

- (e) The seating anchorage in the mortar shall be not less than the following within  $\pm 5$  mm:
  - (i) For solid or cored units up to 100 mm wide . . . . . half the width of the unit.
  - (ii) For solid or cored units 100 mm or wider . . . . . 50 mm.
  - (iii) For hollow units with face-shell bedding . . . . . 50 mm.

NOTE: In a hollow-unit masonry construction, it may be necessary to obtain the required embedment by filling the appropriate cores with mortar.

- (f) The part of a wall tie that provides anchorage to the mortar bed joint in masonry shall have an overall height of the anchorage section, including any crimping or bending, not exceeding 70% of the design joint thickness. This limitation shall not apply to ties used with autoclaved aerated concrete blockwork constructed with thin-bed mortar, but provision shall be made to accommodate the thickness of the tie.
- (g) Wall ties that are intended to be fixed to non-rigid members shall be capable of being fixed by non-impact methods (for example, screwing), unless it can be shown that the method of fixing will not adversely affect the ability of the tie or the mortar to perform as required.

Tie and fasteners shall be supplied as an integral system.

NOTES:

1 Screw fixings do not suffer or produce the same problems as do impact fixings, such as nails.

2 Galvanic compatibility between tie and fastener is required by Clause 2.4.6.

- (h) The tolerance between any moving parts of veneer ties in the direction of the face loads shall be such as to allow no movement.
- (i) Type B wall ties shall be capable of tolerating both horizontal and vertical differential movements of the leaf and the loadbearing frame, so as to maintain compliance with the applicable requirements of Table 2, when subjected to the applicable displacements in Paragraph A8, Appendix A.
- (j) Type B wall ties shall be designed and made so that no component of a tie disengages in service, including during earthquakes.
- (k) Type B flexible veneer ties in their unstressed condition shall be constructed so as to not reduce or increase the cavity width by more than 2 mm when accommodating differential in-plane horizontal and vertical deflections between the attached elements as described in Paragraph A8, Appendix A.
- (l) Remedial ties shall be manufactured to satisfy the performance requirements for Type A or Type B wall ties. Those remedial ties intended for use in upgrading buildings in earthquake-prone areas shall be capable of satisfying the horizontal in-plane and out-of-plane loads and deflections as set out in Paragraph A8, Appendix A, for Type B veneer ties supported from flexible structures. Remedial ties used to upgrade cavity wall buildings shall comply with Clause 2.7.2 for Type A cavity ties.

## 2.7 STRUCTURAL PERFORMANCE—STRENGTH AND STIFFNESS

**2.7.1 Strength** Wall ties shall be tested in accordance with Appendix A or Appendix B. The characteristic stiffness values in tension and compression so obtained for Type B ties shall be not less than the appropriate values given in Table 2 for the particular duty classification.

**2.7.2 Classification of Type A ties** Cavity and veneer ties shall be classified in accordance with their characteristic strength as shown in Table 1. The classification is as follows:

- (a) Light duty.
- (b) Medium duty.
- (c) Heavy duty.

**TABLE 1**  
**MINIMUM CHARACTERISTIC STRENGTH OF TYPE A**  
**VENEER TIES AND TYPE A CAVITY TIES**

Classification	Minimum characteristic strength, kN	
	Tension	Compression
Light duty	0.20	0.24
Medium duty	0.40	0.48
Heavy duty	1.00	1.20

NOTE: A lower bound value on stiffness is imposed on ties by the test method. This places an upper limit of 1.5 mm on the tie deflection at ultimate load.

**2.7.3 Classification of Type B ties** Veneer ties for use in seismic areas shall be classified in accordance with their characteristic strength and stiffness as shown in Table 2. The classification is as follows:

- (a) Earthquake light duty (EL).
- (b) Earthquake medium duty (EM).
- (c) Earthquake heavy duty (EH).

**TABLE 2**  
**TYPE B VENEER TIES (FLEXIBLE OR NON-FLEXIBLE)**  
**MINIMUM CHARACTERISTIC STRENGTH AND CHARACTERISTIC**  
**STIFFNESS UNDER AXIAL LOADING**

Classification for seismic veneer tie	Minimum characteristic axial stiffness kN/mm	Minimum characteristic axial strength (at the end of 4 <sup>th</sup> , 10 mm tension cycle) kN	Minimum characteristic residual strength (at end of 15 mm cycle) kN
Light duty (EL)	0.150	0.500	0.350
Medium duty (EM)	0.175	0.750	0.550
Heavy duty (EH)	0.200	1.500	1.100

NOTE: Type B non-flexible veneer ties are known as 'standard ties' in New Zealand.