Pitched Roofs

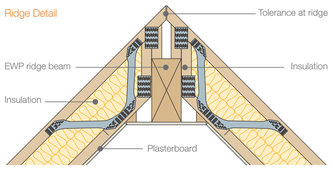
easi-joists® can easily be adapted to create pitched roof structures as a lighter, more thermally efficient alternative to solid sawn timber. By redesigning the end column configuration, the easi-joist® system can be installed onto a wallplate or ridge beam without the need for a bevelled wallplate or special metalwork items. This versatile connection detail enables top and bottom supports to accommodate a range of bearing widths and can also incorporate intermediate supports.

Using joists for roof structures requires consideration of external load factors and more complex geometry at eaves and ridge locations.

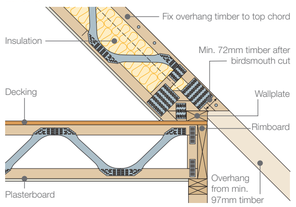
Bracing

easi-joist® roofs should be temporarily braced longitudinally and diagonally during erection Structural sarking is the preferred method of providing racking resistance for the roof structure, however longitudinal and diagonal bracing can also be used.

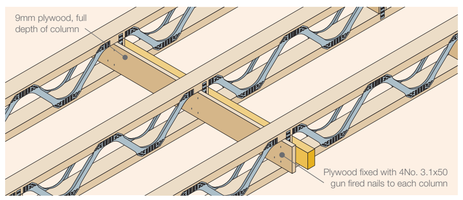
Ridge Detail

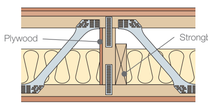


Eaves Detail



Roof Bottom Chord Restraint Detail

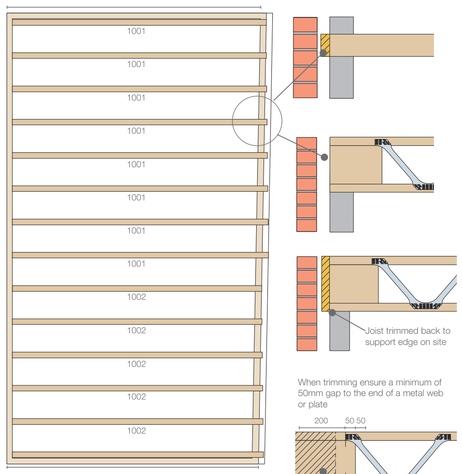




Strongback located on the bottom chord of easi-joist®

Note: Plywood to be placed at 6m intervals, fixed to a minimun of 3 easi-joists® and located at each end of the strongback.

Solid Trimmable End Support



The solid trimmable end is a design solution to a problem presented by some construction projects where parallel walls are uneven. A 47mm web is fixed between the chords using 3.35mm x 65mm nails. The positioning of the nails is determined by the software and will be fixed in the factory.

Trimmable end detail has been tested to allow up to 400mm solid timber webs at each end of the joist which provides huge flexibility should a project require it.

Each trimmable end joist is designed so that it can be supported along the length of the solid web section, adding to the variety of situations and effectiveness of the joists used on site.

Care should be taken on site to ensure that when cutting the solid section, there is at least 50mm of timber remaining to the web to allow for the edge distance of the nails in the nailplate zone of the metalweb.

Health and Safety

Handling

- The site manager or contractor will be responsible for the handling of easi-joist® from the time of unloading the delivery.
- Avoid dropping, twisting or subjecting easi-joist® to heavy impact.
- Always lift easi-joist® in the upright position to prevent lateral distortion.
- Use a fabric sling for lifting joists and ensure even weight distribution.

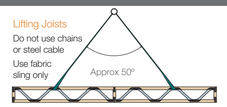
Storage

- Storage time of easi-joist® prior to installation should be kept to a minimum.
- easi-joist® should be left in bundles and remain in packaging until used.
- During such time, joists should be kept as dry as possible, and laid horizontally in an upright position, clear from the ground. Bearers should be used underneath web or column joints to prevent distortion.
- Joists are unstable until fully braced or boarded. Do not walk or store materials on an unrestrained floor area.
- Sheet materials stacked on the easi-joist® floor should not exceed 250mm in height and 150 kg per joist. The stack must not extend more than 1500mm from the edge of the floor with its longest span perpendicular to the joists.

Safety

- Use protective gloves when manually handling easi-joist®.
- Refer to plans for joist weights, remembering to account for multi-ply girders.
- Observe health and safety regulations as set out by the current standards and regulations.

Lifting Joists



Planning

- Study layout drawings and plan which section will be erected first, starting from which end. Identify girder joists and stair trimmer which will need to be installed first to provide support for others.
- Check support conditions for all joists ensuring all internal supporting walls are present and that all supporting masonry is cured.
- Identify joists by reference number and place them next to required areas. (Joists should not be moved from dry storage until immediately before erection.)

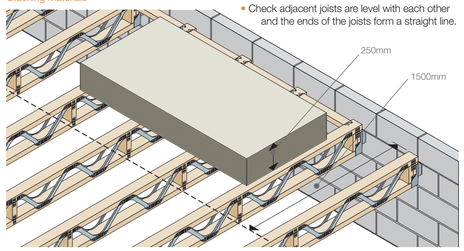
Installation

- All joists are to be installed truly vertical, parallel and top side up.
- Refer to layout plans or profiles for the correct orientation of the joist.
- Noggings, restraint straps, decking and strongbacks should be properly installed to the specification of the manufacturer or designer.
- Where masonry hangers are used, ensure at least three courses of blockwork or equivalent have been laid and the mortar cured before the floor is used.
- Spacing and loading of easi-joist® must not exceed that stated in the design.

Checking

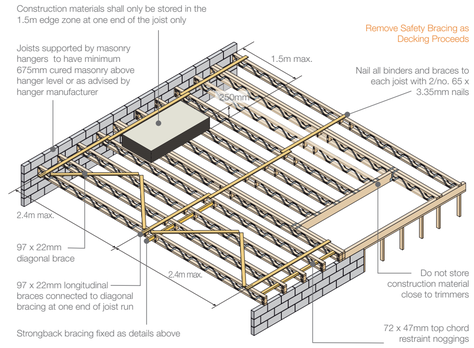
- Ensure all joists are fully bearing on their supports, packing gaps if necessary.
- Check adjacent joists are level with each other and the ends of the joists form a straight line.

Stacking Materials



IMPORTANT: It is inadvisable to stack building materials on floor joists other than floor decking as described above.

Health and Safety



Temporary Bracing

This diagram indicates temporary erection bracing only. It is applicable to both masonry and timber frame construction.

Temporary Erection Bracing

The builder is responsible for identifying and minimising the risks involved in erecting open-web joists to ensure that the health and safety of workers is maintained. Builders should be aware of the health and safety responsibilities imposed on them by the Construction (Design and Management) Regulations 2007.

Proper erection procedures and bracing are vital to the safe construction of open web joist floors.

The following notes may assist builders in preparing a safety assessment.

- Un-braced joists may be unstable.
- Do not allow anyone to walk on unbraced joists.
- Do not store building materials on unbraced joists.
- Open-web joists should be erected straight and vertical. Horizontal deviation : 10mm max. Vertical deviation: 2mm max.
- Temporary bracing comprises diagonal brace, longitudinal brace and permanent strongbacks.
- All longitudinal braces, diagonal braces, strongbacks and hangers should be completely installed and fully nailed as detailed.
- Lateral strength should be provided by a diagonally braced system across at least 3 joists as shown in the temporary bracing diagram. Additional braced and blocked systems should be provided at 12m spacing in long joist runs.
- Construction materials may only be stored on joists when all bracing is in place. The material should be spread over at least 4 joists and not more than 1500mm from a support. Floor/ceiling boards may be stacked up to 250mm high (150 kg per joist at 600mm centres, 100 kg per joist at 400mm centres) on braced floors.
- Flooring should be fully fixed to the joists before additional loads are placed on the floor.
- Temporary bracing may be progressively removed as decking is fixed.

Wyckham Blackwell timber engineering Since 1884

Wolf Systems, Engineering Ease.

easi-joist®

Engineered Metal Web System

EASI-JOIST®

EASI-RAFTER®

Site Guide

This product has been manufactured and supplied by the following company. Any questions, not detailed in this guide should be referenced to the manufacturer. Please refer to the full easi-joist® technical guide for more detailed information.

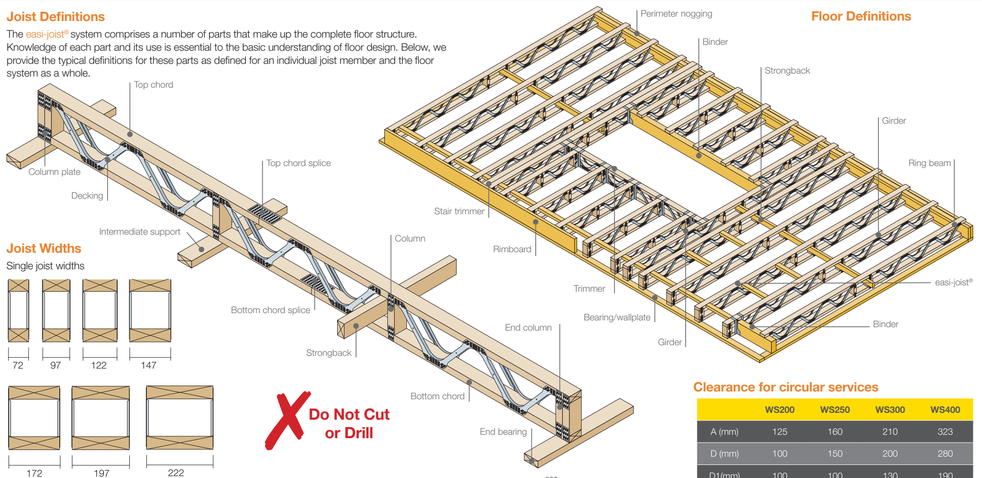
Wyckham Blackwell Ltd, Wyckham Way, Old Station Road, Hampton in Arden, Solihull, West Midlands, B92 0HB
Tel: 01675 442233 **Email:** enquiries@wyckhamblackwell.co.uk **www.**wyckhamblackwell.co.uk

Wolf Systems Limited, Shilton Industrial Estate, Shilton, Coventry CV7 9QL
Tel: 02476 602303 **Email:** info@wolfsystem.co.uk **www.**wolfsystem.co.uk

easi-joist® Floor Details

Joist Definitions

The easi-joist® system comprises a number of parts that make up the complete floor structure. Knowledge of each part and its use is essential to the basic understanding of floor design. Below, we provide the typical definitions for these parts as defined for an individual joist member and the floor system as a whole.



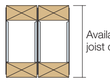
Floor Definitions

Joist Widths

Single joist widths

✗ Do Not Cut or Drill

Multi-ply joist widths



easi-joist® metal web joists are available in 6 different depths utilising 35mm and 47mm top and bottom timber chords.

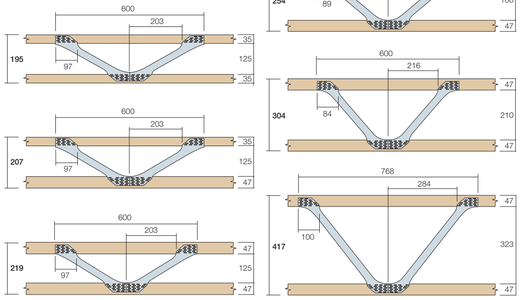
Fixing

Fixing of multi-ply joists is to be carried out to metalwork suppliers instructions using propriety fastening screws.

Type and spacing as specified by easi-joist® software.

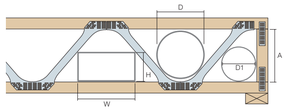
Joist Specification

(All dimensions in mm)



Clearance for circular services

	WS200	WS250	WS300	WS400
A (mm)	125	160	210	323
D (mm)	100	150	200	280
D1(mm)	100	100	130	190



Clearance for rectangular services

	WS200	WS250	WS300	WS400
H mm	W mm	W mm	W mm	W mm
50	300	300	330	500
100	100	200	250	410
150	50	70	170	330
200	N/A	N/A	70	250
250	N/A	N/A	N/A	170
300	N/A	N/A	N/A	70

Strongback Sizes & Installation

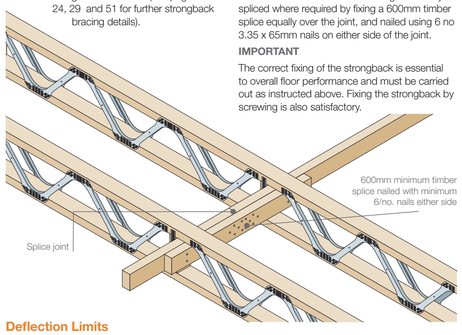
Strongbacks are an essential part of the floor construction as a whole. They provide essential damping qualities to the floor by connecting joists together to form a load sharing system that limits deflection and stiffens the floor. In addition they provide a useful form of lateral bracing within the floor during its construction (see pages 24, 29 and 51 for further strongback bracing details).

Fixing & Splicing

Correct installation of the Strongback and flooring material will ultimately determine how well the easi-joist® floor system will perform. It is recommended that the Strongback be installed tight to the top chord of the easi-joist® beam and should be twice nailed to the columns provided with 3.35 x 65mm wire nails. Strongbacks may be spliced where required by fixing a 600mm timber splice equally over the joint, and nailed using 6 no 3.35 x 65mm nails on either side of the joint.

IMPORTANT

The correct fixing of the strongback is essential to overall floor performance and must be carried out as instructed above. Fixing the strongback by screwing is also satisfactory.



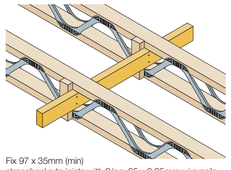
Deflection Limits

When strongbacks are used, easi-joist® beams have a maximum deflection limit of 14mm or span x 0.003, whichever is least. If strongbacks are not provided NHBC Standards 6.4-D4 (a) stipulates a maximum 12mm deflection limit. NHBC requires that strongbacks are to be used and located according to the following rules:

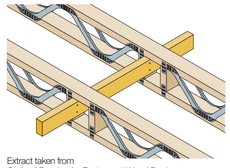
- Spans less than 4.0m = strongback not required
- Spans between 4.0m and 8.0m = 1 strongback at centre of span
- Spans greater than 8.0m = 2 strongbacks at equal spacing

Strongback Details

Fix 75 x 38mm (min) blocks to top and bottom chords with 2.no. 65 x 3.35mm wire nails. Insert strongback through joists before fixing joists in position, as it may not be possible to do this at a later stage. Position strongback tight to underside of top flange. Fix 97 x 35mm (min) strongback to blocks with 2/no. 65 x 3.35mm wire nails.



Fix 97 x 35mm (min) strongbacks to joists with 2/no. 65 x 3.35mm wire nails.

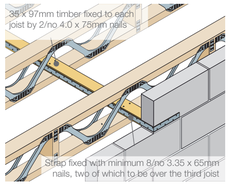


Extract taken from Code of Practice for Engineered Wood Products

Horizontal Restraint Strap

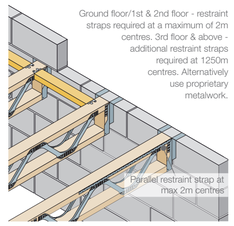
Horizontal bracing straps are required to be fixed to loadbearing walls perpendicular to easi-joist®. This member must be continuous over a minimum of 3 easi-joist®.

Straps to be fixed in strict accordance with manufacturer's instructions.

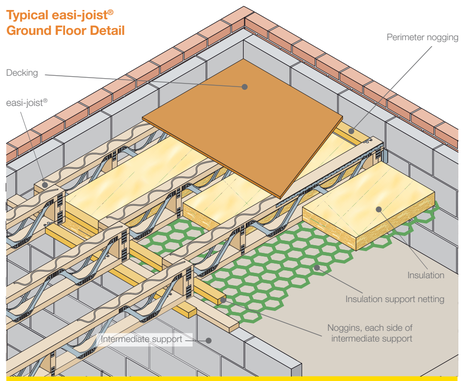


Parallel Restraint Bracing

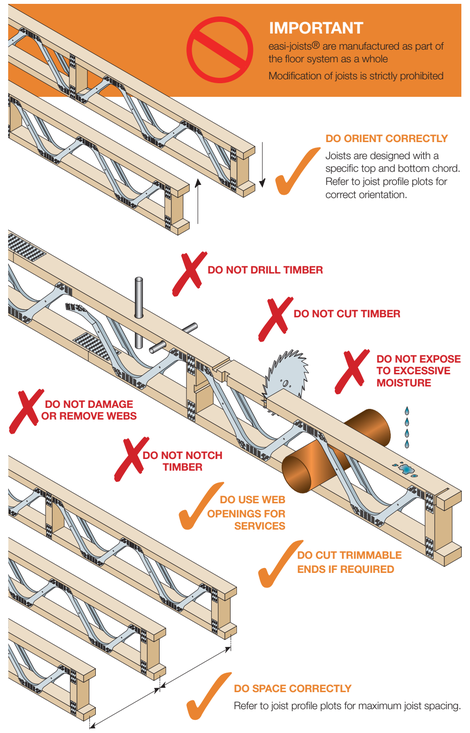
Joists Perpendicular to Masonry Wall



Typical easi-joist® Ground Floor Detail



easi-joist® Nominal Size	Strongback Max Spacing	Strongback Size and Grade	Alternative Strongback
WS200 - 195	3.0m	35 x 97 TR26	35 x 97 C16
WS200 - 219	4.0m	35 x 97 TR26	35 x 97 C16
WS250	4.0m	35 x 97 TR26	35 x 122 C16
WS300	4.0m	35 x 122 TR26	35 x 147 C16
WS400	4.0m	35 x 147 TR26	35 x 172 C16

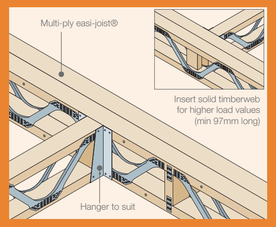


Wyckham Blackwell Ltd, Wyckham Way, Old Station Road, Hampton in Arden, Solihull, West Midlands, B92 0HB
Tel: 01675 442233 **Email:** enquiries@wyckhamblackwell.co.uk
www.wyckhamblackwell.co.uk

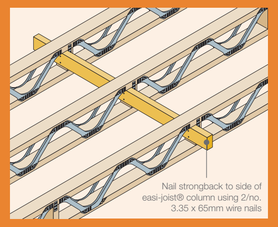
Wolf Systems, Engineering Ease, Shilton Industrial Estate, Shilton, Coventry CV7 9QL
Tel: 02476 602303 **Email:** info@wolfsystem.co.uk
www.wolfsystem.co.uk

GENERAL DETAILS

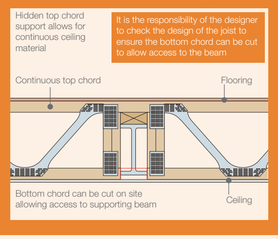
G1 • Face Fix Hanger



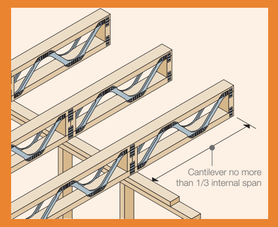
G8 • Strongback



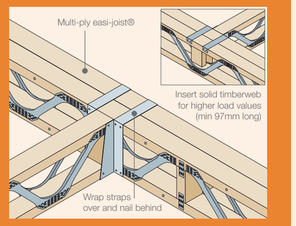
G11 • Joist on I-Beam with Hidden Support



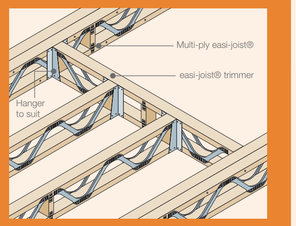
G12 • Cantilevered Joists



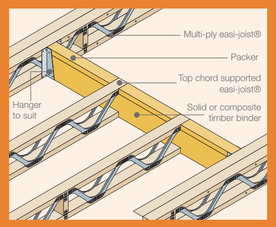
G2 • Strap Hanger



G3 • Stair Opening with easi-joist®



G4 • Stair Opening with Binder



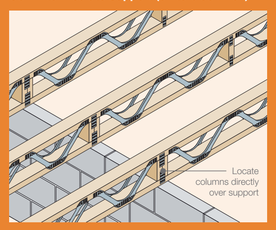
General Floor Detailing: Details G1 to G12

Floor Detailing in Masonry Construction: Details M1 to M10

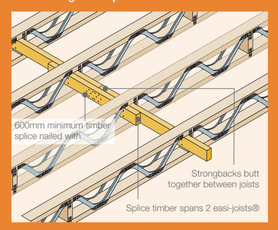
Floor Detailing in Timber Frame Construction: Details T1 to T20

MASONRY DETAILS

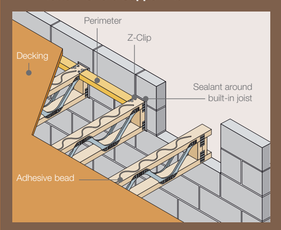
G5 • Intermediate Support (on to block wall)



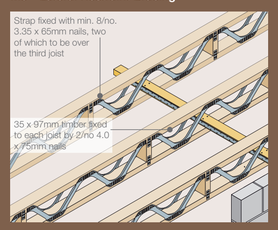
G9 • Strongback Splice



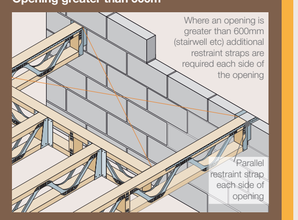
M2 • Bottom Chord Support Built In



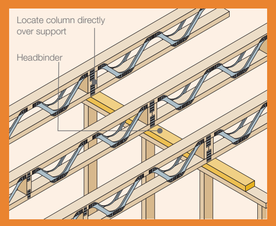
M5 • Lateral Restraint Bracing



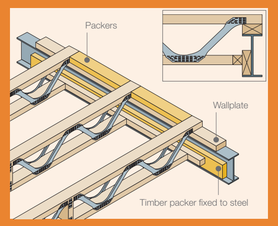
M8 • Parallel Restraint Bracing - Opening greater than 600m



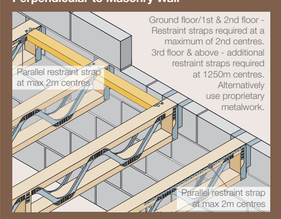
G6 • Intermediate Support (on to stud wall)



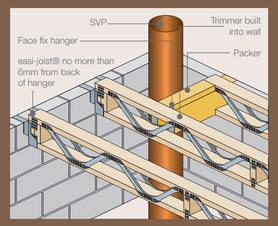
G10 • Top Chord Support on to Steel



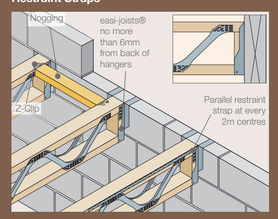
M3 • Parallel Restraint Bracing - Joists Perpendicular to Masonry Wall



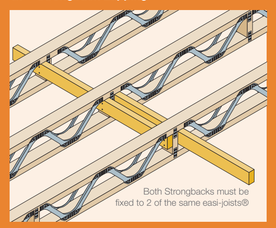
M6 • SVP with Trimmer



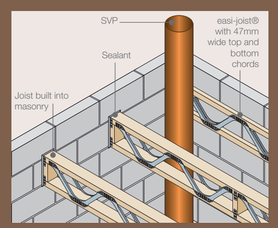
M9 • Hangers with Noggings and Parallel Restraint Straps



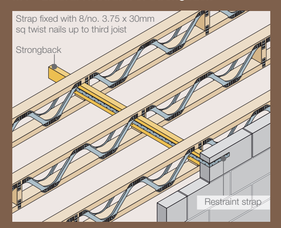
G7 • Strongback Lapping



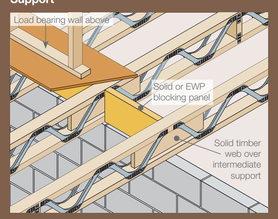
M1 • SVP with Narrow Chord End Joist



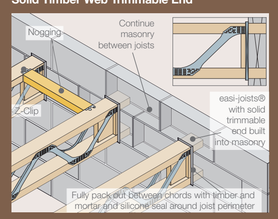
M4 • Lateral Restraint of Strongback



M7 • Solid Timber Web over Intermediate Support

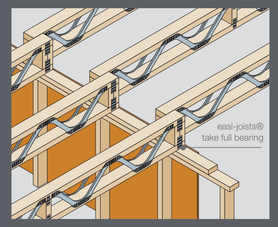


M10 • Bottom Chord Support Built in with Solid Timber Web Trimmable End

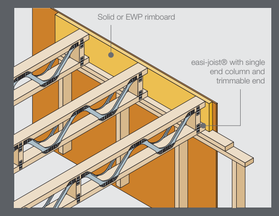


TIMBER DETAILS

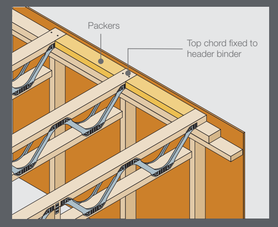
T1 • Internal Wall Lapped Joists



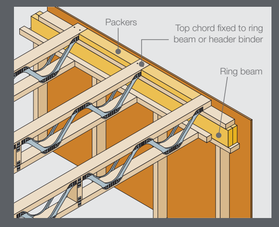
T5 • Bottom Chord Support with Trimmable End and Rimboard



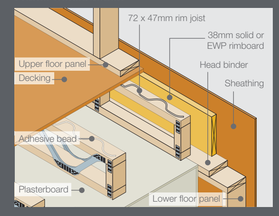
T9 • Top Chord Support



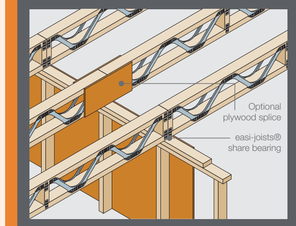
T13 • Top Chord Support on Ring Beam



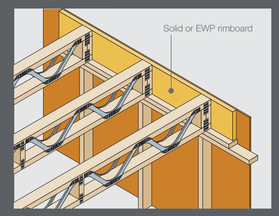
T17 • Proposed Arrangement for Timber Frame Construction



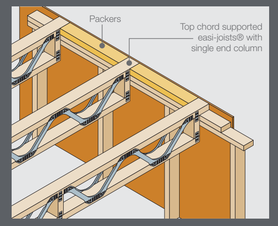
T2 • Internal Wall Butted Joists



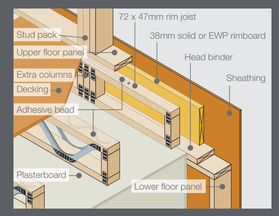
T6 • Bottom Chord Support with Rimboard Closure



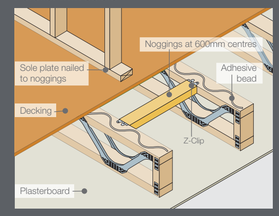
T10 • Top Chord Support with End Column



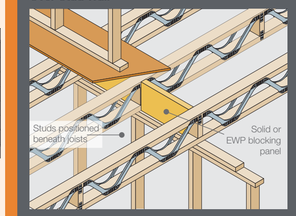
T14 • Proposed Arrangement for Timber Frame Construction



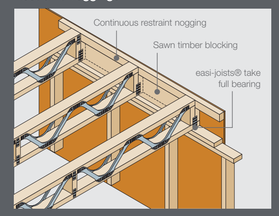
T18 • Non-Load Bearing Wall Support Parallel with Joists



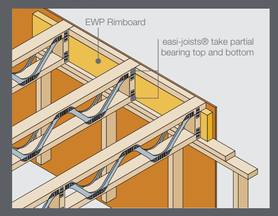
T3 • Intermediate Support Bearing Over Stud Wall



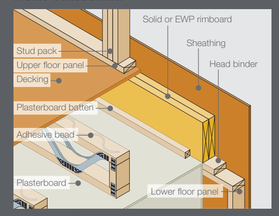
T7 • Bottom Chord Support with Restraint Noggings



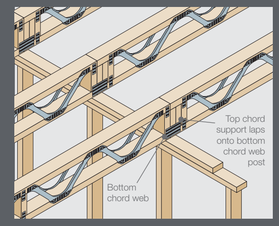
T11 • Bottom and Top Chord Support with EWP Rimboard



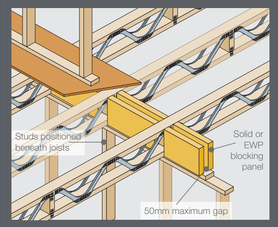
T15 • Proposed Arrangement for Timber Frame Construction



T19 • Internal Wall Lap Support



T4 • Intermediate Support (on to stud wall)



T8 • Bottom Chord Support with Full Height Blocking

T12 • Top Chord Support with Double Rimboard

T16 • General Arrangement for Timber Frame Construction

T20 • Solid Timber Web over Intermediate Support Stud positioned beneath Joists

easi-rafter® DETAILS

easi-joists® can easily be adapted to create pitched roof structures as a lighter, more thermally efficient alternative to solid sawn timber. By redesigning the end column configuration, the easi-joist® system can be installed onto a wallplate or ridge beam without the need for a bevelled wallplate or special metalwork item.

R1 • easi-rafter® Ridge Detail

R2 • easi-rafter® Hanger Detail

R3 • Typical easi-rafter® Heel

R4 • easi-rafter® Opening

R6 • Typical Eaves Detail

R5 • Typical Rafter Detail