



**Prolam**<sup>®</sup>

Engineered Laminated Timber

# Prolam Smartframe.

Design and Install Guide

**JANUARY 2020 – Version 1**

**Register free for  
our beam calculator at**

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# INFORMATION

## General

### Purpose

This guide will help correctly specify and install Prolam Smartframe LVL15 (Smartframe) for use as structural timber beams and studs.

### Important Documents

This guide must be read in conjunction with the:

- › Prolam Smartframe LVL15 pass™
- › Prolam Care and Maintenance
- › Prolam online calculator output
- › Prolam Warranty.

### Skills Required

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

### For more help

Technical assistance is available at

While all reasonable efforts have been made to ensure the accuracy of information provided, this design and install guide is intended for guidance only and may be subject to change.

### For our warranty

Refer to

# SMARTFRAME

## Description

Smartframe is a laminated veneer lumber manufactured from Douglas fir. It is manufactured to AS/NZS 4357:2005 under a SAI Global StandardsMark™ licence and is supplied boron treated to H1.2, or untreated.

Smartframe is supplied in the following standard finished dimensions:

Widths (mm): 90, 120, 140, 190, 240, 290

Depth (mm): 45

Stock lengths (m): 3.6, 4.8, 5.4, 6, and 7.2.

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## Certifications and approvals

Certificate of Registration of Preservative Treatment & Allocated Brand Timber Treatment Plant Registration Authority; 709 11 H1.2 (1/7/19), 614 11 H1.2 (1/7/19)



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## Prowood Assurance Statement

For use, scope and limitations, and performance assurance refer to Prolam Smartframe pass™.



# DESIGN

## Design steps



### Select Smartframe size and span

To specify the correct size and span, use the Prolam online calculator. It delivers:

- › project-specific Smartframe size and span options
- › installation requirements (spacings, fixings, painting)
- › our assurance statement (pass™)
- › care and maintenance requirements
- › our warranty.

Collectively this documentation is referred to as the Prolam Project Documentation.

Uses available through the online calculator are as follows:

- › roof and ceiling framing
- › roof and load-bearing wall framing
- › roof, wall and floor joists
- › ridge beam supporting roof and ceiling
- › internal and external rafters
- › internal floor beams, bearer supporting joists.

Before using the calculator, confirm project-specific factors including loads, wind zones, seismic zone.



### Check for fire requirements

Determine whether NZ Building Code Clauses C6 applies. This will be determined by the position of the Smartframe (proximity to relevant boundaries). Calculation of fire resistance must be performed by a suitably qualified fire engineer.



### Confirm all design requirements are met and check buildability

Confirm that the chosen configuration and support spacings meet all relevant design requirements and that the selections are compatible with the design.



### Documentation

Ensure the building consent plans and specifications include

- › size and location of the Smartframe members and
- › Prolam Project Documentation.

# CONSTRUCTION

## Pre-installation



### Health and Safety

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

- › ensure adequate ventilation or mechanical dust extraction when cutting or drilling
- › ensure the timber is well supported when cutting and nailing
- › use 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
- › treated wood offcuts should be disposed to landfill.

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



### Handling & Storage

#### Delivery

Care must be taken during loading, unloading, and transporting in the yard and on-site, to protect the Smartframe from pre-installation damage.

#### Storage

Store Smartframe flat on a hard, dry surface, laid flat on bearers which extend across the full width of the pack. Smartframe stored near the ground will absorb moisture. To prevent this, place a layer of plastic underneath the bearers. Do not expose Smartframe to rapid change in moisture or temperature, such as may occur from temporary heating units.

When storage inside is not possible, remove any wrap, place timber fillets between the Smartframe, then rewrap or cover with a waterproof cover.



### Moisture effects on Prolam Smartframe

Smartframe is manufactured from Douglas fir (Oregon) which has a durability rating of class 4. Smartframe is supplied without any short-term construction sealer. Once framed into a structure Smartframe may be exposed to weather for a limited time (not greater than three months) without impact on performance, but it may exhibit changes to appearance due to this exposure.

Wetting during construction may lead to temporary elevated moisture content and dimensional changes. Once covered, Smartframe will ultimately dry and re-equilibrate to the ambient humidity conditions, but some expansion or swelling may remain after drying.



# Installation



## Key documents

Refer to building consent documentation details (structural and architectural), spacing set out, connections and fixings.

Where specific assemblies are not contained in the consent documentation, refer to:

- > engineering (specific design)
- > information from supplier of structural brackets
- > Prowood technical resources
  - the Prolam Project Documentation
  - this document.



## Installation requirements

### Tools

Smartframe members may be installed using standard carpentry equipment and tools. Ensure all tools are sharp, used in accordance with good trade practice, and supplier's specifications.

### Cuts, holes and penetrations

Where possible, make all appropriate cuts, holes and preparations at ground level prior to installing the Smartframe in its final position.

Cutting of Smartframe is typically carried out to accept a vertical or sloping structural member. The saw cuts must be accurate and true. Line of horizontal level is critical.

Prime saw cuts, notching, and drilled holes which exposes timber prior to assembly. Where structural brackets, bolts and washers (stainless steel or galvanised) are in contact with the Smartframe, they should be coated with a protective grease (non-petroleum) to reduce metal corrosion and enables, more easily, future replacement.

Smartframe may be ripped through the depth to smaller section sizes without affecting the basic strength properties. It is important that the new members are not cut undersized if the maximum spans in the tables are to be used.

Sawing through the thickness to produce sections of lesser thickness may decrease the integrity of the Smartframe and is therefore not recommended under any circumstances.

### Position Smartframe

Ensure support members have been installed correctly. Smaller members maybe manhandled into position. Large members will require mechanical lifting. Where a hiab or crane is used, woven strops with a spreader bar is recommended to minimise risk of damage to the member.

### **Fix Smartframe**

Fixings are to be in accordance with Building Consent plans and specifications, Prolam Project Documentation or specific engineering design documentation, as applicable.

When installing proprietary structural fixings, follow all the requirements of the manufacturer's technical literature.

# APPENDIX A

## Smartframe product specifications

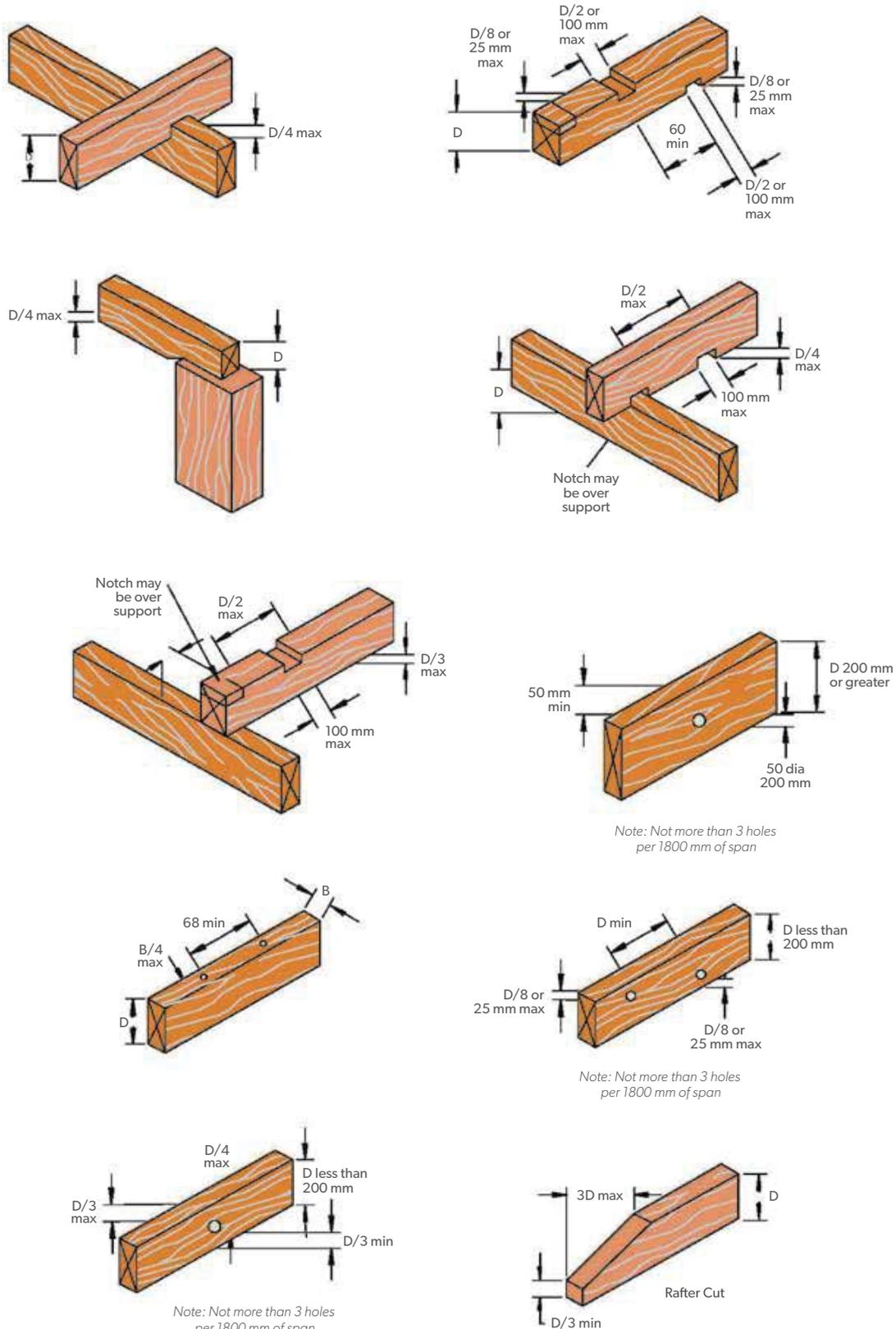
### Product specifications

<b>Veneer</b>	Thickness:	2.5 mm – 3.2 mm
	Species:	Douglas fir ( <i>Pseudotsuga menziesii</i> )
	Grade:	CD (Metriguard graded)
	Joints:	Face scarf and overlap
	Length:	+/- 10 mm
<b>Dimensional Tolerances</b>	Depth:	≤ 200 mm +/- 1 mm
		≥ 201 mm +/- 2 mm
	Thickness:	-0, +4 mm at 12 % moisture content
<b>Adhesive</b>	Phenol Formaldehyde (Type "A", AS 2754.1)	
<b>Formaldehyde Emission Class</b>	E0 (Table 1 AS/NZS 4357)	
<b>Forestry Stewardship</b>	Certified chain of custody system to PEFC	

# APPENDIX B

## Details

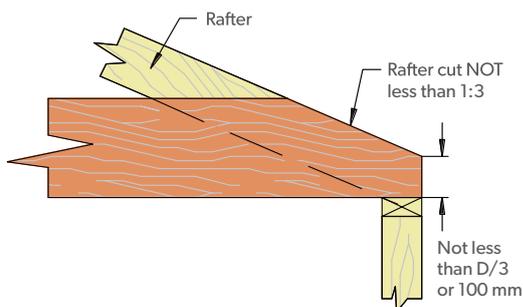
### Cutting and Notching Prolam LVL 15 Beams, Bearers, Rafters and Joists



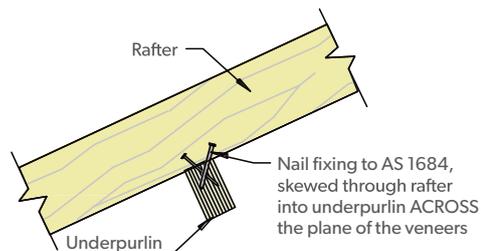
## Roof Construction Detailing

### Rafter Cut Detail

May be used for Counter, Hanging and Strutting Beams

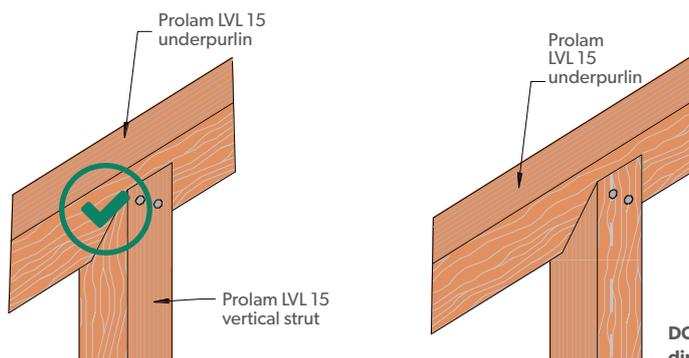


### Rafter Underpurlin Fixing



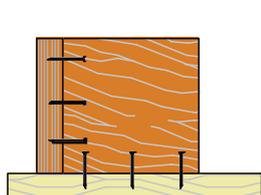
Rafters are NOT to be skew nailed to the underpurlin with the nails parallel to the direction of the veneers

### Vertical Prolam LVL 15 Roof Struts

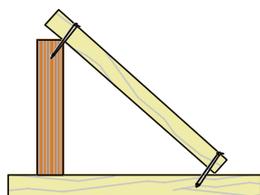


DO NOT cut the birdsmouth in the direction of the Prolam LVL 15 veneers

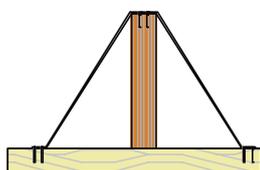
## Lateral Restraint of Hanging, Counter, Strutting, Strutting/Hanging Beams and Strutting/Counter Beams



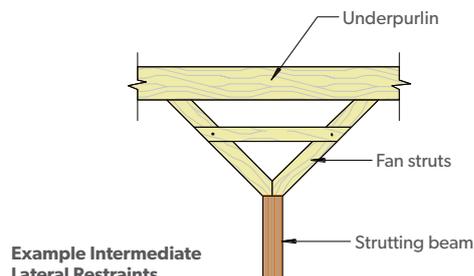
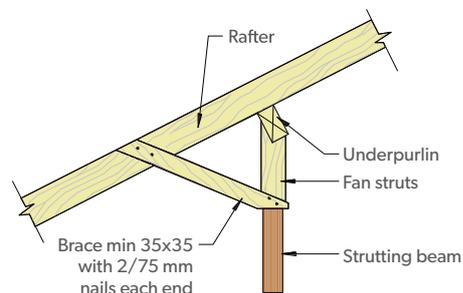
(a) Block skew nailed to beam and to support with 3/75 mm skew nails to each member



(b) Min 35 x 32 mm tie nailed to top of beam and to support with 2/75 mm nails at each end



(c) Galvanised strap nailed to support and top of beam with 2/30 x 2.8 mm nails each end to beam



Example Intermediate Lateral Restraints

Notes:

1. Method used depends upon whether ceiling joists are perpendicular or parallel to the beam.
2. Methods given in (b) and (c) are particularly suitable for restraining strutting beams and strutting/hanging beams at the intermediate points where the beams are supported, as they also permit these beams to be supported up clear of the ceiling joists by packing under at their supports.

