

# Gang-Nail Guide Lines No.21

## IMPROVING TRUSSES WITH INTERNAL GUTTERS



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**T**russ fabricators frequently encounter situations involving internal gutters where the architectural drawings show trusses supported on the extension of their bottom chords.

Extended chord supported trusses are not very efficient trusses as they are not 'triangulated'.

This causes bigger than normal deformations and bending moments to occur. As a result, cumbersome, heavy and expensive large chord sizes are required. Moreover, such trusses cannot be effectively cambered and permanent deflections will result.

The innovative detailer will endeavour to restore 'triangulation' to the truss whilst maintaining an area for the gutter to be formed.

Such trusses will result in smaller, standard timber sizes with lower expected deflections that *can* be cambered.

In the first example (Fig 1a) the architect shows a reversed heel and large extended bottom chord to form the gutter.

A deep purlin size may have been specified specifically to create an adequate depth for the gutter.

The preferred alternative in (Fig 1b)

shows a truss with a larger span and a supplementary chord cutoff.

This option needs only a standard bottom chord and has the added bonus of a much deeper gutter without the larger purlin.

The second example (Fig 2a) shows a similar situation with a pitched warren truss.

The preferred alternative (Fig 2b) is a fully triangulated truss that will be more cost effective.

This option requires the last diagonal web to join the bottom chord at the support.

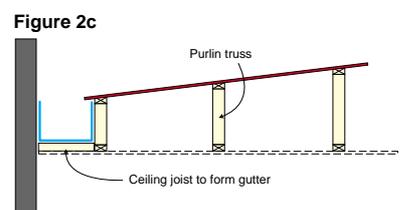
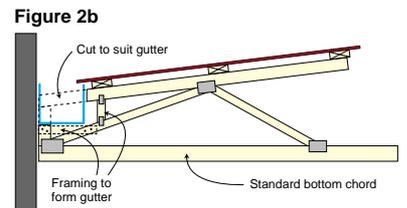
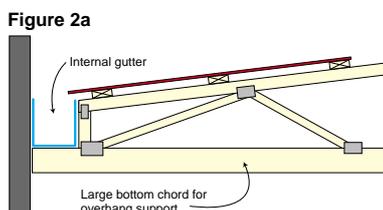
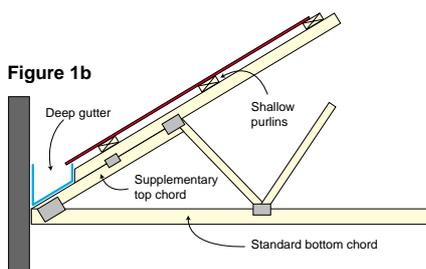
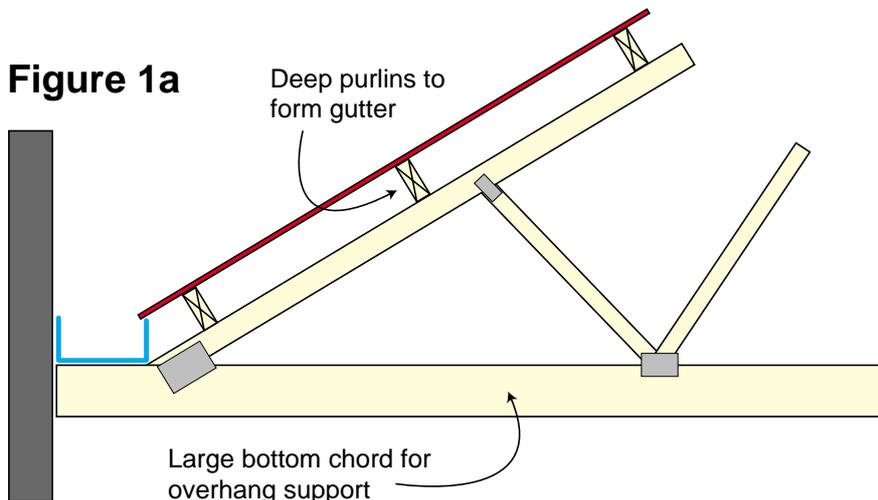
The detailer may have to adjust the angle of this web to suit the gutter width.

The gutter area may then be cut and formed on site to suit the fall, or it may be prefabricated into the truss.

If the pitched warren truss were too shallow to form the above, it may be worth considering the use of purlin trusses as opposed to rafter trusses to form the roof as shown in (Fig 2c).

This system results in savings from the elimination of purlins in addition to trusses.

In summary, the creative detailer should always critically examine any non-triangulated truss situation to see if improvements can be made.



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