

## TIE DOWN THAT TOP PLATE



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**D**esigners are just beginning to realize that there are some profound changes in AS1684 - 1999 in the way top plates are designed.

In the old framing manuals, top plates are designed primarily for roof gravity loads. Their selection charts assume that the top plates span between studs and that the studs offer restraint against wind uplift forces as well.

The new AS1684 now publishes tie

down capacities for different top plate to stud connections. Not surprisingly, the standard two nails commonly used to fix the top plate to each stud have negligible tie down capacity. Hence, the top plate has to span between major tie down points when designing for uplift.

The effect of this is that unless the builder installs a significant top plate tie at close spacing, the size of top plates will have to increase considerably.

As a comparison, Table 1 gives an indication of the maximum tie down spacing necessary to enable the same top plate size derived from the old framing manual.

By contrast, to achieve a standard tie down spacing of 1800mm, the 2/35x70 MGP12 top plate size will have to increase accordingly, as shown in Table 2.

AS1684 does permit a nominal top plate size to be used when there is a stud directly below each truss. However, to take advantage of that clause, the top plate has to be properly tied down to **every** stud below each truss.

It is common practice for many pre-nail plants to rely on the builder to fix the top plate tie down on site after the ribbon plate has been installed. With this new standard, there needs to be close



communication between the builder and fabricator to ensure the required tie down is installed. The optimum balance between tie down spacing and top plate size will have to be worked out between both parties.

Although the sizing of bottom plates does not require consideration of tie down spacing, it is nevertheless evident that the intent of AS1684-1999 is to replicate the top plate tie at the bottom plate. If ties other than steel cyclone rods are used, it will have to be resolved as to whether they are to be installed in the pre-nail plant or by the builder on site.

**Builders are advised to carefully check the top plate size and tie down assumptions when reviewing quotes for the supply of pre-nail frames. The cheapest quote with the lightest top plate may require greater effort and expense to install tie downs.**



Truss Span (m)	Tile roof (N2)	Sheet roof (N2)	Tile roof (N3)	Sheet Roof (N3)
3.0	2250	1800	1350	1350
6.0	1800	1350	1200	900
9.0	1350	1200	900	900
12.0	1350	900	900	600
15.0	1200	900	900	Not applicable

**Design data:** Overhang 750mm, studs at 450mm-600mm centres, 22.5( roof pitch).  
Tile roof has 13mm plasterboard ceiling direct on trusses @ 600 centres,  
Sheet roof has 10mm plasterboard on ICJ's with trusses @ 900 centres.

Truss Span (m)	Tile roof (N2)	Sheet roof (N2)	Tile roof (N3)	Sheet Roof (N3)
3.0	No change	No change	2/35x70 MGP15	2/45x70 MGP12
6.0	No change	2/35x70 MGP15	2/45x70 MGP15	3/45x70 MGP12
9.0	2/35x70 MGP15	2/45x70 MGP15	3/45x70 MGP12	3/45x70 MGP15
12.0	2/35x70 MGP15	3/45x70 MGP12	3/45x70 MGP15	-
15.0	2/45x70 MGP15	3/45x70 MGP15	-	-