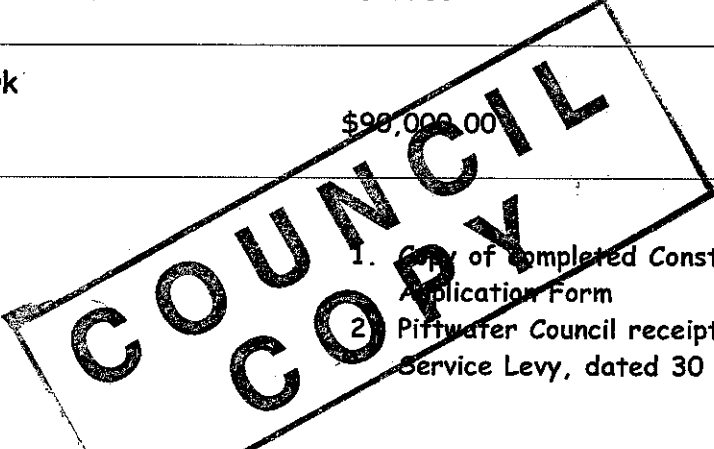


# Construction Certificate Determination

issued under the Environmental  
Planning and Assessment Act 1979  
Section 109C (1) (b), 81A (2) and 81A (4)

**Certificate No. 2006/1342**

<b>Council</b>	Pittwater
<b>Determination</b> date of determination	Approved 21 June 2006
<b>Subject land</b> Address Lot No, DP No.	51 Tasman Road, Avalon Lot 11 DP 13811
<b>Applicant</b> Name Address Contact No. (phone)	Ms Lisa Ann Williams 51 Tasman Road, Avalon NSW 2107 9918 0734
<b>Owner</b> Name Address Contact No. (phone)	Ms Lisa Ann Williams and Mr Stuart Nielsen 51 Tasman Road, Avalon NSW 2107 9918 0734
<b>Description of Development</b> Type of Work	Alterations and Additions to an existing dwelling
<b>Builder or Owner/Builder</b> Name Contractor Licence No/Permit	River Run Designs Pty Ltd 182773C
<b>Value of Work</b> Building	\$98,000.00
<b>Attachments</b>	 <ol style="list-style-type: none"><li>1. Copy of completed Construction Certificate Application Form</li><li>2. Pittwater Council receipt for payment of Long Service Levy, dated 30 May 2006</li></ol>



**Plans & Specifications****certified**

List plans no(s) & specifications  
Reference

1. Architectural Plans and Construction Specifications, reference nos. 818-01 to 818-05 (inclusive), prepared by JD Evans and Company Pty Ltd, dated 20 December 2005
2. Structural Details, reference no. 6045-S1(1), prepared and endorsed by D O'Brien Engineering Services Pty Ltd, dated 27 April 2006
3. Certificate of Structural Adequacy, reference no. cl6045, prepared by D O'Brien Engineering Services Pty Ltd, dated 27 April 2006
4. Copy of Sydney Water approval dated 29 May 2006

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## Certificate

I certify that the work if completed in accordance with these plans and specifications will comply with the requirements of S81A(5) of the Environmental Planning and Assessment Act 1979.

Signed



Date of endorsement  
Certificate No.

21 JUN 2006

2006/1342

---

**Certifying Authority**

Name of Accredited Certifier  
Accreditation No.  
Accreditation Authority

Tom Bowden  
93

Dept of Infrastructure, Planning & Natural Resources  
(NSW Accreditation Scheme)

Contact No.

(02) 9999 0003

Address

13/90 Mona Vale Road, Mona Vale NSW 2103

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**Development Consent**

Development Application No.  
Date of Determination

N0851/05

3 February 2006

---

**BCA Classification**

1a



To Lisa Anne Williams

51 Tasman Road  
Avalon NSW 2107

Applic.	Reference	Amount
SL Recei	QLSL-Builders 1 x N0951/05	\$315.00

Total: \$315.00

Amounts Tendered

Cash	\$0.00
Cheque	\$0.00
Db/Cr Card	\$315.00
Money Order	\$0.00
Agency Rec	\$0.00
Total	\$315.00
Rounding	\$0.00
Change	\$0.00
Nett	\$315.00

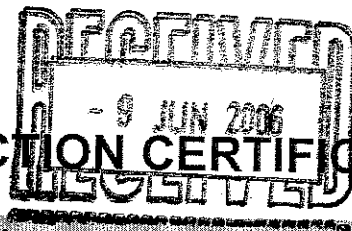
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COMMERCIAL CITY





## APPLICATION FOR A CONSTRUCTION CERTIFICATE

### 1. Applicant's details

It is important that we are able to contact you if we need more information. Please give us as much details as possible.

Mr ☐ Mrs ☐ Ms ☒ Dr ☐ Other

Given Names (or ACN)

LISA ANN

Family Name (or Company)

WILLIAMS

Postal Address (we will post all mail to this address)

51 TASMAN RD AVALON SYDNEY

Post Code 2107

Daytime telephone

02-99180734

Alternate no.

0416 336 530

Mobile no.

0416 336 530

### 2. Owner's consent

Every owner of the land must sign this form. If the owner is a company the form must be signed by an authorized director and the common seal must be stamped on this form. If the property is a unit under the strata title or a lot in a community title, then in addition to the owner's signature, the common seal of the body corporate must be stamped on this form over the signature of the owner and signed by the Chairman or Secretary of the Body Corporate or the appointed managing agent.

Owner(s)

LISA ANN WILLIAMS A WILLIAMS AND STUART NIELSEN

Address

51 TASMAN RD.

AVALON 2107

As owner(s) of the land to which this application relates, I/We consent to this application. I/We also consent for the Principal Certifying Authority and/or Accredited Certifier to enter the land to carry out inspections relating to this application.

Signature(s)

A. Williams

DMC

Without the owner's consent we will not accept the application. This is a very strict requirement for all applications. If you are signing on the owner's behalf as the owner's legal representative, you must state the nature of your legal authority and attach documentary evidence (eg. power of attorney, executor, trustee, company director, etc).

### 3. Location of property

Unit/Street no.

51

Street name

TASMAN RD.

Suburb

AVALON

Post code

2107

Legal Property Description (these details are shown on your rate notices, property deeds, etc)

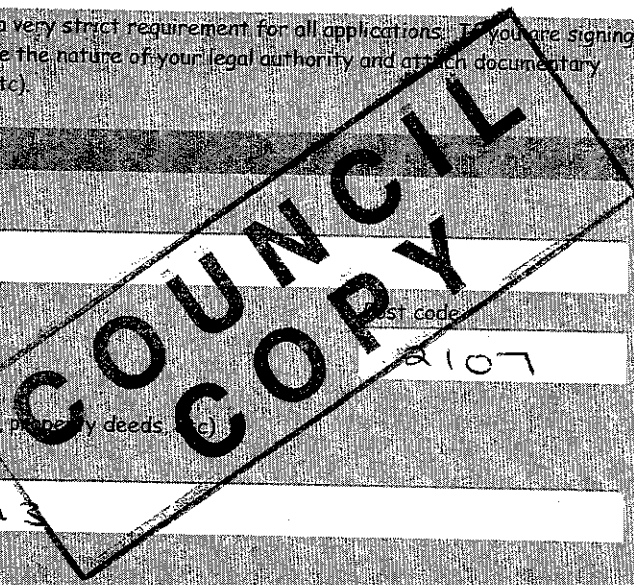
Lot no.

11

DP no.

13811

Section 3





#### 4. Description of work

What type of work do you propose to carry out?

Please describe briefly everything that you want approved

Construction of new carport, study, store room and cabana.  
Construction of internal alterations to existing dwelling.

We would like approved all alterations and additions to the existing dwelling.

#### 5. Estimated cost of work

The estimated cost of the development or contract price may be subject to review

Estimated cost of work \$ 90,000.00

#### 6. Development Consent

Council Consent no. No 851/05

Date of Determination 3.2.06

#### 7. Building Code of Australia classification

This can be found on the development consent

BCA Classification 1a

#### 8. Builder's details

If known to be completed in the case of residential building work

Name Ian Thomas - River Run Designs

License no. 182773C

Owner/builder permit no.

#### 9. Applicant's declaration

I apply for a Construction Certificate to carry out building works as described in this application. I declare that all the information in this application and checklist is, to the best of my knowledge, true and correct.

Signature

J Williams

Date

6 June 06



## SUBMISSION REQUIREMENTS

### A. GENERAL

Are the plans submitted with the Construction Certificate Application in accordance with the Development Consent?

Yes ☒ No ☐

Have all the conditions of Development Consent relating to the issue of the Construction Certificate been fully complied with?

Yes ☒ No ☐

If you have answered NO to either of the above questions, then you will need to speak with the Accredited Certifier BEFORE LODGING YOUR APPLICATION.

### B. ALL PROPOSALS (has the following required information been submitted?)

Yes	No	Not Applicable	<u>In the case of an application for a Construction Certificate for building work:</u>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Three (3) copies of detailed architectural plans and specifications
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The plan for the building must consist of a general plan drawn to a scale not less than 1:100 and a site plan drawn to a scale not less than 1:200. The general plan of the building is to: a) show a plan of each floor section b) show a plan of each elevation of the building c) show the levels of the lowest floor and of any yard or unbuilt on area belonging to that floor and the levels of the adjacent ground d) indicate the height, design, and full construction details e) indicate the provision for fire safety and fire resistance (if any)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Where the proposed building work involves any alteration or addition to, or rebuilding of, an existing building, all copies of the general plan are to be coloured or otherwise marked to the satisfaction of the Council to adequately distinguish the proposed alteration, addition or rebuilding with a separate letter listing the proposed changes being submitted.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3 copies of a specification: a) to describe the construction and materials of which the building is to be built and the method of drainage, sewerage and water supply b) state whether the materials proposed to be used are new or second hand and give particular
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Where the proposed building work involves a modification to previously approved plans and specifications the general plans must be coloured or otherwise marked to the satisfaction of the Accredited Certifier to adequately distinguish the modification.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	If the proposed building work involves a modification to previously approved plans and specification which were subject of a Development Consent, has the original Development Consent been modified by Council?
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Except in the case of an application for, or in respect of domestic building work: a) a list of any fire safety measures that are proposed to be implemented in the building or on the land on which the building is situated, and b) if the application relates to a proposal to carry out any alteration or rebuilding of, or addition to, an existing building, a separate list of such of those measures as are currently implemented in the building or on the land on which the building is situated. This list must specify the standard of design of each of those fire safety measures to which they were originally installed. c) This list must describe the extent, capability and basis of design of each of the measures concerned.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Copy of BASIX Certificate & Report.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All other documentation to satisfy conditions of Development Consent.

### HOME BUILDING ACT 1989 (as amended) OWNER/BUILDER REQUIREMENTS

Applicants for work at a residential property with a value of work over \$12,000 require insurance as specified in the Home Building Act 1989.

Owner Builders require Property Owner Builder's Permit issued by the Department of Fair Trading for all projects over \$5,000. In addition to this permit all projects valued in excess of \$12,000 may also require a contract of insurance under the provisions of the Home Building Act 1989 as amended. This requirement will take effect should the property owner offer the property for sale in the ensuing period of 7 years.

Enquiries on any matters relevant to this section should be taken up with the Department of Fair Trading at Level 21, Astra House, 227 Elizabeth Street, Sydney (ph: 133220).



**LONG SERVICE LEVY (applies to all classes of buildings)**

A Long Service Levy at 0.35% of the cost of works is payable on projects valued \$25,000 or more. This sum can be paid directly to the Long Service Payments Corporation or to Council acting as an agent to the Corporation. Partial exemption from the levy may be granted to non profit organizations, churches and to owner/builders. The levy may also be paid in instalments. Application forms for these exemptions are available from Council but all enquiries in this regard should be address to the Long Service Payments Corporation.

THE CONSTRUCTION CERTIFICATION CANNOT BE ISSUED UNLESS THE LONG SERVICE LEVY AND HOME BUILDING ACT 1989 INSURANCE (APPLICABLE TO RESIDENTIAL PROPERTIES) HAVE BEEN PAID, OR EVIDENCE OF THE EXEMPTION PROVIDED TO COUNCIL.

**PARTICULARS OF THE PROPOSAL**

What is the area of the land (m <sup>2</sup> )? <b>837</b>	Gross floor area of building (m <sup>2</sup> ) as proposed: <b>154</b>
What are the current uses of all or parts of the building(s)/land? <b>Residential</b>	Location: <b>St Tasmania Rd</b> Use: <b>North Avalon</b>
Does the site contain a dual occupancy? <b>No</b>	What is the gross floor area of the proposed addition or new building (sq metres)? <b>27</b>
What are the proposed uses of all parts of the building(s) land? <b>Residential</b>	Number of pre-existing dwellings: <b>1</b>
Number of dwellings to be demolished: <b>0</b>	How many dwellings proposed? <b>N/A</b>
How many storeys will the building consist of? <b>1</b>	Will the new building be attached to the existing building? <b>Yes</b>
	Will the new building be attached to any new building? <b>No</b>

**MATERIALS TO BE USED**

The following information must be supplied for the Australian Bureau of Statistics:

Place a tick (✓) in the box which best describes the materials the new work will be constructed of:

<b>WALLS</b>	<b>FLOOR</b>	<b>ROOF</b>	<b>FRAME</b>
Brick veneer <input type="checkbox"/>	Concrete <input type="checkbox"/>	Aluminium <input type="checkbox"/>	Timber <input checked="" type="checkbox"/>
Full brick <input type="checkbox"/>	Timber <input checked="" type="checkbox"/>	Concrete <input type="checkbox"/>	Steel <input type="checkbox"/>
Single brick <input type="checkbox"/>	Other <input type="checkbox"/>	Concrete tile <input type="checkbox"/>	Other <input type="checkbox"/>
Concrete block <input type="checkbox"/>	Unknown <input type="checkbox"/>	Fibrous cement <input type="checkbox"/>	Unknown <input type="checkbox"/>
Concrete/masonry <input type="checkbox"/>		Fibreglass <input type="checkbox"/>	
Concrete <input type="checkbox"/>		Masonry/terracotta shingle <input type="checkbox"/>	
Steel <input type="checkbox"/>		Tiles <input type="checkbox"/>	
Fibrous cement <input type="checkbox"/>		Slate <input type="checkbox"/>	
Hardiplank <input type="checkbox"/>		Steel <input checked="" type="checkbox"/>	
Timber/weatherboard <input type="checkbox"/>		Terracotta tile <input type="checkbox"/>	
Cladding-aluminium <input type="checkbox"/>		Other <input type="checkbox"/>	
Curtain glass <input type="checkbox"/>		Unknown <input type="checkbox"/>	
Other <input type="checkbox"/>			
Unknown <input type="checkbox"/>			



# SPECIFICATION

(Construction. Cont. 2006/1342).

of works for the erection of

*Alterations & Additions*

*to existing dwelling*

for

*Ms Lisa Ann Williams*

at *51 Tasman Road, Avalon*

lot no. *11* D.P.no *13811*

COUNCIL  
COPY

SPECIFICATION

Revision 17



**BUILDING TYPE**

SINGLE DWELLING ☐ VILLA OR TOWNHOUSE ☐ INDUSTRIAL BUILDING ☐  
 DUAL OCCUPANCY ☐ GARAGE ☐ OFFICE BUILDING ☐  
 MEDIUM DENSITY UNITS ☐ RETAIL BUILDING ☐ ADDITION ☐  
 FARM SHED ☐ ..... ☐ ..... ☐

**CONSTRUCTION**

CAVITY BRICK ☐ TIMBER FRAMED ☐ A.A.C.BLOCK/PANEL ☐  
 BRICK VENEER ☐ STEEL FRAMED ☐ MASONRY BLOCK ☐  
 SINGLE BRICK ☐ STEEL CLAD ☐ CONCRETE PANEL ☐  
 F/C SHEET ☐

*Alterations & Additions*

**ADDENDUM**

*to existing dwelling*

*1122 Ann Williams*

*12 Norman Road, Avalon  
1321*

If any difference in requirements exists between this specification and the Building Code of Australia or relevant Standard that may apply to the construction of any building nominated by this specification, then the requirements of the Building Code of Australia and/or the appropriate Standard shall take precedence over this specification for any construction.

**DISTRIBUTORS:** SOUTHspec PUBLISHING  
P.O. BOX 3381,  
NORTH NOWRA NSW 2541

Phone: (02) 44460358  
Mobile: 0410 470358  
Fax: (02) 44460773

REVISION 17 – FEBRUARY 2005  
BCA 2005  
BASIX Vers. 1.0 (NSW only)

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# SPECIFICATION

FOR THE ERECTION AND COMPLETION OF BUILDING AT: LOT No. 11 DP No. 13811  
ADDRESS 51 Tasman Road TOWN/AREA Avalon  
MUNICIPALITY / SHIRE / CITY Pittwater POST CODE 2107  
FOR Mrs Ann Williams Hereinafter called the Proprietor.

The builder must ensure that relative drawings, plans and construction comply with the prescribed construction, the Local Government Act, the Building Code of Australia and that the work and services are performed by the Builder to the satisfaction of the Proprietor and Lending Authorities.

## INSPECTION NOTICE

This is to apply only if inspections are required by the Lending Authority. The building is to be inspected by the Society or Bank Representative at the following stages of construction and the Builder is to give the Lending Authority and Owner at least (2) clear working days notice that inspections are required.

1. When trenches for footings have been prepared or rock surfaces scabbled and in the case of reinforced concrete footings, when reinforcement and depth pegs have been placed in position just prior to placing of concrete. Footings must not be commenced until the trenches have been inspected and approved by the Society Representative.
2. On completion of floor, wall and roof framing with noggin in position and veneer walling, but before flooring is cut down, roof covering is laid and wall linings and sheetings are secured.
3. When the internal wall coverings have been secured and fixing out commenced, apron mouldings must not be fixed until flashings have been inspected and approved.
4. ON COMPLETION OF BUILDING. The owner is cautioned that if works have advanced beyond these stages without the requisite notices being given, inspections made and unsatisfactory conditions are discovered later, the offer of a loan or the terms and conditions of a loan may be varied by the lending authority.

## REGULATIONS AND NOTICES:

The Builder is to comply with the Building Code of Australia as amended and as applicable to the particular State or Territory in which the building is being constructed and the requirements of legally constituted Authorities for local Government and/or Services. The Builder is to give all notices, obtain all permits and pay all fees required by such Authorities. If any difference in requirements exists between this specification and the Building Code of Australia or relevant Standard that may apply to the construction of any building nominated by this specification then the requirements of the Building Code of Australia and/or the appropriate Standard shall take precedence over this specification for any construction. Where manufacturers materials, components, design factors and construction methods comply with the Performance Requirements of the B.C.A. these may be accepted by approval authorities as an alternative as per the Deemed to Satisfy Provisions.

## INSURANCE:

Insurance of the works against fire will be effected as nominated in the Building Contract. The Builder shall at his own expense adequately insure against Public Risk and arrange indemnification in respect of his liability under the Workers' Compensation Act, Work Cover and/or other regulations as applicable.

## VISIT THE SITE:

Builders tendering are to visit the site and satisfy themselves to the nature and extent of the work, the facilities available and the difficulties entailed in the execution of the said works. No extra amount above the accepted price will be allowed because of work arising due to neglect of this precaution, or assumptions made in respect of levels or ground slopes.

## LABOUR AND MATERIALS:

The Builder is to provide all materials, labour, fittings and plant required to construct and complete the work. Materials shall be of the standard specified and workmanship in each trade shall be performed by tradesmen of that particular trade and in conformity with current good building practice.

## SET OUT:

The Builder shall be responsible for the accuracy and clear delineation of the site boundaries and location of the buildings there on. The Builder is to set out and maintain the works in accordance with the drawings. Figured dimensions to be taken in preference to scale.

## PLANS AND SPECIFICATIONS:

Any work indicated on the plans and not in the specification or vice versa, and any item not shown on either plans or specifications but which is obviously necessary as part of proper construction and/or finish, is to be considered as so shown or specified and is to be duly done as part of the contract. Any variations to plans or specifications to be agreed and recorded by the proprietor and the builder/contractor.

## PLANS ON JOB:

The builder must at all times maintain on the job a legible copy of the plans and specifications, bearing the approval of the Municipal Authority concerned or Principal Certifying Authority.

## STANDARDS

Where an Australian Standard (AS) or Australian New Zealand Standard (AS/NZS) is nominated in this specification then that nomination refers to the latest revision of that Standard unless the Building Code of Australia references a different revision.

## EXCAVATOR - BCA part 3.1.

### EARTHWORKS AND EXCAVATIONS:

All earthworks shall be designed and constructed in accordance with the guidelines of AS3798. Stormwater and other surface water drainage by underground piping or surface diversions shall be in accordance with AS/NZS3500.

All siteworks shall be in accordance with the Environmental Planning and Assessment Act and Regulations for siteworks for the erection of a building, safeguarding excavations, backfilling, preventing soil movement and supporting neighboring buildings. Drainage requirements must be determined according to the soil classifications BCA part 3.1.1.0 and part 3.2. Drainage in reactive soil areas must comply with the requirements of the clauses

### FOOTINGS AND PIERS: BCA part 3.2.2

Excavate for all footings, piers, etc. to dimensions and minimum depth shown on plans or otherwise specified, or to depths necessary to secure solid bottoms and even bearing throughout similar strata. Bottoms of excavations to be level and stepped where necessary. Grade, fill and ram where necessary to receive concrete floors where shown on ground level.

At completion of foundations, all excavations to be filled, well rammed to ground level and surplus soil spread as directed. All seepage and soakage water to be effectively dealt with and diverted clear of the building. Excavate for and lay agricultural drains to back of walls retaining earth and to any other sections of foundations as may be necessary and/or directed.

### ROCK EXCAVATIONS:

Should rock of any type be encountered in excavation of the works the cost of its removal is to be considered as an extra to the contract and charged for at a rate per cubic metre as indicated in the schedule of rates. The Proprietor is to be notified when rock is encountered in excavations.

## CONCRETER - BCA part 3.2.3

All structural concrete shall be ready mixed and in compliance with AS3600, and unless otherwise specified on Engineers drawings, shall be of N20 grade.

The concrete shall be supplied by an approved firm and delivery dockets shall be kept on the job for inspection by the proprietor if he so desires. The concrete for minor works, where strength of concrete is not critical, such as paving on solid ground, may have a minimum compressive strength of 15MPa if unreinforced and 20 MPa if reinforced. Alternatively, such concrete may be mixed on site where the aggregate proportions and water/cement ratio can be controlled so that the required compressive strengths can be obtained.

All concrete work shall comply with the AS3600. Maximum slump shall be 80mm unless otherwise specified by Engineer. Concrete shall be carefully handled and placed to avoid segregation and shall be adequately compacted by means of mechanical vibrators or rodding and spading to ensure maximum compaction. Reinforcing mesh fabric to AS 1304 and all reinforcing bars mild steel grade unless otherwise specified.

### FOOTINGS: BCA parts 3.2.3, 3.2.4 and 3.2.5

Where sites have soils or foundations of reactive nature or problem sites footings shall be approved by a practising structural engineer and in the case of known highly swelling soils or other unstable soils special precautions may have to be taken in the design and construction of concrete footings. In the case of concrete suspended floors to first floor it will be necessary for size of footings to be specified by a practising structural engineer. Footing sizes to be as per AS2870 part 1.

At completion of footing excavations fill to the underside of floor slab with approved hardcore so as to provide a minimum depth of 100mm. Such hardcore may be carried under minor interior footings if required. Cover areas as noted on drawings with waterproof membrane allowing sufficient at perimeters to extend membrane up face of footing to terminate under external brickwork.

Owners are advised that foundations and associated drainage of all buildings requires continuing maintenance to assist footing performance and advice is available in the CSIRO information sheet 10-91. It is the owners responsibility after occupation to maintain the site in accordance with this document.

### TERMITE PROTECTION: BCA part 3.1.3

Where the building is being erected in a prescribed termite area and protection is required by regulation of local government or state authority then protection against subterranean termites shall be installed in accordance with AS 3660. Details of method of protection to be used shall be submitted where required, prior to commencement of building works. Written certification, signed by the installer, that the method used and the manufacturers specification complies with the Australian Standard shall be provided to the relevant authority and owner where required. A durable notice must be permanently fixed in a prominent location in the building prior to its occupation indicating: 1. The method and date of installation of the system and the need to inspect and maintain the system on a regular basis. 2. Where a chemical barrier is used, the life expectancy as listed on the National Registration Authority label and recommended date of renewal. Note that AS3660 and BCA lists the minimum acceptable level of protection only. Owners and/or builders may specify and install additional protection if desired.

FORMWORK: All formwork for concrete shall be in accordance with AS 3610.

### PATHS: (see AS 3727 for guide to residential pavement construction)

Provide paths as indicated on plans. Concrete to be as previously specified and surfaced with wooden float. Excavate for and lay paths to even grades, true lines and curves. Car tracks to be a minimum of 100mm thick and paths a minimum of 75mm. Provide expansion joints in paths at a maximum spacing of 1200mm with bitumen impregnated felt joining strips the full thickness of concrete with tooled V-joints above same.



**CROSS SECTION DIMENSIONS OF REINFORCED CONCRETE FOOTINGS:** for buildings with timber framed floors, for sites classified a or s according to AS2870.

CONSTRUCTION OF WALL	Normal thickness of wall to be supported (not more than)	Size of Concrete (width x depth)	
		For stable soil foundations Class A	Other foundations not subject to significant movement Class S
Brick, single storey with wall height not exceeding 4200mm excluding any gable.	mm 270 110 270	mm 400x300 300x300 400x400	mm 400x400 400x400** 400x500**
Brick, two storey with external wall height not exceeding 7200mm excluding any gable internal wall height not exceeding 7200mm. <b>** use 11TM reinforcement Top and Bottom</b>			
Brick veneer, single storey with wall height not exceeding 4200mm excluding any gable.	110	300x300	300x400
Brick veneer, two storey with external wall height not exceeding 7200mm excluding any gable.	110	300x300	300x400
Timber frame, single storey -- foundation walling measured from the top of the strip footing.	110	300x300	300x400
Up to 1500mm height	110	300x400	300x400
Exceeding 1500mm and up to 3000mm height			

REINFORCEMENT FOR STRIP FOOTINGS	Width of Strip Footing	Minimum number of main wires per layer using 8TM or 11TM fabric	Minimum number of 10mm dia. bars per layer	Minimum number of 12mm dia. bars per layer
	300 400	3 4	3-Y10 4-Y10	3-Y12 4-Y12

Where wall thickness exceeds as specified above, increase footing width to maintain the offset and provide additional bar or bars so that bar centres do not exceed 200mm, or an additional width of trench mesh, maintaining in all cases the required concrete cover.

**CONCRETE FLOORS: BCA parts 3.2.3**

Provide concrete floors where indicated on plans. Where not specifically detailed, floors are to be a minimum of 100mm thick, reinforced with No. F72 hard drawn reinforcing fabric set 32mm below top of concrete. Floor slabs to be full thickness and free from grooves and ridges. Finish surface in one operation as required for tiling or otherwise to fine finish with float or steel trowel and sponge. Thickness of floors shall be maintained under tiling recesses in all cases.

Note that in Climate Zones 6, 7 and 8 the edges and underneath some concrete slab construction may require thermal insulation.

**INTEGRAL FLOOR SLABS AND SLAB ON GROUND: BCA part 3.2.5**

Grade whole area occupied by floor to a minimum depth as required to remove top soil and grass roots etc. Determine level of top of floor to habitable rooms, a minimum of 150mm above highest point of adjacent proposed external ground level (adjust for fill or general excavation as required) or as otherwise required by Local Council.

The external finished ground surface must be graded to drain water away from the building at a minimum slope away of 50mm over the first 1m as per BCA Part3.1.2.3

Excavate for perimeter and other main footings to minimum depths as shown on Engineers drawings or to depths necessary to obtain solid bottoms and even bearing throughout a similar strata. Allow for sufficient recess for brickwork if carried under main footings so as to reduce the amount of concrete necessary, provided that the fill is retained from displacement under the footings (by a temporary earth bank or similar) and provided also that a minimum of 100mm depth of the same hardcore is provided under all footings in such case, roadbase or ungraded bluemetal is recommended as hardcore, coalwash is NOT to be used. Reinforce to Engineers detail and pour in one continuous operation in concrete Grade 20 unless otherwise nominated. Residential slabs and footings must be constructed in accordance with AS2870 as amended.

**SUSPENDED REINFORCED CONCRETE SLABS:**

All concrete slabs to separate areas within or adjoining a building generally of timber floor construction shall be suspended. Temporary formwork must be removed prior to final inspection. Permanent metal formwork approved by the lending authority may be used with slab sizes and reinforcement according to manufacturers recommendation. Suspended floor slabs to have minimum of 100mm bearing on at least two sides and spans are not to exceed 2100mm except where specifically detailed. Solid fill forming may be used under concrete floors (eg. laundry, garage) adjoining the building providing that the level of the top of the slab is not less than 50mm below antcap and/or dampcourse level of the main building. For spans exceeding 2100mm, slabs supporting walls, cantilever slab floors or where beams and columns are used to support the slab, a practising structural engineers details shall be submitted with the drawings and specifications.

**PRESTRESSED BEAM FLOORING:**

Prestressed beams for areas to be constructed by this method shall be delivered to site and stacked for storage on timber packers to avoid damage and where stacked one above the other the timber packers shall be positioned in verticle lines.

Beams shall be purpose made by the manufacturer for this particular project, designed in accordance with AS3600. Beams shall be individually marked for their respective location on the job and positioned in the work to comply with manufacturers key drawing. Cutting or drilling into beams or modification in any way shall be done only with the express authority of the manufacturer or their site representative.

Seating for beams shall be true to line and level before positioning beams commences to ensure even, uniform bearing and such seatings shall be not less in length than shown on the drawing or as follows:

Brickwork - bearing not less than 100mm

Steel - bearing not less than 70mm.

Concrete - bearing not less than 75mm.

A.A.C. lightweight concrete

external walls - bearing not less than 140mm.

Internal walls - full bearing across width of wall.

Spacing of beams and fibre cement infill panel placement shall be strictly to manufacturers detail. Topping slab concrete shall have a 28 day strength of not less than 20 MPA and thickness shall not exceed 50mm unless shown on the drawings. Reinforce with nominal F52 Mesh U.N.O.

Topping slabs shall be continuously cured for 7 days to prevent non structural cracking.

**BRICKLAYER - (construction of masonry building shall be as per AS3700) BCA part 3.3**

**CLAY BRICKS:**

To be sound, hard, of well burnt clay and shale and comply with specifications AS1225 'Burnt Clay and Shale Building Bricks'.

**SAND LIME BRICKS:**

To Comply with AS1654 'Calcium Silicate Bricks' and have a transverse strength no less than as per Specification AS1640 'Clay Bricks'.

**CONCRETE BLOCKS OR BRICKS:**

To comply with AS4455 Masonry Building Blocks/Pavers

**SAND:**

To be clean, sharp and free from all impurities. **CEMENT MORTAR:** To be one part fresh cement to 3 parts sand.

**LIME MORTAR: BCA part 3.3.1.6**

To be one part lime to 3 parts sand. Lime to be well slaked before use. **COMPO MORTAR:** To be one part cement, one part lime and 6 parts sand. All bricks to be well wetted before use. This not to apply to textured bricks. Footing courses to be grouted solid with cement mortar. All brickwork to be properly bonded. laid on full bed and all perpendis filled. All piers are to be built solid and each course grouted as work proceeds. Carry up all work true and plumb to even gauge and in level courses the full height and thickness required. The brickwork faces above damp course level to be finished with neatly ironed or raked joints. Beds and joints to be kept to a reasonable thickness. Finish all other exposed brickwork faces with neat struck joints.

**BUILD THE FOLLOWING IN CEMENT MORTAR; BCA part 3.3.1.6**

All brickwork to underside of floor bearers level. All 110mm thick brickwork. All copings, steps, brick balustrade walls, sills, piers, wing walls, retaining walls. Brick Fences on alignment and/or brickwork under timber fencing also concrete blocks or bricks. **Build compo mortar:** All other Brickwork, including concrete masonry.

**SLEEPER PIERS: BCA table 3.2.5.2.**

230 x 230mm up to 1.5 high, footings are to be two courses of 350mm work. Where pier height exceeds 1.5m up to a maximum of 2.4m footings are to be two courses of 470 work and lower portion of pier to be 350 x 350. Concrete footings must be 500mm square and 200mm thick for an effective supported floor area of not more than 20m². All footings must have Engineers details for soil other than class A or S.

**ENGAGED PIERS:**

To be minimum of 230 x 110, spaced at not more than 1.8m centres up to 1200 high to support floor bearers and at similar centres to stiffen walls supporting concrete slabs. Piers over 1200 high to be 230 x 230. All engaged piers to be anchored to walls with specified wall ties.

**VENEER WALLS: BCA 3.3.1.2**

To be 110mm Brickwork built in Compo Mortar on foundation walls as previously specified. Internal faces to be 38mm from timber frames. Build in 3mm galvanised wall ties opposite each alternate stud, four courses above level of bottom plate, then every fourth course and spaced not more than 460mm horizontally and 610mm vertically or 610mm horizontally and 460mm vertically. Ties to be left open for attachment to studs. A cavity space of between 25mm and 50mm must be maintained throughout. Where thermal insulation is required to comply with Energy Efficiency requirements, clear cavity spaces must be maintained. Cavities and weep holes to be clean and clear at damp course level. All mortar droppings to be caught on paper or other material and removed before internal linings are fixed. Mortar joints on inside face walls to be flush with brickwork.

**SPECIAL WALLS: (if shown on plans)**

Walling not of timber. Veneer on-timber or masonry to be constructed as per Structural Engineers Detail and Certificate.

**SINGLE LEAF MASONRY: (Garage Walls etc.)**

Footings as per BCA part 3.2.5.1 engaged piers and reinforcing to be as per part 3.3.1.

**ACCESS:**

Adequate access in the external foundation wall must be provided with a weatherproof lockable door and crawl access is to be provided to all under floor areas.

**VENTILATION: BCA part 3.4.1**

Sub-floor areas shall be ventilated by means of evenly distributed openings with an unobstructed area of 7300mm² per lineal metre of external wall. Where particle board flooring is used the unobstructed area shall be increased to 7500mm² per lineal metre and evenly spaced. Ventilation of internal walls shall be a minimum of 22000mm² 2/m run of wall. Vents to be immediately below bearers and similarly provide vents under verandah floors and suspended floor slabs. Sufficient cross ventilation to be provided through all walls below floors. No section of the under-floor area should be so constructed that it will hold pockets of still air. Appropriate special provision to be made where a gas bath heater is installed. Ventilation may be varied by Local Council



**BRICK REINFORCEMENT:**

In full brick cavity walls at two courses above level of the highest opening built into each 110mm thickness one continuous strand of 64 wide galvanised metal reinforcement lapped 100mm at joints and full width of layer at intersections.

**ANT CAPS:**

To all brickwork and piers, at the level of underside of floorbearers, ant capping of 0.5mm gauge galvanised steel or other approved metal is to be set, projecting 38mm beyond the internal faces of all brickwork and turned down at a 45 degree angle, lapped 13mm and soldered or crimped at all joints and corners so as to provide a continuous and effective barrier against termites throughout the length of the material. Whole of house protection against subterranean termite attack shall be installed in accordance with AS 3660.

**TIES: BCA PART 3.3.3.1**

Wall ties complying with AS/NZS2699 shall be used for all tie requirements. Corrosion protection and installation of wall ties is to comply with AS3700.

**STEPS:**

If shown on plan in bricks to match other exposed brickwork. To be built in solid work or where side walls are provided in consolidated filling. Treads are to be brick on edge, or pre cast concrete units with a maximum of 355mm going and a maximum of 190mm and minimum of 115mm rises.

**LINTELS: BCA PART 3.3.3.4 AND 3.3.3.5**

Provide galvanised mild steel angle iron or bars of the following sizes over openings to each 110mm thickness (or part thereof) of brickwork, all having a minimum of 110 bearing each end. All lintel angles to be placed with the longer leg vertical.

UPPER STOREY	EXTERNAL WALLS	INTERNAL WALLS
Up to 1210mm span	One 76mmx10mm bar	One 76mmx10mm bar
Up to 1570mm span	One 76x51x10 angle	One 76x51x10 angle
Up to 2410mm span	One 127x76x10 angle	One 127x51x10 angle
Up to 3010mm span	One 152x89x10 angle	One 152x89x10 angle

LOWER STOREY OR BASEMENT	EXTERNAL WALLS	INTERNAL WALLS
Up to 910mm span	One 76x76x10 angle	One 76x76x10 angle
Up to 1210mm span	One 102x76x10 angle	One 127x76x10 angle
Up to 1810mm span	One 152x76x10 angle	One 152x89x10 angle
Up to 2410mm span	One 152x102x10 angle	One 152x102x10 angle

**FIREPLACE CHIMNEY and FLUES: BCA part 3.2.5.5. and 3.7.3**

Reinforced concrete footings 300mm wider all round than brick construction to be provided. Build 110mm brick wall and/or corbel courses to support hearth. Non combustible material to be used for upper surface of hearth with a minimum thickness of 155mm and shall extend not less than 300mm beyond the front of the fireplace opening and not less than 150mm beyond each side of the opening. Local council may vary this requirement. Upper surface of hearth not to slope away from grate. Provide fireplace and chimney in position as shown and to the dimensions on plan. Mild steel bars or angles of suitable sizes and with a 110mm bearing at each end to support work over openings. Up to the level of 300mm above the underside of the arch or lintel, the back and sides of the fireplace to be constructed in two separate sections of solid masonry minimum 190mm thick not including cavity. Concrete masonry not permitted in construction of inner section, balance of walling to be minimum of 90mm thick. Flue to be rendered minimum 12mm thick. Mix; 1 cement, 2 lime, 10 sand or L.C. approved material. Chimney stack is to be not less than the height of the main roof ridge and is to be built in compo mortar. The flue is to be 250 x 250mm or one tenth of the area of the fireplace opening, whichever is the greater, gathered over to break daylight and pargetted to the full height. An 0.6mm galvanised steel tray, in one piece, holed for flue is to be set at level of one course above roof covering on the high side of the roof. The internal edges are to be shaped to form a quadrant gutter 25mm wide, sweated at corners. The tray is to project a minimum of 25mm beyond the external faces of brickwork turned up and/or down as required. Where the tray is turned up, a clearance of at least 6mm is to be maintained between the brickwork and the tray. Provide weep holes by leaving open vertical joints in brickwork above tray. Rake joints in brickwork ready to receive flashing to be provided by Plumber. A loose brick must be left on the back of the chimney stack. This brick must not be set until after the tray has been cleared of all mortar droppings.

**HEATING APPLIANCES:** Domestic type Oil, Gas and Solid Fuel heater installations shall comply with AS2918 'Domestic solid fuel burning appliances - Installation' or AS1691 'Rules for installation of domestic Oil Fired appliances' as applicable. Installation of gas fired appliances shall be carried out by a licensed gas plumber.

**DAMPCOURSE: BCA part 3.3.4**

Provide a continuous run of L.C. Approved dampcourse material to full width of wall thickness on all brickwork at level not higher than bottom of floor bearers and engaged piers. Dampcourse material is to be run in long lengths, lapped minimum 100mm at joints and full width at all intersections. To wall surrounding concrete and/or solid floors an additional run of dampcourse is to be laid, one full course above floor level and stepped down to meet lower dampcourse where other walls abut walls of bathroom, shower recess or laundry. Damp proof courses and flashings shall be installed to give performance as specified in AS/NZS 2904.

**VERMIN PROOFING:**

13mm mesh galvanised bird wire to be built into brickwork and taken across cavity and secured to bottom plate.

**FLASHING:**

L.C. approved dampcourse material to be built in under all window sills 25mm at back of wood sill and 50mm at each end of same. Flashing to be bent down across cavity and built 25mm into veneer wall. L.C. approved dampcourse material to be built in over all exposed window and external door openings.

**WEEP HOLES:**

Perpend joints are to be left open in exterior brick walls spaced approx. 600mm in course immediately over flashings of all exposed openings and to brick retaining walls, fender walls etc. as required. See Bushfire Clauses for protection of weep holes in bush fire areas.

**RETAINING WALLS:**

Retaining walls not specifically detailed, and foundation walling required to retain earth, are to be a minimum of 230mm thick, up to a height of 750mm of retained earth. Cavity walls used to retain earth are to have the leaf adjacent to the retained earth a minimum of 230mm thick, to a maximum of 900mm of retained earth height. All to be properly bonded (see 'Bonded Walls') and provide with a properly constructed agricultural drain to the earth side of retaining wall. For walls in excess of the above heights of retained earth, an Engineers detail will be required.

**BONDED WALL:**

Solid brick walls more than one brick width which are used to retain earth or are otherwise noted as 'Bonded Walls', shall be bonded throughout the thickness of the wall by either header bricks or equivalent tying. Where header bricks are used every sixth course shall be a header course or there shall be at least one header or equivalent tie to every 0.13sq metres (every third course at 480mm centres) Walls 350mm or more in thickness shall have overlapping headers or ties to provide a continuous tie through the wall.

**CAVITY WALLS:**

Walls indicated as cavity walls to be constructed with two leaves 110mm thick spaced nominally at 60mm apart. Where thermal insulation is required to comply with Energy Efficiency requirements clear cavity spaces must be maintained. Connect the two leaves with wall ties as per AS2699 set nominally 600mm apart in every fifth course. Ties to be embedded a minimum of 50mm in each leaf. Keep ties clean of mortar droppings and cavity clear as work proceeds.

**STRAPS:**

BCA part 3.3.3 To full brick cavity walls, secure door and window frames with 1.6mm galvanised iron straps set in brickwork. Straps to be 25mm wide and at least 300mm long, where practicable and spaced at a maximum of five courses apart. Set 25mm x 1.6mm galvanised iron straps 1800 apart and 1200mm down cavity with ends turned 75mm into brickwork to secure wall top plates.

**COMPLETION:**

Clean all cavities. Wait upon and make good after other trades. Replace all damaged and defective bricks. Clean all exposed brickwork with diluted spirits of salts, or as otherwise recommended by brick manufacturers, wash down with clean water and leave free from cement and mortar stains.

**BRICKLAYER (Concrete brick) A.S. 1346 - BCA part 3.3.1**

**MORTAR:** For normal conditions mortar to consist of: Above Dampcourse:

1 part cement  
2 parts lime or lime putty  
9 parts clean sand

Below Dampcourse:

1 part cement  
1 part lime or lime putty  
6 parts clean sand

Mortar mixes must comply with A.S. 3400 (BCA parts 3.3.1.6 and 3.3.1.7

The substitution of other plasticisers for lime is not recommended. Under no circumstances should the proportion of cement be increased.

**GENERALLY:**

Bricks are to be dry when laid in wall. When delivered on site bricks should be stacked openly and off wet ground and where practicable to be covered in wet weather. Footing courses to be grouted solid. All brickwork to be properly bonded, laid on full bed and all perpend filled.

**JOINTS: BCA part 3.3.1.7**

Finish all external brickwork and internal feature walls with raked joints. Finish all other brickwork with neat struck joints, U.N.O.

**JOINT REINFORCEMENT AND CONTROL JOINTS: BCA part 3.3.1.8 and 3.3.1.9**

In addition to reinforcement over openings as later specified provide joint reinforcement in bed joints at vertical spacings not exceeding 600mm. Control joints, providing a continuous vertical separation through the entire thickness of the wall, are to be provided where indicated on plans or where walls exceed 9m in length, as close as practical building will permit. Reinforcement not to extend across control joints.

**AUTOCLAVED AERATED CONCRETE BLOCKS:****GENERALLY:**

Lightweight blockwork shall be Autoclaved Aerated Concrete blocks consisting of sand, cement and lime and shall be installed to areas as indicated on drawings. Site provisions for storage of materials and for the mixing of adhesive shall be as recommended by the manufacturer.

**WORKMANSHIP:**

Fixings, fastenings, anchors, lugs and the like shall be of a type approved by the manufacturer and shall transmit the loads and stresses imposed and ensure the rigidity of the assembly. Block laying shall be in accordance with the manufacturers current published specifications.

**TOLERANCES:**

Maximum planar misalignment shall be 2mm along butt joints. The thickness and width of walls shall not vary by more than 5mm from design sizes. Deviation from plumb, level or dimensional angle must not exceed 5mm per 3.5m of length of member or 6mm in total run in any line.

**INSTALLATIONS:**

All lightweight blockwork shall be installed using thin bed adhesive mortar to all horizontals and perpend. The first course must be made true and level using a normal thick bed mortar with thin bed adhesive to fully seal the perpend. All thin bed adhesive shall be applied using a recommended notched trowel to obtain an even distribution of adhesive to achieve joint thickness of 2-3mm. All lightweight blockwork shall be laid in a format that the vertical joint of the lower course must be staggered at least 100mm relative to the vertical joint of the overlying course. A slip/joint bond breaker must be installed between the first course and the foundations or slab on all internal and external walls to allow for differential movement between the blocks and the supporting structure. Build in as necessary all flashings, reinforcements, arch



bars, lintels, frames, straps, bolts, lugs, wall ties, metalwork, precast units, sills, partitions, joists and the like. Carefully set out and leave openings for other trades to eliminate cutting.

#### CONTROL JOINTS: BCA part 3.3.1.8

Control joints should be built into walls at no greater than 8m centres and at locations in accordance with the recommendations of the manufacturer. Masonry expansion ties shall be installed across the joint every third course.

#### COMPLETION:

On completion clean out all blocks, mortar, droppings, debris etc. and remove all scaffolding, make good all put-log holes and other blemishes and leave all work in perfect condition and protect until handover.

### CONCRETE BLOCK and REINFORCED MASONRY: AS 3700 - BCA part 3.3.2

**GENERALLY:** All masonry units shall comply with AS1500 'Hollow Load Bearing Concrete Units'. Masonry shall be stacked on planks off the ground and in wet weather shall be covered with tarpaulins or otherwise kept dry. At the end of each days work the top of the wall shall be covered with tar paper, polyethylene sheets or by other means protected from becoming excessively weak. Masonry units shall not be dampened prior to laying, but shall be laid in dry state.

#### MORTAR: BCA PARTS 3.3.1.6 AND 3.3.1.7

Mortar shall comply with AS123 in all respects. Plasticisers may be used when approved and where tests show the mortar with plasticisers meets the requirements of these specifications.

#### CONSTRUCTION BEDDING:

All face and end joints shall be fully filled with mortar and joints shall be squeezed tight. Slushing of mortar into joints shall not be permitted. The first course of blocks shall be laid in a full bed of mortar.

#### JOINTS:

Joints on all exposed surfaces shall be as specified. The joint shall be formed by striking the mortar flush and after it has partially set, tooling with the proper shaped tool to adequately compact the surface. The tool shall be of sufficient length to form a straight line free from waves. Internal joints shall be ironed. Where flush joints are left exposed, they shall be first compacted, then repointed and excess mortar removed. Joints shall be 10mm thick unless otherwise specified or directed.

#### PATTERNS AND BOND:

All walls shall be built plumb, true and level, to the thickness shown on the plans and with the pattern indicated, or running bond U.N.O.

#### CONTROL JOINTS:

Shall be located where shown and shall form a continuous vertical break from top to bottom of wall or from bond beam. Provision shall be made for adequate lateral stability. Joint shall be filled with mortar, raked back 16mm and pointed with a non-hardening plastic filler. No reinforcing shall be carried across control joint.

#### JOINT REINFORCEMENT: BCA part 3.3.2.3.

Reinforce every 600mm in height and in the two courses immediately above and below window openings. Lap mesh at least 150mm at all joints and intersections except at control and expansion joints where a slip joint must be provided.

#### BRACING DURING CONSTRUCTION:

Masonry walls constructed in locations where they may be exposed to highwinds during erection shall not be built higher than ten times their thickness unless adequately braced, or unless provision is made for prompt installation of permanent bracing such as intermediate floor or roof structure. Back filling shall not be placed against foundation walls or retaining walls before mortar or grouting has sufficiently hardened, or before wall has been permanently braced to withstand horizontal pressure.

#### WEATHERPROOFING: BCA part 3.3.4

All concrete masonry walls exposed to the weather or below ground level shall be adequately water proofed, using an approved paint or other coating and applied in accordance with the directions of the manufacturer.

#### CLEANING:

During the progress of the work, every effort shall be made to keep walls, that are to be left exposed, clean. Mortar smears shall be allowed to dry for a short period and shall then be promptly removed by trowel or wire brush or both. Care shall be taken to avoid damage to the mortar joint when brushing. Mortar burrs shall be promptly removed. At the conclusion of the work, walls shall be cleaned down, all scaffolding and debris removed and the wall left in good clean condition

### BUSHFIRE PRONE AREAS - BCA 3.7.4

Performance requirements are satisfied for a class 1 building located in a designated bushfire prone area if constructed in accordance with AS3959.

- N.S.W. Variation:
- (a) AS3959 - Construction of buildings in bushfire prone areas, excluding section 2 of that standard which is replaced by "Planning for Bushfire Protection, appendix 3 - Site Assessment for Bushfire Attack.
  - OR (b) subclause (a) as modified by development consent following consultation with NSW Rural Fire Service under sec. 79B of the Environmental Planning and Assessment Act 1979
  - OR (c) subclause (a) as modified for development consent with a bushfire authority issued under section 100B of the Rural Fires Act 1997

#### CONSTRUCTION OF CLASS 1 BUILDINGS as per acceptable methods in BCA clause 3.7.4.1 (for information only)

BUILDING COMPONENT	BUSH FIRE ATTACK CATEGORY		
	MEDIUM	HIGH	EXTREME
Flooring system	(a) Concrete slab on ground (b) Suspended concrete floor (c) Framed floor with all joists and bearers above 600mm above ground (d) Framed floor where timbers are less than 600mm above ground (i) All timbers fire retardant OR (ii) subfloor space fully enclosed as per the wall above OR (iii) fully enclosed with non combustible material or 6mm thick F.R. cement sheets	As per medium requirements	As per medium requirements except that where bearers and joists are greater than 600mm above ground and not enclosed, all timbers must be fire retardant treated or sheeted underneath with non combustible material.
Supporting posts, piers stumps, poles (except where enclosed as per flooring systems)	(a) Non combustible material (b) Fire retardant treated timber to 400mm above ground (c) Timber mounted on 75mm high stirrups	As per medium requirements	As per medium requirements except that all timber is to be fire retardant treated
External Walls	(a) Masonry, concrete or earthwall (b) Framed wall with (i) sarking having a flammability index not more than 5 OR (ii) an insulation material of that standard (c) Timber logs with all joints between the logs planed and sealed (d) Combustible sheet cladding if cladding within 400mm of ground is covered by non combustible sheet material	As per medium requirements except that:- (a) P.V.C. cladding must not be used: and (b) Timber wall cladding must be fire retardant treated	As per high attack category
Windows	The openable part of a window must be screened with aluminium, steel or bronze corrosion resistant mesh with 1.8mm max. aperture size.	As per medium requirements except that: (a) timber must be fire retardant treated except if enclosed by non combustible shutters (b) Leadlight windows must be protected with non combustible material or toughened glass (c) Window screens must not be aluminium	As per high requirements except that windows not protected by non combustible shutters shall be glazed with toughened glass
External doors	External doors must be fitted with (a) weather strips or draught excluders to prevent build up of burning debris and (b) tight fitting screen doors with corrosion resistant mesh as per windows	As per medium requirements except that (i) aluminium mesh must not be used and (ii) leadlight panels must be protected by non combustible shutters or panels	As per high bushfire requirements except that:- (a) Timber doors must be fire retardant treated OR (b) Protected by non combustible shutters OR (c) Solidcore doors min.35mm



Vents and weepholes	Vents and weepholes must be protected by spark guards of corrosion resistant 1.8mm max. mesh size aluminium, steel or bronze	As per medium category except that aluminium mesh must not be used	As per high category requirements
Roof covering, eaves and fascias	(a) Timber shakes or shingles are not allowed. (b) Sheet roofing must be metal or fibre reinforced cement (c) Seal gaps under corrugations at wall or eaves line by (i) fully sarking roof OR (ii) corrosion resistant mesh as per weepholes or profiled metal sheet or mineral wool (d) Hip and ridge capping must be preformed with no gaps or gaps sealed as per (c) (e) Roof wall junctions must be sealed by: (i) fascia and eaves lining OR (ii) sealing to u/side of roofing at wall line with non combustible material (f) Tiled roofs must be fully sarked (including ridge) with sarking directly under tiling battens. All sarking must have Flammability Index less than 5	As per medium requirements except that (a) all roof sheeting must be non combustible and sarked; and (b) Timber eaves lining and/or trimming strips must be of fire retardant treated timber; and (c) Fascias must be non combustible or fire retardant treated.	As per high category requirements except that:- (a) Fibre reinforced cement or aluminium sheet must not be used for roof sheeting or fascias; and (b) Aluminium must not be used for eaves linings
Roof lights	(a) rooflight penetrations and shafts must be sealed with non combustible sleeve and linings (b) A rooflight may be of metal framed thermoplastic provided that the diffuser at ceiling level is wired or toughened glass in a metal frame (c) Vents in rooflights must have a steel or bronze mesh screens with 1.8mm max aperture size	As per medium requirements, except that: (a) roof light glazing must be wired glass (Thermo plastic or toughened glass must not be used)	As per the requirements for high category attack
Roof Ventilators	All components of roof ventilators, including rotary ventilators must be of non combustible materials and ventilation openings must be protected by 1.8mm max. aperture size non corrosive steel or bronze screens.		
Gutters and downpipes	Must be constructed of non combustible materials including materials or devices to stop leaves collecting or clogging.		
Verandah and decks	Supporting posts, columns and piers and external walls must comply with previous requirements as per this table for all categories. If sheeted or tongue and grooved solid flooring is used, the flooring system must comply with previous requirements for flooring systems.		
	(a) spaced timber deck flooring (i) gaps in deck strips must not be less than 5mm (ii) the perimeter of the deck must not be enclosed (iii) The deck flooring must be separated from main building so fire will not spread	(a) spaced timber deck flooring must be fire retardant treated.	(a) as per high category except that all timber (including balustrades) must be fire retardant treated or all materials must be non combustible

NOTES: (a) Fire retardant timber must comply with requirements of AS/NZS3837. Some timber varieties naturally meet the Ignition and Heat Radiance Parameters when tested to ASTM D2898 Method B without having to be fire retardant treated.  
 (b) External timbers in a verandah patio, deck or the like are regarded as protected also if they are under a roof or similar structure that projects to a line at an angle of 30° off the vertical from the base of the wall  
 (c) Where roofing systems are fully sarked, mesh protected vents may be necessary to reduce condensation in some areas.  
 (d) Where sub floor areas are enclosed termite protection must not be compromised.

### ENERGY EFFICIENCY – BCA part 3.12

Performance provisions of the BCA part 2.6 requires that a building must have a level of thermal performance so that greenhouse gas emissions are reduced using energy efficiently. This level of thermal performance must facilitate the efficient use of energy for cooling and heating. This will be achieved by selection of materials and methods of construction of Building Fabric, External Glazing, Building sealing, Air movement and services as best suited to the particular Climatic Zone in which the building is sited. Map of Australian Climate Zones for Thermal Design can be viewed on the Australian Building Code Boards website at [www.abcb.gov.au](http://www.abcb.gov.au)

R-Value is the Thermal Resistance of a component to heat and cold movement. Thermal movement is upwards or downward through a roof or a combination of both.

THERMAL RESISTANCE: minimum TOTAL R-Value required for various climatic zones									
BUILDING COMPONENT	CLIMATE ZONE								
ROOFS	1	2 - Altitude less than 300	2 - Altitude 300m or more	3	4	5	6	7	8
Direction of heat flow	Downwards			Downwards and upwards			Upwards		
Minimum Total R-Value required	2.2	2.2	2.5	2.2	3.0	2.7	3.2	3.8	4.3

BUILDING COMPONENT	CLIMATE ZONE							
WALLS	1	2	3	4	5	6	7	8
Minimum Total R – Value required	1.4	1.4	1.7	1.4	1.7	1.9	2.8	
QLD. Variation minimum Total R-Value	1.0		n.a.	1.4		n.a.		

Special Condition apply to two storey houses

FLOORS	CLIMATE ZONES			Enclosed perimeters and heated slab floors have special requirements. Consult authorities
Suspended floors without heating and unenclosed around perimeter	1.0	1.0	2.5	

Added insulation to achieve minimum R-Values for various climate zones can be: (a) Reflective Insulation or (b) Bulk insulation or a combination of both. Reflective Insulation must be installed with not less than 20mm air space between the more reflective side and a building lining or cladding (note: cavity clearances are not to be reduced) and closely fitted against any penetration and or door/window frame, be adequately supported and overlapped to adjoining sheet not less than 150mm. Bulk insulation must be installed so that it maintains its position by not slumping and forming voids and must about other installation or building members. Care should be taken that insulation does not interfere with the safety or performance of services or fittings. Insulation as manufactured must comply with AS/NZS4859.1.

R-VALUE OF INSULATION TO BE ADDED TO BUILDING COMPONENT TO MEET TOTAL R-VALUE REQUIRED									
ROOF TYPE	ROOFS	CLIMATE ZONE							
		1,2 Below 300m AHD altitude	1,2 at or over 300m AHD	3	4	5	6	7	8
	Minimum required Total R-Value for roofs	2.2	2.5	2.2	3.0	2.7	3.2	3.8	4.3
FLAT ROOF, SKILLION ROOF AND CATHEDRAL CEILING – CEILING LINING UNDER RAFTERS									
TILED	Total R-Value of roof materials	0.4 downwards	0.4 down and up			0.40 upwards			
	Minimum R-Value of insulation to add	1.8	2.1	1.8	2.59	2.29	2.79	3.39	3.89
FLAT ROOF, SKILLION ROOF AND CATHEDRAL CEILING – CEILING ON TOP OF EXPOSED RAFTERS									
TILED	Total R-Value of roof materials	0.4 downwards	0.41 down and up			0.41 upwards			
	Minimum R-Value of insulation to add	1.79	2.09	1.79	2.59	2.29	2.79	3.39	3.89
FLAT CEILING WITH PITCHED ROOF – CAVITY ROOF SPACE									
TILED	Total R-Value of roof materials	0.7 downwards	0.35 down and up			0.35 upwards			
	Minimum R-Value of insulation to add	1.5	2.15	1.85	2.65	2.35	2.85	3.4	3.95
FLAT ROOF, SKILLION ROOF AND CATHEDRAL CEILING – CEILING LINING UNDER RAFTERS									
METAL	Total R-Value of roof materials	0.38 downwards	0.35 down and up			0.39 upwards			
	Minimum R-Value of insulation to add	1.82	2.12	1.82	2.61	2.31	2.81	3.41	3.91
FLAT ROOF, SKILLION ROOF AND CATHEDRAL CEILING – CEILING LINING OF TOP OF EXPOSED RAFTERS									
METAL	Total R-Value of roof materials	0.37 downwards	0.37 down and up			0.39 upwards			
	Minimum R-Value of insulation to add	1.83	2.13	1.83	2.61	2.31	2.81	3.41	3.91
FLAT CEILING WITH PITCHED ROOF – CAVITY ROOF SPACE									
METAL	Total R-Value of roof materials	0.5 downwards	0.4 down and up			0.4 upwards			
	Minimum R-Value of insulation to add	1.7	2.1	1.8	2.6	2.3	2.8	3.4	3.9

A roof must achieve the minimum Total R-Value specified. In Climate Zones 1,2, and 3 pitched roof material with a flat ceiling must have a Solar Absorbance value less than 0.55, RBM installed below the roof and the roof space ventilated by roof, gable, eaves or ridge vents that allow an unobstructed air flow with no dead air spaces. Vents must have a total fixed open area of not less than 1% of the ceiling area. OR not less than 2 wind driven ventilators in association with fixed vents subject to approval.

#### TYPICAL SOLAR ABSORBANCE VALUES OF COLOURED ROOFS

Slate (dark grey)	0.9			Light Grey	0.45
Red, Green	0.75	Zinc Aluminium (dull)	0.55	off white	0.35
Yellow, Buff	0.6	Galvanised steel (dull)	0.55	Light Cream	0.3

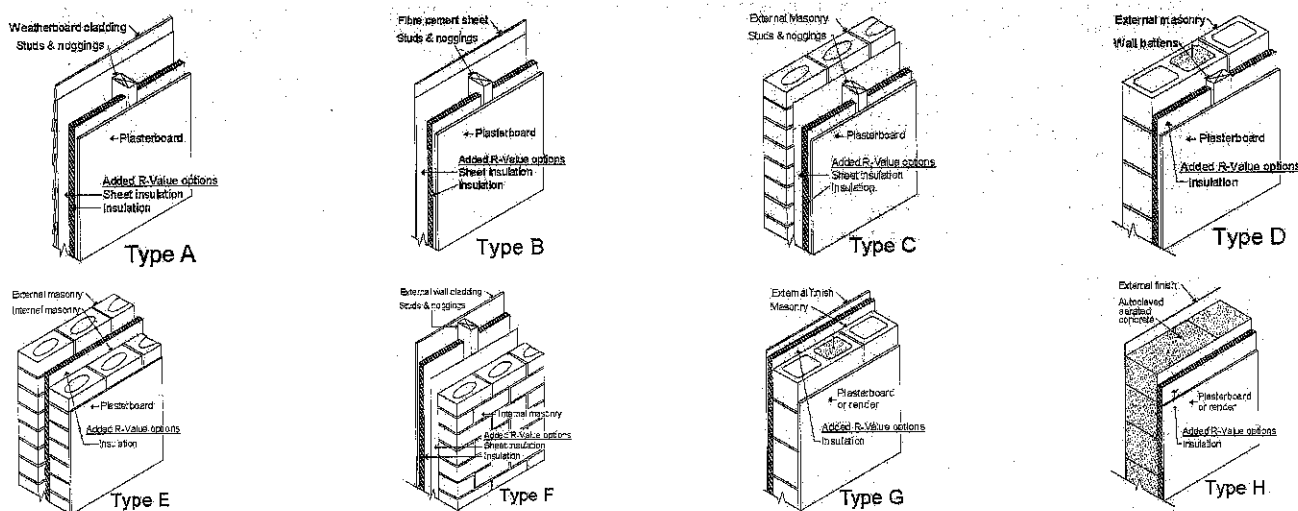


## EXTERNAL WALLS

An external wall must achieve the minimum Total R-Value for the relevant Climate Zone or in Climate Zones 1,2 and 3 to be shaded by a verandah, balcony, carport eaves and gutter or the like. The horizontal projection from the external face of the building must be not less than one quarter of the overall height of the wall measured from the internal floor vertically to the underside of the projection. This applies to all stories. **NOTE:** In Climate Zones 4,5,6,7 and 8 all walls must achieve a surface density of not less than 220 Kg/m<sup>2</sup> and in Climate Zone 6 be constructed on a flooring system that is in direct contact of ground i.e. concrete slab or in Climate Zones 6,7, and 8 incorporate insulation with an R-Value not less than 1.0 to the edges and underneath the slab. These requirements to not apply to South facing walls in Climate Zones 1,2 and 3 south of latitude 20° south

R-VALUE OF INSULATION TO BE ADDED TO BUILDING COMPONENT TO MEET TOTAL R-VALUE REQUIRED					
TYPICAL WALL CONSTRUCTION	R - VALUES	CLIMATE ZONE			
		1,2,3,5	4,6	7	8
	Minimum required Total R – Value for Walls	1.4	1.7	1.9	2.8
(A) Weatherboard: minimum 70mm Timber Frame	Total R-Value of Wall Materials	0.47			
	Minimum R-Value of insulation to add	0.93	1.23	1.43	2.33
(B) Cement or Metal Sheet 70mm timber frame	Total R-Value of Wall Materials	0.4			
	Minimum R-Value of insulation to add	1.0	1.3	1.5	2.4
(C) Clay Masonry Veneer minimum 110mm Veneer	Total R-Value of Wall Materials	0.54			
	Minimum R-Value of insulation to add	0.86	1.16	1.36	2.26
(D) Concrete Block Masonry minimum 140mm Masonry	Total R-Value of Wall Materials	0.52			
	Minimum R-Value of insulation to add	0.88	1.18	1.38	2.28
(E) Cavity Clay Masonry 110 ext. veneer, 90mm internal (min)	Total R-Value of Wall Materials	0.67			
	Minimum R-Value of insulation to add	0.73	See note above		
(F) External insulated Clay Masonry Minimum 110 mm masonry	Total R-Value of Wall Materials	0.5			
	Minimum R-Value of insulation to add	0.9	1.2	1.4	2.3
(G) External insulated Corner Masonry minimum 140mm thick	Total R-Value of Wall Materials	0.48			
	Minimum R-Value of insulation to add	0.92	1.22	1.42	2.32
(H) Auto Claved Aerated Masonry minimum 200mm thick	Total R-Value of Wall Materials	1.73			
	Minimum R-Value of insulation to add	Nil	Nil	Nil	1.07

See diagrams next page for wall construction types A to H.



## ENERGY EFFICIENT EXTERNAL GLAZING – BCA part 3.12.2

This part of the BCA applies to Class 1 buildings and class 10a buildings with a conditioned space.

**Acceptable Construction Practice:** The effective glazing area of a building must not exceed the percentages of the building area as per BCA Table 3.12.2.1. This table defines the maximum effective glazing area (Total glazed area of all windows in a storey) as a percentage of the total floor area of a storey. The glazing area limits listed provide only the minimal protection against overheating (heat flow into the building via the glazing) and heat loss (through the glazing) in cold conditions. The heat loss or gain can be controlled by siting of windows, shading, use of protective films, double glazing with air or gas fill in a sealed unit, and size of windows. Window manufacturers can supply windows to suit the requirements for the site Climate Zone and the window construction depends on shading of the glazed area by verandahs, balcony, fixed canopies etc. or a shading device. A shading device must restrict at least 80% of the solar radiation when in use and can be a shutter, blind, vertical or horizontal screen with blades, battens, slats etc. and be adjustable by the building occupants. Where necessary the nomination of glazing types, window locations, shading etc. should be carried out by an approved specialist.

NSW requirements to comply with BASIX Specifications are selectable in Nathers 2.32A

## CARPENTER

### GENERALLY:

All timber shall comply with the appropriate standard as listed below. Timber sizes to comply with AS1170.2 for serviceability and Design Wind Gust Velocities (permissible stress) of 33 M/s minimum. Substitution of some members may be required for higher Gust Wind Velocities and advice of local authorities Building Department or Structural Engineer should be sought as whether design to W41N or higher is required.

### STRESS GRADES:

Visually Stress Graded Timber: Timbers whose species or place of growth is known may be visually graded for quality in accordance AS 2082.

Mechanically Stress Graded Timber of required stress grade according to AS/NZS 1748 may be used regardless of species.

Seasoned Timbers: All timber shall be regarded as seasoned only if its moisture content does not exceed 18 per cent.

### FRAMING : BCA part 3.4.3.

Timber sizes in this specification are based on AS1684.4 Simplified Non-cyclonic areas with restrictions as follows: Maximum wind classification N2 (33m/s) - maximum roof pitch 30° - maximum building width 12.0m - maximum rafter overhang 750mm - maximum wall height at ext. walls, floor to ceiling 2400mm. The sizes are for information only and should not be used for construction. All design for a structure within these limits should be carried out by reference to AS1684.4

**NOTE:** for wind classification N3 (W41N) and N4 (W50N) Non-cyclonic areas with building widths 12.0m and up to 16.0m and with roof slopes exceeding 30° and up to 35°, design according to AS1684.2 is required

### FLOOR FRAMING:

Ground floor timbers shall be only of hardwood, cypress pine or pressure treated Radiata or Canada Pine below a height of 300mm above finished ground level and must not be built into brickwork. Subfloor ventilation shall conform to BCA part 3.4.1. In Bushfire Prone Areas special conditions apply.

### ANT CAPS:

To all brickwork and piers, at the level of underside of floorbearers, and capping of 0.5mm gauge galvanised steel or other approved metal is to be set, projecting 38mm beyond the internal faces of all brickwork and turned down at a 45 degree angle, lapped 13mm and soldered or crimped at all joints and corners so as to provide a continuous and effective barrier against termites throughout the length of the material. Whole of house protection against subterranean termite attack shall be installed in accordance with AS 3660.1

### BEARERS:

Bearers should be laid in straight and normally parallel lines with top surfaces arranged to give level bedding for joists. Unless specifically noted as otherwise, bearers shall be located directly under all loadbearing walls, except where walls are located at right angles to line of bearers, in which case piers or other approved supports shall be provided for bearers at points where they cross under such walls. Bearers having minor excesses in depth shall be brought to required level by checking out underside over supports. Packing is to be avoided but where there is no alternative, corrosion resistant and incompressible sheet material over full area of contact may be permitted. Bearers having not more than permitted spring shall be placed so that they tend to straighten under loading. Joints in bearers, unless specifically detailed otherwise, shall be made only at points of support on which adequate bearing for both members can be provided and the joint shall be secured by means of bolting or spiking against displacement or separation.

### JOISTS:

Joists shall be laid over bearers in straight and normally parallel lines with top surfaces set accurately to a common level to receive flooring. Underside of joists having minor excesses in depth to be notched out over bearers to obtain required common level. Packing may be employed if unavoidable similar to that for bearers, such packing to be securely fixed. Joists having not more than the permitted amount of spring shall be laid so that they tend to straighten under loading. Joints, unless specifically detailed, shall be made only over bearers or other supports. Joints occurring in joists which parallel and support wallplates shall be made at points of support which provide adequate bearing for both ends which shall be butted or scarfed to maintain a straight line. Posts shall be securely skew nailed, from both sides to bearers at all points of support.



Where floor joists abut solid masonry or concrete walls, they shall be supported on timber wall plates or bearers carried on walling, off-sets or attached piers; where such method is not practicable and height of floor is more than 1800mm above ground the ends of joists or bearers may bear in pockets formed in the wall which allow at least 12mm clear air space at sides and ends of members and provide solid bearing at least 100mm in depth. Where the unsupported span of deep joists exceed 2700mm, 50mm x 50mm herringbone strutting or solid blocking of 25mm min thickness shall be provided in continuous rows between joists at not more than 1800mm centres.

#### STUDS:

Housings or notchings to accept bracing, noggings, trimmers, lintels etc. may be made in any face of stud, providing that their depth does not exceed 10mm and the studs are designed as notched studs. Notches into stud depth are to be max. 20mm for diagonal cut in bracing only and providing also that where notchings or housings are made on opposite faces of the same stud, they shall be spaced not less than twelve times the width of the stud apart.

A stud to the side of openings may however have material equal to half its depth removed over an area sufficient to accept a head or lintel member, providing always that the head or lintel member continues through and is housed into the next stud adjoining the jamb stud.

Studs to sides of openings and studs supporting concentrated loads shall not be cut or notched except as permitted above. Junctions of loadbearing walls shall be framed with three studs. Well blocked and spiked together or with a solid post equal to the depths of intersecting walls.

In brick veneer construction framing of wall junctions with two studs is acceptable providing that such studs are joined at not less than 800mm centres along their height by securely spiking blocking pieces exceeding 200mm in length. Where corners are interrupted by windows the structural corner mullion shall be not less than 100mm x 100mm timber, or equivalent steel section.

Studs to side of openings shall have a depth equal to that of the common stud, except that double studs may be used providing that their total thickness is not less than the required single stud and that the studs are well spiked together. All notchings in studs shall comply with AS1684.4 table 6.1.

#### WALL PLATES:

Wall plates shall be in long lengths to each panel of walling and shall be not less than the size or lower in grade than common studs used in the particular wall section. Trenching shall be max. 3mm deep unless the design uses span tables based on remaining depth. Where plates are machined gauged to a uniform thickness trenching may be omitted. Where due to the use of different centre-to-centre spacing for studs and floor joists or for any other reason the points of support offered by joists, blocking pieces or concrete floors is not vertically over studs then a 75mm thick top plate shall be used in combinations as shown in AS1684.

Where roof trusses supporting tiled roofs are placed more than 50mm from wall studs, minimum thickness of top plates shall be 75mm unless otherwise specified hereunder. Where top plates are required to bear a major load arising from a roof strut, strutting beam, long span deep joists or the like, such loading shall be only at points immediately above a supporting stud, post or column. Where this is not practicable plate is to be adequately stiffened and the load distributed to adjoining studs by means of super imposed blocking pieces, close noggings from below or other approved means.

Where bottom plates are required to carry a stud to the side of an opening or a stud bearing a major load mentioned above the plates shall be supported by a joist, a blocking piece or a concrete floor slab directly beneath the point or points at which such studs are located.

#### EAVES BEAMS AND VERANDAH PLATES:

Eaves beams and verandah plates shall be provided to support rafters or trusses over full height openings or recesses in walls or over verandahs or porches covered by main roof structure. Any reduction in nominal size through mill dressing or scalloping shall be allowed for so that the minimum size listed is not reduced. The ends of eaves beams and verandah plates that are supported on stud wall shall be carried by studs or stud groups as for heads for equivalent spans. End fixing shall provide resistance to uplift or displacement. Verandah Posts to be not less than 100mm x 100mm in timber F11. If supporting roof loads they shall be as per AS1684.2.

#### ROOF FRAMING:

Pitch of roof is to be as shown on plans and length of rafter to longest ridge to be gauged to suit full tile courses.

Roof timbers are to be seated on timber wall frames, positioned so that they are adequately supported. Where supported on masonry walling, they are to be attached to timber wall plates of minimum dimensions 75mm x 38mm unless anchored directly to masonry. Wall plates to be secured to masonry as previously specified under bricklayer, where straps are used such straps are to be drawn snugly over and secured to top of plate. See bricklayer clauses for straps locations.

**ROOFING BATTENS:** Supporting roofing only. (Note: roofing battens are not suitable for the safe support of workers prior to fixing roof cladding). Battens should be continuous over a minimum of two spans and their design to suit rafter/truss spacing and batten spacing must be in accordance with AS1684 for the allowable roof mass.

#### CEILING JOISTS:

Joists shall be in single lengths where practicable, positioned beside and in direction of main rafters where practicable.

Secure to hangers with 35mm x 32mm timber cleats, MGPI0 (seas.), strapping of 25mm x 1.7mm galvanised iron or equivalent fasteners. Provide ceiling joists as shown in tables or AS1684.4 supported from hanging beams so that their span does not exceed 2.4m where joist is continuous over two spans, otherwise reduce span to 2.1m. Provide ceiling battens 38mm x 25mm at 450 centres in timber grade F4 or better where required.

#### HANGING BEAMS:

End bearing of hanging beams shall be the full width of wall plates and they shall be positioned either directly over a stud or their load adequately distributed to stud by intermediate blocking or local reinforcement of wall plate. Where length of hanger exceeds 4.8mm the hanger is to be supported by a beam as for Strutting Beams and the size of hanger is to be governed by new span. (Roof not to be strutted off hangers or beam supporting hanger).

#### RIDGE BOARDS:

Ridge boards used in coupled roofs of simple construction, where they are not required to be strutted or propped and where opposing pairs of rafters are not separated by more than their own thickness at either side of their ridge junction, shall be 50mm greater in depth than rafters x 19mm thick. Otherwise they shall be 50 greater in depth and 35mm thick.

#### VALLEY BOARDS:

Shall not be less than 19mm thick and of sufficient width to adequately support valley gutters.

#### UNDERPURLINS:

Underpurlins shall be in single lengths where possible and in straight runs at right angles to direction of rafters. Where splices cannot be avoided, joint shall be halved, lapped and spiked together at point of support. Ends of underpurlins shall not project (cantilever) beyond a support by more than 25 per cent of span distance of normal supports.

#### STRUTTING BEAMS:

Strutting beams may extend in any direction in roof space so long as their ends are supported on load bearing walls. Where supported by stud walling the beams shall land either directly above a stud of adequate size or their load shall be distributed over two or more studs by blocking or reinforcement of wall top plates. An initial clearance of 25mm shall be provided between underside of beams and top of ceiling joists. Loading of strutting beams over openings shall be avoided unless lintel above opening is sized to carry additional load.

#### MANHOLE:

Trim as required between ceiling joists for manhole 600 x 400mm minimum size. Line the opening and provide a suitable cover.

#### EAVES:

Project rafters to give a soffit at eaves of directed width and fix 200 x 25mm timber fascia or colourbond steel as directed. Where eaves are boxed in, soffit bearers (sprockets) of 50 x 38mm shall be provided, spaced to suit eaves lining and attached directly to outer ends of rafters. In brick veneer buildings the inner ends of soffit bearers shall be fixed to the frame so as to be 20mm or more clear above top of brickwork at time of construction.

In solid masonry buildings the inner ends of soffit bearers shall be located by means of 50 x 25mm hangers from rafters or wall plates.

In Bushfire Prone Areas fascias and eaves linings have special requirements.

#### PREFABRICATED TIMBER WALL FRAMES AND TRUSSES - BCA part 3.4.3

Where prefabricated frames and/or trusses are required for construction of the building, the manufacturers certification of construction according to AS1684.2 or AS1684.4 for the building on the particular site must be obtained. Where certification is attached to truss or framing members the certification labels shall be left in place after erection for approval by the appropriate Building Surveyor, P.C.A., or Council Authority. Timber trusses purpose manufactured for this project and engineer designed according to AS1720.1 are to be spaced at centres as directed, erected and fixed in accordance with the manufacturers instructions as approved. Support only on ends or designed bearing points. Where spacing of trusses exceeds 600mm centres provide intermediate ceiling joists in 100mm x 38mm hardwood (in F7) or 100mm x 50mm (in F8) supported from hangers at maximum of 2100 centres. Hanging beams shall be supported not more than 600mm from bottom chord panel points unless hangers are provided to nearest top chord panel points.

### MASSSES OF TYPICAL ROOF CONSTRUCTION

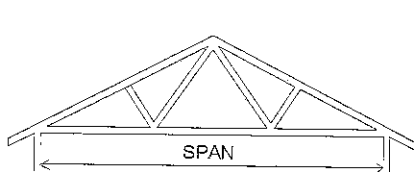
MASS OF ROOF	MATERIAL
10 kg/m <sup>2</sup>	Steel sheet roofing 0.50mm thick and battens
20 kg/m <sup>2</sup>	Metal sheet tiles or medium gauge steel sheet roofing, battens, 12mm softwood ceiling lining, sarking and lightweight insulation
30 kg/m <sup>2</sup>	Steel sheet roofing 0.775mm thick, 13mm plaster ceiling, roof and ceiling battens, sarking and lightweight insulation
40 kg/m <sup>2</sup>	Steel sheet roofing 0.75 thick, battens, graded purlins and high density fibreboard ceiling lining
60 kg/m <sup>2</sup>	Terracotta or concrete tiles and battens
75 kg/m <sup>2</sup>	Terracotta or concrete tiles, roofing and ceiling battens, 10mm plasterboard, sarking and insulation
90 kg/m <sup>2</sup>	Terracotta or concrete tiles, purlins, roofing and ceiling battens, 19mm hardwood ceiling lining, sarking and insulation

#### DEFINITIONS:

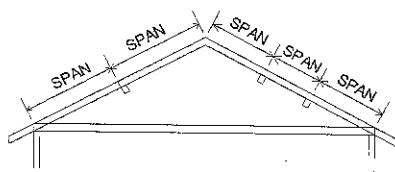
Spacing - Where this term is used the measurement shall be the centre-to-centre distance between members.

Span - Where this term is used the measurement shall be the face-to-face distance between members.

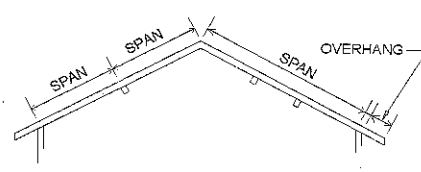
Reference is made to effective roof spans in the tables - the span is an indicator of the mass of roof being carried by the outer wall members.



TRUSSED ROOF



COUPLED ROOF WITH UNDERPURLINS



ROOF WITH LOADBEARING RIDGEBEAMS AND WALLS



# TABLES OF TIMBER SIZES

## SINGLE STOREY TILED ROOF

## SINGLE STOREY SHEET ROOF

Framing Member Stud Height 2400	Span	Unseasoned		Seasoned		Unseasoned		Seasoned	
		F8	F5	MGP10	MGP12	F8	F5	MGP10	MGP12
<b>BEARERS-</b>									
Strutted roof - max. rafter span 3000	1500	100 x 75	2/120 x 35	2/120 x 35	2/90 x 35	100 x 75	2/90 x 35	2/90 x 35	2/90 x 35
@ 1800 spacing continuous over two or more spans-load bearing.	1800	125 x 75	2/140 x 35	2/120 x 35	2/90 x 35	125 x 75	2/120 x 35	2/120 x 35	2/90 x 35
Trussed Roof 9.0 Span, External	1500	175 x 75	2/170 x 35	2/140 x 35	2/140 x 35	125 x 75	2/120 x 35	2/120 x 35	2/90 x 35
Wall 1800 spacing continuous over two or more spans-load bearing.	1800	150 x 75	2/190 x 35	2/190 x 35	2/140 x 35	200 x 75	2/190 x 35	2/190 x 35	2/170 x 35
<b>JOISTS-</b>									
450 spacing-continuous over two or more spans	1800	125 x 38	120 x 45	120 x 35	120 x 35	125 x 38	120 x 45	120 x 35	120 x 35
<b>WALL PLATES-</b>									
Trenched for studs max. 3 @ up to 600 centres									
Raftered roof 3000 Span									
Top Plates		2/50 x 75	2/45 x 70	2/45 x 70	45 x 70	50 x 75	2/45 x 70	2/35 x 70	45 x 70
Bottom Plates		50 x 75	2/45 x 70	2/45 x 70	45 x 70	50 x 75	2/45 x 70	2/35 x 70	45 x 70
Trussed Roof 9000 Span									
Top Plates		3/50 x 75	-----	3/45 x 70	2/45 x 70	2/50 x 75	3/45 x 70	2/45 x 70	2/45 x 70
Bottom Plates		3/50 x 75	-----	3/45 x 70	2/45 x 70	2/50 x 75	3/45 x 70	2/45 x 70	2/45 x 70
<b>JAMB STUDS- (70/75mm frame)</b>									
Truss or Rafter Span (9000 max.)	900	2/75 x 38	2/70 x 45	2/70 x 35	70 x 45	75 x 38	2/70 x 35	70 x 45	70 x 35
Single storey or upper storey ext. or internal load bearing walls	1800	2/75 x 50	3/70 x 45	2/70 x 45	2/70 x 35	2/75 x 38	2/70 x 45	2/70 x 45	70 x 45
	2400	3/75 x 38	4/70 x 45	3/70 x 35	2/70 x 45	2/75 x 38	3/70 x 45	2/70 x 45	2/70 x 35
	3000	3/75 x 50	4/70 x 45	3/70 x 45	2/70 x 45	2/75 x 50	3/70 x 45	2/70 x 45	270 x 35
<b>STUDS under concentrated loading</b>									
@ 600 centres notched up to 20 for bracing Roof area 15m <sup>2</sup>		3/75 x 50	-----	3/70 x 45	2/70 x 45	2/75 x 50	2/70 x 45	2/70 x 35	70 x 45
<b>LINTELS*-</b>									
Raftered roof 3000 Span	900	75 x 75	90 x 35	90 x 35	90 x 35	75 x 50	90 x 35	90 x 35	90 x 35
	1200	100 x 50	2/90 x 35	90 x 45	90 x 35	100 x 38	120 x 35	90 x 45	90 x 35
	1500	125 x 75	120 x 45	2/90 x 35	2/90 x 35	100 x 75	120 x 45	90 x 45	90 x 35
	1800	150 x 75	2/120 x 45	2/120 x 35	120 x 45	125 x 50	2/90 x 45	2/90 x 35	90 x 45
	2100	175 x 75	190 x 35	170 x 35	2/120 x 45	125 x 75	2/120 x 35	120 x 45	2/90 x 35
	2400	200 x 75	2/170 x 45	2/140 x 45	2/140 x 35	150 x 75	2/120 x 45	2/120 x 35	120 x 45
	3000	2/50 x 75	2/240 x 35	2/190 x 45	2/170 x 45	200 x 75	2/170 x 35	170 x 45	2/140 x 35
	3600	300 x 75	2/290 x 35	2/240 x 45	2/24 x 35	250 x 75	2/240 x 35	2/190 x 45	2/170 x 45
Trussed Roof 9000 Span	900	100 x 75	2/90 x 35	90 x 45	90 x 35	100 x 50	2/90 x 35	90 x 45	90 x 35
	1200	125 x 75	2/120 x 35	120 x 45	2/90 x 45	125 x 50	140 x 45	2/90 x 45	2/90 x 35
	1500	175 x 75	2/140 x 45	2/120 x 45	2/120 x 45	150 x 50	2/120 x 35	2/140 x 35	2/90 x 45
	1800	200 x 75	2/170 x 45	2/170 x 35	2/140 x 35	150 x 75	2/140 x 35	2/120 x 35	2/120 x 35
	2100	225 x 75	2/240 x 35	2/170 x 45	2/170 x 35	175 x 75	2/170 x 35	170 x 45	2/120 x 45
	2400	275 x 75	2/240 x 35	2/240 x 35	2/190 x 45	200 x 75	2/170 x 45	2/170 x 35	2/140 x 45
	3000	-----	2/290 x 45	2/290 x 35	2/240 x 45	250 x 75	2/240 x 35	2/190 x 45	2/190 x 35
	3600	-----	-----	-----	2/290 x 45	-----	2/290 x 45	2/290 x 35	2/240 x 45

## SINGLE STOREY TILED ROOF

Framing Member Stud Height 2400	Span	Unseasoned				Seasoned		
		F5	F7	F8	F11	F5	MGP10	MGP12
<b>CEILING JOISTS</b> at 600 centres over two or more max. 2400 Spans		125 x 38	125 x 38	100 x 50	100 x 50	120 x 35	120 x 35	90 x 45
<b>HANGING BEAMS</b> @ max. 2400 centres	2400	100 x 50	150 x 38	150 x 38	125 x 50	120 x 45	120 x 45	120 x 35
	3000	200 x 38	175 x 50	175 x 50	175 x 38	170 x 35	140 x 45	140 x 35
	3600	225 x 50	225 x 38	200 x 50	200 x 50	190 x 45	170 x 45	170 x 35
	4200	275 x 50	250 x 50	250 x 50	225 x 50	240 x 35	190 x 45	190 x 35
	4800	300 x 50	300 x 50	275 x 50	275 x 50	290 x 35	240 x 35	240 x 35
<b>STRUTTING BEAMS</b> @ 2400 centres, max. rafter span 3000	2400	250 x 75	250 x 75	225 x 75	225 x 75	2/240 x 35	2/190 x 45	2/170 x 45
	3000	300 x 75	300 x 75	275 x 75	250 x 75	2/240 x 45	2/240 x 35	2/190 x 45
	3600	-----	-----	300 x 75	300 x 75	2/290 x 35	2/240 x 45	2/240 x 35
<b>RAFTERS</b> @ 600 centres - roof mass 60 kg/m <sup>2</sup> continuous over two or more spans.	3000	150 x 38	125 x 50	125 x 38	125 x 38	120 x 35	120 x 35	90 x 45
<b>Overhang</b>		750	750	750	750	500	550	750
<b>UNDERPURLINS CONTINUOUS SPAN.</b> Max.rafter span 3000. Max. strut spacing 2400		-----	150 x 75	150 x 75	150 x 75	2/140 x 45	2/120 x 45	2/120 x 35
<b>COLLAR TIES</b> to each alternate pair of rafters halved and shouldered	up to 4200 over 4200	75 x 50	75 x 50	75 x 50	75 x 50	70 x 45	70 x 35	70 x 35
		100 x 50	100 x 50	100 x 50	100 x 50	90 x 45	90 x 35	90 x 35

## NOTES:

1. Cantilevers shall not exceed 25% of the allowable span, except that allowable offsets and cantilevers of load bearing walls at right angles to bearers shall be as per Table 4.1 of AS1684.4
2. Multiple members shall be vertically nail laminated according to Clause 2.3 of AS1684.4
3. Edge distances for some sheet bracing materials may require a minimum plate depth and or minimum stud breadth of 45mm for joining sheets
4. For openings greater than 900mm a secondary jamb stud may be required to support a lintel as per tables

## SINGLE STOREY SHEET ROOF

Framing Member Stud Height 2400	Span	Unseasoned				Seasoned		
		F5	F7	F8	F11	F5	MGP10	MGP12
<b>STRUTTING BEAMS</b> @ 2400 centres max. rafter span 3000 under purlin span 2400	2400	200 x 75	200 x 75	175 x 75	175 x 75	2/170 x 35	2/140 x 45	2/140 x 35
	3000	225 x 75	225 x 75	225 x 75	200 x 75	2/190 x 35	2/170 x 45	2/170 x 35
	3600	275 x 75	250 x 75	250 x 75	225 x 75	2/240 x 35	2/190 x 45	2/170 x 45
<b>RAFTERS</b> @ 900 centres roof mass 20kg/m <sup>2</sup> continuous over two or more spans	3000	125 x 38	125 x 38	100 x 50	100 x 38	120 x 35	90 x 45	90 x 35
<b>Overhang</b>		500	650	700	750	450	450	500
<b>UNDERPURLINS CONTINUOUS SPAN</b> Max.rafter span 3000. Max. strut spacing 2400		125 x 75	125 x 75	125 x 75	100 x 75	2/90 x 35	2/90 x 45	2/90 x 35

Where top plates are required to bear a load arising from the placement of a roof strut, such strut shall be located only at a point immediately above a supporting stud unless the top plate is adequately stiffened by means of an intermediate blocking piece. Where bottom plates are required to carry a stud to the side an opening or a stud bearing a major load, the plates shall be supported by a joist or intermediate blocking piece directly beneath that stud. Double studs to be well spiked to ensure their action as one structural member.

The above tables refer to size of studs notched up to 20 for bracing. For sizes of studs not notched refer to AS1684. For doorway openings up to 900 wide where jamb linings or other comparable stiffening are used, common studs are permissible.

Lintels over 175 deep to be seasoned or a low shrinkage timber species used.  
HIPS  
- Depth of Common Rafter + 50 x 13 less than Rafter thickness  
RIDGE BOARDS  
- Depth of Common Rafter + 50 x 25 thick



# VALLEY RAFTERS

- Depth of Common Rafter + 50 x 38 thick

# CEILING JOISTS, HANGING BEAMS, VALLEY BOARDS, COLLAR TIE - As for tiled roofs

For floor joists at 450 centres over single 1800 spans, 100 x 50 unseasoned F8 or F11 can be used. For bearers and joists of other stress grades and spans refer to AS 1684.4 or AS1684.2.

Direct load in relation to top plates is where rafters or trusses are placed within 1.5 times the thickness of the plate from the stud; random load is where the placement of rafters or trusses exceeds that limit. Where points of fixing of studs on bottom wall plates occurs directly above points of support provided by joists, blocking pieces or by concrete floors, bottom wall plate may be as shown above for direct load.

# GABLES OR VERGES:

Where open gables or verges are indicated on plans such are to be formed as extensions to main roof with rafters supported on cantilever extensions of ridge boards, underpurlins and wall plates. Extension to wall plates shall be same size as underpurlin. Alternatively the overhang shall be framed with jack rafters set at right angles to and framed into the common rafters.

Where boxed gables are indicated, such gables shall be framed as above but with 75 x 50mm gable studs halved to side of verge rafters at centres to suit lining material and having 75 x 38mm soffit bearers fixed between the lower ends of gable studs and the structural walls as for boxed eaves. Horizontal location for gable studs and fixing for lower edges of gable linings shall be provided by a 75 x 38mm plate-on-edge let into the face of gable stud level with the soffit bearers. Boxed gables shall be securely strutted from the structural wall plate to support the weight of the gable framing and the roof covering.

# UNCOUPLED ROOF WITH LOADBEARING RIDGEBEAMS AND/OR WALLS

Rafters supporting roof and ceiling loads - non coupled cathedral roof single span

Rafter Span									
Rafter Spacing									
Unseasoned									
F5									
F7									
F8									
F11									
Seasoned									
F5									
MGP10									
MGP12									
F17									
Tiled Roof Ceiled									
3000	Overhang	600	200 x 38 750	200 x 50 750	175 x 50 750	175 x 50 750	175 x 45 750	140 x 45 750	140 x 35 750
3600	Overhang	600	250 x 50 750	225 x 50 750	225 x 50 750	200 x 50 750	240 x 35 750	170 x 45 750	170 x 35 750
4200	Overhang	600	275 x 50 750	275 x 50 750	250 x 50 750	250 x 50 750	240 x 45 750	240 x 35 750	190 x 45 750
4800	Overhang	600	275 x 75 750	275 x 75 750	300 x 50 750	275 x 50 750	290 x 35 750	240 x 45 750	240 x 35 750
5400	Overhang	600	----- 750	300 x 75 750	300 x 75 750	275 x 75 750	----- 750	290 x 35 750	290 x 35 750
Sheet Roof Ceiled									
3000	Overhang	900	175 x 50 750	175 x 50 750	175 x 50 750	150 x 50 750	140 x 45 750	140 x 35 750	120 x 45 750
3600	Overhang	900	225 x 50 750	200 x 50 750	200 x 50 750	200 x 50 750	170 x 45 750	170 x 35 750	140 x 45 750
4200	Overhang	900	250 x 50 750	250 x 50 750	225 x 50 750	225 x 50 750	240 x 35 750	190 x 45 750	170 x 45 750
4800	Overhang	900	300 x 50 750	275 x 50 750	275 x 50 750	250 x 50 750	240 x 45 750	240 x 35 750	190 x 45 750
5400	Overhang	900	300 x 75 750	275 x 75 750	300 x 50 750	275 x 50 750	290 x 35 750	240 x 45 750	240 x 35 750

# NOTE:

- Allowable overhangs are based on a maximum birdsmouth depth of D/3. Where rafters are not birdsmouthed, the allowable overhang may be increased to 30% of the single span for that member, provided that the overhang does not exceed 50% of the actual backspan.
- Overhang limits are only applicable where rafter ends are supported by a structural fascia.

# TABLE OF TIMBER SIZES LOWER STOREY OF TWO STOREY CONSTRUCTION - TILED ROOF

TABLE 1 - MEMBER SIZES - LOWER STOREY OF TWO STOREY CONSTRUCTION - TILED ROOF								
Framing Member Stud Height 2400	Span	Unseasoned				Seasoned		
		F5	F7	F8	F11	F5	MGP10	MGP12
<b>BEARERS</b>								
Strutted Roof - max. rafter span 3000, bearers @ 1800 spacing continuous over two or more spans - load bearing.	1200 1800	125 X 75 200 X 75	125 X 75 175 X 75	100 X 75 150 X 75	100 x 75 150 X 75	2/120 X 35 2/170 X 45	2/90 X 45 2/140 X 45	2/90 X 35 2/120 X 45
Trussed Roof - 9000 span. Bearers @ 1800 spacing continuous over two or more spans - load bearing	1200 1800	150 x 75 225 x 75	150 x 75 200 x 75	125 x 75 175 x 75	125 x 75 175 x 75	2/120 x 45 2/190 x 45	2/120 x 45 2/170 x 45	2/90 x 45 2/140 x 45
<b>JOISTS TO GROUND FLOOR</b>								
			Refer to	Single	Storey	Tables		
<b>WALL PLATES - Not trenched, external load bearing walls - Joists at 600 centres</b>								
RAFTER OR TRUSS SPAN 3000 (70/75mm frame)	B/plates T/plates	2/50 x 75 3/50 x 75	2/50 x 75 2/50 x 75	2/50 x 75 2/50 x 75	2/50 x 75 2/50 x 75	3/45 x 70 3/45 x 70	2/45 x 70 2/45 x 70	2/35 x 70 2/35 x 70
9000	B/plates T/plates	3/50 x 75 -----	3/50 x 75 3/50 x 75	3/50 x 75 3/50 x 75	2/50 x 75 2/50 x 75	----- -----	3/45 x 70 3/45 x 70	3/45 x 70 2/45 x 70
<b>JAMB STUDS - (70/75mm frame)</b>								
Truss or Rafter Span (9000 max)	900 1800	3/75 x 50 4/75 x 50	3/75 x 38 4/75 x 38	2/75 x 50 3/75 x 50	2/75 x 38 3/75 x 38	3/70 x 45 4/70 x 45	2/70 x 35 2/70 x 45	2/70 x 35 2/70 x 45
Opening span	2400 3000	----- -----	4/75 x 50 -----	4/75 x 50 4/75 x 50	3/75 x 50 4/75 x 50	----- -----	3/70 x 45 4/70 x 35	3/70 x 35 3/70 x 45
<b>COMMON STUDS - @ 600 centres notched up to 20mm for bracing</b>								
RAFTER OR TRUSS SPAN 3000 9000		75 x 50 2/75 x 38	75 x 50 2/75 x 38	75 x 38 2/75 x 38	75 x 38 75 x 50	2/70 x 35 2/70 x 35	70 x 35 70 x 45	70 x 35 70 x 35
<b>LINTELS</b>								
Raftered roof 3000 span	900 1200 1500 1800 2400 3000	100 x 75 150 x 50 175 x 75 200 x 75 275 x 75 -----	100 x 75 125 x 50 175 x 75 200 x 75 250 x 75 -----	100 x 50 125 x 75 150 x 75 175 x 75 250 x 75 300 x 75	100 x 50 125 x 50 150 x 75 175 x 75 225 x 75 300 x 75	90 x 45 2/120 x 35 2/140 x 35 2/170 x 35 2/240 x 35 2/290 x 35	90 x 35 2/90 x 45 2/120 x 35 2/140 x 45 2/190 x 45 2/240 x 45	90 x 35 2/90 x 35 2/120 x 35 2/140 x 35 2/170 x 45 2/240 x 35
Trussed Roof 9000 span	900 1200 1500 1800 2400 3000	125 x 50 150 x 75 200 x 75 225 x 75 300 x 75 -----	125 x 50 150 x 75 200 x 75 225 x 75 300 x 75 -----	100 x 75 150 x 75 175 x 75 225 x 75 275 x 75 -----	100 x 75 150 x 50 175 x 75 200 x 75 275 x 75 -----	2/90 x 35 2/120 x 45 2/170 x 35 2/190 x 45 2/240 x 45 -----	90 x 45 2/120 x 35 2/140 x 35 2/170 x 35 2/240 x 45 2/290 x 45	90 x 35 120 x 45 2/120 x 45 2/170 x 35 2/240 x 35 2/290 x 45
NOTES: Member sizes given in the above table are for standard conditions of use and loading. For other conditions, consult the relevant code of practice.								

NOTES: Member sizes shown in the above table are for structures with an upper floor joist maximum span of 4800mm. (for greater spans see AS1684.2)

Direct load in relation to top plates is where first floor joists are placed within 1.5 times the thickness of the plate from the stud, random load is where placement of the joists exceeds that limit. Direct load in relation to bottom plates is where stud bearing occurs directly above points of support provided by joists, blocking pieces, or by concrete floors. Refer to single storey table for upper floor wall framing and roof. For doorway openings up to 900 wide where jamb linings or other comparable stiffenings are used common studs are permissible.

NOTE: Sizes shown in tables in this specification are intended only as a guide to the size and stress grade for a particular member of a building frame. All timber framing should be designed and constructed in accordance with AS1684.2 and/or AS1684.4

Sizes in this specification are based on AS1684.4 Simplified Non-cyclonic areas, with restrictions as follows:-

- Maximum wind classification N2 (33m/s)
- Maximum Roof pitch 30°
- Maximum building width 12.0m

Where a building exceeds the restrictions as listed above, design to comply with AS1684.2 will allow wind speeds up to N4 (50 m/s), roof slopes up to 35° and building widths up to 16.0m.

# PERMANENT BRACING OF WALLS AS PER AS1684.2 Section 8 - BCA parts 3.4.3.8, 3.4.3.11, 3.4.3.19, 3.4.3.20 and 3.4.3.21

This section 'Permanent Bracing of walls as per AS1684 shows typical bracing applicable to timber frame construction as explanatory information only.

TYPE 'A' UNITS (Design racking resistance of 2kN). The following bracing units are deemed satisfactory type 'A' braces.

- A pair of diagonal timber or metal section braces in opposite directions from each end of the wall as per fig (A) OR galvanised metal tensioned strap bracing as per fig (B).
- Single diagonal timber or metal section brace as per figure (C).
- A 900mm minimum wide panel of structural plywood as per figure (D).



## **WINDOWS AND FRAMES:**

In brick veneer construction 10mm clear space shall be left between underside of sill and brickwork. In two storey construction with hardwood timber framing the clearance shall be increased to 20mm.

## **INSTALLATION:**

All windows shall be installed in accordance with the requirements of AS2047-48 for Aluminium windows and AS2146-47 for timber windows.

## **STAIRS AND HANDRAILS: BCA 3.9.1 and 3.9.2**

Stairways shall be constructed to the layout as shown on plans with treads of equal dimensions except where shown or where winders are required. All risers in any flight shall be of equal height. All flights shall have a minimum of 2 and not more than 18 risers. Vertical clearances above stairs shall be 2000mm min. to soffit of floor or structure above when measured vertically above nose of tread. Relationship of riser to going shall be between 1:2 and 1:1.35 unless otherwise directed or as permitted in AS1657. Balustrades shall be provided to all landings, decks roofs other elevated platforms where the vertical distance from that level is more than 1 metre above the adjoining floor or finished ground level. Height of the balustrade must be a minimum of 1 metre above landings etc. and not less than 865mm above the nosings of any stair treads or floor of a ramp. Openings in balustrades (decorative or otherwise) and space between treads, eg. riser opening must not allow a 125 mm dia sphere to pass through. Resistance to loading forces of a balustrade must be in accordance with A.S. 1170. Materials and finish of handrails, newel posts and balustrading shall be as directed or agreed by owner. Where balustrades are constructed of tensioned wires provision shall be made to maintain tension applied.

## **ACCESS AND MOBILITY**

Where access and mobility requirements are to be addressed in the construction of a new building, AS1428.1 General Requirements for Access – New Building Work contains the minimum design requirements to enable access for people with disabilities. Revision of the BCA in order to address requirements of the Disability Discrimination Act (DDA) as applies to the construction of buildings with public areas will require that the latest revision of AS1428 should be used.

## **PLUMBER AND DRAINER**

### **EAVES GUTTERS AND DOWNPIPES:**

Eaves gutters and downpipes of material and finish as nominated on drawings shall be installed as per manufacturers specification to all eaves as required with falls to downpipes in positions shown and to comply with AS/NZS 2179.

### **VALLEYS:**

To be 0.6mm thickness galvanised steel 450mm wide and fixed to valley boards with edge beaded-well lapped and soldered or silicone jointed.

### **FLASHINGS:**

Flash around chimney stacks, exhaust flues and wherever else required with approved flashings dressed well down onto roof slopes and taken vertically at least 75mm. Wedge step flashing into brickwork joints and point up with cement mortar. Eaves gutters, valleys and roof flashings shall be selected from materials compatible with each other and the roof covering to prevent bi-metallic corrosion. (See BHP publications TB8, TB15). Use of lead for flashings, gutters, downpipes and roofing is prohibited if the roof will collect potable water.

### **WATER SERVICES:**

Where a reticulated water supply is available all work shall be carried out by a licensed water plumber. All water supply installations shall be carried out in accordance with AS3500 National Plumbing and Drainage Code.

### **RETICULATED RECYCLED WATER:**

Where a utility supplied reticulated recycled water supply is connected as a dual reticulation it is important that no cross connection between the potable and recycled water can occur. There must be at least one external tap for each system and the recycled water system must have lilac coloured components. Identification markings and signage shall be installed as per AS1319 and AS1345. Recycled water cannot be used for human consumption or contact, household cleaning, personal washing or irrigation where fruit and crops are eaten raw or unprocessed.

### **BATHROOM FLOOR:**

Provide a 50mm grating to overflow outlet in bathroom floor. Connect waste to system or install dry waste if approved..

### **WET ROOM FLASHINGS: BCA 3.8.1**

Waterproofing of wet areas shall be designed and installed in accordance with requirements and construction techniques as per AS3740 and appendix for wall/floor combinations. All to be inspected and approved prior to covering. Where waterproof membranes are used in the construction of wet area membranes shall comply with AS/NZS4858.

### **HOT WATER SERVICE:**

All installations must comply with AS3500.4 Provide from H/water unit with selected tubing to points necessary. Terminate with taps selected. Provide inlet stop cock to hot water unit.

### **GAS SERVICE:**

The whole of the work to be carried out as per requirements of the Local Supply Authority. The plumber is to be responsible for the gas service from fence alignment, including fixing of the meter and cover for same. Installations for bottled gas supply shall comply with the relevant standard.

### **SEWERED AREAS:**

Provide a drainage system from pedestal pan and from wastes of all fittings unless a grey water system is to be installed and connect to the sewer main. where shown on site plan all to be in accordance with the rules and requirements of the Authority for Water Supply and Sewerage. Provide at least one gully outside the building. The Authority Certificate to be produced at Completion of the Work.

### **UNSEWERED AREAS:**

Provide a drainage system from all fittings and from grease trap in accordance with the requirements of the Local Authority concerned. Excavate for drains to provide even falls throughout and a minimum cover of 300mm. Lay 100mm socketed vitrified clay pipes or P.V.C to take soilwater from wastes of washtubs, bath, shower, washbasin and grease trap. All pipes to be completely jointed with rubber rings or solvent cement as approved. All drain lines to be laid so that water is discharged into an absorption trench provided in position shown on plan. Provide an approved grease trap with lid in position shown to take the water from kitchen sink. Top of trap to be 75mm above finished ground or nearby concrete paving level. All drainage work from fittings to the drainage line outside the building to be in accordance with the rules and requirements of the Water Supply and Sewerage Authority for sewer areas. That Authority 'Special Inspection' Certificate of the work to be produced by the builder. All plumbing and drainage shall be in accordance with the Code of Practice for state or territory and regulating local government area.

### **GREYWATER REUSE SYSTEMS:**

Where a greywater reuse system is proposed the installation shall comply with the following Australian Standards and Codes: AS1546 parts 1 and 3: AS1547: NSW Health 1998 AWTS guideline: NSW Health 2000 Domestic greywater treatment guidelines and sewer single domestic premises. An on site greywater reuse system is not permitted in Reticulated Recycled water areas. Domestic Greywater Treatment Systems (DGTS) and Aerated Wastewater Treatment Systems (AWTS) require a certificate of accreditation from NSW Health

### **SEPTIC SYSTEM:**

In position shown on site plan provide and install septic system as nominated by the proprietor together with a holding tank and length of absorption trench installed in accordance with the manufacturers instructions and the requirements of the Local Authority. Installations shall comply with AS1546 part 1

### **STORM WATER TREATMENT METHODS:..**

Provide roof water drains from downpipes and from grates in paving where shown on site plan. Drains to be 100mm socketed vitrified clay pipes or PVC laid to an even and regular fall so as to have a minimum cover of 150mm. Drains to discharge into street gutter where possible. Where outlets are shown within the site they are to discharge at least 3000mm clear of the building into rubble packing 600mm diameter and 600mm deep. Acceptable solutions for stormwater drainage to be as per AS/NZS3500 part 3.2. Stormwater treatment systems should satisfy the following performance requirements:-

1. Conserve Water
  2. Prevent Increases In Flooding/Erosion
  3. Maintain water balance
  4. Control Stormwater Pollution.
- Systems suitable for detached dwellings are:- Roof/rainwater tank; Detention device; Infiltration device and Filter strips. These are also suitable for multi-dwelling developments in addition to Stormwater tanks and Bio retention devices.

### **RAIN WATER TANKS:**

Install rainwater tanks of selected material on slab or support as nominated by tank manufacturer. Rainwater tanks may be trickle topped up (max. 2litres/minute) from a potable water supply main and internally reticulated. A dual supply system should have no direct or indirect connection between the mains potable supply and the rainwater tank supply. Inground concrete tanks may be installed as an option with a suitable pressure pump and a testable backflow prevention device as per AS/NZS2845.1 Where an above ground tank is connected to internal reticulation, a meter with a dual check valve is to be installed and a visible air gap between the mains supply and the rainwater tank as per AS3500 and AS2845.2.1. (See NSW Health circular 2002/1: Use of rainwater tanks where a reticulated mains water supply is available).

**NOTE:** Drain pipes must not be taken through the footings of the building. All seepage and soakage water is to be effectively dealt with and diverted clear of the buildings as shown on site plan. Trenches for drains where running parallel to the building must not be within 600mm of the footings of the building.

## **TILELAYER**

### **GENERALLY:**

For guidance on installation of ceramic tiles see recommendations as set out in AS3958 parts 1 and 2.

### **WALLS:**

Cover the following wall faces with selected glazed tiles:  
To bathroom generally to a height of 135mm.  
To bath recess to a height of 1350mm.

To shower recess to a height of 1800mm.

To enclosing of bath and hobs

To WC to height of one row of tiles or as directed

Above kitchen sink/s and cooking area/s allow for four rows tiles. Finish at top and salient angles with round edge tiles. Provide vent tiles and selected recess fittings. Tiles to be fixed to a backing of Fibre Cement with approved adhesive. Areas for tiles can be increased by proprietors direction or as noted on plans.

### **FLOORS:**

Cover floors of bathroom, shower recess, WC and ES with selected ceramic tiles, set in cement mortar or approved adhesive and graded to give an even and adequate fall to floor waste.

## **PAINTER**

### **GENERALLY:**

All paints, stains, varnishes and water colours are to be of approved brands as selected. Materials used for priming and undercoating are to be the same brand as the finishing paints or as recommended by the manufacturers of the finishes used. All finishing colours are to be selected by the proprietor. Do all necessary stopping after the priming has been applied. Rub down all surfaces to a smooth finish prior the application of each successive coat of paint. External joinery or other exposed woodwork to have a clear plastic finish is to be treated with a priming oil containing wood preservative and a water repellent.



#### EXTERNALLY:

All external woodwork to be given one coat of primer, one coat of oil based undercoat and one coat of gloss finish enamel or to be given one coat of clear primer, one coat of flat clear plastic and one coat of clear plastic.

#### PRIMING WEATHERBOARDS:

Any Pine is to be primed all round as well as on the ends before fixing: Hardwood, cypress pine, radiata pine and oregon are to be primed on external faces including rebates before fixing, pressure treated canada pine is to be primed at ends before fixing.

#### IRONWORK:

Eaves, gutters, downpipes, exposed service pipes and wrought iron etc. to be cleaned and primed and give one coat of gloss paint all round.

#### FIBRE CEMENT:

Clean and prepare all external fibre cement surfaces and finish with two coats of water based paint.

#### INTERNALLY:

All exposed woodwork in kitchen, bathroom, laundry WC EC to be prepared primed and then given one undercoat and finished with one coat of full gloss paint or to be stained and finished with two coats of clear liquid plastic as selected.

#### CEILING:

To be given one coat of sealer and two coats of paint. The finishing coat of bathroom, laundry, and kitchen ceilings to be semi gloss. UNO

#### WALLS:

All rooms except bathroom, laundry and kitchen to be given one coat of sealer and two coats of water based paint. To bathroom, kitchen, WC EC and laundry where no tiled or pre surfaced material is required, walls are to be given one coat of sealer, one coat of undercoat and one coat of gloss oil paint system.

#### GLAZIER: BCA part 3.6

All sashes, doors, fixed lights and other glass in building shall be selected and installed by procedures as set out in AS1288 and/or AS2047 for type, thickness and area of glass according to wind loading, human impact and other considerations for glazing in frames of timber, steel, stainless steel, aluminium and bronze according to type of frame, height of building and glazing compound and for design and glazing of unframed toughened glass assemblies. Specific attention should be made to the selection of frame materials, glazing, location in walls and orientation to the path of the sun for various climate zone. Where windows are not shaded by roof, eaves or other building projections, advice by an approved specialist or manufacturer should be sought to ensure that all installations comply with the Energy Efficiency requirements of the BCA.

#### FENCING

Provide paling fence 1500mm height to side and rear boundaries. Posts to be 125 x 50mm in sawn approved durable hardwood, morticed for two rails and sunk into ground 600mm at maximum of 2700 mm. Posts at angles in fencing to be 125mm square. Well ram around posts. Where rock is encountered posts are to be set in concrete. Fit two rows of 75 x 50mm hardwood rails into mortises. Cover framing with hardwood palings. Double nail to rails at top and bottom. Cut line at top and lop corners. All timber in ground or concrete to be well tarred or treated with an approved preservative. Allow for repairing any existing recommendations of the manufacturer.

#### FRONT FENCING:

Provide front fencing as directed.

#### ALPINE AREAS:

Where a building is to be constructed in an alpine area compliance with the requirements of BCA part 3.7.5. is required. Alpine areas are areas above Australian Height Datum (AHD) as follows:- NSW, VIC, ACT above 1,200 metres AHD. TASMANIA above 900 metres AHD. For sub alpine areas where significant snow loads may occur see BCA fig. 3.5.7.2

#### LANDSCAPING

The area to be landscaped shall comply with the landscape plan and requirements of the Local Council Authorities. Appropriate landscape design will reduce water usage in lawns and gardens by up to 50%. Selection of native (indigenous plants suited to the local micro climate along with exotic species from California, South Africa and the Mediterranean will normally require minimal maintenance and water use. (BASIX website: see table D.2.1 for indigenous plants in various local government areas).

#### CAR PARKING

All carparking and loading bays to be kerbed, guttered, sealed, drained, line marked and landscaped. Drainage of surface water into neighbouring properties is NOT permitted except where an easement is obtained. All car parks shall comply with the provision of Local Council Authorities.

#### COMPLETION

The building shall be completed in every trade. Sashes, doors, locks and all other equipment shall be checked and left in a satisfactory operating condition. Timber floors shall be at least rough sanded. Where fine sanding is specified see CA39: Code of practice for sanding interior wooden floors. All plant, surplus materials and rubbish is to be removed from site. Gutters and drains shall be cleared and the building generally to be left clean and fit for occupation.

The Builder is to furnish the Owner with:

- 1 Notification of Completion
- 2 All Keys for all doors.
- 3 Certificate of termite protection treatment
- 4 Certificate from Sewerage Authority re-sanitary drainage.
- 5 Invoices for all PC items required.

It is the responsibility of the builder to arrange any inspections necessary by Local Council, Waterboard or Lending Authorities and/or Principal Certifying Authority.

It is the responsibility of the Owner to apply to Local Supply Authorities for connection of Electricity from mains to meter box.

**'APPROVAL TO OCCUPY' MUST BE OBTAINED.**

## BASIX: NSW only

### BASIX: The Building Sustainability Index.

This is a planning tool that measures the performance of a new dwelling (residential) by comparing its potential to consume less mains water supply and energy than an existing average home.

Sustainability Indices are assessed for Energy, Water usage, Thermal Comfort, Stormwater treatment and reuse and Landscaping.

NSW Government targets of a 40% reduction in water consumption and a 25% reduction in Greenhouse Gas emissions can be achieved by dwelling design and sustainability features incorporated. These features may include design elements such as recycled water, rainwater tanks, AAA rated shower heads and taps. Heat pump or solar water heaters, gas space heaters, roofs, eaves, awnings and insulation of walls and ceilings.

BASIX Certificate must be submitted with Development Application and/or Complying Development Certificate applications for all of NSW as from 1 July 2005.

Data required to Complete a BASIX Assessment can be found via the BASIX Data Input checklist and should be used in conjunction with the BASIX Assessment Tool.

## BASIX Specification

This information is part of the BASIX Specification version 1.0 dated 25 June 2004 © JULY 2004 NSW Department of Infrastructure, Planning and Natural Resources.

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### SECTION A. WELL-VENTILATED REFRIGERATOR SPACE

#### A.1 OBJECTIVES

- A.1.1 To improve the efficiency of the refrigerator by ensuring there is adequate air passing over the refrigerant coils.

#### A.2 PERFORMANCE REQUIREMENTS

##### A.2.1 PROVISION OF VENTILATION OVER REFRIGERANT COILS

- (a) A refrigerator space is well ventilated if:
- I. The refrigerator would be completely freestanding; or
  - II. The space for the refrigerator is enclosed on only three sides, including the rear and top; or
  - III. Where the refrigerator is installed there is at least a 75mm air space around all sides of the refrigerator; or
  - IV. If the refrigerator is to be enclosed on three sides or more, excluding (ii), ventilation grills should be installed below the refrigerator (either in the floor underneath the refrigerant coils, from the rear, or within the plinth) and above the refrigerant coils to allow an airflow equal to the air flow that would pass over the refrigerant coils in A2.1(a)(III)

### SECTION B. GREYWATER

#### B.1 OBJECTIVES

- B.1.1 To ensure that public health and the environment are not adversely affected by the installation of a greywater re-use system.
- B.1.2 To minimise the adverse impact on the amenity of the premises and surrounding land.
- B.1.3 To provide for the reuse of resources.



## B.2 PERFORMANCE REQUIREMENTS

### B.2.1 GREYWATER DIVERSION DEVICES (GDD)

A greywater diversion device must be installed in accordance with the most recent edition of NSW Health's Greywater reuse in sewered single domestic premises.

### B.2.2 DOMESTIC GREYWATER TREATMENT SYSTEMS (DGTS)

- (a) A domestic greywater treatment system that collects, stores, treats and may disinfect all or any of the sources of greywater must be either:
- A greywater treatment system device that is accredited by NSW Health in accordance with the DTGS Accreditation Guideline, as amended from time-to-time; or
  - An aerated wastewater treatment system (AWTS) accredited by NSW Health in accordance with the NSW Health's AWTS Guidelines, as amended from time-to-time; or
  - A facility that is purposely designed for a particular premises and approved in accordance with the Local Government (Approvals) Regulation 1999, as amended from time-to-time.

### B.2.3 GREYWATER RE-USE STANDARDS

- (a) Greywater must meet the requirements outlined in the most recent edition of NSW Health's Greywater reuse in sewered single domestic premises.

## SECTION C. THERMAL COMFORT

### C.1 OBJECTIVES

- C.1.1 To maintain consistency between the assumptions made within the BASIX tool and the built outcome  
C.1.2 To ensure an adequate level of thermal performance for the building fabric  
C.1.3 To provide applicants, local government, principal certifying authorities and accredited certifiers with the technical requirements relating to commitments made in BASIX.

### C.2 PERFORMANCE REQUIREMENTS

#### C.2.1 SIMULATION METHOD

- (a) Assessments of the thermal performance of the dwelling undertaken through the 'Simulation' method within the BASIX tool are to be in accordance with the BASIX Thermal Comfort Protocols. Assessments are to be conducted by an accredited assessor using approved software.  
(b) Terms used in assessor certificates that are defined or covered by this specification or the BASIX Definitions have the meaning given in this specification and the BASIX Definitions.

#### C.2.2 DEEMED-TO-COMPLY METHOD

- (a) Assessments of the thermal performance of the dwelling undertaken using the 'Deemed-to-Comply' method within the BASIX tool are required to satisfy the performance requirements C2.3 to C2.9 (inclusive) below. Terms used on the BASIX Certificate have the meaning given in this document.  
(b) If a commitment in a BASIX Certificate requires a person to do something in accordance with the BASIX Specification. Then the person must do that thing in accordance with the applicable requirements set out in clauses C2.3 to C2.9 (inclusive) below.  
(c) If a commitment in a BASIX Certificate required a person to install something which meets the requirements set out in the BASIX Specification, then the person must install that thing so it meets the applicable requirements set out in clauses C2.3 to C2.9 (inclusive) below.

#### C.2.3 PRECONDITIONS

- (a) The total area of all skylights must not occupy more than 2% of the gross floor area.

#### C.2.4 CONSTRUCTION

- (a) Walls  
I. Wall types: When a wall type is selected, the properties of the materials must be such that the required minimum R-value of the total system is achieved as stated in the 'Required Insulation and Roof Colours' section of the BASIX Deemed to Comply option.  
II. Wall areas: The wall area is measured from the internal face of the external wall. It excludes the area of walls adjacent to garages, enclosed sub-floor zones, but includes walls of storerooms, laundries and party walls.

#### C.2.5 CROSS VENTILATION

- (a) Living area cross ventilation  
I. The total area of ventilation openings in all living areas must be greater than 12.5% of the floor area of all living areas.  
II. Openings must be provided on opposite or adjacent walls of every living area.  
(b) Bedroom cross ventilation  
I. The bedroom must contain at least two windows or a window and a skylight, which can be opened

#### C.2.6 GLAZING AND SKYLIGHTS

- (a) Orientation  
For the purposes of the BASIX Thermal Comfort Deemed-to-Comply method, the orientations of north, south, east and west are defined as the following compass sectors: NORTH: 316-45, EAST: 46-135, SOUTH: 136-225, WEST: 226-315. (where 0 = north, 90 = east, 180 = south, 270 = west).  
(b) Glazing and skylight types  
I. Glazing types selected within the BASIX Deemed-to-Comply method, or on an assessor certificate if using the BASIX Simulation method must have the characteristics nominated in Appendix1 Glazing and skylight characteristics. (Available on BASIX website)

#### C.2.7 SHADING

- (a) Eaves and projections  
I. May include an eave, horizontal opaque projection, awning or pergola that will block solar gain for the length of the required projection.  
II. Materials/construction: The device shall be made of a durable material suitable for external use.  
III. The projection is measured horizontally from the face of the wall/building. The measurement may include fascias and/or gutters which are fixed and provide shading to the glazing.  
IV. The eave/projection must be located such that the outside edge of the projection is no greater than 2400mm vertically above the sill of the glazing system or a proportionally equivalent projection.  
(b) Vertical adjustable external shading  
I. An adjustable shading device may comprise of shutters, louvres or panels.  
II. Materials/construction: The device should be made of a durable material suitable for external use and must be able to be readily operated either manually, mechanically or electronically by the building occupants.  
III. An adjustable shading device must comply with(d)(I) and (d)(II).  
(c) Vertical fixed external shading  
I. A fixed shading device may comprise of shutters, louvres or panels.  
II. Materials/Construction: They should be made of a durable material suitable for external use.  
III. A fixed shading device must comply with (d)(I).  
IV. An adjacent building over 5 m in height and less than 3.1 m from glazing sill is equivalent to fixed vertical shading.  
(d) Controlling solar gain  
I. BLOCKING SOLAR GAIN: A shading device must restrict at least 80% of solar radiation at the summer solstice. IF: - Adjustable, when the shading device is fully closed or lowered, or - Fixed, at 9.00 am for glazing in the east sector; 12.00 pm noon for glazing in the north sector or 3.00 pm for glazing in the west sector  
II. PERMITTING SOLAR GAIN: An adjustable shading device must permit at least 70% of solar radiation when fully opened at 12.00pm noon at the winter solstice if required to protect glazing in the north sector.  
(e) Concessions to shading requirements  
The following glazing concessions apply and are not required to comply with (a), (b), (c) or (d) above:  
I. Five percent of the maximum glazing area may be unshaded.  
II. Twenty percent of the north sector glazing may have eave/projection greater than the maximum eave/projection (i.e. 1100 mm) or vertical fixed shading as defined by C2.7(c)

#### C.2.8 REQUIRED INSULATION AND ROOF COLOURS

- (a) Roof colour, Roof colour is defined by the solar absorptions set out in Table C.2.8  
TABLE C.2.8. SOLAR ABSORPTANCE VALUES  
LIGHT <0.475 MEDIUM 0.475 - 0.70 DARK >0.70  
(b) Insulation  
I. The technical and installation requirements for thermal insulation are in accordance with the Building Code of Australia, Volume 1 or 2, NSW Appendix  
II. If a foil-backed blanket is used under the roof, then the R-value of the ceiling insulation may be reduced by R0.5  
III. External garage walls do not require insulation to be added to the wall.

#### C.2.9 ROOF VENTILATION

- (a) Roof ventilation is required to meet the following criteria:



- I. **WIND-DRIVEN VENTILATOR:** Not less than two wind-driven roof ventilators having an aggregate opening area of not less than 0.14 m<sup>2</sup>, in conjunction with eave vents, roof vents or the like having an aggregate fixed open area of not less than 0.2% of the ceiling area.
- II. **GABLE END VENTS:** Not less than two gable end vents having an aggregate opening area of not less than 0.8m<sup>2</sup>.

#### **SECTION D. INDIGENOUS PLANT SPECIES**

##### **D.1 OBJECTIVES**

- D.1.1. To promote the planting of indigenous plant species to preserve the character of the local environment and promote a balanced ecosystem.
- D.1.2. To ensure that the species selected are adapted to the natural rainfall patterns of the locality, and hence require minimal additional water consumption to remain healthy.

##### **D.2 PERFORMANCE REQUIREMENTS**

###### **D.2.1 INDIGENOUS PLANT LIST**

- (a) The indigenous plants for each local government area are set out in Table D.2.1. of the full BASIX Specification on [www.basix.nsw.gov.au](http://www.basix.nsw.gov.au)
- (b) In addition, a plant species is considered to be indigenous to a local government area for the purposes of BASIX commitment, if the local council for that area states in writing that the species is indigenous to that local government area.

(Note: Section paragraph numbering has been changed from BASIX sequence to correct numerical order.)

**Generation of a BASIX Certificate can only be made in the NSW Department of Infrastructure, Planning and Natural Resources BASIX Website: [www.basix.nsw.gov.au](http://www.basix.nsw.gov.au)**

#### **ADDITIONAL REQUIREMENTS:**

This is the specification referred to in the Contract dated: ...../...../.....

Date for Completion: ...../...../.....

..... PROPRIETOR / /

..... BUILDER / /



<b>MASONRY CONSTRUCTION</b>	Clay Bricks <input type="checkbox"/>	Face <input type="checkbox"/>	Commons <input type="checkbox"/>	Stone <input type="checkbox"/>
	Concrete Bricks <input type="checkbox"/>	Concrete Blocks <input type="checkbox"/>	AAC Blocks <input type="checkbox"/>	AAC Panels <input type="checkbox"/>
	Rendered <input type="checkbox"/>	Bagged <input type="checkbox"/>	Painted <input type="checkbox"/>	..... <input type="checkbox"/>
<b>MORTAR JOINTS</b>	Colour.....	Ironed <input type="checkbox"/>	Flush <input type="checkbox"/>	Raked <input type="checkbox"/>
<b>SILLS</b>	Brick <input type="checkbox"/>	Quarry Tiles <input type="checkbox"/>	..... <input type="checkbox"/>	..... <input type="checkbox"/>
<b>EXTERNAL WALL SHEETING</b>	Timber Cladding <input type="checkbox"/>	Fibre Cement Cladding <input type="checkbox"/>	Metal Cladding <input type="checkbox"/>	PVC/Vinyl <input type="checkbox"/>
	Type.....	Type.....	Type.....	Type.....
<b>FLOOR CONSTRUCTION</b>	Timber <input type="checkbox"/>	Concrete <input type="checkbox"/>	Pre.Str. Beam Floor <input type="checkbox"/>	Steel <input type="checkbox"/>
<b>FLOORING</b>	T & G <input type="checkbox"/>	Species.....	Compressed FC Sheet <input type="checkbox"/>	Structural Plywood <input type="checkbox"/>
	Particle Board <input type="checkbox"/>	<b>Tiles:</b> Ceramic <input type="checkbox"/>	Terra Cotta <input type="checkbox"/>	Quarry <input type="checkbox"/>
<b>DECKING</b>	Treated Pine <input type="checkbox"/>	Other.....	.....	.....
<b>FRAME CONSTRUCTION</b>	Timber <input type="checkbox"/>	Hardwood <input type="checkbox"/>	Pine <input type="checkbox"/>	Oregon <input type="checkbox"/>
	High strength galvanised steel framing <input type="checkbox"/>	.....	Structural Steel <input type="checkbox"/>	.....
<b>ROOF CONSTRUCTION</b>	Pitched Roof <input type="checkbox"/>	Exposed Rafters <input type="checkbox"/>	Oregon <input type="checkbox"/>	Hardwood <input type="checkbox"/>
	Roof Trusses <input type="checkbox"/>	Raked Ceiling <input type="checkbox"/>	Pine <input type="checkbox"/>	Steel Framing <input type="checkbox"/>
	Flat/Skillion <input type="checkbox"/>	.....	.....	.....
<b>ROOF COVER</b>	Concrete Tiles <input type="checkbox"/>	Terra Cotta Tiles <input type="checkbox"/>	Shingles/Slate <input type="checkbox"/>	Corrugated FC <input type="checkbox"/>
	Zincalume <input type="checkbox"/>	Colorbond <input type="checkbox"/>	Polycarbonate <input type="checkbox"/>	Profile.....
<b>THERMAL INSULATION</b>	Roof/ceiling <input type="checkbox"/>	Reflective Insulation Rating R.....	Bulk Insulation Rating R.....	.....
	Walls <input type="checkbox"/>	Reflective Insulation Rating R.....	Bulk Insulation Rating R.....	.....
	Floors <input type="checkbox"/>	Reflective Insulation Rating R.....	Bulk Insulation Rating R.....	.....
<b>INTERNAL WALL LININGS</b>	Gypsum Plasterboard <input type="checkbox"/>	FC Sheeting <input type="checkbox"/>	Timber Panelling <input type="checkbox"/>	Cement Render <input type="checkbox"/>
	Face Brick <input type="checkbox"/>	Other.....	.....	.....
<b>WET AREA LININGS</b>	WR Gyp. Plasterboard <input type="checkbox"/>	Villaboard <input type="checkbox"/>	Timber Panelling <input type="checkbox"/>	Laminated Panel <input type="checkbox"/>
<b>CEILINGS</b>	Gypsum Plasterboard <input type="checkbox"/>	Timber Panelling <input type="checkbox"/>	FC Sheeting <input type="checkbox"/>	.....
<b>CORNICE</b>	Type.....	Size.....mm	.....	.....
<b>DOOR JAMBS</b>	Timber <input type="checkbox"/>	Galvanised Steel <input type="checkbox"/>	.....	.....
<b>WINDOWS</b>	Timber <input type="checkbox"/>	Aluminium <input type="checkbox"/>	Type/Manufacturer.....	.....
<b>FLYSCREENS</b>	Timber <input type="checkbox"/>	Aluminium <input type="checkbox"/>	Other <input type="checkbox"/>	.....
<b>JOINERY</b>	Timber <input type="checkbox"/>	Species.....	Stained/Polished <input type="checkbox"/>	Painted <input type="checkbox"/>
	Architrave Size.....mm	Skirting Size.....mm	Material.....	.....
	Kitchen Cupboards.....	.....	Stained <input type="checkbox"/>	Painted <input type="checkbox"/>
	Front Door Type.....	.....	Stained <input type="checkbox"/>	Painted <input type="checkbox"/>
	Other External Doors Type.....	.....	Stained <input type="checkbox"/>	Painted <input type="checkbox"/>
	Internal Doors Type.....	.....	Stained <input type="checkbox"/>	Painted <input type="checkbox"/>
	Garage Door Type.....	.....	Size.....mm	Colour.....
<b>EXTERNAL STAIRS</b>	Timber <input type="checkbox"/>	Steel <input type="checkbox"/>	Concrete <input type="checkbox"/>	Brick <input type="checkbox"/>
<b>INTERNAL STAIRS</b>	Timber <input type="checkbox"/>	Steel <input type="checkbox"/>	Concrete <input type="checkbox"/>	Brick <input type="checkbox"/>
	as manufactured by.....	.....	Balustrade type .....	.....
<b>ELECTRICIAN</b>	<b>Provide:</b>	Light Points.....	Single Switches.....	Two way switches.....
		Power Outlets.....	Single.....	Double.....
	Light Fittings.....	.....	Smoke Detectors.....	Exhaust Fans.....
<b>ROOF PLUMBER</b>	Quad Gutters (size.....) <input type="checkbox"/>	Box Gutters <input type="checkbox"/>	Sheerline Gutters <input type="checkbox"/>	.....
<b>GUTTERS/DOWNPINES</b>	Downpipes 100 x 50 <input type="checkbox"/>	100 x 75 <input type="checkbox"/>	100 x 100 <input type="checkbox"/>	Round.....dia <input type="checkbox"/>
	Colorbond <input type="checkbox"/>	PVC <input type="checkbox"/>	Copper <input type="checkbox"/>	Zincalume <input type="checkbox"/>
	Aluminium <input type="checkbox"/>	Galvanised <input type="checkbox"/>	.....	.....
<b>WATER SERVICE</b>	Copper pipe <input type="checkbox"/>	PVC Pipe <input type="checkbox"/>	Flex. pipe system <input type="checkbox"/>	.....
<b>RETICULATED RECYCLED WATER</b>	All Reticulation Systems for Recycled Water must have Lilac Coloured components and markings.			
<b>RAINWATER STORAGE TANKS</b>	Type.....	Size.....(kl)	Nos. ....	Pressure Pump <input type="checkbox"/>
<b>STORMWATER STORAGE TANKS</b>	Type.....	Size.....(kl)	.....	.....
<b>HOT WATER SERVICE</b>	Electric <input type="checkbox"/>	Gas <input type="checkbox"/>	Solar <input type="checkbox"/>	.....
	Mains Pressure <input type="checkbox"/>	Gravity Fed <input type="checkbox"/>	Cylinder capacity.....litres	.....
<b>INTERNAL SEWER SERVICE</b>	Copper <input type="checkbox"/>	PVC <input type="checkbox"/>	Aerated System <input type="checkbox"/>	Greywater diversion <input type="checkbox"/>
<b>DRAINER</b>	Sewer connection <input type="checkbox"/>	Septic System <input type="checkbox"/>	Copper pipes <input type="checkbox"/>	.....
	PVC pipes <input type="checkbox"/>	Vitrified clay pipes <input type="checkbox"/>	Rail <input type="checkbox"/>	Brushwood <input type="checkbox"/>
<b>FENCING</b>	Brick <input type="checkbox"/>	Paling <input type="checkbox"/>	Rear Boundary <input type="checkbox"/>	Colorbond <input type="checkbox"/>
	Front Boundary <input type="checkbox"/>	Side Boundary <input type="checkbox"/>	Type .....	.....
	As manufactured by .....	.....	Above Ground <input type="checkbox"/>	Pool Cover <input type="checkbox"/>
<b>POOL</b>	Type.....	Inground <input type="checkbox"/>	.....	.....

This Schedule is to be fully completed. Items applicable should be marked - items with blank spaces will NOT be included in the works

PROPRIETOR.....

BUILDER.....

DATE / /200



# SCHEDULE OF RATE / P.C. ALLOWANCES AND MATERIALS

ITEMS	MODEL OR TYPE	PRIME COST
1. CONCRETE PIERS TO FOOTINGS.....	.....	\$.....
2. ROCK EXCAVATION : per cubic metre.....	.....	\$.....
3. AGRICULTURAL DRAINS: per lin. metre.....	.....	\$.....
4. STORMWATER.....	.....	\$.....
5. SEWER CONNECTIONS.....	.....	\$.....
6. CERAMIC TILES WALL \$.....PER M2 S/O.....	.....	\$.....
S/O=SUPPLY ONLY FLOOR \$.....PER M2 S/O.....	.....	\$.....
QUARRY \$.....PER M2 S/O.....	.....	\$.....
7. SEPTIC INSTALLATIONS.....	.....	\$.....
8. GREYWATER TREATMENT INSTALLATION.....	.....	\$.....
9. BATHROOM VANITY & CABINET.....	.....	\$.....
10. EN-SUITE VANITY & CABINET.....	.....	\$.....
11. BASIN.....	.....	\$.....
12. BATH.....	.....	\$.....
13. TOWEL RAILS.....	.....	\$.....
14. SOAP HOLDERS.....	.....	\$.....
15. MIRRORS.....	.....	\$.....
16. TOILET SUITES.....	.....	\$.....
17. SHOWER SCREENS.....	.....	\$.....
18. LAUNDRY TUB.....	.....	\$.....
19. STAINLESS STEEL SINK.....	.....	\$.....
20. KITCHEN CUPBOARDS.....	.....	\$.....
21. OVEN.....	.....	\$.....
22. HOT PLATES.....	.....	\$.....
23. STOVE.....	.....	\$.....
24. DISHWASHER.....	.....	\$.....
25. EXHAUST FANS.....	.....	\$.....
26. RANGE HOOD.....	.....	\$.....
27. HOT WATER UNIT.....	.....	\$.....
28. SMOKE/FIRE DETECTORS.....	.....	\$.....
29. PHONE WIRING/FAX WIRING.....	.....	\$.....
30. T.V. WIRING/COMPUTER WIRING.....	.....	\$.....
31. INTERCOM WIRING.....	.....	\$.....
32. SECURITY INSTALLATION.....	.....	\$.....
33. AIR CONDITIONING, SINGLE UNIT.....	.....	\$.....
34. INTERNAL VACUUM SYSTEM.....	.....	\$.....
35. FRONT GATE.....	.....	\$.....
36. FRONT FENCE.....	.....	\$.....
37. CLOTHES HOIST.....	.....	\$.....
38. CONCRETE PATHS per lin. metre.....	.....	\$.....
39. GARAGE DOOR REMOTE CONTROL.....	.....	\$.....
40. LANDSCAPING (As per Design Supplied).....	.....	\$.....
41. UNIT PAVING.....	.....	\$.....
42. RAINWATER TANKS.....	.....	\$.....
43. RETICULATED RECYCLED WATER SYSTEM.....	.....	\$.....
44. ....	.....	\$.....
45. ....	.....	\$.....
46. ....	.....	\$.....

Where there are additional items or different types of the same item a duplicate list should be added and agreed on by the proprietor and builder.

NOTE: The builder is to allow Prime Costs amounts of items set out in this Schedule above. All items to be selected by Owner. The Builders tender is to include the provision of all items, including the cost of cartage, freight, fixing and fitting as part of his contract. Adjustment for substituted fittings will be made on the basis of the prevailing retail price.

This is the specification referred to in the Contract dated: ...../...../.....

..... PROPRIETOR / /

Date for Completion: ...../...../.....

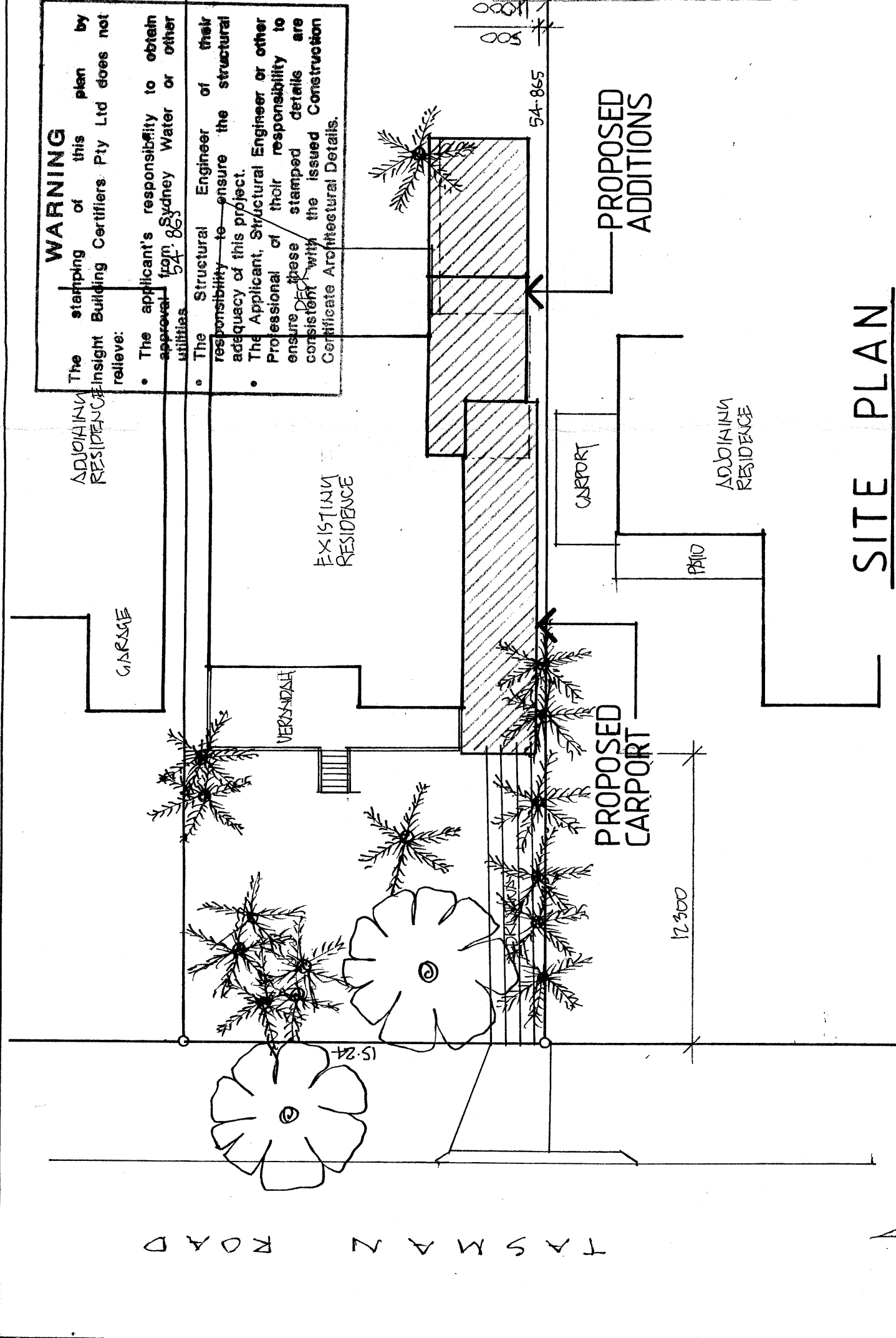
..... BUILDER / /



**Insight** building certifiers pty ltd  
CONSENT NO. NO 851/05 DATE 3/2/06  
CONSTRUCTION CERT. NO. 2006/1342

**CONSTRUCTION CERTIFICATE PLANS**  
Bowden 21 JUN 2006  
T. Bowden Accreditation No. 93

**WARNING**  
The stamping of this plan by Insight Building Certifiers Pty Ltd does not relieve:  
• The applicant's responsibility to obtain approval from Sydney Water or other utilities  
• The Structural Engineer of their responsibility to ensure the structural adequacy of this project.  
• The Applicant, Structural Engineer or other Professional of their responsibility to ensure that these stamped details are consistent with the issued Construction Certificate Architectural Details.



**SITE PLAN**  
LOT 110 SECTION 7 IN D.P. 13811

DECK  
SYDNEY WATER  
APPROVED

1. Position of structure in relation to Sydney Water's assets is satisfactory.
2. Connections to Sydney Water sewer/water services may only be made following the issue of a permit to a licensed plumber/drainier.
3. It is the owner's responsibility to ensure that all proposed fittings will drain to Sydney Water's sewer.
4. Any Plumbing and/or Drainage Work to be carried out in accordance with the Sydney Water Act 1994, AS 3500 and the NSW Code of Practice.
5. Gullies, Inspection Shafts and Boundary Traps shall not be placed under any Roof, Balcony, Verandah, Floor or other cover unless otherwise approved by Sydney Water.
6. Property No. 34566226

Reece, Mona Vale  
Quick Check Agent on behalf of  
SYDNEY WATER  
Paul Torque

DEVELOPMENT CALCULATIONS		
DESCRIPTION	EXISTING sqm	PROPOSED sqm
FLOOR AREA	154	27 (181)
ROOF AREA	259	295
SITE COVERAGE (HARD SURFACE ETC)	350	362 (43%)
LANDSCAPING AREA	-	409 (49%)
SITE AREA	837	NOT APPLICABLE

THE BUILDER IS TO CHECK AND CONFIRM ALL NECESSARY DIMENSIONS AND LEVELS ON SITE, PRIOR TO ORDERING MATERIALS AND COMMENCING CONSTRUCTION. DO NOT SCALE OFF THE DRAWING

1. Builder to check and confirm all necessary dimensions on site prior to construction. Do not scale the drawing.
2. All dimensions that relate to site boundaries and easements are subject to verification by a site survey.
3. All work to be in accordance with BUILDING CODE OF AUSTRALIA & to the satisfaction of local council requirements & other authorities.
4. All construction to be in accordance with the "TIMBER FRAMING" code.
5. Any existing in addition to what is supplied shall be removed between the owner and the builder to the owner's approval, except for structural elements.
6. All work & sub-work to be carried out in the approved manner or as directed by local council inspectors.
7. All work & sub-work to be carried out in the approved manner or as directed by local council inspectors.
8. All work & sub-work to be carried out in the approved manner or as directed by local council inspectors.

No.	AMENDMENT	DATE

**J.D EVANS and COMPANY PTY. LTD.**  
BUILDING DESIGN CONSULTANTS  
14 RIVERVIEW AVE, AVALON BEACH, 2107  
Phone (02) 918 9206 Fax (02) 9973 2454  
Mobile 041 976 596

**PROPOSED ALTERATIONS/ADDITIONS**  
No. 51 TASMAN ROAD  
NORTH AVALON N.S.W. 2107  
CLIENT  
STUART & LISA WILLIAMS

DATE 20/12/05 SCALE 1:200  
DRAWN JDE CHECKED  
ISSUE  
818-01









Unitex

**STRATCO**

# AUSTRAL



**Colorbond**



# WEST ELEVATION

FLOOR LEVEL RU 13.05

150 X 150 TIMBER POSTS  
ON M.S. GALV. SIDING

RIDGE RV 18.00

EXTEND ROOF TO MATCH RIDGE

RIDGE RLY 7.25

150 X 150 TIMBER POSTS  
ON M-9 GAW. SHOEN

FLOOR LEVEL RV 13.05

EGV 11.60

E6V 17-68

COVERED AND CUSTOM ORB ROOF SHEETING  
FIXED NEW OVER POLY UNED BUSHLET.

CLADDING TO MAXIMIZE INSULATION

EGL 13-460

# SOUTH ELEVATION

THE BUILDER IS TO CHECK AND CONFIRM ALL NECESSARY  
DIMENSIONS AND LEVELS ON SITE PRIOR TO ORDERING MATERIALS  
AND COMMENCING CONSTRUCTION. **DO NOT SCALE OFF THE DRAWING**

1. Bidder to check and confirm all necessary dimensions on site prior to construction. Do not waste the drawing.
2. All dimensions that pertain to site boundaries and easements are subject to verification by a site survey.
3. All work to be in accordance with BUILDING CODE of AUSTRALIA, & the codes of all other authorities.
4. All timber construction to be in accordance with the "TIMBER FRAMING" code.
5. Any existing in addition to that set in specified shall be retained and used to the maximum extent possible.
6. Road water & sub-surface drainage to be designed by a Structural Engineer.
7. Road water & sub-surface drainage to be designed to the approved manner or as directed by local council inspectors.
8. All electrical power & light outlets to be determined by owner.
9. Make good and repair all existing finishes damaged by new work. Remove existing materials where possible.

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DRAWINGS ARE SUBJECT OF  
ALL PLANS AND ANY ATTEMPT OR ACTUAL  
COPYRIGHT AND ANY ATTEMPT OR ACTUAL  
INFRINGEMENT BY USING, REPRODUCING OR  
COPYING SAME, WHOLLY OR IN PART, WITHOUT  
PRIOR WRITTEN PERMISSION WILL RESULT IN  
LEGAL PROCEEDINGS.  
J.D. EVANS AND COMPANY, PVT. LTD.

[illegible]

**J.D EVANS and COMPANY PTY. LTD.**  
BUILDING DESIGN CONSULTANTS  
74 RIVIERA AVE, AVALON BEACH, 2107  
Phone (02) 9918 9206 Fax (02) 9973 2454  
Mobile 0483 976 596

MEMBER  
BUILDING  
DESIGNERS  
ASSOCIATION

**PROJECT**  
**PROPOSED ALTERATIONS/ADDITIONS**  
**No. 51 TASMAN ROAD**  
**NORTH AVALON N. S. W. 2107**  
**CLIENT**  
**STUART & LISA WILLIAMS**

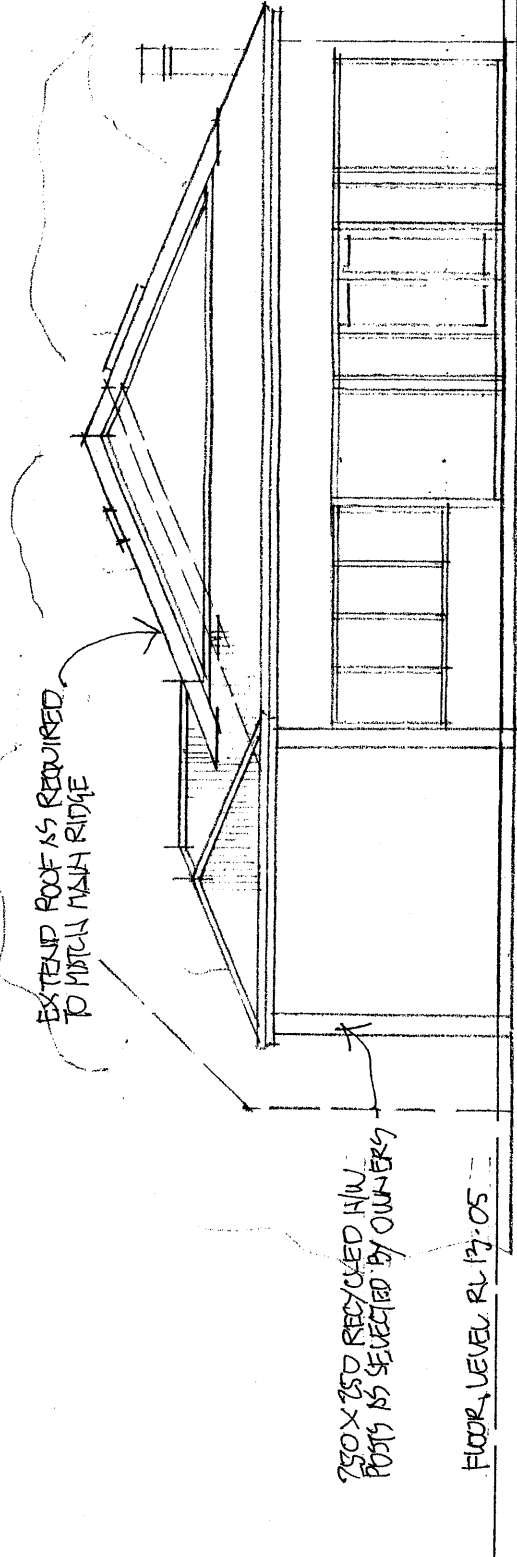
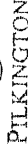
DATE	20/12/05	SCALE	1:100,
DRAWN	JDE	CHECKED	

DRAWING No. 818-03 ISSUE

818-03



ALL FIBRE CEMENT DECKING, EXTERNAL CLADDING,  
WET FLOORING AND WALLING AREAS ARE TO BE LAID  
AND FIXED IN ACCORDANCE WITH THE APPROPRIATE  
JAMES HARDIE FIXING MANUAL



## EAST ELEVATION

VIEWX ROOF WINDOWS?

COVERBOARD CUSTOM ORG. ROOF SHEETING  
FIXED NEW OVER POLYURETHANE BLANKET

150 X 250 RECYCLED HVL  
POSTS AS SELECTED BY OWNER

FLOOR LEVEL RL 13.05

EAU 13.40

EAU 12.93

CUT NEW TIMBER WINDOWS AND  
EXISTING STUMP MAKE GOOD FINISHES?  
(OBSOLETE ALUMINUM)

EAU 11.73


## NORTH ELEVATION

THE BUILDER IS TO CHECK AND CONFIRM ALL NECESSARY  
DIMENSIONS AND LEVELS ON SITE PRIOR TO ORDERING MATERIALS  
AND COMMENCING CONSTRUCTION. DO NOT SCALE OFF THE DRAWING

1. Builder to check and confirm all necessary dimensions on site prior to construction. Do not scale the drawing.
2. All dimensions that relate to site boundaries and easements are subject to verification by a site survey.
3. All work to be in accordance with BUILDING CODE OF AUSTRALIA & to the satisfaction of local council requirements & other authorities.
4. All timber construction to be in accordance with the "TIMBER FRAME" code.
5. Any detailing in addition to what is supplied and will be reviewed and approved by the owner's approval, except for any structural details or design which is to be supplied by a Structural Engineer.
6. Roof water & sub-soil drainage to be designed by the approved engineer or as directed by local council inspectors.
7. Erection power & light cables to be determined by owner.
8. Make good and repair of existing finishes damaged by new work. Remove existing materials where possible.

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J.D. EVANS and COMPANY PTY. LTD.  
74 RIVIERA AVE, AVALON BEACH, NSW

No.	AMENDMENT	DATE

 **J.D. EVANS and COMPANY PTY. LTD.**  
BUILDING DESIGN CONSULTANTS  
74 RIVIERA AVE, AVALON BEACH, 2107  
Phone (02) 9918 9206 Fax (02) 9973 2454  
Mobile 048 976 596

PROJECT  
**PROPOSED ALTERATIONS/ADDITIONS**  
**No. 51 TASMAN ROAD**  
CLIENT  
**NORTH AVALON N. S. W. 2107**  
DRAWING No.  
**818-04**  
ISSUE

DATE 20/12/05 SCALE 1:100  
DRAWN JDE  
CHECKED  
STUART & LISA WILLIAMS



CELVIN R V

2750 EAST.

SKYLINE AS SELECTED  
BY OWNERS

VIEWED LIXING WITH  
R3.0 INSULATION

150 X 150 TIMBER POSTS  
ON M.S. GUSSET PLATES

# SECTION A - A

THE BUILDER IS TO CHECK AND CONFIRM ALL NECESSARY  
DIMENSIONS AND LEVELS ON SITE PRIOR TO ORDERING MATERIALS  
AND COMMENCING CONSTRUCTION. DO NOT SCALE OFF THE DRAWING

1. Builder to check and confirm all necessary requirements on site prior to construction. Do not start the drawing.
2. All dimensions that relate to site boundaries and easements are subject to verification by a site survey.
3. All work to be in accordance with **BUILDING CODE OF AUSTRALIA** & to the satisfaction of local council requirements & other authorities.
4. All timber construction to be in accordance with the "TIGER FRAMING" code.
5. Any detailing in addition to what is stipulated shall be resolved between the owner and the builder to the owner's approval, except for any structural details of design which is to be supplied by a Structural Engineer.
6. Roofing to be in accordance with the approved manner or as directed by local council inspectors.
7. All electrical power & light cables to be determined by a qualified electrician.
8. Make good and repair all existing footpaths damaged by your work. Remove erosion mounds, piles, concrete.

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J.D. KYANIS AND COMPANY PVT. LTD.  
MILLARIO DAMON CONSULTANTS  
P.O. BOX 607  
DUBLIN 2, IRELAND



J.D EVANS and COMPANY. PTY. LTD.

**BUILDING DESIGN CONSULTANTS**  
74 RIVIERA AVE, AVALON BEACH, 2107  
Phone (02) 9918 9206 Fax (02) 9973 2454  
Mobile 048 976 596



MEMBER  
BUILDING  
DESIGNERS  
ASSOCIATION

**PROJECT**  
**PROPOSED ALTERATIONS/ADDITIONS**  
**No. 51 TASMAN ROAD**  
**NORTH AVALON N. S. W. 2107**  
**CLIENT**  
**STUART & LISA WILLIAMS**

DATE	20/12/05	SCALE	1:100
DRAWN	JDE	CHECKED	

DRAWING No. 818-05 ISSUE



# D. O'BRIEN ENGINEERING SERVICES PTY. LTD.

Structural Engineers

A.C.N. 000 526 876 A.B.N.46 000 526 876

Suite 6/319 Condamine St  
MANLY VALE 2093

Post to: P.O. Box 326  
MANLY 1655

Phone: (02) 9907 6947

Fax: (02) 9907 6948

Mobile: 0412 971 107

Mr and Mrs Williams  
51 Tasman Rd  
Avalon Beach NSW 2107

27/04/06  
ref: cl6045

Dear Mr and Mrs Williams

RE: Proposed Alterations and Additions to Residence at  
51 Tasman Rd Avalon Beach  
Structural Certificate for New Loads

The structural design and details for the new alterations and additions for 51 Tasman Rd Avalon Bch are shown on drawing number 6045/S1. The structural drawings are based on the architectural drawings by J D Evans and Co.

A site inspection was made of the existing structure with a view to determining the adequacy of the existing structures to carry the new design loads in accordance with Australian Standard AS1170.1 (Loading Code).

The sizes of supporting walls and footings, at the interface with the new loads, are adequate to carry the design loads subject to the requirements shown on the drawing no. 6045/S1. Some adjustment may be required to the structure details depending on the conditions encountered on site when work commences.

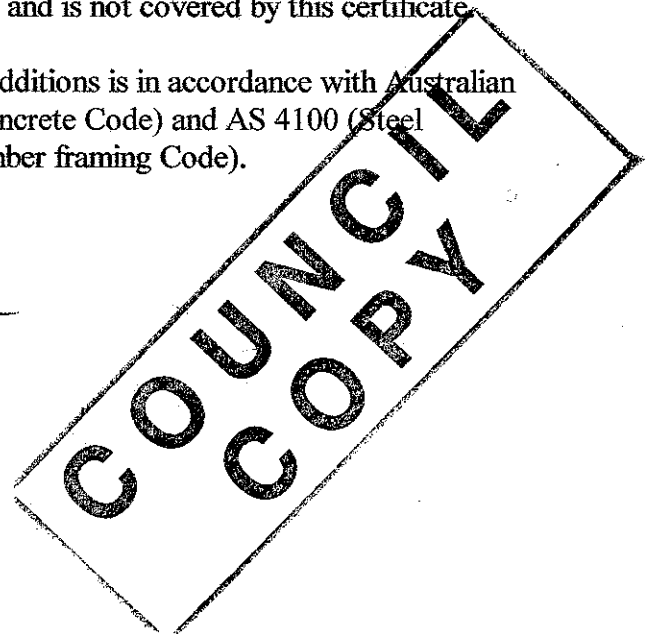
The structural adequacy of the existing residence, that is not associated or connected to the proposed new work, was not inspected on site and is not covered by this certificate.

The design for the proposed new alterations and additions is in accordance with Australian Standards AS3700 (Masonry Code), AS3600 (Concrete Code) and AS 4100 (Steel Code), AS1720 (Timber Code) and AS 1684 (Timber framing Code).

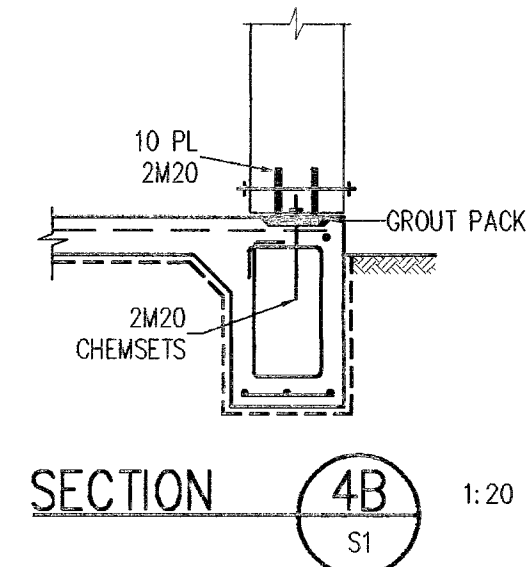
Yours sincerely



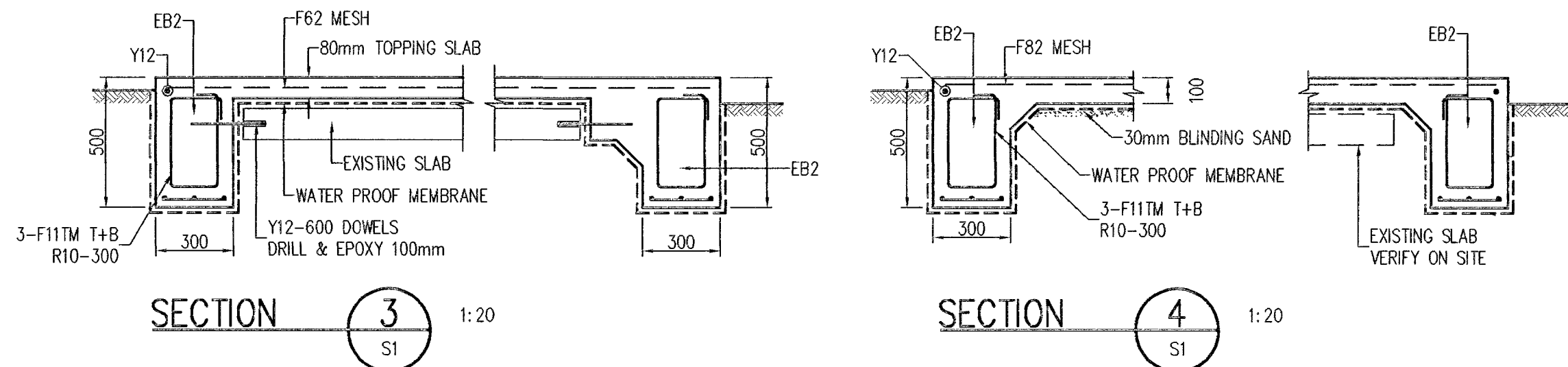
Dermot J. O'Brien, B.E., M.I.E. Aust., C.P. Eng.





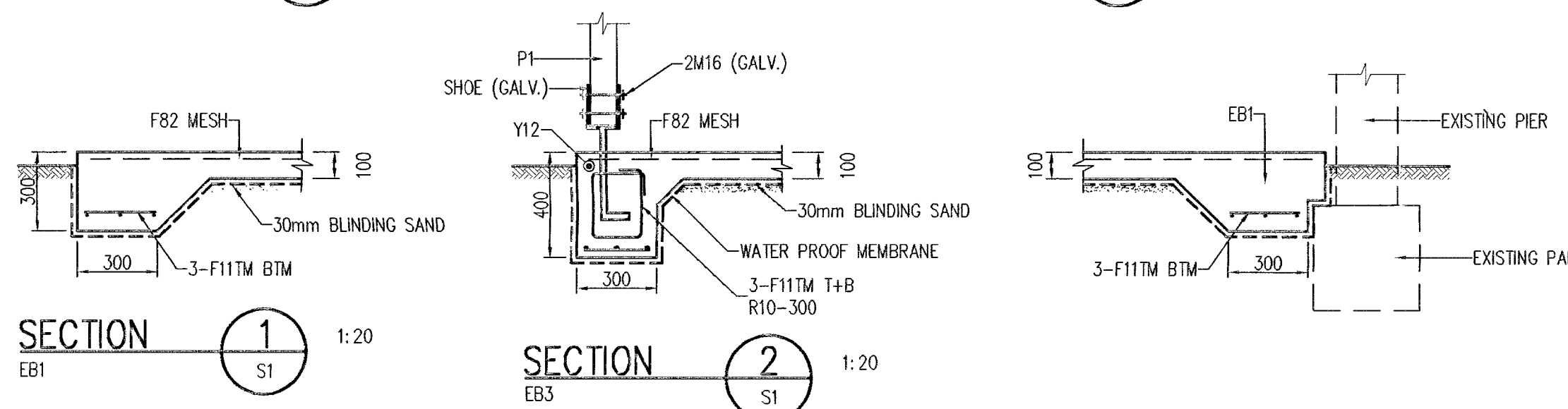


GROUND FLOOR PLAN  
1:100



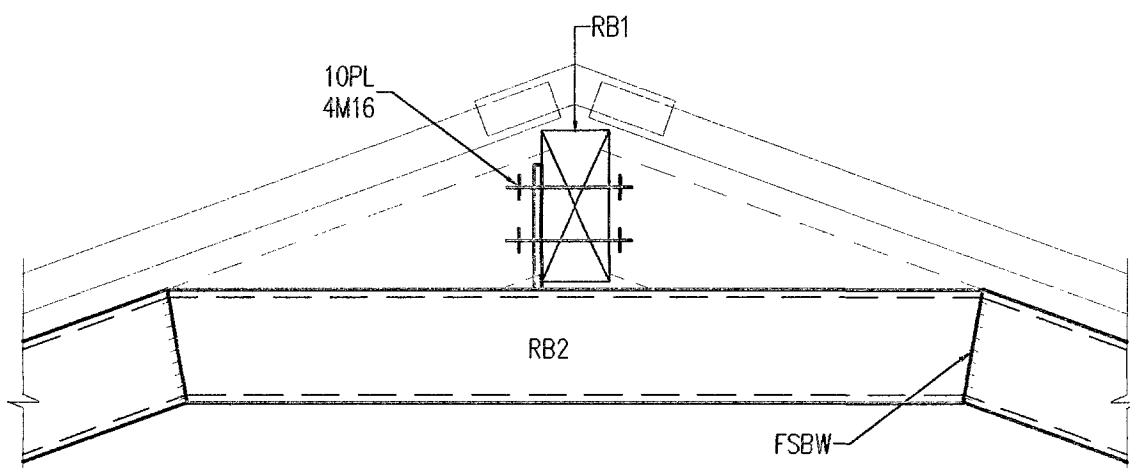
SECTION 3 1:20  
S1

SECTION 4 1:20  
S1

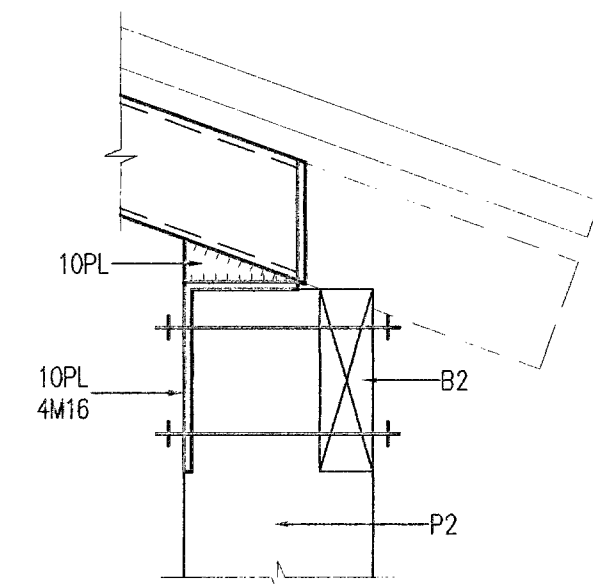


SECTION 1 1:20  
EB1 S1

SECTION 2 1:20  
EB3 S1



SECTION 6 1:10  
S1

REV  
1