

 **TRUfloorsystems**[®]
Part of the STAIRCRAFT Group

Floor Installation Guide



Engineered
Wood
Products



SUPPLY CHAIN SUSTAINABILITY
SCHOL





STAIRCRAFT®
Group

Who We Are & What We Do

Founded in 1984 Staircraft are now:

- Europe's largest manufacturer of staircases with a capacity to supply 1400 new build homes every week.
- Europe's only Stair, i-Joist and Floor-Kit manufacturer.
- Proud to be number 51 in the 2017 Sunday Times Virgin Fast Track 100 League Table.

The Staircraft Group consists of two divisions



The Staircraft team service the major national house builders and TRU building systems the regional builders, timber frame, modular off-site and merchant based business.

Our portfolio of products has expanded, resulting in Staircraft becoming the UK's first manufacturer of fully integrated staircases and i-Joist floor-kits.

We operate from 9 manufacturing facilities, across 4 sites in the Midlands, covering over 200,000 sq. ft. Our team are passionate about manufacturing products that improve site safety and provide hassle-free installation.

Our investment in CNC technology is market leading, specifically designed to create innovative, time saving and safety solutions for tradespeople.

Introducing our brands



Our product categories continue to grow within our family of TRU brands. For more information visit www.staircraft-ltd.co.uk.

Site Safety

We are fully aware of the safety risks faced every day on building sites so improved site safety is a key driver to our product development process.

Examples of our unique solutions to improve floor safety bracing and stairwell protection can be found on pages 17 and 18.





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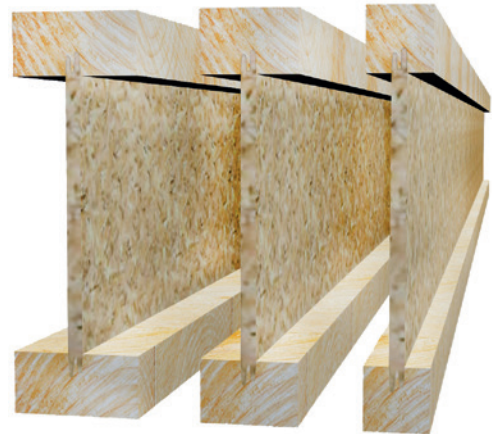
TFSi-Joist

Over recent years i-Joist Floor and Roof Kits have been added to the product portfolio often supplied with stairs for a fully integrated solution. Staircraft has, in a short period of time become one of the largest engineered Floor Kit providers in the UK.

Our new technology i-Joist production plant is a natural progression for the business and is part of a massive investment programme, which will see the company enter new markets with innovative products. The high performance i-Joist is marketed in the UK under the **TRUfloorsystems**[®] TFSi brand which is part of a new family of TRU brands across the range.

The **TRUfloorsystems**[®] i-Joists are produced in a new state of the art facility in Coventry, a few miles from the company's head office and largest stair factory in Nuneaton. Additional factories are in West Bromwich and Hinckley. **TRUfloorsystems**[®] i-Joists are supplemented by our partners Masonite offering customers a full range of specifications.

Our precision made TFSi-Joists feature a high-quality timber flange combined with an enhanced OSB web. The joint between web and flange has been engineered with a double finger to increase strength and there are no web joints traditionally the weakest part of an i-Joist.



i-JOIST SYSTEM



Printed labels are inserted at the end of each joist identifying the site and customer details as well as the joist reference on the framing plan.

The joist labels also uniquely include a QR code which when scanned on your phone will identify the construction detail pertaining to the end detail for the joist in question – so it is easy to understand how it is intended to be fixed at each end.





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Leaders In Innovation

The Staircraft Group are renowned for leading the industry in bringing innovations to market which give our customers a fully integrated, problem free installation. A practical example which improves site safety, and simplifies floor construction is our unique factory applied notch detail. This will typically save 1 hour per plot installation time (no perimeter noggings or z-clips required). In addition, an average of 20kg of site waste is saved per plot by avoiding the need for temporary stability bracing.



Quality and Environmental Credentials

The Staircraft Group operates a comprehensive environmental policy, which covers both the manufacture of its products and the sourcing of raw materials.

TRUfloorsystems i-Joists utilise wood fibre certified under PEFC with full chain of custody.

The **TRUfloorsystems** i-Joists carry TRADA Q-Mark Approval and are ISO 9001 Quality Assured. All **TRUfloorsystems** i-Joists are approved for use in structural applications by the NHBC.



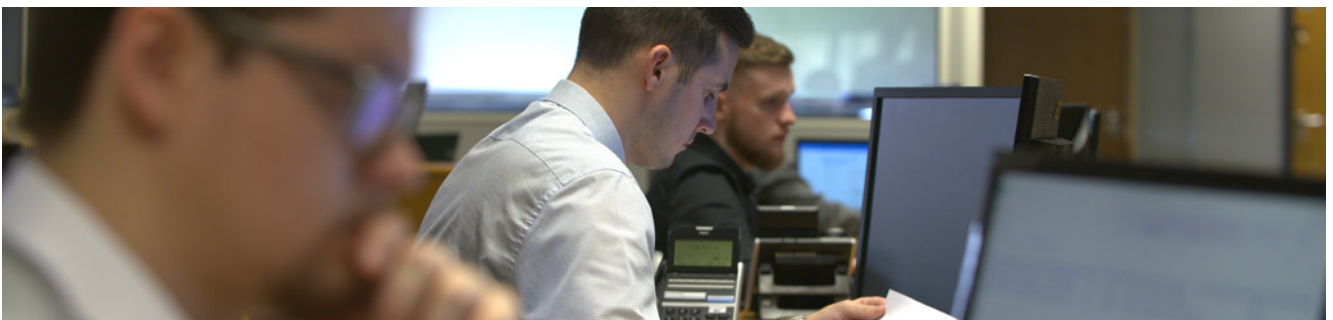
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Software and Technical Support

The Staircraft Group owns its own market leading iPro® design software package. Continuous development and upgrades keeps the software in line with all changes to Building Regulations and Codes of Practice. Exciting new in-house development allows for the design and supply of complete integrated Floor, Deck and Staircase systems.

We offer excellent technical support and can advise on all aspects of product use in Floors, Stairs, Roofs and Walls. Value engineering can save customers a great deal of cost without compromising performance. Full software and after sales service is also part of the extensive customer support package.



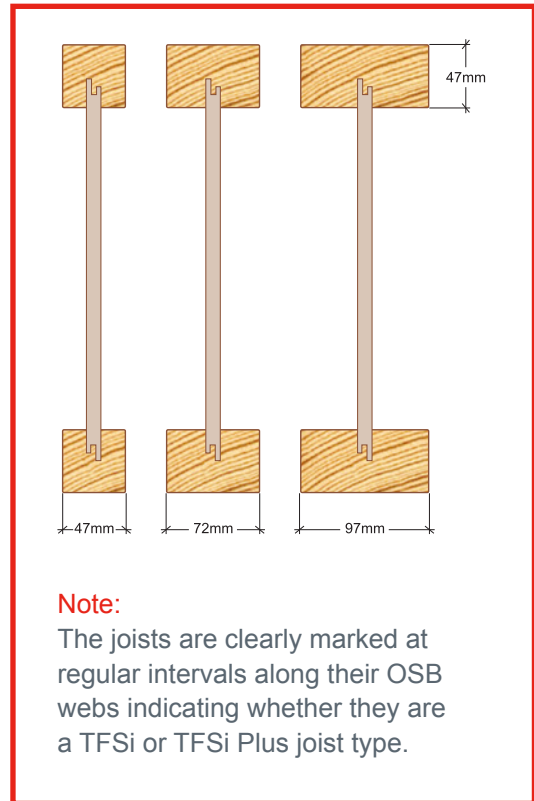
INNOVATION



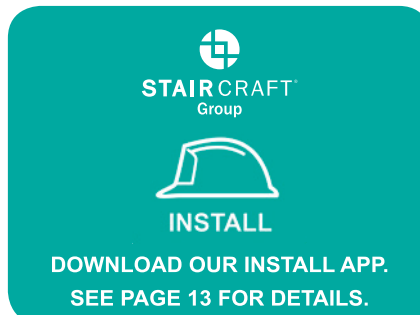
Standard TFSi-Joist Specifications

	Type	47mm Wide	72mm Wide	97mm Wide
220mm Deep	TFSi (C24 5.4m)	✓	✓	✓
	TFSi Plus (C30+ 11m)	✓	✓	✓
240mm Deep	TFSi (C24 5.4m)	✓	✓	✓
	TFSi Plus (C30+ 11m)	✓	✓	✓
300mm Deep	TFSi (C24 5.4m)	✓	✓	✓
	TFSi Plus (C30+ 11m)	✓	✓	✓

Depth	Type	Width	Max span @ 600c/c	Max span @ 400c/c
220mm	TFSi	47	3867	4320
		72	4390	4775
		97	4704	5119
	TFSi Plus	47	4123	4527
		72	4599	5004
		97	4928	5365
240mm	TFSi	47	4166	4559
		72	4630	5037
		97	4959	5397
	TFSi Plus	47	4393	4777
		72	4850	5277
		97	5194	5655
300mm	TFSi	47	4805	5224
		72	5292	5758
		97	5662	6163
	TFSi Plus	47	5024	5464
		72	5538	6027
		97	5925	6452



SPECIFICATIONS



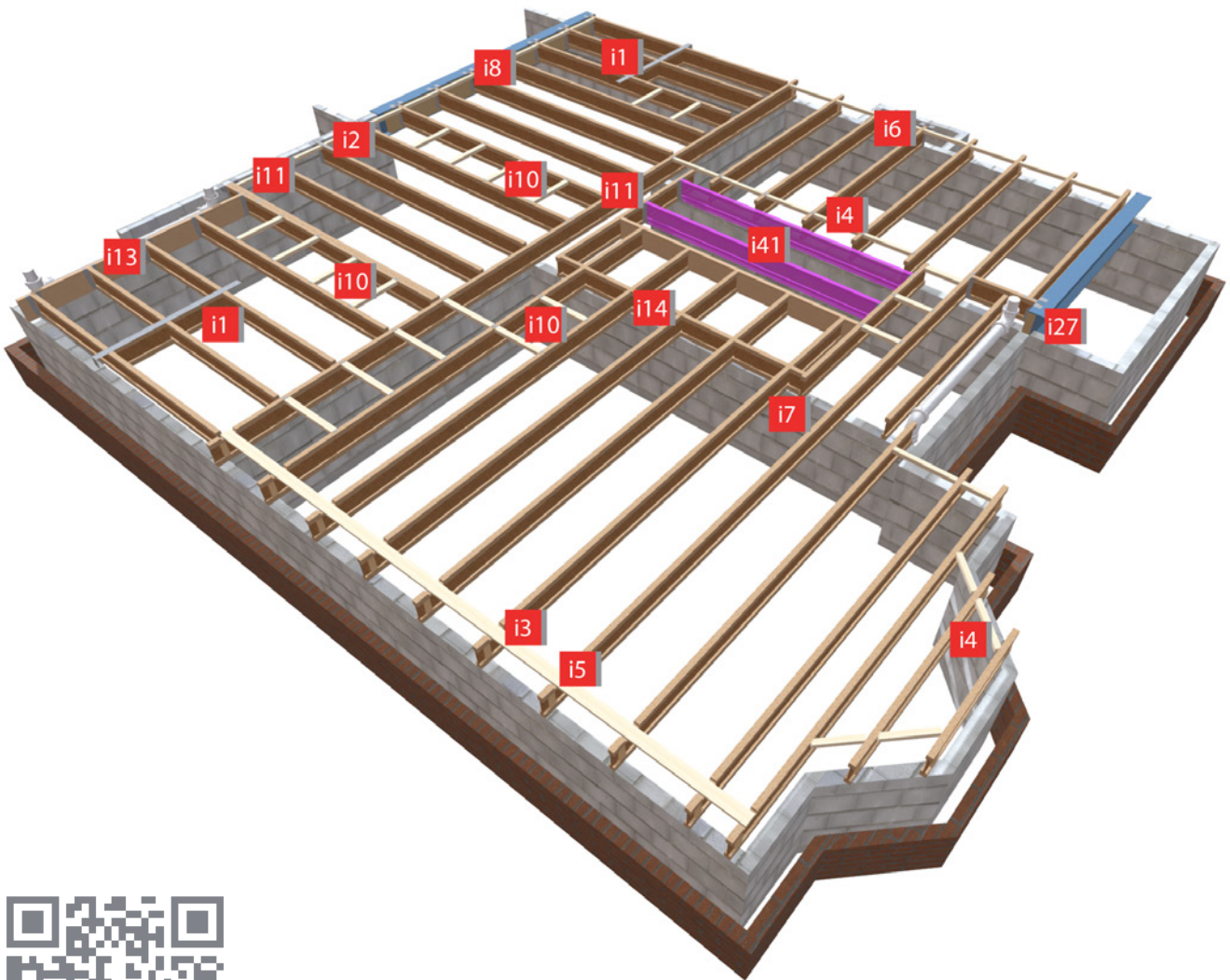
The spans shown above are based on the following assumptions:

- Joists are simply supported on walls or joist hangers, with a minimum bearing of 45mm on each side
- The spans are maximum clear distances between inside face of walls
- Standard domestic (uniformly distributed) loading of 1.5kN/m² live load; 0.5kN/m² dead load; 0.25kN/m² partition allowance
- Calculations in accordance with EN1995-1-1 (Eurocode 5), its UK National Annex and PD6693-1



Framing Details

Typical floor framing plan including construction detail “i” references



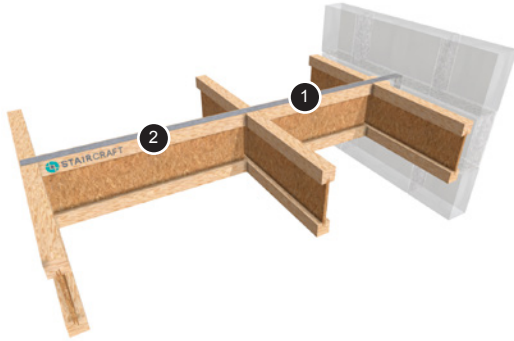
FRAMING DETAILS



Scan the QR codes on the following pages with your phone to bring the construction details to life !

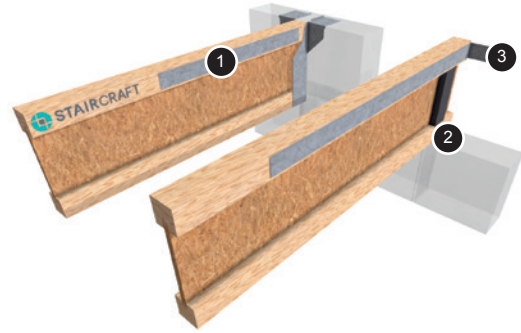


i1 MASONRY WALL RESTRAINT
– Perpendicular to Joist



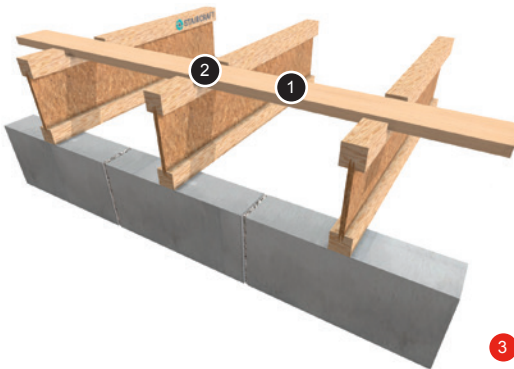
- 1 Thin metal restraint strap installed in accordance with the manufacturer's instructions
- 2 Full depth i-Joist or Min. 38x97mm noggings fixed to joists by skew nails

i2 MASONRY WALL RESTRAINT
– Parallel to Joist



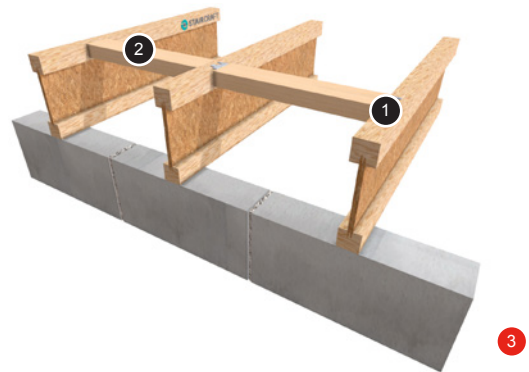
- 1 Restrained strap fitted to joist on non-restraint type masonry hanger
- 2 Restraint straps may only be omitted if the joist has at least 90mm of direct bearing on the wall, provided that the height of the wall does not exceed 2 storeys
- 3 Restraint strap on built-in joist

i3 NOTCHED PERIMETER BRACING



- 1 Only to be used with factory cut notches
- 2 Where required butt joint bracing by skew nailing or fixing with screws
- 3 **Information**
Do NOT cut or notch flanges on site. Only factory notches allowed

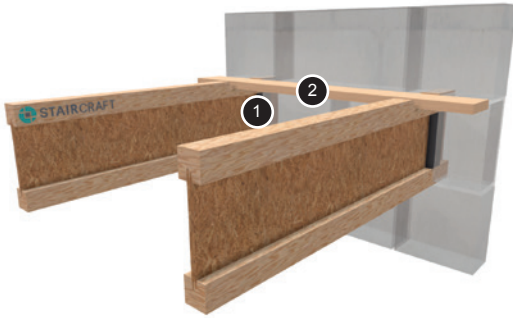
i4 PERIMETER NOGGINGS



- 1 Noggings may be skew nailed to joists or supported on z-clips. Ensure all nail holes filled when using z-clips
- 2 Timber noggings require fitting between joists to support all free edges of decking. Please see floor design for locations.
- 3 **Information**
Do not cut or notch flanges on site



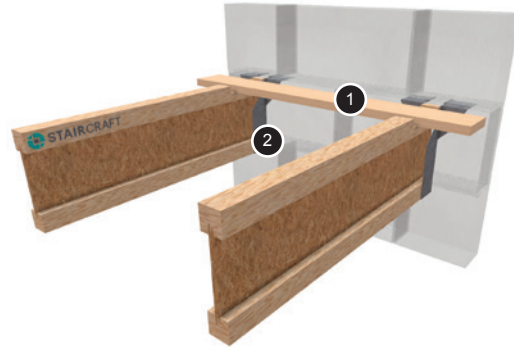
i5 MASONRY WALL BEARING



3

- 1 Joist end built into wall. Note some capping devices may require less than a full bearing to prevent fouling the cavity
- 2 Perimeter nogging for decking support where required please refer to detail i3 & i4
- 3 **Information**
The joist bearing must be sealed to prevent air leakage. This may be achieved by the use of proprietary capping devices. Staircraft factory fitted end blocks DO NOT require sealant

i6 MASONRY HANGER

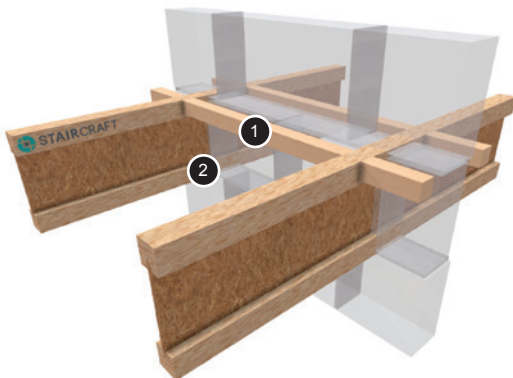


3

- 1 Perimeter nogging for decking support where required please refer to detail i3 & i4
- 2 Proprietary approved masonry joist hangers - web stiffeners may be required
- 3 **Information**
Parallel restraint straps will be required with non-restraining hangers — see detail i2

All round holes in hangers to be filled with 3.75mm diameter square twist nails x 30mm long

i7 INTERMEDIATE BEARING
– Masonry Wall



- 1 Perimeter nogging for decking support where required please refer to detail i4
- 2 Minimum 89mm bearing

i8 STEEL BEAM CONNECTION
– Masonry Wall



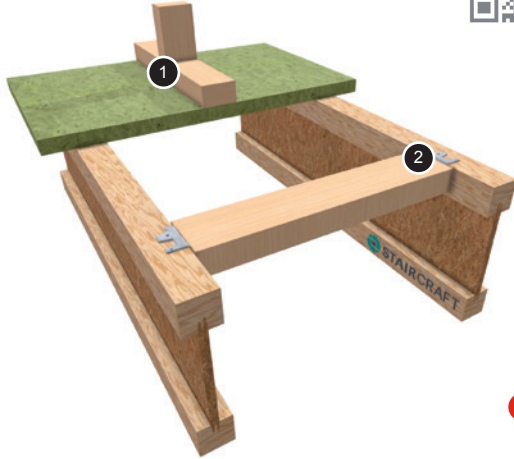
2

- 1 Timber packer installed between steel flanges to prevent rotation on hanger.
- 2 **Information**
Steel MUST be flush with blockwork.



i10

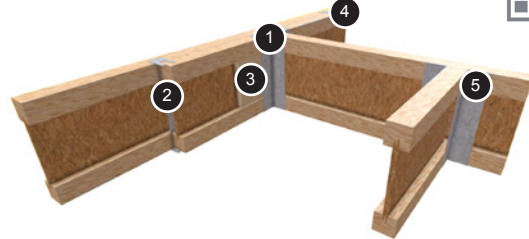
**MASONRY WALL RESTRAINT
– Perpendicular to Joist**



- 1 Non-load bearing stud partition fixed to noggings (max. self-weight of partition 0.8kN/m run)
- 2 Min 38 x 63mm partition noggings supported by metal z-clips, nailed in accordance with the manufacturer's instructions
- 3 **Information**
All round holes in z-clips to be filled with 3.75mm dia square twist nails x 30mm long.

i11

**JOIST TO JOIST CONNECTION
– I Clip**



- 1 Top Mount Hanger
- 2 I Clips fastener fitted max 200mm distance from hanger unless specified on design.
- 3 Backer block on hanger face only for double joists if backer block is required by design
- 4 TRUfloorsystems i-Joist
- 5 Approved hanger designed for use without backer blocks

Information

All round holes in hangers to be filled with 3.75mm diameter square twist nails x 30mm long. . . Note that approved hangers which require the use of backer blocks are available. See details i12

For top mount hangers, backer block tight to top flange of joist.

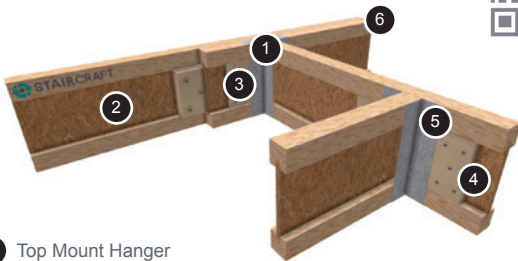
For face mount hanger, backer block tight to bottom flange.

Use 10n. 4.00 nails x 90mm long for joist over 89mm wide

Use 10n. 4.00 nails x 75mm long for all other widths.

i12

**JOIST TO JOIST CONNECTION
– Filler Block**



- 1 Top Mount Hanger
- 2 Filler block or proprietary metal clips must be installed with multiple joists
- 3 Backer block on hanger face only for double joists if backer block is required by design
- 4 Backer block both sides of single joist
- 5 Where backerless hangers are used backerblock is not required. See design for correct detail
- 6 Double i-Joist

7 Information

Backer blocks nailed with 10no. 3.75mm diameter nails x 75mm long, with ends clenched if possible.

For top mount hangers, backer block tight to top flange of joist.

For face mount hangers, backer block tight to bottom flange.

Filler blocks fitted tight to top flange.

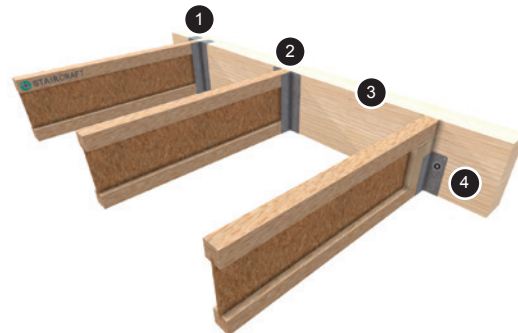
Use 10no. 4.00mm nails x 90mm long.

All round holes in hangers to filled with 3.75mm diameter square twist nails x 30mm long

Note that approved hangers which eliminate the need for backer blocks are available. See detail i11.

i13

JOIST TO SOLID BEAM CONNECTION



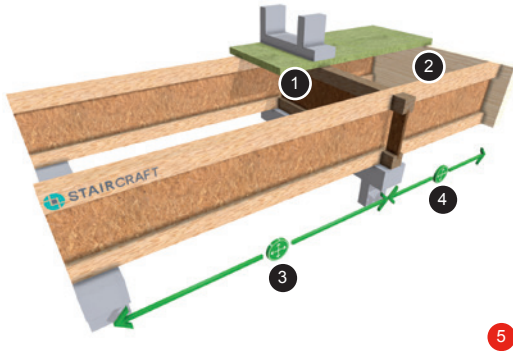
- 1 Top Mounted Hanger
- 2 Face Mounted Hanger
- 3 Rectangular Solid Section
- 4 Face mount hangers which do not laterally support the joist top flange require web stiffeners

5 Information

All round holes in hangers to be filled with 3.75mm diameter square twist nails x 30mm long

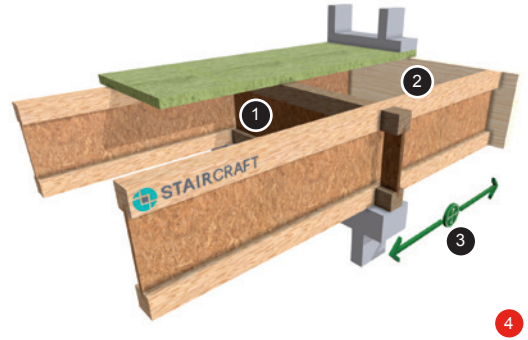


i14 NON LOAD BEARING CANTILEVER



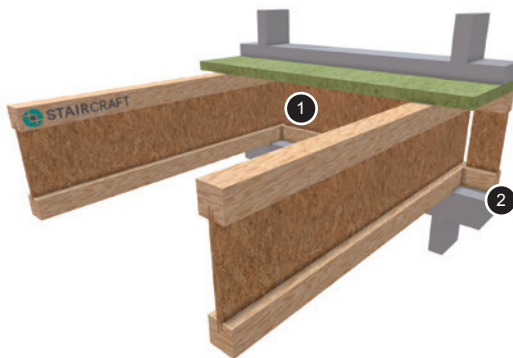
- 1 i-Joist Blocking
- 2 Rectangular Solid Section
- 3 Span
- 4 1/3 Span
- 5 **Information**
Max. cantilever length is 1200mm. No load applied on cantilever

i15 CANTILEVER SUPPORTING WALL



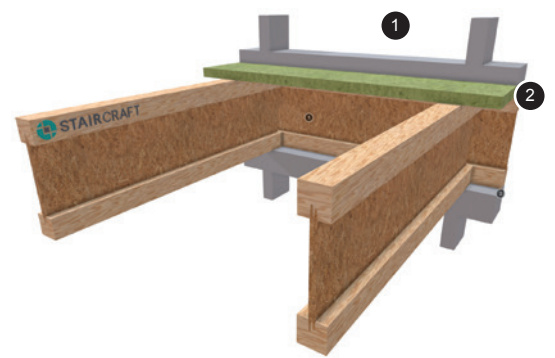
- 1 i-Joist Blocking
- 2 Rectangular Solid Section
- 3 600mm max.
- 4 **Information**
Structural cantilever must not exceed 600mm

i20 i-JOIST BLOCKING PANEL



- 1 i-Joist blocking panel. Fix blocking in place by skew nailing.
- 2 Joist has full bearing on timber plate

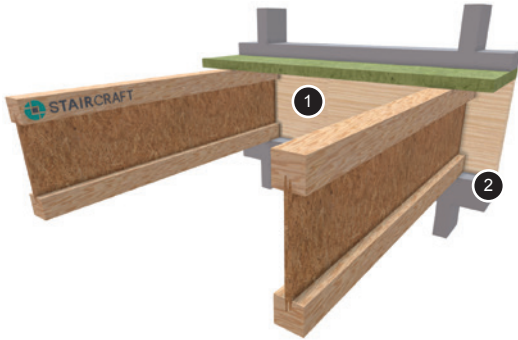
i21 RIM i-JOIST



- 1 i-Joist rim board. Fix rimboard to joists by nailing through the top and bottom flanges of the rimboard into the joists top and bottom flanges. Min 1 nail top and bottom
- 2 Joist requires 45mm minimum bearing

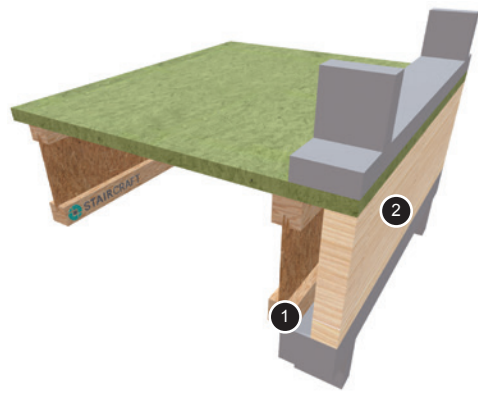


i22 RIM BOARD



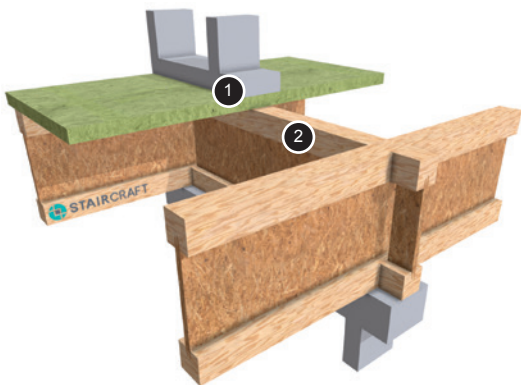
- 1 Ensure joists are fixed to rimboard by nailing through the rimboard into the top and bottom of the joist flanges. Min 1 nail top and bottom
- 2 Joist requires 45mm minimum bearing

i23 PARALLEL TIMBER FRAME WALL



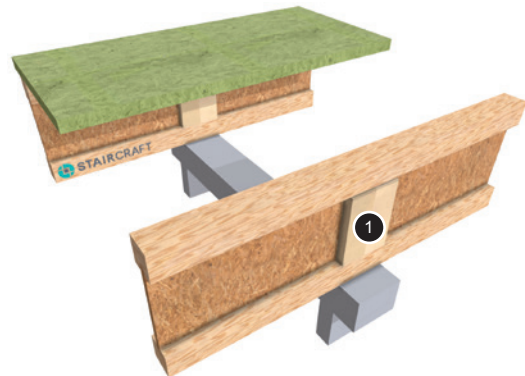
- 1 i-Joist with half bearing into wall
- 2 Rimboard to suit wall load

i24 INTERMEDIATE BEARING
– Load Bearing Wall Above



- 1 Load bearing wall directly above wall below
- 2 i-Joist blocking panels between joists

i25 INTERMEDIATE BEARING
– No Load Bearing Wall Above



- 1 Web stiffeners where required





i26 WALLPLATE CONNECTION




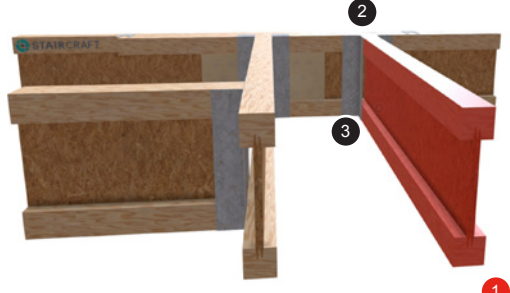

- 1 Top mount hangers
- 2 Timber bearing plate securely fixed to flange of steel beam/masonry wall (design of fixings by Building Designer)
- 3 If bottom flange of steel beam is not touching the back of the hanger timber blocking **MUST** be securely installed to the web of the steel.
- 4 **Information**
All round holes in hangers to be filled with 3.75mm diameter square twist nails / 30mm long

i27 WALLPLATE CONNECTION – Shot fired to steel


- 1 Hangers fixed directly to top flange of steel beam using SPIT P370 Cartridge tool using SC9 nails or equivalent, into the hanger flanges. Hanger must be deeper than the steel beam or timber packer must be installed to prevent hanger rotation.

i41 SACRIFICIAL JOIST DETAIL

- 1 **Information**
i-Joist do not require backer blocks when UH hangers are used as detailed.
- 2 Snap top plate of the hanger and secure screws to all round holes that meet the top and bottom flanges (12no. screws in total).
- 3 Use 3.5 x 40mm multi-purpose wood screws for ease of removal.

i42 NEWEL POST DETAIL

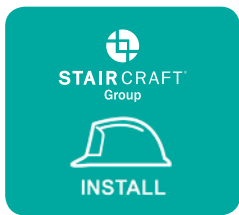



- 1 Notched Newel Post
- 2 Backer Block
- 3 MHIC Hanger fitted to joist & backer block - notched into newel
- 4 Incoming joist fitted into installed MHIC hanger



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Download Our New INSTALL App:



Features:

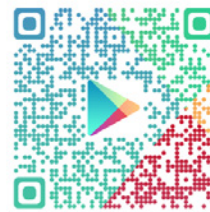
- QR Scanner – scan our TFS i Joist label on site for an interactive image.
- **TRUstair** – Stair Pre-Start Installation Guide.
- **TRUfloorsystems** – Installation Guide with interactive construction details.
- Latest news.

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- 1 Click on App Store icon.
- 2 Search for Staircraft INSTALL and install the free App.
- 3 Once installed tap the Staircraft icon to begin.

TO DOWNLOAD TO AN ANDROID DEVICE:



- 1 Open the Google Play store.
- 2 Search for Staircraft INSTALL and install the free App.
- 3 Once installed tap the Staircraft icon to begin.



Ancillary Block Sizes / Details

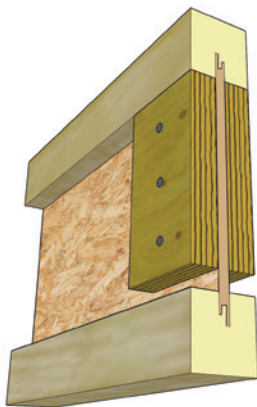
Filler and Backer Block sizes

The length of backer and filler blocks should allow nail installation without splitting and are typically 300-600mm long.

JOIST DEPTH mm	220			240			300		
JOIST WIDTH mm	47	72	97	47	72	97	47	72	97
Block Height	120	120	120	140	140	140	200	200	200
Backer Thickness	18	30	44	18	30	44	18	30	44
Filler Thickness	36	60	88	36	60	88	36	60	88

Web Stiffener Sizes

JOIST DEPTH mm	220			240			300		
JOIST WIDTH mm	47	72	97	47	72	97	47	72	97
Web Stiffener Height	120	120	120	140	140	140	200	200	200
Web Stiffener Thickness	18	30	44	18	30	44	18	30	44
Web Stiffener Nails (min 2.8mm diameter)	3no 65mm	3no 65mm	3no 90mm	3no 65mm	3no 65mm	3no 90mm	3no 65mm	3no 65mm	3no 90mm

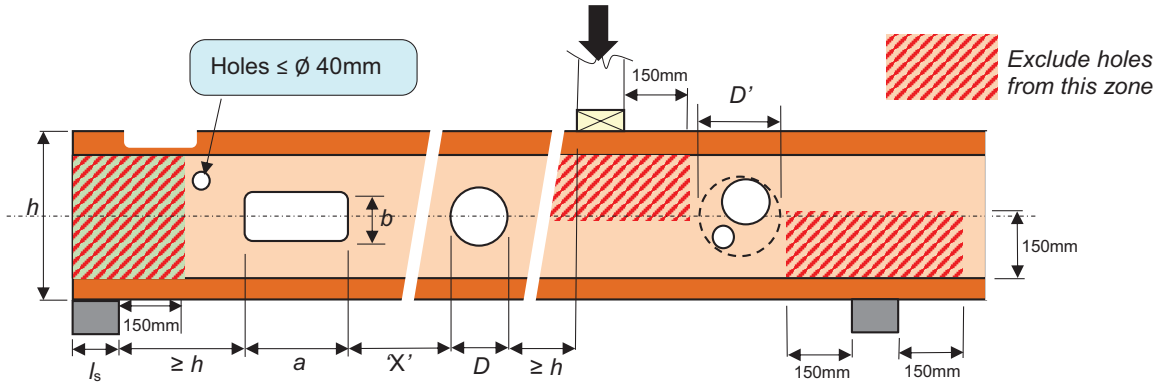


Web stiffeners are required in the following instances:

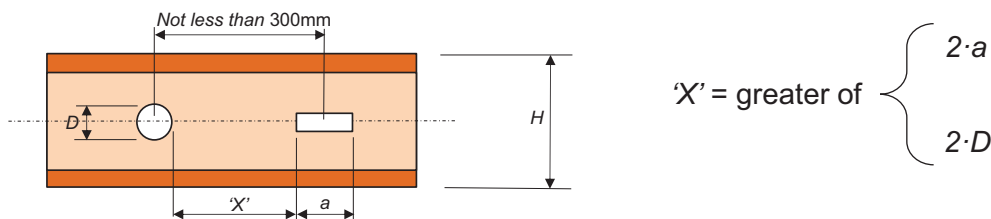
- When a higher load capacity is needed at an internal support.
- When the sides of the hanger do not support the i-Joist top flange.
- When a point load is applied, the web stiffeners should be tight to the top flange with a gap at the bottom flange.

Allowable Hole Rules

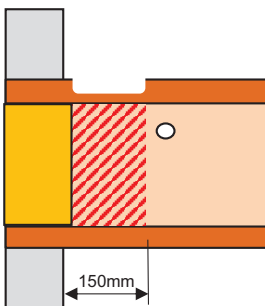
Permissible Web Hole Sizes and Locations



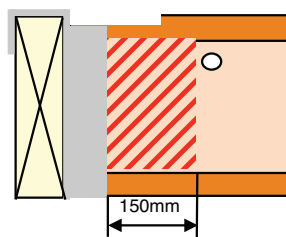
- Service holes must be cut out carefully (no overcutting) and must not be cut in to the TFSi-Joist flange.
- Irrespective of the following size limits for circular and rectangular service holes, a minimum of 3mm clearance to each flange must be maintained.
- Holes should be cut on the centre line of the web where possible.
- Round holes of 40mm diameter or less are allowed anywhere in the web, whilst maintaining 300mm horizontal spacing centre to centre.



- Circular hole diameter is limited to 200mm
- Rectangular hole width (length, a) is limited to 300mm
- Rectangular hole depth (height, b) is limited to 200mm
- No service holes within 150mm of the edge of a bearing or load location



Masonry support



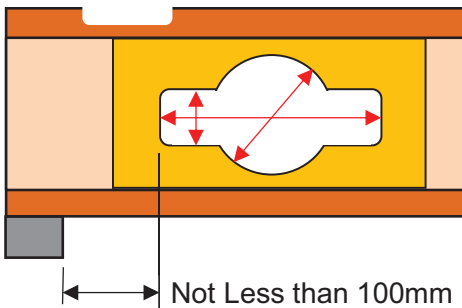
Joist hanger support



Hole Reinforcement Details

Factory-fitted hole reinforcement options

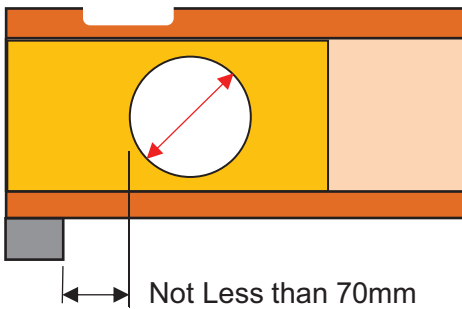
Note: These hole reinforcements are **FACTORY FITTED ONLY** to approved Staircraft specifications.



MVHR (Circle and/or Slot)

Factory fitted 25mm x 400mm long MDF reinforcement blocks glued and nailed on both sides to approved Staircraft specifications

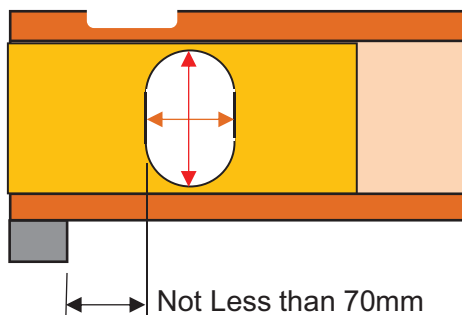
Maximum Hole Dimensions:
Diameter: 135 mm (Circle)
Height: 70 mm (Slot)
Width: 230 mm



Circular SVP

Factory fitted 15mm x 400mm long MDF reinforcement blocks glued and nailed on both sides to approved Staircraft specifications

Maximum Hole Dimensions:
Diameter: 120 mm



Obround SVP

Factory fitted 18mm x 400mm long softwood plywood reinforcement blocks glued and nailed on both sides to approved Staircraft specifications

Maximum Hole Dimensions:
Height: 138 mm
Width: 116 mm



Traditional Safety Bracing

Unbraced I-joists are unstable

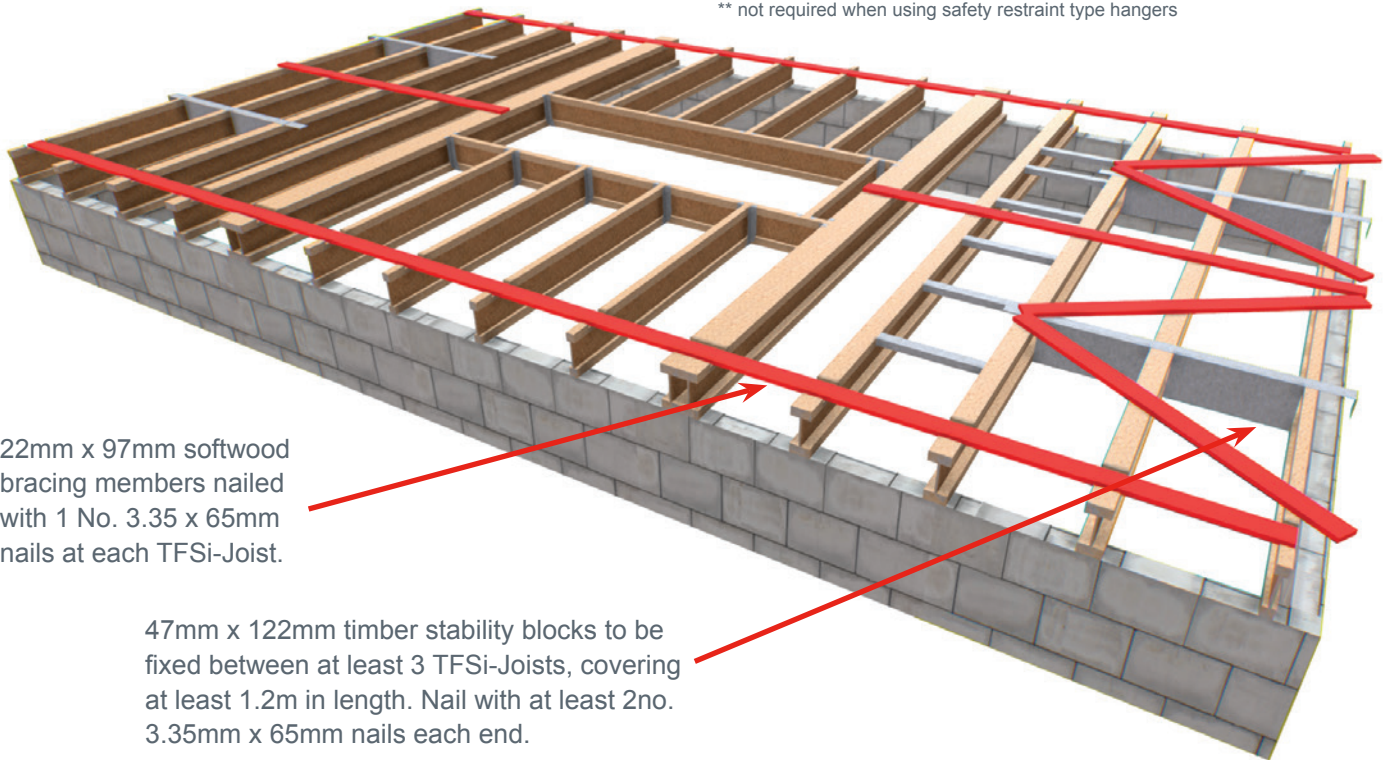
- Do not walk on or apply any materials to TFSi-Joists until the floor system is properly braced.
- The bracing should be removed in sequence as the decking is installed.
- The following represents the traditional method of bracing a floor.



Minimum 675mm cured masonry * is required above certain hangers ** before load may be applied. Refer to hanger manufacturers technical literature.

* or joists may be propped

** not required when using safety restraint type hangers



22mm x 97mm softwood bracing members nailed with 1 No. 3.35 x 65mm nails at each TFSi-Joist.

47mm x 122mm timber stability blocks to be fixed between at least 3 TFSi-Joists, covering at least 1.2m in length. Nail with at least 2no. 3.35mm x 65mm nails each end.

Notes:

- Full depth TFSi-Joist blocking panels may be used instead of solid timber stability blocks.
- All blocks to be cut accurately and squarely to maintain spacing of TFSi-Joists.
- Additional blocks and bracings are required for any areas of TFSi-Joists running in opposite directions and for cantilevered TFSi-Joists (unless permanent closure piece is installed at this stage).

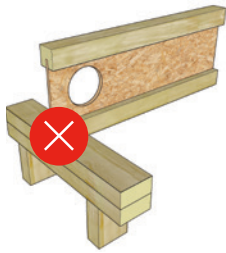


Product Handling & Storage

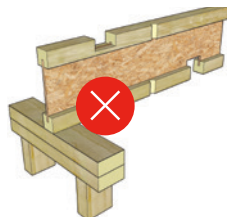
THESE CONDITIONS ARE NOT PERMITTED UNDER ANY CIRCUMSTANCES

If in doubt, please ask before you cut.

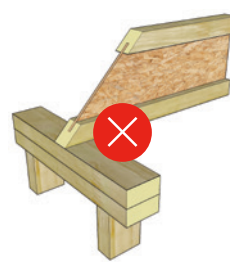
NO holes close to TFSi-Joist ends – use rules on page 15.



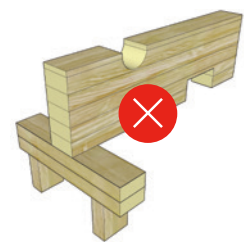
NO site notching of TFSi-Joists flanges



NO bevel cuts beyond the inside face of wall



NO notches or holes in Glulam – except as advised in manufacturers guidelines.



STORAGE

- Always store joist packs flat.
- Never lift or move the joist packs by the flanges.

HANDLING

- Properly covered and above the ground.
- Always follow the HSE guidance on manual handling.

SITE SAFETY

WellSafe™

KEY BENEFITS:

- Removes the need for sacrificial joists
- Reusable and saves time
- Reduces waste by up to 100kg per plot



Staircraft WellSafe™ is a fall protection system that avoids the need for installing temporary (sacrificial) joists, hangers and decking which prevent operatives from falling through stairwell openings on floors during construction.

Contact Staircraft to discuss your needs.



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Group

