Prolam®
Engineered Laminated Timber

Prolam H1.2 and H3.2 Beams.

Design and Install Guide

NOVEMBER 2022

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Prolam®
Engineered Laminated Timber

INFORMATION

General

Purpose

This guide will help correctly specify, design, and install Prolam H1.2 and H3.2 beams (Prolam beams) for use as structural members in buildings.

Important documents

This guide must be read in conjunction with the:

- Prolam H1.2 and H3.2 beams pass™
- Prolam Warranty
- Prolam Care and Maintenance
- Prolam online calculator output

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@PROWOODNZ.COM**

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 our online warranty **CLICK HERE**

PROLAM BEAMS

Description

Prolam glue laminated beams are manufactured from NZ grown *Pinus radiata* and Douglas fir.

Prolam beams are supplied in:

- a range of sizes
- structural grades PL8, PL12, and PLX20
- appearance grades A and C
- treatment hazard class H1.2 (boron) and H3.2 (MCA).

Certifications and approvals

Manufacture of Prolam beams is third-party certified by AsureQuality:

- Engineered Wood Products Programme AEWP05

MORE INFO

Certificate of Registration of Preservative Treatment & Allocated Brand Timber Treatment Plant Registration Authority; 709 11 H1.2, 614 11 H1.2, 709 01 H3.2, 709 90 H3.2.

MORE INFO

Prowood Assurance Statement

For use, scope and limitations, and performance assurance refer to Prolam H1.2 and H3.2 beams pass™.

MORE INFO

DESIGN

Design steps

1 Select beam size and span

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

- project-specific beam 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.

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

Uses available through the online calculator are as follows:

- Lintels
  - lintel supporting roof and ceiling
  - lintel supporting girder/setback trusses or ridge beam
  - lintel supporting roof and loadbearing wall
  - lintel supporting roof, wall and floor joists
  - cantilever lintel for corner window
  - lintel supporting roof with attic truss.
- Roof framing
  - verandah beams
  - ridge beam supporting roof and ceiling
  - internal and external rafters.
- Floor framing
  - external deck beams
  - external deck joists
  - internal floor beams, bearer supporting joists
  - floor joists.

2 Check for fire requirements

Determine whether NZ Building Code Clauses C3 & C6 apply. This will be determined by the position of the Prolam beams (such as proximity to relevant boundaries).

Calculation of fire resistance must be performed by a suitably qualified fire engineer.

3 Confirm all design requirements are met and buildability

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

4 Documentation

Ensure the building consent plans and specifications include:

- size and location of the Prolam beams
- 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 **WWW.WORKSAFE.GOVT.NZ**

Handling and Storage

Delivery

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

Storage

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

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

Moisture effects on Prolam Beams

Prolam Beams are manufactured from NZ-grown Radiata Pine and Douglas Fir (Oregon), both of which have a durability rating of class 4.

All faces of beams should be with protected with a moisture resistant coating if the beams are to remain exposed for more than 5 weeks[1]. Cover the construction area where possible.

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

1 Contact info@prowood.com for information on and to purchase coating.

Installation

Key documents

Refer to building consent documentation for details (structural and architectural), spacing set out, connection, and fastener types for beam to post connections and beam to building structure.

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

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

Installation requirements

Tools

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

Cuts, holes and penetrations

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

Cutting of Prolam Beam would 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 exposing timber must be primed, where exposed prior to assembly.

Coat structural brackets, bolts and washers (stainless steel or galvanised) should be coated with a protective grease where the fixing is in contact with the Prolam beam. This reduces metal corrosion and to enable, ease of future replacement.

Position beams

Ensure support members have been installed correctly. Smaller beams maybe manhandled into position. Large beams 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 beam.

Fix beams

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

Where NZS 3604:2011 applies, refer to table 8.19 (based on the uplift requirements of table 8.14) for the mechanical fixing of Prolam Beam to wall or posts supports .

Where specific engineering applies refer to the applicable documentation.

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

Finish beams

To finish, the beams may be left unfinished or sealed, painted, stained or lined.

Fill and sand any damage e.g., depressions, temporary fixing holes or unintended transport damage. Where unsightly holes or large imperfections exist insert a timber plug using a glue with exterior timber qualities. Sand back until surface is smooth and free from dirt and dust.

Apply primer or clear sealer to any areas where the surface coat has been damaged. If the beams have been coated with a factory applied product, contact Prolam for product details.

If damage has resulted in delamination or the structural adequacy cannot be assured, contact Prolam for a replacement beam.

In applications where the Prolam beams may be exposed to moisture, all exposed surfaces, cut ends and joints must be sealed with a good quality stain or alkyd primer and allowed to dry as per manufacturer's instructions.

For paint: apply a single enamel undercoat and then apply two full topcoats compatible with the undercoat. Painting is to be carried out in accordance with best practice: 1 x undercoat and 2 x topcoats to achieve a total DFT (dry film thickness) of 80 microns, (comprised of undercoat DFT 30 microns, top-coat DFT 25 microns/coat).

For stain: apply three coats of premium oil-based stain, to all exposed surfaces including cut ends and joints. CD50X or Dryden's Penetrating wood oil are recommended oils.

Where the beam is to be enclosed or lined establish that the EMC is 18 % or lower.

APPENDIX A

Prolam beams specifications

Dry use

	Characteristic strength MPa			Elastic moduli MPa		
PL Grade	**Bending**	**Tension parallel to grade**	**Shear in beam**	**Compression parallel to grain**	**Short modulus of elasticity parallel to end grain**	**Short duration modulus of rigidity for beams**
PLX20	40*/45**	4	3.7	18	20000* /21000**	480
PL12	25	12.5	3.7	29	11500	770
PL8	19	10	3.7	24	8000	530

* PLX20H1-250100
**PLX20H1-300100

Wet use

	Characteristic strength MPa			Elastic moduli MPa		
PL Grade	**Bending**	**Tension parallel to grade**	**Shear in beam**	**Compression parallel to grain**	**Short modulus of elasticity parallel to end grain**	**Short duration modulus of rigidity for beams**
PL12	20	10	2.5	23.2	9200	610
PL8	15.2	8	2.5	19.2	6400	420

For compression perpendicular to the grain, use 8.9 mPa dry and 5.3 mPa wet as per NZS 3603:1993 for radiata pine and Douglas fir for all PL grades.

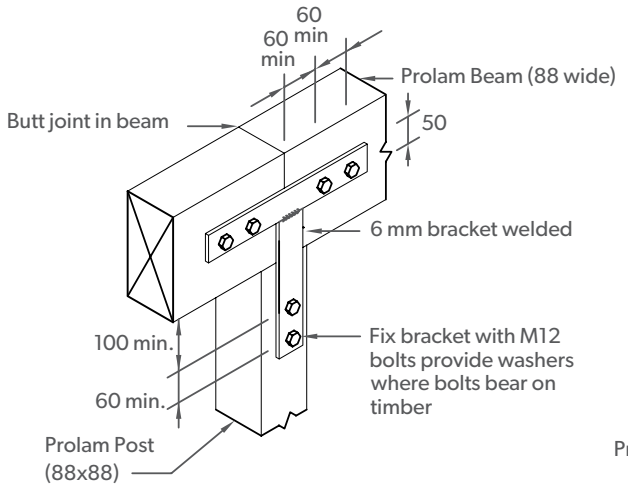
Tables based on PL8 grade. Higher grades will give greater span and load carrying capacity than PL8 for the same section size.

APPENDIX B

Details

Fixings

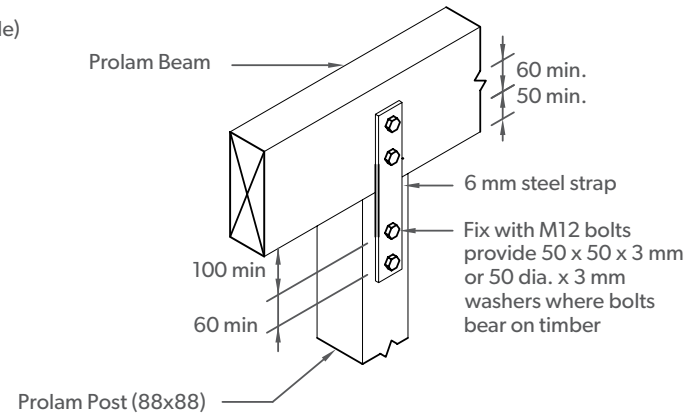
FIGURE 1



NOTE -
(1) Capacity 12.2 kN for 1 bracket.
(2) Capacity 25.5 kN for 2 brackets.

(A)

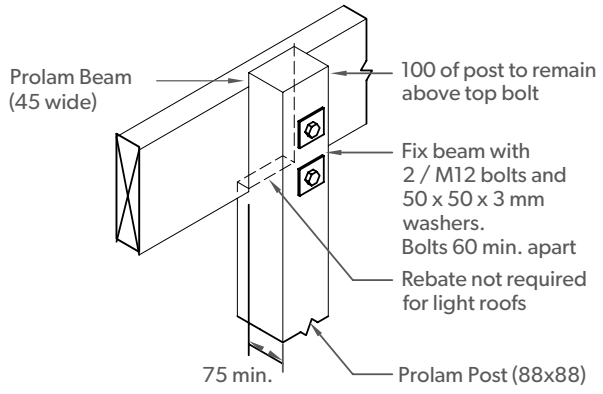
FIGURE 2



NOTE -
(1) Capacity 6.8 kN for 1 bracket.
(2) Capacity 13.7 kN for 2 brackets.

(B)

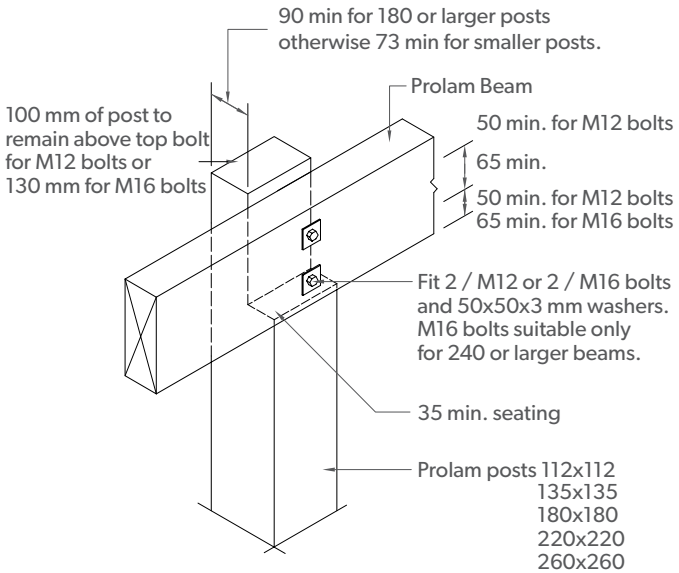
FIGURE 3



NOTE -
Capacity 6.8 kN.

(C)

FIGURE 4



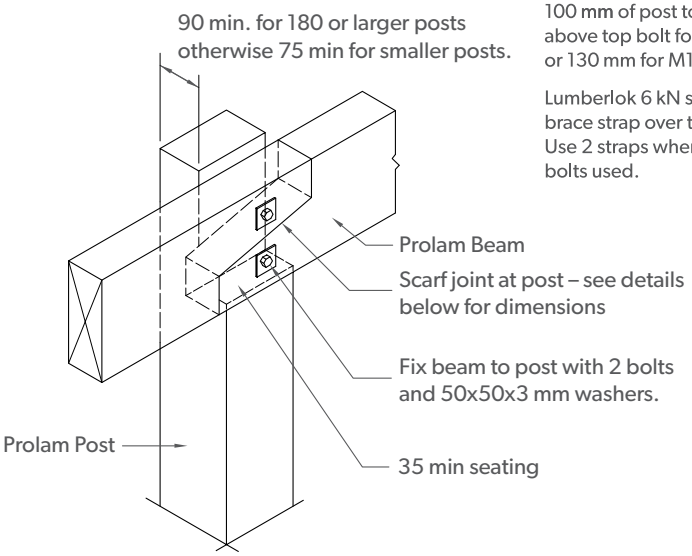
BEAM FIXING

(D)

Uplift capacity
2 / M12 bolts – 7.8 kN
2 / M16 bolts – 12.0 kN

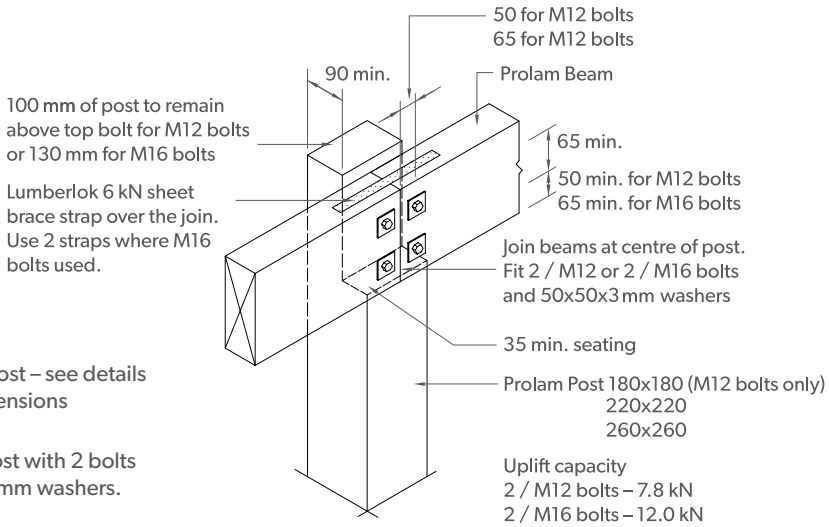
Unless otherwise stated, all dimensions are in mm.

FIGURE 5



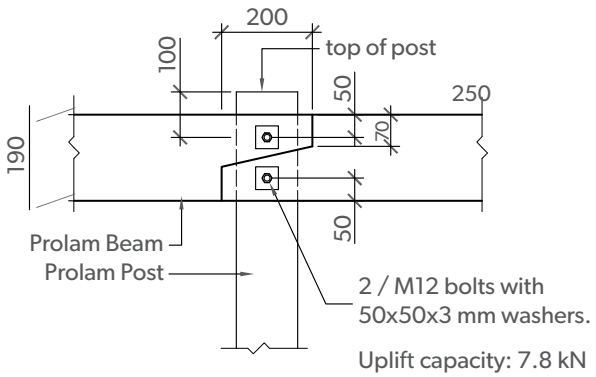
SCARF JOINT AT POSTS

FIGURE 6



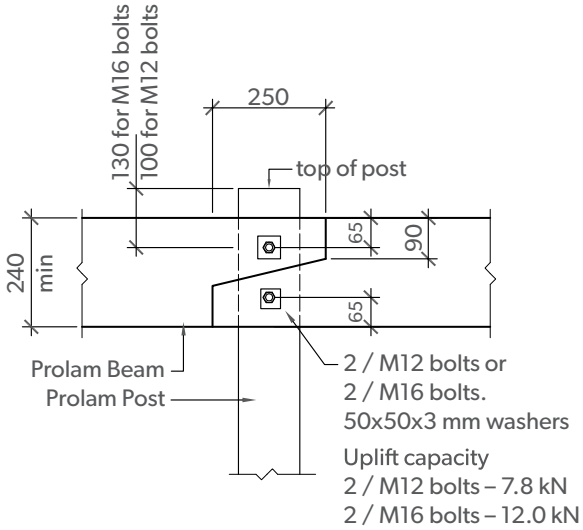
BEAM SPLICE FOR 180x180 OR LARGER POSTS

FIGURE 7



SCARF JOINT FOR 190 BEAMS

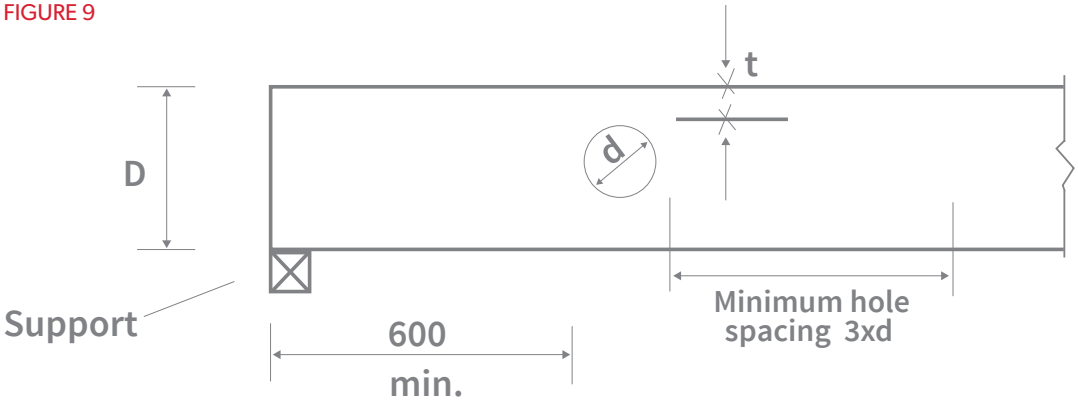
FIGURE 8



SCARF JOINT FOR 240 OR LARGER BEAMS

Penetrations through laminated timber

FIGURE 9



Circular Holes are only Permitted		
Joist Depth D	**Max Hole Dia. (d)**	**Min. Edge Dist. (t)**
140	40	45
190	50	65
240	70	80
290	90	95
315	100	100
360	120	110
405	135	120

No holes in cantilever joist

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