IBUILT™

Building Systems

April 2014

Design and Installation Guide

HYNE TIMBER

LP SOLIDSTART ENGINEERED WOOD PRODUCTS

IBUILT™ LVL

NZWOOD

NEW ZEALAND WOOD PRODUCTS LIMITED

Contents

Scope of this Document

The span tables and construction details contained in this document have been developed primarily for domestic/residential applications in accordance with the principles and intent of NZS3604:2011 'Timber Framed Buildings'; NZS3603:1993 'Timber Structures Standard'; AS1720.1:2010 'Timber Structures – Design Methods'. Loading data is taken from AS/NZS1170:2002 'Structural Design Actions' to satisfy the requirements of Section B1 of the New Zealand Building Code.

All technical information and span tables in this guide are in accordance with the product specific design properties. This data may be used for specific engineering design in applications outside the scope of this document. Please refer to New Zealand Wood Products Ltd for the 'Engineering Data'.

The information in this design guide has been checked and verified, however, it should only be used by designers who are suitably qualified.

NZWOOD accepts no liability or responsibility if the information contained in this document is incorrectly interpreted, inappropriately applied, or used in a manner other than explicitly set out in this design guide.

Note: Other manufacturers' products may have different properties and therefore cannot be substituted or designed using information contained in this document.

Compliance with the New Zealand Building Code (NZBC)

This design guide offers information for designing and installing NZWOOD's I-Built engineered timber products as floor and roof framing systems in both residential and commercial buildings. Additional design guidance can also be achieved by downloading the Hyne Design (HD) software available from the NZWOOD website.

The use of this guide is intended for suitably qualified designers to be able to select engineered beam or framing sizes and to provide installation details for floor and roof construction in the NZ building industry.

Products

The full I-Built Engineered Timber and Ply range is product certified by the Engineered Wood Products Association of Australasia (EWPAA). All NZWOOD's products are manufactured in accordance with AS/NZS 4357.0:2005 and AS/NZS 2269.

LP® SolidStart™ I-Beams are an engineered 'I-Beam' supplied by Louisiana Pacific®. The top and bottom flanges are Laminated Veneer Lumber (LVL) made from strong and naturally durable Douglas Fir timber. Engineered I-Beams are intended to be used as structural floor or roof members and are manufactured in line with the requirements of AS/NZS 4357:2005 Structural Laminated Veneer Lumber. The webs are made from strong OSB (Orientated Strand Board).

Hyne Timber produce a range of Glued-laminated timber products (Glulam). Glulam is produced by finger jointing and gluing shorter and small cross section timber together to make a larger cross section final product.

All Hyne Glued-laminated products are produced at the Maryborough Glulam plant in Brisbane and are manufactured in accordance with AS/NZS 1328.1:1998. The site operates an AS4707-2006 Chain of Custody compliant management system that covers all laminated products produced at the site as well as holding ISO9001:2006 accreditation for its manufacturing systems.

I-Built LVL (Laminated Veneer Lumber) is an engineered wood composite made from 3-4mm thick rotary peeled veneers that have been laid up with parallel grain orientation. One of the main features of LVL is to disperse or remove strength-reducing characteristics of natural wood, i.e. knots and splits. LVL is engineered, highly predictable, dimensionally stable and resists warping and twisting. Veneer sheets are graded ultrasonically and are orientated with in the product to maximise the potential of the stiffer and stronger veneer grades. LVL is manufactured using a phenolic adhesive in a continuous assembly. All I-Built LVL is produced in NZ mills that have been certified by the EWPAA.

Design

NZWOOD's engineered timber products that are used to calculate the span tables in this design guide were determined in accordance with NZS 3603:1993 Timber Structures Standard which is an Acceptable Solution to the New Zealand Building Code Clause 1 Structure.

Guidance has also been taken from AS 1684.1:1999, Residential timber-framed construction in the preparation of this guide and complies with NZS 3604:2011 Timber Framed Buildings which is an Acceptable Solution to NZBC Clause 1 Structure.

The requirements set out in the New Zealand Building Code will be achieved when floor joists and rafter framing components are installed in accordance with this design guide.

This design guide has been prepared and designed within the requirements of the following standards:

- AS/NZS 1170:2002 Structural Design Actions
- AS 1720.1:2010 Timber Structures, Part 1: Design methods.

Durability

NZWOOD's LP I-Beam, Hyne Timber LGL and LVL members' service life is in excess of 50 years when in dry well protected areas where moisture levels are maintained below the requirements specified in NZS 3602:2003. Buildings must remain weather tight and structural framing members must be protected from internal and external moisture exposure. Designers must ensure products specified are fit for purpose and building owners should ensure products remain protected.

Engineered I-Beams, LGL and LVL framing is not suitable in weather exposed applications. Light wetting during construction periods will not affect the performance of framing members, components must be left to dry before applying framing loads.

Note: Damaged, warped or delaminating engineered timber products should not be installed into a building. Please contact NZWOOD if there are any concerns with faulty products prior to installation.

Treatment

The I-Built engineered product range is available both untreated and H3.1 LOSP treated for use for weather-protected applications noted in NZS 3602:2003. LVL with an H1.2 glueline treatment can also be supplied on request. Please enquire with NZWOOD products for availability.

All I-Built engineered products must be installed fully protected from the weather.

Note:

- It is currently acceptable to install untreated engineered timber products in internal weather protected areas as defined by NZS 3602:2003.
- H1.2 LVL with glueline treatment is an acceptable solution for internal framing meeting the requirements of the New Zealand Building Code B2/AS1 for Durability.
- H3.1 LOSP treated LVL is an acceptable solution where it is being using in an H1.2 application.

FSC & PEFC Chain of Custody Certification

NZWOOD has Forest Stewardship Council® (FSC) and Programme for the Endorsement of Forest Certification (PEFC) chain of custody certification. The certification proves that the timber NZWOOD sells meets environmentally and socially responsible timber criteria. FSC and PEFC Chain of custody systems are governed by standards that require specific documentation and procedures for handling certified wood products with the basic aim to prevent the mixing of FSC or PEFC wood with uncontrolled sources. All information relating to the path taken by products from the forest including each stage of processing, transformation, manufacturing and distribution is tracked.

FSC Chain of Custody Certification

FSC chain of custody certified products provide assurances that the wood originates from well managed or responsibly managed forests. NZWOOD provide a range of plywood, scaffolding and LVL products that are FSC Certified with a FSC Mix 70% claim. Our main supplier for these products is Juken New Zealand Ltd.

PEFC Chain of Custody Certification

PEFC differs from FSC at the forest management level, but the chains of custody are similar. The certification includes requirements for traceability and handling of PEFC certified timber. A product carrying the PEFC label means it has originated from a forest certified by a PEFC endorsed scheme and has been handled by PEFC certified organisations. NZWOOD provide a range of I-Beams and engineered timber products that are PEFC certified. Our supplier of I-Beams is Louisiana Pacific Corporation and our supplier for engineered beams is Hyne Pty Australia.

If you require further information regarding our FSC and PEFC certification please contact us at NZWOOD.

FSC
www.fsc.org
FSC® C007462
The mark of responsible forestry

PEFC Certified
SGS-PEFC/COC-1437

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Producer Statement

Issued: February 2013

HYNE produce a range of Glued-laminated products (Glulam). Glulam products are produced by finger jointing and gluing shorter and small cross section timber together to make a larger cross section final product.
All HYNE Glued-laminated products are produced at the Maryborough Glulam plant and are manufactured in accordance with AS/NZS 1328.1-1998. The site operates an AS4707-2006 Chain of Custody compliant management system that covers all laminated products produced at the site as well as holding ISO9001-2006 accreditation for its manufacturing systems.

HYNE BEAM 17 products are high grade glued-laminated timber beams formed from Australian pine.

- All components are assembled using only durable, exterior grade adhesives that comply with Service Class 3 as per AS/NZS 4364-2010.
- The beams are specified as cambered (C) to 600 m radius.
- HYNE BEAM 17 is available in two grades in accordance with AS/NZS1328.1-1998. STR – Structural Grade/Appearance C and SEL –Select Grade/Appearance A.
- HYNE BEAM is available treated to H3.1
- Third party certified through the Glue Laminated Timber Association of Australia (GLTAA).

HYNE BEAM 18 products are high grade glued-laminated timber beams formed from Australian hardwoods.

- All components are assembled using only durable, exterior grade adhesives that comply with Service Class 3 as per AS/NZS 4364-2010.
- The beams are specified as cambered (C) to 600 m radius.
- HYNEBEAM 18 is manufactured from Durability Class 4 timber species and is only suitable for internal applications
- HYNEBEAM 18 is available in two grades in accordance with AS/NZS1328.1-1998. STR – Structural Grade/Appearance C and SEL –Select Grade/Appearance A.

HYNE BEAM 21 products are high grade glued-laminated timber beams formed from Australian hardwoods

- All components are assembled using only durable, exterior grade adhesives that comply with Service Class 3 as per AS/NZS 4364-2010.
- The beams are specified as cambered (C) to 600 m radius.
- HYNE BEAM 21 is manufactured from a minimum Durability Class 2 Timber species.
- HYNE BEAM 21 is available in two grades in accordance with AS/NZS1328.1-1998. STR – Structural Grade/Appearance C and SEL –Select Grade/Appearance A.
- Third party certified through the Glue Laminated Timber Association of Australia (GLTAA).

HYNE LGL44 and HYNE LGL65 are high grade glued-laminated timber beams formed from Australian pine.

- All components are assembled using only durable, exterior grade adhesives that comply with Service Class 3 as per AS/NZS 4364-2010.
- The beams are specified as straight only.
- HYNE LGL44 and HYNE LGL65 are available only in STR – Structural Grade/Appearance C as per AS/NZS1328.1-1998.
- HYNE LGL44 and HYNE LGL65 is available treated to H3.1

Producer Statement

Pryda Timber Connectors

January 2012

This Producer Statement is issued by Pryda NZ to cover the use, installation and durability of PRYDA TIMBER CONNECTORS for both structural application and durability as required by the New Zealand Building Code clauses B1 & B2 respectively.

Description

The PRYDA timber connectors are manufactured from either Z275 or Z600 galvanised coil. Some brackets are also available hot dipped galvanised or stainless steel for use in certain exposed and covered situations.

Application

PRYDA timber connectors are designed for specific connections of timber to timber mostly but also to other materials such as masonry, concrete and steel. Please contact PRYDA technical service should you require assistance relating to these connectors.

Installation

The PRYDA timber conectors should be installed without damage to the finished surfaces. Storage prior to use to be in dry moisture free conditions that would not affect the future durability of the product.

Design Capacity

As timber grades vary the design capacity is derived by the verification method as with the NZBC standards NZS3603:1993 mostly dependant on the shear values of the nails and bolts in timber. Most commonly used brackets have published characteristic strengths published in our literature.

Durability

The durability of the PRYDA timber connectors is in accordance with the acceptable solutions contained in Table 4.1 and Table 4.2 of NZS3604:2011 in order to achieve a 50 year life expectancy for the connectors where applicable. Alternative solutions and direct applications are to be found else where in this publication.

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17 March 2014

New Zealand Wood Products Ltd
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Ref 1763: Structural review of Hyne Design V7 software for New Zealand.

I have structurally reviewed the Hyne Design software version 7.3.1.2 produced by HR Design Group Ltd in accordance with sound engineering practice and with the following standards:

AS/NZS1170:2002
NZS3603:1993, including Amendment4
NZS3604:2011

The program enables the user to design rafters, beams, bearers, joists and wall frame components for domestic applications. Timber products available are Hyne 17C, 18, 21, LGL, MGP10, MGP12; LP Building Products LPI 53-T and LPI 70-T timber I beams, generic LVL11 / 13 grades and solid radiata pine grade SG8.

The review has consisted of running a range of typical scenarios through the software. No review of the internal program logic and programming code has been undertaken.

I am satisfied that with proper use by appropriately qualified personal the results from the software will enable selection of components to comply with the structural requirements of the New Zealand Building Code, subject to correct installation in accordance with the component suppliers' requirements.

Yours faithfully

David Reid
STRUCTURAL ENGINEER, IPENZ Member ID 121639.

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15 August 2012

Louisiana Pacific Corporation
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Ref 1505: Report on structural review of timber I beams for New Zealand market.

I have structurally reviewed the data and methodology for deriving the structural properties for Louisiana Pacific timber I beams LPI53-T, LPI70-T and LPI32. The derivation of the properties has been performed by H R Design Group Ltd, Queensland, Australia and has been done in accordance with the following standards:

- AS/NZS 4063:2010 – Characterization of Structural Timber
- ASTM D5055 - 11a Standard Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists

Table 1: Characteristic Structural Properties of LP timber I beams

Type	LPI 53-T		width = 53mm		LPI 70-T		width = 70mm		LPI 32		width = 63.5mm	
	Mchar	EI	GwAw	Vchar	Mchar	EI	GwAw	Vchar	Mchar	EI	GwAw	Vchar
Depth	kNm	x10^{9}Nmm^2	x10^{6}N	kN	kNm	x10^{9}Nmm^2	x10^{6}N	kN	kNm	x10^{9}Nmm^2	x10^{6}N	kN
200	9.1	367	2.7	11.0	12.4	494	2.7	11.0	8.0	395	1.9	8.0
225	10.5	488	3.0	12.4	14.2	651	3.0	12.4	9.2	530	2.2	9.1
241	11.4	574	3.2	13.3	15.4	769	3.2	13.3	10.0	635	2.3	9.9
302	14.7	967	3.9	15.7	19.9	1286	4.0	15.7	12.9	1080	2.8	12.7
356	17.4	1412	4.6	17.7	23.6	1871	4.7	17.7	15.6	1580	3.3	14.9
406	19.9	1911	5.3	19.7	27	2528	5.3	19.7	18.1	2130	3.7	16.6

The structural properties shown in Table 1 are consistent with the requirements of the NZ Building Code, B1 Structure and may be used for the specific design of timber components utilising NZS 3603:1993 Timber Structures Standard. Connections may be designed using NZS3603:1993 J4 joint group properties.

David Reid

STRUCTURAL ENGINEER, IPENZ Member ID 121639.

Hyne Design

Waiting for you on our website is the feature packed Hyne Design (HD) software, distributed in NZ by New Zealand Wood Products who are the Sole Distributors of the Hyne Timber Product Range.
HD software can specify Louisiana Pacific's Solid Start timber I-Beams for an engineered floor or rafter framing system, a range of LVL11 and LVL13 products, Hyne's 17C, 18C and 21C high strength laminated beams and the Hyne 44mm LGL Edge beam. A range of common SG8 solid timber sizes are included also for additional design scope.
NZWOOD will provide technical support and design services for these products as well as providing support with the HD software package.

Need to see more? Visit New Zealand Wood Products Limited (www.nzwoodproducts.co.nz) for a free programme download with just one click of a button.

I-Built Structural Components

LPI 70-T I-Beam

Description	I-Beams are a unique combination of timber resources, utilising advanced technology to form a structurally efficient 'I' section. Made from Douglas Fir Top & Bottom Flange and an OSB web. Components are assembled using only durable, exterior grade adhesives. I-Beam is available untreated or treated to H3.1 (LOSP) from stock. I-Beams are supplied to H2S levels which is an insecticide treatment only.
Advantages	Dimensional stability, lightweight, long spanability, elimination of mid-span blocking in floor joists.
Applications	Floor joists, rafters.
Section sizes:	225 x 70, 240 x 70, 300 x 70, 356 x 70
Available lengths:	Up to 12m in 300mm increments.
Availability:	Readily available.
Specification example:	225 LPI 70-T I-Beam

Hyne Beam 17C

Description	Hyne Beam 17C products are high grade glued-laminated timber beams formed from Australian pine, into larger rectangular sections. The Hyne Beam 17C product range is manufactured in accordance with AS1328 by Hyne in Maryborough. The Hyne Beam 17C is made from slash pine feedstock. All components are assembled using only durable, exterior grade adhesives (service class 3). The beams are specified as cambered (C) to 600 m radius. Available in structural grades (STR). Hyne Beam 17C is available treated to H3.1 (LOSP).
Advantages	Dimensional stability, long spanability, aesthetically appealing, variety of shapes and curved beam options, simple high-tech connections, termite resistance and durability (when treated), easier to handle and install than steel members, third party certified through the Glue Laminated Timber Association of Australia (GLTAA) and ISO 9002.
Applications	Roof beams, bearers, columns, floor joists, rafters, lintels,portal frames.
Section sizes:	195 x 85 up to 525 x 85, 195 x 130 up to 360 x 130
Available lengths:	Up to 11.4m in 600mm increments.
Availability:	Readily available. (65mm width available on request)
Specification example:	295 x 85 Hyne Beam 17C

Hyne Beam 18C - for premium appearance and strength

Description	Hyne Beam 18C products are high grade glued-laminated timber beams formed from Tasmanian Oak, into larger rectangular sections. The Hyne Beam 18 product range is manufactured by Hyne in Maryborough. The Hyne Beam 18C is made from Tasmanian Oak feedstock. All components are assembled using only durable, exterior grade adhesives (service class 3). The beams are specified as cambered (C) to 600 m radius. Available in appearance / select grade (SEL). Hyne Beam 18C can only be used in internal situations.
Advantages	Dimensional stability, long spanability, aesthetically appealing, variety of shapes and curved beam options, simple high-tech connections, termite resistance and durability (when treated), easier to handle and install than steel members, third party certified through the Glue Laminated Timber Association of Australia (GLTAA) and ISO 9002.
Applications	Roof beams, bearers, floor joists, rafters, lintels, portal frames.
Section sizes:	120 x 65 – 420 x 65, 120 x 85 – 600 x 85, 120 x 130 – 600 x 130
Available lengths:	Up to 11.4m in 600mm increments.
Availability:	Special order
Specification example:	270 x 85 Hyne Beam 18C(SEL)

Hyne Beam 21C - for premium appearance and strength

Description	Hyne Beam 21C products are high grade glued-laminated timber beams formed from Australian Hardwoods, into larger rectangular sections. The Hyne Beam 21 product range is manufactured by Hyne in Maryborough. The Hyne Beam 21 is made from Queensland Hardwood feedstock. All components are assembled using only durable, exterior grade adhesives (service class 3). The beams are specified as cambered (C) to 600m radius. Available in appearance / select grade (SEL). Hyne Beam 21C can only be used in sheltered situations.
Advantages	Dimensional stability, long spanability, aesthetically appealing, variety of shapes and curved beam options, simple high-tech connections, termite resistance and durability (when treated), easier to handle and install than steel members, third party certified through the Glue Laminated Timber Association of Australia (GLTAA) and ISO 9002.
Applications	Roof beams, bearers, floor joists, rafters, lintels, portal frames.
Section sizes:	120 x 65 – 410 x 65, 120 x 85 – 600 x 85
Available lengths:	Up to 11.4m in 600mm increments.
Availability:	Special order.
Specification example:	270 x 85 Hyne Beam 21C(SEL)

Hyne LGL (Edgebeam)

Description	Hyne LGL (Edgebeam) is a high grade edge glued-laminated timber beam product assembled from finger jointed pine scantling, into deeper rectangular sections. The Hyne LGL product range is manufactured in accordance with AS1328 by Hyne in Maryborough. All components are assembled using only durable, exterior grade adhesives (service class 3). Available in a range of depths to ensure compatibility with Hyne-I-Beam. Hyne LGL is available treated or H3.1 (LOSP).
Advantages	Dimensional stability, lightweight, long spanability, treatable to H3.1, may be nail-laminated to provide wider sections.
Applications	Floor joists, bearers, rafters, purlins, lintels.
Section sizes:	200 x 44 up to 360 x 44
Available lengths:	Up to 11.4m in 600mm increments.
Availability:	Readily available. Check with New Zealand Wood Products Ltd for the 65mm availability.
Specification example:	300 x 44 Hyne LGL (E/B)

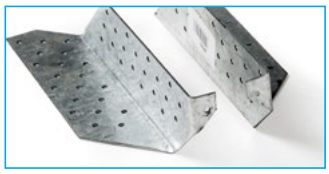
I-Built Rim (RB21, RB35, RB45)

The Rimboard is used as a perimeter board.

Treated to the level of H3.1 (LOSP) to provide a protective envelope to the floor joists.

Rimboard (RB21) ties the end of the I-Beams joists together, providing lateral stability to the floor platform. Rimboard is also used as a stiffener for I-Beams in cantilevered situations.

Rimboard (RB35/RB45) is used in situations where structural fixing is required.



Pryda Hardware

Pryda is a world leader and specialist in the development and manufacture of timber connections systems.

These quality fixings are used throughout our flooring design. The use of Pryda specialised hardware enables quick and simplistic installation.

I-Built LVL 11 & 13

Description

I-Built LVL 11 and 13 is laminated veneer lumber made from rotary peeled veneers, laid up with parallel grain orientation. I-Built LVL is a highly predictable, uniform lumber product because natural defects such as knots, slope of grain and splits have been removed or dispersed throughout the product. In addition, the veneer sheets are placed in a specific sequence and location within the product to maximise the potential of the stiffer and stronger veneer grades. This can be considered as an engineered configuration of the veneers. NZWOOD LVL is dimensionally stable, resists warping and twisting and is machined to consistent uniform sizes.

LVL properties are consequently superior to those of standard stress graded timber. The average of most strength characteristics is higher and the variation is significantly lower when compared to solid wood.

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

Advantages Dimensionally stable, long span ability, simple high tech connections, durable when treated, easier to handle and install than steel members.

Applications Roof beams, bearers, floor joists, rafters, lintels and portal frames.

Section sizes: 90x45 up to 610x63

Available lengths: Up to 12m in 300mm increments.

Availability: Readily Available

Specification example: 300 x 45 LVL13

I-Built 90

Description

I-Built 90 is a light weight Laminated Veneer Lumber product suitable for use in frame construction, as a lintel or a beam or joist. I-Built 90 provides a cost effective, light weight solution. The 90mm beam is designed to match New Zealand framing sizes and is manufactured by Juken New Zealand Limited (an EWPPA certified mill) to meet the ANS/NZS 4357:2005 manufacturing standard for LVL. I-Built 90 is FSC certified and supplied Untreated or Treated to H3.1 (LOSP).

Treated beams are designed for limited exposure to weather. Beams should not be exposed to high moisture and must be contained within a building structure protected from the weather. The 90mm beams are treated by certified treatment plants in accordance with AS/NZS 1604.2004 to meet NZS3602-2003 and achieve both a H1.2 and H3.1 treatment class. Treat end cuts with a solvent based preservative.

I-Built 90 comes standard in 9.5 Mpa. 10.7 Mpa is also available on request.

Advantages Dimensionally stable, long span ability, simple high tech connections, durable when treated, easier to handle and install than steel members.

Applications Lintels, beams.

Section sizes: 150x90, 200x90, 240x90, 300x90, 360x90, 400x90

Available lengths: Up to 9.6m in 300mm increments.

Availability: Readily available

Specification example: 300 x 90 I-Built 90

Product Summary

PRODUCT NAME	PRODUCT TYPE	AVAILABILITY	PRODUCT CODE	SIZE LIST (MM)
LPI 70 I-BEAM	LVL Flange composite I-Beam	Available	LPI	LPI 225 x 70, LPI 240 x 70, LPI 300 x 70, LPI 356 x 70
HYNE BEAM 17C 85MM	Glued-laminated timber	Available	GL17C	195 x 85, 230 x 85, 260 x 85, 295 x 85, 330 x 85, 360 x 85, 395 x 85, 425 x 85, 460 x 85, 495 x 85, 525 x 85, 560 x 85, 590 x 85
HYNE BEAM 17C 135MM	Glued-laminated timber	Available	GL17C	130 x 130, 165 x 130, 195 x 130, 230 x 130, 260 x 130, 295 x 130, 330 x 130, 360 x 130, 395 x 130, 425 x 130, 460 x 130, 495 x 130, 525 x 130, 560 x 130, 590 x 130
HYNE BEAM 18C 65MM	Glued-laminated timber	On Request	GL18C	120 x 65, 155 x 65, 185 x 65, 215 x 65, 240 x 65, 270 x 65, 300 x 65, 330 x 65, 360 x 65, 390 x 65, 420 x 65
HYNE BEAM 18C 85MM	Glued-laminated timber	On Request	GL18C	120 x 85, 155 x 85, 185 x 85, 215 x 85, 240 x 85, 270 x 85, 300 x 85, 330 x 85, 360 x 85, 390 x 85, 420 x 85, 450 x 85, 480 x 85, 510 x 85, 540 x 85, 570 x 85, 600 x 85
HYNE BEAM 18C 130MM	Glued-laminated timber	On Request	GL18C	120 x 130, 155 x 130, 185 x 130, 215 x 130, 240 x 130, 270 x 130, 300 x 130, 330 x 130, 360 x 130, 390 x 130, 420 x 130, 450 x 130, 480 x 130, 510 x 130, 540 x 130, 570 x 130, 600 x 130
HYNE BEAM 21C 65MM	Glued-laminated timber	On Request	GL21C	120 x 65, 155 x 65, 185 x 65, 215 x 65, 240 x 65, 280 x 65, 300 x 65, 315 x 65, 350 x 65, 380 x 65, 410 x 65
HYNE BEAM 21C 85MM	Glued-laminated timber	On Request	GL21C	120 x 85, 155 x 85, 185 x 85, 215 x 85, 240 x 85, 280 x 85, 300 x 85, 315 x 85, 350 x 85, 380 x 85, 410 x 85, 445 x 85, 475 x 85, 505 x 85, 535 x 85, 570 x 85, 600 x 85
HYNE LGL 44 (EDGEBEAM)	Edge glued-laminated timber	Available	LGL	200 x 44, 240 x 44, 300 x 44, 360 x 44
HYNE LGL 65 (EDGEBEAM)	Edge glued-laminated timber	On Request	LGL	150 x 65, 200 x 65, 240 x 65, 300 x 65, 360 x 65
LVL 11 45MM	Laminated veneer lumber	Available	LVL11	90 x 45, 140 x 45, 190 x 45, 240 x 45, 300 x 45
LVL 13 45MM	Laminated veneer lumber	Available	LVL13	150 x 45, 200 x 45, 240 x 45, 300 x 45, 360 x 45
LVL 13 63MM	Laminated veneer lumber	Available	LVL13	150 x 63, 200 x 63, 240 x 63, 300 x 63, 360 x 63
I-BUILT 90	Laminated veneer lumber	Available	LVL 90mm	150 x 90, 200 x 90, 240 x 90, 300 x 90, 360 x 90, 400 x 90

Structural Properties - LVL / LGL

PRODUCT			HYNE LGL 44 (EDGEBEAM)	HYNE LGL 65	HYNE BEAM 17C	HYNE BEAM 18C	HYNE BEAM 21C	I-BUILT LVL 11	I-BUILT LVL 13	I-BUILT 90
TYPE			Glulam	Glulam	High strength Glulam	High strength Glulam	High strength Glulam	Structural LVL	High strength LVL	High strength LVL
GRADE			LGL	LGL	GL17	GL18	GL21	LVL 11	LVL 13	LVL 90
BENDING	f_b	MPa	30	33	40	45	50	38	48	35
TENSION	f_t	MPa	16	16	20	25	25	26	33	–
SHEAR	f_s	MPa	3.7	4.2	4.2	5.0	5.0	5.0	5.3	–
COMP.	f_c	MPa	30	26	33	45	50	38	38	–
MODULUS OF ELASTICITY	E	MPa	13300	13300	16700	18500	21000	11000	13200	9500
MODULUS OF RIDGITY	G	MPa	890	900	1110	1230	1400	550	660	–
DENSITY		kg/m^3	540	650	650	750	1000	570	570	520
JOINT GROUP			JD4	JD4	JD4	JD3	JD2	JD4	JD4	–
STRENGTH GROUP			SD6	SD6	SD5	SD3	SD2	SD5	SD5	–
BEARING PERP	f_p	MPa	10	10	13	19	23	10	10	–
BEARING PARALLEL	f_l	MPa	30	30	40	59	67	–	–	–
SHEAR AT JOINTS	f_{sj}	MPa	4.2	4.2	5.4	7.3	8.4	5.0	5.3	–
TENSION PERP	ft_p	MPa	0.5	0.5	0.5	0.6	0.8	–	–	–
DURABILITY CLASS			4	4	4	4	2	4	4	–

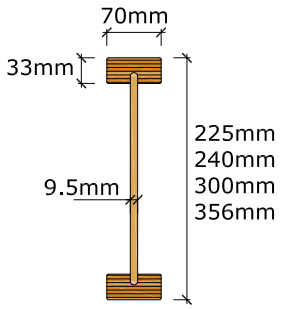
LPI 70-T Structural Properties

LPI 70-T SOLID START I-BEAM DEPTH	JOIST WEIGHT (KG/M)	BENDING RIGIDITY EIXX (KN. M2)	BENDING RIGIDITY EIYY (KN. M2)	TORSIONAL RIGIDITY GJ (KN.M2)	SHEAR RIGIDITY GWAW (MN)	BENDING MOMENT CAPACITY (KN.M)	MAX VERT SHEAR (KN)	END BEARING CAPACITY (KN)	INTERNAL BEARING CAPACITY (KN)
225	3.7	651.0	28.9	4.9	3.0	14.2	12.4	9.5	21.7
240	4.0	769.0	28.9	4.9	3.2	15.4	13.3	9.5	22.0
300	4.1	1286.0	28.9	4.9	4.0	19.9	15.7	9.5	22.9
356	4.5	1871.0	28.9	4.9	4.7	23.6	17.7	9.5	23.7

PLEASE NOTE:

Check with NZWOOD regarding 53mm wide I-Beams & 200 high I-Beam availability

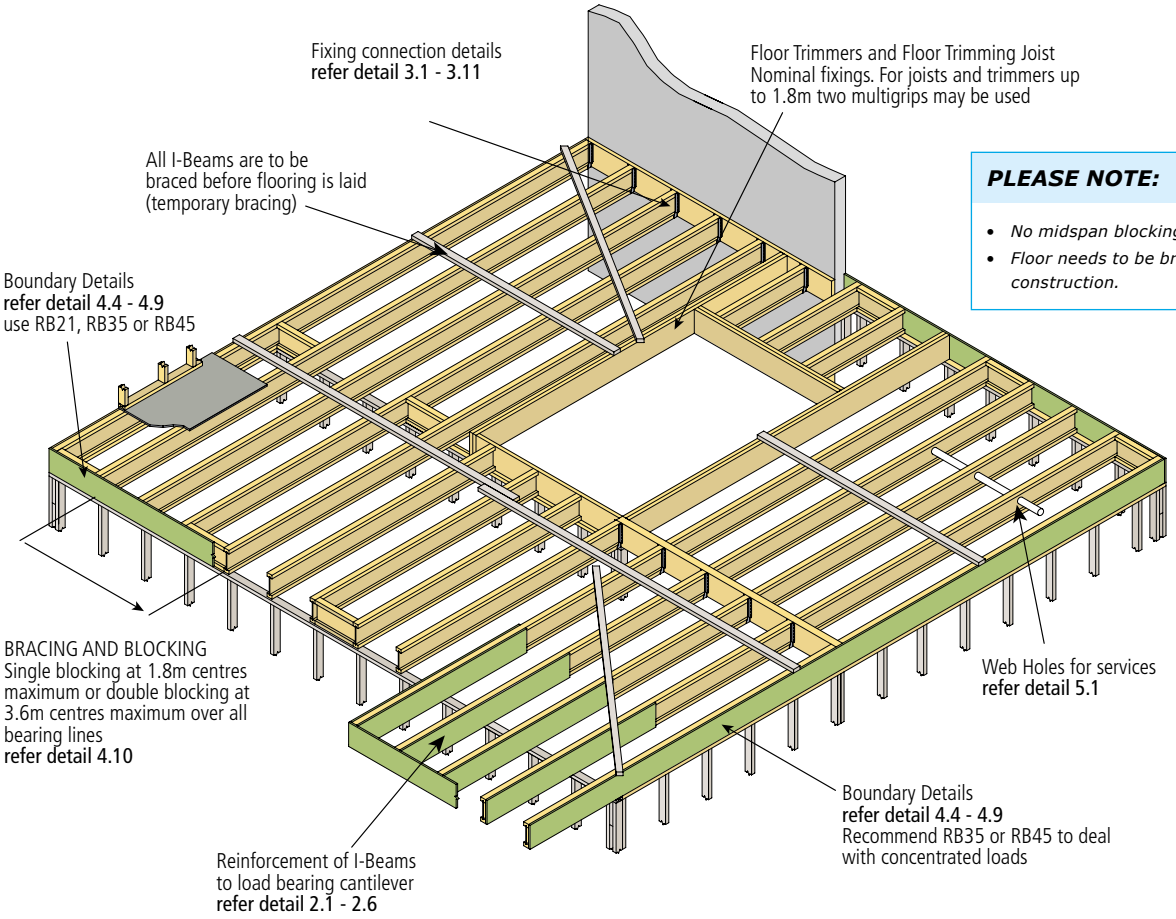
LPI™ 70-T Profile



Typical Floor Construction Plan

1.1 Typical Floor Construction Plan

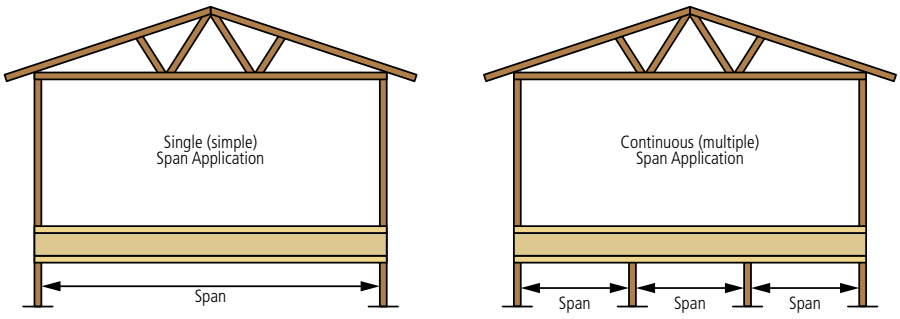
This is a typical floor construction plan. Please see detail numbers on the plan to locate specifics.



PLEASE NOTE:

- *No midspan blocking required.*
- *Floor needs to be braced during construction.*

1.2 Span Definitions Floor Joists



For an Engineered Timber Product member to be considered 'continuous' it shall span at least 2 adjacent spans such that span 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'.

PLEASE NOTE:

- *40% of the live load has been considered to be permanent load for assessing the long-term deflection limits for floors in general office, residential and institutional space. For other applications such as storage areas, where higher permanent loads may be expected, specific engineering design should be applied – refer to HD7 software.*
- *Where heavy permanent dead loads, such as water beds, or tiled floors are to be applied to the floor joist system, allowance should be made. Suitable allowances can be made by designing the floor joists at 450mm or 600mm centres but installing them at 300 or 450mm respectively.*

Floor Joist Span - LPI 70-T I-Beam

Single Span

MAX JOIST SPAN (M)							
		I-BEAM DEPTH	300CRS	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 1.5KPA DISTRIBUTED 1.8KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	225	5.5	5.1	5.0	4.9	4.6
		240	5.7	5.3	5.2	5.1	4.8
		300	6.5	6.1	5.9	5.8	5.4
		356	7.2	6.7	6.5	6.3	6.0
	DEAD LOAD TILED FLOOR 95 KG/M²	225	5.1	4.8	4.6	4.6	4.3
		240	5.3	5.0	4.8	4.8	4.5
		300	6.1	5.7	5.5	5.4	5.1
		356	6.6	6.2	6.0	5.9	5.6

		I-BEAM DEPTH	300CRS	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 2.0KPA DISTRIBUTED 1.8KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	225	5.4	5.1	4.9	4.8	4.6
		240	5.6	5.3	5.1	5.0	4.8
		300	6.4	6.0	5.8	5.7	5.4
		356	7.0	6.6	6.4	6.3	5.9
	DEAD LOAD TILED FLOOR 95 KG/M²	225	5.0	4.6	4.5	4.4	4.1
		240	5.2	4.8	4.7	4.6	4.3
		300	5.9	5.5	5.3	5.2	4.9
		356	6.5	6.0	5.8	5.7	5.4

		I-BEAM DEPTH	300CRS	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 3.0KPA DISTRIBUTED 2.7KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	225	5.0	4.7	4.5	4.5	4.2
		240	5.3	4.9	4.7	4.6	4.4
		300	6.0	5.5	5.4	5.3	4.5
		356	6.6	6.1	5.9	5.6	4.5
	DEAD LOAD TILED FLOOR 95 KG/M²	225	4.7	4.4	4.2	4.1	3.8
		240	4.9	4.6	4.4	4.3	4.0
		300	5.6	5.2	5.0	5.0	4.0
		356	6.1	5.7	5.3	5.0	4.0

Continuous Span

MAX JOIST SPAN (M)							
		I-BEAM DEPTH	300CRS	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 1.5KPA DISTRIBUTED 1.8KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	225	6.0	5.6	5.4	5.3	5.0
		240	6.3	5.8	5.6	5.5	5.2
		300	7.1	6.6	6.4	6.3	5.9
		356	7.8	7.3	7.0	6.9	6.5
	DEAD LOAD TILED FLOOR 95 KG/M²	225	6.0	5.6	5.4	5.3	5.0
		240	6.3	5.8	5.6	5.5	5.2
		300	7.1	6.6	6.4	6.3	5.9
		356	7.8	7.3	7.0	6.9	6.5

		I-BEAM DEPTH	300CRS	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 2.0KPA DISTRIBUTED 1.8KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	225	6.1	5.7	5.5	5.4	5.1
		240	6.4	5.9	5.7	5.6	5.3
		300	7.3	6.7	6.5	6.4	6.0
		356	8.0	7.4	7.2	7.0	6.6
	DEAD LOAD TILED FLOOR 95 KG/M²	225	6.1	5.7	5.5	5.4	5.1
		240	6.4	5.9	5.7	5.6	5.3
		300	7.3	6.7	6.5	6.4	6.0
		356	8.0	7.4	7.2	7.0	6.5

		I-BEAM DEPTH	300CRS	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 3.0KPA DISTRIBUTED 2.7KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	225	5.5	5.1	4.9	4.9	4.6
		240	5.7	5.3	5.2	5.1	4.8
		300	6.5	6.0	5.9	5.8	5.2
		356	7.2	6.6	6.4	6.3	5.2
	DEAD LOAD TILED FLOOR 95 KG/M²	225	5.5	5.1	4.9	4.9	4.5
		240	5.7	5.3	5.2	5.1	4.5
		300	6.5	6.0	5.9	5.8	4.7
		356	7.2	6.6	6.3	5.9	4.7

PLEASE NOTE:

These span tables provide maximum member spans up to 100% of the recommended capacity. For a premium floor or rafter system with minimal deflection, it is recommended that spans should be restricted to 85% of the maximum allowed.

Floor Joist Span - Hyne LGL 44mm

Single Span

MAX JOIST SPAN (M)						
		LGL SIZE	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 1.5KPA DISTRIBUTED 1.8KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	200 x 44	4.6	4.4	4.4	4.1
		245 x 44	5.3	5.2	5.1	4.8
		300 x 44	6.2	6.0	5.9	5.6
		360 x 44	7.1	6.9	6.8	6.4
	DEAD LOAD TILED FLOOR 95 KG/M²	200 x 44	4.2	4.0	4.0	3.7
		245 x 44	4.9	4.8	4.7	4.5
		300 x 44	5.7	5.6	5.5	5.2
		360 x 44	6.6	6.4	6.3	6.0

		LGL SIZE	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 2.0KPA DISTRIBUTED 1.8KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	200 x 44	4.5	4.3	4.3	4.0
		245 x 44	5.2	5.1	5.0	4.8
		300 x 44	6.0	5.9	5.8	5.5
		360 x 44	6.9	6.7	6.6	6.3
	DEAD LOAD TILED FLOOR 95 KG/M²	200 x 44	4.0	3.9	3.8	3.5
		245 x 44	4.8	4.7	4.6	4.3
		300 x 44	5.6	5.4	5.3	5.1
		360 x 44	6.4	6.2	6.1	5.8

		LGL SIZE	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 3.0KPA DISTRIBUTED 2.7KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	200 x 44	4.1	4.0	3.9	3.6
		245 x 44	4.9	4.7	4.7	4.4
		300 x 44	5.7	5.5	5.4	5.1
		360 x 44	6.5	6.3	6.2	5.9*
	DEAD LOAD TILED FLOOR 95 KG/M²	200 x 44	3.8	3.6	3.6	3.3
		245 x 44	4.6	4.5	4.4	4.1
		300 x 44	5.3	5.2	5.1	4.8
		360 x 44	6.1	5.9	5.8	5.5*

* Denotes member must have min 65mm bearingat the 2 supports

PLEASE NOTE:

These span tables provide maximum member spans up to 100% of the recommended capacity. For a premium floor or rafter system with minimal deflection, it is recommended that spans should be restricted to 85% of the maximum allowed.

Continuous Span

		MAX JOIST SPAN (M)				
		LGL SIZE	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 1.5KPA DISTRIBUTED 1.8KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	130 x 44	3.6	3.3	3.2	3.0
		150 x 44	4.0	3.9	3.8	3.6
		170 x 44	4.4	4.3	4.2	4.0
		200 x 44	5.0	4.8	4.8	4.5
		245 x 44	5.8	5.7	5.6	5.3
		300 x 44	6.8	6.6	6.5	6.1
		360 x 44	7.8	7.6	7.4	7.0
	DEAD LOAD TILED FLOOR 95 KG/M²	130 x 44	3.6	3.5	3.4	3.2
		150 x 44	4.0	3.9	3.8	3.6
		170 x 44	4.4	4.3	4.2	4.0
		200 x 44	5.0	4.8	4.8	4.5
		245 x 44	5.8	5.7	5.6	5.3
		300 x 44	6.8	6.6	6.5	6.1
		360 x 44	7.8	7.6	7.4	7.0#

# Denotes member must have min 85mm bearing at the internal support

		LGL SIZE	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 2.0KPA DISTRIBUTED 1.8KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	130 x 44	3.7	3.3	3.2	3.0
		150 x 44	4.1	3.9	3.8	3.6
		170 x 44	4.5	4.4	4.3	4.1
		200 x 44	5.1	4.9	4.9	4.6
		245 x 44	5.9	5.8	5.7	5.3
		300 x 44	6.9	6.7	6.6	6.2
		360 x 44	7.9	7.7	7.6	7.2#
	DEAD LOAD TILED FLOOR 95 KG/M²	130 x 44	3.6	3.4	3.3	2.9
		150 x 44	4.1	3.9	3.8	3.4
		170 x 44	4.5	4.4	4.3	3.8
		200 x 44	5.1	4.9	4.9	4.5
		245 x 44	5.9	5.8	5.7	5.3
		300 x 44	6.9	6.7	6.6	6.2#
		360 x 44	7.9*	7.7#	7.6#	7.2#

* Denotes member must have min 65mm bearing at the internal support

# Denotes member must have min 85mm bearing at the internal support

		LGL SIZE	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 3.0KPA DISTRIBUTED 2.7KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	130 x 44	3.2	3.1	3.0	2.6
		150 x 44	3.7	3.6	3.4	3.0
		170 x 44	4.1	3.9	3.9	3.5
		200 x 44	4.6	4.5	4.4	4.1
		245 x 44	5.3	5.2	5.1	4.8#
		300 x 44	6.2	6.1*	6.0#	5.6#
		360 x 44	7.2#	6.9#	6.8#	6.1#
	DEAD LOAD TILED FLOOR 95 KG/M²	130 x 44	3.1	2.9	2.8	2.5
		150 x 44	3.6	3.4	3.2	2.9
		170 x 44	4.1	3.8	3.7	3.3
		200 x 44	4.6	4.5	4.4	3.9
		245 x 44	5.3	5.2	5.1*	4.8#
		300 x 44	6.2*	6.1#	6.0#	5.4#
		360 x 44	7.2#	6.9#	6.7#	5.4#

* Denotes member must have min 65mm bearing at the internal support

# Denotes member must have min 85mm bearing at the internal support

PLEASE NOTE:

These span tables provide maximum member spans up to 100% of the recommended capacity. For a premium floor or rafter system with minimal deflection, it is recommended that spans should be restricted to 85% of the maximum allowed.

Floor Joist Span - I-Built LVL 11

Single Span

MAX JOIST SPAN (M)						
		LVL11 SIZE	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 1.5KPA DISTRIBUTED 1.8KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	140 x 45	2.9	2.8	2.7	2.6
		190 x 45	4.2	4.0	3.9	3.7
		240 x 45	5.0	4.9	4.8	4.5
		300 x 45	6.0	5.8	5.7	5.4
	DEAD LOAD TILED FLOOR 95 KG/M²	140 x 45	2.8	2.7	2.6	2.4
		190 x 45	3.8	3.6	3.6	3.3
		240 x 45	4.7	4.5	4.5	4.2
		300 x 45	5.5	5.4	5.3	5.0

		LVL11 SIZE	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 2.0KPA DISTRIBUTED 1.8KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	140 x 45	2.9	2.8	2.7	2.6
		190 x 45	4.1	3.9	3.8	3.6
		240 x 45	4.9	4.8	4.7	4.5
		300 x 45	5.8	5.6	5.6	5.3
	DEAD LOAD TILED FLOOR 95 KG/M²	140 x 45	2.7	2.6	2.5	2.3
		190 x 45	3.6	3.5	3.4	3.2
		240 x 45	4.5	4.4	4.3	4.0
		300 x 45	5.4	5.2	5.1	4.9

		LVL11 SIZE	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 3.0KPA DISTRIBUTED 2.7KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	140 x 45	2.7	2.6	2.6	2.4
		190 x 45	3.7	3.6	3.5	3.3
		240 x 45	4.6	4.5	4.4	4.1
		300 x 45	5.4	5.3	5.2	4.9
	DEAD LOAD TILED FLOOR 95 KG/M²	140 x 45	2.5	2.4	2.4	2.2
		190 x 45	3.4	3.3	3.2	3.0
		240 x 45	4.3	4.1	4.0	3.8
		300 x 45	5.1	5.0	4.9	4.6

Continuous Span

MAX JOIST SPAN (M)						
		LVL11 SIZE	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 1.5KPA DISTRIBUTED 1.8KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	140 x 45	3.7	3.4	3.3	3.1
		190 x 45	4.6	4.5	4.4	4.2
		240 x 45	5.5	5.4	5.3	5.0
		300 x 45	6.5	6.3	6.2	5.9
	DEAD LOAD TILED FLOOR 95 KG/M²	140 x 45	3.7	3.6	3.5	3.2
		190 x 45	4.6	4.5	4.4	4.2
		240 x 45	5.5	5.4	5.3	5.0
		300 x 45	6.5	6.3	6.2	5.9

		LVL11 SIZE	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 2.0KPA DISTRIBUTED 1.8KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	140 x 45	3.5	3.2	3.2	3.0
		190 x 45	4.7	4.6	4.5	4.2
		240 x 45	5.6	5.4	5.4	5.1
		300 x 45	6.6	6.4	6.3	6.0
	DEAD LOAD TILED FLOOR 95 KG/M²	140 x 45	3.7	3.5	3.4	3.2
		190 x 45	4.7	4.6	4.5	4.2
		240 x 45	5.6	5.4	5.4	5.1
		300 x 45	6.6	6.4	6.3	6.0

		LVL11 SIZE	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 3.0KPA DISTRIBUTED 2.7KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	140 x 45	3.3	3.2	3.1	2.9
		190 x 45	4.2	4.1	4.1	3.8
		240 x 45	5.1	4.9	4.8	4.6
		300 x 45	6.0	5.8	5.7	5.4
	DEAD LOAD TILED FLOOR 95 KG/M²	140 x 45	3.3	3.2	3.1	2.9
		190 x 45	4.2	4.1	4.1	3.8
		240 x 45	5.1	4.9	4.8	4.6
		300 x 45	6.0	5.8	5.7	5.4

PLEASE NOTE:

These span tables provide maximum member spans up to 100% of the recommended capacity. For a premium floor or rafter system with minimal deflection, it is recommended that spans should be restricted to 85% of the maximum allowed.

Single Span

		MAX JOIST SPAN (M)				
		LVL13 SIZE	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 1.5KPA DISTRIBUTED 1.8KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	150 x 45	3.3	3.1	3.1	2.9
		200 x 45	4.6	4.4	4.3	4.1
		240 x 45	5.3	5.1	5.0	4.8
		300 x 45	6.2	6.1	6.0	5.6
		360 x 45	7.2	7.0	6.8	6.5
		150 x 63	3.8	3.5	3.5	3.3
		200 x 63	5.0	4.9	4.8	4.5
		240 x 63	5.7	5.6	5.5	5.2
		300 x 63	6.8	6.6	6.5	6.1
		360 x 63	7.8	7.6	7.5	7.0
	DEAD LOAD TILED FLOOR 95 KG/M²	150 x 45	3.2	3.1	3.0	2.8
		200 x 45	4.2	4.1	4.0	3.7
		240 x 45	4.9	4.8	4.7	4.5
		300 x 45	5.8	5.6	5.5	5.3
		360 x 45	6.6	6.4	6.3	6.0
		150 x 63	3.9	3.7	3.7	3.4
		200 x 63	5.0	4.8	4.8	4.5
		240 x 63	5.7	5.5	5.5	5.2
		300 x 63	6.7	6.5	6.4	6.1
		360 x 63	7.6	7.4	7.3	7.0

		LVL13 SIZE	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 2.0KPA DISTRIBUTED 1.8KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	150 x 45	3.3	3.1	3.1	2.9
		200 x 45	4.5	4.4	4.3	4.0
		240 x 45	5.2	5.0	5.0	4.7
		300 x 45	6.1	5.9	5.8	5.5
		360 x 45	6.9	6.7	6.7	6.3
		150 x 63	3.8	3.5	3.5	3.3
		200 x 63	5.1	4.9	4.9	4.6
		240 x 63	5.8	5.7	5.6	5.3
		300 x 63	6.9	6.7	6.6	6.2
		360 x 63	7.9	7.7	7.6	7.2
	DEAD LOAD TILED FLOOR 95 KG/M²	150 x 45	3.1	2.9	2.9	2.7
		200 x 45	4.1	3.9	3.8	3.6
		240 x 45	4.8	4.6	4.6	4.3
		300 x 45	5.6	5.5	5.4	5.1
		360 x 45	6.4	6.2	6.1	5.8
		150 x 63	3.7	3.6	3.5	3.3
		200 x 63	4.8	4.7	4.6	4.4
		240 x 63	5.5	5.4	5.3	5.0
		300 x 63	6.5	6.3	6.2	5.9
		360 x 63	7.4	7.2	7.1	6.8

		LVL13 SIZE	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 3.0KPA DISTRIBUTED 2.7KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	150 x 45	3.1	3.0	2.9	2.7
		200 x 45	4.2	4.0	3.9	3.7
		240 x 45	4.8	4.7	4.6	4.4
		300 x 45	5.7	5.5	5.5	5.2
		360 x 45	6.5	6.3	6.2	5.9
		150 x 63	3.7	3.5	3.5	3.3
		200 x 63	4.6	4.5	4.4	4.1
		240 x 63	5.3	5.1	5.0	4.8
		300 x 63	6.2	6.1	6.0	5.6
		360 x 63	7.2	7.0	6.8	6.5
	DEAD LOAD TILED FLOOR 95 KG/M²	150 x 45	2.9	2.7	2.7	2.5
		200 x 45	3.8	3.7	3.6	3.3
		240 x 45	4.5	4.4	4.3	4.0
		300 x 45	5.3	5.2	5.1	4.9
		360 x 45	6.1	5.9	5.9	5.6
		150 x 63	3.5	3.4	3.3	3.1
		200 x 63	4.6	4.5	4.4	4.1
		240 x 63	5.3	5.1	5.0	4.8
		300 x 63	6.2	6.0	6.0	5.6
		360 x 63	7.1	6.9	6.8	6.5

PLEASE NOTE:

These span tables provide maximum member spans up to 100% of the recommended capacity. For a premium floor or rafter system with minimal deflection, it is recommended that spans should be restricted to 85% of the maximum allowed.

Floor Joist Span - I-Built LVL 13

Continuous Span

MAX JOIST SPAN (M)						
		LVL13 SIZE	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 1.5KPA DISTRIBUTED 1.8KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	150 x 45	4.0	3.8	3.7	3.5
		200 x 45	5.0	4.9	4.8	4.5
		240 x 45	5.8	5.6	5.5	5.2
		300 x 45	6.8	6.6	6.5	6.2
		360 x 45	7.8	7.6	7.5	7.1
		150 x 63	4.4	4.3	4.2	4.0
		200 x 63	5.5	5.3	5.2	4.9
		240 x 63	6.3	6.1	6.0	5.7
		300 x 63	7.4	7.2	7.1	6.7
		360 x 63	8.5	8.3	8.2	7.7
	DEAD LOAD TILED FLOOR 95 KG/M²	150 x 45	4.0	3.9	3.9	3.6
		200 x 45	5.0	4.9	4.8	4.5
		240 x 45	5.8	5.6	5.5	5.2
		300 x 45	6.8	6.6	6.5	6.2
		360 x 45	7.8	7.6	7.5	7.1
		150 x 63	4.4	4.3	4.2	4.0
		200 x 63	5.5	5.3	5.2	4.9
		240 x 63	6.3	6.1	6.0	5.7
		300 x 63	7.4	7.2	7.1	6.7
		360 x 63	8.5	8.3	8.2	7.7

		LVL13 SIZE	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 2.0KPA DISTRIBUTED 1.8KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	150 x 45	4.1	3.8	3.7	3.5
		200 x 45	5.1	5.0	4.9	4.6
		240 x 45	5.9	5.7	5.6	5.3
		300 x 45	7.0	6.7	6.6	6.3
		360 x 45	8.0	7.7	7.6	7.2
		150 x 63	4.5	4.3	4.2	4.0
		200 x 63	5.6	5.4	5.3	5.0
		240 x 63	6.4	6.2	6.1	5.8
		300 x 63	7.6	7.3	7.2	6.8
		360 x 63	8.7	8.4	8.3	7.8
	DEAD LOAD TILED FLOOR 95 KG/M²	150 x 45	4.1	4.0	3.9	3.6
		200 x 45	5.1	5.0	4.9	4.6
		240 x 45	5.9	5.7	5.6	5.3
		300 x 45	7.0	6.7	6.6	6.3
		360 x 45	8.0	7.7	7.6	7.2
		150 x 63	4.5	4.3	4.3	4.0
		200 x 63	5.6	5.4	5.3	5.0
		240 x 63	6.4	6.2	6.1	5.8
		300 x 63	7.6	7.3	7.2	6.8
		360 x 63	8.7	8.4	8.3	7.8

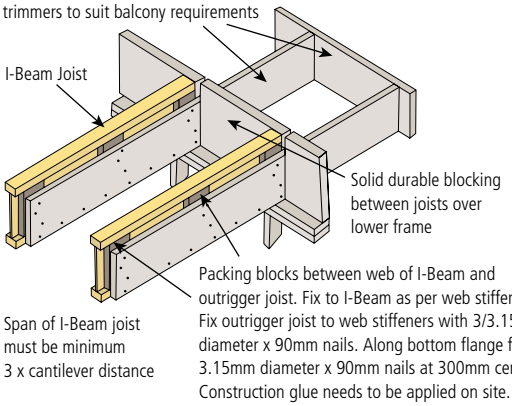
		LVL13 SIZE	400CRS	450CRS	480CRS	600CRS
LIVE LOADS: 3.0KPA DISTRIBUTED 2.7KN CONCENTRATED	DEAD LOAD TIMBER FLOOR 40 KG/M²	150 x 45	3.7	3.6	3.5	3.3
		200 x 45	4.6	4.5	4.4	4.2
		240 x 45	5.3	5.1	5.1	4.8
		300 x 45	6.3	6.1	6.0	5.7
		360 x 45	7.2	7.0	6.9	6.5
		150 x 63	4.0	3.9	3.9	3.6
		200 x 63	5.0	4.9	4.8	4.5
		240 x 63	5.8	5.6	5.5	5.2
		300 x 63	6.8	6.6	6.5	6.2
		360 x 63	7.8	7.6	7.5	7.1
	DEAD LOAD TILED FLOOR 95 KG/M²	150 x 45	3.7	3.6	3.5	3.3
		200 x 45	4.6	4.5	4.4	4.2
		240 x 45	5.3	5.1	5.1	4.8
		300 x 45	6.3	6.1	6.0	5.7
		360 x 45	7.2	7.0	6.9	6.5
		150 x 63	4.0	3.9	3.9	3.6
		200 x 63	5.0	4.9	4.8	4.5
		240 x 63	5.8	5.6	5.5	5.2
		300 x 63	6.8	6.6	6.5	6.2
		360 x 63	7.8	7.6	7.5	7.1

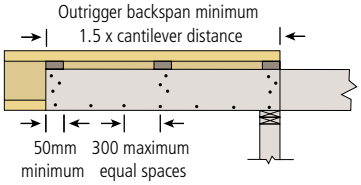
PLEASE NOTE:

These span tables provide maximum member spans up to 100% of the recommended capacity. For a premium floor or rafter system with minimal deflection, it is recommended that spans should be restricted to 85% of the maximum allowed.

2.1 Cantilever Outrigger Deck/Balcony Detail

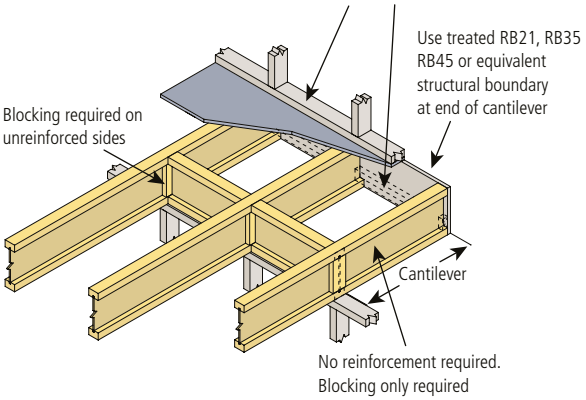
2.0 Durable joist outriggers and edge trimmers to suit balcony requirements





2.2 Cantilever Method (M1)

2.1 If bottom plate is outside the requirements of NZS 3604 Table 8.17 and requires support use min 70 x 35 MSG8 bridge member on top of the bottom flange, fixed using 2/75 x 3.15 nails through web. Nail and glue Rimboard to this bridge member.



PLEASE NOTE:

M1 - no reinforcement required.

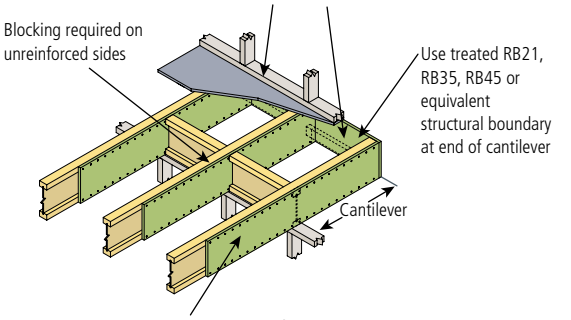
M2 - load-bearing cantilever reinforced one side.

M3 - load-bearing cantilever reinforced both sides.

Cantilever distance allowable for I-Beam sizes to be verified by reference to the I-Beam span tables or HD software.

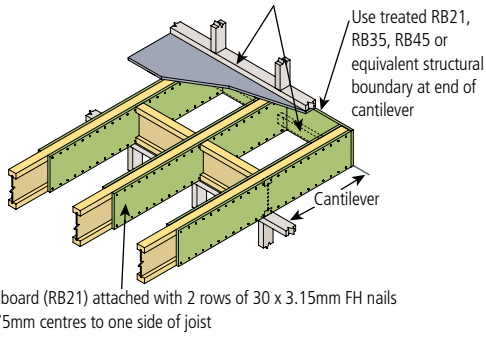
2.3 Cantilever Method 2 (M2) Detail

2.2 If bottom plate is outside the requirements of NZS 3604 Table 8.17 and requires support use min 70 x 35 MSG8 bridge member on top of the bottom flange, fixed using 2/75 x 3.15 nails through web. Nail and glue Rimboard to this bridge member



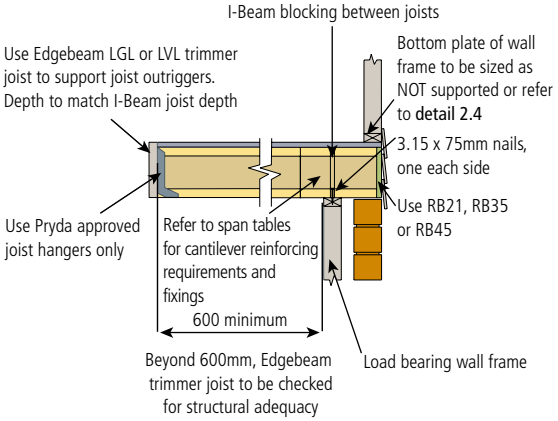
2.4 Cantilever Method 3 (M3)

2.3 If bottom plate is outside the requirements of NZS 3604 Table 8.17 and requires support use 70 x 35 MSG8 bridge member on top of the bottom flange, fixed using 2/75 x 3.15 nails through web. Nail and glue Rimboard to this bridge member.



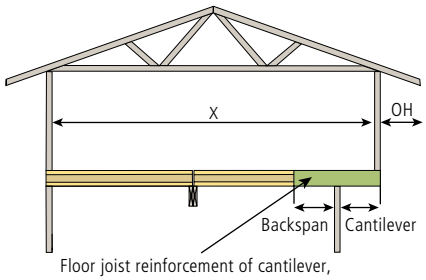
2.5 Brick Edge Cantilever

2.4



2.6 Load Bearing Cantilever Example

2.5



Minimum backspan of reinforcement equals cantilever length

$$\text{Roof load width (RLW)} = \left(\frac{X}{2} + OH\right)$$

Refers to superceded detail number

Cantilever Floor Joist Details / Fixing Details

Span Table – Load Bearing Cantilever - 1.5 kPa Floor

MAXIMUM CANTILEVER	I-BEAM SOLUTION	LIGHT WEIGHT ROOFING - (UP TO 20KG/M²)									HEAVY WEIGHT ROOFING - (UP TO 60KG/M²)								
		ROOF LOAD WIDTH, RLW (M)									ROOF LOAD WIDTH, RLW (M)								
		4.0			6.0			8.0			2.0			4.0			6.0		
FLOOR JOIST SPACINGS(MM)		300	450	600	300	450	600	300	450	600	300	450	600	300	450	600	300	450	600
450MM	LPI 225	M1	M1	M2	M1	M2	M3	M1	M2	-	M1	M1	M2	M1	M2	-	M1	-	-
	LPI 240	M1	M1	M1	M1	M1	M2	M1	M1	M3	M1	M1	M1	M1	M1	M2	M1	M2	-
	LPI 300	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M2
	LPI 356	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M2
750MM	LPI 225	M1	M1	M2	M1	M2	-	M1	M3	-	M1	M1	M2	M1	M2	-	M1	-	-
	LPI 240	M1	M1	M1	M1	M1	M2	M1	M1	M3	M1	M1	M1	M1	M1	M2	M1	M2	-
	LPI 300	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M2
	LPI 356	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M2
900MM	LPI 225	M1	M1	M3	M1	M2	-	M1	M3	-	M1	M1	M3	M1	M3	-	M2	-	-
	LPI 240	M1	M1	M1	M1	M1	M2	M1	M1	M3	M1	M1	M1	M1	M1	M3	M1	M2	-
	LPI 300	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M2
	LPI 356	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M2
1200MM	LPI 225	M1	M3	-	M2	-	-	M3	-	-	M1	M3	-	M2	-	-	-	-	-
	LPI 240	M1	M1	M3	M1	M2	-	M1	M3	-	M1	M1	M3	M1	M3	-	M2	-	-
	LPI 300	M1	M1	M1	M1	M1	M2	M1	M1	M2	M1	M1	M1	M1	M1	M2	M1	M2	M3
	LPI 356	M1	M1	M1	M1	M1	M2	M1	M1	M2	M1	M1	M1	M1	M1	M2	M1	M2	M3

Span Table – Load Bearing Cantilever 0.5 kPa Snow Load

MAXIMUM CANTILEVER	I-BEAM SOLUTION	LIGHT WEIGHT ROOFING - (UP TO 20KG/M²)									HEAVY WEIGHT ROOFING - (UP TO 60KG/M²)								
		ROOF LOAD WIDTH, RLW (M)									ROOF LOAD WIDTH, RLW (M)								
		4.0			6.0			8.0			2.0			4.0			6.0		
FLOOR JOIST SPACINGS(MM)		300	450	600	300	450	600	300	450	600	300	450	600	300	450	600	300	450	600
450MM	LPI 225	M1	M1	M2	M1	M2	M3	M1	M2	-	M1	M1	M2	M1	M2	-	M1	-	-
	LPI 240	M1	M1	M1	M1	M1	M2	M1	M1	M3	M1	M1	M1	M1	M1	M2	M1	M2	-
	LPI 300	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M2
	LPI 356	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M2
750MM	LPI 225	M1	M1	M2	M1	M2	-	M1	M3	-	M1	M1	M2	M1	M2	-	M1	-	-
	LPI 240	M1	M1	M1	M1	M1	M2	M1	M1	M3	M1	M1	M1	M1	M1	M2	M1	M2	-
	LPI 300	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M2
	LPI 356	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M2
900MM	LPI 225	M1	M1	M3	M1	M2	-	M1	M3	-	M1	M1	M3	M1	M3	-	M2	-	-
	LPI 240	M1	M1	M1	M1	M1	M2	M1	M2	M3	M1	M1	M1	M1	M1	M3	M1	M2	-
	LPI 300	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M2
	LPI 356	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M2
1200MM	LPI 225	M1	M3	-	M2	-	-	M3	-	-	M1	M3	-	M2	-	-	-	-	-
	LPI 240	M1	M1	M3	M1	M2	-	M1	M3	-	M1	M1	M3	M1	M3	-	M2	-	-
	LPI 300	M1	M1	M1	M1	M1	M2	M1	M1	M3	M1	M1	M1	M1	M1	M2	M1	M2	M3
	LPI 356	M1	M1	M1	M1	M1	M2	M1	M1	M3	M1	M1	M1	M1	M1	M2	M1	M2	M3

PLEASE NOTE:

These span tables provide maximum member spans up to 100% of the recommended capacity. For a premium floor or rafter system with minimal deflection, it is recommended that spans should be restricted to 85% of the maximum allowed.

Hanger Fixings

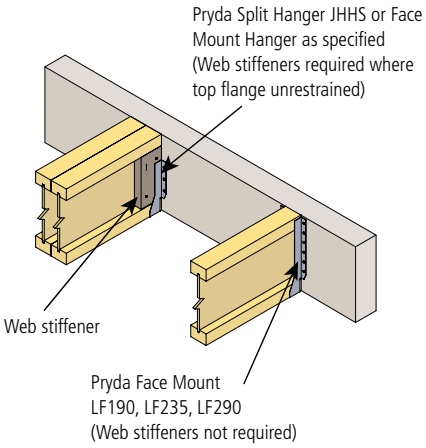
Pryda I-Beam hangers have been engineered to provide support for I-Beams, Hyne LGL and 17C beams in domestic and commercial applications. The hangers are fully compatible with I-Beams, Hyne LGL and 17C beams and are suitable for any support configuration. The product has been developed in accordance with the relevant New Zealand Building Standards and the design capacities are verified by a rigorous testing program. We recommend that installation of I-Beams, Hyne LGL and 17C beams with the Pryda I-Beam hangers is conducted in accordance with the construction guide.

PLEASE NOTE:

- *You must check the capacity of all hangers and connections for your particular application.*
- *Minimum 3mm/maximum 6mm clearance between beams. Contact between beams may cause squeaks.*
- *Ensure fasteners are selected to meet the durability requirements of NZS 3604:2011.*
- *Use the correct nails, screws and nail plates, following installation instructions.*
- *Builder also to refer to the I-Built supplementary site guide.*

3.1 Joist Hanger Connection Types

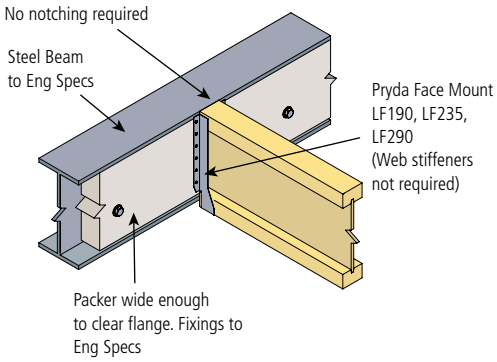
4.0



3.2 I-Beam Fixed to Steel Beam with Face Mount Hanger

Option 1

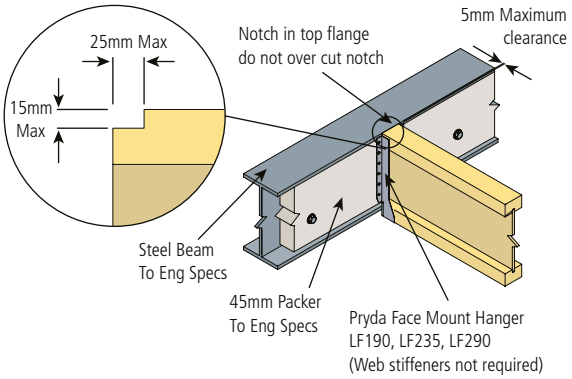
4.1



3.3 I-Beam Fixed to Steel Beam with Face Mount Hanger

Option 2

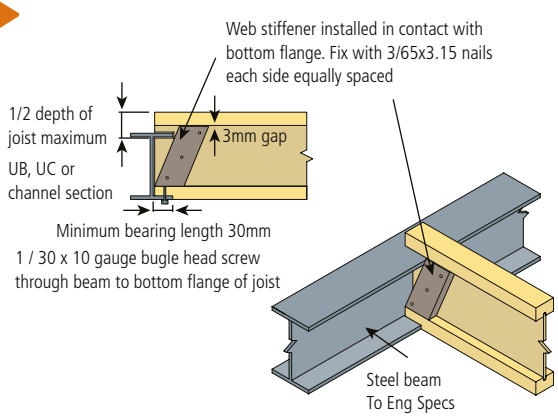
4.2



3.4 Joist Connection to Steel Beam

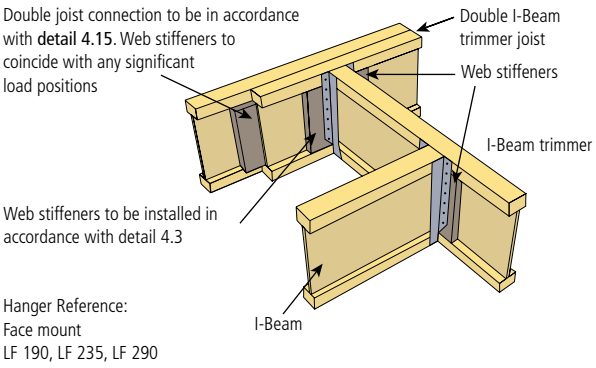
Option 3

4.3



3.5 Joist to Trimmer Connection

4.4



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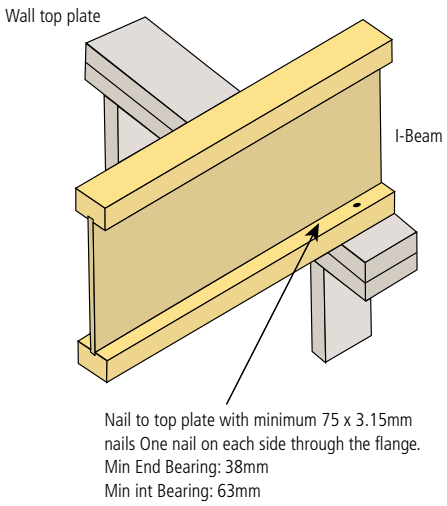
3.6 End Bearing

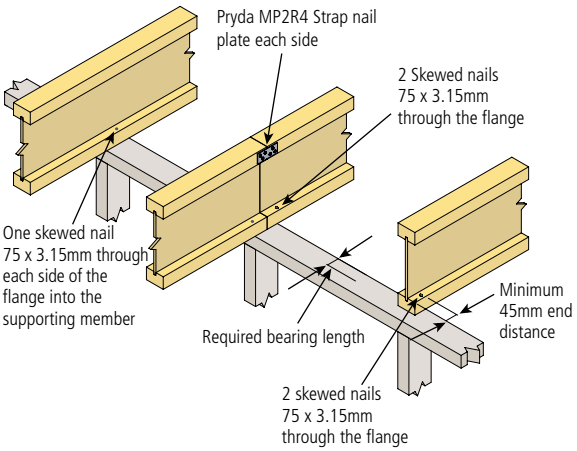
A

4.5



Detail Over the Top Plate at Mid Support

B

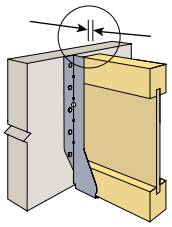


3.7 Fixing Requirements for Face Mount Hangers

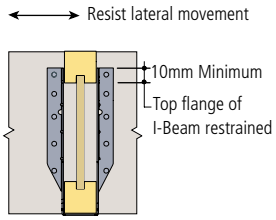
A

4.6

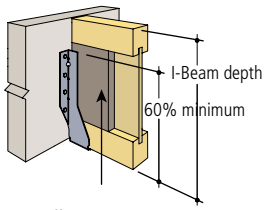
IMPORTANT
Minimum gap 3mm between beam and I-Beam



B



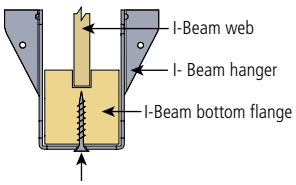
C



Web stiffener required when top flanges are unrestrained

The hanger must support a minimum of 60% of joist depth

D

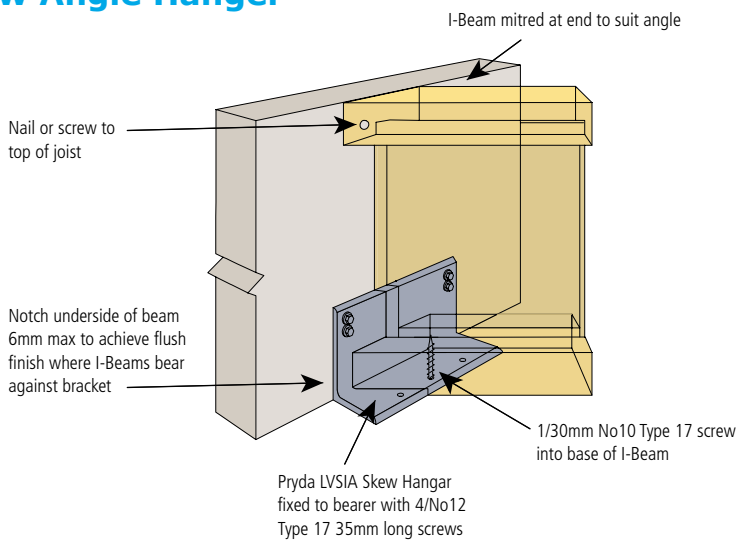


PLEASE NOTE:

Minimum 3mm/maximum 6mm clearance between beams. Contact between beams may cause squeaks.

3.8 Skew Angle Hanger

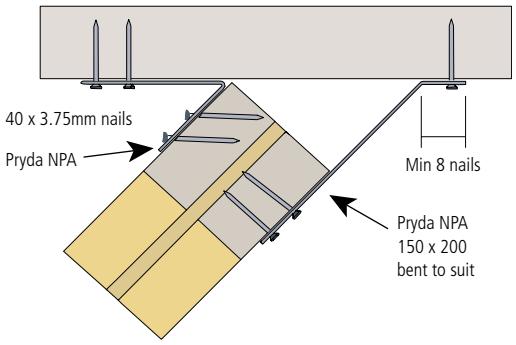
4.7



Refers to superceded detail number

3.9 45° Skew Angle Hanger Fixing

4.8

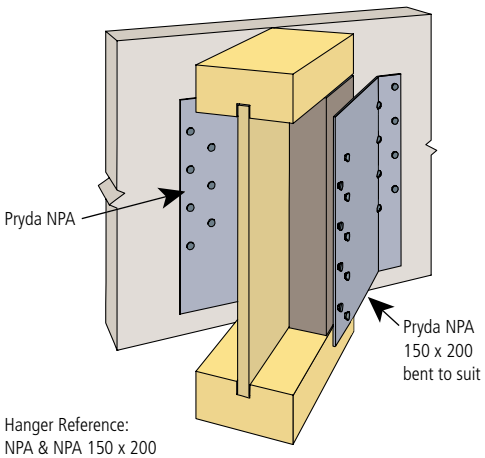


Left or right orientation based on view from the supported I-Beam

Hanger Reference:
NPA & NPA 150 x 200
Refer to New Zealand Wood Products Ltd for alternative solution

3.10 45° Skew Angle Hanger Fixing

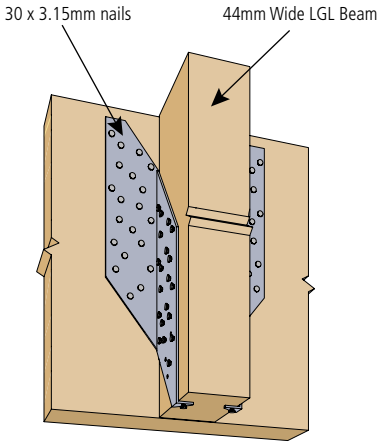
4.9



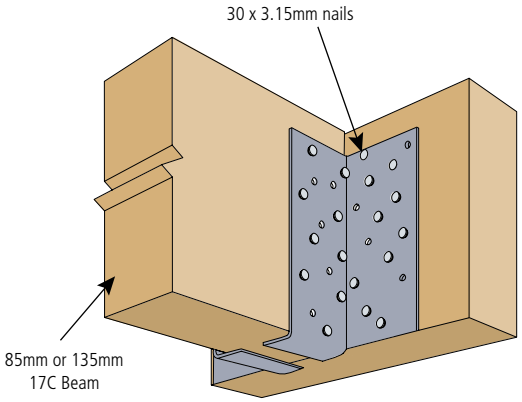
Hanger Reference:
NPA & NPA 150 x 200
Refer to New Zealand Wood Products Ltd for alternative solution

3.11 Hyne LGL & 17c Hanger Fixing

4.10



Hanger Reference:
JHHS



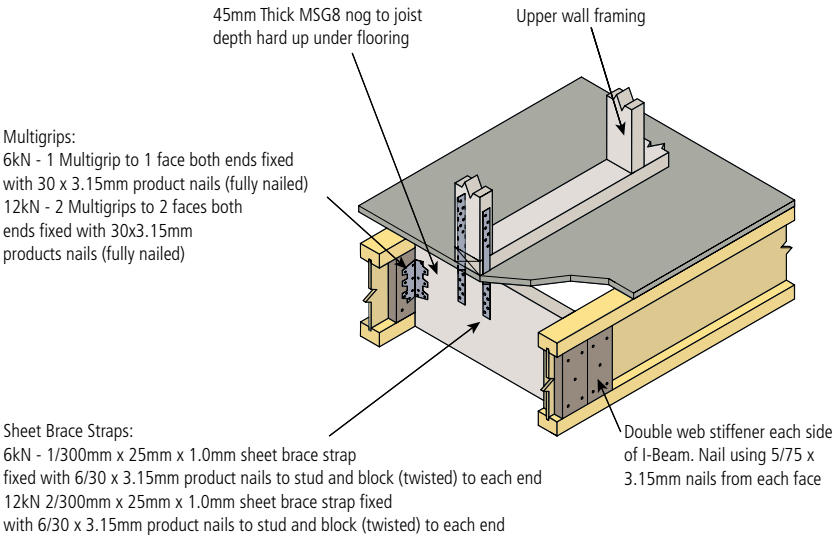
Hanger Reference:
JHSS 212
JHSS 275
JHSS 401

Refers to superceded detail number

Internal Bracing & Web Stiffener Detail

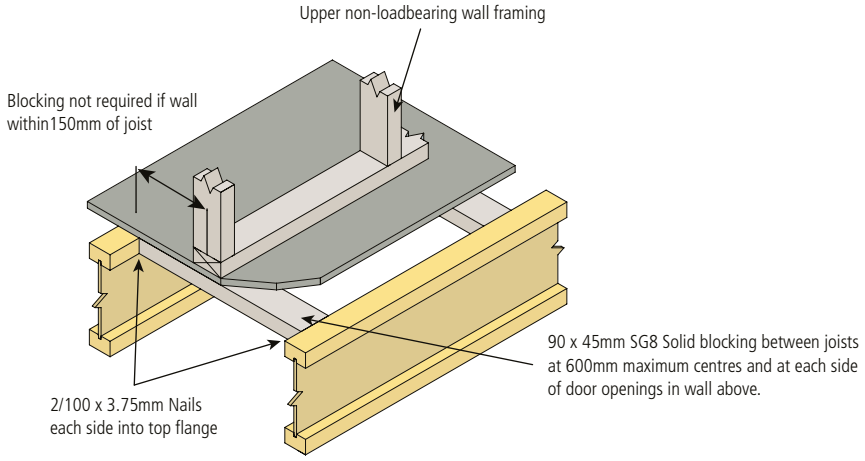
4.1 Bracing Wall Tie Down

5.0



4.2 Non-Loadbearing Wall Parallel

5.1

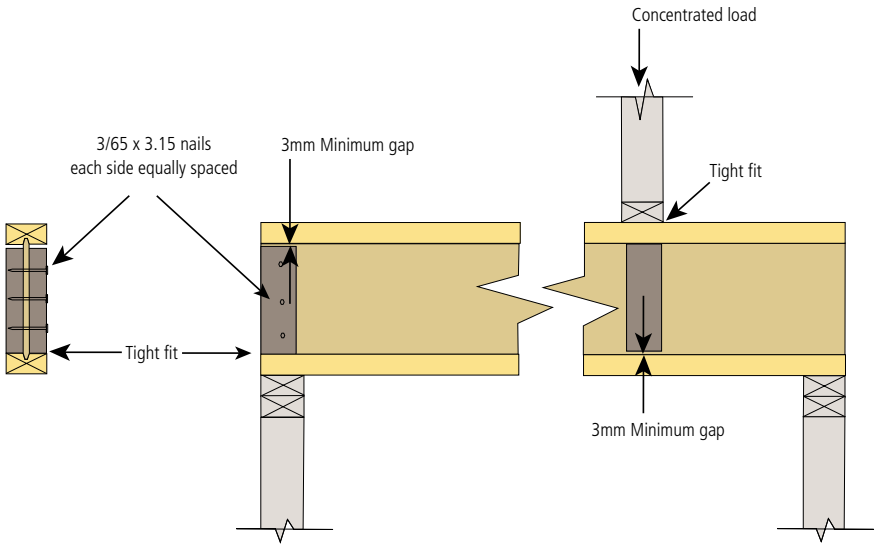


4.3 Web Stiffener Detail

5.2

PLEASE NOTE:

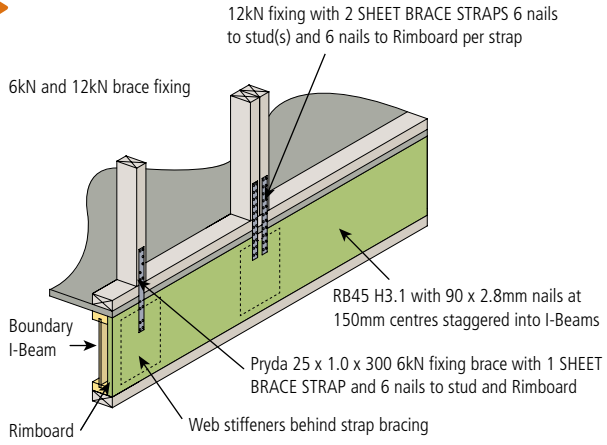
- *Web stiffeners to be used at all concentrated loads and at supports where specified.*
- *Web stiffener size 70 x 30mm.*
- *Web stiffeners are required to prevent buckling of I-Beam web. This occurs when loads are being transferred to the end of the beam.*



Refers to superceded detail number

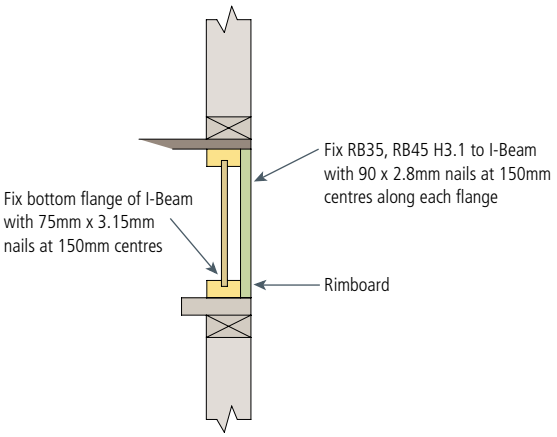
4.4 Rimboard External Wall Bracing Fixing

5.3



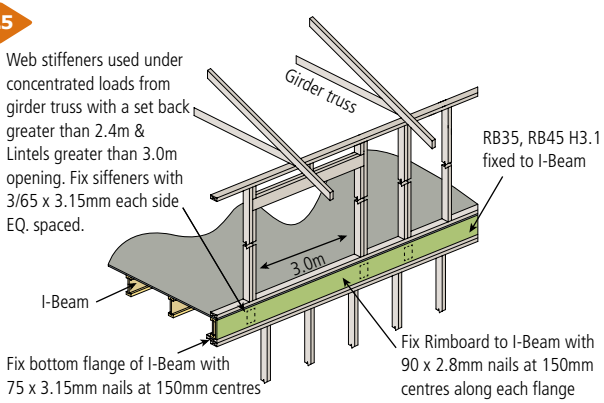
4.5 Rimboard End Joist

5.4



4.6 Load Bearing I-Beam & Rimboard/Boundary

5.5

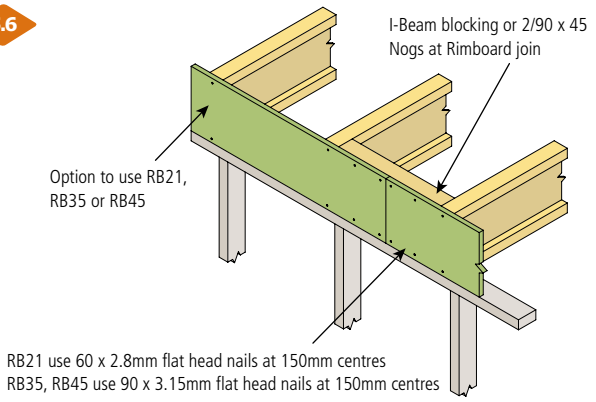


PLEASE NOTE:

- *Avoid using wide section timber.*
- *All Rimboards are treated to H3.1 (LOSP)*
- *Refer to NZS3602.2003 for treatment details.*

4.7 Rimboard Joining

5.6

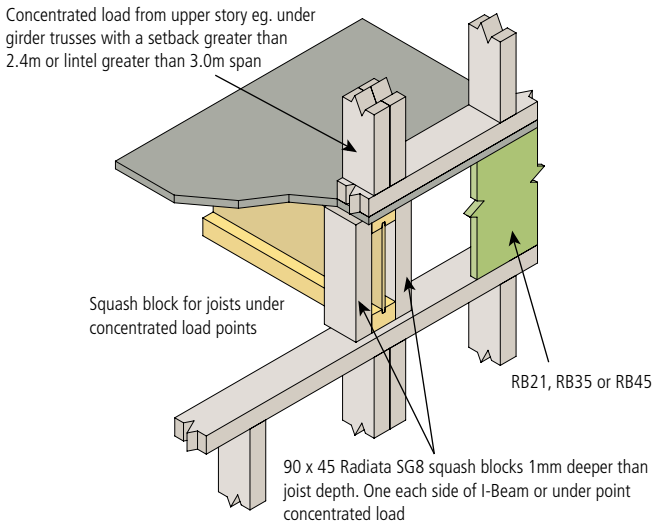


PLEASE NOTE:

- *Blunt nail ends to avoid splitting of flanges.*
- *All Rimboards are treated to H3.1 (LOSP)*
- *Refer to NZS3602.2003 for treatment details.*

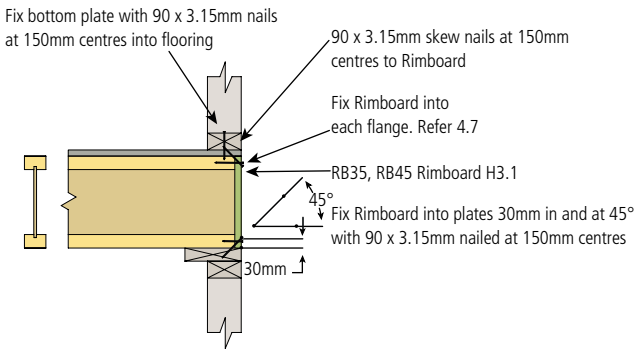
4.8 Concentrated Load at Jam Studs or Posts

5.7



4.9 Rimboard Fixing to I-Beam - Transferring Bracing Load From Wall Above

5.8



PLEASE NOTE:

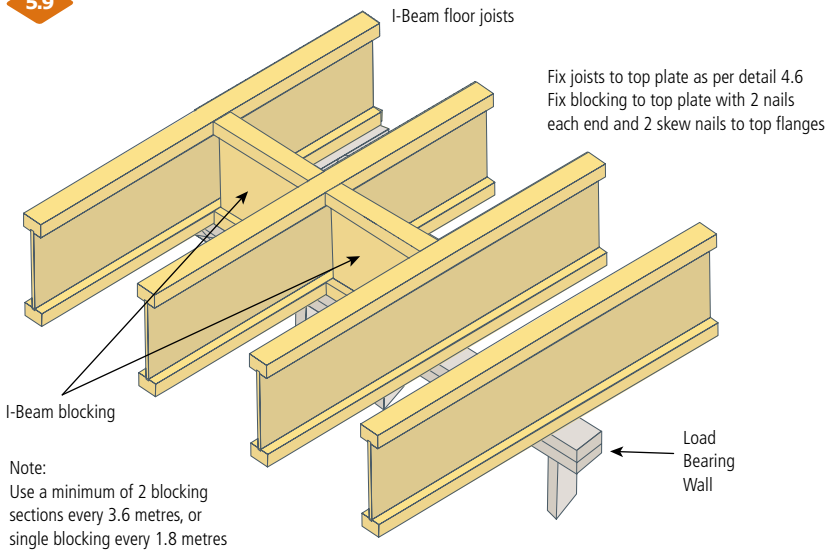
- *Where 6kN and 12kN tie down bracing straps are required - these are to be fixed to manufactures specifications in addition to the fixing shown above.*
- *Other wall fixings to NZS3604 requirements.*

Refers to superceded detail number

Bracing and Blocking & Apron Roof Detail

4.10 Bracing and Blocking

5.9



Note:
Use a minimum of 2 blocking sections every 3.6 metres, or single blocking every 1.8 metres at load bearing wall locations

PLEASE NOTE:

BRACE BLOCKING FOR WIND AND EARTHQUAKE

Bracing of the floor is required to transfer bracing forces from the upper level to the lower level.

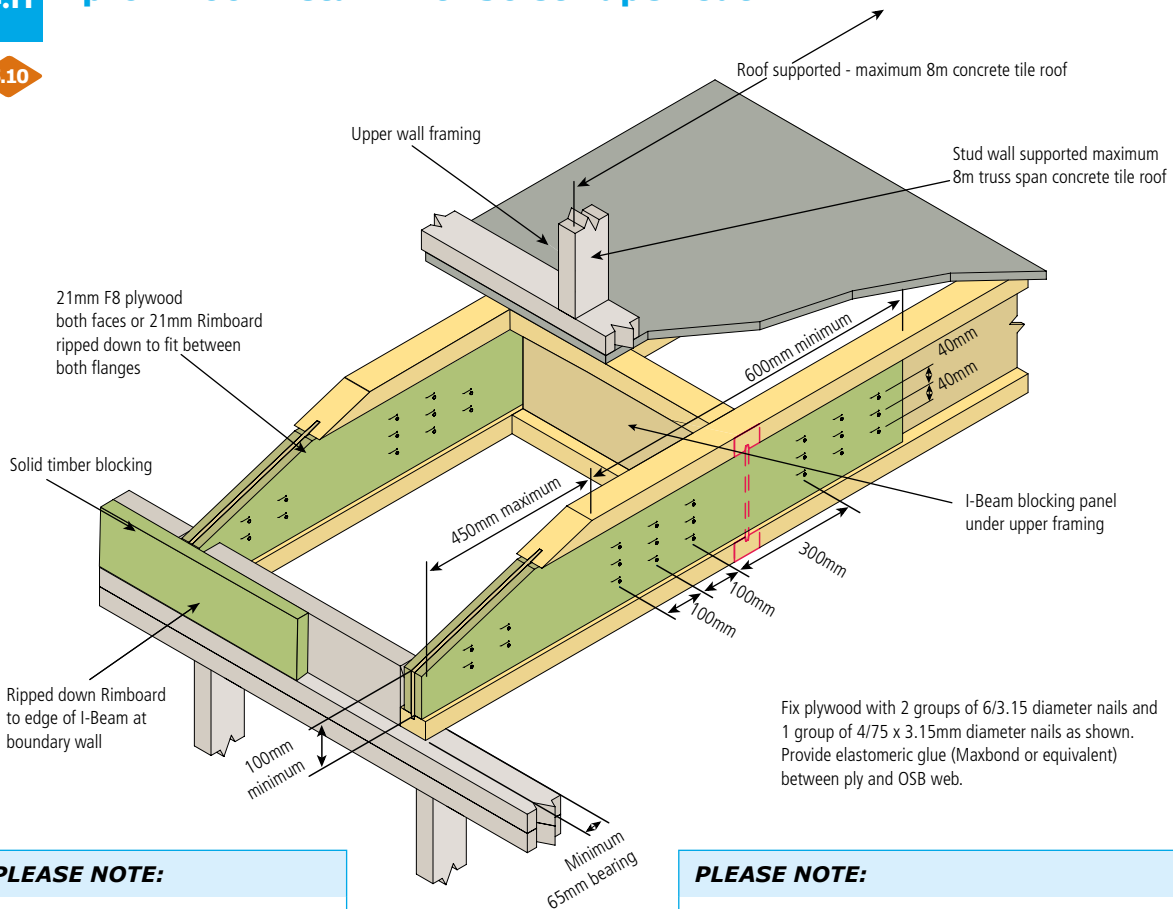
This is achieved by providing lateral restraint to the floor. Where the forces are parallel with the joist this is adequate with the longitudinal shear capacity of the joists.

For forces perpendicular to the joist, brace blocking is required. This can be achieved by two blocking panels at 3.6m centres or one blocking panel at 1.8m centres along bearing and bracing walls.

Along the external wall use the Rimboard.

4.11 Apron Roof Detail With Joist Taper Cut

5.10



Fix plywood with 2 groups of 6/3.15 diameter nails and 1 group of 4/75 x 3.15mm diameter nails as shown. Provide elastomeric glue (Maxbond or equivalent) between ply and OSB web.

PLEASE NOTE:

Refer to NZWOOD's additional Tech Note "Taper Cuts" regarding LP I-Joists maximum reaction capacities at support locations also.

PLEASE NOTE:

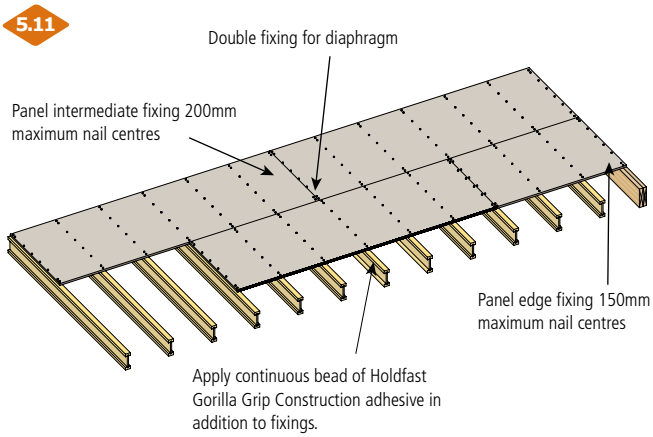
- *Double joist required under load bearing studs supporting upstairs lintels.*
- *For lintel spans greater than 900mm, Engineering design will be required.*
- *Engineered design is required for I-Beams supporting girder trusses.*
- *Rimboard will need to be ripped down on site to fit between flanges.*
- *For I-Beam size selection refer to HD software for walls loaded on joists.*

Refers to superceded detail number

J-Ply Floor Fixing – Details

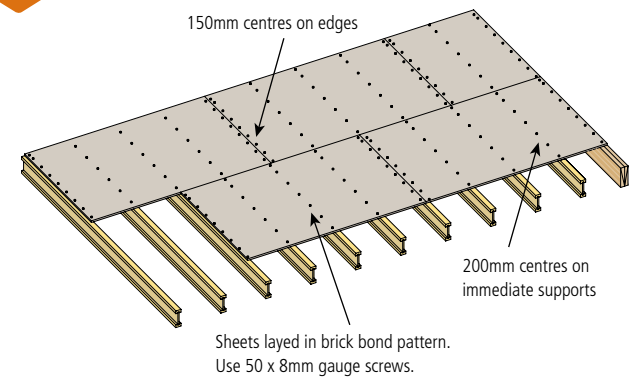
4.12 Fixing Strandfloor/Particle Board Flooring

5.11



4.13 Fixing Plywood Flooring Panels

5.12



PLEASE NOTE:

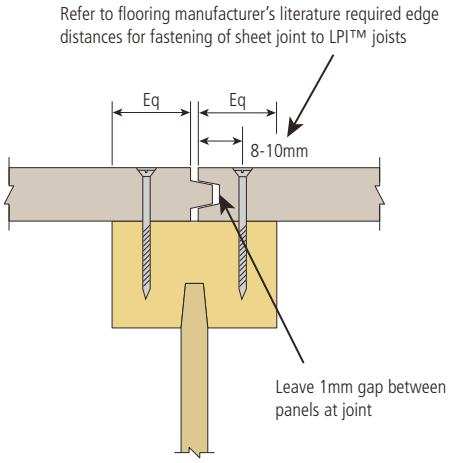
- *Timber nogs or tongue and groove joint is required at sheet edges.*
- *Lay sheets in brick - bond pattern.*

PARTICLE BOARD FIXING OPTIONS		FIXING CENTRES (MM)	
I-BEAM JOISTS	SIZE	ENDS	INTERMEDIATES
Annular grooved galvanised particle board flooring nails	60mm	150	200
Galvanised jolt head nails	60mm	150	200
Type 17 countersunk head self drilling screws	45mm x 8g	150	200

PLYWOOD FIXING OPTIONS		FIXING CENTRES (MM)	
I-BEAM JOISTS	SIZE	ENDS	INTERMEDIATES
Galvanised Flat head Nails	60mm x 2.8g	150	200
Galvanised screw self drilling or counter sunk	60mm x 2.8g	150	200

4.14 Floor Fixing Detail

5.13



PLEASE NOTE:

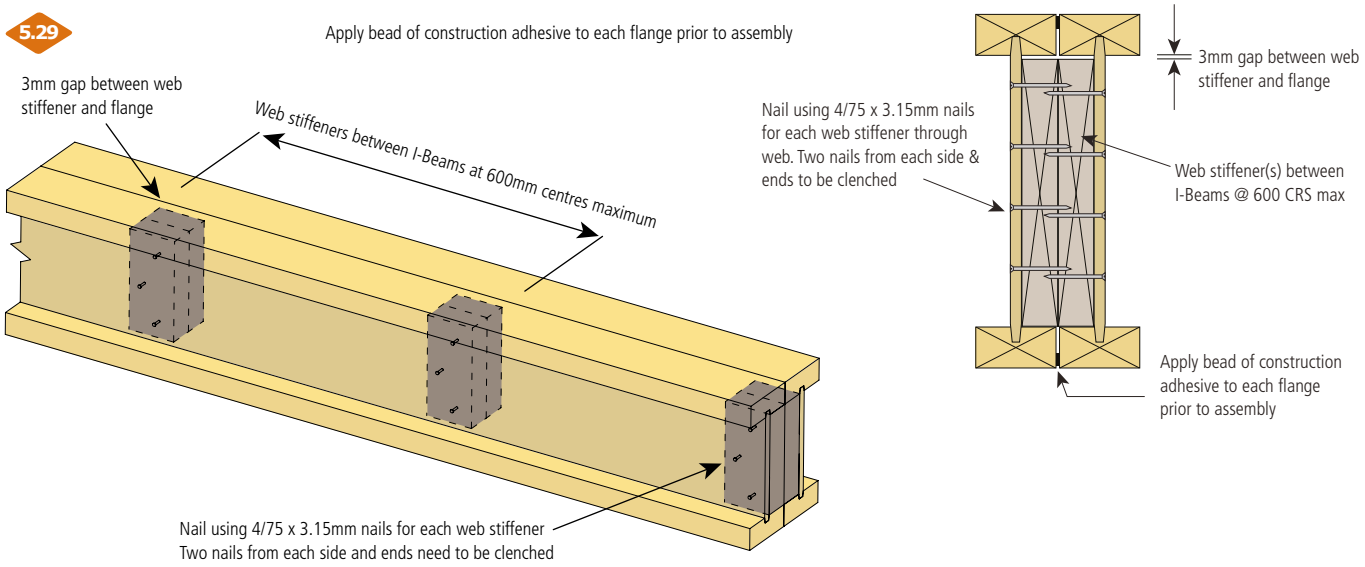
- *NZWOOD recommends the use of tongue and groove floor sheets.*
- *Floor sheets should be installed staggered, with all edges parallel to the joists bearing on the joist.*
- *Screw floor sheets to each joist. The use of properly applied adequate adhesive will*
- *increase floor performance.*
- *All four floor sheet corners should preferably be screwed.*
- *Leave 10mm gap between sheet edges and walls.*
- *Unless otherwise specified by flooring manufacturer, apply fasteners with 8mm*

Refers to superceded detail number

Double Beam Connections

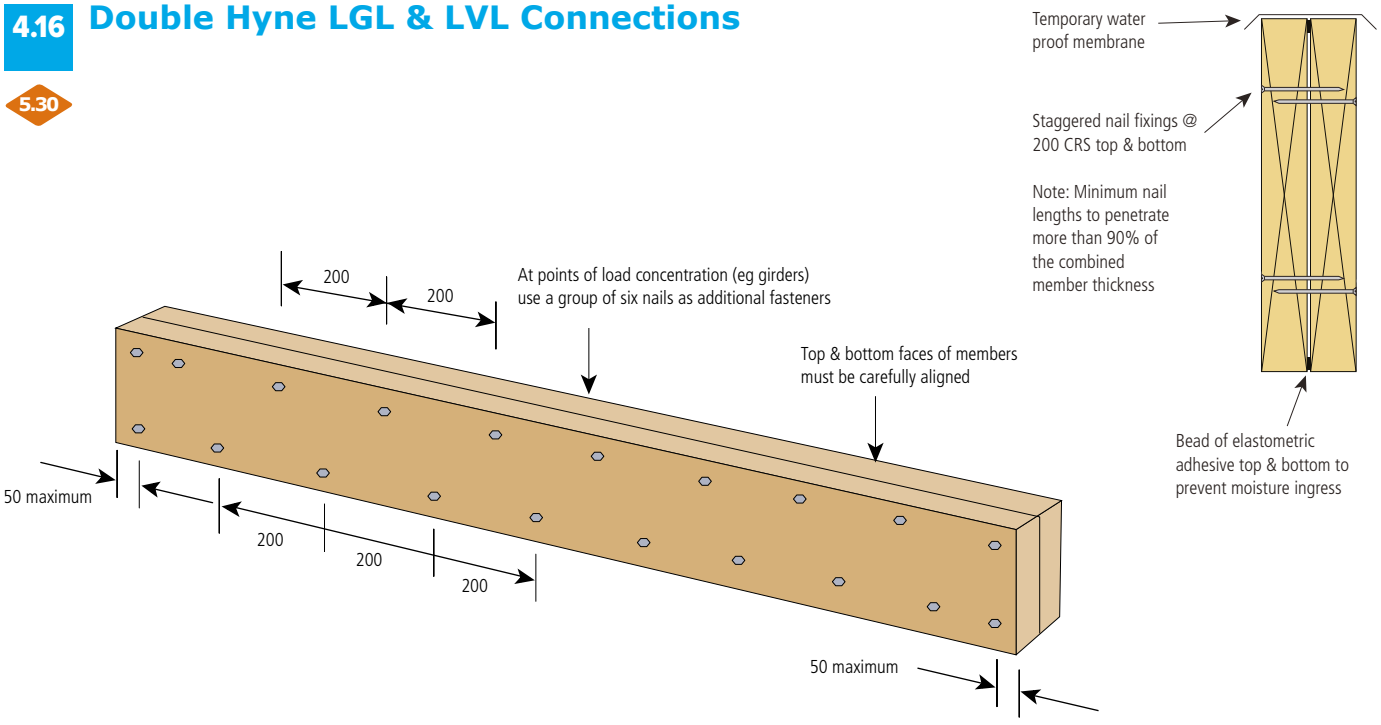
4.15 Double I-Beam Connection

5.29



4.16 Double Hyne LGL & LVL Connections

5.30



PLEASE NOTE:

- *Where the double member supports another member fixed to its face, additional nailing is required from the reverse side of the beam.*
- *Additional fasteners will also be required at points of concentrated load.*
- *Skew nailing is required to avoid prying.*
- *All nails to be alternatively skewed (30° to vertical)*
- *An additional centre row of nails is required to both sides for beams 300mm in depth.*
- *Where a double component has a concentrated load from one side only, use 6x3.15mm diameter nails in the vicinity of the load. Fixing needs to be specifically designed when the load from one side is greater than 4.8kN.*

NAILING SCHEDULE	**2 X 44MM HYNE LGL**	75 x 3.15mm
	2 X 35 LVL	70 x 3.15mm
	2 X 45 LVL	90 x 3.15mm
	2 X 63 LVL	120 x 3.15mm

Refers to superceded detail number

Holes in LP I-Beams

To use:

1. Select the required depth of I-Beam.
2. Determine the support condition for the nearest bearing: End support or interior support (including cantilever-end supports).
3. Select the row corresponding to the required span. For spans between those listed, use the next largest value.
4. Select the column corresponding to the required hole diameter. For diameters between those listed, use the next largest value.
5. The intersection of the Span row and Hole Diameter column gives the minimum distance from the inside face of bearing to the centre of a circular hole.
6. Double check the distance to the other support, using the appropriate support condition.

Notes:

1. **Cut holes carefully! Do not overcut holes! Do not cut or notch joist top and bottom flanges.**
2. Holes may be placed anywhere within the depth of the joist. A minimum 2mm clear distance is required between the hole and the flanges.
3. Round holes up to 38mm diameter may be placed anywhere in the web
4. Perforated "knockouts" may be neglected when locating web holes.
5. Holes larger than 38mm are not permitted in cantilevers without special engineering.
6. Multiple holes shall have a clear separation along the length of the joist of at least twice the length of the larger adjacent hole, or a minimum of 305mm centre-to-centre, whichever is greater.
7. Multiple holes may be spaced closer than specified, but the assessment of the hole must be made for a hole diameter that would enclose both smaller holes together.
8. Locating holes in joists with spans exceeding those in the tables or larger holes, greater uniform loads or non-uniform loads, and closer proximity to supports and other holes may be possible with analysis using Hyne Design (HD) 7 software. Please contact New Zealand Wood Products (NZWOOD) Limited for more information.

JOIST DEPTH (MM)	CLEAR SPAN (M)	DISTANCE (x) FROM END SUPPORT (M)						DISTANCE (x) FROM INTERIOR OR CANT END SUPPORT (M)					
		HOLE DIAMETER (MM)						HOLE DIAMETER (MM)					
		50MM	100MM	150MM	165MM	225MM	280MM	50MM	100MM	150MM	165MM	225MM	280MM
LPI™ 70-T 225	2.0M	0.30	0.30	0.30	-	-	-	0.30	0.30	0.36	-	-	-
	3.0M	0.30	0.30	0.66	-	-	-	0.30	0.36	1.09	-	-	-
	4.0M	0.30	0.51	1.27	-	-	-	0.38	1.07	1.88	-	-	-
	5.0M	0.38	1.09	1.93	-	-	-	1.04	1.80	-	-	-	-
	6.0M	0.94	1.70	2.62	-	-	-	1.78	2.59	-	-	-	-
LPI™ 70-T 240	2.0M	0.30	0.30	0.30	0.30	-	-	0.30	0.30	0.30	0.33	-	-
	3.0M	0.30	0.30	0.43	0.64	-	-	0.30	0.30	0.84	1.07	-	-
	4.0M	0.30	0.30	1.02	1.27	-	-	0.30	0.84	1.60	1.85	-	-
	5.0M	0.30	0.84	1.65	1.93	-	-	0.84	1.55	2.39	-	-	-
	6.0M	0.71	1.45	2.31	2.59	-	-	1.52	2.31	-	-	-	-
	7.0M	1.27	2.06	2.97	3.30	-	-	2.26	3.10	-	-	-	-
LPI™ 70-T 300	2.0M	0.30	0.30	0.30	0.30	0.30	-	0.30	0.30	0.30	0.30	0.41	-
	3.0M	0.30	0.30	0.30	0.30	0.71	-	0.30	0.30	0.30	0.30	1.14	-
	4.0M	0.30	0.30	0.30	0.46	1.32	-	0.30	0.30	0.81	1.02	1.93	-
	5.0M	0.30	0.30	0.84	1.04	2.01	-	0.30	0.84	1.52	1.75	-	-
	6.0M	0.30	0.74	1.42	1.65	2.67	-	0.89	1.55	2.29	2.51	-	-
	7.0M	0.64	1.30	2.03	2.29	3.38	-	1.57	2.29	3.07	3.33	-	-
	8.0M	1.19	1.88	2.67	2.92	-	-	2.31	3.05	3.89	-	-	-
LPI™ 70-T 356	2.0M	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.46
	3.0M	0.30	0.30	0.30	0.30	0.30	0.76	0.30	0.30	0.30	0.30	0.46	1.19
	4.0M	0.30	0.30	0.30	0.30	0.61	1.40	0.30	0.30	0.30	0.41	1.17	2.01
	5.0M	0.30	0.30	0.30	0.41	1.19	2.08	0.30	0.30	0.91	1.09	1.93	-
	6.0M	0.30	0.30	0.79	0.97	1.83	2.77	0.38	0.97	1.60	1.80	2.72	-
	7.0M	0.30	0.71	1.35	1.57	2.46	3.45	1.04	1.68	2.34	2.57	-	-
	8.0M	0.66	1.27	1.96	2.18	3.12	-	1.73	2.39	3.12	3.35	-	-

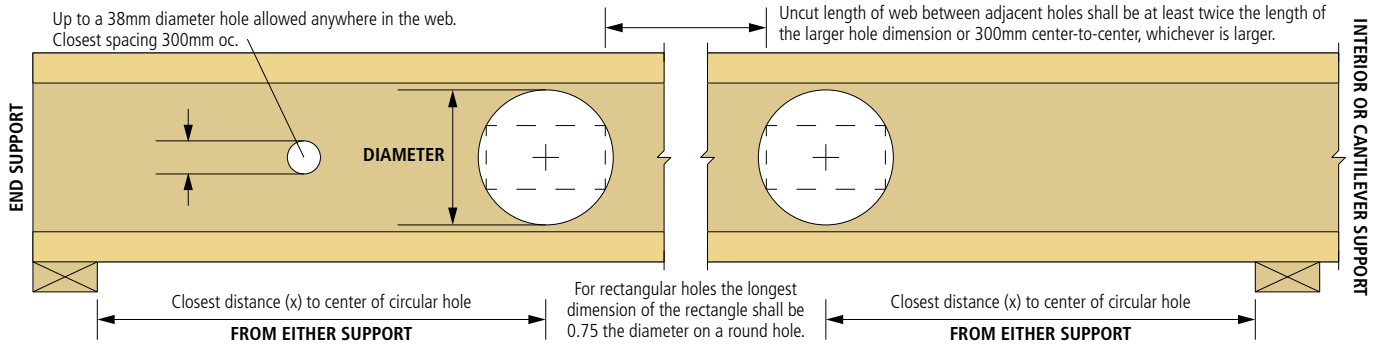
Design assumptions:

1. The hole locations listed above are valid for floor joists supporting only uniform loads that do not exceed those set out in the standard flooring span tables.
2. Hole location is measured from the inside face of bearing to the centre of a circular hole, from the closest support.
3. Clear Span has not been verified for these joists and is shown for informational purposes only. Verify that the joist selected will work for the span and loading conditions needed before checking hole location.
4. The maximum circular hole diameters for I-Beams are: 150mm Dia for 225mm deep, 165mm Dia for 240mm deep, 225mm Dia for 300mm deep and 280mm Dia for 356mm deep.
5. Holes cannot be located in the span where designated "-", without further analysis by a design professional.

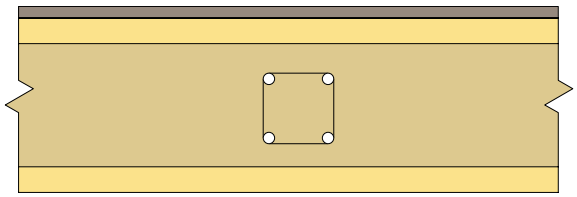
Holes in LP I-Beams

5.1 A Round Holes

6.0



B Square Holes



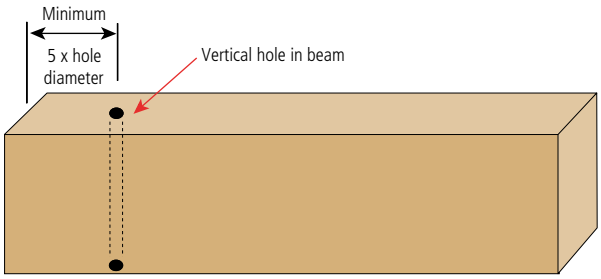
Note: For rectangular hole sizes the longest dimension of the rectangular shall be 0.75 the diameter of a round hole

PLEASE NOTE:

- *Never drill, cut or notch the flange, or over-cut the web.*
- *The holes in the web should be cut with a sharp saw.*
- *For rectangular holes, avoid over cutting the corners as this can cause stress concentrations.*
- *Slightly rounding the corners is recommended to avoid over-cutting, for rectangular holes.*
- *Start the rectangular hole by drilling a 10mm diameter hole in each of the four corners and then making the cuts between the holes to minimise damage to the web.*

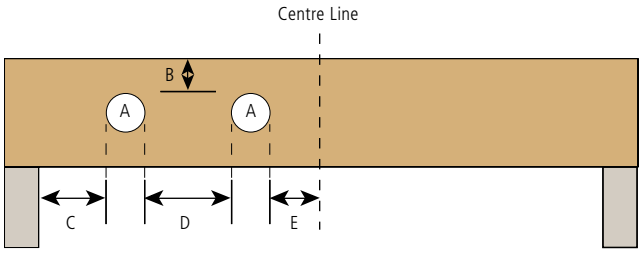
5.2 Vertical Hole Locations in 17c Beams Only

6.7



5.3 Service Hole Locations in Hyne LGL & 17c Beams

6.8



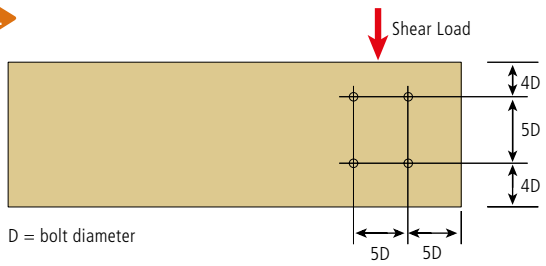
5.4 Service Holes in Hyne LGL & 17c Beams

6.10 The following table outlines the requirements for holes being drilled through Hyne LGL and 17C floor members. For 18C and 21C please phone the technical helpline on 0800 022 357.

	A	B	C	D	E	F
HYNE LGL & 17C BEAMS	MAXIMUM HOLE DIAMETER (MM)	TOP AND BOTTOM EDGE DISTANCE (MM)	MINIMUM END DISTANCE FROM SUPPORT FACE (MM)	MINIMUM HOLE SPACING	MINIMUM DISTANCE FROM CENTRE OF SPAN	MAXIMUM NUMBER OF HOLES IN SPAN
200	25	30	70	5 x Diameter	None	3 Holes / Halfspan
	40	55	290	5 x Diameter	None	3 Holes / Halfspan
	55	55	880	5 x Diameter	440	2 Holes / Halfspan
	75	55	880	1300mm	650	1 Hole / Halfspan
240	25	30	70	5 x Diameter	None	3 Holes / Halfspan
	50	70	360	5 x Diameter	None	3 Holes / Halfspan
	70	70	1050	5 x Diameter	520	2 Holes / Halfspan
	95	70	1050	1600mm	800	1 Hole / Halfspan
295 OR LARGER	25	30	70	5 x Diameter	None	3 Holes / Halfspan
	60	85	440	5 x Diameter	None	3 Holes / Halfspan
	85	85	1200	5 x Diameter	600	2 Holes / Halfspan
	115	85	1200	1800mm	900	1 Hole / Halfspan

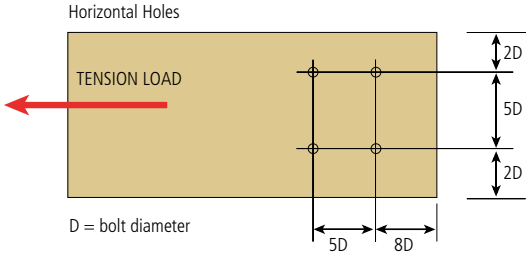
5.5 Fastening Horizontal Holes for Shear Loads

6.11



5.6 Fastening Horizontal Holes for Tension Loads

6.12



PLEASE NOTE:

Details show minimum bolt spacing & bolt edge distances

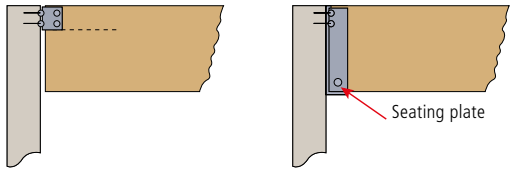
BEAM WIDTH (MM)	MAX HOLE DIA (MM)	MIN HOLE SPACING (MM)
65	15	390
85/130	22	510

Refers to superceded detail number

Overcoming Splitting / Taper Cuts - LGL, 17C & LVL

6.1 Details

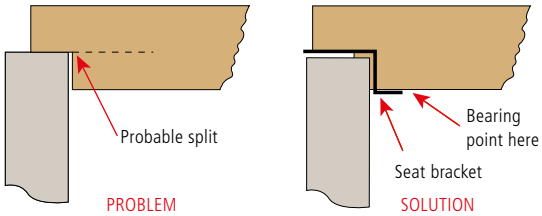
7.0



Splitting at bolted beam support.

6.2 Details

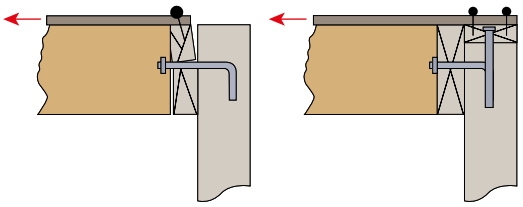
7.1



Splitting at notched beam support.

6.3 Details

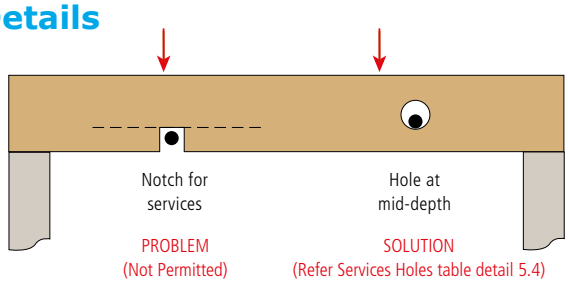
7.2



Splitting due to lateral loads in diaphragm connection.

6.4 Details

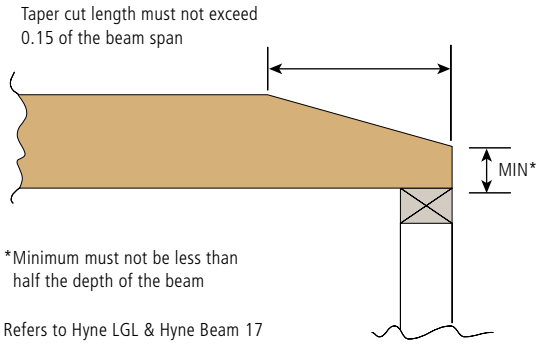
7.3



Splitting at notch in beam.

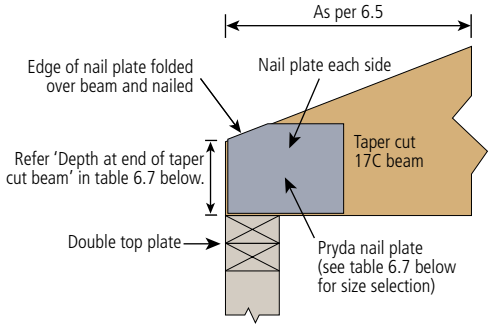
6.5 Unreinforced Tapercut

7.4



6.6 Nail Plate Reinforced Taper Cut

7.5



Pryda NPA 150/190 Nail Plate - 72/30 x 3.15mm nails
Pryda NPB 150/250 Nail Plate - 94/30 x 3.15mm nails
Taper cut length must not exceed 15% of the beam span

6.7 Nail Plate Sizes For Reinforced Taper Cuts Applies to 85mm Hyne Beam 17

7.6 Please phone the technical helpline on 0800 022 357 for beams not listed below.

HYNE 17C BEAM SIZE	NAIL PLATES		TAPER CUT DETAILS	
	DEPTH AT END OF TAPER CUT BEAM (MM)			
	130	160	190	220
330 X 85	NPA 150/190	X	X	X
360 X 85	NPA 150/190	X	X	X
395 X 85	NPB 150/250	NPB 150/250	X	X
425 X 85	NPB 150/250	NPB 150/250	NPB 150/250	X
460 X 85	NPB 150/250	NPB 150/250	NPB 150/250	X
525 X 85	NPB 150/250	NPB 150/250	NPB 150/250	NPB 150/250

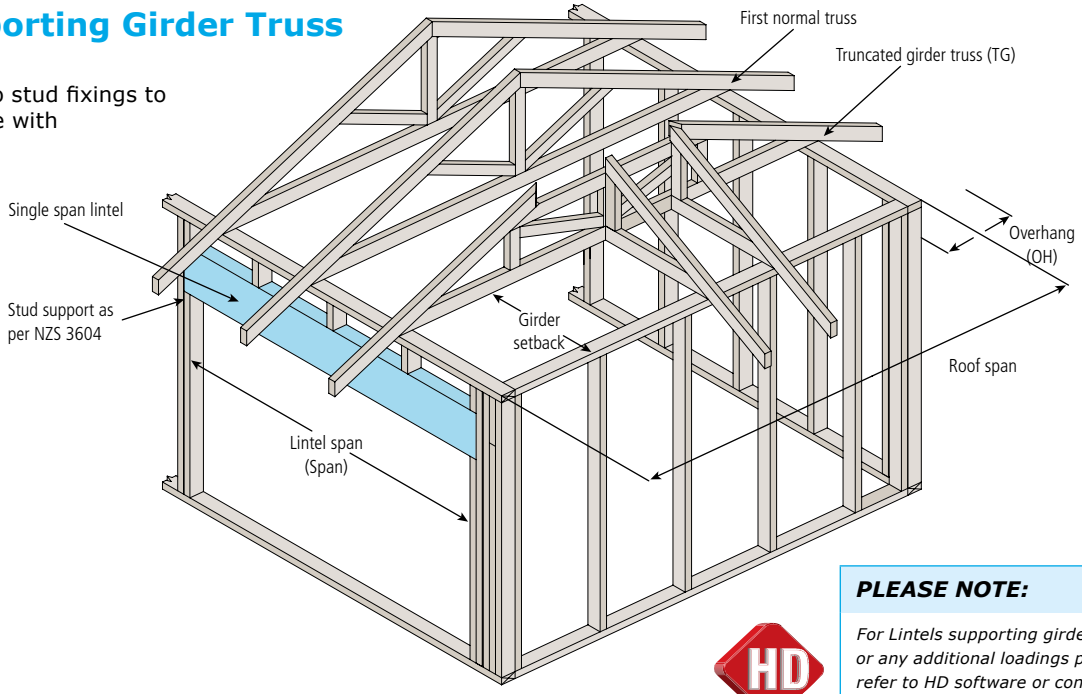
PLEASE NOTE:

Plate to be placed symmetrically about the inner face of the support, i.e. on the shear line
Maximum reaction load for 150 deep NPA is 35kN ultimate. Maximum reaction load for 150 deep NPB is 70kN ultimate
X - indicates where the beam would have more than 50% depth
INSTALLATION: Use 30 x 3.15mm Pryda Timber Connector, Galvanised Nails – GBC030315 (500G)

Refers to superceded detail number

Lintel Supporting Girder Truss

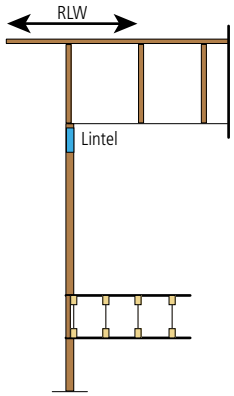
Note: All lintel to stud fixings to be in accordance with NZS3604:2011



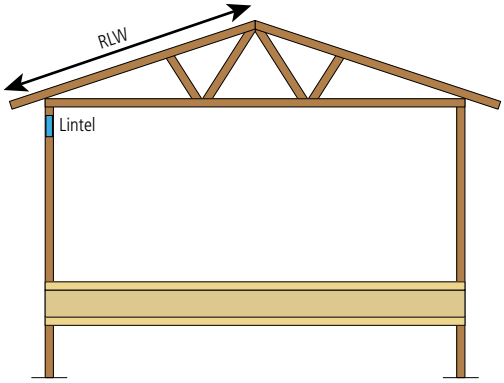
PLEASE NOTE:

For Lintels supporting girder trusses or any additional loadings please refer to HD software or contact your technical rep.

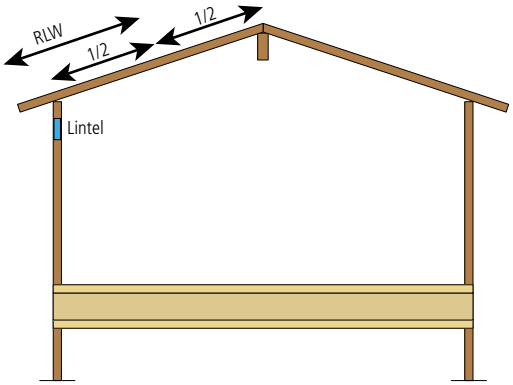
Defining Roof Load Width



Roof load width for gable end



Roof load width for truss design



Roof load width for rafter design

Standard Lintel - I-Built 90 LVL

Span Table - Supporting roof loads only - Up to high wind zone / 30° slope

ROOFING TYPE	LINTEL SIZE	MAXIMUM LINTEL SPAN (M) ROOF LOAD WIDTH - RLW (M) 1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
METAL ROOF AND CEILING (40KG/M2)	150 x 90	3.2	3.0	2.8	2.6	2.5	2.4	2.3	2.3	2.2	2.1
	200 x 90	3.9	3.7	3.5	3.4	3.3	3.2	3.1	3.0	2.9	2.9
	240 x 90	4.5	4.3	4.1	3.9	3.8	3.6	3.5	3.5	3.4	3.3
	300 x 90	5.3	5.0	4.8	4.6	4.5	4.3	4.2	**4.1**	**4.0**	**3.9**
	360 x 90	6.1	5.8	5.5	5.3	5.1	5.0	**4.8**	**4.7**	**4.6**	**4.5**
	400 x 90	6.6	6.3	6.0	5.7	5.5	**5.4**	**5.2**	**5.1**	**5.0#**	**4.9#**
TILED ROOF AND CEILING (90KG/M2)	150 x 90	2.6	2.3	2.2	2.1	2.0	1.9	1.8	1.7	1.7	1.6
	200 x 90	3.3	3.1	2.9	2.8	2.6	2.5	2.4	2.3	2.3	2.2
	240 x 90	3.8	3.5	3.4	3.2	3.1	3.0	2.9	2.8	2.7	2.6
	300 x 90	4.5	4.2	4.0	3.8	3.7	3.6	3.5	3.4	3.3#	3.2#
	360 x 90	5.2	4.8	4.6	4.4	4.2	4.1	4.0#	**3.9#**	**3.8#**	**3.7#**
	400 x 90	5.6	5.2	5.0	4.8	4.6	4.4#	4.3#	**4.2#**	**4.1#**	**4.0#**

# Denotes member muxst have minimum 2x45mm stud supports at each end

4.0 - Uplift fixings to NZS3604, Figure 8.12

4.0 - Uplift fixings requiring Specific Eng Design

PLEASE NOTE:

These span tables provide maximum member spans to 100% of the recommended capacity. It is recommended that deflection is limited to 5mm to ensure the continued performance of items such as Bifolding door joinery is maintained

Standard Lintel - I-Built 90 LVL

Span Table - Supporting roof and ceiling load only - Up to high wind zone

ROOFING TYPE	LINTEL SIZE	FLOOR LOAD WIDTH (FLW)	MAXIMUM LINTEL SPAN (M) ROOF LOAD WIDTH - RLF (M) 2	3	4	5	6
METAL ROOF AND CEILING (40KG/M2)	150 x 90	1	2.1	2.0	1.9	1.9	1.8
		2	1.9	1.9	1.8	1.7	1.7
		3	1.8	1.7	1.7	1.6	1.6
	200 x 90	1	2.8	2.7	2.6	2.5	2.4
		2	2.6	2.5	2.4	2.3	2.3
		3	2.4	2.3	2.3	2.2	2.1
	240 x 90	1	3.3	3.2	3.1	3.0	2.9
		2	3.1	3.0	2.9	2.8	2.7
		3	2.9	2.8	2.7#	2.7#	2.6#
	300 x 90	1	3.9	3.8	3.7	3.6	3.5
		2	3.6	3.5	3.4#	3.4#	3.3#
		3	3.4#	3.4#	3.3#	3.2#	3.2#
	360 x 90	1	4.5	4.3	4.2	4.1#	4.0#
		2	4.2#	4.1#	4.0#	3.9#	3.8#
		3	3.9#	3.9#	3.8#	3.7#	3.6#
	400 x 90	1	4.9	4.7	4.5	4.4#	4.3#
		2	4.5#	4.4#	4.3#	4.2#	4.1#
		3	4.3#	4.2#	4.1#	4.0#	3.9#
TILED ROOF AND CEILING (90KG/M2)	150 x 90	1	1.9	1.8	1.7	1.6	1.5
		2	1.8	1.7	1.6	1.5	1.4
		3	1.7	1.6	1.5	1.4	1.4
	200 x 90	1	2.5	2.4	2.2	2.1	2.0
		2	2.4	2.2	2.1	2.0	1.9
		3	2.2	2.1	2.0	1.9	1.9#
	240 x 90	1	3.0	2.8	2.7	2.5	2.4
		2	2.8	2.7	2.5	2.4#	2.3#
		3	2.7	2.5#	2.4#	2.3#	2.3#
	300 x 90	1	3.6	3.4	3.2	3.1#	3.0#
		2	3.4	3.3#	3.1#	3.0#	2.9#
		3	3.3#	3.1#	3.0#	2.9#	2.8#
	360 x 90	1	4.1	3.9	3.7#	3.6#	3.5#
		2	3.9#	3.7#	3.6#	3.5#	3.4#
		3	3.7#	3.6#	3.5#	3.4#	3.3#
	400 x 90	1	4.5	4.2#	4.0#	3.9#	3.8#
		2	4.2#	4.0#	3.9#	3.8#	3.7#
		3	4.1#	3.9#	3.8#	3.7#	3.6#

# Denotes member muxst have minimum 2x45mm stud supports at each end
4.0 - Uplift fixings to NZS3604, Figure 8.12

Standard Lintel - I-Built LVL 13

Span Table - Supporting roof and ceiling load only - Up to high wind zone

ROOFING TYPE	LINTEL SIZE	MAXIMUM LINTEL SPAN (M) ROOF LOAD WIDTH (M) 1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
LIGHT ROOF: METAL ROOF AND CEILING (40KG/M2)	2/150 X 45	3.5	3.3	3.1	2.9	2.8	2.6	2.5	2.4	2.3	2.2
	2/200 X 45	4.3	4.0	3.8	3.6	3.5	3.4	3.3	3.2	3.1	3.0
	2/240 X 45	5.0	4.6	4.4	4.2	4.0	3.9	3.7	3.6	3.5	3.4
	2/300 X 45	5.8	5.4	5.2	4.9	4.7	4.6	4.4	4.3	4.2	4.1
	2/360 X 45	6.6	6.2	5.9	5.6	5.4	5.2	5.0	4.9	4.8	4.6
	150 X 63	3.5	3.2	3.0	2.9	2.7	2.6	2.5	2.4	2.3	2.2
	200 X 63	4.3	4.0	3.8	3.6	3.4	3.3	3.2	3.1	3.0	2.9
	240 X 63	4.9	4.6	4.3	4.1	4.0	3.8	3.7	3.6	3.5	3.4
	300 X 63	5.8	5.4	5.1	4.9	4.7	4.5	4.3	4.2	4.1	4.0
	360 X 63	6.6	6.2	5.8	5.6	5.3	5.2	5.0	4.8	4.7	4.6
HEAVY ROOF: TILED ROOF AND CEILING (90KG/M2)	2/150 X 45	2.9	2.7	2.5	2.3	2.2	2.1	2.0	1.9	1.8	1.8
	2/200 X 45	3.6	3.4	3.2	3.0	2.9	2.8	2.7	2.6	2.5	2.4
	2/240 X 45	4.2	3.9	3.7	3.5	3.4	3.2	3.1	3.1	3.0	2.9
	2/300 X 45	4.9	4.6	4.3	4.1	4.0	3.8	3.7	3.6	3.5	3.4
	2/360 X 45	5.6	5.2	5.0	4.7	4.6	4.4	4.3	4.1	4.0	3.9
	150 X 63	2.9	2.6	2.4	2.3	2.1	2.0	1.9	1.9	1.8	1.7
	200 X 63	3.6	3.3	3.1	3.0	2.9	2.7	2.6	2.5	2.4	2.3
	240 X 63	4.1	3.8	3.6	3.4	3.3	3.2	3.1	3.0	2.9	2.8
	300 X 63	4.9	4.5	4.3	4.1	3.9	3.8	3.7	3.6	3.5	3.4
	360 X 63	5.6	5.2	4.6	4.7	4.5	4.3	4.2	4.1	4.0	3.9

PLEASE NOTE:

These span tables provide maximum member spans to 100% of the recommended capacity. It is recommended that deflection is limited to 5mm to ensure the continued performance of items such as Bifolding door joinery is maintained

Standard Lintel - Hyne LGL 44mm

Span Table - Supporting roof and ceiling load only - Up to high wind zone

ROOFING TYPE	LINTEL SIZE	MAXIMUM LINTEL SPAN (M) ROOF LOAD WIDTH (M) 1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
METAL ROOF AND CEILING (40KG/M2)	2/200 X 44	4.5	4.2	4.0	3.8	3.6	3.5	3.4	3.3	3.2	3.1
	2/245 X 44	5.2	4.9	4.6	4.4	4.2	4.1	3.9	3.8	3.7	3.6
	2/300 X 44	6.1	5.7	5.4	5.1	4.9	4.7	4.6	4.4	4.3	4.2
	2/360 X 44	6.9	6.5	6.1	5.8	5.6	5.4	5.2	5.1	4.9	4.8
TILED ROOF AND CEILING (90KG/M2)	2/200 X 44	3.7	3.4	3.2	3.1	3.0	2.8	2.8	2.6	2.5	2.4
	2/245 X 44	4.3	4.0	3.8	3.6	3.5	3.5	3.3	3.1	3.1	3.0
	2/300 X 44	5.0	4.7	4.4	4.2	4.0	4.0	3.9	3.7	3.6	3.5*
	2/360 X 44	5.7	5.3	5.0	4.8	4.6	4.6	4.5	4.2*	4.1*	4.0*

* Denotes member must have a minimum 45mm bearing at the 2 supports

Standard Lintel - I-Built LVL 11

Span Table - Supporting roof and ceiling load only - Up to high wind zone

ROOFING TYPE	LINTEL SIZE	MAXIMUM LINTEL SPAN (M) ROOF LOAD WIDTH (M) 1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
LIGHT ROOF: METAL ROOF AND CEILING (40KG/M2)	2/140 X 45	3.2	3.0	2.7	2.6	2.4	2.3	2.2	2.1	2.0	2.0
	2/190 X 45	4.0	3.7	3.5	3.3	3.2	3.1	3.0	2.9	2.8	2.7
	2/240 X 45	4.7	4.4	4.2	4.0	3.8	3.7	3.6	3.5	3.4	3.3
	2/300 X 45	5.6	5.2	4.9	4.7	4.5	4.3	4.2	4.1	4.0	3.9
HEAVY ROOF: TILED ROOF AND CEILING (90KG/M2)	2/140 X 45	2.6	2.3	2.2	2.0	1.9	1.8	1.7	1.7	1.6	1.6
	2/190 X 45	3.3	3.1	2.9	2.8	2.6	2.5	2.4	2.3	2.2	2.1
	2/240 X 45	4.0	3.7	3.5	3.3	3.2	3.1	3.0	2.9	2.8	2.7
	2/300 X 45	4.7	4.4	4.1	3.9	3.8	3.7	3.5	3.4	3.4	3.3

* Denotes member must have a minimum 45mm bearing at the 2 supports

Standard Lintel - Hyne Beam 17C

Span Table - Supporting roof and ceiling load only - Up to high wind zone

ROOFING TYPE	LINTEL SIZE	MAXIMUM LINTEL SPAN (M) ROOF LOAD WIDTH (M) 1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
METAL ROOF AND CEILING (40KG/M2)	195 X 85	5.7	5.2	4.9	4.6	4.4	4.2	4.0	3.9	3.8	3.7
	230 X 85	6.6	6.1	5.7	5.3	5.1	4.8	4.7	4.5	4.3	4.2
	260 X 85	7.5	6.8	6.3	6.0	5.7	5.4	5.2	5.0	4.8	4.7
	295 X 85	8.4	7.7	7.2	6.7	6.4	6.1	5.8	5.6	5.4	5.2
	330 X 85	9.5	8.6	8.0	7.5	7.1	6.8	6.5	6.2	6.0	5.8
	360 X 85	10.4	9.4	8.7	8.2	7.8	7.4	7.1	6.8	6.5	6.3
	395 X 85	11.4	10.4	9.6	9.0	8.5	8.1	7.7	7.4	7.2	6.9
	425 X 85	12.4	11.3	10.4	9.7	9.2	8.7	8.3	8.0	7.7	7.4
	460 X 85	13.5	12.3	11.4	10.6	10.0	9.5	9.1	8.7	8.4	8.1
	495 X 85	14.7	13.3	12.3	11.5	10.8	10.3	9.8	9.4	9.0	8.7
TILED ROOF AND CEILING (90KG/M2)	195 X 85	4.5	4.1	3.9	3.7	3.5	3.4	3.2	3.1	3.1	3.0
	230 X 85	5.2	4.8	4.5	4.2	4.0	3.9	3.7	3.6	3.5	3.4
	260 X 85	5.8	5.3	5.0	4.7	4.5	4.3	4.1	4.0	3.9	3.8
	295 X 85	6.5	6.0	5.6	5.3	5.0	4.8	4.6	4.5	4.3	4.2
	330 X 85	7.3	6.6	6.2	5.8	5.5	5.3	5.1	4.9	4.8	4.7
	360 X 85	7.9	7.2	6.7	6.3	6.0	5.8	5.5	5.3	5.2	5.0*
	395 X 85	8.7	7.9	7.4	6.9	6.6	6.3	6.0	5.8*	5.6*	5.5*
	425 X 85	9.4	8.5	7.9	7.4	7.1	6.7	6.5*	6.3*	6.0*	5.9*
	460 X 85	10.2	9.3	8.6	8.1	7.6	7.3*	7.0*	6.7*	6.5*	6.3#
	495 X 85	11.1	10.1	9.3	8.7	8.2	7.9*	7.5*	7.3#	7.0#	6.8#

* Denotes Member must have a minimum 45mm bearing length at the 2 supports
# Denotes Member must have a minimum 65mm bearing length at the 2 supports

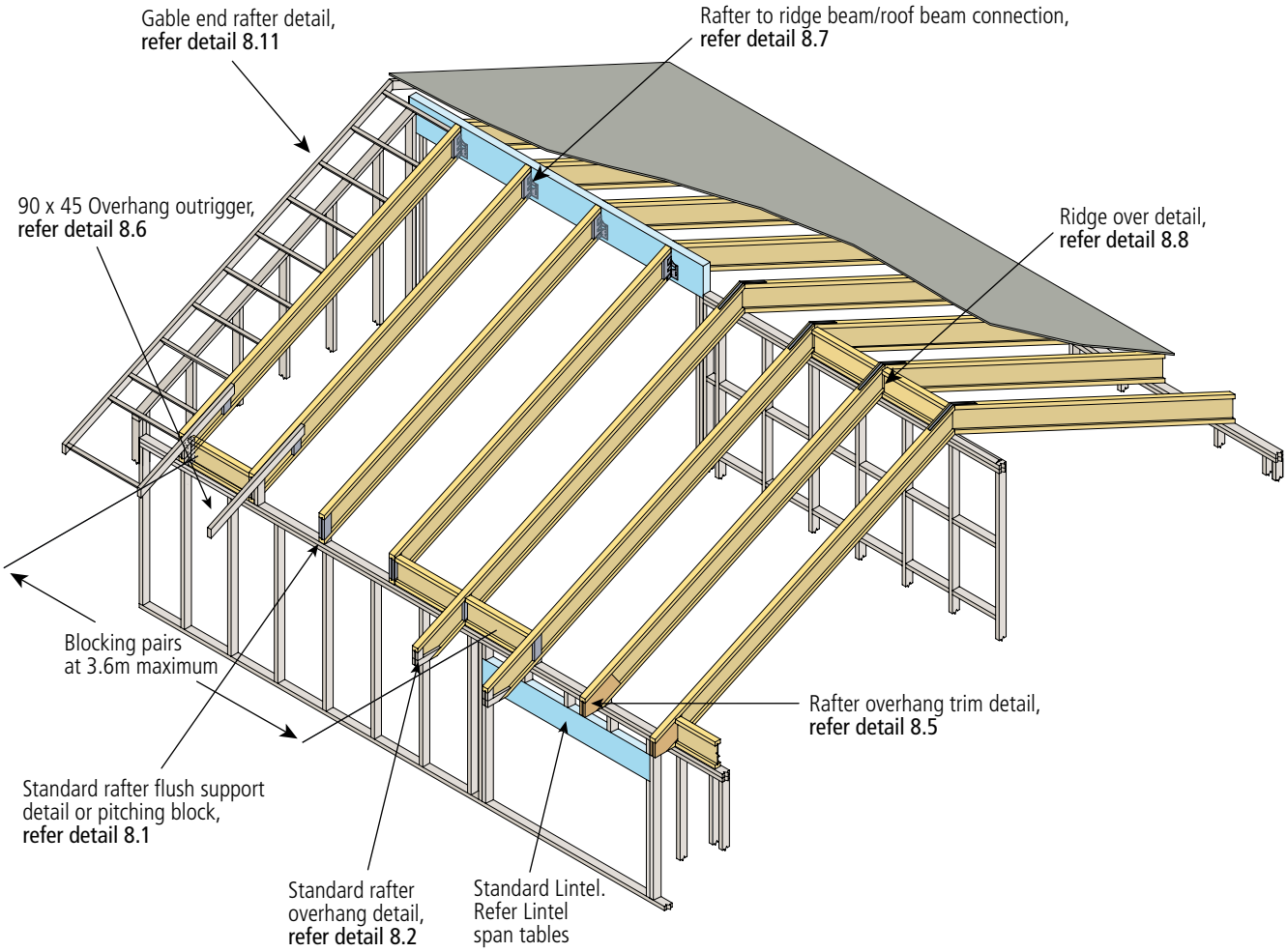
PLEASE NOTE:

These span tables provide maximum member spans to 100% of the recommended capacity. It is recommended that deflection is limited to 5mm to ensure the continued performance of items such as Bifolding door joinery is maintained

Roof Construction Plan

7.1 Typical Roof Construction Plan

1.1 This is a typical roof construction plan. Please see detail numbers on the plan to locate specifics.



PLEASE NOTE:

- *If a beam is above a window or a door, then it is a lintel. If not, then it is a bearer.*
- *Point Loads on rafters i.e. water storage cylinder, air-conditioning units and other such units, where higher permanent loads may be expected, specific engineering design should be applied – refer to HD software.*
- *The Span Tables in this brochure are designed as conservative spans. To run precise spans please use the Hyne Design software.*

DESIGN CRITERIA:

- *The tables provide realistic maximum spans for the given rafter spacings. The serviceability criteria used are as specified in AS/NZS 1170.*

SNOW LOADS:

- *Snow loads have not been considered in the preparation of these tables. Reference should be made to section 15 of NZS 3604:2011 – Timber framed buildings to determine the geographical area of the site. Specific engineering design should be applied – refer to HD software or contact your technical rep.*

Refers to superceded detail number

Rafter Span - LPI 70-T I-Beam

Single Span - Supporting Roof and Ceiling - Up to High Wind Zone

		I-BEAM DEPTH	MAX RAFTER SPAN (M)								
			RAFTERS 600CRS			RAFTERS 900CRS			RAFTERS 1200CRS		
			0-15°	15-25°	25-35°	0-15°	15-25°	25-35°	0-15°	15-25°	25-35°
WIND ZONE: HIGH (44M/ SEC)	METAL ROOF AND CEILING (40KG/M2)	225	6.3	6.0	5.6	5.7	5.5	5.1	5.2	5.0	4.7
		240	6.6	6.2	5.8	6.0	5.7	5.3	5.5	5.3	4.9
		300	7.4	7.1	6.6	6.8	6.5	6.0	6.3	6.0	5.6
		356	8.1	7.8	7.2	7.4	7.1	6.6	6.9	6.6	6.1
	TILED ROOF AND CEILING (90KG/M2)	225	5.0	4.8	4.5	4.4	4.2	3.9	4.0	3.8	3.6
		240	5.3	5.1	4.8	4.6	4.4	4.2	4.2	4.0	3.8
		300	6.2	5.9	5.4	5.5	5.3	4.9	5.0	4.8	4.5
		356	6.8	6.4	6.0	6.1	5.8	5.4	5.7	5.4	5.0

Continuous Span - Supporting Roof and Ceiling - Up to High Wind Zone

		I-BEAM DEPTH	MAX RAFTER SPAN (M)								
			RAFTERS 600CRS			RAFTERS 900CRS			RAFTERS 1200CRS		
			0-15°	15-25°	25-35°	0-15°	15-25°	25-35°	0-15°	15-25°	25-35°
WIND ZONE: HIGH (44M/ SEC)	METAL ROOF AND CEILING (40KG/M2)	225	6.3	6.0	5.6	5.7	5.5	5.1	5.2	5.0	4.7
		240	6.6	6.2	5.8	6.0	5.7	5.3	5.5	5.3	4.9
		300	7.4	7.1	6.6	6.8	6.5	6.0	6.3	6.0	5.6
		356	8.1	7.8	7.2	7.4	7.1	6.6	6.9	6.6	6.1
	TILED ROOF AND CEILING (90KG/M2)	225	5.0	4.8	4.5	4.4	4.2	3.9	4.0	3.8	3.6
		240	5.3	5.1	4.8	4.6	4.4	4.2	4.2	4.0	3.8
		300	6.2	5.9	5.4	5.5	5.3	4.9	5.0	4.8	4.5
		356	6.8	6.4	6.0	6.1	5.8	5.4	5.7	5.4	5.0

Rafter Span - Hyne LGL 44mm

Single Span - Supporting Roof and Ceiling - Up to High Wind Zone

		LGL SIZE	MAX RAFTER SPAN (M)								
			RAFTERS 600CRS			RAFTERS 900CRS			RAFTERS 1200CRS		
			0-15°	15-25°	25-35°	0-15°	15-25°	25-35°	0-15°	15-25°	25-35°
WIND ZONE: HIGH (44M/ SEC)	METAL ROOF AND CEILING (40KG/M2)	200 x 44	5.5	5.2	4.9	4.9	4.6	4.3	4.4	4.3	4.0
		240 x 44	6.4	6.1	5.6	5.9	5.6	5.2	5.4	5.2	4.9
		300 x 44	7.4	7.0	6.5	6.8	6.5	6.0	6.4	6.1	5.6
		360 x 44	8.4	8.0	7.4	7.7	7.4	6.8	7.3	6.9	6.4
	TILED ROOF AND CEILING (90KG/M2)	200 x 44	4.3	4.1	3.8	3.8	3.6	3.4	3.4	3.3	3.1
		240 x 44	5.2	5.0	4.7	4.6	4.4	4.1	4.2	4.0	3.8
		300 x 44	6.2	5.9	5.5	5.6	5.4	5.0	5.1	4.9	4.6
		360 x 44	7.1	6.8	6.3	6.5	6.2	5.7	6.1	5.8	5.3

Continuous Span - Supporting Roof and Ceiling - Up to High Wind Zone

		LGL SIZE	MAX RAFTER SPAN (M)								
			RAFTERS 600CRS			RAFTERS 900CRS			RAFTERS 1200CRS		
			0-15°	15-25°	25-35°	0-15°	15-25°	25-35°	0-15°	15-25°	25-35°
WIND ZONE: HIGH (44M/ SEC)	METAL ROOF AND CEILING (40KG/M2)	200 x 44	5.5	5.2	4.9	4.9	4.6	4.3	4.4	4.3	4.0
		240 x 44	6.4	6.1	5.6	5.9	5.6	5.2	5.4	5.2	4.9
		300 x 44	7.4	7.0	6.5	6.8	6.5	6.0	6.4	6.1	5.6
		360 x 44	8.4	8.0	7.4	7.7	7.4	6.8	7.3	6.9	6.4
	TILED ROOF AND CEILING (90KG/M2)	200 x 44	4.3	4.1	3.8	3.8	3.6	3.4	3.4	3.3	3.1
		240 x 44	5.2	5.0	4.7	4.6	4.4	4.1	4.2	4.0	3.8
		300 x 44	6.2	5.9	5.5	5.6	5.4	5.0	5.1	4.9	4.6
		360 x 44	7.1	6.8	6.3	6.5	6.2	5.7	6.1	5.8	5.3

PLEASE NOTE:

These span tables provide maximum member spans up to 100% of the recommended capacity. For a premium floor or rafter system with minimal deflection, it is recommended that spans should be restricted to 85% of the maximum allowed.

Rafter Span - I-Built LVL 13 - 45mm

Single Span - Supporting Roof and Ceiling - Up to High Wind Zone

		LVL 13 SIZE	MAX RAFTER SPAN (M)								
			RAFTERS 600CRS			RAFTERS 900CRS			RAFTERS 1200CRS		
			0-15°	15-25°	25-35°	0-15°	15-25°	25-35°	0-15°	15-25°	25-35°
WIND ZONE: HIGH (44M/ SEC)	METAL ROOF AND CEILING (40KG/M2)	150 x 45	5.7	5.4	5.0	5.0	4.8	4.5	4.6	4.4	4.1
		200 x 45	7.0	6.7	6.2	6.4	6.1	5.7	6.0	5.7	5.3
		240 x 45	7.9	7.6	7.0	7.3	7.0	6.4	6.9	6.5	6.1
		300 x 45	9.3	8.8	8.2	8.6	8.2	7.6	8.1	7.7	7.1
		360 x 45	10.5	10.0	9.3	9.7	9.3	8.6	9.2	8.8	8.1
	TILED ROOF AND CEILING (90KG/M2)	150 x 45	4.4	4.2	4.0	3.9	3.7	3.5	3.5	3.4	3.2
		200 x 45	5.8	5.6	5.2	5.2	5.0	4.6	4.7	4.5	4.2
		240 x 45	6.7	6.4	5.9	6.1	5.8	5.4	5.7	5.4	5.0
		300 x 45	7.9	7.5	6.9	7.2	6.8	6.3	6.7	6.4	5.9
		360 x 45	9.0	8.5	7.9	8.2	7.8	7.2	7.7	7.3	6.8*

*Denotes member must have a minimum 45mm bearing at the 2 supports

Continuous Span - Supporting Roof and Ceiling - Up to High Wind Zone

		LVL 13 SIZE	MAX RAFTER SPAN (M)								
			RAFTERS 600CRS			RAFTERS 900CRS			RAFTERS 1200CRS		
			0-15°	15-25°	25-35°	0-15°	15-25°	25-35°	0-15°	15-25°	25-35°
WIND ZONE: HIGH (44M/ SEC)	METAL ROOF AND CEILING (40KG/M2)	150 x 45	4.2	4.0	3.7	3.7	3.5	3.3	3.4	3.2	3.0
		200 x 45	5.5	5.2	4.9	4.9	4.7	4.4	4.5	4.3	4.0
		240 x 45	6.3	6.0	5.6	5.8	5.5	5.1	5.3	5.1	4.8
		300 x 45	7.4	7.0	6.5	6.8	6.5	6.0	6.4	6.1	5.6
		360 x 45	8.4	8.0	7.4	7.7	7.4	6.8	7.3	6.9	6.4
	TILED ROOF AND CEILING (90KG/M2)	150 x 45	3.2	3.1	2.9	2.9	2.7	2.6	2.6	2.5	2.3
		200 x 45	4.3	4.1	3.9	3.8	3.6	3.4	3.5	3.3	3.1
		240 x 45	5.2	4.9	4.6	4.6	4.4	4.1	4.2	4.0	3.7
		300 x 45	6.2	5.9	5.5	5.7	5.4	5.0	5.2	5.0	4.6
		360 x 45	7.1	6.8	6.3	6.5	6.2	5.7	6.1	5.8	5.4

PLEASE NOTE:

These span tables provide maximum member spans up to 100% of the recommended capacity. For a premium floor or rafter system with minimal deflection, it is recommended that spans should be restricted to 85% of the maximum allowed.

Single Span - Supporting Roof and Ceiling - Up to High Wind Zone

		LVL 13 SIZE	MAX RAFTER SPAN (M)								
			RAFTERS 600CRS			RAFTERS 900CRS			RAFTERS 1200CRS		
			0-15°	15-25°	25-35°	0-15°	15-25°	25-35°	0-15°	15-25°	25-35°
WIND ZONE: HIGH (44M/ SEC)	METAL ROOF AND CEILING (40KG/M2)	150 x 63	5.0	4.8	4.5	4.5	4.3	4.0	4.1	3.9	3.7
		200 x 63	6.4	6.1	5.6	5.9	5.6	5.2	5.5	5.2	4.9
		240 x 63	7.2	6.9	6.4	6.7	6.4	5.9	6.3	6.0	5.6
		300 x 63	8.4	8.0	7.4	7.8	7.5	6.9	7.4	7.0	6.5
		360 x 63	9.5	9.1	8.4	8.9	8.5	7.8	8.4	8.0	7.4
	TILED ROOF AND CEILING (90KG/M2)	150 x 63	4.0	3.8	3.6	3.5	3.4	3.1	3.2	3.1	2.9
		200 x 63	5.3	5.0	4.7	4.7	4.5	4.2	4.3	4.1	3.8
		240 x 63	6.1	5.9	5.4	5.6	5.3	5.0	5.1	4.9	4.6
		300 x 63	7.2	6.9	6.4	6.6	6.3	5.8	6.2	5.9	5.5
		360 x 63	8.2	7.8	7.2	7.5	7.2	6.7	7.1	6.7	6.2

Continuous Span - Supporting Roof and Ceiling - Up to High Wind Zone

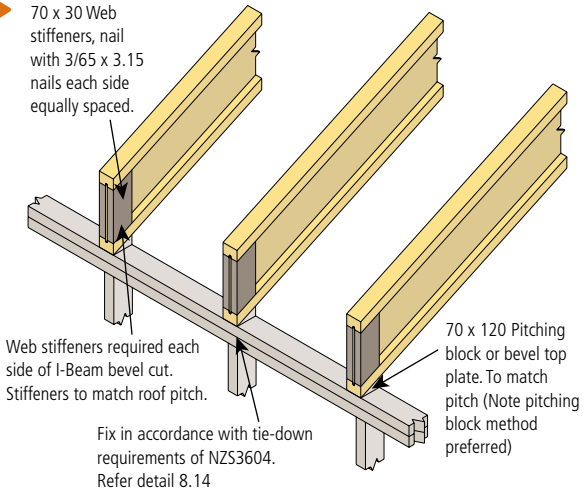
		LVL 13 SIZE	MAX RAFTER SPAN (M)								
			RAFTERS 600CRS			RAFTERS 900CRS			RAFTERS 1200CRS		
			0-15°	15-25°	25-35°	0-15°	15-25°	25-35°	0-15°	15-25°	25-35°
WIND ZONE: HIGH (44M/ SEC)	METAL ROOF AND CEILING (40KG/M2)	150 x 63	6.6	6.3	5.8	6.0	5.7	5.3	5.6	5.4	5.0
		200 x 63	8.0	7.7	7.1	7.4	7.1	6.5	7.0	6.6	6.1
		240 x 63	9.1	8.7	8.0	8.4	8.0	7.4	7.9	7.6	7.0
		300 x 63	10.6	10.1	9.4	9.8	9.4	8.7	9.3	8.9	8.2
		360 x 63	12.0	11.4	10.6	11.2	10.6	9.9	10.6	10.1	9.3
	TILED ROOF AND CEILING (90KG/M2)	150 x 63	5.4	5.2	4.8	4.8	4.6	4.3	4.4	4.2	3.9
		200 x 63	6.8	6.5	6.0	6.2	5.9	5.5	5.8	5.5	5.1
		240 x 63	7.7	7.4	6.8	7.1	6.7	6.2	6.6	6.3	5.8
		300 x 63	9.1	8.6	8.0	8.3	7.9	7.3	7.8	7.4	6.9
		360 x 63	10.3	9.8	9.1	9.5	9.0	8.4	8.9	8.5	7.9

PLEASE NOTE:

These span tables provide maximum member spans up to 100% of the recommended capacity. For a premium floor or rafter system with minimal deflection, it is recommended that spans should be restricted to 85% of the maximum allowed.

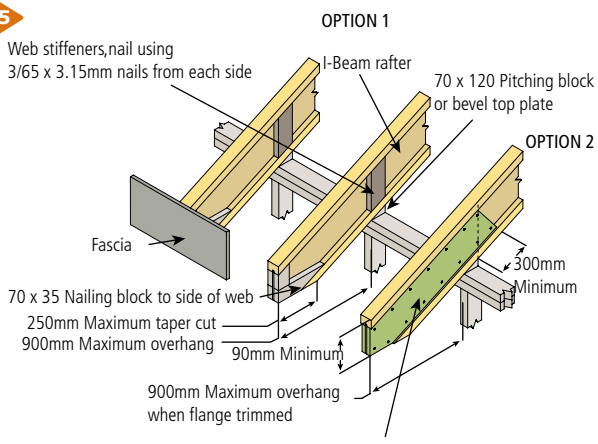
8.1 Pitching Block Detail

5.14



8.2 Standard Rafter Overhang Detail

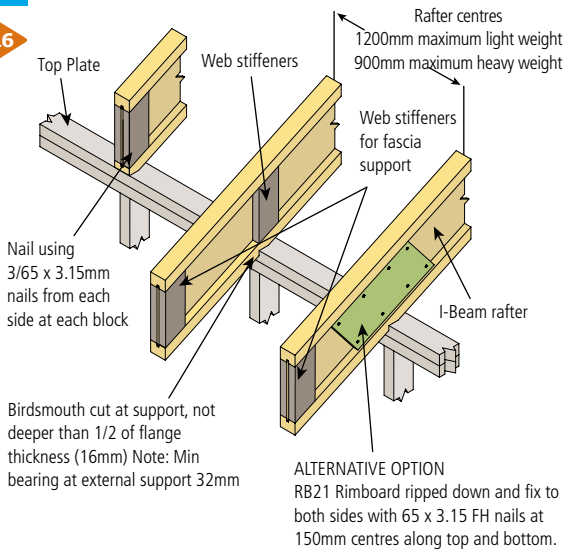
5.15



Note: Greater eave overhangs can be achieved when designing rafters using the HD7 software

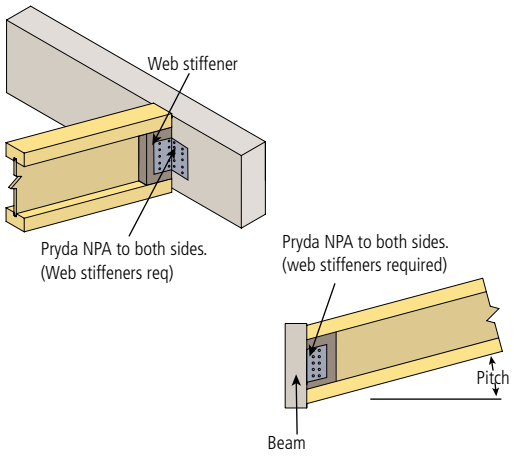
8.3 Rafter Birdsmouth Detail

5.16



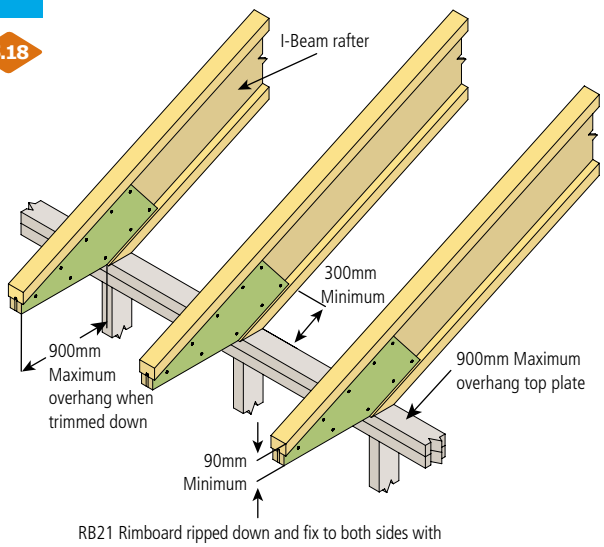
8.4 Rafter to Beam Connection

5.17



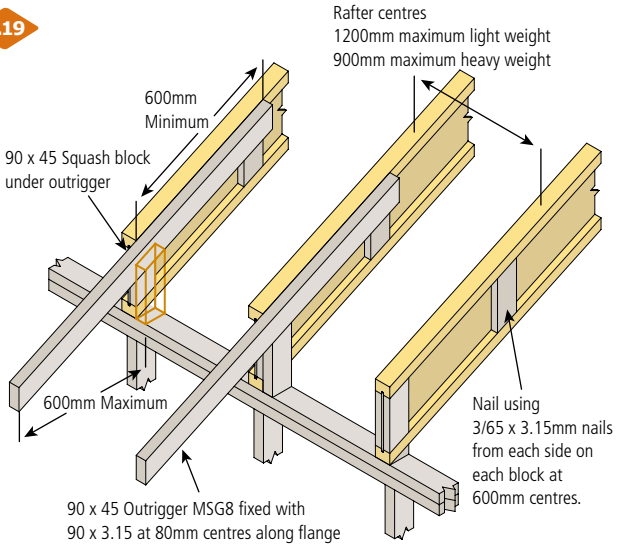
8.5 Rafter Overhang Trim Detail

5.18



8.6 90 x 45 Overhang Outrigger

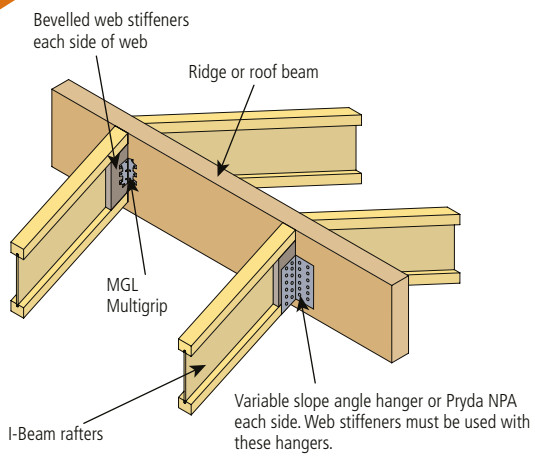
5.19



Refers to superceded detail number

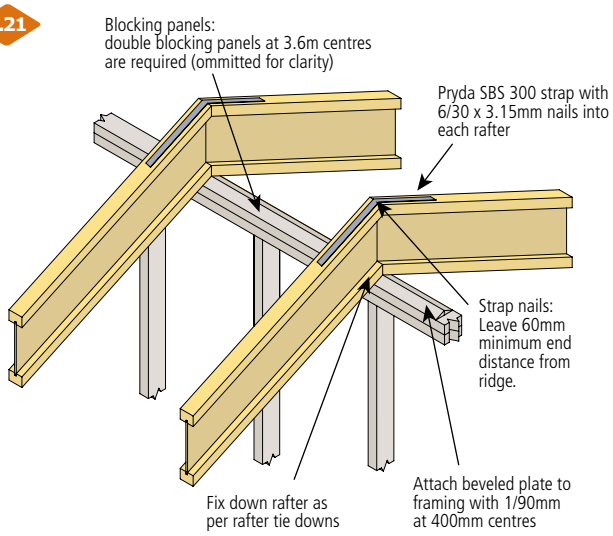
8.7 Rafter to Ridge Beam / Roof Beam Connection

5.20



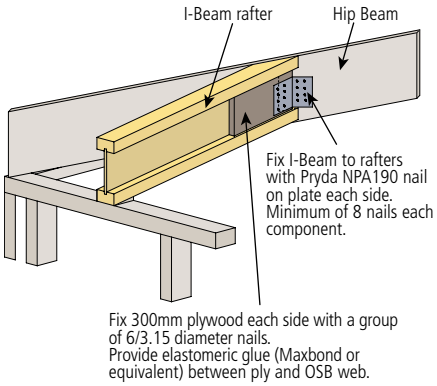
8.8 Ridge Over Detail

5.21



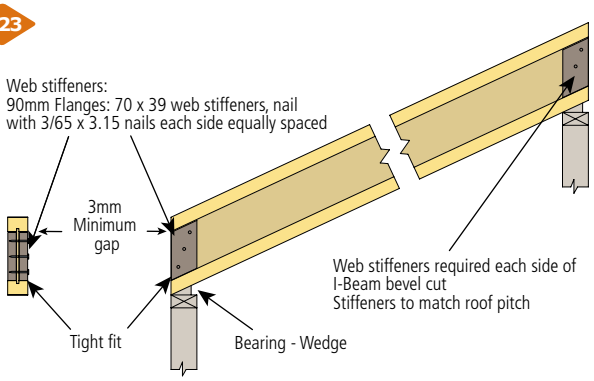
8.9 Hip Rafter Connection

5.22



8.10 Web Stiffener Detail

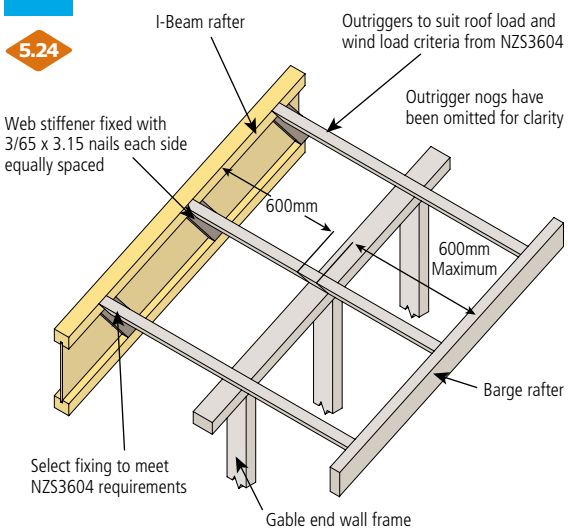
5.23



Web stiffeners:
70mm Flange I-Beam – use 70 x 29mm
Note: I-Beam web stiffeners to be used at all concentrated loads and at supports where specified

8.11 Gable End Rafter Detail

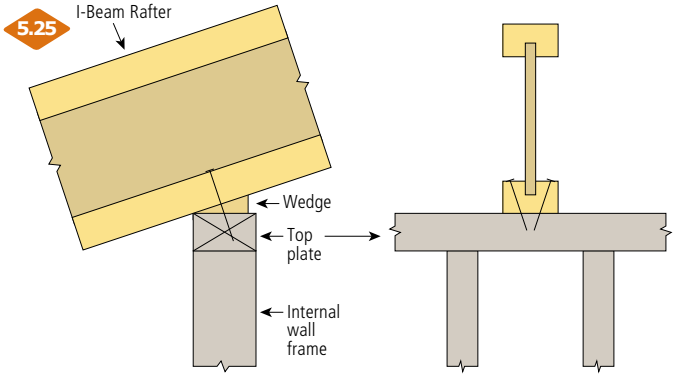
5.24



Refers to superceded detail number

8.12 Intermediate Bearing Detail

5.25

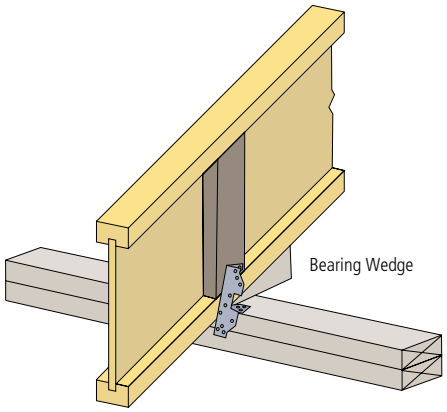


Fixing Requirements at Intermediate Bearing

FOR SLOPES < 18°	=1/75 x 3.15mm nail each side
FOR PITCHES 15-22.5°	=2/75 x 3.15mm nails each side
FOR PITCHES > 22.5°	=2/75 x 3.15 nails each side and tie down strap

8.13 Rafter Tie Down Multigrip

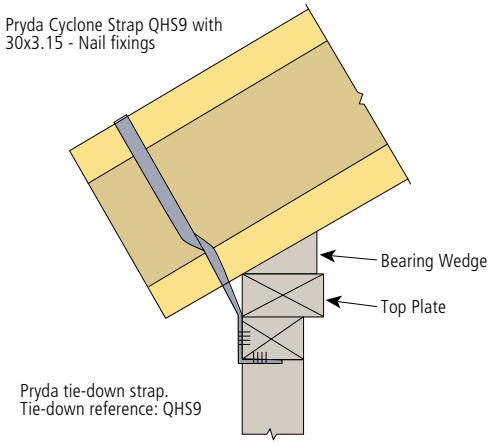
5.26



Site made wedge with Pryda Multigrip (MGL).
Use one each side. Tie-down reference: MGL.
Note: Refer NZS3604 for hold down requirements

8.14 Rafter Tie Down Cyclone Strap

5.27

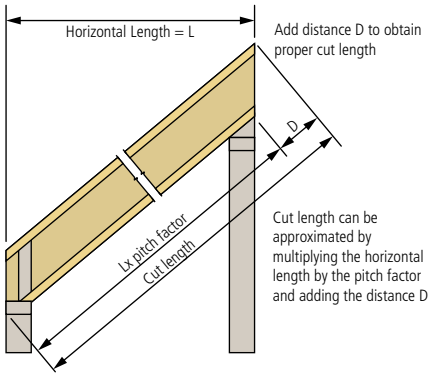


Note: Where possible bend strap legs under support for increased support

8.15 SolidStart™ I-Beam Cut Length Calculation

PITCH FACTORS	
PITCH (DEG)	**PITCH FACTOR**
5	1.01
10	1.02
15	1.04
20	1.07
22.5	1.09
25	1.11
30	1.16
35	1.23

DISTANCE D (MM)				
PITCH (DEG)	**RAFTER DEPTH (MM)**			
	225	**240**	**300**	**356**
5	20	21	26	31
10	40	43	53	63
15	60	65	81	95
20	82	88	110	129
22.5	93	100	125	147
25	105	113	141	166
30	130	139	174	205
35	158	169	211	249

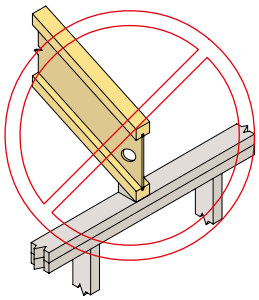


Refers to superceded detail number

Avoid These Practices

A

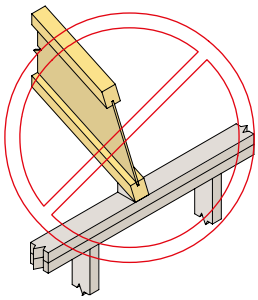
8.0



DO NOT cut holes too close to support.

B

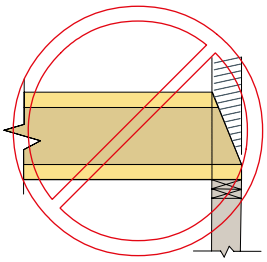
8.1



DO NOT bevel cut rafter beyond inside face of wall.

C

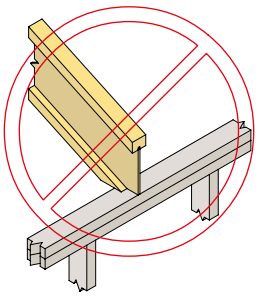
8.2



DO NOT bevel cut joist beyond inside face of wall

D

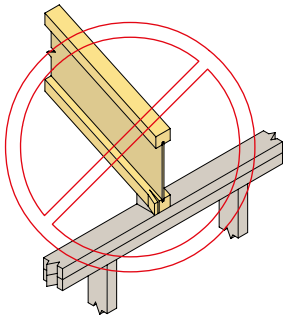
8.3



DO NOT overhang birdsmouth cut from inside face of plate.

E

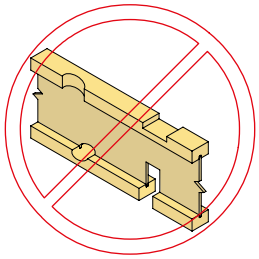
8.4



DO NOT split the flange.
Ensure the correct heel fixing is done.

F

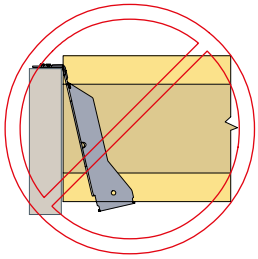
8.5



DO NOT cut, notch or drill top or bottom chords.

G

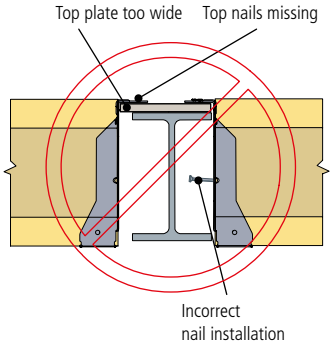
8.6



I-Beam is not seated properly into the hanger, this may cause nail pullout or shear under load.

H

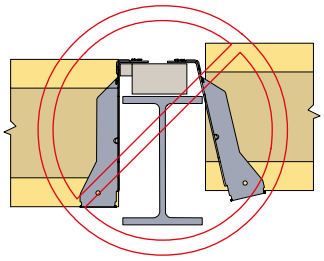
8.7



Top nailing is incorrect due to:
1. Top plate too thin or
2. Wrong length nail is used

I

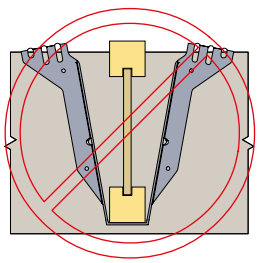
8.8



If the top plate is too narrow it may cause:
1. Hanger deformation
2. Nail pull-out or shear
3. Supporting beam deformation

J

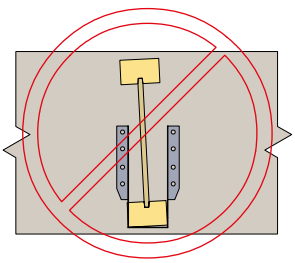
8.9



Spreading hanger legs will push the I-Beam up which may cause uneven floors, squeaky floors and I-Beam rotation.

K

8.10



Hangers not supporting the top flange of the I-Beam will require stiffeners.

Refers to superceded detail number

Storage, Handling and Safety

As with other high quality products, Engineered Timber Products such as I-Beams, Edge Beams and 17C beams require proper storage and handling during distribution and at the job site in order to protect the product from damage. The following information provides techniques for safe and proper handling to minimise physical and moisture damage to our Engineered Timber Products.

Storage:

- Store bundles upright on a level and well drained surface. Beams should not be stored in direct contact with the ground and should always be protected from the weather. Ensure supports of packs do not exceed 3.0m apart.
- Bundles should remain wrapped, strapped and protected from the weather until time of installation.
- Always stack and handle I-Beams in the upright position.
- Twisting of joists or applying loads to the joists when flat can damage the joist.
- Avoid walking on wrapped and unwrapped product.
- Do not stack other materials on top of I-Beams, Edge beams and 17C beams.
- Follow good forklift safety procedures when handling Engineered timber Products in the yard and at building sites:
  - Use wide forks to handle long length material
  - Storage yard should be maintained to provide flat, well drained and level driving surface.
  - Do not handle or rotate loads over people
  - Do not bound or jerk loads
  - Maintain low forklift speeds and brake smoothly to prevent accidental dumping of loads.
  - Stabilise the load if there is a possibility of the load shifting
  - Maintain load height within safe limits

Handling:

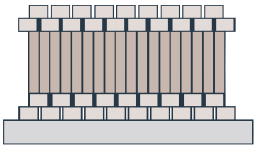
- Use care when handling bundles and individual components to prevent injury to handlers or damage by forklifts or cranes.
- Do not lift or roll I-Beams by the top flange. This activity may cause damage to the beams.
- Avoid excessive bowing during all phases of handling and installation.
- Joists should remain vertical during handling
- Damaged Beams should not be used. Do not try to repair a damaged beam on site.
- Refer table for size/weight when handling. Please take these into account when handling timber

Safety Warning:

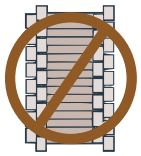
- Never walk on wrapped or unwrapped bundles.
- Do not walk on the joists until they are full installed or correctly braced, joists are unstable until braced laterally.
- During installation, a minimum of 100 x 50 temporary bracing at 2.4m CRS max is required.
- Only remove the bracing as the sheathing is being attached.
- Never overload joists with loads that exceed design limits.
- Stack building materials over walls or main beams only.
- Do not use I-Beams as ramps, planks or walkways.
- Brace each joist as it is erected.
- All hangers, rimboards and blocking at the end supports of the joists must be installed and nail properly.

THE ABOVE ARE GENERAL RECOMMENDATIONS AND IN SOME CASES ADDITIONAL PRECAUTIONS MAY BE REQUIRED

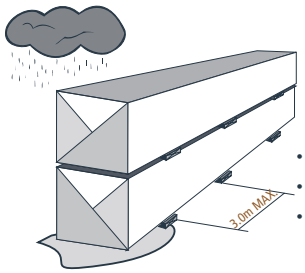
TRANSPORTING I-BEAMS AND LGL BEAMS			
BEAM TYPE	**BEAM DEPTH (MM)**	**BEAM WIDTH (MM)**	**BEAM MASS (KG/M)**
I-BEAM			
225 LPI 70-T	225	70	3.97
240 LPI 70-T	240	70	4.07
300 LPI 70-T	300	70	4.48
356 LPI 70-T	356	70	4.84
EDGE BEAM			
200X44	200	44	4.7
245X44	245	44	5.6
300X44	300	44	7
17C LGL			
295X85	295	85	16.3
330X85	330	85	18.2
360X85	360	85	19.9
425X85	425	85	23.5
460X85	460	85	25.4



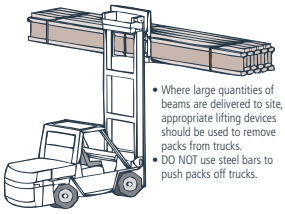
I-Beams in the upright position.



DO NOT stack or handle I-Beams flat.



- Keep I-Beams elevated and place on solid, dry and level surface.
- Ensure supports of packs do not exceed 3.0m apart.
- Ensure wrapping remains on packs to protect I-Beams from the elements.

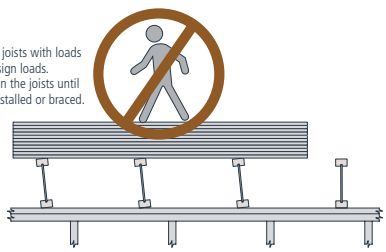


- Where large quantities of beams are delivered to site, appropriate lifting devices should be used to remove packs from trucks.
- DO NOT use steel bars to push packs off trucks.

- Remove packs from truck with forklift or side loader.
- DO NOT use steel bars to lower or push packs off truck.

DO NOT lift or roll I-Beams by the top flange.

DO NOT lift I-Beams whilst they are lying flat. Excessive flapping may cause damage.



Never overload joists with loads that exceed design loads.
DO NOT walk on the joists until they are fully installed or braced.

Chemical Treatment of I-Beams, LGL Edgebeams, 17C, LVL, Rimboard & Plywood

All Engineered Timber Solutions' products are available in the following treatment options: I-Beams LOSP H3.1 and untreated; Edgebeams LOSP H3.1 and untreated; 17C LOSP H3.1 and untreated; Rimboard CCA H3.2. For treated timber, please read the following information carefully before handling the product.

LIGHT ORGANIC SOLVENT PRESERVATIVES (LOSP):

Light Organic Solvent-borne Preservatives (LOSP's): Are preservatives that contain combinations of fungicides and insecticides for timber used in internal and external situations. All of these preservatives components are incorporated in a solvent carrier such as white spirit.

Copper Chrome and Arsenic (CCA) Treatment: Copper Chrome and Arsenic preservative contains copper and arsenic to protect against fungal decay and wood boring insects and chromium to fix the preservative to the cell structure in the wood.

The following information is designed to inform builders, pre-nailers and merchants of the correct procedures for handling and storing treated timber.

HANDLING PRODUCTS TREATED WITH LOSP AND CCA

Some people may experience temporary skin irritation, headaches or light headedness when handling LOSP or CCA treated timber. These undesirable effects are more likely if the timber is not solvent dry.

The following precautions should be taken when handling LOSP/CCA treated timber.

- Where possible packs should be opened a day or 2 before use to allow any residual vapours in the inner boards to evaporate.
- LOSP/CCA treated timber should be stored in a well-ventilated under cover area with any protective wrapping removed.
- Wear gloves and long sleeves for protection against splinters and cuts during handling. If the timber is still damp from treatment, either do not handle or solvent resistant gloves are recommended.
- Wear protective glasses and a filter mask when sawing, sanding or machining treated timber.
- If LOSP/CCA preservative or treated sawdust accumulates on clothes, wash separately before reuse.
- Always wash hands and any exposed areas after handling LOSP/CCA treated timber, especially before eating.
- If undesirable effects occur cease handing or using the material and review your personal protection measures.
- Do not transport LOSP/CCA treated timber in an enclosed environment.

STORAGE

- Always ensure LOSP/CCA treated timber is stored in a well-ventilated space
- Merchants, builders and pre-nailers should remove wrapping off delivered material as soon as convenient to assist in the dissipation of solvent fumes.
- Stored LOSP/CCA treated timber should not be kept in a confined area. Store only in areas that have double ventilated openings or an extraction system.

DISPOSAL

- Dispose of all sawdust and off cuts after construction.
- For normal domestic and trade users, dispose of waste through normal waste collection and disposal services, refer to waste collection guides.
- LOSP/CCA treated timber must not be burned in open fires, stoves, fireplaces or any confined spaces as toxic fumes may be released.

TREATMENT OF CUTS, HOLES AND NOTCHES

NZWOOD recommends that all cuts, holes and notches are coated with generous amounts of preservatives:

H3.1 LOSP – Koppers Arch Enseal clear/green or similar preservative.

H3.2 CCA – A suitable copper or Zinc napthenate based primer.

IDENTIFYING TREATED TIMBER ON SITE

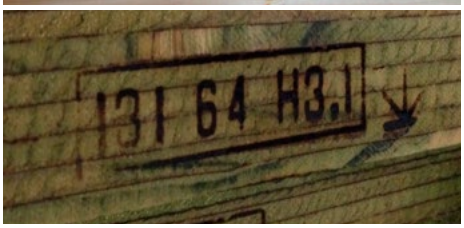
Untreated timber will have no marking on it. Treated timber will have the following markings:

I-Beam

LGL Edgebeam

17C

Rimboard



PLEASE NOTE:

All treated and untreated I-Beams, Edgebeams, 17Cs and Rimboard are not suitable for weather exposed situations.

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You are welcome to contact us for further information about the range of Engineered Timber Products, our Rimboard and Pryda fittings

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