



## **GUIDANCE ON USE OF FRAMING ANCHORS FOR SPECIFIC TIE-DOWN TO MULTIPLE TOP PLATES (RIBBON PLATE CONSTRUCTION)**

### **Introduction**

There has been extensive discussion of late in the housing sector (TQ, HIA, Truss Plate Manufacturers, Certifiers, Designers and Builders etc) regarding the requirements of AS 1684 Part 2 Non-cyclonic and Part 3 Cyclonic and the use of framing anchors – triple grips and multi grips, to provide specific tie-down to multiple top plates (ribbon plates).

TQ published an article in a 'Timber Talk' Technical Update Newsletter outlining our views. In brief, the article said that if the framing anchors were only nailed to the ribbon (upper) plate, then the specific tie-down requirement would be deficient as there would be a discontinuity in tie-down between the upper (ribbon) and lower plate.

The following sets out TQ's opinion in respect of achieving compliance with the intent of AS 1684, which in many instances, such as this one, does not provide explicit advice.



Photo 1: - Example of framing anchor not correctly nailed off and fixed to ribbon plate only

## AS 1684 Requirements

The overarching tie-down requirement of AS 1684 is given in Clause 9.6 which is highlighted below. The intent of this requirement is quite clear and explicit.

This Clause also recognises that gravity loads can be taken into consideration in resisting uplift forces and is reflected in the resulting net Uplift Pressure and Force Tables, 9.2, 9.5 and 9.6 to 9.13 where appropriate.

### **“9.6 SPECIFIC TIE-DOWN FIXINGS**

#### **9.6.1 General**

*This Clause provides details for structural connections to resist uplift and shear forces (lateral loads) in floor framing, wall framing and roof framing. Where specific tie-down fixings provide equal or better resistance to gravity or shear loads, then nominal nailing is not required in addition to the specific tie-down fixing.*

*Continuity of tie-down shall be provided from the roof sheeting to the foundations. Where appropriate, due allowance for the counterbalancing effects of gravity loads may be considered. Where the gravity loads equal or exceed the uplift loads, nominal (minimum) fixings only shall be required unless otherwise noted for shear or racking loads. For trussed roofs, AS 4440 does not provide specific tie-down details. The details given in this Clause for specific tie-down fixings for standard trussed roofs satisfy the general requirements of AS 4440, which states that the fixing of trusses to the supporting structure shall be in accordance with the approved specification. For other trusses (e.g., girder, TG, etc.), refer to appropriate specification.”*

Where, after making allowance for the contribution of gravity loads, there are still net uplift forces, then specific tie-down connections are required to be provided to resist these forces.

Whilst AS 1684 provides an extensive range of alternative tie-down connection details, not all possible scenarios have been addressed and in this case, where specific tie-down is required, use of framing anchors, such as triple grips, to connect rafters and trusses to ribbon plates (double or multiple top plates) is not specifically shown. Irrespective, the overarching requirement for achieving continuity of tie-down must still be met.

Where it is required to achieve continuity of tie-down from the ribbon plate to the lower plate, a number of options could be used such as strapping the plates together or use of a batten screw for each framing anchor used to connect the trusses to the plates i.e. two framing anchors requires 2 screws.

AS 1684 Table 9.19 (e) shows a detail for the use of screws to connect ribbon plates to lower plates.

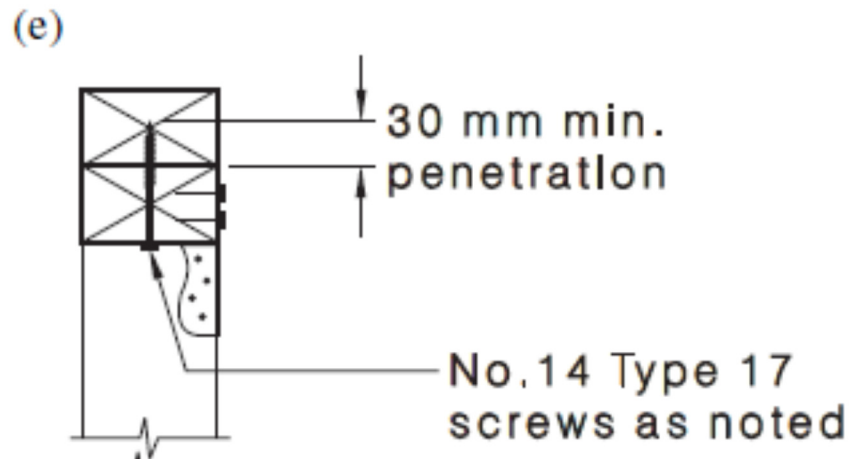


Figure 1: - AS 1684.2/3 TABLE 9.19

## Summary

Where framing anchors are used to achieve specific tie-down, and the nails in the bottom leg of the anchor (at least two of them) cannot be located in the lower of the two plates, the plates need to be connected together to achieve equal or greater uplift resistance than that provided by the framing anchor.

Specific connection (nominal connection still required) between the ribbon plate and the lower plate is not required where the connection is a nominal connection only i.e. Standard trusses, N2 Tile roof situations. For N2 tile roof situations, non-standard trusses such as girders may still require specific tie-down. Refer to Table 9.4, Clause 9.6.1 and 9.6.4.

Specific connection (nominal connection still required) between the ribbon plate and the lower plate is not required where direct tie-down of the top plate (including ribbon plate) is provided. i.e. where a cyclone rod or tie down straps are provided within 100 mm of the truss to top plate connection. The use of other alternative truss to top plate connections such as metal straps or 'hurricane' or 'Uni-tie' ties etc. that enable nailing to the lower of the two plates would also be acceptable.