

•making the connection••

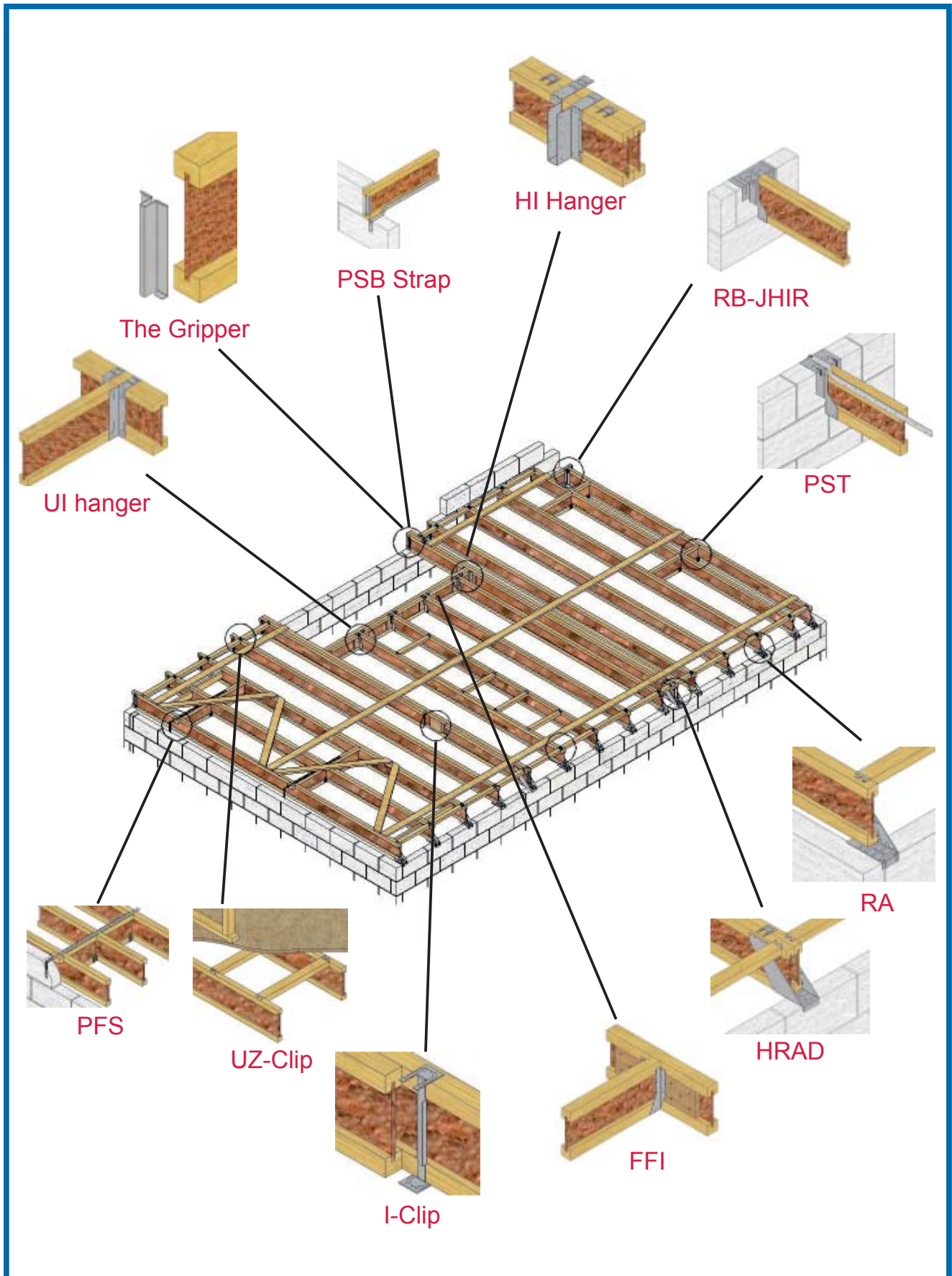


[cullen-bp.com](http://cullen-bp.com)








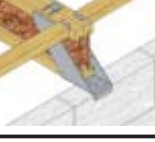
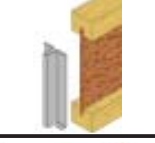
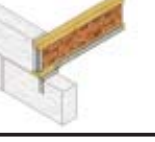
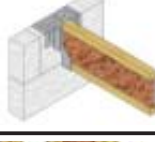




Site Manager's  
Guide

Feb 2008



This guide is intended for use by site managers and others responsible for overseeing the construction of I-Joist floors using Cullen metalwork

For design values, refer to the relevant technical brochure.

	Page 4 - <b>UI hanger</b> - single I-Joist supported from double I-Joist trimmer eliminating the need for backer blocks
	Page 5 - <b>HI hanger</b> - double I-Joist trimmer supported from double I-Joist (high load application) eliminating the need for backer blocks
	Page 6 - <b>FFI Hanger</b> - is a multi-purpose utility connector for any I-Joist to I-Joist or I-Joist to trimmer application
	Page 7 - <b>I-Clip</b> safely transfers load between joists for multiple I-Joist applications eliminating the need for filler blocks
	Page 8 - <b>RA</b> single joist to masonry
	Page 9 - <b>HRAD</b> - double joist to masonry (high load applications)
	Page 10 - <b>The Gripper</b> is a solution for build-in details for I-Joists into masonry
	Page 12 - <b>PSB</b> - Provides parallel restraint for joists required for build-in details over 2-storey
	Page 12 - <b>RB-JHIR</b> I-Joist to masonry hanger, similar profile to traditional joist hanger with a superior level of performance
	Page 13 - The <b>PFS</b> is fixed to the topside or underside of I-Joists providing horizontal restraint perpendicular to joists
	Page 14 - The <b>PST</b> provides practical restraint to blockwork for joist hangers
	Page 14 - <b>UZ-Clip</b> locates noggings for perimeter and non-load bearing partitions
	Page 15 - The <b>VS</b> provides a variable skewed angle between 30° and 90°

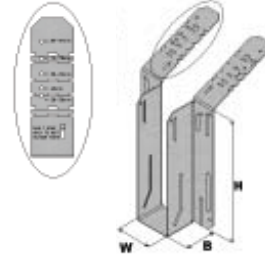
## UI - Universal I-Joist Hanger

The Cullen UI hanger has the ability to transfer loads without the need for either web stiffeners or **backer blocks** and is extremely quick and simple to install.

### ADVANTAGES

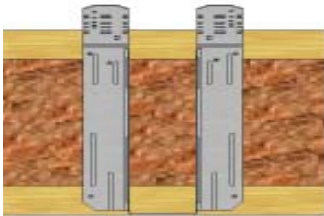
- One size fits all header widths
- Reduced stock requirements
- No web stiffeners or **backer blocks**

Standard Install
1 hanger
6no. 3.75 x 30mm nail (face fix)
2no. 3.75 x 30mm nail (top fix)
2no. 3.75 x 30mm nail (incoming joist fix)



## TYPICAL INSTALLATION

### Stage 1



Position UI against face of I-Joist.

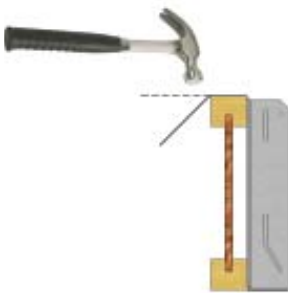
Face fix to I-Joist using, 6 nails.

### Stage 2



Drive home fixing spikes in top plate into top flange of I-Joist.

### Stage 3



Wipe over top plate at appropriate crease line to give a flush fit to I-Joist.

### Stage 4



Nail return legs into back face of I-Joist using 2 nails into appropriate nail holes

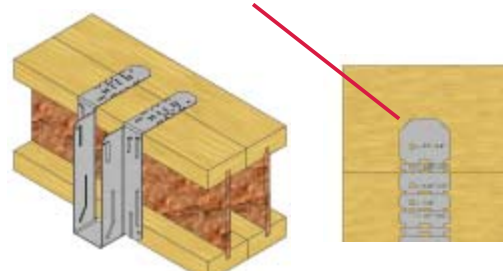
### Stage 5

### HEADER WIDTHS OVER 100mm



Drop incoming joist into UI and fix with 2 nails.

For header widths greater than 100mm, the top legs must be nailed into the rear ply of the double I-Joist using the furthestmost nail holes.



## HI - High Load I-Joist Hanger

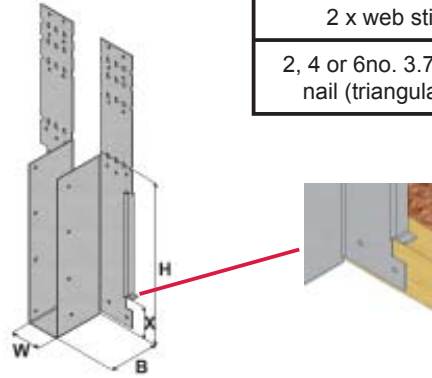
The Cullen HI hanger has all the benefits of the UI Hanger with increased load carrying capacity.

This detail is for connecting I-Joist headers only.

### ADVANTAGES

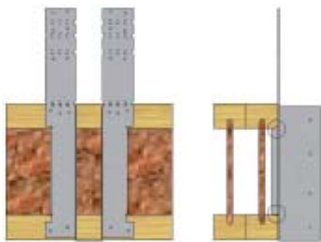
- One size fits all header widths
- Reduced stock requirements
- No web stiffeners or **backer blocks**

Standard Install	Enhanced Uplift
1 hanger	1 hanger
10no. 3.75 x 30mm nail (face fix)	10no. 3.75 x 30mm nail (face fix)
4no. 3.75 x 30mm nail (top fix)	4no. 3.75 x 30mm nail (top fix)
2no. 3.75 x 30mm nail (incoming joist fix)	2no. 3.75 x 30mm nail (incoming joist fix)
	2 x web stiffener
	2, 4 or 6no. 3.75 x 30mm nail (triangular holes)



### TYPICAL INSTALLATION

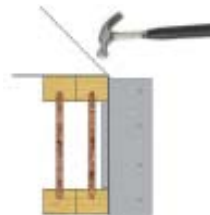
#### Stage 1



Position HI against face of I-Joists ensuring bearing enhancers are located tightly onto bottom flange.

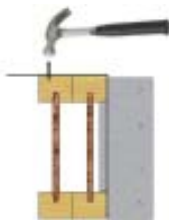
Face fix to I-Joist using 10 nails.

#### Stage 2



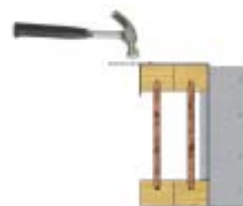
Wipe over top plate.

#### Stage 3



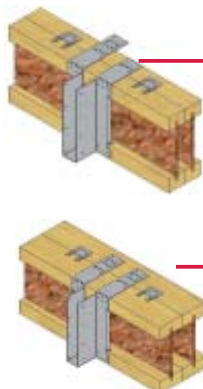
Nail top plate using 4no. nails.

#### Stage 4



Wipe over return leg at crease line to give flush fit to I-Joist.

### Nailing Positions



Up to a maximum of double 75mm wide joists, wipe top legs down the rear of header. Nail furthest nail holes.

For double 89/97mm wide joists nail in furthest nail holes in 2nd ply of header

### ENHANCED UPLIFT



Fix web stiffeners in line with I-Joist manufacturers' guidelines before installing hanger. Then follow standard installation procedure. Finally, fill optional triangular nail holes in incoming joist.

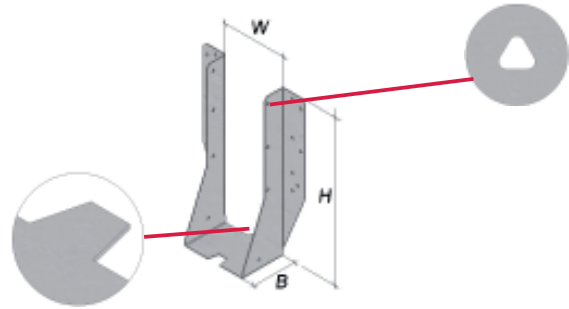
## FFI - Face Fix Hanger

The FFI is a multi-purpose utility connector for any joist to joist or joist to trimmer application.

### ADVANTAGES

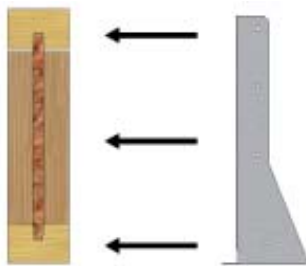
- No web stiffeners required
- Locating spike in base of hanger for easy placement

Standard Install	Enhanced Uplift
1 hanger	1 hanger
10 to 30 (depending on depth) no. 3.75 x 30mm nail (face fix)	10 to 30 (depending on depth) no. 3.75 x 30mm nail (face fix)
2no. 3.75 x 30mm nail (incoming joist fix)	2no. 3.75 x 30mm nail (incoming joist fix)
	2 x web stiffener
	2, 4 or 6no. 3.75 x 30mm nail (triangular holes)



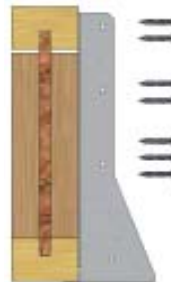
### TYPICAL INSTALLATION

#### Stage 1



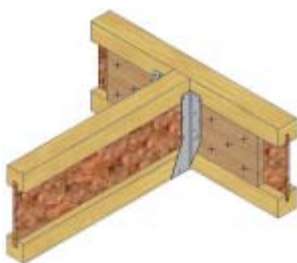
The FFI requires backer blocks installed tightly to the bottom flange of the supporting joist.

#### Stage 2



The FFI is then fixed to the face of the supporting joist in the correct position. Fill all nail holes on face.

#### Stage 3



The incoming member is then dropped into position. 2 lower nail holes in the side flange must be filled.



### ENHANCED UPLIFT



Fix web stiffeners in line with I-Joist manufacturers' guidelines before installing hanger. Then follow standard installation procedure. Finally, fill triangular nail holes in joist.



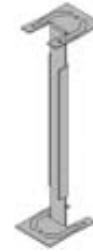
## I-Clip

The Cullen I-Clip safely transfers load between joists for multiple I-Joist applications eliminating the need for filler blocks.

### ADVANTAGES

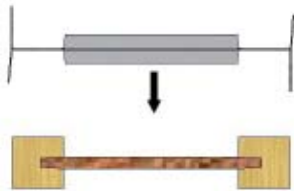
- Quick and simply to install
- Eliminates need for **filler blocks**
- Connections visible to ensure compliance

Standard Install
1 clip
6no. 3.75 x 30mm nail



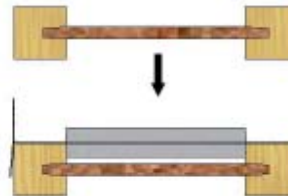
## TYPICAL INSTALLATION

### Stage 1



Lay I-Joist flat, press I-Clip into position.

### Stage 2



Position second ply of multiple I-Joist on top of I-Clip.

### Stage 3



Fully nail.

### Typical Arrangement At Joist Ends

Minimum of 125mm from end of joist

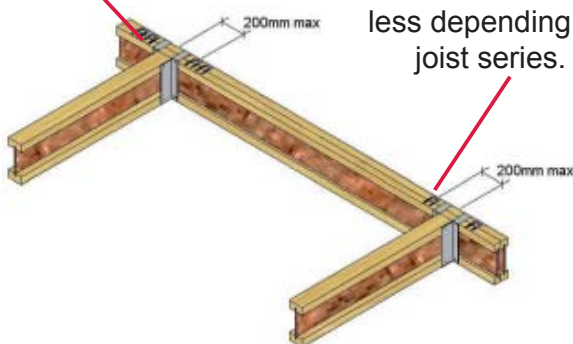


This detail is not a joist requirement, but will provide a safer site handling option.

### Typical Arrangement of I-Clips For a 2-ply Header with Concentrated Point Load

2no. I-Clips each side of joists where incoming load is greater than 7.24kN depending on joist series.

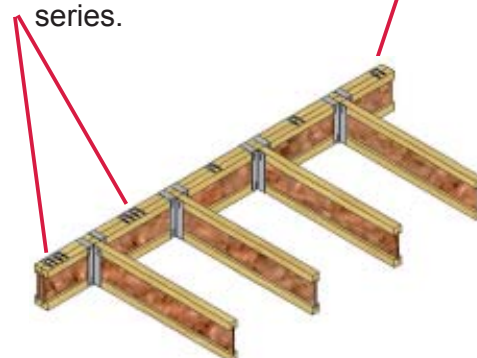
1no. I-Clip fixed each side of joist where incoming load is 7.24kN or less depending on joist series.



### Typical Arrangement of I-Clips For a 2-ply Header with Regular Point Loads

2no. I-Clips each side of joists where incoming load is greater than 3.62kN depending on joist series.

1no. I-Clip fixed each side of joist where incoming loads are 3.62kN or less depending on joist series



## RA - Restraint Angle

The Cullen RA is an I-Joist to masonry hanger that guarantees a qualified safe working load without the need for masonry above.

### ADVANTAGES

- Part L compliant for air leakage
- Can be used as a safe working platform after 24 hours
- Provides all necessary restraint to comply with BS 5628, CERAM, NHBC and Zurich guidelines

#### Standard Install

1 hanger

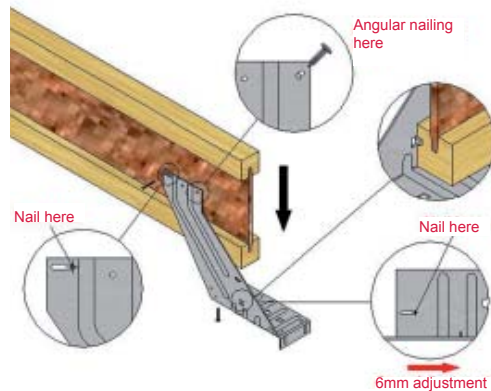
6no. 3.75 x 30mm nail



## TYPICAL INSTALLATION

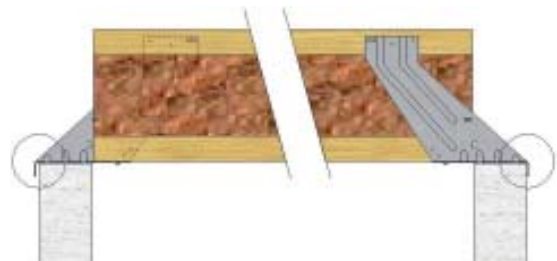
### Stage 1

- Ensure joists just fit between the walls
- If joist is too long trim to fit
- Position joist against location tab
- Pre-fix RA to each end of pre-cut joist nailing through slotted holes in base plate and side flange only as shown
- Slide to opposite side of slots to provide full 6mm adjustment on wallhead
- **Always pre-fix hangers at ground level or on scaffolding**



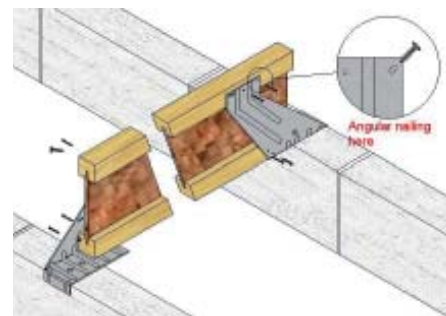
### Stage 2

- Locate assembled joist on wallhead allowing equal adjustment at both ends
- Adjust each end by tapping with a hammer until return flange is correctly positioned tight against blockwork
- This stage provides a maximum horizontal adjustment of 12mm and suits blockwork built to BS5606:1990 Accuracy in Building
- **Ensure return flange abuts masonry**

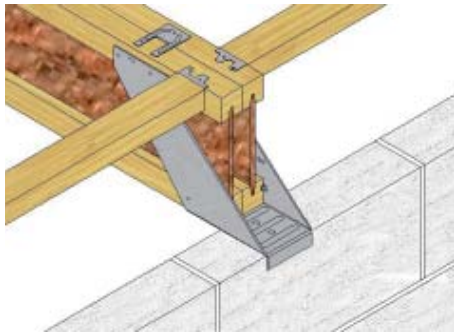


### Stage 3

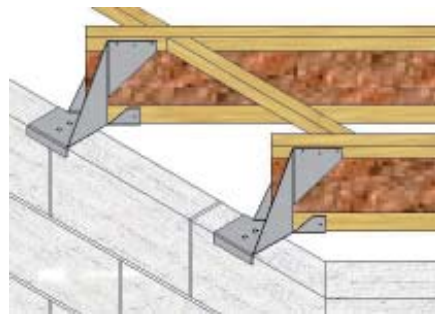
- Fully nail in remaining circular holes (4no.) using 3.75 x 30mm square twist nails
- **DO NOT apply any load to joist prior to RA being full nailed**



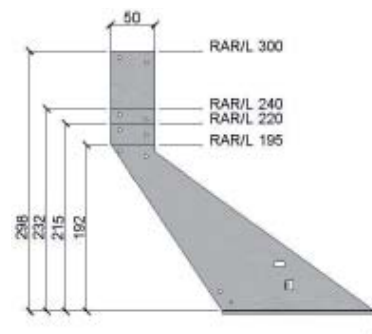
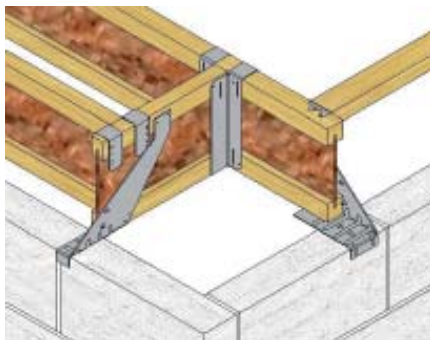
### HRAD For High Load & Multiple Joist Applications



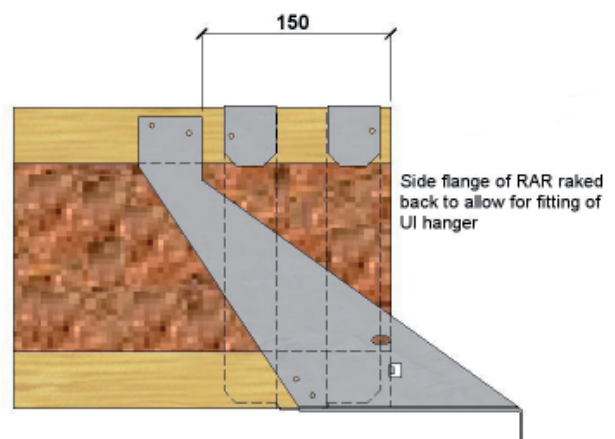
### RADS For Skewed Applications



### RAR/L For Trimming Applications



- RAR/L side flange is raked back to enable installation of incoming I-Joist 50mm from the wall onto a Cullen UI hanger without the return flange of the UI clashing with the RAR/L
- Top fix and face fix hangers can also be used with the RAR/L. Ensure all backer blocks are fitted prior to the RAR/L being fixed
- The RA range provides necessary restraint to supporting walls perpendicular to joists, where joists are spaced at centres no greater than 600mm
- Additional PST restraint straps are required at either side of openings greater than 600mm



## The Gripper

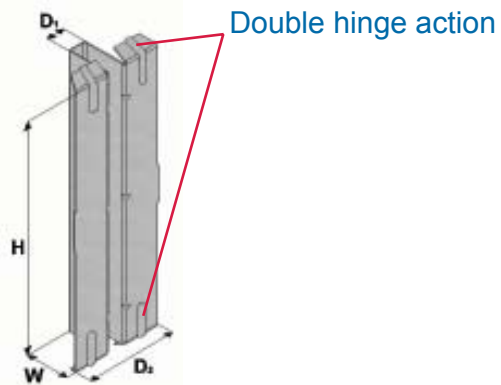
The Gripper is used as a build-in detail for I-Joists into masonry.

### ADVANTAGES

- Meets Part L
- Easy to install - no nailing required
- 60 min Fire Rating

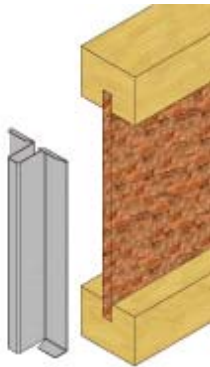


Standard Install
1 Gripper



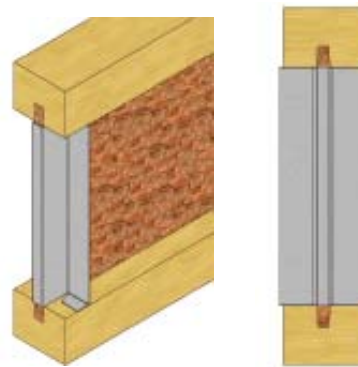
### TYPICAL INSTALLATION

#### Stage 1



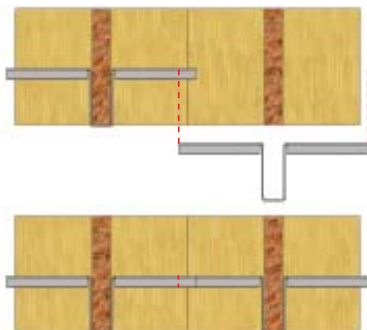
Place the Gripper onto one end of the I-Joist to be built in to the masonry. Ensure that the Gripper flanges fit between the top and bottom I-Joist flanges and point outwards toward the joist end.

#### Stage 2



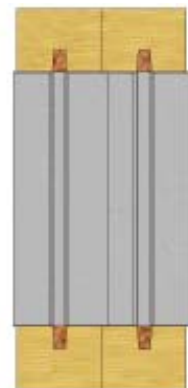
Push to fit until it is fully engaged. Ensure it tightly abuts the I-Joist web and that both ends of the Gripper tightly abut the I-Joist flanges.

### 2-Ply Assembly



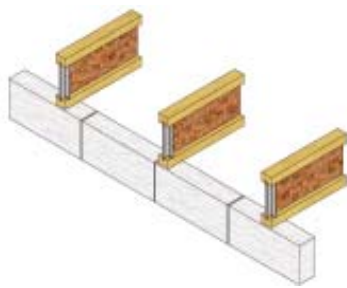
Second gripper abuts first to provide an air tight seal.

\*Double I-Joists must be securely joined with I-Clips

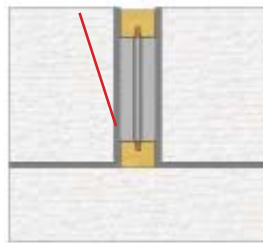


Installation of the Gripper is now complete and I-Joists can be installed upon the masonry

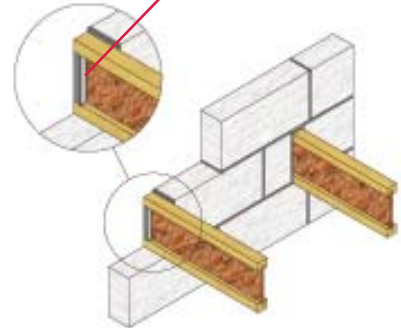
Install the I-Joists onto the masonry at required centres ensuring that they each have a **minimum bearing** onto the masonry of **90mm**



Standard 10mm perp-end mortar joint between end of block and face of Gripper



Mortar to cavity side only to achieve air tightness performance



The floor should be braced in accordance with I-Joist manufacturer's instructions before the masonry is built up around the I-Joists. Ensure that sufficient mortar is applied to the surrounding masonry to provide a tight and secure fit.

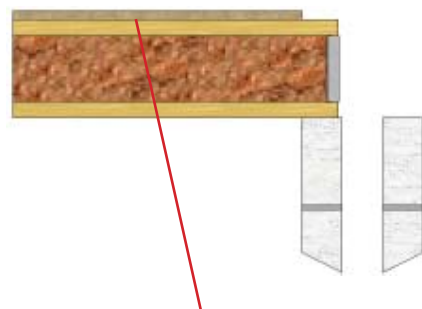
### Party Wall Installation

#### Stage 1



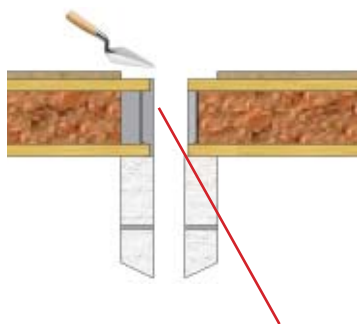
Install the I-Joists onto the masonry at required centres ensuring that they each have a **minimum bearing** onto the masonry of **90mm**

#### Stage 2



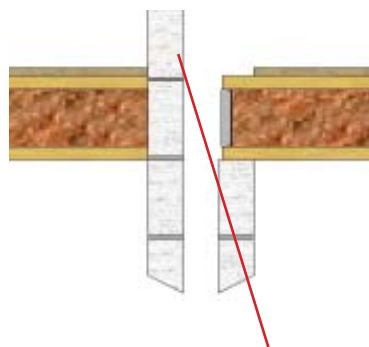
Install decking.

#### Stage 3



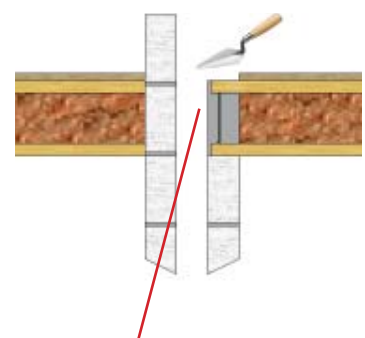
Ensure that sufficient mortar is applied. Mortar to cavity side and to internal face to achieve 60min Fire Rating and air tightness performance.

#### Stage 4



Continue to construct masonry wall on first apartment.

#### Stage 5



Ensure that sufficient mortar is applied to other I-Joist and continue to construct masonry.

### PSB - Parallel Strap Bottom

The PSB provides practical parallel restraint for joists required for build-in details over 2-storey.

<b>Standard Install</b>
1 strap
8no. 3.75 x 30mm nail



### TYPICAL INSTALLATION

Additional parallel restraint is required for build-in details on 2-storeys and above.



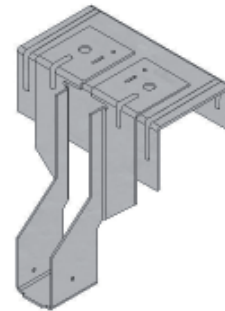
### RB-JHIR - Rapid Build Joist Hanger

The Cullen RB-JHIR is an I-Joist to masonry hanger that guarantees a qualified safe working load without the need for masonry above.

#### ADVANTAGES

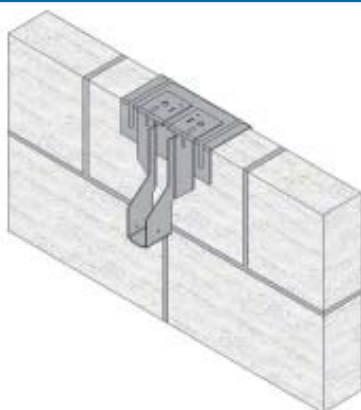
- Speeds up build process and increases on-site safety
- Can be used as a safe working platform after 24 hours
- Return flange design ensures the hanger face tightly abuts masonry and ensures

<b>Standard Install</b>
1 hanger
2no. 3.75 x 30mm nail



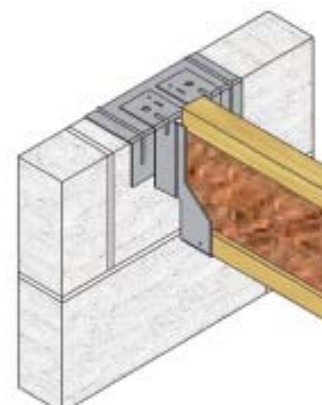
### TYPICAL INSTALLATION

#### Stage 1



Locate RB-JHIR on wallhead.

#### Stage 2



Place incoming joist into hanger.  
Fill two nail holes in the bottom of the side flange.

**RB-JHIR guarantees a qualified safe working load without the need for masonry above.**

### PFS - Pre-Formed Strap

The Cullen PFS is a single piece, 1.5mm galvanised steel strap, designed to provide enhanced performance and greater flexibility of use.

#### ADVANTAGES

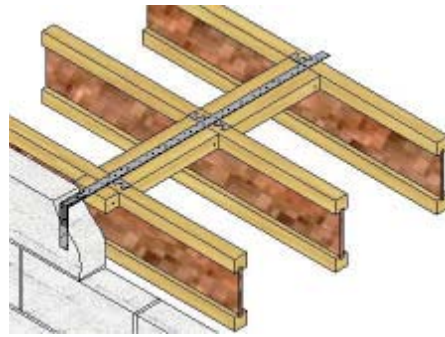
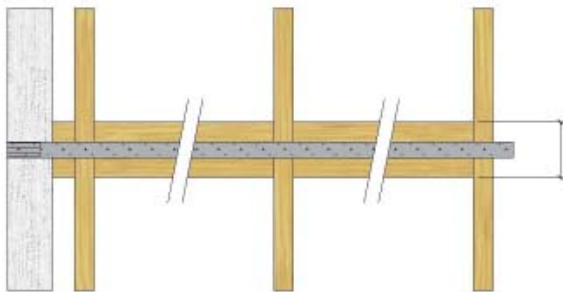
- No punching of slots through the webs of I-Joists
- Simpler nogging fixing
- Heavier galvanised protective coating for greater corrosion resistance

Standard Install
1 strap
8no. 3.75 x 30mm nail



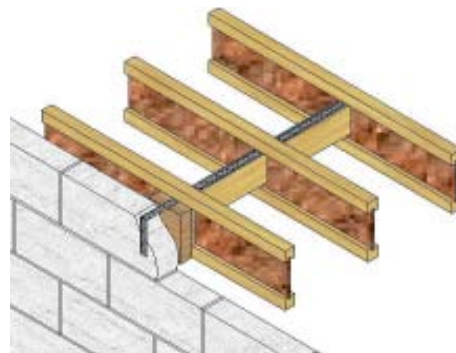
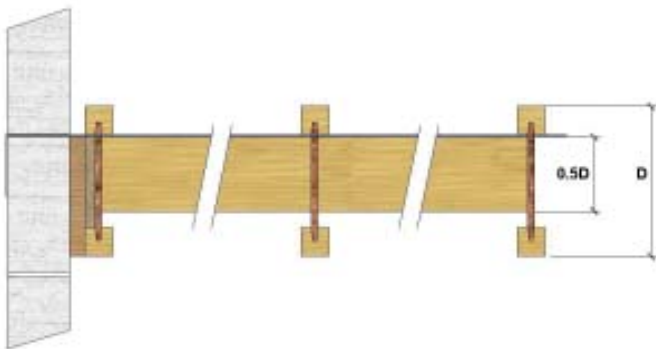
### TYPICAL INSTALLATION

#### Option A



PFS strap runs over top of I-Joists using solid timber noggings supported on UZ-clips or skewed nailing where permitted.

#### Option B

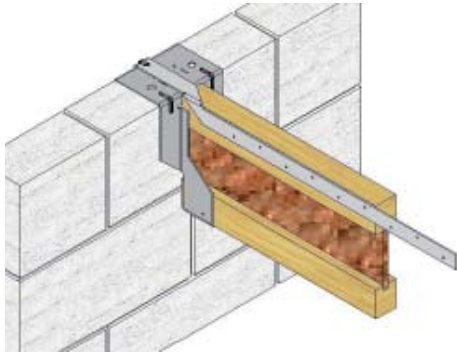


PFS strap runs through slot in web at level to suit blockwork coursing (care must be taken not to cut top flange of I-Joist when cutting slot) using solid timber noggings fixed between webs of I-Joist and nailed in position as per I-Joist manufacturer's guidelines.

Solid noggings must not be less than 0.5 times the depth of the I-Joist to a maximum of 150mm

### PST - Parallel Strap Top

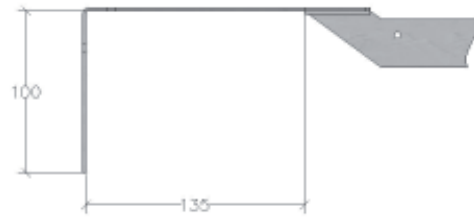
The Cullen PST provides practical parallel restraint.



#### Standard Install

1 strap

8no. 3.75 x 30mm nail



### UZ-Universal Z-Clip

The UZ is a multi-functional connector designed to locate and connect flat noggings between I-Joists at perimeter edges to support flooring or non-load bearing partitions.

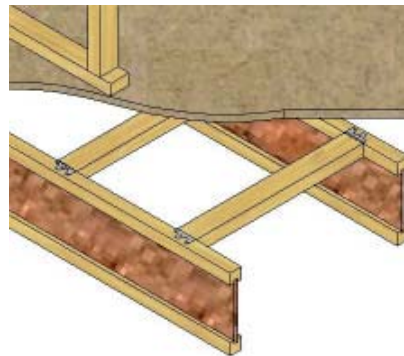
#### ADVANTAGES

- No need for overlapping or staggering, adjacent noggings can be aligned

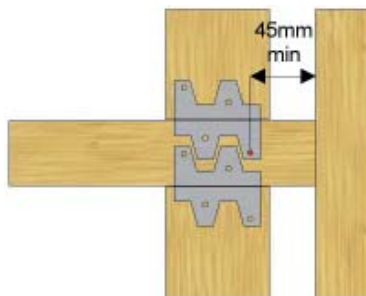
#### Standard Install

1 UZ clip

4no. 3.75 x 30mm nail

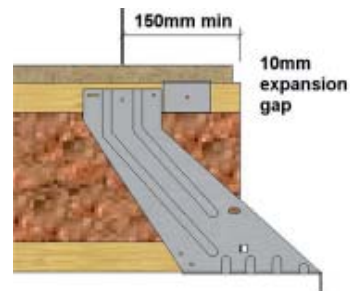


### Fitting of Perimeter Noggings



Minimum edge distance = **45mm** from centre of 1st nail to end of joist.

### Decking Installation



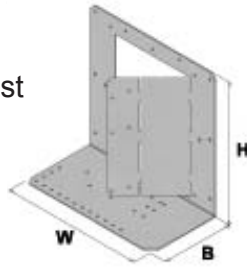
Minimum edge distance for decking nails = **150mm**

## VS - Variable Skewed

The Cullen VS provides a variable skewed angle between 30° and 90°

### ADVANTAGES

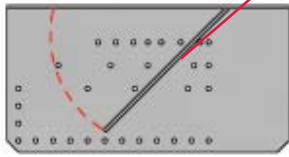
- No need to mitre cut joist
- Angle scale on base to ease adjustment
- **No backer block**



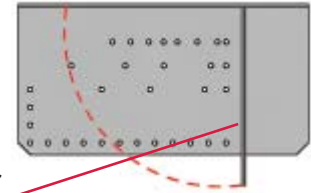
Standard Install	Standard Install (for I-Joist)
1 hanger	1 hanger
11no. 3.75 x 30 mm nail (face fix)	11no. 3.75 x 30 mm nail (face fix)
6no. 3.75 x 30 mm nail (incoming joist fix)	6no. 3.75 x 30 mm nail (incoming joist fix)
2no. 3.75 x 30 mm nail (underside)	2no. 3.75 x 30 mm nail (underside)
	2 correctly fitted web stiffeners

### Stage 1

Adjust side plate to approximate angle between 30° and 90° using scale on base of hanger, bending only once.



OR ALTERNATIVELY

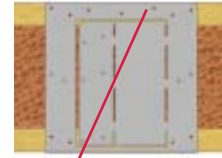
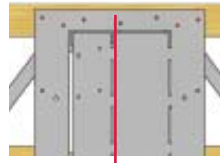
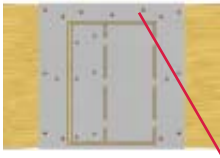


Where incoming members widths are greater than 63mm wide, adjust bend to 90°, bending only once.

**VS hanger can be adjusted to the desired angle once only**

### Stage 2

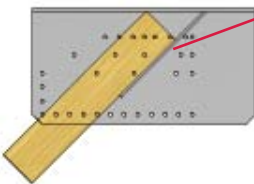
1. Align VS to face of header member.



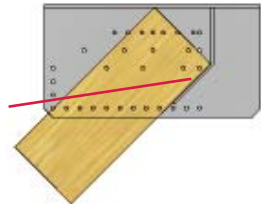
2. Face fix VS to header member using 11no. 3.75 x 30mm square twist nails.

### Stage 3

1. Locate incoming member and adjust side plate to correct angle.



Where incoming members widths are greater than 63mm wide, the side plate has been bent to 90°. Now locate the incoming member and adjust second bend to suit.



2. Fix to incoming member using 6no. 3.75 x 30mm square twist nails.



Where incoming member is an I-Joist, web stiffeners must be fixed as per I-Joist manufacturer's guidelines.



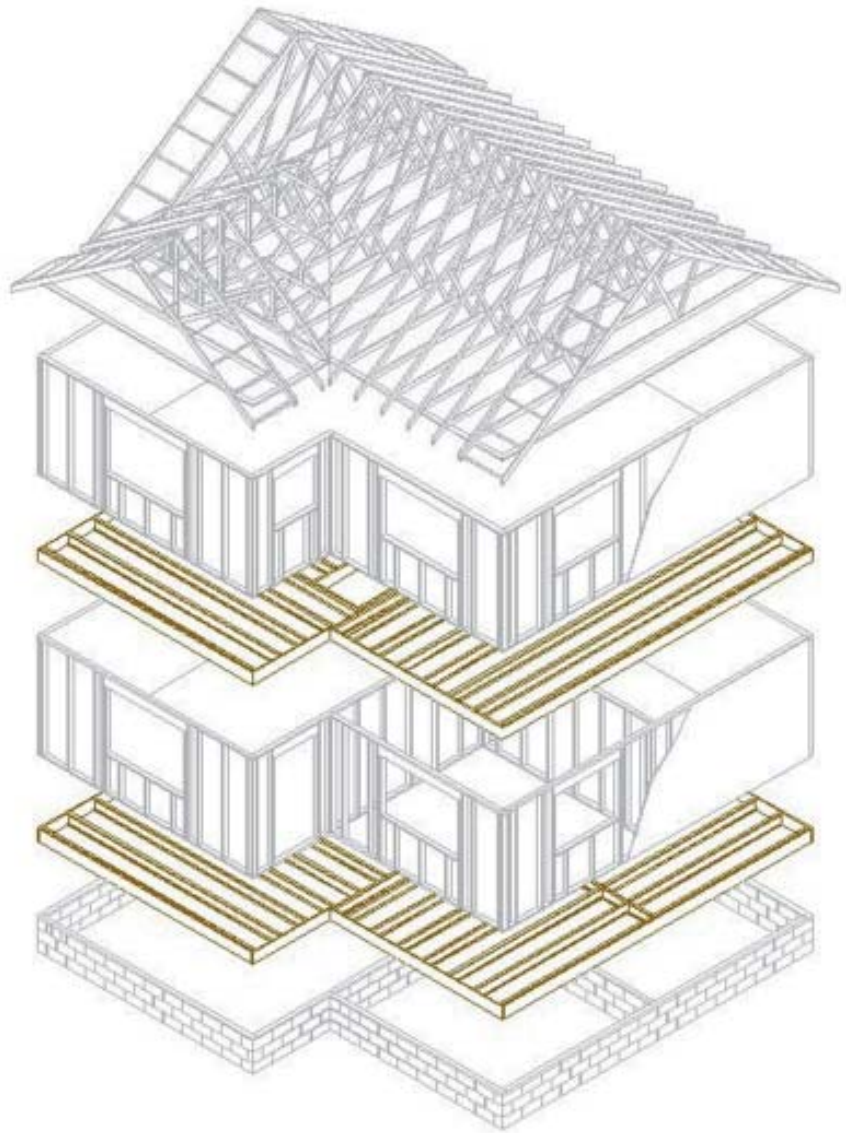
3. Please ensure that: - 1no. inner nail hole (indicated in red)

&

- 1no. outer nail hole (indicated in red)

are filled on the underside with 3.75 x 30mm square twist nails.





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