

Guide to Setting Out & Dimensioning

As outlined in BS.5268-3, in order to ensure that trussed rafters are correctly designed and fabricated and that they are suitable for their intended purpose it is necessary for them to be accurately specified and for adequate information to be available when required.

At MiTek we have developed a number of standard trussed rafter configurations, as shown in figure 4, to which dimensions can be related, this simplifies the specification for design purposes.

Figure 4

| Outside Shape | MiTek Shape Number | Truss Description | Outside Shape | MiTek Shape Number | Truss Description |
|-----------------------------|--------------------|---|---------------------------------|---------------------------|--|
| <i>Triangulated Trusses</i> | | | <i>Triangulated Trusses</i> | | |
| | 00-02 (25-27) | Standard Truss or Duopitch (Asymmetric version also possible) | | 45 | Sloping Flat with Apex/Double Bobtail |
| | 05, 10 | Single Cantilever Duopitch | | 40, 46 52, 58 87, * | Flat *Additional shapes with modified support positions are available |
| | 11 | Double Cantilever Duopitch | | 59, 63 | Half Hip |
| | 14-19 | Bobtail Duopitch | | 64, 68 | Hip |
| | 14-19 | Bobtail Duopitch with Nib | <i>Non-Triangulated Trusses</i> | | |
| | 20-21 | Monopitch | | Various | Attic Truss |
| | 20-21 | Monopitch with Nib | | Various | Attic Truss (Centre Supper) |
| | 35 | Scissors | | Various | Extended Rafter (Raised tie) Truss |

Key

- O Overhang
- SOP Span over setting out points
- SW Span over wallplates
- SC Span over ceiling tie
- C Cantilever
- N Nib
- RW Room width
- RH Room height
- SL Slope length

N.B. Not all of the MiTek Range Of Trusses Are Indicated above

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Setting out and Eaves details

Although often employed as the principle truss type in association with appropriate architectural features of a building, the bobtail is most often needed to accommodate re-entrant areas in perimeter walls as shown in figure 5. The horizontal 'A' dimension indicated in figure 6 therefore, is conveniently used to specify the shape for duo-pitch trusses, while double bobtails and bobtailed mono-pitched trusses which more often are principle trusses are more conveniently specified by a vertical 'A' dimension.

Figure 7a shows typical end details when the outer leaf is of masonry, arrangement (b) is best confined to timber frame construction as separate columns of masonry between trusses could be rather unstable. If the end verticals are to be tile clad one of the

arrangements figure 7c or d is suitable. In (c) a specially wide timber is used as the end vertical of the truss so that the tile battens clear the outer leaf of the wall; the inside of the end vertical must not be located to the right of the centre-line of the wall plate. In some cases the arrangement is impractical owing to the large width required for the end vertical. In many cases the diagonal in the cantilevered part (figure d) can be omitted if there is little load from the cladding.

A special bobtail can be designed to suit practically any requirement.

Bobtailed trusses must never be formed through do-it-yourself site modifications of standard truss types with which they align.

Figure 5

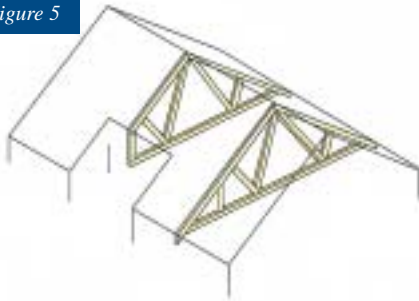


Figure 6

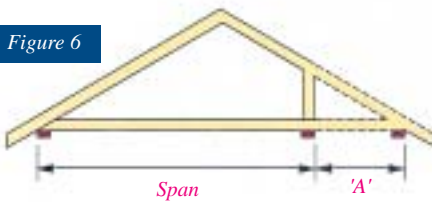


Figure 6a

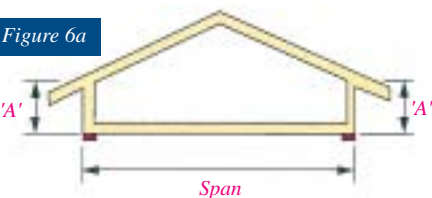


Figure 6b

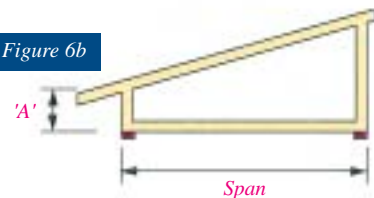
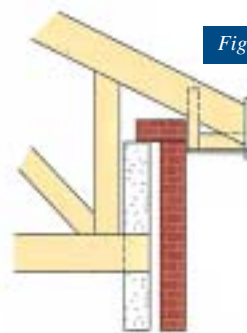


Figure 7a



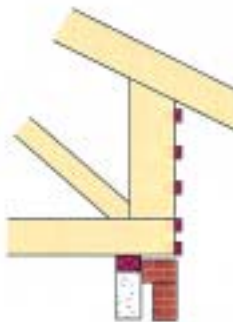
Masonry inner leaf with timber nib

Figure 7b



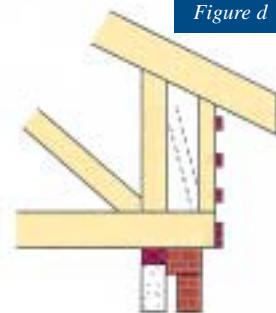
Timber frame

Figure 7c



Tile clad end vertical

Figure d



Tile clad end vertical

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Support details - Cantilevers

The reaction from the bearing is the greatest load (although upwards) to which a truss is subjected and in order to control excessive bending in the supported chord it is important, except in the smallest trusses, to locate a joint at each bearing. The normal eaves joint illustrated in figure 8a accomplishes this if the "Shift" dimension is less than 50mm, or one-third of the scarf length, whichever is the greater.

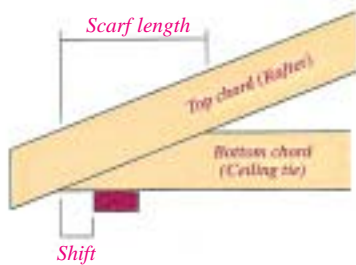
If the Shift is greater than the allowed a stress check is required on the short cantilever.

Unfortunately there is usually insufficient space for an additional web so should the check fail, as it often does, it is necessary to increase the size of the bottom chord or alternatively incorporate a relief rafter, (as

shown in figure 10b) or a heel wedge. Both of these options can add to the final cost of the truss and therefore it is best to avoid cantilevers in this range.

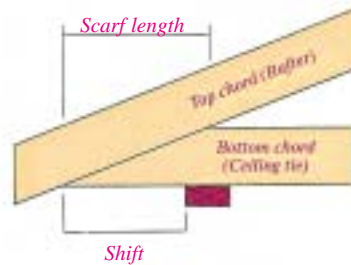
If the "Shift" is greater than two scarf lengths, then a standard cantilever truss as show in figure 10a is employed. The chord sizes are usually no greater than the corresponding non-cantilevered standard truss and the cost is little more. Many variations are possible by adjusting the position of a joint of a non-cantilevered standard truss type so that it is over a bearing. Finally, if required, a non-standard cantilever truss of almost any triangulated configuration can be designed and fabricated. Note that a brace may sometimes be required on the bottom chord which is untypically in compression.

Figure 8a Standard truss



$Shift = \max \times 50mm \text{ or } 1/3 \text{ scarf length whichever is the greatest}$

Figure 8b Check bottom chord

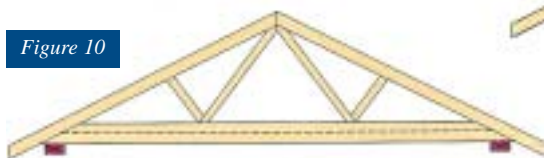


Standard cantilever

Figure 10a

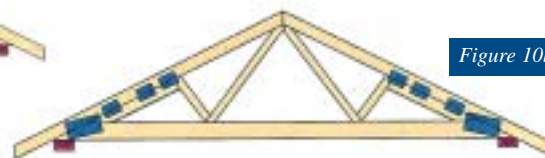
Bottom chord may need brace

Figure 10



Increase bottom chord

Figure 10b



Incorporate relief rafter or slider

Figure 9

Alternative configurations

