AS 1684 USER GUIDE

GUIDE TO THE USE OF AS 1684

Masonry Anchors for Tie-down of Bottom Plates to Slabs

8

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(The Code clause and table references given below apply to Part 2 and Part 3 unless specifically noted)

Background

AS 1684 permits the use of proprietary masonry anchors for fixing bottom plates to concrete slabs.

These fixings may be required for the purposes of resisting the uplift forces at the ends of bracing walls and/or the tie-down of walls due to wind uplift.

Table 8.24 (g) (Table 8.25 (g) in Part 3) and **Table 9.18 (e)** provide details for proprietary masonry anchors, which in turn refers to the manufacturer to obtain the uplift capacity. The uplift capacity obtained from the manufacturer must be a **limit state design capacity** for it to be compatible with AS 1684.

Note:- The normal procedure that a manufacturer should undertake to establish limit state design capacities for their fasteners would be as follows:-

- *Conduct a number of replicated 'pull-out' tests in concrete of the nominated strength at specified edge distances and embedment depths.*
- *Analyse the derived failure loads of the tests using appropriate statistical procedures.*
- *Determine a limit state design capacity based on analysis of the test data. For short duration loading (wind loads), the limit state design capacity will usually be around half of the average ultimate pull-out strength depending upon how variable the test results were and what factors of safety are used.*

Manufacturer's published capacities for masonry anchors may only refer to the tensile strength of the connection or the 'pull-out' strength from the concrete. It may not consider the bearing strength under the head of the fastener in the timber bottom plate or the head pull-through strength of the fastener in the timber bottom plate which in turn are influenced by the timber joint group.

Recommended Procedure

1. Obtain the manufacturers recommended limit state design capacity for their masonry anchors.
2. Check minimum edge and embedment depths required for the specified design capacity.
3. Check that manufacturers capacities consider both head bearing and head pull through of the fastener on the timber bottom plate.
4. If manufacturers capacities do not take into consideration the timber strength issues, their data may not be compatible with AS 1684 and should not be used without further engineering advice which must take into account the minimum head bearing area or washer sizes required and timber joint group.
5. Default values for minimum timber bearing/head pull through can be obtained from AS 1684 for M10 cuphead bolts and for M10 and M12 bolts with 'structural' washers as follows:-

Description	Uplift capacity (kN) Joint Group					
	J2	J3	J4	JD4	JD5	JD6
M10 cuphead bolt, standard washer	16	14	10	10	7	5
M10 bolt with 38 x 38 x 2.0 mm structural washer	18	18	18	15	12	9
M12 bolt with 50 x 50 x 3.0 mm structural washer	27	27	26	20	16	12

The limit state design uplift capacity of masonry anchors shall be the lesser of the manufacturers design capacities and the above values provided the net bearing area under the head of the fastener is not less than the net bearing area of the above washers.

Technical Advice

Further technical information and assistance is available from the following Timber Advisory Services.

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Important Notice

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