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AS 1684.4—2010

Residential timber-framed construction

(Incorporating Amendment No. 1)

Part 4: Simplified—Non-Cyclonic Areas

Australian STANDARD

AS

This Australian Standard® was prepared by Committee TM-002, Timber Framing. It was approved on behalf of the Council of Standards Australia on 21 December 2009.
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The following are represented on Committee TM-002:

- A3P
- Association of Consulting Engineers, Australia
- Australian Building Codes Board
- Australian Institute of Building
- Building Research Association of New Zealand
- CSIRO Manufacturing and Infrastructures Technology
- Engineered Wood Products Association of Australasia
- Engineers Australia
- Forest Industries Federation (WA)
- Frame and Truss Manufacturers Association Australia
- Housing Industry Association
- Master Builders, Australia
- New Zealand Timber Industry Federation
- Scion
- South Australian Housing Trust
- Timber and Building Materials Association, NSW
- Timber Development Association, NSW
- Timber Queensland

Additional Interests:

- Mr Peter Juniper

This Standard was issued in draft form for comment as DR AS 1684.4.

Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

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Australian Standard®

Residential timber-framed construction

Part 4: Simplified—Non-cyclonic areas

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PREFACE

This Standard was prepared by the Joint Standards Australian/Standards New Zealand Committee TM-002, Timber Framing, to supersede AS 1684.4—2006.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

This Standard incorporates Amendment No. 1 (June 2012). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure, or part thereof affected.

The objective of this Standard is to provide the building industry with procedures that can be used to determine building practice, to design or check construction details, and to determine member sizes, and bracing and fixing requirements for timber-framed construction in non-cyclonic wind classifications N1 and N2.

The objectives of this revision are to —

(a) include editorial amendments and some technical changes to correct mistakes, clarify interpretation and enhance the application of the document;

(b) incorporate the outcomes of recent research projects that considered the role and function of wall noggings (Clause 6.2.1.5); and

(c) provide some adjustments to the Span Table values in Appendix A for stress grades MGP 10, MGP 12 and MGP 15 in response to changes to the design characteristic values for these stress grades in AS 1720.1.

NOTE:These adjustments have been made recognising that MGP stress grades represent the major product usage in the marketplace. Further work is required to assess and more fully respond to existing and expected changes to the related loading, design, and design criteria Standards, and this may result in a future revision of Span Tables in the Supplements for all stress grades.

Prior to using this Standard, it is necessary to establish the design gust wind speed and wind classification (see Clause 1.4.2).

This Standard is a companion publication to the following:

AS		
1684	Residential timber-framed construction	
1684.1	Part 1:	Design criteria
1684.2	Part 2:	Non-cyclonic areas
1684.3	Part 3	Cyclonic areas

This Standard has been derived from AS 1684.2 to provide a simpler design procedure for lower wind classification areas where details of bracing and tie-downs are simplified. It should be noted that this Standard differs from AS 1684.2 in a number of areas in order to achieve the simplification. Some of the differences are as follows:

(A) Input to the Span Tables requiring references to span and spacing.

(B) The geometric limits of the house are more restricted, e.g., 12.0 m maximum width and 30° maximum roof pitch.

(C) Span Tables are provided for a more limited range of stress grades.

(D) Design of bracing is simplified.

(E) Where required, design of tie-down is simplified.

Alternatively, for wind classifications N1 and N2, more economical design may be obtained by following the design procedures given in AS 1684.2. For wind classifications N3 and N4 for non-cyclonic areas, see AS 1684.2.

This Standard does not preclude the use of framing, fastening or bracing methods or materials other than those specified. Alternatives may be used, provided they satisfy the requirements of the Building Code of Australia.

Statements expressed in mandatory terms in Notes to the tables and figures are deemed to be requirements of this Standard.

Notes to the text contain information and guidance. They are not an integral part of the Standard.

Statements expressed in mandatory terms in Notes to the Span Tables in Appendix A are deemed to be requirements of this Standard.

CONTENTS

Page

Page

STANDARDS AUSTRALIA

Australian Standard
Residential timber-framed construction

Part 4: Simplified—Non-cyclonic areas

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for building practice and for the selection, placement and fixing of the various structural elements used in the construction of timber-framed Class 1 and Class 10 Buildings as defined by the Building Code of Australia and within the limitations given in Clause 1.4. The provisions of the Standard also apply to alterations and additions to these buildings.

This Standard also provides building practice and procedures that assist in the correct specification and determination of timber members, bracing and connections, thereby minimizing the risk of creating an environment that may adversely affect the ultimate performance of the structure.

This Standard may also be applicable to the design and construction of other classes of buildings where the design criteria, loadings and other parameters applicable to those classes of building are within the limitations of this Standard.

NOTES:

1 See AS 1684.1 for details of design criteria, loadings and other parameters.

2 Whilst this Standard may be used to design Class 10 buildings, less conservative levels of design for this building class may be permitted by building regulations and other Australian Standards.

3 Advisory information for the construction and specifications of timber stairs, handrails and balustrades, is provided in the FWPA's publication (see the Bibliography).

Member Span Tables are given in Appendix A.

1.2 COMPANION DOCUMENTS

This Standard is a companion publication to the following:

AS	
1684	Residential timber-framed construction
1684.1	Part 1: Design criteria
1684.2	Part 2: Non-cyclonic wind areas
1684.3	Part 3: Cyclonic wind areas

1.3 NORMATIVE REFERENCES

The following are the normative documents referenced in this Standard:

AS
1170 Structural design actions
1170.4 Part 4: Earthquake actions in Australia

1214 Hot-dip galvanized coatings on threaded fasteners (ISO metric coarse thread series)

1397 Steel sheet and strip—Hot-dip zinc-coated or aluminium/zinc-coated

1684 Residential timber-framed construction
1684.1 Part 1: Design criteria
1684.2 Part 2: Non-cyclonic areas

1691 Domestic oil-fired appliances—Installation

1720 Timber structures
1720.1 Part 1: Design methods

1810 Timber—Seasoned cypress pine—Milled products

1860 Particleboard flooring
1860.2 Part 2: Installation

2796 Timber—Hardwood—Sawn and milled products
2796.1 Part 1: Product specification

2870 Residential slabs and footings—Construction

4055 Wind loads for housing

4440 Installation of nailplated timber trusses

4785 Timber—Seasoned softwood— Sawn and milled products
4785.1 Part 1: Product specification

5604 Timber—Natural durability ratings

AS/NZS
1170 Structural design actions
1170.1 Part 1: Permanent, imposed and other actions
1170.2 Part 2: Wind actions

1604 Specification for preservative treatment (all Parts)

1859 Reconstituted wood-based panels—Specifications
1859.4 Part 4: Wet-processed fibreboard

1860 Particleboard flooring
1860.1 Part 1: Specifications

2269 Plywood—Structural
2269.0 Part 0 Specifications

2918 Domestic solid fuel burning appliances—Installation

4534 Zinc and zinc/aluminium-alloy coatings on steel wire

4791 Hot-dip galvanized (zinc) coatings on ferrous open sections, applied by an in-line process

ABCB
BCA Building Code of Australia

1.4 LIMITATIONS

1.4.1 General

The criteria specified in this Standard are specifically for conventional timber-framed buildings and applicable to single- and two-storey constructions built within the limits or parameters given in Clauses 1.4.2 to 1.4.11 and Figure 1.1.

1.4.2 Wind classification

For wind loads, the simplified wind classifications for non-cyclonic areas N1 and N2, as described by AS 4055, shall be used with the corresponding maximum design gust wind speeds given in Table 1.1.

Either AS 4055 or AS/NZS 1170.2 shall be used to determine the wind classification necessary for the use of this Standard.

The maximum wind classification shall be N2, which is determined as follows:

(a) Where the wind classification is determined from AS 4055, the maximum building height limitation of 8.5 m, as given in AS 4055, shall apply to this Standard. The maximum building width is specified in Clause 1.4.5.

(b) Where AS/NZS 1170.2 is used to determine the maximum design gust wind speed, a wind classification shall be adopted in accordance with Table 1.1. The ultimate limit state design gust wind speed determined from AS/NZS 1170.2 shall be not more than 5% greater than the ultimate limit state wind speed given in Table 1.1 for the corresponding wind classification adopted.

NOTES:

1 The determination of the design gust wind speed and wind classification should take into account building height, terrain category, topographic classification, and shielding classification given in AS/NZS 1170.2 or AS 4055.

2 Some regulatory authorities provide wind classification maps or wind classifications for designated sites within their jurisdiction.

TABLE 1.1

MAXIMUM DESIGN GUST WIND SPEED

Wind classification	Maximum design gust wind speed, m/s		
Regions A and B	Permissible stress method (V_p)	Serviceability limit state (V_s)	Ultimate limit state (V_u)
N1	28 (W28N)	26	34
N2	33 (W33N)	26	40

1.4.3 Plan

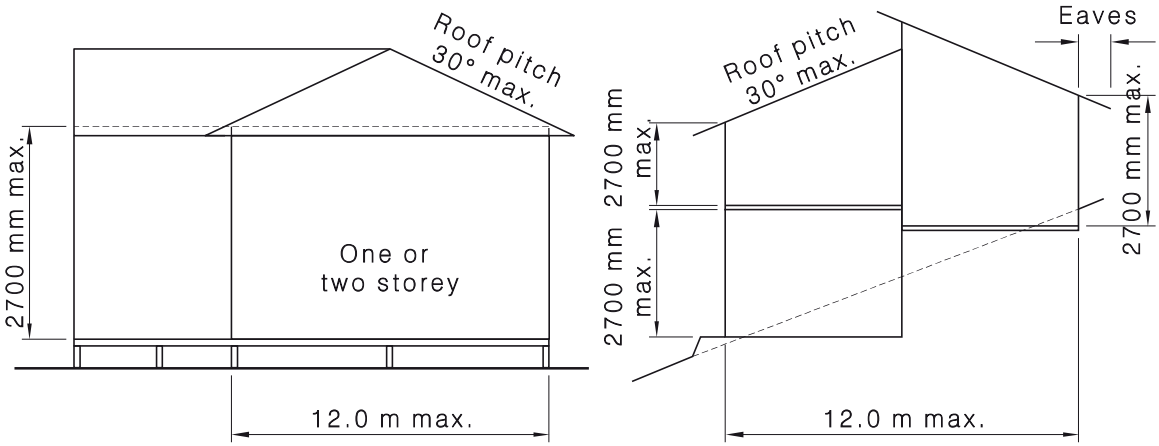
Building shapes shall be essentially rectangular, square, L-shaped or a combination of rectangular elements including splayed-end and boomerang-shaped buildings.

1.4.4 Number of storeys of timber framing

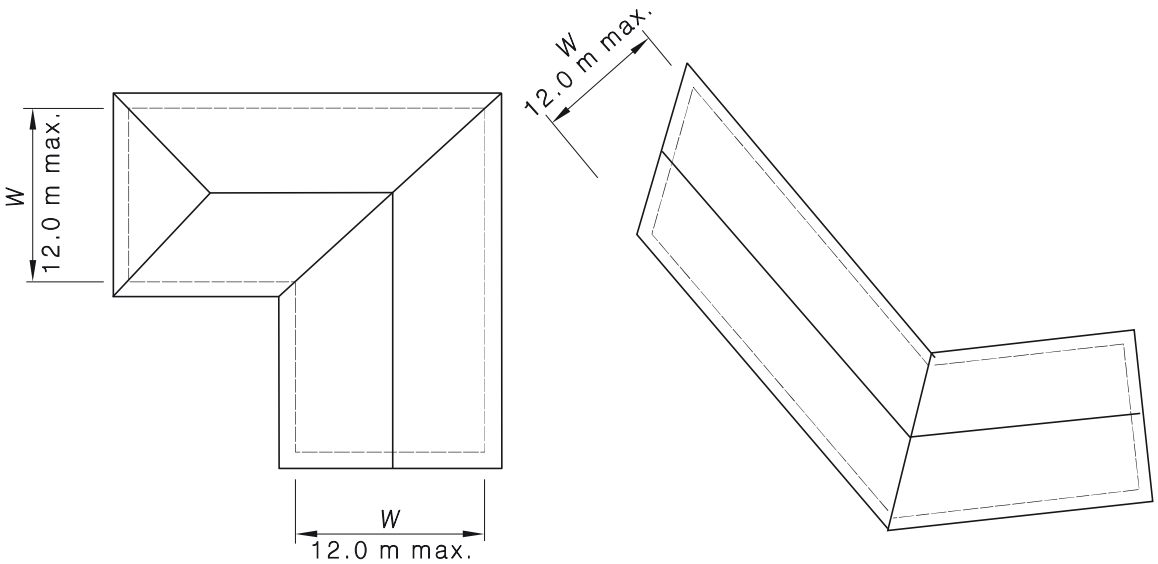
The maximum number of storeys of timber framing shall not exceed two (see Section 2).

1.4.5 Width

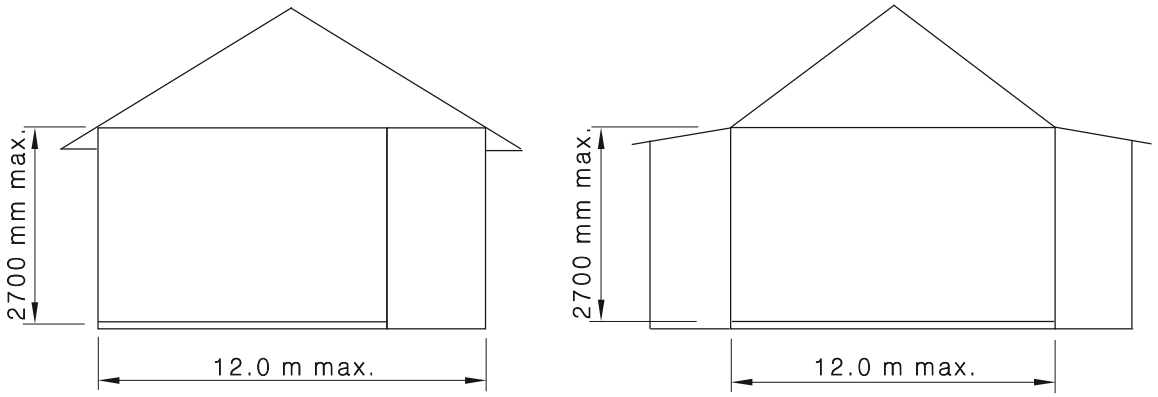
The maximum width of a building shall be 12000 mm, excluding eaves (see Figure 1.1).



(a) Sections



(b) Plan



(c) Verandahs

NOTE: Building height limitations apply where wind classification is determined using AS 4055 (see Clause 1.4.2). See also Clause 1.4.4.

FIGURE 1.1 GEOMETRIC BUILDING PARAMETERS

1.4.6 Wall height

The maximum wall height shall be 2700 mm, floor to ceiling, as measured at external walls (see Figure 1.1).

1.4.7 Rafter overhang

The maximum rafter overhang shall be 750 mm.

1.4.8 Roof pitch

The maximum roof pitch shall be 30° (58:100).

1.4.9 Spacing

1.4.9.1 *Rafters or trusses*

The maximum spacing of rafters or trusses shall be 900 mm for tile roof and 1200 mm for sheet roof.

1.4.9.2 *Bracing*

The spacing of bracing elements, measured at right angles to elements, shall not exceed 9000 mm (see Section 8).

1.4.10 Roof types

Roof construction shall be hip, gable, skillion, cathedral, trussed or pitched or in any combination of these (see Figures 2.2 to 2.7).

1.4.11 Building masses

The maximum building masses (dead loads) specified in Tables 1.2 to 1.4 shall apply to the use of the Span Tables given in Appendix A. Reference shall also be made to the Notes given under each Span Table in Appendix A.

TABLE 1.2

MAXIMUM BUILDING MASSES—FLOOR FRAMING

Description	Max. building mass kg/m^2
Joists and bearers supporting floor loads only	40
Bearers supporting loadbearing walls—	
(a) Floor loads	40
(b) Roof and ceiling loads:	
(i) Sheet roof	40
(ii) Tile roof	90

NOTES:

1 An allowance has also been included for the mass of sheeted walls.

2 The above loads are applicable to upper-, single-, and lower-storey bearers.

TABLE 1.3
MAXIMUM BUILDING MASSES—WALL FRAMING

Description	Max. building mass kg/m^2
Studs, plates, lintels, and similar members, supporting single- or upper-storey loadbearing walls:	
(a) Sheet roof	40
(b) Tile roof	90
Studs, plates, lintel, and similar members, supporting lower-storey loadbearing walls:	
(a) Sheet roof	40 (see Note 2)
(b) Tile roof	90

NOTES:

1 Where appropriate, an allowance has also been included for the mass of the walls.

2 An allowance of 40 kg/m^2 for the mass of the floor supported has been included.

TABLE 1.4
MAXIMUM BUILDING MASSES—ROOF FRAMING

Description	Max. building mass kg/m^2
Ceiling joists, hanging beams and counter beams—Ceiling lining (including battens)	12
Combined strutting/hanging and combined counter/strutting beams:	
(a) Sheet roofing plus ceiling lining (including battens)	32
(b) Tile roofing plus ceiling lining (including battens)	72
Strutting beams and underpurlins:	
(a) Sheet roof	20
(b) Tile roof	60
Rafters supporting roof loads only:	
(a) Sheet roof	20
(b) Tile roof	60
Rafters supporting roof and ceiling loads:	
(a) Sheet roof	40
(b) Tile roof	90
Ridge and intermediate beams:	
(a) Sheet roof	40
(b) Tile roof	90
Roof battens:	
(a) Sheet roof	10
(b) Tile roof	60

1.5 DESIGN CRITERIA

The design criteria that have been used in the preparation of this Standard are the following:

(a) The bases of the design used in the preparation of this Standard are AS 1684.1 and AS 1720.1.

(b) The design dead, live, and wind loadings recommended in AS/NZS 1170.1, AS/NZS 1170.2 and AS 4055, were taken into account in the member computations, with appropriate allowances for the distribution of concentrated or localized loads over a number of members where relevant (see also Clause 1.4.2).

NOTE: Construction supporting vehicle loads is outside the scope of this Standard.

(c) All pressures, loads, forces and capacities given in this Standard are based on limit state design.

(d) The member sizes, bracing and connection details are suitable for construction (including timber-framed brick veneer) of design category H1 and H2 domestic structures in accordance with AS 1170.4. This Standard does not provide specifications for unreinforced masonry construction subject to earthquake loads.

NOTE: Typical unreinforced masonry may include masonry bases for timber-framed houses.

(e) The effects of snow loads up to 0.2 kPa on member sizes, bracing and connection details have been accommodated in the design.

(f) The minimum racking capacity of Type A and Type B bracing units shall be 3 kN and 6 kN, respectively (limit state design).

1.6 LOAD PATHS—OFFSETS AND CANTILEVERS

Roof loads shall be transferred through the timber frame to the footings by the most direct route possible. For floor framing, the limitations imposed regarding the support of point loads and the use of offsets and cantilevers are specified in Section 4.

NOTES:

1 This load path in many cases cannot be maintained in a completely vertical path, relying on structural members that transfer loads horizontally. Offset or cantilevered floor framing supporting loadbearing walls may also be used (see Figures 1.2 and 1.3).

2 Floor members designed as ‘supporting floor load only’ may support a loadbearing wall (walls supporting roof loads) where the loadbearing wall occurs directly over a support or is at or within 1.5 times the depth of the floor member from the support (see also Clause 4.3.2.2 and Clause 4.3.3.3).

3 Other members supporting roof or floor loads where the load occurs directly over the support or is at or within 1.5 times the depth of the member from the support do not require to be designed for that load. For the measurement of offset, see Figure 1.3.

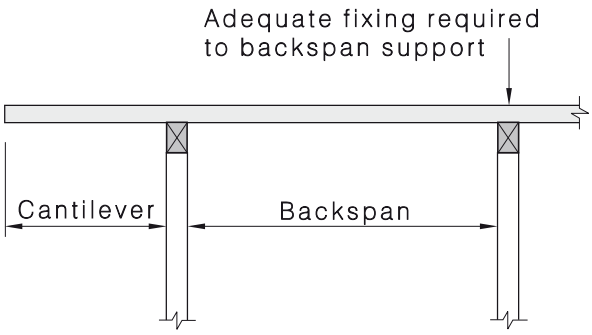


FIGURE 1.2 CANTILEVER

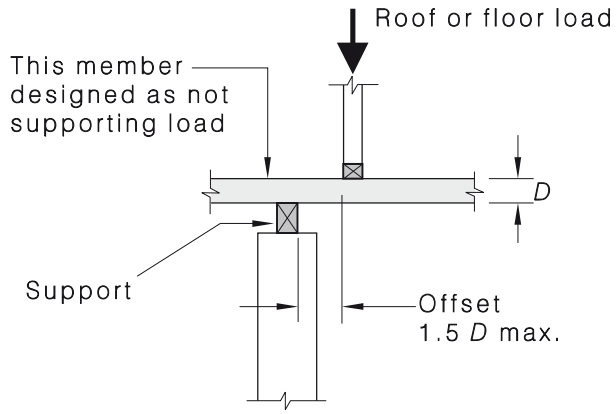


FIGURE 1.3 OFFSET

1.7 DURABILITY

Structural timber used in accordance with this Standard shall have the level of durability appropriate for the relevant climate and expected service life and conditions, including exposure to insect attack or to moisture, which could cause decay.

Structural timber members that are in ground contact or that are not protected from weather exposure and associated moisture ingress shall be of in-ground durability class 1 or 2 as appropriate (see AS 5604), or shall be adequately treated with preservative in accordance with the AS/NZS 1604 series, unless the ground contact or exposure is of a temporary nature.

1.8 DIMENSIONS

Timber dimensions throughout this Standard are stated by nominating the depth of the member first, followed by its breadth (see Figure 1.4); e.g., 90 × 35 mm (studs, joists, etc.), 45 × 70 (wall plates, battens, etc.).

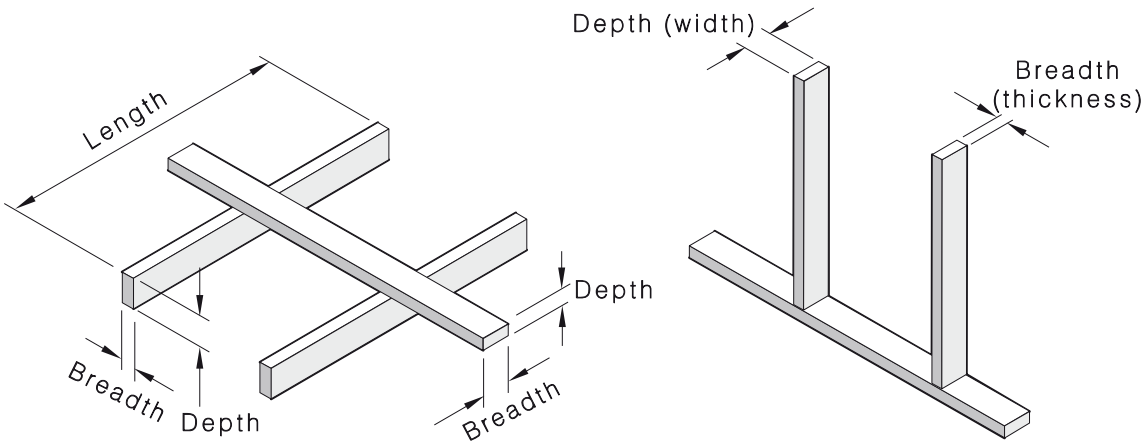


FIGURE 1.4 DIMENSIONS

1.9 BEARING

The minimum bearing for specific framing members (bearers, lintels, hanging beams, strutting beams, combined strutting/hanging beams, counter beams, combined counter and strutting beams, and verandah beams) shall be as given in the Notes to the Span Tables of Appendix A, as appropriate.

In all other cases, framing members shall bear on their supporting element, a minimum of 30 mm at their ends or 60 mm at the continuous part of the member, by their full breadth (thickness). Reduced bearing area shall only be used where additional fixings are provided to give equivalent support to the members.

Where the bearing area is achieved using a non-rectangular area such as a splayed joint, the equivalent bearing area shall not be less than that required above.

1.10 STRESS GRADES

All structural timber used in conjunction with this Standard shall be stress-graded in accordance with the relevant Australian Standard.

All structural timber to be used in conjunction with this Standard shall be identified in respect of stress grade.

NOTE: The timber stress grade is usually designated alphanumerically (e.g., F17, MGP12). Stress grades covered by the Span Tables provided in this Standard are given in Table 1.5.

TABLE 1.5

STRESS GRADES

Species or species group	Stress grade
Cypress (unseasoned)	F5, F7
Hardwood (unseasoned)	F8, F11, F14
Hardwood (seasoned)	F17, (F27 joists and beams only)
Seasoned Softwood (Radiata, slash, hoop, Caribbean, pinaster pines etc.)	F5, F8 (studs and plates only), MGP10, MGP12
Douglas Fir (Oregon) (unseasoned)	F5, F7
Spruce Pine Fir (SPF) (seasoned)	F5
Hemfir (seasoned)	F5

NOTES:

1 Timber that has been visually, mechanically or proof stress-graded may be used in accordance with this Standard at the stress grade branded thereon.

2 Check timber suppliers or contact local timber advisory services to confirm availability of timber stress grades.

1.11 ENGINEERED TIMBER PRODUCTS

Fabricated components, such as roof trusses, glued-laminated timber members, I-beams, laminated veneer lumber and nailplate-joined timber, may be used where their design is in accordance with AS 1720.1, and their manufacture and use complies with the relevant Australian Standards.

NOTE: In some situations, there are no relevant Australian Standards applicable to the design, manufacture or use of engineered timber products. In such cases, the use of these products in accordance with this Standard is subject to the approval of the regulatory authority and the recommendations of the specific manufacturer, who may require provisions additional to those contained in this Standard. These may include, but are not restricted to, additional support, lateral restraint, blocking, and similar provisions.

1.12 SIZE TOLERANCES

When using the Span Tables given in Appendix A, the following maximum undersize tolerances on timber sizes shall be permitted:

(a) *Unseasoned timber:*

(i) *Up to and including F7*.....4 mm.

(ii) *F8 and above* .....3 mm.

(b) *Seasoned timber—All stress grades*.....0 mm.

NOTE: When checking unseasoned timber dimensions onsite, allowance should be made for shrinkage, which may have occurred since milling.

1.13 ALTERNATIVE TIMBER DIMENSIONS

The alternative timber dimensions given by this Clause shall not apply to the Span Tables given in Appendix A.

Where a timber dimension is stated in the Clauses of this Standard, it refers to the usual minimum dimensions of seasoned timber. Alternative nominal dimensions for unseasoned timber shall be in accordance with Table 1.6.

The size tolerances given in Clause 1.12 are also applicable to these dimensions.

TABLE 1.6

ALTERNATIVE TIMBER DIMENSIONS

Minimum seasoned timber dimension mm	Allowable dimension nominal unseasoned timber dimensions mm
19	25
32	38
35	38
42	50
45	50
70	75
90	100
120	125
140	150
170	175
190	200
240	250
290	300

1.14 STEEL GRADE AND CORROSION PROTECTION

All metal used in structural timber connections shall be provided with corrosion protection appropriate for the particular conditions of use.

Where corrosion protection of steel is required it shall be in accordance with AS/NZS 4791, AS/NZS 4534, AS 1397 and AS 1214. The level of corrosion protection provided shall take into consideration weather exposure, timber treatment, moisture and presence of salt.

The minimum corrosion protection that shall be applied to metal straps, framing anchors and similar structural connections shall be Z 275. The minimum thickness of metal strap shall be 0.8 mm and the minimum net cross-section area shall be 21 mm^2, unless noted otherwise.

Where other types of corrosion protection are provided, they shall satisfy the requirements of the relevant authority.

The min. steel grade for metal strap, framing anchors and similar structural connection shall be G 300. The grade of all other metal components shall be in accordance with the relevant Australian Standards.

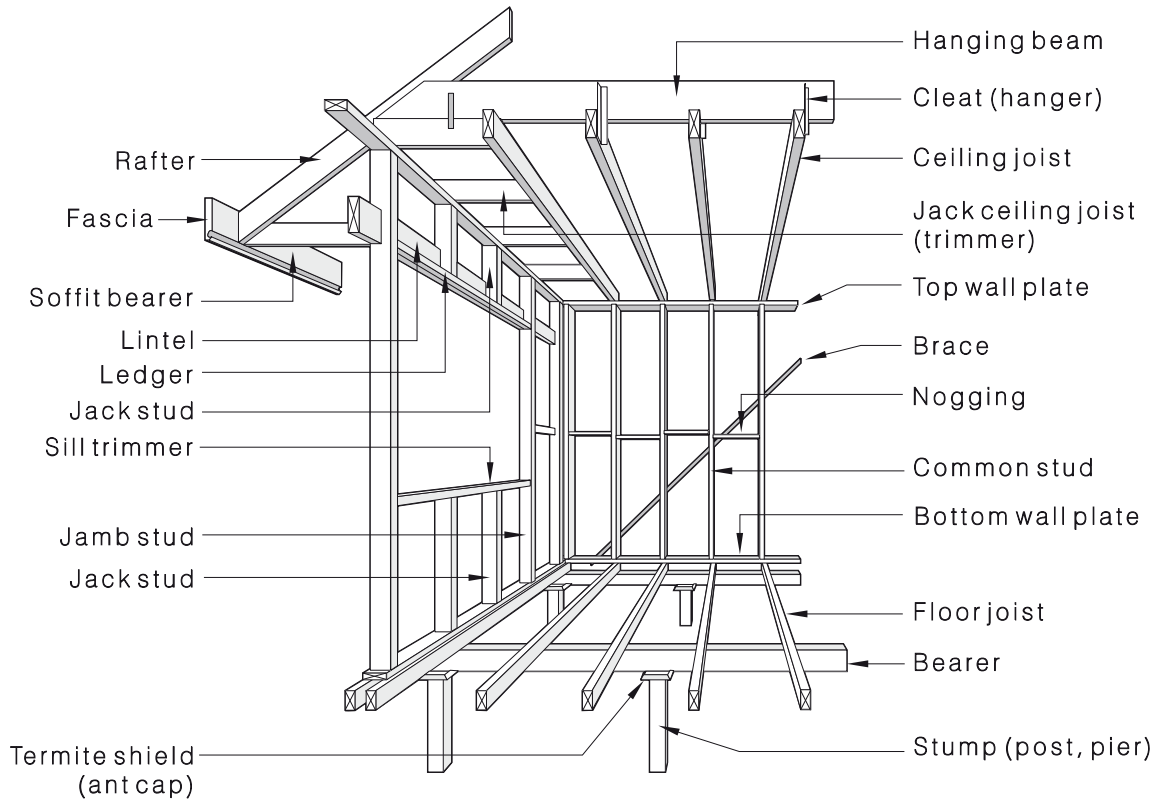
SECTION 2 TERMINOLOGY AND DEFINITIONS

2.1 GENERAL

The terminology and definitions given in this Section shall be used in conjunction with the requirements of this Standard.

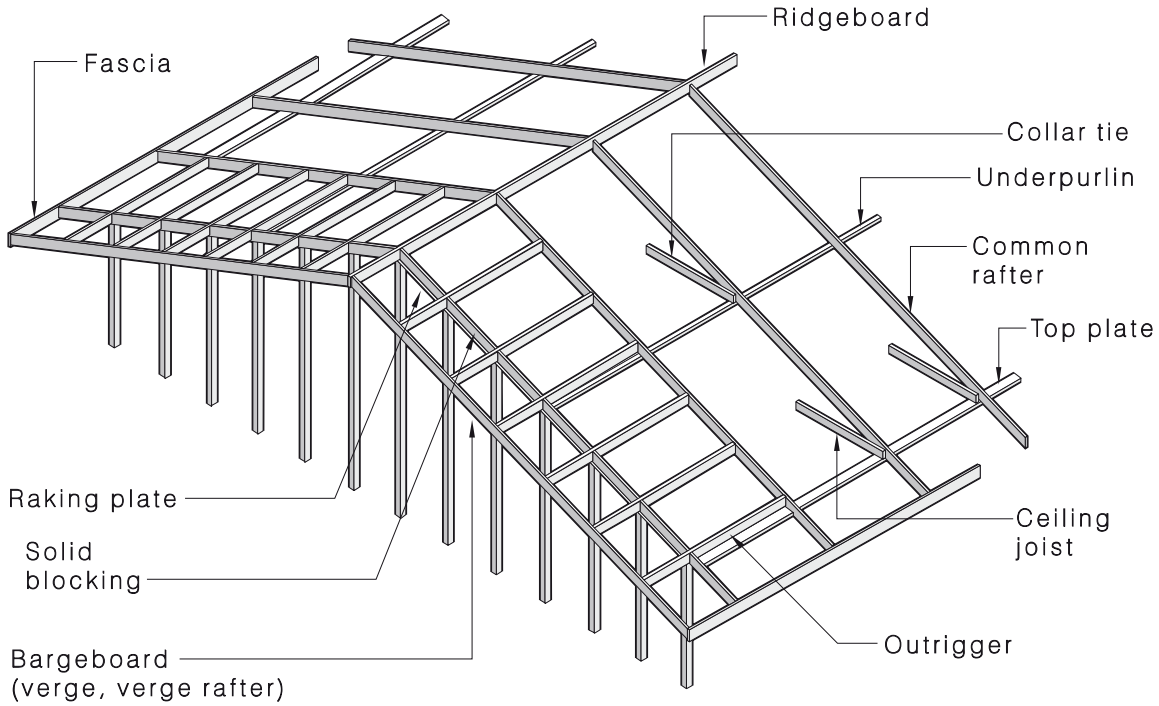
2.2 TERMINOLOGY OF FRAMING MEMBERS

Figure 2.1 details floor, wall and ceiling framing members in general. Figures 2.2 to 2.7 apply to roof framing.



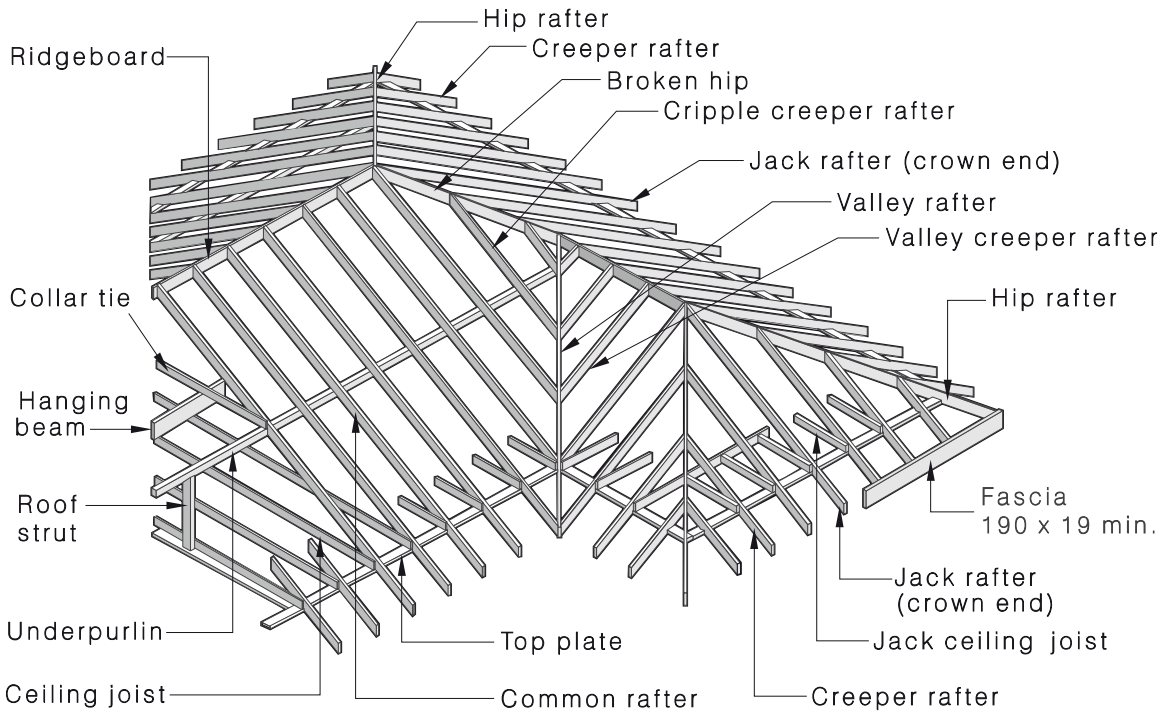
NOTE: The ceiling and floor joists are shown parallel to the external loadbearing wall for clarity. In practice, the more usual case is for the joists to be located perpendicular to the external wall. Lintel location may also vary (see Figure 6.8).

FIGURE 2.1 FRAMING MEMBERS—FLOOR, WALL AND CEILING



NOTE: Some members have been omitted for clarity.

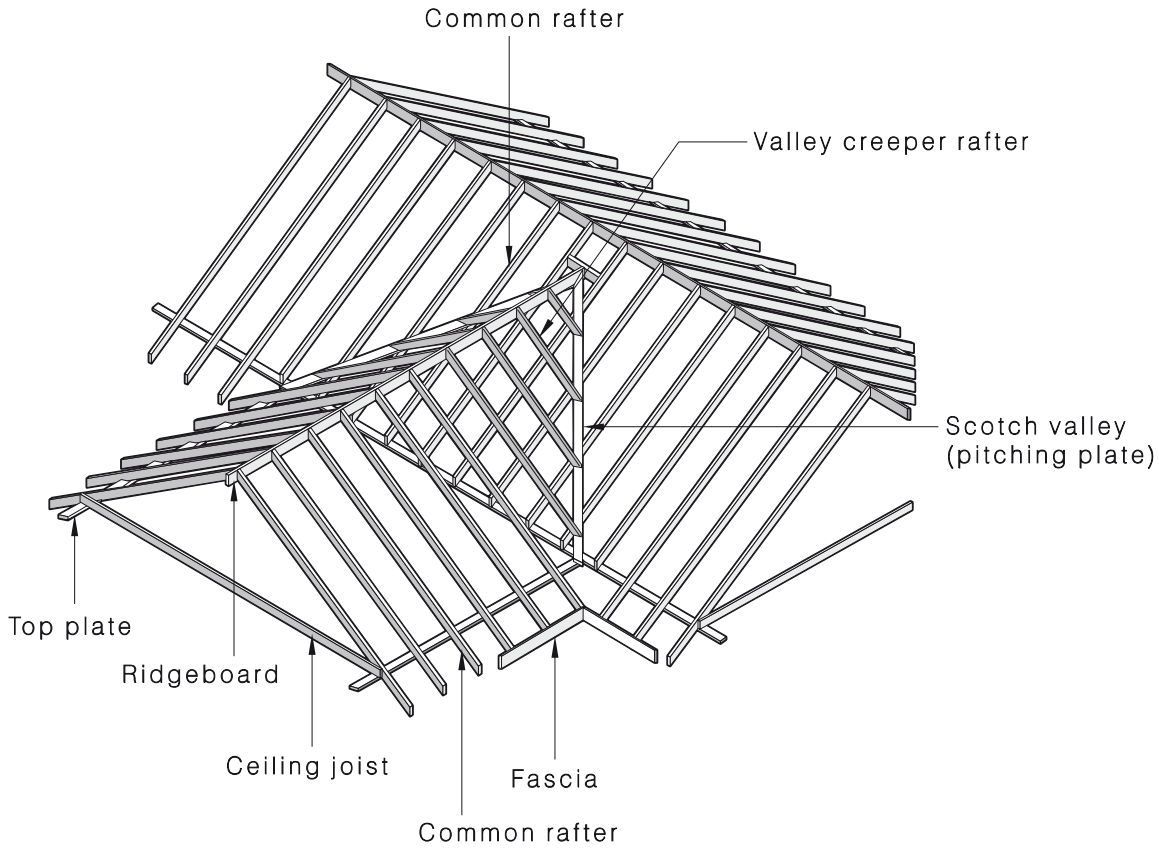
FIGURE 2.2 FRAMING MEMBERS—GABLE ROOF CONSTRUCTION



NOTE: Some members have been omitted for clarity.

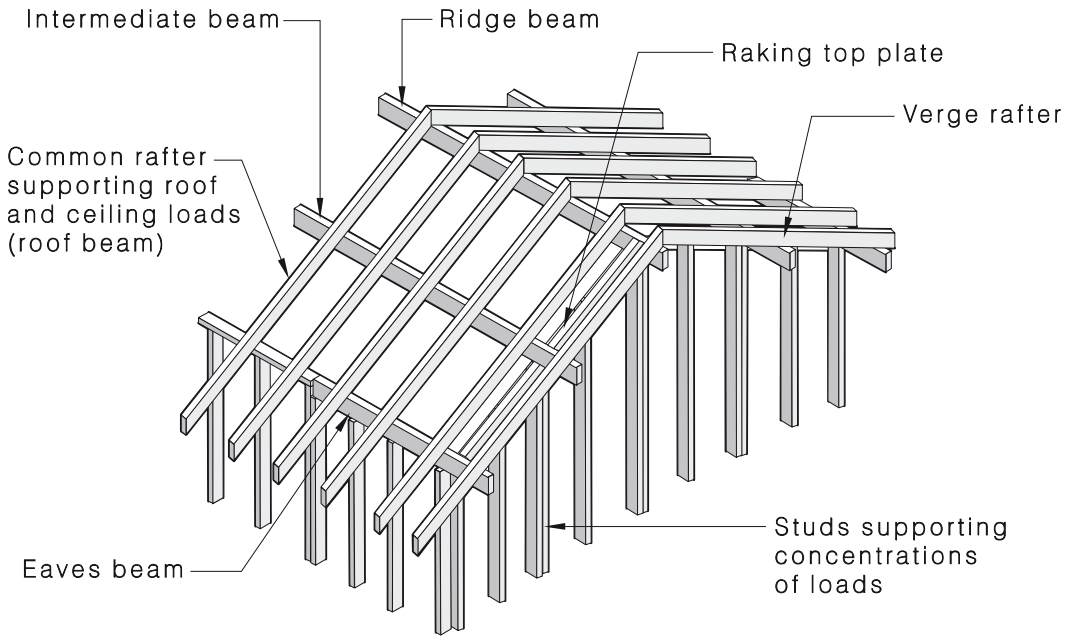
DIMENSIONS IN MILLIMETRES

FIGURE 2.3 FRAMING MEMBERS—HIP AND VALLEY ROOF CONSTRUCTION



NOTE: Some members have been omitted for clarity.

FIGURE 2.4 FRAMING MEMBERS—SCOTCH VALLEY CONSTRUCTION



NOTE: Some members have been omitted for clarity.

FIGURE 2.5 FRAMING MEMBERS—CATHEDRAL ROOF CONSTRUCTION

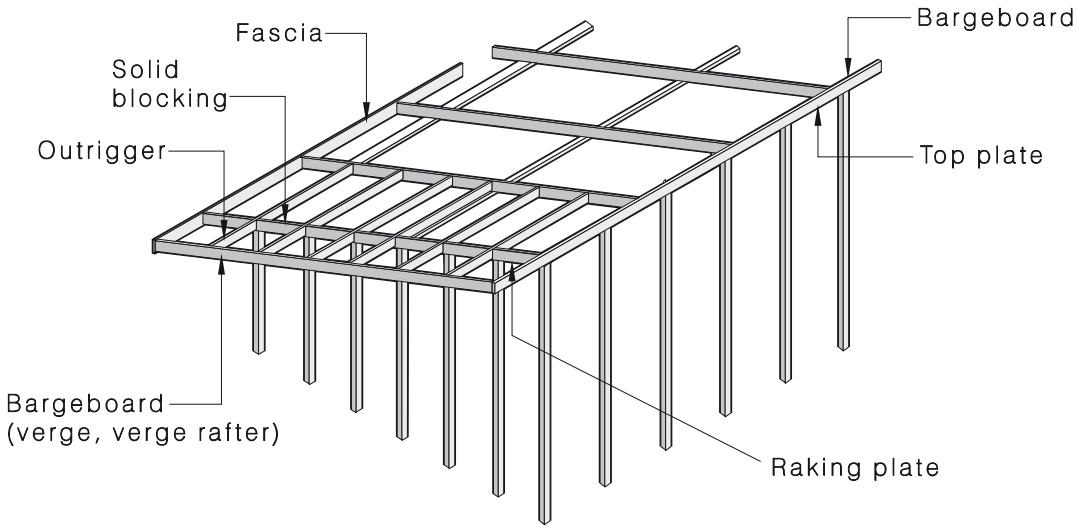
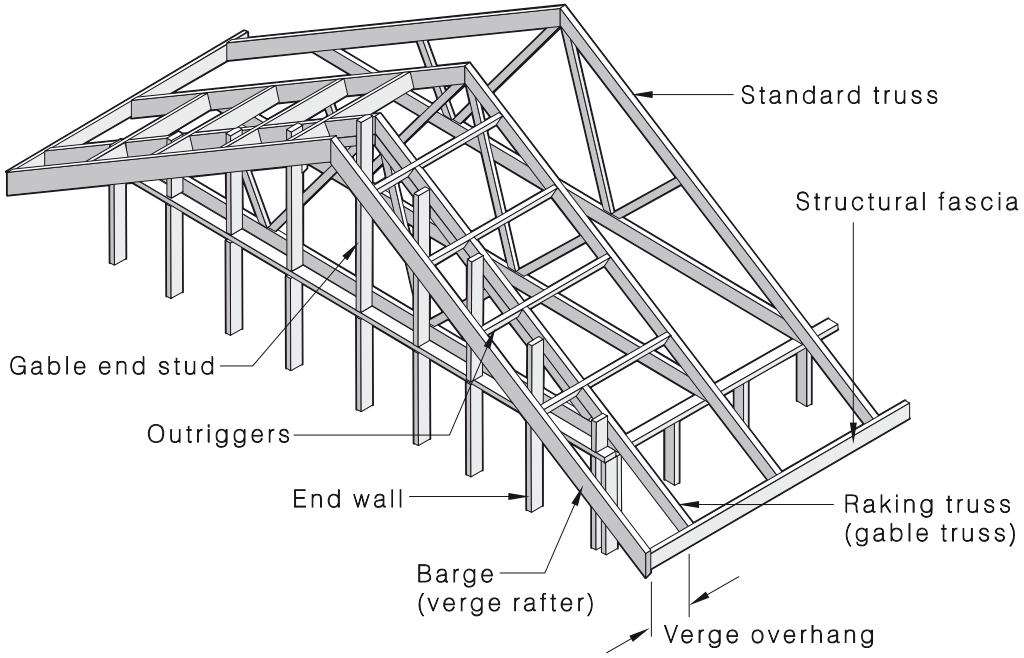


FIGURE 2.6 SKILLION ROOF



NOTE: This diagram applies to verge overhangs greater than 300 mm from the raking or gable truss (see AS 4440).

FIGURE 2.7 GABLE END—TRUSSED ROOF

2.3 VERTICAL NAIL LAMINATION

Vertical nail lamination shall be permitted to achieve the required breadth for the larger section sizes given in the Span Tables in Appendix A using thinner and more readily obtainable sections. This is only permissible using seasoned timber laminations of the same timber type and stress grade. Laminations shall be unjoined in their length. Nails shall be a minimum of 2.8 mm in diameter and shall be staggered as shown in Figure 2.8. They shall be through-nailed and clinched, or nailed from both sides.

Where screws are used in lieu of nails, they shall be minimum No. 10 screws. They may be at the same spacing and pattern, provided they penetrate a minimum of 75% into the thickness of the final receiving member.

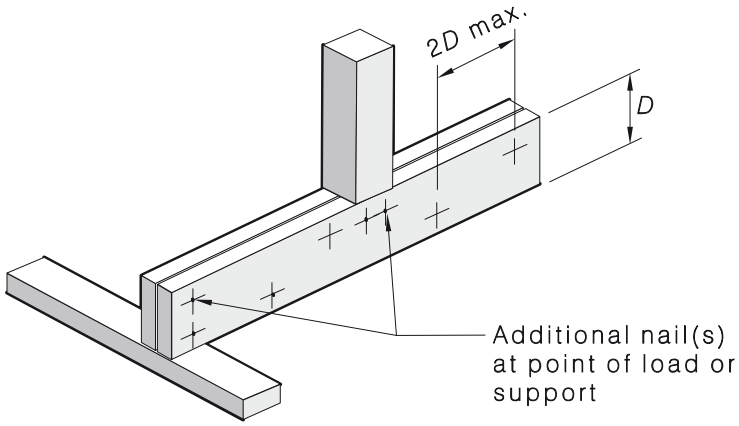


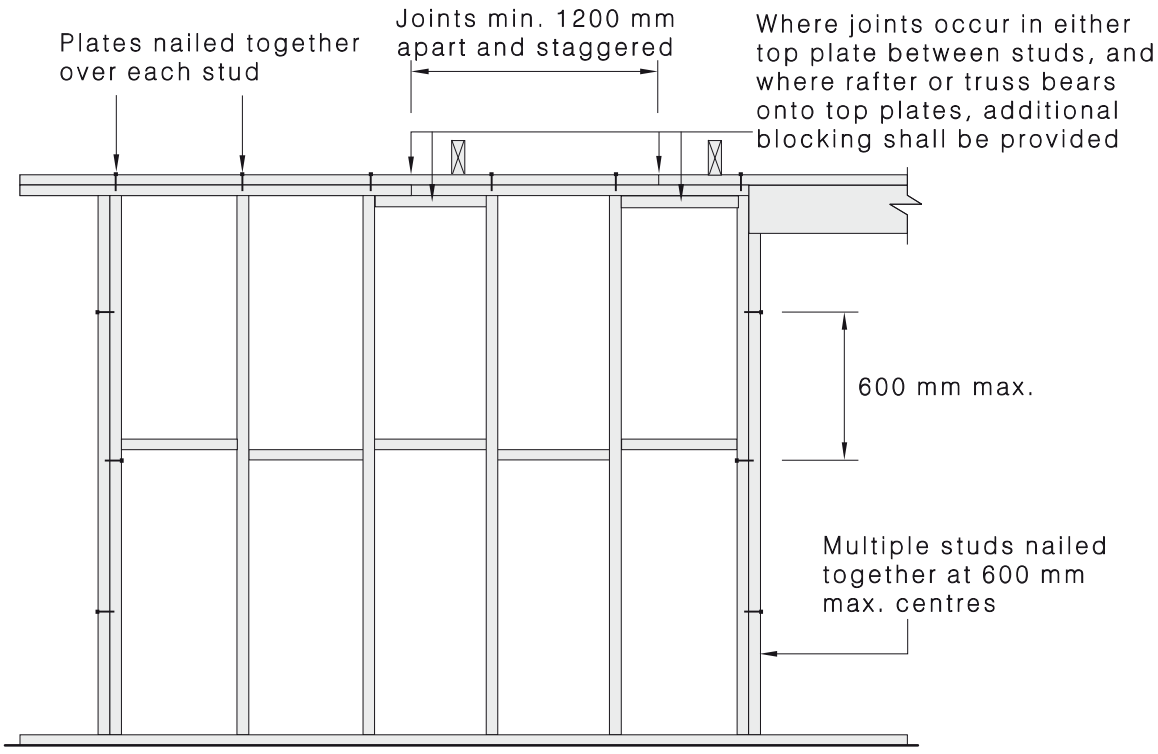
FIGURE 2.8 VERTICAL NAIL LAMINATION (STRUTTING BEAMS SHOWN)

2.4 STUD LAMINATION

The required size may be built up by using two or more laminations of the same timber type, stress grade and moisture content condition, provided the achieved width is at least that of the nominated size. Studs up to 38 mm thick shall be nailed together with one 75 mm nail at maximum 600 mm centres. Studs over 38 mm but not exceeding 50 mm thick shall be nailed with one 90 mm nail at maximum 600 centres (see Figure 2.9).

Where screws are used in lieu of nails, they shall be minimum No. 10 screws. They may be at the same spacing and pattern, provided they penetrate a minimum of 75% into the thickness of the final receiving member.

Posts shall not be nail-laminated.



NOTE: Refer to Section 9 for other nominal fixing requirements including plates to studs.

FIGURE 2.9 STUD OR PLATE LAMINATION

2.5 HORIZONTAL NAIL LAMINATION—WALL PLATES ONLY

Wall plates that are made up of more than one section (e.g., 2/35 × 70) shall be horizontally nail-laminated in accordance with Figure 2.9, using—

(a) two 75 mm long nails for plates up to 38 mm deep; or

(b) two 90 mm long nails for plates up to 50 mm deep (see also Clause 9.2.8).

A minimum of two nails shall be installed at not greater than 600 mm centres along the plate. Where more than two plates are used, the nailing requirement applies to each lamination

All joints in multiple bottom plates shall occur over solid supports such as floor joists, solid blocking between bottom plate and bearer or concrete slab.

2.6 DEFINITIONS

2.6.1 Loadbearing wall

A wall that supports roof or floor loads, or both roof and floor loads.

2.6.2 Non-loadbearing wall

A wall that supports neither roof nor floor loads but which may support ceiling loads and act as a bracing wall. A non-loadbearing external wall may support ceiling and lateral wind loads.

2.6.3 Regulatory authority

The authority that is authorized by legal statute as having justification to approve the design and construction of a building, or any part of the building design and construction process.

NOTE: In the context of this Standard, the regulatory authority may include local council building surveyors, private building surveyors or other persons nominated by the appropriate State or Territory building legislation as having the legal responsibility for approving the use of structural timber products.

2.6.4 Roof

2.6.4.1 *Coupled roof*

Pitched roof construction with a roof slope not less than 10°, with ceiling joists and collar ties fixed to opposing common rafter pairs and a ridgeboard at the apex of the roof (see Figure 7.1). A coupled roof system may include some area where it is not possible to fix ceiling joists or collar ties to all rafters, e.g., hip ends or parts of T- or L-shaped house.

2.6.4.2 *Non-coupled roof*

A pitched roof that is not a coupled roof and includes cathedral roofs and roofs constructed using ridge and intermediate beams.

2.6.4.3 *Pitched roof*

A roof where members are cut to suit, and which is erected on site.

2.6.4.4 *Trussed roof*

An engineered roof frame system designed to carry the roof or roof and ceiling, usually without the support of internal walls.

2.6.5 Span and spacing

2.6.5.1 *General*

NOTE:Figure 2.10 illustrates the terms spacing, span, single span and continuous span.

2.6.5.2 *Spacing*

The centre-to-centre distance between structural members, unless otherwise indicated.

2.6.5.3 *Span*

The face-to-face distance between points capable of giving full support to structural members or assemblies. In particular, rafter spans are measured as the distance between points of support along the length of the rafter and not as the horizontal projection of this distance.

2.6.5.4 *Single span*

The span of a member supported at or near both ends with no immediate supports. This includes the case where members are partially cut through over intermediate supports to remove spring (see Figures 2.10(c) and 2.10(d)).

2.6.5.5 *Continuous span*

The term applied to members supported at or near both ends and at one or more intermediate points such that no span is greater than twice another (see Figure 2.10(e)).

2.6.6 Stress grade

The classification of timber to indicate, for the purposes of design, a set of structural design properties in accordance with AS 1720.1.

2.6.7 Stud height

The distance from top of bottom plate to underside of top plate or the distance between points of lateral restraint provided to both the breadth and depth of the stud.

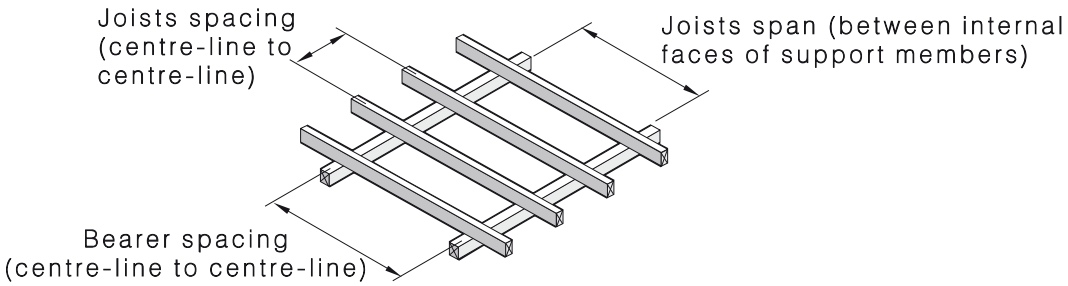
2.6.8 Two-storey

In any section through the house, construction that includes not more than two levels of timber-framed trafficable floor. Trafficable floors in attics and lofts are included in the number of storeys.

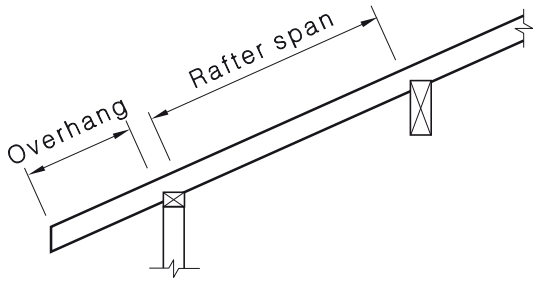
NOTE: This requirement does not preclude the application of this Standard to up to a two-storey timber-framed construction supported—

(a) by a bearer and joist substructure designed in accordance with this Standard; or

(b) by lower levels of timber wall framing or other support systems designed in accordance with engineering principles and approved by the regulatory authority.

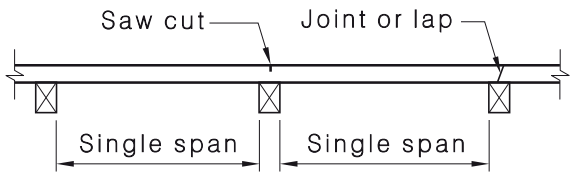


(a) Bearers and joists

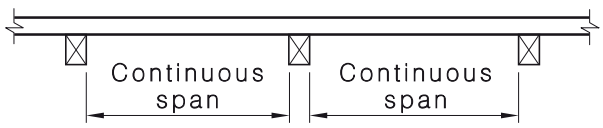


(b) Rafter

(c) Two supports



(d) Joint or sawcut over supports



(e) Continuous span

NOTE: The design span is the average span unless one span is more than 10% longer than another, in which case the design span is the longest span.

FIGURE 2.10 SPACING AND SPAN

SECTION 3 SUBSTRUCTURE

3.1 GENERAL

This Section sets out the requirements for site preparation, subfloor supports and the determination of footing sizes that are suitable to support timber-framed houses.

3.2 SITE PREPARATION AND DRAINAGE

The clearing and drainage of the site, on which the building is to be erected, shall be adequate to ensure protection of any timber framing or components from the effects of prolonged dampness or insect attack.

3.3 GROUND CLEARANCE AND SUBFLOOR VENTILATION

Ground clearance and subfloor ventilation shall be provided in accordance with the provisions of the Building Code of Australia.

3.4 TERMITE MANAGEMENT

In any area in which the risk of termite attack is known to exist, protection against such attack shall be provided in accordance with provisions of the Building Code of Australia.

3.5 SUBSTRUCTURE BRACING

The substructure shall be adequately braced (see Section 8).

3.6 SUBFLOOR SUPPORTS

3.6.1 General

This Clause sets out the requirements for the selection of stumps or posts and pad footings or soleplates required to transfer roof, wall and floor loads to the soil foundation.

NOTES:

1 The bracing requirements of Section 8 may necessitate the use of alternative footing or post/stump details to those given in this Section.

2 For other roof spans, bearer spans, and wind classifications greater than N2, see AS 1684.2.

3.6.2 Footing classification

For the purposes of this Clause, footings for stumps or posts are classified as types 1 to 5, as given in Table 3.1. Footing types 1 to 4 are for use in areas where the allowable foundation bearing pressure is at least 100 kPa. Type 5 footings are only suitable where the allowable foundation bearing pressure equals or exceeds 125 kPa.

When measured across the grain, timber soleplates shall not project from the face of the stump or post they support by a distance greater than their own thickness. The maximum projection from the face of the stump along the grain, which could be considered as effective, shall be three times the thickness of the soleplate.

Footings shall be proportioned to evenly distribute vertical and lateral loads from the building to the foundation material such that significant settlement or other movement is prevented. Further provisions, including minimum depth requirements, are given in AS 2870.

TABLE 3.1
FOOTING CLASSIFICATION

Footing type	Minimum bearing area, m^2	Minimum size of unreinforced concrete pad footing, mm	Minimum size of timber sole plates, mm
1	0.045	230 × 230 × 100 deep *or* 250 dia. × 100 deep	200 × 225 ×38 thick
2	0.090	300 × 300 × 150 deep *or* 350 dia. × 150 deep	250 × 360 × 75 thick
3	0.120	350 × 350 × 200 deep *or* 400 dia. × 200 deep	300 × 400 × 75 thick
4	0.180	430 × 430 × 250 deep *or* 500 dia. × 200 deep	300 × 600 × 100 thick
5	0.180	430 × 430 × 250 deep *or* 500 dia. × 200 deep	300 × 600 × 100 thick

3.6.3 Stumps or posts

3.6.3.1 *Sizes*

Stump or post sizes shall be appropriate to the footing type used, as given in Table 3.2.

The use of stumps or posts in material other than timber shall be subject to the requirements of the relevant authority.

Timber durability and/or preservative treatment shall be appropriate for the expected service conditions.

NOTE: Specifications for stumps or posts in material other than timber are given in the BCA.

TABLE 3.2
STUMP/POST SIZES

Footing type (see Table 3.1)	Stress grade					
	F4	F5	F7	F8	F11	F14
	Minimum timber stump/post size, mm					
1	100 × 100 *or* 110 dia.	100 × 100 *or* 110 dia.	100 × 100 *or* 110 dia.	100 × 100 *or* 110 dia.	100 × 100 *or* 110 dia.	100 × 100 *or* 110 dia.
2	125 × 125 *or* 125 dia.	125 × 125 *or* 120 dia.	100 × 100 *or* 115 dia.	100 × 100 *or* 110 dia.	100 × 100 *or* 110 dia.	100 × 100 *or* 110 dia.
3	125 × 125 *or* 135 dia.	125 × 125 *or* 130 dia.	125 × 125 *or* 120 dia.	100 × 100 *or* 115 dia.	100 × 100 *or* 110 dia.	100 × 100 *or* 110 dia.
4	150 × 150 *or* 150 dia.	125 × 125 *or* 145 dia.	125 × 125 *or* 135 dia.	125 × 125 *or* 125 dia.	125 × 125 *or* 120 dia.	100 × 100 *or* 115 dia.
5	As approved					

NOTES:

1 Stump or post size is also dependent upon height above ground (see Clause 3.6.3.2).

2 For termite management, refer to the Building Code of Australia.

3 Clause 1.13 is not applicable to this Table.

3.6.3.2 *Height*

The above-ground height of any stump or post determined by using Table 3.2 shall not exceed 15 times the required minimum face width or diameter.

NOTE: Where posts or stumps are designed in accordance with engineering principles, the height limitation may be increased.

3.6.3.3 *Embedment*

Stump or post embedment in the foundation material shall be at least 0.3 times the stump height above ground level or 450 mm, whichever is the greater.

3.6.4 Footing type support limitations

Tables 3.3, 3.4 and 3.5 give maximum permissible bearer spans for each footing type, based on footing capacity. The Span Tables in Appendix A give maximum bearer spans based on the capacity of the relevant timber cross-section. Both of these requirements shall be satisfied.

TABLE 3.3

BEARER SPANS FOR FOOTING TYPES 1 TO 2—BEARERS SUPPORTING FLOOR LOADS ONLY

Footing type	Bearer spacing, mm		
	1500	1800	2100
	Maximum permissible bearer span, mm		
1	1900	1600	1400
2	3900	3300	2800

NOTE: Maximum permissible bearer span is for each footing type. Bearer size is determined from the relevant Span Tables given in Appendix A.

TABLE 3.4

BEARER SPANS FOR FOOTING TYPES 1 TO 5—BEARERS SUPPORTING SINGLE STOREY LOADBEARING WALLS

Footing type	Roofing type	Rafter or truss span, mm			
		3000	6000	9000	12 000
		Maximum permissible bearer span, mm			
Bearer spacing up to 1500 mm					
1	Sheet	1300	1100	1000	NS
2		2700	2200	1900	1700
3		3600	3000	2500	2200
4		5400	4400	3800	3300
5		6700	5600	4800	4200
1	Tile	1000	NS	NS	NS
2		1900	1500	1200	1000
3		2600	1900	1600	1300
4		3900	2900	2300	1900
5		4800	3600	2900	2400
Bearer spacing 1500 to 2100 mm					
1	Sheet	1000	NS	NS	NS
2		2100	1800	1600	1400
3		2800	2400	2100	1900
4		4200	3600	3200	2800
5		5200	4500	4000	3600
1	Tile	NS	NS	NS	NS
2		1600	1300	1000	NS
3		2200	1700	1400	1200
4		3200	2500	2100	1800
5		4000	3200	2600	2200

NOTES:

1 NS = not suitable

2 Maximum permissible bearer span is for each footing type. Bearer size is determined from the relevant member Span Tables given in Appendix A.

TABLE 3.5

BEARER SPANS FOR FOOTING TYPES 1 TO 5—BEARERS SUPPORTING TWO-STOREY LOADBEARING WALLS

Footing type	Roofing type	Rafter or truss span, mm			
		3000	6000	9000	12 000
		Maximum permissible bearer span, mm			
Upper plus lower floor joist spans up to 4800 mm					
1	Sheet	NS	NS	NS	NS
2		1100	1000	NS	NS
3		1400	1300	1200	1100
4		2100	2000	1800	1700
5		2700	2500	2300	2100
1	Tile	NS	NS	NS	NS
2		NS	NS	NS	NS
3		1200	1000	NS	NS
4		1800	1600	1400	1300
5		2300	2000	1800	1600
Upper plus lower floor joist spans 4800 to 7200 mm					
1	Sheet	NS	NS	NS	NS
2		NS	NS	NS	NS
3		1000	NS	NS	NS
4		1500	1400	1300	1300
5		1800	1700	1700	1600
1	Tile	NS	NS	NS	NS
2		NS	NS	NS	NS
3		NS	NS	NS	NS
4		1300	1200	1100	1000
5		1700	1500	1400	1200

NOTES:

1 NS = not suitable

2 Maximum permissible bearer span is for each footing type. Bearer size is determined from the relevant member Span Tables given in Appendix A.

SECTION 4 FLOOR FRAMING

4.1 GENERAL

4.1.1 Application

This Section sets out the requirements for the construction of timber-framed floors and shall be used in conjunction with Span Tables A3 to A8 and A38 to A39 given in Appendix A.

4.1.2 Materials

Any timber species may be used for floor framing, provided it is kept dry; that is, not exposed to weather, well ventilated, not in contact with or close to the ground (see Clause 3.3).

4.1.3 Framing configurations

Various configurations of bearers and joists may be used to support flooring at either the ground level, or at the first floor level including conventional joists over bearers and joists in line with bearers (low profile floor framing).

4.1.4 Weatherproofing

The detailing of wall cladding, flashings and damp-proof course in any construction shall be such that timber floor frame members will be protected from the weather or ground moisture rising through the substructure.

4.1.5 Shrinkage

Where large unseasoned timber members or members with different shrinkage characteristics are used, allowance shall be made for shrinkage.

NOTE: Shrinkage associated with the use of small section unseasoned bearers and joists (overall depth of floor frame 200 mm or less) is usually of minimal significance for the overall performance of the structure when using low shrinkage species. Additional allowance should be made for high shrinkage species.

4.1.6 Cuts, holes and notches in bearers and joists

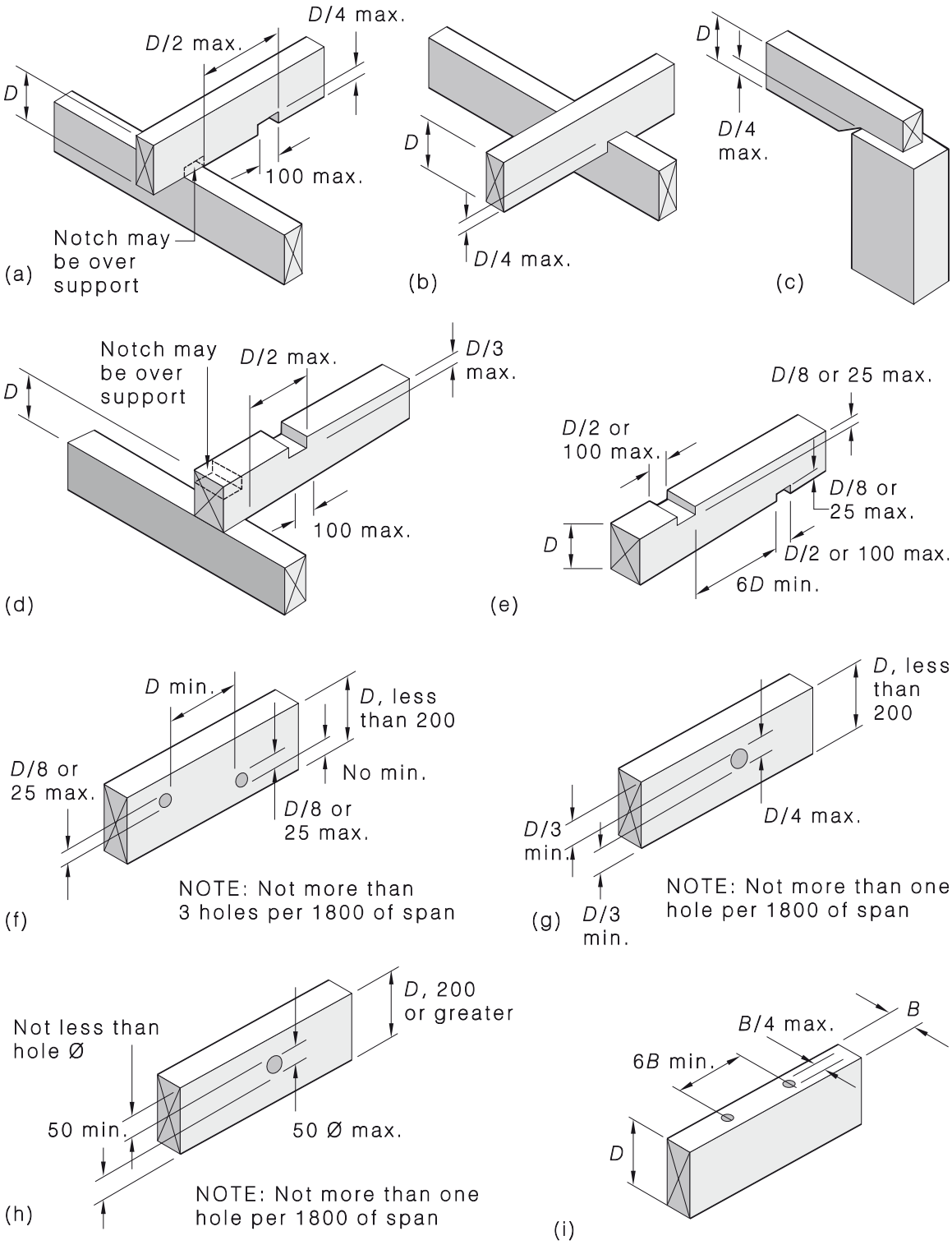
Cuts, holes and notches shall not exceed the sizes, nor be at closer spacing than those, given in Figure 4.1.

Unless otherwise specified, the member size shall not be reduced by any other method to a net section size less than that required to achieve the span requirements.

NOTES:

1 Significant imperfections, such as knots, should be regarded as holes with respect to the hole spacing limitations given in Figure 4.1.

2 Engineered timber products may have their own specific limitations (see Clause 1.11).



DIMENSIONS IN MILLIMETRES

FIGURE 4.1 NOTCHES, CUTS AND HOLES IN BEAMS, BEARERS, JOISTS, RAFTERS

4.2 BUILDING PRACTICE

4.2.1 Bearers

4.2.1.1 *General*

Bearers shall span between subfloor supports or walls. Bearers may either be single or continuous span over supports (see Clause 2.6.5).

Where required bearers shall be levelled, preferably by checking (notching) out the underside over supports. Packing of minor deficiencies in depth is permitted provided the packing is a corrosion-resistant, incompressible material over the full area of support.

Bearers with minor spring, within the allowable limits, shall have the spring placed to allow for straightening under loading.

Joints in bearers shall occur only over supports, with adequate bearing for both members. Figure 4.2 shows various connection methods that may be used over supports. All cuts shall be located over the support.

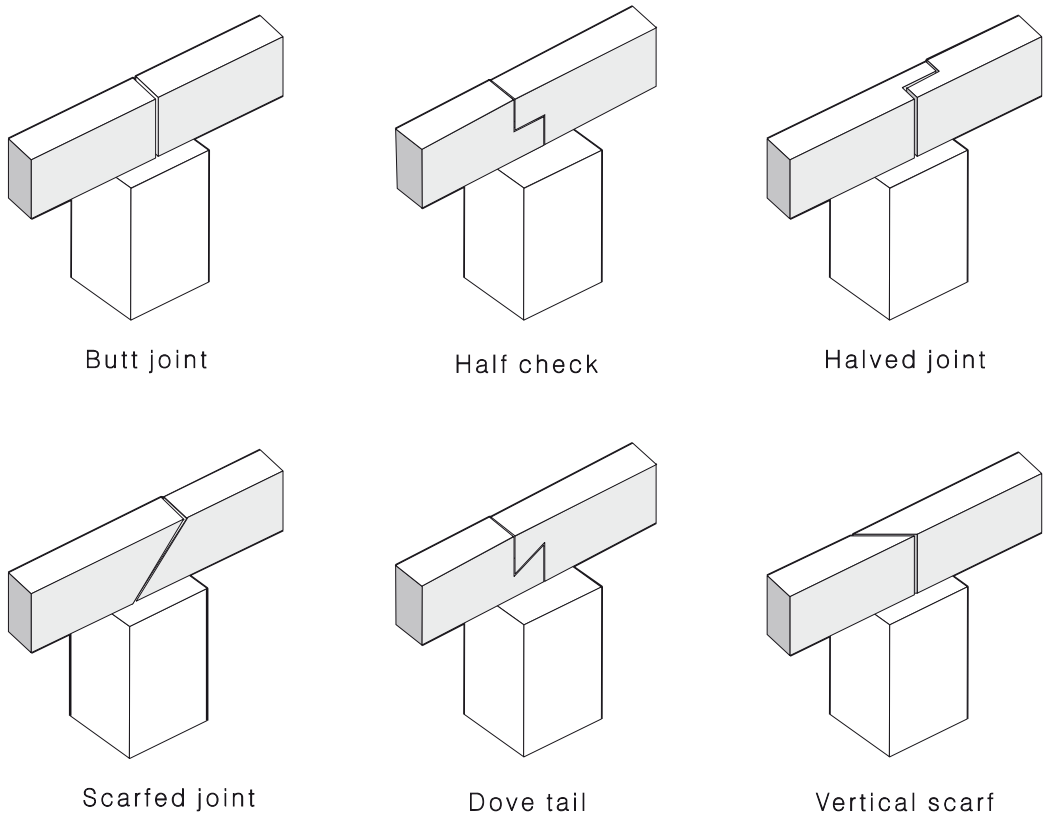
Regardless of their length, if bearers are partially cut through (crippled) over supports to correct bow or spring, they shall be deemed to be supported at two points only, i.e., single span.

The minimum bearing each side of the joint shall be 50 mm

NOTES:

1 Bearers may be planed to within the allowable tolerances of the member specified.

2 Some engineered nailplated products may permit joints to occur other than over supports (see Clause 1.11).



NOTE: Bearers may also be lapped over supports.

FIGURE 4.2 BEARER SUPPORTS (ALTERNATIVES)

4.2.1.2 *Fixing of bearers to supports*

Except as permitted for masonry veneer construction, bearers shall be fixed to their supporting stumps, posts or columns in such a manner as will give adequate bearing and provide restraint against lateral movement (see Section 9 and Table 9.3).

4.2.1.3 *Built-up bearers*

The required breadth of larger section bearers may be obtained by vertically nail-laminating thinner sections together (see Clause 2.3).

4.2.2 Joists

4.2.2.1 *General*

Joists shall be laid with their top surfaces level to receive flooring. The undersides of joists having minor excesses shall be notched over bearers in order to bring them to the required level. Packing of joists having minor deficiencies in depth may be utilized, provided the packing is fixed and is of corrosion-resistant and incompressible material over the full area of contact.

Spacing of joists shall be determined by the span capacity of the flooring (see Section 5). Additional single or double joists shall be provided, where required, to support loadbearing walls parallel to joists (see Clause 4.3.3.4) or flooring (see Clause 5.2).

Joists having minor spring (within allowable limits) shall be laid such as to allow for straightening under loading. Regardless of their length, if joists are partially cut over supports to correct bow or spring they shall be deemed to be supported at two points only (single span). Where cuts are used they shall be located centrally over the support, so that each side of the cut section is adequately supported.

Joints in joists shall be as shown in Figure 4.3 and shall be made only over bearers or supports. Joists joined over bearers or supports shall have minimum 30 mm bearing for each joist. Joints in joists, which are required to be in line (e.g., supporting wall plates or fitted flooring), shall be butted or scarfed, but shall not be lapped.

The minimum length of the lap shall be 3 times the joist depth.

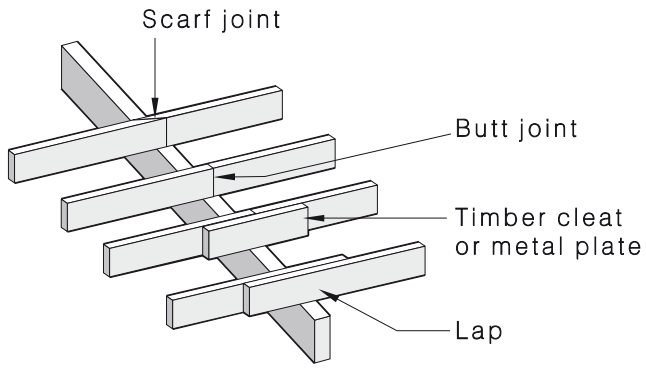


FIGURE 4.3 TYPICAL METHODS OF JOINING JOISTS

4.2.2.2 *Location of joists*

The following shall apply:

(a) *Fitted flooring* For flooring that abuts wall plates, a pair of joists shall be provided under each wall that is parallel to the direction of the joists. These joists shall be spaced to provide solid bearing and fixing for the bottom wall plate and to project not less than 12 mm to give support for fixing of the flooring (see Figure 5.1).

(b) *Platform flooring* Where flooring is continuous under wall plates, joists shall be provided directly under all loadbearing walls parallel to the joists (see Clause 4.3.3.4). A single joist only is required under external non-loadbearing walls.

Joists are not required under internal non-loadbearing walls except as required to support flooring.

4.2.2.3 *Deep joists*

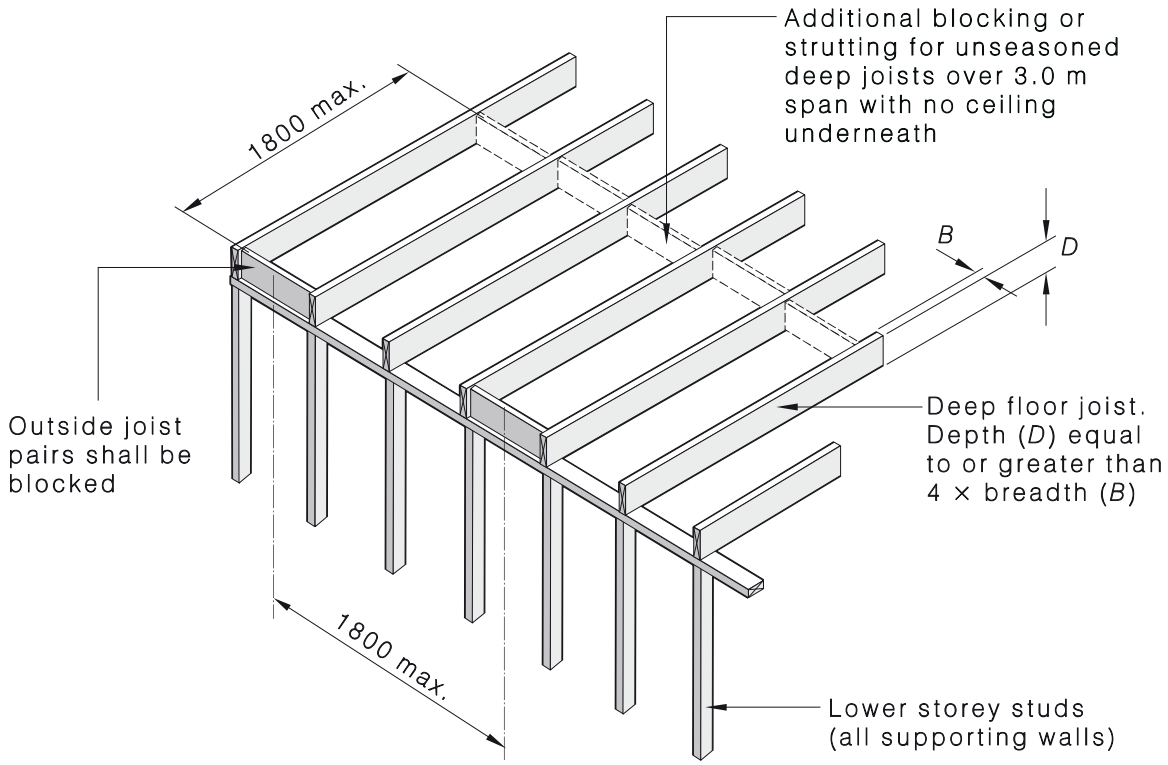
Where the depth of floor joists is equal to or exceeds four times the breadth (deep joists), the joists shall be restrained at their supports with either—

(a) a continuous trimming joist provided to the ends of joists above external bearers or wall plates; or

(b) solid blocking or herringbone strutting between the outer pairs of joists and between intermediate pairs at not more than 1.8 m centres.

Trimmers or solid blocking may be 25 mm less in depth than the joists (see Figure 4.4) and solid blocking shall be a minimum thickness of 25 mm.

In addition, for deep joists in unseasoned timber where the span exceeds 3.0 m and there is no ceiling installed on the underside of joists, herringbone strutting or solid blocking shall be provided between all joists in evenly spaced rows not exceeding 1800 mm centres.



NOTES:

1 For engineered timber products, see Clause 1.11.

2 A temporary batten across the tops of blocked joists, additional blocking or similar fixings, may be necessary to ensure joists do not twist or roll over during construction (prior to fixing of flooring).

FIGURE 4.4 STRUTTING AND BLOCKING FOR DEEP JOISTED FLOORS

4.2.2.4 *Fixing of joists to bearers or lower wall plates*

Joists shall be fixed to bearers at all points of support (see Section 9).

Where joist hangers or specialist connections are utilized, joists shall be completely seated into the hanger and fixed to maintain structural integrity.

4.2.2.5 *External floors (decks, verandahs)*

When constructing floors that are exposed to the weather (decks, verandahs etc.), attention shall be given to the durability of materials and detailing required to ensure an adequate service life (see Clause 1.7).

4.3 MEMBER SIZES

4.3.1 General

Clauses 4.3.2 and 4.3.3 provide details with respect to the determination of floor framing member sizes. Reference shall also be made to the notes accompanying each of the Span Tables given in Appendix A. The Span Tables for joists and bearers are also suitable for decks up to 1 m above ground. For decks over 1 m above ground (see AS 1684.2).

4.3.2 Bearers

4.3.2.1 *Bearers supporting loadbearing walls*

The size of bearers supporting single- or upper-storey loadbearing walls shall be determined from Span Tables A3 to A6 in Appendix A.

The size of bearers supporting the lower storey of two-storey loadbearing walls shall be determined from Span Tables A38 to A39 in Appendix A. These Tables are applicable to loadbearing walls parallel to the bearers where loads are distributed evenly along the bearers (see Clause 4.3.2.3). For support of other non-uniform loads, see Clause 4.3.2.4.

4.3.2.2 *Bearers supporting floor loads only*

The size of bearers supporting floor loads only shall be determined from Span Table A7 in Appendix A.

4.3.2.3 *Single- or upper-storey bearers supporting loadbearing walls at right angles*

Where loadbearing walls are supported at or within 1.5 times the bearer depth from the bearer support, the bearer may be considered as supporting floor loads only.

Where the loadbearing wall occurs outside 1.5 times the depth of the bearers from its support, the allowable offset or cantilever shall be determined from Table 4.1 (see Figure 4.5).

TABLE 4.1

BEARERS SUPPORTING LOADBEARING WALLS AT RIGHT ANGLES

Permissible cantilevers and offsets for bearers under loadbearing walls (maximum roof load width 3600 mm)

Depth of member mm	Maximum permissible cantilever as proportion of actual backspan, %		Maximum permissible offset as proportion of allowable span, %	
	Sheet roof	Tile roof	Sheet roof	Tile roof
Up to 125	11	8	22	16
126 to 200	15	10	30	20
201 to 275	17	12	34	24
Over 275	19	14	38	28

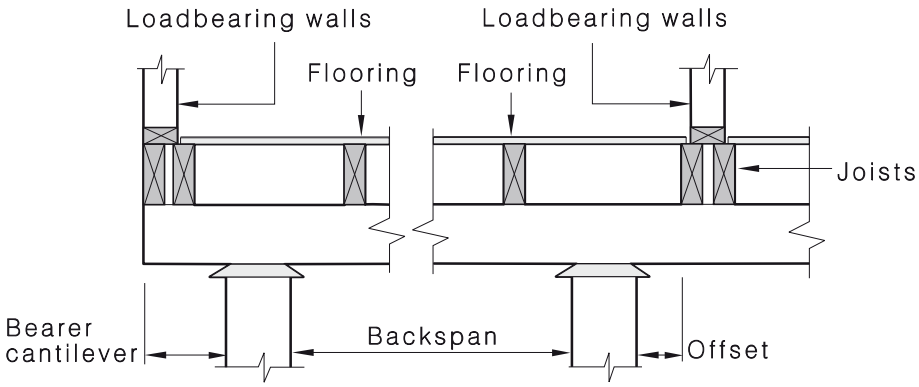


FIGURE 4.5 OFFSETS AND CANTILEVERS

4.3.2.4 *Single- or upper-storey bearers supporting roof point loads*

The maximum roof area contributing to roof point loads that bearers can support are given in Table 4.2.

TABLE 4.2

AREA OF ROOF POINT LOAD*

Roof type	Maximum area of roof supported, m^2
Sheet	5
Tiles	2.5

* Load from a roof strut, strutting beam, girder truss, lintel, and similar members, delivered through studs supporting concentrations of load and studs at sides of openings.

4.3.3 Floor joists

4.3.3.1 *General*

The size of floor joists shall be determined from Span Table A8 in Appendix A

Floor joists supporting floor loads only may cantilever up to 25% of their allowable span provided the minimum backspan is at least twice the cantilever distance.

4.3.3.2 *Floor joists supporting non-loadbearing gable or skillion end walls*

The size of joists supporting non-loadbearing gable or skillion end walls shall be the same as the adjacent floor joists. Where required for the support of flooring, a single joist shall be used.

4.3.3.3 *Floor joists with loadbearing walls at right angles to joists*

Where loadbearing walls are offset up to 1.5 times the joist depth from the supporting bearer or wall, the joist may be considered as supporting floor loads only (see Figure 4.6).

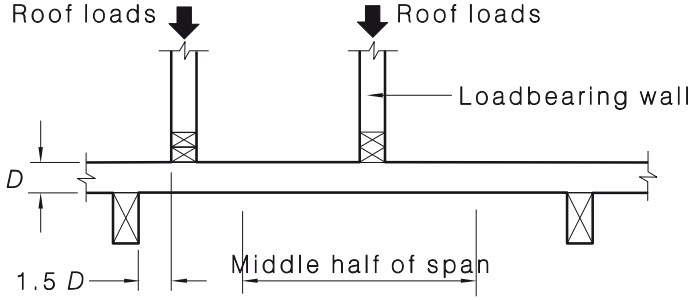


FIGURE 4.6 LOADBEARING WALL OFFSET

4.3.3.4 *Single- or upper-storey floor joists supporting roof point loads or loadbearing walls parallel to joists*

Floor joist sizes determined from Table A8 in Appendix A may support roof point loads or loadbearing walls parallel to joists in accordance with Table 4.3. Where multiple joists are used, the maximum rafter span or point load area may be increased in proportion to the number of additional joists.

For rafter spans greater than those given in Table 4.3, the joists may be considered as for bearers in accordance with the bearer Span Tables in Appendix A and an equivalent joist size provided.

TABLE 4.3

JOISTS SUPPORTING UNIFORM PARALLEL LOADS OR ROOF POINT LOADS

Roof type	Uniform load parallel to joists	Point load*
	Maximum rafter span + overhang, mm	Maximum area of roof supported, m^2
Sheet	3600	5
Tile	2100	2.5

* Load from a roof strut, strutting beam, girder truss, lintel, and similar members, delivered through studs supporting concentrations of load and studs at sides of openings.

4.3.3.5 *Openings in floors*

Trimming joists and trimmers supporting curtailed joists shall be of the same size, and shall be not less in size than the associated floor joists.

Trimmers between 1000 mm and 3000 mm in length shall have their breadth, including the breadth of trimming joist, increased by at least 20% more than the common joist breadth for each 300 mm in length, or part thereof, greater than 1000 mm. Trimmers exceeding 3000 mm in length shall be designed as bearers.

Trimmers and curtailed joists greater than 1000 mm in length shall not rely solely on the strength of nails into end grain and shall be suitably connected (e.g., metal nailplate connectors) (see Figure 4.7).

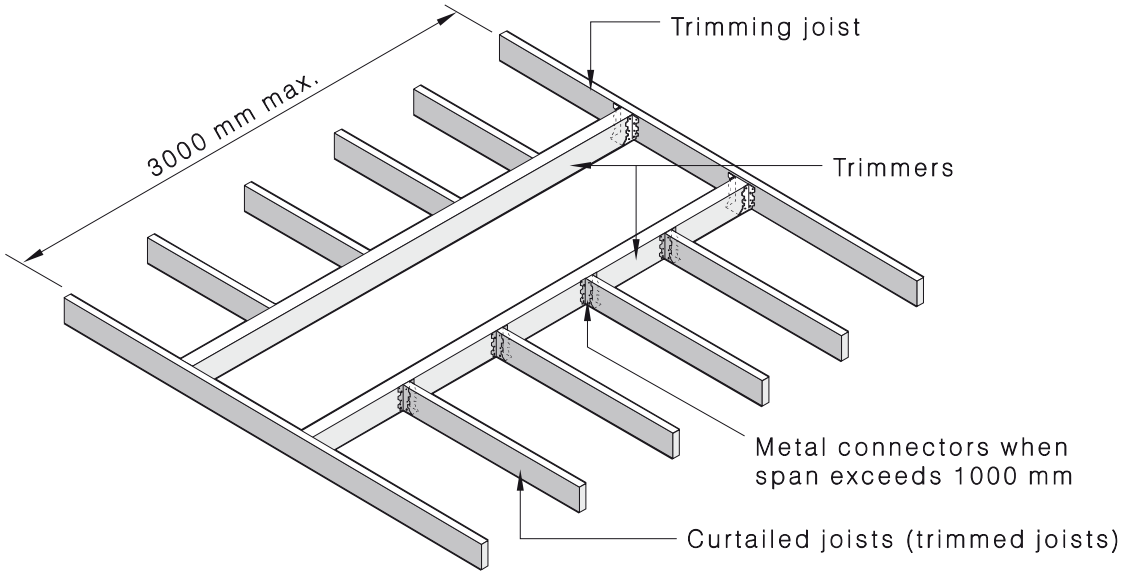


FIGURE 4.7 OPENINGS IN FLOORS

SECTION 5 FLOORING AND DECKING

5.1 GENERAL

This Section specifies the requirements for the installation of tongued and grooved strip flooring and decking as well as plywood and particleboard sheet flooring.

NOTE: Appendix B provides information on the moisture content of timber flooring.

5.2 FITTED FLOORS (CUT-IN FLOORS)

Fitted floors (cut-in floors) are installed after walls have been erected, and after roofing, wall cladding, doors and windows have been fixed.

NOTE: Fitted floors may be tongued and glued, or may be sheet flooring.

Where boards are laid parallel with walls, a minimum 10 mm gap shall be provided between the board adjacent to the bottom plate and the bottom plate, as shown in Figure 5.1.

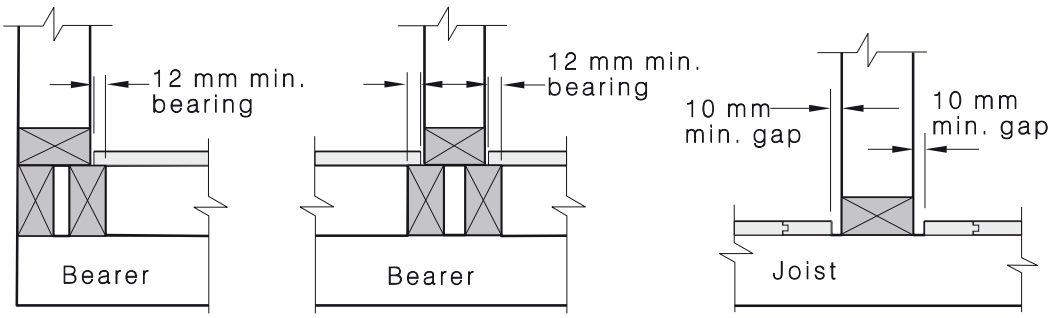


FIGURE 5.1 FITTED FLOORS

5.3 EXPANSION JOINTS

For continuous floor widths over 6 m, measured at right angles to flooring, intermediate expansion joints shall be provided in addition to the perimeter gaps. Each expansion joint shall be either of a single 10 mm wide gap (under a wall or across a hallway), or of smaller gaps with closer spacings to give an equivalent space (for example, 1 mm gaps at 1 m spacing or loose cramping).

5.4 LAYING AND FIXING

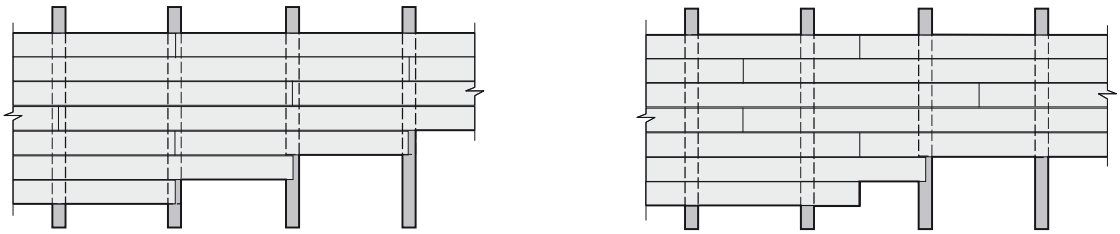
5.4.1 Strip flooring

5.4.1.1 *Laying*

Fitted flooring shall be kept 10 mm clear of walls or wall plates that are parallel to the length of the boards.

End-matched flooring may be laid with end joints between joists, provided end joints are joined tightly together and well distributed and end-matched joints in adjoining boards do not fall within the same joist spacing. Board lengths shall be at least the equivalent of two joist spacings (see Figure 5.2). Finger-jointed hardwood flooring that is manufactured in accordance with AS 2796.1 shall be considered equivalent to continuous strip flooring.

Butt joints shall be cut square and butted tightly together over floor joists. Joints in adjoining boards shall be staggered (see Figure 5.2).



(a) Butt joints over joists—Staggered
(not to occur in adjacent boards on same joist)

(b) End-matched joints—Staggered
(not to occur in adjacent boards within same span)

FIGURE 5.2 END JOINTS

5.4.1.2 *Fixing*

Boards up to 85 mm cover width shall be fixed by face-nailing with one or two nails or shall be secret-nailed with one nail at each joist (see Figure 5.3). Boards over 85 mm cover width shall be fixed with two nails at each joist. Alternate nails in double-nailed boards shall be skewed slightly to the vertical, in opposing directions (see Figure 5.4). The minimum edge distance for nailing at butt joints or board ends shall be 12 mm.

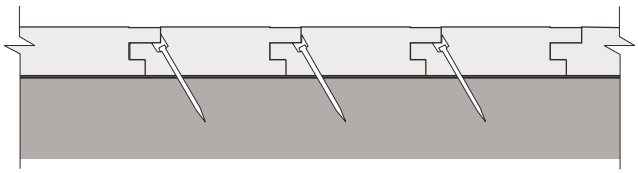
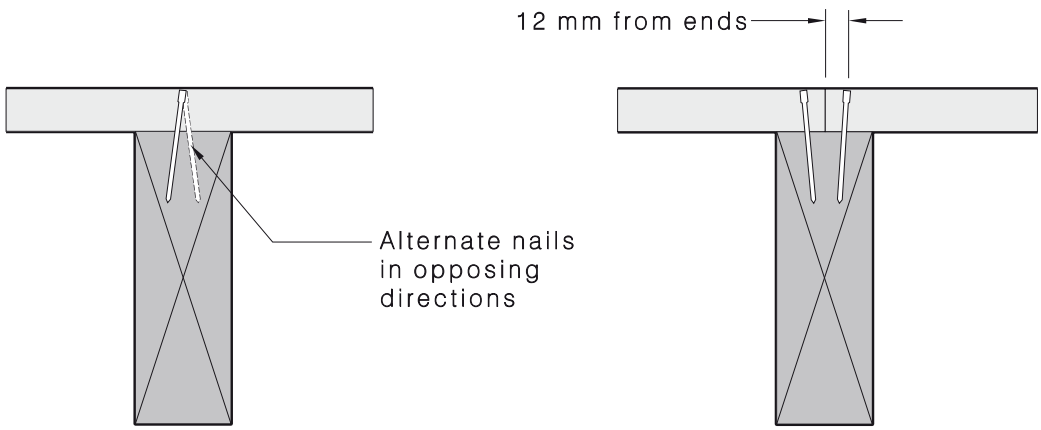


FIGURE 5.3 SECRET NAILING



(a) Intermediate joists

(b) Butt ends

NOTES:

1 All nails, including machine nails, should be punched a minimum of 3 mm below the top surface. Nail punching is to allow for sanding and finishing and to draw boards tightly onto joists.

2 Pre-drilling boards for fixings at butt ends aids in reducing splitting.

FIGURE 5.4 FACE NAILING

The nail sizes for flooring up to 21 mm thick shall be as given in Table 5.1.

TABLE 5.1

NAIL SIZES FOR FIXING TONGUED AND GROOVED FLOORING TO JOISTS

Nailing	Softwood joists	Hardwood and cypress joists
Hand-driven	65 × 2.8 mm bullet-head	50 × 2.8 mm bullet-head
Machine-driven	65 × 2.5 mm	50 × 2.5 mm

5.4.1.3 *Fixing to structural plywood underlay*

Underlay shall be structural plywood to AS/NZS 2269.0. The thickness shall be determined from Table 5.3 except that it shall be not less than 15 mm thick. Strip flooring shall be face-nailed or secret-nailed to plywood underlay in accordance with Table 5.2. Double face-nailing shall be used for boards exceeding 85 mm cover width.

TABLE 5.2

NAIL SIZES FOR FIXING TONGUED AND GROOVED FLOORING TO STRUCTURAL PLYWOOD UNDERLAY

Strip flooring thickness mm	Required nailing (for 15 mm min. thickness subfloor)
19 or 20	38 × 16 gauge chisel point staples or 38 × 2.2 mm nail, at 300 mm spacing
12 , 19 or 20	32 × 16 gauge chisel point staples or 30 × 2.2 mm nails, at 200 mm spacing

5.4.2 Structural plywood flooring

5.4.2.1 *Laying*

Plywood panels shall be laid with the face grain of the plies at right angles to the line of the supporting joists and shall be continuous over at least two spans. Ends of sheets shall be butted over joists. Edges of sheets, unless tongued and grooved, shall be joined over noggings between joists. Noggings shall be of timber not less than 70 × 35 mm section and shall be set flush with the top of the joists.

5.4.2.2 *Fixing (see Figure 5.5)*

Nails used for fixing plywood shall be either 2.8 mm diameter flat-head or bullet-head hand-driven nails or 2.5 mm diameter machine-driven nails and of a length of not less than 2.5 times the thickness of the panel. Nails shall be spaced at 150 mm centres at panel ends and at 300 mm centres at intermediate joists and along noggings. Nails shall be not less than 10 mm from edge of sheets.

Deformed shank nails shall be used where a resilient floor covering is fixed directly to the plywood.

Structural adhesive or deformed shank nails shall be used where plywood is fixed to unseasoned floor joists of depth greater than 150 mm.

Where possible, panel ends shall be staggered.

Structural plywood flooring shall not be cramped during installation.

Structural elastomeric adhesive shall be used in a designated wet area.

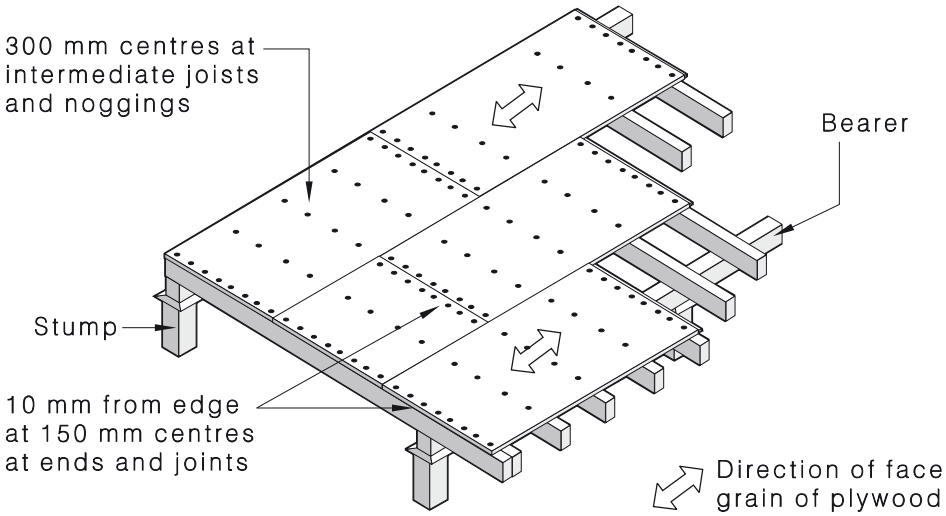


FIGURE 5.5 FIXING OF PLYWOOD SHEET FLOORING

5.4.3 Particleboard

Particleboard flooring shall be laid and fixed in accordance with AS 1860.2.

5.5 JOIST SPACING—FLOORING

The maximum allowable spacing of supports for tongued and grooved strip and sheet flooring shall be in accordance with Table 5.3.

Table 5.3 shall not be used for plywood in which the outer veneers are thinner than any or all of the inner veneers. For plywood sheets supported over one span only, the tabulated spacings shall be reduced by 25%.

TABLE 5.3
STRUCTURAL FLOORING—MAXIMUM ALLOWABLE SPACING OF JOISTS

Flooring	Standard	Grade	Thickness mm	Maximum spacing of joists, mm	
				Butt joined	End matched
Strip flooring					
Australian hardwoods	AS 2796.1	Select	19	680	520
		Medium feature—Standard	19	620	470
Other hardwoods	AS 2796.1				
—Density less than 560 kg/m^3		Medium feature—Standard	19	510	390
—Density greater than 560 kg/m^3		Medium feature—Standard	19	580	450
Cypress	AS 1810	Grade 1	19	580	450
		Grade 2	20	580	450
Radiata Pine	AS 4785.1	Standard	19	450	390
		Utility	19	510	—
		Standard	30	920	700
Softwood other than cypress or radiata pine:	AS 4785.1				
—Density less than 560 kg/m^3		Standard	19	510	390
—Density greater than 560 kg/m^3		Standard	19	580	450

Sheet flooring					
	Standard	Thickness mm	Maximum spacing of joists, mm		
			Grade		
			F8	F11	F14
Plywood (see Note 3)	AS/NZS 2269.0	12	400	420	440
		13	430	450	480
		14	460	480	510
		15	480	520	540
		16	510	540	570
		17	540	560	600
		18	560	590	620
		19	590	620	660
		20	610	650	680
		21	640	670	710
		22	660	700	740
Particleboard (see Note 4)	AS/NZS 1860.1	See AS/NZS 1860.1			

NOTES:

1 An allowance has been made for light sanding.

2 Strip flooring boards may be regraded after elimination of imperfections by docking.

3 For plywood flooring thicknesses detailed above, it has been assumed that in any thickness of plywood the veneers are all of equal thickness. For plywood of a given total thickness, the dimensions listed in this Table will be slightly conservative if the outer veneers are thicker than any or all of the inner veneers.

4 For full details on particleboard flooring, see AS/NZS 1860.1.

5.6 DECKING

The maximum allowable spacing of joists for timber decking shall be in accordance with Table 5.4 (see also Clause 4.3.3).

Specifications given in Tables 5.4 and 5.5 are applicable to decking boards of nominal width up to 100 mm.

NOTE: Spacing of decking boards should allow for possible shrinkage and/or expansion in service.

Decking-board fixing requirements for decking up to 22 mm thickness shall be in accordance with Table 5.5.

TABLE 5.4

DECKING BOARDS

Decking	Minimum grade	Thickness mm	Maximum joist spacing mm
Hardwood	Standard grade (AS 2796.1)	19	500
Cypress	Grade 1 (AS 1810)	19 21	400 450
Treated softwood	Standard grade (AS 4785.1)	19 22	400 450

TABLE 5.5

DECKING-BOARD FIXING REQUIREMENTS

Decking	Joists	Nailing (Hot dipped galvanized or stainless steel, 2 nails per board crossing)			
		Machine driven		Hand driven	
Hardwood and cypress	Hardwood and cypress	50 × 2.5 flat- or dome-head		50 × 2.8 bullet-head	
	Treated softwood	50 × 2.5 flat-head deformed shank	65 × 2.5 flat- or dome-head	50 × 2.8 bullet-head deformed shank	65 × 2.8 bullet-head
Treated softwood	Hardwood and cypress	50 × 2.5 flat- or dome-head		50 × 2.8 flat- or dome-head	
	Treated softwood	50 × 2.5 flat-head deformed shank	65 × 2.5 flat-head	50 × 2.8 flat-head deformed shank	65 × 2.8 flat-head

SECTION 6 WALL FRAMING

6.1 GENERAL

6.1.1 Application

This Section sets out requirements for the construction of conventional stud-framed walls and shall be used in conjunction with Span Tables A9 to A26 and A42 to A50 given in Appendix A.

6.1.2 Bracing

Temporary and permanent bracing shall be provided to stud walls to resist horizontal forces applied to the building. Appropriate connections shall also be provided to transfer these forces through the framework and subfloor structure to the building foundation (see Section 8).

6.2 BUILDING PRACTICE

6.2.1 Studs

6.2.1.1 *Straightening of studs (crippling)*

Common studs may be straightened by crippling with saw cuts and cleats, as shown in Figure 6.1. Up to 20% of common studs, including those in bracing walls, may be crippled.

Studs at the sides of openings and studs supporting concentration of load shall not be crippled.

NOTE: Studs may be planed provided the minimum size remaining is not less than the minimum design size required; for example, a stud of 90 mm depth may be planed down to 70 mm depth if the minimum design depth required is 70 mm.

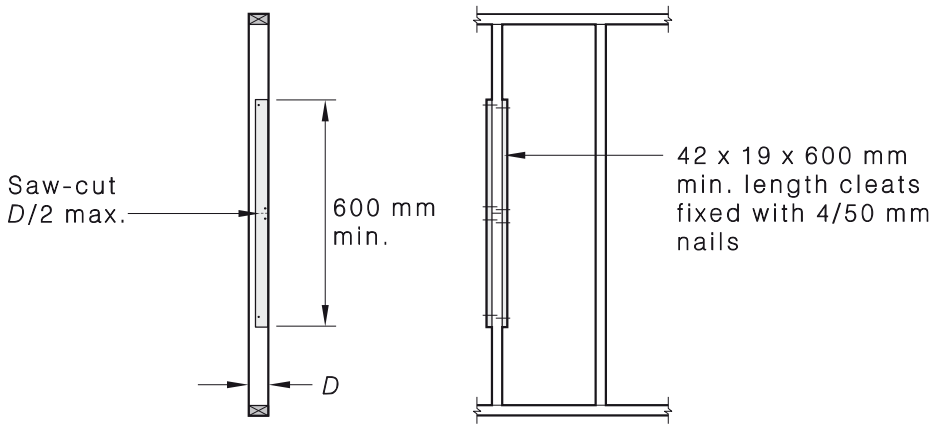


FIGURE 6.1 STUD CRIPPLING

6.2.1.2 *Common studs*

Common studs shall be evenly spaced to suit loads, lining and cladding fixing.

Large size studs may be made up by nail-laminating together two or more smaller-sized studs (see Clauses 2.3 and 2.4).

6.2.1.3 *Wall junctions*

Studs at wall junctions and intersections shall be in accordance with one of the details shown in Figure 6.2. Studs shall be not less in size than common studs. All junctions shall have sufficient studs, which shall be located so as to allow for adequate fixing of linings.

Internal and external walls shall be fixed together with a minimum of 2/75 mm nails at 900 mm centres.

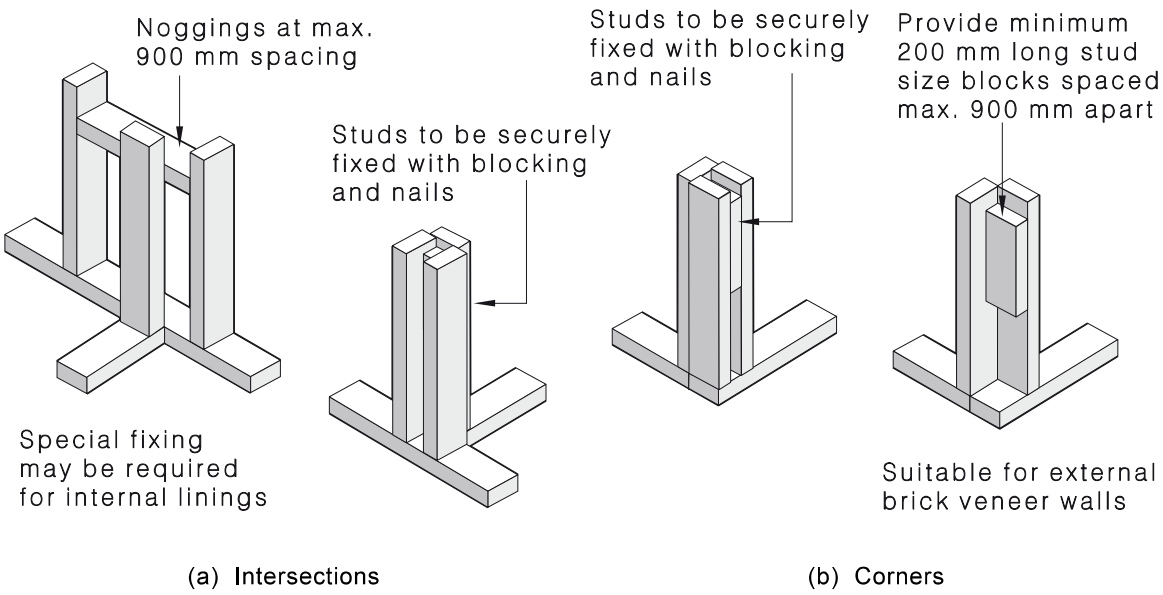


FIGURE 6.2 TYPICAL WALL JUNCTIONS

6.2.1.4 *Notching, trenching and holes in studs and plates*

The maximum size and spacing of cuts, holes, notches, and similar section-reductions, in studs and plates shall be in accordance with Figure 6.3 and Table 6.1. Holes in studs and plates shall be located within the middle half of the depth and breadth of the member respectively.

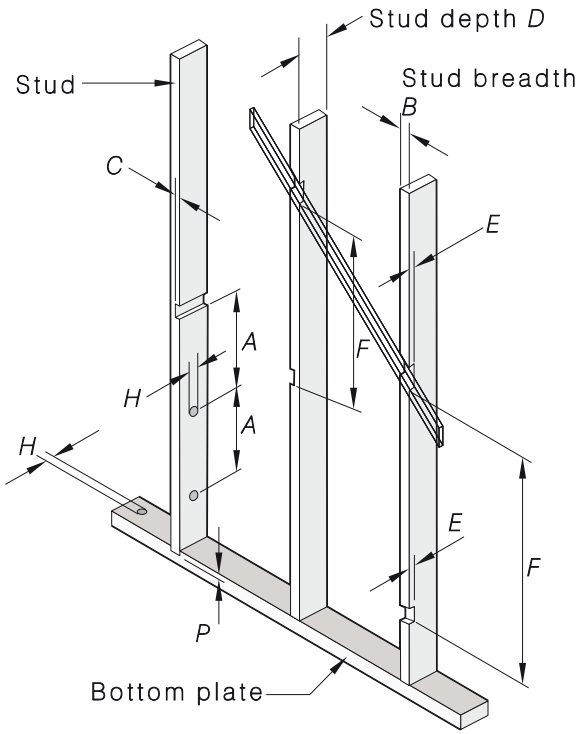


FIGURE 6.3 NOTCHING OF WALL STUDS

TABLE 6.1
HOLES AND NOTCHES IN STUDS AND PLATES

Symbol	Description	Limits	
		Notched	Not notched
A	Distance between holes and/or notches in stud breadth	Min. 3*D*	Min. 3*D*
H	Hole diameter (studs and plates)	Max. 25 mm (wide face only)	Max. 25 mm (wide face only)
C	Notch into stud breadth	Max. 10 mm	Max. 10 mm
E	Notch into stud depth	Max. 20 mm (for diagonal cut in bracing only) (see Notes 1 and 2)	Not permitted (see Note 1)
F	Distance between notches in stud depth	Min. 12*B*	N/A
P	Trenches in plates	3 mm max.	

NOTES:

1 A horizontal line of notches up to 25 mm may be provided for the installation of baths.

2 Except as permitted for diagonal cut in bracing, notches up to 20 mm may occur in every fifth individual stud.

3 For additional jamb stud requirements, see Figures 6.4 and 6.8.

4 Top and bottom plates in internal non-loadbearing and non-bracing walls may be discontinuous up to 60 mm (cut or drilled) to permit installation of services provided that, at the discontinuity, the plates are trimmed or otherwise reinforced either side of the discontinuity to maintain the lateral and longitudinal integrity of the wall.

Studs may be designed as notched or not-notched. For common studs, the maximum notch depth for single- or upper-storey or lower-storey construction shall be 20 mm.

When determined in accordance with the Span Tables in Appendix A, top and bottom plate sizes may be trenched up to a maximum of 3 mm. Where trenching exceeds this depth, the minimum remaining net depth of the plate shall be used when determining the allowable design limits from the Span Tables given in Appendix A.

NOTE: As an example, if a 45 mm deep plate is trenched 10 mm, then the design using the Span Tables shall be based on a 35 mm deep plate.

Jamb Studs in external walls and other loadbearing walls shall not be notched within the middle half of their height or within the height of the opening. A notch up to a maximum of 20 mm in depth is permissible outside this region at the top and/or the bottom of the stud (see Figure 6.4).

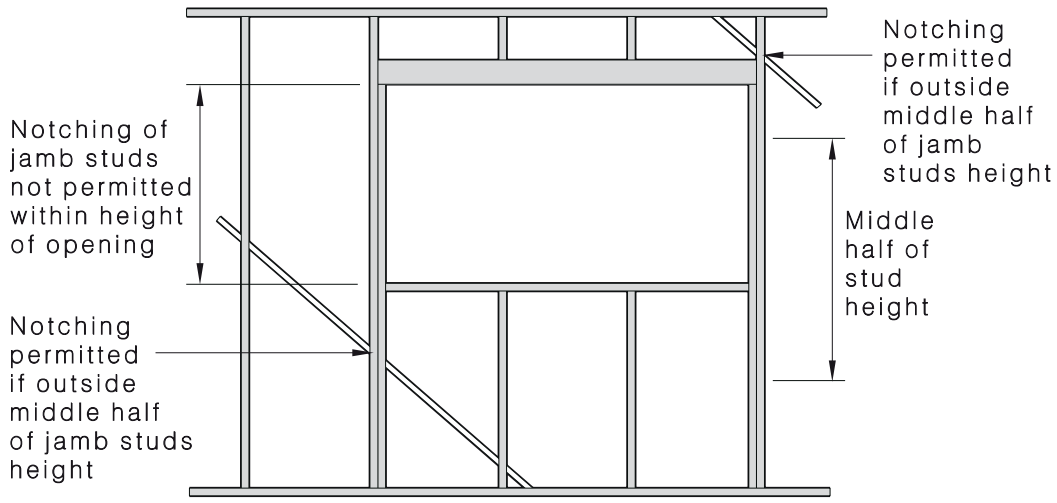


FIGURE 6.4 NOTCHING OF JAMB STUDS

6.2.1.5 *Nogging*

Where required, wall studs shall have continuous rows of noggings, located on flat or on edge, at 1350 mm maximum centres (see Figure 6.5).

Noggings are not required to be stress graded.

Unless otherwise specified, the minimum nogging size shall be the depth of the stud minus 25 mm by 25mm thick, or a nogging shall have a minimum cross-section of 50 mm × 38 mm for unseasoned timber and 42 mm × 35 mm for seasoned timber, and shall be suitable, where required, for the proper fixing of cladding, linings, and bracing.

Where required to provide fixing or support to cladding or lining or for joining bracing sheets at horizontal joints, noggings shall be installed flush with one face of the stud.

Where required to permit joining bracing sheets at horizontal joints, noggings shall be the same size as the top or bottom plate required for that bracing wall.

In other cases, noggings may be installed anywhere in the depth of the stud. Stagger in the row of noggings shall be not greater than 150 mm.

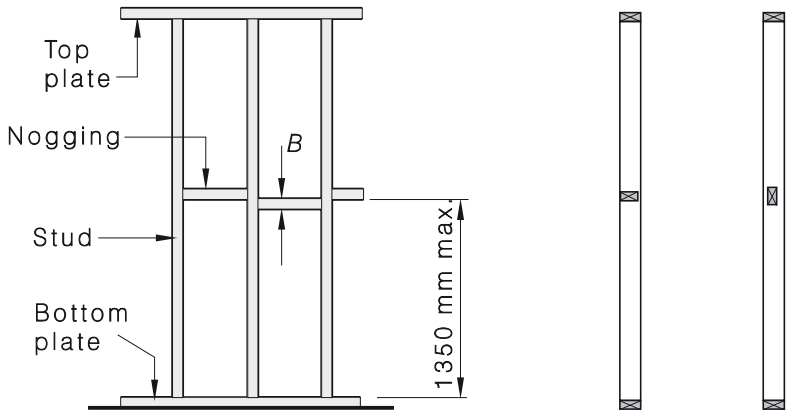


FIGURE 6.5 NOGGING

6.2.2 Wall plates

6.2.2.1 *General*

Top plates shall be provided along the full length of all walls, including over openings. Bottom plates shall be provided along the full length of all walls except at door openings.

6.2.2.2 *Bottom plates*

Bottom plates may be butt-jointed provided both ends are fixed and supported by floor joists, solid blocking or a concrete slab.

Bottom plates supporting jamb studs to openings exceeding 1200 mm, or below studs supporting concentrations of load, shall be stiffened as shown in Figure 6.6.

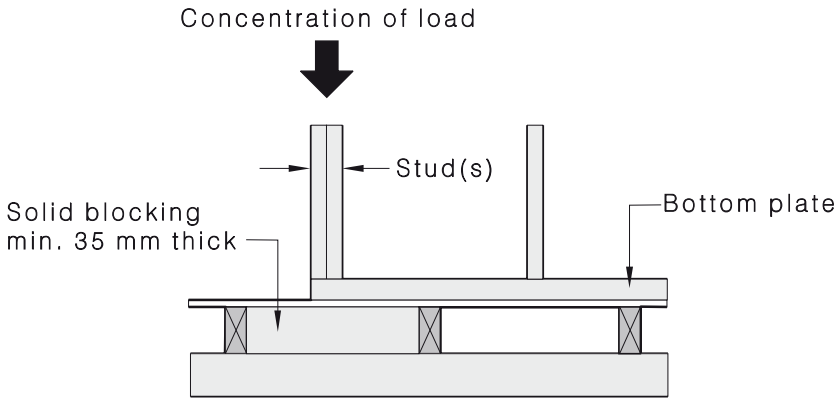


FIGURE 6.6 BOTTOM PLATE STIFFENING

6.2.2.3 *Stiffening of top plates*

For supported roof area up to 10 m^2 and where a concentration of load (from roof beams, struts, strutting beams, hanging beams or counter beams 3000 mm or more in length, combined strutting/hanging beams, combined strut/counter beams, or similar members) occurs between studs (that is, studs supporting concentrations of load are not provided), top plates shall be stiffened in accordance with Figure 6.7, or by placing the block, on edge, extending from stud to stud, on top of the top plate.

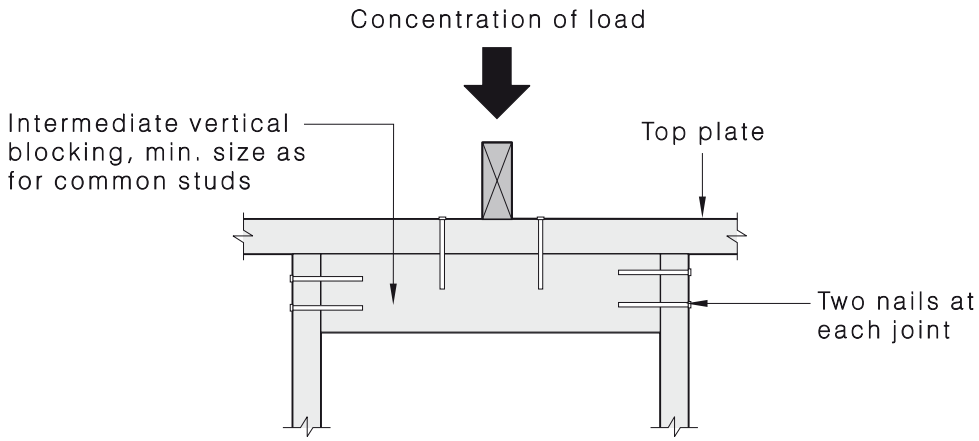


FIGURE 6.7 TOP PLATE STIFFENING

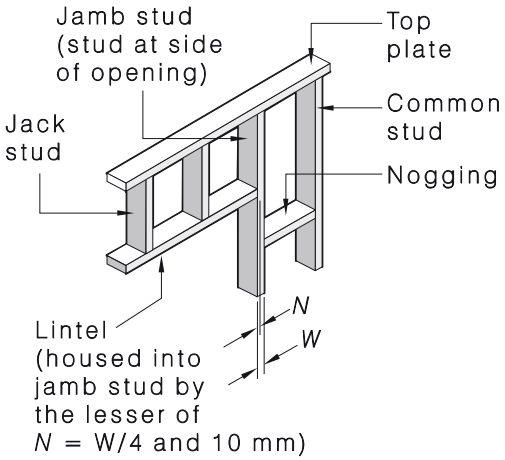
For supported roof area between 10 m^2 and 20 m^2, metal nailplate connectors shall be used for the fixing of blocking to studs. Alternatively, double blocking shall be used and be provided with 3 nails at each end of blocking (total 6 nails at each stud).

6.2.2.4 *Joints in top plates*

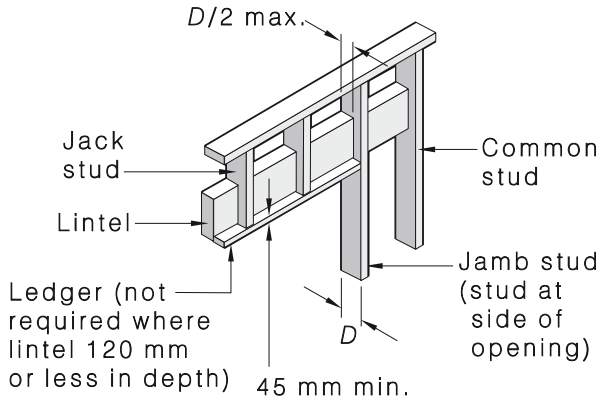
Top plates shall be joined using one of the methods given in Section 9 for the relevant wind classification.

6.2.3 Openings

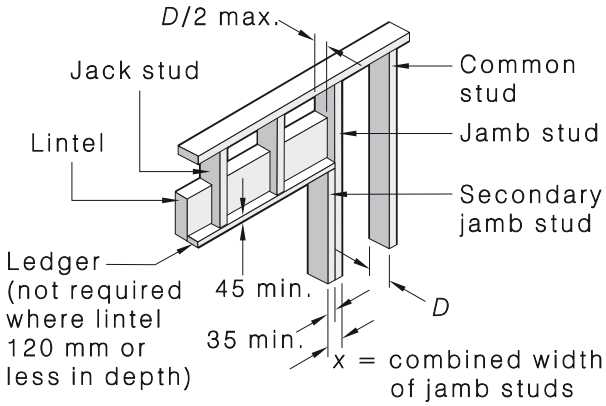
Openings shall be framed with jamb studs and lintels (heads) as shown in Figure 6.8. Where required, jack studs shall be the same size, spacing, and orientation as the common studs, as shown in Figure 6.9 but may be made up by horizontal nail lamination. A minimum clearance of 15 mm shall be provided between the underside of the lintel or lintel trimmer and the top of the window frame.



(a) Spans not exceeding 1800 mm (Non-loadbearing walls)

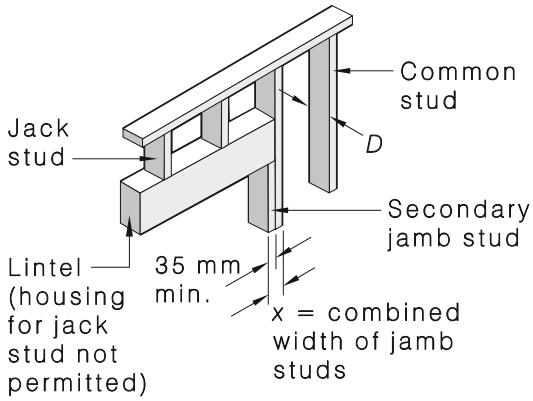


(b) Lintel breadth less than or equal to half stud depth

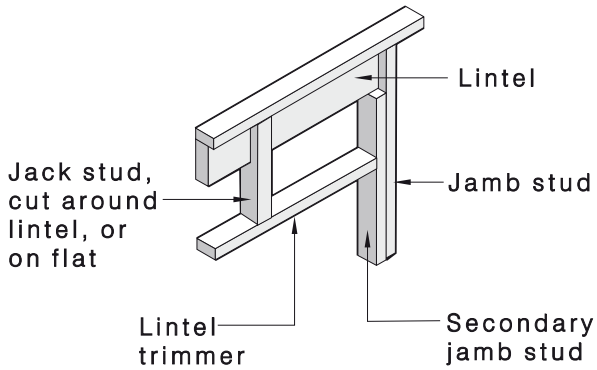


(c) Lintel breadth less than or equal to half stud depth—Alternative

A1



(d) Lintels having breadth greater than half stud depth



NOTE: Where jack studs are not appropriate, a full-length trimmer shall be fixed to the underside of the lintel.

(e) Lintel directly below top plate

FIGURE 6.8 OPENINGS

6.2.4 Framing around chimneys and flues

Placement of all framing members shall be in accordance with AS 1691 and AS/NZS 2918.

6.2.5 Lateral support for non-loadbearing walls

6.2.5.1 *External walls*

External walls shall be laterally supported against wind forces. External walls supporting ceiling joists, rafters or trusses are deemed to have adequate lateral support.

Non-loadbearing external walls, such as gable end walls and verandah walls, where trusses are supported by a verandah plate or other beam, shall be restrained laterally at a maximum of 3000 mm centres by means of—

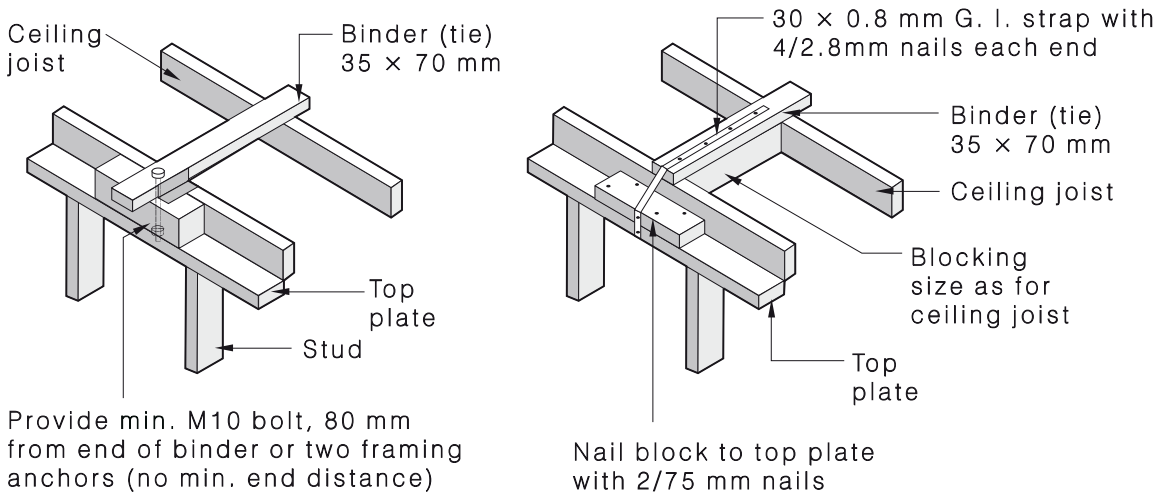
(a) intersecting walls;

(b) ends of hanging or strutting beams;

(c) continuous timber ceiling battens; or

(d) tie members (binders, see Figure 6.9).

Where binders are required, they shall be 35 × 70 mm min. continuous members fixed to the external top plate as shown in Figure 6.9. Binders may be spliced, provided 4/75 mm nails, or equivalent, are provided for each side of the joint; that is, binders overlap at least two ceiling joists with 2/75 mm nails to each joist and/or binder crossing.

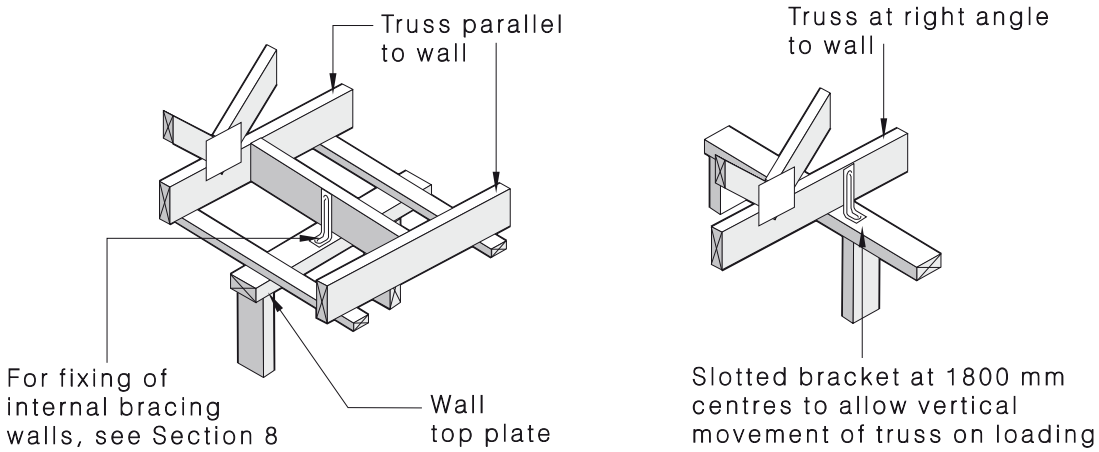


(a) Bolt or framing anchors (b) Metal strap

FIGURE 6.9 BINDERS

6.2.5.2 *Internal walls—(trussed roofs)*

Non-loadbearing walls shall be kept a minimum of 10 mm below the underside of the bottom chord (or ceiling battens when used). Trusses shall be fixed to internal non-loadbearing walls as shown in Figure 6.10.



(a) Truss parallel to wall

(b) Truss perpendicular to wall

FIGURE 6.10 FIXING OF TRUSSES TO A NON-LOADBEARING INTERNAL WALL

6.3 MEMBER SIZES

6.3.1 General

Clauses 6.3.2 to 6.3.8 provide details with respect to the determination of wall framing member sizes, which shall be determined from the appropriate Span Table given in Appendix A.

NOTE: In some instances, sheeting, lining or cladding fixing requirements may necessitate larger sizes than those determined from the Span Tables in Appendix A.

6.3.2 Wall studs

6.3.2.1 *Common studs*

The size of studs in single- or upper-storey loadbearing walls shall be determined from Span Tables A9 and A10 in Appendix A for studs at 450 mm centres and Span Tables A11 and A12 in Appendix A for studs at 600 mm centres.

The size of studs in the lower storey of two-storey loadbearing walls shall be determined from Span Tables A40 and A41 in Appendix A for studs at 450 mm centres and Span Tables A42 and A43 in Appendix A for studs at 600 mm centres.

The Span Tables in Appendix A provide for the design of notched and not-notched wall studs. Where cut-in or metal angle bracing is used (see Clause 6.2.1.4), the studs shall be designed as notched.

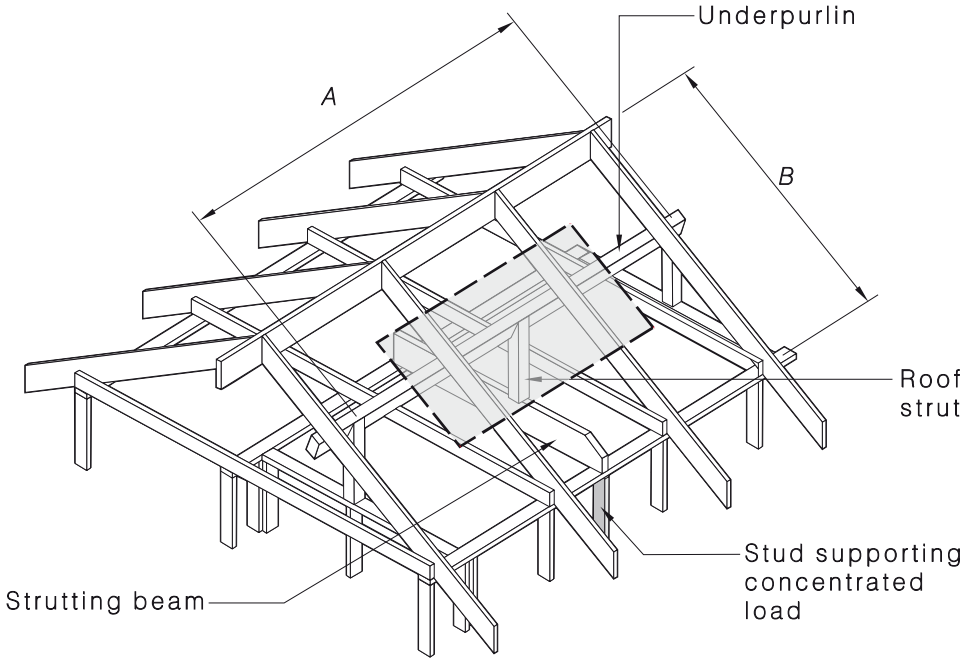
6.3.2.2 *Studs supporting concentrated loads*

The size of studs supporting concentrated loads in single- or upper-storey construction shall be determined from Span Tables A13 and A14 in Appendix A for 2400 mm and 2700 mm high walls respectively.

The Span Tables in Appendix A for studs supporting concentrations of load (upper storey) are appropriate for determining the size of studs supporting concentrated loads such as from strutting beams, roof struts, girder trusses or hanging beams 3000 mm or more in length.

The Tables require an input in terms of roof area supported. Where studs support hanging beam loads only, 'roof area' is not relevant. In such cases, an area equal to half the area of ceiling supported by the hanging beam should be used in the Tables in lieu of area of sheet roof supported.

Design parameters for studs supporting concentrated loads shall be as shown in Figure 6.11.



Roof area supported = $(A \times B)/4$

where

A = total underpurlin spans
B = total of rafter spans

NOTE: Ridge is assumed to be strutted.

FIGURE 6.11 STUDS SUPPORTING CONCENTRATED LOADS

6.3.2.3 *Jamb studs (studs at sides of openings)*

The size of jamb studs for single- or upper-storey construction shall be determined from Span Tables A15 and A16 in Appendix A for 2400 mm high walls and Span Tables A17 and A18 of Appendix A for 2700 mm high walls.

The size of jamb studs in the lower storey of a two-storey construction shall be determined from Span Tables A44 and A45 in Appendix A for 2400 mm high walls and Span Tables A46 and A47 in Appendix A for 2700 mm high walls.

Jamb studs that support lintels, which in turn support major concentrated loads from strutting beams, roof struts, girder trusses, floor bearers or similar members (see Clause 6.3.2.2), shall have their size increased by the size required for a stud supporting the equivalent concentrated load, as determined from Span Tables A13 and A14 in Appendix A.

Where the concentrated load is located at or within the central third of the lintel span, the breadth of the jamb studs, either side of the opening, shall be increased by half of the breadth of the stud required to support the concentrated load.

Where the concentrated load is located at or within one-third of the lintel span from the jamb stud, this jamb stud shall be increased in size by the size of the stud supporting the concentrated load.

For doorway openings up to 900 mm, jamb studs may be the same size as the common studs provided jamb linings or other comparable stiffeners are used and these studs do not support concentrated loads.

Where the jamb stud size required by the Span Tables in Appendix A is made up of multiple members, the following shall apply:

(a) *2 members (e.g., 2/90 × 35)*—provide 1 full-length stud plus 1 secondary jamb stud.

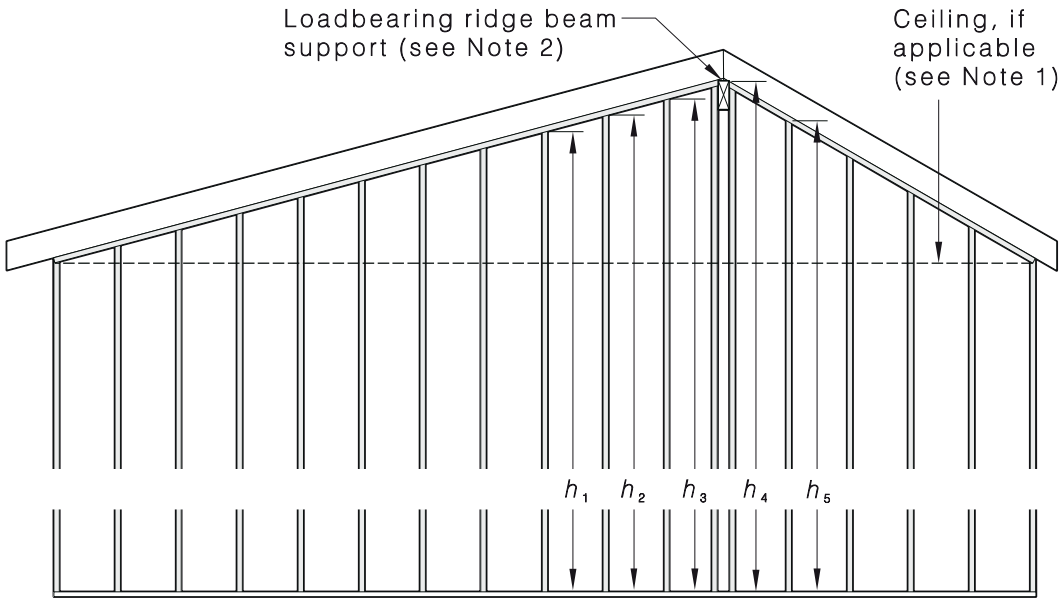
(b) *3 members (e.g., 3/70 × 35)*—provide 2 full-length studs plus 1 secondary jamb stud.

(c) *4 members (e.g., 4/90 × 45)*—provide 2 full-length studs plus 2 secondary jamb studs.

See Figure 6.8 for the terminology of secondary jamb stud.

6.3.2.4 *Gable or skillion end wall studs*

The height of gable or skillion end wall studs shall be determined from Figure 6.12 and their size shall be determined from Span Table A19 in Appendix A.



Stud height = average height of 5 longest studs
$= (h_1 + h_2 + h_3 + h_4 + h_5)/5$

NOTES:

1 Where the house has a horizontal ceiling or where a specially designed horizontal wind beam is provided, the stud height is measured as the greater of the ceiling height or the height from ceiling to roof.

2 Where studs support a loadbearing ridge or intermediate beam, separate consideration is required (e.g., studs supporting concentration of load or posts).

3 Noggings have been omitted for clarity.

FIGURE 6.12 GABLE OR SKILLION END WALL STUD HEIGHT

6.3.2.5 *Mullions*

The size of mullions shall be determined as for jamb studs in Clause 6.3.2.3 except that the opening width shall be equal to the combined opening width either side of the mullion less 600 mm (see Figure 6.13).

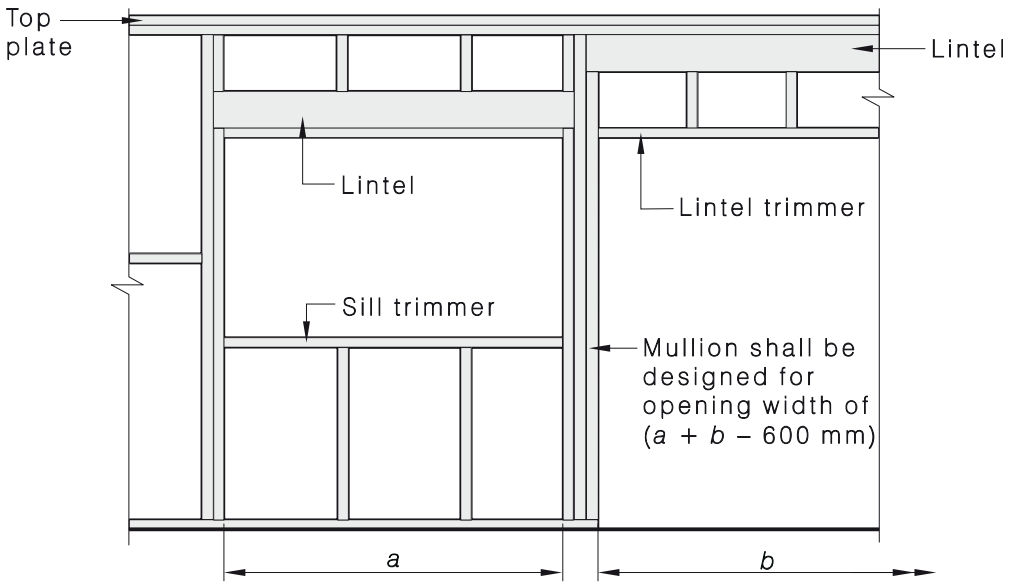


FIGURE 6.13 MULLIONS

6.3.2.6 *Concentrated loads on non-loadbearing internal walls*

Where studs supporting concentrated loads (see Clause 6.3.2.2) are incorporated in an internal wall that is otherwise non-loadbearing, the remainder of the wall shall be deemed to be non-loadbearing.

6.3.3 Bottom plates

The size of bottom plates in single- or upper-storey construction shall be determined from Span Tables A20 or A21 in Appendix A for 70 or 90 mm wall frames respectively.

The size of bottom plates in the lower storey of two-storey construction shall be determined from Span Table A48 in Appendix A.

If wall studs are positioned at or within 1.5 times the depth of bottom plates from supporting floor joists, the bottom plates may be the same size as the common studs, for any stress grade. If the wall studs are positioned directly above floor joists or are supported by blocking or a concrete floor, bottom plates may be 35 mm minimum depth, for any stress grade.

Where bottom plates support studs supporting concentrated loads, posts or jamb studs, the plate shall be supported over a floor joist, solid blocking between bottom plate and bearer or concrete slab.

6.3.4 Top plates

The size of top plates for single storey or the upper storey of a two-storey construction shall be determined from Span Tables A22 or A23 in Appendix A for 70 or 90 mm wall frames, respectively.

The size of top plates for the lower storey of a two-storey construction shall be determined from Span Table A49 in Appendix A.

Wall plate sizes in the Span Tables in Appendix A are appropriate for wall plates supporting rafters or trusses located at any position along the length of the plate.

Top plates may be a minimum of 35 mm deep by the breadth of the stud for any stress grade except—

(a) where rafters or trusses are not required to have specific fixings to top plates (see Tables 9.4 to 9.7); and

(b) where top plate loads from roof trusses, rafters, floor joists, and similar members, are located directly above studs or at or within 1.5 times the depth of the plate from the stud.

Roof beams, struts, strutting beams, girder truss, hanging beams or counter beams 3000 mm or more in length, combined strutting/hanging beams, combined strut/counter beams, and similar members, shall be supported by jamb studs, studs supporting concentrations of load, or posts. Where required, stiffening or blocking of top plates shall be in accordance with Figure 6.7.

6.3.5 Studs, plates and noggings in non-loadbearing internal walls

Non-loadbearing internal walls, with or without openings, shall be constructed using the minimum sizes given in Table 6.2, for any stress grade of timber.

Where studs supporting concentrations of load are incorporated in an internal wall that is otherwise non-loadbearing, the remainder of the wall shall be deemed non-loadbearing.

TABLE 6.2

FRAMING SIZES FOR NON-LOADBEARING INTERNAL WALLS

Member	Minimum size, mm	Maximum spacing, mm
Top and bottom plates	35 × 70	—
Common studs of maximum height 2700 mm	70 × 35	600
Studs supporting lintels	As for common studs	—

NOTES:

1 Plates may be trenched up to 5 mm.

2 Studs may be notched up to 20 mm.

6.3.6 Lintels

6.3.6.1 *General*

Top plates shall be provided above lintels.

Adequate bearing for lintels shall be provided as required by the Notes to the Span Tables in Appendix A.

NOTE: The actual opening widths may be up to 70 mm greater than the maximum spans given in the Span Tables in Appendix A.

6.3.6.2 *Lintels in loadbearing walls*

The size of lintels shall be determined from Table A24 in Appendix A for single- or upper-storey construction or from Span Table A50 in Appendix A for lower storey of two-storey construction. Span Table A24 in Appendix A shall not be used to determine lintel sizes where the lintel is required to support concentrated loads from girder trusses, large strutting beams, and similar members.

NOTE: The size of lintels required to support concentrated loads may be determined from AS 1684.2 or by engineering design.

6.3.6.3 *Lintels in gable end walls*

The size of lintels in gable end walls not supporting roof loads shall be determined as for lintels supporting sheet roofing with a rafter or truss span of 3000 mm.

6.3.6.4 *Lintels in non-loadbearing walls*

The size of lintels in internal walls supporting ceiling joists only, or supporting hanging beams, shall be determined by using the hanging beam or the counter beam (beams supporting hanging beams) Span Tables in Appendix A for these two applications respectively.

For internal walls where ceiling loads are not supported and wall openings are wider than 1800 mm, the size of the lintel shall be determined from Span Table A23 in Appendix A using a ceiling load width of 1800 mm.

Where wall openings wider than 1800 mm occur in non-loadbearing external walls, a lintel shall be provided and the size of the lintel shall be determined from Span Table A28 in Appendix A using a ceiling joist span of 1800 mm.

6.3.6.5 *Windowsill trimmers*

Windowsill trimmers shall be in accordance with Table 6.3. For opening widths up to 2400 mm, windowsill trimmers may be the same size and grade as the common studs in that wall.

TABLE 6.3

SIZE AND GRADE OF WINDOWSILL TRIMMERS

Opening width, mm	Size and grade of windowsill trimmer
Up to 2400	1 × common stud
Over 2400, up to 2700	2 × common stud or 90 × 45 mm
Over 2700, up to 3000	2 × common stud
Over 3000, up to 36	3 × common stud

6.3.7 Verandah beams (plates)

The size of verandah beams shall be determined from Span Table A25 in Appendix A.

The ends of beams that are supported on stud walls shall be carried by jamb studs (with beams considered as lintels) or posts.

Cantilevered beams (e.g., gable ends) shall be sized in accordance with Clause 7.3.16 and Figure 7.20.

6.3.8 Verandah posts supporting roof loads

The size of posts supporting roof loads shall be determined from Span Table A26 in Appendix A.

SECTION 7 ROOF FRAMING

7.1 GENERAL

7.1.1 Application

This Section specifies requirements for the building practice, design, and specification of roof framing members. This Section shall be used in conjunction with Span Tables A27 to A37 in Appendix A.

NOTE: In some diagrams some members have been omitted for clarity.

7.1.2 Types of roofs and limitations

7.1.2.1 *General*

Raftered roofs ('pitched' roofs) shall be either coupled or non-coupled (cathedral or skillion) (see Clause 2.6.4).

7.1.2.2 *Coupled roofs*

The roof pitch in a coupled roof construction (see Figure 7.1) shall be not less than 10° and ceiling joists and collar ties shall be fixed to opposing pairs of rafters in accordance with Section 9.

Rafters shall be continuous in length from ridge to wall plate, or shall be lapped or spliced at their support points. Rafters may be supported on underpurlins.

For a coupled roof with no roof struts, provided with nominal fixing only (see Section 9), the maximum distance between external walls shall not exceed 6000 mm for sheet roofs or 4000 mm for tile roofs, except where the roof connections and members are designed in accordance with AS 1720.1.

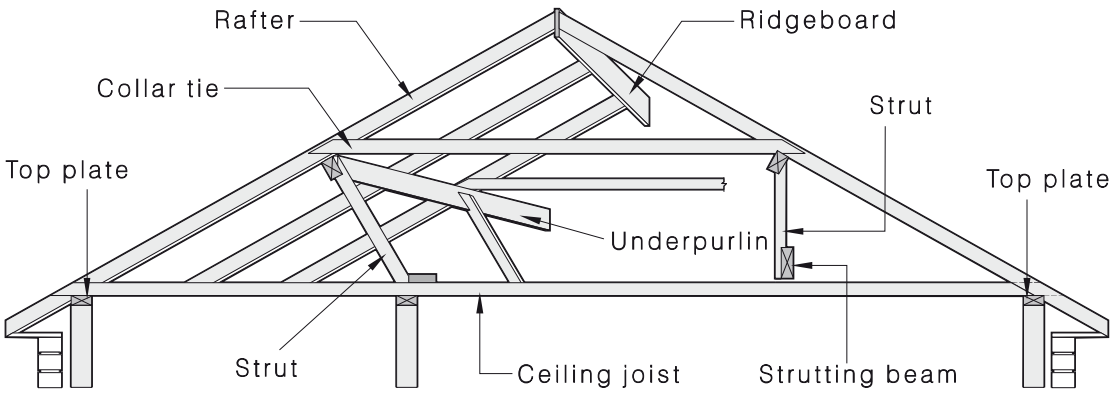


FIGURE 7.1 COUPLED ROOF

7.1.2.3 *Non-coupled roof*

A non-coupled roof (including cathedral and skillion) shall have rafters (raking beams) supported off walls, ridge beams and/or intermediate beams. It may have ceilings in the same plane as the roof. Rafters, ridge and intermediate beams may be exposed internally (see Figure 2.5).

7.1.2.4 *Trussed roof*

The design of a timber roof truss shall be in accordance with engineering principles and AS 1720.1. The wind design criteria shall be consistent with that used in this Standard (see Clause 1.4.2).

7.2 BUILDING PRACTICE

7.2.1 Ceilings

Ceilings may be fixed to the underside of ceiling joists, rafters or purlins or the bottom chord of trusses, with or without battens.

7.2.2 Construction loads on ceiling framing

Ceiling joist sizes determined in accordance with the Span Tables in Appendix A shall not be used to support construction loads or the loads of workers until the joists are adequately fixed and laterally restrained by the installation of ceiling lining or ceiling battens (see also Clause 7.3.4).

Ceiling battens shall not support construction loads or the loads from workers.

NOTE: Construction planks may be used on the top of ceiling joists during construction to support workers.

7.2.3 Ceiling battens

Where ceiling battens are used, the size and fixings shall be appropriate for the mass of the ceiling material used, to provide a flat finish to the ceiling.

7.2.4 Ceiling joists

7.2.4.1 *General*

Ceiling joists shall be at spacings to support ceiling linings.

For coupled roofs, ceiling joists shall be in single lengths or spliced in accordance with Clause 7.2.4.2, and at the same spacing and in the same direction as the main rafters so that they may be fixed to, and act as ties between, the feet of pairs of opposing rafters. Intermediate ceiling joists may be required to support ceiling linings. End bearings of joists shall be the full width of the supporting wall plate except as provided for in Clause 7.2.4.2.

7.2.4.2 *Splices and joints in coupled roof*

Where splices in ceiling joists are necessary they shall be made only at points of support. Splices shall be butt-joined with fishplates of minimum length six times the joist depth. Fishplates shall be a minimum of 19 mm thick by the full depth of ceiling joists. Alternatively, the ceiling joists may be lapped for a distance equivalent to at least three times their depth.

Lapped ceiling joists, or both ends of the ceiling joists butted to fishplates, shall be secured with at least six hand-driven nails, or 8/3.05 mm diameter machine-driven nails, or with an M12 bolt (see Section 9).

Engineered nailplated joists shall be spliced and supported in accordance with the manufacturer's recommendations.

7.2.4.3 *Connection to hanging beams*

Ceiling joists shall be fixed to hanging beams using a minimum of 35×32 mm timber cleats, 25×1.6 mm galvanized steel strapping, steel ceiling joist hangers or equivalent approved fasteners. Each alternate connection shall be fixed to opposite sides of the hanging beam (see Figure 7.3).

7.2.4.4 *Trimming around openings*

Any opening in a joisted ceiling (manholes, skylights, and similar openings) shall be trimmed to provide full support for ceiling linings. Where no loads other than normal ceiling loads shall be carried, trimmers shall be as follows:

(a) Openings up to 1000 mm—same size as ceiling joist.

(b) Openings greater than 1000 mm and up to a maximum of 3000 mm—breadth of trimmer to be increased by 20% for each 300 mm in length greater than 1000 mm. Members shall be connected by framing brackets.

(c) Openings greater than 3000 mm—trimmer size as for hanging beams.

7.2.4.5 *Platforms in roof spaces*

Ceiling joists shall support ceiling loads only. Any platforms constructed in the roof space above a ceiling for the support of a storage water heater, feed tank, flushing cistern, or similar members, shall be designed for these loads.

7.2.5 Hanging beams

7.2.5.1 *General*

Hanging beams shall support ceiling joists and the attached ceiling materials only.

Hanging beams are usually at right angles (or may be angled or placed off centre) to ceiling joists and are located directly above them (see Figure 7.2). Hanging beams shall be held in a vertical position at both ends by nailing or bolting to an available rafter, gable end struts or by means of angle strutting from internal walls.

Requirements for beams supporting roof and ceiling loads are given in Clauses 7.2.7 and 7.2.8.

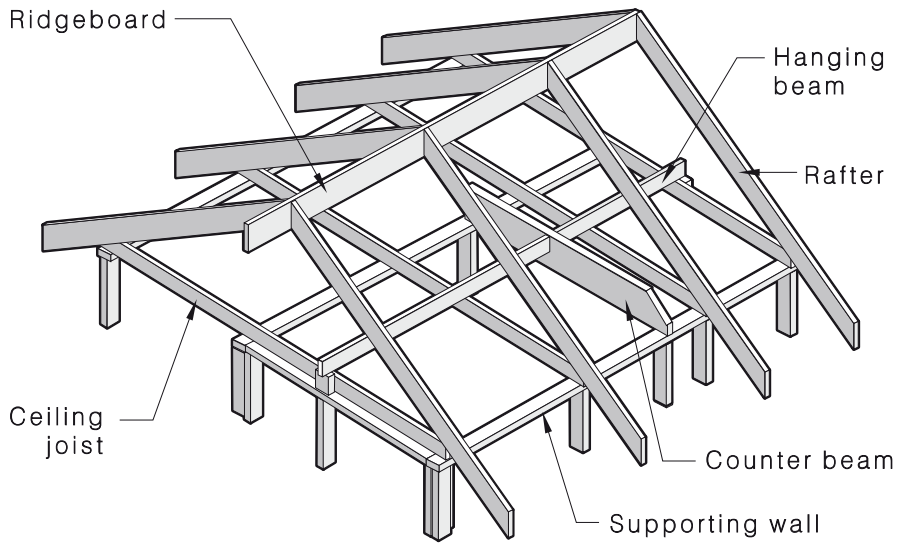


FIGURE 7.2 COUNTER BEAM SUPPORTING HANGING BEAMS

7.2.5.2 *End support of hanging beams*

End-bearings of hanging beams shall be the full width of wall plate. Where hanging beams span 3.0 m or more, they shall be located directly above a stud or the wall plates shall be stiffened (see Figure 6.7).

Where hanging beams are used as binders, the connection to the external walls shall be equivalent to that shown in Figure 6.9.

Where the slope of rafters is such that the depth of a hanging beam has to be reduced by more than two-thirds in order to avoid interference with roof cladding, provision shall be made for additional support incorporating a jack joist (trimmer) as shown in Figure 7.3.

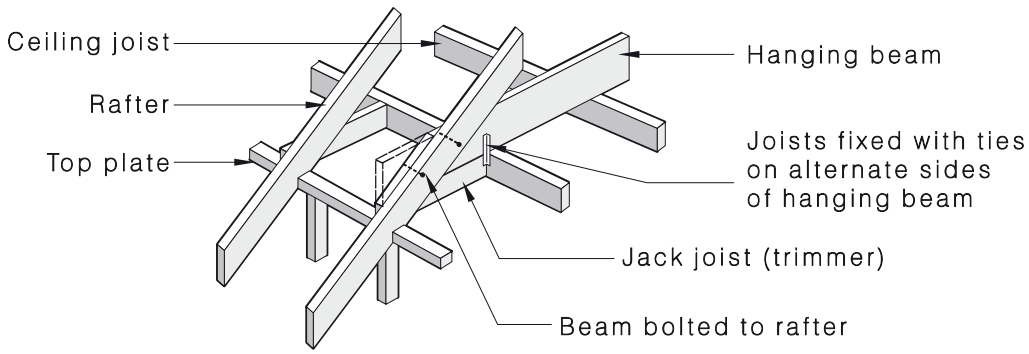


FIGURE 7.3 SUPPORT OF HANGING BEAM WITH JACK JOIST (TRIMMER)

7.2.6 Counter beams

7.2.6.1 *General*

Counter beams may be provided to support hanging beams (see Figures 7.2 and 7.4). End support to counter beams shall be similar to that for hanging beams (see Clause 7.2.5.2).

Where roof loads are to be supported, a combined strutting/counter beam shall be used (see Clause 7.2.8).

7.2.6.2 *Intersection of hanging and counter beams*

At intersections of hanging and counter beams, the hanging beam may be checked out over the counter beam, or butted up to the counter beam. The hanging beams shall be supported by 45 × 42 mm minimum ledgers fixed each side of the counter beam with 5/3.05 mm diameter nails or 2/No. 14 Type 17 screws, or by other connectors such as joist hangers (see Figure 7.4).

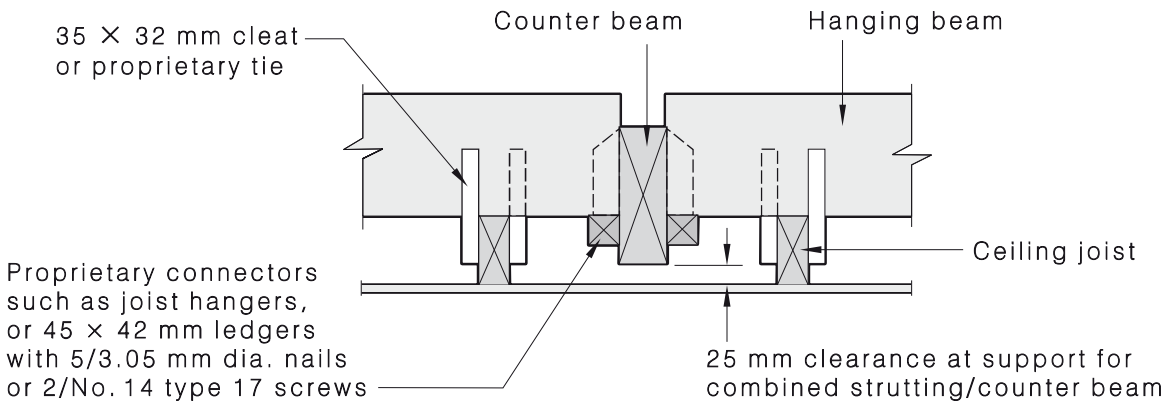


FIGURE 7.4 FIXING HANGING BEAM TO COUNTER BEAM

7.2.7 Combined strutting/hanging beams

Combined strutting/hanging beams may be provided to support both roof (via struts and ceiling loads as for hanging beams.

Combined strutting/hanging beams are usually at right angles (or may be angled or placed off centre) rafters and ceiling joists and are located directly above them.

Requirements for end supports shall be as for strutting beams, as specified in Clause 7.2.9.

NOTE: The clearance requirements specified for the strutting beam are not required, as the hanging beam is located directly over the ceiling joists.

7.2.8 Combined strutting/counter beams

Combined strutting/counter beams are usually located at right angles to hanging beams and parallel to ceiling joists, but may be angled or placed off centre.

At intersections of hanging beams and combined strutting/counter beams, the hanging beam may be checked out over or butted up to the strutting/counter beam. It shall be supported by 45 × 42 mm timber ledgers fixed at each side of the strutting beam or by other proprietary connectors such as joist hangers. See Figure 7.4 for a similar detail.

Requirements for end supports shall be as for strutting beams, as specified in Clause 7.2.9. Where counter beams are located between the ceiling joists, the 25 mm clearance specified for strutting beams is required.

NOTE: Combined strutting/counter beams may be provided to support roof loads and ceiling loads via hanging beams.

7.2.9 Strutting beams

Ends of strutting beams shall bear on the full width of wall plates.

Strutting beams shall support roof loads only. They may extend in any direction in the roof space.

Beams shall bear directly above studs supporting concentrations of load or the loads shall be distributed over two or more studs by means of top plate stiffening (see Figure 6.8). Where strutting beams occur over openings, the lintels shall be designed for a concentrated load (see AS 1684.2).

Blocking shall be provided between strutting beams and wall plates to provide an initial clearance of 25 mm at midspan between the underside of the beams and the tops of ceiling joists, ceiling lining or ceiling battens as appropriate (see Figure 7.5).

The ends of strutting beams may be chamfered to avoid interference with the roof claddings. Where the end dimension is less than 100 mm, or one-third the beam depth, whichever is greater, an alternative support method shall be provided similar to that shown for hanging beams (see Figure 7.3).

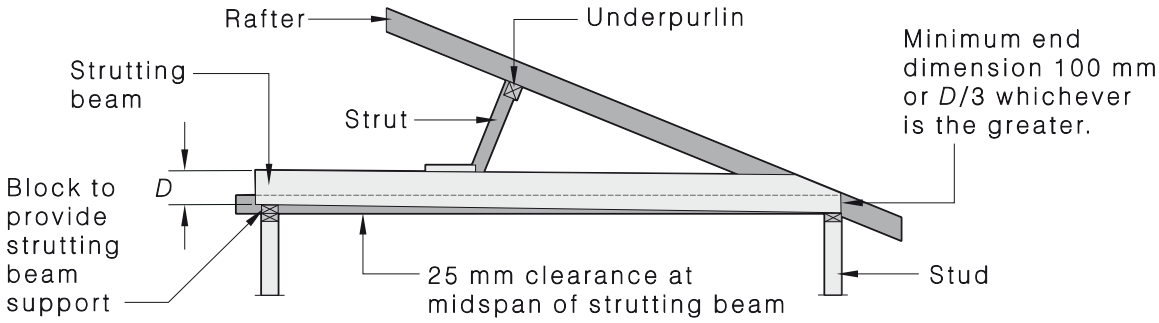


FIGURE 7.5 INSTALLATION OF STRUTTING BEAMS

7.2.10 Underpurlins

7.2.10.1 *General*

Underpurlins shall be in single lengths, where possible, and shall be in straight runs generally at right angles to the direction of rafters. Where two or more rows of underpurlins are required, they shall be spaced evenly between the ridge and the wall top plate.

7.2.10.2 *Joints in underpurlins*

Where underpurlins are joined in their length, the joint shall be made over a point of support, with the joint halved and nailed or lapped and nailed (see Figure 7.6).

Alternatively, underpurlins shall be lapped a minimum of 450 mm and spliced with 6 through nails, or 3/No. 14 Type 17 screws or 2/M10 bolts through the splice. Laps shall be made over a support.

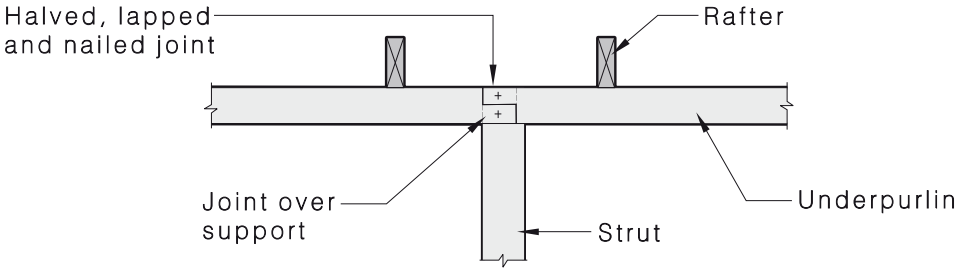


FIGURE 7.6 JOINING UNDERPURLINS

7.2.10.3 *Cantilevered underpurlins*

The ends of an underpurlin may project (cantilever) beyond a support by up to 25% of the maximum allowable span of the underpurlin, provided the actual backspan is at least three times the cantilever length.

7.2.10.4 *Support of underpurlins*

Underpurlins shall be securely fastened to hip or valley rafters in accordance with one of the following options:

(a) *Underpurlins supporting hip or valley rafters*:

(i) They shall not cantilever more than one-eighth of their allowable span.

(ii) They shall be fastened to the hip or valley using one of the following means:

(A) Cutting the underpurlin to and around the hip or valley and providing support directly below via a roof strut.

(B) Proprietary framing anchors and blocking that provide 3 way support, see Figure 7.7, or by a method providing equivalent support.

(C) Proprietary joist hangers.

(D) Using a proprietary/patented tension rod system (equivalent to the old BARAP system).

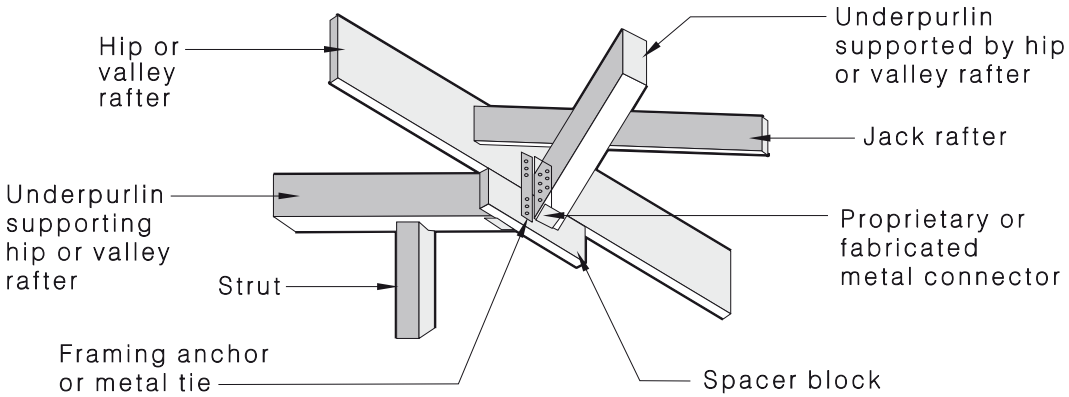


FIGURE 7.7 TYPICAL UNDERPURLIN CONNECTIONS TO HIP OR VALLEY

(b) *Underpurlins supported by hip or valley rafters*:

They shall be fastened to the hip or valley using one of the following means:

(i) Proprietary/patented framing anchors and blocking that provide 3 way support.

(ii) Proprietary/patented joist hangers.

Where underpurlins are not strutted at the junctions with hip or valley rafters and the allowable underpurlin cantilever is exceeded, the underpurlins shall be deemed to be supported by the hip or valley rafters to which they are attached.

7.2.11 Rafters

7.2.11.1 *General*

Rafters shall be single length members from wall plates to ridge.

7.2.11.2 *Birdsmouthing*

Rafters may be birdsmouthed to a depth not exceeding one-third of the rafter depth (see Figure 7.19).

7.2.12 Ridgeboards

7.2.12.1 *General*

Ridgeboards shall be provided to locate and stabilize rafter ends. Opposing pairs of rafters shall not be staggered by more than their own thickness at either side of their ridge junction.

Where ridgeboards are strutted, they shall be strutted for their full length.

The size of ridgeboards shall be determined from Table 7.5.

Junctions of ridgeboard and hip or valley rafters shall be strutted where the hip or valley rafters exceed 5 m span, or where underpurlins are supported by hip or valley rafters.

Where a ridgeboard is required to be strutted along its length, but there are insufficient strutting supports, the ridgeboard shall be designed as a ridge beam for a non-coupled roof, or alternative provisions shall be made for the full support of the rafter loads.

NOTE: An example of an alternative would be the provision of a tie-bolt truss.

7.2.12.2 *Joints in ridgeboards*

Ridgeboards may be joined using a scarf joint at the abutment of a rafter pair, or preferably nail-spliced (minimum of 6 nails per side of splice) using full depth fishplates on both sides of the ridgeboard, as shown in Figure 7.8.

NOTE: Full length ridgeboards should be used wherever possible.

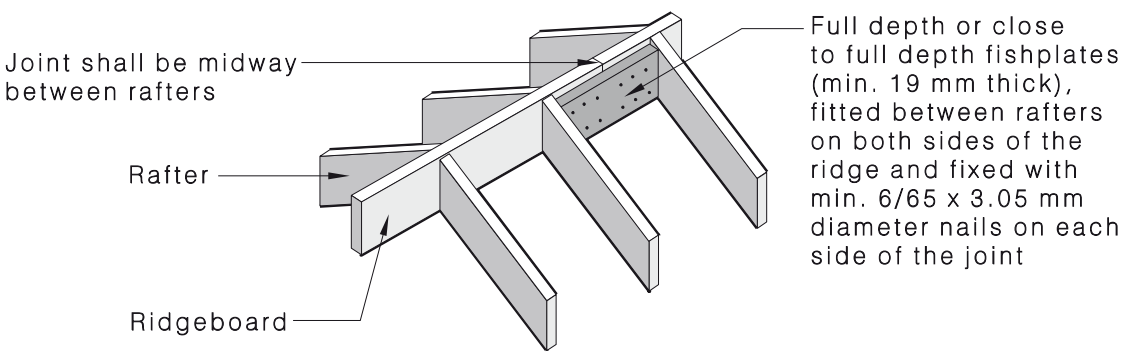


FIGURE 7.8 FISHPLATED RIDGEBOARD SPLICE

7.2.13 Hip and valley rafters

Where strutting points are available and where required, hip and valley rafters shall be supported by struts at the same number of equally spaced intermediate points as for common rafters.

Where strutting points are not available, hip rafters shall be supported by an underpurlin in at least one direction, and valley rafters shall be supported by underpurlins in both directions.

Where the underpurlins are supported by the hip or valley rafters, a tie-bolt truss system, as shown in Figure 7.14, may be installed or the hip or valley rafter may be designed to support the underpurlin loads. This may be used where the underpurlins cantilever beyond a strut by more than 25% of the maximum span and no strutting point is available at the junction of the hip or valley with the underpurlin.

If the hip or valley rafters support the underpurlin, a strut shall be used at the intersection of the hip/valley and ridgeboard.

7.2.14 Scotch valleys

Where scotch valley construction (see Figure 2.4) is used at the junction of two roof surfaces, the pitching plate to which creeper rafters of the secondary roof are fixed shall be securely nailed at each common rafter crossing. The pitching plate shall be minimum 35 mm thick by such width as will provide full bearing for the feet of the creeper rafters.

7.2.15 Roof strutting

7.2.15.1 *Roof struts*

Where necessary, struts shall be provided to support roof members, such as underpurlins, ridgeboards and hip and valley rafters. Struts shall be supported by walls, strutting beams, or combined strutting/hanging beams, or combined counter/strutting beams.

Struts shall not be supported on hanging or counter beams.

Except as provided for in Clauses 7.2.15.2, 7.2.15.3 and 7.2.15.4, struts shall be either vertical or perpendicular to the rafters or at an angle between vertical and perpendicular to the rafter. They shall be birdsmouthed or halved to underpurlins as shown in Figures 7.9 and 7.10.

Alternatively, for struts between vertical and perpendicular to rafter that are not birdsmouthed or halved to the underpurlin, a 30×0.8 mm G.I. strap shall be passed over the underpurlin and nailed to each side of the strut with $4/30 \times 2.8$ mm dia. nails and to the underpurlin with $2/30 \times 2.8$ dia. nails each side in addition to at least 2 skew nails. One framing anchor with four nails to each leg may be used as an alternative to the strap.

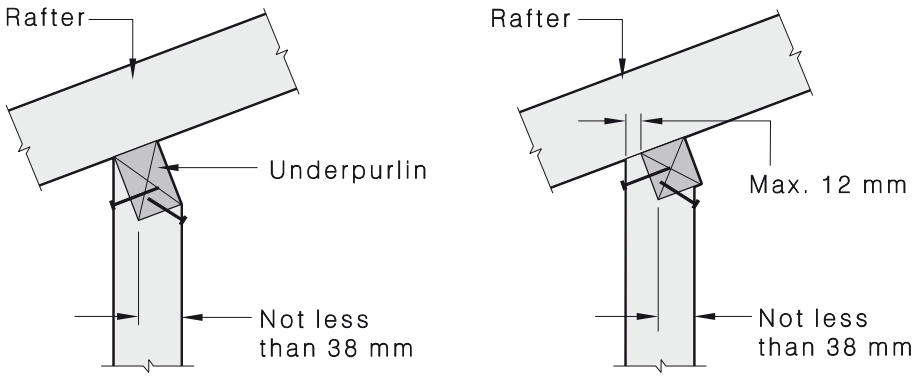


FIGURE 7.9 VERTICAL STRUTS

Studs supporting struts shall be determined in accordance with Clause 6.3.2.2 or Clause 6.3.2.3, as appropriate.

Struts that are not vertical shall be restrained by blocks or chocks, as shown in Figure 7.10.

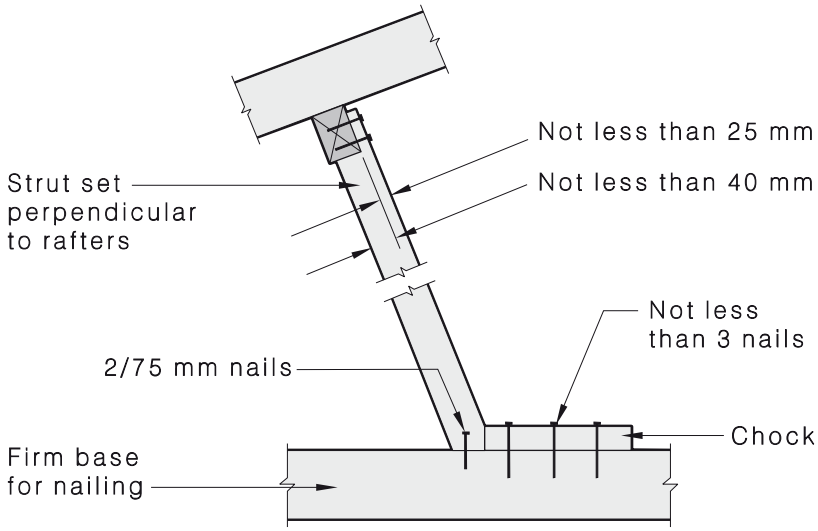
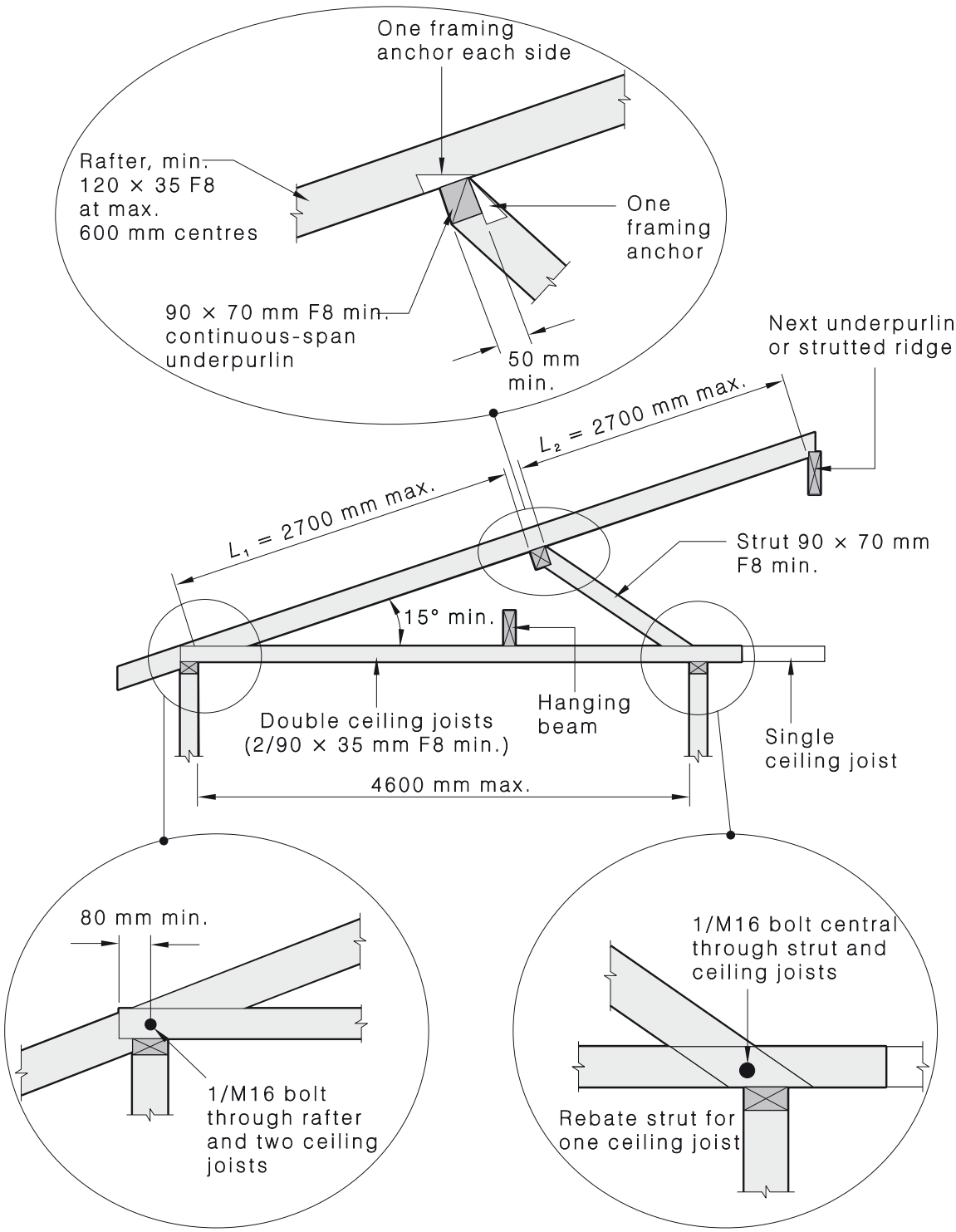


FIGURE 7.10 STRUTS PERPENDICULAR TO RAFTERS

7.2.15.2 *Tied and braced strut system*

Where struts are located at an angle greater than perpendicular to the rafter but less than 60° to the vertical, they shall be tied and braced to form a frame in accordance with Figure 7.11, or they shall be in accordance with Clause 7.2.15.4.



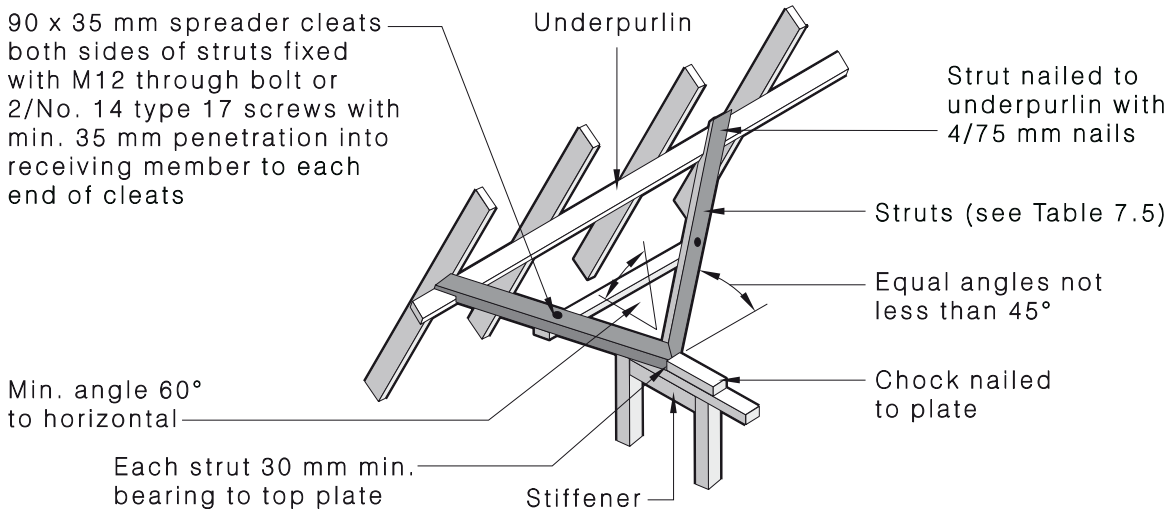
The length of L_1 shall be between L_2 and 1.25 times *L2*

FIGURE 7.11 TIED ROOF STRUTS

7.2.15.3 *Fan struts*

A pair of struts (fan or flying struts) may be used in the same line as, or perpendicular to, the underpurlin with their supports opposing each other. The pair of struts shall be at the same angle, and not greater than 45° to the vertical (see Figure 7.12).

Maximum fan strut length shall be 4.5 m with maximum 3.0 m spacing between the struts and underpurlin connection.



NOTE: Maximum rafter span = 3000 mm.

FIGURE 7.12 FAN OR FLYING STRUTS

7.2.15.4 *Opposing struts*

Where roofs are strutted using opposing struts, they shall comply with Figure 7.13.

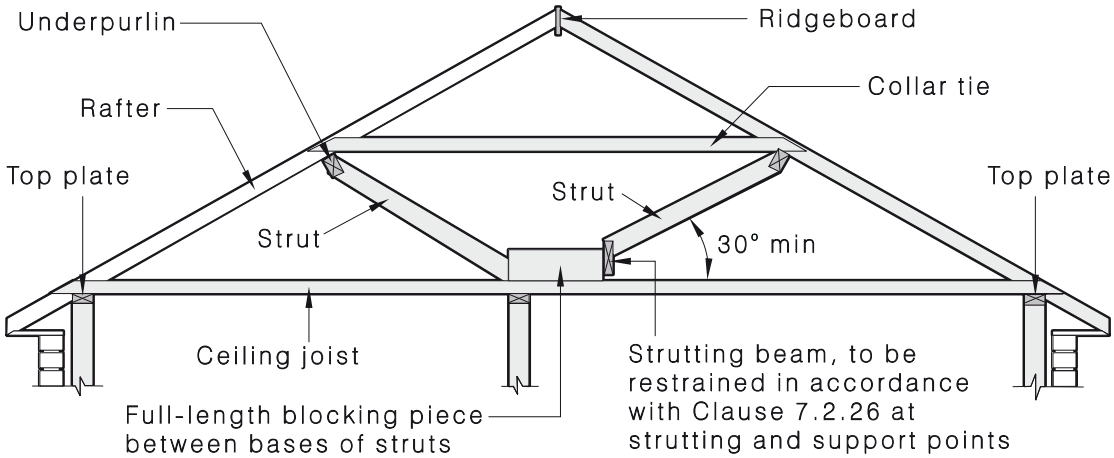


FIGURE 7.13 OPPOSING STRUTS

7.2.16 Collar ties

Collar ties shall be provided in all coupled roof construction. Size of collar ties shall be in accordance with Table 7.5.

Where the rafter span is such as to require support from underpurlins, collar ties shall be fitted to opposing common rafters at a point immediately above the underpurlins. Where underpurlins are not required, the collar ties shall be fitted to opposing rafters at a height above the top plate, not greater than two-thirds of the rise of the roof.

Collar ties shall be fitted to every second pair of common rafters, or at 1200 mm maximum spacing, whichever is the lesser. Collar ties shall be fixed to rafters with one M10 bolt for ties greater than 4.2 m long, or min. 2/75 hand-driven nails or 3/75 × 3.05 mm ∅ machine-driven nails for ties up to 4.2 m long.

Collar ties that exceed 4.2 m in length shall be fixed in accordance with Figure D1, Appendix D.

7.2.17 Hip ends

Hip ends shall be constructed in accordance with one or more of the alternative methods shown in Figure 7.14.

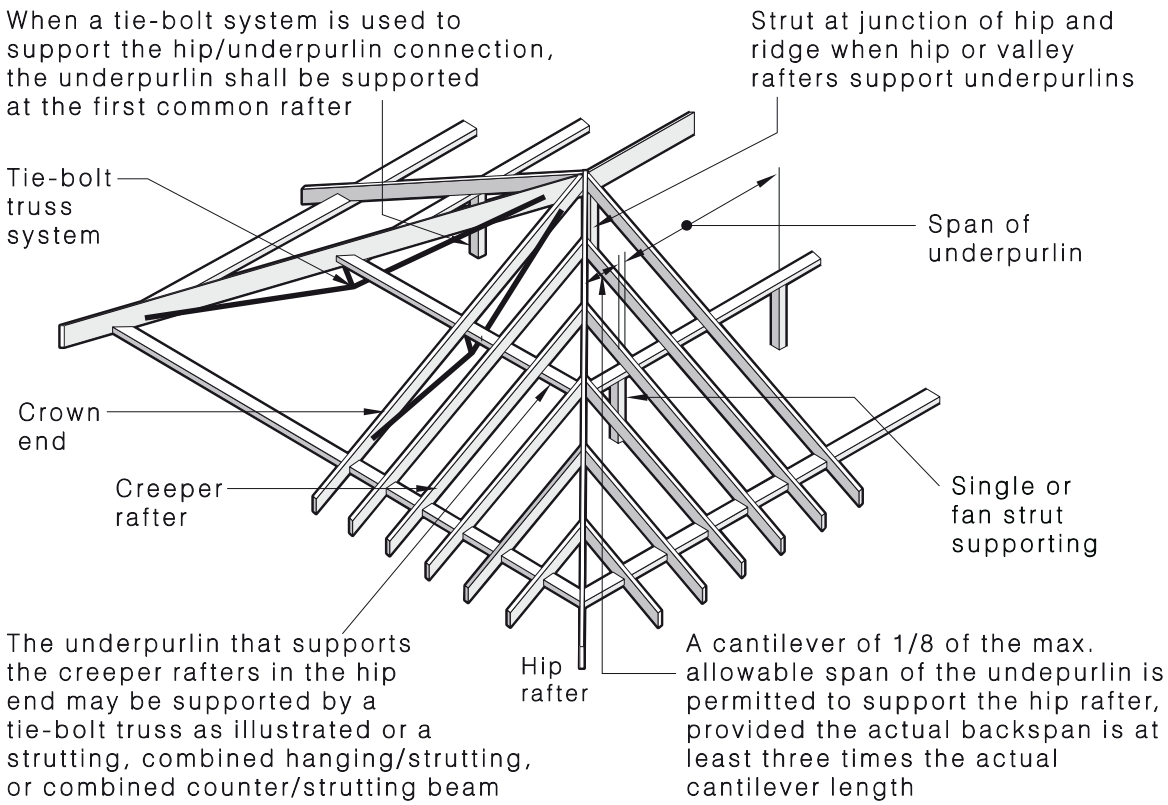


FIGURE 7.14 HIP END

7.2.18 Alternative support systems

Where shown to be suitable through engineering design principles, tie-bolt trusses or other alternative support systems may be used in combination with underpurlins, hip or valley rafters or common or jack rafters, as appropriate.

7.2.19 Non-coupled roofs

7.2.19.1 *General*

Non-coupled roof systems include cathedral roofs (ceiling in line with roof) as well as other raftered roofs outside the limits for ‘coupled roof construction’ (e.g., roof slope below 10°).

Non-coupled roofs shall have rafters, or raking roof beams, supported off walls, ridge beams and/or intermediate beams.

Rafters or raking roof beams to cathedral roofs shall be designed to support roof and ceiling loads.

Studs supporting ridge or intermediate beams shall be designed as studs supporting concentration of load or as posts.

7.2.19.2 *Ridge and intermediate beams*

Ridge beams or walls shall be provided at the apex in the roof and shall be designed to support roof loads and ceiling loads (where required).

Ridge beams shall be at right angles to the rafters and shall be continuous to points of support. They shall be placed either under the rafters or positioned between pairs of rafters, as for a ridgeboard.

Intermediate beams shall be provided, where required, between the ridge and top plate of the wall.

Intermediate beams shall support rafters (and ceiling loads where required) and shall be at right angles to the rafters.

7.2.20 Roof battens

Where possible, battens shall be continuous span.

7.2.21 Trussed roofs

7.2.21.1 *General*

Trusses shall be handled, erected, installed and braced in accordance with AS 4440. Trusses shall be designed in accordance with engineering principles.

7.2.21.2 *Structural fascias*

A structural fascia that is capable of distributing overhang loads to adjacent trusses shall be installed.

A minimum timber (softwood) structural fascia of 190 × 19 mm shall be used.

NOTES:

1 Other fascias or combinations of members with similar stiffness may be used.

2 Grooves in fascia to accept eaves lining are permitted.

7.2.21.3 *Truss layout*

Placement of trusses shall be strictly in accordance with the truss design.

7.2.21.4 *Support of trusses*

Loadbearing walls supporting trusses shall be in accordance with Section 6.

Girder trusses shall be considered concentrations of load and supported as outlined in Section 6. Lintels supporting girder trusses over openings shall be designed in accordance with engineering principles or AS 1684.2.

Non-loadbearing walls shall be kept a minimum of 10 mm below the underside of the bottom chord, or ceiling battens when used.

Trusses shall be fixed to internal non-loadbearing walls as shown in Figure 6.10.

Trusses shall not be supported by internal walls unless the wall and the truss are specifically designed for the purpose.

7.2.22 Bracing for raftered and trussed roofs

All roof frames shall be adequately braced to withstand horizontal forces applied to the building. Bracing shall be designed and fixed to transfer any loads to the supporting structure (see Section 8).

7.2.23 Fixing of ceiling framing to internal bracing walls

All bracing walls shall be fixed to ceiling or roof framing. For trussed roof construction, for bracing walls at right angles to the trusses, blocks that do not prevent the vertical settlement of the trusses shall be nailed to the top plates between truss bottom chords. For bracing walls parallel to trusses, blocks shall be nailed between the truss bottom chord and the block shall be fixed to the top plate with a metal strap or timber cleat nailed off.

7.2.24 Eaves construction

7.2.24.1 *General*

Where fascias and bargeboards are used as structural members to support roof loads, the size shall be determined as either for a rafter or verandah beam.

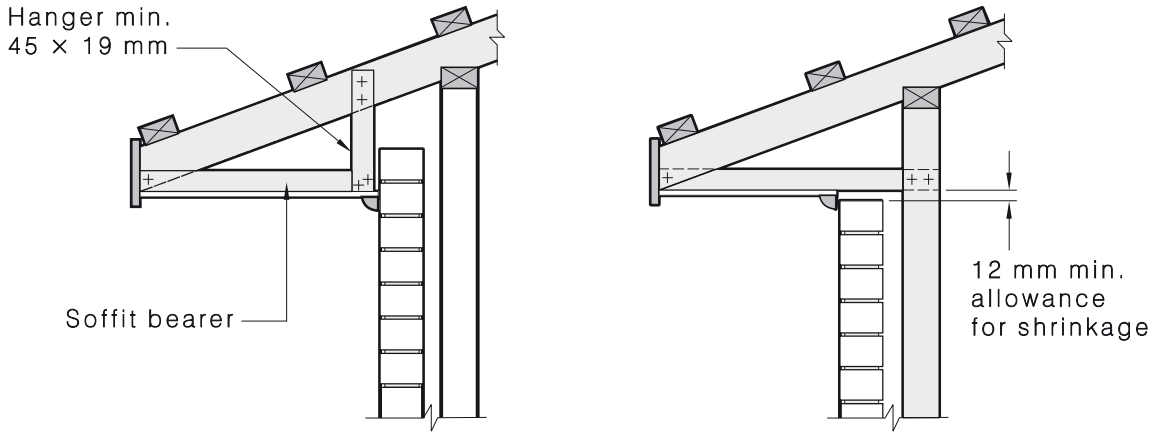
7.2.24.2 *Boxed eaves*

Soffit bearers used in the construction of boxed eaves shall be spaced to suit eaves lining and shall be not less than the following sizes:

(a) 45 × 32 mm where the span does not exceed 600 mm.

(b) 70 × 35 mm where their span is greater than 600 mm but not greater than 1.5 m.

In masonry veneer buildings, the inner ends of soffit bearers shall either be supported by means of minimum 45 × 19 mm hangers from rafters (see Figure 7.15(a)), or shall be fixed to the external wall studs (see Figure 7.15(b)). In the case of masonry veneer buildings where soffit bearers are supported by the wall frame, a minimum 12 mm clearance shall be provided between the soffit bearer and the top of the masonry to allow for frame shrinkage.



(a) Hanger support (b) Wall frame fixing

FIGURE 7.15 TYPICAL BOXED EAVES CONSTRUCTION

7.2.25 Gable or verge construction

7.2.25.1 *General*

Gables or verges shall be formed either—

(a) with rafters supported on cantilevered extensions of ridgeboards or beams, underpurlins, intermediate beams and wall plates; or

(b) with outriggers or outriggers at right angles to and trimmed into common rafters or trusses, which shall be adequately fixed and nogged to prevent overturning and to provide fixing for roof battens.

Members cantilevered to support gables shall not project beyond their supports by more than 25% of the allowable span of the member and their backspan shall be at least twice that of the cantilever.

7.2.25.2 *Open gables*

Open gable end walls may be constructed using—

(a) for exposed rafter (cathedral) roofs, studs continuous up to a raking top plate below rafters;

(b) for pitched roofs with a horizontal ceiling, gable end studs supported off the top plate; or

(c) gable trusses fully supported off the gable end wall (see Figure 7.16).

Gable end studs or additional vertical members and trusses shall be provided at the spacing required to fix cladding, or brick veneer where used, and shall be of sufficient size and stress grade to support dead, live and wind loads. For gable end studs, see Span Table A19 in Appendix A.

Open gable eaves may be unlined or may be sheeted on the upper side or the underside of rafters.

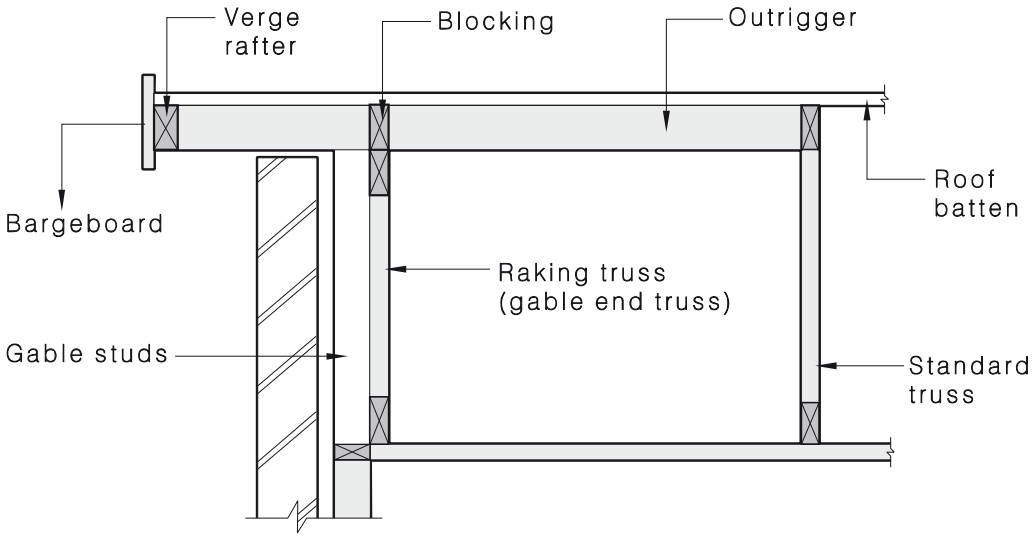


FIGURE 7.16 OPEN GABLE OR VERGE—TRUSSED ROOF

7.2.25.3 *Boxed gables*

Boxed gables shall have 70 × 35 mm soffit bearers fixed between the lower ends of gable studs and the frame wall. Horizontal location for gable studs and fixing for lower edges of gable lining shall be provided by a 70 × 35 mm plate on edge level with the soffit bearers (see Figure 7.17).

Boxed gables shall be securely fixed off the structural wall plate with strutting or bracing as necessary to support the load of the gable framing and the roof covering.

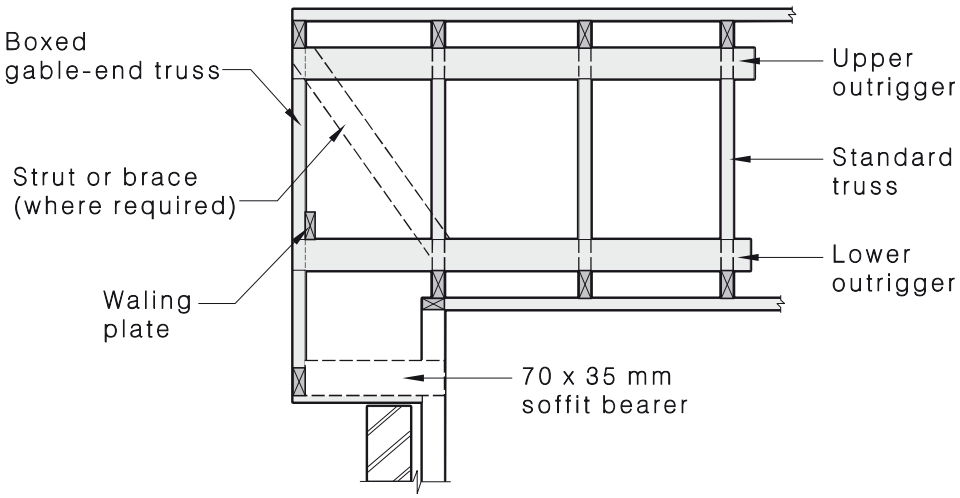
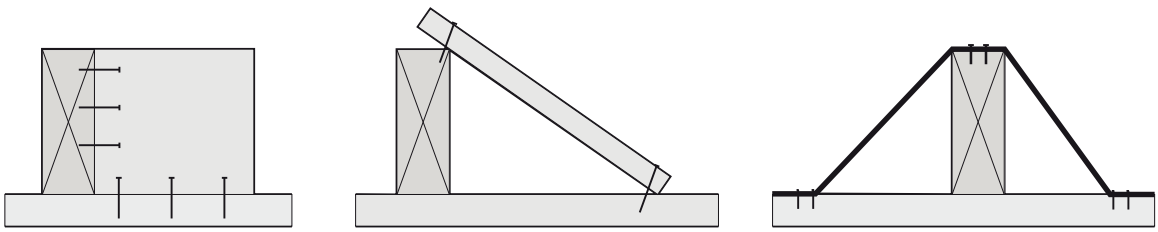


FIGURE 7.17 BOXED GABLE—TRUSSED ROOF

7.2.26 Lateral restraint of hanging, strutting, strutting/hanging beams, and similar members

Where required, lateral restraint shall be provided by one of the methods shown in Figure 7.18.



(a) Block skew-nailed to beam and to support with 3/75 mm skew nails to each member

(b) Min 35 × 32 mm tie nailed to top of beam and to support with 2/75 mm nails each end (see Note 2)

(c) Galvanized strap nailed to support and top of beam with 2/30 × 2.8 mm nails each end and to beam (see Note 2)

NOTES:

1 Method used depends upon whether the ceiling joists are at 90° or parallel to the beam.

2 Methods given in Figures (b) and (c) are particularly suitable for restraining strutting beams and strutting/hanging beams at the intermediate points where the beams are supported, as they also permit these beams to be supported up clear of the ceiling joists by packing under at their supports.

FIGURE 7.18 LATERAL RESTRAINT

7.2.27 Framing around chimneys and flues

Placement of all framing members around chimneys and flues shall be in accordance with AS 1691 and AS/NZS 2918.

7.3 MEMBER SIZES

7.3.1 General

Clauses 7.3.2 to 7.3.17 provide details for the determination of roof framing member sizes.

Member sizes shall be determined from the Span Tables given in Appendix A for coupled or non-coupled roof construction, as appropriate (see Figure 7.1).

7.3.2 Ceiling battens

For glued or glued and screwed or machine-driven nailed ceiling linings with a mass up to 12 kg/m^2, the minimum ceiling batten sizes shall be as given in Table 7.1. For hand-driven nailed or hand-driven nailed and glued ceiling linings, batten sizes may need to be increased to avoid damage to ceiling lining or fixings due to flexibility.

TABLE 7.1

CEILING BATTEN SIZE

Ceiling batten grade	Rafter or truss spacing, mm								
	600			900			1200		
	Batten spacing, mm								
	300	450	600	300	450	600	300	450	600
F5 Unseasoned	38 × 38	38 × 38	38 × 38	38 × 38	38 × 38	38 × 38	38 × 50	38 × 75	38 × 75
F8 Unseasoned	25 × 38	25 × 38	25 × 38	25 × 50	38 × 38	38 × 38	38 × 38	38 × 38	38 × 50
F5 Seasoned	35 × 42	35 × 42	35 × 42	35 × 42	35 × 42	35× 42	35 × 42	35 × 42	38 × 42

7.3.3 Ceiling lining and non-trafficable roof decking

7.3.3.1 *General*

Ceiling lining or non-trafficable roof decking shall be attached directly to rafters or purlins, the underside of ceiling joists, bottom or top chord of trusses or to battens, to ensure the integrity of the roof and the ceiling diaphragm.

NOTE: Suspended ceiling systems are not be assumed to provide diaphragm action to transfer wind loads to bracing walls.

7.3.3.2 *Tongued and grooved non-trafficable roof decking*

Tongued and grooved timber boards used for non-trafficable roofs shall be in accordance with Table 7.2.

Where boards are not at right angles to rafters, the spacing of support shall be taken along the length of the board.

TABLE 7.2

TONGUED AND GROOVED BOARDS FOR NON-TRAFFICABLE ROOFS

Standard	Timber	Visual grade	Minimum thickness of boards, mm			
			Spacing of supports, mm			
			450	600	900	1200
AS 2796.1	Western Australian hardwoods	Standard	11	13	19	24
		Select	10	12	17	22
AS 2796.1	South-eastern Australian hardwoods	Standard	10	13	19	24
		Select	11	12	17	22
AS 2796.1	North-eastern Australian hardwoods	Standard	10	13	18	23
		Select	10	12	17	22
AS 4785.1	Radiata	One grade	12	15	21	26
AS 1810	Cypress	Grade 1 and Grade 2	12	15	21	27
AS 4785.1	Softwood	Standard and Select	12	15	21	26
AS 2796.1	Hardwood (density less than 560 kg/m^3)					
AS 4785.1	Softwood	Standard and Select	11	14	20	25
AS 2796.1	Hardwood (density greater than, or equal to, 560 kg/m^3)					

NOTES:

1 Where battens are used and sized for the rafter spacing, lining is not considered structural.

2 Finger jointing is permitted.

3 Allowance has been made for light sanding.

7.3.3.3 *Structural plywood for non-trafficable roof decking*

Structural plywood used for non-trafficable roof decking shall be in accordance with Table 7.3.

TABLE 7.3

STRUCTURAL PLYWOOD TO AS/NZS 2269.0 FOR NON-TRAFFICABLE ROOFS

Maximum rafter or truss spacing	Minimum allowable plywood thickness, mm		
	Stress grade		
mm	F8	F11	F14
800	13	12	12
900	16	15	15
1200	19	17	16

NOTE: Allowance has been made for light sanding.

Plywood sheets shall be laid with the grain of the face ply parallel to the span, and shall be continuous over at least two spans. Tabulated spacing shall be reduced by 25% if supported over one span only. Edges of sheets that are not tongued and grooved shall be supported.

Structural plywood shall be fixed to all end and intermediate supports with—

(a) 2.8 × 50 mm flat-head nails at 200 mm centres for general roof areas and 100 mm centres for areas within 1200 mm of the roof perimeter; or

(b) for all roof areas with No. 8 × 40 mm Type 17 countersunk screws at 200 mm centres.

7.3.4 Loads on ceilings

The member sizes given for ceiling joists, hanging beams, and similar members, are suitable for the support of normal ceiling loads and linings. Where ceiling framing is required to support other loads, including ladder or stair systems, storage, hot water systems or similar building services, the framing shall be designed in accordance with AS 1720.1.

7.3.5 Binders

Binders may be required in ceilings to provide lateral restraint to external walls. Where required, they shall be a minimum of 35 × 70 mm. For details on the lateral restraint of external walls, see Clause 6.2.5.

7.3.6 Ceiling joists

The size of ceiling joists shall be determined from Span Table A27 in Appendix A.

7.3.7 Hanging beams

The size of hanging beams shall be determined from Span Table A28 in Appendix A. Hanging beams shall support ceiling loads only via ceiling joists.

The top edge of hanging beams of a depth to breadth ratio exceeding 7 shall be laterally restrained at their supports.

7.3.8 Counter beams

The size of counter beams shall be determined from Span Table A29 in Appendix A. This Table may also be used for lintels in internal walls supporting hanging beams. Counter beams shall support ceiling loads via hanging beams.

7.3.9 Combined strutting/hanging beams

The size of combined strutting/hanging beams shall be determined from Span Table A30 in Appendix A. Combined strutting/hanging beams may support both roof loads from struts and ceiling loads from ceiling joists.

The top edge of combined strutting/hanging beams with a depth to breadth ratio exceeding three, shall be laterally restrained at their supports and intermediately restrained at the strutting points.

7.3.10 Combined strutting/counter beams

The size of combined strutting/counter beams shall be determined from Span Table A31 in Appendix A. Combined strutting/counter beams may support roof loads from struts and hanging beams from ceiling loads.

The top edge of combined strutting/counter beams, of a depth to breadth ratio exceeding 3, shall be laterally restrained at their supports.

7.3.11 Strutting beams

The size of strutting beams shall be determined from Span Table A32 in Appendix A. Strutting beams shall support roof loads only.

The top edge of strutting beams, of a depth to breadth ratio exceeding 3, shall be laterally restrained at their supports and intermediately at the strutting points.

7.3.12 Underpurlins

The size of underpurlins shall be determined from Span Table A33 in Appendix A. The ends of underpurlins may project (cantilever) beyond a support by up to 25% of the maximum allowable span of the underpurlin, provided the actual backspan is at least three times the cantilever length.

7.3.13 Rafters and purlins

7.3.13.1 *General*

The size of rafters supporting roofing only shall be determined from Span Table A34 in Appendix A. The size of rafters supporting roof and ceiling loads (cathedral roofs) shall be determined from Span Table A35 in Appendix A.

7.3.13.2 *Rafter overhangs*

Rafter overhang limits contained in the Span Tables in Appendix A are applicable for use with a birdsmouth notch not exceeding one-third of the rafter depth in combination with a structural fascia that is rigidly connected to the ends of the rafters (see Figure 7.19(a)). A minimum timber (softwood) structural fascia of 190 × 19 mm shall be used.

NOTES:

1 The maximum overhangs permitted by the Span Tables in Appendix A and Clause 7.3.13.3 may not be suitable for the support of attachments (pergolas and similar constructions) to the ends of overhangs.

2 Grooves in fascia, to accept eaves lining, are permitted.

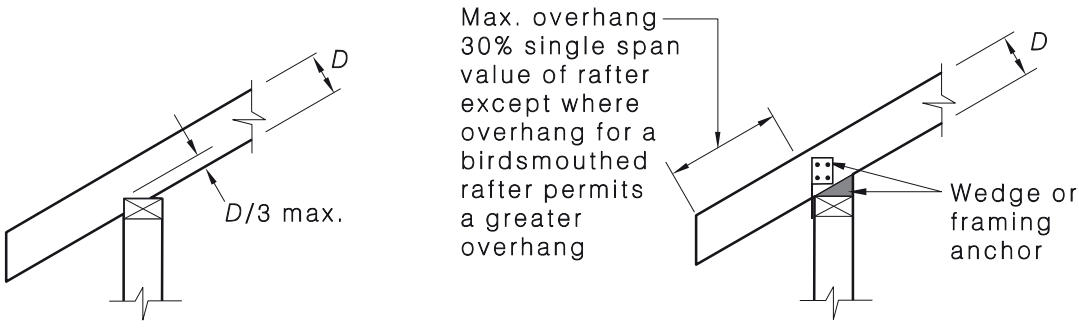
3 For additional limitations on rafter overhangs, refer to the Notes to Span Tables A34 and A35 in Appendix A, and Figure 7.15(b).

7.3.13.3 *Birdsmouthed and non-birdsmouthed rafters*

Where rafters are not birdsmouthed over top plates as shown in Figure 7.19(b), the allowable overhang may be 30% of the single-span value, up to a maximum of 750 mm, for all roof masses. Full bearing shall be provided by means of timber wedges or other alternative support systems; for example, framing anchors which provide equivalent bearing support.

Where rafters are birdsmouthed less than one-third of the depth of the rafter, the allowable overhang may be determined by interpolation between the overhang permitted for a one-third depth birdsmouth and the overhang permitted for a non-birdsmouthed rafter, with a maximum of 750 mm.

In hipped roofs, where common rafters are projected to form rafter overhangs that equal or exceed 750 mm, the hip or valley rafters shall be reinforced with 2/70 × 35 × 900 mm long fishplates extending 450 mm either side of the birdsmouth.



(a) Birdsmouthed (b) Non-birdsmouthed

FIGURE 7.19 RAFTER OVERHANG AND BIRDSMOUTHING

7.3.13.4 *Dressed rafters*

Table 7.4 provides span and overhang reductions for dressed (undersized) rafters, as may be used in cathedral or flat/skillion roofs where rafters are exposed to view.

Unseasoned timber dressed sizes shall be not more than 10 mm in depth or thickness under the nominal sizes stated in the rafter Span Tables in Appendix A, except that for 38 mm nominal thickness, the dressed thickness shall be not less than 32 mm.

Seasoned timber dressed sizes shall be not more than 10 mm in depth and 5 mm in thickness under the sizes stated in the rafter Span Tables in Appendix A. Where the nominated sections suitable for nail lamination are used, each lamination shall be not more than 10 mm in depth and 5 mm in thickness under the sizes stated.

The allowable overhang shall not exceed 30% of the reduced span value for a dressed rafter.

TABLE 7.4

REDUCED SPANS AND OVERHANGS FOR DRESSED RAFTERS

Rafter depth	Allowable span for dressed beams as a percentage of allowable undressed beam span	
mm	Seasoned timber	Unseasoned timber
Under 200	80%	85%
200 to 300	85%	90%
Over 300	Not applicable	95%

7.3.14 Ridge or intermediate beams—Cathedral, skillion roofs, or similar roofs

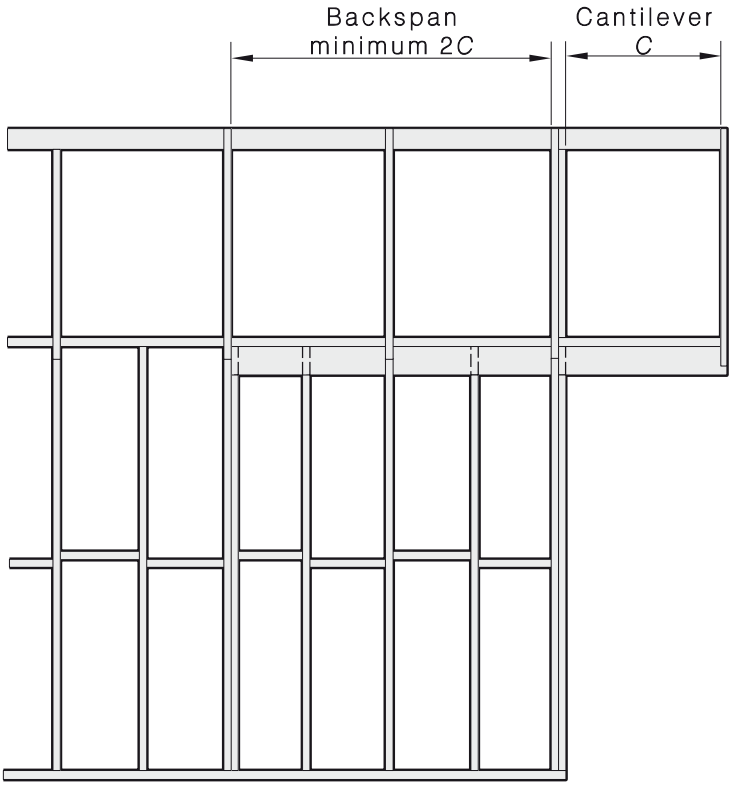
The size of ridge or intermediate beams in non-coupled cathedral, skillion or similar roofs shall be determined from Span Table A36 in Appendix A.

7.3.15 Roof battens

The size of roof battens shall be determined from Span Table A37 in Appendix A.

7.3.16 Cantilevered gable ends

Where cantilevered at gable ends as shown in Figure 7.20, the size of lintels, verandah beams, underpurlins, and similar members, shall be determined from the appropriate Span Table in Appendix A for a single span equal to three times the cantilever distance. The backspan of the cantilevered member shall be at least twice the cantilever length. For ridge and intermediate beams, the cantilever shall not exceed the value given in Span Tables in Appendix A.



NOTE: To determine the size of a cantilevered member, refer to the appropriate Span Tables in Appendix A, using single span = 3 *C*.

FIGURE 7.20 CANTILEVERED GABLE ENDS

7.3.17 Other members/components

Requirements for miscellaneous roof framing members, which are not given in the Span Tables in Appendix A, are specified in Table 7.5.

Junction of ridgeboard and hip or valley rafters shall be strutted where hip or valley rafters exceed 5 m span, or where underpurlins are supported off hip rafters.

Roof strut length shall be measured from the underside of the underpurlin, or ridgeboard, or hip rafter, to the top of the strutting beam or wall.

TABLE 7.5
OTHER MEMBERS AND COMPONENTS

Member	Application	Minimum size, mm
Ridgeboards	Unstrutted ridge in coupled roof	Depth not less than length of the rafter plumb-cut × 19 thick
	Strutted ridge in coupled roof with strut spacing not greater than 1800 mm	Depth not less than length of the rafter plumb-cut × 19 thick
	Strutted ridge in coupled roof with strut spacing greater than 1800 and up to 2300 mm	Depth not less than length of the rafter plumb-cut × 35 thick
Hip rafters	Stress grade F11/MGP15 minimum and not less than rafter stress grade	50 greater in depth than rafters × 19 thick (seasoned) or 25 thick (unseasoned)
	Stress grades less than F11/MGP15	50 greater in depth than rafters × min. thickness as for rafters
Valley rafters	Minimum stress grade, as for rafters	50 greater in depth than rafters with thickness as for rafters (min. 35)
Valley boards	See Note	19 min. thick × width to support valley gutter
Roof struts (sheet roof)	Struts to 1500 mm long for all stress grades	90 × 45 or 70 × 70
	Struts 1500 mm to 2400 mm long for all stress grades	70 × 70
Collar ties	Ties to 4200 mm long for F8/MGP12 or higher stress grade	70 × 35
	Ties to 4200 mm long for less than F8/MGP 12 stress grade	70 × 45 or 90 × 35
	Ties over 4200 mm long for F8/MGP 12 or higher stress grade	90 × 35
	Ties over 4200 mm long for less than F8/MGP 12 stress grade	90 × 45 or 120 × 35
Soffit bearers (boxed eaves)	Max. span 600 mm	42 × 35
	Span 600 mm to 1500 mm	70 × 35
Soffit bearer hangers	Where applicable	42 × 19
Fascias	Rigidly connected to rafter overhangs	190 × 19
Gable struts	Braces for gable ends	See Section 8
Roof struts (tiled roof)	Struts to 1500 mm long for F8/MGP12 and higher stress grades	90 × 45 or 70 × 70
	Struts to 1500 mm long for less than F8/MGP12 stress grade	70 × 70
	Struts 1500 mm to 2400 mm long for F8/MGP12 and higher stress grades	70 × 70
	Struts 1500 mm to 2400 mm long for less than F8/MGP12 stress grade	90 × 70

Roof struts (Roof load area up to 12 m^2)

Roof type	Length, mm	Grade	Type	Size, mm
Sheet	Up to 1500	F5 or better	Solid, glued or nail-laminated	90 × 45 or 2/70 × 35
	1501 to 2400			2/90 × 45
	2401 to 3000	F8 or better		2/90 × 45
	3001 to 3600	MGP 12 or better		2/90 × 45
Tile	Up to 1500	F5 or better	Solid, glued or nail-laminated	2/70 × 45 or 2/90 × 35
	1501 to 2400	F8 or better	Nail-laminated	2/120 × 45
			Solid or glue-laminated	2/90 × 35
	2401 to 3000	MGP 12 or better	Nail-laminated	2/120 × 45
			Solid or glue-laminated	2/90 × 35
	3001 to 3600	MGP 12 or better	Solid or glue-laminated	2/90 × 45

NOTE: 175 × 25 × 6 mm hardwood weatherboards may also be used for valley boards.

SECTION 8 BRACING

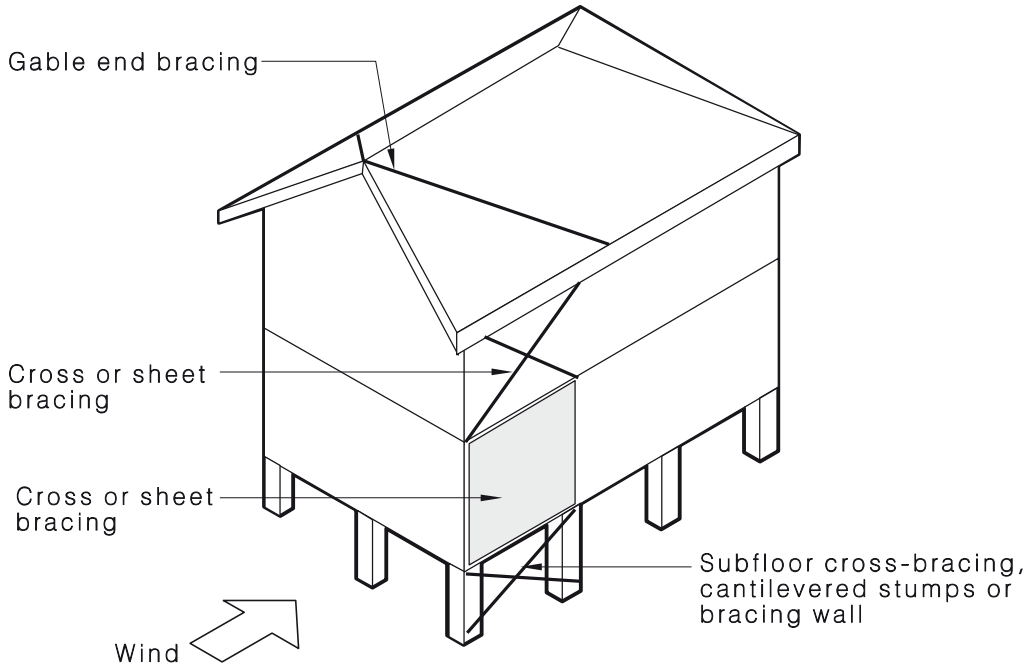
8.1 GENERAL

Permanent bracing shall be provided to enable the roof, wall and floor framework to resist horizontal forces applied to the building (racking forces). Appropriate connection shall also be provided to transfer these forces through the framework and subfloor structure to the building's foundation.

Where required, bracing within the building, which normally occurs in vertical planes, shall be constructed into walls or subfloor supports and shall be distributed evenly throughout.

Where buildings are more than one storey in height, wall bracing shall be designed for each storey.

NOTE: Figure 8.1 illustrates examples of the types and positions where bracing is required.



NOTES:

1 Horizontal wind (racking) forces are applied to external surfaces that are supported by horizontal or near horizontal diaphragms. Diaphragms include roofs, ceilings and floor surfaces including their associated framing.

2 Each horizontal diaphragm transfers racking forces to lower level diaphragms by connections and bracing. This continues down to the subfloor supports or concrete slab on the ground, where the forces are then resisted by the foundations.

FIGURE 8.1 VARIOUS BRACING SYSTEMS CONNECTING HORIZONTAL DIAPHRAGMS

8.2 TEMPORARY BRACING

Temporary bracing is necessary to support wind and construction loads on the building during construction. Temporary bracing shall be equivalent to at least 60% of permanent bracing required. Temporary bracing may form part of the installed permanent bracing.

NOTE: The wind forces on unclad frames may be equal to, or greater than, those on a completed clad or veneered house.

8.3 PERMANENT BRACING

8.3.1 Subfloor bracing

8.3.1.1 *General*

Subfloor bracing shall comply with the relevant details given in Table 8.1.

Brickwork for subfloor bracing shall comply with the requirements of the relevant authority.

TABLE 8.1

SUBFLOOR BRACING REQUIREMENTS

Single- or two-storey building	Outer wall construction (see Note 1)	Full perimeter masonry base (see Note 2)	Max. height of stumps above ground (see Note 3)	Bracing requirement in Clause
Single- or two-storey construction	B.V. or clad frame	Yes	1200 mm	8.3.1.2
Single-storey construction	Clad frame	No	1800 mm	8.3.1.3

NOTES:

1 B.V. = brick veneer on timber frame; clad frame = timber frame with attached timber or other cladding.

2 Minimum 110 mm unreinforced brickwork with engaged piers.

3 Stump/post sizes, height and embedment, see Section 3.

4 For additional subfloor bracing information, see AS 1684.2.

8.3.1.2 *Full perimeter masonry base*

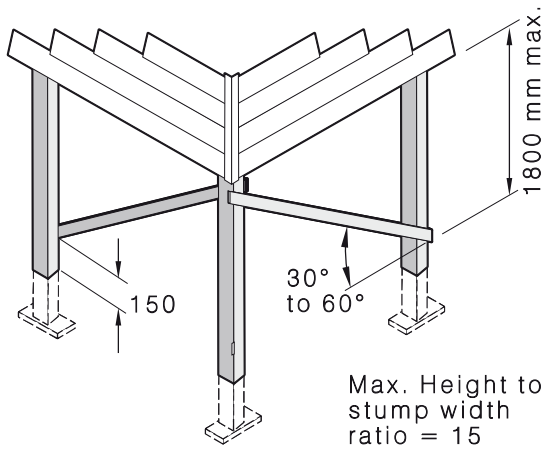
Where there is a full perimeter masonry base, the subfloor structure shall be considered to be adequately braced.

8.3.1.3 *Diagonal bracing*

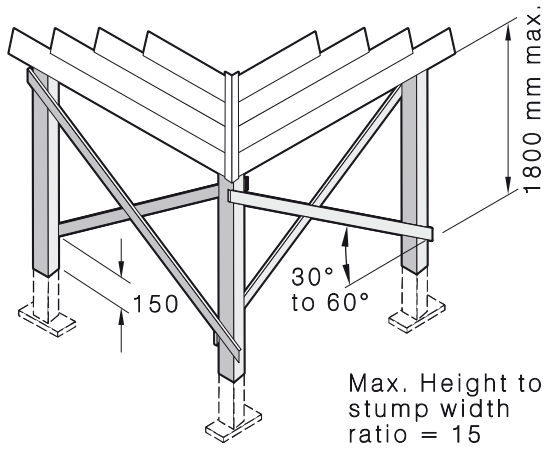
Diagonal bracing shall be provided to corner stumps/posts and the two adjacent stumps/posts in each case, or an equivalent bracing system shall be provided (see Figure 8.2).

Where the height of the floor prevents the use of diagonal bracing, concrete backfill shall be provided to the corner stump and the two adjacent stumps.

Where height and spacing of stumps permit, bracing shall be fixed across three stumps. A 12 mm diameter galvanized through-bolt nut and washer shall be used to fix the bracing at each point of contact and round stumps shall be checked out 12 mm in depth to accept the bracing.



(a) Angle bracing—Minimum 600 mm stump embedment



(b) Cross-bracing—Minimum 450 mm stump embedment

Brace sizes:
Up to 2100 mm long—70 ×35 mm
2100 mm to 3600 mm long—70 × 45 mm
3000 mm to 4800 mm long—90 × 45 mm

FIGURE 8.2 STUMP BRACING FOR SINGLE-STOREY CONSTRUCTION WITHOUT A MASONRY BASE

8.3.2 Wall bracing

8.3.2.1 *General*

Walls shall be permanently braced to resist horizontal racking forces applied to the building.

Structural wall bracing is classified as Type A or Type B bracing units (see Clause 1.5(f)). Type A and Type B bracing units are defined in Table 8.3.

NOTE: The nail spacings given in Table 8.3 are nominal maximum spacings.

Walls shall be permanently braced with any of the described bracing units, or a combination of bracing units. Nominal bracing, as defined in Clause 8.3.2.4, may provide up to a maximum of 50% of the total bracing required.

Other types of structural bracing may be used provided the total capacity of the bracing system is equivalent to that obtained in accordance with this Standard.

Cut-in diagonal timber or metal angle braces shall only be installed in the same section of wall frame to one face of the wall; that is, notches are not permitted in both edges of the same stud. The distribution of bracing units shall be even (see Figure 8.4).

Type A and Type B bracing units shall be connected to the floor frame or concrete slab in accordance with Clauses 8.3.2.7 and 8.3.2.8.

8.3.2.2 *Procedure*

The procedure shall be as follows:

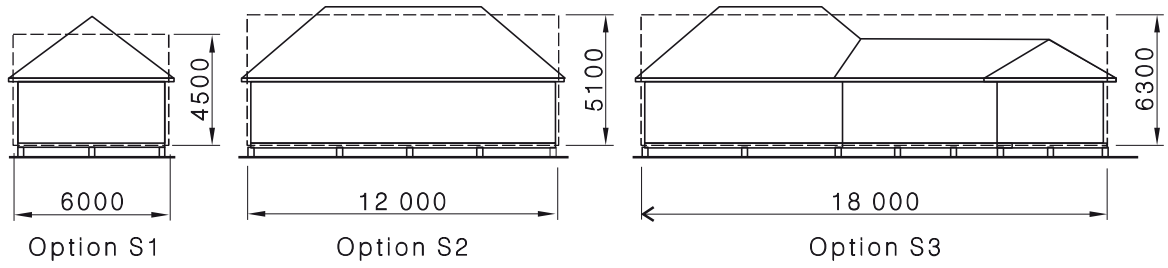
(a) Determine the wind classification (see Clause 1.4.2).

(b) From Figure 8.3 determine the appropriate house elevation option for single-storey or the upper storey or the lower storey of two-storey construction for both wind directions.

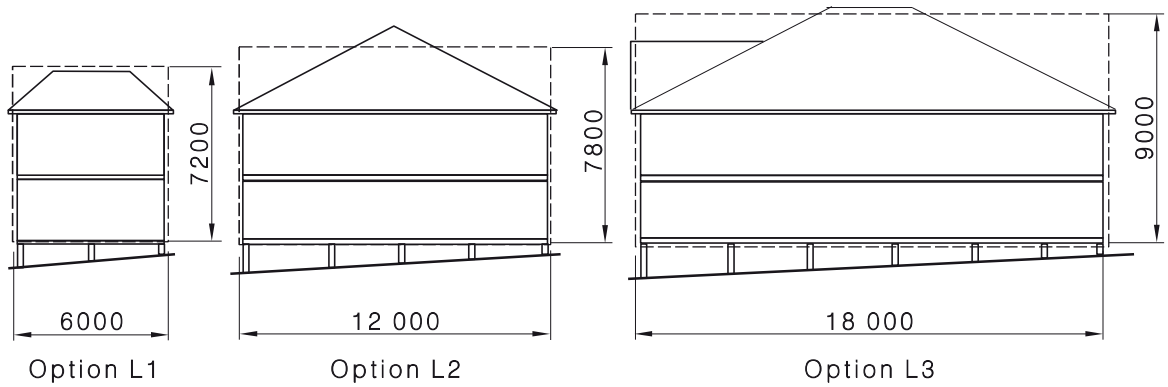
NOTE: For mixed construction, i.e., split level houses, it will be necessary to consider each section separately to determine the number of bracing units for each section for both wind directions.

(c) From Table 8.2 determine the number of bracing units required for each wind direction.

(d) Distribute the structural wall bracing units evenly (see Figure 8.4).



(a) Single- or upper-storey construction



(b) Lower storey of two-storey construction

NOTES:

1 Small areas of roof that project beyond the option limit are permitted, provided the parts that project beyond will fit within unused area remaining within the limit.

2 Multiples of, or a proportion of, the elevation options may be determined to accommodate larger or smaller buildings provided the total amount of required bracing is provided for each section or proportion of section.

3 Excluding gable overhang, eaves up to 750 mm wide may be ignored.

DIMENSIONS IN MILLIMETRES

FIGURE 8.3 HOUSE ELEVATION OPTIONS

TABLE 8.2
AMOUNT OF BRACING

Wind classification	Type of construction	House elevation options (see Figure 8.3)	Total number of Type A bracing units	
			Wind on all vertical surface elements (gable and skillion ends and flat walls) and on elevations with roof pitch up to 5°	Wind on elevations with roof pitch greater than 5°
N1	Single- or upper-storey construction	S1 S2 S3	4 10 20	4 8 16
	Lower storey of two-storey construction	L1 L2 L3	9 17 31	8 15 28
N2	Single- or upper-storey construction	S1 S2 S3	6 14 27	5 11 22
	Lower storey of two-storey construction	L1 L2 L3	11 24 42	10 22 38

8.3.2.3 *Rules and allowances*

The following shall apply:

(a) For each wind direction and storey, the house may be braced using a combination of Type A, Type B and nominal bracing.

(b) Nominal bracing shall not constitute more than 50% of the required bracing for each wind direction or in each storey.

(c) Where structural bracing (Type A or Type B) occurs in the same section of wall as nominal bracing, the nominal bracing in that section of wall shall not be considered as contributing to the house bracing requirements.

(d) A minimum of two structural bracing units (Type A or Type B) shall be provided in each overall length of external wall of each storey, located as close to the external corners as possible. Where the overall length of an external wall does not permit two structural bracing units to be provided, a minimum of one structural bracing unit (Type A or Type B) may be installed in lieu, provided a structural bracing unit is installed in a wall parallel to, and not more than 6.0 m away from, the external wall in question, and the ceiling between the walls is sheeted.

(e) One Type B bracing unit equals two Type A bracing units.

7.0 m of single-sided nominal bracing equals one Type A bracing unit.

4.0 m of double-sided nominal bracing equals one Type A bracing unit.

NOTE: The following provides an example of the application of the above:

(a) Wind classification N2.

(b) Bracing for lower storey of two-storey construction.

(c) House elevation option L1.

(d) Total bracing required for the direction being considered = 11 Type A units.

Alternatively, a combination of bracing using nominal bracing and Type A and/or Type B bracing units may be used, for example—

(i) 6 Type A bracing units plus 20 m of double-sided nominal bracing (5 × 4 m); or

(ii) 4 Type B bracing units plus 12 m of doubled-sided nominal bracing (3 × 4 m).

(f) Bracing units shall be installed at right angles to the wall area of elevation for which the bracing was defined.

8.3.2.4 *Nominal wall bracing*

Nominal wall bracing is wall framing lined with sheet materials such as plywood, plasterboard, fibre cement or hardboard, or similar materials, with sheeting fixed in accordance with relevant Australian Standards and the wall frames nominally fixed to the floor and the roof or ceiling frame.

Nominal wall bracing shall be evenly distributed throughout the building. If this is not the case, the contribution of nominal bracing shall be ignored.

8.3.2.5 *Structural wall bracing*

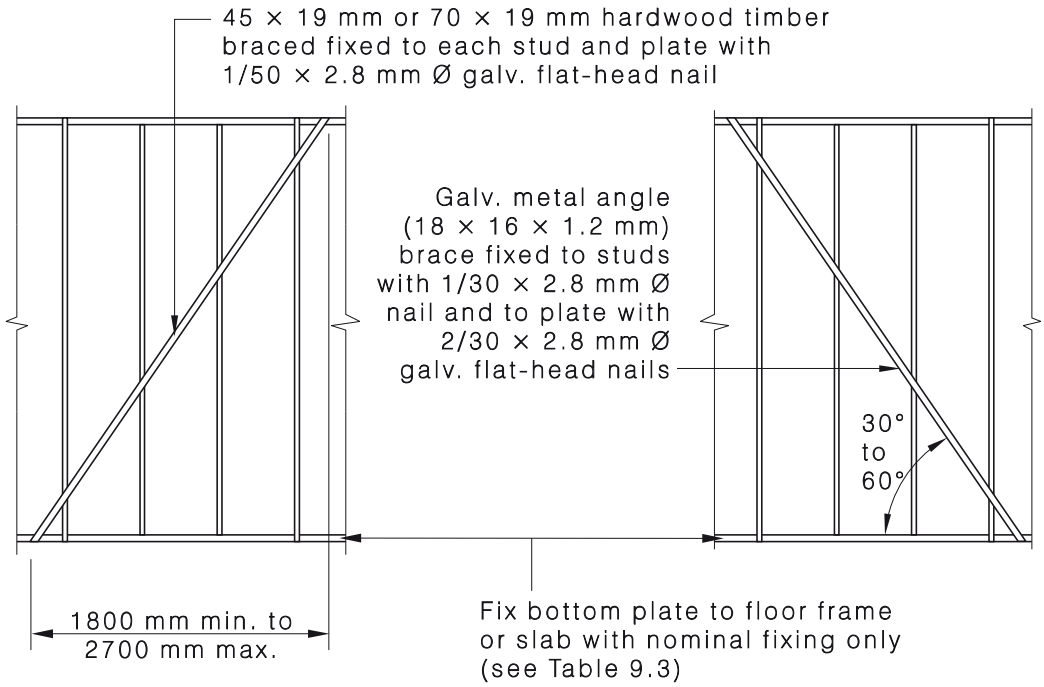
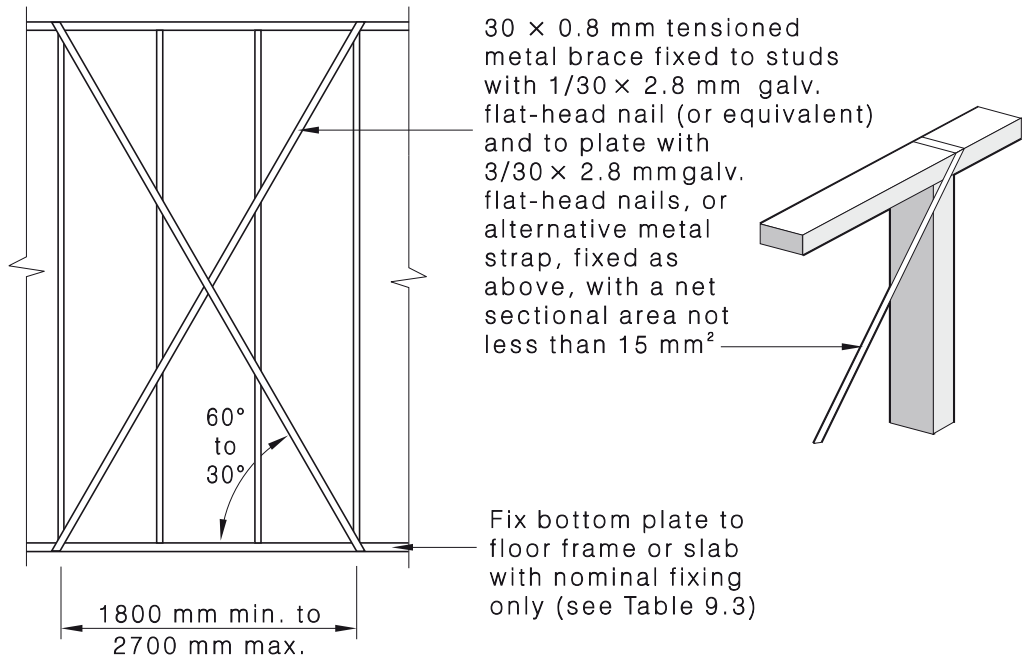
Structural wall bracing is purpose-fitted bracing, being either sheet or diagonal timber or steel bracing. Table 8.3 defines various structural bracing unit types (Type A or Type B).

For sheet-braced walls, the sheeting shall be continuous from the top plate to the bottom plate with any horizontal sheet joints made over nogging with the same fixings as required for top and bottom plates.

Unless otherwise noted, sheet bracing units shall be a minimum of 900 mm wide per Type A or Type B bracing unit.

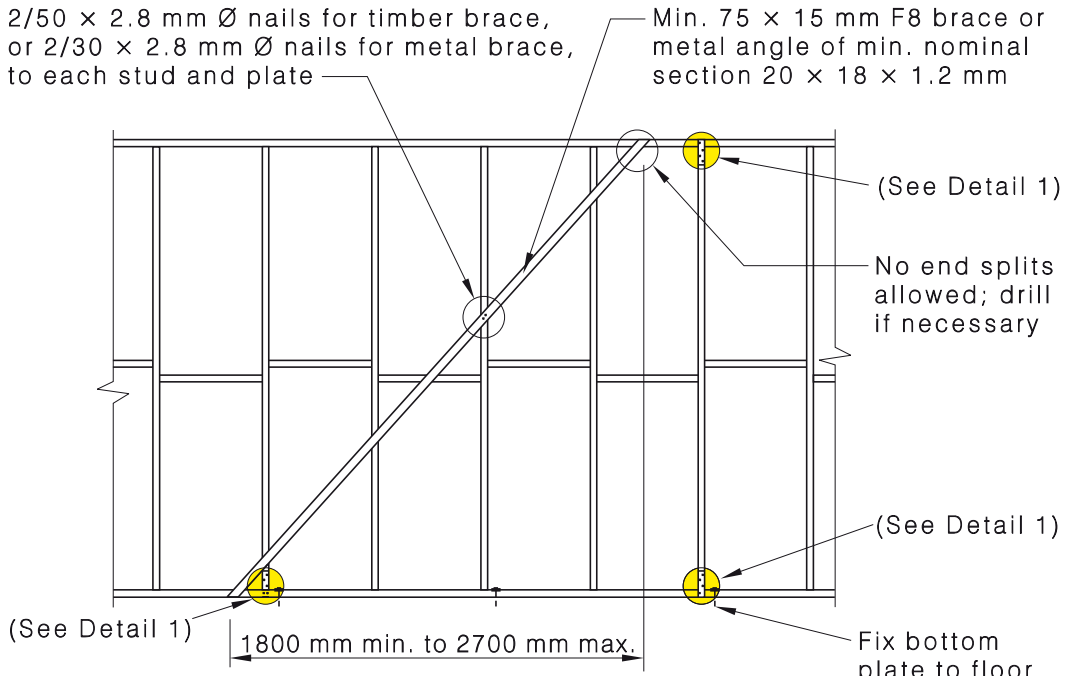
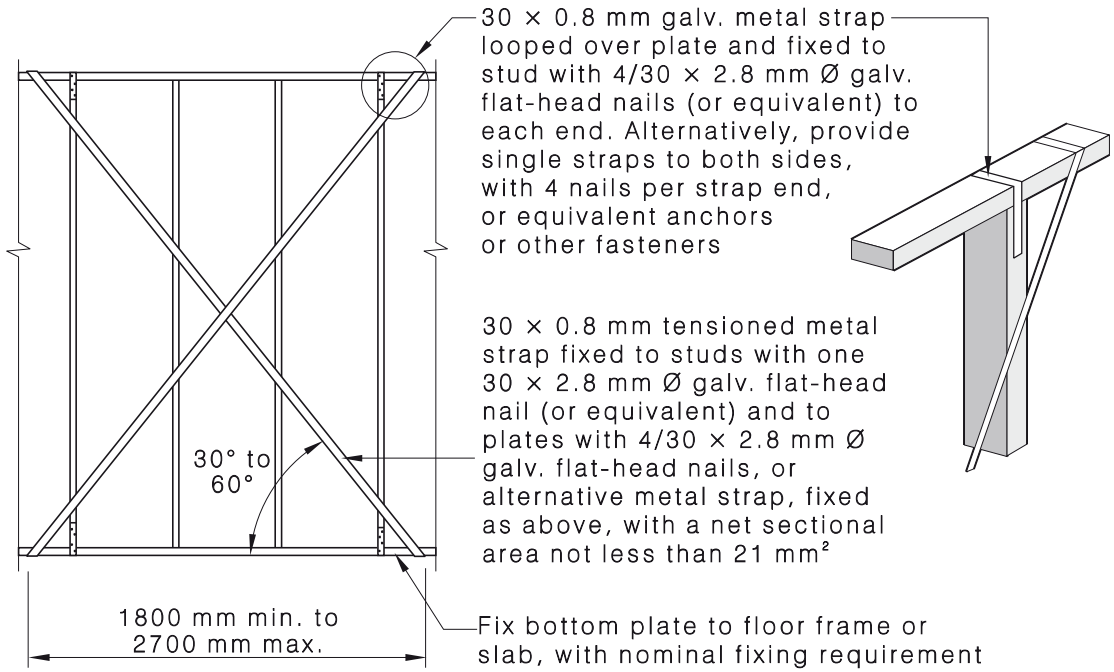
The minimum joint strength group of timber framing for bracing units given in bracing types (g) to (m) of Table 8.3 shall be JD4. If JD5 strength group of timber is used, the required number of bracing units shall be increased by 15%.

TABLE 8.3
STRUCTURAL WALL BRACING (MAXIMUM WALL HEIGHT 2.7 m)

Type of bracing	Bracing unit type
(a) *Two diagonally opposed timber or metal angle braces*  NOTE: All flat-head nails shall be galvanized or equivalent.	A
(b) *Metal straps—Tensioned*  	A

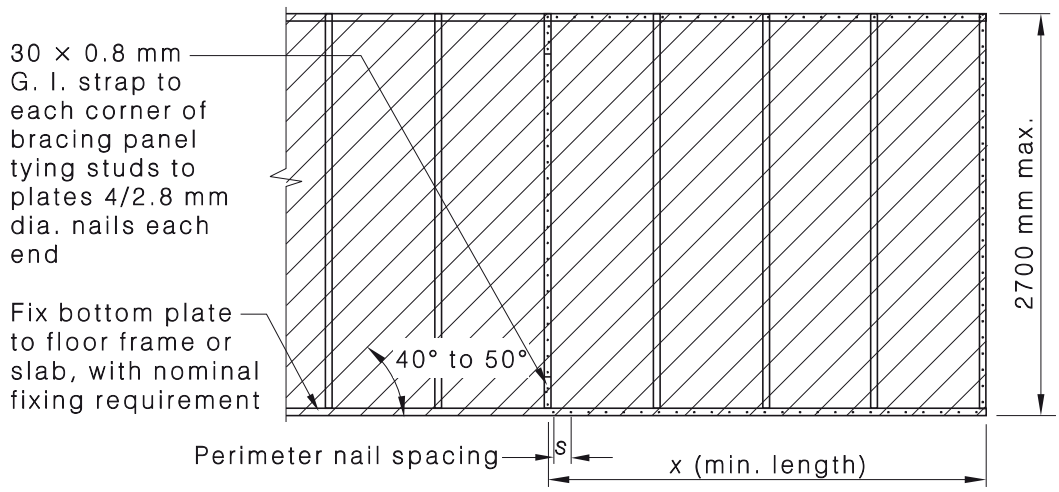
(*continued*)

TABLE 8.3 (*continued*)

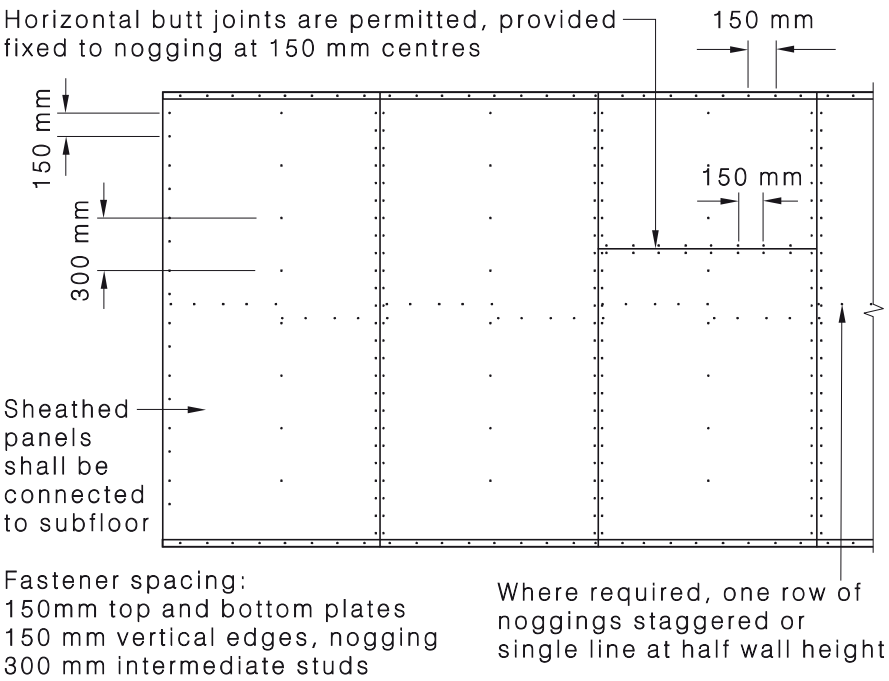
Type of bracing	Bracing unit type
(c) *Timber and metal angle braces* The maximum depth of a notch or saw-cut shall not exceed 20 mm. Saw-cut studs shall be designed as notched.  Detail 1: 30 × 0.8 mm galv. metal strap looped over plate and fixed to stud with 3/30 × 2.8 mm Ø galv. flat-head nails (or equivalent) to each end. Alternatively, provide single straps to both sides, with 3 nails per strap end, or equivalent anchors or other fasteners.	A
(d) *Metal straps—Tensioned—With stud straps*  	B

(*continued*)

TABLE 8.3 (*continued*)

<table>
<tr><th>Type of bracing</th><th>Bracing unit type</th></tr>
<tr><td>(e) Diagonal timber wall lining or cladding Intermediate crossings of boards and studs shall be fixed with one nail.
 

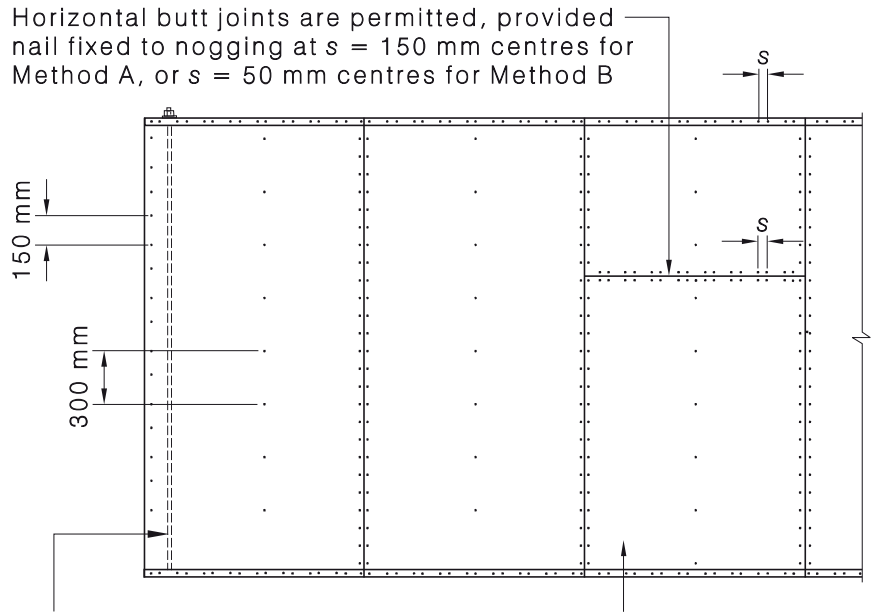
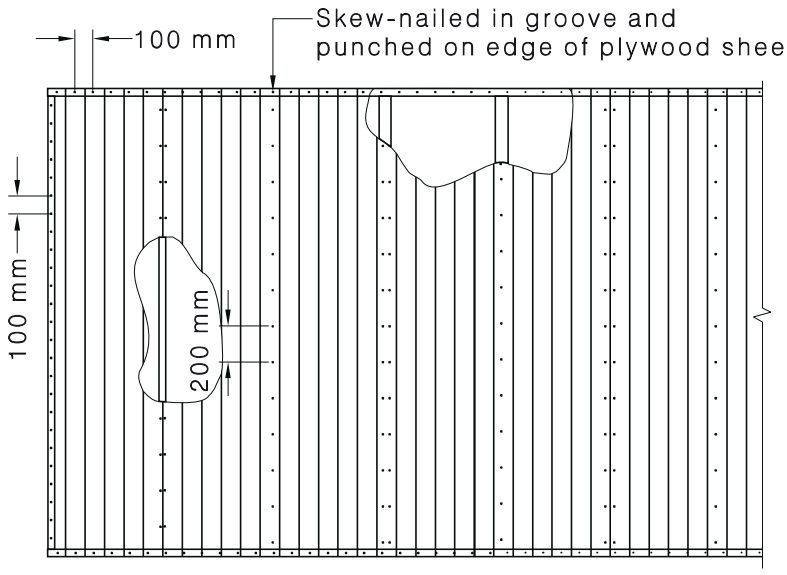
NOTES:
1 Noggings have been omitted for clarity.
2 Fixing of bottom plate to floor frame or slab: Method A—M10 cup-head bolt at each end of bracing panel or proprietary fastener with 5.6 kN capacity. Method B—M10 bolt at each end of bracing panel or proprietary fastener with 8.1 kN capacity.</td><td>A
x = 1400 mm
s = 60 mm

B
x = 2000 mm
s = 40 mm</td></tr>
<tr><td>(f) Other timber, metal angle and strap bracing shall be designed and installed in accordance with engineering principles.</td><td>—</td></tr>
<tr><td>(g) Plywood Plywood shall be nailed to frame using 30 × 2.8 ∅ mm galvanized flat-head nails or equivalent.
 

NOTES:
1 Each 900 mm panel = one Type A bracing unit.
2 No other rods or straps are required between top or bottom plate.
3 Fix bottom plate to floor frame or slab with nominal fixing only (see Table 9.3).</td><td>
<table>
<tr><td colspan="3">Minimum plywood thickness, mm</td></tr>
<tr><td rowspan="2">Stress grade</td><td colspan="2">Stud spacing mm</td></tr>
<tr><td>450</td><td>600</td></tr>
<tr><td colspan="3">No nogging (except horizontal butt joints)</td></tr>
<tr><td>F8
F11
F14
F27</td><td>7
4.5
4
3</td><td>9
7
6
4.5</td></tr>
<tr><td colspan="3">One row of nogging</td></tr>
<tr><td>F8
F11
F14
F27</td><td>7
4.5
4
3</td><td>7
4.5
4
3</td></tr>
</table>
</td><td>A</td></tr>
</table>

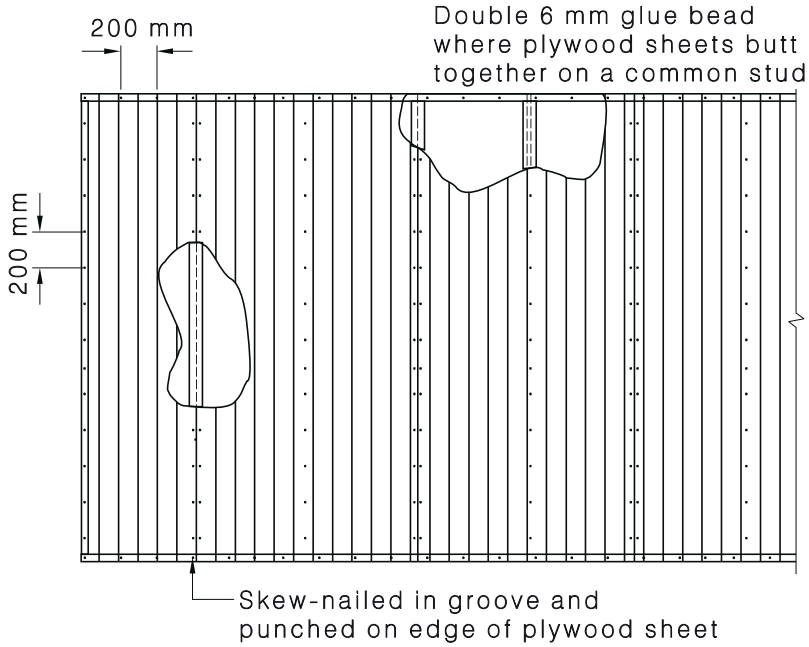
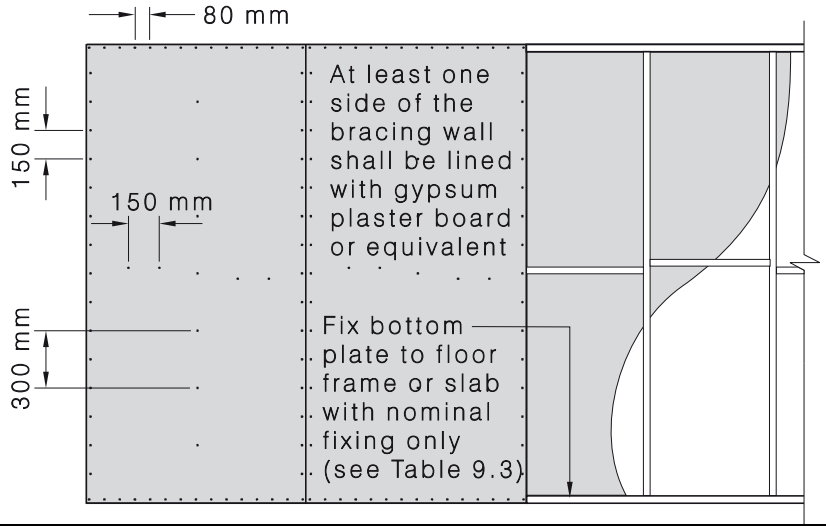
(*continued*)

TABLE 8.3 (*continued*)

Type of bracing		Bracing unit type
(h) *Plywood* Plywood shall be nailed to frame using 30 × 2.8 ∅ mm galvanized flat-head nails or equivalent. Method A requires M12 rods at each end of sheathed section top plate to bottom plate or floor frame. Method B has no rods but sheathing shall be nailed, at 50 mm centres, to top and bottom plates and any horizontal joists.  NOTE: Each 900 mm panel = one Type B bracing unit.	Minimum plywood thickness, mm Stress grade / Stud spacing mm: 450 / 600 F8: 7 / 9 F11: 6 / 7 F14: 4 / 6 F27: 4 / 4.5 Fastener spacing (*s*) mm Top and bottom plate: Method A 150; Method B 50 Vertical edges 150 Intermediate studs 300 Fixing of bottom plate to floor frame or slab Method A: M12 rods as shown plus an M10 bolt or other 13 kN capacity connection at max. 1200 mm centres. Method B: an M10 bolt or other 13 kN capacity connection at each end and intermediately at max. 1200 mm centres	B
(i) *Decorative plywood—nailed* Decorative plywood shall be nailed to frame using minimum 40 × 2.5 mm ∅ bullet-head nails. The depth of groove shall not exceed one-third the nominal thickness.  NOTE: Each 1400 mm panel = one Type A bracing unit.	Stress grade / Min. nominal thickness of decorative structural plywood F11: 6 mm Fastener spacing mm Top and bottom plates 100 Vertical edges 100 Intermediate studs 200 Max. stud spacing: 600 mm NOTE: Fix bottom plate to floor frame or slab with nominal fixing only (see Table 9.3).	A

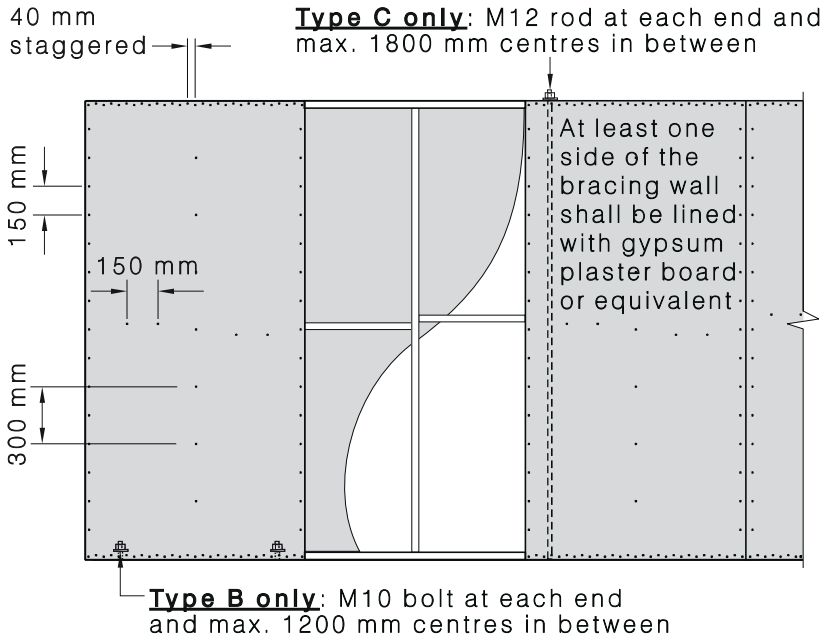
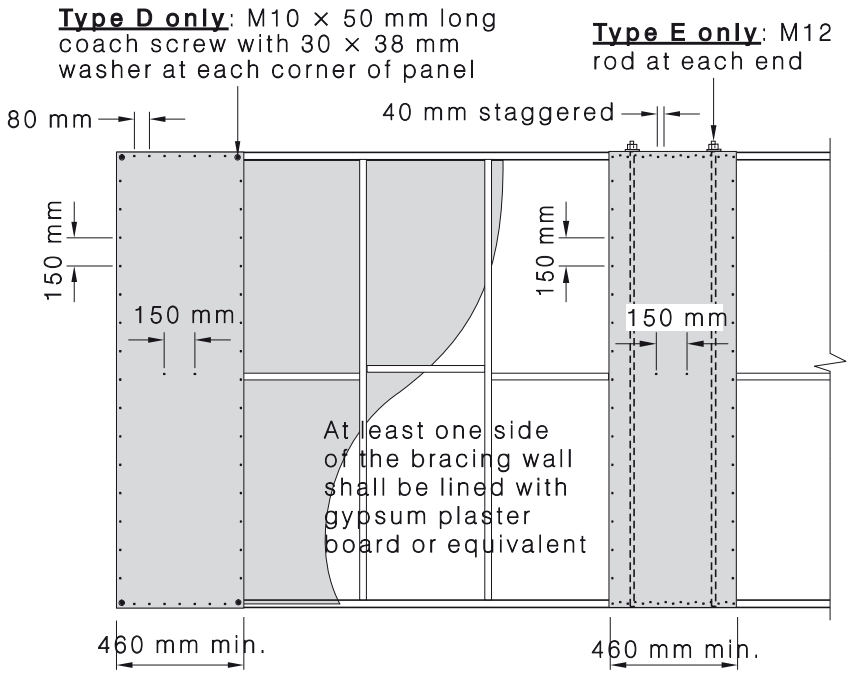
(*continued*)

TABLE 8.3 (*continued*)

Type of bracing		Bracing unit type
(j) *Decorative plywood—glued and nailed* Decorative plywood shall be nailed to frame using min. 40 × 2.5 mm ∅ bullet-head nails. Continuous 6 mm bead of elastomeric adhesive shall apply to studs and plates. Double 6 mm glued bead shall be used where plywood sheets butt together on a common stud. The depth of groove shall not exceed one-third the nominal thickness.  NOTE: Each 1200 mm panel = one Type B bracing unit.	Stress grade: F11 Min. nominal thickness of decorative structural plywood: 6 mm Fastener spacing mm: Top and bottom plates: 200 Vertical edges: 200 Intermediate studs: 200 Max. stud spacing: 600 mm NOTE: Fix bottom plate to floor frame or slab with an M10 bolt or other 13 kN capacity connection at each end of braced panel and at max. 1200 mm centres	B
(k) *Hardboard Type A* Hardboard shall comply with AS/NZS 1859.4. Hardboard shall be nailed to frame using minimum 30 × 2.8 mm ∅ galvanized flat-head nails or equivalent. Nails shall be located a minimum of 10 mm from the vertical edges and 15 mm from the top and bottom edges. Maximum stud spacing = 600 mm. Bracing panel minimum width = 900 mm.  	Minimum hardboard thickness 4.8 mm Fastener spacing, mm: Top and bottom plates: 80 Vertical edges and nogging: 150 Intermediate studs: 300 Fixing of bottom plate to floor frame or slab Type A: Nominal fixing only (see Table 9.3).	A

(*continued*)

TABLE 8.3 (*continued*)

Type of bracing			Bracing unit type
(l) *Hardboard Types B and C* Hardboard shall comply with AS/NZS 1859.4. Hardboard shall be nailed to frame using minimum 30 × 2.8 mm ∅ galvanized flat-head nails or equivalent. Nails shall be located a minimum of 10 mm from the vertical edges and 15 mm from the top and bottom edges. Maximum stud spacing = 600 mm. Bracing panel minimum width = 900 mm.  	Minimum hardboard thickness 4.8 mm Fastener spacing mm Top and bottom plates: 40 Vertical edges and nogging: 150 Intermediate studs: 300 Fixing of bottom plate to floor frame or slab Type B: M10 bolts each end and intermediately at max. 1200 centres. Type C: M12 rods at each end and at max. 1800 centres in between.		B
(m) *Hardboard Types D and E—Short wall bracing systems* Hardboard shall comply with AS/NZS 1859.4, and nailed to frame using minimum 30 × 2.8 mm ∅ galvanized flat-head nails or equivalent. Nails shall be located a minimum of 10 mm from the vertical edges and 15 mm from the top and bottom edges. Maximum stud spacing = 600 mm. Bracing panel minimum width = 460 mm.  	Minimum hardboard thickness 4.8 mm Fastener spacing, mm Top and bottom plates: Type D: 80; Type E: 40 Vertical edges and nogging: 150 Fixing of bottom plate to floor frame or slab Type D: Nominal fixing only (see Table 9.3). Type E: M12 rods at each end. NOTES: 1 Bolt/rod washer sizes as per Table 9.1. 2 Two panels of Type D equal one Type A bracing unit. 3 Two panels of Type E equal one Type B bracing unit.		2/Type D A 2/Type E B

8.3.2.6 *Distribution of bracing*

Bracing shall be approximately evenly distributed and shall be provided in both directions, as shown in Figure 8.4

NOTE: An example of even distribution of bracing is given in Figure C1, Appendix C.

Bracing shall initially be placed in external walls and, where possible, at the corners of the building. The rest of the bracing shall then be evenly distributed throughout the internal walls.

The distance between bracing units at right angles to the building length or width shall not exceed 9000 mm.

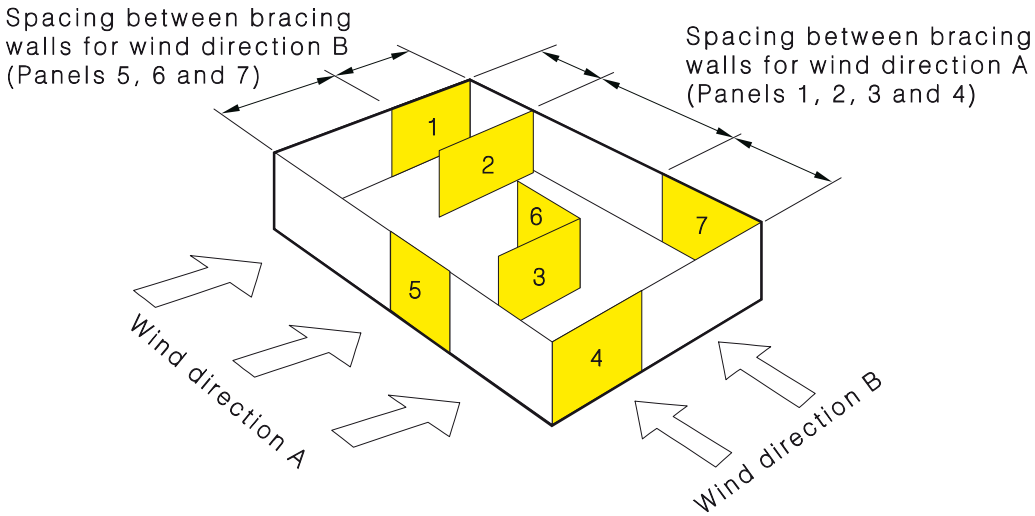


FIGURE 8.4 DISTRIBUTION OF WALL BRACING UNITS

8.3.2.7 *Connection at the bottom of bracing units*

The bottom of Type A and Type B bracing units shall be connected to the floor frame or concrete slab in accordance with the requirements in Table 9.3.

Typical connection for the bottom plates of walls tied to supporting floor joists, or slab, is shown in Figure 8.5 or 8.6, as applicable.

Fixings shall be to alternate joists only or at maximum 1200 mm centres.

NOTE: The fixings should commence as close as possible to the ends of each bracing section.

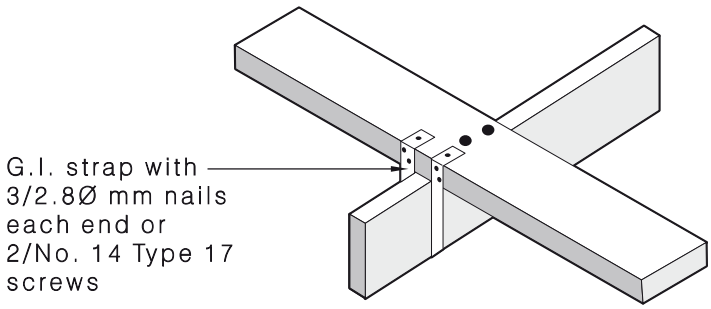


FIGURE 8.5 TYPICAL CONNECTION FOR TYPE B BRACING UNITS—BOTTOM PLATE TO SUPPORTING FLOOR FRAMING

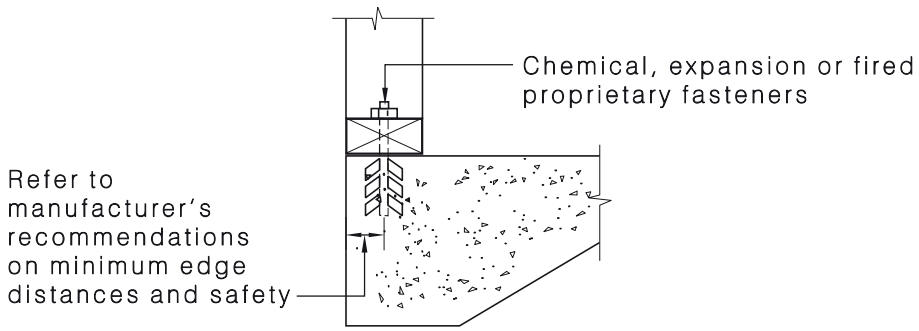


FIGURE 8.6 TYPICAL CONNECTION FOR TYPE B BRACING UNITS—BOTTOM PLATE TO CONCRETE SLAB

8.3.2.8 *Connection at the top of bracing units*

The top of all bracing units shall be fixed to the ceiling frame or roof frame in accordance with the following:

(a) Type A bracing units shall be fixed to rafters, ceiling joists or trimmers with a minimum of 6/3.05 mm diameter skew nails per bracing unit or other straps or framing anchors with a shear capacity of 3 kN.

(b) Type B bracing units shall be fixed to rafters, ceiling joists or trimmers with a minimum of 12/3.05 mm diameter skew nails per bracing unit or other straps or framing anchors with a shear capacity of 6 kN.

8.3.2.9 *Bracing units under eaves*

External walls under ends of eaves may be used as bracing units, provided they are suitably connected to the main ceiling diaphragms using appropriate connections such as crossed metal bracing straps to rafter overhangs or sheet bracing to rafter overhangs, as shown in Figure 8.7.

The same structural requirements that apply to normal external bracing walls shall apply to the external bracing walls under the ends of eaves.

The bracing units under eaves shall be limited to 20% of the total wall bracing required in each direction.

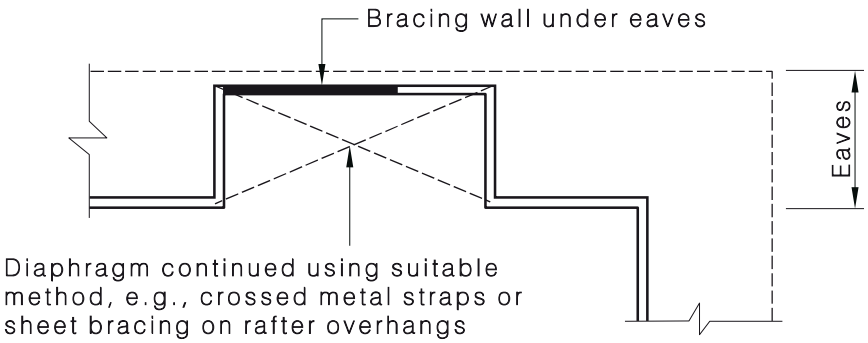


FIGURE 8.7 BRACING UNITS UNDER EAVES

8.3.3 Roof bracing

8.3.3.1 *Pitched roofs (coupled and non-coupled roofs)*

The following applies to the bracing of pitched roofs:

(a) *Hip roofs* Hip roofs do not require any specific bracing as they are restrained against longitudinal movement by hips, valleys and similar structures.

(b) *Gable roofs* For buildings with a roof pitch greater than 10° but less than 25°, roof bracing shall be provided in accordance with Table 8.4 and shall be braced using one of the following methods (see Figure 8.8):

(i) *Ridge to internal wall*—minimum of two timber braces in opposing directions at approximately 45° (see Table 8.4). Minimum timber grade F5 shall be used.

(ii) *Ridge to external wall plates*—single diagonal timber brace on both sides of the ridge running at approximately 45° from ridge to wall plate (see Table 8.4).

(iii) *Diagonal metal bracing*—single or double diagonal bracing shall be designed and installed in accordance with engineering principles.

(iv) *Structural sheet bracing*—structural sheet bracing shall be designed and installed in accordance with engineering principles.

Gable roofs with a pitch greater than 25° shall be braced in accordance with engineering principles.

TABLE 8.4

GABLE ROOF BRACING ALTERNATIVES

Brace location alternative	Brace specification*		
	Length, mm	Minimum size, mm	End connection
Ridge to internal wall in opposing directions	Up to 2100	70 × 45	5/3.05 nails or 4/3.33 ∅ nails
	Over 2100 to 2400	2/90 × 35	M10 cup-head bolt
	Over 2400 to 3000	2/90 × 45	M12 cup-head bolt
	Over 3000 to 4200	3/120 × 35	2/M10 cup-head bolts
Ridge to external wall plates on both sides of ridge.	As required	90 × 19 or 75 × 25 timber or equivalent metal system	5/3.75 nails each end

* See Clause 8.3.3.1(b)(i) for minimum timber grade.

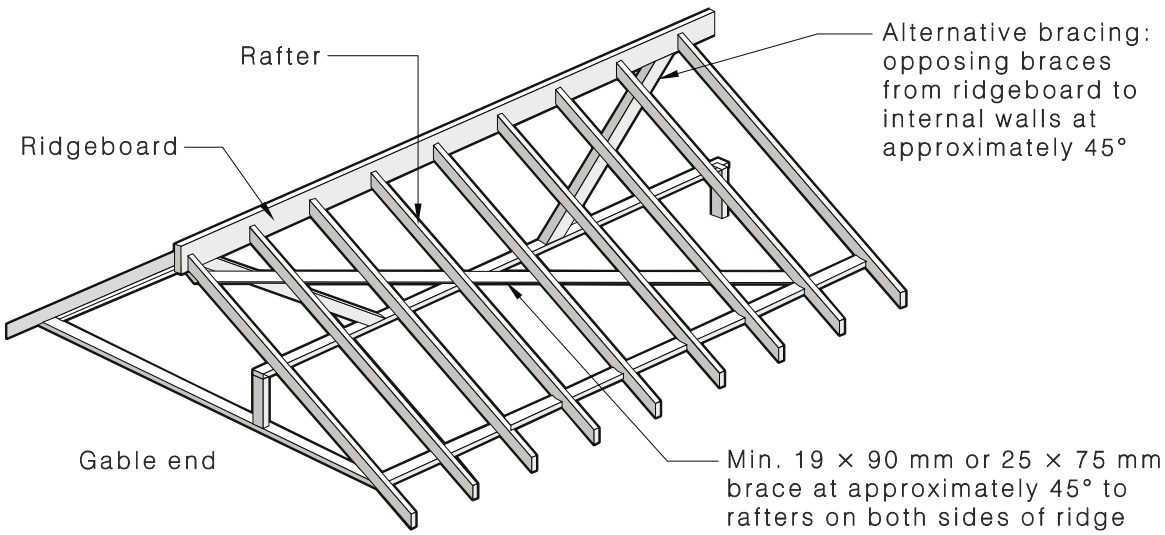


FIGURE 8.8 GABLE ROOF BRACING

(c) *Intersection of timber braces* Where timber braces intersect, they shall be spliced in accordance with Figure 8.9.

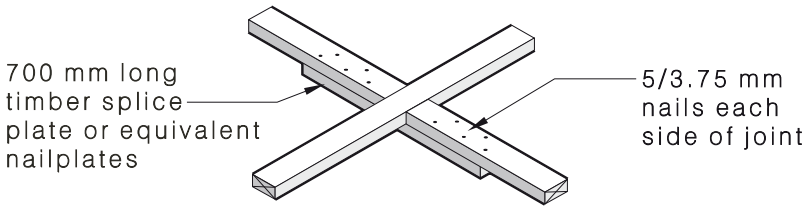


FIGURE 8.9 TIMBER BRACING SPLICE

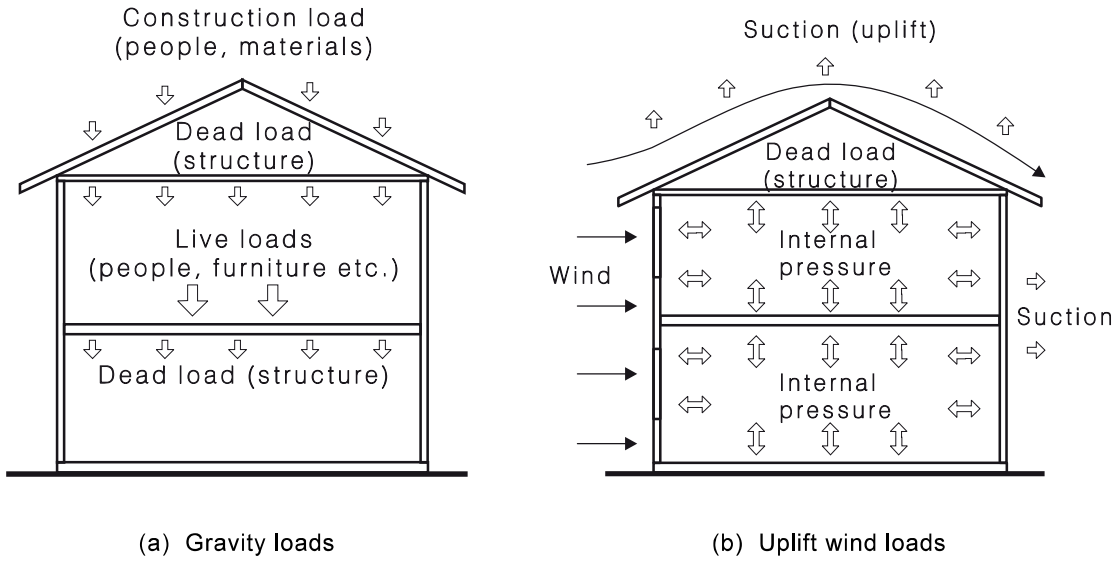
8.3.3.2 *Trussed roofs*

Bracing requirements for trussed roofs shall be in accordance with AS 4440.

SECTION 9 FIXINGS AND TIE-DOWN DESIGN

9.1 GENERAL

This Section specifies fixing requirements for the various framing members described in this Standard. Figure 9.1 gives the load actions that fixing details are provided for.



(a) Gravity loads

(b) Uplift wind loads

(c) Lateral wind loads

FIGURE 9.1 LOAD ACTIONS

9.2 GENERAL CONNECTION REQUIREMENTS

9.2.1 General

The general details given in Clause 9.2.2to 9.2.8 shall apply to all connections and fixings.

9.2.2 Straps, bolts, screws, coach screws and framing anchors

Straps, bolts, screws, coach screws and framing anchors shall be manufactured in accordance with or shall comply with the material requirements of the relevant Australian Standard.

9.2.3 Steel washers

The size of steel washers shall be determined from Table 9.1.

Circular washers of equivalent thickness and with the same net bearing area are also permitted to carry the same full design loads. For thinner washers or washers with smaller net bearing areas, the design loads shall be reduced in proportion to the reduction of thickness and net bearing area, that is less the hole diameter.

TABLE 9.1

STEEL WASHERS

Bolt or coach screw diameter mm	Washer size mm
M10 cup-head	Standard
M12 cup-head	Standard
M10 bolt/coach screw	38 × 38 × 2.0
M12 bolt/coach screw	50 × 50 × 3.0

9.2.4 Drilling for bolts

Bolt holes in unseasoned timber shall be 2 mm to 3 mm greater in diameter than the bolt diameter, and for seasoned timber they shall be 1 mm to 2 mm greater than the bolt diameter.

Bolt holes in steel shall provide a snug fit that is not more than 0.5 mm greater than the bolt diameter.

9.2.5 Drilling for coach screws

Drilling for coach screws shall be as follows:

(a) Hole for shank—shank diameter + 1 mm.

(b) Hole for thread—root diameter.

9.2.6 Screw and coach screw penetration

The minimum penetration of the threaded portion of screws and coach screws into the receiving member shall be not less than 35 mm for screws and 5 times the diameter of coach screws, unless otherwise noted.

9.2.7 Framing anchor and strap nails

All nails used for framing anchor and straps shall be corrosion protected flat-head connector nails. Clout shall not be used for this purpose.

9.2.8 Joining of top plates

Top plates in walls shall be joined by one of the methods shown in Figure 9.2.

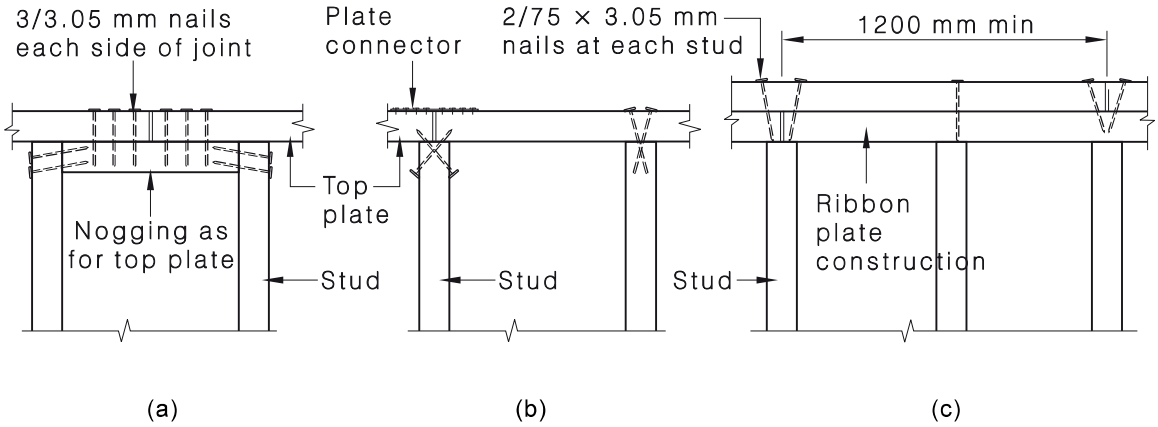


FIGURE 9.2 JOINING OF TOP PLATES

9.3 PROCEDURE FOR DETERMINING FIXING AND TIE-DOWN REQUIREMENTS

The procedure to determine fixing and tie-down requirements shall be as follows:

(a) From Clause 9.4 and Table 9.2 determine if nominal or specific fixings are required for tie-down.

(b) If nominal fixings only are required, see Clause 9.5 and Table 9.3.

(c) If specific fixings are required, determine the rafter or truss span and see Clause 9.6 and Tables 9.4 to 9.7.

9.4 NOMINAL AND SPECIFIC FIXING REQUIREMENTS

For all houses and wind speeds, the nominal (minimum) fixing requirements shall be in accordance with Clause 9.5.

Requirements with respect to resisting racking forces and special fixings for bracing are given in Section 8.

Table 9.2 gives the design situations where either nominal (minimum) fixings or specific fixings shall be used for wind classifications N1 and N2 for the various areas of connection in the house.

TABLE 9.2

NOMINAL OR SPECIFIC FIXINGS

Connection		Wind classification			
		N1		N2	
		Sheet roof	Tile roof	Sheet roof	Tile roof
Roof battens to rafters or trusses	Within 1200 of edges	S	S	S	S
	General area	S	S	S	S
Single storey or upper storey rafters/trusses to wall frames, floor frame or slab		S	N	S	N
Single- or upper-storey floor frame to supports		N	N	N	N
Lower storey wall frame to floor frame or slab		N	N	N	N
Lower storey floor frame to supports		N	N	N	N

N = nominal (minimum) connection only (see Clause 9.5).

S = specific connection may be required for uplift forces (see Clause 9.6).

9.5 NOMINAL FIXINGS (MINIMUM FIXINGS)

Unless otherwise specified, the minimum diameter of machine-driven nails shall be 3.05 mm for hardwood and cypress and 3.33 mm for softwood framing. Machine-driven nails shall be plastic polymer (glue) coated or annular or helical deformed shank nails. Where the nail length is not specified in Table 5.2 or elsewhere, the minimum depth of penetration into the final receiving member shall be 10 times the nail diameter where driven into side grain or 15 times the nail diameter where driven into end grain. Unless otherwise specified herein, not less than two nails shall be provided at each joint.

Where plain shank hand-driven nails are used in lieu of machine-driven nails, they shall be a minimum diameter of 3.15 mm for hardwood and cypress and 3.75 mm for softwood and other low-density timber.

Nails used in joints that are continuously damp or exposed to the weather shall be hot-dip galvanized, stainless steel or monel metal. The nominal (minimum) fixings for most joints are given in Table 9.3.

TABLE 9.3
NOMINAL FIXINGS FOR TIMBER MEMBERS

Joint		Minimum fixing for each joint
Floor framing		
Bearer to timber stump/post		4/75 × 3.33 mm dia. or 5/75 × 3.05 mm machine-driven nails plus 1/30 × 0.8 mm G.I. strap over bearer and fixed both ends to stump with 4/2.8 mm dia. each end; *OR* 1/M10 bolt through bearer halved to stump; *OR* 1/M12 cranked bolt fixed vertically through bearer and bolted to stump plus 4/75 × 3.33 mm or 5/75 × 3.05 mm machine-driven nails
Bearer to masonry column/wall/pier (excluding masonry veneer construction)		1/M10 bolt or 1/50 × 4 mm mild steel bar fixed to bearer with M10 bolt and cast into masonry (to footing)
Bearer to supports (masonry veneer construction)		No requirement
Bearer to concrete stump/post		1/6 mm dia. rod cast into stump, vertically through bearer and bent over
Bearers to steel post		1/M10 coach screw or bolt
Floor joist to bearer		2/75 × 3.05 mm dia. nails
Wall framing		
Plates to studs		Plates up to 38 mm thick—2/75 × 3.05 mm nails through plate; Plates 38 to 50 mm thick—2/90 × 3.05 mm nails through plate; *OR* 2/75 × 3.05 mm nails skewed through stud into plate
Noggings to studs		2/75 × 3.05 mm nail skewed or through nailed
Timber braces to studs or plates		2/50 × 2.8 mm dia. nails at each joint
Lintel to jamb stud		2/75 × 3.05 mm dia. nails at each joint
Bottom plates to joists	Non-loadbearing and non-bracing walls	2/2.8 mm dia. nails at max. 600 mm centres
	Loadbearing, including walls with Type A braces	Plates up to 38 mm thick — 2/75 × 3.05 mm nails at max. 600 mm centres Plates 38 to 50 mm thick — 2/90 × 3.05 mm nails at max. 600 mm centres
	Walls with Type B braces	See Table 8.3
Bottom plates to concrete slab, including walls with Type A braces		One 75 mm masonry nail (hand driven at slab edge), screw or bolt at not more than 1200 mm centres

(*continued*)

TABLE 9.3 (*continued*)

Joint		Minimum fixing for each joint
Bottom plates to concrete slabs for walls with Type B braces		See Table 8.3
Ribbon plate to top plate		Refer Notes to Span Tables in Appendix A, and Clause 2.5 and Clause 9.2.8
Multiple studs		1/75 mm nail at max. 600 mm centres
Posts to bearers or joists		1/M12 or 2/M10 bolts (unless otherwise specified)
Roof framing		
Roof trusses to top plates	Standard trusses	See Clause 1.11; *OR* One framing anchor with three nails to each leg; *OR* 1/30 × 0.8 mm G.I. strap over truss with strap ends fixed to plate with 3/2.8 mm dia. nails plus 2/75 mm skew nails
	Girder trusses	In accordance with Tables 9.5, 9.6, or 9.7
Rafters to top plates—Coupled roofs		2/75 mm skew nails plus, where adjoining a ceiling joist of— (a) 38 mm thick — 2/75 mm nails; *OR* (b) 50 mm thick — 2/90 mm nails, fixing joist to rafter
Rafters to top plates—Non-coupled roofs		2/75 mm skew nails
Rafter to ridge		2/75 mm skew nails
Ceiling joists to top plates		2/75 mm skew nails
Ceiling joists to rafters		In coupled roof construction, 1/75 hand-driven nail or 2/75 × 3.05 mm machine-driven nails
Collar ties to rafters		1/M10 bolt for ties over 4.2 m or 3/75 mm nails for ties up to 4.2 m long
Verandah, ridge, intermediate beams to post		1/M12 or 2/M10 bolts (unless otherwise specified for tie-down).

NOTES:

1 Nails, that are smaller than the nominated size, or are other than those described, may be used provided their performance, as determined by testing, indicates they are not inferior to the nail sizes given above.

2 The nominal connections for roof trusses to top plates given in this Table are based on the minimum connection details recommended by truss plate manufacturers.

9.6 SPECIFIC FIXING (TIE-DOWN)

9.6.1 General

Unless otherwise specified, the specific fixing requirements are in addition to the nominal fixing requirements of Clause 9.5. Specific fixings shall be determined from Tables 9.4 to 9.7 and Clause 9.6.2 for the relevant wind classification and type of roofing.

Unless otherwise specified, a G.I. strap shall have a minimum of 2/30 × 2.8 mm dia. nails at each end and a framing anchor with 4/30 × 2.8 mm dia. nails to each leg.

TABLE 9.4

SPECIFIC FIXING REQUIREMENTS FOR WIND CLASSIFICATION N1 SHEET ROOF

Joint or member	Rafter or truss span mm	Specific fixing requirements		
Top and bottom plates to studs	3000	30 × 0.8 mm G.I. strap at 1800 mm max. centres along wall 2/30 × 2.8 mm nails to each end of strap		
	6000	30 × 0.8 mm G.I. strap at 1200 mm max. centres along wall 2/30 × 2.8 mm nails to each end of strap		
	9000	30 × 0.8 mm G.I. strap at 1200 mm max. centres along wall 4/30 × 2.8 mm nails to each end of strap		
	12 000	30 × 0.8 mm G.I. strap at 1200 mm max. centres along wall 4/30 × 2.8 mm nails to each end of strap		
Rafters to top plates, beams or studs—Non-coupled roofs—No ridge tie-down but rafters tied at ridge For ridge connection, see Figure 9.3(a) or Figure 9.3(b)		Rafter spacing, mm		
		600	900	1200
	3000 (single)	Nominal fixing	30 × 0.8 mm G.I. strap or one framing anchor	30 × 0.8 mm G.I. strap or one framing anchor
	6000 (single)	30 × 0.8 mm G.I. strap or one framing anchor	30 × 0.8 mm G.I. strap or one framing anchor	30 × 0.8 mm G.I. strap 3/30 × 2.8 mm ∅ nails each end or one framing anchor
	3000 (continuous)	30 × 0.8 mm G.I. strap or one framing anchor	30 × 0.8 mm G.I. strap or one framing anchor	30 × 0.8 mm G.I. strap 3/30 × 2.8mm ∅ nails each end or one framing anchor
Rafters to top plates, beams or studs—Non-coupled roofs—Ridge tie-down	3000 (single)	Nominal fixing	Nominal fixing	Nominal fixing
	6000 (single)	Nominal fixing	30 × 0.8 mm G.I. strap or one framing anchor	30 × 0.8 mm G.I. strap or one framing anchor
	3000 (continuous)	Nominal fixing	30 × 0.8 mm G.I. strap or one framing anchor	30 × 0.8 mm G.I. strap or one framing anchor
Rafters to top plates, beams or studs—Coupled roofs—No ridge tie-down (see Note 4)	3000 (single)	Nominal fixing	30 × 0.8 mm G.I. strap or one framing anchor	30 × 0.8 mm G.I. strap or one framing anchor
For ridge connection, see Figure 9.3(a) or Figure 9.3(b)	3000 (continuous)	30 × 0.8 mm G.I. strap or one framing anchor	30 × 0.8 mm G.I. strap or one framing anchor	30 × 0.8 mm G.I. strap 3/30 × 2.8 mm ∅ nails each end or one framing anchor
Rafters to underpurlins—coupled roofs	3000 (continuous)	Nominal fixing	30 × 0.8 G.I. strap or one framing anchor	30 × 0.8 G.I. strap or one framing anchor

(*continued*)

TABLE 9.4 (*continued*)

Joint or member	Rafter or truss span mm	Specific fixing requirements		
Roof trusses to top plates, beams or studs		Truss spacing, mm		
		600	900	1200
	3000	Nominal fixing	Nominal fixing	Nominal fixing
	6000	Nominal fixing	Nominal fixing	Nominal fixing
	9000	Nominal fixing	Nominal fixing	30 × 0.8 mm G.I. strap or one framing anchor 4/30 × 2.8 mm ∅ nails each leg
	12 000	Nominal fixing	30 × 0.8 mm G.I. strap or one framing anchor 4/30 × 2.8 mm ∅ nails each leg	30 × 0.8 mm G.I. strap or two framing anchors
Intermediate beams, verandah beams and lintels to posts or studs		Beam span, mm		
		1800	3000	6000
	3000	30 × 0.8 mm G.I. strap 2/30 × 2.8 mm nails each end	30 × 0.8 mm G.I. strap 2/30 × 2.8 mm nails each end	30 × 0.8 mm G.I. strap 4/30 × 2.8 mm nails each end
	6000	30 × 0.8 mm G.I. strap 2/30 × 2.8 mm nails each end	30 × 0.8 mm G.I. strap 4/30 × 2.8 mm nails each end or 2/M10 or 1/M12 bolt	2/30 × 0.8 mm G.I. straps 4/30 × 2.8 mm nails each end or 2/M10 or 1/M12 bolt
	9000	30 × 0.8 mm G.I. strap 2/30 × 2.8 mm nails each end or 2/M10 or 1/M12 bolt	1/30 × 0.8 mm G.I. straps 4/30 × 2.8 mm nails each end or 2/M12 bolts	M10 vertical tie-down anchor rod to floor frame or footing or 2/M10 bolts
	12 000	30 × 0.8 mm G.I. strap 4/30 × 2.8 mm nails each end or 2/M10 or 1/M12bolt	2/30 × 0.8 mm G.I. straps 4/30 × 2.8 mm nails each end or 2/M12 bolts	M10 vertical tie-down anchor rod to floor frame or footing or 2/M12 bolts
Roof battens to rafters or trusses	Rafter or truss spacing mm	Batten spacing, mm (see Note 3)		
		600		1200
	600	1/75 × 3.05 mm plain shank nail or 1/75 × 3.05 mm deformed shank nail		1/75 × 3.05 mm deformed shank nail
	900	2/75 × 3.05 mm plain shank nails or 1/75 × 3.05 mm deformed shank nail		2/75 × 3.05 mm deformed shank nails
	1200	1/75 × 3.05 mm deformed shank nail		2/75 × 3.75 mm deformed shank nails or 1/75 × No. 14 Type 17 screw

NOTES:

1 Except for nominal fixings, intermediate connections are not required where a connection is continued to a lower member in the frame; for example, connection of a rafter directly to a stud eliminates the need for individual rafter to top plate and to stud connections.

2 Specific tie-down connections in walls are only required in those walls used for tie-down purposes.

3 Unless otherwise specified, the minimum penetration into a rafter or truss is 38 mm.

4 Assumed to be adjoining a ceiling joist.

5 For continuous span beams, the centre support requires twice the fixing specified.

TABLE 9.5

SPECIFIC FIXING REQUIREMENTS—WIND CLASSIFICATION N1 TILE ROOF

Joint or member	Rafter or truss spacing mm	Specific fixing requirements (see Note)
Roof battens to rafters or trusses		Batten spacing 330 mm
	up to 600	1/50 × 2.8 mm plain shank nail—Min. penetration 25 mm
	900	1/75 × 3.05 mm plain shank nail
	1200	1/75 × 3.05 mm deformed shank nail

NOTE: Unless otherwise specified, the minimum penetration into a rafter or truss is 38 mm.

TABLE 9.6

SPECIFIC FIXING REQUIREMENTS—WIND CLASSIFICATION N2 SHEET ROOF

Joint or member	Rafter or truss span mm	Specific fixing requirements		
		Spacing of fixing along plate, mm		
		600	1 200	1 800
Bottom plates to floor frame or slab	3 000	Nominal fixing	Nominal fixing	30 × 0.8 mm G.I. strap 2/30 × 2.8 mm ∅ nails each end or two framing anchors or M10 masonry anchor
	6 000	Nominal fixing	30 × 0.8 mm G.I. strap or one framing anchor or M10 masonry anchor	30 × 0.8 mm G.I. strap 3/30 × 2.8 mm ∅ nails each end or two framing anchors or M10 masonry anchor
	9 000	30 × 0.8 mm G.I. strap or one framing anchor	30 × 0.8 mm G.I. strap 3/30 × 2.8 mm ∅ nails each end or two framing anchors or M10 masonry anchor	30 × 0.8 mm G.I. strap 4/30 × 2.8 mm ∅ nails each end or M10 masonry anchor
	12 000	30 × 0.8 mm G.I. strap or one framing anchor	30 × 0.8 mm G.I. strap 4/30 × 2.8 mm ∅ nails each end or two framing anchors or M10 masonry anchor	30 × 0.8 mm G.I. strap 6/30 × 2.8 mm ∅ nails each end or M10 masonry anchor
Top and bottom plates to studs	3 000	30 × 0.8 mm G.I. strap at 1800 mm max. centres along wall 2/30 × 2.8 mm ∅ nails to each end of strap		
	6 000	30 × 0.8 mm G.I. strap at 1200 mm max. centres along wall 3/30 × 2.8 mm ∅ nails to each end of strap		
	9 000	30 × 0.8 mm G.I. strap at 1200 mm max. centres along wall 6/30 × 2.8 mm ∅ nails to each end of strap		
	12 000	30 × 0.8 mm G.I. strap at 1200 mm max. centres along wall 6/30 × 2.8 mm ∅ nails to each end of strap		

(*continued*)

TABLE 9.6 (*continued*)

Joint or member	Rafter or	Specific fixing requirements		
Rafters to top plates, beams or studs—Non-coupled roofs—No ridge tie-down but rafters tied at ridge		Rafter spacing, mm		
		600	900	1 200
	3 000 (single)	30 × 0.8 mm G.I. strap or one framing anchor (see Figure 9.3(a) or (b) for ridge connection)	30 × 0.8 mm G.I. strap or one framing anchor (see Figure 9.3(a) or (b) for ridge connection)	30 × 0.8 mm G.I. strap or one framing anchor (see Figure 9.3(a) or (b) for ridge connection)
	6 000 (single)	30 × 0.8 mm G.I. strap or one framing anchor (see Figure 9.3(a) or (b) for ridge connection)	30 × 0.8 mm G.I. strap 3/30 × 2.8 mm ∅ nails or two framing anchor (see Figure 9.3(a) or (b) for ridge connection)	30 × 0.8 mm G.I. looped strap 4/30 × 2.8 mm ∅ nails each end (see Figure 9.3(b) or (c) for ridge connection)
	3 000 (continuous)	30 × 0.8 mm G.I. strap or one framing anchor (see Figure 9.3(a) or (b) for ridge connection)	30 × 0.8 mm G.I. strap 3/30 × 2.8 mm ∅ nails or two framing anchor (see Figure 9.3(a) or (b) for ridge connection)	30 × 0.8 mm G.I. looped strap 4/30 × 2.8 mm ∅ nails each end (see Figure 9.3(b) or (c) for ridge connection)
Rafters to top plates, beams or studs—Non-coupled roofs—Ridge tie-down	3 000 (single)	30 × 0.8 mm G.I. strap or one framing anchor	30 × 0.8 mm G.I. strap or one framing anchor	30 × 0.8 mm G.I. strap or one framing anchor
	6 000 (single)	30 × 0.8 mm G.I. strap or one framing anchor	30 × 0.8 mm G.I. strap or one framing anchor	30 × 0.8 mm G.I. strap or one framing anchor
	3 000 (continuous)	30 × 0.8 mm G.I. strap or one framing anchor	30 × 0.8 mm G.I. strap or one framing anchor	30 × 0.8 mm G.I. strap or one framing anchor
Rafters to top plates, beams or studs—Coupled roofs—No ridge tie-down (see Note 4)	3 000 (single)	30 × 0.8 mm G.I. strap or one framing anchor (see Figure 9.3(a) or (b) for ridge connection)	30 × 0.8 mm G.I. strap or one framing anchor (see Figure 9.3(a) or (b) for ridge connection)	30 × 0.8 mm G.I. strap or one framing anchor (see Figure 9.3(a) or (b) for ridge connection)
	3 000 (continuous)	30 × 0.8 mm G.I. strap or one framing anchor (see Figure 9.3(a) or (b) for ridge connection)	30 × 0.8 mm G.I. strap 3/30 × 2.8 mm ∅ nails or two framing anchor (see Figure 9.3(a) or (b) for ridge connection)	30 × 0.8 mm G.I. looped strap 4/30 × 2.8 mm ∅ nails each end (see Figure 9.3(b) or (c) for ridge connection)
Rafters to underpurlins—coupled roofs	3 000 (continuous)	Nominal fixing	30 × 0.8 G.I. strap or one framing anchor	30 × 0.8 G.I. strap or one framing anchor
Roof trusses to top plates, beams or studs		Truss spacing, mm		
		600	900	1 200
	3 000	Nominal fixing	Nominal fixing	Nominal fixing
	6 000	Nominal fixing	Nominal fixing	30 × 0.8 mm G.I. strap or one framing anchor 4/30 × 2.8 mm ∅ nails each leg
	9 000	Nominal fixing	30 × 0.8 mm G.I. strap or two framing anchors	30 × 0.8 mm G.I. looped strap 4/30 × 2.8mm nails each end or two framing anchors
	12 000	30 × 0.8 mm G.I. strap or one framing anchor 4/30 × 2.8 mm ∅ nails each end	30 × 0.8 mm G.I. looped strap 4/30 × 2.8 mm nails each end or two framing anchors	30 × 0.8 mm G.I. looped strap 4/30 × 2.8 mm nails each end.

(*continued*)

TABLE 9.6 (*continued*)

Joint or member	Rafter or	Specific fixing requirements		
Intermediate beams, verandah beams and lintels to posts or studs		Beam span, mm		
		1 800	3 600	6 000
	3 000	30 × 0.8 mm G.I. strap 3/30 × 2.8 mm ∅ nails each end	30 × 0.8 mm G.I. strap 4/30 × 2.8 mm ∅ nails each end	30 × 0.8 mm G.I. strap 6/30 × 2.8 mm ∅ nails each end
	6 000	30 × 0.8 mm G.I. strap 3/30 × 2.8 mm ∅ nails each end	30 × 0.8 mm G.I. looped strap 6/30 × 2.8 mm ∅ nails each end or 2/M10 bolts	2/30 × 0.8 mm G.I. looped strap 4/30 × 2.8 mm ∅ nails each end or 2/M12 bolts
	9 000	30 × 0.8 mm G.I. strap 4/30 × 2.8 mm ∅ nails each end or 2/M10 bolts	2/30 × 0.8 mm G.I. looped strap 4/30 × 2.8 mm ∅ nails each end, or M10 vertical tie-down anchor rod to floor frame or footing or 2/M10 bolts	2/30 × 0.8 mm G.I. looped strap 6/30 × 2.8 mm ∅ nails each end or M10 vertical tie-down anchor rod to floor frame or footing or 2/M12 bolts
	12 000	30 × 0.8 mm G.I. strap 6/30 × 2.8 mm ∅ nails each end or 2/M10 bolts	2/30 × 0.8 mm G.I. looped strap 6/30 × 2.8 mm ∅ nails each end or M10 vertical tie-down anchor rod to floor frame or footing or 2/M10 bolts.	M12 vertical tie-down anchor rod to floor frame or footing
Roof battens to rafters or trusses	**Rafter or truss spacing mm**	Batten spacing, mm (see Note 3)		
		600		1 200
	600	2/75 × 3.05 mm plain shank nails or 1/75 × 3.05 mm deformed shank nail		2/75 × 3.05 mm deformed shank nails
	900	2/75 × 3.05 mm deformed shank nails		2/75 × 3.33 mm deformed shank nails
	1 200	2/75 × 3.05 mm deformed shank nails		1/75 × No 14 Type 17 Screw

NOTES:

1 Except for nominal fixings, intermediate connections are not required where a connection is continued to a lower member in the frame; for example, connection of a rafter directly to a stud eliminates the need for individual rafter to top plate and to stud connections.

2 Specific tie-down connections in walls are only required in those walls used for tie-down purposes

3 Unless otherwise specified, the minimum penetration into a rafter or truss is 38 mm.

4 Assumed to be adjoining a ceiling joist.

5 For continuous span beams, the centre support requires twice the fixing specified.

TABLE 9.7

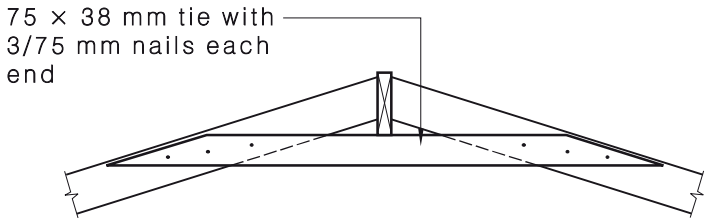
SPECIFIC FIXING REQUIREMENTS FOR WIND CLASSIFICATION N2 TILE ROOF

Joint	Rafter or truss spacing, mm	Specific fixing requirements*
Roof battens to rafters or trusses	450	1/50 × 2.8 mm plain shank nail (min. penetration 25mm)
	600	1/65 × 2.8 mm plain shank nail
	900	2/75 × 3.05 mm plain shank nails or 1/75 × 3.05 mm deformed shank nail
	1200	2/75 × 3.05 mm plain shank nails or 1/75 × 3.05 mm deformed shank nail

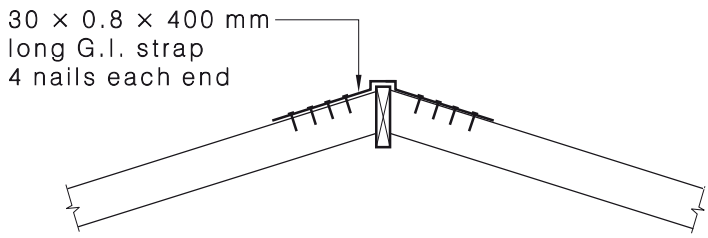
* Batten spacing shall be 330 mm, unless otherwise specified. The minimum penetration into a rafter or truss is 38 mm.

9.6.2 Rafter to ridge connection for sheet roof, N2 wind classification only

In coupled roof construction, where the ridge is not used as a tie-down point, the rafters shall be tied together at the ridge as shown in Figure 9.3.

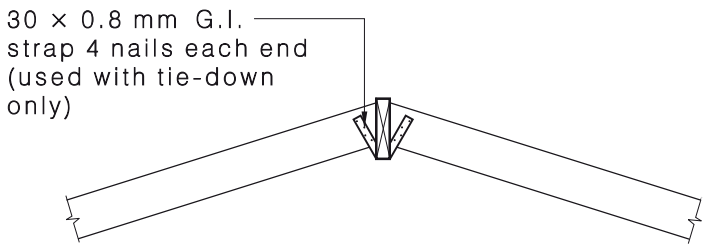


(a) Type A



NOTE: For N1 and N2, a metal ridge cap screwed down with No. 14 Type 17 screws at max. 450 mm centres may be used in lieu of the G.I. strap over the rafters.

(b) Type B



(c) Type C

FIGURE 9.3 RAFTER TO RIDGE CONNECTION

APPENDIX A

MEMBER SPAN TABLES

(Normative)

A1 GENERAL

To establish the correct sizes from the span tables for floor and wall framing members that support roof loads, input of rafter or truss span shall be required. In addition, the maximum eaves overhang shall not exceed 750 mm.

For the purpose of this Appendix, the following shall apply:

(a) Paragraphs A2 to A4 shall apply to the rafter or truss span input.

(b) Figures A1 to A26 give the terminology applying to Span Tables, as appropriate.

(c) Notes to Span Tables expressed in mandatory terms are deemed to be requirements of this Standard.

A2 FLOOR AND WALL FRAMING (EXTERNAL LOADBEARING WALLS)

The following shall apply:

(a) *Strutted roof, maximum rafter span 3000 mm*—use rafter/truss span of 3000 mm.

(b) *Unstrutted roof, maximum rafter span 1500 mm*—use rafter/truss span of 3000 mm.

(c) *Unstrutted roof, maximum rafter span 3000 mm*—use rafter/truss span of 6000 mm.

(d) *Rafters supporting roof and ceiling loads (cathedral roofs)*—

(e) *Maximum rafter span 3000 mm*—use rafter/truss span of 3000 mm.

(f) *Maximum rafter span 6000 mm*—use rafter/truss span of 6000 mm.

(g) *Trussed roofs*—use the spans as shown in the tables.

A3 FLOOR AND WALL FRAMING (INTERNAL LOADBEARING WALLS)

The following shall apply:

(a) *Strutted roof*—struts supported directly by studs supporting concentrations of load remainder of internal wall shall be considered as non-loadbearing. Concentrated load shall be supported directly by stumps, piers, and similar supporting structures, within allowable requirements (see Clauses 1.6, 4.3.2.3, 4.3.2.4, 4.3.3.3 and 4.3.3.4).

(b) *Rafters supporting roof and ceiling loads (cathedral roofs)*—

  (i) *Maximum rafter span 3000 mm*—use rafter/truss span of 6000 mm.

  (ii) *Maximum rafter span 4500 mm*—use rafter/truss span of 9000 mm.

  (iii) *Maximum rafter span 6000 mm*—use rafter/truss span of 12000 mm.

A4 SUBSTITUTION OF SEASONED TIMBER MEMBER SIZES

The sizes given in the Span Tables for beam members (for example, joists, bearers, lintels, verandah beams, strutting beams) in seasoned timber stress grades are based on the smallest depth that provides a satisfactory solution for the design case.

Alternatively, deeper, thinner sections may be substituted for the sizes given in Table A1.

TABLE A1

ALTERNATIVE SECTIONS

Given size mm	Substitute size mm
90 × 45	120 × 35
120 × 45	140 × 35
140 × 45	170 × 35
170 × 45	190 × 35
190 × 45	240 × 35*
240 × 45	290 × 35*
290 × 45	Not suitable
2/90 × 45	2/120 × 35
2/120 × 45	2/140 × 35
2/140 × 45	2/170 × 35
2/170 × 45	2/190 × 35
2/190 × 45	2/240 × 35
2/240 × 45	2/290 × 35
2/290 × 45	Not suitable

* This substitution is not permitted for verandah beams in Table A25.

TABLE A2
SPAN TABLES LIST

Span Table No.	Title
A3	Bearers supporting single storey external loadbearing walls—Sheet roof—Single span
A4	Bearers supporting single storey external loadbearing walls—Sheet roof—Continuous span
A5	Bearers supporting single storey external loadbearing walls—Tile roof—Single span
A6	Bearers supporting single storey external loadbearing walls—Tile roof—Continuous span
A7	Bearers supporting floor loads only (40kg/m^2)
A8	Floor joists supporting floor loads only (40kg/m^2)
A9	Common studs—450 mm centres—70/75 mm frame—Supporting single storey or upper storey external loadbearing walls
A10	Common studs—450 mm centres—90/100 mm frame—Supporting single storey or upper storey external loadbearing walls
A11	Common studs—600 mm centres—70/75 mm frame—Supporting single storey or upper storey external loadbearing walls
A12	Common studs—600 mm centres—90/100 mm frame—Supporting single storey or upper storey external loadbearing walls
A13	Studs supporting concentrated loads—70/75 mm frame—Single storey or upper storey external loadbearing walls
A14	Studs supporting concentrated loads—90/100 mm frame—Single storey or upper storey external loadbearing walls
A15	Jamb studs—Wall height 2400 mm—70/75 mm frame—Supporting single storey or upper storey external loadbearing walls
A16	Jamb studs—Wall height 2400 mm—90/100 mm frame—Supporting single storey or upper storey external loadbearing walls
A17	Jamb studs—Wall height 2700 mm—70/75 mm frame—Supporting single storey or upper storey external loadbearing walls
A18	Jamb studs—Wall height 2700 mm—90/100 mm frame—Supporting single storey or upper storey external loadbearing walls
A19	Studs in gable or skillion ends
A20	Bottom plates—Not trenched—70/75 mm frame—Supporting single storey or upper storey external loadbearing walls
A21	Bottom plates—Not trenched—90/100 mm frame—Supporting single storey or upper storey external loadbearing walls
A22	Top plates—Not trenched—70/75 mm frame—Supporting single storey or upper storey external loadbearing walls
A23	Top plates—Not trenched—90/100 mm frame—Supporting single storey or upper storey external loadbearing walls
A24	Lintels supporting single storey or upper storey loadbearing walls
A25	Verandah beams supporting roof loads only
A26	Verandah posts supporting roof loads only—2400 mm high
A27	Ceiling joists
A28	Hanging beams
A29	Counter beams

(*continued*)

TABLE A2 (*continued*)

Span Table No.	Title
A30	Combined strutting/hanging beams—Maximum rafter and ceiling joist spans 3000 mm
A31	Combined strutting/counter beams
A32	Strutting beams—Maximum rafter span 3000 mm
A33	Underpurlins—Continuous span—Maximum rafter span 3000 mm
A34	Rafters—Supporting roof loads only—Coupled roofs—Continuous span
A35	Rafters—Supporting roof and ceiling loads—Non-coupled roofs (cathedral roofs)—Single span
A36	Ridge and intermediate beams—Supporting roof and ceiling loads (cathedral roofs) single span
A37	Roof battens—Supporting roofing only
A38	Bearers supporting lower storey external loadbearing walls—Sheet roof—Upper + lower floor joist spans 7200 mm max.
A39	Bearers supporting lower storey external loadbearing walls—Tile roof—Single span—Upper + lower floor joist spans 7200 mm max.
A40	Common studs—450 mm centres—Stud height 2400 mm—Lower storey of two-storey loadbearing walls—Upper floor joist spans 4800 mm max.
A41	Common studs—450 mm centres—Stud height 2700 mm—Lower storey of two-storey loadbearing walls—Upper floor joist spans 4800 mm max.
A42	Common studs—600 mm centres—Stud height 2400 mm—Lower storey of two-storey loadbearing walls—Upper floor joist span 4800 mm max.
A43	Common studs—600 mm centres—Stud height 2700 mm—Lower storey of two-storey loadbearing walls—Upper floor joist span 4800 mm max.
A44	Jamb studs—Wall height 2400mm—Sheet roof—Lower storey of two-storey loadbearing walls—Upper floor joist span 4800 mm max.
A45	Jamb studs—Wall height 2400mm—Tile roof—Lower storey of two-storey loadbearing walls—Upper floor joist span 4800 mm max.
A46	Jamb studs—Wall height 2700 mm—Sheet roof—Lower storey of two-storey loadbearing walls—Upper floor joist span 4800 mm max.
A47	Jamb studs—Wall height 2700 mm—Tile roof—Lower storey of two-storey loadbearing walls—Upper floor joist span 4800 mm max.
A48	Bottom plates—Not trenched—Lower storey of two-storey external loadbearing walls—Upper floor joist span 4800 mm max.
A49	Top plates—Not trenched—Lower storey of two-storey external loadbearing walls—Upper floor joist span 4800 mm max.
A50	Lintels lower storey of two-storey loadbearing walls—Upper floor joist span 4800 mm max.

NOTE: Timber member sizes in Span Tables A3 to A50 are in millimetres.

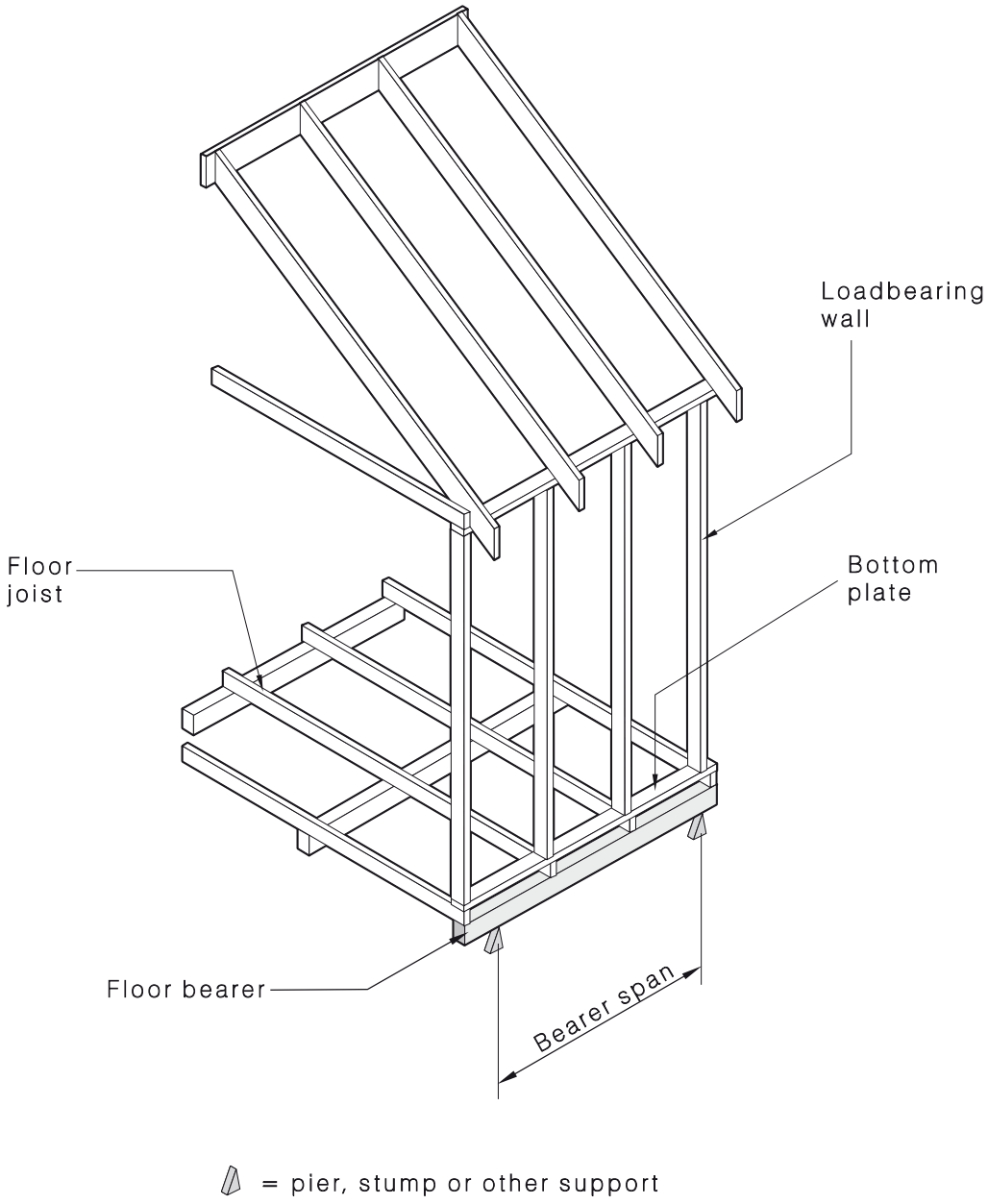


FIGURE A1 BEARERS SUPPORTING LOADBEARING WALLS—
SINGLE OR UPPER STOREY

TABLE A3

BEARERS SUPPORTING SINGLE STOREY EXTERNAL LOADBEARING WALLS—SHEET ROOF—SINGLE SPAN

Bearer spacing mm	Bearer span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Strutted roof—Maximum rafter span 3000 mm											
1500	1200	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	125×75	125×75	125×75	125×75	125×75	2/120×35	2/120×35	2/120×35	2/90×35	2/90×35
	1800	150×75	150×75	150×75	150×75	125×75	2/140×35	2/120×35	2/120×35	2/120×35	2/120×35
	2100	175×75	175×75	175×75	175×75	150×75	2/170×35	2/140×35	2/140×35	2/120×35	2/120×35
1800	1200	125×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	150×75	125×75	125×75	125×75	125×75	2/120×35	2/120×35	2/120×35	2/90×35	2/90×35
	1800	175×75	150×75	150×75	150×75	150×75	2/140×35	2/140×35	2/120×35	2/120×35	2/120×35
	2100	200×75	175×75	175×75	175×75	150×75	2/170×35	2/140×35	2/140×35	2/140×35	2/120×35
2100	1200	125×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	150×75	125×75	125×75	125×75	125×75	2/120×35	2/120×35	2/120×35	2/90×35	2/90×35
	1800	175×75	150×75	150×75	150×75	150×75	2/140×35	2/120×35	2/120×35	2/120×35	2/120×35
	2100	200×75	175×75	175×75	175×75	175×75	2/170×35	2/140×35	2/140×35	2/140×35	2/120×35
3600	3600	—	—	—	—	300×75	2/290×45	2/290×35	2/240×45	2/240×35	2/240×35
Unstrutted roof—Maximum rafter span 3000 mm or trussed roof maximum span 6000 mm											
1500	1200	125×75	125×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	150×75	150×75	150×75	125×75	125×75	2/120×35	2/120×35	2/120×35	2/120×35	2/90×35
	1800	175×75	175×75	175×75	150×75	150×75	2/170×35	2/140×35	2/120×35	2/120×35	2/120×35
	2100	200×75	200×75	200×75	175×75	175×75	2/170×35	2/170×35	2/140×35	2/140×35	2/120×35
1800	1200	125×75	125×75	125×75	100×75	100×75	2/120×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	150×75	150×75	150×75	125×75	125×75	2/120×35	2/120×35	2/120×35	2/120×35	2/90×35
	1800	175×75	175×75	175×75	150×75	150×75	2/170×35	2/140×35	2/140×35	2/120×35	2/120×35
	2100	200×75	200×75	200×75	175×75	175×75	2/170×35	2/170×35	2/170×35	2/140×35	2/140×35
2100	1200	125×75	125×75	125×75	100×75	100×75	2/120×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	150×75	150×75	150×75	125×75	125×75	2/140×35	2/120×35	2/120×35	2/120×35	2/90×35
	1800	200×75	175×75	175×75	150×75	150×75	2/170×35	2/140×35	2/140×35	2/120×35	2/120×35
	2100	225×75	200×75	200×75	175×75	175×75	2/190×35	2/170×35	2/170×35	2/140×35	2/140×35
3600	3600	—	—	—	—	—	—	2/290×35	2/290×35	2/240×45	2/240×35

(*continued*)

TABLE A3 (*continued*)

Bearer spacing mm	Bearer span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Trussed roof maximum span 9000 mm											
1500	1200	125×75	125×75	125×75	125×75	100×75	2/120×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	150×75	150×75	150×75	150×75	125×75	2/140×35	2/120×35	2/120×35	2/120×35	2/120×35
	1800	200×75	175×75	175×75	175×75	150×75	2/170×35	2/140×35	2/140×35	2/140×35	2/120×35
	2100	225×75	200×75	200×75	200×75	175×75	2/190×35	2/170×35	2/170×35	2/170×35	2/140×35
1800	1200	125×75	125×75	125×75	125×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1500	175×75	150×75	150×75	150×75	125×75	2/140×35	2/120×35	2/120×35	2/120×35	2/120×35
	1800	200×75	175×75	175×75	175×75	150×75	2/170×35	2/140×35	2/140×35	2/140×35	2/120×35
	2100	225×75	225×75	200×75	200×75	200×75	2/190×35	2/170×35	2/170×35	2/170×35	2/140×35
2100	1200	125×75	125×75	125×75	125×75	125×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1500	175×75	150×75	150×75	150×75	150×75	2/140×35	2/120×35	2/120×35	2/120×35	2/120×35
	1800	200×75	200×75	175×75	175×75	175×75	2/170×35	2/140×35	2/140×35	2/140×35	2/120×35
	2100	225×75	225×75	200×75	200×75	200×75	2/190×35	2/170×35	2/170×35	2/170×35	2/140×35
3600	3600	—	—	—	—	—	—	2/290×45	2/290×35	2/290×35	2/240×45
Trussed roof maximum span 12000 mm											
1500	1200	150×75	125×75	125×75	125×75	125×75	2/120×35	2/120×35	2/120×35	2/90×35	2/90×35
	1500	175×75	175×75	150×75	150×75	150×75	2/140×35	2/120×35	2/120×35	2/120×35	2/120×35
	1800	200×75	200×75	175×75	175×75	175×75	2/170×35	2/170×35	2/140×35	2/140×35	2/120×35
	2100	225×75	225×75	225×75	200×75	200×75	2/240×35	2/170×35	2/170×35	2/170×35	2/140×35
1800	1200	150×75	125×75	125×75	125×75	125×75	2/120×35	2/120×35	2/120×35	2/90×35	2/90×35
	1500	175×75	175×75	150×75	150×75	150×75	2/140×35	2/120×35	2/120×35	2/120×35	2/120×35
	1800	200×75	200×75	175×75	175×75	175×75	2/170×35	2/170×35	2/140×35	2/140×35	2/120×35
	2100	225×75	225×75	225×75	200×75	200×75	2/240×35	2/170×35	2/170×35	2/170×35	2/140×35
2100	1200	150×75	125×75	125×75	125×75	125×75	2/120×35	2/120×35	2/120×35	2/90×35	2/90×35
	1500	175×75	175×75	150×75	150×75	150×75	2/140×35	2/140×35	2/120×35	2/120×35	2/120×35
	1800	200×75	200×75	200×75	175×75	175×75	2/170×35	2/170×35	2/140×35	2/140×35	2/120×35
	2100	250×75	225×75	225×75	200×75	200×75	2/240×35	2/170×35	2/170×35	2/170×35	2/170×35
3600	3600	—	—	—	—	—	—	—	2/290×45	2/290×35	2/240×45

NOTES:

1 For allowable roof and floor load masses, see Clause 1.4.11.

2 For loadbearing walls parallel to bearers, cantilevers shall not exceed 25% of the allowable span.

3 For allowable offsets and cantilevers of loadbearing walls at right angles to bearers, see Clause 4.3.2.3. For bearers supporting point roof loads, see Clause 4.3.2.4.

4 Minimum bearing length shall be 50 mm at end supports and 100 mm at internal supports of continuous span members.

5 Multiple members shall be vertically nail-laminated (see Clause 2.3).

TABLE A4

BEARERS SUPPORTING SINGLE STOREY EXTERNAL LOADBEARING WALLS SHEET ROOF—CONTINUOUS SPAN

Bearer spacing mm	Bearer span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Strutted roof—Maximum rafter span 3000 mm											
1500	1200	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1800	125×75	125×75	125×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	2100	150×75	125×75	125×75	125×75	125×75	2/120×35	2/120×35	2/120×35	2/90×35	2/90×35
1800	1200	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1800	125×75	125×75	125×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	2100	150×75	150×75	125×75	125×75	125×75	2/140×35	2/120×35	2/120×35	2/90×35	2/90×35
2100	1200	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	100×75	100×75	100×75	100×75	100×75	2/120×35	2/90×35	2/90×35	2/90×35	2/90×35
	1800	125×75	125×75	125×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	2100	150×75	150×75	125×75	125×75	125×75	2/140×35	2/140×35	2/120×35	2/120×35	2/90×35
3600	3600	300×75	275×75	250×75	225×75	225×75	2/290×45	2/290×35	2/190×45	2/170×45	2/170×35
Unstrutted roof—Maximum rafter span 3000 mm or trussed roof maximum span 6000 mm											
1500	1200	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	125×75	100×75	100×75	100×75	100×75	2/120×35	2/90×35	2/90×35	2/90×35	2/90×35
	1800	125×75	125×75	125×75	125×75	125×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	2100	150×75	150×75	150×75	125×75	125×75	2/140×35	2/140×35	2/120×35	2/120×35	2/90×35
1800	1200	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	125×75	100×75	100×75	100×75	100×75	2/120×35	2/90×35	2/90×35	2/90×35	2/90×35
	1800	150×75	125×75	125×75	125×75	125×75	2/120×35	2/120×35	2/120×35	2/90×35	2/90×35
	2100	150×75	150×75	150×75	150×75	125×75	2/140×35	2/140×35	2/120×35	2/120×35	2/90×35
2100	1200	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	125×75	125×75	100×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1800	150×75	125×75	125×75	125×75	125×75	2/140×35	2/120×35	2/120×35	2/90×35	2/90×35
	2100	175×75	150×75	150×75	150×75	125×75	2/170×35	2/140×35	2/120×35	2/120×35	2/120×35
3600	3600	—	300×75	250×75	250×75	250×75	2/290×45	2/290×45	2/240×35	2/190×35	2/170×45

(*continued*)

TABLE A4 (*continued*)

Bearer spacing mm	Bearer span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Trussed roof maximum span 9000 mm											
1500	1200	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	125×75	125×75	100×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1800	150×75	150×75	125×75	125×75	125×75	2/140×35	2/120×35	2/120×35	2/90×35	2/90×35
	2100	175×75	150×75	150×75	150×75	150×75	2/170×35	2/140×35	2/120×35	2/120×35	2/120×35
1800	1200	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	125×75	125×75	125×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1800	150×75	150×75	125×75	125×75	125×75	2/140×35	2/140×35	2/120×35	2/120×35	2/90×35
	2100	175×75	175×75	150×75	150×75	150×75	2/170×35	2/140×35	2/120×35	2/120×35	2/120×35
2100	1200	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	125×75	125×75	125×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1800	150×75	150×75	125×75	125×75	125×75	2/140×35	2/140×35	2/120×35	2/120×35	2/90×35
	2100	175×75	175×75	150×75	150×75	150×75	2/170×35	2/170×35	2/120×35	2/120×35	2/120×35
3600	3600	—	300×75	275×75	275×75	250×75	2/290×45	2/290×45	2/290×35	2/190×45	2/170×45
Trussed roof maximum span 12000 mm											
1500	1200	125×75	100×75	100×75	100×75	100×75	2/120×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	150×75	125×75	125×75	125×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1800	175×75	150×75	150×75	125×75	125×75	2/170×35	2/140×35	2/120×35	2/120×35	2/120×35
	2100	200×75	175×75	150×75	150×75	150×75	2/170×35	2/170×35	2/120×35	2/120×35	2/140×35
1800	1200	125×75	100×75	100×75	100×75	100×75	2/120×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	150×75	125×75	125×75	125×75	100×75	2/140×35	2/120×35	2/90×35	2/90×35	2/90×35
	1800	175×75	150×75	150×75	125×75	125×75	2/170×35	2/140×35	2/120×35	2/120×35	2/120×35
	2100	200×75	175×75	175×75	150×75	150×75	2/170×35	2/170×35	2/140×35	2/120×35	2/140×35
2100	1200	125×75	100×75	100×75	100×75	100×75	2/120×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	150×75	125×75	125×75	125×75	125×75	2/140×35	2/120×35	2/90×35	2/90×35	2/90×35
	1800	175×75	150×75	150×75	150×75	125×75	2/170×35	2/140×35	2/120×35	2/120×35	2/120×35
	2100	200×75	175×75	175×75	150×75	150×75	2/190×35	2/170×35	2/140×35	2/120×35	2/140×35
3600	3600	—	—	300×75	275×75	275×75	2/290×45	2/290×45	2/240×45	2/240×35	2/190×35

NOTES:

1 For allowable roof and floor load masses, see Clause 1.4.11.

2 For loadbearing walls parallel to bearers, cantilevers shall not exceed 25% of the allowable span.

3 For allowable offsets and cantilevers of loadbearing walls at right angles to bearers, see Clause 4.3.2.3. For bearers supporting point roof loads, see Clause 4.3.2.4.

4 Minimum bearing length shall be 50 mm at end supports and 100 mm at internal supports of continuous span members.

5 Multiple members shall be vertically nail-laminated (see Clause 2.3).

TABLE A5

BEARERS SUPPORTING SINGLE STOREY EXTERNAL LOADBEARING WALLS—TILE ROOF—SINGLE SPAN

Bearer spacing mm	Bearer span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Strutted roof—Maximum rafter span 3000 mm											
1500	1200	125×75	125×75	125×75	100×75	100×75	2/120×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	150×75	150×75	150×75	125×75	125×75	2/140×35	2/120×35	2/120×35	2/120×35	2/90×35
	1800	175×75	175×75	175×75	150×75	150×75	2/170×35	2/140×35	2/140×35	2/120×35	2/120×35
	2100	225×75	200×75	200×75	175×75	175×75	2/190×35	2/170×35	2/170×35	2/140×35	2/140×35
1800	1200	125×75	125×75	125×75	125×75	100×75	2/120×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	150×75	150×75	150×75	150×75	125×75	2/140×35	2/120×35	2/120×35	2/120×35	2/90×35
	1800	200×75	175×75	175×75	175×75	150×75	2/170×35	2/140×35	2/140×35	2/120×35	2/120×35
	2100	225×75	200×75	200×75	200×75	175×75	2/190×35	2/170×35	2/170×35	2/140×35	2/140×35
2100	1200	125×75	125×75	125×75	125×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1500	150×75	150×75	150×75	150×75	125×75	2/140×35	2/120×35	2/120×35	2/120×35	2/120×35
	1800	200×75	175×75	175×75	175×75	150×75	2/170×35	2/140×35	2/140×35	2/140×35	2/120×35
	2100	225×75	200×75	200×75	200×75	175×75	2/190×35	2/170×35	2/170×35	2/170×35	2/140×35
3600	3600	—	—	—	—	—	—	2/290×45	2/290×35	2/290×35	2/240×35
Unstrutted roof—Maximum rafter span 3000 mm or trussed roof maximum span 6000 mm											
1500	1200	125×75	150×75	125×75	125×75	125×75	2/120×35	2/120×35	2/120×35	2/90×35	2/90×35
	1500	175×75	175×75	150×75	150×75	150×75	2/140×35	2/140×35	2/120×35	2/120×35	2/120×35
	1800	200×75	200×75	200×75	175×75	175×75	2/170×35	2/170×35	2/170×35	2/140×35	2/140×35
	2100	225×75	225×75	225×75	225×75	200×75	2/240×35	2/190×35	2/170×35	2/170×35	2/170×35
1800	1200	125×75	150×75	125×75	125×75	125×75	2/120×35	2/120×35	2/120×35	2/90×35	2/90×35
	1500	175×75	175×75	150×75	150×75	150×75	2/170×35	2/140×35	2/140×35	2/120×35	2/120×35
	1800	200×75	200×75	200×75	175×75	175×75	2/190×35	2/170×35	2/170×35	2/140×35	2/140×35
	2100	250×75	250×75	225×75	225×75	200×75	2/240×35	2/190×35	2/170×35	2/170×35	2/170×35
2100	1200	150×75	150×75	125×75	125×75	125×75	2/120×35	2/120×35	2/120×35	2/90×35	2/90×35
	1500	175×75	175×75	175×75	150×75	150×75	2/170×35	2/140×35	2/140×35	2/120×35	2/120×35
	1800	225×75	200×75	200×75	200×75	175×75	2/190×35	2/170×35	2/170×35	2/140×35	2/140×35
	2100	250×75	250×75	225×75	225×75	200×75	2/240×35	2/190×35	2/170×35	2/170×35	2/170×35
3600	3600	—	—	—	—	—	—	—	2/290×45	2/290×45	2/290×35

(*continued*)

TABLE A5 (*continued*)

Bearer spacing mm	Bearer span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Trussed roof maximum span 9000 mm											
1500	1200	150×75	150×75	150×75	125×75	125×75	2/140×35	2/120×35	2/120×35	2/120×35	2/90×35
	1500	200×75	175×75	175×75	150×75	150×75	2/170×35	2/140×35	2/140×35	2/140×35	2/120×35
	1800	225×75	225×75	200×75	200×75	200×75	2/190×35	2/170×35	2/170×35	2/170×35	2/140×35
	2100	250×75	250×75	250×75	225×75	225×75	2/240×35	2/240×35	2/190×35	2/190×35	2/170×35
1800	1200	150×75	150×75	150×75	150×75	125×75	2/140×35	2/120×35	2/120×35	2/120×35	2/90×35
	1500	200×75	175×75	175×75	175×75	150×75	2/170×35	2/140×35	2/140×35	2/140×35	2/120×35
	1800	225×75	225×75	200×75	200×75	200×75	2/190×35	2/170×35	2/170×35	2/170×35	2/140×35
	2100	275×75	250×75	250×75	225×75	225×75	2/240×35	2/240×35	2/190×35	2/190×35	2/170×35
2100	1200	150×75	150×75	150×75	150×75	125×75	2/140×35	2/120×35	2/120×35	2/120×35	2/120×35
	1500	200×75	175×75	175×75	175×75	150×75	2/170×35	2/140×35	2/140×35	2/140×35	2/120×35
	1800	225×75	225×75	200×75	200×75	200×75	2/190×35	2/170×35	2/170×35	2/170×35	2/140×35
	2100	275×75	250×75	250×75	225×75	225×75	2/240×35	2/240×35	2/190×35	2/190×35	2/170×35
3600	3600	—	—	—	—	—	—	—	—	—	2/290×35
Trussed roof maximum span 12000 mm											
1500	1200	175×75	150×75	150×75	150×75	150×75	2/140×35	2/120×35	2/120×35	2/120×35	2/120×35
	1500	200×75	200×75	175×75	175×75	175×75	2/170×35	2/170×35	2/140×35	2/140×35	2/140×35
	1800	250×75	225×75	225×75	200×75	200×75	2/240×35	2/190×35	2/170×35	2/170×35	2/170×35
	2100	275×75	275×75	250×75	250×75	225×75	2/240×35	2/240×35	2/240×35	2/190×35	2/190×35
1800	1200	175×75	150×75	150×75	150×75	150×75	2/140×35	2/120×35	2/120×35	2/120×35	2/120×35
	1500	200×75	200×75	175×75	175×75	175×75	2/170×35	2/170×35	2/170×35	2/140×35	2/140×35
	1800	250×75	225×75	225×75	200×75	200×75	2/240×35	2/190×35	2/170×35	2/170×35	2/170×35
	2100	275×75	275×75	250×75	250×75	225×75	2/240×35	2/240×35	2/240×35	2/190×35	2/190×35
2100	1200	175×75	175×75	150×75	150×75	150×75	2/140×35	2/120×35	2/120×35	2/120×35	2/120×35
	1500	200×75	200×75	175×75	175×75	175×75	2/170×35	2/170×35	2/170×35	2/140×35	2/140×35
	1800	250×75	225×75	225×75	225×75	200×75	2/240×35	2/190×35	2/170×35	2/170×35	2/170×35
	2100	300×75	275×75	250×75	250×75	250×75	2/240×35	2/240×35	2/240×35	2/190×35	2/190×35
3600	3600	—	—	—	—	—	—	—	—	—	2/290×45

NOTES:

1 For allowable roof and floor load masses, see Clause 1.4.11.

2 For loadbearing walls parallel to bearers, cantilevers shall not exceed 25% of the allowable span.

3 For allowable offsets and cantilevers of loadbearing walls at right angles to bearers, see Clause 4.3.2.3. For bearers supporting point roof loads, see Clause 4.3.2.4.

4 Minimum bearing length shall be 50 mm at end supports and 100 mm at internal supports of continuous span members.

5 Multiple members shall be vertically nail-laminated (see Clause 2.3).

TABLE A6

BEARERS SUPPORTING SINGLE STOREY EXTERNAL LOADBEARING WALLS—TILE ROOF—CONTINUOUS SPAN

Bearer spacing mm	Bearer span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Strutted roof—Maximum rafter span 3000 mm											
1500	1200	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	125×75	125×75	100×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1800	150×75	125×75	125×75	125×75	125×75	2/140×35	2/120×35	2/120×35	2/90×35	2/90×35
	2100	175×75	150×75	150×75	150×75	125×75	2/170×35	2/140×35	2/120×35	2/120×35	2/120×35
1800	1200	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	125×75	125×75	100×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1800	150×75	125×75	125×75	125×75	125×75	2/140×35	2/120×35	2/120×35	2/90×35	2/90×35
	2100	175×75	150×75	150×75	150×75	150×75	2/170×35	2/140×35	2/120×35	2/120×35	2/120×35
2100	1200	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	125×75	125×75	100×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1800	150×75	150×75	125×75	125×75	125×75	2/140×35	2/120×35	2/120×35	2/90×35	2/90×35
	2100	175×75	150×75	150×75	150×75	150×75	2/170×35	2/140×35	2/120×35	2/120×35	2/120×35
3600	3600	—	300×75	275×75	250×75	250×75	2/290×45	2/290×45	2/290×35	2/190×45	2/170×45
Unstrutted roof—Maximum rafter span 3000 mm or trussed roof maximum span 6000 mm											
1500	1200	125×75	100×75	100×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1500	150×75	125×75	125×75	125×75	125×75	2/140×35	2/120×35	2/120×35	2/90×35	2/90×35
	1800	175×75	150×75	150×75	150×75	125×75	2/170×35	2/140×35	2/120×35	2/120×35	2/120×35
	2100	200×75	175×75	175×75	150×75	150×75	2/190×35	2/170×35	2/140×35	2/120×35	2/120×35
1800	1200	125×75	100×75	100×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1500	150×75	125×75	125×75	125×75	125×75	2/140×35	2/120×35	2/120×35	2/90×35	2/90×35
	1800	175×75	150×75	150×75	150×75	125×75	2/170×35	2/140×35	2/120×35	2/120×35	2/120×35
	2100	200×75	175×75	175×75	175×75	150×75	2/190×35	2/170×35	2/140×35	2/120×35	2/120×35
2100	1200	125×75	100×75	100×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1500	150×75	150×75	125×75	125×75	125×75	2/140×35	2/120×35	2/120×35	2/90×35	2/90×35
	1800	175×75	175×75	150×75	150×75	125×75	2/170×35	2/170×35	2/120×35	2/120×35	2/120×35
	2100	200×75	200×75	175×75	175×75	150×75	2/190×35	2/170×35	2/140×35	2/120×35	2/120×35
3600	3600	—	—	300×75	275×75	275×75	—	—	2/290×35	2/240×35	2/190×45

(*continued*)

TABLE A6 (*continued*)

Bearer spacing mm	Bearer span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Trussed roof maximum span 9000 mm											
1500	1200	125×75	125×75	100×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1500	175×75	150×75	125×75	125×75	125×75	2/170×35	2/140×35	2/120×35	2/120×35	2/90×35
	1800	200×75	175×75	150×75	150×75	150×75	2/190×35	2/170×35	2/140×35	2/120×35	2/120×35
	2100	225×75	200×75	175×75	175×75	175×75	2/240×35	2/190×35	2/170×35	2/140×35	2/120×35
1800	1200	150×75	125×75	100×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1500	175×75	150×75	125×75	125×75	125×75	2/170×35	2/140×35	2/120×35	2/120×35	2/90×35
	1800	200×75	175×75	150×75	150×75	150×75	2/190×35	2/170×35	2/140×35	2/120×35	2/120×35
	2100	225×75	200×75	200×75	175×75	175×75	2/240×35	2/240×35	2/170×35	2/140×35	2/120×35
2100	1200	150×75	125×75	125×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1500	175×75	150×75	150×75	125×75	125×75	2/170×35	2/140×35	2/120×35	2/120×35	2/90×35
	1800	200×75	175×75	175×75	150×75	150×75	2/190×35	2/170×35	2/140×35	2/120×35	2/120×35
	2100	225×75	200×75	200×75	175×75	175×75	2/240×35	2/240×35	2/170×35	2/140×35	2/120×35
3600	3600	—	—	—	300×75	300×75	—	—	2/290×45	2/240×35	2/240×35
Trussed roof maximum span 12000 mm											
1500	1200	150×75	125×75	125×75	100×75	100×75	2/140×35	2/120×35	2/120×35	2/90×35	2/90×35
	1500	175×75	175×75	150×75	125×75	125×75	2/170×35	2/170×35	2/120×35	2/120×35	2/90×35
	1800	225×75	200×75	175×75	150×75	150×75	2/240×35	2/190×35	2/170×35	2/120×35	2/120×35
	2100	250×75	225×75	200×75	200×75	175×75	2/240×35	2/240×35	2/170×35	2/140×35	2/140×35
1800	1200	150×75	125×75	125×75	100×75	100×75	2/140×35	2/120×35	2/120×35	2/90×35	2/90×35
	1500	175×75	175×75	150×75	150×75	125×75	2/170×35	2/170×35	2/120×35	2/120×35	2/90×35
	1800	225×75	200×75	175×75	175×75	150×75	2/240×35	2/190×35	2/170×35	2/120×35	2/120×35
	2100	250×75	225×75	200×75	200×75	175×75	2/240×35	2/240×35	2/170×35	2/140×35	2/140×35
2100	1200	150×75	150×75	125×75	125×75	100×75	2/140×35	2/120×35	2/120×35	2/90×35	2/90×35
	1500	200×75	175×75	150×75	150×75	125×75	2/170×35	2/170×35	2/120×35	2/120×35	2/90×35
	1800	225×75	200×75	175×75	175×75	150×75	2/240×35	2/190×35	2/170×35	2/120×35	2/120×35
	2100	250×75	225×75	200×75	200×75	175×75	2/240×35	2/240×35	2/190×35	2/140×35	2/140×35
3600	3600	—	—	—	—	—	—	—	—	2/240×45	2/240×35

NOTES:

1 For allowable roof and floor load masses, see Clause 1.4.11.

2 For loadbearing walls parallel to bearers, cantilevers shall not exceed 25% of the allowable span.

3 For allowable offsets and cantilevers of loadbearing walls at right angles to bearers, see Clause 4.3.2.3. For bearers supporting point roof loads, see Clause 4.3.2.4.

4 Minimum bearing length shall be 50 mm at end supports and 100 mm at internal supports of continuous span members.

5 Multiple members shall be vertically nail-laminated (see Clause 2.3).

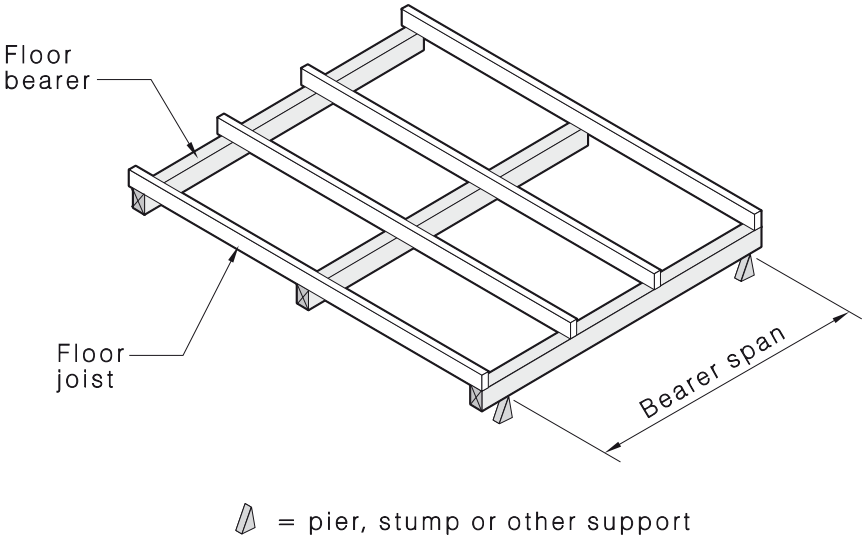


FIGURE A2 BEARERS SUPPORTING FLOOR LOADS ONLY (40 kg/m^2)

TABLE A7

BEARERS SUPPORTING FLOOR LOADS ONLY (40 kg/m^2)

Bearer spacing mm	Bearer span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Single span											
1500	1200	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	125×75	125×75	125×75	100×75	100×75	2/120×35	2/90×35	2/90×35	2/90×35	2/90×35
	1800	150×75	150×75	125×75	125×75	125×75	2/120×35	2/120×35	2/120×35	2/120×35	2/90×35
	2100	175×75	175×75	150×75	150×75	150×75	2/140×35	2/140×35	2/120×35	2/120×35	2/120×35
1800	1200	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	125×75	125×75	125×75	125×75	125×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1800	150×75	150×75	150×75	150×75	125×75	2/140×35	2/120×35	2/120×35	2/120×35	2/90×35
	2100	175×75	175×75	200×75	150×75	150×75	2/170×35	2/140×35	2/140×35	2/120×35	2/120×35
2100	1200	125×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	150×75	125×75	125×75	125×75	125×75	2/120×35	2/120×35	2/120×35	2/90×35	2/90×35
	1800	175×75	150×75	150×75	150×75	150×75	2/140×35	2/120×35	2/120×35	2/120×35	2/90×45
	2100	200×75	175×75	175×75	175×75	150×75	2/170×35	2/140×35	2/140×35	2/140×35	2/120×35
3600	3600	—	—	—	—	—	—	—	2/290×35	2/290×35	2/240×35

(*continued*)

TABLE A7 (*continued*)

Bearer spacing mm	Bearer span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Continuous span											
1500	1200	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	100×75	100×75	100×75	100×75	100×75	2/120×35	2/90×35	2/90×35	2/90×35	2/90×35
	1800	125×75	125×75	100×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	2100	150×75	125×75	125×75	125×75	100×75	2/140×35	2/120×35	2/120×35	2/90×35	2/90×35
1800	1200	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	125×75	100×75	100×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1800	150×75	125×75	125×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	2100	150×75	150×75	125×75	125×75	125×75	2/140×35	2/140×35	2/120×35	2/120×35	2/90×35
2100	1200	100×75	100×75	100×75	100×75	100×75	2/90×35	2/90×35	2/90×35	2/90×35	2/90×35
	1500	125×75	125×75	100×75	100×75	100×75	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	1800	150×75	125×75	100×75	125×75	100×75	2/140×35	2/120×35	2/120×35	2/90×35	2/90×35
	2100	175×75	150×75	150×75	125×75	125×75	2/170×35	2/140×35	2/120×35	2/120×35	2/90×35
3600	3600	—	—	300×75	250×75	250×75	—	—	2/290×35	2/240×35	2/190×35

NOTES:

1 Cantilevers shall not exceed 25% of the allowable span.

2 Minimum bearing length shall be 50 mm at end supports and 100 mm at internal supports of continuous span members.

3 Multiple members shall be vertically nail-laminated (see Clause 2.3).

TABLE A8

FLOOR JOISTS SUPPORTING FLOOR LOADS ONLY (40 kg/m^2)

Joist spacing mm	Joist span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Single span											
450	1200	100×50	100×38	75×50	75×38	75×38	120×35	90×45	70×45	70×35	70×35
	1500	100×50	100×50	100×38	100×38	100×38	120×35	120×35	90×35	90×35	70×45
	1800	125×50	125×38	125×38	100×50	100×50	120×45	120×35	120×35	90×45	90×35
	2100	150×38	150×38	125×50	125×38	125×38	140×35	120×45	120×35	120×35	120×35
	2400	150×50	150×50	150×38	150×38	125×50	170×35	140×35	140×35	120×45	120×35
	3000	200×38	175×50	175×50	175×38	150×50	190×45	170×45	170×35	170×35	140×35
	3600	225×50	225×38	200×50	200×50	200×38	240×35	190×45	190×45	170×45	170×35
	4800	300×50	300×50	275×50	275×50	250×50	290×45	240×45	240×45	240×35	240×35
600	1200	100×50	100×38	100×38	75×50	75×38	120×35	120×35	90×35	70×35	70×35
	1500	125×50	100×50	100×50	100×38	100×38	120×45	120×35	90×45	90×35	90×35
	1800	125×50	125×50	125×38	125×38	100×50	120×45	120×45	120×35	120×35	90×45
	2100	150×50	150×38	150×38	125×50	125×50	140×45	140×35	120×45	120×35	120×35
	2400	175×75	175×38	150×50	150×50	150×38	170×35	140×45	140×45	140×35	120×45
	3000	200×50	200×50	200×38	175×50	175×50	240×35	190×35	170×45	170×35	140×45
	3600	250×50	225×50	225×50	200×50	200×50	240×45	240×35	240×35	190×45	170×45
	4800	—	—	300×50	300×50	275×50	—	290×45	290×45	240×45	240×35
Continuous span											
450	1200	100×38	75×50	75×38	75×38	75×38	90×45	90×35	70×35	70×35	70×35
	1500	100×38	100×38	100×38	75×50	75×50	90×45	90×45	90×35	70×35	70×35
	1800	100×50	100×50	100×38	100×38	100×38	120×35	90×45	90×45	90×35	70×45
	2100	125×50	125×38	125×38	100×50	100×50	120×45	120×35	120×35	90×45	90×35
	2400	150×38	125×50	125×50	125×38	125×38	140×35	120×45	120×35	120×35	120×35
	3000	175×38	150×50	150×50	150×38	150×38	170×35	140×45	140×45	120×45	120×35
	3600	200×38	175×50	175×50	175×38	150×50	190×45	170×45	170×35	170×35	140×35
	4800	250×50	225×50	225×50	200×50	200×50	240×45	240×35	190×45	190×45	170×45
600	1200	100×38	100×38	75×38	75×38	75×38	90×45	90×45	70×45	70×35	70×35
	1500	100×50	100×38	100×38	100×38	75×50	120×35	90×45	90×35	70×45	70×35
	1800	125×38	125×38	100×50	100×50	100×38	120×35	120×35	90×45	90×35	90×35
	2100	125×50	125×50	125×38	125×38	125×38	120×45	120×35	120×35	120×35	90×45
	2400	150×50	150×38	150×38	125×50	125×50	140×35	140×35	120×45	120×35	120×35
	3000	175×50	175×50	175×38	150×50	150×50	170×45	170×35	170×35	140×45	140×35
	3600	225×38	200×50	200×38	175×50	175×50	240×35	190×45	170×45	170×45	170×35
	4800	275×50	250×50	250×50	225×50	225×50	290×45	240×45	240×35	240×35	190×45

NOTES:

1 Cantilevers shall not exceed 25% of the allowable span.

2 Minimum bearing length shall be 50 mm at end supports and 100 mm at internal supports of continuous span members.

3 Multiple members shall be vertically nail-laminated (see Clause 2.3).

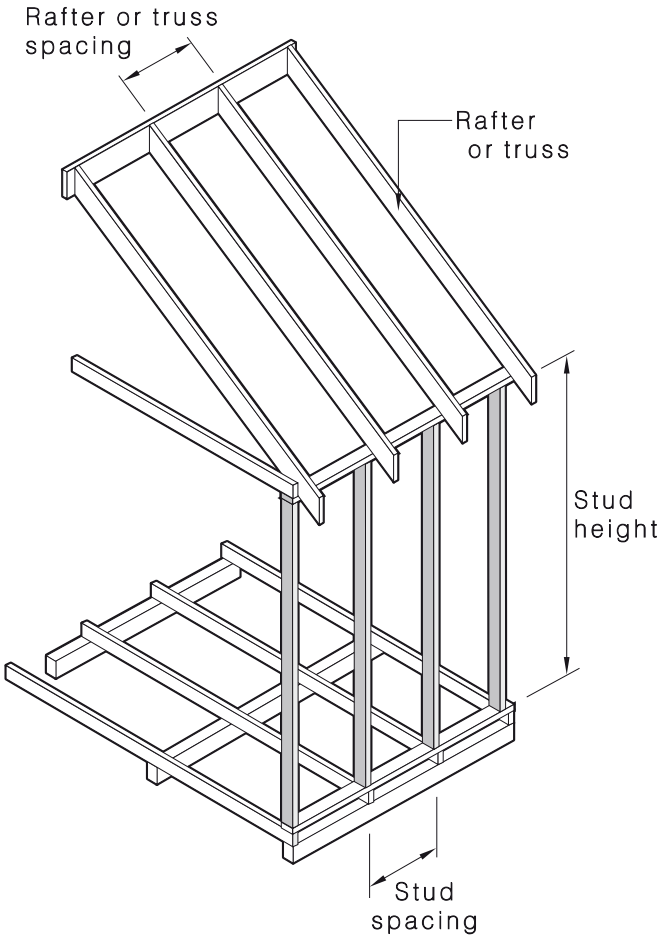


FIGURE A3 COMMON STUDS—SINGLE OR UPPER STOREY

TABLE A9

COMMON STUDS—450 mm CENTRES—70/75 mm FRAME SUPPORTING SINGLE STOREY OR UPPER STOREY EXTERNAL LOADBEARING WALLS

Roof type	Rafter or truss span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Wall height 2400 mm											
Sheet	Notched—20 mm maximum										
	3000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	6000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×35	70×35	70×35
	9000	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×45	70×35	70×35	70×35
	12 000	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	2/70×35	70×45	70×35	70×35
	Not notched										
	3000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	6000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	9000	75×38	75×38	75×38	75×38	75×38	70×45	70×35	70×35	70×35	70×35
	12 000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×35	70×35	70×35

(*continued*)

TABLE A9 (*continued*)

Roof type	Rafter or truss span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Wall height 2400 mm (*continued*)											
Tile	Notched—20 mm maximum										
	3000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	6000	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×45	70×35	70×35	70×35
	9000	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×35	2/70×35	70×45	70×35	70×35
	12 000	2/75×50	2/75×50	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×35	70×45	70×45
	Not notched										
	3000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	6000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	9000	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×35	70×35	70×35	70×35
	12 000	2/75×38	2/75×38	75×50	75×50	75×38	2/70×35	70×45	70×35	70×35	70×35
Wall height 2700 mm											
Sheet	Notched—20 mm maximum										
	3000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×35	70×35	70×35
	6000	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	70×45	70×35	70×35
	9000	2/75×38	2/75×38	75×50	2/75×38	75×50	2/70×35	2/70×45	2/70×35	70×45	70×35
	12 000	2/75×50	2/75×38	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×35	70×45	70×45
	Not notched										
	3000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	6000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×35	70×35	70×35
	9000	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×35	70×35	70×35	70×35
	12 000	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	70×45	70×35	70×35
Tile	Notched—20 mm maximum										
	3000	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×35	70×35	70×35	70×35
	6000	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×35	2/70×35	70×45	70×35	70×35
	9000	—	2/75×50	2/75×38	2/75×38	2/75×38	—	2/70×35	2/70×35	70×45	70×45
	12 000	—	—	2/75×50	2/75×50	2/75×38	—	2/70×45	2/70×45	2/70×35	2/70×35
	Not notched										
	3000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	6000	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×35	70×35	70×35	70×35
	9000	2/75×38	2/75×38	2/75×38	75×50	75×38	2/70×35	2/70×35	70×45	70×35	70×35
	12 000	2/75×50	2/75×50	2/75×38	2/75×38	75×50	2/70×45	2/70×35	70×45	70×45	70×45

NOTES:

1 For allowable roof load masses, see Clause 1.4.11.

2 Studs for internal non-loadbearing walls shall be in accordance with Clause 6.3.5.

3 For limitations on notching, see Clause 6.2.1.4.

4 Multiple members shall be nail-laminated (see Clause 2.4).

5 Edge distances for some sheet bracing materials may require a minimum stud width of 45 mm for joining sheets.

TABLE A10

COMMON STUDS—450 mm CENTRES—90/100 mm FRAME SUPPORTING SINGLE STOREY OR UPPER STOREY EXTERNAL LOADBEARING WALLS

Roof type	Rafter or truss span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Wall height 2400 mm											
Sheet	Notched—20 mm maximum										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12 000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	Not notched										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12 000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
Tile	Notched—20 mm maximum										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12 000	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
	Not notched										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12 000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
Wall height 2700 mm											
Sheet	Notched—20 mm maximum										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
	12 000	100×50	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
	Not notched										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12 000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
Tile	Notched—20 mm maximum										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×50	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
	12 000	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	90×35	90×35	90×35
	Not notched										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12 000	100×50	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35

NOTES:

1 For allowable roof load masses, see Clause 1.4.11.

2 Studs for internal non-loadbearing walls shall be in accordance with Clause 6.3.5.

3 For limitations on notching, see Clause 6.2.1.4.

4 Multiple members shall be nail-laminated (see Clause 2.4.

5 Edge distances for some sheet bracing materials may require a minimum stud width of 45 mm for joining sheets.

TABLE A11

COMMON STUDS—600 mm CENTRES—70/75 mm FRAME SUPPORTING SINGLE STOREY OR UPPER STOREY EXTERNAL LOADBEARING WALLS

Roof type	Rafter or truss span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Wall height 2400 mm											
Sheet	Notched—20 mm maximum										
	3000	75×38	75×38	75×38	75×38	75×38	70×45	70×35	70×35	70×35	70×35
	6000	75×50	75×50	75×38	75×38	75×38	2/70×35	70×35	70×35	70×35	70×35
	9000	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	70×45	70×35	70×35
	12 000	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	2/70×35	2/70×35	70×45	70×35
	Not notched										
	3000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	6000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	9000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×35	70×35	70×45
	12 000	75×50	75×50	75×38	75×38	75×38	2/70×35	70×35	70×35	70×35	70×35
Tile	Notched—20 mm maximum										
	3000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×35	70×35	70×35
	6000	2/75×38	75×50	75×50	75×38	75×38	2/70×35	70×45	70×45	70×35	70×35
	9000	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×35	2/70×35	2/70×35	70×45	70×35
	12 000	2/75×50	2/75×50	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×35	70×45	70×45
	Not notched										
	3000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	6000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×35	70×35	70×35
	9000	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×35	70×35	70×35	70×35
	12 000	2/75×38	75×50	2/75×38	75×50	75×38	2/70×35	70×45	70×35	70×35	70×35
Wall height 2700 mm											
Sheet	Notched—20 mm maximum										
	3000	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×45	70×45	70×35	70×35
	6000	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	2/70×35	2/70×35	70×35	70×35
	9000	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×45	2/70×35	2/70×35	70×45	70×35
	12 000	2/75×50	2/75×50	2/75×38	2/75×38	75×50	—	2/70×35	2/70×35	2/70×35	70×45
	Not notched										
	3000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	6000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×35	70×35	70×35
	9000	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×45	70×35	70×35	70×35
	12 000	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	2/70×35	70×45	70×35	70×35
Tile	Notched—20 mm maximum										
	3000	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×45	70×45	70×35	70×35
	6000	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×45	2/70×35	2/70×35	70×45	70×35
	9000	—	2/75×50	2/75×38	2/75×38	2/75×38	—	2/70×45	2/70×35	2/70×35	70×45
	12 000	—	—	2/75×50	2/75×50	2/75×38	—	—	2/70×35	2/70×35	2/70×35
	Not notched										
	3000	75×38	75×38	75×38	75×38	75×38	70×45	70×35	70×35	70×35	70×35
	6000	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×45	70×35	70×35	70×35
	9000	2/75×38	2/75×38	2/75×38	75×50	75×38	2/70×35	2/70×35	70×45	70×35	70×35
	12 000	2/75×50	2/75×50	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×35	70×45	70×45

NOTES:

1 For allowable roof load masses, see Clause 1.4.11.

2 Studs for internal non-loadbearing walls shall be in accordance with Clause 6.3.5.

3 For limitations on notching, see Clause 6.2.1.4.

4 Multiple members shall be nail-laminated (see Clause 2.4).

5 Edge distances for some sheet bracing materials may require a minimum stud width of 45 mm for joining sheets.

TABLE A12

COMMON STUDS—600 mm CENTRES—90/100 mm FRAME SUPPORTING SINGLE STOREY OR UPPER STOREY EXTERNAL LOADBEARING WALLS

Roof type	Rafter or truss span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Wall height 2400 mm											
Sheet	Notched—20 mm maximum										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12 000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	Not notched										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12 000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
Tile	Notched—20 mm maximum										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12 000	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
	Not notched										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12 000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
Wall height 2700 mm											
Sheet	Notched—20 mm maximum										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
	12 000	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×35	90×35	90×35
	Not notched										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12 000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
Tile	Notched—20 mm maximum										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
	9000	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×35	90×35	90×35
	12 000	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
	Not notched										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12 000	100×50	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35

NOTES:

1 For allowable roof load masses, see Clause 1.4.11.
2 Studs for internal non-loadbearing walls shall be in accordance with Clause 6.3.5.
3 For limitations on notching, see Clause 6.2.1.4.
4 Multiple members shall be nail-laminated (see Clause 2.4).
5 Edge distances for some sheet bracing materials may require a minimum stud width of 45 mm for joining sheets.

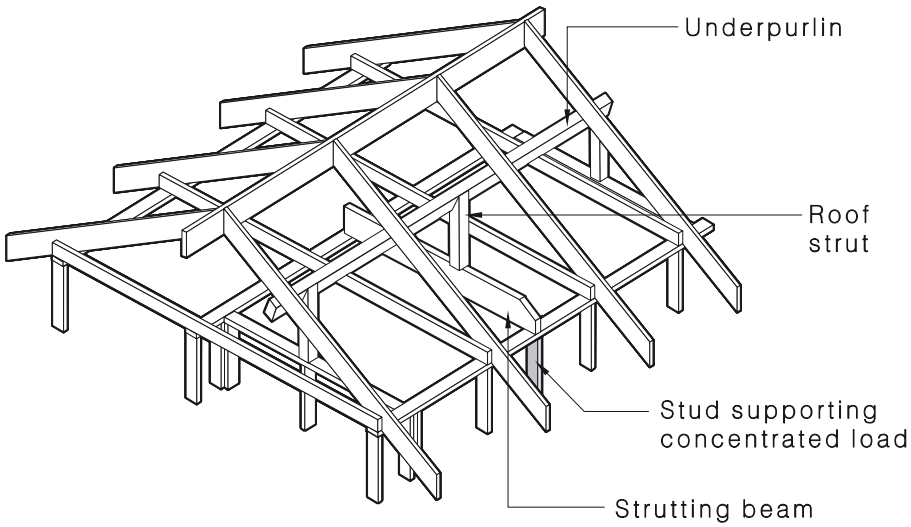


FIGURE A4 STUDS SUPPORTING CONCENTRATED LOADS

TABLE A13

STUDS SUPPORTING CONCENTRATED LOADS—70/75 mm FRAME—SINGLE STOREY OR UPPER STOREY EXTERNAL LOADBEARING WALLS

Roof type	Roof area supported m^2	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Wall height 2400 mm											
Sheet	Notched—20 mm maximum										
	5	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	10	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	70×35	70×35	70×35
	15	2/75×50	2/75×50	2/75×50	2/75×38	75×50	2/70×45	2/70×35	2/70×35	70×45	70×45
	Not notched										
	5	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	10	2/75×38	75×50	75×38	75×38	75×38	70×45	70×35	70×35	70×35	70×35
	15	2/75×38	2/75×38	2/75×38	75×50	75×38	2/70×35	2/70×35	70×35	70×35	70×35
Tile	Notched—20 mm maximum										
	5	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	70×45	70×35	70×35
	10	3/75×50	3/75×50	2/75×50	2/75×50	2/75×38	3/70×45	2/70×45	2/70×45	2/70×35	2/70×35
	15	—	—	3/75×50	3/75×50	3/75×38	—	3/70×45	3/70×45	3/70×35	2/70×45
	Not notched										
	5	75×50	75×50	75×38	75×38	75×38	70×45	70×35	70×35	70×35	70×35
	10	3/75×38	2/75×50	2/75×50	2/75×38	75×50	3/70×35	2/70×45	2/70×35	70×45	70×45
	15	—	3/75×50	3/75×38	2/75×50	2/75×38	—	3/70×35	2/70×45	2/70×35	2/70×35

(*continued*)

TABLE A13 (*continued*)

Roof type	Roof area supported m^2	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Wall height 2700 mm											
Sheet	Notched—20 mm maximum										
	5	2/75×50	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	10	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×45	2/70×35	2/70×35	70×45	70×35
	15	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	2/70×35	2/70×35	2/70×35
	Not notched										
	5	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	10	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	70×35	70×35	70×35
	15	2/75×50	2/75×38	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×35	70×45	70×35
Tile	Notched—20 mm maximum										
	5	2/75×50	2/75×50	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×35	70×45	70×35
	10	—	—	3/75×50	3/75×38	2/75×50	—	3/70×45	3/70×35	2/70×45	2/70×45
	15	—	—	—	—	3/75×50	—	—	—	3/70×45	3/70×45
	Not notched										
	5	2/75×38	2/75×38	75×50	75×50	75×38	2/70×35	70×45	70×45	70×35	70×35
	10	3/75×50	3/75×38	2/75×50	2/75×50	2/75×38	3/70×45	2/70×45	2/70×45	2/70×35	2/70×35
	15	—	—	3/75×50	3/75×50	3/75×38	—	3/70×45	3/70×45	2/70×45	2/70×45

NOTES:

1 For allowable roof load masses, see Clause 1.4.11.

2 Studs for internal non-loadbearing walls shall be in accordance with Clause 6.3.5.

3 For limitations on notching, see Clause 6.2.1.4.

4 Multiple members shall be nail-laminated (see Clause 2.4).

5 Edge distances for some sheet bracing materials may require a minimum stud width of 45 mm for joining sheets.

6 For supported roof area, see Figure 6.11.

TABLE A14

STUDS SUPPORTING CONCENTRATED LOADS—90/100 mm FRAME—SINGLE STOREY OR UPPER STOREY EXTERNAL LOADBEARING WALLS

Roof type	Roof area supported m^2	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Wall height 2400 mm											
Sheet	Notched—20 mm maximum										
	5	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	10	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	15	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
	Not notched										
	5	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	10	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	15	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
Tile	Notched—20 mm maximum										
	5	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	10	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	90×35	90×35	90×35
	15	2/100×50	2/100×38	2/100×38	100×50	100×50	2/90×45	2/90×35	2/90×35	90×45	90×45
	Not notched										
	5	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	10	100×50	100×50	100×38	100×38	100×38	2/90×35	90×35	90×35	90×35	90×35
	15	2/100×38	2/100×38	100×50	100×50	100×38	2/90×35	90×45	90×45	90×35	90×35
Wall height 2700 mm											
Sheet	Notched—20 mm maximum										
	5	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	10	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	15	100×50	100×50	100×38	100×38	100×38	2/90×35	90×45	90×35	90×35	90×35
	Not notched										
	5	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	10	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	15	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
Tile	Notched—20 mm maximum										
	5	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	10	2/100×38	2/100×38	100×50	100×50	100×38	2/90×45	2/90×35	2/90×35	90×35	90×35
	15	3/100×38	2/100×50	2/100×38	2/100×38	2/100×38	3/90×45	2/90×45	2/90×35	2/90×35	2/90×35
	Not notched										
	5	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	10	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	90×35	90×35	90×35
	15	2/100×50	2/100×38	2/100×38	100×50	100×50	2/90×45	2/90×35	2/90×35	90×45	90×35

NOTES:

1 For allowable roof load masses, see Clause 1.4.11.

2 Studs for internal non-loadbearing walls shall be in accordance with Clause 6.3.5.

3 For limitations on notching, see Clause 6.2.1.4.

4 Multiple members shall be nail-laminated (see Clause 2.4).

5 Edge distances for some sheet bracing materials may require a minimum stud width of 45 mm for joining sheets.

6 For supported roof area, see Figure 6.11.

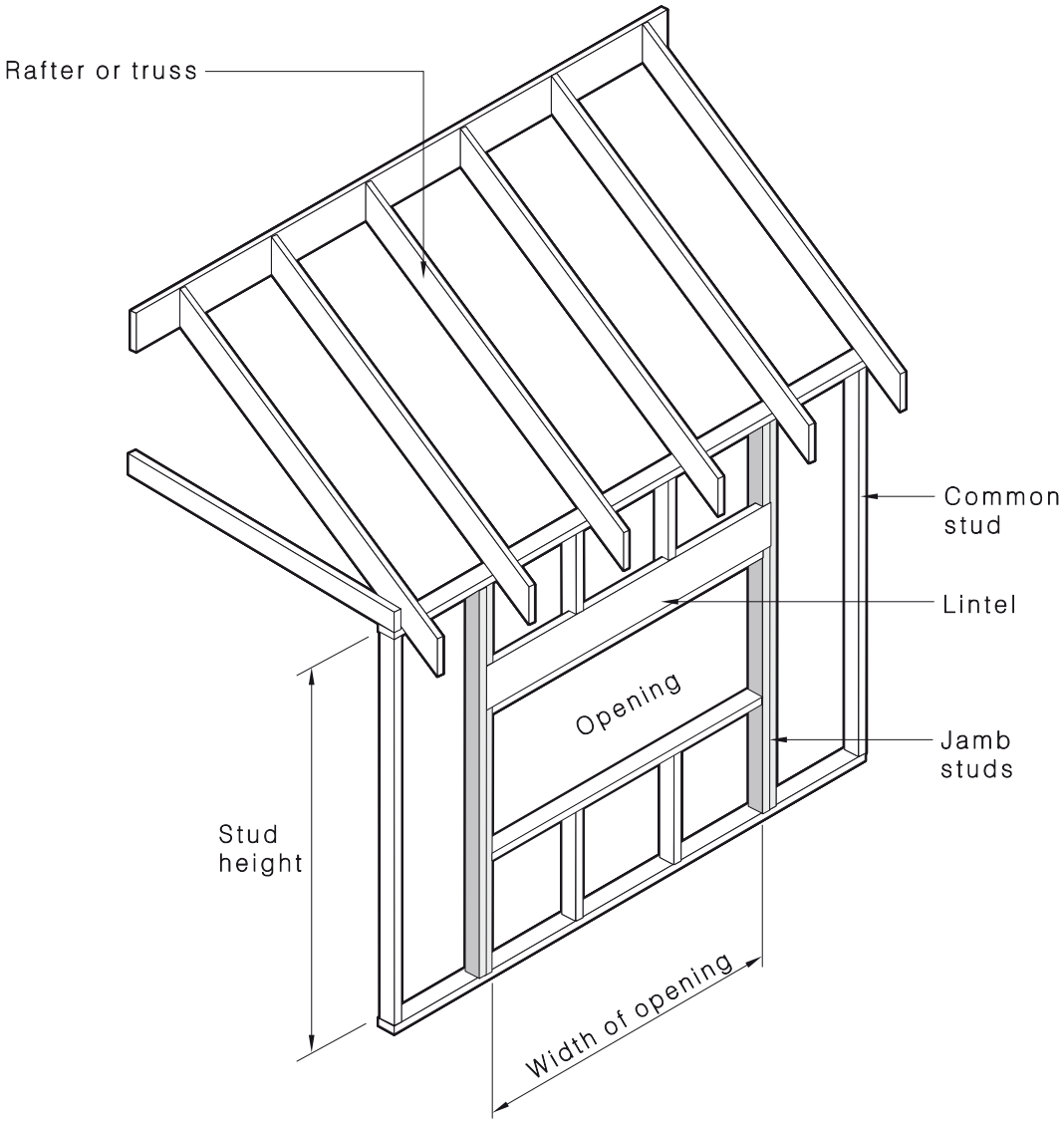


FIGURE A5 JAMB STUDS—SINGLE OR UPPER STOREY

TABLE A15

JAMB STUDS—WALL HEIGHT 2400 mm—70/75 mm FRAME—SUPPORTING SINGLE STOREY OR UPPER STOREY EXTERNAL LOADBEARING WALLS

Roof type	Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Sheet	3000	900	75×38	75×38	75×38	75×38	75×38	70×45	70×35	70×35	70×35	70×35
		1200	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×45	70×35	70×35
		1500	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×45	70×45	70×35	70×35
		1800	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×45	2/70×35	70×35	70×35
		2100	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	2/70×35	2/70×35	70×45	70×35
		2400	2/75×38	2/75×38	75×50	75×50	75×38	2/70×35	2/70×35	2/70×35	70×45	70×35
		3000	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×45	2/70×35	2/70×35	2/70×35	70×45
		3600	2/75×50	2/75×50	2/75×38	2/75×38	75×50	3/70×35	2/70×35	2/70×45	2/70×35	70×45
	6000	900	75×50	75×50	75×38	75×38	75×38	2/70×35	70×35	70×35	70×35	70×35
		1200	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×45	70×45	70×35	70×35
		1500	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	2/70×35	70×35	70×35
		1800	2/75×38	2/75×38	75×50	75×50	75×38	2/70×45	2/70×35	2/70×35	70×45	70×35
		2100	2/75×50	2/75×38	2/75×38	75×50	75×38	2/70×45	2/70×35	2/70×35	2/70×35	70×35
		2400	2/75×50	2/75×38	2/75×38	75×50	75×50	3/70×35	2/70×35	2/70×35	2/70×35	70×45
		3000	3/75×38	2/75×50	2/75×38	2/75×38	2/75×38	3/70×45	2/70×45	2/70×45	2/70×35	2/70×35
		3600	3/75×38	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	3/70×35	3/70×35	2/70×35	2/70×35
	9000	900	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×45	70×45	70×35	70×35
		1200	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	2/70×35	2/70×35	70×45	70×35
		1500	2/75×50	2/75×38	2/75×38	75×50	75×38	2/70×45	2/70×35	2/70×35	70×45	70×35
		1800	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×45	2/70×35	2/70×35	2/70×35	70×45
		2100	2/75×50	2/75×50	2/75×38	2/75×38	75×50	3/70×35	2/70×35	2/70×35	2/70×35	70×45
		2400	3/75×38	2/75×50	2/75×38	2/75×38	2/75×38	3/70×45	2/70×45	2/70×45	2/70×35	2/70×35
		3000	3/75×50	3/75×38	2/75×50	2/75×50	2/75×38	3/70×45	3/70×35	3/70×35	2/70×45	2/70×35
		3600	4/75×50	3/75×50	3/75×38	2/75×50	2/75×38	4/70×45	3/70×45	3/70×35	2/70×45	2/70×35
	12 000	900	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	2/70×35	70×45	70×35	70×35
		1200	2/75×38	2/75×38	75×50	75×50	75×38	2/70×45	2/70×35	2/70×35	70×45	70×35
		1500	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×45	2/70×35	2/70×35	2/70×35	70×45
		1800	3/75×38	2/75×50	2/75×38	2/75×38	75×50	3/70×35	2/70×45	2/70×35	2/70×35	70×45
		2100	3/75×38	2/75×50	2/75×38	2/75×38	2/75×38	3/70×45	2/70×45	2/70×45	2/70×35	2/70×35
		2400	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	3/70×35	2/70×45	2/70×35	2/70×35
		3000	4/75×50	3/75×50	3/75×38	2/75×50	2/75×38	4/70×45	3/70×45	3/70×35	2/70×45	2/70×35
		3600	4/75×50	4/75×50	3/75×50	3/75×38	2/75×50	—	3/70×45	3/70×45	3/70×35	2/70×45

(*continued*)

TABLE A15 (*continued*)

Roof type	Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Tile	3000	900	75×50	75×50	75×38	75×38	75×38	2/70×35	70×35	70×35	70×35	70×35
		1200	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×45	70×45	70×35	70×35
		1500	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	2/70×35	70×45	70×35
		1800	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	2/70×35	2/70×35	70×45	70×35
		2100	2/75×38	2/75×38	2/75×38	75×50	75×38	2/70×45	2/70×35	2/70×35	70×45	70×35
		2400	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×45	2/70×35	2/70×35	2/70×35	70×35
		3000	3/75×38	2/75×50	2/75×38	3/75×38	75×50	3/70×35	2/70×35	2/70×45	2/70×35	70×45
		3600	3/75×50	2/75×50	2/75×50	3/75×38	2/75×38	3/70×45	2/70×45	2/70×45	2/70×35	2/70×35
	6000	900	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	70×45	70×35	70×35
		1200	2/75×38	2/75×38	75×50	75×50	75×38	2/70×35	2/70×35	2/70×35	70×45	70×35
		1500	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×45	2/70×35	2/70×35	70×45	70×35
		1800	2/75×50	2/75×50	2/75×38	2/75×38	75×50	3/70×35	2/70×35	2/70×35	2/70×35	70×45
		2100	3/75×38	2/75×50	2/75×38	2/75×38	2/75×38	3/70×35	2/70×45	2/70×45	2/70×35	70×45
		2400	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	2/70×45	2/70×35	2/70×35
		3000	3/75×50	3/75×50	2/75×50	2/75×50	2/75×38	4/70×35	3/70×35	3/70×35	2/70×45	2/70×35
		3600	4/75×50	3/75×50	3/75×38	2/75×50	2/75×50	4/70×45	3/70×45	3/70×45	2/70×45	2/70×35
	9000	900	2/75×50	2/75×38	2/75×38	75×38	75×50	2/70×45	2/70×35	2/70×35	70×45	70×35
		1200	2/75×50	2/75×38	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×35	2/70×35	70×45
		1500	3/75×38	2/75×50	2/75×38	2/75×38	2/75×38	3/70×35	2/70×35	2/70×35	2/70×35	70×45
		1800	3/75×50	3/75×38	2/75×50	2/75×50	2/75×38	3/70×45	2/70×45	2/70×45	2/70×35	2/70×35
		2100	3/75×38	3/75×50	2/75×50	2/75×50	2/75×38	3/70×45	3/70×35	2/70×45	2/70×35	2/70×35
		2400	4/75×38	3/75×50	3/75×38	2/75×50	2/75×38	4/70×45	3/70×35	3/70×35	2/70×45	2/70×35
		3000	4/75×50	4/75×50	3/75×50	3/75×38	2/75×50	4/70×45	3/70×45	3/70×45	2/70×45	2/70×45
		3600	—	4/75×50	3/75×50	3/75×50	3/75×38	—	4/70×45	3/70×45	3/70×35	2/70×45
	12 000	900	2/75×50	2/75×50	2/75×38	2/75×38	2/75×38	2/70×45	2/70×35	2/70×35	70×45	70×45
		1200	3/75×38	2/75×50	2/75×50	2/75×38	2/75×38	3/70×35	2/70×45	2/70×35	2/70×35	2/70×35
		1500	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	2/70×45	2/70×35	2/70×35
		1800	4/75×50	3/75×50	3/75×38	2/75×50	2/75×50	4/70×35	3/70×35	2/70×45	2/70×45	2/70×35
		2100	4/75×50	3/75×50	3/75×50	3/75×38	2/75×50	4/70×35	3/70×45	3/70×35	2/70×45	2/70×35
		2400	4/75×50	4/75×50	3/75×50	3/75×38	2/75×50	4/70×45	3/70×45	3/70×45	2/70×45	2/70×45
		3000	—	4/75×50	4/75×50	3/75×50	3/75×50	—	4/70×45	3/70×45	3/70×45	3/70×35
		3600	—	—	4/75×50	4/75×50	3/75×50	—	—	4/70×45	3/70×45	3/70×45

NOTES:

1 For allowable roof and floor load masses, see Clause 1.4.11.

2 For limitations on notching and housing, see Clause 6.2.1.4 and Figure 6.3.

3 Multiple members shall be nail-laminated (see Clause 2.4).

4 Edge distances for some sheet bracing materials may require a minimum stud width of 45 mm for joining sheets.

5 For openings greater than 900 mm, a secondary jamb stud may be required to support the lintel (see Figure 6.8).

TABLE A16

JAMB STUDS—WALL HEIGHT 2400 mm—90/100 mm FRAME—SUPPORTING SINGLE STOREY OR UPPER STOREY EXTERNAL LOADBEARING WALLS

Roof type	Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Sheet	3000	900	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
		1200	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
		1500	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
		1800	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
		2100	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		2400	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		3000	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×45	90×35	90×35
		3600	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×35	90×35
	6000	900	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
		1200	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
		1500	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		1800	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		2100	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×35	90×35	90×35
		2400	100×50	100×38	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		3000	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×35	90×35
		3600	2/100×38	2/100×38	100×50	100×38	100×38	2/90×45	2/90×35	2/90×35	90×45	90×35
	9000	900	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
		1200	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		1500	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		1800	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×35	90×35	90×35
		2100	100×50	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		2400	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		3000	2/100×38	2/100×38	100×50	100×38	100×38	2/90×45	2/90×35	2/90×35	90×45	90×35
		3600	2/100×38	2/100×38	2/100×38	100×50	100×38	2/90×45	2/90×35	2/90×35	2/90×35	90×35
	12 000	900	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
		1200	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		1500	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×35	90×35	90×35
		1800	100×50	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		2100	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		2400	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	2/90×35	2/90×35	90×45	90×35
		3000	2/100×38	2/100×38	2/100×38	100×50	100×38	2/90×45	2/90×35	2/90×35	90×45	90×35
		3600	2/100×50	2/100×38	2/100×38	100×50	100×50	3/90×35	2/90×35	2/90×35	2/90×35	90×45

(*continued*)

TABLE A16 (*continued*)

Roof type	Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Tile	3000	900	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
		1200	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
		1500	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
		1800	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		2100	100×50	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		2400	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×45	90×35	90×35
		3000	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		3600	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	2/90×35	2/90×35	90×45	90×35
	6000	900	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
		1200	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		1500	100×50	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		1800	100×50	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		2100	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		2400	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×35	90×35
		3000	2/100×38	2/100×38	100×50	100×38	100×38	2/90×45	2/90×35	2/90×35	90×45	90×35
		3600	2/100×50	2/100×38	2/100×38	100×50	100×38	2/90×45	2/90×35	2/90×35	2/90×35	90×35
	9000	900	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		1200	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×35	90×35	90×35
		1500	100×50	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		1800	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		2100	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	2/90×35	2/90×35	90×45	90×35
		2400	2/100×38	2/100×38	100×50	100×38	100×38	2/90×45	2/90×35	2/90×35	90×45	90×35
		3000	2/100×50	2/100×38	2/100×38	100×50	100×50	3/90×35	2/90×35	2/90×35	2/90×35	90×45
		3600	2/100×50	2/100×50	2/100×38	2/100×38	100×50	3/90×45	2/90×45	2/90×45	2/90×35	2/90×35
	12 000	900	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×35	90×35	90×35
		1200	100×50	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		1500	2/100×38	100×50	100×50	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		1800	2/100×38	2/100×38	100×50	100×50	100×38	2/90×45	2/90×35	2/90×35	90×45	90×35
		2100	2/100×38	2/100×38	2/100×38	100×50	100×38	2/90×45	2/90×35	2/90×35	90×45	90×35
		2400	2/100×50	2/100×38	2/100×38	100×50	100×50	2/90×45	2/90×35	2/90×35	2/90×35	90×45
		3000	3/100×38	2/100×50	2/100×38	2/100×38	100×50	3/90×45	2/90×45	2/90×35	2/90×35	2/90×35
		3600	3/100×50	2/100×50	2/100×50	2/100×38	2/100×38	3/90×45	3/90×35	2/90×45	2/90×35	2/90×35

NOTES:

1 For allowable roof and floor load masses, see Clause 1.4.11.

2 For limitations on notching and housing, see Clause 6.2.1.4 and Figure 6.3.

3 Multiple members shall be nail-laminated (see Clause 2.4).

4 Edge distances for some sheet bracing materials may require a minimum stud width of 45 mm for joining sheets.

5 For openings greater than 900 mm, a secondary jamb stud may be required to support the lintel (see Figure 6.8).

TABLE A17

JAMB STUDS—WALL HEIGHT 2700 mm—70/75 mm FRAME—SUPPORTING SINGLE STOREY OR UPPER STOREY EXTERNAL LOADBEARING WALLS

Roof type	Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Sheet	3000	900	75×50	75×50	75×38	75×38	75×38	2/70×35	70×45	70×45	70×35	70×35
		1200	2/75×38	75×50	75×50	75×38	75×38	2/70×35	70×45	70×45	70×35	70×35
		1500	2/75×38	2/75×38	75×50	75×50	75×38	2/70×35	2/70×35	2/70×35	70×45	70×35
		1800	2/75×38	2/75×38	2/75×38	75×50	75×50	2/70×45	2/70×35	2/70×35	70×45	70×35
		2100	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×45	2/70×35	2/70×35	2/70×35	70×45
		2400	2/75×50	2/75×50	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×35	2/70×35	70×45
		3000	3/75×38	2/75×50	2/75×50	2/75×38	2/75×38	3/70×35	2/70×45	2/70×45	2/70×35	2/70×35
		3600	3/75×50	3/75×38	2/75×50	2/75×50	2/75×38	3/70×45	2/70×45	3/70×35	2/70×45	2/70×35
	6000	900	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	70×45	70×35	70×35
		1200	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	2/70×35	2/70×35	70×45	70×35
		1500	2/75×50	2/75×38	2/75×38	75×50	75×38	2/70×45	2/70×35	2/70×35	70×45	70×35
		1800	2/75×50	2/75×38	2/75×38	75×50	75×50	3/70×35	2/70×35	2/70×35	2/70×35	70×45
		2100	3/75×38	2/75×50	2/75×38	2/75×38	75×50	3/70×35	2/70×45	2/70×45	2/70×35	70×45
		2400	3/75×38	2/75×50	2/75×38	2/75×38	2/75×38	3/70×45	2/70×45	2/70×45	2/70×35	2/70×35
		3000	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	4/70×35	3/70×35	3/70×35	2/70×45	2/70×35
		3600	4/75×50	3/75×50	3/75×38	2/75×50	2/75×38	4/70×45	3/70×45	3/70×45	2/70×45	2/70×35
	9000	900	2/75×38	2/75×38	75×38	75×38	75×38	2/70×35	2/70×35	2/70×35	70×45	70×35
		1200	2/75×50	2/75×38	2/75×38	75×50	75×38	2/70×45	2/70×35	2/70×35	70×45	70×35
		1500	2/75×50	2/75×38	2/75×38	2/75×38	75×50	3/70×35	2/70×35	2/70×35	2/70×35	70×45
		1800	3/75×38	2/75×50	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	2/70×45	2/70×35	2/70×35
		2100	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	2/70×45	2/70×35	2/70×35
		2400	3/75×50	3/75×38	3/75×50	2/75×38	2/75×38	4/70×35	3/70×35	3/70×35	2/70×45	2/70×35
		3000	4/75×50	3/75×50	3/75×50	2/75×50	2/75×50	4/70×45	3/70×45	3/70×45	2/70×45	2/70×35
		3600	4/75×50	4/75×50	3/75×50	3/75×38	2/75×50	—	4/70×35	3/70×45	3/70×35	2/70×45
	12 000	900	2/75×38	2/75×38	2/75×38	75×50	75×38	2/70×45	2/70×35	2/70×35	70×45	70×35
		1200	2/75×50	2/75×38	2/75×38	2/75×38	75×50	3/70×35	2/70×35	2/70×35	2/70×35	70×45
		1500	3/75×38	2/75×50	2/75×38	2/75×38	2/75×38	3/70×45	2/70×45	2/70×45	2/70×35	2/70×35
		1800	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	3/70×35	2/70×45	2/70×35	2/70×35
		2100	3/75×50	3/75×50	2/75×50	2/75×50	2/75×38	4/70×45	3/70×35	3/70×35	2/70×45	2/70×35
		2400	4/75×50	3/75×50	3/75×38	2/75×50	2/75×38	4/70×45	3/70×45	3/70×35	2/70×45	2/70×35
		3000	4/75×50	4/75×50	3/75×50	3/75×38	2/75×50	—	4/70×35	3/70×45	3/70×35	2/70×45
		3600	—	4/75×50	4/75×50	3/75×50	3/75×38	—	4/70×45	4/70×45	3/70×45	3/70×35

(*continued*)

TABLE A17 (*continued*)

Roof type	Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Tile	3000	900	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×45	70×45	70×35	70×35
		1200	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	2/70×35	70×45	70×35
		1500	2/75×38	2/75×38	2/75×38	75×50	75×38	2/70×45	2/70×35	2/70×35	70×45	70×35
		1800	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×45	2/70×35	2/70×35	2/70×35	70×35
		2100	2/75×50	2/75×50	2/75×38	2/75×38	75×50	3/70×35	2/70×35	2/70×35	2/70×35	70×45
		2400	3/75×38	2/75×50	2/75×38	2/75×38	75×50	3/70×35	2/70×45	2/70×45	2/70×35	70×45
		3000	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	3/70×35	2/70×35	2/70×35
		3600	3/75×50	3/75×50	2/75×50	2/75×50	2/75×38	4/70×45	3/70×35	3/70×35	2/70×45	2/70×35
	6000	900	2/75×50	2/75×38	2/75×38	75×50	75×38	2/70×45	2/70×35	2/70×35	70×45	70×35
		1200	2/75×50	2/75×38	2/75×38	75×50	75×38	2/70×45	2/70×35	2/70×35	2/70×35	70×45
		1500	3/75×38	2/75×50	2/75×38	2/75×38	75×50	3/70×35	2/70×35	2/70×35	2/70×35	70×45
		1800	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	2/70×45	2/70×35	2/70×35
		2100	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	3/70×35	2/70×45	2/70×35	2/70×35
		2400	3/75×50	3/75×50	3/75×38	2/75×50	2/75×38	4/70×45	3/70×35	3/70×35	2/70×45	2/70×35
		3000	4/75×50	4/75×38	3/75×50	2/75×50	2/75×50	4/70×45	3/70×45	3/70×45	2/70×45	2/70×45
		3600	—	4/75×50	3/75×50	3/75×38	3/75×38	—	4/70×45	3/70×45	3/70×35	2/70×45
	9000	900	2/75×50	2/75×50	2/75×38	2/75×38	75×50	3/70×35	2/70×35	2/70×35	2/70×35	70×45
		1200	3/75×38	2/75×50	2/75×38	2/75×38	2/75×38	3/70×35	2/70×45	2/70×35	2/70×35	70×45
		1500	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	2/70×45	2/70×35	2/70×35
		1800	4/75×38	3/75×50	3/75×38	2/75×50	2/75×38	4/70×45	3/70×35	3/70×35	2/70×45	2/70×35
		2100	4/75×50	3/75×50	3/75×50	2/75×50	2/75×50	4/70×45	3/70×45	3/70×35	2/70×45	2/70×35
		2400	4/75×50	4/75×50	3/75×50	3/75×38	2/75×50	—	4/70×35	3/70×45	3/70×35	2/70×45
		3000	—	4/75×50	4/75×50	3/75×50	3/75×50	—	4/70×45	4/70×35	3/70×45	3/70×35
		3600	—	—	4/75×50	4/75×50	3/75×50	—	—	4/70×45	3/70×45	3/70×45
	12 000	900	3/75×38	3/75×50	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	2/70×35	2/70×35	2/70×35
		1200	3/75×50	3/75×50	2/75×50	2/75×50	2/75×38	3/70×45	3/70×35	2/70×45	2/70×35	2/70×35
		1500	4/75×50	3/75×50	3/75×38	2/75×50	2/75×38	4/70×45	3/70×45	3/70×35	2/70×45	2/70×35
		1800	4/75×50	4/75×50	3/75×50	3/75×38	2/75×50	4/70×45	3/70×45	3/70×45	2/70×45	2/70×45
		2100	—	4/75×50	4/75×38	3/75×50	3/75×38	—	4/70×45	3/70×45	3/70×35	2/70×45
		2400	—	—	4/75×50	3/75×50	3/75×50	—	4/70×45	4/70×35	3/70×45	3/70×35
		3000	—	—	—	4/75×50	3/75×50	—	—	4/70×45	3/70×45	3/70×45
		3600	—	—	—	—	4/75×50	—	—	—	4/70×45	4/70×35

NOTES:

1 For allowable roof and floor load masses, see Clause 1.4.11.

2 For limitations on notching and housing, see Clause 6.2.1.4 and Figure 6.3.

3 Multiple members shall be nail-laminated (see Clause 2.4).

4 Edge distances for some sheet bracing materials may require a minimum stud width of 45 mm for joining sheets.

5 For openings greater than 900 mm, a secondary jamb stud may be required to support the lintel (see Figure 6.8).

TABLE A18

JAMB STUDS—WALL HEIGHT 2700 mm—90/100 mm FRAME—SUPPORTING SINGLE STOREY OR UPPER STOREY EXTERNAL LOADBEARING WALLS

Roof type	Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Sheet	3000	900	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
		1200	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
		1500	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		1800	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		2100	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×45	90×35	90×35
		2400	100×50	100×38	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		3000	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×35	90×35
		3600	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	2/90×35	2/90×35	90×45	90×35
	6000	900	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
		1200	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		1500	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×35	90×35	90×35
		1800	100×50	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		2100	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		2400	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×35	90×35
		3000	2/100×38	2/100×38	100×50	100×38	100×38	2/90×45	2/90×35	2/90×35	90×45	90×35
		3600	2/100×50	2/100×38	2/100×38	100×50	100×38	2/90×45	2/90×35	2/90×35	2/90×35	90×45
	9000	900	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		1200	100×50	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		1500	100×50	100×38	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		1800	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		2100	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	2/90×35	2/90×35	90×45	90×35
		2400	2/100×38	2/100×38	100×50	100×38	100×38	2/90×45	2/90×35	2/90×35	90×45	90×35
		3000	2/100×50	2/100×38	2/100×38	100×50	100×38	3/90×35	2/90×35	2/90×35	2/90×35	90×45
		3600	2/100×50	2/100×38	2/100×38	2/100×38	100×50	3/90×35	2/90×45	2/90×35	2/90×35	90×45
	12 000	900	100×50	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		1200	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×45	90×35	90×35
		1500	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		1800	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	2/90×35	2/90×35	90×45	90×35
		2100	2/100×38	2/100×38	100×50	100×38	100×38	2/90×45	2/90×35	2/90×35	90×45	90×35
		2400	2/100×38	2/100×38	2/100×38	100×50	100×38	2/90×45	2/90×35	2/90×35	90×45	90×45
		3000	2/100×50	2/100×50	2/100×38	2/100×38	100×50	3/90×35	2/90×45	2/90×35	2/90×35	90×45
		3600	3/100×38	2/100×50	2/100×38	2/100×38	2/100×38	3/90×45	2/90×45	2/90×45	2/90×35	2/90×35

(*continued*)

TABLE A18 (*continued*)

Roof type	Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Tile	3000	900	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
		1200	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		1500	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		1800	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×45	90×35	90×35
		2100	100×50	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		2400	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×35	90×35
		3000	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	2/90×35	2/90×35	90×45	90×35
		3600	2/100×38	2/100×38	2/100×38	100×50	100×38	2/90×45	2/90×35	2/90×35	2/90×35	90×35
	6000	900	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
		1200	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×35	90×35	90×35
		1500	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		1800	2/100×38	100×50	100×50	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		2100	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	2/90×35	2/90×35	90×45	90×35
		2400	2/100×38	2/100×38	100×50	100×38	100×38	2/90×45	2/90×35	2/90×35	90×45	90×35
		3000	2/100×50	2/100×50	2/100×38	100×50	100×50	3/90×35	2/90×35	2/90×35	2/90×35	90×45
		3600	3/100×38	2/100×50	2/100×38	2/100×38	100×50	3/90×45	2/90×45	2/90×45	2/90×35	2/90×35
	9000	900	100×50	100×50	100×38	100×38	100×38	2/90×35	90×35	90×35	90×35	90×35
		1200	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		1500	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	2/90×35	2/90×35	90×35	90×35
		1800	2/100×38	2/100×38	100×50	100×50	100×38	2/90×45	2/90×35	2/90×35	90×45	90×35
		2100	2/100×50	2/100×38	2/100×38	100×50	100×38	2/90×45	2/90×35	2/90×35	90×45	90×45
		2400	2/100×50	2/100×38	2/100×38	100×50	100×50	3/90×35	2/90×35	2/90×35	2/90×35	90×45
		3000	3/100×38	2/100×50	2/100×38	2/100×38	2/100×38	3/90×45	2/90×45	2/90×45	2/90×35	2/90×35
		3600	3/100×50	3/100×38	2/100×50	2/100×38	2/100×38	4/90×35	3/90×35	2/90×45	2/90×35	2/90×35
	12 000	900	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
		1200	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	2/90×35	90×45	90×35	90×35
		1500	2/100×38	2/100×38	2/100×38	100×50	100×38	2/90×45	2/90×35	2/90×35	90×45	90×35
		1800	2/100×50	2/100×38	2/100×38	100×50	100×50	3/90×35	2/90×35	2/90×35	2/90×35	90×45
		2100	2/100×50	2/100×50	2/100×38	2/100×38	100×50	3/90×35	2/90×45	2/90×35	2/90×35	90×45
		2400	3/100×38	2/100×50	2/100×38	2/100×38	2/100×38	3/90×45	2/90×45	2/90×45	2/90×35	2/90×35
		3000	3/100×50	3/100×38	2/100×50	2/100×38	2/100×38	4/90×35	3/90×35	2/90×45	2/90×35	2/90×35
		3600	3/100×50	3/100×50	3/100×38	2/100×50	2/100×38	4/90×45	3/90×45	3/90×35	2/90×45	2/90×35

NOTES:

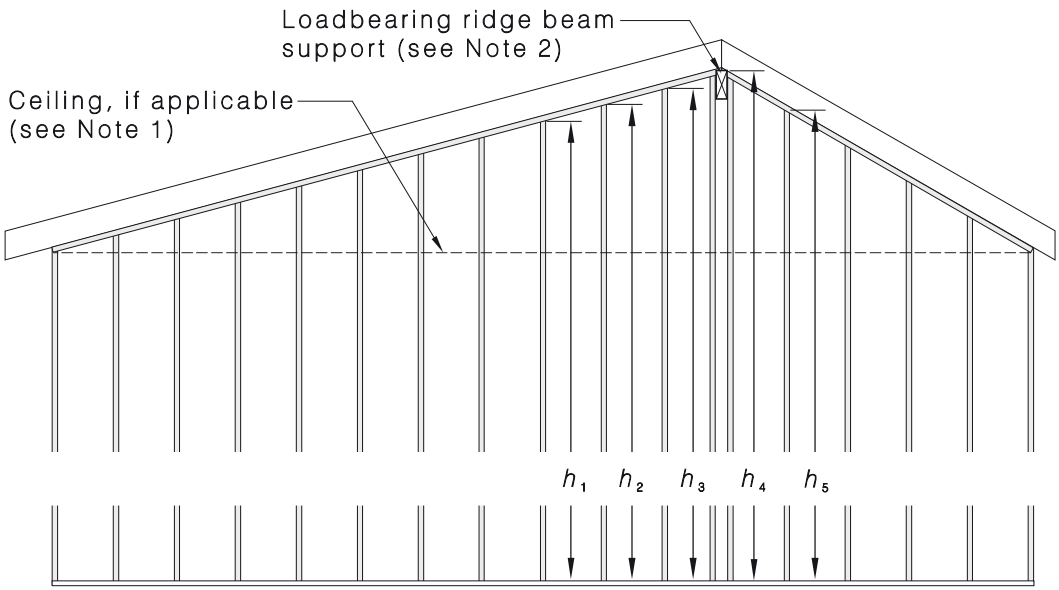
1 For allowable roof and floor load masses, see Clause 1.4.11.

2 For limitations on notching and housing, see Clause 6.2.1.4 and Figure 6.3.

3 Multiple members shall be nail-laminated (see Clause 2.4).

4 Edge distances for some sheet bracing materials may require a minimum stud width of 45 mm for joining sheets.

5 For openings greater than 900 mm, a secondary jamb stud may be required to support the lintel (see Figure 6.8).



NOTES:

1 Where the house has a horizontal ceiling or where a specially designed horizontal wind beam is provided, the stud height is measured as the greater of the ceiling height or the height from ceiling to roof.

2 Where studs support a loadbearing ridge or intermediate beam, separate consideration is required (e.g., studs supporting concentration of load).

3 Noggings are omitted for clarity.

FIGURE A6 STUDS IN GABLE OR SKILLION ENDS

TABLE A19

STUDS IN GABLE OR SKILLION ENDS

Stud height mm	Unseasoned timber					Seasoned timber				
	F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Stud spacing 450 mm centres										
70/75 mm frame										
Notched—20 mm maximum										
2400	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
2700	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×45	70×35	70×35
3000	75×50	75×38	75×38	75×38	75×38	2/70×35	70×35	70×45	70×35	70×35
3600	2/75×50	2/75×50	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×45	2/70×35	70×45
Not notched										
2400	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
2700	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
3000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
3600	2/75×50	2/75×38	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×35	2/70×35	70×45

(*continued*)

TABLE A19 (*continued*)

Stud height mm	Unseasoned timber					Seasoned timber				
	F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
90/100 mm fame										
Notched—20 mm maximum										
2400	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
2700	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
3600	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×45	90×35	90×35
4800	—	—	—	2/100×50	2/100×50	—	—	—	2/90×45	2/90×45
Not notched										
2400	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
2700	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
3600	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
4800	—	—	2/100×50	2/100×50	2/100×38	—	—	—	—	2/90×45
Stud spacing 600 mm centres										
70/75 mm frame										
Notched—20 mm maximum										
2400	75×38	75×38	75×38	75×38	75×38	70×45	70×35	70×45	70×35	70×35
2700	75×50	75×38	75×38	75×38	75×38	2/70×35	70×35	70×45	70×35	70×35
3000	2/75×38	75×50	75×38	75×38	75×38	2/70×45	70×45	2/70×35	70×45	70×35
3600	—	—	2/75×50	2/75×38	2/75×38	—	2/70×45	—	2/70×35	2/70×35
Not notched										
2400	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
2700	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
3000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×35	70×35	70×35
3600	—	2/75×50	2/75×50	2/75×38	2/75×38	—	2/70×45	2/70×45	2/70×35	2/70×35
90/100 mm frame										
Notched—20 mm maximum										
2400	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
2700	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
3000	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
3600	100×50	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×35	90×35
4800	—	—	—	—	—	—	—	—	—	—
Not notched										
2400	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
2700	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
3600	100×50	100×38	100×38	100×38	100×38	2/90×35	90×45	90×35	90×35	90×35
4800	—	—	—	—	2/100×50	—	—	—	—	—

NOTES:

1 For limitations on notching, see Clause 6.2.1.4.

2 Multiple members shall be vertically nail-laminated (see Clause 2.4).

3 Edge distances for some sheet bracing materials may require a minimum stud width of 45 mm for joining sheets.

4 For calculation of stud height, see Clause 2.6.7 and Figure A6.

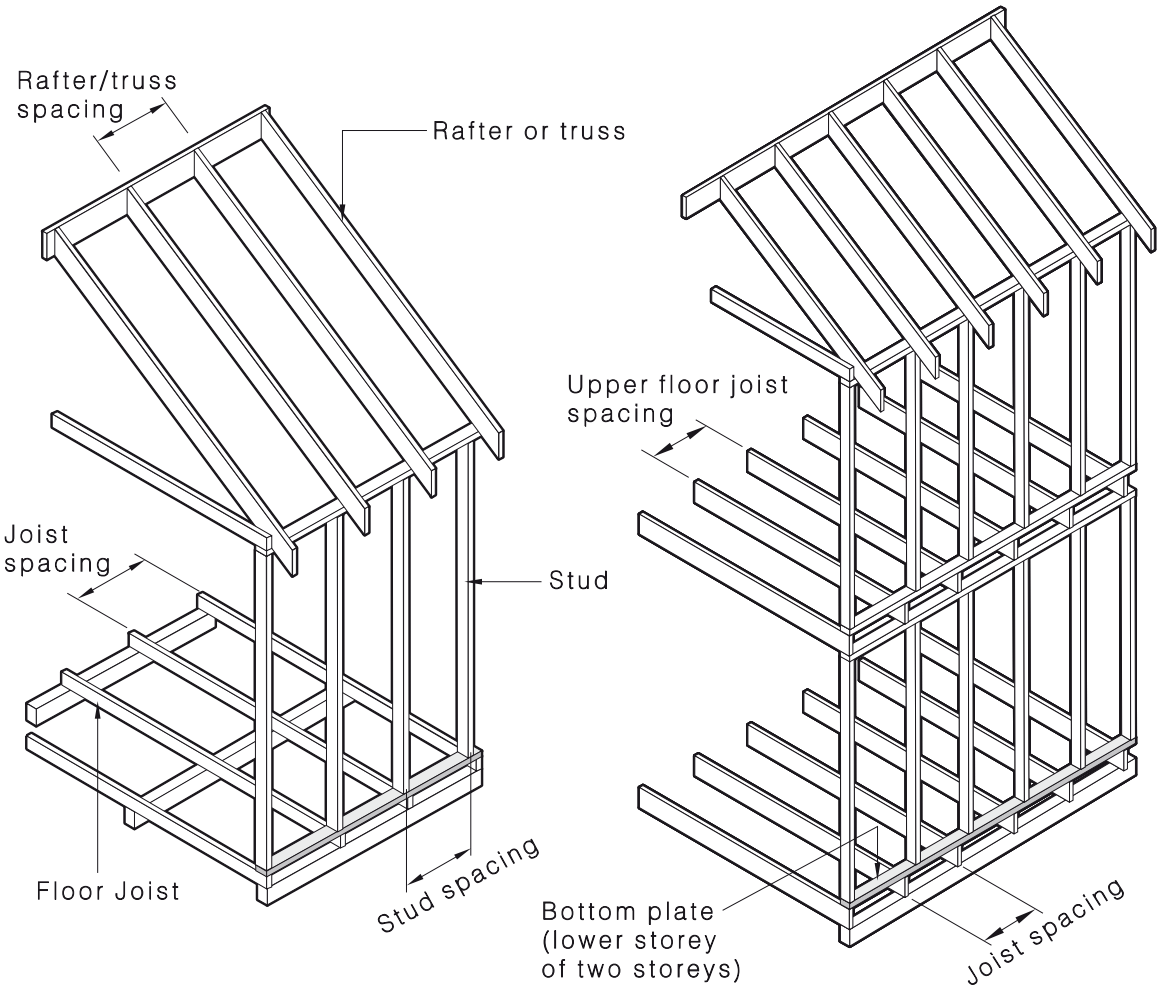


FIGURE A7 BOTTOM PLATES

TABLE A20

BOTTOM PLATES—NOT TRENCHED—70/75 mm FRAME—SUPPORTING SINGLE STOREY OR UPPER STOREY EXTERNAL LOADBEARING WALLS

Roof type/ Joist spacing mm	Rafter or truss span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Sheet roof											
450	3000	2/50×75	50×75	50×75	38×75	38×75	2/45×70	2/35×70	2/35×70	45×70	35×70
	6000	2/50×75	2/50×75	2/38×75	50×75	50×75	2/45×70	2/35×70	2/45×70	2/35×70	45×70
	9000	2/50×75	2/50×75	2/50×75	50×75	50×75	3/45×70	2/45×70	2/45×70	2/35×70	45×70
	12000	3/50×75	2/50×75	2/50×75	2/50×75	50×75	3/45×70	2/45×70	2/45×70	2/45×70	45×70
600	3000	2/50×75	2/38×75	50×75	50×75	50×75	2/45×70	2/35×70	2/35×70	45×70	35×70
	6000	2/50×75	2/50×75	2/50×75	2/50×75	50×75	2/45×70	2/45×70	2/45×70	2/35×70	45×70
	9000	3/50×75	3/50×75	2/50×75	2/50×75	2/50×75	3/45×70	2/45×70	2/45×70	2/45×70	45×70
	12000	—	3/50×75	3/50×75	2/50×75	2/50×75	3/45×70	3/45×70	3/45×70	2/45×70	2/45×70
Tile roof											
450	3000	2/50×75	50×75	50×75	50×75	50×75	2/35×70	2/35×70	2/35×70	45×70	35×70
	6000	2/50×75	2/50×75	2/50×75	50×75	50×75	3/45×70	2/45×70	2/45×70	2/35×70	45×70
	9000	3/50×75	3/50×75	2/50×75	2/50×75	2/50×75	3/45×70	2/45×70	3/45×70	2/45×70	2/35×70
	12000	—	3/50×75	3/50×75	2/50×75	2/50×75	—	3/45×70	3/45×70	2/45×70	2/45×70
600	3000	2/50×75	2/50×75	50×75	50×75	50×75	2/45×70	2/35×70	2/45×70	45×70	45×70
	6000	3/50×75	3/50×75	2/50×75	2/50×75	2/50×75	3/45×70	2/45×70	2/45×70	2/45×70	45×70
	9000	—	—	3/50×75	3/50×75	2/50×75	—	3/45×70	3/45×70	2/45×70	2/45×70
	12000	—	—	—	3/50×75	3/50×75	—	—	—	3/45×70	2/45×70

NOTES:

1 For allowable roof load masses, see Clause 1.4.11.

2 For plates for internal non-loadbearing walls, see Clause 6.3.5.

3 For limitations on trenching, see Clause 6.2.1.4.

4 Multiple members shall be nail-laminated (see Clause 2.5).

5 Edge distances for some sheet bracing materials may require a minimum plate depth of 45 mm for joining sheets.

6 Plates that are required to support concentrated loads from jamb studs, posts or studs supporting concentrated loads shall be supported in accordance Clause 6.2.2.2.

TABLE A21

BOTTOM PLATES—NOT TRENCHED—90/100 mm FRAME—SUPPORTING SINGLE STOREY OR UPPER STOREY EXTERNAL LOADBEARING WALLS

Roof type/ Joist spacing mm	Rafter or truss span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Sheet roof											
450	3000	50×100	50×100	50×100	38×100	38×100	2/35×90	45×90	45×90	45×90	35×90
	6000	2/50×100	50×100	50×100	50×100	38×100	2/35×90	2/35×90	2/35×90	45×90	35×90
	9000	2/50×100	2/50×100	50×100	50×100	50×100	2/45×90	2/35×90	2/45×90	45×90	35×90
	12000	2/50×100	2/50×100	2/38×100	50×100	50×100	2/45×90	2/45×90	2/45×90	2/35×90	45×90
600	3000	2/38×100	50×100	50×100	38×100	38×100	2/35×90	45×90	45×90	45×90	35×90
	6000	2/50×100	2/50×100	50×100	50×100	50×100	2/45×90	2/45×90	2/35×90	45×90	35×90
	9000	2/50×100	2/50×100	2/50×100	2/50×100	50×100	2/45×90	2/45×90	2/45×90	2/35×90	45×90
	12000	3/50×100	2/50×100	2/50×100	2/50×100	2/50×100	3/45×90	2/45×90	2/45×90	2/45×90	45×90
Tile roof											
450	3000	50×100	50×100	50×100	38×100	38×100	2/35×90	45×90	45×90	45×90	35×90
	6000	2/50×100	2/50×100	50×100	50×100	50×100	2/45×90	2/35×90	2/35×90	45×90	35×90
	9000	2/50×100	2/50×100	2/50×100	2/50×100	50×100	3/45×90	2/45×90	2/45×90	2/35×90	45×90
	12000	2/50×100	2/50×100	2/50×100	2/50×100	2/50×100	3/45×90	2/45×90	3/45×90	2/45×90	2/35×90
600	3000	2/50×100	50×100	50×100	50×100	50×100	2/35×90	45×90	2/35×90	45×90	35×90
	6000	2/50×100	2/50×100	2/50×100	2/50×100	50×100	2/45×90	2/45×90	2/45×90	2/35×90	45×90
	9000	3/50×100	3/50×100	2/50×100	2/50×100	2/50×100	3/45×90	2/45×90	3/45×90	2/45×90	2/45×90
	12000	3/50×100	3/50×100	3/50×100	3/50×100	2/50×100	—	3/45×90	3/45×90	2/45×90	2/45×90

NOTES:

1 For allowable roof load masses, see Clause 1.4.11.

2 For plates for internal non-loadbearing walls, see Clause 6.3.5.

3 For limitations on trenching, see Clause 6.2.1.4.

4 Multiple members shall be nail-laminated (see Clause 2.5).

5 Edge distances for some sheet bracing materials may require a minimum plate depth of 45 mm for joining sheets.

6 Plates that are required to support concentrated loads from jamb studs, posts or studs supporting concentrated loads shall be supported in accordance Clause 6.2.2.2.

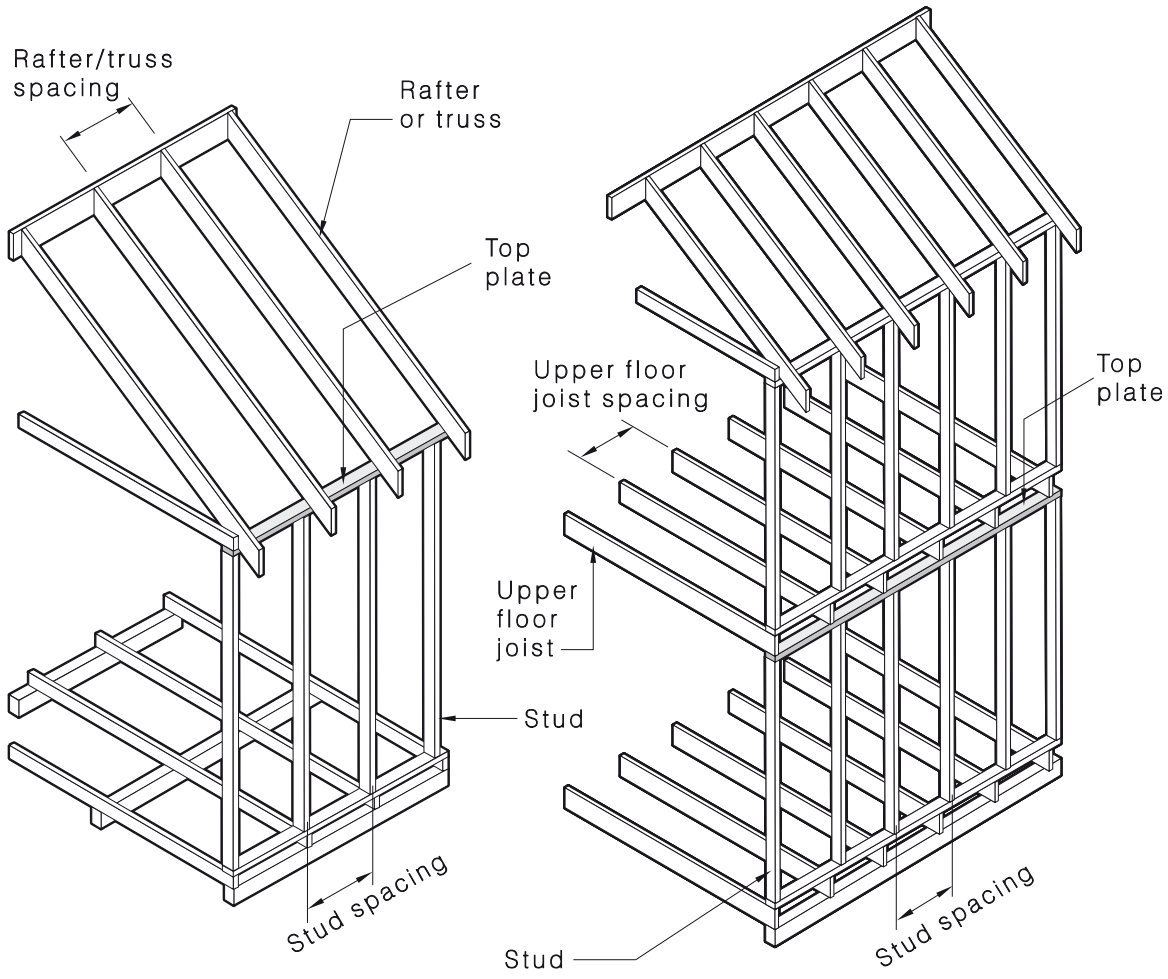


FIGURE A8 TOP PLATES

TABLE A22

TOP PLATES—NOT TRENCHED—70/75 mm FRAME—SUPPORTING SINGLE STOREY OR UPPER STOREY EXTERNAL LOADBEARING WALLS

Roof type/ Stud spacing mm	Rafter or truss span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Sheet roof											
450	3000	2/50×75	2/38×75	50×75	50×75	38×75	2/45×70	45×70	2/35×70	45×70	35×70
	6000	2/50×75	2/50×75	50×75	50×75	50×75	2/45×70	2/35×70	2/45×70	2/35×70	35×70
	9000	2/50×75	2/50×75	2/35×75	50×75	50×75	2/45×70	2/45×70	2/45×70	2/35×70	45×70
	12000	2/50×75	2/50×75	2/50×75	50×75	50×75	3/45×70	2/45×70	3/45×70	2/45×70	45×70
600	3000	2/50×75	2/50×75	50×75	50×75	50×75	2/45×70	2/35×70	2/35×70	45×70	35×70
	6000	2/50×75	2/50×75	2/50×75	50×75	50×75	2/45×70	2/35×70	2/45×70	2/35×70	45×70
	9000	3/50×75	2/50×75	2/50×75	2/50×75	2/50×75	3/45×70	2/45×70	2/45×70	2/45×70	45×70
	12000	3/50×75	3/50×75	2/50×75	2/50×75	2/50×75	3/45×70	2/45×70	3/45×70	2/45×70	2/45×70
Tile roof											
450	3000	2/50×75	50×75	50×75	50×75	50×75	2/35×70	45×70	2/35×70	45×70	35×70
	6000	2/50×75	2/50×75	2/50×75	50×75	50×75	2/45×70	2/35×70	2/45×70	2/35×70	45×70
	9000	3/50×75	2/50×75	2/50×75	2/50×75	2/50×75	3/45×70	2/45×70	3/45×70	2/45×70	45×70
	12000	3/50×75	3/50×75	2/50×75	2/50×75	2/50×75	—	3/45×70	3/45×70	2/45×70	2/35×70
600	3000	2/50×75	2/50×75	2/50×75	2/50×75	50×75	2/45×70	2/45×70	2/45×70	45×70	45×70
	6000	3/50×75	3/50×75	2/50×75	2/50×75	2/50×75	3/45×70	2/45×70	2/45×70	2/45×70	45×70
	9000	—	3/50×75	3/50×75	3/50×75	2/50×75	—	3/45×70	3/45×70	2/45×70	2/45×70
	12000	—	—	3/50×75	3/50×75	3/50×75	—	3/45×70	—	3/45×70	2/45×70

NOTES:

1 For allowable roof load masses, see Clause 1.4.11.

2 For plates for internal non-loadbearing walls, see Clause 6.3.5.

3 For limitations on trenching, see Clause 6.2.1.4.

4 Multiple members shall be nail-laminated (see Clause 2.5).

5 Edge distances for some sheet bracing materials may require a minimum plate depth of 45 mm for joining sheets.

6 Plates that are required to support concentrated loads from jamb studs, posts or studs supporting concentrated loads shall be supported in accordance Clause 6.2.2.3

TABLE A23

TOP PLATES—NOT TRENCHED—90/100 mm FRAME—SUPPORTING SINGLE STOREY OR UPPER STOREY EXTERNAL LOADBEARING WALLS

Roof type/ Stud spacing mm	Rafter or truss span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Sheet roof											
450	3000	2/38×100	50×100	50×100	38×100	38×100	2/35×90	45×90	45×90	35×90	35×90
	6000	2/50×100	2/38×100	50×100	38×100	38×100	2/45×90	45×90	2/35×90	45×90	35×90
	9000	2/50×100	2/38×100	50×100	50×100	50×100	2/45×90	2/35×90	2/45×90	45×90	35×90
	12000	2/50×100	2/50×100	2/38×100	50×100	50×100	2/45×90	2/35×90	2/45×90	2/35×90	45×90
600	3000	2/50×100	50×100	50×100	50×100	50×100	2/35×90	45×90	45×90	45×90	35×90
	6000	2/50×100	2/50×100	50×100	50×100	50×100	2/45×90	45×90	2/35×90	45×90	35×90
	9000	2/50×100	2/50×100	2/50×100	2/50×100	50×100	2/45×90	2/45×90	2/45×90	2/35×90	45×90
	12000	3/50×100	2/50×100	2/50×100	2/50×100	2/50×100	3/45×90	2/45×90	2/45×90	2/45×90	45×90
Tile roof											
450	3000	50×100	50×100	50×100	38×100	38×100	2/35×90	45×90	45×90	45×90	35×90
	6000	2/50×100	2/50×100	50×100	50×100	50×100	2/45×90	2/35×90	2/35×90	45×90	35×90
	9000	2/50×100	2/50×100	2/50×100	50×100	50×100	2/45×90	2/45×90	2/45×90	2/35×90	45×90
	12000	3/50×100	2/50×100	2/50×100	2/50×100	2/50×100	3/45×90	2/45×90	3/45×90	2/45×90	45×90
600	3000	2/50×100	2/50×100	2/50×100	50×100	50×100	2/45×90	2/35×90	2/35×90	45×90	45×90
	6000	2/50×100	2/50×100	2/50×100	2/50×100	50×100	2/45×90	2/45×90	2/45×90	2/35×90	45×90
	9000	3/50×100	3/50×100	2/50×100	2/50×100	2/50×100	3/45×90	2/45×90	3/45×90	2/45×90	2/45×90
	12000	—	3/50×100	3/50×100	2/50×100	2/50×100	—	3/45×90	3/45×90	2/45×90	2/45×90

NOTES:

1 For allowable roof load masses, see Clause 1.4.11.

2 For plates for internal non-loadbearing walls, see Clause 6.3.5.

3 For limitations on trenching, see Clause 6.2.1.4.

4 Multiple members shall be nail-laminated (see Clause 2.5).

5 Edge distances for some sheet bracing materials may require a minimum plate depth of 45 mm for joining sheets.

6 Plates that are required to support concentrated loads from jamb studs, posts or studs supporting concentrated loads shall be supported in accordance Clause 6.2.2.3.

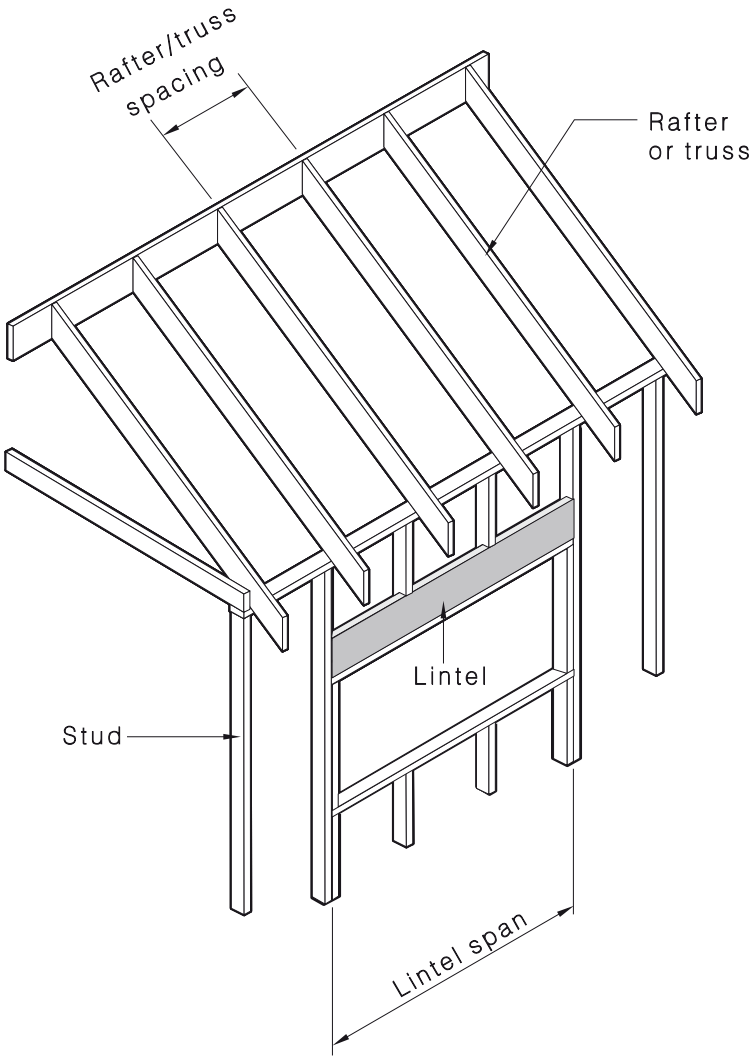


FIGURE A9 LINTELS—SINGLE OR UPPER STOREY

TABLE A24

LINTELS SUPPORTING SINGLE STOREY OR UPPER STOREY LOADBEARING ALLS

Roof type	Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Sheet	3000	900	100×38	100×38	75×50	75×38	75×38	90×35	90×35	90×35	90×35	90×35
		1200	100×50	100×50	100×38	75×75	75×75	120×35	90×45	90×35	90×35	90×35
		1500	125×50	100×75	100×75	100×50	100×50	120×45	120×35	90×35	90×35	90×35
		1800	125×75	125×75	125×50	125×50	100×75	2/90×45	2/90×35	2/90×35	90×45	90×35
		2100	150×75	150×50	125×75	125×75	125×75	2/120×35	140×45	120×35	2/90×35	90×45
		2400	175×75	150×75	150×75	150×75	150×50	2/120×45	140×45	140×35	120×45	2/90×35
		3000	200×75	200×75	200×75	175×75	175×75	2/170×35	190×35	2/140×45	2/140×35	2/120×35
		3600	275×75	250×75	250×75	225×75	225×75	2/240×35	2/190×45	2/170×45	2/190×35	2/170×35
	6000	900	100×50	100×50	100×38	75×75	75×75	120×35	90×35	90×35	90×35	90×35
		1200	125×50	125×50	100×75	100×75	100×50	2/90×35	2/90×35	90×35	90×35	90×35
		1500	150×50	125×75	125×75	125×50	125×50	2/120×35	2/90×35	2/90×35	2/90×35	90×35
		1800	150×75	150×75	150×50	125×75	125×75	2/120×45	140×45	120×45	2/90×45	2/90×35
		2100	175×75	175×75	175×50	150×75	150×75	170×45	2/120×45	2/120×35	2/120×35	120×45
		2400	200×75	200×75	175×75	175×75	175×75	2/170×35	2/140×35	2/120×45	2/120×45	2/120×35
		3000	250×75	250×75	225×75	225×75	200×75	2/190×45	2/170×45	2/170×35	2/170×35	2/140×45
		3600	—	300×75	300×75	275×75	275×75	2/290×35	2/240×35	2/240×35	2/240×35	2/190×45
	9000	900	100×75	100×75	100×50	100×50	100×38	2/90×35	2/90×35	90×35	90×35	90×35
		1200	125×75	125×75	125×50	125×50	100×75	140×45	2/90×35	2/90×35	90×45	90×35
		1500	150×75	150×75	150×50	125×75	125×75	2/120×35	2/120×35	2/90×45	2/90×45	2/90×35
		1800	175×75	175×75	150×75	150×75	150×75	2/140×35	2/120×35	2/120×35	140×35	2/90×45
		2100	200×75	200×75	175×75	175×75	175×75	2/170×35	2/140×35	2/120×45	2/120×45	2/120×35
		2400	225×75	225×75	200×75	200×75	200×75	2/170×45	2/170×35	2/140×45	2/140×45	2/120×45
		3000	275×75	275×75	250×75	250×75	225×75	2/240×35	240×45	2/190×35	2/170×45	2/170×35
		3600	—	—	—	300×75	300×75	2/290×45	2/240×45	2/240×45	2/240×35	2/240×35
	12 000	900	125×50	125×50	100×75	100×75	100×50	2/90×35	120×35	90×35	90×35	90×35
		1200	150×75	150×50	125×75	125×75	125×50	2/120×35	2/90×45	2/90×35	2/90×35	2/90×35
		1500	175×75	150×75	150×75	150×75	150×50	2/140×35	2/120×35	140×35	120×45	2/90×45
		1800	200×75	175×75	175×75	175×50	150×75	2/140×45	2/120×45	140×45	2/120×35	2/120×35
		2100	225×75	200×75	200×75	200×75	175×75	2/170×45	2/140×45	2/140×45	2/140×35	2/140×35
		2400	250×75	225×75	225×75	200×75	200×75	2/190×45	2/170×35	2/170×35	190×45	2/140×45
		3000	300×75	300×75	275×75	275×75	250×75	2/240×45	290×45	2/190×45	2/190×45	2/170×45
		3600	—	—	—	—	—	—	2/290×35	2/240×45	2/240×45	2/240×35

(*continued*)

TABLE A24 (*continued*)

Roof type	Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Tile	3000	900	100×38	100×38	75×75	75×38	75×38	90×35	90×35	90×35	90×35	90×35
		1200	100×75	100×75	100×50	100×50	100×38	2/90×35	120×35	90×35	90×35	90×35
		1500	125×75	125×75	125×75	125×50	125×50	120×45	2/90×45	2/90×35	90×45	90×35
		1800	175×50	150×75	150×75	150×50	125×75	2/120×45	2/120×35	140×35	120×45	2/90×35
		2100	200×75	175×75	175×75	175×50	150×75	190×35	170×35	2/120×45	2/120×35	2/120×35
		2400	225×75	200×75	200×75	200×75	175×75	2/170×45	190×45	2/140×45	2/140×35	2/120×45
		3000	275×75	250×75	250×75	225×75	225×75	2/240×35	2/190×45	2/170×45	2/170×35	2/170×35
		3600	—	—	300×75	300×75	300×75	2/290×35	290×45	2/240×35	2/190×45	2/190×45
	6000	900	100×75	100×50	100×50	100×38	75×75	2/90×35	120×35	90×35	90×35	90×35
		1200	125×75	125×75	125×75	125×50	100×75	120×45	120×45	2/90×35	90×45	90×35
		1500	175×50	150×75	150×75	150×50	125×75	2/120×45	2/120×35	140×35	120×45	2/90×35
		1800	200×75	200×75	175×75	175×75	175×75	190×45	2/140×35	2/120×45	2/120×45	2/120×35
		2100	225×75	225×75	200×75	200×75	200×75	2/190×35	190×45	2/140×45	2/140×45	2/140×35
		2400	250×75	250×75	225×75	225×75	225×75	2/240×35	2/170×45	2/170×45	2/170×35	2/170×35
		3000	—	300×75	300×75	300×75	275×75	2/290×35	2/240×35	2/240×35	2/240×35	2/190×45
		3600	—	—	—	—	—	—	2/290×45	2/290×35	2/290×35	2/240×45
	9000	900	125×50	100×75	100×75	100×50	100×50	2/90×35	2/90×35	2/90×35	90×35	90×35
		1200	150×75	150×78	125×75	125×75	125×75	2/120×35	140×45	120×45	2/90×35	2/90×35
		1500	175×75	175×75	175×75	150×75	150×75	2/140×45	2/120×45	140×45	2/120×35	120×45
		1800	225×75	200×75	200×75	200×75	175×75	2/170×45	2/140×45	2/140×45	2/140×35	2/120×45
		2100	250×75	250×75	225×75	225×75	200×75	2/240×35	2/170×45	2/170×35	2/170×35	2/140×45
		2400	300×75	275×75	275×75	250×75	250×75	2/240×35	2/190×45	2/190×45	2/190×35	2/170×45
		3000	—	—	—	—	300×75	2/290×45	2/240×45	2/240×45	2/240×35	2/240×35
		3600	—	—	—	—	—	—	—	2/290×45	2/290×45	2/290×35
	12 000	900	125×75	125×50	125×50	100×75	100×75	2/90×45	2/90×45	2/90×35	90×35	90×35
		1200	175×50	150×75	150×75	150×50	125×75	2/120×45	2/120×35	2/120×35	2/90×45	2/90×35
		1500	200×75	200×75	200×50	175×75	175×50	2/170×35	2/140×35	2/140×35	2/120×45	2/120×35
		1800	250×75	225×75	225×75	200×75	200×75	2/190×45	2/170×35	2/170×35	190×45	2/140×45
		2100	275×75	275×75	250×75	250×75	225×75	2/240×35	$2/190\times45_{(15)}$	2/170×45	2/170×45	2/170×35
		2400	300×75	300×75	275×75	275×75	250×75	2/240×45	2/240×35	$2/240\times35_{(5)}$	2/190×45	2/190×35
		3000	—	—	—	—	—	—	$2/290\times45_{(5)}$	$2/290\times35_{(20)}$	2/240×45	2/240×35
		3600	—	—	—	—	—	—	—	—	—	2/290×45

NOTES:

1 For allowable roof and floor load masses, see Clause 1.4.11.

2 Lintels supporting concentrated loads shall be designed in accordance with engineering principles (see Clause 6.3.6.2).

3 Lintels for internal non-loadbearing walls shall be sized as for hanging beams.

4 Lintels shall be used in conjunction with top plates, ledgers and, where required, lintel trimmers.

5 Multiple members shall be vertically nail-laminated (see Clause 2.3).

6 Lintels in gable or skillion end walls not supporting roof loads shall be determined as for sheet roof, 3000 mm rafter span.

7 Minimum bearing length at supports shall be 35 mm. Subscript values, where applicable, indicate the minimum additional bearing length where required to be greater than 35 mm.

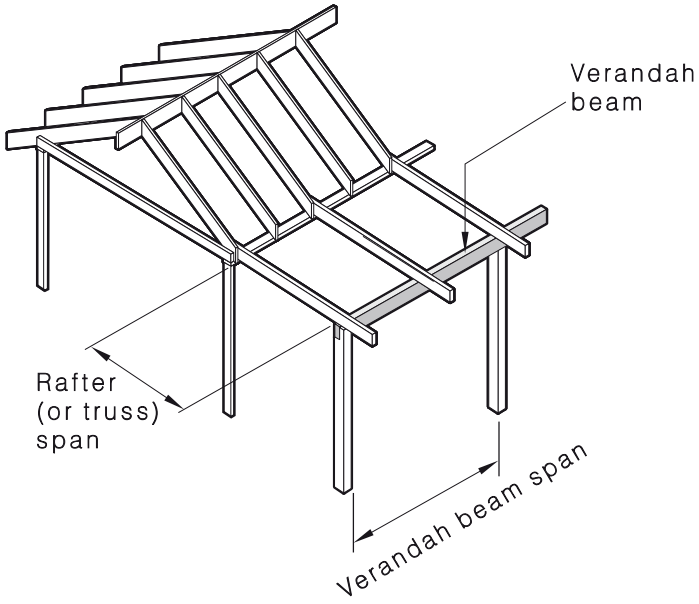


FIGURE A10 VERANDAH BEAMS

TABLE A25
VERANDAH BEAMS SUPPORTING ROOF LOADS ONLY

Roof type	Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Sheet	1800	2100	175×50	175×50	150×50	150×50	150×50	170×35	170×35	140×35	120×35	120×35
		2400	200×50	175×50	175×50	175×50	150×50	170×35	170×35	140×45	140×35	120×35
		2700	225×50	200×50	200×50	175×50	175×50	190×35	170×35	170×35	170×35	140×35
		3000	250×50	225×50	225×50	200×50	200×50	2/190×35	190×35	190×35	170×35	170×35
	3000	2100	200×50	175×50	175×50	175×50	150×50	190×35	170×35	140×35	140×35	120×35
		2400	225×50	200×50	200×50	200×50	175×50	190×35	170×35	170×35	170×35	140×35
		2700	225×50	225×50	225×50	200×50	200×50	190×45	170×45	170×45	170×35	170×35
		3000	225×75	250×50	250×50	225×50	225×50	240×45	2/170×35	190×45	190×35	170×35
	6000	2100	225×50	225×50	200×50	200×50	175×50	190×45	170×45	170×35	170×35	140×35
		2400	250×50	250×50	225×50	225×50	200×50	240×45	190×45	190×35	190×35	170×35
		2700	250×75	225×75	250×50	250×50	225×50	240×45	240×45	190×45	190×45	190×35
		3000	275×75	250×75	250×75	225×75	250×50	2/240×35	240×45	240×45	240×45	190×45
	9000	2100	250×50	225×50	225×50	225×50	200×50	240×45	190×45	190×35	190×35	170×35
		2400	250×75	225×75	250×50	250×50	225×50	240×45	240×45	190×45	190×45	190×35
		2700	275×75	250×75	250×75	225×75	250×50	2/240×35	240×45	240×45	240×45	190×45
		3000	300×75	275×75	275×75	250×75	250×75	2/290×35	2/290×35	240×45	240×45	240×45
	12 000	2100	225×75	250×50	250×50	225×50	225×50	240×45	240×45	190×45	190×35	170×35
		2400	250×75	250×75	250×75	250×50	250×50	2/240×35	240×45	240×45	240×45	190×45
		2700	300×75	275×75	275×75	250×75	250×75	2/240×35	2/240×35	240×45	240×45	240×45
		3000	—	300×75	300×75	275×75	275×75	2/290×35	2/240×35	2/240×35	2/240×35	240×45

(*continued*)

TABLE A25 (*continued*)

Roof type	Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Tile	1800	2100	225×50	200×50	200×50	200×50	175×50	190×45	170×35	170×35	170×35	140×35
		2400	250×50	225×50	225×50	225×50	200×50	240×45	190×45	190×35	190×35	170×35
		2700	250×75	225×75	250×50	250×50	225×50	240×45	240×45	2/170×35	190×45	190×35
		3000	275×75	250×75	250×75	225×75	250×50	2/240×35	240×45	240×45	240×45	190×45
	3000	2100	250×50	225×50	225×50	200×50	200×50	240×45	190×35	170×45	170×35	170×35
		2400	250×75	250×50	250×50	250×50	225×50	240×45	240×45	190×45	190×45	190×35
		2700	275×75	250×75	250×75	225×75	250×50	2/240×35	240×45	240×45	240×45	190×45
		3000	300×75	275×75	275×75	250×75	250×75	2/290×35	2/240×35	240×45	240×45	240×45
	6000	2100	250×75	225×75	250×50	250×50	225×50	240×45	240×45	2/170×35	190×45	190×35
		2400	275×75	275×75	250×75	250×75	225×75	2/240×35	2/240×35	240×45	240×45	190×45
		2700	300×75	300×75	275×75	275×75	250×75	2/290×35	2/240×35	2/240×35	240×45	240×45
		3000	—	—	—	300×75	275×75	2/290×35	2/290×35	2/290×35	2/240×35	240×45
	9000	2100	275×75	250×75	250×75	250×75	250×50	2/240×35	2/240×35	240×45	240×45	190×45
		2400	300×75	300×75	275×75	275×75	250×75	2/290×35	2/240×35	2/240×35	240×45	240×45
		2700	—	—	—	300×75	275×75	2/290×35	2/290×35	2/290×35	2/240×35	240×45
		3000	—	—	—	—	—	—	2/290×35	2/290×35	2/290×35	2/240×35
	12 000	2100	300×75	275×75	275×75	250×75	250×75	2/290×35	2/240×35	2/240×35	240×45	240×45
		2400	—	—	300×75	300×75	275×75	2/290×35	2/290×35	2/240×35	2/240×35	240×45
		2700	—	—	—	—	300×75	2/290×45	2/290×35	2/290×35	2/290×35	2/240×35
		3000	—	—	—	—	—	—	—	—	2/290×35	2/290×35

NOTES:

1 For allowable roof and floor load masses, see Clause 1.4.11.

2 Multiple members shall be vertically nail-laminated (see Clause 2.3).

3 The minimum bearing length for verandah beams shall be 35 mm at end supports and 70 mm at internal supports for continuous span members.

4 Overhangs shall not exceed 25% of the actual backspan.

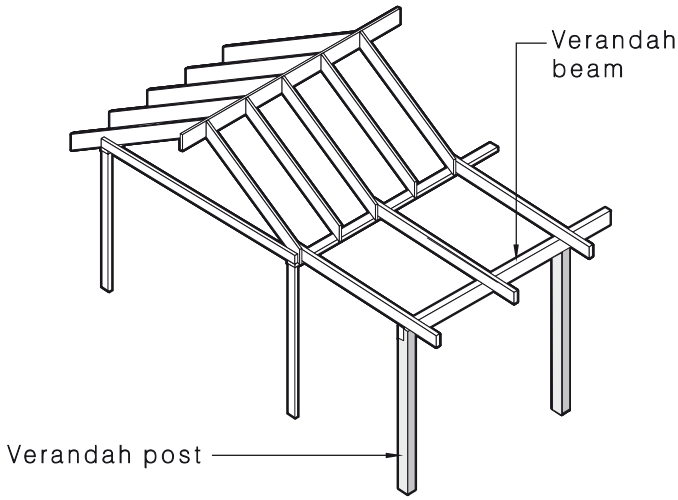


FIGURE A11 VERANDAH POSTS

TABLE A26

VERANDAH POSTS SUPPORTING ROOF LOADS ONLY—2400 mm HIGH

Roof type	Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Sheet	1800	2100	75×75	75×75	75×75	75×75	75×75	70×70	70×70	70×70	70×70	70×70
		2400	75×75	75×75	75×75	75×75	75×75	70×70	70×70	70×70	70×70	70×70
		2700	75×75	75×75	75×75	75×75	75×75	70×70	70×70	70×70	70×70	70×70
		3000	75×75	75×75	75×75	75×75	75×75	70×70	70×70	70×70	70×70	70×70
	3000	2100	75×75	75×75	75×75	75×75	75×75	70×70	70×70	70×70	70×70	70×70
		2400	75×75	75×75	75×75	75×75	75×75	70×70	70×70	70×70	70×70	70×70
		2700	75×75	75×75	75×75	75×75	75×75	70×70	70×70	70×70	70×70	70×70
		3000	75×75	75×75	75×75	75×75	75×75	70×70	70×70	70×70	70×70	70×70
	6000	2100	75×75	75×75	75×75	75×75	75×75	70×70	70×70	70×70	70×70	70×70
		2400	75×75	75×75	75×75	75×75	75×75	70×70	70×70	70×70	70×70	70×70
		2700	75×75	75×75	75×75	75×75	75×75	70×70	70×70	70×70	70×70	70×70
		3000	100×100	75×75	75×75	75×75	75×75	90×90	70×70	70×70	70×70	70×70
	9000	2100	100×100	75×75	75×75	75×75	75×75	90×90	70×70	70×70	70×70	70×70
		2400	100×100	75×75	75×75	75×75	75×75	90×90	70×70	70×70	70×70	70×70
		2700	100×100	100×100	75×75	75×75	75×75	90×90	70×70	70×70	70×70	70×70
		3000	100×100	100×100	100×100	75×75	75×75	90×90	70×70	70×70	70×70	70×70
	12 000	2100	100×100	100×100	75×75	75×75	75×75	90×90	70×70	70×70	70×70	70×70
		2400	100×100	100×100	100×100	75×75	75×75	90×90	70×70	70×70	70×70	70×70
		2700	100×100	100×100	100×100	75×75	75×75	90×90	70×70	70×70	70×70	70×70
		3000	100×100	100×100	100×100	100×100	75×75	90×90	90×90	70×70	70×70	70×70

(*continued*)

TABLE A26 (*continued*)

Roof type	Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Tile	1800	2100	75×75	75×75	75×75	75×75	75×75	70×70	70×70	70×70	70×70	70×70
		2400	75×75	75×75	75×75	75×75	75×75	70×70	70×70	70×70	70×70	70×70
		2700	100×100	75×75	75×75	75×75	75×75	70×70	70×70	70×70	70×70	70×70
		3000	100×100	75×75	75×75	75×75	75×75	70×70	70×70	70×70	70×70	70×70
	3000	2100	100×100	75×75	75×75	75×75	75×75	70×70	70×70	70×70	70×70	70×70
		2400	100×100	75×75	75×75	75×75	75×75	70×70	70×70	70×70	70×70	70×70
		2700	100×100	75×75	75×75	75×75	75×75	70×70	70×70	70×70	70×70	70×70
		3000	100×100	100×100	75×75	75×75	75×75	90×90	70×70	70×70	70×70	70×70
	6000	2100	100×100	100×100	100×100	100×100	75×75	90×90	70×70	70×70	70×70	70×70
		2400	100×100	100×100	100×100	100×100	75×75	90×90	70×70	70×70	70×70	70×70
		2700	100×100	100×100	100×100	100×100	100×100	90×90	90×90	90×90	70×70	70×70
		3000	100×100	100×100	100×100	100×100	100×100	90×90	90×90	90×90	70×70	70×70
	9000	2100	100×100	100×100	100×100	100×100	100×100	90×90	90×90	90×90	70×70	70×70
		2400	100×100	100×100	100×100	100×100	100×100	90×90	90×90	90×90	70×70	70×70
		2700	100×100	100×100	100×100	100×100	100×100	90×90	90×90	90×90	90×90	70×70
		3000	—	100×100	100×100	100×100	100×100	—	90×90	90×90	90×90	90×90
	12 000	2100	100×100	100×100	100×100	100×100	100×100	90×90	90×90	90×90	90×90	70×70
		2400	—	100×100	100×100	100×100	100×100	—	90×90	90×90	90×90	90×90
		2700	—	100×100	100×100	100×100	100×100	—	90×90	90×90	90×90	90×90
		3000	—	—	100×100	100×100	100×100	—	—	—	90×90	90×90

NOTES:

1 For allowable roof and floor load masses, see Clause 1.4.11.

2 Verandah posts shall not be nail-laminated.

3 Minimum post sizes given above may need to be increased in size to enable verandah beams to be adequately supported.

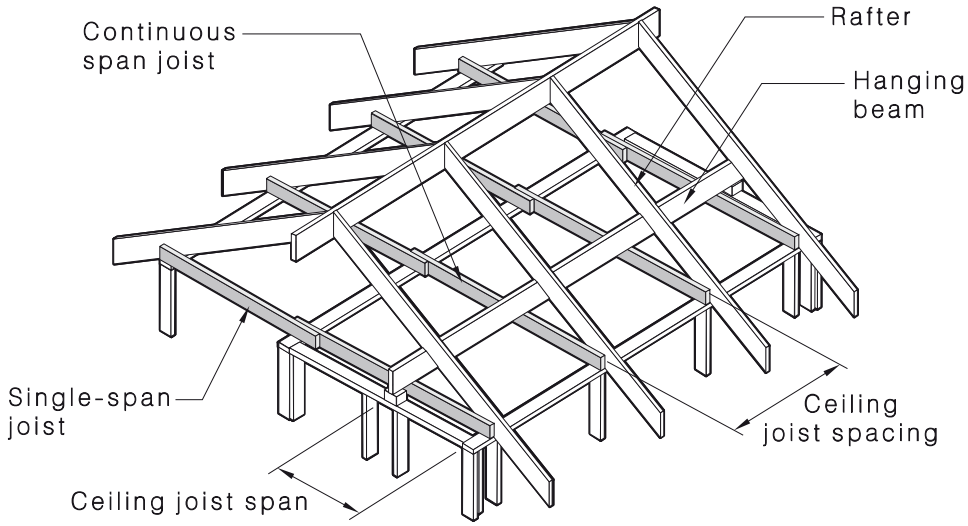


FIGURE A12 CEILING JOISTS

TABLE A27
CEILING JOISTS

Joist spacing mm	Joist span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
450	Single span										
	1800	100×50	100×38	100×38	100×38	100×38	90×45	90×45	90×35	70×45	70×35
	2400	125×38	125×38	100×50	100×50	100×50	120×35	120×35	120×35	90×45	90×35
	3000	150×38	125×50	125×50	125×38	125×38	140×35	120×45	120×35	120×35	90×45
	3600	150×50	150×50	150×38	150×38	150×38	170×35	140×35	120×45	120×45	120×35
	Continuous span										
	1800	100×38	100×38	75×50	75×50	75×38	90×35	90×35	70×45	70×35	70×35
	2400	100×50	100×50	100×38	100×38	100×38	120×35	90×45	90×35	90×35	70×45
	3000	125×50	125×38	125×38	100×50	100×50	120×45	120×35	120×35	90×45	90×35
	3600	150×38	125×50	125×50	125×38	125×38	140×35	120×45	120×35	120×35	120×35
600	Single span										
	1800	100×50	100×38	100×38	100×38	100×38	90×45	90×45	90×35	70×45	70×35
	2400	125×38	125×38	100×50	100×50	100×38	120×35	120×35	120×35	90×45	90×35
	3000	150×38	125×50	125×50	125×38	125×38	140×35	120×45	120×35	120×35	90×45
	3600	175×38	150×50	150×50	150×38	150×38	170×35	140×35	120×45	120×45	120×35
	Continuous span										
	1800	100×38	100×38	75×50	75×50	75×38	90×35	90×35	70×45	70×35	70×35
	2400	100×50	100×50	100×38	100×38	100×38	120×35	90×45	90×35	90×35	70×45
	3000	125×50	125×38	125×38	100×50	100×50	120×45	120×35	120×35	90×45	90×35
	3600	150×38	125×50	125×50	125×38	125×38	140×35	120×45	120×35	120×35	120×35

NOTES:

1 Maximum spans are based on the support of a maximum ceiling lining mass of 12 kg/m^2 including ceiling battens.

2 During construction, planks shall be secured on top of the ceiling joists to support construction loads.

3 Roof loads shall not be strutted onto ceiling joists.

4 The sizes and spans given in this Table are not suitable for the support of platforms used for storage in the ceiling space.

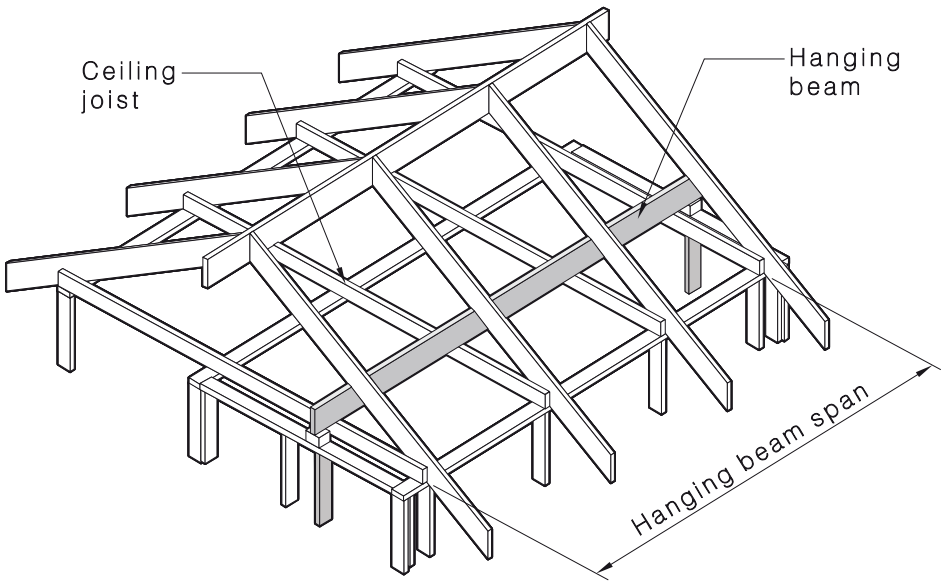


FIGURE A13 HANGING BEAM

TABLE A28
HANGING BEAMS

Ceiling joist span mm	Hanging beam span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
1800	2400	150×38	125×38	125×50	125×38	125×38	120×45	120×35	120×35	90×45	90×35
	3000	175×38	175×38	150×50	150×50	150×38	140×45	140×35	120×45	120×35	120×35
	3600	200×50	200×50	200×38	175×50	175×38	170×45	170×35	140×45	140×45	120×45
	4200	250×38	225×50	225×50	200×50	200×50	240×35	190×35	170×45	170×35	140×45
	4800	275×50	275×38	250×50	250×38	225×50	240×35	240×35	190×45	190×45	170×45
	5400	300×50	300×50	300×38	275×50	275×38	290×35	240×45	240×35	240×35	190×45
	6000	—	—	—	300×50	300×50	290×45	290×35	240×45	240×45	240×35
2400	2400	150×50	150×38	150×38	125×50	125×50	120×45	120×45	120×35	120×35	90×45
	3000	200×38	175×50	175×50	175×38	150×50	170×35	140×45	140×35	120×45	120×35
	3600	225×50	225×38	200×50	200×50	200×38	190×45	170×45	170×35	170×35	140×45
	4200	275×50	250×50	250×50	225×50	225×50	240×35	240×35	190×45	190×35	170×35
	4800	300×50	300×50	275×50	275×50	250×50	290×35	240×45	240×35	240×35	190×45
	5400	—	—	—	300×50	300×38	290×45	290×35	240×45	240×45	240×35
	6000	—	—	—	—	—	—	290×45	290×35	290×35	240×45
3000	2400	175×38	150×50	150×50	150×38	150×38	140×45	140×35	120×45	120×35	120×35
	3000	200×50	200×50	200×38	175×50	175×50	170×45	170×35	140×45	140×45	120×45
	3600	250×50	225×50	225×50	225×38	250×50	240×35	190×45	170×45	170×45	170×35
	4200	275×50	275×50	275×38	250×50	250×38	240×45	240×35	240×35	190×45	170×45
	4800	—	—	300×50	300×38	275×50	290×45	290×35	240×45	240×35	240×35
	5400	—	—	—	—	300×50	—	290×45	290×35	290×35	240×35
	6000	—	—	—	—	—	—	—	290×45	290×45	290×35

(*continued*)

TABLE A28 (*continued*)

Ceiling joist span mm	Hanging beam span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
3600	2400	175×50	175×38	175×38	150×50	150×50	170×35	140×45	120×45	120×45	120×35
	3000	225×50	200×50	200×50	200×38	175×50	190×45	170×45	170×35	170×35	140×35
	3600	275×50	250×50	250×50	225×50	225×50	240×35	240×35	190×45	190×35	170×35
	4200	300×50	300×50	275×50	275×50	250×50	290×35	240×45	240×35	240×35	190×45
	4800	—	—	—	300×50	300×50	—	290×45	290×35	240×45	240×35
	5400	—	—	—	—	—	—	—	290×45	290×35	240×45
	6000	—	—	—	—	—	—	—	—	—	290×35

NOTES:

1 Maximum spans are based on the support of a maximum ceiling lining mass of 12 kg/m^2 including ceiling battens.

2 Beam ends may be chamfered to a minimum of 100 mm or one-third of the beam depth, whichever is greater.

3 Roof loads shall not be strutted onto hanging beams.

4 Minimum bearing length at supports shall be 70 mm.

5 Where the depth to breadth ratio exceeds 7:1, the beam shall be restrained at the top at supports (see Clause 7.2.26).

6 Multiple members shall be vertically nail-laminated in accordance with Clause 2.3.

7 Where the ceiling joist spans either side of the hanging beam differ, the average of the two spans shall be used to enter the table.

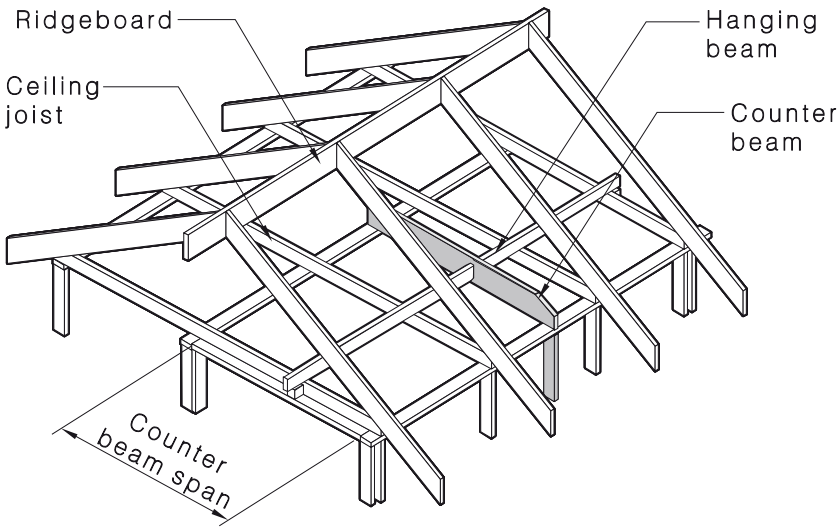


FIGURE A14 COUNTER BEAMS

TABLE A29
COUNTER BEAMS

Counter beam span mm	Hanging beam span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
2400	2400	150×50	150×38	150×38	125×50	125×50	140×35	120×45	120×35	120×35	120×35
	3000	150×50	150×50	150×38	150×38	125×50	140×45	140×35	120×35	120×35	120×35
	3600	175×38	150×50	150×50	150×38	150×38	140×45	140×45	120×45	120×35	120×35
	4800	175×50	175×50	175×38	150×50	150×50	170×35	170×35	140×35	120×45	120×35
3000	2400	175×50	175×50	175×38	175×38	150×50	170×35	140×45	140×35	120×35	120×35
	3000	200×50	200×38	175×50	175×50	175×38	170×45	170×35	140×45	140×35	120×45
	3600	200×50	200×50	200×38	175×50	175×50	170×45	170×45	170×35	140×45	140×35
	4800	225×50	225×50	200×50	200×50	200×38	190×45	190×45	170×35	170×35	140×45
3600	2400	225×50	225×38	200×50	200×38	200×38	190×45	170×45	170×35	170×35	140×35
	3000	250×50	225×50	225×38	225×38	200×50	240×35	190×45	170×45	170×35	140×45
	3600	250×50	250×38	225×50	225×50	200×50	240×45	240×35	170×45	170×45	170×35
	4800	250×75	250×50	250×50	250×38	225×50	240×45	240×45	190×45	190×45	170×45
4200	2400	250×75	250×50	250×50	225×50	225×50	240×45	240×35	190×45	190×35	170×45
	3000	250×75	275×50	275×38	250×50	250×38	240×45	240×45	240×35	190×45	170×45
	3600	275×75	300×50	275×50	275×38	250×50	290×45	290×35	240×35	240×35	190×45
	4800	—	—	300×50	275×50	275×50	290×45	290×45	240×45	240×35	240×35
4800	2400	300×75	275×75	300×50	275×50	275×50	290×45	240×45	240×35	240×35	240×35
	3000	300×75	300×75	275×75	300×50	300×50	290×45	290×35	240×45	240×45	240×35
	3600	—	300×75	300×75	275×75	300×50	2/290×35	290×45	290×35	240×45	240×35
	4800	—	—	—	300×75	300×75	2/290×35	2/290×35	2/240×35	290×45	290×35

NOTES:

1 Maximum spans are based on the support of a maximum ceiling mass of 15 kg/m^2. The mass of ceiling joists and hanging beams is included in the Span Table calculations.

2 Beam ends may be chamfered to a minimum of 100 mm or one-third of the beam depth, whichever is greater.

3 Roof loads shall not be strutted onto counter beams.

4 Minimum bearing length at supports shall be 70 mm.

5 Multiple members shall be vertically nail-laminated in accordance with Clause 2.3.

6 Where the hanging beam spans differ either side of the counter beam, the average of the two spans shall be used to enter the table.

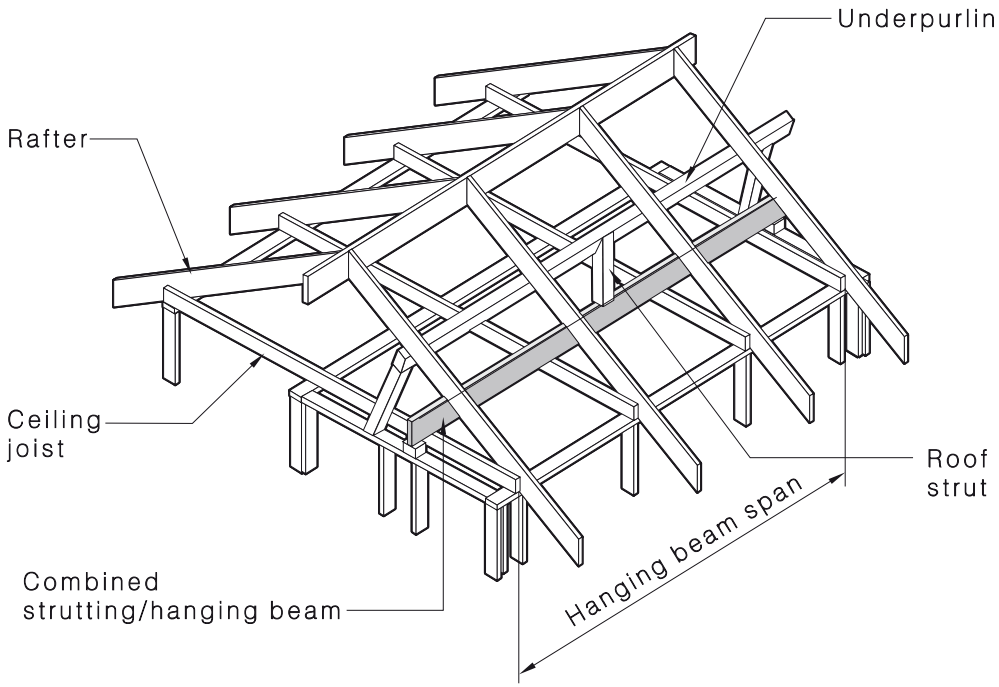


FIGURE A15 COMBINED STRUTTING/HANGING BEAM

TABLE A30

COMBINED STRUTTING/HANGING BEAMS—MAXIMUM RAFTER AND CEILING JOIST SPANS 3000 mm

Roof type	Combined strutting/ hanging beam span	Unseasoned timber					Seasoned timber				
mm	mm	F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Sheet roof	1800	150×75	150×75	125×75	125×75	125×75	2/120×35	2/120×35	2/120×35	2/120×35	2/120×35
	2400	200×75	175×75	175×75	175×75	150×75	2/140×45	2/140×35	2/120×45	2/120×35	2/120×35
	3000	225×75	225×75	225×75	200×75	200×75	2/190×35	2/170×45	2/170×35	2/140×45	2/120×35
	3600	275×75	275×75	250×75	250×75	225×75	2/240×35	2/190×45	2/190×35	2/170×45	2/170×35
	4800	—	—	—	—	—	—	2/290×45	2/290×35	2/290×35	2/240×45
	6000	—	—	—	—	—	—	—	—	—	—
Tile roof	1800	175×75	175×75	150×75	150×75	150×75	2/140×35	2/120×45	2/120×35	2/120×35	2/120×35
	2400	225×75	225×75	200×75	200×75	175×75	2/170×45	2/170×35	2/140×45	2/140×45	2/120×45
	3000	275×75	275×75	250×75	250×75	225×75	2/240×35	2/190×45	2/190×35	2/170×45	2/170×35
	3600	—	—	300×75	275×75	275×75	2/290×35	2/240×45	2/240×35	2/240×35	2/190×45
	4800	—	—	—	—	—	—	—	—	—	2/290×35
	6000	—	—	—	—	—	—	—	—	—	—

NOTES:

1 For allowable roof and ceiling masses, see Clause 1.4.11.

2 Beam ends may be chamfered to a minimum of 100 mm or one-third of the beam depth, whichever is greater.

3 Roof loads can be strutted onto strutting/hanging beams.

4 Minimum bearing length at supports shall be 70 mm.

5 Multiple members shall be vertically nail-laminated in accordance with Clause 2.3.

6 Where the depth to breadth ratio exceeds 3:1, the beam shall be restrained at the top edge at supports (see Clause 7.2.26).

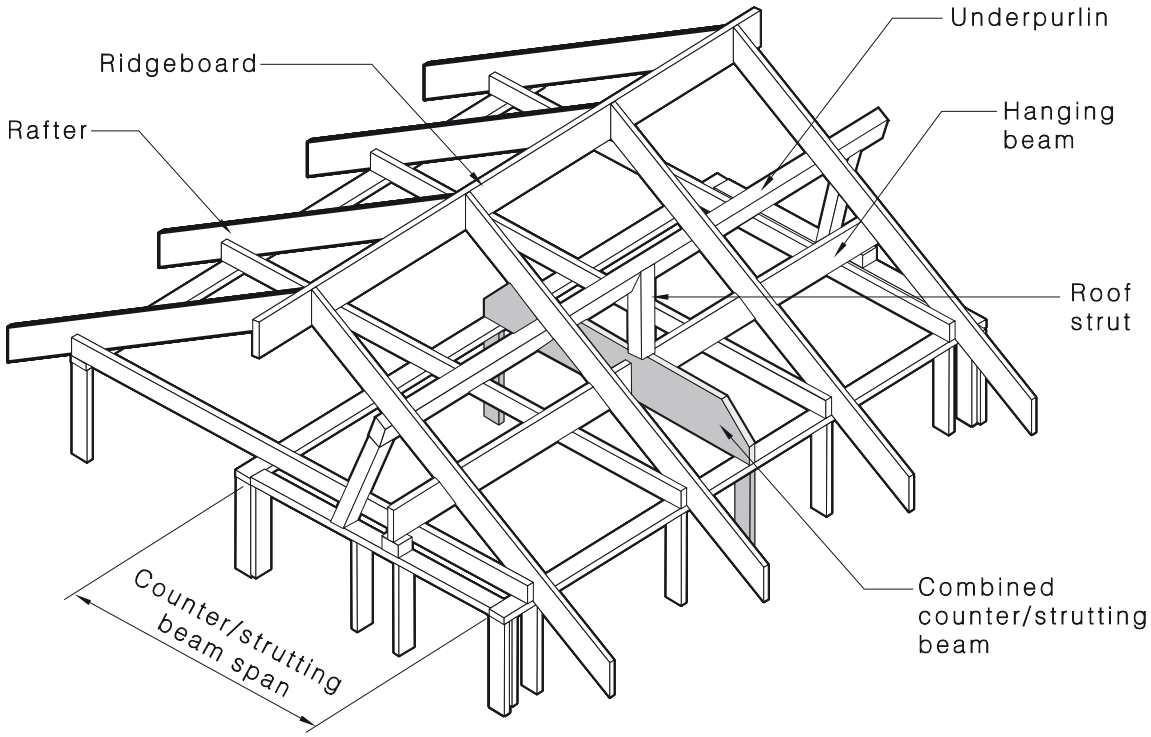


FIGURE A16 COMBINED COUNTER/STRUTTING BEAM

TABLE A31
COMBINED COUNTER/STRUTTING BEAMS

Counter/ strutting beam span mm	Hanging beam span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Sheet roof											
2400	2400	200×75	200×75	200×75	175×75	175×75	2/170×35	2/140×45	2/140×35	2/140×35	2/120×35
	3000	225×75	200×75	200×75	200×75	175×75	2/170×45	2/170×45	2/140×45	2/140×45	2/120×45
	3600	225×75	225×75	200×75	200×75	200×75	2/190×35	2/170×45	2/170×35	2/140×45	2/140×35
	4800	250×75	250×75	225×75	225×75	200×75	2/240×35	2/190×45	2/170×45	2/170×35	2/140×45
3000	2400	250×75	225×75	225×75	200×75	200×75	2/190×45	2/190×35	2/170×35	2/170×35	2/140×45
	3000	250×75	250×75	225×75	225×75	225×75	2/240×35	2/190×45	2/170×45	2/170×35	2/140×45
	3600	275×75	250×75	250×75	250×75	225×75	2/240×35	2/190×45	2/190×35	2/170×45	2/170×35
	4800	300×75	275×75	275×75	250×75	250×75	2/240×45	2/240×35	2/190×45	2/190×45	2/170×45
3600	2400	275×75	275×75	250×75	250×75	225×75	2/240×35	2/240×35	2/190×45	2/170×45	2/170×35
	3000	300×75	275×75	275×75	250×75	250×75	2/240×45	2/240×35	2/240×35	2/190×45	2/170×45
	3600	300×75	300×75	275×75	275×75	250×75	2/240×45	2/240×45	2/240×35	2/190×45	2/190×35
	4800	—	—	300×75	300×75	275×75	2/290×35	2/240×45	2/240×35	2/240×35	2/190×45
4200	2400	—	—	300×75	275×75	275×75	2/290×35	2/240×45	2/240×35	2/240×35	2/190×45
	3000	—	—	—	300×75	300×75	2/290×35	2/290×35	2/240×45	2/240×35	2/240×35
	3600	—	—	—	—	300×75	2/290×45	2/290×35	2/240×45	2/240×45	2/240×35
	4800	—	—	—	—	—	—	2/290×45	2/290×35	2/290×35	2/240×35
4800	2400	—	—	—	—	—	2/290×45	2/290×35	2/290×35	2/240×45	2/240×35
	3000	—	—	—	—	—	—	2/290×45	2/290×45	2/290×35	2/240×45
	3600	—	—	—	—	—	—	—	2/290×45	2/290×35	2/240×45
	4800	—	—	—	—	—	—	—	—	2/290×45	2/290×35

(*continued*)

TABLE A31 (*continued*)

Counter/ strutting beam span mm	Hanging beam span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Tile roof											
2400	2400	250×75	250×75	225×75	225×75	225×75	2/240×35	2/190×45	2/170×45	2/170×35	2/140×45
	3000	275×75	275×75	250×75	250×75	225×75	2/240×35	2/240×35	2/190×45	2/170×45	2/170×35
	3600	300×75	275×75	275×75	250×75	250×75	2/240×45	2/240×45	2/190×45	2/190×45	2/170×45
	4800	—	300×75	300×75	275×75	275×75	2/290×45	2/290×45	2/240×35	2/240×35	2/190×35
3000	2400	300×75	275×75	275×75	250×75	250×75	2/240×45	2/240×35	2/240×35	2/190×45	2/170×45
	3000	—	300×75	300×75	275×75	275×75	2/290×35	2/240×45	2/240×35	2/240×35	2/190×45
	3600	—	—	300×75	300×75	275×75	2/290×45	2/290×45	2/240×35	2/240×35	2/190×45
	4800	—	—	—	—	300×75	—	—	2/240×45	2/240×45	2/240×35
3600	2400	—	—	300×75	300×75	275×75	2/290×45	2/290×45	2/240×45	2/240×35	2/190×45
	3000	—	—	—	—	300×75	2/290×45	2/290×45	2/240×45	2/240×45	2/240×35
	3600	—	—	—	—	—	—	—	2/290×35	2/240×45	2/240×35
	4800	—	—	—	—	—	—	—	—	2/290×35	2/240×45
4200	2400	—	—	—	—	—	—	2/290×45	2/290×35	2/290×35	2/240×35
	3000	—	—	—	—	—	—	—	2/290×45	2/290×35	2/240×45
	3600	—	—	—	—	—	—	—	—	2/290×45	2/290×35
	4800	—	—	—	—	—	—	—	—	—	2/290×45
4800	2400	—	—	—	—	—	—	—	—	2/290×45	2/290×35
	3000	—	—	—	—	—	—	—	—	—	2/290×45

NOTES:

1 For allowable roof and ceiling masses, see Clause 1.4.11. The mass of rafters, underpurlins and strutting beams is included in the Span Table calculations.

2 Beam ends may be chamfered to a minimum of 100 mm or one-third the beam depth, whichever is greater.

3 Roof loads may be strutted onto combined strutting/hanging beams.

4 Minimum bearing length at supports shall be 70 mm.

5 Multiple members shall be vertically nail-laminated in accordance with Clause 2.3.

6 Where the depth to breadth ratio exceeds 3:1, the beam shall be restrained at the top edge at supports (see Clause 7.2.26).

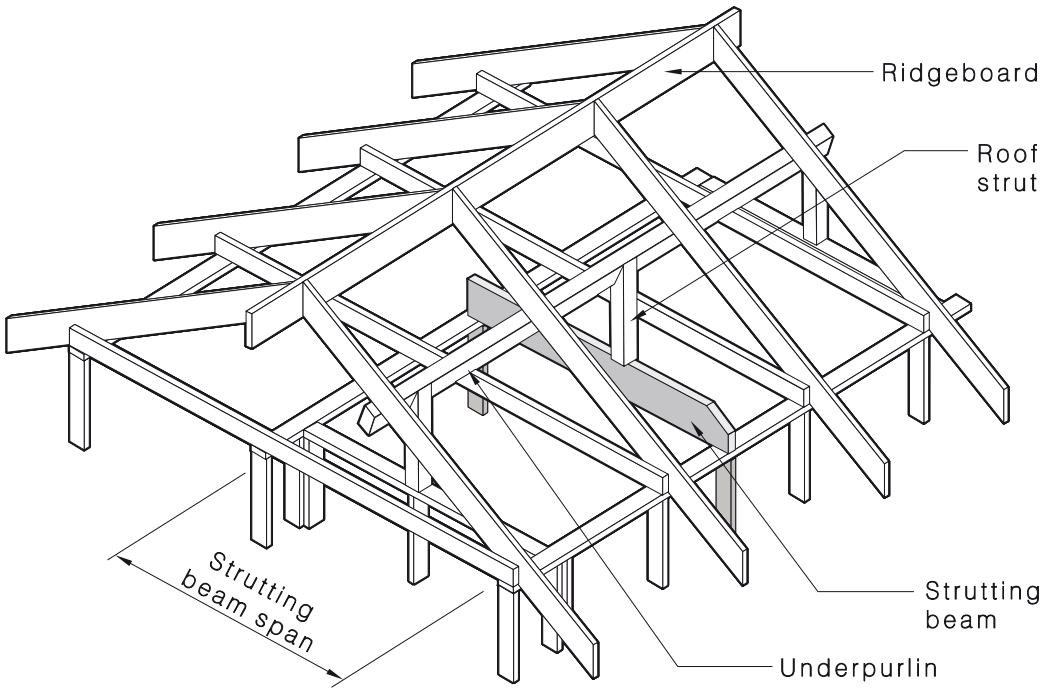


FIGURE A17 STRUTTING BEAM

TABLE A32

STRUTTING BEAMS—MAXIMUM RAFTER SPAN 3000 mm

Roof type	Strutting beam span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
1200 mm underpurlin span											
Sheet roof (20 kg/m^2)	1800	125×75	125×75	125×50	125×50	125×50	2/120×35	2/120×35	2/90×35	2/90×35	2/90×35
	2400	175×50	150×75	150×75	150×75	150×50	2/120×45	2/120×45	2/120×35	2/120×35	2/90×45
	3000	200×75	175×75	175×75	175×75	150×75	2/170×35	2/140×45	2/120×45	2/120×45	2/120×35
	3600	225×75	200×75	200×75	200×75	175×75	2/170×45	2/170×35	2/140×45	2/140×35	2/120×45
	4800	275×75	250×75	250×75	250×75	225×75	2/240×35	2/190×35	2/170×45	2/170×45	2/170×35
	6000	—	300×75	300×75	300×75	275×75	2/290×35	2/240×35	2/240×35	2/240×35	2/190×35
Tile roof (60 kg/m^2)	1800	175×75	175×75	150×75	150×75	150×75	2/140×35	2/120×45	2/120×35	2/120×35	2/120×35
	2400	200×75	200×75	200×75	175×75	175×75	2/170×35	2/140×45	2/140×35	2/140×35	2/120×45
	3000	250×75	225×75	225×75	225×75	200×75	2/190×45	2/170×45	2/170×35	2/170×35	2/140×45
	3600	275×75	275×75	250×75	250×75	225×75	2/240×35	2/190×45	2/170×45	2/170×45	2/170×45
	4800	—	—	—	300×75	275×75	2/290×35	2/240×45	2/240×35	2/240×35	2/190×45
	6000	—	—	—	—	—	—	2/290×35	2/290×35	2/290×35	2/240×35

(*continued*)

TABLE A32 (*continued*)

Roof type	Strutting beam span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
2400 mm underpurlin span											
Sheet roof (20 kg/m^2)	1800	175×75	150×75	150×75	150×75	150×50	2/140×35	2/120×45	2/120×35	2/120×35	2/90×45
	2400	200×75	200×75	175×75	175×75	175×75	2/170×35	2/140×45	2/140×35	2/120×45	2/120×35
	3000	225×75	225×75	225×75	200×75	200×75	2/190×35	2/170×45	2/170×35	2/140×45	2/140×35
	3600	275×75	250×75	250×75	225×75	225×75	2/240×35	2/190×45	2/170×45	2/170×45	2/170×35
	4800	—	300×75	300×75	275×75	275×75	2/290×35	2/240×35	2/240×35	2/240×35	2/190×45
	6000	—	—	—	—	—	—	2/290×35	2/240×45	2/240×45	2/240×35
Tile roof (60 kg/m^2)	1800	225×75	200×75	200×75	175×75	175×75	2/170×45	2/170×35	2/140×45	2/140×35	2/120×45
	2400	250×75	250×75	225×75	225×75	225×75	2/240×35	2/190×45	2/170×45	2/170×35	2/170×35
	3000	300×75	300×75	275×75	250×75	250×75	2/240×45	2/240×35	2/190×45	2/190×45	2/170×45
	3600	—	—	300×75	300×75	275×75	2/290×35	2/240×45	2/240×35	2/240×35	2/190×45
	4800	—	—	—	—	—	—	2/290×45	2/290×35	2/290×35	2/240×45
	6000	—	—	—	—	—	—	—	—	—	2/290×45

NOTES:

1 For allowable roof and ceiling masses, see Clause 1.4.11. The mass of rafters and underpurlins is included in the Span Table calculations.

2 Beam ends may be chamfered to a minimum of 100 mm or one-third of the beam depth, whichever is greater.

3 Roof loads may be strutted onto strutting beams.

4 Minimum bearing length at supports shall be 70 mm.

5 Multiple members shall be vertically nail-laminated in accordance with Clause 2.3.

6 Where the depth to breadth ratio exceeds 3:1, the beam shall be restrained at the top edge at supports (see Clause 7.2.26).

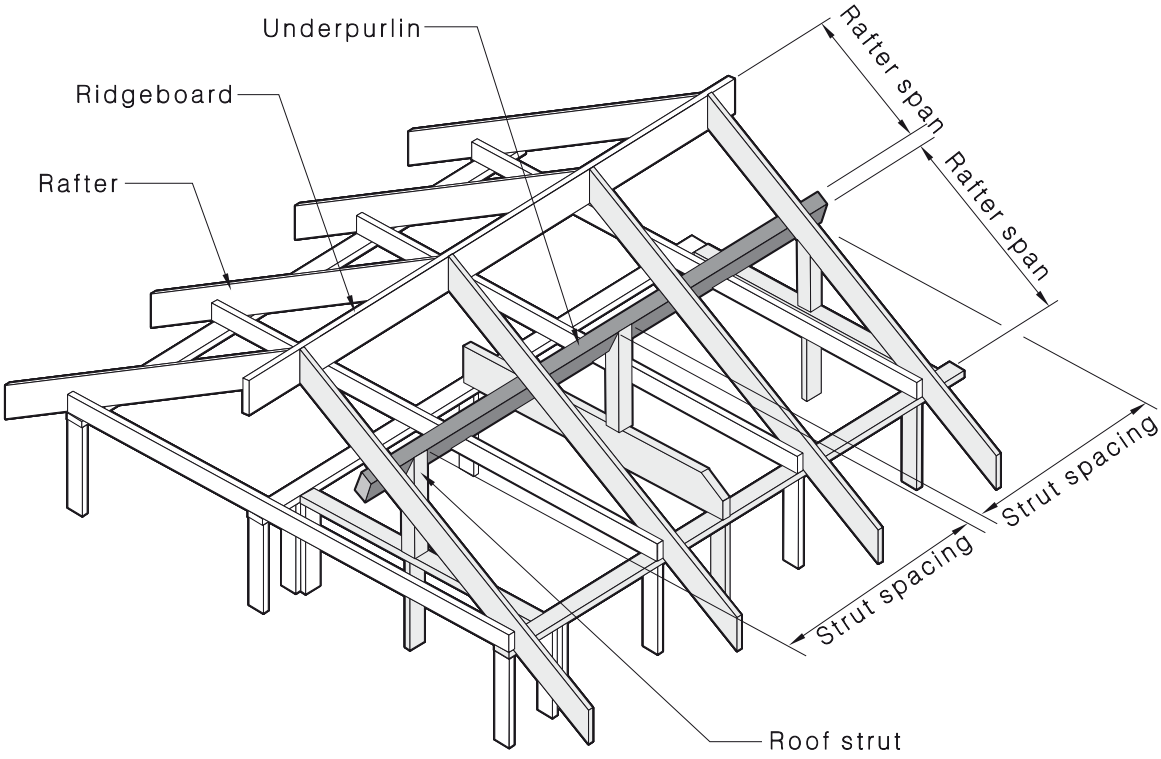


FIGURE A18 UNDERPURLIN

TABLE A33

UNDERPURLINS—CONTINUOUS SPAN—MAXIMUM RAFTER SPAN 3000 mm

Roof type	Strut spacing mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Sheet	1200	75×75	75×50	75×50	75×50	75×50	2/70×35	2/70×35	2/70×35	2/70×35	2/70×35
	1800	100×75	100×50	100×50	75×75	75×75	2/70×45	2/70×45	2/70×45	2/70×45	2/70×35
	2400	125×75	125×75	125×75	100×75	100×75	2/90×35	2/90×45	2/90×35	2/70×45	2/70×35
Tile	1200	100×50	100×50	75×75	75×75	75×75	2/70×45	2/70×45	2/70×35	2/70×35	2/70×35
	1800	125×75	125×75	125×75	125×75	100×75	2/120×35	2/90×45	2/90×35	2/90×35	2/70×45
	2400	—	150×75	150×75	150×75	150×75	2/140×45	2/140×35	2/120×35	2/120×35	2/90×45

NOTES:

1 For allowable roof mass, see Clause 1.4.11. The mass of rafters is included in the Span Table calculations.

2 Minimum bearing length at supports shall be 70 mm.

3 Multiple members shall be vertically nail-laminated in accordance with Clause 2.3.

4 Maximum allowable cantilever is 25% of the span, but not more than one-third of the actual backspan.

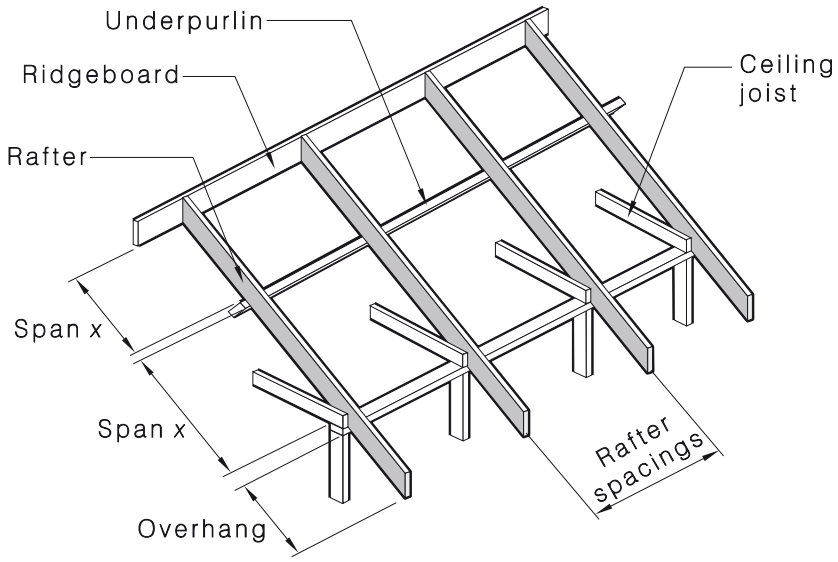


FIGURE A19 RAFTERS—COUPLED ROOF

TABLE A34

RAFTERS—SUPPORTING ROOF LOADS ONLY—COUPLED ROOFS—CONTINUOUS SPAN

Roof type (mass)	Rafter spacing mm	Rafter span mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Sheet (20 kg/m^2)	900	1800	100×38	100×38	75×50	75×38	75×38	90×35	90×35	70×45	70×35	70×35
		O'hang	300	400	400	450	500	300	300	400	550	700
		2100	100×38	100×38	100×38	75×50	75×50	90×45	90×45	90×35	70×45	70×35
		O'hang	350	400	550	600	650	350	400	450	650	700
		2400	100×50	100×38	100×38	100×38	100×38	120×35	90×45	90×35	90×35	70×45
		O'hang	450	400	550	750	750	400	400	450	750	750
		2700	100×50	100×50	100×38	100×38	100×38	120×35	90×45	90×35	90×35	70×45
		O'hang	450	550	550	750	750	450	400	450	750	750
		3000	125×38	125×38	100×50	100×38	100×38	120×35	120×35	90×45	90×35	90×35
		O'hang	500	650	700	750	750	450	500	600	750	750
	1200	1800	100×38	100×38	75×50	75×50	75×38	90×35	90×45	70×45	70×35	70×35
		O'hang	300	400	350	500	450	300	350	350	450	600
		2100	100×38	100×50	100×38	100×38	75×50	90×45	90×45	90×35	70×45	70×35
		O'hang	300	450	500	650	550	350	350	400	600	600
		2400	100×50	100×50	100×38	100×38	100×38	120×35	120×35	90×35	90×35	70×45
		O'hang	400	450	500	650	700	400	450	450	700	650
		2700	125×38	100×50	100×50	100×38	100×38	120×35	120×35	90×45	90×35	90×35
		O'hang	450	450	600	650	700	400	450	500	700	700
		3000	125×38	125×38	125×38	100×50	100×50	120×35	120×35	90×45	90×45	90×35
		O'hang	450	550	700	750	750	400	450	500	750	700

(*continued*)

TABLE A34 (*continued*)

Roof type (mass)	Rafter spacing mm	Rafter span mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Tile (60 kg/m^2)	450	1800	100×38	75×50	75×38	75×38	75×38	70×45	70×45	70×35	70×35	70×35
		O'hang	450	400	450	650	700	300	300	400	700	750
		2100	100×38	100×38	75×50	75×50	75×38	90×35	90×35	70×45	70×35	70×35
		O'hang	450	600	600	750	700	400	400	500	700	750
		2400	100×50	100×38	100×38	100×38	100×38	90×45	90×35	90×35	70×45	70×35
		O'hang	600	600	750	750	750	400	400	700	750	750
		2700	125×38	100×50	100×50	100×38	100×38	90×45	90×45	90×35	90×35	70×35
		O'hang	750	750	750	750	750	450	500	700	750	750
		3000	125×50	125×38	125×38	100×50	100×50	120×35	90×45	90×35	90×35	70×45
		O'hang	750	750	750	750	750	650	500	700	750	750
	600	1800	100×38	75×50	75×38	75×38	75×38	90×35	90×35	70×35	70×35	70×35
		O'hang	400	350	400	500	600	350	350	350	600	750
		2100	100×38	100×38	100×38	100×38	75×50	90×45	90×35	70×45	70×35	70×35
		O'hang	400	450	600	750	700	400	350	450	600	750
		2400	125×38	100×50	100×50	100×38	100×38	90×45	90×45	90×35	70×45	70×35
		O'hang	550	600	750	750	750	400	400	500	700	750
		2700	125×38	125×38	125×38	100×50	100×50	120×35	90×45	90×35	90×35	70×45
		O'hang	550	700	750	750	750	500	400	500	750	750
		3000	150×38	125×50	125×38	125×38	125×38	120×35	120×35	90×45	90×45	90×35
		O'hang	750	750	750	750	750	500	550	700	750	750

NOTES:

1 For allowable roof mass, see Clause 1.4.11.

2 Allowable overhangs are based on a maximum birdsmouth depth of $D/3$ (see Figure 7.19). Where rafters are not birdsmouthed, the allowable overhang may be increased to 30% of the single span for that member, provided the overhang does not exceed 50% of the actual backspan. For intermediate values, see Clause 7.3.13.3.

3 Overhang limits are only applicable where rafter ends are supported by a structural fascia (see Clause 7.3.13.2).

4 Multiple members shall be vertically nail-laminated in accordance with Clause 2.3.

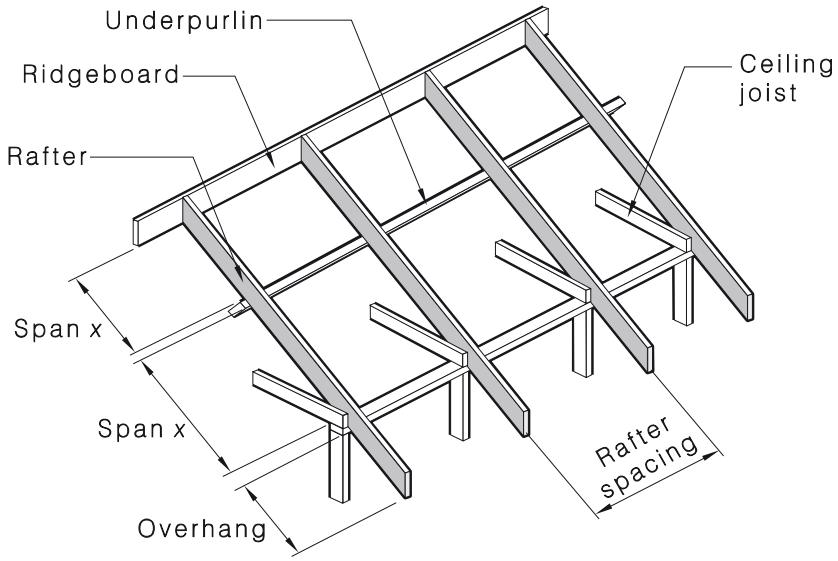


FIGURE A20 RAFTERS—NON-COUPLED (CATHEDRAL) ROOF

TABLE A35

RAFTERS—SUPPORTING ROOF AND CEILING LOADS—NON-COUPLED ROOFS (CATHEDRAL ROOFS)—SINGLE SPAN

Roof type (mass)	Rafter spacing mm	Rafter span mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Sheet (40 kg/m^2)	900	3000	175×50	175×50	175×50	150×50	150×50	140×45	140×45	140×35	120×45	120×35
		O'hang	750	750	750	750	750	700	750	800	750	750
		3600	225×50	200×50	200×50	200×50	175×50	170×45	170×45	170×35	140×45	140×35
		O'hang	750	750	750	750	750	750	1050	950	750	750
		4200	250×50	250×50	225×50	225×50	200×50	240×35	190×45	190×35	170×45	170×35
		O'hang	750	750	750	750	750	750	1150	1000	750	750
		4800	300×50	275×50	275×50	250×50	250×50	240×45	240×35	240×35	190×45	190×35
		O'hang	750	750	750	750	750	750	1250	1250	750	750
		5400	300×75	275×75	300×50	275×50	275×50	290×35	290×35	240×45	240×35	240×35
		O'hang	750	750	750	750	750	750	1450	1450	750	750
	1200	3000	200×50	175×50	175×50	175×50	150×50	170×45	170×45	140×45	140×35	120×45
		O'hang	750	750	750	750	750	700	700	800	750	750
		3600	225×50	250×50	200×50	200×50	200×50	190×45	190×35	170×45	170×35	140×45
		O'hang	750	750	750	750	750	750	850	900	750	750
		4200	250×50	250×50	250×50	225×50	225×50	240×35	240×35	190×45	190×35	170×45
		O'hang	750	750	750	750	750	750	1050	1000	750	750
		4800	275×75	275×75	275×50	275×50	250×50	290×35	240×45	240×35	240×35	190×45
		O'hang	750	750	750	750	750	750	1200	1050	750	750
		5400	—	—	300×75	300×50	300×50	290×45	290×35	290×35	240×45	240×35
		O'hang	—	—	750	750	750	750	1200	1200	750	750

(*continued*)

TABLE A35 (*continued*)

Roof type (mass)	Rafter spacing mm	Rafter span mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Tile (90 kg/m^2)	600	3000	200×50	200×50	175×50	175×50	175×50	170×45	170×35	140×35	140×35	120×45
		O'hang	750	750	750	750	750	750	950	1050	750	750
		3600	250×50	225×50	225×50	200×50	200×50	240×35	190×45	170×35	170×35	170×35
		O'hang	750	750	750	750	750	750	1350	1200	750	750
		4200	275×50	275×50	250×50	250×50	225×50	240×45	240×35	190×35	190×45	170×45
		O'hang	750	750	750	750	750	750	1500	1350	750	750
		4800	275×75	275×75	300×50	275×50	275×50	290×35	290×35	240×35	240×35	240×35
		O'hang	750	750	750	750	750	750	1850	1600	750	750
		5400	—	300×75	300×75	275×75	300×50	—	290×45	240×45	240×45	240×35
		O'hang	—	750	750	750	750	—	2250	1850	750	750
	900	3000	225×50	225×50	200×50	200×50	175×50	190×45	190×35	140×45	170×35	140×45
		O'hang	750	750	750	750	750	750	800	950	750	750
		3600	275×50	250×50	250×50	225×50	225×50	240×35	240×35	170×45	190×35	170×45
		O'hang	750	750	750	750	750	750	1150	1100	750	750
		4200	275×75	275×75	300×50	275×50	275×50	290×35	240×45	190×45	240×35	240×35
		O'hang	750	750	750	750	750	750	1400	1250	750	750
		4800	—	300×75	300×75	275×75	300×50	—	290×45	240×45	240×45	240×35
		O'hang	—	750	750	750	750	—	1750	1500	750	750
		5400	—	—	—	—	300×75	—	—	290×35	290×45	290×35
		O'hang	—	—	—	—	750	—	—	1500	750	750

NOTES:

1 For allowable roof mass, see Clause 1.4.11.

2 Allowable overhangs are based on a maximum birdsmouth depth of *D*/3 (see Figure 7.19). Where rafters are not birdsmouthed, the allowable overhang may be increased to 30% of the single span for that member, provided the overhang does not exceed 50% of the actual backspan. For intermediate values, see Clause 7.3.13.3.

3 Overhang limits are only applicable where rafter ends are supported by a structural fascia (see Clause 7.3.13.2).

4 Multiple members shall be vertically nail-laminated in accordance with Clause 2.3.

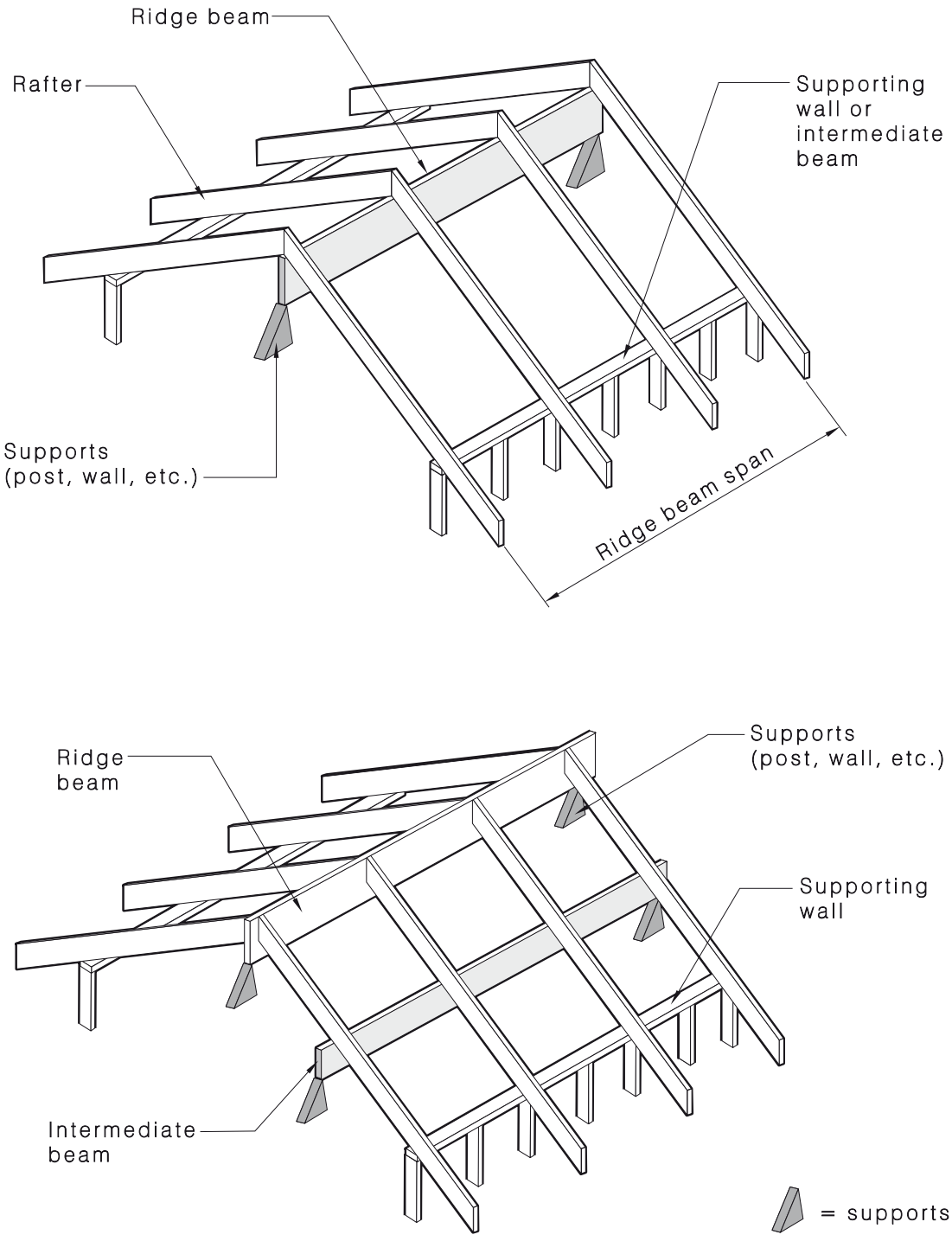


FIGURE A21 RIDGE AND INTERMEDIATE BEAMS

TABLE A36

RIDGE AND INTERMEDIATE BEAMS—SUPPORTING ROOF AND CEILING LOADS (CATHEDRAL ROOF)—SINGLE SPAN

Roof type (mass)	Beam spacing mm	Beam span mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Sheet (40 kg/m^2)	2400	2400	175×75	175×75	150×75	150×75	150×75	2/140×35	2/140×35	140×45	2/120×35	120×45
		3000	225×75	200×75	200×75	200×75	175×75	2/170×45	2/170×35	190×35	2/140×35	2/120×45
		3600	250×75	250×75	225×75	225×75	225×75	2/240×35	2/190×45	2/170×45	2/170×35	2/170×35
		4800	400×75	300×100	300×100	300×75	300×75	2/290×35	2/290×35	2/240×45	2/240×35	2/240×35
		6000	400×100	400×100	—	—	—	—	—	2/290×45	2/290×45	2/290×35
	3600	2400	200×75	200×75	175×75	175×75	175×75	2/170×35	2/140×45	170×45	2/120×45	2/120×35
		3000	250×75	225×75	225×75	225×75	200×75	2/190×45	2/190×35	2/170×45	2/170×35	2/140×45
		3600	300×75	275×75	275×75	250×75	250×75	2/240×45	2/240×35	240×45	2/190×45	2/170×45
		4800	400×75	400×75	—	—	300×100	—	2/290×45	2/290×35	2/290×35	2/240×45
		6000	—	—	—	—	—	—	—	—	—	2/290×45
	4800	2400	225×75	200×75	200×75	200×75	175×75	2/170×45	2/170×35	190×45	2/140×35	2/140×35
		3000	275×75	250×75	250×75	225×75	225×75	2/240×35	2/240×35	2/190×45	2/170×45	2/170×35
		3600	400×75	300×75	300×75	275×75	275×75	2/290×35	2/240×45	2/240×35	2/240×35	240×45
		4800	400×100	400×100	400×75	400×75	400×75	—	—	2/290×45	2/290×35	2/290×35
		6000	—	—	—	—	—	—	—	—	—	—
	6000	2400	225×75	225×75	225×75	200×75	200×75	2/190×45	2/170×45	2/170×35	2/140×45	2/140×45
		3000	300×75	275×75	275×75	250×75	250×75	2/240×45	2/240×35	2/240×35	2/190×45	2/170×45
		3600	400×75	300×100	300×100	300×75	300×75	2/290×45	2/290×35	2/240×45	2/240×35	2/240×35
		4800	—	—	—	—	—	—	—	—	—	2/290×45
		6000	—	—	—	—	—	—	—	—	—	—
Tile (90 kg/m^2)	2400	2400	225×75	200×75	200×75	175×75	175×75	2/170×45	2/170×35	190×45	2/140×35	2/120×45
		3000	275×75	250×75	250×75	225×75	225×75	2/240×35	2/240×35	2/190×45	2/170×45	2/170×35
		3600	300×100	300×75	300×75	275×75	275×75	2/290×35	2/240×45	2/240×35	2/240×35	2/190×45
		4800	400×100	400×75	400×75	—	—	—	—	2/290×45	2/290×35	2/290×35
		6000	—	—	—	—	—	—	—	—	—	—
	3600	2400	250×75	225×75	225×75	200×75	200×75	2/190×45	2/190×45	2/170×45	2/170×35	2/140×45
		3000	300×75	300×75	275×75	275×75	250×75	2/240×45	2/240×35	2/240×35	2/190×45	2/190×35
		3600	400×75	400×75	300×100	300×100	300×75	2/290×45	2/290×35	2/290×35	2/240×45	2/240×35
		4800	—	—	—	—	—	—	—	—	—	2/290×45
		6000	—	—	—	—	—	—	—	—	—	—
	4800	2400	275×75	250×75	250×75	225×75	225×75	2/240×35	2/240×35	2/190×45	2/170×45	2/170×35
		3000	300×100	300×100	300×75	300×75	275×75	2/290×35	2/290×35	2/240×45	2/240×35	2/240×35
		3600	400×75	400×75	—	—	—	—	—	2/290×45	2/290×35	2/240×45
		4800	—	—	—	—	—	—	—	—	—	—
		6000	—	—	—	—	—	—	—	—	—	—
	6000	2400	300×75	275×75	275×75	250×75	250×75	2/240×35	2/240×45	2/240×35	2/190×35	2/170×45
		3000	400×75	400×75	300×100	275×100	300×75	2/290×45	2/290×45	2/240×35$_{(10)}$	2/240×35	2/240×35
		3600	400×100	400×100	—	—	—	—	—	2/290×45	2/290×35	2/290×35
		4800	—	—	—	—	—	—	—	—	—	—
		6000	—	—	—	—	—	—	—	—	—	—

NOTES:

1 For allowable roof mass, see Clause 1.4.11.

2 Multiple members shall be vertically nail-laminated in accordance with Clause 2.3.

3 Minimum bearing length at supports shall be 35 mm. Subscript values, where applicable, indicate the minimum additional bearing length where required to be greater than 35 mm.

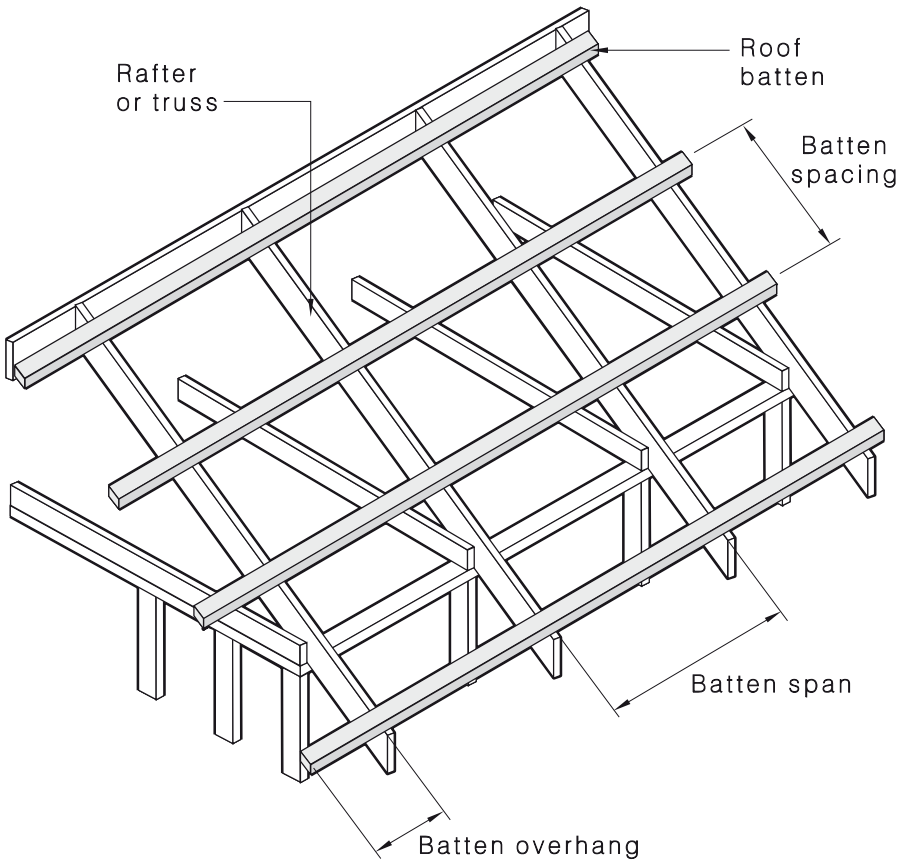


FIGURE A22 ROOF BATTENS

TABLE A37

ROOF BATTENS—SUPPORTING ROOFING ONLY

Roof type (mass)	Rafter spacing mm	Batten spacing mm	Unseasoned timber					Seasoned timber			
			F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17
Sheet (10 kg/m^2)	900	600	50×75	50×50	38×75	38×50	38×50	35×90	35×90	35×70	35×42
		900	50×75	50×75	38×75	38×75	38×50	45×70	45×70	35×70	35×42
		1200	50×75	50×75	38×75	38×75	38×50	45×90	45×70	35×70	35×42
	1200	600	50×75	50×75	50×50	38×75	38×50	45×90	45×70	35×90	35×42
		900	—	50×75	50×75	38×75	38×75	—	45×90	45×70	35×70
		1200	—	50×75	50×75	38×75	38×75	—	45×90	45×70	35×70
Tile (60 kg/m^2)	450	330	25×75	25×50	25×38	25×50	25×50	35×42	35×42	35×42	35×42
	600	330	38×38	38×38	25×50	25×50	25×50	35×42	35×42	35×42	35×42
	900	330	50×50	38×50	38×38	38×50	25×75	35×70	35×70	35×42	35×42

NOTES:

1 Battens are not suitable for support of workers prior to the fixing of roof cladding.

2 For allowable roof mass, see Clause 1.4.11.

3 Roof battens shall not cantilever by more than 25% of their span and cantilevers shall not exceed 50% of the actual backspan.

4 Where possible, battens shall be supported at a minimum of three points (continuous span).

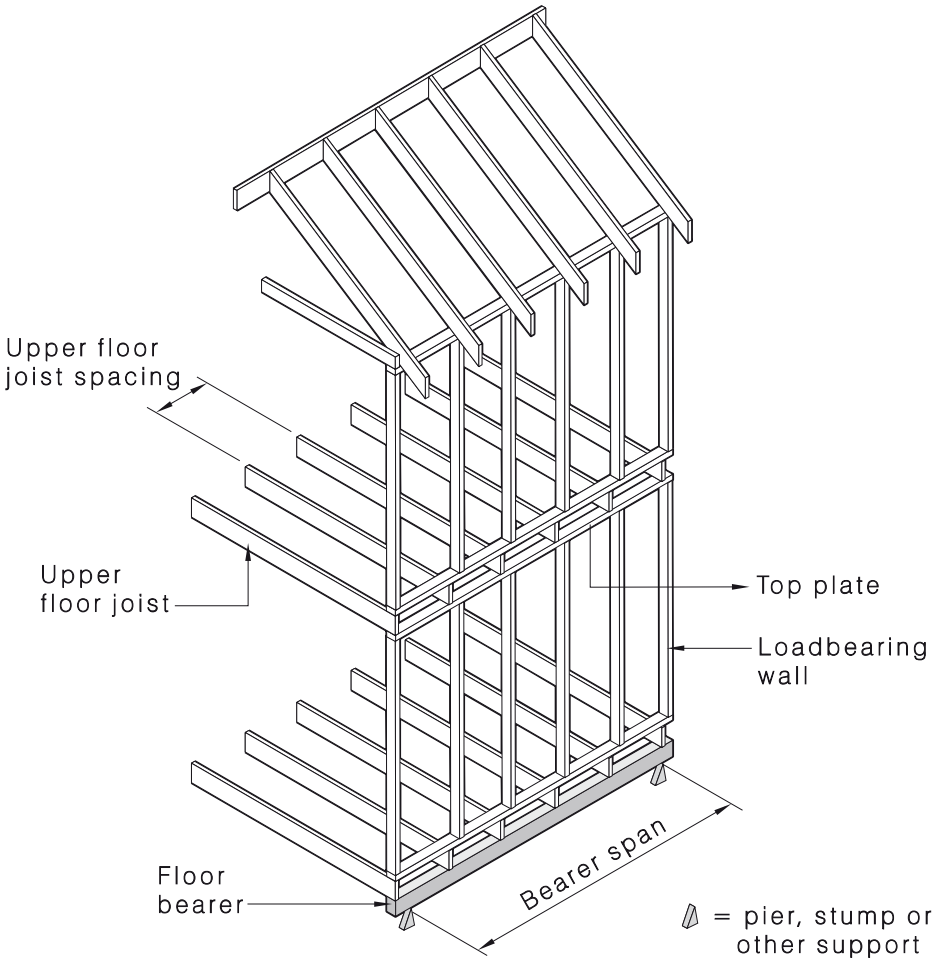


FIGURE A23 BEARERS SUPPORTING LOADBEARING WALLS—LOWER STOREY OF TWO-STOREY CONSTRUCTION

TABLE A38

BEARERS SUPPORTING LOWER STOREY EXTERNAL LOADBEARING WALLS—SHEET ROOF—UPPER + LOWER FLOOR JOIST SPANS 7200 mm MAX.

Bearer span	Unseasoned timber					Seasoned timber				
mm	F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Single span										
Strutted roof—Maximum rafter span 3000 mm										
1200	175×75	175×75	175×75	150×75	150×75	2/140×45	2/140×45	2/120×45	2/120×35	2/120×35
1500	225×75	200×75	200×75	200×75	175×75	2/190×45	2/170×45	2/140×45	2/140×45	2/120×45
1800	275×75	250×75	250×75	225×75	225×75	2/240×35	2/240×35	2/170×45	2/170×45	2/170×35
2100	275×100	275×100	275×75	275×75	250×75	2/290×35	2/290×35	2/240×35(5)	2/190×45	2/170×45
Unstrutted roof—Maximum rafter span 3000 mm or trussed roof maximum span 6000 mm										
1200	175×75	175×75	175×75	150×75	150×75	2/140×45	2/140×45	2/120×45	2/120×35	2/120×35
1500	225×75	225×75	200×75	200×75	175×75	2/190×45	2/170×45	2/170×35	2/140×45	2/140×35
1800	275×75	250×75	250×75	225×75	225×75	2/240×35	2/240×35	2/170×45	2/170×45	2/170×35
2100	275×100	275×100	275×75	275×75	250×75	2/290×45	2/290×45	2/240×35(5)	2/190×45	2/190×35

(*continued*)

TABLE A38 (*continued*)

Bearer span mm	Unseasoned timber					Seasoned timber				
	F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Single span (continued)										
Trussed roof maximum span 9000 mm										
1200	200×75	175×75	175×75	175×75	150×75	2/170×45	2/140×45	2/120×45	2/120×35	2/120×35
1500	225×75	225×75	200×75	200×75	200×75	2/190×45	2/170×45	2/170×35	2/140×45	2/140×35
1800	275×75	250×75	250×75	225×75	225×75	2/240×45	2/240×45	2/190×35	2/170×45	2/170×35
2100	275×100	275×100	275×75	275×75	275×75	2/290×45	2/290×45	$2/240\times35_{(5)}$	2/240×35	2/190×35
Trussed roof maximum span 12000 mm										
1200	200×75	175×75	175×75	175×75	150×75	2/170×35	2/140×45	2/120×45	2/120×35	2/120×35
1500	225×75	225×75	225×75	200×75	200×75	2/190×45	2/190×45	2/170×35	2/140×45	2/140×35
1800	275×75	275×75	250×75	250×75	225×75	2/240×45	2/240×45	2/190×45	2/170×45	2/170×35
2100	—	275×100	300×75	275×75	275×75	2/290×45	2/290×45	$2/240\times35_{(5)}$	2/240×35	2/190×45
Continuous span										
Strutted roof—Maximum rafter span 3000 mm										
1200	175×75	150×75	150×75	125×75	125×75	2/140×45	2/140×45	2/120×35	2/90×35	2/90×35
1500	225×75	200×75	175×75	150×75	150×75	2/170×45	2/170×45	2/140×45	2/120×35	2/90×45
1800	250×75	225×75	200×75	175×75	175×75	2/240×35	2/240×35	2/170×45	2/120×45	2/120×35
2100	275×100	275×75	225×75	200×75	200×75	$2/290\times35_{(5)}$	$2/290\times35_{(5)}$	2/190×45	2/140×45	2/140×35
Unstrutted roof—Maximum rafter span 3000 mm or trussed roof maximum span 6000 mm										
1200	175×75	150×75	150×75	125×75	125×75	2/140×45	2/140×45	2/120×35	2/90×35	2/90×35
1500	225×75	200×75	175×75	150×75	150×75	2/190×45	2/170×45	2/140×45	2/120×35	2/90×45
1800	250×75	225×75	200×75	175×75	175×75	2/240×35	2/240×35	2/170×45	2/120×45	2/120×35
2100	275×100	275×75	250×75	200×75	200×75	2/290×45	2/290×45	2/190×45	2/140×45	2/140×35
Trussed roof maximum span 9000 mm										
1200	175×75	175×75	150×75	125×75	125×75	2/170×35	2/140×45	2/120×35	2/90×45	2/90×35
1500	225×75	200×75	175×75	150×75	150×75	2/190×45	2/170×45	2/140×45	2/120×35	2/120×35
1800	250×75	225×75	200×75	175×75	175×75	2/240×45	2/240×45	2/190×35	2/140×35	2/120×35
2100	275×100	275×75	250×75	200×75	200×75	2/290×45	2/290×45	2/190×45	2/170×35	2/140×35
Trussed roof maximum span 12000 mm										
1200	175×75	175×75	150×75	125×75	125×75	2/170×35	2/140×45	2/120×45	2/90×45	2/90×35
1500	225×75	200×75	175×75	150×75	150×75	2/190×45	2/190×45	2/140×45	2/120×35	2/120×35
1800	275×75	250×75	225×75	175×75	175×75	2/240×45	2/240×45	2/170×45	2/140×35	2/120×45
2100	275×100	275×75	250×75	200×75	200×75	2/290×45	2/290×45	$2/240\times35_{(30)}$	2/170×35	2/140×45

NOTES:

1 For allowable roof and floor load masses, see Clause 1.4.11.

2 Cantilevers shall not exceed 25% of the allowable span.

3 Minimum bearing length shall be 50 mm at end supports and 100 mm at internal supports of continuous span members. Subscript values, where applicable, indicate the minimum additional bearing length where required to be greater than 35 mm at end supports and 100 mm at internal supports.

4 Multiple members shall be vertically nail-laminated (see Clause 2.3).

TABLE A39

BEARERS SUPPORTING LOWER STOREY EXTERNAL LOADBEARING WALLS—TILE ROOF—UPPER + LOWER FLOOR JOIST SPANS 7200 mm MAX.

Bearer span mm	Unseasoned timber					Seasoned timber				
	F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Single span										
Strutted roof—Maximum rafter span 3000 mm										
1200	200×75	175×75	175×75	175×75	150×75	2/170×35	2/140×45	2/120×45	2/120×35	2/120×35
1500	225×75	225×75	200×75	200×75	200×75	2/190×45	2/170×45	2/170×35	2/140×45	2/140×35
1800	275×75	250×75	250×75	225×75	225×75	2/240×45	2/240×45	2/190×35	2/170×45	2/170×35
2100	275×100	275×100	275×75	275×75	275×75	2/290×45	2/290×45	$2/240\times35_{(5)}$	2/240×35	2/190×35
Unstrutted roof—Maximum rafter span 3000 mm or trussed roof maximum span 6000 mm										
1200	200×75	200×75	175×75	175×75	175×75	2/170×35	2/140×45	2/140×35	2/120×45	2/120×35
1500	250×75	225×75	225×75	200×75	200×75	2/190×45	2/190×45	2/170×35	2/170×35	2/140×35
1800	275×75	275×75	250×75	250×75	225×75	2/240×45	2/240×45	2/190×45	2/170×45	2/170×35
2100	—	275×100	275×100	275×75	275×75	2/290×45	2/290×45	$2/240\times35_{(5)}$	2/240×35	2/190×45
Trussed roof maximum span 9000 mm										
1200	200×75	200×75	175×75	175×75	175×75	2/170×45	2/170×45	2/140×35	2/120×45	2/120×35
1500	250×75	225×75	225×75	225×75	200×75	2/190×45	2/190×45	2/170×35	2/170×35	2/140×45
1800	275×100	275×75	275×75	250×75	250×75	2/240×45	2/240×45	2/190×45	2/190×45	2/170×45
2100	—	—	275×100	300×75	275×75	2/290×45	2/290×45	$2/240\times35_{(10)}$	2/240×35	2/190×45
Trussed roof maximum span 12000 mm										
1200	200×75	200×75	200×75	175×75	175×75	2/170×45	2/170×45	2/140×45	2/140×35	2/120×45
1500	250×75	250×75	225×75	225×75	200×75	2/240×35	2/240×35	2/170×45	2/170×35	2/140×45
1800	275×100	275×100	275×75	250×75	250×75	$2/290\times35_{(5)}$	$2/290\times35_{(5)}$	$2/240\times35_{(10)}$	2/190×45	2/170×45
2100	—	—	—	300×75	300×75	—	—	$2/240\times45_{(5)}$	2/240×35	2/240×35

(*continued*)

TABLE A39 (*continued*)

Bearer span mm	Unseasoned timber					Seasoned timber				
	F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Continuous span										
Strutted roof—maximum rafter span 3000 mm										
1200	175×75	175×75	150×75	125×75	125×75	2/170×35	2/140×45	2/120×35	2/90×45	2/90×35
1500	225×75	200×75	175×75	150×75	150×75	2/190×45	2/170×45	2/140×45	2/120×35	2/120×35
1800	250×75	225×75	200×75	175×75	175×75	2/240×45	2/240×45	2/170×45	2/120×45	2/120×35
2100	275×100	275×75	250×75	200×75	200×75	2/290×45	2/290×45	2/190×45	2/140×45	2/140×35
Unstrutted roof—Maximum rafter span 3000 mm or trussed roof maximum span 6000 mm										
1200	200×75	175×75	150×75	125×75	125×75	2/170×35	2/140×45	2/120×45	2/90×45	2/90×35
1500	225×75	200×75	175×75	150×75	150×75	2/190×45	2/190×45	2/140×45	2/120×35	2/120×35
1800	275×75	250×75	225×75	175×75	175×75	2/240×45	2/240×45	2/170×45	2/140×35	2/120×45
2100	275×100	275×75	250×75	225×75	200×75	2/290×45	2/290×45	$2/240\times35_{(35)}$	2/170×35	2/140×45
Trussed roof maximum span 9000 mm										
1200	200×75	175×75	150×75	125×75	125×75	2/170×45	2/170×35	2/120×45	2/90×45	2/90×35
1500	225×75	225×75	200×75	175×75	150×75	2/190×45	2/190×45	2/140×45	2/120×45	2/120×35
1800	275×75	250×75	225×75	200×75	175×75	2/240×45	2/240×45	2/190×45	2/140×45	2/120×45
2100	—	275×100	250×75	225×75	200×75	$2/290\times45_{(5)}$	$2/290\times45_{(5)}$	$2/240\times35_{(40)}$	2/170×35	2/140×45
Trussed roof maximum span 12000 mm										
1200	200×75	175×75	175×75	150×75	125×75	2/170×45	2/170×45	2/120×45	2/120×35	2/90×35
1500	250×75	225×75	200×75	175×75	150×75	$2/240\times35_{(5)}$	$2/240\times35_{(5)}$	$2/170\times35_{(5)}$	2/120×45	2/120×35
1800	275×100	275×75	225×75	200×75	200×75	$2/290\times35_{(30)}$	$2/290\times35_{(30)}$	2/190×45	2/140×45	2/140×35
2100	—	275×100	275×75	225×75	225×75	—	—	$2/240\times45_{(25)}$	2/170×45	2/170×35

NOTES:

1 For allowable roof and floor load masses, see Clause 1.4.11.

2 Cantilevers shall not exceed 25% of the allowable span.

3 Minimum bearing length shall be 50 mm at end supports and 100 mm at internal supports of continuous span members. Subscript values, where applicable, indicate the minimum additional bearing length where required to be greater than 35 mm at end supports and 100 mm at internal supports.

4 Multiple members shall be vertically nail-laminated (see Clause 2.3).

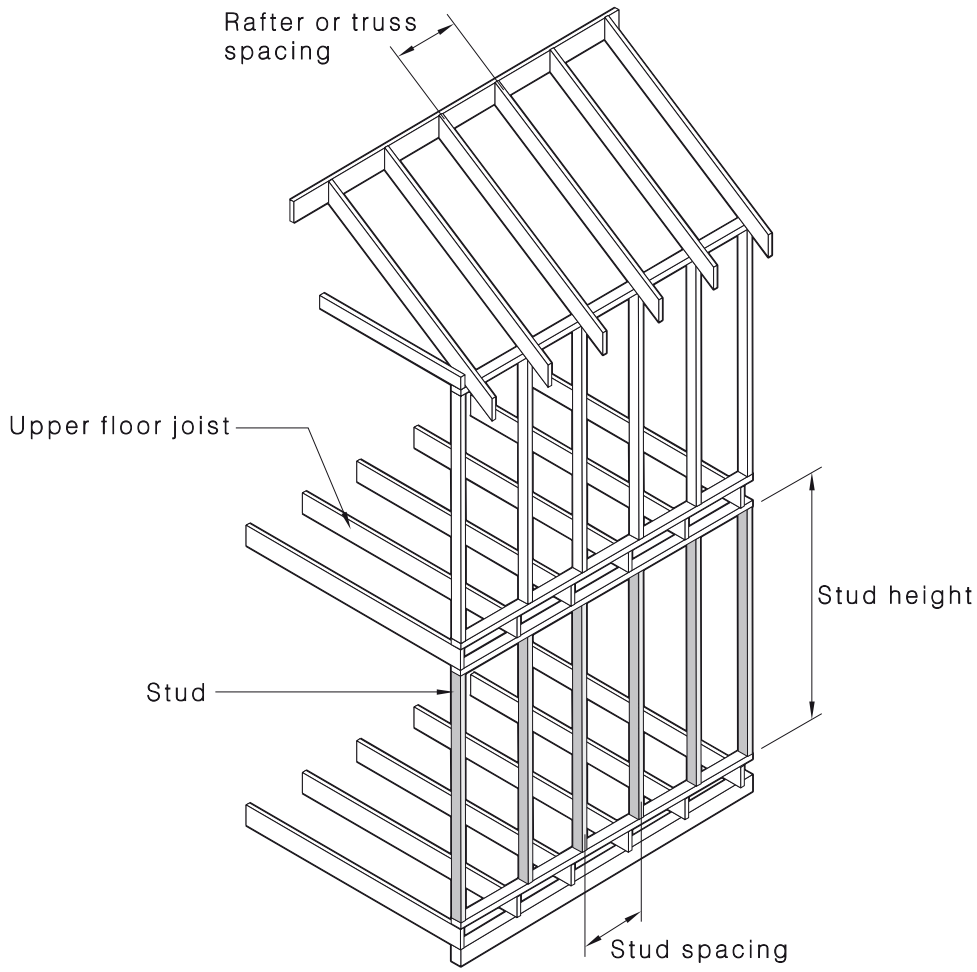


FIGURE A24 COMMON STUDS—LOWER STOREY OF TWO-STOREY CONSTRUCTION

TABLE A40

COMMON STUDS—450 mm CENTRES—STUD HEIGHT 2400 mm—LOWER STOREY OF TWO-STOREY LOADBEARING WALLS—UPPER FLOOR JOIST SPANS 4800 mm MAX.

Roof type	Rafter or truss span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
70/75 mm frame											
Sheet	Notched—20 mm maximum										
	3000	75×38	75×38	75×38	75×38	75×38	70×45	70×35	70×45	70×35	70×35
	6000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×45	70×35	70×35
	9000	75×50	75×50	75×38	75×38	75×38	2/70×35	70×35	70×45	70×35	70×35
	12000	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×45	2/70×35	70×45	70×35
	Not notched										
	3000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	6000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	9000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	12000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35

(*continued*)

TABLE A40 (*continued*)

Roof type	Rafter or truss span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
70/75 mm frame (continued)											
Tile	Notched—20 mm maximum										
	3000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×45	70×35	70×35
	6000	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	2/70×35	70×45	70×35
	9000	2/75×38	2/75×38	2/75×38	75×50	75×38	2/70×35	2/70×35	2/70×35	70×45	70×35
	12000	2/75×50	2/75×50	2/75×38	2/75×38	75×50	—	2/70×35	2/70×35	2/70×35	70×45
	Not notched										
	3000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	6000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×45	70×35	70×35
	9000	2/75×38	75×50	75×38	75×38	75×38	70×45	70×35	70×45	70×35	70×35
	12000	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	70×45	70×45	70×35
90/100 mm frame											
Sheet	Notched—20 mm maximum										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	Not notched										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
Tile	Notched—20 mm maximum										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	Not notched										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35

NOTES:

1 For allowable roof load masses, see Clause 1.4.11.

2 Studs for internal non-loadbearing walls shall be in accordance with Clause 6.3.5.

3 For limitations on notching, see Clause 6.2.1.4.

4 Multiple members shall be nail-laminated (see Clause 2.4).

5 Edge distances for some sheet bracing materials may require a minimum stud width of 45 mm for joining sheets.

TABLE A41

COMMON STUDS—450 mm CENTRES—STUD HEIGHT 2700 mm—LOWER STOREY OF TWO-STOREY LOADBEARING WALLS—UPPER FLOOR JOIST SPANS 4800 mm MAX.

Roof type	Rafter/ truss span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
70/75 mm frame											
Sheet	Notched—20 mm maximum										
	3000	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×35	2/70×35	70×45	70×35
	6000	2/75×38	75×50	75×50	75×38	75×38	2/70×35	70×45	2/70×35	70×45	70×35
	9000	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	2/70×35	70×45	70×35
	12000	2/75×38	2/75×38	2/75×38	75×50	75×38	2/70×45	2/70×35	2/70×35	2/70×35	70×35
	Not notched										
	3000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	6000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×45	70×35	70×35
	9000	75×50	75×50	75×38	75×38	75×38	70×45	70×35	70×45	70×35	70×35
	12000	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×35	70×45	70×35	70×35
Tile	Notched—20 mm maximum										
	3000	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	2/70×35	70×45	70×35
	6000	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×45	2/70×35	2/70×45	2/70×35	70×35
	9000	—	2/75×50	2/75×38	2/75×38	2/75×38	—	2/70×35	2/70×45	2/70×35	70×45
	12000	—	—	2/75×50	2/75×38	2/75×38	—	2/70×45	—	2/70×45	2/70×35
	Not notched										
	3000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×45	70×35	70×35
	6000	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	2/70×35	70×45	70×35
	9000	2/75×38	2/75×38	2/75×38	75×50	75×38	2/70×35	2/70×35	2/70×35	70×45	70×35
	12000	2/75×50	2/75×38	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×35	2/70×35	70×35

(*continued*)

TABLE A41 (*continued*)

Roof type	Rafter/ truss span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
90/100 mm frame											
Sheet	Notched—20 mm maximum										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12000	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
	Not notched										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
Tile	Notched—20 mm maximum										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
	9000	100×50	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
	12000	100×50	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
	Not notched										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12000	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35

NOTES:

1 For allowable roof load masses, see Clause 1.4.11.

2 Studs for internal non-loadbearing walls shall be in accordance with Clause 6.3.5.

3 For limitations on notching, see Clause 6.2.1.4.

4 Multiple members shall be nail-laminated (see Clause 2.4).

5 Edge distances for some sheet bracing materials may require a minimum stud width of 45 mm for joining sheets.

TABLE A42

COMMON STUDS—600 mm CENTRES—STUD HEIGHT 2400 mm—LOWER STOREY OF TWO-STOREY LOADBEARING WALLS—UPPER FLOOR JOIST SPANS 4800 mm MAX.

Roof type	Rafter/ truss span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
70/75 mm frame											
Sheet	Notched—20 mm maximum										
	3000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×45	70×35	70×35
	6000	75×50	75×50	75×38	75×38	75×38	2/70×35	70×35	2/70×35	70×35	70×35
	9000	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×45	2/70×35	70×35	70×35
	12000	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	2/70×35	70×45	70×35
	Not notched										
	3000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	6000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	9000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	12000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×35	70×35	70×35
Tile	Notched—20 mm maximum										
	3000	75×50	75×50	75×38	75×38	75×38	2/70×35	70×35	2/70×35	70×35	70×35
	6000	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	2/70×35	70×45	70×35
	9000	2/75×38	2/75×38	2/75×38	75×50	75×38	2/70×35	2/70×35	2/70×35	70×45	70×35
	12000	2/75×50	2/75×50	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×35	2/70×35	70×45
	Not notched										
	3000	75×38	75×38	75×38	75×38	75×38	70×35	70×35	70×35	70×35	70×35
	6000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×45	70×35	70×35
	9000	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×35	70×45	70×35	70×35
	12000	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	70×45	70×45	70×35
90/100 mm frame											
Sheet	Notched—20 mm maximum										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	Not notched										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
Tile	Notched—20 mm maximum										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12000	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
	Not notched										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35

NOTES:

1 For allowable roof load masses, see Clause 1.4.11.

2 Studs for internal non-loadbearing walls shall be in accordance with Clause 6.3.5.

3 For limitations on notching, see Clause 6.2.1.4.

4 Multiple members shall be nail-laminated (see Clause 2.4).

5 Edge distances for some sheet bracing materials may require a minimum stud width of 45 mm for joining sheets.

TABLE A43

COMMON STUDS—600 mm CENTRES—STUD HEIGHT 2700 mm—LOWER STOREY OF TWO-STOREY LOADBEARING WALLS—UPPER FLOOR JOIST SPANS 4800 mm MAX.

Roof type	Rafter or truss span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
70/75 mm frame											
Sheet	Notched—20 mm maximum										
	3000	2/75×38	75×50	75×50	75×38	75×38	2/70×35	70×45	2/70×35	70×45	70×35
	6000	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	2/70×35	2/70×35	70×45	70×35
	9000	2/75×38	2/75×38	2/75×38	75×50	75×38	2/70×45	2/70×35	2/70×35	2/70×35	70×35
	12000	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×45	2/70×35	2/70×45	2/70×35	70×35
	Not notched										
	3000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×45	70×35	70×35
	6000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×45	70×35	70×35
	9000	75×50	75×50	75×38	75×38	75×38	2/70×35	70×35	70×45	70×35	70×35
	12000	2/75×38	75×50	75×38	75×38	75×38	2/70×35	70×45	2/70×35	70×35	70×35
Tile	Notched—20 mm maximum										
	3000	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	2/70×35	70×45	70×35
	6000	2/75×50	2/75×38	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×45	2/70×35	70×35
	9000	—	2/75×50	2/75×38	2/75×38	2/75×38	—	2/70×35	2/70×45	2/70×35	70×45
	12000	—	—	2/75×50	2/75×38	2/75×38	—	2/70×45	—	2/70×45	2/70×35
	Not notched										
	3000	75×50	75×38	75×38	75×38	75×38	70×45	70×35	70×45	70×35	70×35
	6000	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	2/70×35	70×45	70×35
	9000	2/75×50	2/75×38	2/75×38	75×50	75×38	2/70×35	2/70×35	2/70×35	70×45	70×35
	12000	2/75×50	2/75×38	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×35	2/70×35	70×45
90/100 mm frame											
Sheet	Notched—20 mm maximum										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
	12000	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×45	90×35	90×35
	Not notched										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
Tile	Notched—20 mm maximum										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×45	90×35	90×35
	9000	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×45	90×35	90×35
	12000	100×50	100×50	100×50	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
	Not notched										
	3000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	6000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	9000	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	12000	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35

NOTES:

1 For allowable roof load masses, see Clause 1.4.11.

2 Studs for internal non-loadbearing walls shall be in accordance with Clause 6.3.5.

3 For limitations on notching, see Clause 6.2.1.4.

4 Multiple members shall be nail-laminated (see Clause 2.4).

5 Edge distances for some sheet bracing materials may require a minimum stud width of 45 mm for joining sheets.

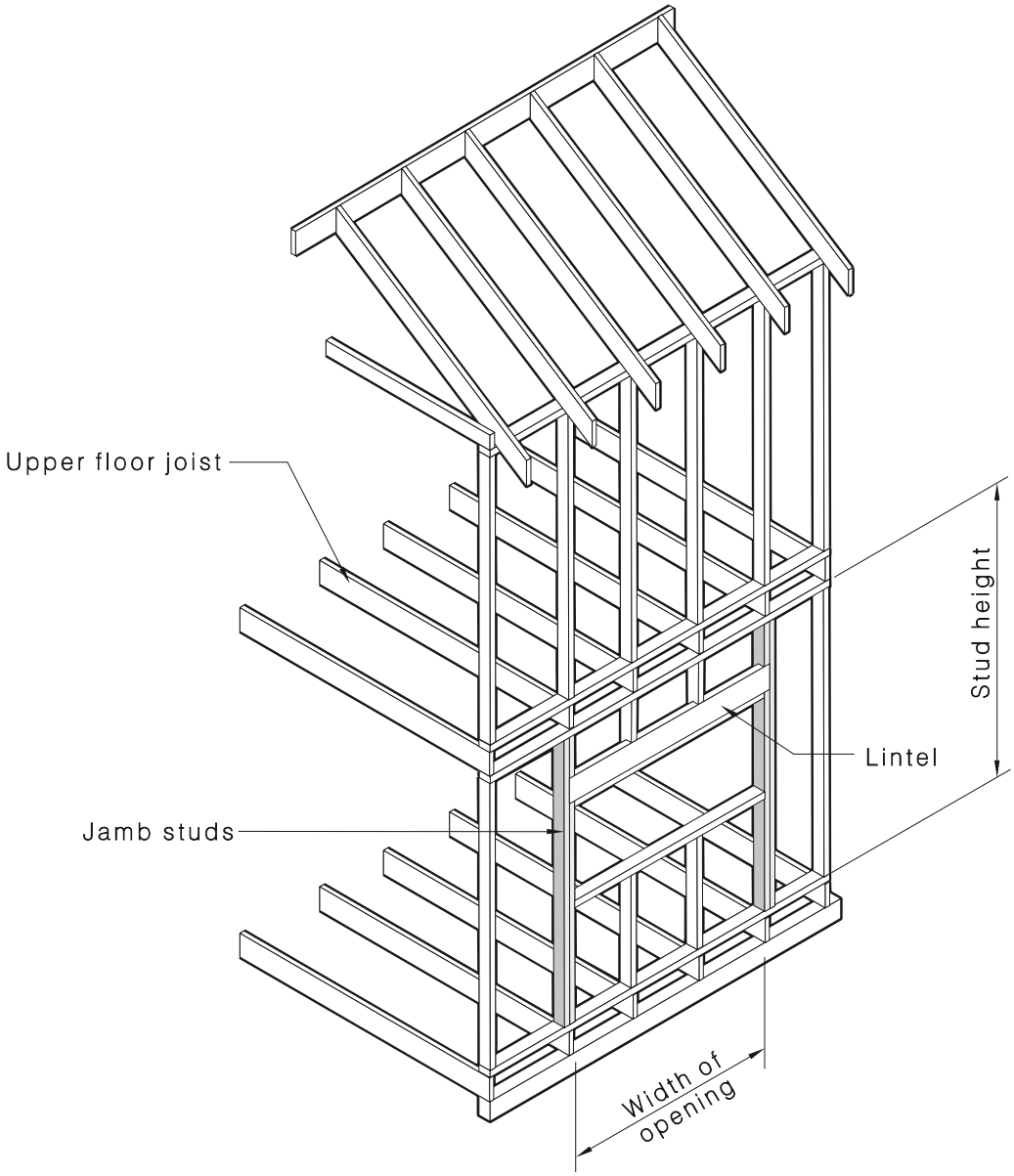


FIGURE A25 JAMB STUDS—LOWER STOREY OF TWO-STOREY CONSTRUCTION

TABLE A44

JAMB STUDS—WALL HEIGHT 2400 mm—SHEET ROOF—LOWER STOREY OF TWO-STOREY LOADBEARING WALLS—UPPER FLOOR JOIST SPAN 4800 mm MAX.

Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
70/75 mm frame											
3000	900	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	2/70×35	70×45	70×35
	1200	2/75×38	2/75×38	75×50	75×38	75×38	2/70×35	70×45	2/70×35	2/70×35	70×35
	1500	2/75×38	2/75×38	2/75×38	75×50	75×38	2/70×45	2/70×35	2/70×45	2/70×35	70×35
	1800	2/75×50	2/75×38	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×45	2/70×35	70×45
	2100	3/75×38	2/75×50	2/75×38	2/75×38	2/75×38	3/70×35	2/70×35	3/70×35	2/70×45	70×45
	2400	3/75×38	2/75×50	2/75×38	2/75×38	2/75×38	3/70×45	2/70×45	3/70×45	2/70×45	2/70×35
	3000	3/75×50	3/75×38	2/75×50	2/75×50	2/75×38	3/70×45	3/70×35	3/70×45	2/70×35	2/70×35
	3600	4/75×50	3/75×50	3/75×38	2/75×50	2/75×50	4/70×45	3/70×45	4/70×35	3/70×45	2/70×35
6000	900	2/75×38	2/75×38	75×50	75×50	75×38	2/70×35	2/70×35	2/70×35	2/70×35	70×35
	1200	2/75×38	2/75×38	2/75×38	75×50	75×38	2/70×45	2/70×35	2/70×45	2/70×35	70×35
	1500	2/75×50	2/75×38	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×45	2/70×35	70×45
	1800	3/75×38	2/75×50	2/75×38	2/75×38	2/75×38	3/70×35	2/70×35	3/70×35	2/70×45	70×45
	2100	3/75×38	2/75×50	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	3/70×45	2/70×45	2/70×35
	2400	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	3/70×45	3/70×35	2/70×35
	3000	4/75×50	3/75×50	3/75×38	2/75×50	2/75×50	4/70×45	3/70×35	4/70×45	3/70×45	2/70×35
	3600	4/75×50	4/75×50	3/75×50	3/75×38	2/75×50	4/70×45	3/70×45	4/70×45	3/70×45	2/70×35
9000	900	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×45	2/70×35	2/70×35	2/70×35	70×35
	1200	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×45	2/70×35	2/70×45	2/70×35	70×35
	1500	2/75×50	2/75×50	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×45	2/70×35	70×45
	1800	3/75×38	2/75×50	2/75×50	2/75×38	2/75×38	3/70×35	2/70×45	3/70×35	2/70×45	2/70×35
	2100	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	3/70×45	2/70×45	2/70×35
	2400	3/75×50	3/75×50	2/75×50	2/75×50	2/75×38	3/70×45	3/70×35	3/70×45	2/70×35	2/70×35
	3000	4/75×50	3/75×50	3/75×50	3/75×38	2/75×50	4/70×45	3/70×45	4/70×45	3/70×45	2/70×45
	3600	—	4/75×50	3/75×50	3/75×50	3/75×38	—	3/70×45	4/70×45	3/70×45	2/70×45
12 000	900	2/75×50	2/75×38	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×35	2/70×35	70×45
	1200	2/75×50	2/75×50	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×45	2/70×35	70×45
	1500	3/75×38	2/75×50	2/75×38	2/75×38	2/75×38	3/70×35	2/70×45	3/70×35	2/70×45	70×45
	1800	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	3/70×45	2/70×45	2/70×35
	2100	3/75×50	3/75×50	3/75×38	2/75×50	2/75×38	4/70×35	3/70×35	3/70×45	2/70×35	2/70×35
	2400	4/75×50	3/75×50	3/75×38	2/75×50	2/75×50	4/70×45	3/70×45	3/70×45	3/70×45	2/70×35
	3000	4/75×50	4/75×50	3/75×50	3/75×38	2/75×50	4/70×45	3/70×45	4/70×45	3/70×45	2/70×45
	3600	—	4/75×50	4/75×50	3/75×50	3/75×50	—	4/70×45	—	4/70×45	3/70×35

(*continued*)

TABLE A44 (*continued*)

Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
90/100 mm frame											
3000	900	100×38	100×38	100×38	100×38	100×38	90×35	90×35	90×35	90×35	90×35
	1200	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×45	90×35	90×35
	1500	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×45	90×35	90×35
	1800	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	2/90×35	90×35	90×35
	2100	100×50	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	2400	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	3000	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	2/90×35	2/90×35	2/90×35	90×35
	3600	2/100×38	2/100×38	100×50	100×38	100×38	2/90×45	2/90×35	2/90×45	2/90×35	90×35
6000	900	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
	1200	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×45	90×35	90×35
	1500	100×50	100×38	100×38	100×38	100×38	90×45	90×35	90×45	90×35	90×35
	1800	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	2/90×35	90×35	90×35
	2100	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	2400	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	3000	2/100×38	2/100×38	100×50	100×38	100×38	2/90×45	2/90×35	2/90×35	2/90×35	90×35
	3600	2/100×38	2/100×38	2/100×38	100×50	100×38	2/90×45	2/90×35	2/90×45	2/90×35	90×45
9000	900	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
	1200	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×45	90×35	90×35
	1500	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	2/90×35	90×35	90×35
	1800	100×50	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	2100	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	2400	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	3000	2/100×38	2/100×38	2/100×38	100×50	100×38	2/90×45	2/90×35	2/90×45	2/90×35	90×35
	3600	2/100×50	2/100×38	2/100×38	100×50	100×50	2/90×45	2/90×35	2/90×45	2/90×35	90×45
12 000	900	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
	1200	100×50	100×38	100×38	100×38	100×38	90×45	90×35	90×45	90×35	90×35
	1500	100×50	100×50	100×38	100×38	100×38	2/90×35	90×35	2/90×35	90×35	90×35
	1800	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	2100	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	2400	2/100×38	2/100×38	100×50	100×50	100×38	2/90×35	2/90×35	2/90×35	2/90×35	90×35
	3000	2/100×50	2/100×38	2/100×38	100×50	100×50	2/90×45	2/90×35	2/90×45	2/90×35	90×45
	3600	2/100×50	2/100×50	2/100×38	2/100×38	100×50	3/90×35	2/90×35	2/90×45	2/90×35	90×45

NOTES:

1 For allowable roof and floor load masses, see Clause 1.4.11.

2 For studs for internal non-loadbearing walls, see Clause 6.3.5.

3 For limitations on notching, see Clause 6.2.1.4.

4 Multiple members shall be nail-laminated (see Clause 2.4).

5 Edge distances for some sheet bracing materials may require a minimum stud width of 45 mm for joining sheets.

6 For openings greater than 900 mm, a secondary jamb stud may be required to support the lintel (see Figure 6.8).

TABLE A45

JAMB STUDS—WALL HEIGHT 2400 mm—TILE ROOF—LOWER STOREY OF TWO-STOREY LOADBEARING WALLS—UPPER FLOOR JOIST SPAN 4800 mm MAX.

Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
70/75 mm frame											
3000	900	2/75×38	2/75×38	2/75×38	75×50	75×38	2/70×35	2/70×35	2/70×35	2/70×35	70×35
	1200	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×45	2/70×35	2/70×45	2/70×35	70×35
	1500	2/75×50	2/75×50	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×45	2/70×35	70×45
	1800	3/75×38	2/75×50	2/75×50	2/75×38	2/75×38	3/70×35	2/70×45	3/70×35	2/70×45	70×45
	2100	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	3/70×35	3/70×45	2/70×45	2/70×35
	2400	3/75×50	3/75×50	2/75×50	2/75×50	2/75×38	3/70×45	3/70×35	3/70×45	2/70×35	2/70×35
	3000	4/75×50	3/75×50	3/75×38	2/75×50	2/75×50	4/70×45	3/70×45	4/70×45	3/70×45	2/70×35
	3600	4/75×50	4/75×50	3/75×50	3/75×38	2/75×50	4/70×45	3/70×45	4/70×45	3/70×45	2/70×45
6000	900	3/75×38	2/75×50	2/75×38	2/75×38	2/75×38	2/70×45	2/70×35	2/70×45	2/70×35	70×45
	1200	3/75×38	2/75×50	2/75×38	2/75×38	2/75×38	3/70×35	2/70×35	2/70×45	2/70×35	70×45
	1500	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	3/70×35	2/70×45	2/70×35
	1800	3/75×50	3/75×50	2/75×50	2/75×50	2/75×38	3/70×45	3/70×35	3/70×45	2/70×35	2/70×35
	2100	4/75×50	3/75×50	3/75×38	2/75×50	2/75×50	4/70×45	3/70×35	3/70×45	2/70×35	2/70×35
	2400	4/75×50	4/75×50	3/75×50	3/75×38	2/75×50	4/70×45	3/70×45	4/70×45	3/70×45	2/70×45
	3000	—	4/75×50	4/75×38	3/75×50	3/75×38	—	4/70×35	4/70×45	4/70×35	2/70×45
	3600	—	—	4/75×50	4/75×38	3/75×50	—	4/70×45	—	4/70×45	3/70×35
9000	900	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	2/70×45	2/70×35	2/70×35
	1200	3/75×50	3/75×38	2/75×50	2/75×50	2/75×38	3/70×45	2/70×45	3/70×35	2/70×45	2/70×35
	1500	4/75×38	3/75×50	3/75×38	2/75×50	2/75×38	3/70×45	3/70×35	3/70×45	2/70×35	2/70×35
	1800	4/75×50	4/75×38	3/75×50	3/75×38	2/75×50	4/70×45	3/70×45	3/70×45	3/70×45	2/70×35
	2100	—	4/75×50	3/75×50	3/75×50	3/75×38	4/70×45	3/70×45	4/70×45	3/70×45	2/70×45
	2400	—	4/75×50	4/75×50	3/75×50	3/75×38	—	4/70×45	4/70×45	3/70×45	2/70×45
	3000	—	—	4/75×50	4/75×50	3/75×50	—	4/70×45	—	4/70×45	3/70×45
	3600	—	—	—	4/75×50	4/75×50	—	—	—	—	3/70×45
12 000	900	3/75×50	3/75×50	3/75×38	2/75×50	2/75×38	3/70×45	3/70×35	3/70×35	2/70×45	2/70×35
	1200	4/75×50	3/75×50	3/75×38	2/75×50	2/75×50	4/70×35	3/70×35	3/70×45	2/70×45	2/70×35
	1500	4/75×50	4/75×50	3/75×50	3/75×38	2/75×50	4/70×45	3/70×45	3/70×45	3/70×35	2/70×45
	1800	—	4/75×50	3/75×50	3/75×50	3/75×38	—	3/70×45	4/70×45	3/70×45	2/70×45
	2100	—	—	4/75×50	3/75×50	3/75×50	—	4/70×45	4/70×45	3/70×45	3/70×35
	2400	—	—	4/75×50	4/75×50	4/75×38	—	4/70×45	—	4/70×45	3/70×45
	3000	—	—	—	4/75×50	4/75×38	—	—	—	4/70×45	3/70×45
	3600	—	—	—	—	4/75×50	—	—	—	—	4/70×45

(*continued*)

TABLE A45 (*continued*)

Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
90/100 mm frame											
3000	900	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×35	90×35	90×35
	1200	100×38	100×38	100×38	100×38	100×38	90×45	90×35	90×45	90×35	90×35
	1500	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	2/90×35	90×35	90×35
	1800	100×50	100×50	100×38	100×38	100×38	2/90×35	90×35	2/90×35	90×45	90×35
	2100	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	2400	2/100×38	100×50	100×50	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	3000	2/100×38	2/100×38	100×50	100×50	100×38	2/90×45	2/90×35	2/90×45	2/90×35	90×35
	3600	2/100×50	2/100×38	2/100×38	100×50	100×50	2/90×45	2/90×35	2/90×45	2/90×35	90×45
6000	900	100×50	100×38	100×38	100×38	100×38	90×45	90×35	90×45	90×35	90×35
	1200	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×45	90×35	90×35
	1500	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	1800	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	2100	2/100×38	2/100×38	100×50	100×50	100×38	2/90×35	2/90×35	2/90×35	2/90×35	90×45
	2400	2/100×38	2/100×38	2/100×38	100×50	100×38	2/90×45	2/90×35	2/90×35	2/90×35	90×45
	3000	2/100×50	2/100×50	2/100×38	2/100×38	100×50	3/90×35	2/90×35	2/90×45	2/90×35	90×45
	3600	3/100×38	2/100×50	2/100×38	2/100×38	2/100×38	3/90×45	2/90×45	3/90×35	2/90×45	2/90×35
9000	900	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
	1200	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	1500	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	2/90×35	2/90×35	90×45	90×35
	1800	2/100×38	2/100×38	2/100×38	100×50	100×38	2/90×45	2/90×35	2/90×35	2/90×35	90×35
	2100	2/100×50	2/100×38	2/100×38	2/100×38	100×50	2/90×45	2/90×35	2/90×45	2/90×35	90×45
	2400	2/100×50	2/100×50	2/100×38	2/100×38	100×50	3/90×35	2/90×35	2/90×45	2/90×35	90×45
	3000	3/100×38	2/100×50	2/100×50	2/100×38	2/100×38	3/90×45	2/90×45	3/90×35	2/90×45	2/90×35
	3600	3/100×50	3/100×38	2/100×50	2/100×50	2/100×38	3/90×45	3/90×35	3/90×45	2/90×45	2/90×35
12 000	900	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
	1200	2/100×38	2/100×38	100×50	100×50	100×38	2/90×35	2/90×35	2/90×35	90×45	90×35
	1500	2/100×38	2/100×38	2/100×38	100×50	100×38	2/90×45	2/90×35	2/90×35	2/90×35	90×35
	1800	2/100×50	2/100×38	2/100×38	2/100×38	100×50	2/90×45	2/90×35	2/90×45	2/90×35	90×45
	2100	3/100×38	2/100×50	2/100×38	2/100×38	2/100×38	3/90×35	2/90×45	2/90×45	2/90×35	90×45
	2400	3/100×38	2/100×50	2/100×50	2/100×38	2/100×38	3/90×45	2/90×45	2/90×45	2/90×35	2/90×35
	3000	3/100×50	3/100×50	2/100×50	2/100×50	2/100×38	3/90×45	3/90×35	3/90×45	2/90×45	2/90×35
	3600	4/100×50	3/100×50	3/100×38	2/100×50	2/100×50	4/90×45	3/90×45	3/90×45	3/90×35	2/90×35

NOTES:

1 For allowable roof and floor load masses, see Clause 1.4.11.

2 For studs for internal non-loadbearing walls, see Clause 6.3.5.

3 For limitations on notching, see Clause 6.2.1.4.

4 Multiple members shall be nail-laminated (see Clause 2.4).

5 Edge distances for some sheet bracing materials may require a minimum stud width of 45 mm for joining sheets.

6 For openings greater than 900 mm, a secondary jamb stud may be required to support the lintel (see Figure 6.8).

TABLE A46

JAMB STUDS—WALL HEIGHT 2700 mm—SHEET ROOF—LOWER STOREY OF TWO-STOREY LOADBEARING WALLS—UPPER FLOOR JOIST SPAN 4800 mm MAX.

Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
70/75 mm frame											
3000	900	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×45	2/70×35	2/70×35	70×45	70×35
	1200	2/75×50	2/75×38	2/75×38	75×50	75×50	2/70×45	2/70×35	2/70×45	2/70×35	70×35
	1500	2/75×50	2/75×50	2/75×38	2/75×38	75×50	3/70×35	2/70×35	3/70×35	2/70×45	70×45
	1800	3/75×50	2/75×50	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	3/70×45	2/70×45	2/70×35
	2100	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	3/70×45	3/70×35	2/70×35
	2400	3/75×50	3/75×50	2/75×50	2/75×50	2/75×38	3/70×45	3/70×35	4/70×35	3/70×45	2/70×35
	3000	4/75×50	3/75×50	3/75×50	3/75×38	2/75×50	4/70×45	3/70×45	4/70×45	3/70×45	2/70×45
	3600	4/75×50	4/75×50	3/75×50	3/75×50	3/75×38	—	—	—	4/70×45	2/70×45
6000	900	2/75×50	2/75×38	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×45	2/70×35	70×45
	1200	2/75×50	2/75×50	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×45	2/70×35	70×45
	1500	3/75×38	2/75×50	2/75×38	2/75×38	2/75×38	3/70×35	2/70×45	3/70×35	2/70×45	2/70×35
	1800	3/75×50	3/75×38	2/75×50	2/75×50	2/75×38	3/70×45	3/70×35	3/70×45	2/70×45	2/70×35
	2100	3/75×50	3/75×50	3/75×38	2/75×50	2/75×38	4/70×35	3/70×35	3/70×45	3/70×35	2/70×35
	2400	4/75×50	3/75×50	3/75×38	2/75×50	2/75×50	4/70×45	3/70×45	4/70×45	3/70×45	2/70×35
	3000	4/75×50	4/75×50	3/75×50	3/75×50	3/75×38	—	3/70×45	4/70×45	3/70×45	2/70×45
	3600	—	4/75×50	4/75×50	3/75×50	3/75×38	—	4/70×45	—	4/70×45	3/70×35
9000	900	3/75×38	2/75×50	2/75×38	2/75×38	2/75×38	3/70×35	2/70×35	2/70×45	2/70×35	70×45
	1200	3/75×38	2/75×50	2/75×38	2/75×38	2/75×38	3/70×35	2/70×45	3/70×35	2/70×45	70×45
	1500	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	3/70×45	2/70×45	2/70×35
	1800	4/75×38	3/75×50	3/75×38	2/75×50	2/75×38	4/70×35	3/70×35	3/70×45	2/70×35	2/70×35
	2100	4/75×50	3/75×50	3/75×38	2/75×50	2/75×50	4/70×45	3/70×45	4/70×45	3/70×45	2/70×35
	2400	4/75×50	4/75×50	3/75×50	3/75×38	2/75×50	4/70×45	3/70×45	4/70×45	3/70×45	2/70×45
	3000	—	4/75×50	4/75×38	3/75×50	3/75×38	—	4/70×45	—	4/70×45	3/70×35
	3600	—	—	4/75×50	4/75×38	3/75×50	—	4/70×45	—	4/70×45	3/70×45
12 000	900	3/75×38	2/75×50	2/75×50	2/75×38	2/75×38	3/70×35	2/70×45	2/70×45	2/70×35	2/70×35
	1200	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	3/70×35	2/70×45	2/70×35
	1500	3/75×50	3/75×50	2/75×50	2/75×50	2/75×38	3/70×45	2/70×45	3/70×45	2/70×45	2/70×35
	1800	4/75×50	3/75×50	3/75×50	2/75×50	2/75×50	4/70×45	3/70×45	3/70×45	3/70×35	2/70×45
	2100	4/75×50	4/75×50	3/75×50	3/75×38	2/75×50	4/70×45	3/70×45	4/70×45	3/70×45	2/70×45
	2400	—	4/75×50	3/75×50	3/75×50	3/75×38	—	3/70×45	4/70×45	3/70×45	2/70×45
	3000	—	—	4/75×50	3/75×50	3/75×50	—	4/70×45	—	4/70×45	3/70×35
	3600	—	—	—	4/75×50	3/75×50	—	—	—	4/70×45	3/70×45

(*continued*)

TABLE A46 (*continued*)

Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
90/100 mm frame											
3000	900	100×50	100×38	100×38	100×38	100×38	90×45	90×35	90×45	90×35	90×35
	1200	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	2/90×35	90×35	90×35
	1500	100×50	100×50	100×38	100×38	100×38	2/90×35	90×35	2/90×35	90×45	90×35
	1800	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	2100	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	2400	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	2/90×35	2/90×35	2/90×35	90×35
	3000	2/100×38	2/100×38	2/100×38	100×50	100×38	2/90×45	2/90×35	2/90×45	2/90×35	90×35
	3600	2/100×50	2/100×38	2/100×38	100×50	100×50	3/90×35	2/90×35	3/90×35	2/90×35	90×45
6000	900	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×45	90×35	90×35
	1200	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	2/90×35	90×35	90×35
	1500	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	1800	2/100×38	100×50	100×50	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	2100	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	2/90×35	2/90×35	2/90×35	90×35
	2400	2/100×38	2/100×38	100×50	100×50	100×38	2/90×45	2/90×35	2/90×45	2/90×35	90×35
	3000	2/100×50	2/100×38	2/100×38	100×50	100×50	2/90×45	2/90×35	2/90×45	2/90×35	90×45
	3600	2/100×50	2/100×50	2/100×38	2/100×38	100×50	3/90×35	2/90×45	3/90×35	2/90×45	90×45
9000	900	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×45	90×35	90×35
	1200	100×50	100×50	100×38	100×38	100×38	2/90×35	90×35	2/90×35	90×35	90×35
	1500	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	1800	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	2/90×35	2/90×35	90×45	90×35
	2100	2/100×38	2/100×38	100×50	100×50	100×38	2/90×45	2/90×35	2/90×35	2/90×35	90×35
	2400	2/100×38	2/100×38	2/100×38	100×50	100×38	2/90×45	2/90×35	2/90×45	2/90×35	90×45
	3000	2/100×50	2/100×50	2/100×38	2/100×38	100×50	3/90×35	2/90×35	2/90×45	2/90×35	90×45
	3600	3/100×38	2/100×50	2/100×38	2/100×38	2/100×38	3/90×45	2/90×45	3/90×35	2/90×45	2/90×35
12 000	900	100×50	100×50	100×38	100×38	100×38	2/90×35	90×35	90×45	90×35	90×35
	1200	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	1500	2/100×38	100×50	100×50	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	1800	2/100×38	2/100×38	100×50	100×50	100×38	2/90×45	2/90×35	2/90×35	2/90×35	90×35
	2100	2/100×50	2/100×38	2/100×38	100×50	100×50	2/90×45	2/90×35	2/90×35	2/90×35	90×45
	2400	2/100×50	2/100×38	2/100×38	2/100×38	100×50	2/90×45	2/90×35	2/90×45	2/90×35	90×45
	3000	3/100×38	2/100×50	2/100×38	2/100×38	2/100×38	3/90×45	2/90×45	3/90×35	2/90×45	2/90×35
	3600	3/100×50	3/100×38	2/100×50	2/100×38	2/100×38	3/90×45	2/90×45	3/90×45	3/90×45	2/90×35

NOTES:

1 For allowable roof and floor load masses, see Clause 1.4.11.

2 For studs for internal non-loadbearing walls, see Clause 6.3.5.

3 For limitations on notching, see Clause 6.2.1.4.

4 Multiple members shall be nail-laminated (see Clause 2.4).

5 Edge distances for some sheet bracing materials may require a minimum stud width of 45 mm for joining sheets.

6 For openings greater than 900 mm, a secondary jamb stud may be required to support the lintel (see Figure 6.8).

TABLE A47

JAMB STUDS—WALL HEIGHT 2700 mm—TILE ROOF—LOWER STOREY OF TWO-STOREY LOADBEARING WALLS—UPPER FLOOR JOIST SPAN 4800 mm MAX.

Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
70/75 mm frame											
3000	900	2/75×50	2/75×50	2/75×38	2/75×38	75×50	2/70×45	2/70×35	2/70×45	2/70×35	70×45
	1200	3/75×38	2/75×50	2/75×38	2/75×38	2/75×38	3/70×35	2/70×35	2/70×45	2/70×45	70×45
	1500	3/75×50	2/75×50	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	3/70×45	2/70×45	2/70×35
	1800	3/75×50	3/75×50	2/75×50	2/75×50	2/75×38	3/70×45	3/70×35	3/70×45	3/70×35	2/70×35
	2100	4/75×50	3/75×50	3/75×38	2/75×50	2/75×50	4/70×45	3/70×35	3/70×45	3/70×45	2/70×35
	2400	4/75×50	3/75×50	3/75×50	3/75×38	2/75×50	4/70×45	3/70×45	4/70×45	4/70×45	2/70×45
	3000	—	4/75×50	3/75×50	3/75×50	3/75×38	—	4/70×45	4/70×45	4/70×45	2/70×45
	3600	—	—	4/75×50	3/75×50	3/75×38	—	4/70×45	—	4/70×45	3/70×35
6000	900	3/75×50	3/75×38	2/75×50	2/75×38	2/75×38	3/70×45	2/70×45	2/70×45	2/70×45	2/70×35
	1200	3/75×50	3/75×50	2/75×50	2/75×50	2/75×38	3/70×45	2/70×45	3/70×45	2/70×45	2/70×35
	1500	4/75×50	3/75×50	3/75×38	2/75×50	2/75×50	4/70×35	3/70×35	3/70×45	3/70×35	2/70×35
	1800	4/75×50	4/75×50	3/75×50	3/75×38	2/75×50	4/70×45	3/70×45	4/70×45	3/70×45	2/70×45
	2100	—	4/75×50	3/75×50	3/75×50	3/75×38	—	3/70×45	4/70×45	3/70×45	2/70×45
	2400	—	4/75×50	4/75×50	3/75×50	3/75×50	—	4/70×45	4/70×45	4/70×45	3/70×35
	3000	—	—	4/75×50	4/75×50	3/75×50	—	4/70×45	—	4/70×45	3/70×45
	3600	—	—	—	4/75×50	4/75×50	—	—	—	—	3/70×45
9000	900	4/75×50	3/75×50	3/75×38	2/75×50	2/75×50	4/70×35	3/70×35	3/70×35	2/70×45	2/70×35
	1200	4/75×50	3/75×50	3/75×50	2/75×50	2/75×50	4/70×45	3/70×45	3/70×45	3/70×35	2/70×35
	1500	4/75×50	4/75×50	3/75×50	3/75×38	2/75×50	4/70×45	3/70×45	4/70×45	3/70×45	2/70×45
	1800	—	—	4/75×50	3/75×50	3/75×50	—	4/70×45	4/70×45	3/70×45	3/70×35
	2100	—	—	4/75×50	4/75×38	3/75×50	—	4/70×45	—	4/70×45	3/70×35
	2400	—	—	4/75×50	4/75×50	3/75×50	—	—	—	4/70×45	3/70×45
	3000	—	—	—	—	4/75×50	—	—	—	—	4/70×35
	3600	—	—	—	—	—	—	—	—	—	4/70×45
12 000	900	4/75×50	4/75×50	3/75×50	3/75×38	2/75×50	4/70×45	3/70×45	3/70×45	3/70×35	2/70×45
	1200	—	4/75×50	3/75×50	3/75×50	3/75×38	4/70×45	3/70×45	4/70×45	3/70×45	2/70×45
	1500	—	4/75×50	4/75×50	3/75×50	3/75×50	—	4/70×45	4/70×45	3/70×45	3/70×35
	1800	—	—	4/75×50	4/75×50	3/75×50	—	4/70×45	—	4/70×45	3/70×45
	2100	—	—	—	4/75×50	4/75×50	—	—	—	4/70×45	3/70×45
	2400	—	—	—	4/75×50	4/75×50	—	—	—	—	3/70×45
	3000	—	—	—	—	—	—	—	—	—	4/70×45
	3600	—	—	—	—	—	—	—	—	—	—

(*continued*)

TABLE A47 (*continued*)

Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
90/100 mm frame											
3000	900	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	90×45	90×35	90×35
	1200	100×50	100×38	100×38	100×38	100×38	2/90×35	90×35	2/90×35	90×35	90×35
	1500	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	1800	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	2/90×35	2/90×35	90×45	90×35
	2100	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	2/90×35	2/90×35	2/90×35	90×35
	2400	2/100×38	2/100×38	100×50	100×50	100×38	2/90×45	2/90×35	2/90×45	2/90×35	90×35
	3000	2/100×50	2/100×38	2/100×38	2/100×38	100×50	3/90×35	2/90×35	2/90×45	2/90×35	90×45
	3600	2/100×50	2/100×50	2/100×38	2/100×38	100×50	3/90×45	2/90×45	3/90×35	2/90×45	2/90×35
6000	900	2/100×38	100×50	100×38	100×38	100×38	2/90×35	90×45	90×45	90×35	90×35
	1200	2/100×38	100×50	100×50	100×38	100×38	2/90×35	90×45	2/90×35	90×45	90×35
	1500	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	2/90×35	2/90×35	2/90×35	90×35
	1800	2/100×50	2/100×38	2/100×38	100×50	100×50	2/90×45	2/90×35	2/90×35	2/90×35	90×45
	2100	2/100×50	2/100×38	2/100×38	2/100×38	100×50	2/90×45	2/90×35	2/90×45	2/90×35	90×45
	2400	2/100×50	2/100×50	2/100×38	2/100×38	100×50	3/90×35	2/90×35	2/90×45	2/90×35	90×45
	3000	3/100×50	3/100×38	2/100×50	2/100×38	2/100×38	3/90×45	2/90×45	3/90×35	2/90×45	2/90×35
	3600	3/100×50	3/100×50	2/100×50	2/100×50	2/100×38	3/90×45	3/90×35	3/90×45	3/90×35	2/90×35
9000	900	2/100×38	2/100×38	100×50	100×38	100×38	2/90×35	2/90×35	2/90×35	90×45	90×35
	1200	2/100×38	2/100×38	100×50	100×50	100×38	2/90×35	2/90×35	2/90×35	90×45	90×35
	1500	2/100×50	2/100×38	2/100×38	100×50	100×50	2/90×45	2/90×35	2/90×35	2/90×35	90×45
	1800	2/100×50	2/100×50	2/100×38	100×50	100×50	3/90×35	2/90×45	2/90×45	2/90×35	90×45
	2100	3/100×38	2/100×50	2/100×38	2/100×38	2/100×38	3/90×45	2/90×45	2/90×45	2/90×35	2/90×35
	2400	3/100×50	3/100×38	2/100×50	2/100×38	2/100×38	3/90×45	2/90×45	3/90×35	2/90×45	2/90×35
	3000	3/100×50	3/100×50	3/100×38	2/100×50	2/100×38	4/90×45	3/90×35	3/90×45	2/90×45	2/90×35
	3600	3/100×50	3/100×50	3/100×50	2/100×50	2/100×50	4/90×45	3/90×45	3/90×45	3/90×45	2/90×45
12 000	900	2/100×50	2/100×38	2/100×38	100×50	100×50	2/90×45	2/90×35	2/90×35	90×45	90×35
	1200	2/100×50	2/100×38	2/10×38	100×50	100×50	2/90×45	2/90×35	2/90×35	2/90×35	90×45
	1500	2/100×50	2/100×50	2/100×50	2/100×38	100×50	3/90×35	2/90×35	2/90×45	2/90×35	90×45
	1800	3/100×50	3/100×38	2/100×50	2/100×38	2/100×38	3/90×45	2/90×45	2/90×45	2/90×35	2/90×35
	2100	3/100×50	3/100×38	2/100×50	2/100×38	2/100×38	3/90×45	3/90×35	3/90×35	2/90×45	2/90×35
	2400	3/100×50	3/100×50	2/100×50	2/100×50	2/100×38	4/90×35	3/90×35	3/90×45	2/90×45	2/90×35
	3000	4/100×50	3/100×50	3/100×50	3/100×38	2/100×50	4/90×45	3/90×45	3/90×45	3/90×35	2/90×45
	3600	—	4/100×50	3/100×50	3/100×50	3/100×38	—	—	4/90×45	3/90×45	2/90×45

NOTES:

1 For allowable roof and floor load masses, see Clause 1.4.11.

2 For studs for internal non-loadbearing walls, see Clause 6.3.5.

3 For limitations on notching, see Clause 6.2.1.4.

4 Multiple members shall be nail-laminated (see Clause 2.4).

5 Edge distances for some sheet bracing materials may require a minimum stud width of 45 mm for joining sheets.

6 For openings greater than 900 mm, a secondary jamb stud may be required to support the lintel (see Figure 6.8).

TABLE A48

BOTTOM PLATES—NOT TRENCHED—LOWER STOREY OF TWO-STOREY EXTERNAL LOADBEARING WALLS—UPPER FLOOR JOIST SPAN 4800 mm MAX.

Roof type	Rafter or truss span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Joists at 450 mm centres—70/75 mm frame—upper and lower floor joists											
Sheet	3000	2/38×75	50×75	50×75	38×75	38×75	2/45×70	2/35×70	2/45×70	2/35×70	35×70
	6000	2/38×75	50×75	50×75	50×75	38×75	2/45×70	2/35×70	2/45×70	2/35×70	35×70
	9000	2/50×75	2/38×75	50×75	50×75	50×75	2/45×70	2/35×70	2/45×70	2/35×70	35×70
	12000	2/50×75	2/38×75	50×75	50×75	50×75	2/45×70	2/35×70	2/45×70	2/35×70	35×70
Tile	3000	2/50×75	2/38×75	50×75	50×75	38×75	2/45×70	2/35×70	2/45×70	2/35×70	35×70
	6000	2/50×75	2/50×75	50×75	50×75	50×75	2/45×70	2/35×70	2/45×70	2/35×70	35×70
	9000	2/50×75	2/50×75	2/50×75	50×75	50×75	2/45×70	2/35×70	3/45×70	2/45×70	45×70
	12000	2/50×75	2/50×75	2/50×75	50×75	50×75	—	2/45×70	—	2/45×70	45×70
Joists at 450 mm centres—90/100 mm frame											
Sheet	3000	50×100	50×100	38×100	38×100	38×100	2/35×90	35×90	2/35×90	45×90	35×90
	6000	50×100	50×100	50×100	38×100	38×100	2/35×90	45×90	2/35×90	45×90	35×90
	9000	2/38×100	50×100	50×100	38×100	38×100	2/45×90	45×90	2/45×90	45×90	35×90
	12000	2/38×100	50×100	50×100	38×100	38×100	2/45×90	45×90	2/45×90	45×90	35×90
Tile	3000	50×100	50×100	50×100	38×100	38×100	2/45×90	45×90	2/45×90	2/35×90	35×90
	6000	2/38×100	50×100	50×100	50×100	38×100	2/45×90	45×90	2/45×90	2/35×90	35×90
	9000	2/50×100	2/50×100	50×100	50×100	50×100	2/45×90	2/35×90	2/45×90	—	35×90
	12000	2/50×100	2/50×100	2/38×100	50×100	50×100	3/45×90	2/35×90	3/45×90	—	45×90
Joists at 600 mm centres—70/75 mm frame—upper and lower floor joists											
Sheet	3000	2/50×75	2/50×75	2/50×75	50×75	50×75	2/45×70	2/45×70	2/45×70	2/45×70	45×70
	6000	2/50×75	2/50×75	2/50×75	2/50×75	50×75	3/45×70	2/45×70	2/45×70	2/45×70	45×70
	9000	3/50×75	2/50×75	2/50×75	2/50×75	2/50×75	3/45×70	2/45×70	3/45×70	2/45×70	45×70
	12000	3/50×75	2/50×75	2/50×75	2/50×75	2/50×75	3/45×70	2/45×70	3/45×70	2/45×70	45×70
Tile	3000	2/50×75	2/50×75	2/50×75	2/50×75	50×75	3/45×70	2/45×70	3/45×70	2/45×70	45×70
	6000	3/50×75	3/50×75	2/50×75	2/50×75	2/50×75	3/45×70	2/45×70	3/45×70	2/45×70	45×70
	9000	3/50×75	3/50×75	3/50×75	2/50×75	2/50×75	—	3/45×70	—	3/45×70	2/45×70
	12000	—	—	3/50×75	3/50×75	2/50×75	—	3/45×70	—	3/45×70	2/45×70
Joists at 600 mm centres—90/100 mm frame											
Sheet	3000	2/50×100	2/50×100	50×100	50×100	50×100	2/45×90	2/35×90	2/45×90	2/35×90	35×90
	6000	2/50×100	2/50×100	2/50×100	50×100	50×100	2/45×90	2/35×90	2/45×90	2/35×90	35×90
	9000	2/50×100	2/50×100	2/50×100	50×100	50×100	2/45×90	2/35×90	2/45×90	2/35×90	45×90
	12000	2/50×100	2/50×100	2/50×100	50×100	50×100	2/45×90	2/45×90	2/45×90	2/35×90	45×90
Tile	3000	2/50×100	2/50×100	2/50×100	50×100	50×100	2/45×90	2/35×90	2/45×90	2/35×90	45×90
	6000	2/50×100	2/50×100	2/50×100	2/50×100	50×100	3/45×90	2/45×90	2/45×90	2/35×90	45×90
	9000	3/50×100	2/50×100	2/50×100	2/50×100	2/50×100	3/45×90	2/45×90	3/45×90	2/45×90	45×90
	12000	3/50×100	3/50×100	2/50×100	2/50×100	2/50×100	3/45×90	2/45×90	3/45×90	2/45×90	2/45×90

NOTES:

1 For allowable roof and floor masses, see Clause 1.4.11.

2 Plates for internal non-loadbearing walls shall be in accordance with Clause 6.3.5.

3 For limitations on trenching, see Clause 6.2.1.4.

4 Multiple members shall be nail-laminated (see Clause 2.5).

5 Edge distances for some sheet bracing materials may require a minimum plate depth of 45 mm.

6 Plates required to support concentrated loads from jamb studs, posts or studs supporting concentrated loads, shall be supported in accordance Clause 6.2.2.2.

7 For other design requirements, see Clause 6.3.3.

TABLE A49

TOP PLATES—NOT TRENCHED—LOWER STOREY OF TWO-STOREY EXTERNAL LOADBEARING WALLS—UPPER FLOOR JOIST SPAN 4800 mm MAX.

Roof type	Rafter or truss span mm	Unseasoned timber					Seasoned timber				
		F5	F7	F8	F11	F14	F5	F8	MGP10	MGP12	F17
Studs at 450 mm centres—70/75 mm frame											
Sheet	3000	2/38×75	50×75	50×75	38×75	38×75	2/45×70	45×70	2/45×70	2/35×70	35×70
	6000	2/38×75	50×75	50×75	50×75	38×75	2/45×70	45×70	2/45×70	2/35×70	35×70
	9000	2/50×75	2/38×75	50×75	50×75	50×75	2/45×70	45×70	2/45×70	2/35×70	35×70
	12000	2/50×75	2/38×75	50×75	50×75	50×75	2/45×70	2/45×70	2/45×70	2/35×70	35×70
Tile	3000	2/50×75	2/38×75	50×75	50×75	38×75	2/45×70	45×70	2/45×70	2/35×70	35×70
	6000	2/50×75	2/50×75	50×75	50×75	38×75	2/45×70	2/35×70	2/45×70	2/35×70	35×70
	9000	2/50×75	2/50×75	2/50×75	50×75	50×75	3/45×70	2/35×70	3/45×70	2/45×70	45×70
	12000	2/50×75	2/50×75	2/50×75	50×75	50×75	3/45×70	2/45×70	3/45×70	2/45×70	45×70
Studs at 450 mm centres—90/100 mm frame											
Sheet	3000	50×100	50×100	38×100	38×100	38×100	2/45×90	45×90	2/45×90	45×90	35×90
	6000	50×100	50×100	50×100	38×100	38×100	2/45×90	45×90	2/45×90	45×90	35×90
	9000	2/38×100	50×100	50×100	38×100	38×100	2/45×90	45×90	2/45×90	45×90	35×90
	12000	2/38×100	50×100	50×100	38×100	38×100	2/45×90	45×90	2/45×90	45×90	35×90
Tile	3000	2/38×100	50×100	50×100	38×100	38×100	2/45×90	45×90	2/45×90	2/35×90	35×90
	6000	2/38×100	50×100	50×100	50×100	38×100	2/45×90	45×90	2/45×90	2/35×90	35×90
	9000	2/50×100	2/50×100	50×100	50×100	50×100	3/45×90	2/35×90	3/45×90	2/45×90	35×90
	12000	2/50×100	2/50×100	2/38×100	50×100	50×100	3/45×90	2/35×90	3/45×90	2/45×90	45×90
Studs at 600 mm centres—70/75 mm frame											
Sheet	3000	2/50×75	2/50×75	2/50×75	50×75	50×75	2/45×70	2/45×70	2/45×70	2/45×70	45×70
	6000	2/50×75	2/50×75	2/50×75	2/50×75	50×75	3/45×70	2/45×70	2/45×70	2/45×70	45×70
	9000	3/50×75	2/50×75	2/50×75	2/50×75	2/50×75	3/45×70	2/45×70	3/45×70	2/45×70	45×70
	12000	3/50×75	2/50×75	2/50×75	2/50×75	2/50×75	3/45×70	2/45×70	3/45×70	2/45×70	45×70
Tile	3000	3/50×75	2/50×75	2/50×75	2/50×75	50×75	3/45×70	2/45×70	3/45×70	2/45×70	45×70
	6000	3/50×75	3/50×75	2/50×75	2/50×75	2/50×75	3/45×70	2/45×70	3/45×70	2/45×70	2/35×70
	9000	—	3/50×75	3/50×75	2/50×75	2/50×75	—	3/45×70	—	3/45×70	2/45×70
	12000	—	—	3/50×75	3/50×75	2/50×75	—	3/45×70	—	3/45×70	2/45×70
Studs at 600 mm centres—90/100 mm frame											
Sheet	3000	2/50×100	2/50×100	50×100	50×100	50×100	2/45×90	2/35×90	2/45×90	2/35×90	35×90
	6000	2/50×100	2/50×100	2/50×100	2/50×100	50×100	2/45×90	2/35×90	2/45×90	2/35×90	45×90
	9000	2/50×100	2/50×100	2/50×100	2/50×100	50×100	2/45×90	2/35×90	2/45×90	2/35×90	45×90
	12000	2/50×100	2/50×100	2/50×100	2/50×100	50×100	2/45×90	2/45×90	2/45×90	2/35×90	45×90
Tile	3000	2/50×100	2/50×100	2/50×100	50×100	50×100	2/45×90	2/35×90	2/45×90	2/35×90	45×90
	6000	2/50×100	2/50×100	2/50×100	2/50×100	50×100	3/45×90	2/45×90	2/45×90	2/35×90	45×90
	9000	3/50×100	2/50×100	2/50×100	2/50×100	2/50×100	3/45×90	2/45×90	3/45×90	2/45×90	45×90
	12000	3/50×100	3/50×100	2/50×100	2/50×100	2/50×100	3/45×90	2/45×90	3/45×90	2/45×90	2/45×90

NOTES:

1 For allowable roof and floor masses, see Clause 1.4.11.

2 Plates for internal non-loadbearing walls shall be in accordance with Clause 6.3.5.

3 For limitations on trenching, see Clause 6.2.1.4.

4 Multiple members shall be nail-laminated (see Clause 2.5).

5 Edge distances for some sheet bracing materials may require a minimum plate depth of 45 mm for joining sheets.

6 Plates required to support concentrated loads from jamb studs, posts or studs supporting concentrated loads, shall be supported in accordance Clause 6.2.2.3.

7 For other design requirements, see Clause 6.3.4.

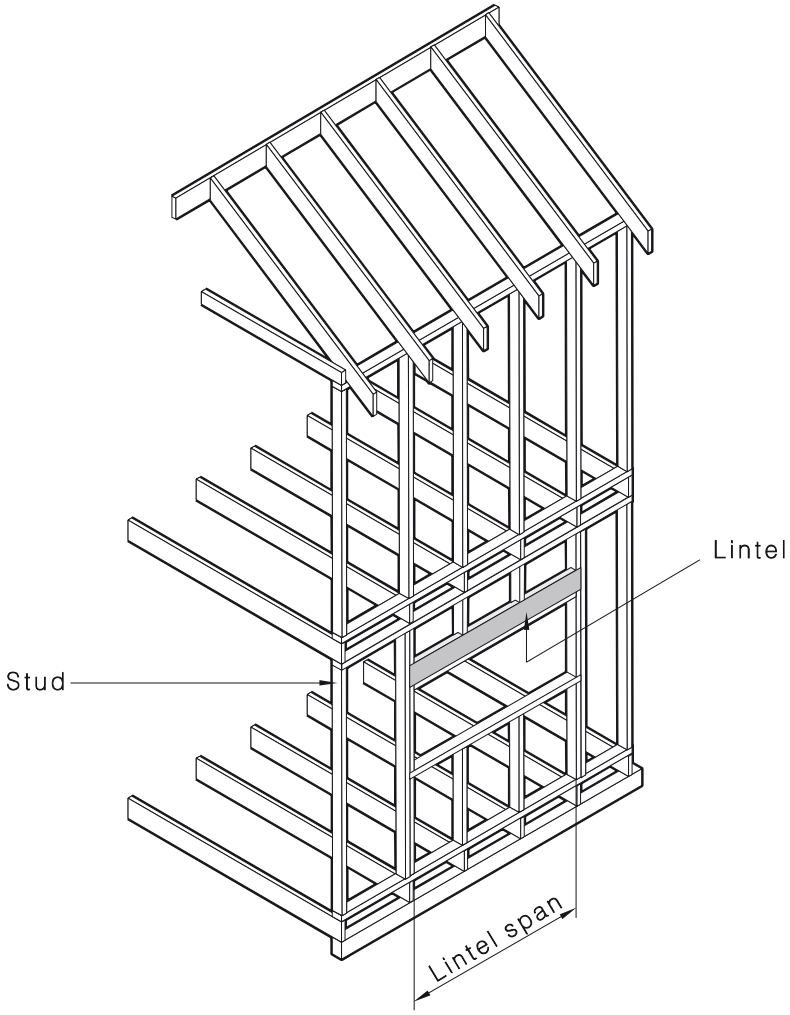


FIGURE A26 LINTEL—LOWER STOREY OF TWO-STOREY CONSTRUCTION

TABLE A50

LINTELS—LOWER STOREY OF TWO-STOREY LOADBEARING WALLS—UPPER FLOOR JOIST SPAN 4800 mm MAX.

Roof type	Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Sheet	3000	900	100×50	100×75	100×50	100×75	100×50	90×35	90×35	90×35	90×35	90×35
		1200	125×75	125×75	125×50	100×75	100×75	2/90×45	2/90×45	2/90×35	90×35	90×35
		1500	150×75	175×75	150×50	125×75	125×75	2/120×45	2/120×35	140×35	2/90×45	2/90×35
		1800	200×75	200×75	175×75	175×50	150×75	2/170×35	190×45	2/140×35	2/120×35	2/120×35
		2100	225×75	200×75	200×75	200×75	175×75	2/170×45	2/170×35	190×45	2/140×35	2/120×45
		2400	250×75	250×75	225×75	225×75	200×75	290×45(5)	290×45(5)	2/170×45	2/170×35	2/140×45
		3000	300×75	300×75	275×75	275×75	250×75	2/240×45	2/240×45	2/240×35	2/190×45	2/170×45
		3600	—	—	—	—	—	—	2/290×45	2/290×35(5)	2/240×45	2/240×45
	6000	900	100×75	100×50	100×50	100×50	100×50	90×35	90×35	90×35	90×35	90×35
		1200	125×75	125×75	125×75	125×50	100×75	120×45	2/90×45	2/90×35	90×45	90×35
		1500	175×75	150×75	150×75	150×75	150×50	2/140×35	2/120×45	2/120×35	120×45	2/90×45
		1800	200×75	200×75	175×75	175×75	175×75	2/170×35	2/140×45	2/140×35	2/120×45	2/120×35
		2100	225×75	225×75	200×75	200×75	200×75	2/190×35	2/170×45	2/170×35	2/140×45	2/140×35
		2400	275×75	250×75	250×75	225×75	225×75	2/240×35	2/190×45	2/190×35	2/170×45	2/170×35
		3000	—	—	300×75	275×75	275×75	2/290×35	2/240×45	2/240×45	2/240×35	2/190×45
		3600	—	—	—	—	—	—	—	2/290×45	2/290×35	2/240×45
	9000	900	100×75	100×75	100×50	100×50	100×50	90×45	90×45	90×35	90×35	90×35
		1200	150×75	125×75	125×75	125×75	125×50	2/120×35	120×45	2/90×45	2/90×35	90×35
		1500	175×75	175×75	150×75	150×75	150×75	2/140×35	2/120×45	2/120×35	2/120×35	2/90×45
		1800	200×75	200×75	175×75	175×75	175×75	2/170×35	2/170×35	2/140×45	2/120×45	2/120×35
		2100	250×75	225×75	225×75	200×75	200×75	2/190×45	2/170×45	2/170×35	2/170×35	2/140×35
		2400	275×75	250×75	250×75	225×75	225×75	2/240×35	2/240×35	2/190×45	2/170×45	2/170×35
		3000	—	—	300×75	300×75	275×75	2/290×45	2/290×45	2/240×45	2/240×35	2/190×45
		3600	—	—	—	—	—	—	—	2/290×45	2/290×35	2/240×45
	12 000	900	100×75	100×75	100×75	100×50	100×50	2/90×35	90×45	90×35	90×35	90×35
		1200	150×75	150×50	125×75	125×75	125×75	2/120×35	140×45	120×45	2/90×35	90×45
		1500	175×75	175×75	175×75	150×75	150×75	2/140×45	2/140×35	2/120×45	2/120×35	120×45
		1800	225×75	200×75	200×75	200×75	175×75	2/170×45	2/170×35	2/140×45	2/140×35	2/120×45
		2100	250×75	250×75	225×75	225×75	225×75	2/240×35	2/190×45	2/170×45	2/170×35	2/140×45
		2400	300×75	275×75	275×75	250×75	250×75	2/240×35	2/240×35	2/190×45	2/170×45	2/170×45
		3000	—	—	—	—	300×75	2/290×45	2/290×45	2/240×45	2/240×35	2/240×35
		3600	—	—	—	—	—	—	—	—	2/290×45	2/290×35

(*continued*)

TABLE A50 (*continued*)

Roof type	Rafter or truss span mm	Opening width mm	Unseasoned timber					Seasoned timber				
			F5	F7	F8	F11	F14	F5	MGP10	MGP12	F17	F27
Tile	3000	900	100×75	100×75	100×50	100×50	100×50	90×45	90×45	90×35	90×35	90×35
		1200	150×50	125×50	125×75	125×50	125×50	2/120×35	120×45	120×35	2/90×35	90×35
		1500	175×75	175×75	150×75	150×75	150×75	2/140×35	2/120×45	2/120×35	2/120×35	2/90×45
		1800	200×75	200×75	175×75	175×75	175×75	2/170×35	2/140×45	170×45	2/120×45	2/120×35
		2100	250×75	225×75	225×75	200×75	200×75	2/190×45	2/170×45	2/170×35	2/170×35	2/140×35
		2400	275×75	250×75	250×75	225×75	225×75	2/240×35	2/240×35	2/190×45	2/170×45	2/170×35
		3000	—	—	300×75	300×75	275×75	2/290×35	2/290×35	2/240×45	2/240×35	2/190×45
		3600	—	—	—	—	—	—	—	2/290×45	2/290×35	2/240×45
	6000	900	125×50	100×75	100×75	100×50	100×50	2/90×35	2/90×35	90×45	90×35	90×35
		1200	150×75	150×75	150×50	125×75	125×75	2/120×35	2/120×35	120×45	2/90×45	2/90×35
		1500	200×75	175×75	175×75	175×75	150×75	2/170×35	190×45	2/120×45	2/120×35	2/120×35
		1800	225×75	225×75	200×75	200×75	200×75	2/170×45	2/170×45	2/170×35	2/140×45	2/140×35
		2100	275×75	250×75	250×75	225×75	225×75	2/240×35	2/190×45	2/170×45	2/170×45	2/170×35
		2400	300×75	300×75	275×75	250×75	250×75	2/240×45	2/240×35	2/240×35	2/190×45	2/170×45
		3000	—	—	—	—	300×75	2/290×45	2/290×45	2/290×35	2/240×45	2/240×35
		3600	—	—	—	—	—	—	—	—	—	2/290×35
	9000	900	125×50	125×50	100×75	100×75	100×50	2/90×35	2/90×35	2/90×35	90×35	90×35
		1200	150×75	150×75	150×75	150×50	125×75	2/120×45	2/120×35	2/120×35	2/90×45	2/90×35
		1500	200×75	200×75	175×75	175×75	175×75	2/170×35	2/140×45	2/140×35	2/120×45	2/120×35
		1800	225×75	225×75	225×75	200×75	200×75	2/190×45	2/170×45	2/170×35	2/140×45	2/140×35
		2100	275×75	275×75	250×75	250×75	225×75	2/240×35	2/240×35	2/190×45	2/170×45	2/170×35
		2400	300×75	300×75	275×75	275×75	250×75	2/240×45	2/240×45	2/240×35	2/190×45	2/190×35
		3000	—	—	—	—	—	—	—	2/290×45	2/240×45	2/240×35
		3600	—	—	—	—	—	—	—	—	—	2/290×45
	12 000	900	125×75	125×75	125×50	125×50	100×75	2/120×45	2/90×45	2/90×35	90×45	90×35
		1200	175×75	175×75	150×75	150×75	150×75	2/140×35	2/120×45	2/120×35	2/120×35	2/90×45
		1500	225×75	200×75	200×75	200×75	175×75	2/170×45	2/170×35	2/140×45	2/140×35	2/120×45
		1800	250×75	250×75	225×75	225×75	225×75	2/240×35	2/190×45	2/170×45	2/170×35	2/140×45
		2100	300×75	300×75	275×75	250×75	250×75	2/240×45	2/240×45	2/190×45	2/190×45	2/170×45
		2400	—	—	300×75	300×75	275×75	$2/290\times45_{(5)}$	$2/290\times45_{(5)}$	$2/240\times35_{(10)}$	2/240×35	2/190×45
		3000	—	—	—	—	—	—	—	$2/290\times45_{(10)}$	2/290×35	2/240×45
		3600	—	—	—	—	—	—	—	—	—	—

NOTES:

1 For allowable roof and floor load masses, see Clause 1.4.11.

2 Lintels supporting concentrated loads shall be designed in accordance with engineering principles.

3 Lintels shall be used in conjunction with bottom and top plates, ledgers and, where required, lintel trimmers.

4 Multiple members shall be vertically nail-laminated (see Clause 2.3).

5 Lintels in gable or skillion end walls not supporting roof loads shall be determined as for sheet roof, 3000 mm rafter span.

6 Minimum bearing length at supports shall be 35 mm. Subscript values, where applicable, indicate the minimum additional bearing length where required to be greater than 35 mm.

APPENDIX B

MOISTURE CONTENT

(Informative)

Timber flooring should be installed at an average moisture content appropriate to the average internal equilibrium moisture content for the location. Table B1 lists equilibrium moisture contents (EMC) likely to be encountered.

TABLE B1

MOISTURE CONTENT OF FLOORING

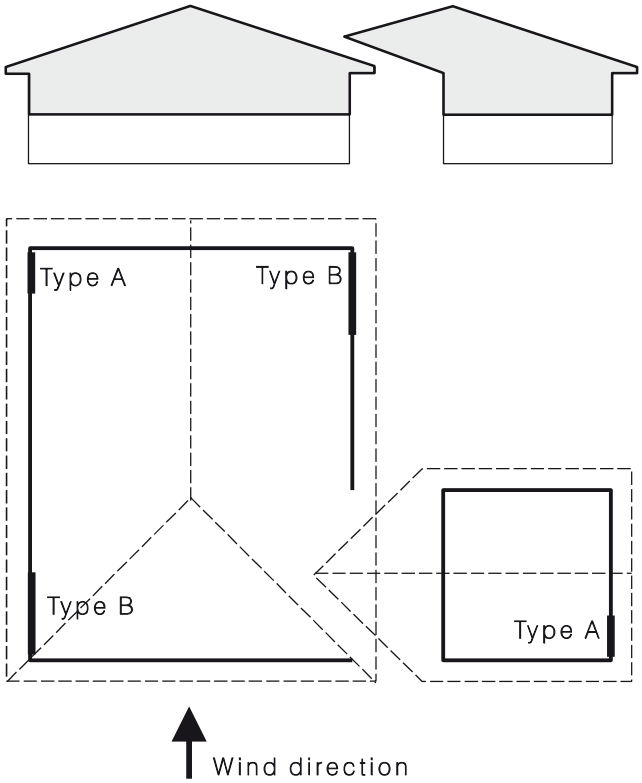
Climatic zone	Average indoor EMC %	Seasonal EMC range %	Recommended average moisture content at installation %
Coastal (Zone 3)	12	10 to 15	12
Inland (Zone 1 and Zone 2)	9	7 to 12	9
Airconditioned	9	7 to 12	9

NOTES:

1 For a map of climate zones, refer to the subfloor ventilation requirements in the Building Code of Australia.

2 More detailed information for specific locations can be obtained from timber advisory services.

APPENDIX C
EXAMPLE OF EVEN DISTRIBUTION OF BRACING
(Informative)



NOTE: The sections of the house have been separated to illustrate the distribution required.

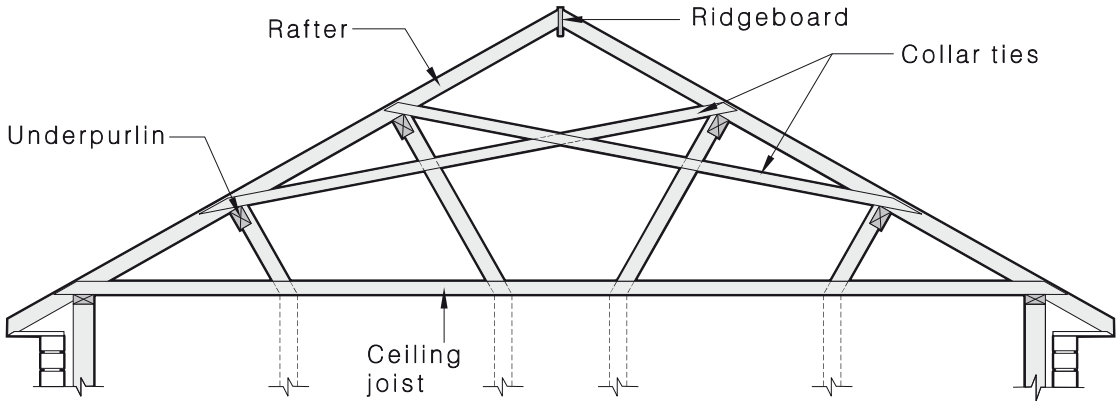
FIGURE C1 EXAMPLE OF EVEN DISTRIBUTION OF BRACING

APPENDIX D

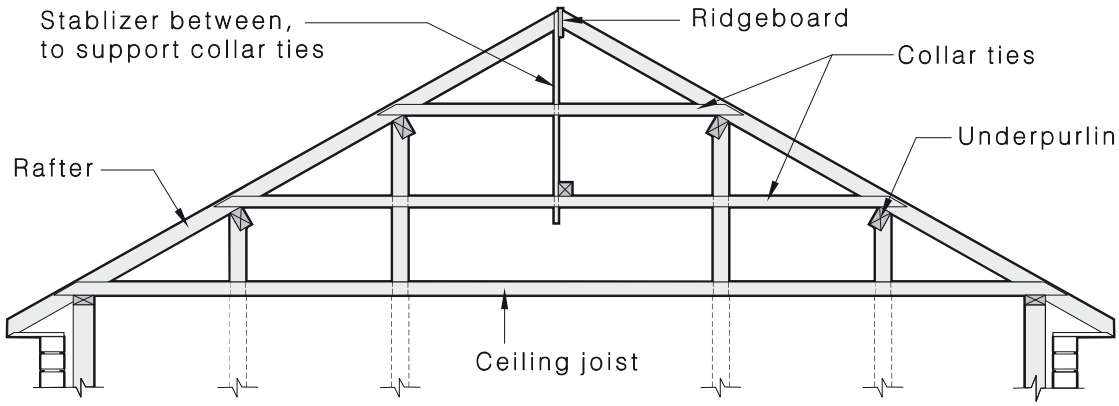
COLLAR TIES WITH MULTIPLE ROWS OF UNDERPURLINS

(Normative)

This Appendix specifies typical fixing details for collar ties with multiple rows of underpurlins, which are given in Figure D1.



(a) Typical method of fixing scissor collar ties when two underpurlins are required on a roof with equal pitches



(b) Typical method of fixing conventional collar ties when two underpurlins are required on a roof with equal or unequal pitches

NOTE: Collar tie may be spliced as for ceiling joist (see Clause 7.2.4.2).

FIGURE D1 FIXING OF COLLAR TIES WITH MULTIPLE ROWS OF UNDERPURLINS

BIBLIOGRAPHY

Attention is drawn to the following related documents:

FWPA www.timber.org.au
MRTFC—Multi-residential Timber Framed Construction Manuals

Timber Stairs, Balustrades and Handrails—External and Internal

EWPAA
LP91, Low profile plywood floor system

AS 1684.4—2010

Amendment No. 1 (2012)

CORRECTION

SUMMARY: This Amendment applies to Figures 6.8(d) and 6.8(e).

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