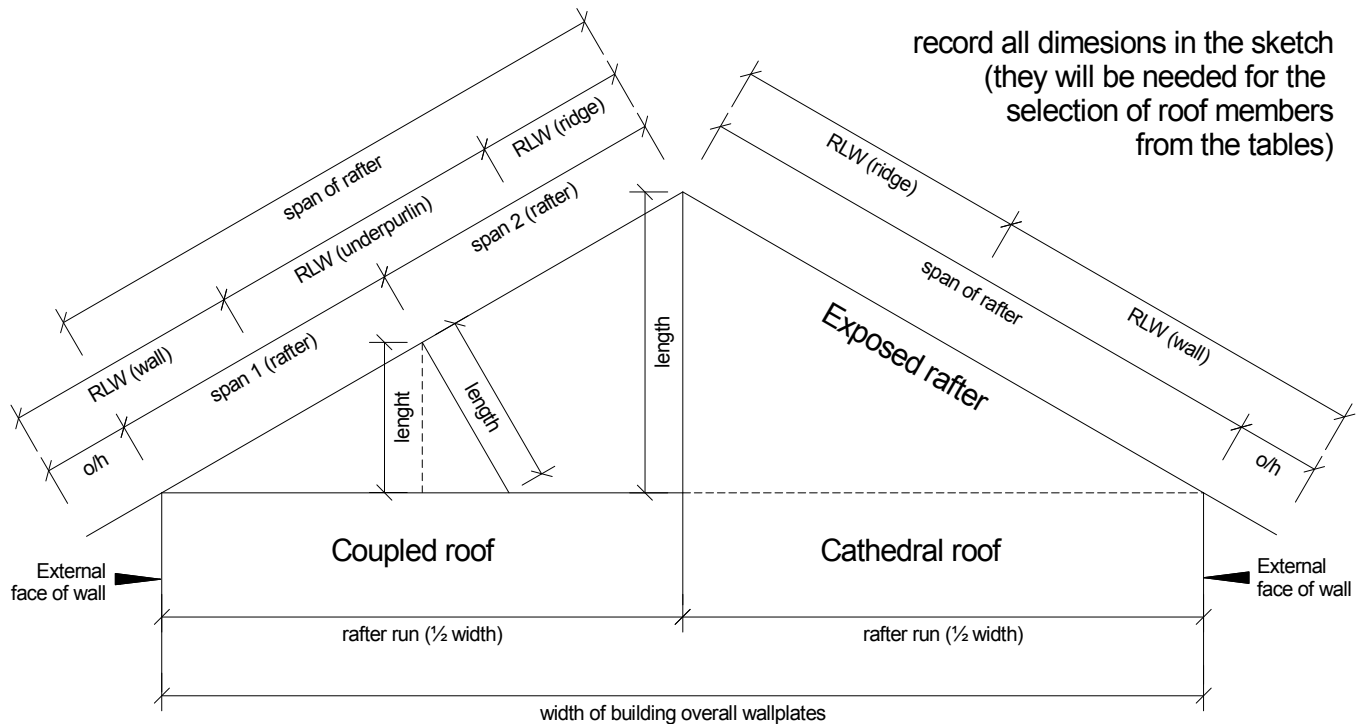


Calculation template for roof members



Rafter run = overall external width of wall plates divided by two.

Rafter span = rafter run divided by \cos° .

Overhang = eaves width divided by \cos° (add dimensions for brick veneer).

Ridge strut = rafter run $\times \tan^\circ$.

Decide whether an underpurlin is needed; if it is place it at mid-span.

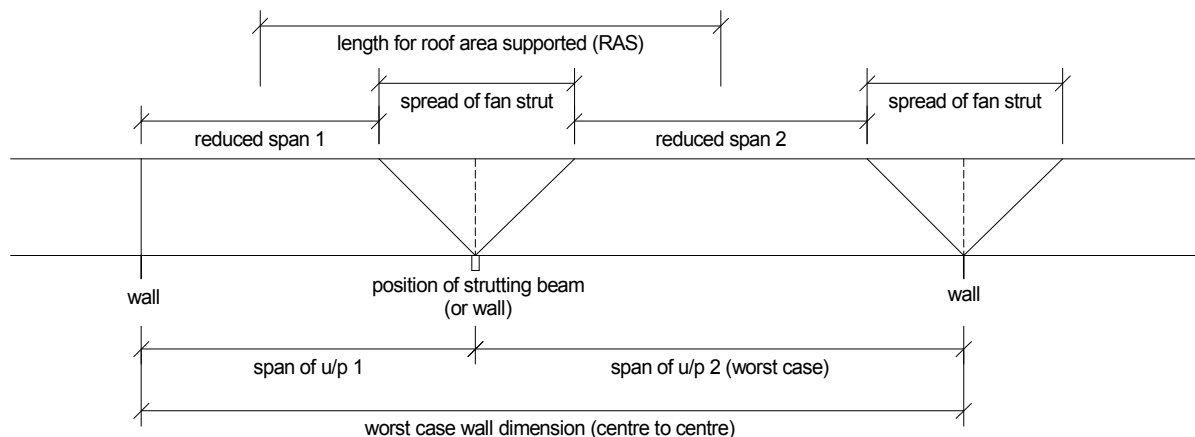
New rafter span = rafter span found in 2) divided by two.

Strut perpendicular to rafter = rafter span $\times \tan^\circ$ (if u/p positioned at midspan).

Vertical strut to underpurlin = ridge strut length divided by 2 (if u/p positioned at midspan).

Roof load width (RLW) = rafter span (if placed at midspan) otherwise $\frac{1}{2}$ span1 + $\frac{1}{2}$ span2.

Underpurlin & Fan strut example



Determine the position of struts (usually on supporting walls).

If the distance between supporting walls is excessive a strutting beam may be needed.

Span of underpurlin can also be reduced if fan-strut is used.

Determine the length of the strut (perpendicular or vertical to rafter)

and the dimensions between the struts (or fan-struts).

Find the worst case and calculate the span of the underpurlin.

Roof load area = $RLW \times (\frac{1}{2} \text{ u/p span left} + \frac{1}{2} \text{ u/p span right from strut})$

(with fan strut) = $RLW \times (\frac{1}{2} \text{ u/p reduced span left} + \text{spread of fan strut} + \frac{1}{2} \text{ u/p reduced span right})$

Hanging beams are required if ceiling joist span is excessive.

Place hanging beams in center of room or if needed divide room length/width by 3 (4)

and space them equally.