environment; placed horizontally on bearers (no more than 2000mm apart) which extend across the full width of the pack. Panels stored on or near the ground will absorb moisture. To prevent this a layer of plastic should be laid underneath the bearers.

Where storage inside is not possible remove the weatherproof wrap, place timber spacers on top of the panels then re-wrap and cover with a waterproof cover for additional protection.

Storing the panels this way allows airflow to circulate and prevents condensation accumulation.

INSTALLATION

3 KEY DOCUMENTS

Building Consent Plans & Specifications

Building consent documentation shows spacing, set out and connection, and fastener type for:

- › Panel to panel joints,
- › Panel to building structure connections,
- › Passive fire details,
- › System layout where the panel is part of a system, e.g. acoustic system.

Shop Drawings

Shop drawings identify panel set out and assembly sequence.

4 MOISTURE CONTROL

To maintain the look and functionality of Woodspan PLT panels, exposure to moisture must be controlled.

During all stages of supply, storage and installation, climatic conditions shall be as close as possible to in-service conditions. Where changes to EMC cannot be avoided, the coefficients for shrinkage and expansion of wood must be taken into consideration.

Managing Moisture Before a Building is Weathertight

- › Ensure water does not pond on the surface, Sweep ponded water from the surface,
- › Cover the construction area where possible.

For further information go to www.woodspan.co.nz/resources/moisture-management

Note

- › Woodspan PLT should only be enclosed or lined once EMC is 14% or lower¹,
- › 5mm expansion gaps perpendicular to panel edge must be allowed for,
- › Ceiling linings susceptible to cracking (e.g. stopped plasterboard) should not be fixed directly to Woodspan PLT. Instead a layer of battens/strapping should be installed (refer Woodspan PLT standard details).
www.woodspan.co.nz.

¹ NZBC E2/AS1 Clause 10.2

5 LIFTING THE PANELS INTO PLACE

Woodspan PLT panels should be lifted by crane or HIAB.

Woodspan recommend the use of screw-on lifting brackets. These are available on-loan from Woodspan and are supplied as two sets. While one panel is being installed, the next panel can be prepared for lifting.

The Woodspan screw-on lifting brackets are supplied with d-shackles for crane to bracket connection, and self tapping structural screws for temporarily attaching the bracket to the panel.

The length of the screws will depend on the depth of the Woodspan PLT panel. Woodspan recommends a minimum thread embedment to be no less than 50% of the panel depth. Screw holes can be filled or plugged after installation.

Figure 1 Tag lines attached to panel.



Figure 2 Packets lifted using slings.



Figure 3 Bolt on lifting brackets.



6 FIXING THE PANELS

Ensure fixing and finishing is in accordance with the plans and specifications and all requirements of this guide.

Woodspan PLT Panels should be screwed down immediately after placement.

This includes panel to panel jointing and fixing of PLT panels to support structure.

- › Information on creating penetrations see page 16 for details,
- › Information on passive fire protection of penetrations www.woodspan.co.nz/technical,
- › Information on screw fixing requirements see page 14 for details.

7 FINISHING THE PANELS

Primarily Woodspan PLT is used as a structural member and is concealed by floor and ceiling linings. In these situations, no additional finishing or coating system is required.

Woodspan can supply visual grade PLT for use as an exposed ceiling. If considering the use of PLT in a visual application the effect of weather and moisture needs to be considered. Despite all measures being taken to protect panels, some minor remediation of panels due to watermarking, transport and construction damage is to be expected.

Once any repair and sanding has been completed, Woodspan recommends that the panels are finished with a protective coating system such as stain, sealer, polyurethane, or oil.

For more technical information please visit www.woodspan.co.nz/technical.

APPENDIX

APPENDIX A

Basis of Engineered Span Tables



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15 August 2018

Our ref 2409

Woodspan PLT Panels
PO Box 7145
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New Plymouth 4341

Re: Woodspan Parallel Laminated Timber Panels Selection Tables

Woodspan PLT is a glue laminated timber product manufactured in sheets 890mm wide, in depths ranging from 70mm to 140mm, from Radiata Pine grade MSG8.

The Woodspan PLT span tables in the Woodspan PLT Design Guide have been developed by Lignum Structural Ltd in accordance with Compliance Documents and Verification Method B1/VM1 of the NZ Building Code; and in accordance with sound and widely accepted engineering principles. The tables reference the following standards and documents:

AS/NZS1170:2002

NZS3603:1993

FP Innovations CLT Handbook

The tables are a guide to selecting the product and should be used by suitably qualified design professionals.

A handwritten signature in blue ink, appearing to read 'D Reid'.

David Reid

STRUCTURAL ENGINEER, Engineering NZ Member ID 121639.

Structural Timber Engineering

David V Reid, Structural Engineer, BE, Dip Bus, CMEngNZ, CPEng

APPENDIX B

Thermal Performance (Insulation)

Timber has a low thermal conductivity, which can aid in designing a building envelope with high resistance to heat flow. At 12% moisture content (which is the expected equilibrium moisture content in service of Woodspan PLT Panels), the conductivity of Radiata pine is 0.120 W/mK.

The thermal resistance (R-value) is calculated by dividing panel thickness [m] by their thermal conductivity [W/mK].

The total thermal resistance (R_{total}) for an assembly is calculated by adding the R-values of other roof or floor assembly layers, including the internal and external surface values.

$$R_{\text{total}} = R_{\text{se}} + R_{\text{PLT}} + R_{\text{si}} \quad [\text{m}^2\text{K/W}]$$

R_{se} = Thermal Insulation attached on the outside (external) of the Woodspan PLT Panel.

R_{si} = Thermal Insulation attached on the inside (internal) of the Woodspan PLT Panel.

R-values [m²K/W] for typical panel thicknesses¹:

- > 90mm PLT: $R_{\text{PLT}90} = 0.75,$
- > 117mm PLT: $R_{\text{PLT}117} = 0.98,$
- > 140mm PLT: $R_{\text{PLT}140} = 1.17.$

APPENDIX C

Sustainability & Environmental Impact

The combination of carbon sequestration in growing trees and the long-term carbon storage in wood products represents a significant net sink and store of carbon and can significantly reduce the environmental impact of construction.

The environmental impact of the production of Woodspan has been assessed independently and is available in the form of a New Zealand industry average Environmental Product Declaration (EPD). www.woodspan.co.nz/news/environmental-product-declaration/

An EPD is an independently verified and registered document that communicates transparent and comparable data and other relevant environmental information about the life cycle environmental impact of a product. Building materials are measured using a range of indicators, one of which is Global Warming Potential; this is measured in units of carbon dioxide equivalent (CO₂ e).

The production of Woodspan has a negative GWP (global warming potential) of **-596kg CO₂ eq/m³**. This compares favourably to average concrete production which is **+350kg CO₂ eq/m³**, an almost 1 tonne per m³ difference in CO₂ released in the atmosphere.

¹ Raw panel values only: R_{se}, R_{si}; and R-values of other floor assembly layers need be added as required to get a construction R-value.



INSTALLED IN HOURS. NOT DAYS.

Our PLT products are quick and easy to install, without the need for an entire construction crew. We'll ensure you can keep your overheads as low as possible.