NZS 3604:1999

TIMBER FRAMED BUILDINGS

AMENDMENT NO. 2

May 2006

REVISED TEXT

EXPLANATORY NOTE

Standards New Zealand issued Amendment No. 4 to NZS 3603:1993 *Timber structures standard* on 31 March 2005. NZS 3603 forms the basis for the design solutions given in NZS 3604:1999 *Timber framed buildings* to which most housing is built.

Amendment No. 4 to NZS 3603 resulted from the general acknowledgement that structural and framing timbers are not reliably achieving the engineering properties (stiffness and strength) specified in NZS 3603 and:

- Introduces and gives the engineering properties for new visual grades, being VSG8 and VSG10 for dry timber and G8 for green timber. These grades have had their engineering properties verified.
- Retains the existing No. 1 Framing visual grade, but down-rates its engineering properties.
- Introduces and gives the engineering properties for new machine stress grades called 'MSG' grades. MSG grades have had their engineering properties verified.
- Requires that where timber is verified, the verification be to the provisions of NZS 3622: 2004 *Verification of timber properties*.
- Requires the use of a lower bound Modulus of Elasticity (E_{lb}) for members that do not act as part of a group of four or more members.

Amendment No. 2 to NZS 3604 provides for, and is limited to, the flow-on effects from Amendment No. 4 to NZS 3603. Amendment No. 2 therefore updates the provisions of NZS 3604 to account for the new grades MSG6, G8, VSG8/MSG8 and VSG10/MSG10 and engineering properties defined in Amendment No. 4 to NZS 3603.

The design philosophy for Amendment No. 2 remains the same as the original. Wherever errors in the design calculations existed the opportunity has now been taken to correct these.

Amendment No. 2 identifies the grade of timber in the title and also by the colour of the tables. Throughout the Amendment No. 1 Framing/MSG6 tables are blue, VSG8/MSG8 tables are yellow and VSG10/MSG10 tables are green.

Amendment No. 2 still provides a complete set of tables for No. 1 Framing and allows the use of No. 2 Framing for certain applications (see 8.5).

Framing practice has moved predominantly from green gauged framing to dry sizes. Therefore Amendment No. 2 gives actual minimum dried sizes in both the new and amended clauses and tables (see 2.3.4).

Wherever the term *Territorial Authority* appears replace this with *Building Consent Authority* as included in the replacement pages.

Amendment No. 2 consists of 105 replacement pages which are to be inserted according to the instructions on the next (red) page.

APPROVAL

Amendment No. 2 was approved on 26 May 2006 by the Standards Council to be an amendment to NZS 3604:1999.

STANDARDS NEW ZEALAND
PRIVATE BAG 2439
WELLINGTON 6020

Single User PDF Terms & Conditions

You have material which is subject to strict conditions of use. Copyright in this material is owned by the New Zealand Standards Executive. Please read these terms and conditions carefully, as in addition to the usual range of civil remedies available to Standards New Zealand on behalf of the New Zealand Standards Executive for infringement of copyright, under New Zealand law every person who infringes copyright may be liable to a fine of up to $10,000 for every infringing copy or imprisonment of up to 5 years, or a fine of up to $150,000 or imprisonment not exceeding 5 years.

You have access to a single-user licence to read this non-revisable Adobe Acrobat PDF file and print out and retain ONE printed copy only.

We retain title and ownership of the copyright in this PDF file and the corresponding permitted printed copy at all times.

Under this license use of both the PDF file and the single permitted printed copy of this PDF file you may make are restricted to you. Under no circumstances are you permitted to save, sell, transfer, or copy this PDF file, the one permitted printed copy of this PDF file, or any part of either of them.

You undertake that you will not modify, adapt, translate, reverse engineer, decompile, disassemble or create derivative works based on any of the downloaded PDF file, nor will you merge it with any other software or document, even for internal use within your organization.

Under no circumstances may this PDF file be placed on a network of any sort without our express permission.

You are solely responsible for the selection of this PDF file and any advice or recommendation given by us about any aspect of this PDF file is intended for guidance only and is followed or acted upon entirely at your own risk.

We are not aware of any inherent risk of viruses in this PDF file at the time that it is accessed. We have exercised due diligence to ensure, so far as practicable, that this file does not contain such viruses.

No warranty of any form is given by us or by any party associated with us with regard to this PDF file, and you accept and acknowledge that we will not be liable in any way to you or any to other person in respect of any loss or damage however caused which may be suffered or incurred or which may arise directly or indirectly through any use of this PDF file.

Regardless of where you were when you received this PDF file you accept and acknowledge that to the fullest extent possible you submit to New Zealand law with regard to this licence and to your use of this PDF file.

NZS 3604:1999 AMENDMENT 2 - REPLACEMENT PAGE INSTRUCTIONS

Page to remove	Replace with	Explanation
3/4 and 5/6	3/4 and 5/6	Text amended.
1 - 13/14 and **1** - 17 to **1** - 20	**1** - 13, **1** - 17/18, **1** - 19/20	Text amended.
2 - 3 to **2** - 8	**2** - 3/4, **2** - 5/6, **2** - 7/8	Clauses 2.3.1, 2.3.2, 2.3.4, 2.4.4.7 and 2.5 amended. New clause 2.3.5 added.
6 - 25/26	**6** - 25/26, **6** - 26A/26B	Table 6.3 replaced.
6 - 37/38	**6** - 37/38, **6** - 38A/38B	Clause 6.12.2.2 amended. Table 6.6 replaced.
6 - 41/42	**6** - 41/42	Table 6.8 amended.
7 - 3/4	**7** - 3/4, **7** - 4A/4B	Clause 7.1.1.1 amended. Table 7.1 replaced.
7 - 7 to **7** - 12 (inclusive)	**7** - 7/8, **7** - 9/10, **7** - 11/11A, **7** - 11B/12	Clauses 7.1.3.3, 7.1.3.6, 7.1.4.2(b), 7.1.5.1 and comment 7.1.5.1 amended. Table 7.2 replaced.
7 - 19/20	**7** - 19/20	Clause 7.4.1.2 amended.
8 - 3 to **8** - 16 (inclusive)	**8** - 3/4, **8** - 5/6, **8** - 7/8, **8** - 9/10, **8** - 7A/8A, **8** - 9A/10A, **8** - 7B/8B, **8** - 9B/10B, **8** - 10C/11, **8** - 11A/11B, blank/**8** - 12, **8** - 13/14, **8** - 15/16	Clauses 8.3.1.2, 8.3.3.3, 8.3.3.4, 8.5.1.1, 8.5.1.2, 8.5.1.7, 8.5.3(b) and comment 8.5.1.3 amended. Clause 8.5.1.5 deleted. Figures 8.1, 8.3 and 8.4 amended. Tables 8.3 and 8.5 amended. Tables 8.2 and 8.4 replaced.
8 - 19 to **8** - 24 (inclusive)	**8** - 19/19A, **8** - 19B/20, **8** - 20A/21, **8** - 21A/21B, blank/**8** - 22, **8** - 22A/23, **8** - 23A/24	Clause 8.6.1.6 amended. Tables 8.9, 8.10, 8.11, 8.12 and 8.13 replaced.
8 - 27 to **8** - 32 (inclusive)	**8** - 27/28, **8** - 29/28A, **8** - 29A/28B, **8** - 29B/30, **8** - 31/31A, **8** - 31B/31C, **8** - 31D/32	Clauses 8.7.1.2, 8.7.1.3, 8.7.2.1 and 8.7.2.2 amended. Figures 8.13, 8.14 and 8.15 amended. Tables 8.15, 8.16 and 8.17 replaced.
10 - 7 to **10** - 26 (inclusive)	**10** - 7/8, **10** - 9/10, **10** - 11/12, **10** - 13/14, **10** - 8A/9A, **10** - 10A/11A, **10** - 12A/13A, **10** - 14A/8B, **10** - 9B/10B, **10** - 11B/12B, **10** - 13B/14B blank/**10** - 14C, **10** - 15/16, **10** - 17/18, **10** - 18A/19, **10** - 19A/20, **10** - 21/22, **10** - 23/24, **10** - 21A/22A, **10** - 23A/24A, **10** - 21B/22B, **10** - 23B/24B, **10** - 25/26	Clauses 10.2.1.3.3, 10.2.1.3.4, 10.2.1.4.1, 10.2.1.4.2, 10.2.1.8, 10.2.1.10.2 and 10.2.1.10.3(d) amended. Figures 10.9 and 10.10 amended. Tables 10.2, 10.4, 10.5 and 10.6 replaced.
10 - 29/30 and **10** - 31/32	**10** - 29/29A, **10** - 29B/30, **10** - 31/31A, **10** - 31B/32	Clauses 10.2.1.13.2(c), 10.2.1.13.3(c), 10.2.1.14.1 and 10.2.1.14.3 amended. Tables 10.7 and 10.8 replaced.
10 - 35/36 and **10** - 37/38	**10** - 35/36, **10** - 36A/blank, **10** - 37/38	Clauses 10.2.1.15.2, 10.2.1.15.3 and 10.2.1.1.6 amended. New Clause 10.2.1.16.6 added. Table 10.9 replaced.
10 - 49/50	**10** - 49/50	Clauses 10.4.2.3(b)(i), 10.4.3.2(c), and 10.4.3.3 amended. Figure 10.25 amended.
14 - 7 to **14** - 14 (inclusive)	**14** - 7/7A, **14** - 8/9, **14** - 9A/10, **14** - 10A/10B, **14** - 11/11A, **14** - 12/12A, **14** - 13/13A, **14** - 13B/14	Tables 14.5 and 14.7 amended. Tables 14.4, 14.8, 14.10, 14.12, 14.13, 14.14 and 14.15 replaced.
15 - 5 to **15** - 16 (inclusive)	**15** - 5/5A, **15** - 5B/6, **15** - 6A/6B, **15** - 6C/7, **15** - 7A/8, **15** - 9/10, **15** - 11/12, **15** - 13/8A, **15** - 9A/10A, **15** - 11A/12A, **15** - 13A/8B, **15** - 9B/10B, **15** - 11B/12B, **15** - 13B/14, **15** - 15/14A, **15** - 15A/14B, **15** - 15B/16, **15** - 16A/16B	Tables 15.2, 15.3, 15.4, 15.5, 15.6, 15.7 and 15.8 replaced.
16 - 3/4	**16** - 3/4	Clause 16.1 amended.

NZS 3604:1999 Timber Framed Buildings

REMINDER TABLES

WHICH SIZE?

Call size (mm)	Actual minimum dried size (mm)
25	19
40	35
50	45
75	70
100	90
150	140
200	190
250	240
300	290

WHICH TABLE?

No. 1 Framing / MSG 6

VSG 8 / MSG 8

VSG 10 / MSG 10

(May 2006)

Insert this sheet into the inside front of the Standard folder as a ready reminder.

CONTENTS

PAGE

Committee representation .....IFC
Copyright .....IFC
Notice of disclaimer..... 2
Related documents 4
Foreword 9

1 SCOPE AND INTERPRETATION **1**-1

2 GENERAL..... **2**-1

3 SITE REQUIREMENTS **3**-1

4 DURABILITY **4**-1

5 BRACING DESIGN..... **5**-1

6 FOUNDATION AND SUBFLOOR FRAMING..... **6**-1

7 FLOORS **7**-1

8 WALLS **8**-1

9 POSTS **9**-1

10 ROOF FRAMING..... **10**-1

11 THE BUILDING ENVELOPE – WALL AND ROOF CLADDINGS **11**-1

12 INTERIOR LININGS **12**-1

13 CEILINGS **13**-1

ADDITIONAL INFORMATION (NORMATIVE)

14 REQUIREMENTS FOR 3 KPa FLOOR LOADINGS **14**-1

15 0.5 kPa or 1 kPa SNOW LOADING **15**-1

16 COMPOSITE CONSTRUCTION LINTEL TABLES **16**-1

ADDITIONAL INFORMATION (INFORMATIVE)

17 EXPANSIVE SOILS **17**-1

18 BUILDING PRODUCT APPRAISALS AND BIA ACCREDITATIONS **18**-1

19 STATUTORY INFORMATION **19**-1

20 INDUSTRY INFORMATION **20**-1

INDEX

Amd 1 Dec '00

RELATED DOCUMENTS

Reference is made in this document to the following:

NEW ZEALAND STANDARDS

	NZS/BS 1449:- - - -	Steel plate, sheet and strip
Amd 1 Dec '00	NZS 2295:1988	Building papers (breather type)
	NZS 3101:1995	Concrete structures standard
Amd 1 Dec '00	NZS 3109:1997	Concrete construction
	NZS 3124:1997	Concrete construction for minor works
	NZS 3403:1978	Specification for hot-dip galvanized corrugated steel sheet for building purposes
	NZS 3601:1973	Metric dimensions for timber
	NZS 3602:2003	Timber and wood-based products for use in building
	NZS 3603:1993	Timber structures standard
	NZS 3605:1992	Specification for timber piles and poles for use in building
	NZS 3611:1970	Specification for exterior plywood
	NZS 3617:1979	Specification for profiles of weatherboards, fascia boards, and flooring
	NZS 3631:1988	New Zealand timber grading rules
	NZS 3640:2003	Chemical preservation of round and sawn timber
	NZS 4203:1992	General structural design and design loadings for buildings
	NZS 4206:1992	Concrete interlocking roofing tiles
	NZS 4210:1989	Code of practice for masonry construction: materials and workmanship
	NZS 4211:1985	Specification for performance of windows

Amd 2 May '06

Amd 2 May '06

	NZS 4217:- - - -	Pressed metal tile roofs	
	Part 1:1980	Specification for roofing tiles and their accessories	
	Part 2:1980	Code of practice for preparation of the structure and the laying and fixing of metal roofing tiles	
	NZS 4229:1999	Concrete masonry buildings not requiring specific engineering design	Amd 1 Dec '00
	NZS 4230:1990	Code of practice for the design of masonry structures	
	NZS 4251:- - - -	Solid plastering	
	Part 1:1998	Cement plasters for walls, ceilings and soffits	
	NZS 4402:- - - -	Methods of testing soils for civil engineering purposes	
	Part 2, Section 2:1986 Test 2.2	Determination of the liquid limit	
	Part 2, Section 6:1986 Test 2.6	Determination of the linear shrinkage	
	Part 6, Section 5.2:1988 Test 6.5.2	Determination of the penetration resistance of a soil: Hand method using a dynamic cone penetrometer	
	NZS 4408:1988	Specification for asphalt roofing shingles made from glass felt and surfaced with mineral granules	
	NZS 4431:1989	Code of practice for earth fill for residential development	Amd 1 Dec '00
	NZS 7401:1985	Specification for solid fuel burning domestic appliances	
	NZS 7421:1990	Specification for installation of solid fuel burning domestic appliances	
*	NZS 7703:1985	The painting of buildings	

* Currently under revision

JOINT AUSTRALIAN/NEW ZEALAND STANDARDS

*	AS/NZS 1100:- - - -	Technical drawing
	AS/NZS 1111:1996	ISO metric hexagon commercial bolts and screws
	AS/NZS 1328:- - - -	Glued laminated structural timber
	Part 1:1998	Performance requirements and minimum production requirements
	Part 2:1998	Guidelines for AS/NZS 1328:Part 1 for the selection, production and installation of glued laminated structural timber
	AS/NZS 1393:1996	Coach screws – Metric series with ISO hexagon heads
Amd 1 Dec '00	AS/NZS 1859:- - - -	Reconstituted wood-based panels
Amd 1 Dec '00	Part 1:1997	Particleboard
Amd 1 Dec '00	Part 2:1997	Medium density fibreboard (MDF)
	AS/NZS 2269:1994	Plywood – Structural
	AS/NZS 2312:1994	Guide to the protection of iron and steel against exterior atmospheric corrosion
	AS/NZS 2699:- - - -	Built-in components for masonry construction
	Part 1:2000	Wall ties
	Part 2:2000	Connectors and accessories
	Part 3:2000	Lintels and shelf angles (durability requirements)
	AS/NZS 2908:- - - -	Cellulose-cement products
Amd 1 Dec '00	Part 1-2000	Corrugated sheets
Amd 1 Dec '00	Part 2-2000	Flat sheets
	AS/NZS 4201:1994	Pliable building membranes and underlays – Methods of test
	AS/NZS 4284:1995	Testing of building facades
	AS/NZS 4534:1998	Zinc and zinc/aluminium-alloy coatings on steel wire
Amd 2 May '06	AS/NZS 4671:2001	Steel reinforcing materials
	AS/NZS 4680:1999	Hot-dip galvanized (zinc) coating on fabricated ferrous articles

AMERICAN NATIONAL STANDARD

ANSI/AHA A135.6-1990	Hardboard siding

AMERICAN SOCIETY FOR TESTING AND MATERIALS

ASTM E96-1994	Standard test methods for water vapour transmission of materials

* Currently under revision

1.2.5
The full titles of reference documents, cited in NZS 3604 are given in the list of Related Documents immediately preceding the Foreword.

1.2.6
Unless inconsistent with the context, and subject to 1.3, terms defined in the *NZBC* shall have the same meaning in NZS 3604.

1.3 Definitions

For the purposes of NZS 3604, the following definitions shall apply:

C1.3
Where words which are defined in 1.3 appear in the text of mandatory clauses of this Standard, they appear in italics. Where such words occur in tables, notes to tables or figures they are not in italics.

ANCHOR PILE. A *pile* directly supporting a *bearer*, and used to resist horizontal as well as vertical *loads*. The *pile* is embedded in concrete to a depth of 900 mm below cleared ground.

BALCONY. An open floor (i.e. no roof or walls) attached to the exterior of the main structure of a building and supported on cantilevered *joists*.

BATTEN. See **CEILING BATTEN, TILE BATTEN.**

BEARER. A beam supported on *jack studs*, *foundation walls*, *piles*, or piers and carrying *joists*, *jack studs*, or subfloor *framing*. See also **EAVES BEARER.**

BLOCK. See **WING.**

BLOCKING. Solid timber having the same depth as the *joists* and set at right angles between the *joists* to stiffen and prevent them from buckling.

BOND, RUNNING or **STRETCHER.** The bond when the units of each course overlap the units in the preceding course by between 25 % and 75 % of the length of the units.

BOTTOM PLATE. A *plate* other than a *wall plate* placed under the bottom ends of *studs*.

BOUNDARY JOIST or **HEADER JOIST**. A *joist* running along the outer ends of the floor *joists*.

BRACE. See **DIAGONAL BRACE, SUBFLOOR BRACE, WALL BRACING ELEMENT.**

BRACED PILE SYSTEM. A group of 2 *piles*, between which a *diagonal brace* is fixed. Each *pile* is embedded in concrete to a depth of 450 mm below cleared ground. A *braced pile system* is used to resist horizontal as well as vertical *loads*.

BRACE RUNNER. A horizontal member attached to the upper edges of ceiling *joists* or truss bottom chords to which a *diagonal brace* is attached.

BRACING. Any method employed to provide lateral support to a building.

BRACING CAPACITY. Strength of *bracing* of a whole building or of elements within a building. *Bracing capacity* is measured in "*Bracing Units*, BUs, and shall be determined from section 5.

BRACING DEMAND. The horizontal forces resisted by a whole building or by an element within a building. These horizontal forces are a result of wind or earthquake action. *Bracing demand* forces are measured in "*Bracing Units*", BUs. They shall be determined as set out in 5.2 (wind) or 5.3 (earthquake).

BRACING LINE. A line along or across a building for controlling the distribution of *wall bracing elements*.

BRACING RATING. The lateral *load* resistance assigned to a subfloor or wall *bracing* system, when tested in accordance with the BRANZ P21 Test Procedure.

BRACING UNIT (BU). A *bracing unit* is a measure of:

(a) The horizontal force (*bracing demand*) on the building (1 kilonewton is equal to 20 *Bracing Units*).

(b) The resistance to horizontal force (*bracing capacity*) of building elements.

BUILDING CONSENT AUTHORITY A *Building Consent Authority* as defined in the Building Act 2004 and includes a Territorial Authority or a private body acting within the scope of their approval. Amd 2 May '06

CALL DIMENSIONS. The dimensions as given by NZS 3601 and by which timber is referred to in commercial transactions.

CANTILEVER PILE. A *driven timber pile* directly supporting a *bearer*, and used to resist horizontal as well as vertical *loads*.

CANTILEVERED FOUNDATION WALL. A *foundation wall* receiving lateral support only by means of cantilever action from its *footing*.

CAPACITY. The *load* resistance of a connector or fixing determined in accordance with 2.4.7.

CEILING BATTEN. A horizontal timber member fixed below *rafters*, ceiling *joists*, or truss bottom chords to which the ceiling *lining* is attached.

CEILING RUNNER. A beam supporting ceiling *joists*.

CLADDING. The outside or exterior weathering surface of a building.

CLEARED GROUND LEVEL (CGL). The *ground level* after completion of site excavation and removal of all harmful material, but before excavation for *foundations*.

CLEAT. A short member used in roof construction to tie a pair of *rafters* together immediately below the *ridge board*.

COLLAR TIE. A horizontal member connecting paired *rafters* together at intermediate points between the ceiling level and the level of the *ridge board*. It is often fixed directly above the *underpurlins*.

CONCRETE BLINDING or **SITE CONCRETE**. Concrete laid over exposed ground, to form a working surface.

CONCRETE SLAB BAY. The section of a concrete floor resulting from division of the slab by construction and control joints.

CONCRETE SLAB CONSTRUCTION JOINT. A joint that results from concrete in one section of the slab being poured up against another vertical section of slab that has already been poured and allowed to harden for 16 hours. Amd 1 Dec '00

INTERNAL WALL. A wall other than an *external wall*.

JACK RAFTER. A short *rafter* extending from the *valley rafter* to the *ridge board* or *hip rafter* or *trimmer*, or from the *top plate* to the *hip rafter* or *trimmer*.

JACK STUD.

(a) A *stud* of less length than the full height, from *plate* to *plate* of wall of which it forms part; or

Amd 1 Dec '00

(b) A *stud* at *pile spacing* forming part of the supporting framing under the ground floor of a building.

JOIST. A horizontal *framing* member to which is fixed floor decking, or ceiling *linings,* and which is identified accordingly as a floor *joist* or ceiling *joist*. See **BOUNDARY JOIST, CURTAILED JOIST, DEEP JOIST, TRIMMER JOIST, TRIMMING JOIST.**

LIGHT ROOF. A roof with roofing material (*cladding* and any *sarking*), having a mass not exceeding 20 kg/m^2 of roof area. Typical examples are steel, copper, and aluminium roof *claddings* of normal thickness, 6 mm thick cellulose cement tiles, 6 mm thick corrugated cellulose cement, and the like, without *sarking*.

LIGHT WALL CLADDING. A wall *cladding* having a mass not exceeding 30 kg/m^2. Typical examples are weatherboards.

LINING. The covering for the inside of a room, cupboard, wall, ceiling, or other interior surface.

LINTEL. A horizontal *framing* timber spanning an opening in a wall.

LOAD. See **FLOOR LOAD.**

LOADBEARING STUD. A *stud* in a *loadbearing wall*.

LOADBEARING WALL. A wall supporting vertical loading from floors, ceiling *joists*, roof, or any combination thereof.

LOADED DIMENSION. The *loaded dimension* of structural elements which support other members at right angles shall be as defined by figure 1.3.

M. A steel bolt of the stated diameter in millimetres.

MANSARD ROOF. A symmetrical roof enclosing a full *storey* with 2 pitches on each side of a ridge, the steeper commencing at the eaves and intersecting with a flatter pitch finishing at the ridge. The steeper pitched part is formed from wall *framing,* sloped at maximum 20° from the vertical and the flatter part formed as roof *framing*, with both parts clad with roof *cladding*.

MEDIUM WALL CLADDING. A wall *cladding* having a mass exceeding 30 kg/m^2 but not exceeding 80 kg/m^2 of wall area (a typical example is stucco *cladding*).

MEMBER SPAN. The clear distance between supports, measured along the members. See figure 1.3.

METAL ANGLE WALING. A horizontal member manufactured of metal angle, usually steel, checked into a saw cut in the face of *studs*.

NATURAL GROUND LEVEL. The *ground level* before the site has been cleared.

NOGGING. See **DWANG.**

NON-LOADBEARING STUD. A *stud* in a *non-loadbearing wall*.

Vertical loadings on non-loadbearing walls which result from the long term creep settlement of loadbearing members, such as trusses, rafters or joists, do not affect the "non-loadbearing" classification of such walls (see also C10.2.2.5).

NON-LOADBEARING WALL. A wall other than a *loadbearing wall* and may contain bracing elements. Amd 2 May '06

NZBC. New Zealand Building Code.

ORDINARY PILE. A *pile* required to resist vertical *loads* only.

PART STOREY. A basement, or a *storey* in a roof space, the floor area of which basement or *storey,* as the case may be, does not exceed 50 % of the area of the ground floor area of the same *wing* or *block* in which the *part storey* occurs.

PILE. A block or a column-like member used to transmit *loads* from the building and its contents to the ground. See **ANCHOR PILE, BRACED PILE, CANTILEVER PILE, DRIVEN TIMBER PILE, ORDINARY PILE.**

PITCHED ROOF. A roof having its exterior surface at an angle of 10° or more to the horizontal (that is, at a slope of 1 in 6 or steeper).

PLAN FLOOR AREA. The area of the site covered by the building in plan view not necessarily on one level (the foot print).

PLATE. A timber supported by a wall or *bearers* or *joists,* to support and distribute the *load* from floors, walls, roofs or ceiling. See **BOTTOM PLATE, TOP PLATE, WALL PLATE.**

POST. An isolated vertical member acting as a support.

PURLIN includes **TILE BATTEN**. A horizontal member laid to span across *rafters* or trusses and to which the roof *cladding* is attached. See also **UNDERPURLIN.**

R. A plain round reinforcing bar of the stated diameter in millimetres.

RAFTER. A *framing* timber normally parallel to the slope of the roof and providing support for *sarking*, *purlins* or roof covering. See **HIP RAFTER, JACK RAFTER, VALLEY RAFTER.**

REINFORCEMENT. Any form of reinforcing rod, bar, or mesh that complies with the relevant requirements of NZS 3109.

RIBBON BOARD includes **SOFFIT PLATE**. A horizontal *framing* timber secured to, or checked into, the edges of *studs* and supporting floor or ceiling *joists* or *eaves bearers*.

RIDGE BEAM. A single or, sometimes, double beam (timber pole construction) supporting the common *rafters* of a framed roof.

RIDGE BOARD. The horizontal timber to which *rafters* of *couple-close roofs* are fixed at their upper ends.

ROOF. That part of the building having its upper surface exposed to the outside and at an angle of 60° or less to the horizontal. See **COUPLE-CLOSE ROOF, FLAT ROOF, HEAVY ROOF, LIGHT ROOF, PITCHED ROOF, SKILLION ROOF.**

ROOF STRUT. See **UNDERPURLIN STRUT.**

RUNNER. See **BRACE RUNNER, CEILING RUNNER.**

SARKING. Boarding or sheet material secured to *rafters*, trusses, or *purlins* and which may also serve as the ceiling *lining*.

SHEATHING. Material used as a backing to *cladding* and includes *sarking*.

SILL TRIMMER. A member supporting the wall *framing* beneath an opening and carrying wind loads to the *trimmer studs*.

SKILLION ROOF. A *pitched roof* where the ceiling *lining* is parallel and close to the roof *cladding*. The roof may be mono-pitch or may consist of more than one roof plane. These roofs often have *rafters* exposed below the ceiling.

SLEEPER. See **BEARER.**

SOFFIT BEARER. See **EAVES BEARER.**

SOFFIT PLATE. See **RIBBON BOARD.**

SPACING or **SPACED**. The distance at which members are *spaced* measured centre to centre.

SPAN. See **MEMBER SPAN** and **SUPPORT SPAN**.

SPECIFIC ENGINEERING DESIGN (SED). Requires calculation and design beyond the scope of this Standard.

SPROCKET. See **EAVES BEARER.**

STOREY. That portion of a building included between the upper surface of any floor and the upper surface of the floor next above, except that the topmost *storey* shall be that portion of a building included between the upper surface of the topmost floor, and the ceiling or roof above.

STRINGER. A horizontal *framing* timber on edge fixed to the side of a concrete or concrete masonry wall, to support the ends of *joists* or *rafters*.

STRUT. See **UNDERPURLIN STRUT.**

STRUTTING. Short members fixed between *joists* to stiffen and prevent them from buckling. See **HERRINGBONE STRUTTING.**

STRUTTING BEAM. A structural beam spanning between *loadbearing walls* from which *underpurlins* may be strutted.

STUD. A vertical *framing* timber.

SUBFLOOR BRACE. A *bracing element* below the ground floor level.

SUPPORT SPAN. The clear distance along a member between supports, measured in plan (horizontally). See figure 1.3.

TERRITORIAL AUTHORITY. Wherever the term *Territorial Authority* appears replace this with *Building Consent Authority*.

Amd 2 May '06

TILE BATTEN. See **PURLIN.**

TOP PLATE. A *plate* placed over the top ends of *studs*.

TRIMMER. A *framing* timber supported by 2 *trimming joists*, *studs* or *rafters*, to which is fixed one or more *curtailed joists*, *jack studs*, or *jack rafters*.

TRIMMING JOIST. A *joist* which is of the full span as other *joists,* but which on one side supports one or more *trimmers*.

TRIMMING STUD. A *stud* located on the side of an opening.

UNDERPURLIN. A horizontal timber member laid underneath *rafters*, supporting the *rafters* at intermediate points along their length.

UNDERPURLIN STRUT. A member used to transfer load from an *underpurlin* to a loadbearing wall or a *strutting* beam.

VALLEY BOARD. A board laid to support a valley gutter.

VALLEY RAFTER. A *rafter* which conforms to the slope of the intersection of 2 roof surfaces meeting in a valley and into which *jack rafters* are trimmed.

WALING. A horizontal *framing* member secured to, or checked into, the edges of *studs*. See **METAL ANGLE WALING.**

WALL. See **EXTERNAL WALL, FOUNDATION WALL, INTERNAL WALL, LOADBEARING WALL, NON-LOADBEARING WALL.**

WALL BRACING ELEMENT. A section of wall above the ground floor level that performs a *bracing* function.

WALL PLATE. A *plate* laid upon a concrete or concrete masonry *foundation wall*.

WING or **BLOCK**. A *wing* or *block* is any part of the building which projects by more than 6 m from the remainder of the building.

WIRE DOG. Galvanized or stainless steel wire, D or Z shaped nail, spiked at each end. Used for fixing timber together to resist uplift. (See figure 2.2).

2 GENERAL

2.1 Dimensions

The cross section dimensions of components or fixings quoted in this Standard are those deemed to be adequate for the particular application. Identical material of larger dimensions may be used unless specifically excluded.

2.2 Tolerances

Tolerances shall be as given in table 2.1.

2.3 Timber and wood-based products

2.3.1

The timber species, preservative treatment, in-service moisture range and their end use environment shall comply with NZS 3602.

2.3.2

The *framing* grades to be used with this Standard shall be as follows. These grades, except No. 2 *Framing*, are as specified in NZS 3603.

(a) Dry Timber
- (i) No. 1 *Framing* or MSG6;
- (ii) VSG8 or MSG8;
- (iii) VSG10 or MSG10;
- (iv) No. 2 *Framing* to NZS 3631 is allowed for *non-loadbearing walls* as given in clause 8.5.1.1.

(b) Wet Timber
- (i) No. 1 *Framing*;
- (ii) G8.

Wet No. 1 *Framing* and G8 can be used as if it was dry No. 1 *Framing* or VSG 8 (or MSG 8) respectively provided the conditions of 2.3.4 are met.

Where different member sizes, *spans* or other design properties apply for the different grades, the Standard specifies the different requirements necessary. Where such distinction is not given then the member sizes, *spans* or other design properties given apply equally to all grades.

Amd 2 May '06

Table 2.1 – Timber framing tolerances

Item	Tolerances
Deviation from the position shown on plan for a building	15 mm
Deviation from vertical	15 mm per 2 storey height (5 mm per 2.4 m)
Deviation from vertical for buildings in excess of 2 full storeys	20 mm
Relative displacement between loadbearing walls in adjacent storeys intended to be in vertical alignment	5 mm
Deviation from line in plan: (a) In any length up to 10 m (b) In any length over 10 m	 5 mm 10 mm total
Deviation from horizontal: (a) In any length up to 10 m (b) In any length over 10 m	 5 mm 10 mm total
Straightness of corners (where 2 walls meet at right angles) Other studs (gradual bow)	2 mm in 2.4 m in both studs 6 mm in 2.4 m
Wall framing: (a) At mid-height under 3 m long horizontal straight edge (b) At mid-height under 1.3 m long horizontal straight edge	 6 mm gradual bow 1.5 mm out of line

C2.3.4
The Standard's provisions may be applicable to timbers other than Radiata pine and Douglas Fir such as other softwood species. Such use however, needs to be subject to demonstration of adequate structural performance and durability. Such designs constitute alternative solution proposals and need to be submitted to and be approved by the Building Consent Authority as part of the normal building consent process.

Over recent years framing practice has moved from predominantly green gauged framing to dry sizes. Further, those dry sizes are based on the Australian dried softwood sizes rather than the dry dressed sizes specified in NZS 3601. There are significant differences between these two sets of dried sizes in sizes 200 mm and over. To avoid confusion, the Standard, including its tables, now gives the actual minimum dried size based on the Australian sizes. This brings the tables into line with Australian practice and is simpler for the consumer.

This Standard does not provide design solutions for timber loaded in situations where prolonged high moisture contents can be expected, except for the members specifically noted in Clause 2.3.4. Such wet timber designs constitute alternative solution proposals and need to be submitted to the Building Consent Authority for approval as part of the normal building consent process. However, timber that is graded and installed green, namely G8 and green No. 1 Framing, or timber that has been installed dry and become wetted during the building process, may still be used with the Standard, provided it is propped and dried in place before being loaded and remains dry in service from that point on.

2.3.3
As shown in figure 2.1 *framing* timbers shall be separated from direct contact with concrete or masonry by either:

(a) A free-draining air space of not less than 12 mm; or

(b) A bituminous *damp-proof course* (DPC) or other suitable impervious material overlapping the timber by at least 6 mm;

This clause need not apply to:

(c) Timber treated to Hazard Class H4 of NZS 3640;

(d) Situations where the concrete or masonry is protected from moisture by a *DPM* or by virtue of its position in a building. Included are *bottom plates* of *internal walls* on concrete floors with a *DPM* and wall *framing*, or *stringers* fixed to concrete, or concrete masonry walls which are not exposed to moisture from the external environment, or from wet areas within a building.

2.3.4
This Standard applies to Radiata pine and Douglas Fir. The design solutions are for timber which is dry (maximum moisture content 18 %) throughout its design life. Timber may be installed green provided non-vertical members are propped and are not subjected to design loadings until they are dry.

The exceptions to the requirement that timber remain dry in service are as follows: *piles* to section 6, *bearers* to table 6.6(B), *stringers* to section 6, *joists* to table 7.1(b), cantilevered balcony floor *joists* to part table 7.2, *posts* to section 9 and timbers under roof overhangs (ie the exposed ends of *rafters*, *purlins*, *battens* and outriggers) to sections 10 and 15. These members can be installed either dry or green and can be wetted in service.

The cross-section dimensions of timber given in the Standard are the actual minimum dried sizes that must be used. Where green timber is used its dimensions shall be no less than the green gauged equivalent size given in the table below:

Actual minimum dried size (mm)	35	45	70	90	140	190	240	290
Green gauged equivalent size (mm)	37	47	69	94	144	194	244	294

The only exceptions to these requirements are for *piles* and *battens* which shall be sawn timber to the sizes required in clauses 6.4 and 10.2.1.16 respectively.

2.3.5
Where the Standard specifies members by call size those sizes shall be read as the actual minimum dried sizes as given in the table below:

Call sizes (mm)	25	40	50	75	100	150	200	250	300
Actual minimum dried size (mm)	19	35	45	70	90	140	190	240	290

2.4 Fastenings and fabrication

2.4.1
All parts of the building shall be securely fastened in accordance with 2.4.2, in order to resist all forces likely to be encountered during construction, or during the expected life of the building and to ensure that the building as a whole acts as a single structural entity.

Amd 2
May '06

2.4.2
Fastenings and connections shall be as specified in the relevant clause of this Standard or have a *capacity* as specified in the relevant clause of this Standard.

2.4.3
All timbers shall be set true to the required lines and levels with all mitres, butts, laps, housings, and other functions cut accurately so as to provide full and even contact over all bearing surfaces. Timber *framing* tolerances shall be as given in table 2.1.

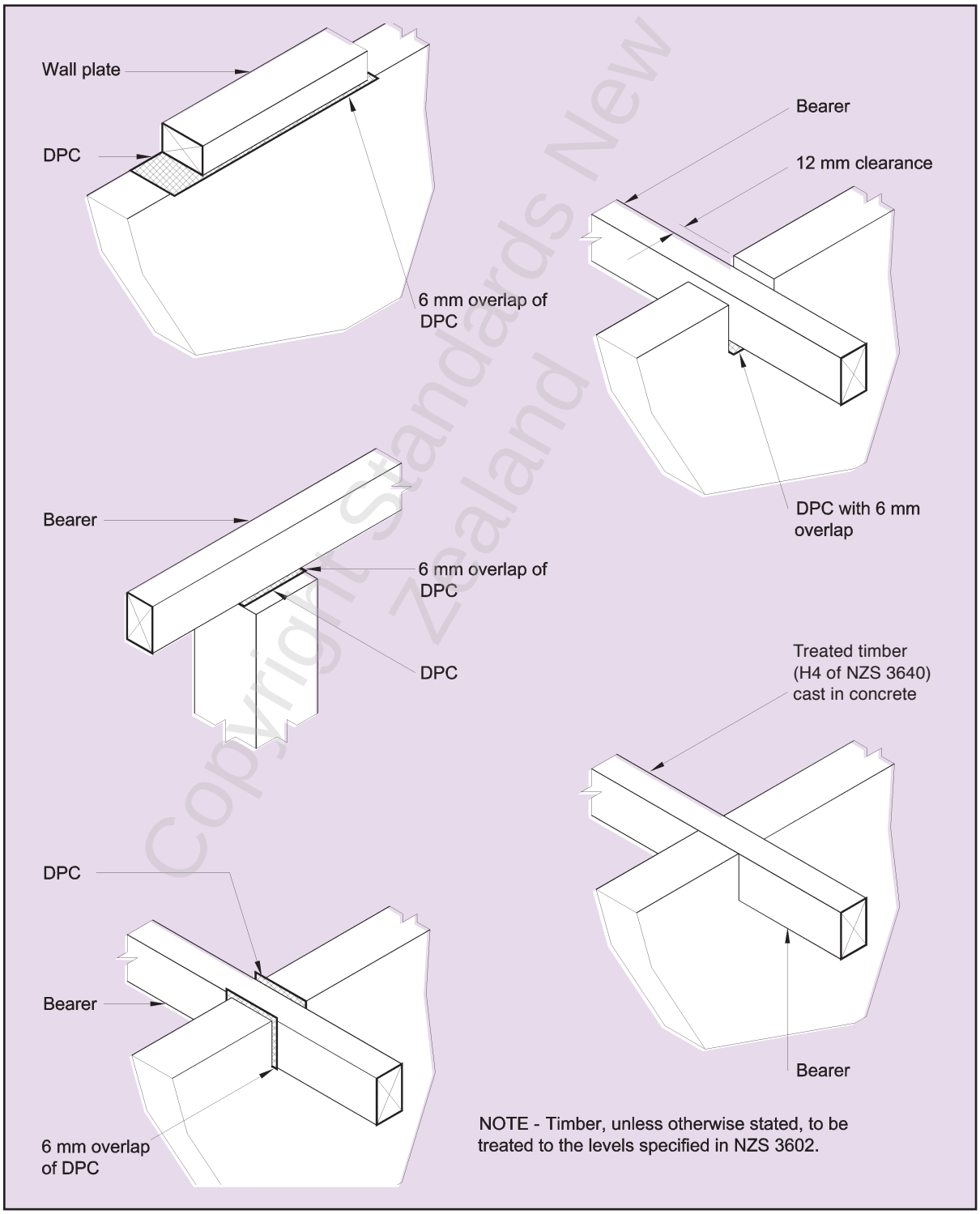


Figure 2.1 – Protection of subfloor framing timber from direct contact with concrete (see 2.3.3)

Amd 2 May '06

2.4.4 *Nails (other than those used to attach roofing materials)*

2.4.4.1
Nailing requirements are specified by the length and diameter, sometimes also the number and edge clearance, throughout the text and in nailing schedules at the ends of some sections. Durability requirements are specified in table 4.3. The letters "FH" specify that flatheaded nails shall be used.

2.4.4.2
The length of nails passing through sheet material thicker than 10 mm shall be the length specified in the nailing schedules, or 3 times the sheet thickness, whichever is the greater.

2.4.4.3
The joints listed in the nailing schedule tables shall be made with the number of connectors of the specified type, length, and diameter driven in the specified locations into both pieces of timber at right angles, unless skewed nails are specified.

2.4.4.4
The depth of penetration into the point side piece of timber shall be at least 45 % of the length of the nail.

2.4.4.5
Where the nail size specified would cause splitting, the nail holes shall be pre-drilled to a diameter of 80 % of the nail diameter.

2.4.4.6
Nails in structural joints shall be fully driven.

2.4.4.7
Members in this Standard, except for *jack studs*, *bottom plates* and *top plates*, may be substituted with built-up members comprising up to six *framing* members nailed together, provided the following conditions are satisfied:

(a) In respect of the individual *framing* members comprising the built-up member:

  (i) All *framing* members match the width and grade of the member being substituted, and

  (ii) The combined thickness of the *framing* members equals or exceeds the thickness of the member being substituted.

(b) In respect of nailing requirements of the built-up member, where the built-up member comprises up to three members:

  (i) Spacings of nails along the built-up member shall not exceed six times the thickness of the thinnest *framing* member, and

  (ii) All nails shall penetrate at least 3/4 of the thickness of the last *framing* member and the nails shall be driven alternatively from either face of the built-up member, and

  (iii) For members of width 140 mm or more there shall be at least two rows of nails across the member width at the centres required in (i) above.

(c) In respect of nailing requirements of the built-up member, where the built-up member comprises more than three members (see 8.5.1.2): Amd 2 May '06

Amd 2
May '06

(i) The first three members shall be built up as described in 2.4.4.7. Additional members shall be fixed with nails twice as long, and spaced at six times the thickness of the additional member being added.

2.4.5 *Bolts and coach screws*

In bolted joints, washers shall be provided at each timber surface under the bolt or coach screw head and the nut. For an M12 bolt the washers shall be not less than 50 mm x 50 mm x 3 mm if square or not less than 55 mm diameter x 3 mm if round. (Bolts to comply with the requirements of AS/NZS 1111 and coach screws to AS/NZS 1393).

2.4.6 *Timber connectors or fixings*

2.4.6.1

Manufacturers of a timber connector or fixing shall provide the following information on each package of fixings, or on a label securely attached thereto:

(a) The name, or registered trade name, or make and address of manufacturer;

(b) The materials used in manufacture including fasteners and corrosion protection;

(c) The *capacity* of the timber connector or fixing in kN determined in accordance with 2.4.7;

(d) Fastener's requirements;

(e) Details of intended use.

2.4.6.2

Timber connectors to be tested for compliance with this Standard shall be sampled at random from a particular package and the test results recorded.

2.4.7 *Connector capacity and durability*

The *capacity* of a connector or fixing shall be calculated in accordance with the following equation:

$R = \phi \times Q_k \times n \times k$

where

R	=	connector *capacity* in kN
ϕ	=	capacity reduction factor from NZS 3603
Q_k	=	characteristic value obtained by test in accordance with BRANZ Evaluation Method EM1 or AS/NZS 2699:Part 2 as appropriate
n	=	number of tested elements making up the complete joint
k	=	modification factors from NZS 3603 (section 4) as appropriate to specific application.

In addition to verifying the *load* carrying *capacity* the manufacturer shall also demonstrate, to the satisfaction of the *Building Consent Authority*, that the fixings shall conform with the durability requirements of Clause B2 of the *NZBC*.

2.4.8 *Wire dogs*

Wire dogs shall be of steel of at least 4.9 mm diameter and shall penetrate at least 30 mm into each piece of timber. Figure 2.2 shows the minimum dimensions required between the edge of the timber and the spike of the *wire dog*.

2.5 Reinforcing steel

Reinforcing bars and steel mesh shall comply with AS/NZS 4671. Reinforcing bars shall be grade 300E. Mesh shall be grade 500N or 500E.

Amd 2 May '06

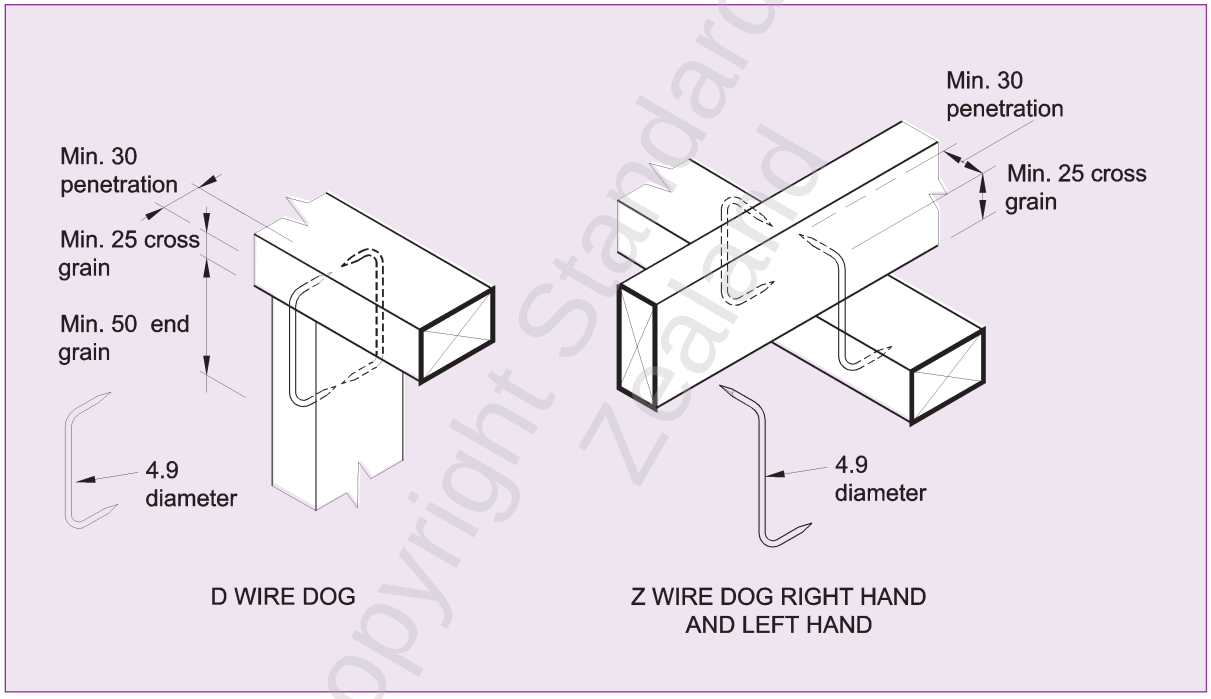


Figure 2.2 – Wire dog (see 2.4.8)

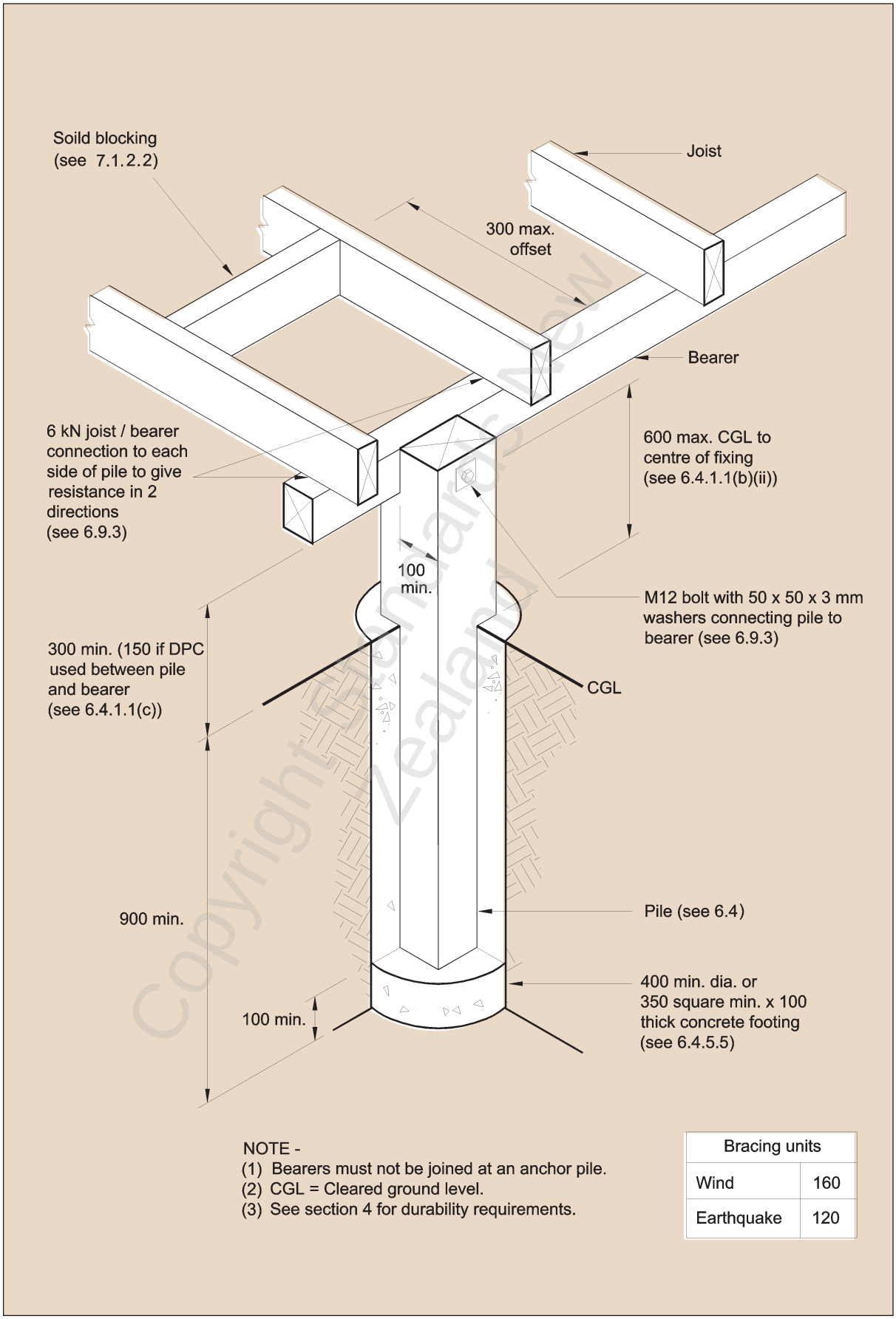


Figure 6.10 – Anchor pile directly connected to bearer only (see 6.9)

Amd 1
Dec '00

Table 6.3 – Subfloor jack studs (see 6.10.2.1) **– No. 1 Framing and MSG 6**

1.5 kPa and 2 kPa floor load floor load

Maximum span of bearers (m)	Jack stud size (mm x mm)	Maximum jack stud height for loaded dimension of bearer:		
		2.0 (m)	**3.5** (m)	**5.0** (m)
Supporting 1 storey				
1.30	90 x 70 90 x 90	1.8 2.7	1.8 2.6	1.7 2.5
1.65	90 x 70 90 x 90	1.6 2.4	1.6 2.3	1.4 2.2
2.00	90 x 70 90 x 90	1.4 2.1	1.4 2.1	1.3 1.9
Supporting 2 storeys				
1.30	90 x 70 90 x 90	1.6 2.4	1.5 2.2	1.3 2.0
1.65	90 x 70 90 x 90	1.4 2.1	1.2 1.9	1.0 1.7
2.00	90 x 70 90 x 90	1.2 1.9	1.0 1.7	– 1.4
Supporting 3 storeys				
1.30	90 x 70 90 x 90	1.5 2.2	1.2 1.9	0.9 1.7
1.65	90 x 70 90 x 90	1.2 1.9	0.9 1.6	– 1.3
2.00	90 x 70 90 x 90	1.0 1.7	– 1.3	– –

* For definition of loaded dimension see 1.3.

NOTE – Substitution with built-up members is not allowed.

Amd 2 May '06

Table 6.3 – Subfloor jack studs (see 6.10.2.1) – VSG 8 and MSG 8

1.5 kPa and 2 kPa floor load floor load

Maximum span of bearers (m)	Jack stud size (mm x mm)	Maximum jack stud height for loaded dimension of bearer:		
		2.0 (m)	3.5 (m)	5.0 (m)
Supporting 1 storey				
1.30	90 x 70 90 x 90	2.0 3.0	2.0 2.9	1.8 2.7
1.65	90 x 70 90 x 90	1.8 2.6	1.7 2.5	1.6 2.4
2.00	90 x 70 90 x 90	1.6 2.4	1.5 2.3	1.4 2.2
Supporting 2 storeys				
1.30	90 x 70 90 x 90	1.8 2.7	1.6 2.4	1.5 2.2
1.65	90 x 70 90 x 90	1.6 2.4	1.4 2.1	1.2 1.9
2.00	90 x 70 90 x 90	1.4 2.1	1.2 1.9	1.0 1.7
Supporting 3 storeys				
1.30	90 x 70 90 x 90	1.6 2.4	1.4 2.1	1.2 1.9
1.65	90 x 70 90 x 90	1.4 2.1	1.2 1.8	0.8 1.6
2.00	90 x 70 90 x 90	1.2 1.9	0.8 1.6	– 1.2

* For definition of loaded dimension see 1.3.

NOTE – Substitution with built-up members is not allowed.

Amd 2
May '06

Table 6.3 – Subfloor jack studs (see 6.10.2.1) **– VSG 10 and MSG 10**

1.5 kPa and 2 kPa floor load floor load

Maximum span of bearers (m)	Jack stud size (mm x mm)	Maximum jack stud height for loaded dimension of bearer:		
		2.0 (m)	**3.5** (m)	**5.0** (m)
Supporting 1 storey				
1.30	90 X 70 90 x 90	2.1 3.1	2.1 3.0	1.9 2.9
1.65	90 x 70 90 x 90	1.9 2.8	1.8 2.7	1.7 2.5
2.00	90 x 70 90 x 90	1.7 2.5	1.6 2.4	1.5 2.3
Supporting 2 storeys				
1.30	90 x 70 90 x 90	1.9 2.8	1.7 2.6	1.6 2.3
1.65	90 x 70 90 x 90	1.7 2.5	1.5 2.3	1.4 2.0
2.00	90 x 70 90 x 90	1.5 2.3	1.3 2.0	1.1 1.8
Supporting 3 storeys				
1.30	90 x 70 90 x 90	1.7 2.6	1.5 2.2	1.4 2.1
1.65	90 x 70 90 x 90	1.5 2.3	1.3 2.0	1.1 1.8
2.00	90 x 70 90 x 90	1.3 2.0	1.0 1.7	– 1.4

* For definition of loaded dimension see 1.3.

NOTE – Substitution with built-up members is not allowed.

Amd 2
May '06

6.12.2 *Sizes*

6.12.2.1
Bearers shall be of the dimensions given in tables 6.6 (1.5 kPa and 2 kPa *floor loads*) and 14.4 (3 kPa *floor loads*) except as provided by 6.12.2.2 and 6.12.4. The 1.5 kPa and 3 kPa *bearer* tables are for internal situations (i.e. where the timber will remain dry) and the 2 kPa tables for external situations (i.e. for *decks* where the timber will be exposed to wetting).

6.12.2.2
Where a *bearer* in a single *storey* building runs parallel to, and not more than 200 mm away from a *loadbearing wall* supporting a *heavy roof,* of *loaded dimension* greater than 4.0 m, its size shall be as given in table 6.6, but the *loaded dimension* of the *bearer* shall not be taken as less than 2.7 m.

6.12.3 *Laminated bearers*

Bearers may be built-up as specified in 2.4.4.7, provided that where a dowel or bolt fixing passes through the depth of such a *bearer* then an M12 bolt shall be located within 50 mm of that fixing, to tie the laminations together.

Amd 2
May '06

6.12.4 *Cantilevered bearers*

Bearers may project as cantilevers beyond the face of the support to a distance not exceeding:

(a) *Bearers* at *spacings* not exceeding 2 m: 300 mm;

(b) *Bearers* at *spacings* exceeding 2 m: 200 mm.

Cantilevered *bearers* shall support not more than one floor, and an *external wall* and roof.

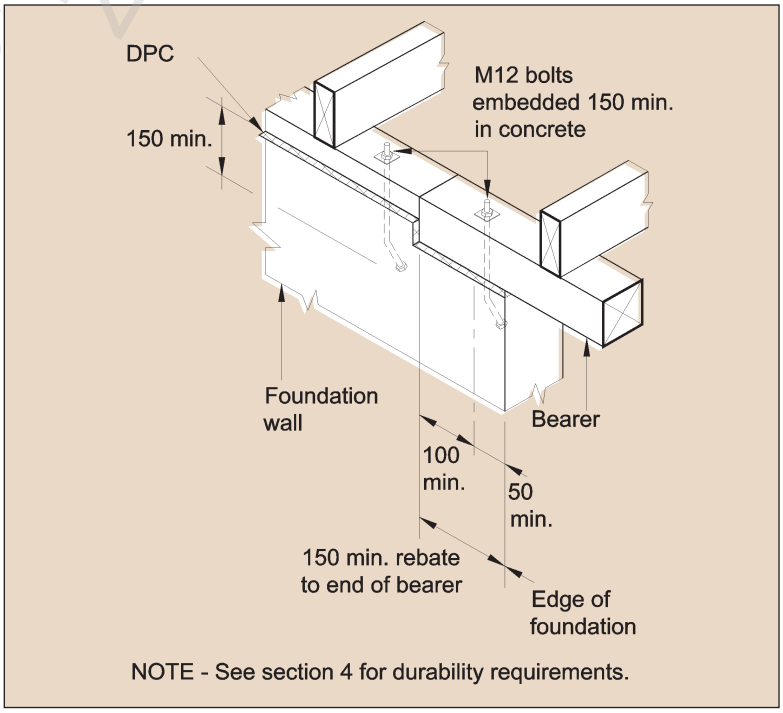


Figure 6.18 – Fixing of bearers in line with foundation walls
(see 6.12.1(c))

Table 6.6 – Bearers (see 6.12.2.1) **– No. 1 Framing and MSG 6**

Maximum span of bearer continuous over 2 or more spans	Loaded dimension* of bearer	Bearer size (Width x thickness)
(m)	(m)	(mm x mm)
A 1.5 kPa floor load (dry in service)		
1.30	1.30	90 x 90
	2.45	140 x 70
	3.15	140 x 90
	4.50	190 x 70
1.65	1.50	140 x 70
	1.95	140 x 90
	2.80	190 x 70
2.00	1.00	140 x 70
	1.30	140 x 90
	1.90	190 x 70
B 2.0 kPa floor load (wetted in service)		
1.30	1.00	90 x 90
	1.40	140 x 70
	1.85	140 x 90
	2.60	190 x 70
1.65	1.60	190 x 70

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Table 6.6 – Bearers (see 6.12.2.1) **– VSG 8, MSG 8 and G 8**

Maximum span of bearer continuous over 2 or more spans	Loaded dimension* of bearer	Bearer size (Width x thickness)
(m)	(m)	(mm x mm)
A 1.5 kPa floor load VSG 8 and MSG 8 (dry in service)		
1.30	1.40	90 x 70
	1.80	90 x 90
	3.40	140 x 70
	4.40	140 x 90
	6.30	190 x 70
1.65	2.10	140 x 70
	2.70	140 x 90
	3.90	190 x 70
2.00	1.45	140 x 70
	1.85	140 x 90
	2.65	190 x 70
B 2.0 kPa floor load VSG 8, MSG 8 and G 8 (wetted in service)		
1.30	1.40	90 x 90
	2.20	140 x 70
	2.85	140 x 90
	4.10	190 x 70
1.65	0.80	90 x 90
	1.35	140 x 70
	1.75	140 x 90
	2.55	190 x 70
2.00	1.20	140 x 90

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2
May '06

Table 6.6 – Bearers (see 6.12.2.1) **– MSG 10 and VSG 10**

Maximum span of bearer continuous over 2 or more spans	Loaded dimension* of bearer	Bearer size (Width x thickness)
(m)	(m)	(mm x mm)
A 1.5 kPa floor load (dry in service)		
1.30	2.00	90 x 70
	2.60	90 x 90
	4.90	140 x 70
1.65	1.60	90 x 90
	3.05	140 x 70
	3.90	140 x 90
	5.60	190 x 70
2.00	2.05	140 x 70
	2.62	140 x 90
	3.80	190 x 70
B 2.0 kPa floor load (wetted in service)		
1.30	1.40	90 x 90
	2.20	140 x 70
	2.85	140 x 90
	4.10	190 x 70
1.65	0.80	90 x 90
	1.35	140 x 70
	1.75	140 x 90
	2.55	190 x 70
2.00	1.20	140 x 90

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

6.14 Prevention of dampness

6.14.1 *Ventilation opening area required*

To prevent subfloor dampness, provide subfloor ventilation openings over the whole subfloor area, unless the provisions of 6.14.3 are applied. Ventilation openings shall be not less than 3500 mm^2 per m^2 of floor area and evenly distributed around the *foundation* perimeter.

6.14.2

Acceptable methods include:

(a) Ventilators with sufficient opening *spaced* regularly, commencing 750 mm from the corner and at intervals not exceeding 1.8 m (see figure 6.11);

(b) Continuous 20 mm wide slots between baseboards;

(c) A 50 mm gap between the *wall plates* and a *boundary joist* at the ends of cantilevered floor *joists* and the *wall plate* and *joist,* where the *bearer* is cantilevered;

(d) Other regularly *spaced* openings that will provide adequate ventilation.

C6.14.3

0.125 mm thick polythene sheet lapped 75 mm at the joints and complying with the above conditions is adequate as a ground cover.

6.14.3 *Ground cover*

Where ventilation openings of 3500 mm^2 per m^2 can not be provided, or the subfloor airflow is obstructed by party walls, attached terraces or similar, or where for larger buildings any part of the subfloor space is more than 7.5 m from the nearest ventilation opening, a damp-proof ground cover over the whole subfloor shall be used. The following conditions shall apply:

(a) The vapour barrier shall be a ground cover of not less than 50 MNs/g vapour flow resistance held against movement;

(b) It is held in place with rocks or bricks or similar method; and

(c) Ventilation openings shall have a net open area of no less than 700 mm^2 for every m^2 of floor level and be located to provide a cross-flow in the subfloor space; and

(d) The ground is shaped to prevent water accumulation on the vapour barrier and to drain to the exterior.

C6.14.4

Clause 6.14.4 requires access height not less than 450 mm but does not require all timbers to be 450 mm or more above ground.

6.14.4

Access shall be provided to permit visual inspection of all subfloor *framing* members. A crawl space for this purpose shall be not less than 450 mm high to the underside of the floor *joists*.

6.14.5

A clear horizontal separation of not less than 450 mm shall be maintained between the outside of any wall *cladding* and the adjacent ground (see figure 6.21).

6.15 Nailing schedule

Table 6.8 specifies the nails to be used in subfloor *framing*. See 2.4.4 for other requirements for nails.

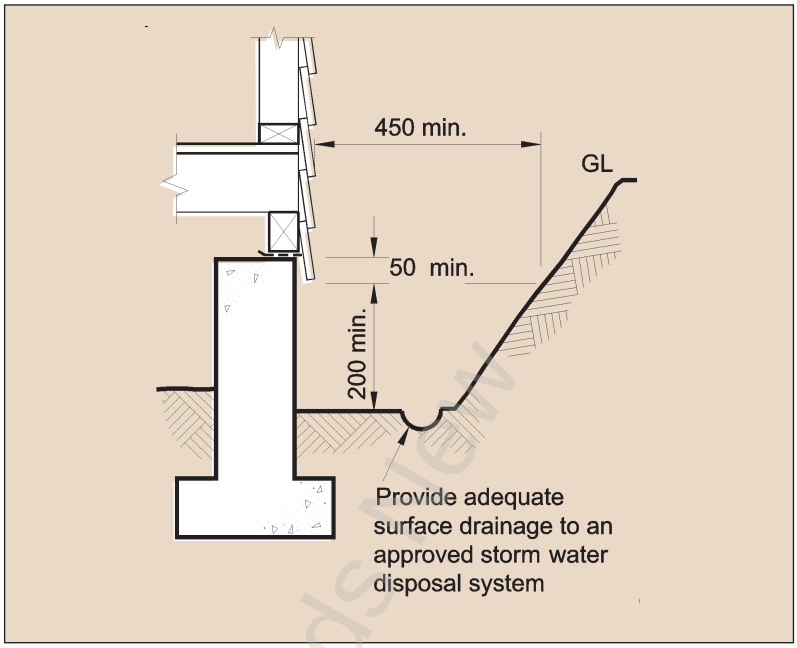


Figure 6.21 – Clearance between cladding and adjacent ground
(see 6.14.5)

Table 6.8 – Nailing schedule for hand driven and power driven nails

Joint	Hand driven nails		Power driven nails	
	Length x diameter and type (mm x mm)	**Number and location**	**Length x diameter and type** (mm x mm)	**Number and location**
Bearer to jack stud	100 x 3.75	2 (skewed)	90 x 3.15	2 (skewed)
Bearer end to cut-between plates	100 x 3.75	4 (skewed)	90 x 3.15	4 (skewed)
Bearer to top plate of wall framing	100 x 3.75	4 (skewed)	90 x 3.15	6 (skewed)
Stud or jack stud to plate	100 x 3.75 or 75 x 3.15	2 (end nailed) 4 (skewed)	90 x 3.15	3 (end nailed)

Amd 2 May '06

NOTE –
(1) Nail lengths and diameters are the minimum required.
(2) Refer to 4.4 for required protective coatings for metal fasteners.

7 FLOORS

This section sets down requirements for suspended timber framed floors and concrete slab-on-ground floors for live *loads* up to 2 kPa, (3 kPa live *loads* are covered in section 14). Floors required to be structural floor *diaphragms* in accordance with 5.4.2.2 must meet the requirements of 7.3, in addition to the other provisions of this section.

7.1 Floor joists

7.1.1 *General*

7.1.1.1
Floor *joists* shall be of the dimensions given in tables 7.1 (1.5 kPa and 2 kPa *floor loads*) and 14.8 (3 kPa *floor loads*). The 1.5 kPa and 3 kPa floor *joist* tables are for internal situations (i.e. where the timber will remain dry) and the 2 kPa tables for external situations (i.e. for *decks* where the timber will be exposed to wetting).

Amd 2 May '06

7.1.1.2
Floor *joists* shall have their top surfaces set to a common level to support flooring and shall be laid in straight lines on edge.

C7.1.1.3
'Green' floor joists spanning more than 3 m should be propped level until their moisture content is 20 % or less.

7.1.1.3
Floor *joists* shall be laid so that any crook in them will straighten under *load*. They may be cut through to the centreline and over supports only to correct the crook, and in such cases they shall be considered as being jointed over those supports, for the purpose of determining the span.

7.1.1.4
Floor *joists* shall have minimum bearing on their supports of 32 mm.

7.1.1.5
Joints in floor *joists* shall be made only over supports, but not where the *joist* is cantilevered beyond the support.

7.1.1.6
Joints in floor *joists* may be butted over supports provided that in the following cases joints shall be lapped or flitched as specified in 7.1.1.7:

(a) In any *joist* to which a *diagonal brace* is attached;

(b) In every third *joist* at a line of support, except where a sheet flooring extends not less than 600 mm on each side of the joint.

7.1.1.7
Joints in floor *joists* (see figure 7.1) shall either:

(a) Be lapped not less than 150 mm on each side of the centre line of the support and nailed together from both sides; or

(b) Be butted and flitched with a piece of timber of the same dimensions as the *joists* and extending not less than 150 mm on each side of the *joist* ends and nailed to both lengths of *joists* from both sides;

(c) Have an alternative fixing with a *capacity* of 6 kN in tension.

Table 7.1 – Floor joists (see 7.1.1.1) **– No. 1 Framing and MSG 6**

(a) 1.5 kPa floor load (dry in service)

Floor joist size	Maximum span* of joists at a maximum spacing (mm) of:		
	400	450	600
(mm x mm)	(m)	(m)	(m)
90 x 35	1.20	1.20	1.05
90 x 45	1.30	1.25	1.10
140 x 35	1.90	1.80	1.60
140 x 45	2.45	2.35	1.80
190 x 45	3.20	3.10	2.80
240 x 45	4.00	3.90	3.50
290 x 45	4.70	4.55	4.15

(b) 2 kPa floor load (wetted in service)

Floor joist size	Maximum span* of joists at a maximum spacing (mm) of:		
	400	450	600
(mm x mm)	(m)	(m)	(m)
90 x 35	1.10	1.05	0.90
90 x 45	1.20	1.15	1.00
140 x 35	1.70	1.60	1.40
140 x 45	1.95	1.85	1.60
190 x 45	2.65	2.50	2.15
240 x 45	3.35	3.15	2.70
290 x 45	4.05	3.80	3.30

* May be increased by 10 % for joists continuous over 2 or more spans.

Amd 2
May '06

Table 7.1 – Floor joists (see 7.1.1.1) – VSG 8, MSG 8 and G 8

(a) 1.5 kPa floor load VSG 8 and MSG 8 (dry in service)

Floor joist size	Maximum span* of joists at a maximum spacing (mm) of:		
	400	450	600
(mm x mm)	(m)	(m)	(m)
90 x 35	1.35	1.30	1.20
90 x 45	1.45	1.40	1.25
140 x 35	2.10	2.00	1.80
140 x 45	2.70	2.60	2.00
190 x 45	3.55	3.45	3.15
240 x 45	4.40	4.30	3.90
290 x 45	5.20	5.05	4.60

(b) 2 kPa floor load VSG 8, MSG 8 and G 8 (wetted in service)

Floor joist size	Maximum span* of joists at a maximum spacing (mm) of:		
	400	450	600
(mm x mm)	(m)	(m)	(m)
90 x 35	1.35	1.30	1.10
90 x 45	1.55	1.45	1.25
140 x 35	2.10	2.00	1.75
140 x 45	2.45	2.30	2.00
190 x 45	3.30	3.10	2.70
240 x 45	4.15	3.95	3.40
290 x 45	5.05	4.75	4.10

* May be increased by 10 % for joists continuous over 2 or more spans.

Amd 2
May '06

Table 7.1 – Floor joists (see 7.1.1.1) **– VSG 10 and MSG 10**

(a) 1.5 kPa floor load (dry in service)

Floor joist size	Maximum span* of joists at a maximum spacing (mm) of:		
	400	450	600
(mm x mm)	(m)	(m)	(m)
90 x 35	1.45	1.40	1.25
90 x 45	1.55	1.50	1.35
140 x 35	2.25	2.15	1.90
140 x 45	2.90	2.80	2.15
190 x 45	3.80	3.70	3.35
240 x 45	4.70	4.60	4.20
290 x 45	5.60	5.40	4.95

(b) 2 kPa floor load (wetted in service)

Floor joist size	Maximum span* of joists at a maximum spacing (mm) of:		
	400	450	600
(mm x mm)	(m)	(m)	(m)
90 x 35	1.35	1.30	1.10
90 x 45	1.55	1.45	1.25
140 x 35	2.10	2.00	1.75
140 x 45	2.45	2.30	2.00
190 x 45	3.30	3.10	2.70
240 x 45	4.15	3.95	3.40
290 x 45	5.05	4.75	4.10

* May be increased by 10 % for joists continuous over 2 or more spans.

Amd 2 May '06

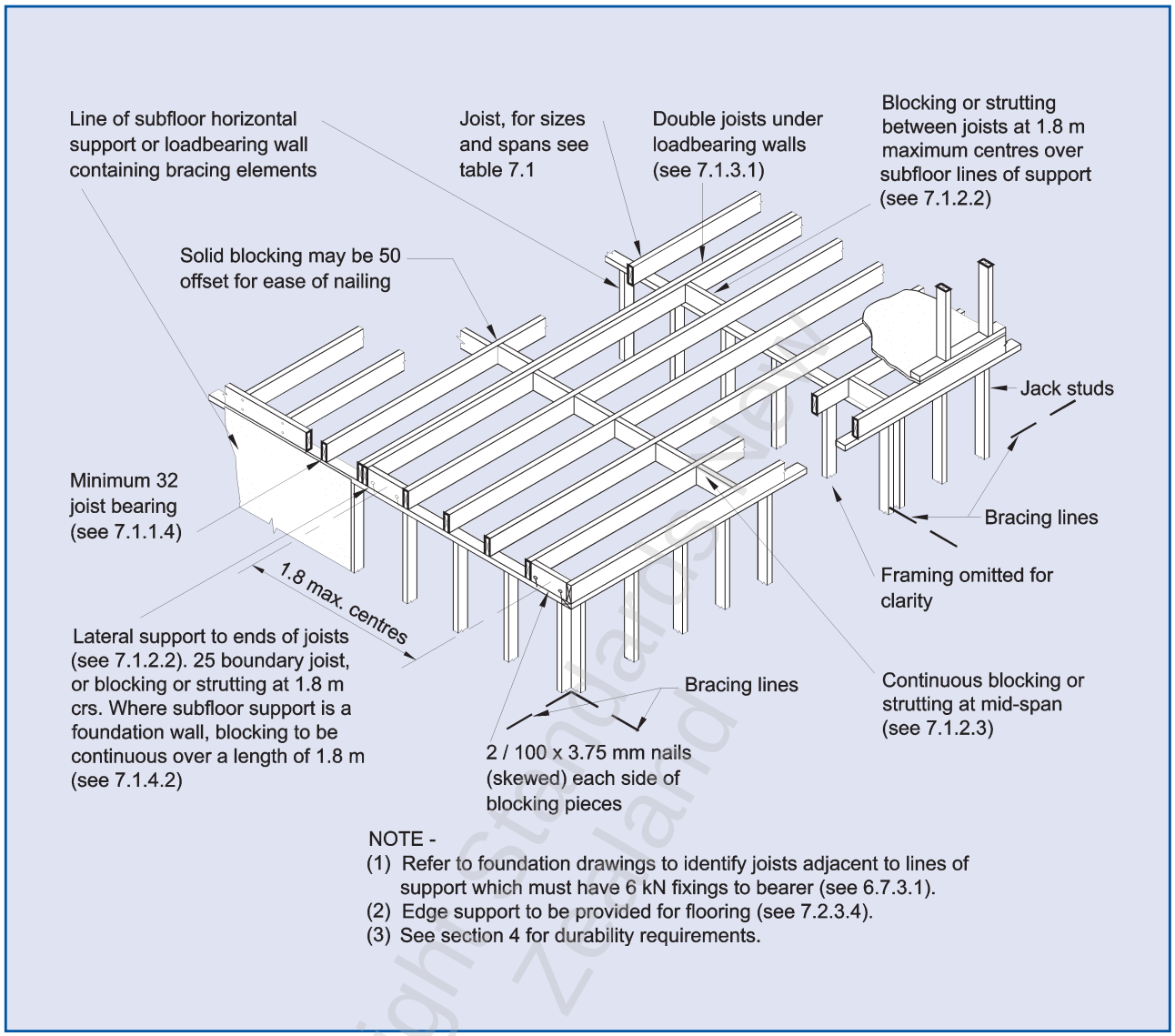


Figure 7.2 – Floor joists layout criteria (see 7.1.2.2)

7.1.3.2

Amd 1 Dec '00

Where such doubled *joists* support a *trimmer stud*, itself supporting a roof only, the *trimmer stud* shall be located within 300 mm of the end of the span of the doubled floor *joist*. Floor *joists* supporting *trimmer studs* landing outside that limit, or supporting *trimmer studs* which in turn support *floor loads*, shall be subject to *specific engineering design*.

7.1.3.3

Amd 2 May '06

Where a *loadbearing wall* runs at right angles to the line of *joists*, such a *loadbearing wall* shall be located at not more than 200 mm centre-to-centre from a *bearer* or subfloor *loadbearing wall* (see figure 7.3(E)).

7.1.3.4

Where a *loadbearing wall* is directly over a continuous concrete or concrete masonry *foundation wall*, it may be supported by a 200 mm long packer *spaced* at the same distance as the *studs* in the *loadbearing wall*, provided that the *joist* and packers are supported over the entire wall length by the *wall plate* (see figure 7.4).

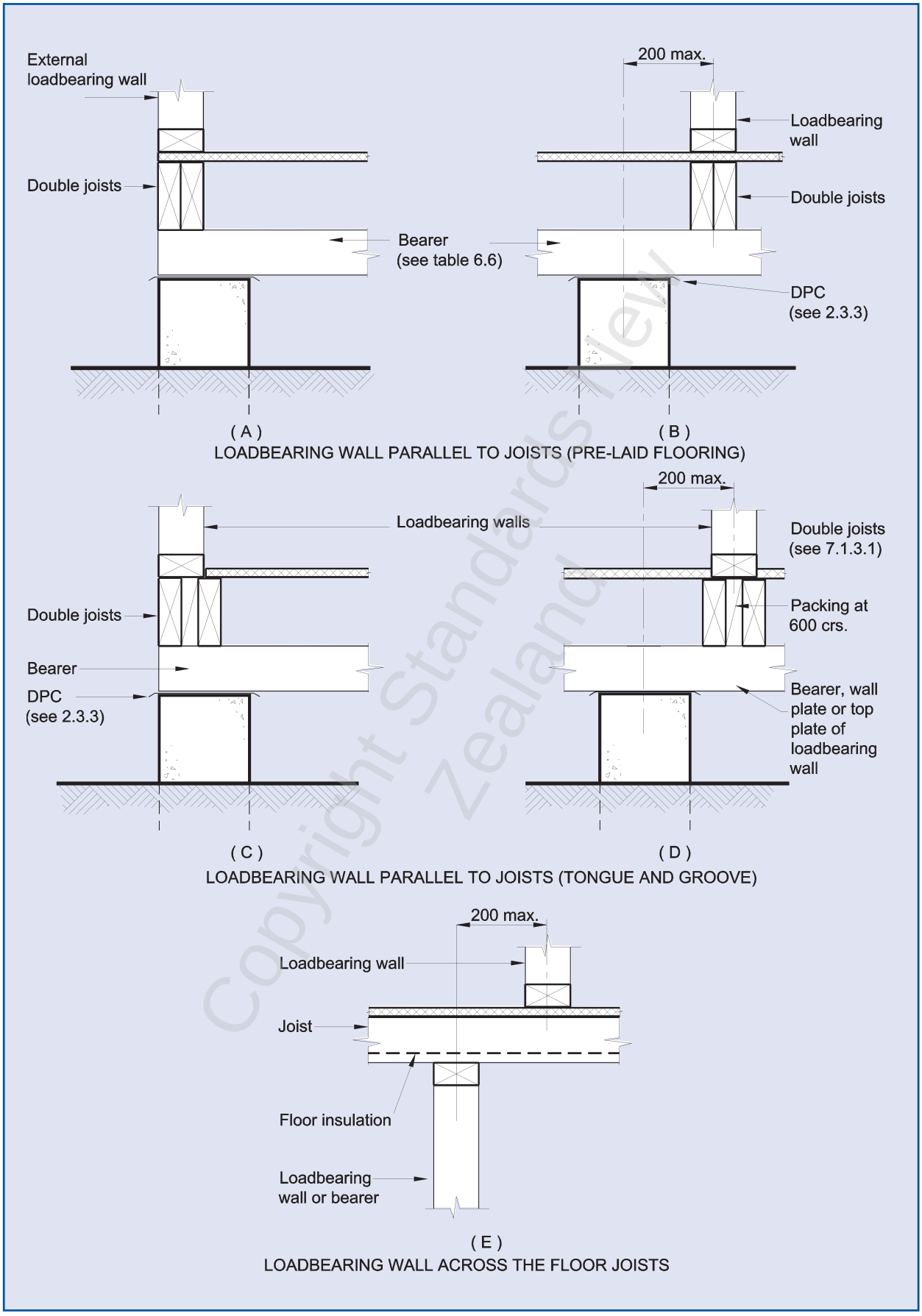


Figure 7.3 – Support to floor joists under loadbearing walls (see 7.1.3)

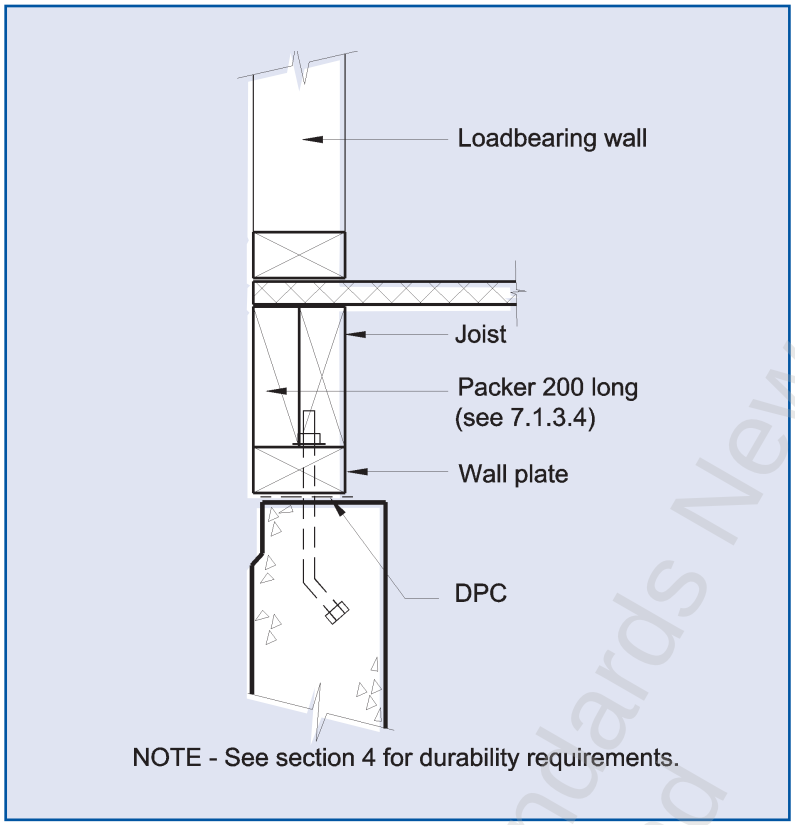


Figure 7.4 – Loadbearing wall over foundation (see 7.1.3.4)

7.1.3.5
Where a *non-loadbearing wall*:

(a) Which contains *wall bracing elements* runs parallel to the line of floor *joists* beneath, it shall either:

(i) Be over a *joist*; or

(ii) Be supported by solid *blocking* between the *joists* on either side of the wall in accordance with 7.1.3.6 as shown in figure 7.5; or

(b) Does not contain a *wall bracing element* it shall be within 150 mm of a *joist* measured between centrelines.

Amd 2
May '06

7.1.3.6
Solid *blocking* shall be 90 mm x 45 mm cut neatly between *joists*, with its top flush with the top of the *joists*, set at each end of the wall above, at each side of any door openings, and at not more than 1.2 m centres elsewhere.

7.1.4 *Floor joists connected to foundation walls acting as subfloor braces*

7.1.4.1
Where floor *joists* run parallel to *foundation walls*, one *joist* shall be directly above the length of *foundation wall* and shall be directly supported for a length of not less than 1.4 m by a *wall plate* or *bearer,* fixed to the *foundation wall* in accordance with 6.11.9.1 (see figure 6.16).

7.1.4.2
Where the floor *joists* run at right angles to the *foundation wall*, then either:

(a) The ends of the *joists* shall be laterally supported by a continuous *boundary joist* in accordance with 7.1.2.2 (a); or

(b) The solid *blocking* required by 7.1.2.2 (b) shall be provided between each pair of *joists* for a length of 1.8 m along the line of the *foundation wall* and either:

(i) Where the *foundation wall* is at a corner, the 1.8 m length shall be measured from the corner (see figure 7.9); or

(ii) Where the *foundation wall* is not at a corner, the 1.8 m length shall be symmetrically disposed on the *foundation wall*.

7.1.5 *Cantilevered floor joists*

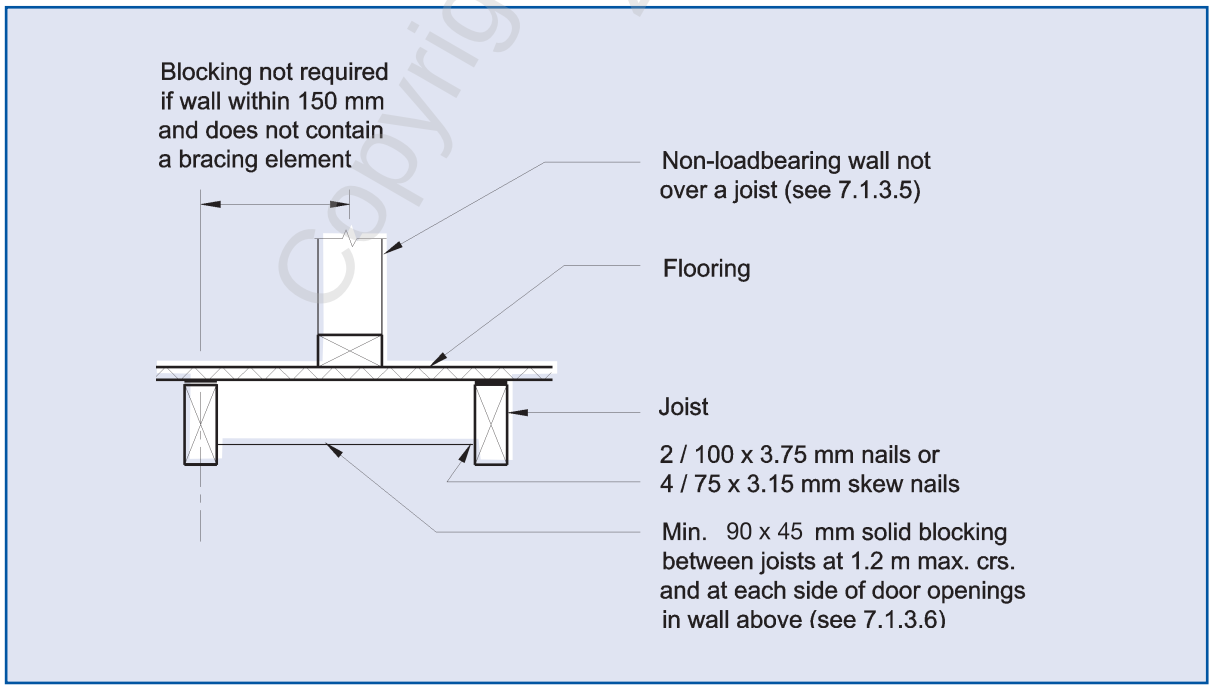
7.1.5.1
Floor *joists* may project as cantilevers to the distance beyond the face of the support given by table 7.2 provided that cantilevered floor *joists* shall neither support a *balcony* decking having a mass exceeding 25 kg/m^2, nor support a *balcony* balustrade having a mass exceeding 5.5 kg/m^2. The maximum height of a *wall* supported by cantilevered *joists* shall be 2.4 m.

The cantilevered floor *joists* in table 7.2 under the heading "2.0 kPa *floor load Balcony* floor and balustrade only" may be wetted in service. All other cantilevered *joists* shall be kept dry in service. Amd 2 May '06

7.1.5.2
The depth of the *joist* to be used in table 7.2 shall be the net depth at any notch, step, or hole occurring within two-thirds of the cantilever length from the face of the support.

C7.1.5.1
Amd 1 Dec '00
(a) Cantilevered floors for bay windows are outside the scope of table 7.2.
(b) Refer to NZS 3602 and section 4 for protection required for cantilevered joists exposed to the elements.
(c) The cantilever lengths for the balcony joists have been determined on the basis of the engineering properties of wet timber. For this reason these joists may be exposed to the weather and wetting. The same does not apply to the other joists as these have been determined based on dry properties and accordingly must be kept dry, by closing in or other means, throughout the life of the building.

C7.1.5.2
When a cantilevered floor joist supports a balcony or the like, it is frequently necessary to provide a notch or step in the joist at the external wall for weatherproofing.



Amd 2 May '06

Figure 7.5 – Support to non-loadbearing walls (see 7.1.3.5)

Table 7.2 – Cantilevered floor joists (see 7.1.5) **– No. 1 Framing and MSG 6**

Joist size	Joist spacing	Maximum cantilever length of joist supporting:						
		Wall, 1.5 kPa floor load						2 kPa floor load
		Light roof of span: (m)			Heavy roof of span: (m)			Balcony* floor and balustrade only
		4.0	8.0	12.0	4.0	8.0	12.0	
(mm x mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
90 x 45	600	50	50	50	50	50	50	500
	450	100	50	50	50	50	50	550
	400	100	100	100	100	50	50	600
140 x 45	600	200	150	100	150	100	100	750
	450	300	200	150	200	150	100	900
	400	300	250	150	200	150	100	950
190 x 45	600	400	300	200	300	200	150	1000
	450	550	400	250	400	250	200	1250
	400	550	450	300	400	300	200	1300
240 x 45	600	650	450	300	450	300	200	1350
	450	800	650	400	600	400	300	1550
	400	850	650	500	650	450	350	1650
290 x 45	600	950	700	500	650	450	350	1650
	450	1150	900	650	900	600	450	1900
	400	1150	950	700	900	650	500	2000

* Applies to balconies of single residences only. Only these joists may be wetted in service.

Amd 2 May '06

Table 7.2 – Cantilevered floor joists (see 7.1.5) **– VSG 8 and MSG 8**

Joist size	Joist spacing	Maximum cantilever length of joist supporting:						
		Wall, 1.5 kPa floor load						2 kPa floor load
		Light roof of span: (m)			Heavy roof of span: (m)			Balcony* floor and balustrade only
		4.0	8.0	12.0	4.0	8.0	12.0	
(mm x mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
90 x 45	600	100	50	50	50	50	50	600
	450	150	100	50	100	50	50	700
	400	150	100	50	100	50	50	750
140 x 45	600	300	200	150	200	150	100	950
	450	300	250	200	250	150	100	1150
	400	350	250	200	250	150	100	1200
190 x 45	600	550	400	250	400	250	200	1350
	450	600	450	350	450	300	250	1550
	400	600	450	400	450	300	250	1650
240 x 45	600	800	650	400	650	450	300	1700
	450	900	700	550	700	500	350	1950
	400	900	700	600	700	500	400	2050
290 x 45	600	1150	900	650	900	650	500	2050
	450	1200	1000	800	950	700	550	2350
	400	1250	1000	850	1000	700	550	2500

* Applies to balconies of single residences only. Only these joists may be wetted in service.

Amd 2 May '06

Table 7.2 – Cantilevered floor joists (see 7.1.5) **– VSG 10 and MSG 10**

Joist size	Joist spacing	Maximum cantilever length of joist supporting:						
		Wall, 1.5 kPa floor load						2 kPa floor load
		Light roof of span: (m)			Heavy roof of span: (m)			Balcony* floor and balustrade only
		4.0	8.0	12.0	4.0	8.0	12.0	
(mm x mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
90 x 45	600	150	100	50	100	50	50	600
	450	150	100	100	100	50	50	700
	400	150	100	100	100	50	50	750
140 x 45	600	300	250	150	250	150	100	950
	450	350	250	200	250	150	150	1150
	400	350	300	200	250	200	150	1200
190 x 45	600	550	450	350	450	300	200	1350
	450	600	500	400	450	350	250	1550
	400	650	500	400	500	350	250	1650
240 x 45	600	850	700	550	650	450	350	1700
	450	950	750	600	400	500	400	1950
	400	1000	800	650	650	550	400	2050
290 x 45	600	1200	950	800	950	700	550	2050
	450	1300	1050	850	1000	750	600	2350
	400	1350	1100	900	1050	750	600	2500

* Applies to balconies of single residences only. Only these joists may be wetted in service.

Amd 2 May '06

7.1.5.3
Cantilevered floor *joists* shall either:

(a) Be continuous over the outermost support; or

(b) Be lapped over the outermost support and fixed to the adjacent *joist* as shown in figure 7.6, with the total length of the cantilevered *joist* being not less than 2.25 times the cantilever length.

C7.1.5.3
The free ends of cantilevered floor joists of green timber should be propped level until the moisture content is 20 % or less, because green timber cantilevered joists can deflect excessively under their own weight and assume permanent deformations unless propped, see NZS 3602.

7.1.6 *Trimmers and trimming joists*

7.1.6.1
Openings in *joisted* floors shall be bounded by *trimmer* and *trimming joists* defined in 1.3 (see figure 7.7).

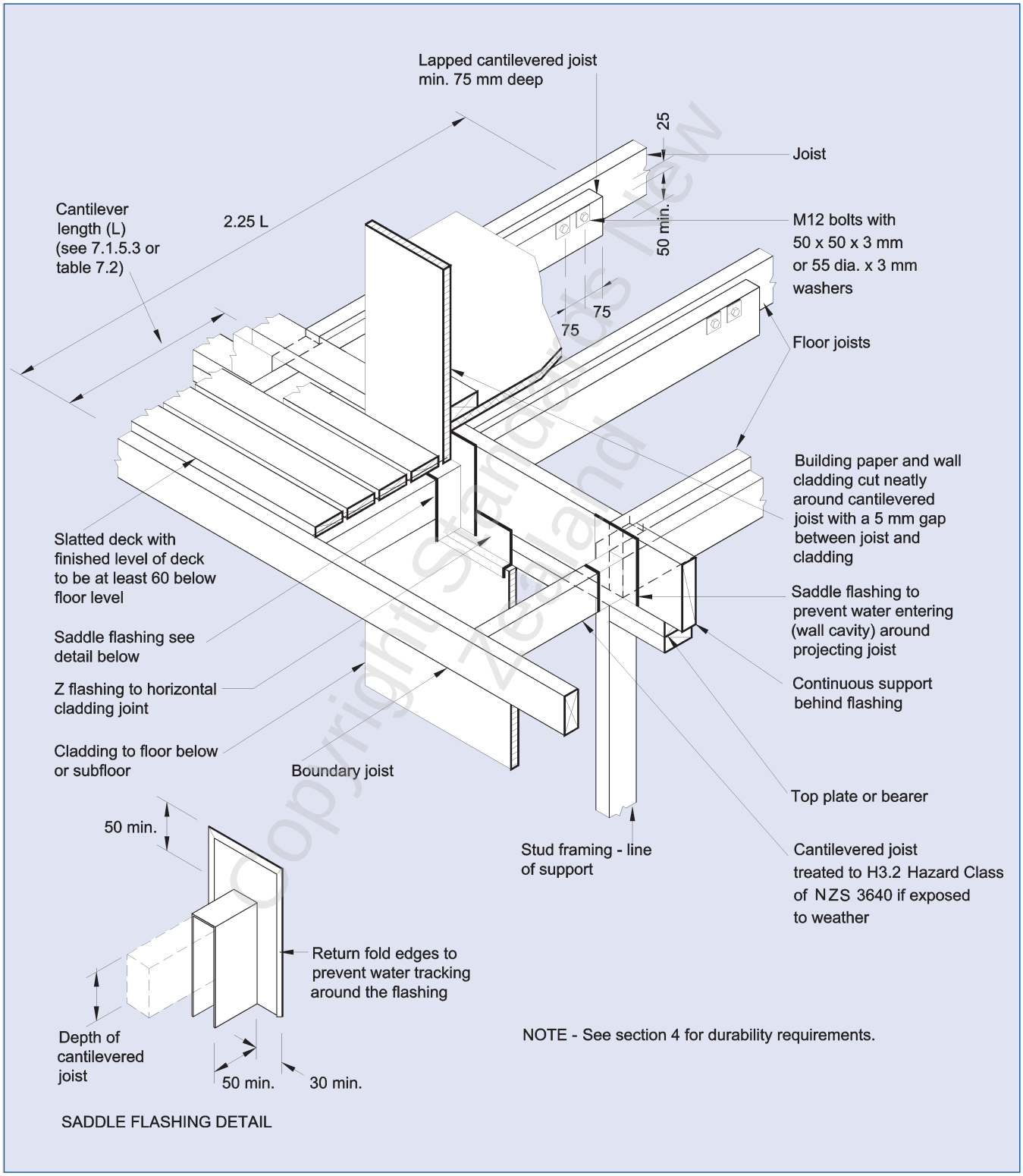


Figure 7.6 – Lapped cantilevered joists (stepped/notched) (see 7.1.5.3)

7.3 Structural floor diaphragms

7.3.1

Floor *diaphragms* required to comply with 5.6 shall be constructed in accordance with figure 7.9 and as follows:

Diaphragms shall have a maximum length of 15 m and the following limitations:

(a) The length and width of a *diaphragm* shall be between supporting *bracing lines* at right angles to each other;

(b) Any *diaphragm* or part of a *diaphragm* shall have a length not exceeding 2.5 times its width for single *storey* buildings, and a length not exceeding 2.0 times its width for 2 *storey* buildings;

(c) The flooring shall consist of a sheet material complying with 7.2.3 over the entire area of the *diaphragm*;

(d) The minimum sheet size shall be 2400 mm x 1200 mm except where the building dimensions prevent the use of a complete sheet;

(e) Floor *joists* in a structural floor *diaphragm* shall be laterally supported around the entire perimeter of the *diaphragm* in accordance with 7.1.2.2(a) or as shown in figure 7.9;

(f) The *joist* to *plate*, and *blocking* to *plate* and blocking to *stringer* connections shall be as in table 7.5.

7.3.2

Where it is necessary to subdivide a floor into more than one *diaphragm* so as to comply with 7.3.1(a) and (b), one wall can be used to support the edges of 2 *diaphragms*.

7.3.3 *Ground floor diaphragms*

The entire perimeter of the ground floor *diaphragm* for*:*

(a) Single *storey* and 2 *storey* buildings complying with 5.4.3.2(b) buildings shall be supported by either a continuous *foundation wall*, or an evenly distributed perimeter *bracing* system;

(b) Two *storey* buildings shall be directly supported by a continuous *foundation wall,* as specified by 5.4.3.2(a).

7.3.4 *Upper floor diaphragms*

The entire perimeter of:

(a) An upper floor *diaphragm* shall be located over, and connected to walls containing the number of *bracing* units required by 5.6.2.

(b) The first floor *diaphragm* of a 3 *storey* building shall be supported by a full *storey* height reinforced concrete masonry wall to NZS 4229.

C7.3.1

A floor diaphragm permits wider spacing of bracing lines below the floor, but has no effect on bracing line (wall) spacing above the floor.

Amd 1 Dec '00

7.4 Timber decks

7.4.1 *General*

7.4.1.1
This section shall be used for decks supported from the main part of the building and which are not more than 3.0 m high measured from the lowest *cleared ground level* to the upper surface of the decking.

7.4.1.2
Timber decks covered by this Standard shall be designed for 2 kPa *floor loads* as follows:

(a) Decking shall be as given by 7.4.3;

(b) *Joists* shall be as in table 7.1(b);

(c) *Bearers* shall be as in table 6.6B;

(d) *Piles and footings* shall be as given in section 6;

(e) *Stringers* connected to the building, where used, shall be as in table 6.7 and 6.13 or, if connected to the building's timber *framing* shall be fixed with M12 bolts at *spacings* as in table 6.7 (see section 4 for Durability requirements);

(f) Where the decking surface is more than 1000 mm above the ground a barrier constructed in accordance with Acceptable Solution B1/AS2 in the Compliance Document for clause B1 of the NZBC shall be provided. Amd 2 May '06

7.4.2 *Bracing*

7.4.2.1
Decks with *stringers* and/or *joists* bolted to the building on one or more sides and which project no more than 2 m from the building, do not require *subfloor bracing*.

7.4.2.2
Decks which project more than 2 m from the building shall have *subfloor bracing* provided by *anchor* and/or *braced piles,* at half the *bracing demand* required by table 5.8 for "light/light/light" *cladding*, for 0° roof slope and for "*foundation* structures".

7.4.3 *Decking*
The thickness of the decking shall be not less than:

(a) 32 mm for 600 mm *joist* centres; or

(b) 19 mm for 450 mm *joist* centres.

7.4.4 *Surface*
Deck surfaces that provide access to a building shall have a slip resistance not less than 0.4 when wet. Demonstration of having achieved this slip resistance shall be to the satisfaction of the *Building Consent Authority*.

C7.4.4
Uncoated profiled timber has a slip resistance from 0.45 – 0.60 across the direction of travel. Uncoated smooth timber has a slip resistance of 0.20 – 0.35 (i.e. it does not meet the requirements of this clause).

8 WALLS

8.1 General

8.1.1
The wall system of each *storey* shall consist of:

(a) A system to resist vertical *loads* and complying with 8.2; combined with

(b) A system to resist horizontal loads and complying with 8.3; and

(c) Any other walls (such walls will be non-loadbearing).

8.1.2
Walls designed to this section will support floors that carry 1.5 kPa and 2 kPa loadings (see section 14 when *floor loads* are 3 kPa).

8.2 Systems to resist vertical loads
The wall system shall be designed to carry vertical *loads* in accordance with 8.4 to 8.8.

8.3 Systems to resist horizontal loads

8.3.1 *General*

8.3.1.1
See section 5 for *bracing* design requirements.

8.3.1.2
The *bracing capacity* of *wall bracing elements*, other than those given in 8.3.2, shall be determined from the BRANZ P21 Test Procedure and rated in accordance with BRANZ Supplement to P21. The *wall bracing element* shall duplicate the test in all regards including grade, *framing* size and centres, fixing of *linings* and fixing to the floor.

Amd 2
May '06

8.3.1.3 *Adjustment of bracing elements for length*
Braced wall elements longer than those tested, shall have their *bracing capacity* determined by multiplying the *bracing rating* by the length of the wall. The end *studs* of the longer wall shall be provided with identical hold down details to those used in the tested wall. Where required as part of the tested wall, a *diagonal brace* must be provided over the full length of the extended wall.

8.3.1.4 *Adjustment of bracing elements for height*
Adjustment of *bracing capacity* of walls of different heights and walls with sloping *top plates* shall be obtained by the following method:

(a) For *wall bracing elements* of heights other than 2.4 m, the *bracing rating* determined by test or from table 8.1 shall be multiplied by

$$\frac{2.4}{\text{element height in metres}}$$

except that elements less than 1.8 m high shall be rated as if they were 1.8 m high.

(b) Walls of varying heights, shall have their *bracing capacity* adjusted in accordance with 8.3.1.4(a), using the average height.

Table 8.1 – Ratings of 2.4 m high reinforced concrete or reinforced concrete masonry wall bracing elements (see 8.3.2.1)

If ratio $\frac{\text{wall length}}{\text{average wall height}}$ is:	Rating in bracing units per metre of wall (BUs/m)
▶ Less than 0.625	0
▶ More than 0.625 but less than 1.5	42
▶ More than 1.5 but less than 3.0	100
▶ More than 3.0 but less than 4.5	200
▶ More than 4.5	300

Amd 1 Dec '00

NOTE –
(1) Bracing units for walls relate to the ratio of wall length to the average wall height.
(2) Walls to be greater than 1.5 m in length.

8.3.2 *Reinforced concrete and reinforced concrete masonry*

C8.3.2.1
The bracing ratings recognize that the strength contribution of a masonry or concrete wall is limited by the strength of its connections to other structural elements, such as floor or ceiling diaphragms.

Wall bracing elements of reinforced concrete, or reinforced concrete masonry, which are uniformly distributed throughout a building, may be used to contribute to the horizontal bracing of a building, to the ratings permitted in table 8.1.

8.3.2.1
Wall bracing elements of reinforced concrete or reinforced concrete masonry shall have the ratings given in table 8.1.

8.3.2.2
Concrete masonry *bracing elements* shall have a length not less than 1.5 m.

8.3.2.3
The construction of reinforced concrete masonry walls shall comply with NZS 4229.

8.3.2.4
Fixing of timber *framing* to concrete or concrete masonry walls shall be as required for *foundation* walls.

8.3.2.5
The *bracing* provisions permitted for isolated concrete masonry brace elements in this section shall not be used as an alternative to those required in NZS 4229, for reinforced concrete masonry buildings.

C8.3.3
Dragon ties help stop walls from spreading.

8.3.3 Dragon ties

8.3.3.1 ***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 figure 8.1).

8.3.3.2
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*.

8.3.3.3
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:

Amd 2 May '06 | (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.

8.3.3.4
Dragon ties shall be fixed as follows:

Amd 2 May '06 | (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

Amd 1 Dec '00 | (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 figure 8.1).

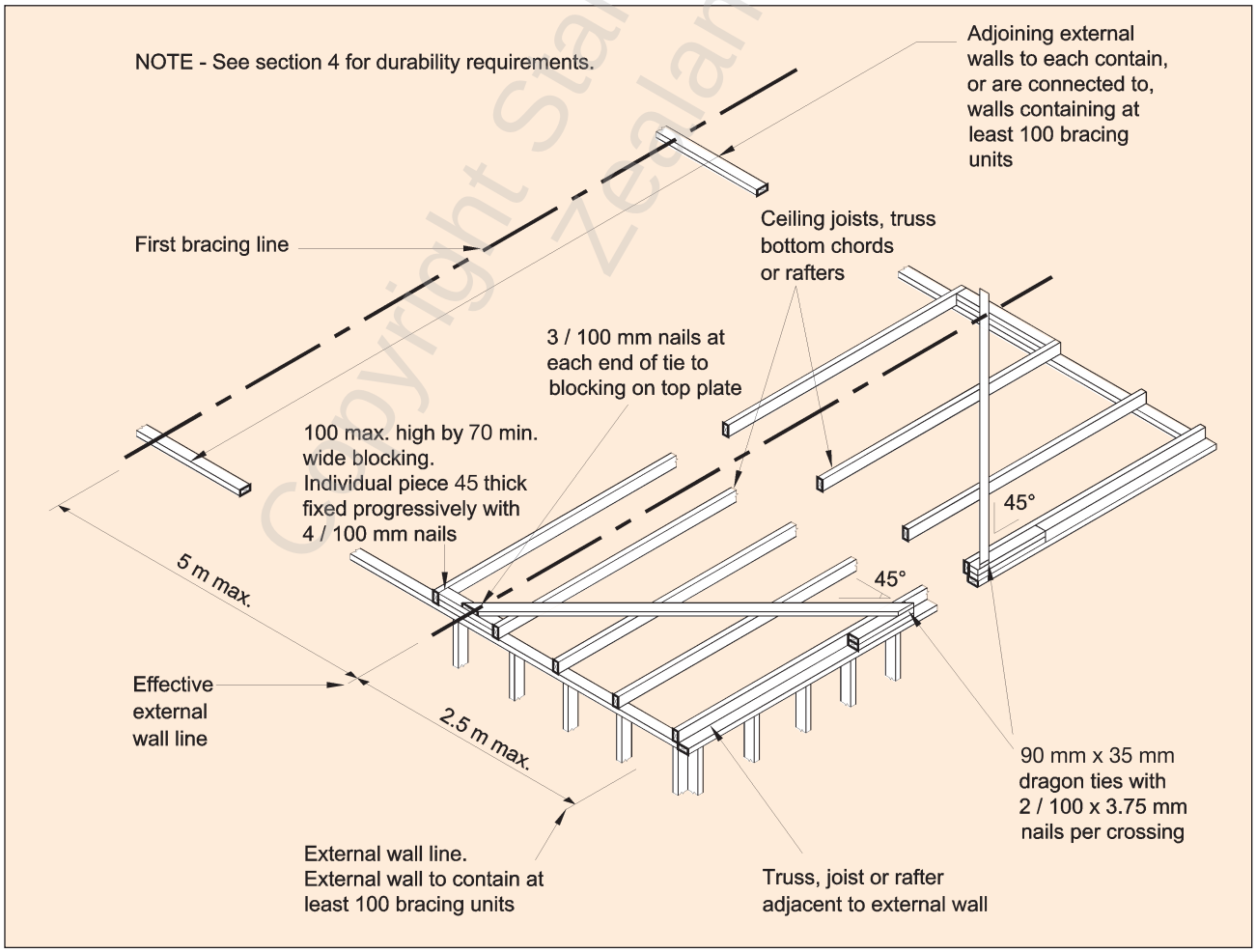


Figure 8.1 – Dragon ties (see 8.3.3.1)

Amd 2 May '06

8.4 Wall framing – General requirements

8.4.1
Wall *framing* timbers shall be set plumb and square, except as permitted by 8.4.2.

8.4.2
Wall frames may be inclined not more than 20° from the vertical, for the purpose of forming *mansard roof*s only.

C8.4.3
The span determined in accordance with figure 1.3 in section 1 relates to the roof mass carried by the walls. It does not correspond to the span and must not be used for determining the sizes of roof members.

8.4.3
The *loaded dimension* shall be determined in accordance with 1.3, for the purpose of determining the dimensions of wall *framing* members.

8.5 Studs

8.5.1 *General*

C8.5.1.1
Figure 8.3 shows the location of walls as referred to in table 8.2. This Standard does not provide for wall framing supporting vertical loads from heavy wall cladding.

8.5.1.1
Studs shall be as follows.

(a) *Loadbearing walls*: As given by tables 8.2 and 14.10.

(b) *Non-loadbearing walls*: As given by tables 8.3 and 8.4. 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 table 8.4.

8.5.1.2
Wall *framing studs* and *trimming studs* may be built-up by nailing 2 or more pieces together to the required size as follows:

	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 comprising other combinations of framing members are allowed provided that overall thickness of the original member is matched or exceeded.

Amd 2 May '06

Table 8.2 – Studs in loadbearing walls (see 8.5.1.1) – No. 1 Framing and MSG 6

1.5 kPa and 2 kPa floor loads

A Single or top storey – Light roof

Wind Zone	Loaded dimension* of wall	Stud sizes for maximum length (height) of: (m)								
		2.4			2.7			3		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	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)								
Very high	3.0	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 90	90 x 90	140 x 45	140 x 45
	4.5	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	90 x 90	90 x 90	140 x 45	140 x 45
	6.0	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	90 x 90	90 x 90	140 x 45	140 x 70
High	3.0	90 x 45	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45
	4.5	90 x 45	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45
	6.0	90 x 45	90 x 45	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
Medium	3.0	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	4.5	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	6.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
Low	3.0	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	4.5	70 x 45	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	6.0	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
Internal walls	3.0	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	4.5	70 x 45	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	6.0	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
		3.6			4.2			4.8		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	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)								
Very high	3.0	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 70	190 x 70	190 x 70	-
	4.5	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 70	190 x 70	190 x 70	-
	6.0	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 70	190 x 70	190 x 70	-
High	3.0	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45	190 x 70	190 x 70
	4.5	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45	190 x 70	190 x 70
	6.0	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45	190 x 70	190 x 70
Medium	3.0	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45	190 x 45
	4.5	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45	190 x 45
	6.0	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45	190 x 45
Low	3.0	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
	4.5	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
	6.0	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
Internal walls	3.0	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
	4.5	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
	6.0	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45

* For definition of loaded dimension see 1.3.

NOTE –

(1) 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.

(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 substituted with built-up members sized in accordance with 8.5.1.2 and nailed together in accordance with 2.4.4.7.

Amd 2 May '06

Table 8.2 – Studs in loadbearing walls (continued) (see 8.5.1.1) – No. 1 Framing and MSG 6

1.5 kPa and 2 kPa floor loads

B Single or top storey – Heavy roof

Wind zone	Loaded dimension* of wall	Stud sizes for maximum length (height) of: (m)								
		2.4			2.7			3		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	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)								
Very high	3.0	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45	90 x 90	140 x 45	140 x 70
	4.5	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45	90 x 90	140 x 45	140 x 70
	6.0	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45	90 x 90	140 x 45	140 x 70
High	3.0	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
	4.5	90 x 45	90 x 70	90 x 70	90 x 70	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 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
Medium	3.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	4.5	90 x 35	90 x 35	90 x 45	90 x 45	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	6.0	90 x 35	90 x 45	90 x 45	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 70
Low	3.0	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	4.5	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 45	90 x 45	90 x 70
	6.0	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 45	90 x 70
Internal walls	3.0	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	4.5	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 45	90 x 45	90 x 70
	6.0	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 45	90 x 45	90 x 45	90 x 70
		3.6			4.2			4.8		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	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)								
Very High	3.0	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 70	190 x 70	190 x 70	–
	4.5	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 70	190 x 70	190 x 70	–
	6.0	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 70	190 x 70	190 x 70	–
High	3.0	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45	190 x 70	190 x 70
	4.5	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45	190 x 70	190 x 70
	6.0	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45	190 x 70	190 x 70
Medium	3.0	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45	190 x 45
	4.5	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45	190 x 45
	6.0	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45	190 x 45
Low	3.0	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
	4.5	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
	6.0	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
Internal walls	3.0	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
	4.5	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
	6.0	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45

* For definition of loaded dimension see 1.3.

NOTE –

(1) 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.

(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 substituted with built-up members sized in accordance with 8.5.1.2 and nailed together in accordance with 2.4.4.7.

Amd 2 May '06

Table 8.2 – Studs in loadbearing walls (continued) (see 8.5.1.1) – **No. 1 Framing and MSG 6**

1.5 kPa and 2 kPa floor loads

C Lower of two storeys or subfloor beneath one storey

Wind zone	Loaded dimension* of wall	Stud sizes for maximum length (height) of: (m)								
		2.4			2.7			3		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	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)								
Very high	3.0	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45	90 x 90	140 x 45	140 x 70
	4.5	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45	90 x 90	140 x 45	140 x 70
	6.0	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45	90 x 90	140 x 45	140 x 70
High	3.0	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
	4.5	90 x 45	90 x 70	90 x 70	90 x 70	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 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
Medium	3.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	4.5	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	6.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
Low	3.0	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	4.5	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	6.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
Internal walls	3.0	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	4.5	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	6.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	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.

Amd 2
May '06

Table 8.2 – Studs in loadbearing walls (continued) (see 8.5.1.1) – No. 1 Framing and MSG 6

1.5 kPa and 2 kPa floor loads

D Subfloor beneath two storeys

Wind zone	Loaded dimension* of wall	Stud sizes for maximum length (height) of: (m)								
		2.4			2.7			3		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	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)								
Very high	3.0	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45	90 x 90	140 x 45	140 x 70
	4.5	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45	90 x 90	140 x 45	140 x 70
	6.0	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45	90 x 90	140 x 45	140 x 70
High	3.0	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
	4.5	90 x 70	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 90	90 x 90	140 x 45
	6.0	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	90 x 90	90 x 90	90 x 90	140 x 45
Medium	3.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	4.5	90 x 45	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	6.0	90 x 45	90 x 45	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 70	90 x 90
Low	3.0	90 x 35	90 x 35	90 x 45	90 x 45	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	4.5	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 70
	6.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
Internal walls	3.0	90 x 35	90 x 35	90 x 45	90 x 45	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	4.5	90 x 35	90 x 45	90 x 45	90 x 45	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70
	6.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90

* For definition of loaded dimension see 1.3.

NOTE –

(1) Determine the loaded dimension of the subfloor wall 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) 140 x 45 may be substituted for 90 x 90.

(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.

Amd 2 May '06

Table 8.2 – Studs in loadbearing walls (see 8.5.1.1) – VSG 8 and MSG 8

1.5 kPa and 2 kPa floor loads

A Single or top storey – Light roof

Wind Zone	Loaded dimension* of wall	Stud sizes for maximum length (height) of: (m)								
		2.4			2.7			3		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	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)								
Very high	3.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 90	90 x 90
	4.5	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 90	90 x 90
	6.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 90	90 x 90
High	3.0	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70
	4.5	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70
	6.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70
Medium	3.0	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 45
	4.5	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	6.0	70 x 35	70 x 45	90 x 35	70 x 45	70 x 45	90 x 45	90 x 35	90 x 45	90 x 70
Low	3.0	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35
	4.5	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45
	6.0	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45
Internal walls	3.0	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35
	4.5	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45
	6.0	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45
		3.6			4.2			4.8		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	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)								
Very high	3.0	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45	190 x 70	190 x 70
	4.5	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45	190 x 70	190 x 70
	6.0	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45	190 x 70	190 x 70
High	3.0	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45	190 x 70
	4.5	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45	190 x 70
	6.0	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45	190 x 70
Medium	3.0	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
	4.5	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
	6.0	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
Low	3.0	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70
	4.5	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70
	6.0	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70
Internal walls	3.0	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70
	4.5	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70
	6.0	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70

* For definition of loaded dimension see 1.3.

NOTE –

(1) 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.

(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 substituted with built-up members sized in accordance with 8.5.1.2 and nailed together in accordance with 2.4.4.7.

Amd 2 May '06

Table 8.2 – Studs in loadbearing walls (continued) (see 8.5.1.1) – VSG 8 and MSG 8

1.5 kPa and 2 kPa floor loads

B Single or top storey – Heavy roof

Wind zone	Loaded dimension* of wall	Stud sizes for maximum length (height) of: (m)								
		2.4			2.7			3		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	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)								
Very high	3.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 90	90 x 90
	4.5	90 x 45	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 90	90 x 90
	6.0	90 x 45	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 90
High	3.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70
	4.5	90 x 35	90 x 35	90 x 45	90 x 45	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70
	6.0	90 x 35	90 x 45	90 x 45	90 x 45	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70
Medium	3.0	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	4.5	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	6.0	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
Low	3.0	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45
	4.5	70 x 35	70 x 35	70 x 45	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45
	6.0	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45
Internal walls	3.0	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45
	4.5	70 x 35	70 x 35	70 x 45	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45
	6.0	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45
		3.6			4.2			4.8		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	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)								
Very High	3.0	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45	190 x 70	190 x 70
	4.5	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45	190 x 70	190 x 70
	6.0	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45	190 x 70	190 x 70
High	3.0	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45	190 x 70
	4.5	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45	190 x 70
	6.0	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45	190 x 70
Medium	3.0	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
	4.5	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
	6.0	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
Low	3.0	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70
	4.5	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70
	6.0	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70
Internal walls	3.0	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70
	4.5	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70
	6.0	90 x 70	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70

* For definition of loaded dimension see 1.3.

NOTE –

(1) 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.

(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 substituted with built-up members sized in accordance with 8.5.1.2 and nailed together in accordance with 2.4.4.7.

Amd 2 May '06

Table 8.2 – Studs in loadbearing walls (continued) (see 8.5.1.1) – VSG 8 and MSG 8

1.5 kPa and 2 kPa floor load

C Lower of two storeys or subfloor beneath one storey

Wind zone	Loaded dimension* of wall	Stud sizes for maximum length (height) of: (m)								
		2.4			2.7			3		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	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)								
Very high	3.0	90 x 45	90 x 45	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	90 x 90
	4.5	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	90 x 90
	6.0	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
High	3.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	4.5	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	6.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
Medium	3.0	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 45	90 x 45	90 x 70
	4.5	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 45	90 x 70
	6.0	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
Low	3.0	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	90 x 35	90 x 35	90 x 45
	4.5	70 x 45	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	6.0	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
Internal walls	3.0	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	90 x 35	90 x 35	90 x 45
	4.5	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	6.0	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	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.

Amd 2
May '06

Table 8.2 – Studs in loadbearing walls (continued) (see 8.5.1.1) – VSG 8 and MSG 8

1.5 kPa and 2 kPa floor load

D Subfloor beneath two storeys

Wind zone	Loaded dimension* of wall	Stud sizes for maximum length (height) of: (m)								
		2.4			2.7			3		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	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)								
Very high	3.0	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
	4.5	90 x 45	90 x 70	90 x 70	90 x 70	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 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
High	3.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	4.5	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	6.0	90 x 45	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
Medium	3.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	4.5	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	6.0	90 x 35	90 x 35	90 x 45	90 x 45	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
Low	3.0	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	4.5	70 x 45	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	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 45	90 x 45	90 x 45	90 x 70
Internal walls	3.0	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	4.5	70 x 45	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	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 45	90 x 45	90 x 45	90 x 70

* For definition of loaded dimension see 1.3.

NOTE –

(1) Determine the loaded dimension of the subfloor wall 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) 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.

Amd 2 May '06

Table 8.2 – Studs in loadbearing walls (see 8.5.1.1) – VSG 10 and MSG 10

1.5 kPa and 2 kPa floor loads

A Single or top storey – Light roof

Wind Zone	Loaded dimension* of wall	Stud sizes for maximum length (height) of: (m)								
		2.4			2.7			3		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	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)								
Very high	3.0	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 45	90 x 45	90 x 70	90 x 70
	4.5	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	6.0	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
High	3.0	70 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 70
	4.5	70 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	6.0	70 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
Medium	3.0	70 x 35	70 x 35	70 x 35	70 x 35	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35
	4.5	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35
	6.0	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35
Low	3.0	70 x 35	70 x 35	70 x 35	70 x 35	70 x 35	70 x 35	70 x 35	70 x 45	90 x 35
	4.5	70 x 35	70 x 35	70 x 35	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35
	6.0	70 x 35	70 x 35	70 x 35	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35
Internal walls	3.0	70 x 35	70 x 35	70 x 35	70 x 35	70 x 35	70 x 35	70 x 35	70 x 45	90 x 35
	4.5	70 x 35	70 x 35	70 x 35	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35
	6.0	70 x 35	70 x 35	70 x 35	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35
		3.6			4.2			4.8		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	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)								
Very high	3.0	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45
	4.5	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45
	6.0	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45
High	3.0	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
	4.5	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
	6.0	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
Medium	3.0	90 x 45	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 45	140 x 70
	4.5	90 x 45	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 45	140 x 70
	6.0	90 x 45	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 45	140 x 70
Low	3.0	90 x 35	90 x 45	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 45
	4.5	90 x 35	90 x 45	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 45
	6.0	90 x 35	90 x 45	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 45
Internal walls	3.0	90 x 35	90 x 45	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 45
	4.5	90 x 35	90 x 45	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 45
	6.0	90 x 35	90 x 45	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 45

* For definition of loaded dimension see 1.3.

NOTE –

(1) 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.

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

(2) 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.

Amd 2 May '06

Table 8.2 – Studs in loadbearing walls (continued) (see 8.5.1.1) – VSG 10 and MSG 10

1.5 kPa and 2 kPa floor loads

B Single or top storey – Heavy roof

Wind zone	Loaded dimension* of wall	Stud sizes for maximum length (height) of: (m)								
		2.4			2.7			3		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	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)								
Very high	3.0	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	4.5	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	6.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
High	3.0	70 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	4.5	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	6.0	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
Medium	3.0	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35
	4.5	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45
	6.0	70 x 35	70 x 35	70 x 45	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45
Low	3.0	70 x 35	70 x 35	70 x 35	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35
	4.5	70 x 35	70 x 35	70 x 35	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35
	6.0	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	70 x 45	70 x 45	70 x 45	90 x 35
Internal walls	3.0	70 x 35	70 x 35	70 x 35	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35
	4.5	70 x 35	70 x 35	70 x 35	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35
	6.0	70 x 35	70 x 35	70 x 35	70 x 35	70 x 45	70 x 45	70 x 45	70 x 45	90 x 35
		3.6			4.2			4.8		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	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)								
Very High	3.0	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45
	4.5	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45
	6.0	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	190 x 45	190 x 45	190 x 45
High	3.0	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
	4.5	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
	6.0	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 70	140 x 70	140 x 70	190 x 45
Medium	3.0	90 x 45	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 45	140 x 70
	4.5	90 x 45	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 45	140 x 70
	6.0	90 x 45	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 45	140 x 70
Low	3.0	90 x 35	90 x 45	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 45
	4.5	90 x 35	90 x 45	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 45
	6.0	90 x 35	90 x 45	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 45
Internal walls	3.0	90 x 35	90 x 45	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 45
	4.5	90 x 35	90 x 45	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 45
	6.0	90 x 35	90 x 45	90 x 70	90 x 70	90 x 90	140 x 45	140 x 45	140 x 45	140 x 45

* For definition of loaded dimension see 1.3.

NOTE –

(1) 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.

(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 substituted with built-up members sized in accordance with 8.5.1.2 and nailed together in accordance with 2.4.4.7.

Amd 2 May '06

Table 8.2 – Studs in loadbearing walls (continued) (see 8.5.1.1) – VSG 10 and MSG 10

1.5 kPa and 2 kPa floor loads

C Lower of two storeys or subfloor beneath one storey

Wind zone	Loaded dimension* of wall	Stud sizes for maximum length (height) of: (m)								
		2.4			2.7			3		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	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)								
Very high	3.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	4.5	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	6.0	90 x 35	90 x 45	90 x 45	90 x 45	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
High	3.0	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	4.5	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 45	90 x 45	90 x 45	90 x 70
	6.0	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 45	90 x 70
Medium	3.0	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45
	4.5	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45
	6.0	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 45
Low	3.0	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 35
	4.5	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45
	6.0	70 x 35	70 x 35	70 x 45	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45
Internal walls	3.0	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 35
	4.5	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 35
	6.0	70 x 35	70 x 35	70 x 45	70 x 45	70 x 45	90 x 35	90 x 35	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) 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.

Amd 2
May '06

Table 8.2 – Studs in loadbearing walls (continued) (see 8.5.1.1) – VSG 10 and MSG 10

1.5 kPa and 2 kPa floor loads

D Subfloor beneath two storeys

Wind zone	Loaded dimension* of wall	Stud sizes for maximum length (height) of: (m)								
		2.4			2.7			3		
		At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:			At maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	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)								
Very high	3.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 70
	4.5	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	6.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
High	3.0	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	4.5	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	6.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
Medium	3.0	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	4.5	70 x 45	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	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
Low	3.0	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45
	4.5	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45
	6.0	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	90 x 35	90 x 35	90 x 45
Internal walls	3.0	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45
	4.5	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45
	6.0	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	90 x 35	90 x 35	90 x 45

* For definition of loaded dimension see 1.3.

NOTE –

(1) Determine the loaded dimension of the subfloor wall 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) 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.

Amd 2 May '06

Table 8.3 – No. 2 Framing in internal non-loadbearing walls (see 8.5.1.1)

Amd 2 May '06

	Maximum length (height) of stud	Minimum stud size for maximum spacing of studs (mm) of:		
		400	480	600
Internal non-loadbearing walls in all wind zones	(m)	(mm x mm)	(mm x mm)	(mm x mm)
	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

Table 8.4 – Studs in non-loadbearing walls (see 8.5.1.1 and figure 8.2) **– No. 1 Framing and MSG 6**

Wind Zone	Maximum length (height) of stud	Stud size for maximum spacing of studs (mm) of:		
		400	480	600
	(m)	(mm x mm)	(mm x mm)	(mm x mm)
		(Width x thickness)		
Very high	2.4	90 x 45	90 x 70	90 x 70
	2.7	90 x 70	90 x 70	90 x 90
	3.0	90 x 90	140 x 45	140 x 45
High	2.4	90 x 35	90 x 45	90 x 70
	2.7	90 x 45	90 x 70	90 x 70
	3.0	90 x 70	90 x 90	140 x 45
	3.3	140 x 45	140 x 45	140 x 45
	3.6	140 x 45	140 x 45	140 x 70
	3.9	140 x 70	140 x 70	190 x 45
	4.2	140 x 70	190 x 45	190 x 45
	4.8	190 x 45	190 x 70	190 x 70
Medium	2.4	70 x 45	90 x 35	90 x 45
	2.7	90 x 35	90 x 45	90 x 70
	3.0	90 x 45	90 x 70	90 x 70
	3.3	90 x 70	90 x 90	90 x 90
	3.6	90 x 90	140 x 45	140 x 45
	3.9	140 x 45	140 x 45	140 x 70
	4.2	140 x 45	140 x 70	140 x 70
	4.8	140 x 70	190 x 45	190 x 45
Low	2.4	70 x 35	70 x 45	70 x 45
	2.7	70 x 45	90 x 35	90 x 35
	3.0	90 x 35	90 x 45	90 x 70
	3.3	90 x 45	90 x 70	90 x 70
	3.6	90 x 70	90 x 90	140 x 45
	3.9	90 x 90	140 x 45	140 x 45
	4.2	140 x 45	140 x 45	140 x 70
	4.8	140 x 70	140 x 70	190 x 45
Internal walls in all wind zones	2.4	70 x 35	70 x 45	70 x 45
	2.7	70 x 45	90 x 35	90 x 35
	3.0	90 x 35	90 x 45	90 x 70
	3.3	90 x 45	90 x 70	90 x 70
	3.6	90 x 70	90 x 90	140 x 45
	3.9	90 x 90	140 x 45	140 x 45
	4.2	140 x 45	140 x 45	140 x 70
	4.8	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.

Amd 2 May '06

Table 8.4 – Studs in non-loadbearing walls (see 8.5.1.1 and figure 8.2) **– VSG 8 and MSG 8**

Wind Zone	Maximum length (height) of stud	Stud size for maximum spacing of studs (mm) of:		
		400	480	600
	(m)	(mm x mm)	(mm x mm)	(mm x mm)
		(Width x thickness)		
Very high	2.4	90 x 35	90 x 45	90 x 70
	2.7	90 x 45	90 x 70	90 x 70
	3.0	90 x 70	90 x 90	90 x 90
High	2.4	70 x 45	90 x 35	90 x 45
	2.7	90 x 35	90 x 45	90 x 70
	3.0	90 x 70	90 x 70	90 x 70
	3.3	90 x 70	90 x 90	140 x 45
	3.6	140 x 45	140 x 45	140 x 45
	3.9	140 x 45	140 x 45	140 x 70
	4.2	140 x 70	140 x 70	190 x 45
	4.8	190 x 45	190 x 45	190 x 70
Medium	2.4	70 x 35	70 x 35	70 x 45
	2.7	70 x 45	90 x 35	90 x 35
	3.0	90 x 35	90 x 45	90 x 45
	3.3	90 x 45	90 x 70	90 x 70
	3.6	90 x 70	90 x 90	140 x 45
	3.9	90 x 90	140 x 45	140 x 45
	4.2	140 x 45	140 x 45	140 x 70
	4.8	140 x 70	140 x 70	190 x 45
Low	2.4	70 x 35	70 x 35	70 x 35
	2.7	70 x 35	70 x 45	90 x 35
	3.0	90 x 35	90 x 35	90 x 35
	3.3	90 x 35	90 x 45	90 x 70
	3.6	90 x 70	90 x 70	90 x 70
	3.9	90 x 70	90 x 90	140 x 45
	4.2	90 x 90	140 x 45	140 x 45
	4.8	140 x 45	140 x 70	140 x 70
Internal walls in all wind zones	2.4	70 x 35	70 x 35	70 x 35
	2.7	70 x 35	70 x 45	90 x 35
	3.0	90 x 35	90 x 35	90 x 35
	3.3	90 x 35	90 x 45	90 x 70
	3.6	90 x 70	90 x 70	90 x 70
	3.9	90 x 70	90 x 90	140 x 45
	4.2	90 x 90	140 x 45	140 x 45
	4.8	140 x 45	140 x 70	140 x 70

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.

Amd 2
May '06

Table 8.4 – Studs in non-loadbearing walls (see 8.5.1.1 and figure 8.2) **– VSG 10 and MSG 10**

Wind Zone	Maximum length (height) of stud	Stud size for maximum spacing of studs (mm) of:		
		400	480	600
	(m)	(mm x mm) (Width x thickness)	(mm x mm)	(mm x mm)
Very high	2.4	70 x 45	90 x 35	90 x 35
	2.7	90 x 35	90 x 35	90 x 45
	3.0	90 x 45	90 x 70	90 x 70
High	2.4	70 x 35	70 x 45	90 x 35
	2.7	90 x 35	90 x 35	90 x 35
	3.0	90 x 35	90 x 45	90 x 70
	3.3	90 x 70	90 x 70	90 x 90
	3.6	90 x 70	90 x 90	140 x 45
	3.9	140 x 45	140 x 45	140 x 45
	4.2	140 x 45	140 x 45	140 x 70
	4.8	140 x 70	140 x 70	190 x 45
Medium	2.4	70 x 35	70 x 35	70 x 35
	2.7	70 x 35	70 x 45	70 x 45
	3.0	90 x 35	90 x 35	90 x 35
	3.3	90 x 35	90 x 45	90 x 70
	3.6	90 x 45	90 x 70	90 x 70
	3.9	90 x 70	90 x 90	140 x 45
	4.2	90 x 90	140 x 45	140 x 45
	4.8	140 x 45	140 x 45	140 x 70
Low	2.4	70 x 35	70 x 35	70 x 35
	2.7	70 x 35	70 x 35	70 x 35
	3.0	70 x 35	70 x 45	90 x 35
	3.3	90 x 35	90 x 35	90 x 45
	3.6	90 x 35	90 x 45	90 x 70
	3.9	90 x 70	90 x 70	90 x 70
	4.2	90 x 70	90 x 90	140 x 45
	4.8	140 x 45	140 x 45	140 x 45
Internal walls in all wind zones	2.4	70 x 35	70 x 35	70 x 35
	2.7	70 x 35	70 x 35	70 x 35
	3.0	70 x 35	70 x 45	90 x 35
	3.3	90 x 35	90 x 35	90 x 45
	3.6	90 x 35	90 x 45	90 x 70
	3.9	90 x 70	90 x 70	90 x 70
	4.2	90 x 70	90 x 90	140 x 45
	4.8	140 x 45	140 x 45	140 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.

Amd 2 May '06

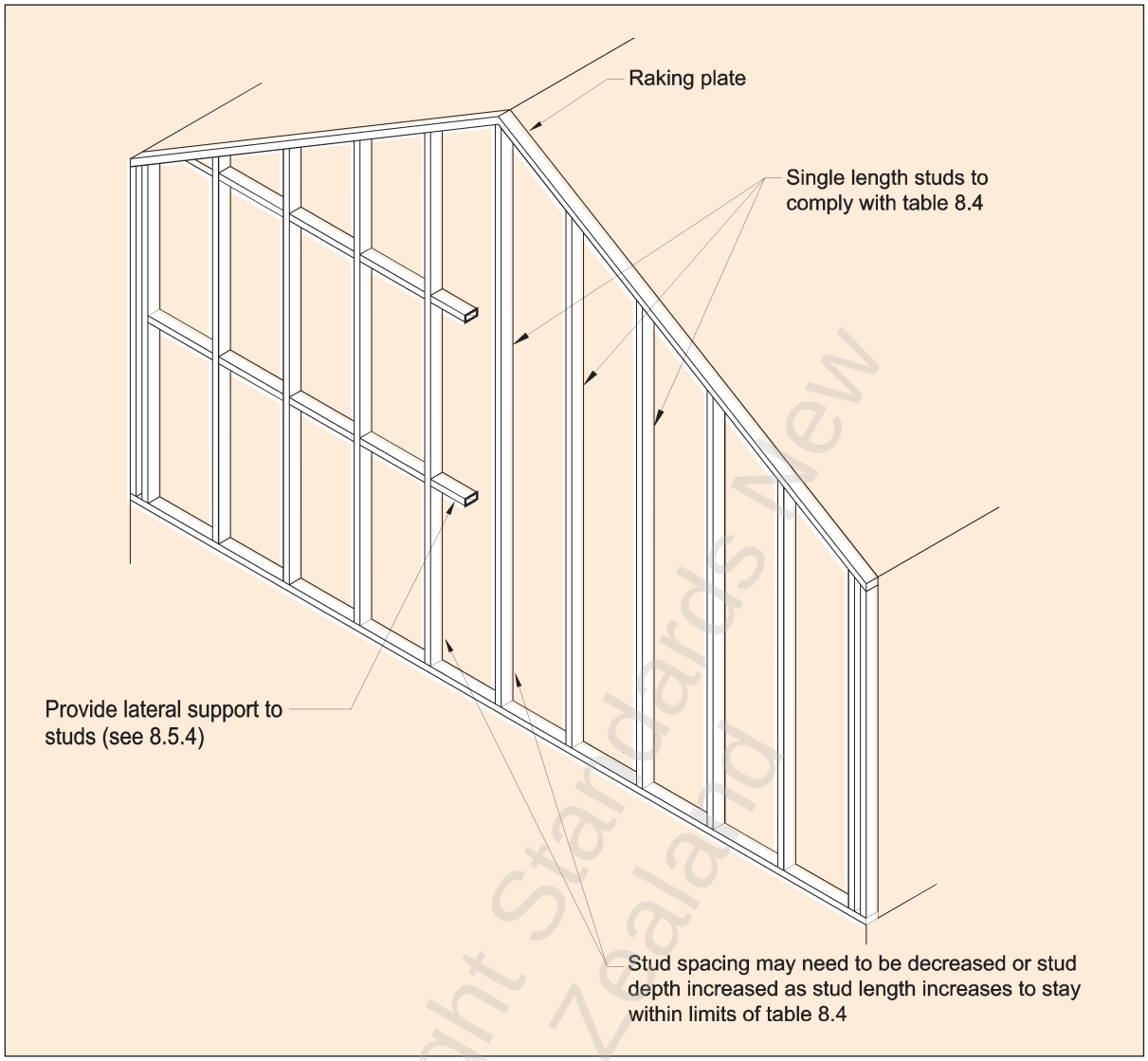


Figure 8.2 – Framing gable end walls to resist wind loads (skillion roofs)
(see table 8.4)

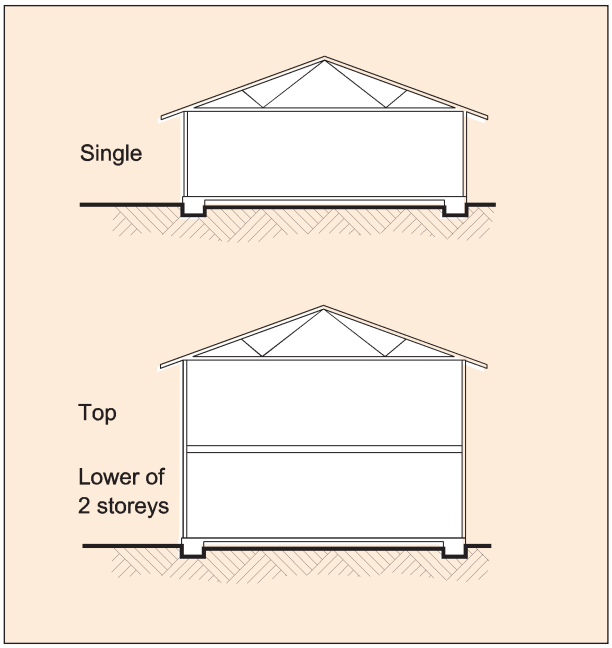


Figure 8.3 – Location of wall framing for the purposes of tables 8.2 (see C8.5.1.1)

Amd 2
May '06

C8.5.1.3

Internal walls have been designed for, among other things, the effects of varying air pressures within a building (which can impose significant loadings during high winds if doors, windows, and the like are open or break). The design of internal walls ensures a minimum level of strength and stiffness for general serviceability.

8.5.1.3

For external walls the wind zone shall be as determined by tables 5.1 and 5.2. The requirements for internal walls as given in tables 8.3 and 8.4 can be used for any wind zone.

8.5.1.4

When both floors and roofs contribute load to a *loadbearing wall*, the *loaded dimension* for the wall shall be determined from the Note under table 8.2.

8.5.1.5 (deleted)

Amd 2 May '06

8.5.1.6

Wall junctions shall be framed up with not less than 2 *studs* blocked and nailed.

8.5.1.7

Holes in the face and notches in the edge of a *stud* (see figure 8.4) shall:

(a) Be placed anywhere over the face of the *stud* except that:

(i) In brick veneer *cladding*, holes shall be at least 50 mm clear of the outside face of the *stud* supporting the veneer, to prevent damage from the fixings to services.

(ii) For limitations on *trimming studs* see 8.5.2.

(b) Be not more in diameter or depth than:

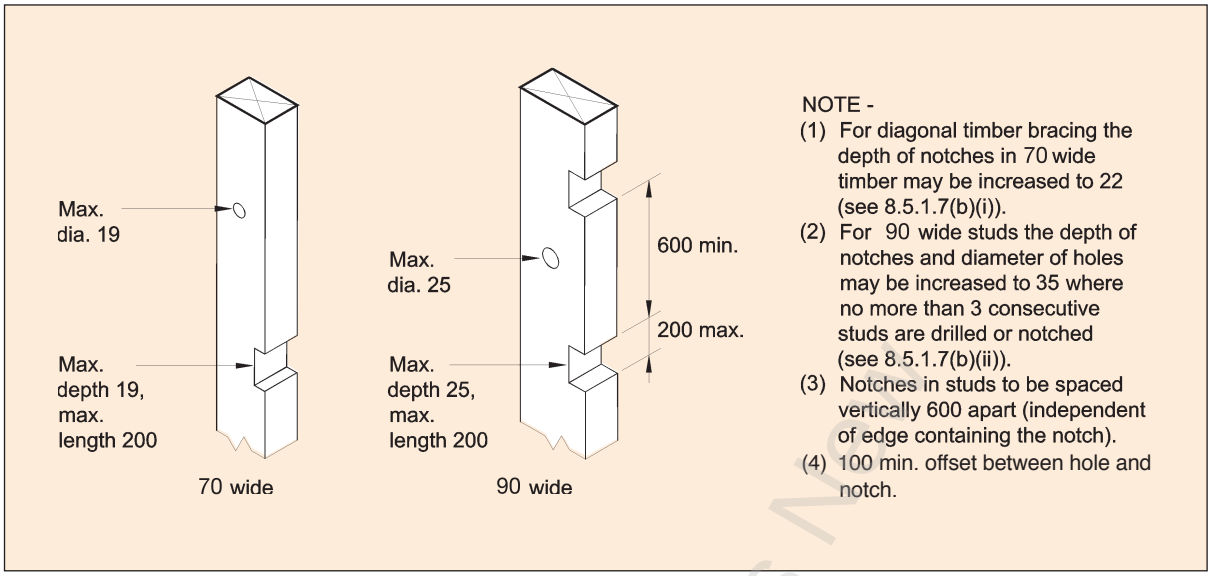
Amd 2 May '06

(i) 70 mm deep *studs*: 19 mm. This may be increased to 22 mm for the purpose of fitting metal *diagonal braces*

Amd 2 May '06

(ii) 90 mm deep *studs*: 25 mm. This may be increased to 35 mm where not more than 3 consecutive *studs* are drilled or notched.

(c) Notches in *studs* to be *spaced* vertically not less than 600 mm apart, irrespective of the edge containing the notch.



Amd 2 May '06
Amd 1 Dec '00
Amd 1 Dec '00
Amd 2 May '06

Figure 8.4 – Checking and boring studs (see 8.5.1.7)

8.5.2 *Trimming studs*

8.5.2.1
A *trimming stud* shall be provided to each side of any opening as follows (see figure 8.5 and table 8.5).

8.5.2.2
Trimming studs shall have the same width as the *studs* in the wall and subject to 8.5.2.3 shall have the thickness given by table 8.5.

8.5.2.3
Trimming studs, whether single or double, shall not contain holes, notches, checks, or cuts in the middle third of their length.

8.5.2.4
Where a doubling *stud* which provides support for a *lintel* is shorter by 400 mm or more than the full *stud* height, its thickness shall not be included as contributing to the thickness of *trimming studs* from table 8.5.

8.5.3 *Straightening studs*
Timber to be used as a *stud* shall not have a crook exceeding the maximum permitted by NZS 3631. Any crook within that limitation, may be corrected or *studs* straightened by cutting from one edge through to not further than the centre line (see figure 8.6) provided that:

(a) There shall not be more than 2 such cuts in any *stud*;

(b) Fishplates the same width as the *stud*, 19 mm thick, and extending not less than 225 mm past each side of the cut shall be nailed to both faces of the *stud*;

(c) Not more than one quarter of the *studs* in any run of wall shall be partially cut, and no 2 such cut *studs* shall be adjacent to one another;

(d) No *trimming stud*, whether single or double, shall be partially cut.

Amd 2 May '06

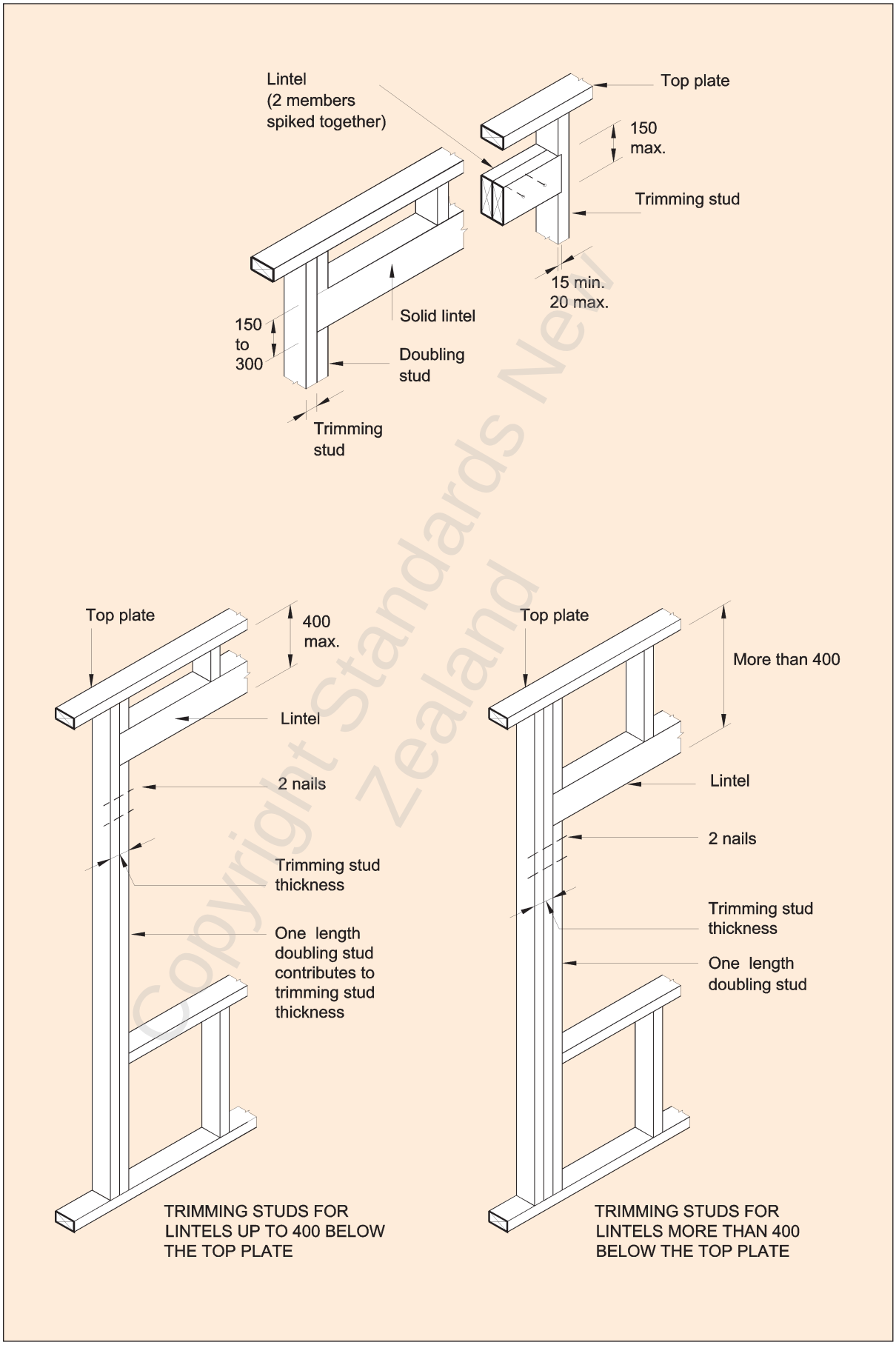


Figure 8.5 – Trimming studs and lintels (see 8.5.2.1)

Amd 1
Dec '00

Table 8.5 – Trimming studs (see 8.5.2.1)

1.5 kPa and 2 kPa floor loads

Maximum clear width of opening (span of lintel)	Stud thickness required for 600 mm spaced studs	Thickness of trimming studs
A Single storey, top storey or non-loadbearing walls		
(m)	(mm)	(mm)
1.8	35 45 70 90	45 45 90 115
3.0	35 45 70 90	45 70 90 135
3.6	35 45 70 90	70 90 140 180
4.2	35 45 70 90	105 135 210 270
B Any other location		
0.9	35 45 70 90	45 70 90 135
1.8	35 45 70 90	70 70 115 135
3.0	35 45 70 90	70 90 140 180

Amd 2 May '06

NOTE – To use this table.

(1) Enter the row corresponding to the lintel span being considered.

(2) From the second column, select the thickness of the studs required for the body of the wall, assuming that they are spaced at 600 mm.

(3) Read the trimming stud thickness from the right side column.

Table 8.8 – Reference table for lintel load cases (see 8.6.1.4)

Table	Supporting			Load type			
No.	Roof	Walls	Floor	Roof	Snow	Walls	Floor
					(kPa)		(kPa)
8.9	✓			Light	0		
	✓			Heavy	0		
8.10	✓	✓		Light	0	Light	
	✓	✓		Light	0	Medium	
	✓	✓		Heavy	0	Light	
	✓	✓		Heavy	0	Medium	
8.11	✓	✓	✓	Light	0	Light	1.5 or 2
	✓	✓	✓	Light	0	Medium	1.5 or 2
	✓	✓	✓	Heavy	0	Light	1.5 or 2
	✓	✓	✓	Heavy	0	Medium	1.5 or 2
8.12		✓	✓			Light	1.5 or 2
		✓	✓			Medium	1.5 or 2
8.13			✓				1.5 or 2

NOTE – Refer to tables 15.1 to 15.5 for snow loading cases and tables 14.11 to 14.14 for 3 kPa floor loads.

Table 8.9 – Lintels supporting roof only (see figure 8.7) **– No. 1 Framing and MSG 6**

	Loaded dimension* of lintel (m)	Maximum span for lintel sizes listed below (m)									
		Width x thickness (mm)									
		90 x 70	90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof	3	0.9	1.0	1.5	1.6	2.0	2.2	2.6	2.8	3.1	3.4
	4	0.8	0.9	1.3	1.5	1.8	2.0	2.3	2.6	2.8	3.1
	5	0.8	0.9	1.2	1.4	1.7	1.9	2.1	2.4	2.6	2.9
	6	0.7	0.8	1.1	1.3	1.5	1.8	1.9	2.3	2.3	2.8
Heavy roof	3	0.7	0.8	1.2	1.3	1.6	1.8	2.0	2.3	2.4	2.7
	4	–	0.8	1.0	1.2	1.4	1.6	1.8	2.1	2.2	2.5
	5	–	0.7	0.9	1.1	1.3	1.5	1.6	1.9	2.0	2.4
	6	–	–	0.8	1.0	1.2	1.4	1.5	1.8	1.8	2.2

* Loaded dimension is defined in figure 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

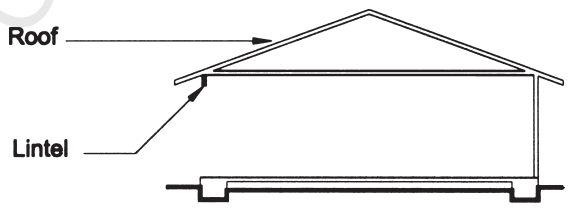


Figure 8.7 – Lintel supporting roof only (see 8.6.1.1 and table 8.9)

Table 8.9 – Lintels supporting roof only (see figure 8.7) **– VSG 8 and MSG 8**

	Loaded dimension* of lintel (m)	Maximum span for lintel sizes listed below (m)									
		Width x thickness (mm)									
		90 x 70	90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof	3	1.0	1.1	1.6	1.8	2.3	2.5	2.9	3.1	3.5	3.8
	4	1.0	1.0	1.5	1.6	2.1	2.3	2.6	2.9	3.2	3.5
	5	0.9	1.0	1.4	1.5	1.9	2.1	2.5	2.7	3.0	3.2
	6	0.8	0.9	1.3	1.5	1.8	2.0	2.3	2.5	2.8	3.1
Heavy roof	3	0.8	0.9	1.3	1.4	1.8	2.0	2.3	2.5	2.8	3.0
	4	0.8	0.8	1.2	1.3	1.7	1.8	2.1	2.3	2.6	2.8
	5	0.7	0.8	1.1	1.2	1.5	1.7	1.9	2.2	2.3	2.6
	6	–	0.7	1.0	1.2	1.4	1.6	1.8	2.0	2.1	2.5

* Loaded dimension is defined in figure 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 8.9 – Lintels supporting roof only (see figure 8.7) **– VSG 10 and MSG 10**

	Loaded Dimension* of lintel (m)	Maximum span for lintel sizes listed below (m)									
		Width x thickness (mm)									
		90 x 70	90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof	3	1.1	1.2	1.8	1.9	2.4	2.6	3.1	3.3	3.7	4.0
	4	1.0	1.1	1.6	1.8	2.2	2.4	2.8	3.1	3.4	3.7
	5	1.0	1.1	1.5	1.7	2.1	2.3	2.6	2.9	3.2	3.5
	6	0.9	1.0	1.4	1.6	2.0	2.1	2.5	2.7	3.0	3.3
Heavy roof	3	0.9	1.0	1.4	1.6	2.0	2.1	2.5	2.7	3.0	3.3
	4	0.8	0.9	1.3	1.4	1.8	2.0	2.3	2.5	2.8	3.0
	5	0.8	0.8	1.2	1.3	1.7	1.8	2.1	2.3	2.6	2.8
	6	0.7	0.8	1.2	1.3	1.6	1.7	2.0	2.2	2.4	2.7

* Loaded dimension is defined in figure 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2
May '06

Table 8.10 – Lintels supporting roof and wall (see figure 8.8) **– No. 1 Framing and MSG 6**

	Loaded dimension* of lintel (m)	Maximum span for lintel sizes listed below (m)									
		Width x thickness (mm)									
		90 x 70	90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof Light wall	3	0.8	0.9	1.3	1.4	1.8	2.0	2.3	2.5	2.8	3.0
	4	0.8	0.9	1.2	1.4	1.7	1.8	2.1	2.3	2.6	2.8
	5	0.7	0.8	1.1	1.3	1.5	1.8	2.0	2.2	2.4	2.7
	6	0.7	0.8	1.0	1.2	1.4	1.7	1.8	2.1	2.2	2.6
Light roof Medium wall	3	0.7	0.8	1.2	1.3	1.6	1.8	2.0	2.3	2.5	2.8
	4	0.7	0.8	1.1	1.3	1.5	1.7	1.9	2.2	2.3	2.6
	5	–	–	0.8	1.0	1.1	1.4	1.4	1.7	1.7	2.1
	6	–	–	0.8	0.9	1.0	1.3	1.3	1.6	1.6	2.0
Heavy roof Light wall	3	0.7	0.8	1.0	1.2	1.4	1.7	1.8	2.1	2.2	2.6
	4	–	0.7	0.9	1.1	1.3	1.6	1.6	2.0	2.0	2.4
	5	–	0.7	0.9	1.0	1.2	1.4	1.5	1.8	1.8	2.2
	6	–	–	0.8	1.0	1.1	1.3	1.4	1.7	1.7	2.1
Heavy roof Medium wall	3	–	0.7	1.0	1.1	1.3	1.6	1.7	2.0	2.0	2.4
	4	–	0.7	0.9	1.1	1.2	1.5	1.5	1.9	1.9	2.3
	5	–	–	0.8	1.0	1.1	1.4	1.4	1.7	1.7	2.1
	6	–	–	0.8	0.9	1.0	1.3	1.3	1.6	1.6	2.0

* For definition of loaded dimension see 1.3.

NOTE –

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

(2) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Amd 1 Dec '00

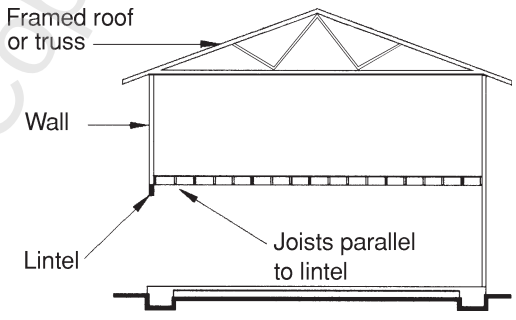


Figure 8.8 – Lintel supporting roof and wall (see 8.6.1.1 and table 8.10)

Table 8.10 – Lintels supporting roof and wall (see figure 8.8) **– VSG 8 and MSG 8**

	Loaded dimension* of lintel (m)	Maximum span for lintel sizes listed below (m)									
		Width x thickness (mm)									
		90 x 70	90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof Light wall	3	0.9	1.0	1.5	1.6	2.0	2.2	2.5	2.8	3.1	3.3
	4	0.9	0.9	1.4	1.5	1.9	2.0	2.4	2.6	2.9	3.1
	5	0.8	0.9	1.3	1.4	1.8	1.9	2.3	2.5	2.7	3.0
	6	0.8	0.9	1.2	1.4	1.7	1.9	2.2	2.4	2.6	2.9
Light roof Medium wall	3	0.8	0.9	1.3	1.5	1.8	2.0	2.3	2.5	2.8	3.1
	4	0.8	0.9	1.3	1.4	1.7	1.9	2.2	2.4	2.7	2.9
	5	–	0.7	1.0	1.1	1.3	1.6	1.7	2.0	2.0	2.4
	6	–	0.7	0.9	1.1	1.2	1.5	1.6	1.9	1.9	2.3
Heavy roof Light wall	3	0.8	0.8	1.2	1.3	1.7	1.8	2.1	2.3	2.6	2.8
	4	0.7	0.8	1.1	1.3	1.5	1.7	1.9	2.2	2.4	2.6
	5	–	0.7	1.0	1.2	1.4	1.6	1.8	2.1	2.2	2.5
	6	–	0.7	0.9	1.1	1.3	1.5	1.7	2.0	2.0	2.4
Heavy roof Medium wall	3	0.7	0.8	1.1	1.3	1.6	1.7	2.0	2.2	2.4	2.7
	4	0.7	0.8	1.0	1.2	1.4	1.6	1.8	2.1	2.2	2.5
	5	–	0.7	1.0	1.1	1.3	1.6	1.7	2.0	2.0	2.4
	6	–	0.7	0.9	1.1	1.2	1.5	1.6	1.9	1.9	2.3

* For definition of loaded dimension see 1.3.

NOTE –
(1) Determine the loaded dimension of the wall above the lintel at roof level and use this value in the table.
(2) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 8.10 – Lintels supporting roof and wall (see figure 8.8) **– VSG 10 and MSG 10**

	Loaded dimension* of lintel (m)	Maximum span for lintel sizes listed below (m)									
		Width x thickness (mm)									
		90 x 70	90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof Light wall	3	1.0	1.1	1.6	1.7	2.1	2.3	2.7	3.0	3.3	3.6
	4	0.9	1.0	1.5	1.6	2.0	2.2	2.6	2.8	3.1	3.4
	5	0.9	1.0	1.4	1.5	1.9	2.1	2.4	2.7	3.0	3.2
	6	0.8	0.9	1.3	1.5	1.8	2.0	2.3	2.5	2.8	3.1
Light roof Medium wall	3	0.9	1.0	1.4	1.6	2.0	2.1	2.5	2.7	3.0	3.3
	4	0.9	0.9	1.4	1.5	1.9	2.0	2.4	2.6	2.9	3.1
	5	0.7	0.8	1.1	1.2	1.5	1.7	2.0	2.1	2.4	2.6
	6	0.7	0.7	1.1	1.2	1.5	1.6	1.9	2.0	2.3	2.5
Heavy roof Light wall	3	0.8	0.9	1.3	1.5	1.8	2.0	2.3	2.5	2.8	3.1
	4	0.8	0.9	1.2	1.4	1.7	1.9	2.2	2.3	2.6	2.8
	5	0.7	0.8	1.2	1.3	1.6	1.7	2.0	2.2	2.5	2.7
	6	0.7	0.8	1.1	1.2	1.5	1.7	1.9	2.1	2.4	2.6
Heavy roof Medium wall	3	0.8	0.9	1.3	1.4	1.7	1.9	2.2	2.4	2.6	2.9
	4	0.7	0.8	1.2	1.3	1.6	1.8	2.1	2.2	2.5	2.7
	5	0.7	0.8	1.1	1.2	1.5	1.7	2.0	2.1	2.4	2.6
	6	0.7	0.7	1.1	1.2	1.5	1.6	1.9	2.0	2.3	2.5

* For definition of loaded dimension see 1.3.

NOTE –
(1) Determine the loaded dimension of the wall above the lintel at roof level and use this value in the table.
(2) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2
May '06

Table 8.11 – Lintels supporting roof, wall and floor (see figure 8.9) **– No. 1 Framing and MSG 6**

1.5 kPa or 2 kPa floor loads

	Loaded dimension* of lintel (m)	Maximum span for lintel sizes listed below (m)							
		Width x thickness (mm)							
		140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof Light wall	3	0.8	1.0	1.1	1.3	1.4	1.7	1.7	2.0
	4	0.8	0.9	1.0	1.3	1.3	1.6	1.6	2.0
	5	0.7	0.9	1.0	1.2	1.3	1.6	1.6	1.9
	6	0.7	0.9	1.0	1.2	1.2	1.5	1.5	1.8
Light roof Medium wall	3	0.8	0.9	1.0	1.3	1.3	1.6	1.6	2.0
	4	0.7	0.9	1.0	1.2	1.3	1.6	1.6	1.9
	5	–	0.8	0.9	1.1	1.1	1.4	1.4	1.7
	6	–	0.8	0.9	1.0	1.1	1.3	1.3	1.6
Heavy roof Light wall	3	0.7	0.9	1.0	1.2	1.3	1.6	1.6	1.9
	4	0.7	0.8	1.0	1.2	1.2	1.5	1.5	1.8
	5	0.7	0.8	0.9	1.1	1.2	1.4	1.4	1.7
	6	–	0.8	0.9	1.1	1.1	1.4	1.4	1.7
Heavy roof Medium wall	3	0.7	0.9	1.0	1.2	1.2	1.5	1.5	1.8
	4	0.7	0.8	0.9	1.1	1.2	1.4	1.4	1.8
	5	–	0.8	0.9	1.1	1.1	1.4	1.4	1.7
	6	–	0.8	0.9	1.0	1.1	1.3	1.3	1.6

* For definition of loaded dimension see 1.3.

NOTE –

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

(2) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

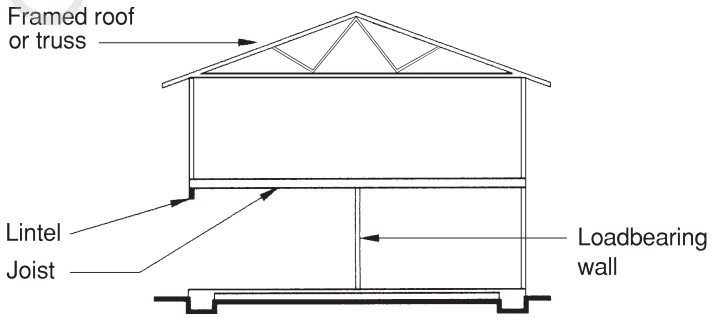


Figure 8.9 – Lintel supporting roof, floor joists and walls (see 8.6.1.1 and table 8.11)

Amd 1 Dec '00

Table 8.11 – Lintels supporting roof, wall and floor (see figure 8.9) **– VSG 8 and MSG 8**

1.5 kPa or 2 kPa floor loads

	Loaded dimension* of lintel (m)	Maximum span for lintel sizes listed below (m)							
		Width x thickness (mm)							
		140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof Light wall	3	0.9	1.1	1.3	1.6	1.6	2.0	2.0	2.4
	4	0.9	1.1	1.2	1.5	1.6	1.9	1.9	2.3
	5	0.9	1.1	1.2	1.5	1.5	1.9	1.8	2.2
	6	0.8	1.0	1.2	1.4	1.5	1.8	1.8	2.2
Light roof Medium wall	3	0.9	1.1	1.2	1.5	1.6	1.9	1.9	2.3
	4	0.9	1.1	1.2	1.5	1.5	1.9	1.9	2.3
	5	0.8	0.9	1.1	1.3	1.4	1.6	1.6	2.0
	6	0.7	0.9	1.0	1.2	1.3	1.6	1.6	1.9
Heavy roof Light wall	3	0.9	1.1	1.2	1.5	1.5	1.9	1.9	2.3
	4	0.8	1.0	1.1	1.4	1.5	1.8	1.8	2.1
	5	0.8	1.0	1.1	1.3	1.4	1.7	1.7	2.1
	6	0.8	0.9	1.0	1.3	1.3	1.6	1.6	2.0
Heavy roof Medium wall	3	0.8	1.0	1.2	1.4	1.5	1.8	1.8	2.2
	4	0.8	1.0	1.1	1.4	1.4	1.7	1.7	2.1
	5	0.8	0.9	1.1	1.3	1.4	1.6	1.6	2.0
	6	0.7	0.9	1.0	1.2	1.3	1.6	1.6	1.9

* For definition of loaded dimension see 1.3.

NOTE –

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

Amd 2 May '06

(2) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 1 Dec '00

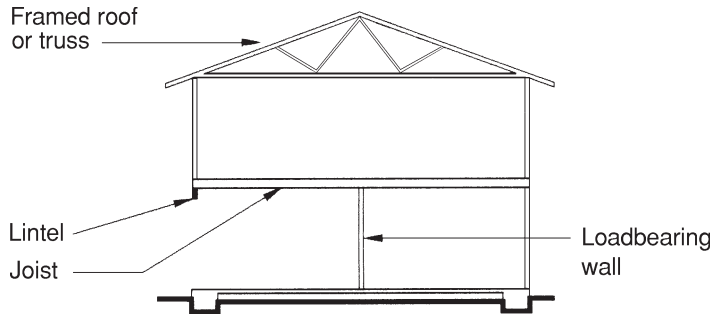


Figure 8.9 – Lintel supporting roof, floor joists and walls (see 8.6.1.1 and table 8.11)

Table 8.11 – Lintels supporting roof, wall and floor (see figure 8.9) **– VSG 10 and MSG 10**

1.5 kPa or 2 kPa floor loads

	Loaded dimension* of lintel (m)	Maximum span for lintel sizes listed below (m)							
		Width x thickness (mm)							
		140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof Light wall	3	1.1	1.3	1.5	1.8	2.0	2.3	2.4	2.8
	4	1.1	1.3	1.5	1.8	1.9	2.2	2.3	2.7
	5	1.0	1.3	1.4	1.7	1.8	2.2	2.2	2.6
	6	1.0	1.2	1.4	1.7	1.8	2.1	2.1	2.6
Light roof Medium wall	3	1.1	1.3	1.5	1.7	1.9	2.2	2.3	2.7
	4	1.1	1.2	1.4	1.7	1.8	2.1	2.2	2.6
	5	0.9	1.1	1.3	1.5	1.6	1.9	1.9	2.3
	6	0.9	1.1	1.2	1.4	1.6	1.8	1.8	2.2
Heavy roof Light wall	3	1.1	1.2	1.4	1.7	1.8	2.1	2.2	2.6
	4	1.0	1.2	1.4	1.6	1.7	2.0	2.1	2.5
	5	1.0	1.1	1.3	1.5	1.7	1.9	2.0	2.4
	6	0.9	1.1	1.3	1.5	1.6	1.9	1.9	2.3
Heavy roof Medium wall	3	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.5
	4	1.0	1.1	1.3	1.5	1.7	2.0	2.1	2.4
	5	0.9	1.1	1.3	1.5	1.6	1.9	1.9	2.3
	6	0.9	1.1	1.2	1.4	1.6	1.8	1.8	2.2

* For definition of loaded dimension see 1.3.

NOTE –

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

(2) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

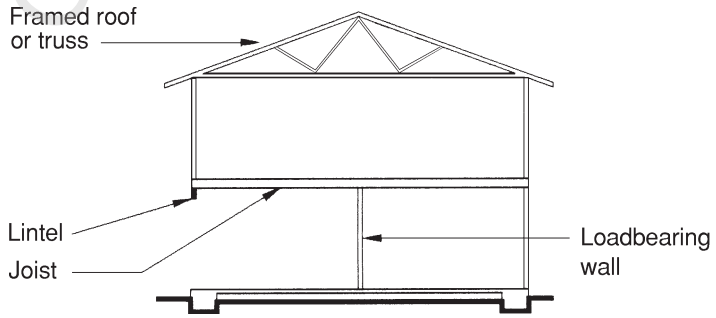


Figure 8.9 – Lintel supporting roof, floor joists and walls (see 8.6.1.1 and table 8.11)

Amd 1 Dec '00

Table 8.12 – Lintels supporting wall and floor (see figure 8.10) **– No. 1 Framing and MSG 6**

1.5 kPa or 2 kPa floor loads

	Loaded dimension* of lintel (m)	Maximum span for lintel sizes listed below (m)							
		Width x thickness (mm)							
		140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light wall	3	0.9	1.1	1.3	1.6	1.6	2.0	2.0	2.4
Medium wall	3	0.9	1.1	1.2	1.5	1.6	1.9	1.9	2.3

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

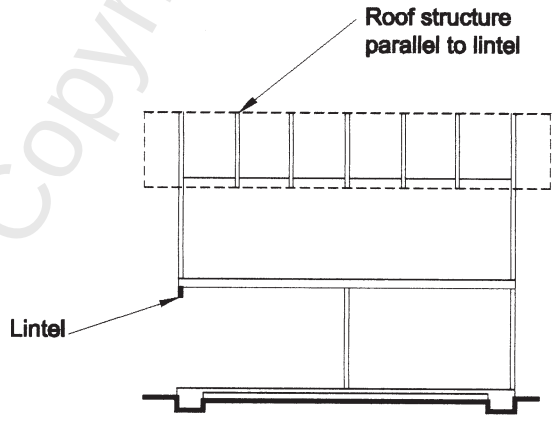


Figure 8.10 – Lintel supporting wall and floor (truss parallel to lintel) (see 8.6.1.1 and table 8.12)

Table 8.12 – Lintels supporting wall and floor (see figure 8.10) **– VSG 8 and MSG 8**

1.5 kPa or 2 kPa floor loads

	Loaded dimension* of lintel (m)	Maximum span for lintel sizes listed below (m)							
		Width x thickness (mm)							
		140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light wall	3	1.1	1.4	1.5	1.9	1.9	2.4	2.4	2.9
Medium wall	3	1.1	1.3	1.5	1.8	1.9	2.3	2.3	2.7

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 8.12 – Lintels supporting wall and floor (see figure 8.10) **– VSG 10 and MSG 10**

1.5 kPa or 2 kPa floor loads

	Loaded dimension* of lintel (m)	Maximum span for lintel sizes listed below (m)							
		Width x thickness (mm)							
		140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light wall	3	1.3	1.5	1.8	2.1	2.3	2.6	2.8	3.2
Medium wall	3	1.3	1.4	1.8	2.0	2.2	2.5	2.7	3.0

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2
May '06

Table 8.13 – Lintels supporting floor only (see figure 8.11) **– No. 1 Framing and MSG 6**

1.5 kPa or 2 kPa floor loads

Loaded dimension* of lintel (m)	Maximum span for lintel sizes listed below (m)							
	Width x thickness (mm)							
	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
3	1.0	1.2	1.4	1.6	1.7	2.1	2.1	2.5
4.5	0.8	1.0	1.1	1.3	1.4	1.7	1.7	2.1
6	0.7	0.8	0.9	1.2	1.2	1.5	1.5	1.8

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

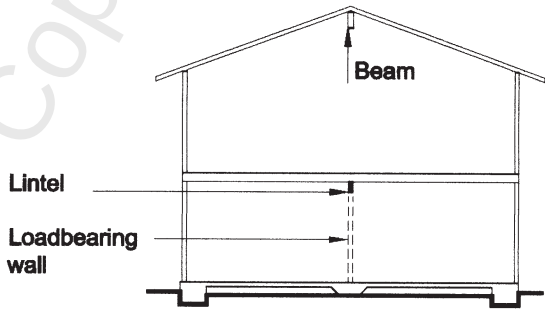


Figure 8.11 – Lintel supporting floor only (see 8.6.1.1 and table 8.13)

Table 8.13 – Lintels supporting floor only (see figure 8.11) – VSG 8 and MSG 8

1.5 kPa or 2 kPa floor loads

Loaded dimension* of lintel (m)	Maximum span for lintel sizes listed below (m)							
	Width x thickness (mm)							
	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
3	1.2	1.4	1.6	2.0	2.0	2.5	2.5	3.0
4.5	0.9	1.2	1.3	1.6	1.7	2.0	2.0	2.4
6	0.8	1.0	1.1	1.4	1.4	1.7	1.7	2.1

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 8.13 – Lintels supporting floor only (see figure 8.11) – VSG 10 and MSG 10

1.5 kPa or 2 kPa floor loads

Loaded dimension* of lintel (m)	Maximum span for lintel sizes listed below (m)							
	Width x thickness (mm)							
	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
3	1.4	1.7	1.9	2.3	2.5	2.9	3.0	3.5
4.5	1.1	1.4	1.6	1.9	2.0	2.4	2.4	2.9
6	1.0	1.2	1.4	1.6	1.7	2.1	2.1	2.5

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2
May '06

8.6.1.5
The thickness of a *lintel* may be made up of 2 or more members, but each member must be the length of the *lintel*.

8.6.1.6
Lintels shown in figures 8.7 to 8.11 shall be supported at each end for the full thickness of the *lintel* by:

(a) For *lintels* not exceeding 140 mm wide: The *trimming stud* checked not less than 15 mm nor more than 20 mm; | Amd 2 May '06

(b) For *lintels* not exceeding 240 mm wide: A 35 mm thick doubling *stud* or *jack stud*; | Amd 2 May '06

(c) For *lintels* not exceeding 290 mm wide: A 45 mm thick doubling *stud* or *jack stud*. | Amd 2 May '06

8.6.1.7
Lintels supporting *rafters* or trusses of *roofs* shall be secured against uplift where indicated in table 8.14. Where fixing to resist uplift is not required, the fixings in table 8.19 for "*Lintel* to *trimming stud*" shall be used.

8.6.1.8
Each *lintel* required by table 8.14 to be secured against uplift shall be fixed at each end to a *trimming stud* which in turn shall be fixed to the floor *framing*. Each fixing to be as shown in figure 8.12, or an alternative fixing of 7.5 kN *capacity* in tension along the line of the *trimming stud*.

8.7 Plates

8.7.1 *Top plates*

8.7.1.1
Top plates of *loadbearing walls* shall be of the dimensions given by table 8.16 except:

(a) As provided by 8.7.1.2; or

(b) Where substituted by a *lintel*; or

(c) Where trusses land more than 150 mm away from a *stud* position, refer to figure 8.13 for plate support; or

(d) Where low density ceilings are installed and the *bracing lines* are *spaced* between 5.0 m and 6.0 m provide an additional plate, refer to 8.7.4.2.

8.7.1.2
Table 8.16 does not apply where a roof or floor *framing* member supported by a *loadbearing wall* lands on the *top plate,* directly over a *stud*. The *top plate* shall in that case be the same width as the *studs* and 35 mm thick.

Amd 2 May '06

8.7.1.3
Top plates of *non-loadbearing walls* shall be the same width as the *studs* and no less than 35 mm thick.

Amd 2 May '06

8.7.1.4
Joints and connections in *top plates* are covered in 8.7.3.

Table 8.15 – Sill and head trimmers (see 8.6.2.1 and 8.6.2.2) **– No. 1 Framing and MSG 6**

Maximum clear width of opening	Minimum thickness of sill and header trimmers
(m)	(mm)
2.0	40
2.4	75
3.0	150

Table 8.15 – Sill and head trimmers (see 8.6.2.1 and 8.6.2.2) **– VSG 8 and MSG 8**

Maximum clear width of opening	Minimum thickness of sill and header trimmers
(m)	(mm)
2.0	40
2.4	50
3.0	100
3.6	150

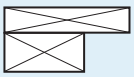
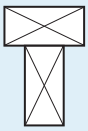
Amd 2 May '06

Table 8.15 – Sill and head trimmers (see 8.6.2.1 and 8.6.2.2) **– VSG 10 and MSG 10**

Maximum clear width of opening	Minimum thickness of sill and header trimmers
(m)	(mm)
2.0	40
2.4	50
3.0	75
3.6	150

Table 8.16 – Top plates of loadbearing walls (see 8.7.1.1) – No. 1 Framing and MSG 6

1.5 kPa and 2 kPa floor loads

Plate size (mm x mm)		Position of truss or rafter centre line relative to centre line of nearest stud	Maximum spacing of trusses or rafters (mm)	Light roof			Heavy roof		
				Stud spacing (mm)					
				400	480	600	400	480	600
				Maximum loaded dimension* of wall (m)					
A Single or top storey (Applies for any spacing of trusses or rafters)									
70 x 45		Anywhere	600	6.0	4.6	3.3	3.3	2.5	1.7
			900	3.8	2.8	2.0	2.0	1.4	0.9
			1200	2.7	2.0	1.4	–	–	–
		Within 150 mm	600	6.0	5.7	5.0	3.7	3.1	2.7
			900	4.2	3.6	3.2	2.2	1.9	1.6
			1200	3.0	2.6	2.2	–	–	–
90 x 45		Anywhere	600	6.0	6.0	4.4	4.4	3.3	2.4
			900	5.0	3.8	2.7	2.7	2.0	1.4
			1200	3.6	2.7	1.9	–	–	–
		Within 150 mm	600	6.0	6.0	6.0	4.9	4.2	3.7
			900	5.6	4.8	4.2	3.0	2.6	2.3
			1200	4.0	3.5	3.0	–	–	–
90 x 45 plus 140 x 35 or 2/90 x 45	 or 	Anywhere	600	6.0	6.0	6.0	6.0	6.0	5.6
			900	6.0	6.0	6.0	6.0	4.8	3.5
			1200	6.0	6.0	4.6	–	–	–
		Within 150 mm	600	6.0	6.0	6.0	6.0	6.0	6.0
			900	6.0	6.0	6.0	6.0	6.0	5.3
			1200	6.0	6.0	6.0	–	–	–
90 x 45 plus 90 x 45 dwang		Anywhere	600	6.0	6.0	6.0	6.0	6.0	6.0
			900	6.0	6.0	6.0	6.0	6.0	5.9
			1200	6.0	6.0	6.0	–	–	–
		Within 150 mm	600	6.0	6.0	6.0	6.0	6.0	6.0
			900	6.0	6.0	6.0	6.0	6.0	6.0
			1200	6.0	6.0	6.0	–	–	–

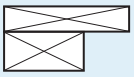
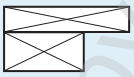
* For definition of loaded dimension see 1.3.

NOTE – Substitution with built-up members is not allowed.

Amd 2 May '06

Table 8.16 – Top plates of loadbearing walls (continued) (see 8.7.1.1) **– No. 1 Framing and MSG 6**

1.5 kPa and 2 kPa floor loads

Plate size (mm x mm)		Maximum Loaded dimension of wall supporting floor (m)	Maximum spacing of floor joists (mm)	Light roof Stud spacing (mm) 400	480	600	Heavy roof Stud spacing (mm) 400	480	600
				Maximum loaded dimension* of wall above supporting roof (m)					
B Lower of 2 storeys and subfloor stud walls supporting 1 storey									
90 x 45		1.5	400	6.0	4.3	1.9	4.5	2.7	–
			450	5.6	3.2	–	3.5	1.9	–
			600	2.8	–	–	1.7	–	–
		3.0	400	2.9	–	–	1.7	–	–
			450	1.5	–	–	–	–	–
90 x 45 plus 140 x 35 or 2/90 x 45	 or 	1.5	400	6.0	6.0	6.0	6.0	6.0	6.0
			450	6.0	6.0	6.0	6.0	6.0	5.3
			600	6.0	6.0	4.8	6.0	5.2	3.0
		3	400	6.0	6.0	5.8	6.0	6.0	3.7
			450	6.0	6.0	4.1	6.0	5.5	2.5
			600	6.0	4.0	–	4.9	2.4	–
90 x 70		1.5	400	6.0	6.0	6.0	6.0	6.0	6.0
			450	6.0	6.0	6.0	6.0	6.0	6.0
			600	6.0	6.0	6.0	6.0	6.0	4.1
		3	400	6.0	6.0	6.0	6.0	6.0	5.4
			450	6.0	6.0	6.0	6.0	6.0	4.0
			600	6.0	6.0	2.4	6.0	4.0	1.4
C Subfloor stud walls supporting 2 storeys									
90 x 45 plus 140 x 35 or 2/90 x 45	 or 	1.5	400	6.0	6.0	5.0	6.0	6.0	3.1
			450	6.0	6.0	3.2	6.0	4.9	1.9
			600	6.0	3.1	–	4.3	1.9	–
		3.0	400	6.0	1.7	–	4.6	–	–
			450	4.4	–	–	2.7	–	–
90 x 70		1.5	400	6.0	6.0	6.0	6.0	6.0	4.8
			450	6.0	6.0	5.5	6.0	6.0	3.5
			600	6.0	5.4	1.5	6.0	3.4	–
		3	400	6.0	5.1	–	6.0	3.2	–
			450	6.0	2.5	–	5.3	1.4	–
			600	1.5	–	–	–	–	–

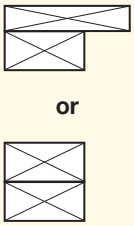
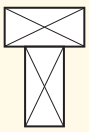
* For definitiion of loaded dimension see 1.3.

NOTE – Substitution with built-up members is not allowed.

Amd 2
May '06

Table 8.16 – Top plates of loadbearing walls (see 8.7.1.1) – VSG 8 and MSG 8

1.5 kPa and 2 kPa floor loads

Plate size (mm x mm)		Position of truss or rafter centre line relative to centre line of nearest stud	Maximum spacing of trusses or rafters (mm)	Light roof			Heavy roof		
				Stud spacing (mm x mm)					
				400	480	600	400	480	600
				Maximum loaded dimension* of wall (mm x mm)					
A Single or top storey (Applies for any spacing of trusses or rafters)									
70 x 45		Anywhere	600 900 1200	6.0 5.5 4.0	6.0 4.2 3.0	4.9 3.0 2.1	4.8 3.0 –	3.7 2.3 –	2.6 1.6 –
		Within 150 mm	600 900 1200	6.0 6.0 4.4	6.0 5.3 3.8	6.0 4.7 3.3	5.4 3.4 –	4.6 2.9 –	4.1 2.5 –
90 x 45		Anywhere	600 900 1200	6.0 6.0 5.3	6.0 5.6 4.0	6.0 4.1 2.9	6.0 4.1 –	4.9 3.1 –	3.6 2.2 –
		Within 150 mm	600 900 1200	6.0 6.0 5.9	6.0 6.0 5.1	6.0 6.0 4.5	6.0 4.5 –	6.0 3.9 –	5.4 3.4 –
90 x 45 plus 140 x 35 or 2/90 x 45	 or	Anywhere	600 900 1200	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 –	6.0 6.0 –	6.0 5.1 –
90 x 45 plus 90 x 45 dwang		Anywhere	600 900 1200	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 –	6.0 6.0 –	6.0 6.0 –

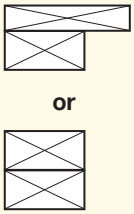
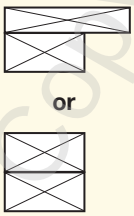
* For definition of loaded dimension see 1.3.

NOTE – Substitution with built-up members is not allowed.

Amd 2 May '06

Table 8.16 – Top plates of loadbearing walls (continued) (see 8.7.1.1) **– VSG 8 and MSG 8**

1.5 kPa and 2 kPa floor loads

Plate size (mm x mm)		Maximum Loaded dimension of wall supporting floor (m)	Maximum spacing of floor joists (mm)	Light roof Stud spacing (mm) 400	480	600	Heavy roof Stud spacing (mm) 400	480	600
				Maximum loaded dimension* of wall above supporting roof (m)					
B Lower of 2 storeys and subfloor stud walls supporting 1 storey									
90 x 45		1.5	400	6.0	6.0	4.9	6.0	5.3	3.0
			450	6.0	6.0	3.7	6.0	4.3	2.3
			600	6.0	3.7	1.4	3.9	2.2	–
		3.0	400	6.0	4.2	–	5.1	2.5	–
			450	6.0	2.6	–	3.7	1.5	–
			600	2.0	–	–	–	–	–
90 x 45 plus 140 x 35 or 2/90 x 45	 or	1.5	400	6.0	6.0	6.0	6.0	6.0	6.0
			450	6.0	6.0	6.0	6.0	6.0	6.0
			600	6.0	6.0	6.0	6.0	6.0	5.7
		3	400	6.0	6.0	6.0	6.0	6.0	6.0
			450	6.0	6.0	6.0	6.0	6.0	6.0
			600	6.0	6.0	4.8	6.0	6.0	3.0
90 x 70		1.5	400	6.0	6.0	6.0	6.0	6.0	6.0
			450	6.0	6.0	6.0	6.0	6.0	6.0
			600	6.0	6.0	6.0	6.0	6.0	6.0
		3	400	6.0	6.0	6.0	6.0	6.0	6.0
			450	6.0	6.0	6.0	6.0	6.0	6.0
			600	6.0	6.0	6.0	6.0	6.0	4.6
C Subfloor stud walls supporting 2 storeys									
90 x 45 plus 140 x 35 or 2/90 x 45	 or	1.5	400	6.0	6.0	6.0	6.0	6.0	6.0
			450	6.0	6.0	6.0	6.0	6.0	5.6
			600	6.0	6.0	3.9	6.0	5.5	2.4
		3.0	400	6.0	6.0	2.9	6.0	6.0	1.7
			450	6.0	6.0	–	6.0	4.2	–
			600	5.5	–	–	3.5	–	–
90 x 70		1.5	400	6.0	6.0	6.0	6.0	6.0	6.0
			450	6.0	6.0	6.0	6.0	6.0	6.0
			600	6.0	6.0	6.0	6.0	6.0	4.0
		3	400	6.0	6.0	6.0	6.0	6.0	4.1
			450	6.0	6.0	3.7	6.0	6.0	2.3
			600	6.0	3.5	–	3.8	2.1	–

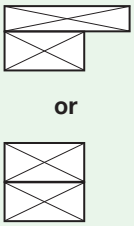
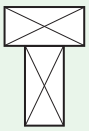
* For definitiion of loaded dimension see 1.3.

NOTE – Substitution with built-up members is not allowed.

Amd 2
May '06

Table 8.16 – Top plates of loadbearing walls (see 8.7.1.1) – VSG 10 and MSG 10

1.5 kPa and 2 kPa floor loads

Plate size (mm x mm)		Position of truss or rafter centre line relative to centre line of nearest stud	Maximum spacing of trusses or rafters (mm)	Light roof			Heavy roof		
				Stud spacing (mm)					
				400	480	600	400	480	600
				Maximum loaded dimension* of wall (m)					
A Single or top storey (Applies for any spacing of trusses or rafters)									
70 x 45		Anywhere	600	6.0	6.0	6.0	6.0	5.5	4.0
			900	6.0	6.0	4.6	4.3	3.5	2.5
			1200	5.7	4.6	3.3	–	–	–
		Within 150 mm	600	6.0	6.0	6.0	6.0	6.0	6.0
			900	6.0	6.0	6.0	4.3	4.1	3.9
			1200	5.7	5.4	5.0	–	–	–
90 x 45		Anywhere	600	6.0	6.0	6.0	6.0	6.0	5.3
			900	6.0	6.0	6.0	5.8	4.6	3.4
			1200	6.0	6.0	4.4	–	–	–
		Within 150 mm	600	6.0	6.0	6.0	6.0	6.0	6.0
			900	6.0	6.0	6.0	5.8	5.5	5.1
			1200	6.0	6.0	6.0	–	–	–
90 x 45 plus 140 x 35 or 2/90 x 45	 or	Anywhere	600	6.0	6.0	6.0	6.0	6.0	6.0
			900	6.0	6.0	6.0	6.0	6.0	6.0
			1200	6.0	6.0	6.0	–	–	–
90 x 45 plus 90 x 45 dwang		Anywhere	600	6.0	6.0	6.0	6.0	6.0	6.0
			900	6.0	6.0	6.0	6.0	6.0	6.0
			1200	6.0	6.0	6.0	–	–	–

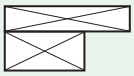
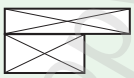
* For definition of loaded dimension see 1.3.

NOTE - Substitution with built-up members is not allowed.

Amd 2 May '06

Table 8.16 – Top plates of loadbearing walls (continued) (see 8.7.1.1) **– VSG 10 and MSG 10**

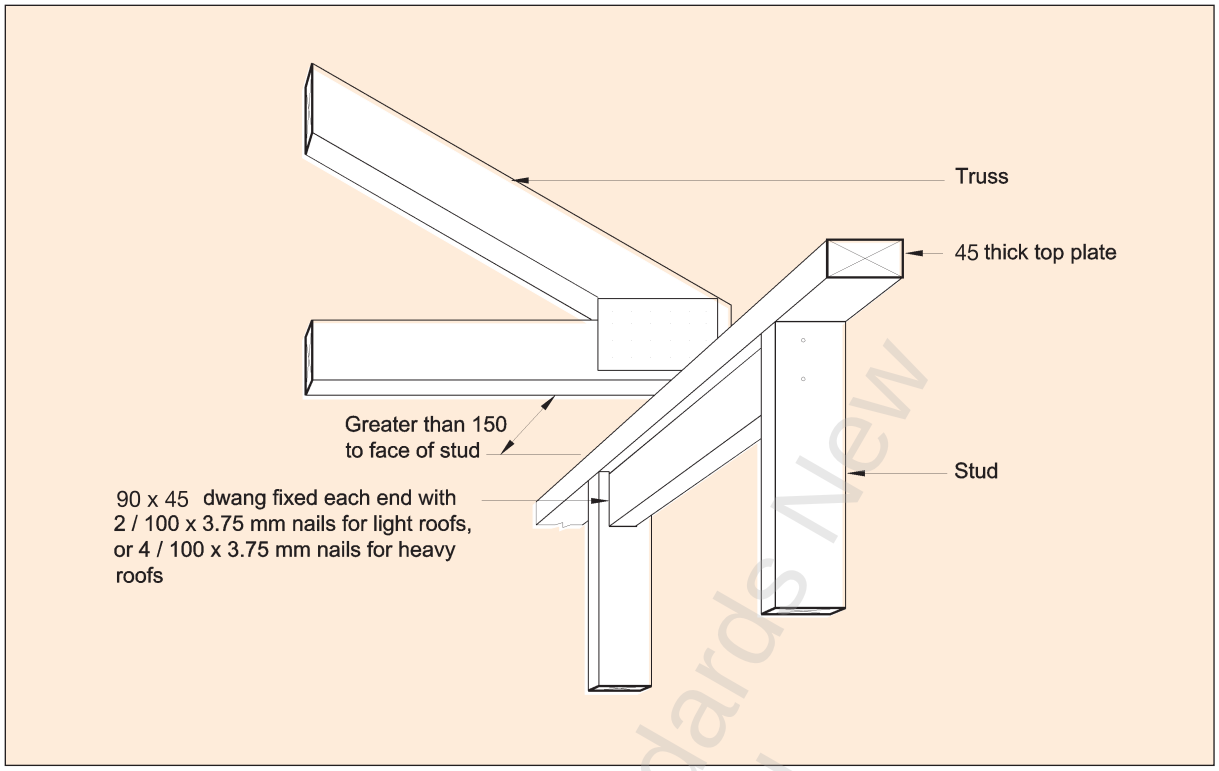
1.5 kPa and 2 kPa floor loads

Plate size (mm x mm)		Maximum Loaded dimension of wall supporting floor (m)	Maximum spacing of floor joists (mm)	Light roof Stud spacing (mm) 400	480	600	Heavy roof Stud spacing (mm) 400	480	600
				Maximum loaded dimension* of wall above supporting roof (m)					
B Lower of 2 storeys and subfloor stud walls supporting 1 storey									
90 x 45		1.5	400	6.0	6.0	6.0	6.0	6.0	6.0
			450	6.0	6.0	6.0	6.0	6.0	4.9
			600	6.0	6.0	4.4	6.0	4.9	2.7
		3.0	400	6.0	6.0	5.3	6.0	6.0	3.3
			450	6.0	6.0	3.6	6.0	5.0	2.2
			600	6.0	3.5	–	4.0	2.1	–
90 x 45 plus 140 x 35 or 2/90 x 45	 or 	1.5	400	6.0	6.0	6.0	6.0	6.0	6.0
			450	6.0	6.0	6.0	6.0	6.0	6.0
			600	6.0	6.0	6.0	6.0	6.0	6.0
		3	400	6.0	6.0	6.0	6.0	6.0	6.0
			450	6.0	6.0	6.0	6.0	6.0	6.0
			600	6.0	6.0	6.0	6.0	6.0	6.0
90 x 70		1.5	400	6.0	6.0	6.0	6.0	6.0	6.0
			450	6.0	6.0	6.0	6.0	6.0	6.0
			600	6.0	6.0	6.0	6.0	6.0	6.0
		3	400	6.0	6.0	6.0	6.0	6.0	6.0
			450	6.0	6.0	6.0	6.0	6.0	6.0
			600	6.0	6.0	6.0	6.0	6.0	6.0
C Subfloor stud walls supporting 2 storeys									
90 x 45 plus 140 x 35 or 2/90 x 45	 or 	1.5	400	6.0	6.0	6.0	6.0	6.0	6.0
			450	6.0	6.0	6.0	6.0	6.0	6.0
			600	6.0	6.0	2.8	6.0	6.0	6.0
		3.0	400	6.0	6.0	6.0	6.0	6.0	6.0
			450	6.0	6.0	6.0	6.0	6.0	5.6
			600	6.0	6.0	1.8	6.0	5.5	–
90 x 70		1.5	400	6.0	6.0	6.0	6.0	6.0	6.0
			450	6.0	6.0	6.0	6.0	6.0	6.0
			600	6.0	6.0	6.0	6.0	6.0	6.0
		3	400	6.0	6.0	6.0	6.0	6.0	6.0
			450	6.0	6.0	6.0	6.0	6.0	6.0
			600	6.0	4.9	3.8	3.8	3.0	2.3

* For definition of loaded dimension see 1.3.

NOTE – Substitution with built-up members is not allowed.

Amd 2
May '06



Amd 2 May '06

Amd 2 May '06

Figure 8.13 – Strengthening top plate (see 8.7.1.1 and table 8.16)

8.7.2 *Bottom plates*

8.7.2.1
Bottom plates shall be of the following dimensions:

(a) *Loadbearing walls*: As given by table 8.17 except as provided by 8.7.2.2 (for walls supporting floors with a live load of 3 kPa see table 14.15);

(b) *Non-loadbearing walls*: The same width as the studs and at least 35 mm thick.

Amd 2 May '06

8.7.2.2
The *bottom plate* of a *loadbearing wall* which is continuously supported by either:

(a) A *joist* (including a *boundary joist*); or

(b) Solid *blocking*; or

(c) A concrete floor slab;

shall be the same width as the *studs* and at least 35 mm thick.

Amd 2 May '06

8.7.3 *Joints in plates*

8.7.3.1
Joints in *top plates* shall be made only over supports being either a *stud* or *blocking*.

Table 8.17 – Bottom plates of loadbearing walls (see 8.7.2.1) – No. 1 Framing and MSG 6

1.5 kPa and 2 kPa floor loads

Plate size (mm x mm)	Maximum loaded dimension of wall supporting floor (m)	Maximum spacing of floor joists (m)	Light roof			Heavy roof		
			Stud spacing (m)					
			400	480	600	400	480	600
			Maximum loaded dimension* of wall supporting roof (m)					
A Single or top storey								
70 x 35	NA	400 450	3.3 2.7	2.4 1.9	1.5 –	1.5 –	– –	– –
70 x 45	NA	400 450 600	6.0 5.6 3.2	5.2 4.4 2.4	3.8 3.2 1.6	3.3 2.8 1.7	2.5 2.1 1.2	1.7 1.4 –
70 x 70	NA	400 450 600	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 4.9	6.0 5.4 3.7
90 x 35	NA	400 450 600	4.7 4.0 1.4	3.7 3.0 –	2.5 2.0 –	2.3 1.9 –	1.7 1.3 –	– – –
90 x 45	NA	400 450 600	6.0 6.0 4.6	6.0 6.0 3.5	5.4 4.6 2.5	4.7 4.0 2.6	3.7 3.1 1.9	2.6 2.2 1.3
90 x 70	NA	400 450 600	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 5.1
B One floor above								
90 x 45	1.5	400 450	3.8 2.6	2.0 –	– –	2.3 1.5	1.2 –	– –
2/90 x 45	1.5	400 450 600	6.0 6.0 6.0	6.0 6.0 4.6	6.0 6.0 2.5	6.0 6.0 3.9	6.0 6.0 2.6	5.2 4.1 1.3
	3.0	400 450 600	6.0 6.0 3.7	6.0 5.6 1.5	4.0 2.3 –	6.0 5.6 2.0	4.8 3.5 –	2.4 1.3 –
90 x 70	1.5	400 450 600	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 4.5	6.0 6.0 6.0	6.0 6.0 4.6	6.0 5.2 2.8
	3.0	400 450 600	6.0 6.0 5.9	6.0 6.0 3.1	5.9 4.0 –	6.0 6.0 3.7	6.0 4.9 1.9	3.7 2.5 –
C Two floors above								
2/90 x 45	1.5	400 450 600	6.0 6.0 2.6	6.0 4.7 –	3.1 1.5 –	6.0 5.1 1.3	4.3 2.9 –	1.8 – –
	3.0	400	2.1	–	–	1.2	–	–
90 x 70	1.5	400 450 600	6.0 6.0 5.0	6.0 6.0 2.3	5.0 3.2 –	6.0 6.0 3.1	5.8 4.3 1.3	3.1 1.9 –
	3.0	400 450	5.0 2.2	– –	– –	3.1 1.3	– –	– –

* For definition of loaded dimension see 1.3. NOTE – Substitution with built-up members is not allowed.

Amd 2
May '06

Table 8.17 – Bottom plates of loadbearing walls (see 8.7.2.1) – VSG 8 and MSG 8

1.5 kPa and 2 kPa floor loads

Plate size (mm x mm)	Maximum loaded dimension of wall supporting floor (m)	Maximum spacing of floor joists (m)	Light roof			Heavy roof		
			Stud spacing (m)					
			400	480	600	400	480	600
			Maximum loaded dimension* of wall supporting roof (m)					
A Single or top storey								
70 x 35	NA	400 450 600	5.3 4.5 1.6	4.2 3.5 –	2.9 2.4 –	2.6 2.2 –	1.9 1.6 –	1.3 – –
70 x 45	NA	400 450 600	6.0 6.0 4.9	6.0 6.0 3.8	6.0 5.1 2.7	5.2 4.5 2.8	4.1 3.5 2.1	3.0 2.5 1.4
70 x 70	NA	400 450 600	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 5.7
90 x 35	NA	400 450 600	6.0 6.0 2.5	5.8 5.0 1.8	4.3 3.6 –	3.7 3.2 1.3	2.9 2.4 –	2.0 1.6 –
90 x 45	NA	400 450 600	6.0 6.0 6.0	6.0 6.0 5.4	6.0 6.0 4.0	6.0 6.0 3.9	5.7 4.9 3.0	4.3 3.6 2.2
90 x 70	NA	400 450 600	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0

* For definition of loaded dimension see 1.3.

NOTE – Substitution with built-up members is not allowed.

Amd 2 May '06

Table 8.17 – Bottom plates of loadbearing walls (see 8.7.2.1) – VSG 8 and MSG 8

1.5 kPa and 2 kPa floor loads

Plate size (mm x mm)	Maximum loaded dimension of wall supporting floor (m)	Maximum spacing of floor joists (m)	Light roof			Heavy roof		
			Stud spacing (m)					
			400	480	600	400	480	600
			Maximum loaded dimension* of wall supporting roof (m)					
B One floor above								
90 x 45	1.5	400	6.0	5.5	3.1	5.0	3.4	1.8
		450	6.0	4.1	2.0	3.9	2.5	–
		600	2.6	1.2	–	1.4	–	–
	3.0	400	3.7	1.3	–	2.2	–	–
		450	2.1	–	–	1.2	–	–
2/90 x 45	1.5	400	6.0	6.0	6.0	6.0	6.0	6.0
		450	6.0	6.0	6.0	6.0	6.0	6.0
		600	6.0	6.0	5.5	6.0	4.8	3.1
	3.0	400	6.0	6.0	6.0	6.0	6.0	6.0
		450	6.0	6.0	6.0	6.0	6.0	4.8
		600	6.0	5.2	2.4	4.7	3.0	1.2
90 x 70	1.5	400	6.0	6.0	6.0	6.0	6.0	6.0
		450	6.0	6.0	6.0	6.0	6.0	6.0
		600	6.0	6.0	6.0	6.0	6.0	5.7
	3.0	400	6.0	6.0	6.0	6.0	6.0	6.0
		450	6.0	6.0	6.0	6.0	6.0	6.0
		600	6.0	6.0	4.8	6.0	5.5	3.0
C Two floors above								
90 x 45	1.5	400	2.8	–	–	1.7	–	–
		450	1.2	–	–	–	–	–
2/90 x 45	1.5	400	6.0	6.0	6.0	6.0	6.0	5.7
		450	6.0	6.0	6.0	6.0	6.0	4.2
		600	6.0	4.2	1.3	4.0	2.3	–
	3.0	400	6.0	5.7	–	6.0	3.6	–
		450	6.0	2.9	–	4.7	1.7	–
90 x 70	1.5	400	6.0	6.0	6.0	6.0	6.0	6.0
		450	6.0	6.0	6.0	6.0	6.0	5.8
		600	6.0	6.0	3.9	6.0	4.9	2.4
	3.0	400	6.0	6.0	3.3	6.0	5.8	2.0
		450	6.0	5.9	–	6.0	3.7	–
		600	3.3	–	–	2.0	–	–

* For definition of loaded dimension see 1.3.

NOTE – Substitution with built-up members is not allowed.

Amd 2
May '06

Table 8.17 – Bottom plates of loadbearing walls (see 8.7.2.1) – VSG 10 and MSG 10

1.5 kPa and 2 kPa floor loads

Plate size (mm x mm)	Maximum loaded dimension of wall supporting floor (m)	Maximum spacing of floor joists (m)	Light roof			Heavy roof		
			Stud spacing (m)					
			400	480	600	400	480	600
			Maximum loaded dimension* of wall supporting roof (m)					
A Single or top storey								
70 x 35	NA	400 450 600	6.0 6.0 2.4	6.0 5.7 1.7	5.0 4.2 –	4.3 3.7 1.2	3.4 2.8 –	2.4 2.0 –
70 x 45	NA	400 450 600	6.0 6.0 6.0	6.0 6.0 5.1	6.0 6.0 3.8	6.0 6.0 3.7	6.0 5.6 2.9	4.9 4.2 2.1
70 x 70	NA	400 450 600	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0
90 x 35	NA	400 450 600	6.0 6.0 3.5	6.0 6.0 2.6	6.0 5.9 1.8	5.9 5.1 1.9	4.7 4.0 1.4	3.5 2.9 –
90 x 45	NA	400 450 600	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 5.3	6.0 6.0 5.1	6.0 6.0 4.1	6.0 5.8 3.0
90 x 70	NA	400 450 600	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0

* For definition of loaded dimension see 1.3.

NOTE – Substitution with built-up members is not allowed.

Amd 2
May '06

Table 8.17 – Bottom plates of loadbearing walls (see 8.7.2.1) – VSG 10 and MSG 10

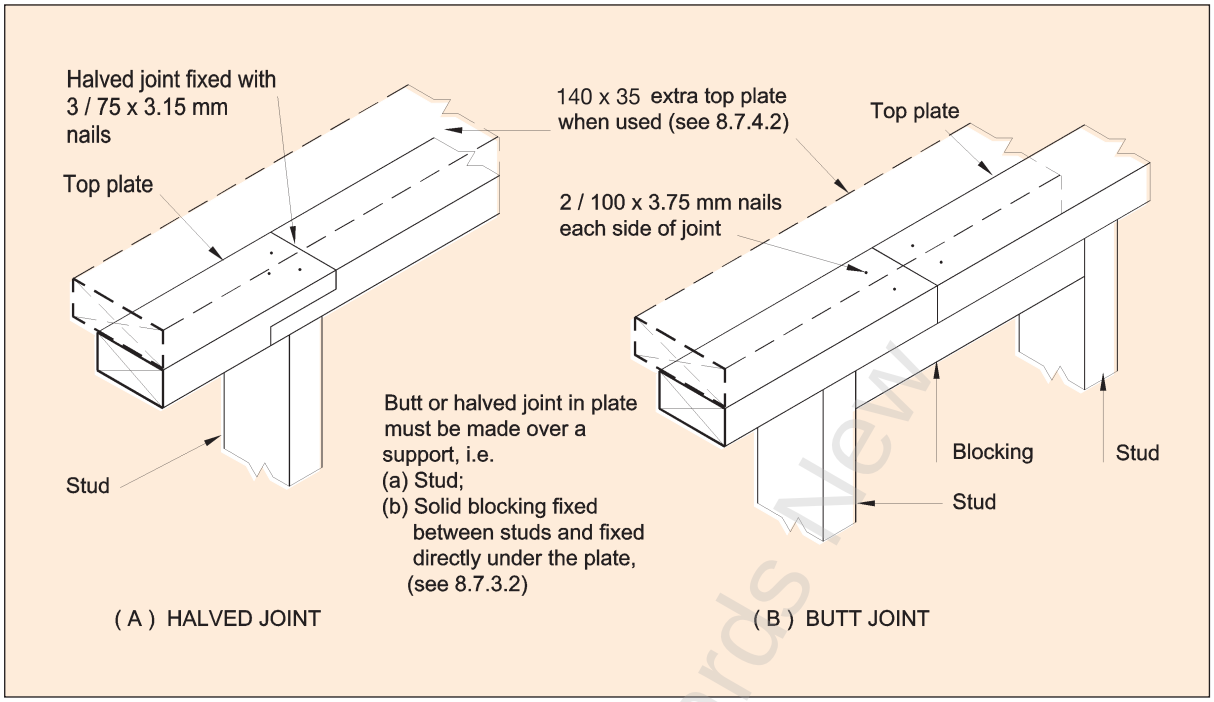
1.5 kPa and 2 kPa floor loads

Plate size (mm x mm)	Maximum loaded dimension of wall supporting floor (m)	Maximum spacing of floor joists (m)	Light roof			Heavy roof		
			Stud spacing (m)					
			400	480	600	400	480	600
			Maximum loaded dimension* of wall supporting roof (m)					
B One floor above								
90 x 45	1.5	400	6.0	6.0	6.0	6.0	6.0	4.5
		450	6.0	6.0	5.6	6.0	5.5	3.5
		600	4.7	2.9	1.2	2.6	1.6	–
	3.0	400	6.0	6.0	3.0	6.0	4.0	1.8
		450	6.0	4.5	1.5	4.8	2.8	–
		600	1.6	–	–	–	–	–
2/90 x 45	1.5	400	6.0	6.0	6.0	6.0	6.0	6.0
		450	6.0	6.0	6.0	6.0	6.0	6.0
		600	6.0	6.0	6.0	6.0	6.0	4.8
	3.0	400	6.0	6.0	6.0	6.0	6.0	6.0
		450	6.0	6.0	6.0	6.0	6.0	6.0
		600	6.0	6.0	5.1	6.0	5.0	2.9
90 x 70	1.5	400	6.0	6.0	6.0	6.0	6.0	6.0
		450	6.0	6.0	6.0	6.0	6.0	6.0
		600	6.0	6.0	6.0	6.0	6.0	6.0
	3.0	400	6.0	6.0	6.0	6.0	6.0	6.0
		450	6.0	6.0	6.0	6.0	6.0	6.0
		600	6.0	6.0	6.0	6.0	6.0	6.0
C Two floors above								
90 x 45	1.5	400	6.0	5.6	2.1	5.7	3.5	1.2
		450	6.0	3.7	–	4.2	2.2	–
2/90 x 45	1.5	400	6.0	6.0	6.0	6.0	6.0	6.0
		450	6.0	6.0	6.0	6.0	6.0	6.0
		600	6.0	6.0	4.1	6.0	4.4	2.2
	3.0	400	6.0	6.0	6.0	6.0	6.0	6.0
		450	6.0	6.0	6.0	6.0	6.0	3.9
		600	5.0	1.4	–	2.8	–	–
90 x 70	1.5	400	6.0	6.0	6.0	6.0	6.0	6.0
		450	6.0	6.0	6.0	6.0	6.0	6.0
		600	6.0	6.0	6.0	6.0	6.0	6.0
	3.0	400	6.0	6.0	6.0	6.0	6.0	6.0
		450	6.0	6.0	6.0	6.0	6.0	6.0
		600	6.0	6.0	2.2	6.0	4.9	1.3

* For definition of loaded dimension see 1.3.

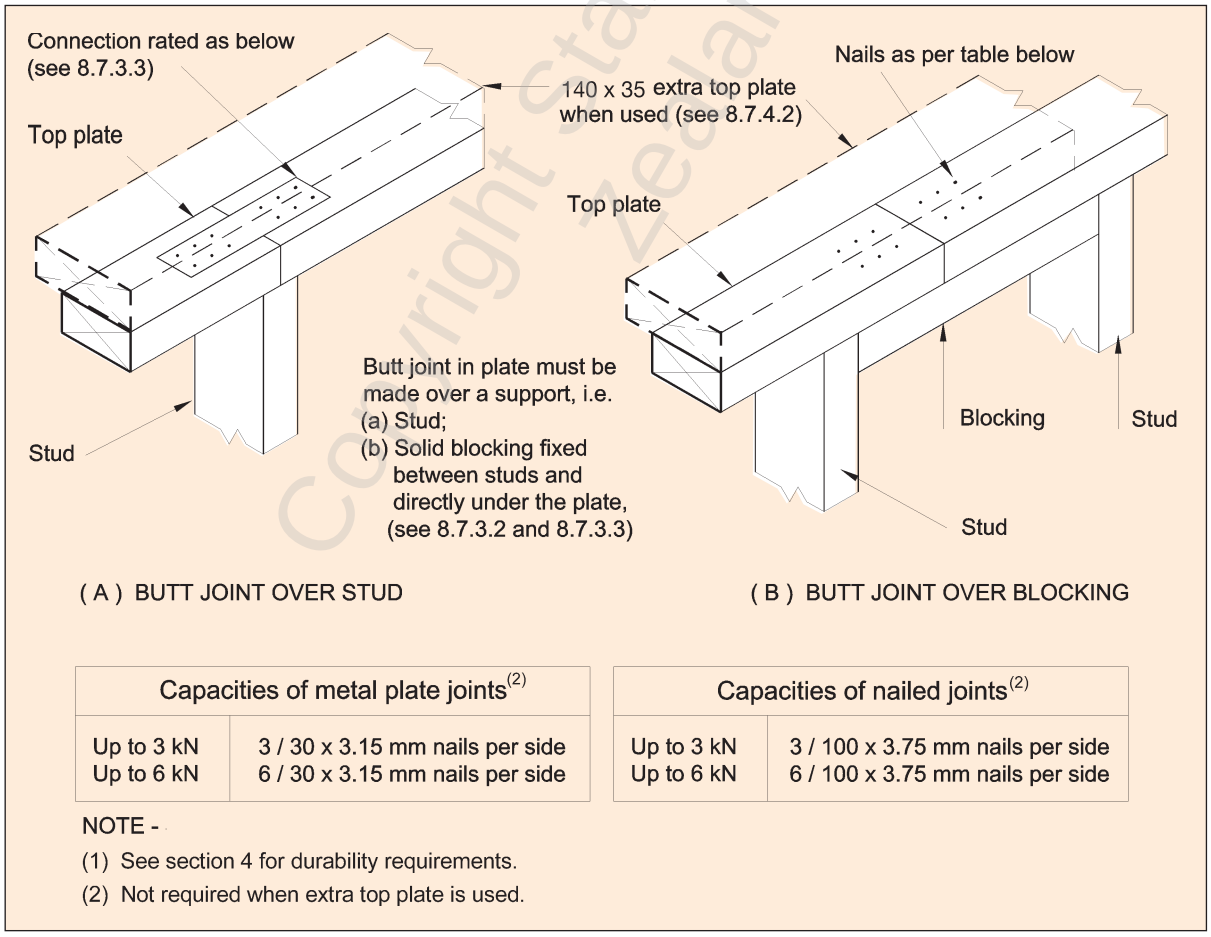
NOTE – Substitution with built-up members is not allowed.

Amd 2
May '06



Amd 2 May '06

Figure 8.14 – Connecting top plates – Walls not containing bracing (see 8.7.3.2)



Amd 2 May '06

Capacities of metal plate joints(2)	
Up to 3 kN	3 / 30 x 3.15 mm nails per side
Up to 6 kN	6 / 30 x 3.15 mm nails per side

Capacities of nailed joints(2)	
Up to 3 kN	3 / 100 x 3.75 mm nails per side
Up to 6 kN	6 / 100 x 3.75 mm nails per side

Amd 1 Dec '00

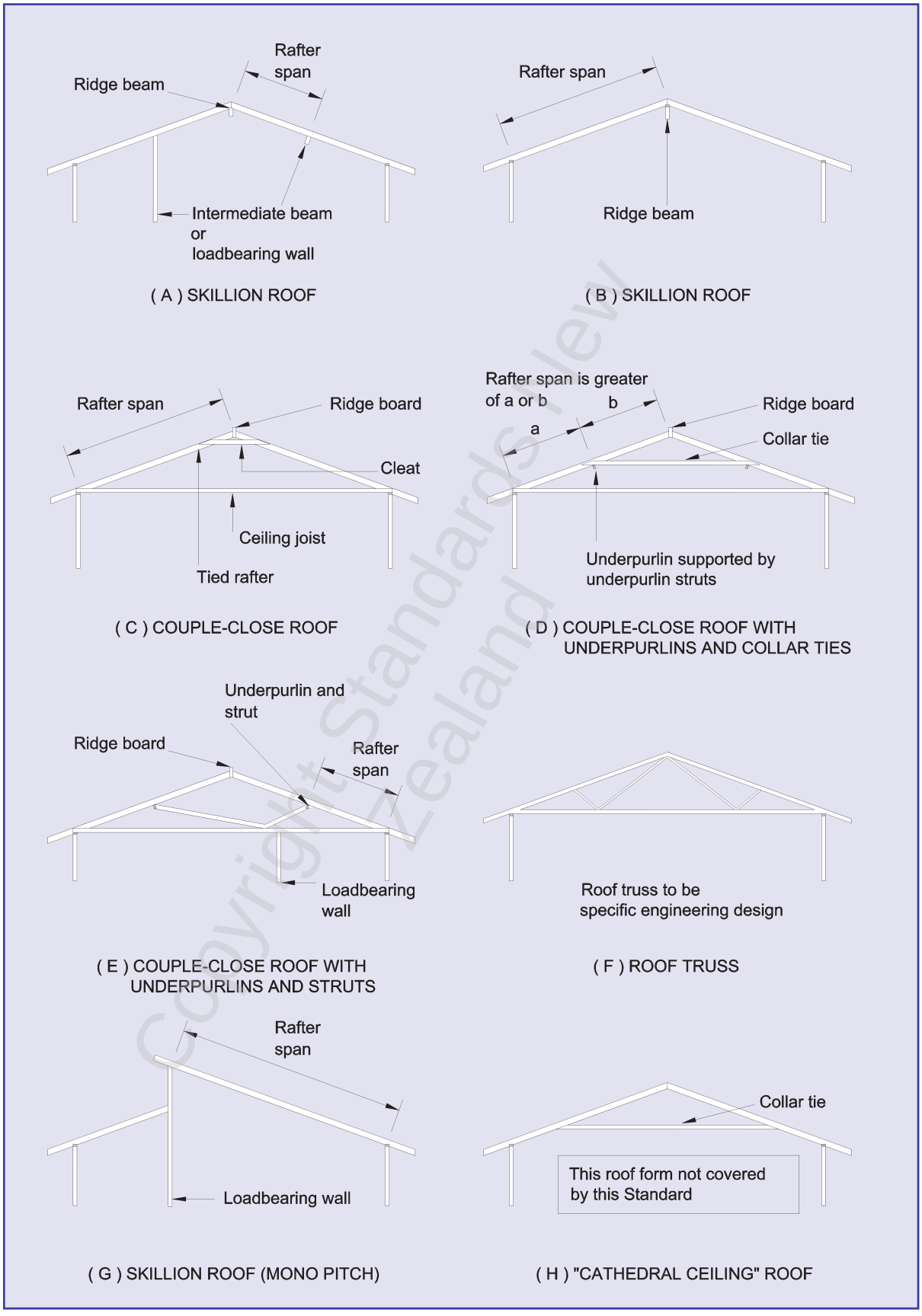
NOTE -

(1) See section 4 for durability requirements.

(2) Not required when extra top plate is used.

Amd 1 Dec '00

Figure 8.15 – Connecting top plates in line – Walls containing bracing (see 8.7.3.3)



10.3 – Rafter spans (see 10.2.1.3.1)

Table 10.2 – Rafters (see 10.2.1.3.2) – No. 1 Framing and MSG 6

(a) Light roof for low wind zone

Rafter size (Width x thickness)	Rafter spacing (mm)					
	600		900		1200	
	Rafter span	Fixing type	Rafter span	Fixing type	Rafter span	Fixing type
(mm x mm)	(m)		(m)		(m)	
70 x 35	1.6	A	1.4	A	1.2	A
90 x 35	2.0	A	1.8	A	1.6	A
140 x 35	3.1	A	2.6	B	2.4	B
70 x 45	1.7	A	1.5	A	1.4	A
90 x 45	2.2	A	1.9	A	1.8	A
140 x 45	3.5	A	3.0	B	2.8	B
190 x 45	4.4	B	3.8	B	3.4	B
240 x 45	4.7	B	4.1	B	3.7	B
290 x 45	5.0	B	4.4	B	4.0	B
90 x 70	2.6	A	2.3	A	2.0	B
140 x 70	4.0	B	3.5	B	3.2	B
190 x 70	5.5	B	4.8	B	4.4	B
240 x 70	7.0	B	6.1	B	5.5	B
290 x 70	7.9	B	6.9	B	6.2	B

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.

(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.

(3) For the full range of fixing types and capacity see table 10.13.

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

Amd 2 May '06

Table 10.2 – Rafters (continued) (see 10.2.1.3.2) **– No. 1 Framing and MSG 6**

(b) Light roof for medium wind zone

Rafter size (Width x thickness)	Rafter spacing (mm)					
	600		900		1200	
	Rafter span	Fixing type	Rafter span	Fixing type	Rafter span	Fixing type
(mm x mm)	(m)		(m)		(m)	
70 x 35	1.5	A	1.3	A	1.2	A
90 x 35	1.9	A	1.7	A	1.5	B
140 x 35	2.7	A	2.4	B	2.1	B
70 x 45	1.6	A	1.4	A	1.3	A
90 x 45	2.1	A	1.8	A	1.6	B
140 x 45	3.3	B	2.9	B	2.6	B
190 x 45	3.9	B	3.4	B	3.1	B
240 x 45	4.2	B	3.7	B	3.3	B
290 x 45	4.5	B	3.9	B	3.6	B
90 x 70	2.4	A	2.1	B	1.9	B
140 x 70	3.8	B	3.3	B	3.0	B
190 x 70	5.2	B	4.5	B	4.1	B
240 x 70	6.5	B	5.7	B	5.2	B
290 x 70	7.0	B	6.1	B	5.5	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.

(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.

(3) For the full range of fixing types and capacity see table 10.13.

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

Amd 2 May '06

Table 10.2 – Rafters (continued) (see 10.2.1.3.2) **– No. 1 Framing and MSG 6**

(c) Light roof for high wind zone

Rafter size (Width x thickness)	Rafter spacing (mm)					
	600		900		1200	
	Rafter span	Fixing type	Rafter span	Fixing type	Rafter span	Fixing type
(mm x mm)	(m)		(m)		(m)	
70 x 35	1.3	A	–	–	–	–
90 x 35	1.7	A	1.4	B	1.3	B
140 x 35	2.4	B	2.1	B	1.8	B
70 x 45	1.4	A	1.2	A	–	–
90 x 45	1.8	A	1.6	B	1.4	B
140 x 45	2.8	B	2.5	B	2.2	B
190 x 45	3.4	B	3.0	B	2.7	B
240 x 45	3.7	B	3.2	B	2.9	B
290 x 45	4.0	B	3.5	B	3.1	B
90 x 70	2.1	B	1.8	B	1.7	B
140 x 70	3.3	B	2.9	B	2.6	B
190 x 70	4.5	B	3.9	B	3.6	B
240 x 70	5.7	B	5.0	B	4.5	C
290 x 70	6.2	B	5.4	C	4.9	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.

(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.

(3) For the full range of fixing types and capacity see table 10.13.

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

Amd 2 May '06

Table 10.2 – Rafters (continued) (see 10.2.1.3.2) **– No. 1 Framing and MSG 6**

(d) Light roof for very high wind zone

Rafter size (Width x thickness)	Rafter spacing (mm)					
	600		900		1200	
	Rafter span	Fixing type	Rafter span	Fixing type	Rafter span	Fixing type
(mm x mm)	(m)		(m)		(m)	
70 x 35	1.2	A	–	–	–	–
90 x 35	1.5	B	1.3	B	1.2	B
140 x 35	2.2	B	1.9	B	1.7	B
70 x 45	1.3	A	–	–	–	–
90 x 45	1.6	B	1.4	B	1.3	B
140 x 45	2.6	B	2.2	B	2.0	B
190 x 45	3.1	B	2.7	B	2.4	B
240 x 45	3.4	B	2.9	B	2.7	B
290 x 45	3.6	B	3.1	B	2.9	C
90 x 70	1.9	B	1.7	B	1.5	B
140 x 70	3.0	B	2.6	B	2.4	B
190 x 70	4.1	B	3.6	B	3.2	C
240 x 70	5.2	B	4.5	C	4.1	C
290 x 70	5.6	B	4.9	C	4.4	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.

(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.

(3) For the full range of fixing types and capacity see table 10.13.

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

Amd 2 May '06

Table 10.2 – Rafters (continued) (see 10.2.1.3.2) **– No. 1 Framing and MSG 6**

(e) Heavy roof for low and medium wind zones

Rafter size (Width x thickness)	Rafter spacing (mm)								
	480			600			900		
	Rafter span	Fixing type		Rafter span	Fixing type		Rafter span	Fixing type	
(mm x mm)	(m)	L	M	(m)	L	M	(m)	L	M
70 x 35	1.2	A	A	–	–	–	–	–	–
90 x 35	1.5	A	A	1.4	A	A	1.2	A	A
140 x 35	2.4	A	A	2.2	A	A	1.9	A	A
70 x 45	1.3	A	A	1.2	A	A	–	–	–
90 x 45	1.6	A	A	1.5	A	A	1.3	A	A
140 x 45	2.6	A	A	2.4	A	A	2.1	A	A
190 x 45	3.5	A	A	3.3	A	A	2.9	A	B
240 x 45	4.5	A	A	4.2	A	A	3.6	A	B
290 x 45	5.4	A	B	5.0	A	B	4.4	A	B
90 x 70	1.9	A	A	1.8	A	A	1.5	A	A
140 x 70	3.0	A	A	2.8	A	A	2.4	A	A
190 x 70	4.1	A	A	3.8	A	A	3.3	A	B
240 x 70	5.2	B	B	4.8	B	B	4.2	B	B
290 x 70	6.3	B	B	5.8	B	B	5.1	B	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.

(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.

(3) For the full range of fixing types and capacity see table 10.13.

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

Amd 2 May '06

Table 10.2 – Rafters (continued) (see 10.2.1.3.2) **– No. 1 Framing and MSG 6**

(f) Heavy roof for high and very high wind zones

Rafter size (Width x thickness)	Rafter spacing (mm)								
	480			600			900		
	Rafter span	Fixing type		Rafter span	Fixing type		Rafter span	Fixing type	
(mm x mm)	(m)	H	VH	(m)	H	VH	(m)	H	VH
70 x 35	1.2	A	A	–	–	–	–	–	–
90 x 35	1.5	A	A	1.4	A	A	1.2	A	B
140 x 35	2.4	A	B	2.2	A	B	1.9	B	B
70 x 45	1.3	A	A	1.2	A	A	–	–	–
90 x 45	1.6	A	A	1.5	A	A	1.3	A	B
140 x 45	2.6	A	B	2.4	A	B	2.1	B	B
190 x 45	3.5	B	B	3.3	B	B	2.9	B	B
240 x 45	3.9	B	B	3.6	B	B	3.1	B	B
290 x 45	4.7*	B	–	4.3*	B	–	3.8*	B	–
290 x 45	4.2†	–	B	3.9†	–	B	3.4†	–	B
90 x 70	1.9	A	A	1.8	A	B	1.5	A	B
140 x 70	3.0	A	B	2.8	B	B	2.4	B	B
190 x 70	4.1	B	B	3.8	B	B	3.3	B	B
240 x 70	5.2	B	B	4.8	B	B	4.2	B	B
290 x 70	6.3	B	B	5.8	B	B	5.1	B	C

* High wind zone
† Very high wind zone

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –
(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.
(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.
(3) For the full range of fixing types and capacity see table 10.13.
(4) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Table 10.2 – Rafters (continued) (see 10.2.1.3.2) **– No. 1 Framing and MSG 6**

(g) Dimensions for valley rafters for all wind zones

Rafter size (Width x thickness)	Maximum span of valley rafters (m) and their fixing types for all wind zones			
	Light roof		Heavy roof	
	Rafter span	Fixing type	Rafter span	Fixing type
(mm x mm)	(m)		(m)	
70 x 35	1.2	B	–	–
90 x 35	1.4	B	1.3	B
140 x 35	2.0	B	1.9	B
70 x 45	1.2	B	1.2	B
90 x 45	1.5	B	1.4	B
140 x 45	2.1	B	2.0	B
190 x 45	2.7	B	2.5	B
240 x 45	3.2	B	3.0	B
290 x 45	3.7	C	3.5	B
90 x 70	1.7	B	1.6	B
140 x 70	2.4	B	2.2	B
190 x 70	3.0	B	2.8	B
240 x 70	3.6	C	3.4	B
290 x 70	4.1	C	3.9	B

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) For the full range of fixing types and capacity see table 10.13.

(2) Proprietary fixings that have the required fxing capacity indicated in tables may be used.

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

Amd 2 May '06

Table 10.2 – Rafters (see 10.2.1.3.2) – VSG 8 and MSG 8

(a) Light roof for low wind zone

Rafter size (Width x thickness)	Rafter spacing (mm)					
	600		900		1200	
	Rafter span	Fixing type	Rafter span	Fixing type	Rafter span	Fixing type
(mm x mm)	(m)		(m)		(m)	
70 x 35	1.7	A	1.5	A	1.4	A
90 x 35	2.3	A	2.0	A	1.8	A
140 x 35	3.4	A	3.0	B	2.7	B
70 x 45	1.9	A	1.7	A	1.5	A
90 x 45	2.5	A	2.1	A	1.9	A
140 x 45	3.9	A	3.4	B	3.1	B
190 x 45	4.9	B	4.3	B	3.9	B
240 x 45	5.3	B	4.6	B	4.2	B
290 x 45	5.7	B	4.9	B	4.5	B
90 x 70	2.9	A	2.5	A	2.3	B
140 x 70	4.5	B	3.9	B	3.5	B
190 x 70	6.1	B	5.3	B	4.8	B
240 x 70	7.7	B	6.7	B	6.1	B
290 x 70	8.8	B	7.7	B	7.0	B

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.

(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.

(3) For the full range of fixing types and capacity see table 10.13.

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

Amd 2 May '06

Table 10.2 – Rafters (continued) (see 10.2.1.3.2) **– VSG 8 and MSG 8**

(b) Light roof for medium wind zone

Rafter size (Width x thickness)	Rafter spacing (mm)					
	600		900		1200	
	Rafter span	Fixing type	Rafter span	Fixing type	Rafter span	Fixing type
(mm x mm)	(m)		(m)		(m)	
70 x 35	1.6	A	1.4	A	1.3	A
90 x 35	2.1	A	1.8	A	1.7	B
140 x 35	3.1	B	2.7	B	2.4	B
70 x 45	1.8	A	1.6	A	1.4	B
90 x 45	2.3	A	2.0	B	1.8	B
140 x 45	3.6	B	3.2	B	2.9	B
190 x 45	4.4	B	3.8	B	3.4	B
240 x 45	4.7	B	4.1	B	3.7	B
290 x 45	5.1	B	4.4	B	4.0	B
90 x 70	2.7	A	2.3	B	2.1	B
140 x 70	4.2	B	3.7	B	3.3	B
190 x 70	5.7	B	5.0	B	4.5	B
240 x 70	7.2	B	6.3	B	5.7	C
290 x 70	7.9	B	6.9	B	6.2	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.

(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.

(3) For the full range of fixing types and capacity see table 10.13.

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

Amd 2 May '06

Table 10.2 – Rafters (continued) (see 10.2.1.3.2) **– VSG 8 and MSG 8**

(c) Light roof for high wind zone

Rafter size (Width x thickness)	Rafter spacing (mm)					
	600		900		1200	
	Rafter span	Fixing type	Rafter span	Fixing type	Rafter span	Fixing type
(mm x mm)	(m)		(m)		(m)	
70 x 35	1.4	A	1.2	A	–	–
90 x 35	1.8	A	1.6	B	1.4	B
140 x 35	2.7	B	2.3	B	2.1	B
70 x 45	1.5	A	1.3	B	1.2	B
90 x 45	2.0	B	1.7	B	1.6	B
140 x 45	3.1	B	2.7	B	2.5	B
190 x 45	3.9	B	3.3	B	3.0	B
240 x 45	4.2	B	3.6	B	3.3	B
290 x 45	4.4	B	3.9	B	3.5	B
90 x 70	2.3	B	2.0	B	1.8	B
140 x 70	3.6	B	3.2	B	2.9	B
190 x 70	5.0	B	4.3	B	3.9	C
240 x 70	6.3	B	5.5	C	5.0	C
290 x 70	6.9	B	6.1	C	5.5	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.

(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.

(3) For the full range of fixing types and capacity see table 10.13.

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

Amd 2 May '06

Table 10.2 – Rafters (continued) (see 10.2.1.3.2) **– VSG 8 and MSG 8**

(d) Light roof for very high wind zone

Rafter size (Width x thickness)	Rafter spacing (mm)					
	600		900		1200	
	Rafter span	Fixing type	Rafter span	Fixing type	Rafter span	Fixing type
(mm x mm)	(m)		(m)		(m)	
70 x 35	1.3	A	–	–	–	–
90 x 35	1.7	B	1.5	B	1.3	B
140 x 35	2.4	B	2.1	B	1.9	B
70 x 45	1.4	A	1.2	B	–	–
90 x 45	1.8	B	1.6	B	1.4	B
140 x 45	2.9	B	2.5	B	2.3	B
190 x 45	3.5	B	3.0	B	2.7	B
240 x 45	3.8	B	3.3	B	3.0	C
290 x 45	4.1	B	3.5	B	3.2	C
90 x 70	2.1	B	1.8	B	1.7	B
140 x 70	3.3	B	2.9	B	2.6	B
190 x 70	4.5	B	3.9	C	3.6	C
240 x 70	5.7	B	5.0	C	4.5	C
290 x 70	6.3	C	5.5	C	5.0	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.

(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.

(3) For the full range of fixing types and capacity see table 10.13.

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

Amd 2 May '06

Table 10.2 – Rafters (continued) (see 10.2.1.3.2) **– VSG 8 and MSG 8**

(e) Heavy roof for low and medium wind zone

Rafter size (Width x thickness)	Rafter spacing (mm)								
	480			600			900		
	Rafter span	Fixing type		Rafter span	Fixing type		Rafter span	Fixing type	
(mm x mm)	(m)	L	M	(m)	L	M	(m)	L	M
70 x 35	1.3	A	A	1.2	A	A	–	–	–
90 x 35	1.7	A	A	1.6	A	A	1.4	A	A
140 x 35	2.6	A	A	2.4	A	A	2.1	A	A
70 x 45	1.4	A	A	1.3	A	A	–	–	–
90 x 45	1.8	A	A	1.7	A	A	1.5	A	A
140 x 45	2.9	A	A	2.7	A	A	2.3	A	A
190 x 45	3.9	A	A	3.6	A	A	3.2	A	B
240 x 45	4.9	A	A	4.6	A	B	4.0	A	B
290 x 45	6.0	A	B	5.6	A	B	4.8	A	B
90 x 70	2.1	A	A	2.0	A	A	1.7	A	A
140 x 70	3.3	A	A	3.1	A	A	2.7	A	A
190 x 70	4.5	A	A	4.2	A	A	3.7	A	B
240 x 70	5.7	B	B	5.3	B	B	4.6	B	C
290 x 70	6.9	B	B	6.4	B	B	5.6	B	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.

(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.

(3) For the full range of fixing types and capacity see table 10.13.

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

Amd 2 May '06

Table 10.2 – Rafters (continued) (see 10.2.1.3.2) **– VSG 8 and MSG 8**

(f) Heavy roof for high and very high wind zone

Rafter size (Width x thickness)	Rafter spacing (mm)								
	480			600			900		
	Rafter span	Fixing type		Rafter span	Fixing type		Rafter span	Fixing type	
(mm x mm)	(m)	H	VH	(m)	H	VH	(m)	H	VH
70 x 35	1.3	A	A	1.2	A	A	–	–	–
90 x 35	1.7	A	A	1.6	A	A	1.4	A	B
140 x 35	2.6	A	B	2.4	A	B	2.1	B	B
70 x 45	1.4	A	A	1.3	A	A	–	–	–
90 x 45	1.8	A	A	1.7	A	A	1.5	A	B
140 x 45	2.9	A	B	2.7	B	B	2.3	B	B
190 x 45	3.9	B	B	3.6	B	B	3.2	B	B
240 x 45	4.4	B	B	4.1	B	B	3.5	B	B
290 x 45	5.2*	B	–	4.9*	B	–	4.2*	B	–
290 x 45	4.7†	–	B	4.3†	–	B	3.8†	–	B
90 x 70	2.1	A	A	2.0	A	B	1.7	B	B
140 x 70	3.3	B	B	3.1	B	B	2.7	B	B
190 x 70	4.5	B	B	4.2	B	B	3.7	B	B
240 x 70	5.7	B	B	5.3	B	B	4.6	B	C
290 x 70	6.9	B	B	6.4	B	B	5.6	B	C

* High wind zone
† Very high wind zone

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –
(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.
(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.
(3) For the full range of fixing types and capacity see table 10.13.
(4) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Table 10.2 – Rafters (continued) (see 10.2.1.3.2) **– VSG 8 and MSG 8**

(g) Dimensions for valley rafters for all wind zones

Rafter size (Width x thickness)	Maximum span of valley rafters (m) and their fixing types for all wind zones			
	Light roof		Heavy roof	
	Rafter span	Fixing type	Rafter span	Fixing type
(mm x mm)	(m)		(m)	
70 x 35	1.3	B	1.2	B
90 x 35	1.5	B	1.4	B
140 x 35	2.1	B	2.0	B
70 x 45	1.3	B	1.3	B
90 x 45	1.6	B	1.5	B
140 x 45	2.3	B	2.2	B
190 x 45	2.9	B	2.7	B
240 x 45	3.4	C	3.3	B
290 x 45	4.0	C	3.8	B
90 x 70	1.8	B	1.7	B
140 x 70	2.5	B	2.4	B
190 x 70	3.2	B	3.1	B
240 x 70	3.8	C	3.6	B
290 x 70	4.4	C	4.2	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) For the full range of fixing types and capacity see table 10.13.

(2) Proprietary fixings that have the required fxing capacity indicated in tables may be used.

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

Amd 2
May '06

Table 10.2 – Rafters (see 10.2.1.3.2) – VSG 10 and MSG 10

(a) Light roof for low wind zone

Rafter size (Width x thickness)	Rafter spacing (mm)					
	600		900		1200	
	Rafter span	Fixing type	Rafter span	Fixing type	Rafter span	Fixing type
(mm x mm)	(m)		(m)		(m)	
70 x 35	1.9	A	1.6	A	1.5	A
90 x 35	2.4	A	2.1	A	1.9	A
140 x 35	3.8	A	3.3	B	3.0	B
70 x 45	2.1	A	1.8	A	1.6	A
90 x 45	2.7	A	2.3	A	2.1	B
140 x 45	4.1	B	3.6	B	3.3	B
190 x 45	5.5	B	4.8	B	4.4	B
240 x 45	6.0	B	5.2	B	4.7	B
290 x 45	6.4	B	5.6	B	5.0	B
90 x 70	3.1	A	2.7	B	2.7	B
140 x 70	4.8	B	4.2	B	3.8	B
190 x 70	6.5	B	5.7	B	5.2	B
240 x 70	8.1	B	7.2	B	6.6	B
290 x 70	9.3	B	8.4	B	7.8	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.

(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.

(3) For the full range of fixing types and capacity see table 10.13.

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

Amd 2 May '06

Table 10.2 – Rafters (continued) (see 10.2.1.3.2) **– VSG 10 and MSG 10**

(b) Light roof for medium wind zone

Rafter size (Width x thickness)	Rafter spacing (mm)					
	600		900		1200	
	Rafter span	Fixing type	Rafter span	Fixing type	Rafter span	Fixing type
(mm x mm)	(m)		(m)		(m)	
70 x 35	1.8	A	1.5	A	1.4	B
90 x 35	2.3	A	2.0	B	1.8	B
140 x 35	3.5	B	3.0	B	2.7	B
70 x 45	1.9	A	1.7	A	1.5	B
90 x 45	2.5	A	2.2	B	2.0	B
140 x 45	3.9	B	3.4	B	3.1	B
190 x 45	4.9	B	4.3	B	3.9	B
240 x 45	5.4	B	4.7	B	4.2	B
290 x 45	5.7	B	5.0	B	4.5	B
90 x 70	2.9	B	2.5	B	2.3	B
140 x 70	4.5	B	3.9	B	3.6	B
190 x 70	6.1	B	5.4	B	4.9	B
240 x 70	7.7	B	6.8	B	6.2	C
290 x 70	8.9	B	7.8	C	7.0	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.

(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.

(3) For the full range of fixing types and capacity see table 10.13.

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

Amd 2 May '06

Table 10.2 – Rafters (continued) (see 10.2.1.3.2) **– VSG 10 and MSG 10**

(c) Light roof for high wind zone

Rafter size (Width x thickness)	Rafter spacing (mm)					
	600		900		1200	
	Rafter span	Fixing type	Rafter span	Fixing type	Rafter span	Fixing type
(mm x mm)	(m)		(m)		(m)	
70 x 35	1.5	A	1.3	B	1.2	B
90 x 35	2.0	B	1.7	B	1.6	B
140 x 35	3.0	B	2.6	B	2.4	B
70 x 45	1.7	A	1.4	B	1.3	B
90 x 45	2.2	B	1.9	B	1.7	B
140 x 45	3.4	B	2.9	B	2.7	B
190 x 45	4.4	B	3.8	B	3.4	B
240 x 45	4.7	B	4.1	B	3.7	B
290 x 45	5.0	B	4.4	B	4.0	C
90 x 70	2.5	B	2.2	B	2.0	B
140 x 70	3.9	B	3.4	B	3.1	B
190 x 70	5.3	B	4.7	B	4.2	C
240 x 70	6.7	B	5.9	C	5.3	C
290 x 70	7.8	C	6.8	C	6.2	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.

(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.

(3) For the full range of fixing types and capacity see table 10.13.

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

Amd 2 May '06

Table 10.2 – Rafters (continued) (see 10.2.1.3.2) **– VSG 10 and MSG 10**

(d) Light roof for very high wind zone

Rafter size (Width x thickness)	Rafter spacing (mm)					
	600		900		1200	
	Rafter span	Fixing type	Rafter span	Fixing type	Rafter span	Fixing type
(mm x mm)	(m)		(m)		(m)	
70 x 35	1.4	A	1.2	B	–	–
90 x 35	1.8	B	1.6	B	1.4	B
140 x 35	2.8	B	2.4	B	2.2	B
70 x 45	1.5	B	1.3	B	1.2	B
90 x 45	2.0	B	1.7	B	1.5	B
140 x 45	3.1	B	2.7	B	2.4	B
190 x 45	4.0	B	3.4	B	3.1	C
240 x 45	4.3	B	3.7	B	3.4	C
290 x 45	4.6	B	4.0	C	3.6	C
90 x 70	2.3	B	2.0	B	1.8	B
140 x 70	3.6	B	3.1	B	2.8	C
190 x 70	4.8	B	4.2	C	3.8	C
240 x 70	6.1	C	5.4	C	4.9	C
290 x 70	7.1	C	6.2	C	5.6	D

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.

(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.

(3) For the full range of fixing types and capacity see table 10.13.

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

Amd 2 May '06

Table 10.2 – Rafters (continued) (see 10.2.1.3.2) **– VSG 10 and MSG 10**

(e) Heavy roof for low and medium wind zone

Rafter size (Width x thickness)	Rafter spacing (mm)								
	480			600			900		
	Rafter span	Fixing type		Rafter span	Fixing type		Rafter span	Fixing type	
(mm x mm)	(m)	L	M	(m)	L	M	(m)	L	M
70 x 35	1.4	A	A	1.3	A	A	1.1	A	A
90 x 35	1.8	A	A	1.7	A	A	1.5	A	A
140 x 35	2.8	A	A	2.6	A	A	2.3	A	A
70 x 45	1.5	A	A	1.4	A	A	1.2	A	A
90 x 45	2.0	A	A	1.8	A	A	1.6	A	A
140 x 45	3.1	A	A	2.9	A	A	2.5	A	A
190 x 45	4.2	A	A	3.9	A	A	3.4	A	B
240 x 45	5.3	A	B	4.9	A	B	4.3	A	B
290 x 45	6.4	A	B	6.0	A	B	5.2	B	B
90 x 70	2.3	A	A	2.1	A	A	1.8	A	A
140 x 70	3.6	A	A	3.3	A	A	2.9	A	B
190 x 70	4.9	A	A	4.5	A	B	3.9	A	B
240 x 70	6.2	B	B	5.7	B	B	5.0	B	C
290 x 70	7.5	B	B	6.9	B	C	6.0	B	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.

(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.

(3) For the full range of fixing types and capacity see table 10.13.

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

Amd 2 May '06

Table 10.2 – Rafters (continued) (see 10.2.1.3.2) **– VSG 10 and MSG 10**

(f) Heavy roof for high and very high wind zone

Rafter size (Width x thickness)	Rafter spacing (mm)								
	480			600			900		
	Rafter span	Fixing type		Rafter span	Fixing type		Rafter span	Fixing type	
(mm x mm)	(m)	H	VH	(m)	H	VH	(m)	H	VH
70 x 35	1.4	A	A	1.3	A	A	1.1	A	B
90 x 35	1.8	A	A	1.7	A	A	1.5	A	B
140 x 35	2.8	A	B	2.6	B	B	2.3	B	B
70 x 45	1.5	A	A	1.4	A	A	1.2	A	B
90 x 45	2.0	A	A	1.8	A	B	1.6	A	B
140 x 45	3.1	B	B	2.9	B	B	2.5	B	B
190 x 45	4.2	B	B	3.9	B	B	3.4	B	B
240 x 45	4.9	B	B	4.6	B	B	4.0	B	B
290 x 45	5.9*	B	–	5.5*	B	–	4.8*	B	–
290 x 45	5.3†	–	B	4.9†	–	B	4.3†	–	B
90 x 70	2.3	A	B	2.1	A	B	1.8	B	B
140 x 70	3.6	B	B	3.3	B	B	2.9	B	B
190 x 70	4.9	B	B	4.5	B	B	3.9	B	B
240 x 70	6.2	B	B	5.7	B	B	5.0	B	C
290 x 70	7.5	B	B	6.9	B	B	6.0	B	C

* High wind zone
† Very high wind zone

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –
(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.
(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.
(3) For the full range of fixing types and capacity see table 10.13.
(4) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Table 10.2 – Rafters (continued) (see 10.2.1.3.2) **– VSG 10 and MSG 10**

(g) Dimensions for valley rafters for all wind zones

Rafter size (Width x thickness)	Maximum span of valley rafters (m) and their fixing types for all wind zones			
	Light roof		Heavy roof	
	Rafter span	Fixing type	Rafter span	Fixing type
(mm x mm)	(m)		(m)	
70 x 35	1.3	B	1.3	B
90 x 35	1.6	B	1.5	B
140 x 35	2.3	B	2.1	B
70 x 45	1.4	B	1.3	B
90 x 45	1.7	B	1.6	B
140 x 45	2.4	B	2.3	B
190 x 45	3.0	B	2.9	B
240 x 45	3.6	C	3.4	B
290 x 45	4.2	C	4.0	B
90 x 70	1.9	B	1.8	B
140 x 70	2.7	B	2.6	B
190 x 70	3.4	B	3.2	B
240 x 70	4.1	C	3.9	B
290 x 70	4.7	C	4.4	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) For the full range of fixing types and capacity see table 10.13.

(2) Proprietary fixings that have the required fxing capacity indicated in tables may be used.

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

Amd 2 May '06

10.2.1.3.3
Hip rafters that support *jack rafters,* which are horizontally restrained by ceiling *joists* and ceiling *framing,* shall be 19 mm thick and 50 mm deeper than the members that they support. Amd 2 May '06

10.2.1.3.4
Hip rafters that project 600 mm or more, measured along the *rafter* beyond their supports, so as to form overhanging eaves shall either be:

(a) Of the same thickness as the *rafters* they support; or

(b) Flitched on both sides with timber 19 mm thick, extending not less than 450 mm along the *rafter* in both directions from the birdsmouth (see figure 10.4 for birdsmouth details). Each flitch shall be nailed to each *rafter* end with 6 evenly-*spaced* 60 x 2.8 nails. Amd 2 May '06

10.2.1.3.5
Each *rafter* other than a hip or *valley rafter* shall run at right angles to its associated ridge or eaves line.

10.2.1.3.6
Rafters shall be seated to *top plates*, *lintels*, and beams as shown in figures 10.4 and 10.5 and according to the following criteria:

(a) The bearing width shall not be less than 32 mm;

(b) The net depth of the *rafter* at the notch or birdsmouth shall not be less than 80 % of the actual depth of the *rafter,* nor less than 65 mm.

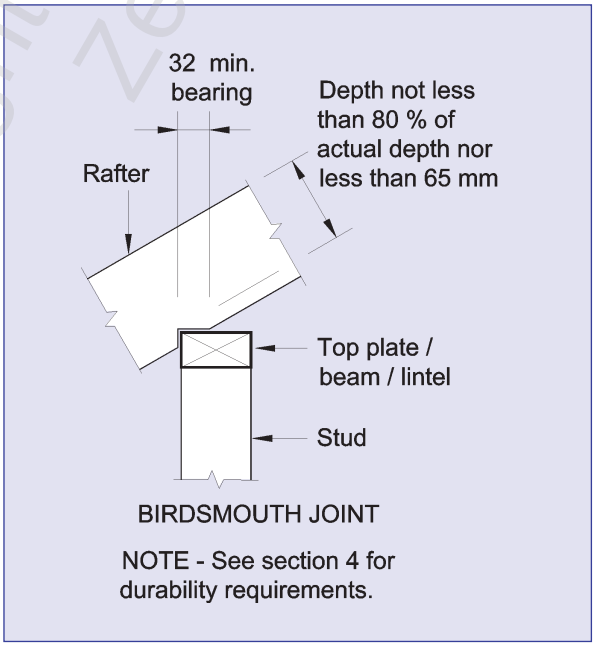
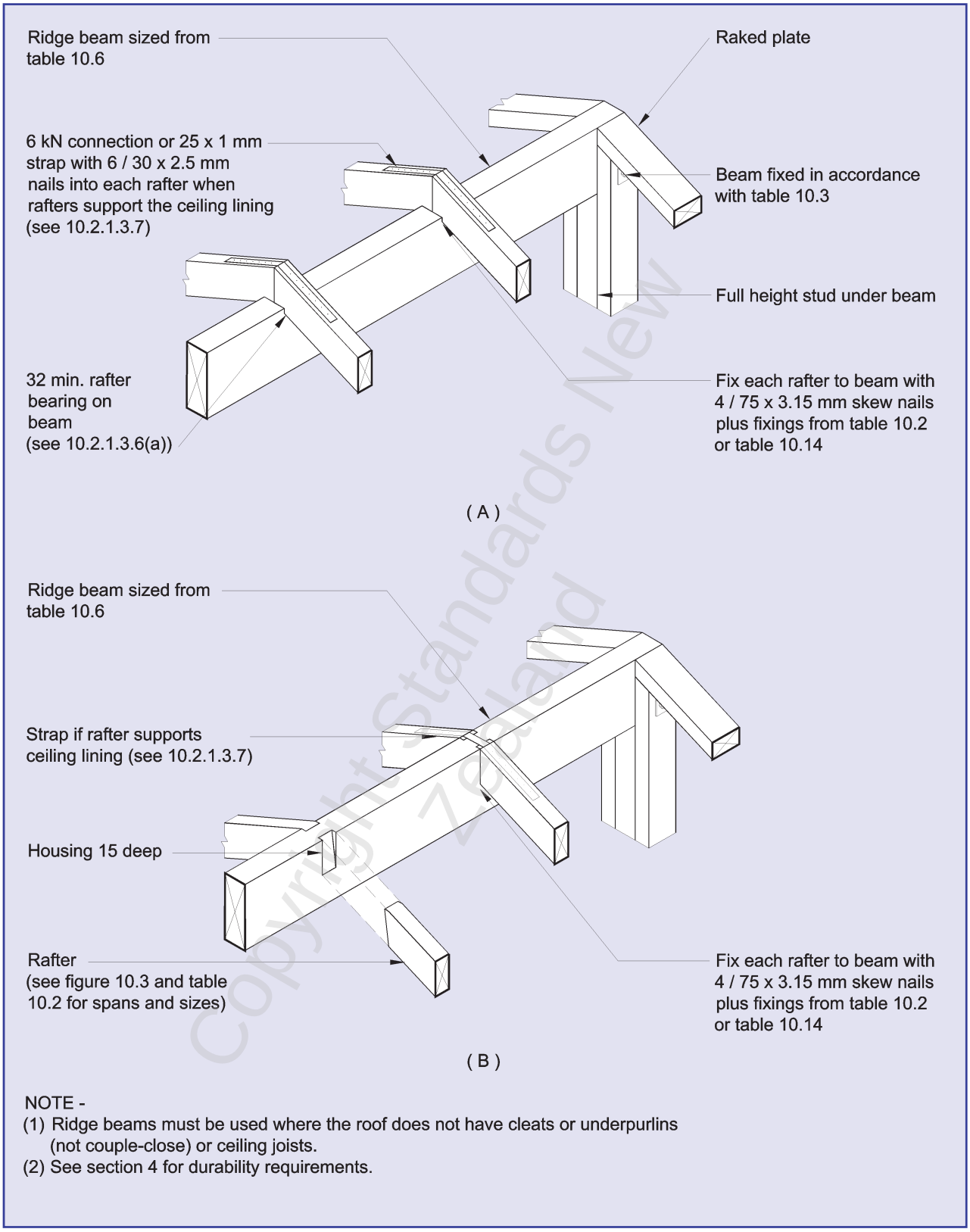


Figure 10.4 – Seating of rafters (see 10.2.1.3.6)



NOTE -
(1) Ridge beams must be used where the roof does not have cleats or underpurlins (not couple-close) or ceiling joists.
(2) See section 4 for durability requirements.

Figure 10.5 – Rafter to ridge beam connections (see 10.2.1.3.6)

10.2.1.3.7
Any *rafter* that directly supports ceiling *lining* material shall be fixed as follows:

(a) To *top plates*: As required by tables 10.12 and 10.13 as if the *rafter* were a truss;

(b) To corresponding *rafters*: As shown in figure 10.6, or by an alternative connection of 6 kN *capacity* in tension and compression along the line of the *rafter*.

10.2.1.4 *Ridge boards*

10.2.1.4.1
Ridge boards in *couple-close roofs* shall be 19 mm thick and provide full bearing for the whole depth of the *rafters* (see figure 10.14). Amd 2 May '06

10.2.1.4.2
Any length of *ridge board* that supports one or more *jack rafters* shall itself be supported by *struts* at no more than the following centres depending on the timber grade of the *ridge board*: 1.4 m for No. 1 *Framing* or MSG6; 1.6 m for VSG8 or MSG8; and 1.8 m for VSG10 or MSG10. Such *struts* shall comply with the requirements for *underpurlin struts* given by 10.2.1.10. Amd 2 May '06

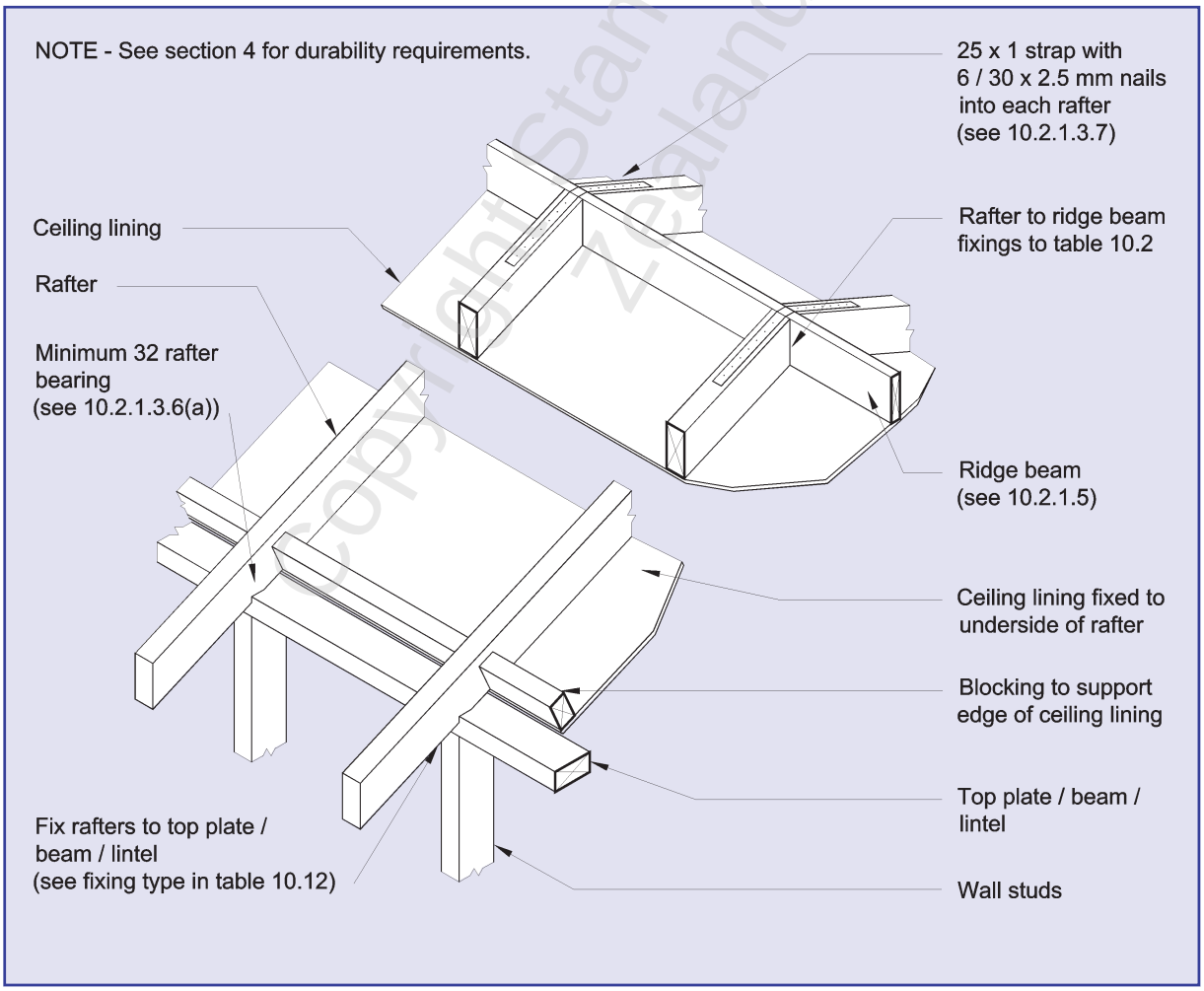


Figure 10.6 – Fixing rafters – Skillion roof (see 10.2.1.3.7)

10.2.1.4.3
Ridge boards may project as a cantilever to a distance beyond the face of its support not exceeding one quarter of its span.

10.2.1.5 *Ridge beams*

10.2.1.5.1
Amd 1 Dec '00
Ridge beams may be used to support the upper ends of paired *rafters* whose lower ends are not tied with ceiling *joists* or other *framing*. *Collar ties* do not provide this tie.

10.2.1.5.2
Amd 1 Dec '00
The *ridge beam* sizes shall be determined from table 10.6. The *ridge beam* shall be secured to the wall with a fixing type determined from table 10.6. The fixing shall be as required by table 10.3 and shown by figure 10.7. The built up *studs* shown in figure 10.7 shall be provided with base connections as required by table 10.3 and the wall base connection details of figure 8.12.

10.2.1.6 *Ceiling joists*

10.2.1.6.1
Ceiling *joists* shall be of the dimensions given by table 10.4.

10.2.1.6.2
Ceiling *joists* shall have their bottom surfaces set to a common level to support ceiling *lining* and shall be laid in straight lines on edge.

10.2.1.6.3
Ceiling *joists* shall have minimum landing on their supports, other than *ceiling runners*, of 32 mm.

10.2.1.6.4
Ceiling *joists* shall not be supported by *roof* or ceiling *framing* members other than *ceiling runners* complying with 10.2.1.7.

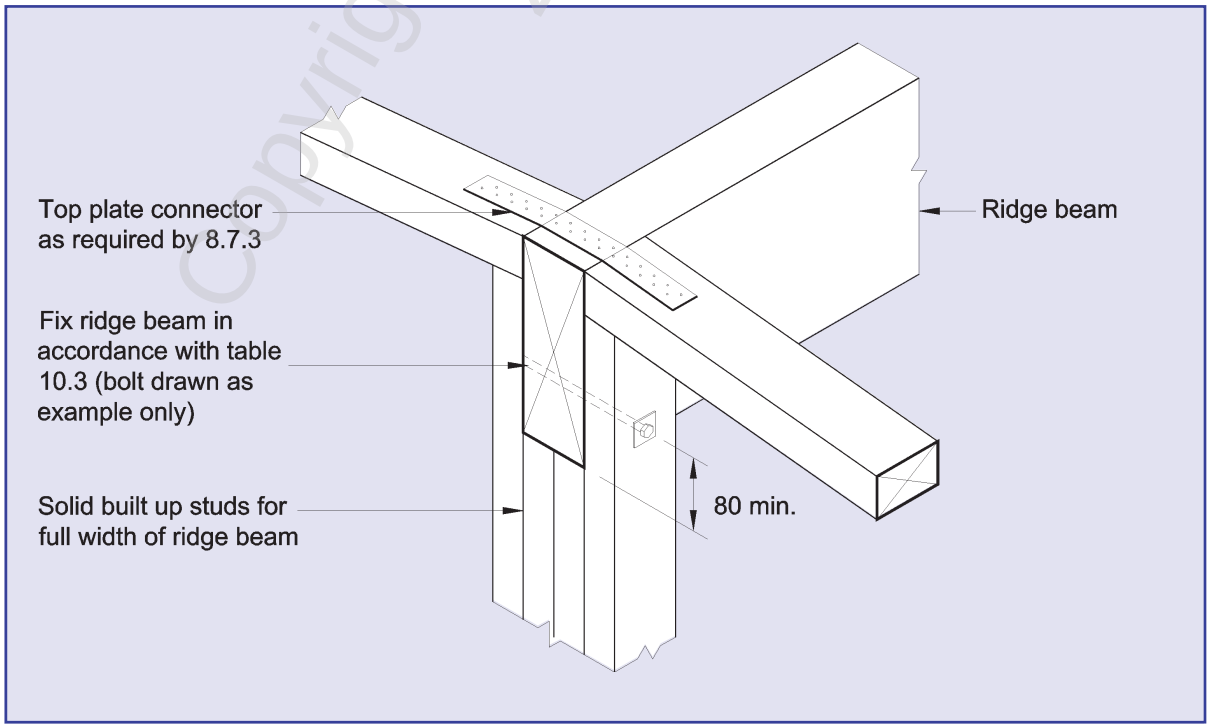


Figure 10.7 – Fixing ridge beam to wall (see 10.2.1.5)

Table 10.3 – Key to fixing types to restrain ridge beam uplift (see 10.2.1.5.2)

Fixing type	Fixing to resist uplift		Alternative fixing capacity (kN)
	Base connection of built up studs	Ridge beam to built up studs	
A	2/100 x 3.75 skew nails into bottom plate	2/100 x 3.75 nails	0.7
B	4/100 x 3.75 skew nails into bottom plate	4/100 x 3.75 nails	2.7
C	6/100 x 3.75 skew nails into bottom plate	6/100 x 3.75 nails	4.7
D	25 x 1 strap with 6 nails to stud and plate(1)(3)	1/M12 bolt	6.7
E	2/25 x 1 strap with 6 nails to stud and plate. 12 nails total(1)(3)	1/M12 bolt	8.7
F	3/25 x 1 strap with 6 nails to stud and plate. 18 nails total(2)(3)	2/M16 bolts	18.6

NOTE –
(1) Fix plate to joist with 1/M12 x 150 coach screw.
(2) Fix plate to joist with 2/M12 x 150 coach screws.
(3) Strap nails to be 30 x 2.5 mm.

Amd 1 Dec 2000

Table 10.4 – Ceiling joists (see 10.2.1.6.1) – **No. 1 Framing and MSG 6**

Ceiling joist size	Maximum span* of ceiling joists at a maximum spacing (mm) of:		
	480	600	900
(mm x mm)	(m)	(m)	(m)
90 x 35	2.0	1.9	1.6
90 x 45	2.2	2.1	1.8
140 x 35	3.2	3.0	2.5
140 x 45	3.5	3.2	2.8
190 x 45	4.7	4.4	3.8

* May be increased by 10 % for joists continuous over 2 or more spans.

NOTE – This table is applicable to all wind zones.

Table 10.4 – Ceiling joists (see 10.2.1.6.1) – **VSG 8 and MSG 8**

Ceiling joist size	Maximum span* of ceiling joists at a maximum spacing (mm) of:		
	480	600	900
(mm x mm)	(m)	(m)	(m)
90 x 35	2.3	2.1	1.8
90 x 45	2.5	2.3	2.0
140 x 35	3.5	3.3	2.9
140 x 45	3.8	3.6	3.1
190 x 45	5.2	4.8	4.2

* May be increased by 10 % for joists continuous over 2 or more spans.

NOTE – This table is applicable to all wind zones.

Table 10.4 – Ceiling joists (see 10.2.1.6.1) – **VSG 10 and MSG 10**

Ceiling joist size	Maximum span* of ceiling joists at a maximum spacing (mm) of:		
	480	600	900
(mm x mm)	(m)	(m)	(m)
90 x 35	2.4	2.3	2.0
90 x 45	2.6	2.5	2.1
140 x 35	3.8	3.5	3.1
140 x 45	4.1	3.8	3.3
190 x 45	5.6	5.2	4.6

* May be increased by 10 % for joists continuous over 2 or more spans.

NOTE – This table is applicable to all wind zones.

Amd 2
May '06

10.2.1.6.5
As shown in figure 10.8, joints in ceiling *joists* shall be made over supports and shall either:

(a) Be lapped not less than 300 mm; or

(b) Be butted and flitched with timber of the same dimensions as the *joists* and extending not less than 225 mm on each side of the joint.

10.2.1.7 *Ceiling runners*
10.2.1.7.1
Ceiling runners shall be of the dimensions given by table 10.5.

10.2.1.7.2
Ceiling runners shall be laid in straight lines on edge.

10.2.1.7.3
Ceiling runners shall have a minimum landing of 65 mm on a packer, which is directly supported by the *top plate* of a *loadbearing wall*, provided that either:

(a) The *ceiling runner* shall land directly over a *stud*; or

(b) The packer shall span between the *studs* on each side of the *ceiling runner*.

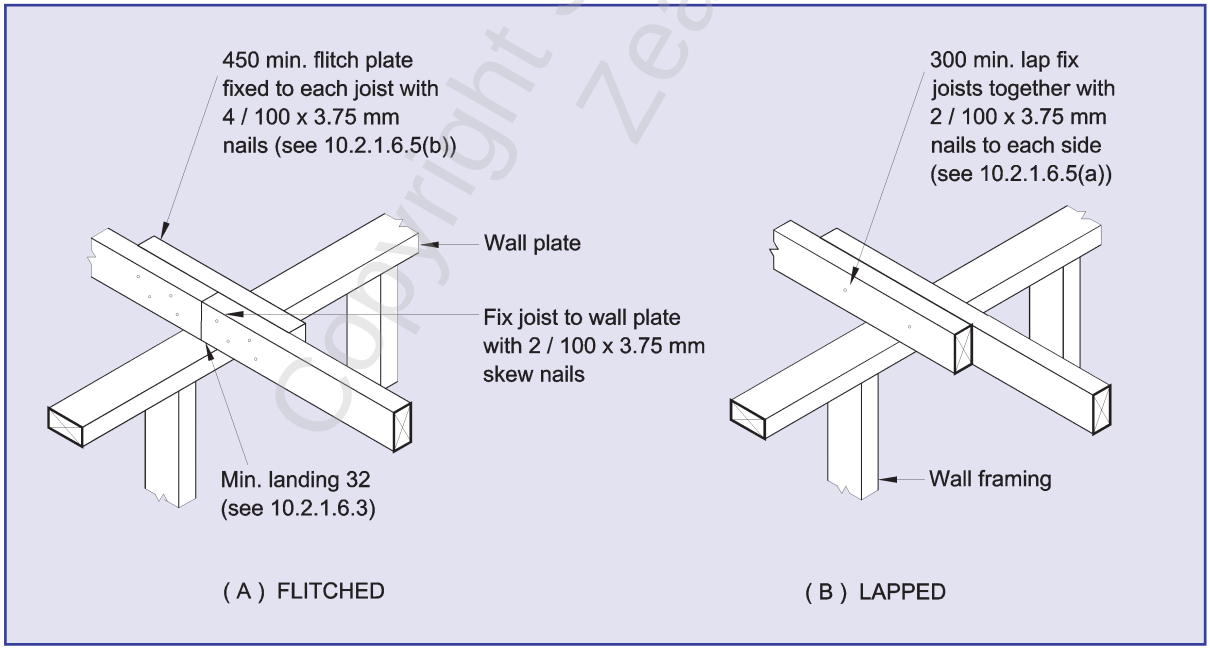


Figure 10.8 – Joints in ceiling joists (see 10.2.1.6.5)

Table 10.5 – Ceiling runners (see 10.2.1.7.1) **– No. 1 Framing and MSG 6**

Ceiling runner size (Width x thickness)	Maximum span of ceiling runners at a maximum spacing (m) of:		
	1.8	2.4	3
(mm x mm)	(m)	(m)	(m)
140 x 45	1.8	1.5	1.4
190 x 45	2.4	2.1	1.8
190 x 70	2.9	2.6	2.3
290 x 45	3.1	2.7	2.4

NOTE – Members 70 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 10.5 – Ceiling runners (see 10.2.1.7.1) **– VSG 8 and MSG 8**

Ceiling runner size (Width x thickness)	Maximum span of ceiling runners at a maximum spacing (m) of:		
	1.8	2.4	3
(mm x mm)	(m)	(m)	(m)
140 x 45	2.1	1.9	1.8
190 x 45	2.9	2.7	2.5
190 x 70	3.4	3.1	2.9
290 x 45	4.1	3.6	3.2

NOTE – Members 70 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 10.5 – Ceiling runners (see 10.2.1.7.1) **– VSG 10 and MSG 10**

Ceiling runner size (Width x thickness)	Maximum span of ceiling runners at a maximum spacing (m) of:		
	1.8	2.4	3
(mm x mm)	(m)	(m)	(m)
90 x 45	1.4	1.2	–
140 x 45	2.1	1.9	1.8
190 x 45	2.9	2.7	2.5
190 x 70	3.4	3.1	2.9
290 x 45	4.4	3.8	3.4

NOTE – Members 70 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2
May '06

10.2.1.7.4
The ends of *ceiling runners* may be chamfered, but the depth of the *ceiling runner* at its support shall remain at least 50 %.

10.2.1.7.5
Ceiling runners shall be restrained from twisting at each end with *framing* or packing timbers.

10.2.1.7.6
Ceiling *joists* may be fixed to *ceiling runners* by hangers which alternate on opposite sides of the *ceiling runner,* or be skew nailed to the *ceiling runner* (see figure 10.9).

10.2.1.8 *Valley boards*
Each *valley board* shall be:

(a) 19 mm thick and wide enough to support the valley gutter; Amd 2 May '06

(b) Laid over the *jack rafters* abutting the *valley rafter*;

(c) Fixed to each *jack rafter*.

10.2.1.9 *Underpurlins*

10.2.1.9.1
The sizes of *underpurlins* and the fixings to their supports shall be as given in table 10.6 (and table 15.7 for snow loads).

C10.2.1.9.2
Cantilevered ends of underpurlins will generally occur at hips and valleys, where the underpurlin should be mitred and fixed to the hip or valley rafter.

10.2.1.9.2
An *underpurlin* may project as a cantilever to a distance beyond the face of its support, not exceeding one quarter of its span.

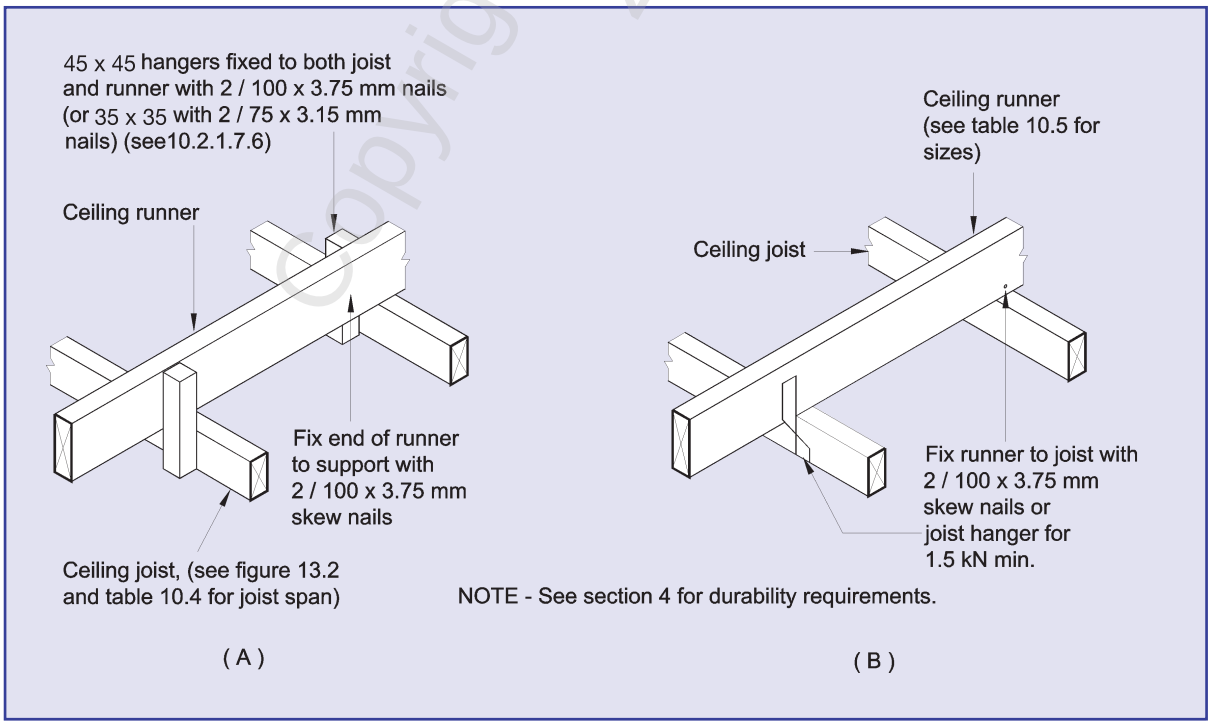


Figure 10.9 – Ceiling runners (see 10.2.1.7.6)

Table 10.6 – Underpurlins and ridge beams (see 10.2.1.5.2 and 10.2.1.9.1 and figures 10.10 and 10.11) **– No. 1 Framing and MSG 6**

(a) Light roof in low and medium wind zones

	Loaded dimension* of underpurlin or ridge beam (m)											
	1.8			2.7			3.6			4.2		
	Span	Fixing type		Span	Fixing type		Span	Fixing type		Span	Fixing type	
Wind zone		L	M		L	M		L	M		L	M
Underpurlin or ridge beam size												
(mm x mm) (Width x thickness)	(m)			(m)			(m)			(m)		
140 x 45	1.6	B	B	1.3	B	B	–	–	–	–	–	–
190 x 45	2.1	B	B	1.7	B	B	1.5	B	B	1.3	B	C
240 x 45	2.5	B	B	2.1	B	C	1.8	B	C	1.6	B	C
290 x 45	2.9	B	B	2.4	B	C	2.1	B	C	1.9	C	C
90 x 70	1.3	B	B	–	–	–	–	–	–	–	–	–
140 x 70	2.0	B	B	1.6	B	B	1.4	B	B	1.3	B	B
190 x 70	2.7	B	B	2.2	B	C	1.9	B	C	1.8	B	C
240 x 70	4.4	B	C	3.8	C	D	3.4	C	D	3.2	C	D
290 x 70	5.3	C	C	4.6	C	D	4.1	D	E	3.8	D	E
190 x 90	3.8	B	C	3.3	C	C	3.0	C	D	2.8	C	D
240 x 90	4.8	C	C	4.2	C	D	3.8	C	D	3.6	D	E
290 x 90	5.8	C	D	5.0	C	D	4.6	D	E	4.3	D	F

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift for underpurlins (For ridge beams refer to table 10.3 and figure 10.7)	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Span may be increased by 10 % for underpurlins continuous over 2 or more spans.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) For the full range of underpurlin fixing types and capacities see table 10.13.

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

Amd 2 May '06

Table 10.6 – Underpurlins and ridge beams (see 10.2.1.5.2 and 10.2.1.9.1 and figures 10.10 and 10.11) **– No. 1 Framing and MSG 6**

(b) Light roof in high wind zones

Underpurlin or ridge beam size (Width x thickness)	Loaded dimension* of underpurlin or ridge beam (m)							
	1.8		2.7		3.6		4.2	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
140 x 45	1.6	B	1.3	B	–	–	–	–
190 x 45	2.1	C	1.7	C	1.5	C	1.3	C
240 x 45	2.4	C	2.1	C	1.8	C	1.6	D
290 x 45	2.6	C	2.2	C	2.0	D	1.9	D
90 x 70	1.3	B	–	–	–	–	–	–
140 x 70	2.0	B	1.6	C	1.4	C	1.3	C
190 x 70	2.7	C	2.2	C	1.9	D	1.8	D
240 x 70	4.4	D	3.8	E	3.4	F	3.2	F
290 x 70	5.0	D	4.4	E	3.9	F	3.7	F
190 x 90	3.8	D	3.3	D	3.0	E	2.8	E
240 x 90	4.8	D	4.2	E	3.8	F	3.6	F
290 x 90	5.8	E	5.0	F	4.6	F	4.3	F

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift for underpurlins (For ridge beams refer to table 10.3 and figure 10.7)	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Span may be increased by 10 % for underpurlins continuous over 2 or more spans.
(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.
(3) For the full range of underpurlin fixing types and capacities see table 10.13.
(4) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Table 10.6 – Underpurlins and ridge beams (see 10.2.1.5.2 and 10.2.1.9.1 and figures 10.10 and 10.11) **– No. 1 Framing and MSG 6**

(c) Light roof in very high wind zones

Underpurlin or ridge beam size (Width x thickness)	Loaded dimension* of underpurlin or ridge beam (m)							
	1.8		2.7		3.6		4.2	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
140 x 45	1.6	C	1.3	C	–	–	–	–
190 x 45	1.9	C	1.6	C	1.4	D	1.3	D
240 x 45	2.2	C	1.9	D	1.7	D	1.6	D
290 x 45	2.3	C	2.0	D	1.8	D	1.7	E
90 x 70	1.2	B	–	–	–	–	–	–
140 x 70	1.9	C	1.6	C	1.4	D	1.3	D
190 x 70	2.7	C	2.2	D	1.9	D	1.8	E
240 x 70	4.2	E	3.6	F	3.2	F	3.0	F
290 x 70	4.6	E	4.0	F	3.6	F	3.3	F
190 x 90	3.7	D	3.2	E	2.9	F	2.7	F
240 x 90	4.6	E	4.0	F	3.7	F	3.5	F
290 x 90	5.6	F	4.9	F	4.4	F	–	–

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift for underpurlins (For ridge beams refer to table 10.3 and figure 10.7)	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Span may be increased by 10 % for underpurlins continuous over 2 or more spans.
(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.
(3) For the full range of underpurlin fixing types and capacities see table 10.13.
(4) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Table 10.6 – Underpurlins and ridge beams (see 10.2.1.5.2 and 10.2.1.9.1 and figures 10.10 and 10.11) **– No. 1 Framing and MSG 6**

(d) Heavy roof in all wind zones

Underpurlin or ridge beam size (Width x thickness)	Loaded dimension* of underpurlin or ridge beam (m)																			
	1.8					2.7					3.6					4.2				
	Span	Fixing type				Span	Fixing type				Span	Fixing type				Span	Fixing type			
(mm x mm)	(m)	L	M	H	VH	(m)	L	M	H	VH	(m)	L	M	H	VH	(m)	L	M	H	VH
140 x 45	1.3	A	B	B	B	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
190 x 45	1.7	A	B	B	B	1.4	A	B	B	C	1.2	B	B	B	C	–	–	–	–	–
240 x 45	2.1	A	B	B	C	1.7	B	B	B	C	1.5	B	B	C	C	1.4	B	B	C	C
290 x 45	2.4	B	B	B	C	2.0	B	B	C	C	1.7	B	B	C	D	1.6	B	B	C	D
140 x 70	1.5	A	B	B	B	1.3	A	B	B	C	–	–	–	–	–	–	–	–	–	–
190 x 70	2.1	A	B	B	C	1.8	B	B	B	C	1.6	B	B	C	C	1.4	B	B	C	D
240 x 70	3.3	B	B	C	C	2.9	B	B	C	D	2.6	B	C	D	E	2.5	B	C	D	E
290 x 70	4.0	B	B	C	D	3.5	B	C	D	E	3.2	B	C	D	F	3.0	B	C	E	F
190 x 90	2.8	B	B	C	C	2.5	B	B	C	D	2.2	B	B	C	D	2.1	B	C	D	E
240 x 90	3.6	B	B	C	D	3.1	B	B	C	D	2.8	B	C	D	E	2.7	B	C	D	F
290 x 90	4.3	B	B	C	D	3.8	B	C	D	E	3.4	B	C	E	F	3.3	B	C	E	F

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Span may be increased by 10 % for underpurlins continuous over 2 or more spans.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) For the full range of underpurlin fixing types and capacities see table 10.13.

(4) For ridge beam to wall fixing use the fixing type determined from the upper table and select the appropriate fixing from table 10.3.

(5) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Table 10.6 – Underpurlins and ridge beams (see 10.2.1.5.2 and 10.2.1.9.1 and figures 10.10 and 10.11) **– VSG 8 and MSG 8**

(a) Light roof in low and medium wind zones

	Loaded dimension* of underpurlin or ridge beam (m)											
	1.8			2.7			3.6			4.2		
	Span	Fixing type		Span	Fixing type		Span	Fixing type		Span	Fixing type	
Wind zone		L	M		L	M		L	M		L	M
Underpurlin or ridge beam size												
(mm x mm) (Width x thickness)	(m)			(m)			(m)			(m)		
90 x 45	1.2	B	B	–	–	–	–	–	–	–	–	–
140 x 45	1.9	B	B	1.5	B	B	1.3	B	B	1.2	B	B
190 x 45	2.5	B	B	2.0	B	B	1.7	B	C	1.6	B	C
240 x 45	3.0	B	B	2.5	B	C	2.1	B	C	2.0	C	C
290 x 45	3.5	B	C	2.8	B	C	2.5	C	C	2.3	C	C
90 x 70	1.4	B	B	1.2	B	B	–	–	–	–	–	–
140 x 70	2.2	B	B	1.9	B	B	1.7	B	C	1.5	B	C
190 x 70	3.0	B	B	2.6	B	C	2.3	C	C	2.1	C	C
240 x 70	4.8	C	C	4.2	C	D	3.8	C	D	3.6	D	E
290 x 70	5.9	C	D	5.1	C	D	4.6	D	E	4.4	D	F
190 x 90	4.2	B	C	3.6	C	D	3.3	C	D	3.1	C	D
240 x 90	5.3	C	C	4.6	C	D	4.2	D	E	4.0	D	E
290 x 90	6.4	C	D	5.6	D	E	5.1	D	F	4.8	E	F

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift for underpurlins (For ridge beams refer to table 10.3 and figure 10.7)	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Span may be increased by 10 % for underpurlins continuous over 2 or more spans.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) For the full range of underpurlin fixing types and capacities see table 10.13.

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

Amd 2 May '06

Table 10.6 – Underpurlins and ridge beams (see 10.2.1.5.2 and 10.2.1.9.1 and figures 10.10 and 10.11) **– VSG 8 and MSG 8**

(b) Light roof in high wind zones

Underpurlin or ridge beam size (Width x thickness)	Loaded dimension* of underpurlin or ridge beam (m)							
	1.8		2.7		3.6		4.2	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
90 x 45	1.2	B	–	–	–	–	–	–
140 x 45	1.9	B	1.5	C	1.3	C	1.2	C
190 x 45	2.4	C	2.0	C	1.7	C	1.6	D
240 x 45	2.7	C	2.3	C	2.1	D	2.0	D
290 x 45	2.9	C	2.5	D	2.0	D	2.1	D
90 x 70	1.4	B	1.2	B	–	–	–	–
140 x 70	2.2	C	1.9	C	1.7	C	1.5	C
190 x 70	3.0	C	2.6	D	2.3	D	2.1	D
240 x 70	4.8	D	4.2	E	3.8	F	3.6	F
290 x 70	5.7	E	4.9	F	4.5	F	4.2	F
190 x 90	4.2	D	3.6	E	3.3	E	3.1	F
240 x 90	5.3	E	4.6	F	4.2	F	4.0	F
290 x 90	6.4	E	5.6	F	5.1	F	4.8	F

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift for underpurlins (For ridge beams refer to table 10.3 and figure 10.7)	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Span may be increased by 10 % for underpurlins continuous over 2 or more spans.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) For the full range of underpurlin fixing types and capacities see table 10.13.

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

Amd 2 May '06

Table 10.6 – Underpurlins and ridge beams (see 10.2.1.5.2 and 10.2.1.9.1 and figures 10.10 and 10.11) **– VSG 8 and MSG 8**

(c) Light roof in very high wind zones

Underpurlin or ridge beam size (Width x thickness)	Loaded dimension* of underpurlin or ridge beam (m)							
	1.8		2.7		3.6		4.2	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
90 x 45	1.2	B	–	–	–	–	–	–
140 x 45	1.8	B	1.5	C	1.3	C	1.2	D
190 x 45	2.2	C	1.9	D	1.7	D	1.6	D
240 x 45	2.4	C	2.1	D	1.9	D	1.8	E
290 x 45	2.6	C	2.3	D	2.0	E	1.9	E
90 x 70	1.4	B	1.2	C	–	–	–	–
140 x 70	2.2	C	1.9	D	1.7	D	1.5	D
190 x 70	2.9	D	2.6	D	2.3	E	2.1	E
240 x 70	4.7	E	4.1	F	3.7	F	3.4	F
290 x 70	5.1	F	4.5	F	4.0	F	3.8	F
190 x 90	4.0	E	3.5	F	3.2	F	3.0	F
240 x 90	5.1	F	4.5	F	4.1	F	3.9	F
290 x 90	6.2	F	5.4	F	–	–	–	–

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift for underpurlins (For ridge beams refer to table 10.3 and figure 10.7)	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Span may be increased by 10 % for underpurlins continuous over 2 or more spans.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) For the full range of underpurlin fixing types and capacities see table 10.13.

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

Amd 2 May '06

Table 10.6 – Underpurlins and ridge beams (see 10.2.1.5.2 and 10.2.1.9.1 and figures 10.10 and 10.11) **– VSG 8 and MSG 8**

(d) Heavy roof in all wind zones

Underpurlin or ridge beam size (Width x thickness)	Loaded dimension* of underpurlin or ridge beam (m)																			
	1.8					2.7					3.6					4.2				
	Span	Fixing type				Span	Fixing type				Span	Fixing type				Span	Fixing type			
(mm x mm)	(m)	L	M	H	VH	(m)	L	M	H	VH	(m)	L	M	H	VH	(m)	L	M	H	VH
140 x 45	1.4	A	B	B	B	1.2	A	B	B	B	–	–	–	–	–	–	–	–	–	–
190 x 45	2.0	A	B	B	C	1.7	B	B	B	C	1.4	B	B	C	C	1.3	B	B	C	C
240 x 45	2.5	B	B	B	C	2.0	B	B	C	C	1.7	B	B	C	D	1.6	B	B	C	D
290 x 45	2.7	B	B	B	C	2.3	B	B	C	D	2.0	B	B	C	D	1.9	B	B	C	D
140 x 70	1.7	A	B	B	B	1.4	A	B	B	C	1.3	B	B	B	C	1.2	B	B	C	C
190 x 70	2.3	A	B	B	C	2.0	B	B	C	C	1.8	B	B	C	D	1.7	B	B	C	D
240 x 70	3.6	B	B	C	D	3.2	B	B	C	D	2.9	B	C	D	E	2.7	B	C	D	F
290 x 70	4.4	B	B	C	D	3.8	B	C	D	E	3.5	B	C	E	F	3.3	B	C	E	F
190 x 90	3.1	B	B	C	C	2.7	B	B	C	D	2.5	B	C	D	E	2.3	B	C	D	E
240 x 90	4.0	B	B	C	D	3.5	B	C	D	E	3.1	B	C	D	F	3.0	B	C	E	F
290 x 90	4.8	B	B	C	E	4.2	B	C	D	F	3.8	B	C	E	F	3.6	B	C	E	F

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift for underpurlins (For ridge beams refer to table 10.3 and figure 10.7)	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Span may be increased by 10 % for underpurlins continuous over 2 or more spans.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) For the full range of underpurlin fixing types and capacities see table 10.13.

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

Amd 2 May '06

Table 10.6 – Underpurlins and ridge beams (see 10.2.1.5.2 and 10.2.1.9.1 and figures 10.10 and 10.11) **– VSG 10 and MSG 10**

(a) Light roof in low and medium wind zones

	Loaded dimension* of underpurlin or ridge beam (m)											
	1.8			2.7			3.6			4.2		
	Span	Fixing type		Span	Fixing type		Span	Fixing type		Span	Fixing type	
Wind zone		L	M		L	M		L	M		L	M
Underpurlin or ridge beam size												
(mm x mm) (Width x thickness)	(m)			(m)			(m)			(m)		
90 x 45	1.3	B	B	–	–	–	–	–	–	–	–	–
140 x 45	2.1	B	B	1.8	B	B	1.6	B	C	1.4	B	C
190 x 45	2.8	B	B	2.4	B	C	2.1	B	C	1.9	C	C
240 x 45	3.6	B	C	2.9	C	C	2.5	C	C	2.3	C	D
290 x 45	4.0	B	C	3.4	C	C	2.9	C	D	2.7	C	D
90 x 70	1.5	B	B	1.3	B	B	1.2	B	B	–	–	–
140 x 70	2.4	B	B	2.1	B	C	1.9	B	C	1.8	B	C
190 x 70	3.3	B	C	2.8	B	C	2.6	C	C	2.4	C	D
240 x 70	5.2	C	C	4.5	C	D	4.1	D	E	3.9	D	E
290 x 70	6.3	C	D	5.5	D	E	5.0	D	F	4.7	E	F
190 x 90	4.5	C	C	3.9	C	D	3.5	C	D	3.4	D	E
240 x 90	5.7	C	D	4.9	C	D	4.5	D	E	4.3	D	E
290 x 90	6.9	C	D	6.0	D	E	5.4	D	F	5.2	E	F

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift for underpurlins (For ridge beams refer to table 10.3 and figure 10.7)	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Span may be increased by 10 % for underpurlins continuous over 2 or more spans.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) For the full range of underpurlin fixing types and capacities see table 10.13.

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

Amd 2 May '06

Table 10.6 – Underpurlins and ridge beams (see 10.2.1.5.2 and 10.2.1.9.1 and figures 10.10 and 10.11) **– VSG 10 and MSG 10**

(b) Light roof in high wind zones

Underpurlin or ridge beam size (Width x thickness)	Loaded dimension* of underpurlin or ridge beam (m)							
	1.8		2.7		3.6		4.2	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
90 x 45	1.3	B	–	–	–	–	–	–
140 x 45	2.1	B	1.8	C	1.6	C	1.4	C
190 x 45	2.8	C	2.4	C	2.1	D	1.9	D
240 x 45	3.0	C	2.6	D	2.4	D	2.3	E
290 x 45	3.2	C	2.8	D	2.6	D	2.4	E
90 x 70	1.5	B	1.3	B	1.2	C	–	–
140 x 70	2.4	C	2.1	C	1.9	D	1.8	D
190 x 70	3.3	C	2.8	D	2.6	E	2.4	E
240 x 70	5.2	E	4.5	F	4.1	F	3.9	F
290 x 70	6.3	E	5.5	F	5.0	F	4.7	F
190 x 90	4.5	D	3.9	E	3.5	F	3.4	F
240 x 90	5.7	E	4.9	F	4.5	F	4.3	F
290 x 90	6.9	F	6.0	F	5.4	F	5.2	F

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift for underpurlins (For ridge beams refer to table 10.3 and figure 10.7)	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Span may be increased by 10 % for underpurlins continuous over 2 or more spans.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) For the full range of underpurlin fixing types and capacities see table 10.13.

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

Amd 2 May '06

Table 10.6 – Underpurlins and ridge beams (see 10.2.1.5.2 and 10.2.1.9.1 and figures 10.10 and 10.11) **– VSG 10 and MSG 10**

(c) Light roof in very high wind zones

Underpurlin or ridge beam size (Width x thickness)	Loaded dimension* of underpurlin or ridge beam (m)							
	1.8		2.7		3.6		4.2	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
90 x 45	1.3	B	–	–	–	–	–	–
140 x 45	2.0	C	1.7	C	1.6	D	1.4	D
190 x 45	2.5	C	2.2	D	1.9	E	1.8	E
240 x 45	2.8	D	2.4	D	2.2	E	2.0	E
290 x 45	2.9	D	2.6	D	2.3	E	2.2	F
90 x 70	1.5	B	1.3	C	1.2	C	–	–
140 x 70	2.3	C	2.0	D	1.8	D	1.7	E
190 x 70	3.2	D	2.8	E	2.5	E	2.4	F
240 x 70	5.1	E	4.4	F	4.0	F	3.8	F
290 x 70	5.8	F	5.1	F	4.6	F	–	–
190 x 90	4.4	E	3.8	F	3.4	F	3.3	F
240 x 90	5.5	F	4.8	F	4.4	F	–	–
290 x 90	6.7	F	5.8	F	–	–	–	–

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift for underpurlins (For ridge beams refer to table 10.3 and figure 10.7)	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Span may be increased by 10 % for underpurlins continuous over 2 or more spans.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) For the full range of underpurlin fixing types and capacities see table 10.13.

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

Amd 2 May '06

Table 10.6 – Underpurlins and ridge beams (see 10.2.1.5.2 and 10.2.1.9.1 and figures 10.10 and 10.11) **– VSG 10 and MSG 10**

(d) Heavy roof in all wind zones

Underpurlin or ridge beam size (Width x thickness)	Loaded dimension* of underpurlin or ridge beam (m)																			
	1.8					2.7					3.6					4.2				
	Span	Fixing type				Span	Fixing type				Span	Fixing type				Span	Fixing type			
(mm x mm)	(m)	L	M	H	VH	(m)	L	M	H	VH	(m)	L	M	H	VH	(m)	L	M	H	VH
140 x 45	1.5	A	B	B	B	1.3	A	B	B	C	1.2	B	B	B	C	–	–	–	–	–
190 x 45	2.1	A	B	B	C	1.8	B	B	C	C	1.7	B	B	C	D	1.6	B	B	C	D
240 x 45	2.7	B	B	B	C	2.3	B	B	C	D	2.1	B	B	C	D	1.9	B	B	C	D
290 x 45	3.1	B	B	C	C	2.7	B	B	C	D	2.4	B	B	C	D	2.2	B	C	D	E
140 x 70	1.8	A	B	B	B	1.6	A	B	B	C	1.4	B	B	C	C	1.3	B	B	C	C
190 x 70	2.4	B	B	B	C	2.1	B	B	C	C	1.9	B	B	C	D	1.8	B	B	C	D
240 x 70	3.9	B	B	C	D	3.4	B	C	D	E	3.1	B	C	D	F	2.9	B	C	E	F
290 x 70	4.7	B	B	C	D	4.1	B	C	D	E	3.8	B	C	E	F	3.6	B	C	E	F
190 x 90	3.4	B	B	C	D	2.9	B	B	C	D	2.7	B	C	D	E	2.5	B	C	D	E
240 x 90	4.3	B	B	C	D	3.7	B	C	D	E	3.4	B	C	D	F	3.2	B	C	E	F
290 x 90	5.2	B	C	D	E	4.5	B	C	E	F	4.1	B	C	E	F	3.9	B	D	F	F

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift for underpurlins (For ridge beams refer to table 10.3 and figure 10.7)	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Span may be increased by 10 % for underpurlins continuous over 2 or more spans.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) For the full range of underpurlin fixing types and capacities see table 10.13.

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

Amd 2 May '06

10.2.1.9.3
The *underpurlin spacing* shall be the distance between the *underpurlin* and the adjacent *rafter* support, measured along the *rafter*.

10.2.1.10 *Underpurlin struts*

10.2.1.10.1
Underpurlin struts provided to support *underpurlins* shall be either:

(a) *Isolated struts*
Positioned at any angle between the vertical and at a right angle to the plane of the roof (see figure 10.10); or

(b) *As pairs*
Fixed to a common member and supporting 2 *underpurlins*. This common member shall be located at more than a quarter of the distance between the *underpurlins,* measured from either side of the building and within 300 mm centre-to-centre of a loadbearing wall (see figure 10.11(A)).

10.2.1.10.2
The maximum length of *underpurlins struts* shall be selected from the following:

Underpurlin struts			
	Timber grade		
	No.1 Framing MSG6	VSG8 MSG8	VSG10 MSG10
Member size (mm)	**Maximum length** (m)		
90 x 45	1.45	1.60	1.70
90 x 70	3.15	3.45	3.65

Amd 2 May '06

NOTE – Members 70 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

10.2.1.10.3
Underpurlin struts shall be directly supported by one of the following:

(a) The *top plate* of a *loadbearing wall*, provided that either:
(i) The *underpurlin strut* shall land directly over a *stud*; or
(ii) The *top plate* shall be doubled between the *studs* on each side of the *underpurlin strut*;

(b) A *lintel* complying with 8.6;

(c) A *strutting beam* complying with 10.2.1.11;

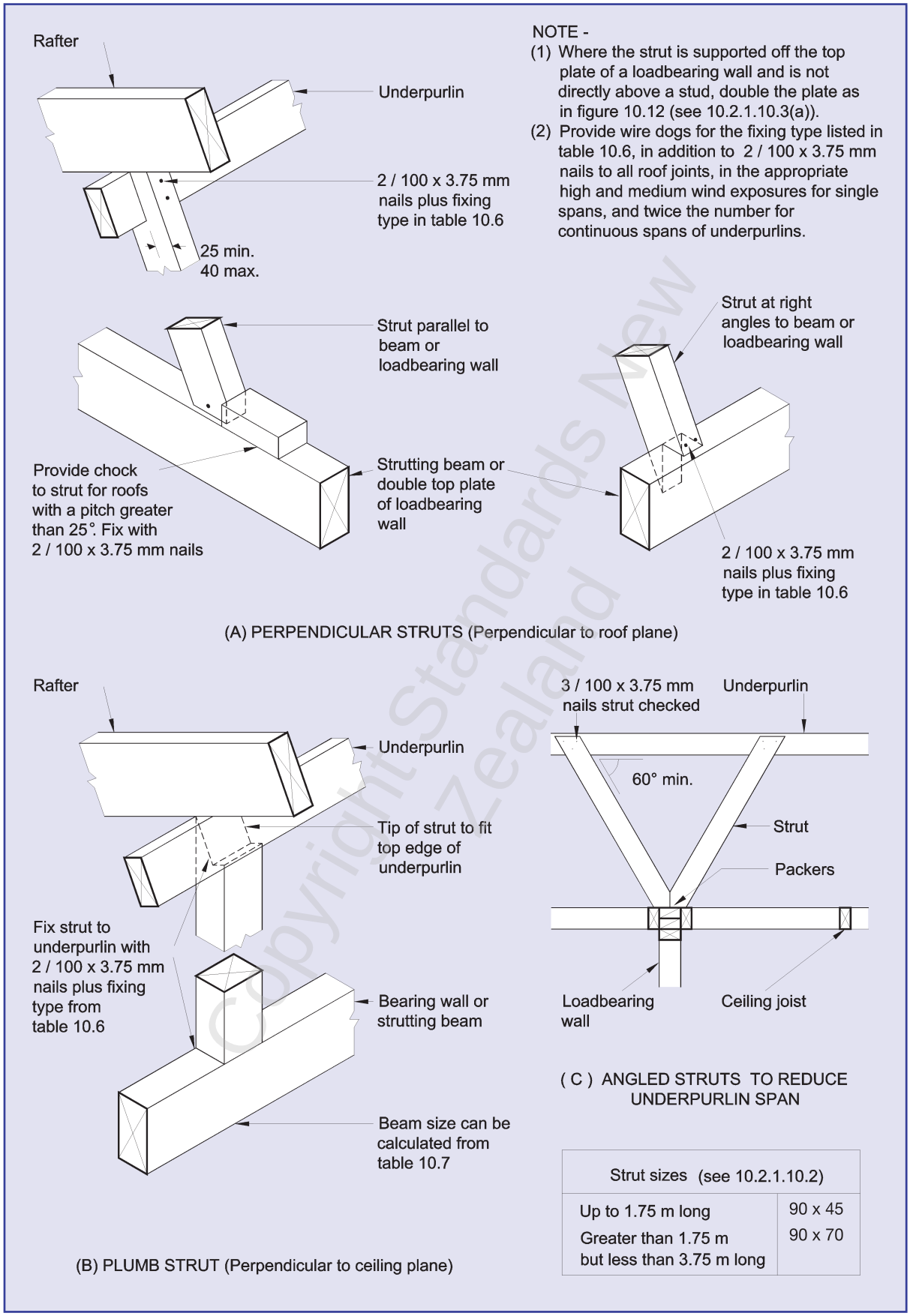
Amd 2 May '06

(d) A 90 mm x 45 mm timber *plate* laid on its flat on top of ceiling *joists* and within 300 mm of a *loadbearing wall*. The timber shall be fixed to at least 2 *joists* each side of the *underpurlin strut*.

10.2.1.10.4
Underpurlin struts shall be fixed to *underpurlins*, *strutting beams*, *top plates*, and *lintels* as shown in figures 10.10 and 10.11 together with those additional fixings listed in tables 10.6(a) to 10.6(d), depending on the weight of the roof and wind speed to which the building is subjected.

10.2.1.11 *Strutting beams*

10.2.1.11.1
Strutting beams shall be of the dimensions given by table 10.7 and figure 10.12.



Strut sizes (see 10.2.1.10.2)	
Up to 1.75 m long	90 x 45
Greater than 1.75 m but less than 3.75 m long	90 x 70

Amd 2 May '06

Figure 10.10 – Underpurlin struts – Single (see 10.2.1.10.1(a))

Table 10.7 – Maximum span and fixing types for strutting beams (see 10.2.1.11) – **No. 1 Framing and MSG 6**

Strutting beam size (Width x thickness)	Maximum loaded dimension* of underpurlin	Spacing of struts (m)			
		1.8		2.7	
(mm x mm)	(m)	Span (m)	Fixing type	Span (m)	Fixing type
A Light weight roof					
140 x 90	1.8	1.4	D	–	–
190 x 90	1.8	2.7	E	1.8	E
	2.4	2.0	E	1.3	E
	2.7	1.8	E	1.2	E
B Heavy weight roof					
190 x 90	1.8	2.1	D	1.4	D
	2.4	1.6	D	–	–
	2.7	1.4	D	–	–

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7

NOTE –

(1) Fixing types for continuous spans shall have double the capacity to that listed in the table.
(2) For the full range of fixing types and capacities see table 10.13.
(3) Members 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Table 10.7 – Maximum span and fixing types for strutting beams (see 10.2.1.11) **– VSG 8 and MSG 8**

Strutting beam size (Width x thickness) (mm x mm)	Maximum loaded dimension* of underpurlin (m)	Spacing of struts (m) 1.8 Span (m)	1.8 Fixing type	2.7 Span (m)	2.7 Fixing type
A Light weight roof					
140 x 90	1.8 2.4 2.7	2.0 1.5 1.3	D D D	1.3 – 0.9	D – D
190 x 90	1.8 2.4 2.7	3.3 2.8 2.5	F F F	2.5 1.9 1.7	F F F
B Heavy weight roof					
140 x 90	1.8 2.4	1.6 1.2	C C	– –	– –
190 x 90	1.8 2.4 2.7	2.5 2.2 2.0	D E E	2.0 1.5 1.3	E E E

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Fixing types for continuous spans shall have double the capacity to that listed in the table.
(2) For the full range of fixing types and capacities see table 10.13.
(3) Members 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Table 10.7 – Maximum span and fixing types for strutting beams (see 10.2.1.11) **– VSG 10 and MSG 10**

Strutting beam size (Width x thickness) (mm x mm)	Maximum loaded dimension* of underpurlin (m)	Spacing of struts (m)			
		1.8		2.7	
		Span (m)	Fixing type	Span (m)	Fixing type
A Light weight roof					
140 x 90	1.8 2.4 2.7	2.3 2.0 1.9	E E F	1.9 1.4 1.3	F F F
190 x 90	1.8 2.4 2.7	3.7 3.2 3.0	F F F	3.0 – –	F – –
B Heavy weight roof					
140 x 90	1.8 2.4	1.7 1.5	C D	1.4 –	D –
190 x 90	1.8 2.4 2.7	2.8 2.4 2.3	E E F	2.3 2.0 1.8	F F F

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Fixing types for continuous spans shall have double the capacity to that listed in the table.
(2) For the full range of fixing types and capacities see table 10.13.
(3) Members 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

10.2.1.11.2
Strutting beams shall have a clearance of not less than 25 mm above the ceiling *lining* or *framing.*

10.2.1.11.3
Strutting beams shall not be used as *ceiling runners.*

10.2.1.11.4
The ends of *strutting beams* may be chamfered provided that the depth of the *strutting beam* at its support shall not be reduced by more than 50 %.

10.2.1.11.5
Strutting beams shall have a minimum landing of 65 mm on a packer directly supported by one of the following:

(a) The *top plate* of a *loadbearing wall,* provided that either:

(i) The *strutting beam* shall land directly over a *stud;* or

(ii) The *top plate* shall be doubled between the *studs* on each side of the *strutting beam.*

(b) A *lintel* complying with 8.6.

10.2.1.12 *Verandah beams*
Verandah beams shall be of the dimensions given in table 10.8 (and table 15.8 for snow loads) in low to very high wind zones.

C10.2.1.12
Verandah beams are subject to high uplift wind forces from below and above the rafters. Lightweight roofs are affected by higher uplift forces than are heavy roofs.

10.2.1.13 *Collar ties and cleats*

10.2.1.13.1
In *couple-close roofs* steeper than 10° to the horizontal (1 in 6), pairs of *rafters* shall be connected by the following (see figures 10.13 and 10.14):

(a) Where *underpurlins* are used: *Collar ties* complying with 10.2.1.13.2;

(b) Where *underpurlins* are not used: *Cleats* complying with 10.2.1.13.3.

C10.2.1.13.1
Collar ties provide horizontal restraint to the horizontal reaction of underpurlin struts supporting underpurlins. They cannot be used without a ceiling joist connection to the base of the rafters, unless on its own, as a roof structure member. Rafters, collar ties, and all connections should be specifically designed to resist loads and deflections.

Table 10.8 – Verandah beams (see 10.2.1.12) **– No. 1 Framing and MSG 6**

Beam size (Width x thickness)	Loaded dimension of verandah beam (m)							
	0.9		1.4		1.8		2.1	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
A Light roof in low to very high wind zone								
140 x 45	1.7	CC	1.2	CC	–	–	–	–
190 x 45	2.0	CC	1.5	CC	1.4	DD	1.3	DD
240 x 45	2.3	CC	1.8	DD	1.6	DD	1.5	DD
290 x 45	2.4	CC	1.9	DD	1.8	DD	1.7	EE
140 x 70	2.0	CC	1.5	CC	1.4	DD	1.3	DD
190 x 70	2.8	CC	2.1	DD	1.9	EE	1.8	EE
240 x 70	3.4	DD	2.5	EE	2.3	EE	2.2	FF
290 x 70	3.7	DD	2.9	EE	2.6	FF	2.5	FF
140 x 90	2.2	CC	1.8	DD	1.6	DD	1.5	DD
190 x 90	3.0	CC	2.4	EE	2.1	EE	2.0	EE
240 x 90	3.8	DD	3.0	FF	2.7	FF	2.5	FF
290 x 90	5.8	FF	4.7	FF	4.3	FF	4.1	FF
B Heavy roof in low to very high wind zone								
140 x 45	1.4	CC	–	–	–	–	–	–
190 x 45	1.8	CC	1.3	CC	1.2	CC	–	–
240 x 45	2.0	CC	1.6	CC	1.4	CC	1.3	DD
290 x 45	2.2	CC	1.7	CC	1.6	DD	1.5	DD
140 x 70	1.6	CC	1.3	CC	1.2	CC	–	–
190 x 70	2.2	CC	1.8	CC	1.6	DD	1.5	DD
240 x 70	2.8	CC	2.2	DD	2.0	DD	1.9	DD
290 x 70	3.3	CC	2.5	DD	2.3	EE	2.2	EE
140 x 90	1.8	CC	1.4	CC	1.3	CC	1.2	CC
190 x 90	2.4	CC	1.9	DD	1.8	DD	1.7	DD
240 x 90	3.1	CC	2.4	DD	2.3	EE	2.1	EE
290 x 90	4.7	DD	3.7	FF	3.5	FF	3.3	FF

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
CC	6/100 x 3.75 nails	4.7
DD	1/M12 bolt	6.7
EE	1/M12 bolt	8.7
FF	3/M12 bolts or 2/M16 bolts	18.6

NOTE –
(1) This table includes provision for the rafters cantilevering a maximum of 750 mm beyond the verandah beam to support a soffit.
(2) Fixing type for continuous spans shall have a double capacity to that listed in the table.
(3) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Table 10.8 – Verandah beams (see 10.2.1.12) **– VSG 8 and MSG 8**

Beam size (Width x thickness)	Loaded dimension of verandah beam (m)							
	0.9		1.4		1.8		2.1	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
A Light roof in low to very high wind zone								
140 x 45	1.9	CC	1.4	CC	1.3	DD	1.2	DD
190 x 45	2.3	CC	1.8	DD	1.6	DD	1.5	DD
240 x 45	2.5	CC	2.0	DD	1.8	EE	1.8	EE
290 x 45	2.7	CC	2.2	DD	2.0	EE	1.9	EE
140 x 70	2.2	CC	1.8	DD	1.6	DD	1.5	DD
190 x 70	3.1	CC	2.4	EE	2.2	EE	2.1	FF
240 x 70	3.9	DD	2.9	EE	2.7	FF	2.5	FF
290 x 70	4.2	DD	3.3	FF	3.0	FF	2.9	FF
140 x 90	2.4	CC	2.0	DD	1.8	EE	1.7	EE
190 x 90	3.3	DD	2.7	EE	2.5	FF	2.4	FF
240 x 90	4.2	DD	3.4	FF	3.1	FF	3.0	FF
290 x 90	6.5	FF	5.2	FF	4.8	FF	–	–
B Heavy roof in low to very high wind zone								
140 x 45	1.5	CC	1.2	CC	–	–	–	–
190 x 45	2.0	CC	1.5	CC	1.4	CC	1.3	DD
240 x 45	2.3	CC	1.8	CC	1.6	DD	1.5	DD
290 x 45	2.4	CC	1.9	DD	1.8	DD	1.7	DD
140 x 70	1.8	CC	1.4	CC	1.3	CC	1.3	CC
190 x 70	2.4	CC	2.0	DD	1.8	DD	1.7	DD
240 x 70	3.1	CC	2.5	DD	2.3	EE	2.2	EE
290 x 70	3.7	DD	2.9	EE	2.6	EE	2.5	FF
140 x 90	2.0	CC	1.6	CC	1.4	CC	1.4	DD
190 x 90	2.7	CC	2.1	DD	2.0	DD	1.9	DD
240 x 90	3.4	CC	2.7	DD	2.5	EE	2.4	EE
290 x 90	5.2	DD	4.1	FF	3.8	FF	3.7	FF

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
CC	6/100 x 3.75 nails	4.7
DD	1/M12 bolt	6.7
EE	1/M12 bolt	8.7
FF	3/M12 bolts or 2/M16 bolts	18.6

NOTE –
(1) This table includes provision for the rafters cantilevering a maximum of 750 mm beyond the verandah beam to support a soffit.
(2) Fixing type for continuous spans shall have a double capacity to that listed in the table.
(3) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with clause 2.4.4.7.

Amd 2 May '06

Table 10.8 – Verandah beams (see 10.2.1.12) **– VSG 10 and MSG 10**

Beam size (Width x thickness)	Loaded dimension of verandah beam (m)							
	0.9		1.4		1.8		2.1	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
A Light roof in low to very high wind zone								
140 x 45	2.1	CC	1.7	DD	1.5	DD	1.4	DD
190 x 45	2.6	CC	2.0	DD	1.9	EE	1.8	EE
240 x 45	2.9	CC	2.3	EE	2.1	EE	2.0	EE
290 x 45	3.1	CC	2.5	EE	2.3	EE	2.2	FF
140 x 70	2.4	CC	1.9	DD	1.8	DD	1.7	EE
190 x 70	3.3	DD	2.6	EE	2.4	FF	2.3	FF
240 x 70	4.2	DD	3.3	FF	3.1	FF	2.9	FF
290 x 70	4.8	EE	3.8	FF	3.5	FF	3.4	FF
140 x 90	2.6	CC	2.1	DD	1.9	EE	1.9	EE
190 x 90	3.6	DD	2.9	EE	2.7	FF	2.5	FF
240 x 90	4.5	EE	3.6	FF	3.4	FF	3.2	FF
290 x 90	6.9	FF	5.6	FF	–	–	–	–
B Heavy roof in low to very high wind zone								
140 x 45	1.7	CC	1.3	CC	1.2	CC	1.2	CC
190 x 45	2.3	CC	1.8	CC	1.6	DD	1.6	DD
240 x 45	2.6	CC	2.0	DD	1.9	DD	1.8	DD
290 x 45	2.7	CC	2.2	DD	2.0	DD	1.9	EE
140 x 70	1.9	CC	1.5	CC	1.4	CC	1.4	DD
190 x 70	2.6	CC	2.1	DD	1.9	DD	1.9	DD
240 x 70	3.3	CC	2.7	DD	2.5	EE	2.4	EE
290 x 70	4.0	DD	3.2	EE	3.0	FF	2.9	FF
140 x 90	2.1	CC	1.7	CC	1.6	DD	1.5	DD
190 x 90	2.9	CC	2.3	DD	2.1	DD	2.0	EE
240 x 90	3.6	CC	2.9	EE	2.7	EE	2.6	FF
290 x 90	5.6	EE	4.4	FF	4.1	FF	3.9	FF

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
CC	6/100 x 3.75 nails	4.7
DD	1/M12 bolt	6.7
EE	1/M12 bolt	8.7
FF	3/M12 bolts or 2/M16 bolts	18.6

NOTE –
(1) This table includes provision for the rafters cantilevering a maximum of 750 mm beyond the verandah beam to support a soffit.
(2) Fixing type for continuous spans shall have a double capacity to that listed in the table.
(3) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

10.2.1.13.2
Collar ties shall (see figure 10.13):

(a) Be at 1.8 m centres or every third pair of *rafters,* whichever is the closer;

(b) Be fixed to the sides of the *rafters* immediately above each *underpurlin;*

(c) Consist of 140 mm x 19 mm or 90 mm x 45 mm timber.

Amd 2 May '06

10.2.1.13.3
Cleats shall (see figure 10.14):

(a) Be at 1.8 m centres or every third pair of *rafters,* whichever is the closer;

(b) Be fixed to the sides of the *rafters* immediately beneath the *ridge board;*

(c) Consist of 90 mm x 19 mm timber.

Amd 2 May '06

10.2.1.14 *Eaves*

10.2.1.14.1
A *rafter* may extend as a cantilever beyond its supporting *top plate* for a distance not exceeding one quarter of its maximum permitted span, or 750 mm measured horizontally from the face of the support, whichever is the lesser. Where 90 mm x 45 mm *rafters* are supported by *eaves bearers* (boxed) they may extend to 750 mm.

C10.2.1.14.1
The eaves of truss roofs are covered by the design requirements of 10.2.2.

Amd 2 May '06

10.2.1.14.2
Where the eaves are boxed, the *eaves bearers* shall be attached to the ends of *rafters* or trusses and to *studs* or *ribbon boards,* and shall be at not more than 1200 mm centres.

10.2.1.14.3
Eaves bearers shall consist of:

(a) Not exceeding 600 mm long: 45 mm x 35 mm timber;

(b) Not exceeding 750 mm long: 70 mm x 35 mm timber on edge.

Amd 2 May '06

10.2.1.15 *Gable verges*

10.2.1.15.1
Gable verges shall be framed by either:

(a) *Purlins* extending as cantilevers beyond their end supports as shown in figure 10.15 for a distance not exceeding that given by 10.2.1.15.2; or

(b) Outriggers complying with 10.2.1.15.3 and as shown in figure 10.15.

10.2.1.15.2
Purlins with a back span over at least 3 *rafters* may extend as cantilevers beyond their end supports for a distance not exceeding:

(a) Laid on their flat:

(i) *Light roofs*
45 mm x 45 mm *purlins:* 300 mm
70 mm x 45 mm *purlins:* 500 mm
90 mm x 45 mm *purlins :* 600 mm

(ii) *Heavy roofs*
45 mm x 45 mm *purlins* at 400 mm centres: 300 mm
70 mm x 45 mm *purlins* at 400 mm centres: 400 mm
90 mm x 45 mm *purlins* at 400 mm centres: 500 mm

(b) Laid on their edge:

(i) *Light roofs*
70 mm x 45 mm *purlins:* 600 mm
90 mm x 45 mm *purlins:* 700 mm

(ii) *Heavy roofs*
70 mm x 45 mm *purlins* at 400 mm centres: 500 mm
90 mm x 45 mm *purlins* at 400 mm centres: 600 mm

10.2.1.15.3
Outriggers shall (see figure 10.15):

(a) Be laid on edge and be of minimum size 90 mm x 35 mm;

(b) Be located at not more than 900 mm centres;

(c) Extend beyond their end supports for a distance not exceeding 600 mm;

(d) Have a flying *rafter* of minimum size 90 mm x 35 mm fixed to their ends;

(e) Have *blocking* pieces of the same size as the outriggers fitted and fixed between the outriggers along the line of the end support. *Purlins* shall be fixed to the *blocking* pieces and to the flying *rafter.*

(f) Be fixed to wall *framing* with fixings determined from table 10.9 as if the outriggers are *purlins.*

Amd 2
May '06

Table 10.9 – Purlins or tile battens (see 10.2.1.16.1) **– No. 1 Framing and MSG 6**

(a) Light roof cladding (see figures 10.16 and 10.17)

	Maximum span	Maximum spacing and fixing loads in the following wind zones											
		Low			Medium			High			Very high		
		Spacing	Fixing capacity		Spacing	Fixing capacity		Spacing	Fixing capacity		Spacing	Fixing capacity	
			M[1]	P[1]		M[1]	P[1]		M[1]	P[1]		M[1]	P[1]
(mm x mm) Tile batten size	(mm)	(mm)	(kN)	(kN)	(mm)	(kN)	(kN)	(mm)	(kN)	(kN)	(mm)	(kN)	(kN)
50 x 40	900	400	0.3	0.4	400	0.4	0.5	400	0.5	0.8	400	0.7	1.0
50 x 50	1200	400	0.4	0.5	400	0.5	0.7	400	0.7	1.0	400	0.9	1.3
Purlin size													
70 x 45	900	900	0.5	0.8	900	0.7	1.1	900	1.0	1.5	800	1.2	1.8
70 x 45	900	1200	0.7	1.0	1200	1.0	1.4	1000	1.1	1.7	800	1.2	1.8
70 x 45	900	1800	1.0	1.5	1500	1.2	1.8	1000	1.1	1.7	800	1.2	1.8
70 x 45	1200	1000	0.8	1.2	800	0.9	1.3	600	0.9	1.4	–	–	–
90 x 45	1200	1300	1.0	1.5	1000	1.1	1.6	700	1.1	1.6	–	–	–

NOTE –
(1) M = Main roof; P = Periphery (see figures 10.16 and 10.17).
(2) Fixings with the capacity required by the table shall be selected from table 10.10.
(3) Batten sizes are sawn timber.
(4) Purlin and batten sizes are on the flat.

(b) Heavy roof cladding

Tile batten size	Maxiumum span	Spacing	Fixing loads (all wind areas; all roof areas)
(mm x mm)	(mm)	(mm)	(kN)
50 x 25	480	400	0.4
50 x 40	600	400	0.4
50 x 50	900	400	0.4

NOTE –
(1) Fixings with the capacity required by the table shall be selected from table 10.10.
(2) Batten sizes are sawn timber.
(3) Batten sizes are on the flat.

Amd 2
May '06

Table 10.9 – Purlins (see 10.2.1.16.1) – VSG 8 and MSG 8

(a) Light roof cladding (see figures 10.16 and 10.17)

Purlin size	Maximum span	Maximum spacing and fixing loads in the following wind zones											
		Low			Medium			High			Very high		
		Spacing	Fixing capacity		Spacing	Fixing capacity		Spacing	Fixing capacity		Spacing	Fixing capacity	
			M(1)	P(1)		M(1)	P(1)		M(1)	P(1)		M(1)	P(1)
(mm x mm)	(mm)	(mm)	(kN)	(kN)	(mm)	(kN)	(kN)	(mm)	(kN)	(kN)	(mm)	(kN)	(kN)
70 x 45	900	900	0.5	0.8	900	0.7	1.1	900	1.0	1.5	900	1.3	2.0
70 x 45	900	1200	0.7	1.0	1200	1.0	1.4	1200	1.4	2.0	1200	1.8	2.6
70 x 45	900	1800	1.0	1.5	1800	1.4	2.1	1400	1.6	2.3	1400	2.0	3.1
70 x 45	1200	1200	0.9	1.4	1100	1.2	1.7	800	1.2	1.8	800	1.6	2.3
70 x 45	1200	1300	1.0	1.5	1100	1.2	1.7	800	1.2	1.8	800	1.6	2.3
90 x 45	1200	1700	1.3	1.9	1500	1.6	2.3	1000	1.5	2.2	1000	2.0	2.9

NOTE –
(1) M = Main roof; P = Periphery (see figures 10.16 and 10.17).
(2) Fixings with the capacity required by the table shall be selected from table 10.10.
(3) Purlin sizes are on the flat.

Table 10.9 – Purlins (see 10.2.1.16.1) – VSG 10 and MSG 10

(a) Light roof cladding (see figures 10.16 and 10.17)

Purlin size	Maximum span	Maximum spacing and fixing loads in the following wind zones											
		Low			Medium			High			Very high		
		Spacing	Fixing capacity		Spacing	Fixing capacity		Spacing	Fixing capacity		Spacing	Fixing capacity	
			M(1)	P(1)		M(1)	P(1)		M(1)	P(1)		M(1)	P(1)
(mm x mm)	(mm)	(mm)	(kN)	(kN)	(mm)	(kN)	(kN)	(mm)	(kN)	(kN)	(mm)	(kN)	(kN)
70 x 45	900	900	0.5	0.8	900	0.7	1.1	900	1.0	1.5	900	1.3	2.0
70 x 45	900	1200	0.7	1.0	1200	1.0	1.4	1200	1.4	2.0	1200	1.8	2.6
70 x 45	900	1800	1.0	1.5	1800	1.4	2.1	1800	2.0	2.9	1400	2.0	3.1
70 x 45	1200	1200	0.9	1.4	1200	1.3	1.9	1100	1.7	2.5	900	1.8	2.6
70 x 45	1200	1400	1.1	1.6	1400	1.5	2.2	1100	1.7	2.5	900	1.8	2.6
90 x 45	1200	1800	1.4	2.0	1800	1.9	2.8	1400	2.1	3.1	1100	2.1	3.2

NOTE –
(1) M = Main roof; P = Periphery (see figures 10.16 and 10.17).
(2) Fixings with the capacity required by the table shall be selected from table 10.10.
(3) Purlin sizes are on the flat.

Amd 2
May '06

NOTES

Table 10.10 – Capacity of fixings for purlins or battens (see 10.2.1.16.1 and 10.2.1.16.5)

Fixing description	Fixing capacity
	(kN)
1/100 x 3.75 nail or 1/90 x 3.15 power driven nail	0.4
2/100 x 3.75 skewed nails or 2/90 x 3.15 power driven nails	0.7
2/100 x 3.75 skewed nails + 1 wire dog or 2/100 x 3.75 skewed nails + 1/14 g Type 17 screw to AS 3566*	2.7
2/100 x 3.75 skewed nails + 2 wire dogs or 2/100 x 3.75 skewed nails + 2/14 g Type 17 screws to AS 3566*	4.7
* If screw fixed, screws shall be sufficiently long so as to penetrate rafter by at least 50 mm.	

Amd 1 Dec '00

NOTE –

(1) Purlins on flat may be substituted for the following sizes:

On flat	On edge
70 x 45	70 x 35
90 x 45	70 x 45

(2) Alternative fixings with required uplift capacity determined in accordance with 2.4.6 may be used.

(3) Where purlins are fixed over sarking or ceiling sheet lining material refer to 10.2.1.16.5(b).

Amd 1 Dec '00

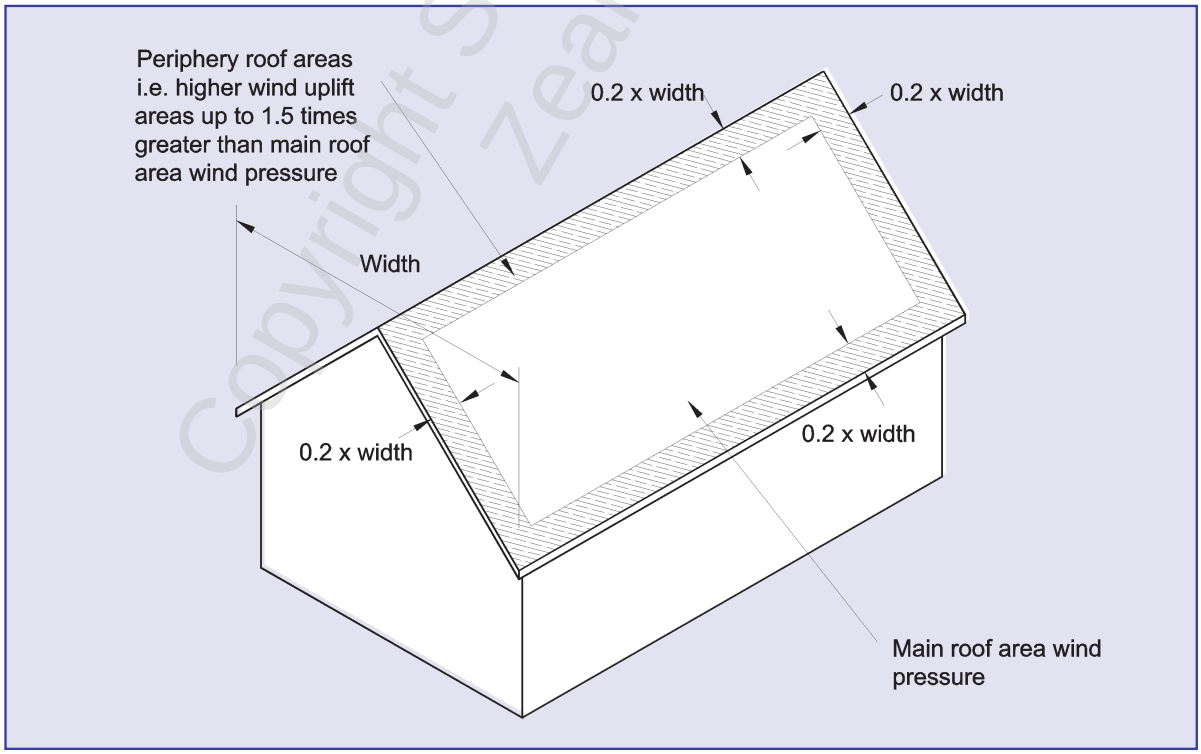


Figure 10.16 – Gable roof showing higher wind uplift areas requiring extra purlin and batten fixings (see table 10.9)

Amd 1 Dec '00

10.2.1.16 *Purlins and tile battens*

C10.2.1.16.1
Purlin spacings should not be greater than those recommended by the manufacturer of the roof cladding.

10.2.1.16.1
The size of *purlins* and tile battens shall be taken from table 10.9 using *spacing* to suit the spanning capability of the *cladding*. Fixings shall be selected from table 10.10 to have a capacity equal to or greater than that required by table 10.9. Amd 1 Dec '00

10.2.1.16.2
Purlins and tile battens shall be laid directly over *rafters* or dummy *rafters* and parallel to the associated ridge or eaves line as shown in figures 10.18 and 10.19.

C10.2.1.16.3
The strength of purlins is increased by being a continuous length over as many spans as is possible.

10.2.1.16.3
Purlins and tile battens shall be continuous over at least 2 spans, and may be butt jointed over supports provided that no 2 adjacent *purlins* or tile battens shall be jointed over the same truss or *rafter*.

10.2.1.16.4
Purlins may extend as cantilevers to form a *gable* verge as provided by 10.2.1.15.1.

10.2.1.16.5
Purlins and tile battens shall be fixed in accordance with the following:

(a) Laid directly over *rafters* and fixed to *rafters* in accordance with the fixing type set out in table 10.10;

(b) Where *purlins* and tile battens are laid directly over sheet *sarking* or ceiling sheet *lining material* of maximum 13 mm thickness, the *purlin* or tile batten shall be fixed as shown in figure 10.20(B). Amd 1 Dec '00

C10.2.1.16.6
The test represents the weight of a roof worker, and may be conducted between any two suitable supports at ground level.

10.2.1.16.6 *Tile Battens*
Tile battens shall be sawn No. 1 Framing, selected on site as follows: Battens shall be selected so as to be free from defects, or alternatively be able to resist a load of 100 kg gradually applied at midspan without failure. The test span must be the same as the spacing of the rafters where the batten is to be used. Amd 2 May '06

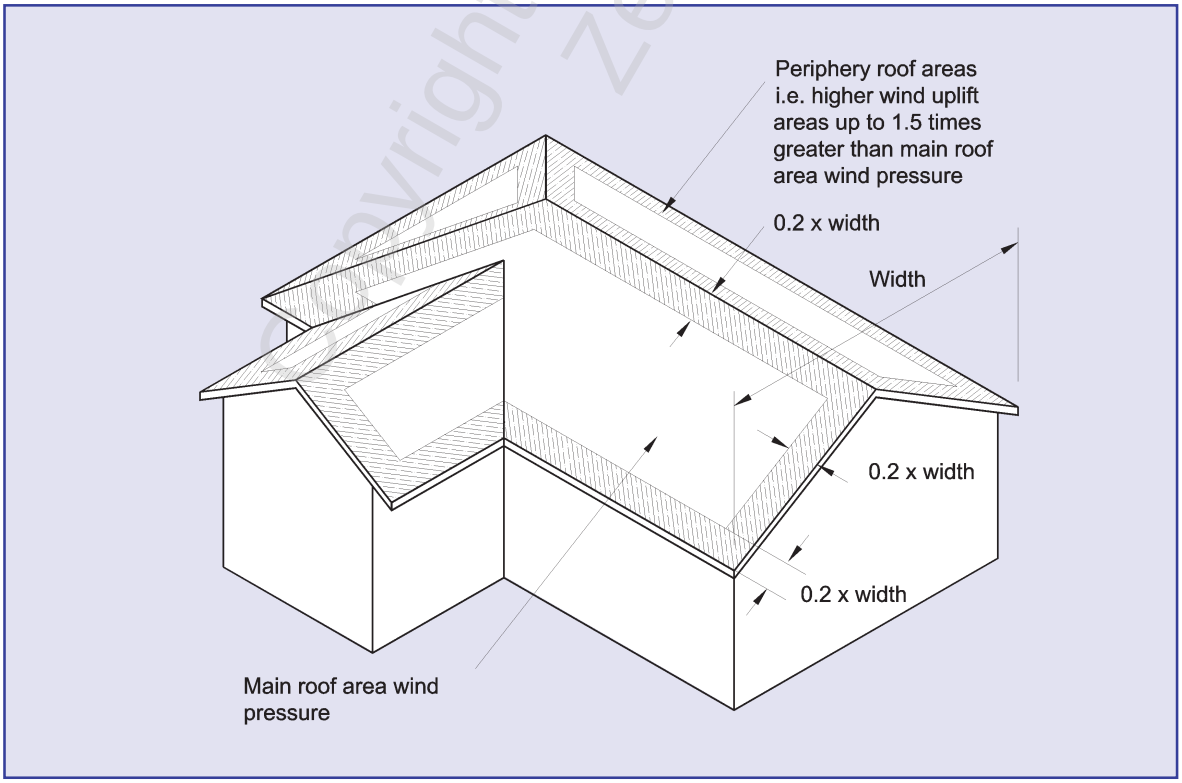


Figure 10.17 – Hip and valley roof showing higher wind uplift areas requiring extra purlin and batten fixings (see table 10.9) Amd 1 Dec '00

10.4.2 *Roof plane diagonal braces*

10.4.2.1
Where only one roof plane *diagonal brace* is required, then it shall intersect one end of the ridge line.

10.4.2.2
Where more than one roof plane *diagonal brace* is required, then one shall intersect each end of the ridge line and any others shall, as far as possible, be evenly distributed along the ridge and run alternately in opposing directions.

10.4.2.3
Each roof plane *diagonal brace* shall (see figure 10.25):

(a) Run at 45° to the ridge line and from the ridge to the supporting wall;

(b) Consist of either:

Amd 2 May '06

(i) A continuous length of 90 mm x 19 mm timber; or

(ii) A diagonally opposing pair of continuous steel strips each having a *capacity* of 8.0 kN in tension, fixed to each top chord or *rafter* that is intersected, and to the *top plate*.

C10.4.2.3
(b) Blocking between trusses or joists may be necessary at the intersection with the top plate (see figure 10.25).

10.4.3 *Roof space diagonal braces* (see figure 10.26)

10.4.3.1
Roof space *diagonal braces* shall as far as possible be evenly distributed over the length of the roof and run alternately in opposite directions.

10.4.3.2
Each roof space *diagonal brace* shall:

(a) Run not steeper than 45° to the horizontal from top chord level to bottom chord level or from *ridge board* or *rafter* level to ceiling *joist* level as appropriate;

(b) In plan view be parallel to or at not more than 25° to the ridge line;

(c) Consist of 90 mm x 45 mm continuous members as required below. Where 2 members are required they shall be *spaced* 45 mm apart and nailed together through the *spacing* pieces at centres not exceeding 1 m.

C10.4.3.2
(c) Where a roof space brace can be fixed to a roof framing member within its length, then the effective length shall be measured between such a fixing and end of the brace.

Roof space diagonal braces

	Timber grade		
	No.1 Framing MSG6	VSG8 MSG8	VSG10 MSG10
Member size (mm)	**Maximum length** (m)		
90 x 45	1.65	1.85	2.00
2/90 x 45 spaced	4.30	4.80	5.00

Amd 2 May '06

10.4.3.3
Amd 2 May '06
The top end of each roof space *diagonal brace* shall be fixed to the *ridge board* or to a 90 mm x 45 mm *blocking* piece fixed between adjacent top chords or *rafters*.

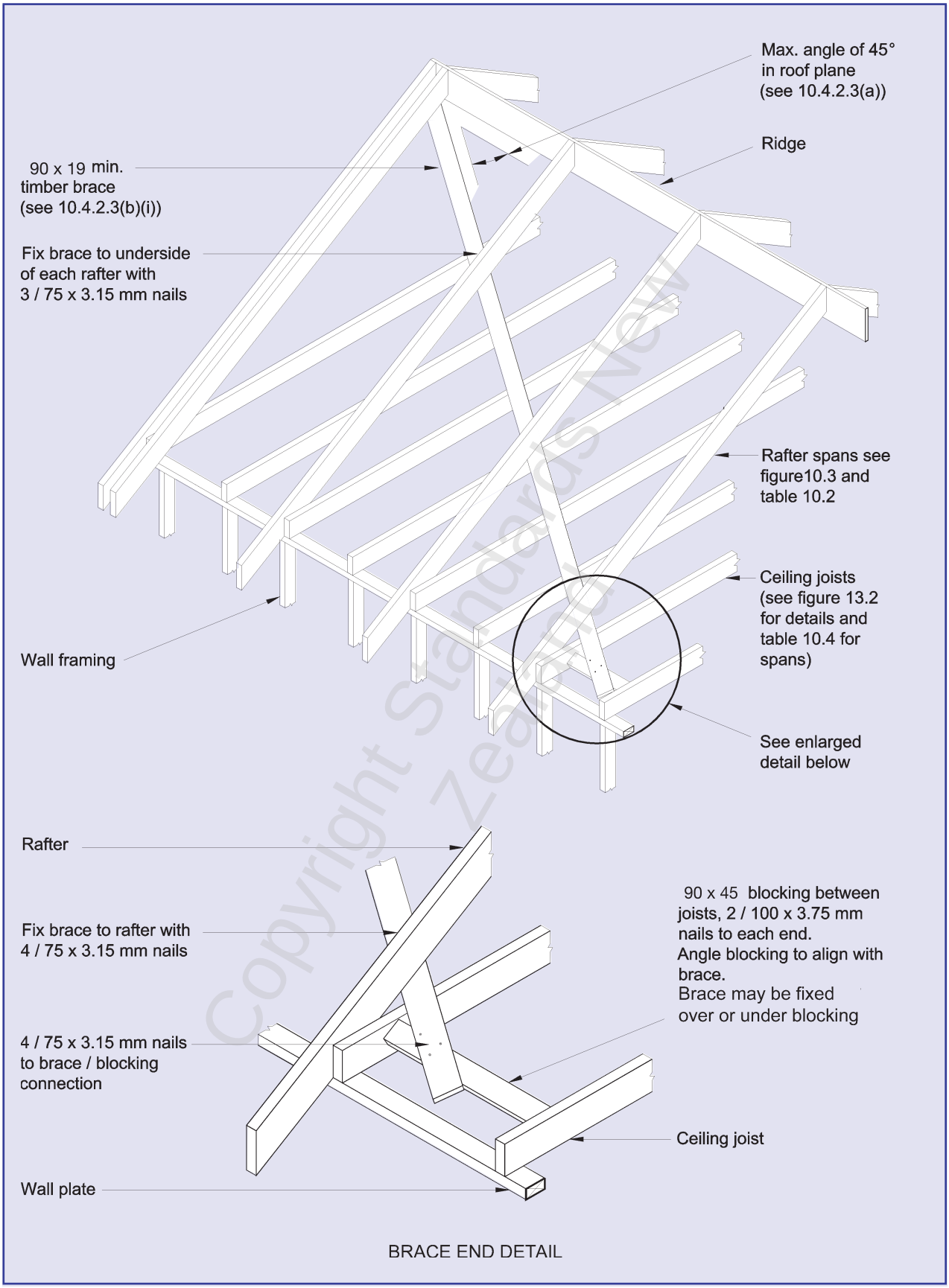


Figure 10.25 – Roof plane diagonal brace – Timber (see 10.4.2.3)

Table 14.4 – Bearers, 3 kPa floor load (see 6.12.2.1) **– No. 1 Framing and MSG 6**

Maximum span of bearer continuous over 2 or more spans (m)	Loaded dimension* of bearer (m)	Bearer size (width x thickness) (mm x mm)
1.30	1.3	140 x 70
	1.7	140 x 90
	2.4	190 x 70
1.65	1.5	190 x 70

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 14.4 – Bearers, 3 kPa floor load (see 6.12.2.1) **– VSG 8 and MSG 8**

Maximum span of bearer continuous over 2 or more spans (m)	Loaded dimension* of bearer (m)	Bearer size (width x thickness) (mm x mm)
1.30	1.8	140 x 70
	2.3	140 x 90
	3.4	190 x 70
1.65	1.4	140 x 90
	2.1	190 x 70
2.00	1.4	190 x 70

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Table 14.4 – Bearers, 3 kPa floor load (see 6.12.2.1) **– VSG 10 and MSG 10**

Maximum span of bearer continuous over 2 or more spans (m)	Loaded dimension* of bearer (m)	Bearer size (width x thickness) (mm x mm)
1.30	1.4	90 x 90
	2.6	140 x 70
	3.4	140 x 90
	4.8	190 x 70
1.65	1.6	140 x 70
	2.1	140 x 90
	3.0	190 x 70
2.00	1.4	140 x 90
	2.0	190 x 70

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Table 14.5 – Subfloor jack studs, 3 kPa floor load (see 6.10.2.1)

Maximum span of bearers (m)	Jack stud (mm x mm)	Maximum jack stud height for loaded dimension of the bearer of: (m)		
		2.0 (m)	3.5 (m)	5.0 (m)
Supporting 1 storey				
1.30	90 x 70	2.4	1.2	–
	90 x 90	3.0	2.4	2.4
1.65	90 x 70	1.8	–	–
	90 x 90	3.0	2.4	1.8
2.00	90 x 70	1.8	–	–
	90 x 90	3.0	2.4	1.8
Supporting 2 storeys				
1.30	90 x 70	1.2	–	–
	90 x 90	2.4	1.8	–
1.65	90 x 70	2.4	–	–
2.00	90 x 90	1.8	–	–

Amd 2 May '06

* For definition of loaded dimension see 1.3.

NOTE – Substitution with built-up members is not allowed.

Table 14.6 – Square pile footings for 3 kPa floor load (see 6.4.5.4)

Amd 1 Dec '00

Maximum spans* of:		Minimum plan dimensions of square footing for pile supporting:		
Bearers	Joists	Floor only	Floor and walls of:	
			1 storey	2 storeys
(m)	(m)	(mm x mm)	(mm x mm)	(mm x mm)
1.30	2.0	225 x 225†	300 x 300†	375 x 375
	3.5	300 x 300†	400 x 400	500 x 500
	5.0	325 x 325†	450 x 450	575 x 575
	6.0	350 x 350	500 x 500	625 x 625
1.65	2.0	250 x 250†	350 x 350	425 x 425
	3.5	325 x 325†	425 x 425	575 x 575
	5.0	375 x 375	500 x 500	650 x 650
2.0	2.0	275 x 275†	375 x 375	475 x 475
	3.5	375 x 375	475 x 475	625 x 625

* Span is the average of the bearer or joist spans on either side of the pile under consideration.

† 350 mm x 350 mm for anchor piles.

Table 14.7 – Spacing of M12 bolts supporting stringers for 3 kPa floor load (see 6.13.1)

Amd 2 May '06

Maximum span of floor joists	Maximum spacing of bolts	Stringer nominal size
(m)	(m)	(mm)
2	1.25	140 x 45
3	0.9	140 x 45
4	0.7	140 x 45
5	0.5	140 x 45
6	0.5	140 x 45

Table 14.8 – Floor joists for 3 kPa floor load (see 7.1.1.1) **– No. 1 Framing and MSG 6**

Floor joist size	Maximum span* of joists at a maximum spacing (mm) of:		
	400	450	600
(mm x mm)	(m)	(m)	(m)
90 x 35	1.05	1.00	0.85
90 x 45	1.20	1.10	0.95
140 x 35	1.65	1.55	1.35
140 x 45	1.85	1.75	1.50
190 x 45	2.55	2.40	2.05
240 x 45	3.20	3.05	2.60
290 x 45	3.90	3.65	3.15

* May be increased by 10 % for joists continuous over 2 or more spans.

Table 14.8 – Floor joists for 3 kPa floor load (see 7.1.1.1) **– VSG 8 and MSG 8**

Floor joist size	Maximum span* of joists at a maximum spacing (mm) of:		
	400	450	600
(mm x mm)	(m)	(m)	(m)
90 x 35	1.25	1.15	1.00
90 x 45	1.40	1.35	1.15
140 x 35	1.95	1.85	1.60
140 x 45	2.20	2.10	1.80
190 x 45	3.00	2.85	2.45
240 x 45	3.80	3.60	3.10
290 x 45	4.60	4.35	3.75

* May be increased by 10 % for joists continuous over 2 or more spans.

Amd 2
May '06

Table 14.8 – Floor joists for 3 kPa floor load (see 7.1.1.1) – VSG 10 and MSG 10

Floor joist size	Maximum span* of joists at a maximum spacing (mm) of:		
	400	450	600
(mm x mm)	(m)	(m)	(m)
90 x 35	1.45	1.40	1.20
90 x 45	1.55	1.50	1.35
140 x 35	2.25	2.15	1.90
140 x 45	2.65	2.50	2.15
190 x 45	3.60	3.40	2.95
240 x 45	4.55	4.30	3.70
290 x 45	5.50	5.20	4.50

Amd 2 May '06

* May be increased by 10 % for joists continuous over 2 or more spans.

Table 14.9 – Strip flooring for 3 kPa floor load (see 7.2.2.1)

Maximum spacing of joists	Minimum dry dressed thickness of tongued and grooved strip flooring of species listed below as:	
	Type A	Type B
(mm)	(mm)	(mm)
400	22	19
450	22	22
600	25	25

Type A timbers: Radiata pine, matai, rimu, red beech, silver beech, douglas fir, larch.

Type B timbers: Tawa, hard beech, jarrah, karri, blackbutt, tallowwood.

Table 14.10 – Studs in loadbearing walls for heavy or light roofs with medium wall claddings or light wall claddings for 3 kPa floor load (see 8.5.1.1) – No. 1 Framing and MSG 6

Wind zone	Loaded dimension* of wall	Stud sizes for studs of maximum length (height) of: (m)								
		2.4			2.7			3.0		
		At a maximum stud spacing (mm) of:			At a maximum stud spacing (mm) of:			At a maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	600
A Lower of 2 storeys or subfloor beneath 1 storey										
	(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)								
Very High	3.0	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45	90 x 90	140 x 45	140 x 70
	4.5	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45	90 x 90	140 x 45	140 x 70
	6.0	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45	90 x 90	140 x 45	140 x 70
High	3.0	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
	4.5	90 x 45	90 x 70	90 x 70	90 x 70	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 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
Medium	3.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	4.5	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	6.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
Low	3.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	4.5	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	6.0	90 x 35	90 x 35	90 x 45	90 x 45	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
Internal Walls	3.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	4.5	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	6.0	90 x 35	90 x 35	90 x 45	90 x 45	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
B Subfloor beneath 2 storeys										
	(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)								
Very High	3.0	90 x 70	90 x 70	90 x 90	90 x 90	90 x 90	140 x 45	90 x 90	140 x 45	140 x 70
	4.5	90 x 70	90 x 70	90 x 90	90 x 90	90 x 90	140 x 45	90 x 90	140 x 45	140 x 70
	6.0	90 x 70	90 x 70	90 x 90	90 x 90	90 x 90	140 x 70	140 x 45	140 x 45	140 x 70
High	3.0	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	90 x 90	90 x 90	90 x 90	140 x 45
	4.5	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45	90 x 90	90 x 90	140 x 45
	6.0	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45	90 x 90	140 x 45	140 x 45
Medium	3.0	90 x 45	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	4.5	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	90 x 90
	6.0	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
Low	3.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 45	90 x 70	90 x 90
	4.5	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	6.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
Internal Walls	3.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	4.5	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	6.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90

* 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 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 (or laminated) members sized in accordance with 8.5.1.2 and nailed together in accordance with 2.4.4.7.

Amd 2 May '06

Table 14.10 – Studs in loadbearing walls for heavy or light roofs with medium wall claddings or light wall claddings for 3 kPa floor load (see 8.5.1.1) – VSG 8 and MSG 8

Wind zone	Loaded dimension* of wall	Stud sizes for studs of maximum length (height) of: (m)								
		2.4			2.7			3.0		
		At a maximum stud spacing (mm) of:			At a maximum stud spacing (mm) of:			At a maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	600
A Lower of 2 storeys or subfloor beneath 1 storey										
	(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)								
Very High	3.0	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	90 x 90
	4.5	90 x 45	90 x 70	90 x 70	90 x 70	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 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
High	3.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	4.5	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	6.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
Medium	3.0	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 45	90 x 70
	4.5	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	6.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
Low	3.0	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	4.5	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	6.0	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
Internal Walls	3.0	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	4.5	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	6.0	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
B Subfloor beneath 2 storeys										
	(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)								
Very High	3.0	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
	4.5	90 x 45	90 x 70	90 x 70	90 x 70	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 70	90 x 70	90 x 70	90 x 90	90 x 70	90 x 90	140 x 45
High	3.0	90 x 45	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	4.5	90 x 45	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	6.0	90 x 45	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
Medium	3.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	4.5	90 x 35	90 x 35	90 x 45	90 x 45	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	6.0	90 x 35	90 x 45	90 x 45	90 x 45	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70
Low	3.0	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 45	90 x 45	90 x 45	90 x 70
	4.5	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 45	90 x 70
	6.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
Internal Walls	3.0	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 45	90 x 45	90 x 45	90 x 70
	4.5	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 45	90 x 70
	6.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	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 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 (or laminated) members sized in accordance with 8.5.1.2 and nailed together in accordance with 2.4.4.7.

Amd 2 May '06

Table 14.10 – Studs in loadbearing walls for heavy or light roofs with medium wall claddings or light wall claddings for 3 kPa floor load (see 8.5.1.1) – VSG 10 and MSG 10

Wind zone	Loaded dimension* of wall	Stud sizes for studs of maximum length (height) of: (m)								
		2.4			2.7			3.0		
		At a maximum stud spacing (mm) of:			At a maximum stud spacing (mm) of:			At a maximum stud spacing (mm) of:		
		400	480	600	400	480	600	400	480	600
A Lower of 2 storeys or subfloor beneath 1 storey										
	(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)								
Very High	3.0	90 x 35	90 x 35	90 x 45	90 x 45	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	4.5	90 x 35	90 x 35	90 x 45	90 x 45	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	6.0	90 x 35	90 x 45	90 x 45	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 70
High	3.0	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 45	90 x 45	90 x 70
	4.5	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 45	90 x 70
	6.0	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
Medium	3.0	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45
	4.5	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 45
	6.0	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
Low	3.0	70 x 45	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 35
	4.5	70 x 35	70 x 35	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 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45
Internal Walls	3.0	70 x 35	70 x 35	70 x 45	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 35
	4.5	70 x 35	70 x 35	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 35	70 x 45	90 X 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45
B Subfloor beneath 2 storeys										
	(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)								
Very High	3.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	4.5	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
	6.0	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90
High	3.0	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	4.5	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
	6.0	90 x 35	90 x 35	90 x 45	90 x 45	90 x 45	90 x 70	90 x 45	90 x 70	90 x 70
Medium	3.0	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
	4.5	70 x 45	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	70 x 45	90 x 35	90 x 45	90 x 35	90 x 45	90 x 45	90 x 45	90 x 45	90 x 70
Low	3.0	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45
	4.5	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 45
	6.0	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 70
Internal Walls	3.0	70 x 35	70 x 45	90 x 35	70 x 45	90 x 35	90 x 35	90 x 35	90 x 35	90 x 45
	4.5	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	90 x 45
	6.0	70 x 45	70 x 45	90 x 35	90 x 35	90 x 35	90 x 45	90 x 35	90 x 45	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 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 (or laminated) members sized in accordance with 8.5.1.2 and nailed together in accordance with 2.4.4.7.

Amd 2 May '06

Table 14.11 – Reference table for lintel load cases

Table No.	Supporting			Load type			
	Roof	Walls	Floor	Roof	Snow (kPa)	Walls	Floor (kPa)
14.12	✓	✓	✓	Light	0	Light	3
	✓	✓	✓	Light	0	Medium	3
	✓	✓	✓	Heavy	0	Light	3
	✓	✓	✓	Heavy	0	Medium	3
14.13		✓	✓			Light	3
		✓	✓			Medium	3
14.14			✓				3

Amd 1 Dec '00

Table 14.12 – Lintels supporting roof, wall and floor for 3 kPa floor load (see figure 8.9) – No. 1 Framing and MSG 6

Roof pitch up to 45°

Loaded dimension* of lintel (m)		Maximum span for lintel sizes listed below (m) (Width x thickness)							
		140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof Light wall	3	0.7	0.8	1.0	1.2	1.2	1.5	1.5	1.8
	4	0.7	0.8	0.9	1.1	1.2	1.4	1.4	1.7
	5	–	0.8	0.9	1.1	1.1	1.4	1.4	1.7
	6	–	0.8	0.9	1.1	1.1	1.4	1.4	1.6
Light roof Medium wall	3	0.7	0.8	0.9	1.1	1.2	1.4	1.4	1.7
	4	–	0.8	0.9	1.1	1.1	1.4	1.4	1.7
	5	–	0.7	0.8	1.0	1.0	1.3	1.3	1.5
	6	–	0.7	0.8	1.0	1.0	1.2	1.2	1.5
Heavy roof Light wall	3	0.7	0.8	0.9	1.1	1.1	1.4	1.4	1.7
	4	–	0.8	0.9	1.1	1.1	1.3	1.3	1.6
	5	–	0.7	0.8	1.0	1.1	1.3	1.3	1.6
	6	–	0.7	0.8	1.0	1.0	1.2	1.2	1.5
Heavy roof Medium wall	3	–	0.8	0.9	1.1	1.1	1.4	1.4	1.7
	4	–	0.7	0.8	1.0	1.1	1.3	1.3	1.6
	5	–	0.7	0.8	1.0	1.0	1.3	1.3	1.5
	6	–	0.7	0.8	1.0	1.0	1.2	1.2	1.5

* For definition of loaded dimension see 1.3.

NOTE –

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

(2) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Table 14.12 – Lintels supporting roof, wall and floor for 3 kPa floor load (see figure 8.9) – VSG 8 and MSG 8

Roof pitch up to 45°

Loaded dimension* of lintel (m)		Maximum span for lintel sizes listed below (m) (Width x thickness)							
		140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof Light wall	3	0.8	1.0	1.1	1.4	1.4	1.8	1.8	2.1
	4	0.8	1.0	1.1	1.3	1.4	1.7	1.7	2.1
	5	0.8	0.9	1.1	1.3	1.4	1.7	1.7	2.0
	6	0.8	0.9	1.0	1.3	1.3	1.6	1.6	2.0
Light roof Medium wall	3	0.8	1.0	1.1	1.3	1.4	1.7	1.7	2.1
	4	0.8	1.0	1.1	1.3	1.4	1.7	1.7	2.0
	5	0.7	0.9	1.0	1.2	1.2	1.5	1.5	1.8
	6	0.7	0.8	0.9	1.1	1.2	1.5	1.5	1.8
Heavy roof Light wall	3	0.8	1.0	1.1	1.3	1.4	1.7	1.7	2.0
	4	0.7	0.9	1.0	1.3	1.3	1.6	1.6	1.9
	5	0.7	0.9	1.0	1.2	1.3	1.5	1.5	1.9
	6	0.7	0.8	1.0	1.2	1.2	1.5	1.5	1.8
Heavy roof Medium wall	3	0.8	0.9	1.0	1.3	1.3	1.6	1.6	2.0
	4	0.7	0.9	1.0	1.2	1.3	1.6	1.6	1.9
	5	0.7	0.9	1.0	1.2	1.2	1.5	1.5	1.8
	6	0.7	0.8	0.9	1.1	1.2	1.5	1.5	1.8

* For definition of loaded dimension see 1.3.

NOTE –

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

(2) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 14.12 – Lintels supporting roof, wall and floor for 3 kPa floor load (see figure 8.9) – VSG 10 and MSG 10

Roof pitch up to 45°

Loaded dimension* of lintel (m)		Maximum span for lintel sizes listed below (m) (Width x thickness)								
		90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof Light wall	3	0.8	1.0	1.2	1.4	1.7	1.7	2.1	2.1	2.6
	4	0.7	1.0	1.2	1.3	1.6	1.7	2.0	2.0	2.5
	5	0.7	0.9	1.1	1.3	1.6	1.6	2.0	2.0	2.4
	6	0.7	0.9	1.1	1.2	1.5	1.6	1.9	1.8	2.3
Light roof Medium wall	3	0.7	1.0	1.2	1.3	1.6	1.7	2.1	2.0	2.5
	4	0.7	0.9	1.1	1.3	1.6	1.6	2.0	2.0	2.4
	5	–	0.8	1.0	1.2	1.4	1.5	1.8	1.6	2.1
	6	–	0.8	1.0	1.1	1.4	1.4	1.7	1.5	2.0
Heavy roof Light wall	3	0.7	0.9	1.1	1.3	1.6	1.6	2.0	2.0	2.4
	4	0.7	0.9	1.1	1.2	1.5	1.6	1.9	1.8	2.3
	5	0.7	0.9	1.1	1.2	1.5	1.5	1.8	1.7	2.2
	6	–	0.8	1.0	1.1	1.4	1.5	1.8	1.6	2.0
Heavy roof Medium wall	3	0.7	0.9	1.1	1.3	1.5	1.6	1.9	1.9	2.4
	4	0.7	0.9	1.1	1.2	1.5	1.5	1.9	1.7	2.2
	5	–	0.8	1.0	1.2	1.4	1.5	1.8	1.6	2.1
	6	–	0.8	1.0	1.1	1.4	1.4	1.7	1.5	2.0

* For definition of loaded dimension see 1.3.

NOTE –

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

(2) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Table 14.13 – Lintels supporting wall and floor only for 3 kPa floor load (see figure 8.10) **– No. 1 Framing and MSG 6**

Loaded dimension* of lintel (m)		Maximum span for lintel sizes listed below (m) (Width x thickness)							
		140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light wall	3	0.8	1.0	1.1	1.3	1.4	1.7	1.7	2.0
Medium wall	3	0.8	0.9	1.0	1.3	1.3	1.6	1.6	2.0

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 14.13 – Lintels supporting wall and floor only for 3 kPa floor load (see figure 8.10) **– VSG 8 and MSG 8**

Loaded dimension* of lintel (m)		Maximum span for lintel sizes listed below (m) (Width x thickness)								
		90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light wall	3	0.7	0.9	1.1	1.3	1.6	1.6	2.0	2.0	2.4
Medium wall	3	0.7	0.9	1.1	1.2	1.5	1.6	1.9	1.9	2.3

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 14.13 – Lintels supporting wall and floor only for 3 kPa floor load (see figure 8.10) **– VSG 10 and MSG 10**

Loaded dimension* of lintel (m)		Maximum span for lintel sizes listed below (m) (Width x thickness)									
		90 x 70	90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light wall	3	0.7	0.9	1.1	1.4	1.5	1.9	2.0	2.4	2.4	2.9
Medium wall	3	0.7	0.8	1.1	1.3	1.5	1.8	1.9	2.3	2.3	2.8

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Table 14.14 – Lintels supporting floor only for 3 kPa floor load (see figure 8.11) – **No. 1 Framing and MSG 6**

Loaded dimension* of lintel (m)	Maximum span for lintel sizes listed below (m) (Width x thickness)							
	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
3	0.8	1.0	1.1	1.4	1.4	1.7	1.7	2.1
4.5	0.7	0.8	0.9	1.1	1.2	1.4	1.4	1.7
6	–	0.7	0.8	1.0	1.0	1.2	1.2	1.5

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 14.14 – Lintels supporting floor only for 3 kPa floor load (see figure 8.11) – **VSG 8 and MSG 8**

Loaded dimension* of lintel (m)	Maximum span for lintel sizes listed below (m) (Width x thickness)								
	90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
3	0.7	1.0	1.2	1.3	1.6	1.7	2.1	2.1	2.5
4.5	–	0.8	1.0	1.1	1.3	1.4	1.7	1.7	2.0
6	–	0.7	0.8	0.9	1.1	1.2	1.4	1.4	1.8

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 14.14 – Lintels supporting floor only for 3 kPa floor load (see figure 8.11) – **VSG 10 and MSG 10**

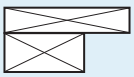
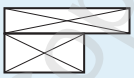
Loaded dimension* of lintel (m)	Maximum span for lintel sizes listed below (m) (Width x thickness)									
	90 x 70	90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
3	0.7	0.9	1.2	1.4	1.6	2.0	2.0	2.5	2.5	3.0
4.5	–	0.7	0.9	1.2	1.3	1.6	1.7	2.0	2.0	2.4
6	–	–	0.8	1.0	1.1	1.4	1.4	1.7	1.5	1.9

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2
May '06

Table 14.15 – Top and bottom plates for loadbearing walls, 3 kPa floor load (see 8.7.2.1) **– No. 1 Framing and MSG 6**

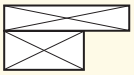
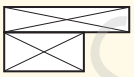
Plate size (mm) x (mm)		Maximum loaded dimension* of wall supporting floor (m)	Maximum spacing of trusses or rafters (m)	Light roof			Heavy roof		
				Stud spacing (mm)					
				400	480	600	400	480	600
				Maximum loaded dimension* of wall above supporting roof (m)					
A Top plate of subfloor wall or lower of 2 storeys supporting 1 floor									
90 x 45		1.5	400	5.2	2.5	–	3.3	1.5	–
			450	3.8	1.4	–	2.3	–	–
			600	1.0	–	–	–	–	–
90 x 45 plus 140 x 35 or 2/90 x 45	 or 	1.5	400	6.0	6.0	6.0	6.0	6.0	5.2
			450	6.0	6.0	6.0	6.0	6.0	4.1
			600	6.0	6.0	3.0	6.0	4.0	1.8
		3.0	400	6.0	6.0	2.2	6.0	4.6	1.3
			450	6.0	4.9	–	6.0	3.1	–
			600	4.1	–	–	2.5	–	–
B Bottom plate of lower of 2 storeys support 1 floor									
90 x 45		1.5	400	1.9	–	–	1.1	–	–
			450	–	–	–	–	–	–
90 x 70		1.5	400	6.0	6.0	6.0	6.0	6.0	5.2
			450	6.0	6.0	6.0	6.0	6.0	4.0
			600	6.0	5.5	2.7	5.2	3.4	1.6
		3	400	6.0	6.0	2.3	6.0	4.0	1.3
			450	6.0	4.1	–	4.9	2.5	–
			600	2.3	–	–	1.3	–	–
C Top plate of subfloor stud walls of 2 storey building supporting 2 floors									
90 x 45 plus 140 x 35 or 2/90 x 45	 or 	1.5	400	6.0	6.0	1.3	6.0	4.0	–
			450	6.0	4.1	–	5.8	2.5	–
			600	3.2	–	–	1.9	–	–
90 x 70		1.5	400	6.0	6.0	4.0	6.0	6.0	2.4
			450	6.0	6.0	1.9	6.0	4.5	–
			600	1.4	1.8	–	3.9	–	–
		3	400	4.4	–	–	2.7	–	–
			450	–	–	–	–	–	–

* For definition of loaded dimension see 1.3.

NOTE – Substitution with built-up members is not allowed.

Amd 2 May '06

Table 14.15 – Top and bottom plates for loadbearing walls, 3 kPa floor load (see 8.7.2.1) **– VSG 8 and MSG 8**

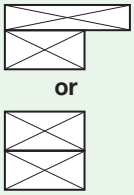
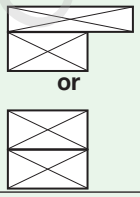
Plate size (mm) x (mm)		Maximum loaded dimension* of wall supporting floor (m)	Maximum spacing of trusses or rafters (m)	Light roof			Heavy roof		
				Stud spacing (mm)					
				400	480	600	400	480	600
				Maximum loaded dimension* of wall above supporting roof (m)					
A Top plate of subfloor wall or lower of 2 storeys supporting 1 floor									
90 x 45		1.5	400 450 600	6.0 6.0 4.4	6.0 5.0 1.9	3.1 1.9 –	6.0 5.3 2.7	4.1 3.1 –	1.9 – –
		3.0	400 450	4.3 2.4	– –	– –	2.7 1.4	– –	– –
90 x 45 plus 140 x 35 or 2/90 x 45	 or 	1.5	400 450 600	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 4.5
		3.0	400 450 600	6.0 6.0 6.0	6.0 6.0 5.9	6.0 6.0 1.2	6.0 6.0 6.0	6.0 6.0 3.7	5.4 3.8 –
B Bottom plate of lower of 2 storeys support 1 floor									
90 x 45		1.5	400 450 600	6.0 4.4 1.3	3.7 2.3 –	1.3 – –	3.8 2.7 –	2.2 1.3 –	– – –
90 x 70		1.5	400 450 600	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 4.5
		3	400 450 600	6.0 6.0 6.0	6.0 6.0 5.0	6.0 6.0 1.2	6.0 6.0 5.7	6.0 6.0 3.1	5.7 4.0 –
C Top plate of subfloor stud walls of 2 storey building supporting 2 floors									
90 x 45 plus 140 x 35 or 2/90 x 45	 or 	1.5	400 450 600	6.0 6.0 6.0	6.0 6.0 5.0	6.0 5.2 –	6.0 6.0 6.0	6.0 6.0 3.1	4.8 3.2 –
		3	400 450	6.0 6.0	2.7 –	– –	6.0 4.1	1.6 –	– –
90 x 70		1.5	400 450 600	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 2.7	6.0 6.0 6.0	6.0 6.0 5.2	6.0 5.4 1.6
		3	400 450	6.0 6.0	6.0 3.8	– –	6.0 4.6	4.8 2.3	– –

* For definition of loaded dimension see 1.3.

NOTE – Substitution with built-up members is not allowed.

Amd 2 May '06

Table 14.15 – Top and bottom plates for loadbearing walls, 3 kPa floor load (see 8.7.2.1) – VSG 10 and MSG 10

Plate size (mm) x (mm)		Maximum loaded dimension* of wall supporting floor (m)	Maximum spacing of trusses or rafters (m)	Light roof: Stud spacing (mm) 400	480	600	Heavy roof: Stud spacing (mm) 400	480	600
				Maximum loaded dimension* of wall above supporting roof (m)					
A Top plate of subfloor wall or lower of 2 storeys supporting 1 floor									
90 x 45		1.5	400 450 600	6.0 6.0 6.0	6.0 6.0 5.8	6.0 5.9 2.6	6.0 6.0 5.5	6.0 6.0 3.7	4.8 3.7 1.5
		3.0	400 450 600	6.0 6.0 2.7	6.0 4.3 –	1.7 – –	6.0 5.2 1.6	4.1 2.6 –	– – –
90 x 45 plus 140 x 35 or 2/90 x 45		1.5	400 450 600	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0
		3.0	400 450 600	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 4.7
B Bottom plate of lower of 2 storeys support 1 floor									
90 x 45		1.5	400 450 600	6.0 6.0 3.5	6.0 6.0 1.7	5.4 3.8 –	6.0 6.0 1.9	5.6 4.3 –	3.3 2.3 –
		3	400 450	6.0 3.9	2.8 –	– –	3.9 2.4	1.7 –	– –
90 x 70		1.5	400 450 600	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0
		3	400 450 600	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 4.9
C Top plate of subfloor stud walls of 2 storey building supporting 2 floors									
90 x 45 plus 140 x 35 or 2/90 x 45		1.5	400 450 600	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 4.1
		3	400 450 600	6.0 6.0 6.0	6.0 6.0 1.3	5.0 1.6 –	6.0 6.0 5.3	6.0 6.0 –	3.1 – –
90 x 70		1.5	400 450 600	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 6.0	6.0 6.0 5.4
		3	400 450	6.0 6.0	6.0 5.6	6.0 4.2	6.0 4.6	6.0 3.5	5.1 2.6

* For definition of loaded dimension see 1.3.

NOTE – Substitution with built-up members is not allowed.

Amd 2 May '06

Table 14.16 – Structural plywood flooring (see 7.2.3.5)

Maximum spacing of joists (mm)	Minimum thickness (mm) of plywood for floor loads	
	3 kPa office General	3 kPa assembly, educational, restaurants
400	15	17
450	15	19
600	19	21

Table 15.1 – Reference table for lintel load cases

Table No.	Supporting			Load type			
	Roof	Walls	Floor	Roof	Snow*	Walls	Floor
					(kPa)		(kPa)
15.2	✓			Light	0.5		
	✓			Heavy	0.5		
15.3	✓	✓		Light	0.5	Light	
	✓	✓		Light	0.5	Medium	
	✓	✓		Heavy	0.5	Light	
	✓	✓		Heavy	0.5	Medium	
15.4	✓	✓	✓	Light	0.5	Light	1.5 or 2
	✓	✓	✓	Light	0.5	Medium	1.5 or 2
	✓	✓	✓	Heavy	0.5	Light	1.5 or 2
	✓	✓	✓	Heavy	0.5	Medium	1.5 or 2
15.5	✓	✓	✓	Light	0.5	Light	3
	✓	✓	✓	Light	0.5	Medium	3
	✓	✓	✓	Heavy	0.5	Light	3
	✓	✓	✓	Heavy	0.5	Medium	3

Amd 1 Dec '00

* For 1 kPa snow loads refer to 15.2.3.

Table 15.2 – Lintels supporting roof only (see figure 8.7) **– No. 1 Framing and MSG 6**

Loaded dimension* of lintel (m)		Maximum span for lintel sizes listed below (m) (Width x thickness)									
		90 x 70	90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof	3	0.9	1.0	1.5	1.6	2.0	2.2	2.6	2.8	3.1	3.4
	4	0.8	0.9	1.3	1.5	1.8	2.0	2.3	2.6	2.8	3.1
	5	0.8	0.9	1.2	1.4	1.7	1.9	2.1	2.4	2.6	2.9
	6	0.7	0.8	1.1	1.3	1.5	1.8	1.9	2.3	2.3	2.8
Heavy roof	3	0.7	0.8	1.2	1.3	1.6	1.8	2.0	2.3	2.4	2.7
	4	–	0.8	1.0	1.2	1.4	1.6	1.8	2.1	2.2	2.5
	5	–	0.7	0.9	1.1	1.3	1.5	1.6	1.9	2.0	2.4
	6	–	–	0.8	1.0	1.2	1.4	1.5	1.8	1.8	2.2

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 15.2 – Lintels supporting roof only (see figure 8.7) **– VSG 8 and MSG 8**

Loaded dimension* of lintel (m)		Maximum span for lintel sizes listed below (m) (Width x thickness)									
		90 x 70	90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof	3	1.0	1.1	1.6	1.8	2.3	2.5	2.9	3.1	3.5	3.8
	4	1.0	1.0	1.5	1.6	2.1	2.3	2.6	2.9	3.2	3.5
	5	0.9	1.0	1.4	1.5	1.9	2.1	2.5	2.7	3.0	3.2
	6	0.8	0.9	1.3	1.5	1.8	2.0	2.3	2.5	2.8	3.1
Heavy roof	3	0.8	0.9	1.3	1.4	1.8	2.0	2.3	2.5	2.8	3.0
	4	0.8	0.8	1.2	1.3	1.7	1.8	2.1	2.3	2.6	2.8
	5	0.7	0.8	1.1	1.2	1.5	1.7	1.9	2.2	2.3	2.6
	6	–	0.7	1.0	1.2	1.4	1.6	1.8	2.0	2.1	2.5

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2
May '06

Table 15.2 – Lintels supporting roof only (see figure 8.7) **– VSG 10 and MSG 10**

Loaded dimension* of lintel (m)		Maximum span for lintel sizes listed below (m) (Width x thickness)									
		90 x 70	90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof	3	1.1	1.2	1.8	1.9	2.4	2.6	3.1	3.3	3.7	4.0
	4	1.0	1.1	1.6	1.8	2.2	2.4	2.8	3.1	3.4	3.7
	5	1.0	1.1	1.5	1.7	2.1	2.3	2.6	2.9	3.2	3.5
	6	0.9	1.0	1.4	1.6	2.0	2.1	2.5	2.7	3.0	3.3
Heavy roof	3	0.9	1.0	1.4	1.6	2.0	2.1	2.5	2.7	3.0	3.3
	4	0.8	0.9	1.3	1.4	1.8	2.0	2.3	2.5	2.8	3.0
	5	0.8	0.8	1.2	1.3	1.7	1.8	2.1	2.3	2.6	2.8
	6	0.7	0.8	1.2	1.3	1.6	1.7	2.0	2.2	2.4	2.7

* For definition of loaded dimension see 1.3.

Amd 2 May '06

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 15.3 – Lintels supporting roof and wall (see figure 8.8) **– No. 1 Framing and MSG 6**

Loaded dimension* of lintel (m)		Maximum span for lintel sizes listed below (m) (Width x thickness)									
		90 x 70	90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof Light wall	3	0.8	0.9	1.3	1.4	1.8	2.0	2.3	2.5	2.8	3.0
	4	0.8	0.9	1.2	1.4	1.7	1.8	2.1	2.3	2.6	2.8
	5	0.7	0.8	1.1	1.3	1.5	1.8	2.0	2.2	2.4	2.7
	6	0.7	0.8	1.0	1.2	1.4	1.7	1.8	2.1	2.2	2.6
Light roof Medium wall	3	0.7	0.8	1.2	1.3	1.6	1.8	2.0	2.3	2.5	2.8
	4	0.7	0.8	1.1	1.3	1.5	1.7	1.9	2.2	2.3	2.6
	5	–	–	0.8	1.0	1.1	1.4	1.4	1.7	1.7	2.1
	6	–	–	0.8	0.9	1.0	1.3	1.3	1.6	1.6	2.0
Heavy roof Light wall	3	0.7	0.8	1.0	1.2	1.4	1.7	1.8	2.1	2.2	2.6
	4	–	0.7	0.9	1.1	1.3	1.6	1.6	2.0	2.0	2.4
	5	–	0.7	0.9	1.0	1.2	1.4	1.5	1.8	1.8	2.2
	6	–	–	0.8	1.0	1.1	1.3	1.4	1.7	1.7	2.1
Heavy roof Medium wall	3	–	0.7	1.0	1.1	1.3	1.6	1.7	2.0	2.0	2.4
	4	–	0.7	0.9	1.1	1.2	1.5	1.5	1.9	1.9	2.3
	5	–	–	0.8	1.0	1.1	1.4	1.4	1.7	1.7	2.1
	6	–	–	0.8	0.9	1.0	1.3	1.3	1.6	1.6	2.0

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 15.3 – Lintels supporting roof and wall (see figure 8.8) **– VSG 8 and MSG 8**

Loaded dimension* of lintel (m)		Maximum span for lintel sizes listed below (m) (Width x thickness)									
		90 x 70	90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof Light wall	3	0.9	1.0	1.5	1.6	2.0	2.2	2.5	2.8	3.1	3.3
	4	0.9	0.9	1.4	1.5	1.9	2.0	2.4	2.6	2.9	3.1
	5	0.8	0.9	1.3	1.4	1.8	1.9	2.3	2.5	2.7	3.0
	6	0.8	0.9	1.2	1.4	1.7	1.9	2.2	2.4	2.6	2.9
Light roof Medium wall	3	0.8	0.9	1.3	1.5	1.8	2.0	2.3	2.5	2.8	3.1
	4	0.8	0.9	1.3	1.4	1.7	1.9	2.2	2.4	2.7	2.9
	5	–	0.7	1.0	1.1	1.3	1.6	1.7	2.0	2.0	2.4
	6	–	0.7	0.9	1.1	1.2	1.5	1.6	1.9	1.9	2.3
Heavy roof Light wall	3	0.8	0.8	1.2	1.3	1.7	1.8	2.1	2.3	2.6	2.8
	4	0.7	0.8	1.1	1.3	1.5	1.7	1.9	2.2	2.4	2.6
	5	–	0.7	1.0	1.2	1.4	1.6	1.8	2.1	2.2	2.5
	6	–	0.7	0.9	1.1	1.3	1.5	1.7	2.0	2.0	2.3
Heavy roof Medium wall	3	0.7	0.8	1.1	1.3	1.6	1.7	2.0	2.2	2.4	2.7
	4	0.7	0.8	1.0	1.2	1.4	1.6	1.8	2.1	2.2	2.5
	5	–	0.7	1.0	1.1	1.3	1.6	1.7	2.0	2.0	2.4
	6	–	0.7	0.9	1.1	1.2	1.5	1.6	1.9	1.9	2.3

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2
May '06

Table 15.3 – Lintels supporting roof and wall (see figure 8.8) **– VSG 10 and MSG 10**

Loaded dimension* of lintel (m)		Maximum span for lintel sizes listed below (m) (Width x thickness)									
		90 x 70	90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof Light wall	3	1.0	1.1	1.6	1.7	2.1	2.3	2.7	3.0	3.3	3.6
	4	0.9	1.0	1.5	1.6	2.0	2.2	2.6	2.8	3.1	3.4
	5	0.9	1.0	1.4	1.5	1.9	2.1	2.4	2.7	3.0	3.2
	6	0.8	0.9	1.3	1.5	1.8	2.0	2.3	2.5	2.8	3.1
Light roof Medium wall	3	0.9	1.0	1.4	1.6	2.0	2.1	2.5	2.7	3.0	3.3
	4	0.9	0.9	1.4	1.5	1.9	2.0	2.4	2.6	2.9	3.1
	5	0.7	0.8	1.1	1.2	1.5	1.7	2.0	2.1	2.4	2.6
	6	0.7	0.7	1.1	1.2	1.5	1.6	1.9	2.0	2.3	2.5
Heavy roof Light wall	3	0.8	0.9	1.3	1.5	1.8	2.0	2.3	2.5	2.8	3.1
	4	0.8	0.9	1.2	1.4	1.7	1.9	2.2	2.3	2.6	2.8
	5	0.7	0.8	1.2	1.3	1.6	1.7	2.0	2.2	2.5	2.7
	6	0.7	0.8	1.1	1.2	1.5	1.7	1.9	2.1	2.4	2.6
Heavy roof Medium wall	3	0.8	0.9	1.3	1.4	1.7	1.9	2.2	2.4	2.6	2.9
	4	0.7	0.8	1.2	1.3	1.6	1.8	2.1	2.2	2.5	2.7
	5	0.7	0.8	1.1	1.2	1.5	1.7	2.0	2.1	2.4	2.6
	6	0.7	0.7	1.1	1.2	1.5	1.6	1.9	2.0	2.3	2.5

* For definition of loaded dimension see 1.3.

NOTE – Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Table 15.4 – Lintels supporting roof and wall with 1.5 or 2 kPa floor loads (see figure 8.9) **– No. 1 Framing and MSG 6**

Loaded dimension* of lintel (m)		Maximum span for lintel sizes listed below (m) (Width x thickness)							
		140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof Light wall	3	0.8	1.0	1.1	1.3	1.4	1.7	1.7	2.0
	4	0.8	0.9	1.0	1.3	1.3	1.6	1.6	2.0
	5	0.7	0.9	1.0	1.2	1.3	1.6	1.6	1.9
	6	0.7	0.9	1.0	1.2	1.2	1.5	1.5	1.8
Light roof Medium wall	3	0.8	0.9	1.0	1.3	1.3	1.6	1.6	2.0
	4	0.7	0.9	1.0	1.2	1.3	1.6	1.6	1.9
	5	–	0.8	0.9	1.1	1.1	1.4	1.4	1.7
	6	–	0.8	0.9	1.0	1.1	1.3	1.3	1.6
Heavy roof Light wall	3	0.7	0.9	1.0	1.2	1.3	1.6	1.6	1.9
	4	0.7	0.8	1.0	1.2	1.2	1.5	1.5	1.8
	5	0.7	0.8	0.9	1.1	1.2	1.4	1.4	1.7
	6	–	0.8	0.9	1.1	1.1	1.4	1.4	1.7
Heavy roof Medium wall	3	0.7	0.9	1.0	1.2	1.2	1.5	1.5	1.8
	4	0.7	0.8	0.9	1.1	1.2	1.4	1.4	1.8
	5	–	0.8	0.9	1.1	1.1	1.4	1.4	1.7
	6	–	0.8	0.9	1.0	1.1	1.3	1.3	1.6

* For definition of loaded dimension see 1.3.

NOTE –

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

(2) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 15.4 – Lintels supporting roof and wall with 1.5 or 2 kPa floor loads (see figure 8.9) **– VSG 8 and MSG 8**

Loaded dimension* of lintel (m)		Maximum span for lintel sizes listed below (m) (Width x thickness)								
		90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof Light wall	3	0.7	0.9	1.1	1.3	1.6	1.6	2.0	2.0	2.4
	4	0.7	0.9	1.1	1.2	1.5	1.6	1.9	1.9	2.3
	5	0.7	0.9	1.1	1.2	1.5	1.5	1.9	1.8	2.2
	6	–	0.8	1.0	1.2	1.4	1.5	1.8	1.8	2.2
Light roof Medium wall	3	0.7	0.9	1.1	1.2	1.5	1.6	1.9	1.9	2.3
	4	0.7	0.9	1.1	1.2	1.5	1.5	1.9	1.9	2.3
	5	–	0.8	0.9	1.1	1.3	1.4	1.6	1.6	2.0
	6	–	0.7	0.9	1.0	1.2	1.3	1.6	1.6	1.9
Heavy roof Light wall	3	0.7	0.9	1.1	1.2	1.5	1.5	1.9	1.9	2.3
	4	–	0.8	1.0	1.1	1.4	1.5	1.8	1.8	2.1
	5	–	0.8	1.0	1.1	1.3	1.4	1.7	1.7	2.1
	6	–	0.8	0.9	1.0	1.3	1.3	1.6	1.6	2.0
Heavy roof Medium wall	3	–	0.8	1.0	1.2	1.4	1.5	1.8	1.8	2.2
	4	–	0.8	1.0	1.1	1.4	1.4	1.7	1.7	2.1
	5	–	0.8	0.9	1.1	1.3	1.4	1.6	1.6	2.0
	6	–	0.7	0.9	1.0	1.2	1.3	1.6	1.6	1.9

* For definition of loaded dimension see 1.3.

NOTE –

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

(2) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2
May '06

Table 15.4 – Lintels supporting roof and wall with 1.5 or 2 kPa floor loads (see figure 8.9) **– VSG 10 and MSG 10**

Loaded dimension* of lintel (m)		Maximum span for lintel sizes listed below (m) (Width x thickness)									
		90 x 70	90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof Light wall	3	0.7	0.8	1.1	1.3	1.5	1.8	2.0	2.3	2.4	2.8
	4	0.7	0.8	1.1	1.3	1.5	1.8	1.9	2.2	2.3	2.7
	5	0.7	0.8	1.0	1.3	1.4	1.7	1.8	2.2	2.2	2.6
	6	–	0.8	1.0	1.2	1.4	1.7	1.8	2.1	2.1	2.6
Light roof Medium wall	3	0.7	0.8	1.1	1.3	1.5	1.7	1.9	2.2	2.3	2.7
	4	0.7	0.8	1.1	1.2	1.4	1.7	1.8	2.1	2.2	2.6
	5	–	0.7	0.9	1.1	1.3	1.5	1.6	1.9	1.9	2.3
	6	–	0.7	0.9	1.1	1.2	1.4	1.6	1.8	1.8	2.2
Heavy roof Light wall	3	0.7	0.8	1.1	1.2	1.4	1.7	1.8	2.1	2.2	2.6
	4	–	0.7	1.0	1.2	1.4	1.6	1.7	2.0	2.1	2.5
	5	–	0.7	1.0	1.1	1.3	1.5	1.7	1.9	2.0	2.4
	6	–	0.7	0.9	1.1	1.3	1.5	1.6	1.9	1.9	2.3
Heavy roof Medium wall	3	–	0.7	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.5
	4	–	0.7	1.0	1.1	1.3	1.5	1.7	2.0	2.1	2.4
	5	–	0.7	0.9	1.1	1.3	1.5	1.6	1.9	1.9	2.3
	6	–	0.7	0.9	1.1	1.2	1.4	1.6	1.8	1.8	2.2

* For definition of loaded dimension see 1.3.

NOTE –

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

Amd 2 May '06

(2) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 15.5 – Lintels supporting roof and wall with 3 kPa floor loads (see figure 8.9) – No. 1 Framing and MSG 6

Loaded dimension* of lintel (m)		Maximum span for lintel sizes listed below (m) (Width x thickness)							
		140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof Light wall	3	0.7	0.8	1.0	1.2	1.2	1.5	1.5	1.8
	4	0.7	0.8	0.9	1.1	1.2	1.4	1.4	1.7
	5	–	0.8	0.9	1.1	1.1	1.4	1.4	1.7
	6	–	0.8	0.9	1.1	1.1	1.4	1.4	1.6
Light roof Medium wall	3	0.7	0.8	0.9	1.1	1.2	1.4	1.4	1.7
	4	–	0.8	0.9	1.1	1.1	1.4	1.4	1.7
	5	–	0.7	0.8	1.0	1.0	1.3	1.3	1.5
	6	–	0.7	0.8	1.0	1.0	1.2	1.2	1.5
Heavy roof Light wall	3	0.7	0.8	0.9	1.1	1.1	1.4	1.4	1.7
	4	–	0.8	0.9	1.1	1.1	1.3	1.3	1.6
	5	–	0.7	0.8	1.0	1.1	1.3	1.3	1.6
	6	–	0.7	0.8	1.0	1.0	1.2	1.2	1.5
Heavy roof Medium wall	3	–	0.8	0.9	1.1	1.1	1.4	1.4	1.7
	4	–	0.7	0.8	1.0	1.1	1.3	1.3	1.6
	5	–	0.7	0.8	1.0	1.0	1.3	1.3	1.5
	6	–	0.7	0.8	1.0	1.0	1.2	1.2	1.5

* For definition of loaded dimension see 1.3.

NOTE –

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

(2) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 15.5 – Lintels supporting roof and wall with 3 kPa floor loads (see figure 8.9) – VSG 8 and MSG 8

Loaded dimension* of lintel (m)		Maximum span for lintel sizes listed below (m) (Width x thickness)							
		140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof Light wall	3	0.8	1.0	1.1	1.4	1.4	1.8	1.8	2.1
	4	0.8	1.0	1.1	1.3	1.4	1.7	1.7	2.1
	5	0.8	0.9	1.1	1.3	1.4	1.7	1.7	2.0
	6	0.8	0.9	1.0	1.3	1.3	1.6	1.6	2.0
Light roof Medium wall	3	0.8	1.0	1.1	1.3	1.4	1.7	1.7	2.1
	4	0.8	1.0	1.1	1.3	1.4	1.7	1.7	2.0
	5	0.7	0.9	1.0	1.2	1.2	1.5	1.5	1.8
	6	0.7	0.8	0.9	1.1	1.2	1.5	1.5	1.8
Heavy roof Light wall	3	0.8	1.0	1.1	1.3	1.4	1.7	1.7	2.0
	4	0.7	0.9	1.0	1.3	1.3	1.6	1.6	1.9
	5	0.7	0.9	1.0	1.2	1.3	1.5	1.5	1.9
	6	0.7	0.8	1.0	1.2	1.2	1.5	1.5	1.8
Heavy roof Medium wall	3	0.8	0.9	1.0	1.3	1.3	1.6	1.6	2.0
	4	0.7	0.9	1.0	1.2	1.3	1.6	1.6	1.9
	5	0.7	0.9	1.0	1.2	1.2	1.5	1.5	1.8
	6	0.7	0.8	0.9	1.1	1.2	1.5	1.5	1.8

* For definition of loaded dimension see 1.3.

NOTE –

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

(2) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2
May '06

Table 15.5 – Lintels supporting roof and wall with 3 kPa floor loads (see figure 8.9) **– VSG 10 and MSG 10**

Loaded dimension* of lintel (m)		Maximum span for lintel sizes listed below (m) (Width x thickness)								
		90 x 90	140 x 70	140 x 90	190 x 70	190 x 90	240 x 70	240 x 90	290 x 70	290 x 90
Light roof Light wall	3	0.8	1.0	1.2	1.4	1.7	1.7	2.1	2.1	2.6
	4	0.7	1.0	1.2	1.3	1.6	1.7	2.0	2.0	2.5
	5	0.7	0.9	1.1	1.3	1.6	1.6	2.0	2.0	2.4
	6	0.7	0.9	1.1	1.2	1.5	1.6	1.9	1.8	2.3
Light roof Medium wall	3	0.7	1.0	1.2	1.3	1.6	1.7	2.1	2.0	2.5
	4	0.7	0.9	1.1	1.3	1.6	1.6	2.0	2.0	2.4
	5	0.6	0.8	1.0	1.2	1.4	1.5	1.8	1.6	2.1
	6	0.6	0.8	1.0	1.1	1.4	1.4	1.7	1.5	2.0
Heavy roof Light wall	3	0.7	0.9	1.1	1.3	1.6	1.6	2.0	2.0	2.4
	4	0.7	0.9	1.1	1.2	1.5	1.6	1.9	1.8	2.3
	5	0.7	0.9	1.1	1.2	1.5	1.5	1.8	1.7	2.2
	6	0.6	0.8	1.0	1.1	1.4	1.5	1.8	1.6	2.0
Heavy roof Medium wall	3	0.7	0.9	1.1	1.3	1.5	1.6	1.9	1.9	2.4
	4	0.7	0.9	1.1	1.2	1.5	1.5	1.9	1.7	2.2
	5	–	0.8	1.0	1.2	1.4	1.5	1.8	1.6	2.1
	6	–	0.8	1.0	1.1	1.4	1.4	1.7	1.5	2.0

* For definition of loaded dimension see 1.3.

NOTE –

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

Amd 2 May '06

(2) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 15.6 – Rafters (see 10.2.1.3.2) – No. 1 Framing and MSG 6

(a) Light roof for low and medium wind zone

Rafter size (Width x thickness)	Maximum span of rafters at a maximum spacing (mm) and their fixing types (mm)							
	400		600		900		1200	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
70 x 35	1.7	A	1.5	A	1.3	A	1.2	A
90 x 35	2.2	A	1.9	A	1.6	B	1.5	B
140 x 35	3.1	A	2.7	B	2.4	B	2.1	B
70 x 45	1.8	A	1.6	A	1.4	A	1.3	A
90 x 45	2.4	A	2.1	A	1.8	A	1.6	B
140 x 45	3.7	A	3.2	B	2.8	B	2.6	B
190 x 45	4.5	B	3.9	B	3.4	B	3.1	B
240 x 45	4.9	B	4.2	B	3.7	B	3.3	B
290 x 45	5.2	B	4.5	B	3.9	B	3.6	B
90 x 70	2.7	A	2.4	A	2.1	B	1.9	B
140 x 70	4.3	B	3.8	B	3.3	B	3.0	B
190 x 70	5.9	B	5.1	B	4.5	B	4.0	B
240 x 70	7.4	B	6.5	B	5.6	B	5.1	B
290 x 70	8.1	B	7.0	B	6.1	B	5.5	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birds mouthed at intermediate supports.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) See table 10.13 for fixing types and capacity. Fixings suitable for low and medium wind zones.

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

Amd 2
May '06

Table 15.6 – Rafters (see 10.2.1.3.2) – No. 1 Framing and MSG 6

(b) Light roof for high wind zone

Rafter size (Width x thickness)	Maximum span of rafters at a maximum spacing (mm) and their fixing types (mm)							
	400		600		900		1200	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
70 x 35	1.5	A	1.3	A	–	–	–	–
90 x 35	1.9	A	1.7	A	1.4	B	1.3	B
140 x 35	2.7	A	2.4	B	2.1	B	1.8	B
70 x 45	1.6	A	1.4	A	1.2	A	–	–
90 x 45	2.1	A	1.8	A	1.6	B	1.4	B
140 x 45	3.3	B	2.8	B	2.5	B	2.2	B
190 x 45	3.9	B	3.4	B	3.0	B	2.7	B
240 x 45	4.3	B	3.7	B	3.2	B	2.9	B
290 x 45	4.6	B	4.0	B	3.5	B	3.1	B
90 x 70	2.4	A	2.1	B	1.8	B	1.7	B
140 x 70	3.8	B	3.3	B	2.9	B	2.6	B
190 x 70	5.1	B	4.5	B	3.9	B	3.6	B
240 x 70	6.5	B	5.7	B	5.0	B	4.5	C
290 x 70	7.1	B	6.2	B	5.4	C	4.9	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birds mouthed at intermediate supports.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) See table 10.13 for fixing types and capacity.

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

Amd 2 May '06

Table 15.6 – Rafters (see 10.2.1.3.2) **– No. 1 Framing and MSG 6**

(c) Light roof for very high wind zone

Rafter size (Width x thickness)	Maximum span of rafters at a maximum spacing (mm) and their fixing types (mm)							
	400		600		900		1200	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
70 x 35	1.3	A	1.2	A	–	–	–	–
90 x 35	1.7	A	1.5	B	1.3	B	1.2	B
140 x 35	2.5	B	2.2	B	1.9	B	1.7	B
70 x 45	1.5	A	1.3	A	–	–	–	–
90 x 45	1.9	A	1.6	B	1.4	B	1.3	B
140 x 45	3.0	B	2.6	B	2.2	B	2.0	B
190 x 45	3.6	B	3.1	B	2.7	B	2.4	B
240 x 45	3.9	B	3.4	B	2.9	B	2.7	B
290 x 45	4.1	B	3.6	B	3.1	B	2.9	C
90 x 70	2.2	A	1.9	B	1.7	B	1.5	B
140 x 70	3.4	B	3.0	B	2.6	B	2.4	B
190 x 70	4.7	B	4.1	B	3.6	B	3.2	C
240 x 70	5.9	B	5.2	B	4.5	C	4.1	C
290 x 70	6.5	B	5.6	B	4.9	C	4.4	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birds mouthed at intermediate supports.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) See table 10.13 for fixing types and capacity. Fixings suitable for high and very high wind zones.

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

Amd 2
May '06

Table 15.6 – Rafters (see 10.2.1.3.2) – No. 1 Framing and MSG 6

(d) Heavy roof for low and medium wind zone

Rafter size (Width x thickness)	Maximum span of rafters at a maximum spacing (mm) and their fixing types (mm)							
	400		480		600		900	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
70 x 35	1.2	A	1.1	A	1.0	A	0.9	A
90 x 35	1.5	A	1.4	A	1.3	A	1.1	A
140 x 35	2.3	A	2.2	A	2.0	A	1.8	A
70 x 45	1.3	A	1.2	A	1.1	A	0.9	A
90 x 45	1.6	A	1.5	A	1.4	A	1.2	A
140 x 45	2.6	A	2.4	A	2.2	A	1.9	A
190 x 45	3.5	A	3.3	A	3.0	A	2.6	A
240 x 45	4.4	A	4.2	A	3.8	A	3.4	B
290 x 45	5.3	A	5.0	A	4.7	B	4.1	B
90 x 70	1.9	A	1.8	A	1.6	A	1.4	A
140 x 70	3.0	A	2.8	B	2.6	A	2.3	A
190 x 70	4.0	A	3.8	A	3.5	A	3.1	B
240 x 70	5.1	A	4.8	A	4.5	B	3.9	B
290 x 70	6.2	A	5.8	B	5.4	B	4.7	B

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birds mouthed at intermediate supports.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) See table 10.13 for fixing types and capacity. Fixings suitable for low and medium wind zones.

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

Amd 2 May '06

Table 15.6 – Rafters (see 10.2.1.3.2) – No. 1 Framing and MSG 6

(e) Heavy roof for high and very high wind zone

Rafter size (Width x thickness)	Maximum span of rafters at a maximum spacing (mm) and their fixing types (mm)							
	400		480		600		900	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
70 x 35	1.2	A	–	–	–	–	–	–
90 x 35	1.5	A	1.4	A	1.3	A	–	–
140 x 35	2.3	A	2.2	A	2.0	B	1.8	B
70 x 45	1.3	A	1.2	A	–	–	–	–
90 x 45	1.6	A	1.5	A	1.4	A	1.2	B
140 x 45	2.6	A	2.4	B	2.2	B	1.9	B
190 x 45	3.5	B	3.3	B	3.0	B	2.6	B
240 x 45	4.1	B	3.9	B	3.6	B	3.1	B
290 x 45	5.0	B	4.7	B	4.3	B	3.8	–
90 x 70	1.9	A	1.8	A	1.6	A	1.4	B
140 x 70	3.0	B	2.8	B	2.6	B	2.3	B
190 x 70	4.0	B	3.8	B	3.5	B	3.1	B
240 x 70	5.1	B	4.8	B	4.5	B	3.9	B
290 x 70	6.2	B	5.8	B	5.4	B	4.7	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birds mouthed at intermediate supports.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) See table 10.13 for fixing types and capacity. Fixings suitable for high and very high wind zones.

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

Amd 2
May '06

Table 15.6 – Rafters (see 10.2.1.3.2) – No. 1 Framing and MSG 6

(f) Dimensions of valley rafters for all wind zones

Rafter size (Width x thickness)	Maximum span of valley rafters (m) and their fixing types for all wind zones			
	Light roof		Heavy roof	
	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)	
70 x 35	1.2	B	–	–
90 x 35	1.4	B	1.3	B
140 x 35	2.0	B	1.8	B
70 x 45	1.2	B	–	–
90 x 45	1.5	B	1.3	B
140 x 45	2.1	B	1.9	B
190 x 45	2.7	B	2.4	B
240 x 45	3.2	B	2.9	B
290 x 45	3.7	C	3.3	B
90 x 70	1.7	B	1.5	B
140 x 70	2.4	B	2.1	B
190 x 70	3.0	B	2.7	B
240 x 70	3.6	C	3.2	B
290 x 70	4.1	C	3.7	B

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –
(1) For the full range of fixing types and capacity see table 10.13.
(2) Proprietary fixings that have the required fixing capacity indicated in tables may be used.
(3) Members 70 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Table 15.6 – Rafters (see 10.2.1.3.2) – VSG 8 and MSG 8

(a) Light roof for low and medium wind zone

Rafter size (Width x thickness)	Maximum span of rafters at a maximum spacing (mm) and their fixing types (mm)							
	400		600		900		1200	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
70 x 35	1.9	A	1.6	A	1.4	A	1.3	A
90 x 35	2.4	A	2.1	A	1.8	A	1.7	B
140 x 35	3.5	A	3.1	B	2.7	B	2.4	B
70 x 45	2.0	A	1.8	A	1.5	A	1.4	B
90 x 45	2.6	A	2.3	A	2.0	B	1.8	B
140 x 45	4.1	A	3.6	B	3.1	B	2.8	B
190 x 45	5.0	B	4.4	B	3.8	B	3.4	B
240 x 45	5.4	B	4.7	B	4.1	B	3.7	B
290 x 45	5.8	B	5.1	B	4.4	B	4.0	B
90 x 70	3.0	A	2.7	B	2.3	B	2.1	B
140 x 70	4.8	B	4.2	B	3.6	B	3.3	B
190 x 70	6.5	B	5.6	B	4.9	B	4.5	B
240 x 70	8.0	B	7.1	B	6.2	B	5.7	C
290 x 70	9.1	B	7.9	B	6.9	B	6.2	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birds mouthed at intermediate supports.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) See table 10.13 for fixing types and capacity. Fixings suitable for low and medium wind zones.

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

Amd 2
May '06

Table 15.6 – Rafters (see 10.2.1.3.2) – VSG 8 and MSG 8

(b) Light roof for high wind zone

Rafter size (Width x thickness)	Maximum span of rafters at a maximum spacing (mm) and their fixing types (mm)							
	400		600		900		1200	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
70 x 35	1.6	A	1.4	A	1.2	A	–	–
90 x 35	2.1	A	1.8	A	1.6	B	1.4	B
140 x 35	3.1	B	2.7	B	2.3	B	2.1	B
70 x 45	1.8	A	1.5	A	1.3	B	1.2	B
90 x 45	2.3	A	2.0	B	1.7	B	1.6	B
140 x 45	3.6	B	3.1	B	2.7	B	2.5	B
190 x 45	4.4	B	3.9	B	3.3	B	3.0	B
240 x 45	4.8	B	4.2	B	3.6	B	3.3	B
290 x 45	5.1	B	4.4	B	3.9	B	3.5	B
90 x 70	2.7	A	2.3	B	2.0	B	1.8	B
140 x 70	4.2	B	3.6	B	3.2	B	2.9	B
190 x 70	5.7	B	5.0	B	4.3	B	3.9	C
240 x 70	7.2	B	6.3	B	5.5	C	5.0	C
290 x 70	8.0	B	6.9	B	6.1	C	5.5	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birds mouthed at intermediate supports.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) See table 10.13 for fixing types and capacity.

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

Amd 2 May '06

Table 15.6 – Rafters (see 10.2.1.3.2) **– VSG 8 and MSG 8**

(c) Light roof for very high wind zone

Rafter size (Width x thickness)	Maximum span of rafters at a maximum spacing (mm) and their fixing types (mm)							
	400		600		900		1200	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
70 x 35	1.5	A	1.3	A	–	–	–	–
90 x 35	1.9	A	1.7	B	1.5	B	1.3	B
140 x 35	2.8	B	2.4	B	2.1	B	1.9	B
70 x 45	1.6	A	1.4	A	1.2	B	–	–
90 x 45	2.1	A	1.8	B	1.6	B	1.4	B
140 x 45	3.3	B	2.9	B	2.5	B	2.3	B
190 x 45	4.0	B	3.5	B	3.0	B	2.7	B
240 x 45	4.4	B	3.8	B	3.3	B	3.0	C
290 x 45	4.7	B	4.1	B	3.5	B	3.2	C
90 x 70	2.4	B	2.1	B	1.8	B	1.7	B
140 x 70	3.8	B	3.3	B	2.9	B	2.6	B
190 x 70	5.2	B	4.5	B	3.9	C	3.6	C
240 x 70	6.5	B	5.7	B	5.0	C	4.5	C
290 x 70	7.3	B	6.3	C	5.5	C	5.0	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birds mouthed at intermediate supports.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) See table 10.13 for fixing types and capacity. Fixings suitable for high and very high wind zones.

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

Amd 2
May '06

Table 15.6 – Rafters (see 10.2.1.3.2) – VSG 8 and MSG 8

(d) Heavy roof for low and medium wind zone

Rafter size (Width x thickness)	Maximum span of rafters at a maximum spacing (mm) and their fixing types (mm)							
	400		480		600		900	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
70 x 35	1.3	A	1.2	A	1.1	A	1.0	A
90 x 35	1.7	A	1.6	A	1.4	A	1.3	A
140 x 35	2.6	A	2.4	A	2.3	A	2.0	A
70 x 45	1.4	A	1.3	A	1.2	A	1.1	A
90 x 45	1.8	A	1.7	A	1.6	A	1.4	A
140 x 45	2.8	A	2.7	A	2.5	A	2.1	A
190 x 45	3.9	A	3.6	A	3.4	A	2.9	B
240 x 45	4.9	A	4.6	A	4.3	B	3.7	B
290 x 45	5.9	A	5.6	B	5.2	B	4.5	B
90 x 70	2.1	A	2.0	A	1.8	A	1.6	A
140 x 70	3.3	A	3.1	A	2.9	A	2.5	A
190 x 70	4.5	A	4.2	A	3.9	A	3.4	B
240 x 70	5.7	A	5.3	B	4.9	B	4.3	B
290 x 70	6.9	B	6.4	B	6.0	B	5.2	B

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birds mouthed at intermediate supports.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) See table 10.13 for fixing types and capacity. Fixings suitable for low and medium wind zones.

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

Amd 2 May '06

Table 15.6 – Rafters (see 10.2.1.3.2) – VSG 8 and MSG 8

(e) Heavy roof for high and very high wind zone

Rafter size (Width x thickness)	Maximum span of rafters at a maximum spacing (mm) and their fixing types (mm)							
	400		480		600		900	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
70 x 35	1.3	A	1.2	A	–	–	–	–
90 x 35	1.7	A	1.6	A	1.4	A	1.3	B
140 x 35	2.6	A	2.4	B	2.3	B	2.0	B
70 x 45	1.4	A	1.3	A	1.2	A	–	–
90 x 45	1.8	A	1.7	A	1.6	A	1.4	B
140 x 45	2.8	B	2.7	B	2.5	B	2.1	B
190 x 45	3.9	B	3.6	B	3.4	B	2.9	B
240 x 45	4.7	B	4.4	B	4.1	B	3.5	B
290 x 45	5.6	B	5.2	B	4.9	B	4.2	B
90 x 70	2.1	A	2.0	A	1.8	B	1.6	B
140 x 70	3.3	B	3.1	B	2.9	B	2.5	B
190 x 70	4.5	B	4.2	B	3.9	B	3.4	B
240 x 70	5.7	B	5.3	B	4.9	B	4.3	B
290 x 70	6.9	B	6.4	B	6.0	B	5.2	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birds mouthed at intermediate supports.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) See table 10.13 for fixing types and capacity.

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

Amd 2
May '06

Table 15.6 – Rafters (see 10.2.1.3.2) – VSG 8 and MSG 8

(f) Dimensions of valley rafters for all wind zones

Rafter size (Width x thickness)	Maximum span of valley rafters (m) and their fixing types for all wind zones			
	Light roof		Heavy roof	
	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)	
70 x 35	1.3	B	–	–
90 x 35	1.5	B	1.4	B
140 x 35	2.1	B	1.9	B
70 x 45	1.3	B	1.2	B
90 x 45	1.6	B	1.5	B
140 x 45	2.3	B	2.0	B
190 x 45	2.9	B	2.6	B
240 x 45	3.4	C	3.1	B
290 x 45	4.0	C	3.6	B
90 x 70	1.8	B	1.6	B
140 x 70	2.5	B	2.3	B
190 x 70	3.2	B	2.9	B
240 x 70	3.8	C	3.4	B
290 x 70	4.4	C	4.0	B

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –
(1) For the full range of fixing types and capacity see table 10.13.
(2) Proprietary fixings that have the required fixing capacity indicated in tables may be used.
(3) Members 70 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Table 15.6 – Rafters (see 10.2.1.3.2) – VSG 10 and MSG 10

(a) Light roof for low and medium wind zone

Rafter size (Width x thickness)	Maximum span of rafters at a maximum spacing (mm) and their fixing types (mm)							
	400		600		900		1200	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
70 x 35	2.0	A	1.7	A	1.5	A	1.4	A
90 x 35	2.6	A	2.3	A	2.0	B	1.8	B
140 x 35	4.0	A	3.5	B	3.0	B	2.7	B
70 x 45	2.2	A	1.9	A	1.7	A	1.5	B
90 x 45	2.8	A	2.5	A	2.1	B	1.9	B
140 x 45	4.4	B	3.8	B	3.4	B	3.0	B
190 x 45	5.7	B	4.9	B	4.3	B	3.9	B
240 x 45	6.1	B	5.4	B	4.7	B	4.2	B
290 x 45	6.6	B	5.7	B	5.0	B	4.5	B
90 x 70	3.3	A	2.9	B	2.5	B	2.3	B
140 x 70	5.1	B	4.5	B	3.9	B	3.5	B
190 x 70	7.0	B	6.1	B	5.3	B	4.8	B
240 x 70	8.4	B	7.6	B	6.7	B	6.1	C
290 x 70	9.7	B	8.8	B	7.8	C	7.0	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birds mouthed at intermediate supports.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) See table 10.13 for fixing types and capacity. Fixings suitable for low and medium wind zones.

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

Amd 2
May '06

Table 15.6 – Rafters (see 10.2.1.3.2) – VSG 10 and MSG 10

(b) Light roof for high wind zone

Rafter size (Width x thickness)	Maximum span of rafters at a maximum spacing (mm) and their fixing types (mm)							
	400		600		900		1200	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
70 x 35	1.8	A	1.5	A	1.3	B	1.2	B
90 x 35	2.3	A	2.0	B	1.7	B	1.6	B
140 x 35	3.5	B	3.0	B	2.6	B	2.4	B
70 x 45	1.9	A	1.7	A	1.4	B	1.3	B
90 x 45	2.5	A	2.2	B	1.9	B	1.7	B
140 x 45	3.9	B	3.4	B	2.9	B	2.7	B
190 x 45	5.0	B	4.4	B	3.8	B	3.4	B
240 x 45	5.4	B	4.7	B	4.1	B	3.7	B
290 x 45	5.8	B	5.0	B	4.4	B	4.0	C
90 x 70	2.9	A	2.5	B	2.3	B	2.0	B
140 x 70	4.5	B	3.9	B	3.4	B	3.1	B
190 x 70	6.1	B	5.3	B	4.7	B	4.2	C
240 x 70	7.7	B	6.7	B	5.9	C	5.3	C
290 x 70	8.8	B	7.8	C	6.8	C	6.2	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birds mouthed at intermediate supports.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) See table 10.13 for fixing types and capacity.

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

Amd 2 May '06

Table 15.6 – Rafters (see 10.2.1.3.2) – VSG 10 and MSG 10

(c) Light roof for very high wind zone

Rafter size (Width x thickness)	Maximum span of rafters at a maximum spacing (mm) and their fixing types (mm)							
	400		600		900		1200	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
70 x 35	1.6	A	1.4	A	1.2	B	–	–
90 x 35	2.1	A	1.8	B	1.6	B	1.4	B
140 x 35	3.2	B	2.8	B	2.4	B	2.2	B
70 x 45	1.7	A	1.5	B	1.3	B	1.2	B
90 x 45	2.2	B	2.0	B	1.7	B	1.5	B
140 x 45	3.5	B	3.1	B	2.7	B	2.4	B
190 x 45	4.6	B	4.0	B	3.4	B	3.1	C
240 x 45	4.9	B	4.3	B	3.7	B	3.4	C
290 x 45	5.3	B	4.6	B	4.0	C	3.6	C
90 x 70	2.6	B	2.3	B	2.0	B	1.8	B
140 x 70	4.1	B	3.6	B	3.1	B	2.8	C
190 x 70	5.6	B	4.8	B	4.2	C	3.8	C
240 x 70	7.6	B	6.1	C	5.4	C	4.9	C
290 x 70	8.2	B	7.1	C	6.2	C	5.6	D

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birds mouthed at intermediate supports.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) See table 10.13 for fixing types and capacity. Fixings suitable for high and very high wind zones.

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

Amd 2
May '06

Table 15.6 – Rafters (see 10.2.1.3.2) – VSG 10 and MSG 10

(d) Heavy roof for low and medium wind zone

Rafter size (Width x thickness)	Maximum span of rafters at a maximum spacing (mm) and their fixing types (mm)							
	400		480		600		900	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
70 x 35	1.4	A	1.3	A	1.2	A	1.0	A
90 x 35	1.8	A	1.7	A	1.6	A	1.3	A
140 x 35	2.4	A	2.6	A	2.4	A	2.1	A
70 x 45	1.5	A	1.4	A	1.3	A	1.1	A
90 x 45	1.9	A	1.8	A	1.7	A	1.5	A
140 x 45	3.0	A	2.9	A	2.7	A	2.3	A
190 x 45	4.1	A	3.9	A	3.6	A	3.2	B
240 x 45	5.2	A	4.9	A	4.6	B	4.0	B
290 x 45	6.4	A	6.0	B	5.5	B	4.8	B
90 x 70	2.3	A	2.1	A	2.0	A	1.7	A
140 x 70	3.5	A	3.3	A	3.1	A	2.7	A
190 x 70	4.8	A	4.5	A	4.2	A	3.7	B
240 x 70	6.1	A	5.7	B	5.3	B	4.6	B
290 x 70	7.4	B	6.9	B	6.4	B	5.6	B

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birds mouthed at intermediate supports.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) See table 10.13 for fixing types and capacity. Fixings suitable for low and medium wind zones.

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

Amd 2 May '06

Table 15.6 – Rafters (see 10.2.1.3.2) – VSG 10 and MSG 10

(e) Heavy roof for high and very high wind zone

Rafter size (Width x thickness)	Maximum span of rafters at a maximum spacing (mm) and their fixing types (mm)							
	400		480		600		900	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
70 x 35	1.4	A	1.3	A	1.2	A	–	–
90 x 35	1.8	A	1.7	A	1.6	A	1.3	B
140 x 35	2.8	B	2.6	B	2.4	B	2.1	B
70 x 45	1.5	A	1.4	A	1.3	A	1.1	A
90 x 45	1.9	A	1.8	A	1.7	A	1.5	B
140 x 45	3.0	B	2.9	B	2.7	B	2.3	B
190 x 45	4.1	B	3.9	B	3.6	B	3.2	B
240 x 45	5.2	B	4.9	B	4.6	B	4.0	B
290 x 45	6.3	B	5.9	B	5.5	B	4.8	B
90 x 70	2.3	A	2.1	A	2.0	B	1.7	B
140 x 70	3.5	B	3.3	B	3.1	B	2.7	B
190 x 70	4.8	B	4.5	B	4.2	B	3.7	B
240 x 70	6.1	B	5.7	B	5.3	B	4.6	C
290 x 70	7.4	A	6.9	A	6.4	A	5.6	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
A	2/100 x 3.75 skewed nails	0.7
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birds mouthed at intermediate supports.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

(3) See table 10.13 for fixing types and capacity.

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

Amd 2
May '06

Table 15.6 – Rafters (see 10.2.1.3.2) – VSG 10 and MSG 10

(f) Dimensions of valley rafters for all wind zones

Rafter size (Width x thickness)	Maximum span of valley rafters (m) and their fixing types for all wind zones			
	Light roof		Heavy roof	
	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)	
70 x 35	1.3	B	1.2	B
90 x 35	1.6	B	1.4	B
140 x 35	2.3	B	2.0	B
70 x 45	1.4	B	1.3	B
90 x 45	1.7	B	1.5	B
140 x 45	2.4	B	2.2	B
190 x 45	3.0	B	2.7	B
240 x 45	3.6	C	3.3	B
290 x 45	4.2	C	3.8	B
90 x 70	1.9	B	1.7	B
140 x 70	2.7	B	2.4	B
190 x 70	3.4	B	3.0	B
240 x 70	4.1	C	3.6	B
290 x 70	4.7	C	4.2	C

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7

NOTE –
(1) For the full range of fixing types and capacity see table 10.13.
(2) Proprietary fixings that have the required fixing capacity indicated in tables may be used.
(3) Members 70 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2 May '06

Table 15.7 – Underpurlins and ridge beams (see 10.2.1.9.1) – No. 1 Framing and MSG 6

(a) Light roof for low, medium, high and very high wind speed

Underpurlin or ridge beam size (Width x thickness)	Loaded dimension* of underpurlin or ridge beam (m)							
	1.8		2.7		3.6		4.2	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
140 x 45	1.6	C	1.3	C	–	–	–	–
190 x 45	1.9	C	1.6	C	1.4	D	1.3	D
240 x 45	2.2	C	1.9	D	1.7	D	1.6	D
290 x 45	2.3	C	2.0	D	1.8	D	1.7	E
90 x 70	1.2	B	–	–	–	–	–	–
140 x 70	1.9	C	1.6	C	1.4	D	1.3	D
190 x 70	2.7	C	2.2	D	1.9	D	1.8	E
240 x 70	4.2	E	3.6	F	3.2	F	3.0	F
290 x 70	4.6	E	4.0	F	3.6	F	3.3	F
190 x 90	3.7	D	3.2	E	2.9	F	2.7	F
240 x 90	4.6	E	4.0	F	3.7	F	3.5	F
290 x 90	5.6	F	4.9	F	4.4	F	–	–

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift for underpurlins (For ridge beams refer to table 10.3 and figure 10.7)	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Spans may be increased by 10 % for underpurlins over 2 or more spans.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

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

Amd 2
May '06

Table 15.7 – Underpurlins and ridge beams (see 10.2.1.9.1) – No. 1 Framing and MSG 6

(b) Heavy roof for low, medium, high and very high wind zone

Underpurlin or ridge beam size (Width x thickness)	Loaded dimension* of underpurlin or ridge beam (m)							
	1.8		2.7		3.6		4.2	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
140 x 45	1.3	B	–	–	–	–	–	–
190 x 45	1.7	B	1.4	C	1.2	C	–	–
240 x 45	2.1	C	1.7	C	1.5	C	1.4	C
290 x 45	2.3	C	2.0	C	1.7	D	1.6	D
140 x 70	1.5	B	1.3	C	–	–	–	–
190 x 70	2.1	C	1.8	C	1.6	C	1.4	D
240 x 70	3.3	C	2.9	D	2.6	E	2.5	E
290 x 70	4.0	D	3.5	E	3.2	F	3.0	F
190 x 90	2.8	C	2.5	D	2.2	D	2.1	E
240 x 90	3.6	D	3.1	D	2.8	E	2.7	F
290 x 90	4.3	D	3.8	E	3.4	F	3.3	F

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift for underpurlins (For ridge beams refer to table 10.3 and figure 10.7)	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Spans may be increased by 10 % for underpurlins over 2 or more spans.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

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

Amd 2 May '06

Table 15.7 – Underpurlins and ridge beams (see 10.2.1.9.1) – VSG 8 and MSG 8

(a) Light roof for low, medium, high and very high wind speed

Underpurlin or ridge beam size (Width x thickness)	Loaded dimension* of underpurlin or ridge beam (m)							
	1.8		2.7		3.6		4.2	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
90 x 45	1.2	B	–	–	–	–	–	–
140 x 45	1.8	C	1.5	C	1.3	C	1.2	D
190 x 45	2.2	C	1.9	D	1.7	D	1.6	D
240 x 45	2.4	C	2.1	D	1.9	D	1.8	E
290 x 45	2.6	C	2.3	D	2.0	E	1.9	E
90 x 70	1.4	B	1.2	C	–	–	–	–
140 x 70	2.2	C	1.9	D	1.7	D	1.5	D
190 x 70	2.9	D	2.6	D	2.3	E	2.1	E
240 x 70	4.7	E	4.1	F	3.7	F	3.4	F
290 x 70	5.1	F	4.5	F	4.0	F	3.8	F
190 x 90	4.0	E	3.5	F	3.2	F	3.0	F
240 x 90	5.1	F	4.5	F	4.1	F	3.9	F
290 x 90	6.2	F	5.4	F	–	–	–	–

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift for underpurlins (For ridge beams refer to table 10.3 and figure 10.7)	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Spans may be increased by 10 % for underpurlins over 2 or more spans.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

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

Amd 2
May '06

Table 15.7 – Underpurlins and ridge beams (see 10.2.1.9.1) – VSG 8 and MSG 8

(b) Heavy roof for low, medium, high and very high wind zone

Underpurlin or ridge beam size (Width x thickness)	Loaded dimension* of underpurlin or ridge beam (m)							
	1.8		2.7		3.6		4.2	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
140 x 45	1.4	B	1.2	B	–	–	–	–
190 x 45	2.0	C	1.7	C	1.4	C	1.3	C
240 x 45	2.4	C	2.0	C	1.7	D	1.6	D
290 x 45	2.6	C	2.3	D	2.0	D	1.9	D
140 x 70	1.7	B	1.4	C	1.3	C	1.2	C
190 x 70	2.3	C	2.0	C	1.8	D	1.7	D
240 x 70	3.6	D	3.2	D	2.9	E	2.7	F
290 x 70	4.4	D	3.8	E	3.5	F	3.3	F
190 x 90	3.1	C	2.7	D	2.5	E	2.3	E
240 x 90	4.0	D	3.5	E	3.1	F	3.0	F
290 x 90	4.8	E	4.2	F	3.8	F	3.6	F

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift for underpurlins (For ridge beams refer to table 10.3 and figure 10.7)	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Spans may be increased by 10 % for underpurlins over 2 or more spans.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

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

Amd 2 May '06

Table 15.7 – Underpurlins and ridge beams (see 10.2.1.9.1) – VSG 10 and MSG 10

(a) Light roof for low, medium, high and very high wind speed

Underpurlin or ridge beam size (Width x thickness)	Loaded dimension* of underpurlin or ridge beam (m)							
	1.8		2.7		3.6		4.2	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
90 x 45	1.3	B	–	–	–	–	–	–
140 x 45	2.0	C	1.7	C	1.6	D	1.4	D
190 x 45	2.5	C	2.2	D	1.97	E	1.8	E
240 x 45	2.8	D	2.4	D	2.2	E	2.0	E
290 x 45	2.9	D	2.6	D	2.3	E	2.2	F
90 x 70	1.5	B	1.3	C	1.2	C	–	–
140 x 70	2.3	C	2.0	D	1.8	D	1.7	E
190 x 70	3.2	D	2.8	E	2.5	E	2.4	F
240 x 70	5.1	E	4.6	F	4.0	F	3.8	F
290 x 70	5.8	F	5.1	F	4.6	F	–	–
190 x 90	4.4	E	3.8	F	3.4	F	3.3	F
240 x 90	5.5	F	4.8	F	4.4	F	–	–
290 x 90	6.7	F	5.8	F	–	–	–	–

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift for underpurlins (For ridge beams refer to table 10.3 and figure 10.7)	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Spans may be increased by 10 % for underpurlins over 2 or more spans.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

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

Amd 2
May '06

Table 15.7 – Underpurlins and ridge beams (see 10.2.1.9.1) – VSG 10 and MSG 10

(b) Heavy roof for low, medium, high and very high wind zone

Underpurlin or ridge beam size (Width x thickness)	Loaded dimension* of underpurlin or ridge beam (m)							
	1.8		2.7		3.6		4.2	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
40 x 45	1.5	B	1.3	C	1.2	C	–	–
190 x 45	2.1	C	1.8	C	1.7	D	1.6	D
240 x 45	2.7	C	2.3	D	2.1	D	1.9	D
290 x 45	3.0	C	2.6	D	2.3	D	2.2	E
140 x 70	1.8	B	1.6	C	1.4	C	1.3	C
190 x 70	2.4	C	2.1	C	1.9	D	1.8	D
240 x 70	3.9	D	3.4	E	3.8	F	3.6	F
290 x 70	4.7	D	4.1	F	3.8	F	3.6	F
190 x 90	3.4	D	2.9	D	2.7	E	2.5	E
240 x 90	4.3	D	3.7	E	3.4	F	3.2	F
290 x 90	5.2	E	4.5	F	4.1	F	3.9	F

* For definition of loaded dimension see 1.3.

Fixing type	Fixing to resist uplift for underpurlins (For ridge beams refer to table 10.3 and figure 10.7)	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7
E	2/100 x 3.75 skewed nails + 4 wire dogs	8.7
F	2/100 x 3.75 skewed nails + U strap of 27 mm x 1.2 mm 10/30 x 3.15 nails at each end	16.0

NOTE –

(1) Spans may be increased by 10 % for underpurlins over 2 or more spans.

(2) Fixing types for continuous spans shall have double the capacity to that listed in the table.

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

Amd 2 May '06

Table 15.8 – Verandah beams – Low to very high wind zones (see 10.2.1.12) **– No. 1 Framing and MSG 6**

Beam size (Width x thickness)	Loaded dimension of verandah beam (m)							
	0.9		1.4		1.8		2.1	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
A Light roof								
140 x 45	1.7	CC	1.2	CC	–	–	–	–
190 x 45	2.0	CC	1.5	CC	1.4	DD	1.3	DD
240 x 45	2.3	CC	1.8	DD	1.6	DD	1.5	DD
290 x 45	2.4	CC	1.9	DD	1.8	DD	1.7	EE
140 x 70	2.0	CC	1.5	CC	1.4	DD	1.3	DD
190 x 70	2.8	CC	2.1	DD	1.9	EE	1.8	EE
240 x 70	3.4	DD	2.5	EE	2.3	EE	2.2	FF
290 x 70	3.7	DD	2.9	EE	2.6	FF	2.5	FF
140 x 90	2.2	CC	1.8	DD	1.6	DD	1.5	DD
190 x 90	3.0	CC	2.4	EE	2.1	EE	2.0	EE
240 x 90	3.8	DD	3.0	FF	2.7	FF	2.5	FF
290 x 90	5.8	FF	4.7	FF	4.3	FF	4.1	FF
B Heavy roof								
140 x 45	1.4	CC	–	–	–	–	–	–
190 x 45	1.8	CC	1.3	CC	1.2	CC	–	–
240 x 45	2.0	CC	1.6	CC	1.4	CC	1.3	DD
290 x 45	2.2	CC	1.7	CC	1.6	DD	1.5	DD
140 x 70	1.6	CC	1.3	CC	1.2	CC	–	–
190 x 70	2.2	CC	1.8	CC	1.6	DD	1.5	DD
240 x 70	2.8	CC	2.2	DD	2.0	DD	1.9	DD
290 x 70	3.3	CC	2.5	DD	2.3	EE	2.2	EE
140 x 90	1.8	CC	1.4	CC	1.3	CC	1.2	CC
190 x 90	2.4	CC	1.9	DD	1.8	DD	1.7	DD
240 x 90	3.1	CC	2.4	DD	2.3	EE	2.1	EE
290 x 90	4.7	DD	3.7	FF	3.5	FF	3.3	FF

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
CC	6/100 x 3.75 nails	4.7
DD	1/M12 bolt	6.7
EE	1/M12 bolt	8.7
FF	3/M12 bolts or 2/M16 bolts	18.6

NOTE –
(1) This table includes provision for the rafters cantilevering a maximum of 750 mm beyond the verandah beam to support a soffit.
(2) Fixing type for continuous spans shall have double the capacity to that listed in table.
(3) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2
May '06

Table 15.8 – Verandah beams – Low to very high wind zones (see 10.2.1.12) **– VSG 8 and MSG 8**

Beam size (Width x thickness)	Loaded dimension of verandah beam (m)							
	0.9		1.4		1.8		2.1	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
A Light roof								
140 x 45	1.9	CC	1.4	CC	1.3	DD	1.2	DD
190 x 45	2.3	CC	1.8	DD	1.6	DD	1.5	DD
240 x 45	2.5	CC	2.0	DD	1.8	EE	1.8	EE
290 x 45	2.7	CC	2.2	DD	2.0	EE	1.9	EE
140 x 70	2.2	CC	1.8	DD	1.6	DD	1.5	DD
190 x 70	3.1	CC	2.4	EE	2.2	EE	2.1	FF
240 x 70	3.9	DD	2.9	EE	2.7	FF	2.5	FF
290 x 70	4.2	DD	3.3	FF	3.0	FF	2.9	FF
140 x 90	2.4	CC	2.0	DD	1.8	EE	1.7	EE
190 x 90	3.3	DD	2.7	EE	2.5	FF	2.4	FF
240 x 90	4.2	DD	3.4	FF	3.1	FF	3.0	FF
290 x 90	6.5	FF	5.2	FF	4.8	FF	–	–
B Heavy roof								
140 x 45	1.5	CC	1.2	CC	–	–	–	–
190 x 45	2.0	CC	1.5	CC	1.4	CC	1.3	DD
240 x 45	2.3	CC	1.8	CC	1.6	DD	1.5	DD
290 x 45	2.4	CC	1.9	DD	1.8	DD	1.7	DD
140 x 70	1.8	CC	1.4	CC	1.3	CC	1.3	CC
190 x 70	2.4	CC	2.0	DD	1.8	DD	1.7	DD
240 x 70	3.1	CC	2.5	DD	2.3	EE	2.2	EE
290 x 70	3.7	DD	2.9	EE	2.6	EE	2.5	FF
140 x 90	2.0	CC	1.6	CC	1.4	CC	1.4	DD
190 x 90	2.7	CC	2.1	DD	2.0	DD	1.9	DD
240 x 90	3.4	CC	2.7	DD	2.5	EE	2.4	EE
290 x 90	5.2	DD	4.1	FF	3.8	FF	3.7	FF

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
CC	6/100 x 3.75 nails	4.7
DD	1/M12 bolt	6.7
EE	1/M12 bolt	8.7
FF	3/M12 bolts or 2/M16 bolts	18.6

Amd 2 May '06

NOTE –
(1) This table includes provision for the rafters cantilevering a maximum of 750 mm beyond the verandah beam to support a soffit.
(2) Fixing type for continuous spans shall have double the capacity to that listed in table.
(3) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Table 15.8 – Verandah beams – Low to very high wind zones (see 10.2.1.12) **– VSG 10 and MSG 10**

Beam size (Width x thickness)	Loaded dimension of verandah beam (m)							
	0.9		1.4		1.8		2.1	
	Span	Fixing type	Span	Fixing type	Span	Fixing type	Span	Fixing type
(mm x mm)	(m)		(m)		(m)		(m)	
A Light roof								
140 x 45	2.1	CC	1.7	DD	1.5	DD	1.4	DD
190 x 45	2.6	CC	2.0	DD	1.9	EE	1.8	EE
240 x 45	2.9	CC	2.3	EE	2.1	EE	2.0	EE
290 x 45	3.1	CC	2.5	EE	2.3	EE	2.2	FF
140 x 70	2.4	CC	1.9	DD	1.8	DD	1.7	EE
190 x 70	3.3	DD	2.6	EE	2.4	FF	2.3	FF
240 x 70	4.2	DD	3.3	FF	3.1	FF	2.9	FF
290 x 70	4.8	EE	3.8	FF	3.5	FF	3.3	FF
140 x 90	2.6	CC	2.1	DD	1.9	EE	1.9	EE
190 x 90	3.6	DD	2.9	EE	2.7	FF	2.5	FF
240 x 90	4.5	EE	3.6	FF	3.4	FF	3.2	FF
290 x 90	6.9	FF	5.6	FF	–	–	–	–
B Heavy roof								
140 x 45	1.7	CC	1.3	CC	1.2	CC	1.2	CC
190 x 45	2.3	CC	1.8	CC	1.6	DD	1.6	DD
240 x 45	2.6	CC	2.0	DD	1.9	DD	1.8	DD
290 x 45	2.7	CC	2.2	DD	2.0	DD	1.9	EE
140 x 70	1.9	CC	1.5	CC	1.4	CC	1.4	DD
190 x 70	2.6	CC	2.1	DD	1.9	DD	1.9	DD
240 x 70	3.3	CC	2.7	DD	2.5	EE	2.4	EE
290 x 70	4.0	DD	3.2	EE	3.0	FF	2.9	FF
140 x 90	2.1	CC	1.7	CC	1.6	DD	1.5	DD
190 x 90	3.1	CC	2.3	DD	2.1	EE	2.2	EE
240 x 90	3.6	CC	2.9	EE	2.7	EE	2.6	FF
290 x 90	5.6	EE	4.4	FF	4.1	FF	3.9	FF

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
CC	6/100 x 3.75 nails	4.7
DD	1/M12 bolt	6.7
EE	1/M12 bolt	8.7
FF	3/M12 bolts or 2/M16 bolts	18.6

NOTE –
(1) This table includes provision for the rafters cantilevering a maximum of 750 mm beyond the verandah beam to support a soffit.
(2) Fixing type for continuous spans shall have double the capacity to that listed in table.
(3) Members 70 mm and 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

Amd 2
May '06

16 COMPOSITE CONSTRUCTION LINTEL TABLES

16.1 Plywood box beam lintels

Plywood box beam *lintels* shall be constructed as shown in figures 16.1 and 16.2 and may be used instead of those given in 8.6 to support roofs that are not subjected to snow loading. Beam sizes shall be as given in table 16.1 depending on roof type and pitch, and the *loaded dimension*. Other requirements shall be as given in 8.6. The fixings shall be in accordance with tables 8.14 and 8.19 for spans up to 4.1 m and in accordance with figure 16.2 for spans greater than 4.1 m. Use only VSG 8/MSG 8 or VSG 10/MSG10 for top and bottom chords of box beams.

Amd 1 Dec '00

Amd 2 May '06

C16

Lintels supporting walls, floors or snow loading must be to specific engineering design.

Table 16.1 – Plywood box beam lintels supporting roof only (see 8.6.1.2)

Lintel size		Roof	Maximum span of lintel for loaded dimension of (m)			
Depth (mm)	Width (mm)	pitch (degrees)	3.0	4.0	5.0	6.0
A Light roof						
400	88	15	4.8	4.5	4.3	4.1
		25	4.7	4.4	4.2	4.0
		45	4.4	4.2	4.0	3.8
360	88	15	4.5	4.2	4.0	3.8
		25	4.4	4.1	3.9	3.7
		45	4.1	3.9	3.7	3.3
B Heavy roof						
400	88	25	4.0	3.8	3.4	2.9
		45	3.8	3.2	2.7	2.3
360	88	25	3.8	3.5	3.0	2.5
		45	3.5	2.8	2.3	2.0

16.2 Glue laminated timber lintels

Glue laminated timber *lintels* manufactured in accordance with AS/NZS 1328:Parts 1 and 2, as given in table 16.2, may be substituted for plywood box beam *lintels* in table 16.1.

Table 16.2 – Glue laminated timber lintel equivalents to plywood box beam lintels in table 16.1 (see 8.6.1.2)

Plywood box beam lintel No. 1 framing chords		Equivalent glue laminated beam					
		Glulam grade					
		GL8		GL10		GL12	
Depth (mm)	Width (mm)	Depth (mm)	Width (mm)	Depth (mm)	Width (mm)	Depth (mm)	Width (mm)
400	88	355	90	329	90	310	90
360	88	324	90	301	90	283	90

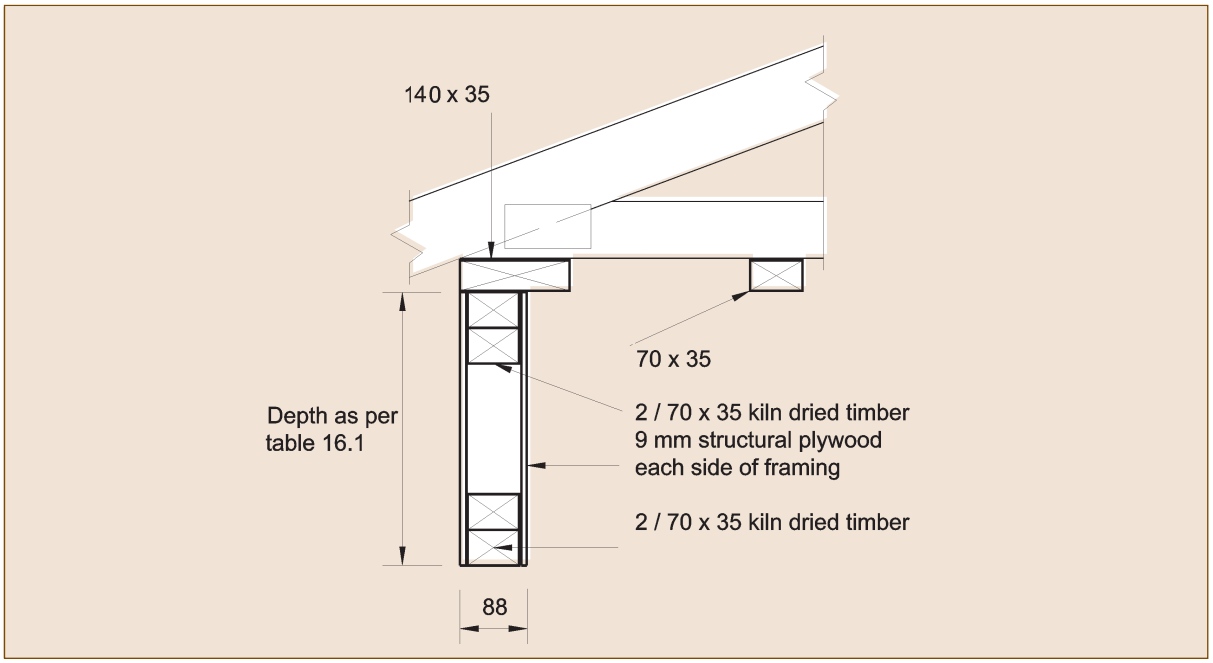


Figure 16.1 – Built-up plywood box beam lintel – vertical section (see 8.6.1.7)

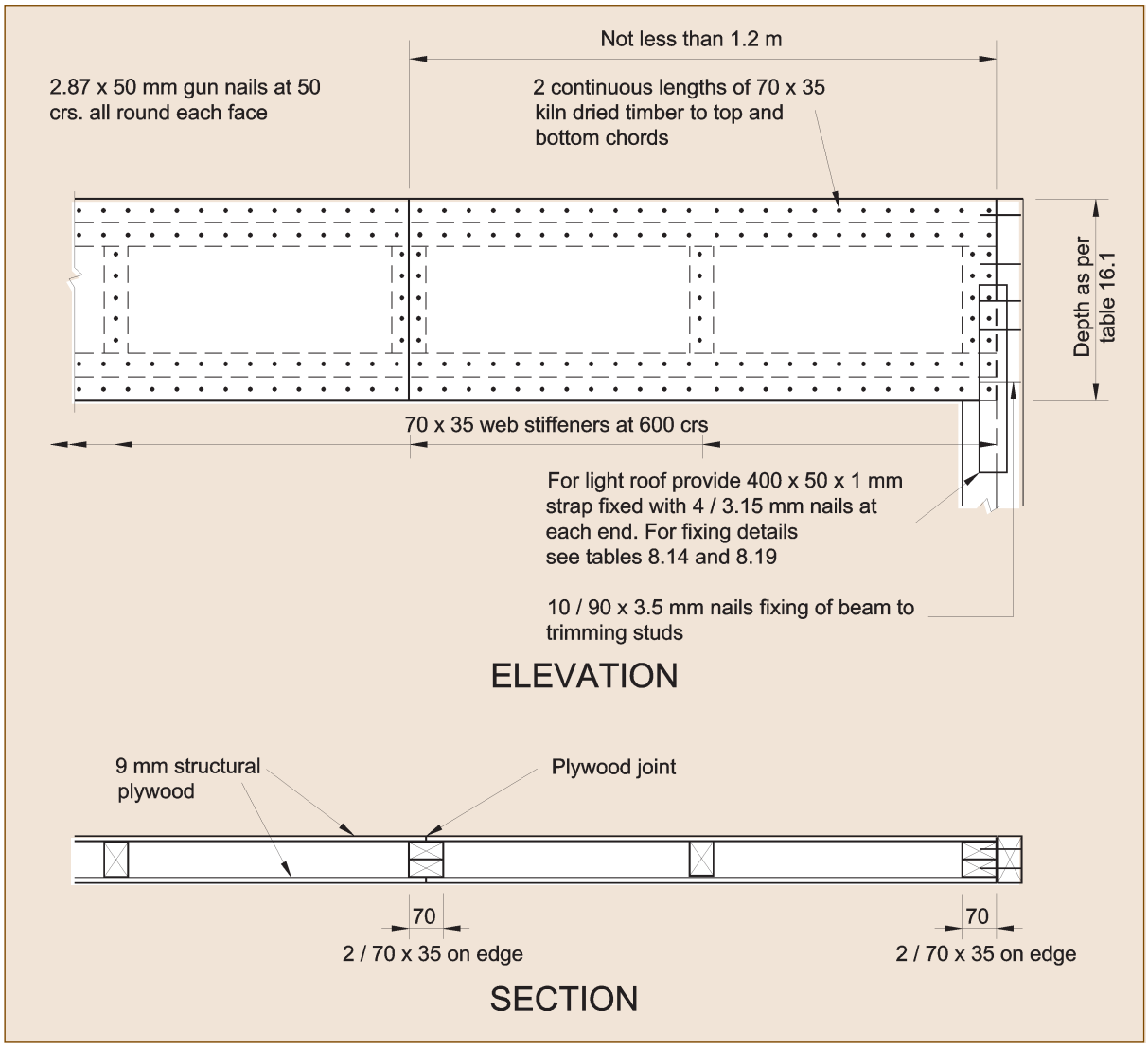


Figure 16.2 – Built-up plywood box beam lintel – elevation and longitudinal section (see 8.6.1.7)

Amd 1
Dec '00

(Amendment No. 1, December 2000)
(Amendment No. 2, May 2006)