

### Connection Details

Careful erection, fixing and strapping is essential if a trussed rafter roof is to provide a sound platform for roof coverings and contribute effectively to the stability of the roof and gable ends.

#### Strapping gables to ceiling ties

Ceiling tie straps may be excluded from the specification for roof pitches below 20 degrees. Check with the building designer. If they are needed, fix as shown for rafter straps, but attach to the upper edge of the ceiling tie. Use a twisted strap to engage a vertical joint if horizontal courses do not coincide.

#### Strapping at the separating wall

In addition to the normal strapping to walls, additional straps may have been specified to provide longitudinal bracing between roofs, these should be run over the top of the separating wall and fixed to the specified number of trusses on each side. Include noggings and packing to transmit loads properly.

#### Holding down roofs to walls

Roof to wall (vertical) strapping is not required unless the location of building construction is known to be wind stressed, then it is essential to carry out the roof designer's specifications. Lighter roof coverings in areas of higher wind load require holding down straps as may be specified for brick/block construction. In extreme cases the design may call for direct strapping of rafters to the walls (see figure 54).

Straps are normally 30 x 2.5mm section galvanised steel but any higher specification should be followed. The tops of the straps should be nailed (three 30 x 3.75mm nails or more) to the wall plate, or the rafter in the case of a rafter to wall strap. When fixing to the wall, it is critical that the straps are long enough to run over the specified number of blocks, and that at least two of the fixings engage the last full block at the base of the strap.

#### How to fix rafter straps

Engage at least three trusses with each strap. Use galvanised steel straps 30 x 5mm or approved profile galvanised steel straps.

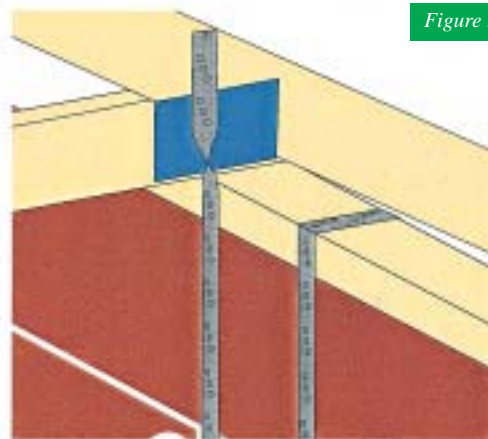
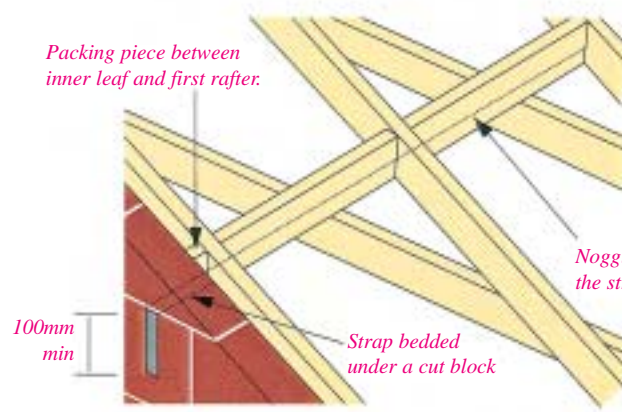


Figure 54

Figure 53



*Strap fixed to solid noggin with a minimum of four fixings of which at least one is to be in the third rafter or in a noggin beyond the third rafter*

*Use only corrosion resistant nails (65 x 3.35mm)*

*Noggings to be provided and set horizontal unless the strap has a twist to line it up with the roof slope.*

### Connection Details

#### Heavy-duty joist hanger to BS6178 Part 1

These are used to carry trusses or joists at masonry load bearing or fire break walls. Careful consideration must always be given to the method of support. We would recommend that advice is obtained from the responsible Building Designer or Structural Engineer since in a number of cases special hangers may have to be manufactured. The Building Designer may also specify high density brick courses above and below the hangers to avoid crushing of blocks. The bearing length for these joist hangers is approximately 90mm. (See figures 55 and 56).

*Hanger for building into brick or block walls*

Figure 55



#### Heavy-duty girder to girder truss shoes

These are designed to support a secondary girder off the main girder ensuring that the loads are transferred efficiently. The shoe is usually fixed to the main girder (A) by means of bolts as specified by the manufacturer with washers under the bolt heads and nuts. The bearing length for these shoes is approximately 120mm. (See figure 57). NB. Refer to manufacturers instructions for the correct application and procedure.

Figure 56



*Straddle hanger for supporting joists either side of a wall or beam*

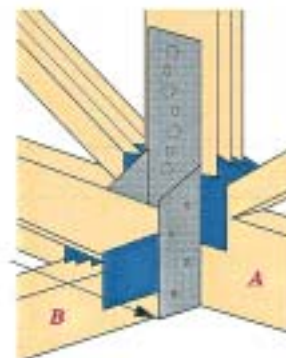
#### Girder truss shoe and long legged hangers

Girder truss shoes are used to fix single trusses to compound girders or for other truss to truss connections. The bearing length is approximately 65mm.

The shoe or hanger must have side flanges of a size which suits the depth of the girder chord to which it is fixed. Some joist hangers are suitable only for timber or timber to truss connections not for truss to truss connections, always use the appropriate hanger. (See figure 58).

Figure 57

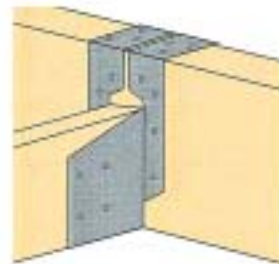
*Incoming trusses supported by bolted heavy duty shoes and hangers, should be notched to provide a smooth ceiling line*



Metal fixings used in timber roof structures should have safe working loads which can be substantiated by freely available reports in accordance with BS6178 and TRADA recommendations. They should always have a manufacturer's mark and show the certified safe working load.

Figure 58

It is strongly recommended that timber to timber fixings and timber to brick fixings should be supplied by the Roof Truss Fabricator, and delivered to site with the trusses.



NB. For all the hangers and shoes described above, every fixing hole requires a 30 x 3.75mm square twisted sheradised nail unless otherwise specified by the manufacturer.

### Connection Details

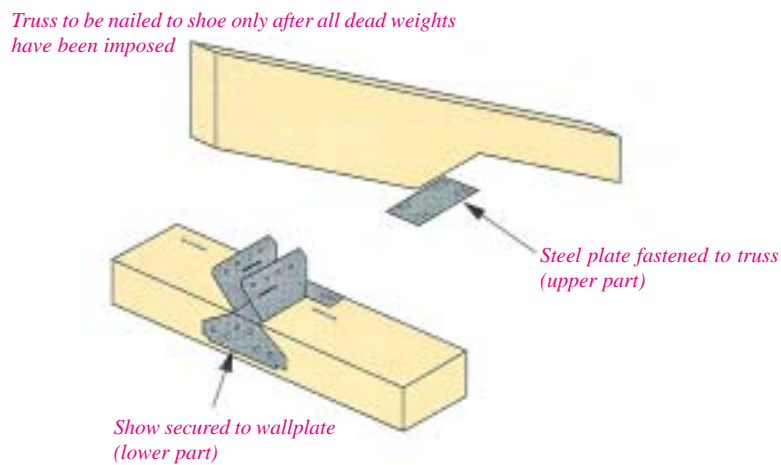
#### Raised Tie Support Clip (Glide Shoe)

This is a special application fixing that has been specifically designed to allow horizontal movement at a truss bearing without affecting the overall stability of the truss whilst continuing to provide resistance to lateral and uplift forces.

Used in trussed rafter roof construction the (medium term/long term) horizontal deflection should be restricted to a maximum of 6mm per side (truss bearing). A minimum 100mm horizontal seat cut must be made to fix the upper bearing plate. The lower bearing plate is fixed to the inner (or inner and outer) edge of the wallplate using 3.75 x 30mm square twisted sherardised nails.

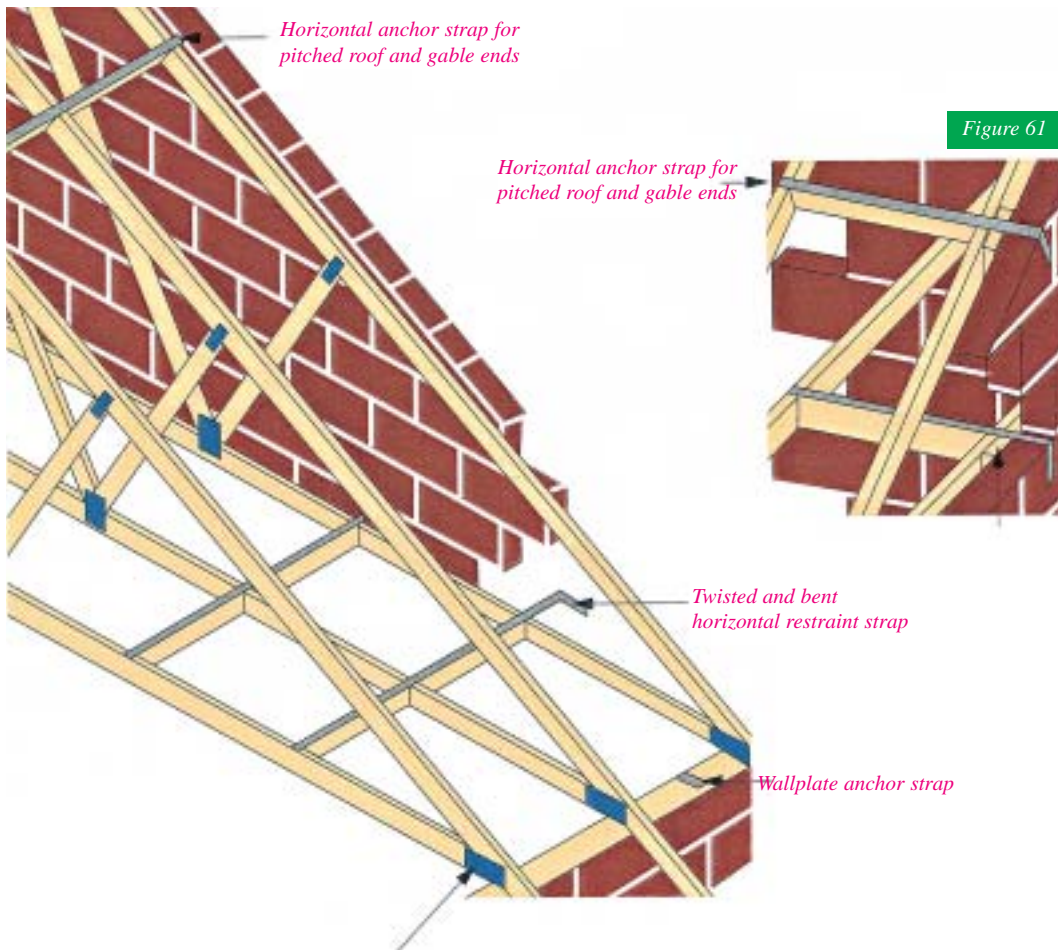
The truss is temporarily secured by single nailing into the centre slots to allow lateral spread between the bearing plates after the roof structure is completed. The longer the period of construction lasts, together with the absolute stiffness of the truss configuration, the greater the lateral movement will be (up to the design limit). Finally additional nails should be inserted (3.75 c 30mm long square twisted sherardised) for stability or uplift resistance in the remaining fixing holes.

Figure 59



Connection Details

Figure 60



Truss clips are for fixing timber trusses to wallplates. They avoid the damage often caused by skew nailing. Follow the manufacturers recommendations for safe application of truss slip.

Figure 62

