Pryda Timber Connectors

Hangers & Truss Boots Guide

A complete guide to the design, specification and installation of Pryda Hangers and Truss Boots

March 2014

ESSENTIAL NOTES – PRYDA PRODUCT GUIDES

INTRODUCTION

The information in this Product Guide is provided for use in Australia by architects, engineers, building designers, builders and others. It is based upon the following criteria:

1. **No Substitution**: The products covered by or recommended in this guide must not be substituted with other products.

2. **Design Capacity Basis**: See Codes & Standards following

3. **Supporting Constructions**: Constructions using Pryda products must be built in accordance with the BCA or an appropriate Australian standard. *Note: This includes appropriate corrosion protection- See Corrosion Protection following*

4. **Correct Installation**: Installation of Pryda products must be strictly in accordance with the instructions in this guide

5. **Current Guide Version Used**: The current version of this guide, including any amendments or additions, must be used. Users are advised to check with Pryda for updates at least every three months by telephone, the web site: www.pryda.com.au or by email to: info@pryda.com.au.

CODES & STANDARDS

Product design capacities in this guide have been derived from:

(a) results of laboratory tests carried out by or for Pryda Australia

(b) engineering computations in accordance with the relevant Australian standards, ie:

* AS1720.1-2010 Timber Structures. Part 1: Design Methods
* AS/NZS1170 series : 2002 Structural Design Actions
* AS4055 -2006 Wind Loads for Housing

Design capacities tabulated in this guide apply directly for **Category 1** joints. For all other joints, reduce design capacities by using the factors as specified in *General Notes* (if applicable). Design capacities are related to the **Joint Group** of the timber as defined in AS1720 and AS1684. If the joint group of timber members joined together varies, the lower group must be assumed for design, eg: JD5 is lower than JD4.

DEFINITIONS

Special terms used in this guide are as defined in Australian standards, including:

Design Capacity: the maximum Limit State Design load (aka "action") which the product can safely support under the specified load condition, eg: 1.2G + 1.5Q (dead+roof live). *See General Notes for details (if applicable)*

Joint Group: classification of a timber according to its fastener-holding capacity. *See General Notes for details (if applicable)*

CORROSION PROTECTION

Most Pryda products are manufactured using Z275 light-gauge steel, having zinc coating of 275 gsm (total weight). This protection is adequate only for INTERNAL applications in most corrosion environments, except areas that are classified as heavy industrial or those subject to high humidity (eg: enclosed swimming pools) etc. Under these circumstances, seek advice from experts as special protection will be required. *Note: INTERNAL areas are those within the building envelope that are kept permanently dry*.

AS1684.2-2010 and AS1684.3-2010- *Australian Standards for Residential Timber Frame Construction* stipulates a minimum Z275 steel for all sheet metal products used in an internal environment.

In areas outside the building envelope that are exposed to repeated wetting (EXTERNAL areas), Pryda's stainless steel products or equivalent should be considered. Some alternatives include hot dip galvanised or powder coated steel, which are not supplied by Pryda. For more detailed information, read Pryda's Technical Update on *Corrosion Resistance of Pryda Products* or contact a Pryda office.

PRODUCT CERTIFICATION

Pryda Australia warrants:

* Products in this guide are free from defects in the material or manufacturing
* Design capacities are in accordance with test results or current, relevant Australian standards and the Building Code of Australia.
* Pryda products are structurally adequate provided they are designed, installed and used completely in accordance with this guide.

This warranty applies only to:

* products in this guide
* products used in the specified applications and not damaged after manufacture and supply
* joints free from wood splitting, decay or other timber defects within the joint or within 150 mm of the joint.

INSTRUCTIONS FOR INSTALLATION

These notes are provided to ensure proper installation.

1. All fasteners used must be manufactured by reputable companies and be of structural quality.
2. Connectors must not be installed on timber which is split before or during installation. If the timber is likely to split as fasteners are driven, fastener holes must be pre-drilled.
3. Do not overload the joints- during construction or in service.
4. Bolt hole diameter must be 0.8 mm to 1.5 mm larger than the bolt diameter and the specified washers must be installed.
5. Use proper safety equipment and due care in installing these connectors
6. Any gaps in joints between the timber members must not exceed 3 mm
7. Do not over-tighten screws.

Pryda Hangers & Truss Boots Guide

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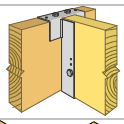
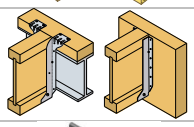
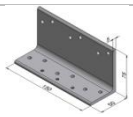
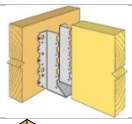
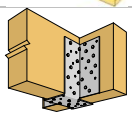
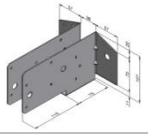
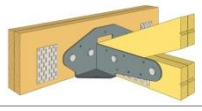
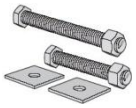
	**BEAM HANGERS** Heavy brackets for large size beams	5
	**I-JOIST HANGERS** Top mount and face mount hangers for timber I-joists	9
	**LVSIA – angle brackets** Brackets used as either angle cleat or angle seat	14
	**FRAMING BRACKETS** Brackets for beam to beam connections	15
	**JOIST HANGERS (HEAVY DUTY)** Brackets for heavy beam to beam or beam connections **Joist Hangers- Split**	18 19
	**TRUSS BOOTS – MULTI FIX** For Truss to Truss Connections with option for fixing with bolts and screws	20
	**TRUSS BOOTS – HEAVY DUTY** Bolted Steel Brackets for Heavy Roof Truss to Truss Connections	25
	**BOLTS KITS FOR TRUSS BOOTS** Kits of bolts, nuts and washers for fixing truss boots	29
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Product Information Updates
Information contained in this product guide is subject to change.
The latest updates are available from www.pryda.com.au.

GENERAL NOTES

Timber Joint Groups

Joint groups for some common timber are tabulated below. For further information refer Table H2.3 and H2.4 in Australian Standards AS1720.1:2010 — Timber Structures Part 1.

Timbers	Strength Group		Joint Group	
	Dry	Green	Dry	Green
Oregon (Douglas fir) – America	SD5	S5	JD4	J4
Oregon from elsewhere	SD6	S6	JD5	J5
Radiata pine, heart-excluded	SD6	NA	JD4	NA
Radiata pine, heart-in	SD6	NA	JD5	NA
Slash pine	SD5	S5	JD3	J3
Ash type hardwoods from Vic, NSW highlands & Tas	SD4	S4	JD3	J3
Non-Ash type hardwoods from Qld & NSW	SD3	S3	JD2	J2

Material Thickness

All material thicknesses referred to in this guide are the total coated thickness. This includes the zinc coating thickness, which is typically around 0.04mm for Z275 steel.

Design Load Cases

Following is a description of the combined load cases adopted in this design guide. These load cases are in compliance with AS/NZS1170.0:2002 – Structural design actions Part 0:General principles

Load Case	Description
1.35G	Permanent Action (*or Dead Load*) only
1.2G+1.5Qr	Permanent and Roof Imposed Actions (*or Dead & Roof Live*)
1.2G+1.5Qf	Permanent and Floor Imposed Actions (*or Dead & Floor Live*)
1.2G+Wd	Permanent and Wind down Actions (*or Dead & Wind down*)
Wind Uplift (0.9G – Wup)	Permanent and Wind Up Actions (*or Dead & Wind up*)

Design Loads & Capacities

The tabulated capacities are for Category 1 joints. For all other joints, reduce design capacities by using the following factors:

- Category 2 Joints: **0.94**
- Category 3 Joints: **0.88**

Note: Category 1 joints are defined in Table 2.2 AS1720.1:2010 as structural joints for houses for which failure would be unlikely to affect an area of 25 sqm OR joints for secondary elements in structures other than houses.

Fastener Usage Summary

Following is a summary of the common nails, screws and bolts used in hangers and truss boot fixing. Read the relevant page in this guide for a detailed specification for the respective hanger and truss oot.

	Pryda Timber Connector Nails (35 x 3.15 dia)	Pryda Timber Connector Nails (40 x 3.75 dia)	No.12 Type 17 screws	M12 Bolts with washers	M16 Bolts with washers
I joist Hangers		**Y**			
Framing Brackets	**Y**		**Y**		
HD Joist Hangers	**Y**				
LVSIA and HSB			**Y**		
Truss Boots			**Y**	**Y**	**Y**
HD Truss Boots			**Y****		**Y**

** Only used for TBHD75/T or TBHD75 out of the HD truss boots.

Note on Pryda Product Codes:

(a) No.12 Type 17 screws in the above table refer to either WTF12-35 or WSF12-35 or WTF12-65.

(b) M12 bolts refer to OBS12/65 or OBS12/100 set screws or OBM12/150 or OBM12/180 hex-head bolts used in conjunction with OW12/56S washers.

(c) M16 bolts refer to OBS16/110 set screws or OBM16/150 or OBM16/180 hex-head bolts used in conjunction with OW16/63S washers.

Machine Driven Nail Use

For Framing Brackets and HD joist hangers, 50 x 2.87mm Paslode Impulse nails may be used in lieu of Pryda Connector nails (35 x 3.15 dia), without any capacity reduction. Refer related pages for more details.

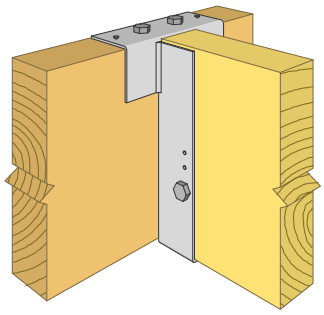
For I-joist hangers, a specific machine driven nail is not nominated, as the corresponding hand hammered nail is 3.75mm diameter. Contact Pryda office for advice

Fixing into steel supporting structure

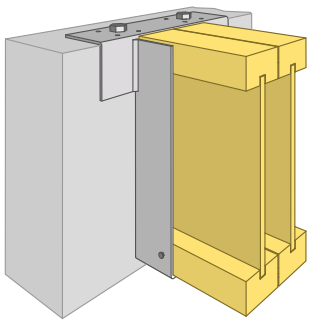
Pryda products can be fixed into steel using Teks screws or similar. Design Capacities can be obtained at request from a Pryda Design Office.

BEAM HANGERS

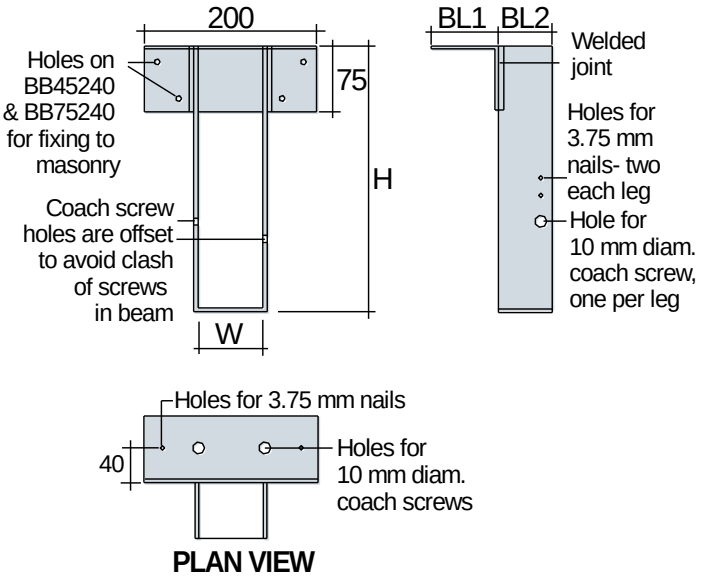
Heavy Brackets for Large Size Beams & I-joists



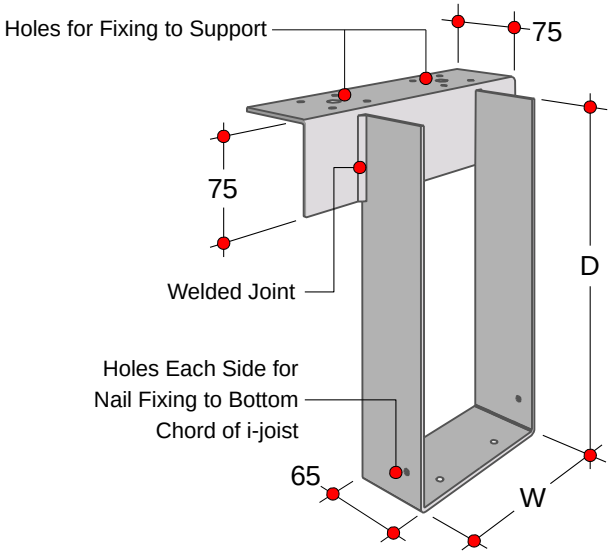
Beam Hanger for Beams



Beam Hanger for I-Joists



Beam Hangers for Beams (BB Series)



180mm wide Beam Hangers for double I-joists (BBT Series)

Description

Pryda Beam Hangers are heavy duty welded hangers for connection of large size beams or I-joists, ranging in thickness from 45 mm to 180 mm, to timber beams or masonry walls.

Features

Pryda Beam Hangers are:

- **easy to install** with a small number of coach screws and/or nails onto timber or with masonry anchors onto masonry or concrete
- an **economical** means of forming these connections
- ideal for supporting heavily loaded beams on fire rated brick walls, eliminating the need for a girder truss or false wall to support the beams
- additional top flange holes on two sizes to allow for easy casting into mortar joints
- 180mm wide hangers support double I-joists

Supply

Beam Hangers are supplied individually.

Dimensions

Dimensions of **Pryda Beam Hangers** are shown below.

Hanger Code	Dimensions (mm)			
	D	W	BL1	BL2
BB180	186	77	75	65
BB300	306	77	75	65
BBT180240	240	180	75	65
BBT180300	300	180	75	65
BBT180360	360	180	75	65

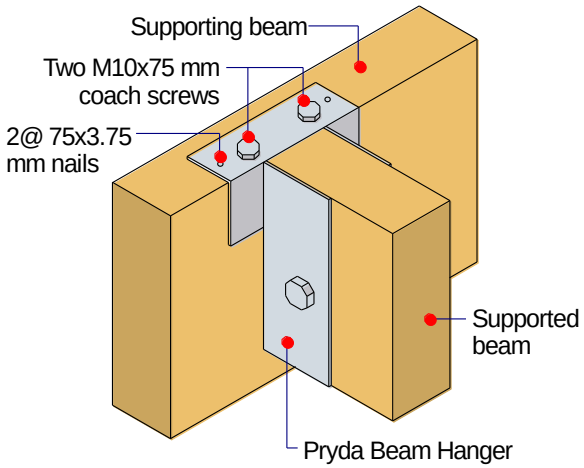
Specifications

Pryda Beam Hangers are manufactured out of G250, 3mm thick steel and are hot dipped galvanized to a minimum 300 gsm.

Installation

Fixing to Supporting Member
On timber supports, **Pryda Beam Hangers** can be installed using M10x75 mm coach screws, 75x3.75 mm galvanised flat head nails or a combination of both types of fasteners. Fix 45 mm thick supported beams to the Hanger with M10x50 mm coach screws, 50x3.75 mm nails or with both types of fasteners.

On concrete, use M10 Heavy Duty or Chemical Anchors and on masonry use Chemical Anchors or Anchorscrews. Consult Ramset Australia for types and capacities.



Installation on Timber Support Beam

Fixing to Supported Member

BB Series Hangers
Fix BB series hangers to supported timber beams with one M10x50 mm coach screw each side. If required for additional wind uplift capacity, also drive two 50x3.75 mm flat head nails from each side.

BBT Series Hangers
Fix BBT series hangers to timber I-joists or trusses with one 35x3.15 mm **Pryda Timber Connector Nail** each side and one 35x3.15 mm **Pryda Timber Connector Nail** up into each of the two I-joists or trusses, ie: four nails per hanger.

Design Capacities - General

The design capacity **of Pryda Beam Hangers** depends on the criteria for each load direction as follows:

Load Direction	Load Case	Design Criteria for:	
		Supporting Beam/Wall	Supported Beam
Down	1.35G, 1.2G + 1.5Qr 1.2G + Wd	Not critical	Bearing of the beam on bracket
Up	Wind Uplift	Withdrawal of fasteners	Shear at fixings

Design Capacities: Downward loads

Design **Permanent** load capacities (LSD) for Pryda Beam Hangers are tabulated below in Table D1. For live loads, increase these capacities by 20% for floors (1.2G+1.5Qf) or 35% for roofs (1.2G+1.5Qr).

Table D1. Supported Beam Bearing

Beam Thickness (mm)	Strength Group				
	Capacity Dry Timber for 1.35G load case				
	SD6	SD5	SD4	SD3	SD2
45	15.7	19.6	26.2	30.1	35.3
65	22.7	28.3	37.8	43.5	51.0
70	24.4	30.2	40.7	46.8	54.9
75	26.2	32.7	43.6	50.1	58.9
120	41.9	52.3	69.8	80.2	94.2
140	48.9	61.0	81.4	93.5	109.9
180	62.9	78.5	104.6	120.2	141.4

Note: For green timber of equivalent strength group (eg: S6 for SD6), **reduce** the above bearing capacities by half.

Design Capacities: Wind Uplift

For Beam Hangers for Beams (not the BBT Series for I-joists), capacities and fixings for wind uplift are as specified in the following tables:

Table U1. Supported Beam Fastener Shear

Beam Thick. (mm)	Fixing	Strength Group			
		Dry Timber			
		JD5	JD4	JD3	JD2
45	2/M10x50 mm Coach screws	3.8	6.5	10.1	11.3
	4/50x3.75 mm Nails	4.3	5.2	7.2	9.2
	Total	**8.1**	**11.7**	**17.3**	**20.5**
65 Min.	2/M10x75 mm Coach screws	9.8	12.1	14.5	15.4
	4/75x3.75 mm Nails	4.3	5.2	7.2	9.2
	Total	**14.1**	**17.3**	**21.7**	**24.6**

Table U2. Supporting Beam Fastener Withdrawal
Fixing: 2 coach screws & 2 nails

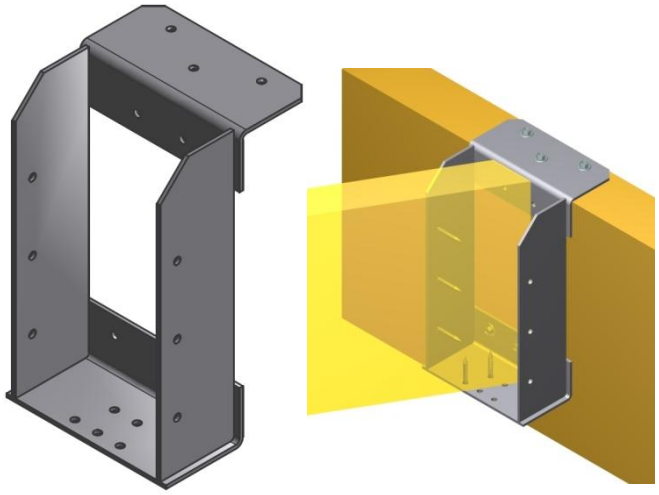
Green Timber			Dry Timber			
J4	J3	J2	JD5	JD4	JD3	JD2
9.6	13.2	17.6	8.2	11.1	16.1	19.2

Notes:
(a) The values in the above tables apply directly for Category 1 joints. Refer general Notes in page 4 for advice on how
the values should be reduced for Category 2 and Category 3 joints.

(b) For bearing and uplift capacities of concrete or masonry walls, consult a structural engineer.

BBT125240 BEAM HANGERS

Heavy Brackets for Large Strutting Beams



BBT125240
Beam Hanger

Description

Pryda BBT125240 Beam Hanger is a heavy duty welded hanger for connection of large sized strutting beams placed at angles between 30 and 60 deg, to timber beams or masonry walls. This bracket is commonly adopted in Western Australia.

Specifications

This Beam Hanger is manufactured from G300, 3mm thick steel and are hot dipped galvanized to a minimum 300 gsm.

Features

Pryda BBT125240 Beam Hanger is:

- **easy to install** with Type 17 screws
- an **economical** means of forming these connections
- provides superior uplift resistance compared to other conventional fixings
- suitable to use with a large range of beam sizes and connection angles (splays).

Supply

Code:	BBT125240
Brackets per carton:	8
Screws per Bracket:	14
Screw type:	No 12x35 Type 17 Hex-head screws

Dimensions

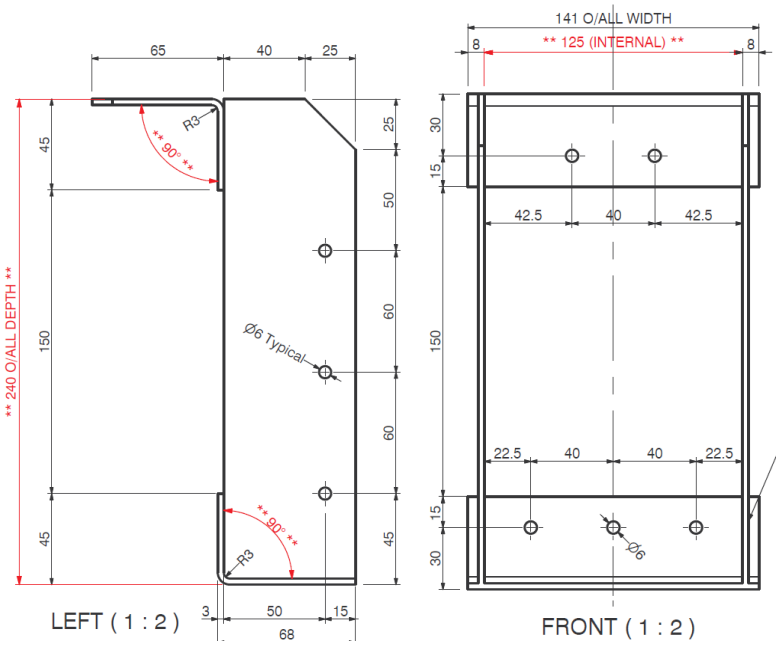
Dimensions of this Beam Hanger is shown below

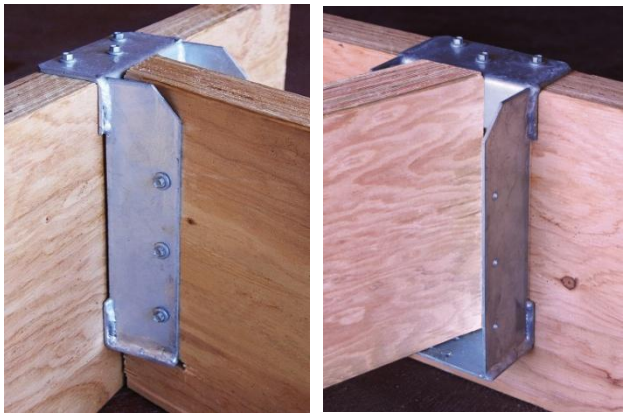
Design Capacities

The following capacity assumes that a minimum JD4 joint group is available at the connection.

Load Direction	Capacity (kN)
DOWNWARD	**15.0**
UPLIFT (light fixing)	**4.0**
UPLIFT (medium fixing)	**10.0**
UPLIFT (heavy fixing)	**20.0**

Note: refer next page for details of different fixing methods

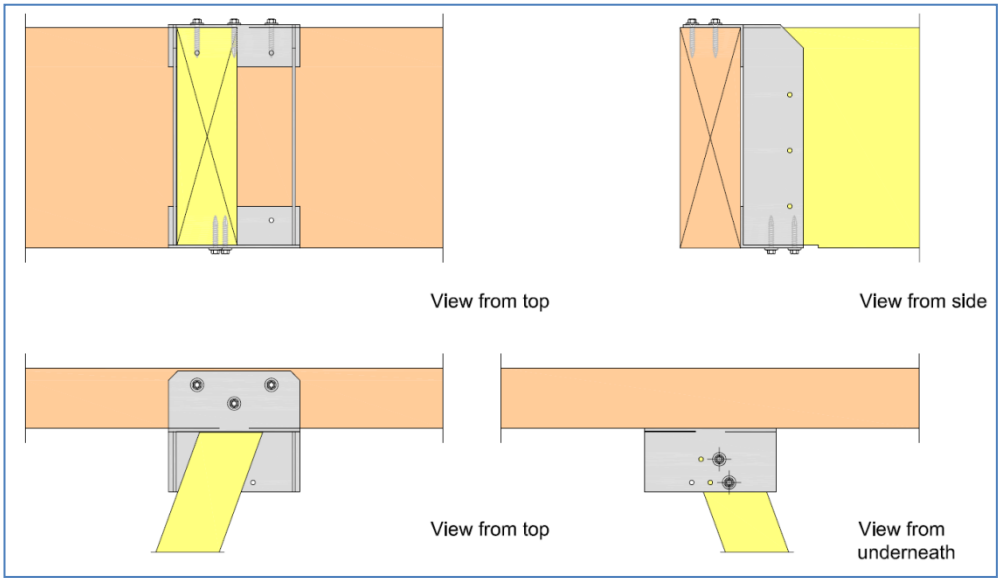




In application

BBT125240 BEAM HANGERS ….

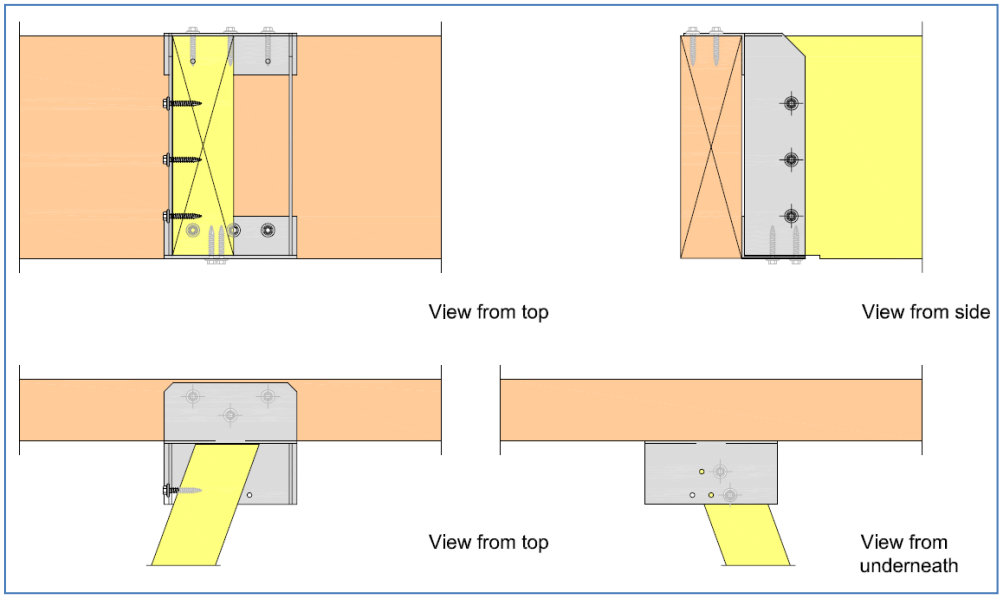
Fixing Methods



Light Fixing:

Supporting Beam:
3 screws on top

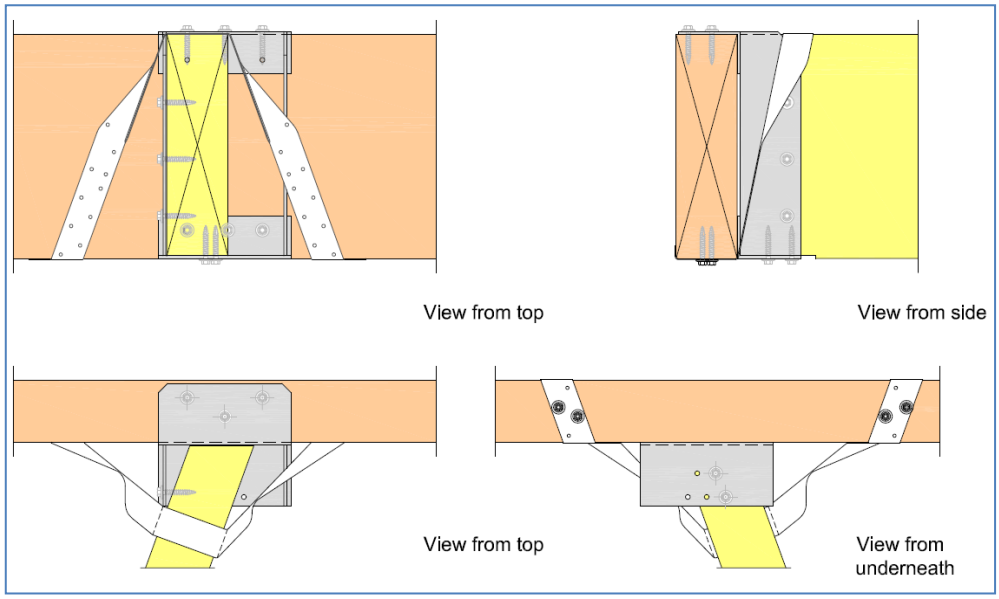
Supported Beam:
2 screws through bottom



Medium Fixing:

Supporting Beam:
3 screws on top and
3 screws through side

Supported Beam:
3 screws from side
2 screws through bottom

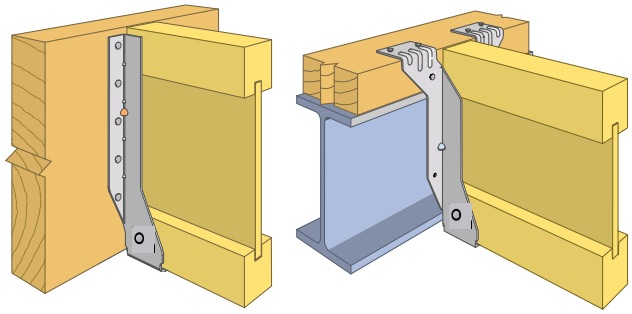


Heavy Fixing:

Medium Fixing in combination with a Cyclonic Strap.

I-JOIST HANGERS

Face mount and top mount hangers for timber I-joists



Features

Pryda I-Joist Hangers have features as follows:

- Ideally suited to **support of modern timber I-Joists**.
- Use of full depth hangers provides torsional restraint to the I-joist.
- There is provision for a screw through the hanger into the bottom of the bottom flange to minimize squeaking. A hole towards the bottom of each side flange is also available for fixing into bottom flange to further reduce the effect of squeaking.

Description

LT and LF types hangers are specifically designed for use with proprietary I-Joists such as Carter Holt Harvey hyJOIST, Tillings SmartFrame I-joist, Wesbeam e-joist and LP I joist. Refer guide on page 11.

LT type are for top fixing and LF for face fixing. LFVS are variable slope and skew. LFSL and LFSR are 45° degree skewed, left and right respectively. LVSIA type is a variable skew angle.

Specification

Dimensions are tabulated on the next page. All hangers are manufactured from G300 Z275 galvanised steel in 1.2 mm thickness, except for:

LFSL/SR	- 2.0 mm
LF220/105, LF300/105, LT240/105	- 1.6 mm
LT300/105, LT356/121	- 2.6 mm
LVSIA (G250, hot dip galv)	- 5 mm

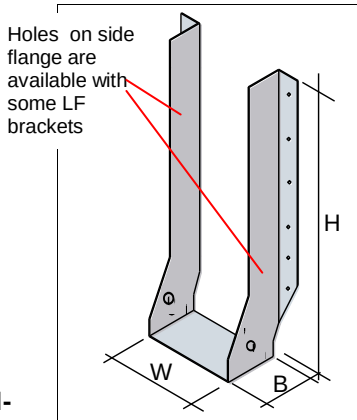
Packaging

All products are packaged in quantities of 25 per carton except some of the largest hangers which are sold 15 per carton and LVSIA at 10 per carton. See the **Price List** for details.

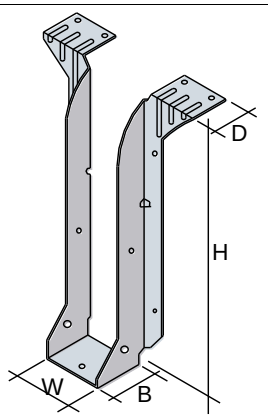
Details of the available range of **Pryda I-Joist Hangers** are tabulated in the following. 'Double' I-Joist Hangers are for support of two I-Joists, side by side or a single 90 or 120 mm wide I-Joist.

Bracket Types

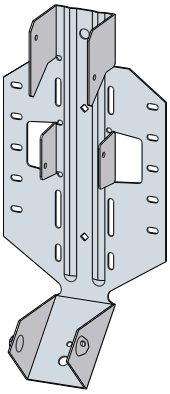
Pryda I-Joist Hanger types are illustrated below:



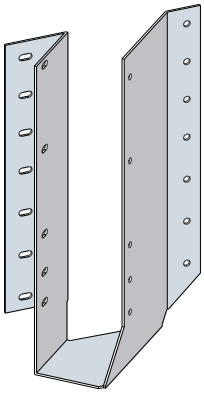
LF Type
Face Mount



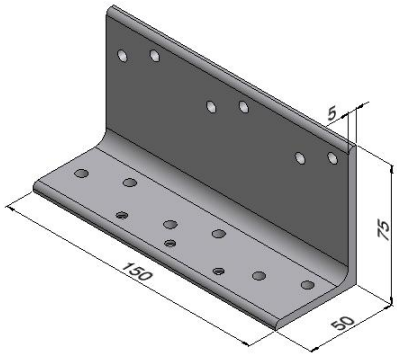
LT Type
Top Mount



LFVS Type
Variable Slope & Skew



LFSL/SR Type
45 deg Skewed Hanger



LVSIA Type
Angle Bracket

Dimensions H, B and W are tabulated in the **Dimension** tables following.

Note: Some LF hangers have holes on the side flanges as well. For example: LF190/90 (2 holes on each side flange), LF235/90 (3 holes each), LF 290/90 (4 holes each) and LF350/90 (5 holes on each side flange).

Dimensions

Dimensions as shown on previous page (Bracket Types) are as follows:

Face Mount

Product Code	H (mm)	W (mm)	B (mm)	Face Nail Holes
LF235/40	237	41	50	10
LF297/40	296	41	50	12
LF190/45	189	46	50	8
LF240/45	235	46	50	10
LF300/45	296	46	50	12
LF235/50	231	52	50	10
LF297/50	297	52	50	12
LF240/53	231	53	50	10
LF300/53	296	53	50	12
LF350/53	343	53	50	14
LF340/60	342	60	50	14
LF200/65	200	65	50	8
LF235/65	235	65	50	10
LF290/65	290	65	50	12
LF340/65	340	65	50	14
LF235/70	232	70	50	10
LF290/70	288	70	50	12
LF350/70	350	70	50	14
LF400/70	400	70	50	16
LF190/90	190	90	50	8
LF235/90	235	90	50	10
LF290/90	290	90	50	12
LF350/90	350	90	50	14
LF220/105	220	105	50	8
LF235/120	235	120	50	10
LF290/130	290	130	50	12
LF235/180	235	180	50	10

Top Mount

Product Code	H mm	W mm	B mm	D mm	Face Nail Holes	Top Nail Holes
LT240/40	240	40	50	40	4	6
LT300/40	300	40	50	40	4	6
LT200/45	200	45	50	40	4	6
LT240/45	240	45	50	40	4	6
LT245/45	245	45	50	40	4	6
LT300/47	300	47	50	40	4	6
LT200/50	200	50	50	40	4	6
LT240/50	241	50	50	40	4	6
LT240/52	240	52	50	40	4	6
LT300/52	302	52	50	40	4	6
LT360/60	246	60	50	40	4	6
LT200/65	200	65	50	40	4	6
LT240/65	240	65	50	40	4	6
LT245/65	245	63	50	40	4	6
LT302/65	302	65	50	40	4	6
LT360/65	356	65	50	40	4	6
LT240/70	240	70	50	40	4	6
LT300/70	300	70	50	40	4	6
LT200/90	200	90	50	40	4	6
LT240/90	240	90	50	40	4	6
LT245/90	245	90	50	40	4	6
LT300/90	300	90	50	40	4	6
LT360/90	360	90	50	40	4	6
LT400/90	302	105	50	40	4	6
LT240/105	240	105	50	40	4	6
LT300/105	300	105	50	40	4	6
LT356/121	356	121	76	40	4	6

Variable Slope & Skew, Face Mount

Product Code	H (mm)	W (mm)	B (mm)	Face Nail Holes
LF215/90SL	215	90	64	16
LF215/90SR	215	90	64	16
LF275/60SL	275	60	64	16
LF275/60SR	275	60	64	16
LF190/47VS	190	47	70	10
LF224/59VS	224	59	70	14
LF224/65VS	224	65	70	14
LF224/90VS	224	90	70	14

Installation - Fixing

1. Use only 40x3.75 mm galvanised **Pryda Timber Connector Nails**, Pryda product code OSNIB/1 or OSNIB/5.
2. For screwing the joist to the hanger seat, use No. 6 x 30 mm bugle-head or wafer-head wood screws.
3. All nail holes are to be filled with the specified nails in order to achieve hanger capacity.

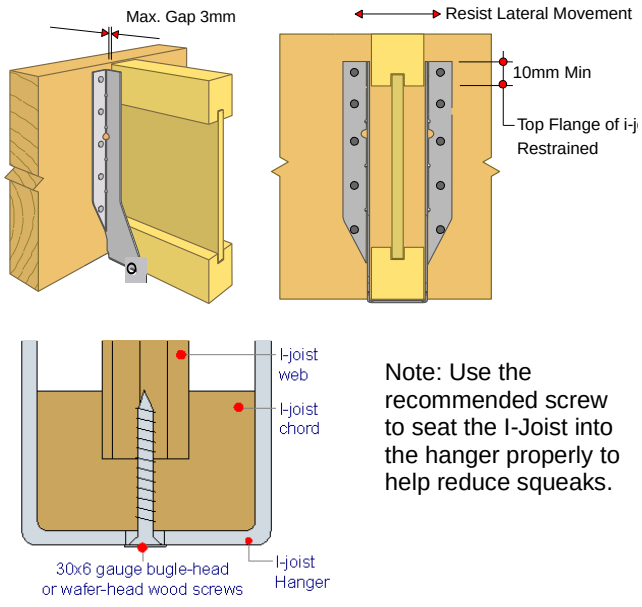
Installation

To achieve the specified design loads, **Pryda I-Joist Hangers** must be correctly installed as specified in the following topics:

Installation - General

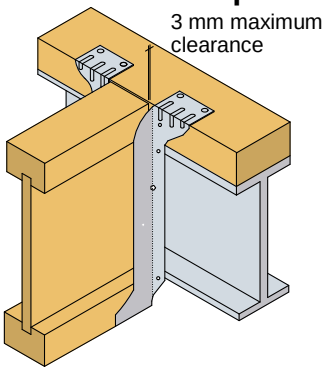
Refer to I-joist manufacturers' instruction manuals for span table selection and other details for on-site installation of their systems.

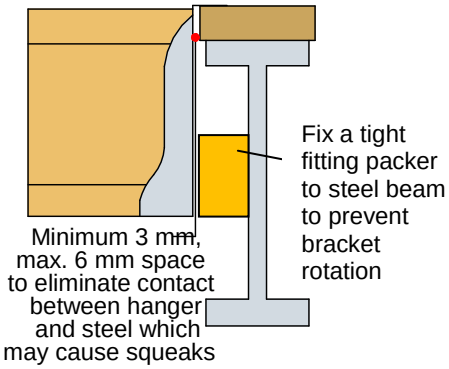
Installation – Face Mount Hangers

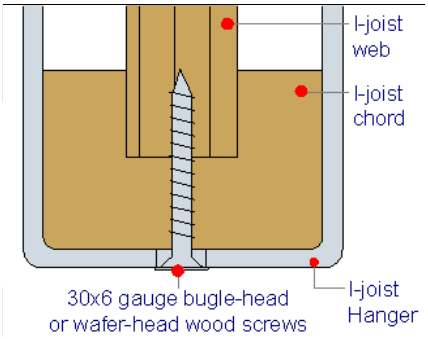


Note: Use the recommended screw to seat the I-Joist into the hanger properly to help reduce squeaks.

Installation – Top Mount Hangers

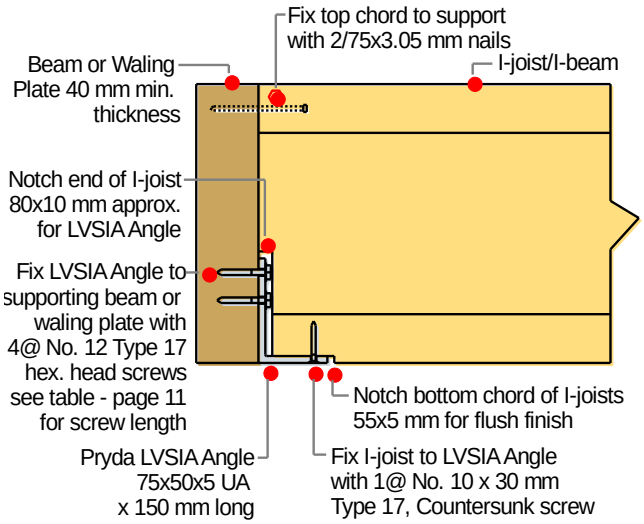






Note: Use the recommended screw to seat the I-Joist into the hanger properly to help minimize squeaks. Alternatively, if nails are used from sides (holes available with some LT brackets), ensure **special nails** are adopted to avoid squeaks from nails coming in contact with the hanger's seat. Packers will be required as noted if the hanger is shorter than the supporting beam.

Installation – LVSIA



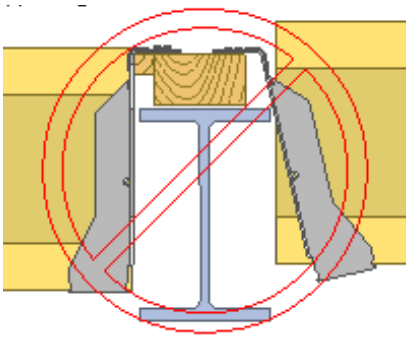
Installation- Variable Skew Angles

LVSIA variable skew angles are installed as shown in the following diagram, ie:

1. Notch the I-joist at ends to provide for fitting the LVSIA.
2. Locate the angle with the 75 mm leg vertical and its mid-length at the middle of the required end location of the I-joist. Fix the angle to the supporting beam, waling plate or ledger with 4 or 6 No. 12 Type 17 screws. *Note: The capacities in page 10 are given for 35mm screw lengths, but 40mm screw lengths may be used to achieve increased capacities*.
3. Locate the I-joist on the angle and fix it up through the bottom of angle with 1@ No. 10 x 30 mm countersunk or bugle head Type 17 screw.
4. Nail the I-joist top chord to the support with 2/75x3.05 mm nails.

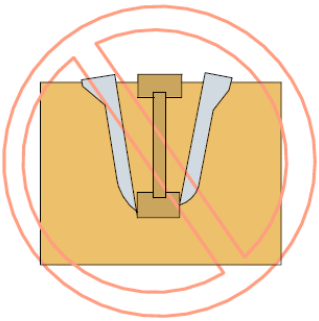
Installation – Common Problems

Poor or incorrect installation can lead to serious problems. Common problems are illustrated opposite:

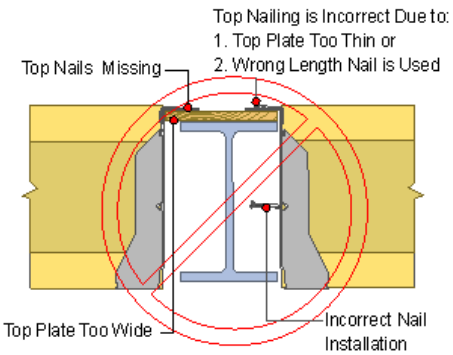


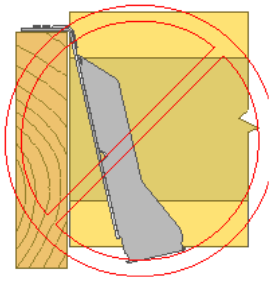
If the top plate is too narrow it may cause:

1. Hanger Deformation.
2. Nail pull-out or shear.
3. Supporting beam deformation



Spreading hanger legs will push the joist up which may cause un-even floors, squeaky floors and joist rotation.





Joist is not seated properly in to the hanger. This may cause nail pull-out.

Design Capacities

Tabulated below are design capacities for Pryda I-joist Hangers fixed with the number of nails tabulated. "Face nails" are driven into the face of the supporting beam, "Top nails" into the top of the supporting beams and "Joist nails" into the carried member.

General Notes

1. For joints on primary beams in structures other than houses, see General Notes in page 4 for information.
2. Fixing into supporting member : Use only Pryda 40x3.75mm or 35x3.75 mm galvanised **Pryda Timber Connector Nails**, or equivalent for all LF and LT brackets. No.12 Type 17 screws to be used for fixing LVSIA bracket.
3. "Dead" is permanent load plus any portion of imposed load considered to be permanent.

Face Mounted Hangers

With a minimum of eight face nails, these hangers can carry the design residential floor loads of (1.5 kPa live) for joists up to 5.9 m span at 600 mm spacing or 7.9 m span at 450 mm spacing, provided that the timber in supporting beams has a joint group of JD4 or better.

Hanger Codes	Face Nails	1.2G + 1.5Qf (Dead & Floor Live) Design Capacity, ΦN_j (kN), for Supporting Beam with Joint Group:		
		JD5	JD4	JD3
All LF190/.. and LF220/..	8	5.2	6.2	8.7
LF 235/.., LF240/..	10	6.4	7.8	10.9
All LF290/.. LF297/.. LF300/..	12	7.7	9.3	13.1
All LF340/.. LF350/.., LF356/..	14	9.0	10.9	14.2
LF400/70	16	10.4	12.4	17.4

Note: Where these hangers are fixed to a 35 mm thick supporting member, use the 35x3.75 mm nails and multiply design capacities by 0.88.

Top Mounted Hangers

The design capacities of top mounted brackets is greater than that required to support the applied residential floor loads (1.5 kPa live) for the I-joist products listed in this file.

Hanger Code	Top Nails (incl. both top mount tab)	1.2G + 1.5Qf (Dead & Floor Live) Design Capacity, ΦN_j (kN), for Supporting Beam with Joint Group:		
		JD5	JD4	JD3
All LT series	6	4.8	5.7	6.1

Note: 4 nail (2 nails on each tab) fixing may be used at reduced capacities of 4.0 (JD5), 4.7 (JD4), 5.1 (JD3).

Variable Slope & Skew Hangers

Typically used to support I-joists used as roof rafters.

Hanger Code	Face Nails	Joist Nails	Design Capacity, ΦN_j (kN), for Supporting Beam with JD5 or Higher Joint Group for Load Case:		
			1.35G	1.2G+1.5Qr	Wind Uplift
LF190/47VS, LF224/59VS	10	7	2.8	4.6	3.2
LF224/65VS, LF224/90VS	14	12	4.0	6.4	4.5

Notes:

1. Most of these brackets are suitable for applications where the supported member (eg: rafter) is placed at angles betweens 45 deg and 90 deg to the supporting member (eg: roof beam). However, LF224/90VS is only suitable for angles of 22.5 deg from either side of the perpendicular.
2. These brackets are not suitable for floor joists.
3. Where these hangers are fixed to a 35 mm thick supporting member, use the 35x3.75 mm nails and multiply design capacities by 0.88.

Skewed Hangers

Typically used to support I-joists used in floors at 45° to the supporting beam.

Hanger Code	Face Nails	Joist Nails	Design Capacity, ΦN_j (kN), for Supporting Beam with JD5 or Higher Joint Group for Load Case:
			1.2G+1.5Qf (Dead & Floor Live)
LF215/90SL/R LF275/60SL/R	16	10	5.4

Note: Where these hangers are fixed to a 35 mm thick supporting member, use the 35x3.75 mm nails and multiply design capacities by 0.88.

Variable Skew Angles

Used to support I-joists at an angle other than 90° to the support, LVSIA design capacities are:

Fixing in to supporting member using No.12x35 Type 17 screws	Screw Length (mm)	1.2G+1.5Qf (Dead&Floor live) Design Capacity, ΦN_j (kN), for Supporting Beam with Joint Group:		
		JD5	JD4	JD3
4 screws	35	3.9	5.5	7.8
6 screws	35	5.8	8.2	11.5

Notes:

- For joints on primary beams in structures other than houses, see General Notes in page 4 for information.
- Capacities of LVSIA in other applications are given in page 14
- Fixing into joist - An additional No.10x30 Type 17 counter-sunk screw is required on horizontal leg,
- The capacities may be increased by 15% if 40mm screw lengths are used in to 45mm or thicker supporting beam.

I-Joist Hanger Cross Reference Guide

The recommended size of **Pryda I-Joist Hangers** for support of proprietary I-joists in house floors is as follows:

I-joist Code	I-joist Size (mm)	Face Mount Hanger Code	Top Mount Hanger Code	Variable Slope & Skew Rafter Hanger Code	Variable Skew Hanger Left Code	Variable Skew Hanger Right Code	Double I-joist Hanger Code Face Mount	Double I-joist Hanger Code Top Mount
Carter Holt Harvey hyJOIST								
HJ200-45	200x45	LF190/45	LT200/45	LF190/47VS*	LVSIA	LVSIA	JHH100*	N/A
HJ240-45	240x45	LF240/45	LT240/45	LF190/47VS*	LVSIA	LVSIA	JHH100*	N/A
HJ300-45	300x45	LF300/45	LT300/47	LF190/47VS*	LVSIA	LVSIA	LF220/105*	N/A
HJ240-63	240x63	LF235/65	LT240/65	LF224/65VS*	LVSIA	LVSIA	N/A	N/A
HJ300-63	300x63	LF290/65	LT302/65	LF224/65VS*	LVSIA	LVSIA	LF290/130	N/A
HJ360-63	360x63	LF340/65	LT360/65	LF224/65VS*	LVSIA	LVSIA	LF290/130*	N/A
HJ240-90	240x90	LF235/90	LT240/90	LF224/90VS*	LF215/90SL*	LF215/90SR*	LF235/180	BBT180240
HJ300-90	300x90	LF290/90	LT300/90	LF224/90VS*	LF215/90SL*	LF215/90SR*	LF235/180*	BBT180300
HJ360-90	360x90	LF350/90	LT360/90	LF224/90VS*	LF215/90SL*	LF215/90SR*	LF235/180*	BBT180360
HJ400-90	400x90	LF350/90	LT400/90	LF224/90VS*	LF215/90SL*	LF215/90SR*	LF235/180*	N/A
Tillings SmartFrame Joist								
SJ24040	240x40	LF235/40	LT240/40	N/A	LVSIA	LVSIA	N/A	N/A
SJ30040	300x40	LF297/40	LT300/40	N/A	LVSIA	LVSIA	N/A	N/A
SJ20044	200x44	LF190/45	LT200/45	LF190/47VS*	LVSIA	LVSIA	LF190/90	NA
SJ24051	240x51	LF235/50	LT240/52	N/A	LVSIA	LVSIA	LF220/105	LT240/105
SJ30051	300x50	LF297/50	LT300/52	N/A	LVSIA	LVSIA	LF220/105*	LT300/105
SJ36058	360x58	LF340/60	LT360/60	LF224/59VS*	LF275/60SL*	LF275/60SR*	LF235/120*	LT356/121
SJ24070	240x70	LF235/70	LT240/70	N/A	LVSIA	LVSIA	LF235/140	LT240/140
SJ30070	300x70	LF290/70	LT300/70	N/A	LVSIA	LVSIA	LF290/140	LT300/140
SJ24090	240x90	LF235/90	LT240/90	LF224/90VS*	LF215/90SL*	LF215/90SR*	LF235/180	BBT180240
SJ30090	300x90	LF290/90	LT300/90	LF224/90VS*	LF215/90SL*	LF215/90SR*	LF235/180*	BBT180300
SJ36090	360x90	LF350/90	LT360/90*	LF224/90VS*	LF215/90SL*	LF215/90SR*	LF235/180*	BBT180360
SJ40090	400x90	LF350/90*	LT400/90	LF224/90VS*	LF215/90SL*	LF215/90SR*	LF235/180*	NA
Wesbeam e-joist								
EJ20045	200x45	LF190/45	LT200/45	LF190/47VS*	LVSIA	LVSIA	JHH100*	NA
EJ24045	240x45	LF240/45	LT240/45	LF190/47VS*	LVSIA	LVSIA	JHH100*	NA
EJ24545	245x45	LF240/45	LT245/45	LF190/47VS*	LVSIA	LVSIA	JHH100*	NA
EJ24051	240x51	LF235/50	LT240/52	N/A	LVSIA	LVSIA	LF220/105	LT240/105
EJ24090	240x90	LF235/90	LT240/90	LF224/90VS*	LF215/90SL*	LF215/90SR*	LF235/180	BBT180240
EJ30045	300x45	LF300/45	LT300/47	LF190/47VS*	LVSIA	LVSIA	LF220/105*	NA
EJ30051	300x51	LF297/50	LT300/52	N/A	LVSIA	LVSIA	LF220/105*	LT300/105
EJ30090	300x90	LF290/90	LT300/90	LF224/90VS*	LF215/90SL*	LF215/90SR*	BBT180/300	BBT180300
EJ24563	245x63	LF235/63	LT245/65	LF224/65VS*	LVSIA	LVSIA	N/A	N/A
EJ36063	360x63	LF340/65	LT360/65	LF224/65VS*	LVSIA	LVSIA	LF290/130*	N/A
EJ36090	360x90	LF350/90	LT360/90	LF224/90VS*	LF215/90SL*	LF215/90SR*	LF235/180*	BBT180360
EJ40090	400x90	LF350/90 *	LT400/90	LF224/90VS*	LF215/90SL*	LF215/90SR*	LF235/180*	N/A
LP I Joist								
LPI 225x53	225x53	LF225/53	N/A	N/A	LVSIA	LVSIA	N/A	N/A
LPI 241x53	241x53	LF240/53	LT240/52	N/A	LVSIA	LVSIA	N/A	N/A
LPI 302x53	302x53	LF300/53	LT300/52	N/A	LVSIA	LVSIA	N/A	N/A
LPI 356x53	356x53	LF356/53	N/A	N/A	LVSIA	LVSIA	N/A	N/A
LPI 225x70	225x70	LF225/70	N/A	N/A	LVSIA	LVSIA	N/A	N/A
LPI 241x70	241x70	LF235/70	LT240/70	N/A	LVSIA	LVSIA	LF235/140	LT240/140
LPI 302x70	302x70	LF290/70	LT300/70	N/A	LVSIA	LVSIA	LF290/140	LT300/140
LPI 356x70	356x70	LF350/70	N/A	N/A	LVSIA	LVSIA	N/A	N/A
LPI 406x70	406x70	LF400/70	N/A	N/A	LVSIA	LVSIA	N/A	N/A

Notes: 1. For hangers marked *, web stiffeners must be installed in accordance with the I-joist manufacturers' specification.

2. JHH100 are **Heavy Duty Joist Hangers**

LVSIA ANGLE BRACKET

Applications

LVSIA is a versatile bracket that can be used in a 'horizontal' direction as an angle SEAT to support beams or trusses coming in at any direction. This angle bracket can also be used in a 'vertical' direction as an angle CLEAT for beam to beam connections especially in situations where normal joist hangers cannot be used.

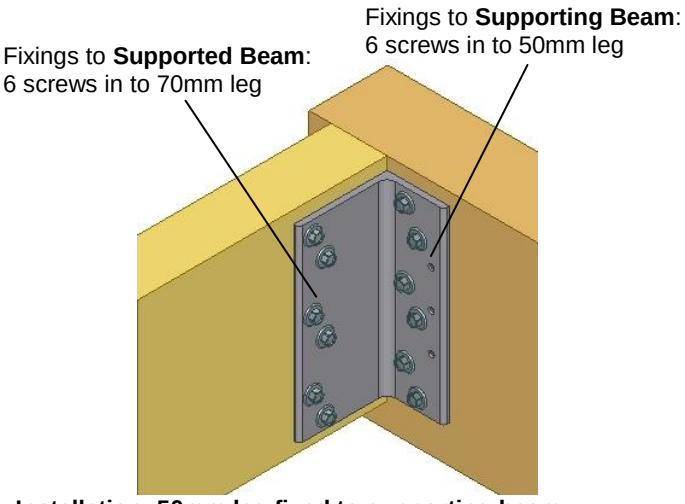
Specifications

LVSIA bracket is a 150mm long x 5.0mm thick un-equal angle of size 75 x 50 x 5.0 using G300 galvanized steel.

Design Capacities

(A) 'Vertical' Application as an angle CLEAT– Bracket fixed only on one face

Fixings – 6/No.12 x 35 Type 17 hex-head screws on each leg.



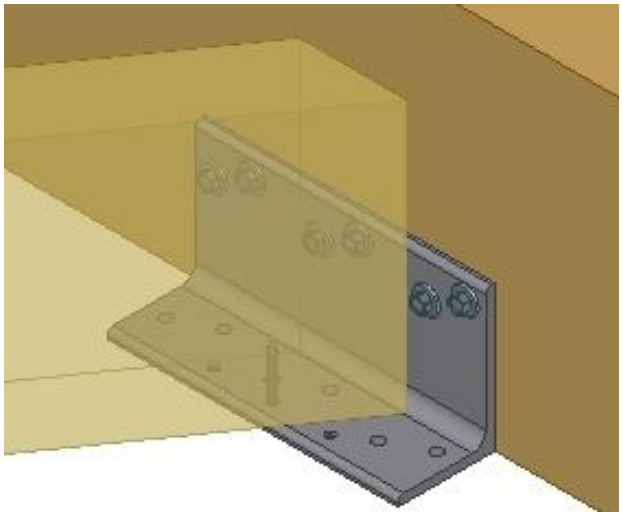
Installation: 50mm leg fixed to supporting beam

JOINT GROUP	Single LVSIA as an angle cleat for given Load Cases			
	1.35G	1.2G+1.5Qf	1.2G+1.5Qr	Wind Uplift
JD4	4.8	5.8	6.4	8.6
JD3 (1)	6.7	8.0	9.0	13.3

Notes:
(1) Provide 2/No.14 x 90 Type 17 screws from the back of supporting beam in to end-grain of supported beam to resist twisting of supporting beam. Use longer screw lengths if required to ensure a minimum 35mm penetration.
(2) When the supported member used is prone to splitting (like hardwoods-JD3), additional precautions should be taken.
These can be in the form of prebored holes or provision of anti-split nailplates at ends of the supported beam.
(3) Screws with longer lengths are required when LVSIA brackets are fixed into multiple laminated beams. For double laminates, use 65 long screws per flange.
(4) Increase capacities by 15% for 40mm long screws.

(B) 'Horizontal' Application as an angle SEAT

Fixings – 6/No.12 x 35 Type 17 hex-head screws on vertical leg and 1/No.10x30 Type 17 counter-sunk screw on horizontal leg.



JOINT GROUP	LOAD CAPACITIES(kN) for LVSIA as an angle seat for given Load Cases			
	1.35G	1.2G+1.5Qf	1.2G+1.5Qr	Wind Uplift
JD5	4.8	5.8	6.5	1.0
JD4	6.7	8.2	9.1	1.4
JD3	9.5	11.5	12.9	1.8

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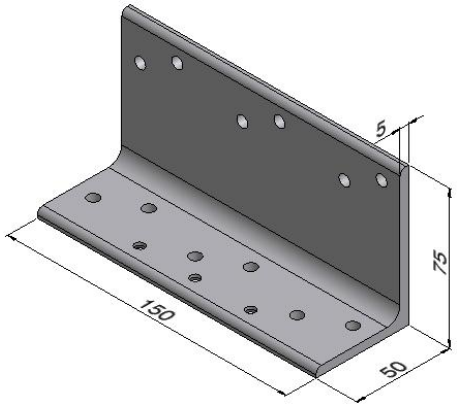
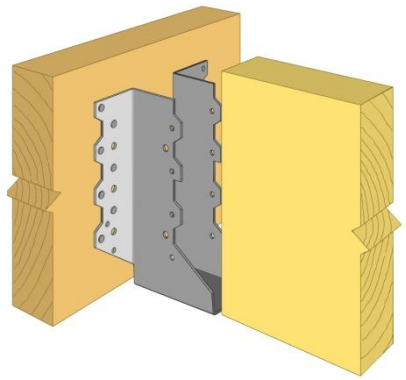
Notes:
(1) The above table values may be increased by 15% if 40mm screw lengths are used

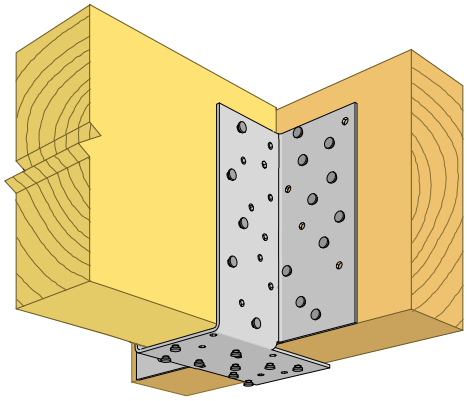


FRAMING BRACKETS AND HEAVY DUTY JOIST HANGERS

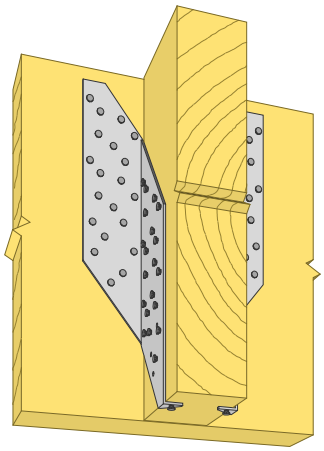
Brackets for Beam to Beam or Beam to Brickwork/Concrete Connections



Framing Bracket for beam to beam Connections



Heavy Duty Joist Hanger for Large Sizes, Heavy Loads



Split Joist Hanger for Heavy Loads

General Description

Pryda Framing Brackets, **Split Joist Hangers** and **Heavy Duty Joist Hangers** have been preferred and used in Australia and overseas for more than 20 years. They are strong, easy to install, cost effective, well designed connectors for many timber beam to beam and beam to concrete or masonry joints.

The wide range of these brackets provides for all common timber sizes and for glued laminated timber beams. These brackets have been designed to achieve high design loads at low cost through incorporating Pryda's extensive design expertise and taking account of the results of laboratory testing at Monash University in Melbourne.

Advantages

In addition to being well designed and laboratory tested, **Pryda Framing Brackets** (formerly called Pryda Joist Hangers) are:

- **cost effective**, eliminating the need for costly on-site skilled labour to make special housing for joints etc.
- **easily fixed into position** with **Pryda Timber Connector Nails**, or self drilling screws. These hangers have wide flanges for ease of nailing and screwing.

Framing Bracket Size Selection

To establish a suitable Framing Bracket size, determine:

1. The **joint group** of the timber to be jointed.

   Joint groups are specified in AS1720.1 SAA Timber Structures Code and in Pryda Timber Data. Groups for some timbers commonly used in Australia are:

Timbers	Joint Group	
	Dry	Green
North American Oregon, western Hemlock	JD4	J4
Heart-excluded Radiata pine and other softwoods	JD4	J4
Pine as above – heart-in	JD5	
Slash pine	JD3	J3
Ash type hardwoods from Victoria, NSW highlands and Tasmania	JD3	J3
Non-Ash type hardwoods from Queensland and NSW	JD2	J2

   Note: The moisture content of "dry" timber must not exceed 15%. Where beams of different joint groups are to be joined together, apply the lower group to both.

2. **Loads** to be supported.
   Applied loads are to be calculated in accordance with appropriate standards. These loads (reactions) can also be obtained from **Pryda Build** software.
3. **Thickness of beam, truss or joist** to be supported and **supporting beam thickness**.
   Ensure 1 or 2 mm tolerance is considered when selecting the appropriate Bracket/Hanger for the given beam or truss thickness. The internal dimensions (thickness) of the bracket or hanger are provided in this guide.
4. **Fixing method**: nails or screws or both.
5. **Bracket/Hanger size** from the design capacity tables in this guide based on the above data.

Description

This section covers properties of **Pryda Framing Brackets**, formerly known as Joist Hangers.

Features

Pryda Framing Brackets are suitable for many joints including:

- joist to beam
- jack to TG truss
- ceiling joist to hanger
- floor truss to beam
- pergola rafters to fascia
- beams to masonry

Installation

Fix Framing Brackets to supporting beams **using either nails or screws, not both types of fasteners.**
Suitable Fasteners are:

Nails: Use only 35 x 3.15 mm, galvanised Pryda Timber Connector Nails or 50x2.87 mm Paslode Impulse galvanized screw hardened D head nails (Code: B20573V) driven through the metal- not into the holes. Note: The use of 50x2.87 nails should be restricted to timber thicknesses of 50mm or more.

Screws: **No. 12x35 mm Type 17 hex head screws** (code: WTF12-35).

See the Design Capacities table on the following page for the maximum number of nails or screws for each Framing Bracket.

Specification

Dimensions (sizes) are as shown here. All framing brackets are manufactured from G300 Z275 galvanised steel in 1.0 mm thickness.

Packing

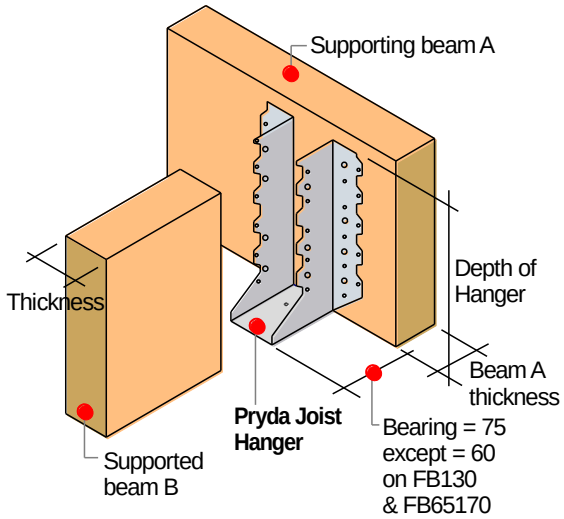
Framing Brackets are supplied in cartons as follows:

Product Codes	Carton Number
FB: 3860*, 5060*, 3590*, 3890*, 4590*, 5090*, 35120*, 38120*, 45120*, 50120*	45
FB: 35140*, 38140*, 45140*, 50140*	40
FB: 35180, 45180*, 50180*	30
FB: 60130, 65170, 70200, 90200, 72163, 94152	25
FB: 38220, 45220, 50220*	15

Notes:

1. * Means also available as an individually barcoded **Merchant Pack**.
2. Available in stainless steel are: FB3590, FB3890, FB4590 and FB5090- sold by piece.

Dimensions



Code	Thick-ness**	Depth	Code	Thick-ness**	Depth
FB3860	39	60	FB3590	36	82
FB3890	39	80	FB35120	36	116
FB38120	39	115	FB35140	36	139
FB38140	39	138	FB35180	36	182
FB38180	39	180	FB4590	46	77
FB38220	39	220	FB45120	46	110
FB5090	50	75	FB45140	46	134
FB50120	50	108	FB45180	46	176
FB50140	50	132	FB45220	46	216
FB50180	50	174	FB70200	71	194
FB50220	50	214	FB90200	91	194
FB60130	60	120	FB72163	72	163
FB65170	65	167	FB94152	94	152

Note: FB70200, FB72163, FB90200 and FB94152 are suited to support of **Pryda Longreach** or **Pryda Span floor trusses**.

** Thickness here refers to the internal dimension of the bracket between flanges, facilitating beam thickness.

Design Capacities per Framing Bracket

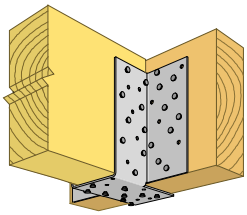
Framing Bracket Code	Fixing to Supporting Beam (Beam A)	1.2G+1.5Qf (Dead +Floor Live Load) Design Capacity ϕN_j (kN) for Joint Group:			Fixing to Supported Beam (Beam B)	Wind Uplift (k1 = 1.14) Design Capacity ϕN_j (kN) for Joint Group:			
		JD5	JD4	JD3	mm	JD5	JD4	JD3	Max.
FB3860	6 Nails	2.9	3.4	4.8	3 nails	2.4	2.8	3.9	4.5
	2 Screws	2.1	3.0	4.3	2 screws	3.5	5.0	5.0	5.0
FB3590, FB3890 FB4590, FB5090	8 Nails	3.8	4.6	6.4	4 nails	3.2	3.7	5.3	6.0
	4 Screws	4.3	6.1	8.5	2 screws	3.5	5.0	5.0	5.0
FB35120, FB38120 FB45120, FB50120	12 Nails	5.3	6.4	8.9	6 nails	4.7	5.7	7.9	9.0
	6 Screws	6.4	9.1	12.8	4 screws	7.1	10.0	10.0	10.0
FB35140, FB38140 FB45140, FB50140	16 Nails	7.0	8.4	11.8	8 nails	6.2	7.5	10.6	12.0
	6 Screws	6.4	9.1	12.8	4 screws	7.1	10.0	10.0	10.0
FB35180, FB38180, FB45180, FB50180	20 Nails	8.6	10.3	14.4	10 nails	7.4	8.9	12.4	15.0*
	8 Screws	8.6	12.1	15.0*	6 Screws	10.6	15.0*	15.0*	15.0*
FB38220, FB50220 FB45220	26 Nails	11.0	13.1	15.0*	13 nails	9.5	11.3	15.0*	15.0*
	10 Screws	10.1	14.2	15.0*	8 Screws	14.2	15.0*	15.0*	15.0*
FB60130	12 Nails	5.3	6.4	8.9	3 nails	2.4	2.8	3.9	4.5
	4 screws	4.3	6.1	8.5	7 nails	5.4	6.6	9.3	10.5
					4 screws	7.1	10.0	10.0	10.0
FB65170	18 Nails	7.8	9.3	13.1	6 nails	4.7	5.7	7.9	9.0
	6 screws	6.4	9.1	12.8	11 nails	8.1	9.8	13.6	15.0*
					6 screws	10.6	15.0*	15.0*	15.0*
FB70200	24 Nails	10.0	11.9	15.0*	3 nails	2.4	2.8	3.9	4.5
	10 Screws	10.1	14.2	15.0*	13 nails	9.6	11.6	15.0*	15.0*
					7 screws	12.3	15.0*	15.0*	15.0*
FB72163	18 Nails	7.8	9.4	13.0	3 nails	2.4	2.8	3.9	4.5
	6 screws	6.4	9.1	12.8	10 nails	7.4	8.9	12.4	15.0*
					6 screws	10.6	15.0*	15.0*	15.0*
FB90200	26 Nails	10.8	12.9	15.0*	3 nails	2.4	2.8	3.9	4.5
	10 Screws	10.1	14.2	15.0*	13 nails	9.6	11.6	15.0*	15.0*
					8 screws	14.2	15.0*	15.0*	15.0*
FB94152	18 Nails	7.8	9.3	13.1	3 nails	2.4	2.8	3.9	4.5
	6 screws	6.4	9.1	12.8	10 nails	7.4	8.9	12.4	15.0*
					6 screws	10.6	15.0*	15.0*	15.0*

Notes:

1. Beam A = Supporting, Beam B = Supported – see diagram on the previous page.
2. The above tabulated capacities are for a minimum Beam A thickness of 35 mm.
3. Framing Bracket capacity has been limited to 15.0 kN (shown '*').
4. The values in the table apply directly for Category 1 joints. Refer general Notes in page 4 for advice on how the values should be reduced for Category 2 and Category 3 joints.
5. For FB60130 and FB65170 brackets, wind uplift – dead load values have been reduced due to a shorter end distance on the supported beam compared to the other brackets.
6. For FB70200 to FB94152, the wind uplift 3 Nails fixing option allows for fixing to the chords only of I-beams or trusses.
7. Multiple Laminated Supporting Beams - Fasteners with longer lengths are required when Joist Hangers are fixed into a multiple laminated supporting beam. For double laminates, use 65 long nails or screws. Alternatively, for double or triple laminated supporting beams, additional fixings may be provided at hanger locations to laminate plies. Seek advice from the Engineer.

JOIST HANGERS – HEAVY DUTY

Heavy Duty Hanger for Large Sizes, Heavy Loads



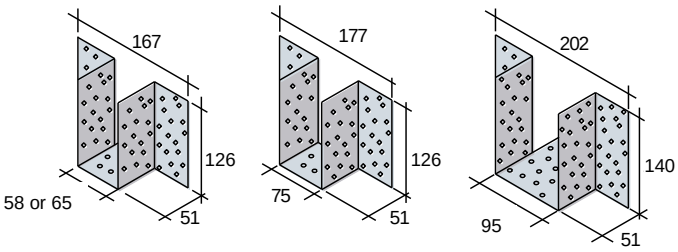
JHH.. Hanger

Features

Pryda Heavy Duty Joist Hangers are designed to support heavily loaded timber beams or two ply trusses on supporting timber beams or girder trusses. All have tongues for fixing to supports to resist twisting and rotation.

Specification

Steel:	1.2 mm Zincform® G300-Z275
Packing	10 per carton
Sizes:	As below:



JHH 58 or JHH65 **JHH 75** **JHH100**

Dimensions

Note: The internal dimension of the JHH100 hanger is only 95mm, specially designed to cater for 2/45 thick beams, i-joists or trusses or 90mm thick floor trusses or equivalent.

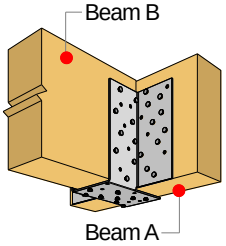
JHH75 (internal dimension of 75mm) is suitable for 2/35 thick beams or trusses or 70mm thick floor trusses or equivalent.

Installation

Correct installation of **Pryda Heavy Duty Joist Hangers** is essential to achieve the design capacities. Use only 35x3.15 mm galvanised **Pryda Timber Connector Nails** or **50x2.87 mm Paslode Impulse galvanized screw hardened D head nails** (code B20573V). Alternatively use **No. 12x35 mm Type 17 hex head screws** (ID: WTF12-35).

Do not nail or screw within 30 mm of the ends of the timber beams or within 6 mm of beam edges. Fix the tongue to the underside of supporting beam A with:

* minimum 4 fasteners for single laminate Beam A
* minimum 3 fasteners into each laminate for multi-laminate Beam A.



Design Capacities

Design capacities per Heavy Duty Hanger are as follows:

JHH58, JHH65 and JHH75 Hangers

Load Cases	Design Capacities (ΦN_j) in kN for Fasteners and Joint Group:					
	35x3.15 mm Nails 30 nails to Beam A 18 nails* to Beam B			No. 12x35 mm Type 17 Screws 20 screws to Beam A 16 screws to Beam B		
	JD5	JD4	JD3	JD5	JD4	JD3
1.35G	10.7	12.7	17.8	15.9	22.5	30.0
1.2G + 1.5Qf	12.9	15.4	21.6	19.3	27.2	30.0
1.2G + 1.5Qr	14.4	17.2	24.1	21.5	30.0	30.0
1.2G + Wd	24.4	29.0	30.0	30.0	30.0	30.0
Wind Uplift	13.0	15.4	13.7*	26.0	30.0	30.0

JHH100 Hangers (typically suited for 2/45 thick beams/trusses or 90mm wide floor trusses)

Load Cases	Design Capacities (ΦN_j) in kN for Fasteners and Joint Group:					
	35x3.15 mm Nails 34 nails to Beam A 22 nails* to Beam B			No. 12x35 mm Type 17 Screws 24 screws to Beam A 18 screws to Beam B		
	JD5	JD4	JD3	JD5	JD4	JD3
1.35G	12.1	14.4	20.2	19.1	27.4	30.0
1.2G + 1.5Qf	14.6	17.5	24.5	23.1	30.0	30.0
1.2G + 1.5Qr	16.3	19.5	27.3	25.8	30.0	30.0
1.2G + Wd	27.6	30.0	30.0	30.0	30.0	30.0
Wind Uplift	16.1	19.2	17.1*	29.7	28.2	30.0

Notes:

1. Beam A = Supporting Beam, Beam B = Supported Beam
2. Wind capacities –

   The JD3 capacities (marked *) are based on 11 nails for JHH65 and JHH75 and 14 nails for JHH100 to satisfy end distance requirements (also see Note 3).

3. Supported Beam prone to Splitting - JHH brackets are not recommended to resist uplift loads for supported members using timbers that are prone to splitting (like hardwoods-JD3 joint group) unless additional precautions are taken. These can be in the form of prebored holes or provision of anti-split nailplates at ends of the supported beam.

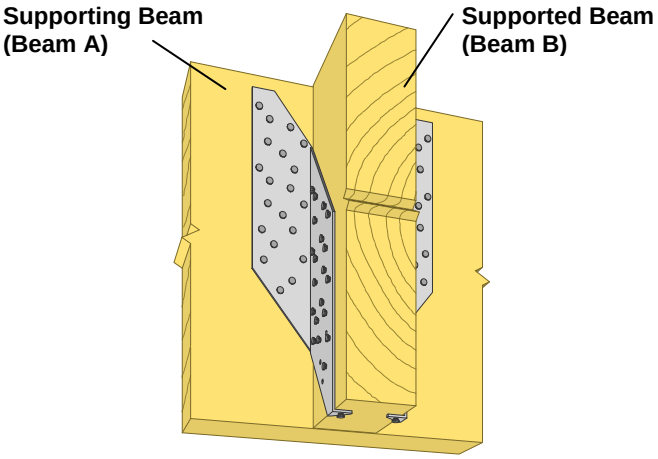
4. Multiple Laminated Supporting Beams - Fasteners with longer lengths are required when JHH brackets are fixed into a multiple laminated supporting beam. For double laminates, use 65 long nails or screws. Alternatively, for double or triple laminated supporting beams, additional fixings may be provided at hanger locations to laminate plies. Seek advice from the Engineer.

5. The limiting capacity for steel is taken as 30.0 kN

6. The values in the table apply directly for Category 1 joints. Refer general Notes in page 4 for advice on how the values should be reduced for Category 2 and Category 3 joints.

7. Design capacities tabulated above apply directly to joints where the depth of Beams A and B are at least Hanger depth + 8 mm. For beams of lesser depth, capacities can be calculated as the tabulated capacity times the number of effective fasteners divided by the maximum numbers of fasteners tabulated above.

SPLIT JOIST HANGERS



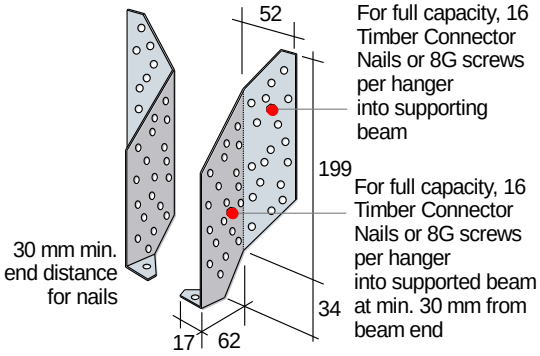
Features

Pryda Split Joist Hangers are:

- suitable for any practical thickness of timber beam.
- manufactured from heavy duty (1.6 mm) steel

Specification

Steel:	1.6 mm Zincform® G300-Z275
Packing per carton	Supplied in cartons of 10, ie. 5 right hand and 5 left hand.
Code & Size:	Product code is JHHS. Size is as below



Installation

Use only 35 x 3.15 mm galvanised **Pryda Timber Connector Nails** or **50x2.87 mm Paslode Impulse galvanized screw hardened D head nails** (code B20573V) driven though the metal, not through the holes, to fix these connectors.

In order to achieve increased capacities, use **No. 8 x 25 Type 17 pan head screws** through the nail holes. These screws are not supplied by Pryda, but available from ITW Buildex. (Note: No. 12 Type 17 screws may be used to achieve higher capacities.)

Do not nail or screw within 30 mm of the ends of the timber beams. For each hanger, drive 16 nails or screws into the supporting beam and 16 nails or screws into the supported beam.

Design Capacities

Design capacities for **a pair of Pryda Split Joist Hangers** in houses are:

Load Cases	Design Capacities (ΦN_j) in kN for Fasteners and Joint Group:					
	35x3.15 mm Nails 16 nails to Beam A 16 nails to Beam B			No. 8x25 mm Type 17 Screws 16 screws to Beam A 16 screws to Beam B		
	JD5	JD4	JD3	JD5	JD4	JD3
1.35G	10.4	12.4	13.3	14.8	20.7	21.7
1.2G + 1.5Qf	12.6	15.0	16.1	17.9	25.1	26.3
1.2G + 1.5Qr	14.1	16.8	17.9	19.9	28.1	29.3
1.2G + Wd or Wind uplift	23.8	28.3	29.8	33.7	40.0	40.0

Notes:
1. Beam A = Supporting Beam, Beam B = Supported Beam

2. Wind capacities –
The JD3 capacities are based on a reduced number of fasteners to satisfy end distance requirements (also see Note 3).

3. Supported Beam prone to Splitting - JHHS brackets are not recommended for supported members that are prone to splitting (like hardwoods-JD3 joint group) unless additional precautions are taken. These can be in the form of prebored holes or provision of anti-split nailplates at ends of the supported beam.

4. Multiple Laminated Supporting Beams - Fasteners with longer lengths are required when JHHS brackets are fixed into a multiple laminated supporting beam. For double laminates, use 65 long nails or screws. Alternatively, for double or triple laminated supporting beams, additional fixings may be provided at hanger locations to laminate plies. Seek advice from the Engineer

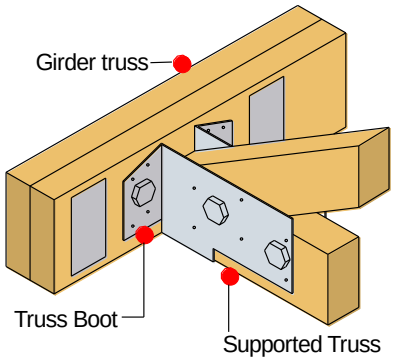
5. The limiting capacity for steel is taken as 40.0 kN

6. The values in the table apply directly for Category 1 joints. Refer general Notes in page 4 for advice on how the values should be reduced for Category 2 and Category 3 joints.

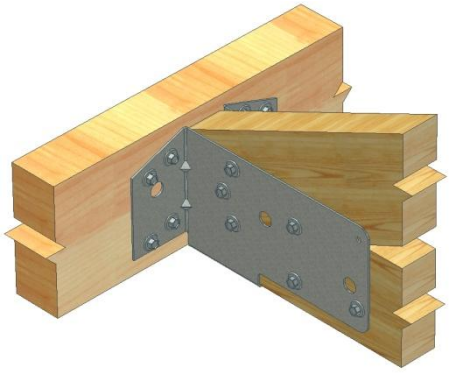
7. Design capacities tabulated above apply directly to joints where the depth of Beams A and B are at least Hanger depth + 8 mm. For beams of lesser depth, capacities can be calculated as the tabulated capacity times the number of effective fasteners divided by the maximum numbers of fasteners tabulated above.

TRUSS BOOTS- MULTI-FIX

Metal brackets for truss to truss connections



Bolted Truss Boots



Screw Fixed Truss Boots

Application & Features

Pryda Multi-Fix Truss Boots are used to connect roof trusses or other roof members to supporting "girder" trusses and they comprise:

- **Joist Boots** –used for:
  - * End support of joists and beams
  - * Support of lightly loaded trusses from girder trusses
- **Truss Boots** – used for support of standard trusses.

See also **Pryda Heavy Duty Truss Boots**.

"Multi-fix" means that these connectors can be fixed with bolts or screws, or bolts and screws together.

Specification

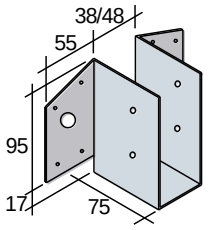
Type	Product Code	Timber Thick.	Bolt Diam.	Application- Support of:
Joist Boot	TBS35	35	12	Small components eg: at hip ends Lightly loaded trusses
	TBJ35	35	12	
	TBJ35/T	35	12	
	TBJ45	45	12	
	TBJ70	70	12	
Truss Boot	TB35/12	35	12	Standard trusses
	TB35/16	35	16/12	
	TB45/16	45	16/12	

Steel	TBS – 1.2 mm G300 –Z275 Galvanised TBJ & TB – 1.6 mm G300 –Z275 Galvanised
Packing	10 per carton
Size	See dimensions following

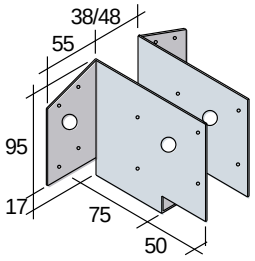
Note: The TBJ35/T has a tongue to tie the supported truss to the girder.

Dimensions

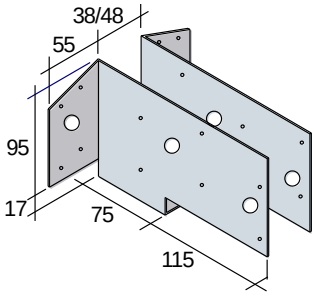
Dimensions of **Pryda Joist Boots** and **Truss Boots** are:



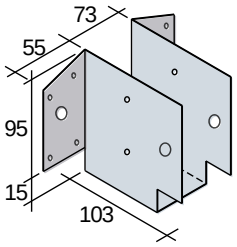
TBS35



TBJ35, TBJ35/T, TBJ45



TB35, TB45



TBJ70

Installation

Fix **Pryda Multi-Fix Truss Boots** with fasteners as tabulated below:

Boot Type	To Girder	To Suppd. Truss
TBS35	2 M12 Bolts or 8 Screws or Bolts + Screws	4 Screws
TBJ35/45, TBJ70	2 M12 Bolts, or 8 Screws or Bolts + Screws	1 M12 Bolt or 8 Screws or Bolts + Screws
TB35/12	2 M12 Bolts, or 8 Screws or Bolts + Screws	2 M12 Bolts or 12 Screws or Bolts + Screws
TB35/16, TB45/16	2 M16 Bolts, or 8 Screws or Bolts + Screws	2 M12 Bolts or 12 Screws or Bolts + Screws

Notes:

1. M12 or ½ inch diameter must be fitted with nuts and 55 mm diameter or **50x50 mm square by 3 mm thick washers**. M16 or 5/8 inch diameter bolts must be fitted with nuts and 65 mm diameter or 57x57 mm square by 4 mm thick washers. See Pryda **Bolt Kits**
2. Screws are **No.12 x 35 mm Type 17 hex head screws**

Installation of Pryda Multi-Fix Truss Boots:

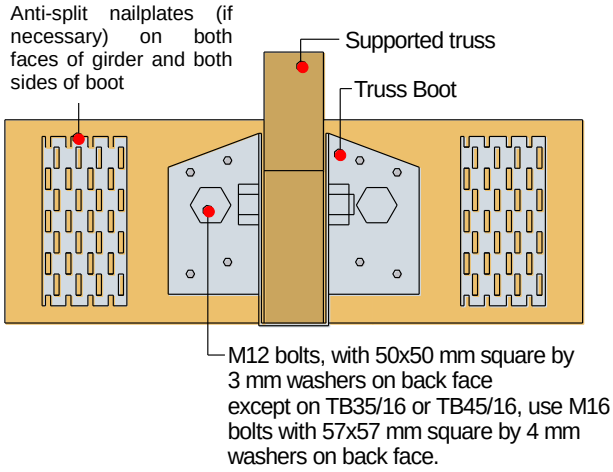
Bolts Only Installation:

1. Fit the Boot flush with the bottom of the girder bottom chord and tack fix with two nails or screws. Drill the bolt hole and fit the bolt with the nut and washer on the face opposite to the boot.
2. Sit the incoming member into the boot and fix it in place. The clearance between the end of the incoming member and the face of the girder truss chord should not exceed 5 mm, preferably 0 mm. Drill the bolt hole (TBJ and TB types only) and fit the bolt(s) and nut(s).
3. Hammer apply anti-split Claw nailplates on the girder truss chord on both faces and both sides of the Boot, ie: 4 nailplates of:

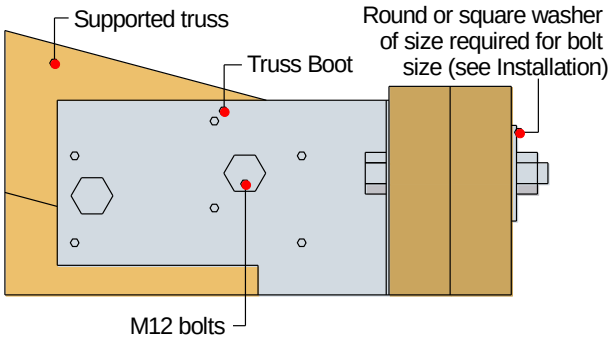
Chord width (mm)	90	120,140	170,190
Anti-split Plate Size	3C2	4C2	6C2

Note: Anti-split Claw nailplates are NOT required for boots fixed with M12 bolts into timbers that are not prone to splitting.

4. **Important**: The roof cladding (tiles, sheet steel etc) must be installed only after the truss boots are fully fixed into both the girder and supported truss, with all bolts and washers in place.



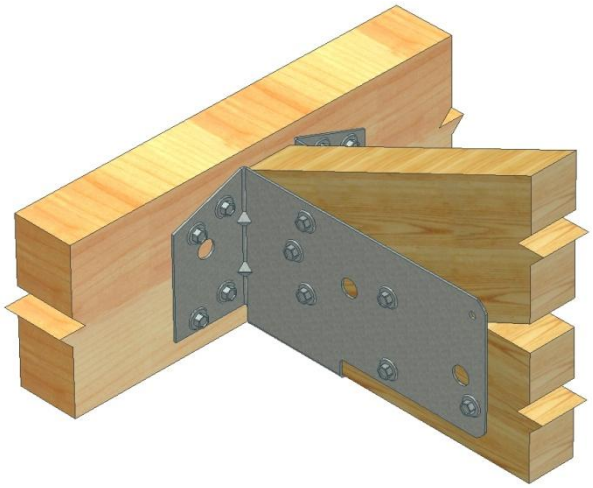
Bolts Only Installation Detail 1



Bolts Only Installation Detail 2

Screws Only Installation:

1. If the girder truss is comprised of two or more laminates (ie: a "double" or "triple" girder), the laminates must be fixed together using one of the details specified in **Fixing Details For Double or Triple Girders** opposite.
2. Fit the Boot flush with the bottom of the girder bottom chord and tack fix with two screws. Drive the remaining screws
3. Sit the incoming member into the boot and fix it in place. The clearance between the end of the incoming member and the face of the girder truss chord should not exceed 5 mm, preferably 0 mm. Drive screws into all holes.



Note that anti-split nailplates are not required for Screws Only fixing.

Bolts & Screws Installation:

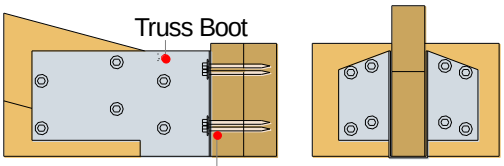
1. Install the Truss Boot and supported truss as per the Bolts Only method.
2. Drive the screws into all screw holes.

Important: The roof cladding (tiles, sheet steel etc) must be installed only after the truss boots are fully fixed into both the girder and supported truss.

Fixing Details For Double & Triple Girders- Screws Only Fixing Option

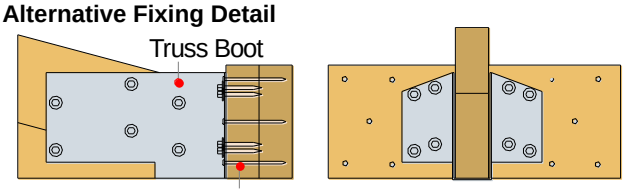
DOUBLE GIRDERS

2@ 35 Girder Laminations – Preferred Fixing Detail



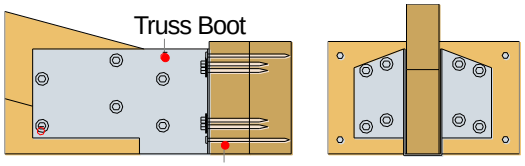
65 mm Self drilling wood screws into the girder

Alternative Fixing Detail



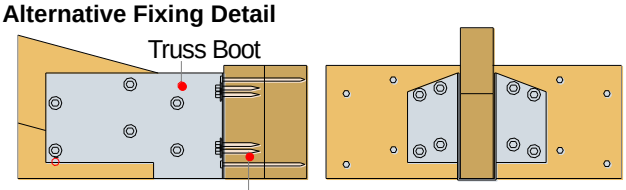
8@ 35 mm Self drilling wood screws
+ 10@ 65x2.87 mm nails into girder

2@ 45 Girder Laminations – Preferred Fixing Detail



65 mm Self drilling wood screws
+ 4@ 90x3.33 mm nails into girder

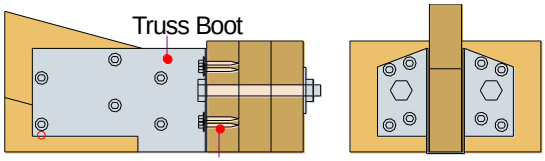
Alternative Fixing Detail



35 mm Self drilling wood screws
+ 8@ 90x3.33 mm nails into girder

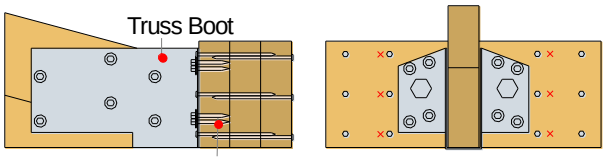
TRIPLE GIRDERS

3@ 35 or 3@ 45 mm Laminations – Preferred Fixing



35 mm Self drilling wood screws
+ 2@ M12 bolts with 50x50x3 mm
square washers on timber side only

Alternative Fixing Detail

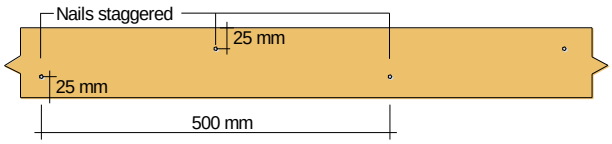


35 mm Self drilling wood screws
+ 18@ 90x3.33 mm nails:
(12 to front lamination, 6 to back lamination)

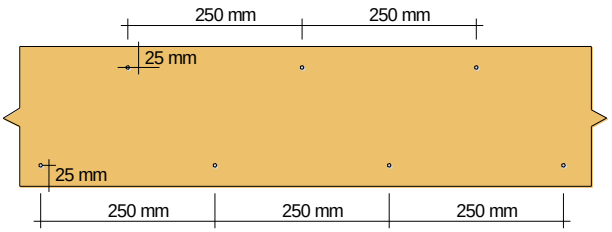
Notes

1. Nails at the Truss Boot are to be spaced 70mm (min) apart along the grain and 40 mm (min) apart across the grain. They should be as close to the Truss Boot as practical, but not further away than the depth of the member.
2. Use the details for 35 mm laminates for timber thickness between 35 and 40 mm, and the 45 mm details for timber thickness between 41 and 50 mm.
3. All screws are to be **No. 12 x35 mm Type 17 hex. head** or No 12 x65 mm Type 17 hex head.
4. For all double and triple girder trusses, the chords (top and bottom) and webs are to be nailed at:

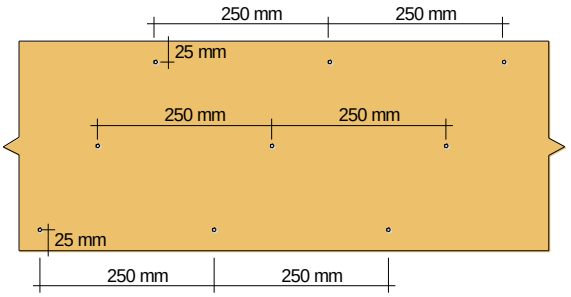
Timber Width	Nail Rows & Maximum Spacing
Up to 100 mm	2 rows (staggered) at 500 mm
101 - 200 mm	2 rows (staggered) at 250 mm
201 - 300 mm	3 rows (staggered) at 250 mm



Timber Up to 100 mm Chords or Webs



101 - 200 mm Chords or Webs



201 -300 mm Chords or Webs

Design Capacities for Pryda Truss Boots

Determine Truss Boot capacities in the following manner:

For downward loads: design capacity is the lesser of the values in Table TB1 (at Girder truss) and Table TB2 (at supported truss) for the corresponding load case.

For wind uplift: design capacity is the lesser of the G-Wu values in Table TB1 (at Girder truss) and Table TB3 (at supported truss)

Table TB1: Girder Truss Capacity
(Downward and Uplift – due to fasteners)

Boot Code	Load Case	Design Capacity ΦNj (kN) - Joint Group:					
		JD3			JD4		
		Minimum Girder Thickness (mm)					
		35	45	70	35	45	70
Bolts Only							
TBS35	G	6.9	8.9	10.3	5.1	6.5	8.6
	G + Qr	9.4	12.0	13.9	6.9	8.8	11.6
	G + Wd or G-Wu	13.2+	13.2+	13.2+	10.2	13.1	13.2+
TBJ35, TBJ35/T TBJ45 TB35/12 TBJ70	G	6.9	8.9	10.3	5.1	6.5	8.6
	G + Qr	9.4	12.0	13.9	6.9	8.8	11.6
	G + Wd G-Wu	13.8	17.6+	17.6+	10.2	13.1	17.1
TB35/16 TB45/16	G	9.2	11.9	14.0	6.8	8.7	12.2
	G + Qr	12.5	16.0	21.1	9.2	11.8	16.5
	G + Wd	18.5	23.4+	23.4+	13.6	17.4	23.4+
	G-Wu	18.5	20.0*	20.0*	13.6	17.4	20.0*
Screws Only							
TBS35	G	14.1	14.1	14.1	10.0	10.0	10.0
	G + Qr	19.1	19.1	19.1	13.5	13.5	13.5
	G + Wd	20.0*	20.0*	20.0*	20.0*	20.0*	20.0*
	G - Wu	15.0*	15.0*	15.0*	15.0*	15.0*	15.0*
All other truss Boots	G	14.1	14.1	14.1	10.0	10.0	10.0
	G + Qr	19.1	19.1	19.1	13.5	13.5	13.5
	G + Wd	24.0+	24.0+	24.0+	20.1	20.1	20.1
	G-Wu	20.0*	20.0*	20.0*	20.0*	20.0*	20.0*
Bolts & Screws							
TBS35	G	20.0*	20.0*	20.0*	15.5	17.0	19.0
	G + Qr	20.0*	20.0*	20.0*	20.0*	20.0*	20.0*
	G + Wd	20.0*	20.0*	20.0*	20.0*	20.0*	20.0*
	G - Wu	15.0*	15.0*	15.0*	15.0*	15.0*	15.0*
TBJ35 TBJ35/T TBJ45 TB35/12 TBJ70	G	20.2	22.0	25.0*	15.5	17.0	19.0
	G + Qr	25.0*	25.0*	25.0*	21.0	22.5	25.0*
	G + Wd	25.0*	25.0*	25.0*	25.0*	25.0*	25.0*
	G-Wu	20.0*	20.0*	20.0*	20.0*	20.0*	20.0*
TB35/16 TB45/16	G	22.2	25.0*	25.0*	15.5	17.0	19.0
	G + Qr	25.0*	25.0*	25.0*	21.0	22.5	25.0*
	G + Wd	25.0*	25.0*	25.0*	25.0*	25.0*	25.0*
	G - Wu	20.0*	20.0*	20.0*	20.0*	20.0*	20.0*

Note: For Screws Only capacities for 70 mm girder trusses (double girders), the laminates of the girder truss must be fixed together in accordance with the Fixing Details For Double & Triple Girders requirements on pages 17 and18.

Table TB2: Supported Truss Capacity
(Downward – due to Bearing + Fasteners)

Truss Boot Code	Load Case	Design Capacity ΦNj (kN) - Joint Group:					
		JD3			JD4		
		Fixing Option:					
		Bolts only	Screws only	Bolts + Screws	Bolts only	Screws only	Bolts + Screws
TBS35	G	NA	20.0*	NA	NA	15.1	NA
	G + Qr	NA	20.0*	NA	NA	20.0*	NA
	G + Wd	NA	20.0*	NA	NA	20.0*	NA
TBJ70	G	25.0*	25.0*	25.0*	21.0	25.0*	25.0*
	G + Qr	25.0*	25.0*	25.0*	25.0*	25.0*	25.0*
	G + Wd	25.0*	25.0*	25.0*	25.0*	25.0*	25.0*
TBJ35 TBJ35/T	G	13.6	21.8	24.9	9.4	15.1	17.4
	G + Qr	21.5	25.0*	25.0*	14.8	22.5	25.0*
	G + Wd	25.0*	25.0*	25.0*	17.0	25.0*	25.0*
TBJ45	G	17.6	25.0*	25.0*	12.1	17.3	20.2
	G + Qr	25.0*	25.0*	25.0*	19.2	25.0*	25.0*
	G + Wd	25.0*	25.0*	25.0*	25.0	25.0*	25.0*
TB35/12	G	16.0	25.0*	25.0*	11.2	18.4	22.4
	G + Qr	24.8	25.0*	25.0*	17.2	25.0*	25.0*
	G + Wd	25.0	25.0*	25.0*	20.6	25.0*	25.0*
TB35/16	G	17.9	25.0*	25.0*	12.5	18.4	23.8
	G + Qr	25.0*	25.0*	25.0*	19.0	25.0*	25.0*
	G + Wd	25.0*	25.0*	25.0*	23.3	25.0*	25.0*
TB45/16	G	23.1	25.0*	25.0*	16.2	20.5	25.0*
	G + Qr	25.0*	25.0*	25.0*	25.0*	25.0*	25.0*
	G + Wd	25.0*	25.0*	25.0*	25.0*	25.0*	25.0*

Notes:

1. Load case symbols are: (refer page 4 for descriptions)
   G = 1.35G G+Qr = 1.2G+1.5Qr
   G+Wd = 1.2G+Wd G-Wu = Wind uplift
2. Girder timber thicknesses are minimums. Supported truss thicknesses are minimums for bolt capacity and maximums (3 mm tolerance for two nailplates) for fitting the timber into the boot. 70 mm thickness can be made from 2@ 35 mm trusses, nail or bolt laminated together as specified by the truss designer.
3. Bearing + fasteners capacities above apply to standard heel joints with a 10 mm minimum square cut or non-heel ends of cut-off and mono trusses.
4. **The values in the table apply directly for Category 1 joints.** Refer general Notes in page 4 for advice on how the values should be reduced for Category 2 and Category 3 joints.
5. For other design conditions, contact a Pryda design office.
6. The capacities with an asterisks (*) are governed by steel strength of the truss boot.
7. The capacities with a plus sign (+) are governed by steel strength screw or bolt bearing on steel.

Table TB3: Supported Truss Capacity

(Uplift– due to fasteners)

Boot Code	Thick-ness (mm)	Fixing Method	Des.Cap. ΦNj (kN) Wind Uplift (G-Wu) k_1 = 1.14	
			JD3	JD4
TBS35	35	6 screws	15.0*	13.5
TBJ35 TBJ35/T	35	8 screws	20.0*	18.0
		1/M12 bolt	5.5	4.1
		Bolt + screws	20.0*	20.0*
TBJ45	45	8 screws	20.0	18.0
		1/M12 bolt	7.1	5.2
		Bolt + screws	20.0*	20.0*
TBJ70	70	6 screws	18.0	13.5
		1/M12 bolt	11.0	8.1
		Bolt + screws	20.0*	20.0*
TB35/12 TB35/16	35	12 screws	20.0*	20.0*
		2/M12 bolts	11.1	8.1
		Bolts + screws	20.0*	20.0*
TB45/16	45	12 screws	20.0*	20.0*
		2/M12 bolts	14.2	10.5
		Bolts + screws	20.0*	20.0*

Notes:

1. For wind uplift, take the lower of the capacities for the supported truss and girder, ie: look up both tables.

2. **The values in the table apply directly for Category 1 joints.** Refer general Notes in page 4 for advice on how the values should be reduced for Category 2 and Category 3 joints

3. The capacities with '*' are governed by steel strength of the truss boot.

Examples

Below are examples of selecting a suitable Pryda Truss Boot based on the Design Capacities tables.

Example 1:

Design data:

Supported truss thickness	35 mm
Supported truss timber	MGP12 dry pine (JD4)
Girder truss thickness	45 mm
Girder truss timber	F17 dry hardwood (JD3)
Preferred fixing method	Screws

Design Loads:

Load case	1.35G	G + Qr	G + Wd	G – Wu
Load (kN)	3.5	6.8	5.4	1.6

Try TBS35: - which suits the 35 mm supported truss:

Looking up tables: TB1(JD3, 45) and TB2(JD4) for: Screws only -

Load Case	TB1	TB2	Design	Load	Suit
G =	14.1	15.1	14.1	3.5	OK
G + Qr =	19.1	20.0	19.1	6.8	OK
G + Wd =	20.0	20.0	20.0	5.4	OK

Uplift:

Looking up Table TB3 for JD4 – Screws Only:

Load Case	TB1	TB3	Design	Load	Suit
G - Wu	15.0	13.5	13.5	1.6	OK

Therefore, a TBS35 is suitable.

Example 2:

Design data:

Supported truss thickness	35 mm
Supported truss timber	MGP12 dry pine (JD4)
Girder truss thickness	70 mm
Girder truss timber	F17 dry hardwood (JD3)
Preferred fixing method	Bolts

Design Loads:

1.35G	1.5 kN
1.2G+1.5Qr	4.8 kN
1.2G+Wd	7.3 kN
0.9G-Wu (Wind uplift)	-11.9 kN

Try TBJ35: - which suits the 35 mm supported truss:

Looking up tables TB1(JD3, 70) and TB2 (JD4) for TBJ35, Bolts only:

Load Case	TB1	TB2	Design	Load	Suit
G =	9.1	9.4	9.1	1.5	OK
G + Qr =	12.2	14.8	12.2	4.8	OK
G + Wd =	17.6	17.0	17.0	7.3	OK

Uplift:

Looking up Table TB3 for TBJ35, JD4 – Bolt Only and TB1, TBJ35, JD3, Bolts only

Load Case	TB1	TB3	Design	Load	Suit
G - Wu	17.6	3.6	4.1	11.9	NS

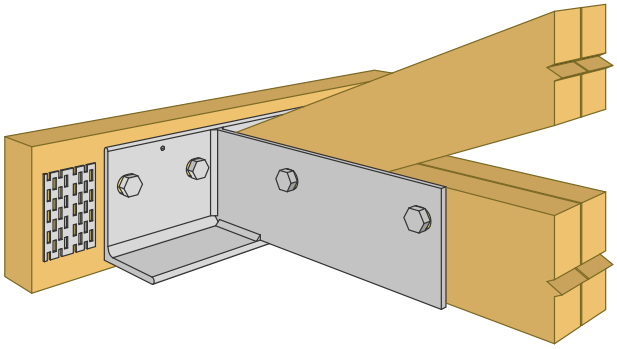
Try screws only – for wind uplift:

Load Case	TB1	TB3	Design	Load	Suit
G - Wu	20.0	18.0	18.0	11.9	OK

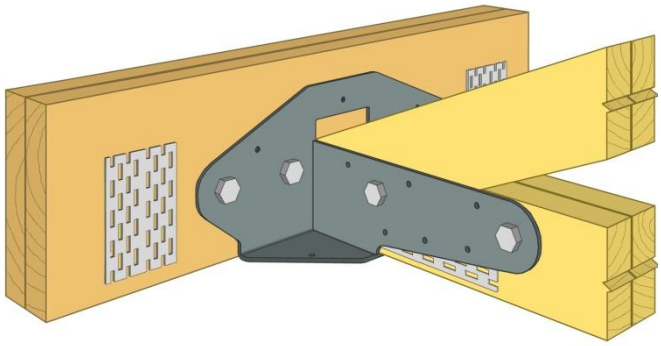
Therefore, a TBJ35 is suitable with screw fixing of supported truss.

TRUSS BOOTS – HEAVY DUTY

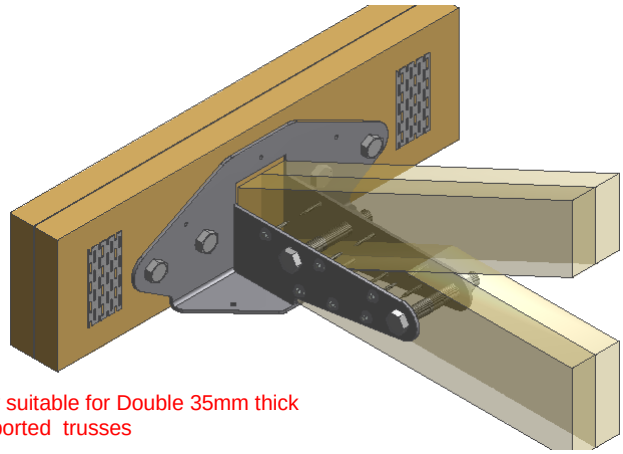
Steel Brackets for Heavy Roof Truss to Truss Connections



TB80 Truss Boot



TBHD75 Truss Boot



Only suitable for Double 35mm thick supported trusses

TBHD75/T Truss Boot with Twin Fin

Features

The long anti-rotation fin and heavy duty steel of **Pryda Heavy Duty Truss Boots**, combined with the inherent high stiffness of the carried truss, prevents twisting of the bottom chord of the girder. Consequently, anti-rotation bars are not necessary. Useful variations of this product have : welded hinges to allow for any angle (TB80V)

The **TBHD75 and TBHD75/T** Truss Boots have further benefits which include:

* Special shape to reduce weight, and rounded edges for easier handling
* Improved bearing capacity for supported truss.
* A unique slot in the back of the boot to eliminate the need to cut 6-10mm from the heel of the supported truss.
* Additional screw fixings into supported trusses to improve uplift capacity, if required.
* Nail holes in the back flange to allow the boot to be easily located on the girder truss prior to drilling for bolts.
* Holes in the base to allow screw to hold any incoming angled member at ceiling level (such as a hip truss) in position. These holes are countersunk to allow flush finish if required.
* The twin-fin of TBHD75/T has been specially developed to enhance uplift capacities and meet the demands of girder to girder connections in cyclonic regions. Note: Screws are required in combination with bolts to achieve the desired uplift capacities.

Installation

Pryda Heavy Duty Truss Boots are installed with 6@ M16 or 5/8 inch bolts and with **63x4 mm square washers** on all surfaces where the bolt head or nut bears directly on the timber. Anti-split **Claw nailplates** are to be installed central to the bolt line on both faces of the girder and on both sides of the truss boot at approx. 80mm away from the centre of the outside bolts.

Screws used on the TBHD75/T Truss Boot are to be **No. 12x35 mm Type 17 hex head screws** (code WTF12-35).

Specification

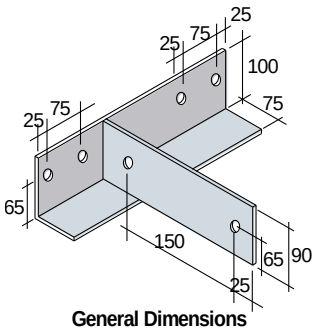
Pryda Heavy Duty Truss Boots are made to the following specification:

Sizes:	See Dimensions following.
Steel:	Mild steel, hot dipped galvanized- thickness: - 5 mm for TB80 range - 4 mm for TBHD75, TBHD75/T
Product Codes:	TB80C, TB80V, TBHD75, TBHD75/T C denotes anti-rotation fin located centrally V denotes variable angle (hinged)
Packing	TBHD75 - 4 per bundle TBHD75/T – Sold as singles TB80C, TB80V: Sold as singles

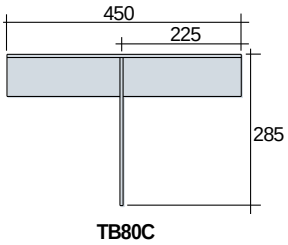
Important: The roof cladding (tiles, sheet steel etc) must be installed only after the truss boots are fully fixed into both the girder and supported truss, with all bolts and washers in place.

Dimensions

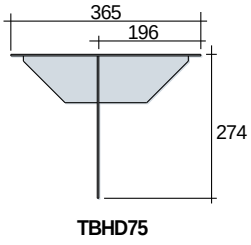
The dimensions of **Heavy Duty Truss Boots** are :



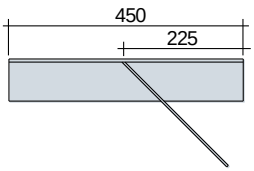
General Dimensions



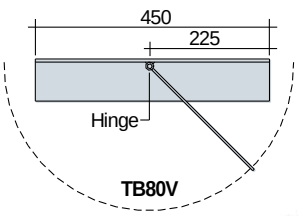
TB80C



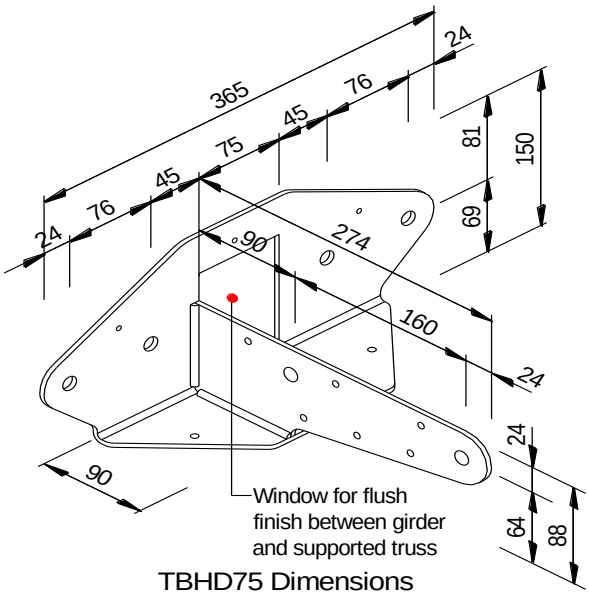
TBHD75



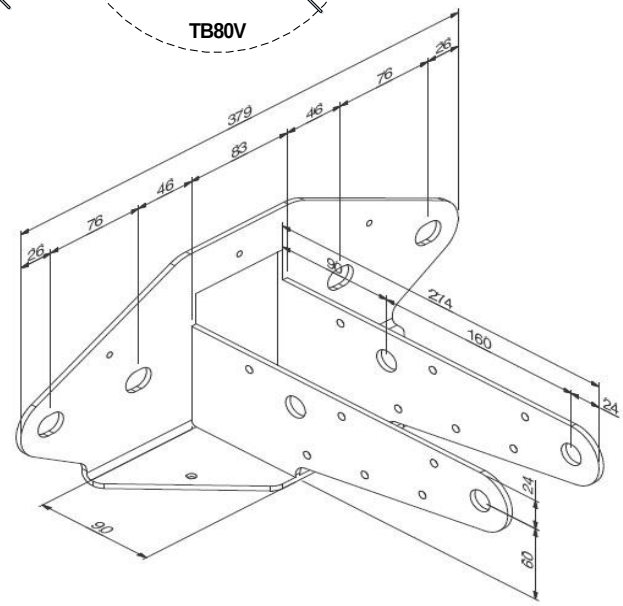
TB80C45/R



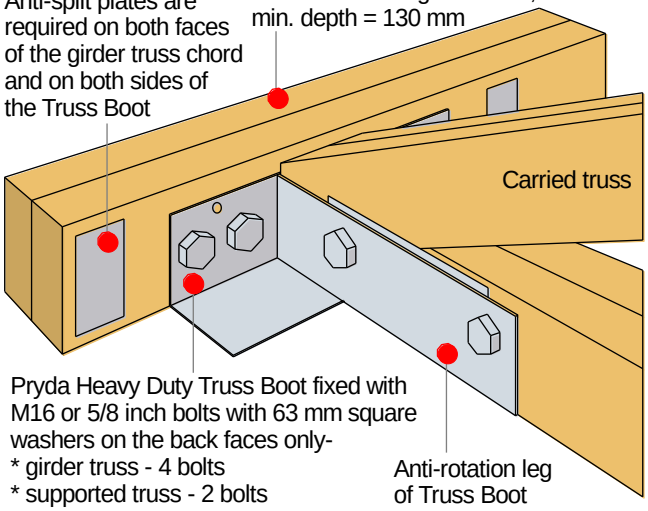
TB80V



TBHD75 Dimensions

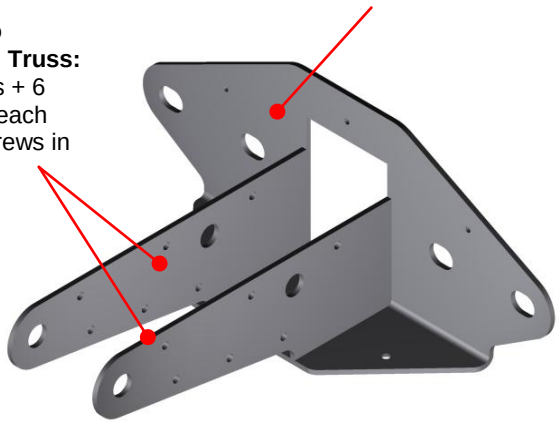


Applications



Fixing into Girder Truss:
4/M16 bolts + washers

Fixing into Supported Truss:
2/M16 bolts + 6 screws on each arm (12 screws in total).



TBHD75/T
Suitable for 2/35 supported trusses only, to achieve large tie-down capacities

Design Capacities for TBHD75 (also applicable for TB80C and TB80V)

Table- **JD4**

Girder Truss bottom Chord using JD4 Joint Group (eg: MGP12, MGP15, Hychord, E-beam etc) with a minimum 130mm depth.

Girder Truss Thickness (mm)	Supported Truss Thickness	Design Capacities (kN) for varying Load Cases and Supported Truss Joint Groups											
		Supported Truss = JD5				Supported Truss = JD4				Supported Truss = JD3			
		1.35G (Dead Only)	1.2G+1.5Q (Dead+Live)	Wind Uplift		1.35G (Dead Only)	1.2G+1.5Q (Dead+Live)	Wind Uplift		1.35G (Dead Only)	1.2G+1.5Q (Dead+Live)	Wind Uplift	
				Bolts Only	*Bolts+Screws*			*Bolts Only*	*Bolts+Screws*			*Bolts Only*	*Bolts+Screws*
35	35	13.6	18.3	7.8	15.8	12.0	16.2	10.9	22.2	13.6	18.3	14.8	24.0
	2/35	13.6	18.3	15.6	23.6	13.6	18.3	21.7	27.2	13.6	18.3	27.1	27.1
45	35	14.5 (1)	22.3 (1)	6.9	14.9	15.3	20.8	10.9	22.2	17.4	23.6	14.8	30.0 (2)
	2/35	17.4	23.6	15.6	23.6	17.4	23.6	21.7	30.0 (2)	17.4	23.6	29.5	30.0 (2)
2/35	35	14.5 (1)	22.3 (1)	6.9	14.9	17.3 (1)	28.3 (1)	10.9	22.2	24.3 (1)	33.0	14.8	29.0
	2/35	24.4	33.0	15.6	23.6	24.4	33.0	21.7	30.0 (2)	24.4	33.0	29.5	30.0 (2)
3/35	35	14.5 (1)	22.3 (1)	6.9	14.9	17.3 (1)	28.3 (1)	10.9	22.2	24.3 (1)	35.6	14.8	29.0
	2/35	26.4	35.6	15.6	23.6	26.4	35.6	21.7	30.0 (2)	26.4	35.6	29.5	30.0 (2)

Table- **JD3**

Girder Truss bottom Chord using JD3 Joint Group (eg: F17, e-beam+ etc) with a minimum 130mm depth.

Girder Truss Thickness (mm)	Supported Truss Thickness	Design Capacities (kN) for varying Load Cases and Supported Truss Joint Groups											
		Supported Truss = JD5				Supported Truss = JD4				Supported Truss = JD3			
		1.35G (Dead Only)	1.2G+1.5Q (Dead+Live)	Wind Uplift		1.35G (Dead Only)	1.2G+1.5Q (Dead+Live)	Wind Uplift		1.35G (Dead Only)	1.2G+1.5Q (Dead+Live)	Wind Uplift	
				Bolts Only	*Bolts+Screws*			*Bolts Only*	*Bolts+Screws*			*Bolts Only*	*Bolts+Screws*
35	35	14.5 (1)	22.3 (1)	7.8	15.8	17.3 (1)	28.3 (1)	10.9	20.9	18.5	24.9	14.8	30.0 (2)
	2/35	18.5	24.9	15.6	23.6	18.5	24.9	21.7	30.0 (2)	18.5	24.9	29.5	30.0 (2)
45	35	14.5 (1)	22.3 (1)	6.9	14.9	17.3 (1)	28.3 (1)	10.9	22.2	23.7	32.0	14.8	30.0 (2)
	2/35	23.7	32.0	15.6	23.6	23.7	32.0	21.7	30.0 (2)	23.7	32.0	29.5	30.0 (2)
2/35	35	14.5 (1)	22.3 (1)	6.9	14.9	17.3 (1)	28.3 (1)	10.9	22.2	24.3 (1)	40.0 (2)	14.8	29.0
	2/35	28.8	40.0 (2)	15.6	23.6	27.1 (1)	40.0 (2)	21.7	30.0 (2)	31.6	40.0 (2)	29.5	30.0 (2)
3/35	35	14.5 (1)	22.3 (1)	6.9	14.9	17.3 (1)	28.3 (1)	10.9	22.2	24.3 (1)	40.0 (2)	14.8	29.0
	2/35	28.8	40.0 (2)	15.6	23.6	27.1 (1)	40.0 (2)	21.7	30.0 (2)	31.6	40.0 (2)	29.5	30.0 (2)

Notes:

(1) The above capacities (except *Bolts+Screws*) are valid for TB80C and TB80V truss boots. See note (3) for steel limits.

(2) The values with a superscript (1) refers to the design capacities that are limited by bearing- i.e crushing of the supported truss against the seat of the truss boot.

(3) The values (30 kN) with a superscript (2) refers to the capacities that are limited by steel strength of TBHD75 in uplift. The The limiting steel value for downward loading is 40 kN. The limiting steel value for TB80V equals 26 kN (downward loads) and 18.0 kN (uplift).

(4) 2/35 refers to 35mm thick double laminated truss and 3/35 refers to 35mm thick triple laminated truss.

(5) The values in the table apply directly for Category 1 joints. Refer general Notes in page 4 for advice on how the values should be reduced for Category 2 and Category 3 joints.

(6) The values related to **1.35G (Dead only)** load case should be checked against reactions arising from 1.35G load case. Similarly **1.2G+1.5Q (Dead + Roof Live)** capacities should be checked against factored reactions from 1.2G+1.5Q load case.

(7) A 120mm deep bottom chord for girder trusses may be used when supporting concrete tile roofs in low wind areas (upto N2 wind class) where wind uplift is not critical or when the truss boot is located at a panel point.

(8) It is important to use the specified washer (63 x 5 square) against the timber face to achieve full capacity of M16 bolts.

Design Capacities for the *Twin Fin* TBHD75/T (suitable only for double 35mm supported trusses)

Table: JD4

Girder Truss bottom Chord using JD4 Joint Group (eg: MGP12, MGP15, Hychord, E-beam etc) with a minimum

Girder Truss Thickness (mm)	Supported Truss Thickness	Design Capacities (kN) for varying Load Cases and Supported Truss Joint Groups											
		Supported Truss = JD5				Supported Truss = JD4				Supported Truss = JD3			
		1.35G (Dead Only)	1.2G+1.5Q (Dead+Live)	Wind Uplift		1.35G (Dead Only)	1.2G+1.5Q (Dead+Live)	Wind Uplift		1.35G (Dead Only)	1.2G+1.5Q (Dead+Live)	Wind Uplift	
				Bolts Only	*Bolts+Screws*			*Bolts Only*	*Bolts+Screws*			*Bolts Only*	*Bolts+Screws*
35	2/35	13.6	18.3	15.6	27.2 (3)	13.6	18.3	21.7	27.2 (3)	13.6	18.3	27.2 (3)	27.2 (3)
45	2/35	17.4	23.6	15.6	32.6	17.4	23.6	21.7	34.9 (3)	17.4	23.6	29.5	34.9 (3)
2/35	2/35	24.4	33.0	15.6	32.6	24.4	33.0	21.7	45.7	24.4	33.0	29.5	48.8 (3)
3/35	2/35	26.4	35.6	15.6	32.6	26.4	35.6	21.7	45.7	26.4	35.6	29.5	50.0 (2)

Table: JD3

Girder Truss bottom Chord using JD3 Joint Group (eg: F17, E-beam+ etc) with a minimum 130mm depth.

Girder Truss Thickness (mm)	Supported Truss Thickness	Design Capacities (kN) for varying Load Cases and Supported Truss Joint Groups											
		Supported Truss = JD5				Supported Truss = JD4				Supported Truss = JD3			
		1.35G (Dead Only)	1.2G+1.5Q (Dead+Live)	Wind Uplift		1.35G (Dead Only)	1.2G+1.5Q (Dead+Live)	Wind Uplift		1.35G (Dead Only)	1.2G+1.5Q (Dead+Live)	Wind Uplift	
				Bolts Only	*Bolts+Screws*			*Bolts Only*	*Bolts+Screws*			*Bolts Only*	*Bolts+Screws*
35	2/35	18.5	24.9	15.6	32.6	18.5	24.9	21.7	36.9 (3)	18.5	24.9	29.5	36.9 (3)
45	2/35	23.7	32.0	15.6	32.6	23.7	32.0	21.7	45.7	23.7	32.0	29.5	47.4 (3)
2/35	2/35	28.8	42.7	15.6	32.6	28.8	42.7	21.7	45.7	28.8	42.7	29.5	50.0 (2)
3/35	2/35	28.8	42.7	15.6	32.6	28.8	42.7	21.7	45.7	28.8	42.7	29.5	50.0 (2)

Notes:

(1) 2/35 refers to 35mm thick double laminated truss and 3/35 refers to 35mm thick triple laminated truss.

(2) The values (50 kN) with a superscript (2) refers to the capacities that are limited by steel strength of TBHD75/T in uplift. The limiting steel value for "down-loading' is 50 kN.

(3) Uplift Capacities - The values with a superscript (3) are limited by 4/M16 bolt fixings in girder truss. U.N.O in Notes 2 and 3, fixing into supported truss governs for UPLIFT.

(4) The values in the table apply directly for Category 1 joints. Refer general Notes in page 4 for advice on how the values should be reduced for Category 2 and Category 3 joints.

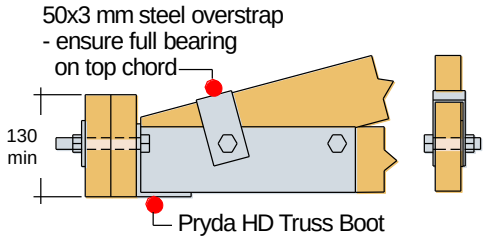
(5) The values related to **1.35G (Dead only)** load case should be checked against reactions arising from 1.35G load case. Similarly **1.2G+1.5Q (Dead + Roof Live)** capacities should be checked against factored reactions from 1.2G+1.5Q load case.

(6) A 120mm deep bottom chord for girder trusses may be used when supporting concrete tile roofs in low wind areas (upto N2 wind class) where wind uplift is not critical or when the truss boot is located at a panel point.

(7) It is important to use the specified washer (63 x 5 square) against the timber face to achieve full capacity of M16 bolts. Required only against Girder truss when using TBHD75/T.

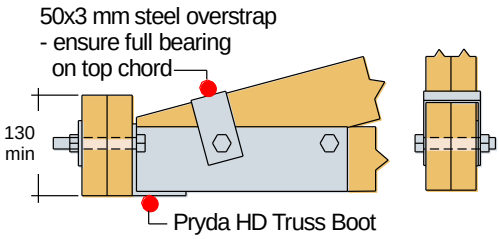
Heavy Duty Truss Boot Uplift Reinforcement

Where necessary, TB80 and TBHD75 truss boots can be reinforced to provide additional uplift resistance as follows:



Note: The bolt through the overstrap must be installed through or above the heel joint nailplates.

For 35 mm Supported Trusses



Note: The bolt through the overstrap must be installed through or above the heel joint nailplates.

For 70 mm Supported Trusses

UPLIFT CAPACITY (kN) for Timber Joint Group & Strength Group:						
Supp. Thick.	**J4** (S6)	**J3** (S4)	**J2** (S3)	**JD5** (SD7)	**JD4** (SD6)	**JD3** (SD5)
35	11.5	18.3	25.2	13.9	18.3	25.2
70	20.6	31.4	35.0	21.4	26.7	35.0

Notes:

1. The capacities for details with the overstrap, are limited by either 4@ M16 bolts bearing on carrying truss or based on Details TD-06/TD-07 published by TRADAC (December 2000). For these tabulated capacities, the bolt through the over-strap must be installed through or above the heel joint nailplates.

2. The bottom chord of carrying (girder) truss shall be a minimum of 130 mm deep. A 120mm deep bottom chord for girder trusses may be used provided the truss boot is located at a panel point.

3. Fix the over-angle to the TB80 or TBHD75 with the M16 H.S bolt and nut used for fixing the Truss Boot to the supported truss. Install 63x5 mm square washers where the bolt or nut bears directly onto timber.

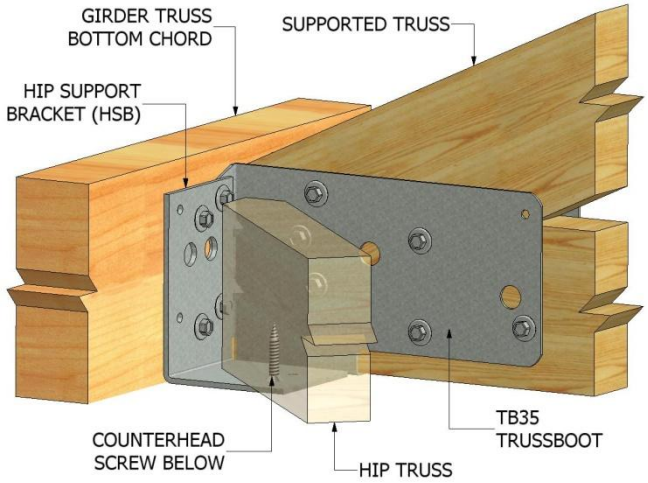
Bolt Kits For Truss Boots

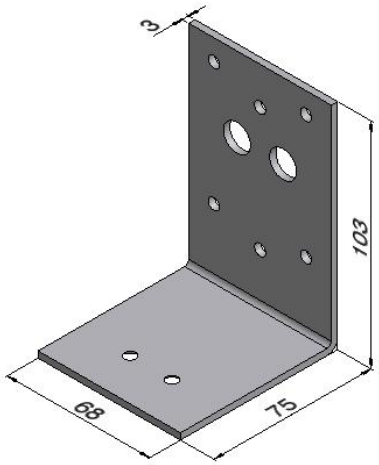
Hot dipped galvanised **Kits** of bolts, nuts and washers are available to suit all bolt fixed truss boots. Details are:

Product Code:	**OBK312**	**OBK316**	**OBK816**
To suit:	TBS35/45, TBJ35/45/70 TB35/12	TB35/16, TB45/16	TB80, TBHD75
Packed:	80	80	60
Bolts (mm):	2@ 12x65 2@ 12x100	2@ 12x65 2@ 16x110	6@ 16x110
Washers (square):	4@ 55x3	2@ 55x3 2@ 63x5	6@ 63x5

HIP SUPPORT BRACKETS (HSB)

Supports hip trusses/rafters at girder truss junctions





Application & Features

Hip Support Brackets (HSB) are used to connect hip trusses or hip rafters to supporting "girder" trusses at a girder to girder junction.

Steel	3.0 mm G300 – Galvanised
Packing	50 per carton
Size	75 x 68 x 103 x 3mm thick

Design Capacities

1. Table 1 - Downward Loads

Joint Group of Supporting Truss	HSB Capacity (kN) Fixing: 4/No.12 Type 17 screws into supporting truss		HSB+TB35 Capacity (kN) Fixing: 8/No.12 Type 17 screws into supporting truss	
	1.35G	1.2G + 1.5Qr	1.35G	1.2G + 1.5Qr
JD4	4.8	6.5	9.3	12.6
JD3	6.8	9.2	13.2	17.8

Notes

(i) The HSB+TB35 capacity in the above table is the same as the TB35 capacity by itself as it is based on the 8/No.12 Type 17 screws into the supporting truss. These values therefore relate to the maximum combined load that can be resisted (i.e. load from hip truss + supported girder)

(ii) Screws with longer lengths are required when HSBs are fixed into multiple laminated trusses. For double laminates, use 65mm long screws into supporting truss.

2. Table 2 -Uplift Loads

Minimum Joint Group	Uplift Capacity (kN)	
	HSB	HSB + TB35
JD5	1.5	13.2
JD4	2.0	18.7
JD3	2.5	20.0

Notes:

(i) **T**he Uplift Capacity of HSB is based on 1/No.12 x 35mm Type 17 screw in withdrawal. This value relates to the maximum uplift reaction of the hip truss that can be resisted. The uplift capacity may be enhanced using alternative tie-down fixings like cyclone straps etc.

(ii) The HSB+TB35 capacity has the same meaning as in Table 1.

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