HB 3 WALLS

On-site building consent requirements of the *building consent authority* (BCA) take precedence over the guidance in this document.

HB 3.1 SYSTEMS TO RESIST VERTICAL LOADS

HB 3.1.1 General requirements *(from NZS 3604, 8.4)*

Wall framing timbers shall be set plumb and square, except that they may be inclined not more than 20° from the vertical, for the purpose of forming *mansard roofs* only.

The *loaded dimension* (required for determining the dimensions of *wall framing* members including *lintels*) is shown in NZS 3604 figure 1.3 (page 1–13).

HB 3.1.2 Dragon ties *(from NZS 3604, 8.3.3)*

HB 3.1.2.1 General

Dragon ties may be used with a *braced wall* system to permit the construction of spaces up to 7.5 m x 7.5 m, without the need for a ceiling *diaphragm* (see NZS 3604 figure 8.1).

HB 3.1.2.2

When diagonal *dragon ties* are used, the distance to the nearest *bracing line* shall be a maximum of 5.0 m from the junction of the *dragon tie* with the *top plate*, in accordance with the following:

(a) The distance from the external corner to the first *bracing line* shall not exceed 7.5 m;

(b) Every *external wall* with a *dragon tie* attached to the *top plate* shall have a *bracing capacity* of at least 100 *bracing units*.

HB 3.1.2.3

Dragon ties shall only be located at external corners and shall be used in pairs, one at each end of the *wall*.

Each *dragon tie* shall:

(a) Consist of a continuous length of 90 mm x 35 mm timber;

(b) Be connected to the *top plates* of the *external wall* and the adjoining *external wall* at right angles, and to intermediate *roof* and ceiling members;

(c) Be fixed at an angle between 40° and 50° to both *external walls*, not more than 2.5 m from the corner.

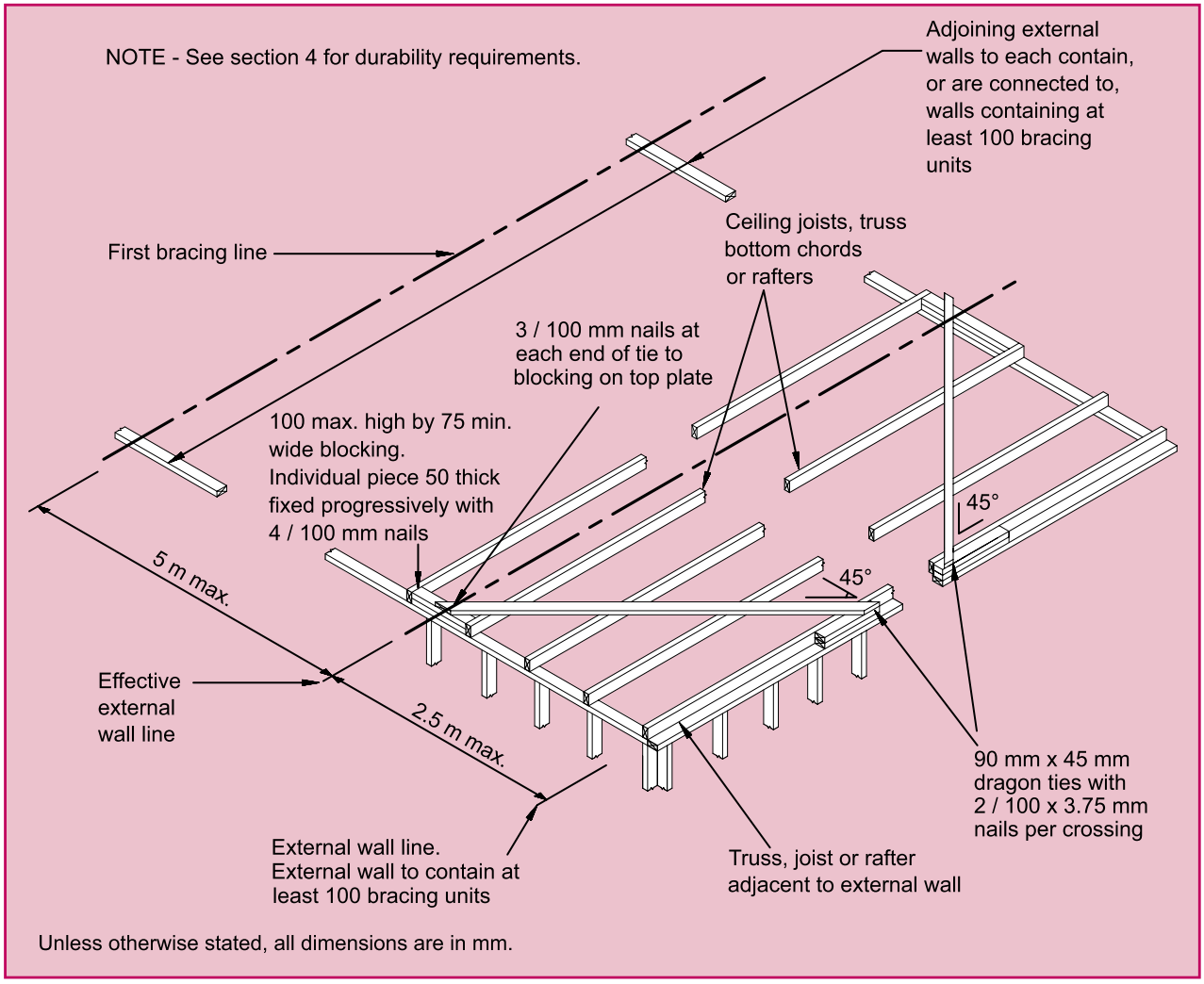
HB 3.1.2.4

Dragon ties shall be fixed as follows:

(a) Either directly to the *top plates* or, to *blocking pieces* which are no deeper than 90 mm and are at least 70 mm wide; and

(b) At the *external wall* being considered, the *dragon ties* shall also be fixed within 100 mm of the *top plate* to a *joist*, truss or *rafter*; and

(c) At the adjoining *walls* which are at right angles, the *blocking piece* shall *span* between, and be fixed to, adjacent *joists*, trusses or *rafters* (see NZS 3604 figure 8.1).



NZS 3604 figure 8.1 – Dragon ties (see 8.3.3.1)

The wind zone may be obtained from the *bracing* schedule in the building consent requirements of the BCA or from the designer or engineer.

HB 3.1.3 Studs *(from NZS 3604, 8.5)*

Studs shall be as follows:

(a) *Loadbearing walls*: As given by NZS 3604 tables 8.2 and 14.10;

(b) *Non-loadbearing walls*: As given by NZS 3604 tables 8.3 and 8.4. See also NZS 3604 figure 8.3. NZS 3604 table 8.3 applies only to internal *non-loadbearing walls* and provides for the use of No. 2 Framing. *Gable* end *walls* within 1.2 metres of adjoining *rafter* or truss shall be regarded as *non-loadbearing walls* and designed in accordance with NZS 3604 table 8.4.

Sizes of *wall framing studs* and *trimming studs* may be built-up by nailing 2 or more pieces together to the required size as in HB 3604 table 3A (from NZS 3604, 8.5.1.2).

HB 3604 table 3A – Built-up thicknesses for studs thicker than 45 mm *(from NZS 3604, 8.5.1.2)*

Stud thickness in table		Built-up thickness
Trimming studs	70 mm	2/35 mm
	90 mm	2/45 mm
	105 mm	3/35 mm
	115 mm	2/45 mm + 1/35 mm or 2/35 mm + 1/45 mm
	135 mm	3/45 mm
	140 mm	2/70 mm or 4/35 mm
	180 mm	4/45 mm
	210 mm	4/45 mm + 1/35 mm or 6/35 mm
	270 mm	6/45 mm
NOTE – Built-up members comprised of other combinations of framing members are allowed provided that overall thickness of the original member is matched or exceeded.		

NZS 3604 table 8.2 – Studs in loadbearing walls for all wind zones – SG 8 (see 8.5.1.1)

Wind zone	Loaded dimension* of wall	Stud sizes for maximum length (height) of: (m)								
		2.4			2.7			3.0		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		300	400	600	300	400	600	300	400	600
	(m)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)
		(width x thickness)								
(a) Single or top storey – Light and heavy roof										
Extra high	2.0	–	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90	90 x 70	90 x 70	140 x 45
	4.0	–	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90	90 x 70	90 x 70	140 x 45
	6.0	–	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90	90 x 70	90 x 70	140 x 45
Very high	2.0	–	90 x 45	90 x 70	90 x 35	90 x 70	90 x 70	90 x 45	90 x 70	90 x 90
	4.0	–	90 x 45	90 x 70	90 x 35	90 x 70	90 x 70	90 x 45	90 x 70	90 x 90
	6.0	–	90 x 45	90 x 70	90 x 35	90 x 70	90 x 70	90 x 45	90 x 70	90 x 90
High	2.0	–	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 35	90 x 70	90 x 70
	4.0	–	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 35	90 x 70	90 x 70
	6.0	–	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 35	90 x 70	90 x 70
Medium	2.0	–	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 35	90 x 70
	4.0	–	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 35	90 x 70
	6.0	–	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 35	90 x 70
Low	2.0	–	90 x 35	90 x 35	90 x 35	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45
	4.0	–	90 x 35	90 x 35	90 x 35	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45
	6.0	–	90 x 35	90 x 35	90 x 35	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45
Internal walls for all wind zones	2.0	–	70 x 45	70 x 45	70 x 45	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45
	4.0	–	70 x 45	70 x 45	70 x 45	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45
	6.0	–	70 x 45	70 x 45	70 x 45	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45

* For definition of loaded dimension see 1.3.

NOTE –

(1) Determine the loaded dimension of the wall at floor level and the loaded dimension of the wall above at roof level and use the greater value in this table.

(2) 140 x 45 may be substituted for 90 x 90. 90 x 35 may be substituted for 70 x 45.

(3) Studs 70 mm and 90 mm thick may be replaced with studs of 35 mm and 45 mm thickness respectively, provided they are placed at no more than one half the spacing required for the 70 mm and 90 mm stud they are replacing.

(4) Studs 70 mm and 90 mm thick may be substituted with built-up members sized in accordance with 8.5.1.2 and nailed together in accordance with 2.4.4.7.

Table continued on next page ➤

For corresponding SG 6 and SG 10 tables see the appendices in relevant sections of NZS 3604.

NZS 3604 table 8.2 – Studs in loadbearing walls for all wind zones – SG 8 (continued) (see 8.5.1.1)

Wind zone	Loaded dimension* of wall	Stud sizes for maximum length (height) of: (m)								
		3.6			4.2			4.8		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		300	400	600	300	400	600	300	400	600
	(m)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)
		(width x thickness)								
(a) Single or top storey – Light and heavy roof										
Extra high	2.0	140 x 45	140 x 45	140 x 90	140 x 90	140 x 90	190 x 45	140 x 90	190 x 90	190 x 90
	4.0	140 x 45	140 x 45	140 x 90	140 x 90	140 x 90	190 x 45	140 x 90	190 x 90	190 x 90
	6.0	140 x 45	140 x 45	140 x 90	140 x 90	140 x 90	190 x 45	140 x 90	190 x 90	190 x 90
Very high	2.0	140 x 45	140 x 45	140 x 90	140 x 90	140 x 90	190 x 45	140 x 90	190 x 45	190 x 90
	4.0	140 x 45	140 x 45	140 x 90	140 x 90	140 x 90	190 x 45	140 x 90	190 x 45	190 x 90
	6.0	140 x 45	140 x 45	140 x 90	140 x 90	140 x 90	190 x 45	140 x 90	190 x 45	190 x 90
High	2.0	90 x 90	140 x 45	140 x 45	140 x 45	140 x 90	140 x 90	140 x 90	140 x 90	190 x 90
	4.0	90 x 90	140 x 45	140 x 45	140 x 45	140 x 90	140 x 90	140 x 90	140 x 90	190 x 90
	6.0	90 x 90	140 x 45	140 x 45	140 x 45	140 x 90	140 x 90	140 x 90	140 x 90	190 x 90
Medium	2.0	90 x 70	90 x 70	140 x 45	90 x 90	140 x 45	140 x 90	140 x 45	140 x 90	140 x 90
	4.0	90 x 70	90 x 70	140 x 45	90 x 90	140 x 45	140 x 90	140 x 45	140 x 90	140 x 90
	6.0	90 x 70	90 x 70	140 x 45	90 x 90	140 x 45	140 x 90	140 x 45	140 x 90	140 x 90
Low	2.0	90 x 35	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 90
	4.0	90 x 35	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 90
	6.0	90 x 35	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 90
Internal walls for all wind zones	2.0	90 x 35	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 90
	4.0	90 x 35	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 90
	6.0	90 x 35	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 90

* For definition of loaded dimension see 1.3.

NOTE –

(1) Determine the loaded dimension of the wall at floor level and the loaded dimension of the wall above at roof level and use the greater value in this table.

(2) 140 x 45 may be substituted for 90 x 90. 90 x 35 may be substituted for 70 x 45.

(3) Studs 70 mm and 90 mm thick may be replaced with studs of 35 mm and 45 mm thickness respectively, provided they are placed at no more than one half the spacing required for the 70 mm and 90 mm stud they are replacing.

(4) Studs 70 mm and 90 mm thick may be substituted with built-up members sized in accordance with 8.5.1.2 and nailed together in accordance with 2.4.4.7.

Table continued on next page ➤

For corresponding SG 6 and SG 10 tables see the appendices in relevant sections of NZS 3604.

NZS 3604 table 8.2 – Studs in loadbearing walls for all wind zones – SG 8 (continued) (see 8.5.1.1)

Wind zone	Loaded dimension* of wall	Stud sizes for maximum length (height) of: (m)								
		2.4			2.7			3.0		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		300	400	600	300	400	600	300	400	600
	(m)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)
		(width x thickness)								
(b) Lower of two storeys or subfloor beneath one storey										
Extra high	2.0	-	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
	4.0	-	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
	6.0	-	90 x 70	90 x 70	90 x 45	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
Very high	2.0	-	90 x 45	90 x 70	90 x 35	90 x 70	90 x 70	90 x 45	90 x 70	90 x 90
	4.0	-	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90	90 x 45	90 x 70	90 x 90
	6.0	-	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90	90 x 45	90 x 70	90 x 90
High	2.0	-	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 35	90 x 70	90 x 70
	4.0	-	90 x 35	90 x 70	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90
	6.0	-	90 x 35	90 x 70	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90
Medium	2.0	-	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 35	90 x 70
	4.0	-	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	6.0	-	90 x 35	90 x 45	90 x 35	90 x 35	90 x 70	90 x 35	90 x 45	90 x 70
Low	2.0	-	90 x 35	90 x 35	90 x 35	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45
	4.0	-	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 35	90 x 45
	6.0	-	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 35	90 x 70
Internal walls for all wind zones	2.0	-	70 x 45	90 x 35	70 x 45	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45
	4.0	-	70 x 45	90 x 35	70 x 45	70 x 45	90 x 45	70 x 45	90 x 35	90 x 45
	6.0	-	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	70 x 45	90 x 35	90 x 70

* For definition of loaded dimension see 1.3.

NOTE –
(1) Determine the loaded dimension of the wall at floor level and the loaded dimension of the wall above at roof level and use the greater value in this table.
(2) 140 x 45 may be substituted for 90 x 90. 90 x 35 may be substituted for 70 x 45.
(3) Studs 70 mm and 90 mm thick may be replaced with studs of 35 mm and 45 mm thickness respectively, provided they are placed at no more than one half the spacing required for the 70 mm and 90 mm stud they are replacing.
(4) Studs 70 mm and 90 mm thick may be substituted with built-up members sized in accordance with 8.5.1.2 and nailed together in accordance with 2.4.4.7.

Table continued on next page ➤

For corresponding SG 6 and SG 10 tables see the appendices in relevant sections of NZS 3604.

Table 8.2 – Studs in loadbearing walls for all wind zones – SG 8 (continued) (see 8.5.1.1)

Wind zone	Loaded dimension* of wall	Stud sizes for maximum length (height) of: (m)								
		2.4			2.7			3.0		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		300	400	600	300	400	600	300	400	600
	(m)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)
		(width x thickness)								
(c) Subfloor beneath two storeys										
Extra high	2.0	90 x 45	90 x 70	90 x 70	90 x 45	90 x 70	90 x 90	90 x 70	90 x 70	140 x 45
	4.0	90 x 45	90 x 70	90 x 70	90 x 45	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
	6.0	90 x 45	90 x 70	90 x 90	90 x 45	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
Very high	2.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90	90 x 45	90 x 70	90 x 90
	4.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90	90 x 70	90 x 70	140 x 45
	6.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90	90 x 70	90 x 70	140 x 45
High	2.0	90 x 35	90 x 35	90 x 70	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90
	4.0	90 x 35	90 x 35	90 x 70	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90
	6.0	90 x 35	90 x 35	90 x 70	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90
Medium	2.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 35	90 x 70	90 x 35	90 x 45	90 x 70
	4.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 35	90 x 70	90 x 35	90 x 45	90 x 70
	6.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 35	90 x 70	90 x 35	90 x 45	90 x 70
Low	2.0	90 x 35	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 35	90 x 70
	4.0	90 x 35	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 35	90 x 70
	6.0	90 x 35	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 35	90 x 70
Internal walls for all wind zones	2.0	70 x 45	70 x 45	90 x 35	70 x 45	70 x 45	90 x 45	70 x 45	90 x 35	90 x 70
	4.0	70 x 45	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	70 x 45	90 x 35	90 x 70
	6.0	70 x 45	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	90 x 35	90 x 35	90 x 70

* For definition of loaded dimension see 1.3.

NOTE –
(1) Determine the loaded dimension of the wall at floor level and the loaded dimension of the wall above at roof level and use the greater value in this table.
(2) 140 x 45 may be substituted for 90 x 90. 90 x 35 may be substituted for 70 x 45.
(3) Studs 70 mm and 90 mm thick may be replaced with studs of 35 mm and 45 mm thickness respectively, provided they are placed at no more than one half the spacing required for the 70 mm and 90 mm stud they are replacing.
(4) Studs 70 mm and 90 mm thick may be substituted with built-up members sized in accordance with 8.5.1.2 and nailed together in accordance with 2.4.4.7.

For corresponding SG 6 and SG 10 tables see the appendices in relevant sections of NZS 3604.

NZS 3604 table 14.10 – Studs in loadbearing walls for all wind zones for 3 kPa floor loads – SG 8 (see 8.5.1.1)

Wind zone	Loaded dimension* of wall	Stud sizes for maximum length (height) of: (m)								
		2.4			2.7			3.0		
		At maximum stud spacing of: (mm)			At maximum stud spacing of: (mm)			At maximum stud spacing of: (mm)		
		300	400	600	300	400	600	300	400	600
	(m)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)	(mm x mm)
		(width x thickness)								
(a) Lower of 2 storeys or subfloor beneath 1 storey										
Extra high	2.0	–	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90	90 x 70	90 x 70	140 x 45
	4.0	–	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90	90 x 70	90 x 70	140 X 45
	6.0	–	90 x 70	90 x 70	90 x 45	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
Very high	2.0	–	90 x 45	90 x 70	90 x 35	90 x 70	90 x 70	90 x 45	90 x 70	90 x 90
	4.0	–	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90	90 x 45	90 x 70	90 x 90
	6.0	–	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90	90 x 70	90 x 70	140 x 45
High	2.0	–	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 35	90 x 70	90 x 70
	4.0	–	90 x 35	90 x 70	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90
	6.0	–	90 x 35	90 x 70	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 90
Medium	2.0	–	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 35	90 x 70
	4.0	–	90 x 35	90 x 45	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	6.0	–	90 x 35	90 x 45	90 x 35	90 x 35	90 x 70	90 x 35	90 x 45	90 x 70
Low	2.0	–	90 x 35	90 x 35	90 x 35	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45
	4.0	–	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 35	90 x 45
	6.0	–	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 35	90 x 70
Internal walls in all wind zones	2.0	–	70 x 45	90 x 35	70 x 45	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45
	4.0	–	70 x 45	90 x 35	70 x 45	70 x 45	90 x 45	70 x 45	90 x 35	90 x 45
	6.0	–	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	70 x 45	90 x 35	90 x 70

* For definition of loaded dimension see 1.3.

NOTE –

(1) Determine the loaded dimension of the wall (lower or subfloor as appropriate) at floor level and the loaded dimension of the walls above at floor and roof levels and use the greatest value in this table.

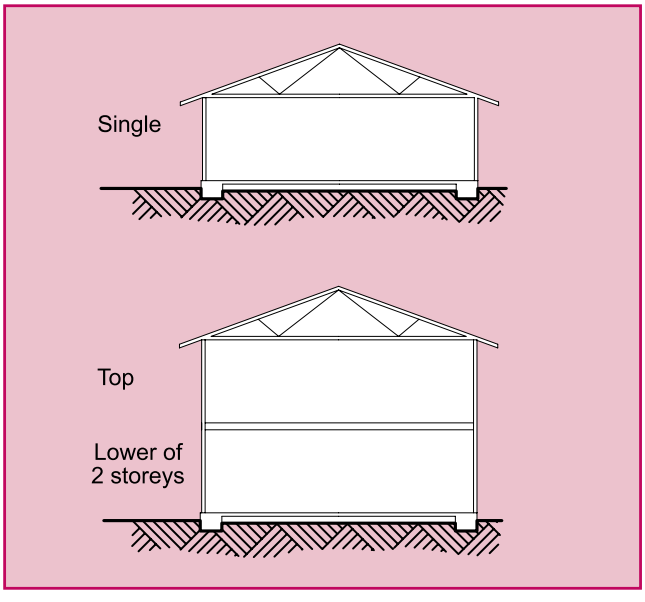
(2) Studs 90 mm thick may be replaced with studs of 35 mm and 45 mm thickness respectively, provided they are placed at no more than one half the spacing required for the 90 mm stud they are replacing.

(3) Studs 90 mm thick may be substituted with built-up (or laminated) members sized in accordance with 8.5.1.2 and nailed together in accordance with 2.4.4.7.

For corresponding SG 6 and SG 10 tables see the appendices in relevant sections of NZS 3604.

NZS 3604 table 8.3 – No. 2 Framing in internal and non-loadbearing walls (see 8.5.1.1)

	Maximum length (height) of stud	Minimum stud size for maximum spacing of studs (mm) of:		
		400	450	600
	(m)	(mm x mm)	(mm x mm)	(mm x mm)
Internal non-loadbearing walls in all wind zones	2.4	70 x 45	70 x 45	90 x 35
	2.7	90 x 35	90 x 35	90 x 45
	3.0	90 x 35	90 x 35	90 x 45



NZS 3604 figure 8.3 – Location of wall framing for the purposes of table 8.2 (see C8.5.1.1)

NZS 3604 table 8.4 – Studs in non-loadbearing walls for all wind zones – SG 8 (see 8.5.1.1 and figure 8.2)

Wind zone	Maximum length (height) of stud	Stud size for maximum spacing of studs (mm) of:		
		300	400	600
	(m)	(mm x mm)	(mm x mm)	(mm x mm)
		(width x thickness)		
Extra high	2.4 2.7 3.0 3.3 3.6 3.9 4.2 4.8	90 x 35 90 x 45 90 x 70 90 x 90 140 x 45 140 x 45 140 x 70 190 x 45	90 x 45 90 x 70 90 x 70 140 x 45 140 x 45 140 x 70 140 x 70 190 x 70	90 x 70 90 x 90 140 x 45 140 x 45 140 x 70 190 x 45 190 x 45 –
Very high	2.4 2.7 3.0 3.3 3.6 3.9 4.2 4.8	90 x 35 90 x 35 90 x 45 90 x 70 90 x 90 140 x 45 140 x 45 140 x 70	90 x 35 90 x 45 90 x 70 90 x 90 140 x 45 140 x 45 140 x 70 190 x 45	90 x 70 90 x 70 90 x 90 140 x 45 140 x 45 140 x 70 190 x 45 190 x 70
High	2.4 2.7 3.0 3.3 3.6 3.9 4.2 4.8	90 x 35 90 x 35 90 x 35 90 x 70 90 x 70 90 x 90 140 x 45 140 x 70	90 x 35 90 x 35 90 x 45 90 x 70 90 x 90 140 x 45 140 x 45 190 x 45	90 x 45 90 x 70 90 x 70 140 x 45 140 x 45 140 x 70 140 x 70 190 x 45

NOTE –

(1) 90 x 35 may be substituted for 70 x 45.
140 x 45 may be substituted for 90 x 90.

(2) Studs 70 mm and 90 mm thick may be replaced with studs of 35 mm and 45 mm thickness respectively, provided they are placed at no more than one half the spacing required for the 70 mm and 90 mm stud they are replacing.

(3) Studs 70 mm and 90 mm thick may be substituted with built-up members sized in accordance with 8.5.1.2 and nailed together in accordance with 2.4.4.7.

Table continued on next page ➤

For corresponding SG 6 and SG 10 tables see the appendices in relevant sections of NZS 3604.