PCA
PRIVATE CERTIFIERS AUSTRALIA

Address Suite 1a / 226 Condamine Street PO Box 907
Balgowlah
Manly Vale NSW 2093
Tel 02 9907 6300
Fax 02 9907 6344
Email grant@pcaservices com au

18 November 2008

Our ref 080067

The General Manager
Pittwater Council
PO Box 882,
Mona Vale NSW 1660

Dear Sir/Madam,

Re 115 McCarrs Creek Road Church Point
Construction Certificate No 080067

Development application No N0036/08

Private Certifiers Australia has issued a Construction Certificate under Part 4A of the Environmental Planning and Assessment Act 1979 for the above premises

Please find enclosed the following documentation

- Construction Certificate No 080067
- Copy of application for Construction Certificate
- Documentation used to determine the application for the Construction Certificate as detailed in Schedule 1 of the Certificate
- Cheque for Council's registration fee

Our client has been advised of the necessity to submit to Council the Notice of Commencement of building works 48 hours prior to the commencement of works

Should you need to discuss any issues, please do not hesitate to contact the Accredited Building Surveyor Grant Harrington.

Yours faithfully,

REC 250222
21/11/08.
$30 —
KO

Grant Harrington
Accredited Building Surveyor
Private Certifiers Australia

Building Regulations Consultant

Principle Certifying Authority

Construction Certification

Fire Upgrade Surveys

Planning

Private Certifiers Australia

NOTICE TO THE APPLICANT/ OWNER OF THE PROPERTY

1) READ YOUR PAPER WORK CAREFULLY!

2) *NOTICE OF COMMENCEMENT FORM*

YOU MUST FILL OUT THE NOTICE OF COMMENCEMENT FORM AND RETURN IT TO OUR OFFICES, OUR COMPANY WILL NOTIFY COUNCIL TWO (2) DAYS PRIOR TO YOU COMMENCING WORK ON SITE DO NOT START WORK UNTIL THIS HAS BEEN DONE

3) *MANDATORY INSPECTIONS*

MANDATORY INSPECTION IS THE RESPONSIBILITY OF THE OWNER, THE PERSON HAVING THE BENEFIT OF THE CONSENT UNDER WHICH THIS CERTIFICATE HAS BEEN ISSUED

PLEASE MAKE YOUR SELF AWARE OF YOUR RESPONSIBILITY TO CONTACT OUR OFFICE 48HRS PRIOR REQUIRING A MANDATORY INSPECTION AS OUTLINED IN OUR FORM – SEE CRITICAL MANDATORY INSPECTIONS

FAILING TO ARRANGE OR GIVE 48 HRS NOTICE (2 DAYS) TO OUR COMPANY TO ARRANGE THE MANDATORY INSPECTION MAY AFFECT THE ABILITY OF OUR COMPANY ACTING AS THE PRINCIPAL CERTIFYING AUTHORITY TO UNDERTAKE THE INSPECTION FAILING TO UNDERTAKE A MANDATORY INSPECTION AS OUTLINED IN THE DOCUMENTS WILL RESULT IN THE OCCUPATION CERTIFICATE AT THE COMPLETION OF THE PROJECT UNABLE TO BE ISSUED TO COUNCIL, THE OWNER OR THE APPLICANT

***4)* PLEASE FIND ATTACHED A PAPER COPY OF OUR APPOINTED PRINCIPAL CERTIFIER SIGN PLEASE PUT THE SIGN AT THE FRONT OF YOUR DEVELOPMENT UNTIL WE VISIT SITE AND PROVIDE YOU WITH A CORFLUTE SIGN**

5) WE UNDERSTAND THAT YOU, AS THE PROPERTY OWNER, HAVE READ THE ABOVE REQUIREMENTS AND THE CONSTRUCTION CERTIFICATE DOCUMENTATION SURROUNDING INSPECTIONS FOR THE PROJECT

Yours Sincerely

Grant Harrington
Accredited Building Surveyor

Telephone 99076300 Facsimile 99076344 Mobil 0401 81 6661
PO Box 907 Balgowlah 2093 wwwpcaservices com au

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CONSTRUCTION CERTIFICATE 080067 (RESIDENTIAL)

Issued under Part 4A of the Environmental Planning and Assessment Act 1979 Sections 109C and 81A(5)

APPLICANT DETAILS

Applicant	Darryn Parkinson
Address	PO Box 260 AVALON NSW 2107
Contact Details	**Phone** 9973 2756 **Fax** 9973 2756

OWNER DETAILS

Name of person having benefit of the development consent	Murray McKenzie
Address	115 McCarrs Creek Road Church Point NSW 2105
Contact Details	**Phone** xx

RELEVANT CONSENTS

Consent Authority/Local Government Area	Pittwater Council
Development Consent No	N0036/08 **Date issued** 16/05/2008

PROPOSAL

Address of Development	115 McCarrs Creek Road Church Point NSW 2105 Lot 59 DP 11691
Building Classification	Class 1
Scope of building works covered by this Notice	Alterations and Additions
Value of Construction Certificate (Incl GST)	150 000 00
Plans and Specifications approved	Schedule 1
Fire Safety Schedule	N/A
Exclusions	
Critical stage inspections	See attached Notice
Conditions (Cls 187 or 188 of EPA Regs 2000)	Nil

CERTIFYING AUTHORITY

Certifying Authority	Grant Harrington
Accreditation Body	Building Professionals Board Registration No DPNR ACC BPB0170

I Grant Harrington as the certifying authority certify that the work if completed in accordance with the plans and specifications identified in Schedule 1 (with such modifications verified by the certifying authority as may be shown on that documentation) will comply with the requirements of the Environmental Planning & Assessment Regulation 2000 as referred to in section 81A(5) of the Environmental Planning and Assessment Act 1979

Dated this 18/11/2008

Grant Harrington
Accredited Building Surveyor

NB Prior to the commencement of work S81A (2) (b) and (c) of the Environment Planning and Assessment Act 1979 must be satisfied

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SCHEDULE 1 APPROVED PLANS AND SPECIFICATIONS

1 Endorsed Architectural plans

PREPARED BY	DOCUMENT	DRAWING NO	REV	DATE
Your Abode	Site Plan	2006-015 09		1/01/2008
Your Abode	Shadow Diagram	2006 015 08		1/01/2008
Your Abode	Sections A A & B B	2006 015 07		1/01/2008
Your Abode	North & East Elevations	2006 015-06		1/01/2008
Your Abode	South & West Elevations	2006-015-05	June 08 A	1/01/2008
Your Abode	First Floor Plan	2006-015 04	June 08- A	1/01/2008
Your Abode	Ground Floor Plan	2006-015 03		1/01/2008
Your Abode	Basement Floor Plan	2006-015 02	June 08 A	1/01/2008

2 Endorsed Engineering plans

PREPARED BY	DOCUMENT	DRAWING NO	REV	DATE
Tihanyi Consulting Engineers	Structural Details I	AYAA 1288/1		1/07/2008
Tihanyi Consulting Engineers	Structural Details II	AYAA 1288/2		1/07/2008

3 Endorsed Other documents

PREPARED BY	DOCUMENT	DRAWING NO	REV	DATE
Darryn Parkinson	Construction Certificate Application Form			25/06/2007
Tihanyi Consulting Engineers	Letter of Structural Adequacy			11/08/2008
Tihanyi Consulting Engineers	Letter of Structural Design			11/08/2008
Lachlan Taylor	Geotechnical Investigation Report			12/08/2008
Taylor Geotechnical Engineering	Report on Geotechnical Investigation			20/12/2007
Your Abode	Schedule of External Finishes			
Dept of Planning	BASIX Certificate	A26603		24/01/2008
Your Abode	Domestic Specifications			
Sydney Water	Stamped Approved Plan			7/10/2008
Pittwater Council	LSL Receipt	248745		31/10/2008

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Email	grant@pcaservices com au

NOTICE TO APPLICANT OF MANDATORY CRITICAL STAGE INSPECTIONS

Made under Part 4 of the Environmental Planning and Assessment Act 1979 Sections 81A(2)(b1)(ii)

OWNER DETAILS

Name of person having benefit of the development consent	Murray McKenzie
Address	115 McCarrs Creek Road Church Point NSW 2105
Contact Details	**Phone** xx

RELEVANT CONSENTS

Consent Authority/Local Government Area	*Pittwater Council*
Development Consent No	N0036/08 **Date issued** 16/05/2008
Construction Certificate Number 080067	**Date issued** 18/11/2008

PROPOSAL

Address of Development	115 McCarrs Creek Road Church Point NSW 2105
Scope of building works covered by this Notice	Alterations and Additions

CERTIFICATION DETAILS

Principal Certifying Authority	Grant Harrington
Accreditation Body	Building Professionals Board
	Registration No DPNR ACC BPB0170

Please telephone **9907 6300** to book a critical stage inspection A minimum period of 48 hours is to be provided

*I **Grant Harrington** **Private Certifiers Australia** located at Suite 1a / 226 Condamine Street PO Box 907 Balgowlah Manly Vale NSW 2093 acting as the principal certifying authority hereby give notice in accordance with Section 81A(2)(b1)(ii) of the Environmental Planning and Assessment Act 1979 to the person having the benefit of the development consent that the mandatory critical stage inspections identified in Schedule 1 & Schedule 2 are to be carried out in respect of the building work*

The applicant being the person having benefit of the development consent is required under Section 81A(2)(b2)(ii) of the Environmental Planning and Assessment Act 1979 to notify the principal contractor (if not an owner builder) of the applicable mandatory critical stage inspections specified under this notice

To allow a principal certifying authority or another certifying authority time to carry out mandatory critical stage inspections the principal contractor for the building site or the owner builder must notify the principal certifying authority at least 48 hours before building work is commenced at the site if a mandatory critical stage inspection is required before the commencement of the work in accordance with Clause 163 of the Environmental Planning & Assessment Regulation 2000

Failure to request a mandatory critical stage inspections will prohibit the principal certifying authority under with Section 109E(3)(d) of the Environmental Planning and Assessment Act 1979 to issue an occupation certificate

Dated 18/11/2008

Grant Harrington
Principal Certifying Authority

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Manly Vale NSW 2093
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SCHEDULE 1
MANDATORY CRITICAL STAGE INSPECTIONS

NO	CRITICAL STAGE INSPECTION	INSPECTOR
1	At commencement of building work	Certifying Authority
2	Prior to pouring any in situ reinforced concrete building element	Certifying Authority
3	Prior to covering of the framework for any floor wall roof or other building element	Certifying Authority
4	Prior to covering waterproofing in any wet areas	Certifying Authority
5	Prior to covering any stormwater drainage connections	Certifying Authority
6	After the building work has been completed & prior to any occupation certificate being issued in relation to the building	Certifying Authority

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Balgowlah
Manly Vale NSW 2093
Tel 02 9907 6300
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Email grant@pcaservices com au

18 November 2008

Our ref 080067

Darryn Parkinson
Your Abode Design & Development Pty Ltd
PO Box 260
AVALON NSW 2107

Dear Sir,

Re 115 McCarrs Creek Road Church Point
Construction Certificate No 080067

Enclosed are two (2) copies of the approved **Construction Certificate** for the subject development and two (2) copies of the stamped plans One copy of each has been forwarded directly to Pittwater Council for their records

The Notice of Appointment of Principal Certifying Authority and Commencement of Building Work form is required to be submitted to the Consent Authority (Council) 48 hours prior to commencement of building work Private Certifiers Australia will lodge this form to Council on your behalf after being returned to the appointed Principal Certifying Authority

The PCA role to be undertaken by Private Certifiers Australia will require inspections and certification Please have the Owner/Builder liaise with our Accredited Building Surveyor Grant Harrington prior to commencement of the work

Should you need to discuss any issues, please do not hesitate to contact the undersigned on the above numbers

Yours faithfully,

Grant Harrington
Accredited Building Surveyor
Private Certifiers Australia

Building Regulations Consultant

Principle Certifying Authority

Construction Certification

Fire Upgrade Surveys

Planning

Private Certifiers Australia

CC RECEIVED ON 02 JUL 2008

CONSTRUCTION CERTIFICATE APPLICATION

Made under the *Environmental Planning and Assessment Act 1979*
Sections 81A(2), 109C(1)(b)

IDENTIFICATION OF BUILDING

Address 115 McCarrs Creek Rd

Lot DP/MPS etc 54 DP 11691

Suburb or town Church Point Post Code 2105

DESCRIPTION OF DEVELOPMENT

Detailed Description Alterations + additions

APPLICANT

Name Darryn Rathmore Company your abode

Address Po Box 260

Suburb or town Avalon Post Code 2107

Phone B/H 9973 2756 Fax No 9973 2758

Mobile _____ Email darryn@yourabode.com.au

As the applicant I/we hereby

1 *Submit this Construction Certificate Application under the Environmental Planning & Assessment Act 1979 with Private Certifiers Australia and appoint Grant Harrington as the Principal Certifying Authority for the building work identified in this application*

Signature of applicant **Sign** _____ **Date** 13/6/07

CONSENT TO ALL OWNER(S)

Name Murray McKenzie Company _____

Address 115 McCarrs Creek Rd

Suburb or town Church Pt Post Code 2105

Phone B/H _____ Fax No _____

Mobile _____ Email _____

I/We as the owner of the above building/property consent to the Appointed PCA (Principal Certifying Authority) or their representative to lodge the Notice of Commencement on our behalf

Signature of Owner **Sign** _____ **Date** 25/6/07

VALUE OF WORK

Estimated Cost of work $ 150 k

GST $ 150 k

For developments over $5 million a Quantity Surveyors Certificate verifying the cost must be submitted on lodgement of the application

DEVELOPMENT CONSENT

Development Consent No No N 0056/08

Date of Determination Date 16 may 08.

BUILDING CODE OF AUSTRALIA BUILDING CLASSIFICATION

Nominated on the Development Consent Class 1

RESIDENTIAL BUILDING WORK

Relevant only to residential building work

Owner-builder Permit No TBC

or

Name of Builder

Address

Telephone Fax

Contractor License No

REQUIRED ATTACHMENTS

- Note 1 details the information that must be submitted with an application for a construction certificate for proposed building works
- Note 2 details the additional information that may be submitted with an application for a construction certificate for proposed residential building work

Schedule 1 information to be
Collected for ABS Particulars of the proposal

DESCRIPTION

What is the area of the land (m^2) 2957 m^2

Gross floor area of existing building (m^2) 106 m^2

What are the current uses of all or parts of the building(s)/land?

(If vacant state vacant)

Location	Use
Church Road	Dwelling

Does the site contain a dual occupancy? No

What is the gross floor area of the proposed addition or new building (m^2) 185 m^2

What are the proposed uses of all parts of the building(s)/land?

Location	Use
Dwelling.	

Number of pre-existing dwellings 1

Number of dwellings to be demolished 0

How many dwellings are proposed? 1

How many storeys will the building consist of? 2

MATERIALS TO BE USED

Walls	Code		Roof	Code	
Brick veneer	12		Aluminium	70	
Full brick	11		Concrete	20	
Single brick	11		Concrete tile	10	
Concrete block	11		Fibrous cement	30	
Concrete/ masonary	20		fibreglass	80	
Concrete	20		Masonry/terracott a shingle tiles	10	
Steel	60	✓	Slate	20	
Fibrous cement	30	✓	Steel	60	✓
Hardiplank	30		Terracotta tile	10	
Timber/weatherboard	40		Other	80	
Cladding aluminium	70		Unknown	90	
Curtain glass	50				
Other					
Unknown	90				

Floor	Code		Frame	Code	
Concrete	20	✓	Timber	40	
Timber	10		Steel	60	✓
Other	80		Other	80	
Unknown	90		Unknown	90	

NOTES
For Completing Construction Certificate Application

Note 1

The following information must accompany applications for a construction certificate for building and subdivision work

Building Work

In the case of an application for a construction certificate for **building work**

a) Copies of compliance certificates relied upon

b) Four (4) copies of detailed plans and specifications

The plan for the building must be drawn to a suitable scale and consist of a general plan and a block plan The general plan of the building is to
- show a plan of each floor section
- show a plan of each elevation of the building
- 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
- indicate the height design construction and provision for fire safety and fire resistance (if any)

Where the proposed building work involves any alteration or addition to or rebuilding of an existing building the general plan is to be coloured or otherwise marked to the satisfaction of the certifying authority to adequately distinguish the proposed alteration addition or rebuilding

Where the proposed building work involves a modification to previously approved plans and specification the general plans must be coloured or otherwise marked to the satisfaction of the certifying authority to adequately distinguish the modification

The specification is
- to describe the construction and materials of which the building is to be built and the method of drainage sewerage and water supply
- state whether the materials proposed to be used are new or second hand and give particulars of any second hand and give particulars of any second hand materials to be used

c) Where the application involves an alternative solution to meet the performance requirements of the BCA the application must also be accompanied by
- details of the performance requirements that the alternative solution is intended to meet and
- details of the assessment methods used to establish compliance with those performance requirements

d) Evidence of any accredited component process or design sought to be relied upon

e) Except in the case of an application for or in respect of a class 1a or class 10 building
- 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
- 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

The list must describe the extent capacity and basis of design of each of the measures concerned

Note 2

Home Building Act Requirements

In the case of an application for a construction certificate for residential building work (within the meaning of the *Home Building Act 1989*) attach the following

a) In the case of work by a licensee under that Act
   (i) a statement detailing the licensee s name and contractor licence number and
   (ii) documentary evidence that the licensee has complied with the applicable requirements of that Act* or

b) In the case of work done by any other person
   (i) a statement detailing the person s name and owner builder permit number or
   (ii) a declaration signed by the owner of the land to the effect that the reasonable market cost of the labour and materials involved in the work is less than the amount prescribed for the purposes of the definition of ***owner builder work*** in section 29 of that Act
   (iii)

A certificate purporting to be issued by an approved insurer under Part 6 of the *Home Building Act 1989* to the effect that a person is the holder of an insurance contract issued for the purposes of that Part is sufficient evidence that the person has complied with the requirements of that Part

Tihanyi CONSULTING ENGINEERS PTY LTD
Structural Specialists 6 Suzanne Rd Mona Vale NSW 2103 Email tihanyi@optusnet.com.au
Phone (0)9997 9821 Fax (02) 9997 9340 Mob 0412 704 718

11 August 2008 Job No AYAA-1288

Mr & Mrs Murray & Beverley MacKenzie
C/o Your Abode
P O Box 260
AVALON NSW 2107

Att Darryn Parkinson

Dear Sir / Madam

Re 115 McCarrs Creek Rd, Church Point – Alterations and Additions

At the request of Darryn Parkinson of Your Abode Design we made a visit to your house to assess it structurally in the light of your proposal to extend the living areas with an extension over the flat concrete roof of the building and extend the ground floor with a staircase and a deck

We have conducted a visual inspection which covered structural elements involved in carrying any extra loads from the proposed alterations Investigation of other parts of the then existing residence and the site was not requested and is not subject of this letter The letter shall not be taken as report on the existing conditions

On the basis of the above we have formed the view that the existing walls and their foundations would not be adversely effected by supporting extra loads from the additions as it shown on the drawings prepared by Your Abode Design provided it is constructed in accordance with the structural drawing prepared by this office The live loading of the new living area will not exceed the live loading of the existing trafficable roof The new roof will be supported on steel posts located over walls and posts loading from the new roof will not adversely effect the existing structures The ground floor extensions are planned to be supported on new footings

The new works may result in some opening of existing cracks and formation of new cracks In the event of such cracks occurring, we are on the opinion that they will not be the result of extra loading from the new additions

The Builder shall be responsible at all times for maintaining the refurbished building and the neighbouring structures in a stable and safe condition Nothing shown or called for on the structural engineering drawing relieves the builder of his responsibilities in this regard

Yours faithfully
Tihanyi Consulting Engineers

Eva Tihanyi
BE MIEAust. MACEAust CPEng

Tihanyi CONSULTING ENGINEERS PTY LTD ACN [illegible]
Structural Specialists 6 Suzanne Rd Mona Vale NSW 2103 Email tihanyieng@ozemail.net.com.au
Phone (02) 9997 8321 Fax (02) 9997 8940 Mob 0412 701 718

Job No **AYAA-1288**

11 August 2008

Mr & Mrs Murray & Beverley MacKenzie
C/o Your Abode
P O Box 260
AVALON NSW 2107

Att Darryn Parkinson

Dear Sir/Madam

STRUCTURAL DESIGN CERTIFICATE

Re 115 McCarrs Creek Rd, Church Point – Alterations and Additions

We, Tihanyi Consulting Engineers Pty Ltd, being practicing and qualified Structural Engineers within the meaning of the Building Code of Australia, hereby certify that we have carried out structural design and documentation in accordance with accepted engineering practice and principles as shown on the plans and details on drawings AYAA-1288/1 & 2 dated July 2008 for the above project and that the design and structural engineering details on the drawing comply with the relevant sections of Australian Standards AS 1170 AS 3600 AS 4100 AS 1720 and AS 3700, listed under Part 3 of the BCA

Sincerely yours
Tihanyi Consulting Engineers Pty Ltd

Eva Tihanyi
BE MIEAust MACEAust CPEng
NPER Registered
Colleges Structural (No 109225)

GEOTECHNICAL RISK MANAGEMENT POLICY FOR PITTWATER
FORM NO 2 – To be submitted with detailed design for construction certificate

Development Application for MURRAY & BEVERLEY McKENZIE
Name of Applicant

Address of site 115 McCARRS CREEK RD CHURCH POINT

Declaration made by Structural or Civil Engineer in relation to the incorporation of the Geotechnical issues into the project design

I EVA TIHANYI (insert name) on behalf of TIHANYI CONSULTING ENGINEERS PTY LTD (trading or company name)

on this the 12 AUGUST 2008 (date)

certify that I am a Structural or Civil Engineer as defined by the Geotechnical Risk Management Policy for Pittwater I am authorised by the above organization/company to issue this document and to certify that the organization/company has a current professional indemnity policy of at least $2million I also certify that I have prepared the below listed structural documents in accordance with the recommendations given in the Geotechnical Report for the above development

Geotechnical Report Details

Report Title	REPORT ON GEOTECHNICAL INVESTIGATION PROPOSED RESIDENTIAL HOUSE DEVELOPMENT 115 McCARRS CREEK RD CHURCH POINT
Report Date	20 DECEMBER 2007
Author	LACHLAN TAYLOR

Structural Documents list

AYAA-1288/1 STRUCTURAL DETAILS I
AYAA-1288/2 STRUCTURAL DETAILS II

I am also aware that Pittwater Council relies on the processes covered by the Geotechnical Risk Management Policy including this certification as the basis for ensuring that the geotechnical risk management aspects of the proposed development have been adequately addressed to achieve an "Acceptable Risk Management' level for the life of the structure taken as at least 100 years unless otherwise stated and justified

EVA TIHANYI (name) (signature)

Declaration made by Geotechnical Engineer or Engineering Geologist in relation to Structural Drawings

I prepared and/or technically verified the abovementioned Geotechnical Report as per Form 1 dated 20/12/07 and now certify that I have viewed the above listed structural documents prepared for the same development. I am satisfied that the recommendations given in the Geotechnical Report have been appropriate taken into account by the structural engineer in the preparation of these structural documents I am aware that Pittwater Council relies on the processes covered by the Geotechnical Risk Management Policy including this certification as the basis for ensuring that the geotechnical risk management aspects of the proposed development have been adequately addressed to achieve an "Acceptable Risk Management" level for the life of the structure taken as at least 100 years unless otherwise stated and justified in the Report and that reasonable and practical measures have been identified to remove foreseeable risk

Signature LTaylor
Name Lachlan Taylor
Chartered Professional Status CPEng NPER MIEAust
Membership No 2145895

ENGINEERS AUSTRALIA
Lachlan Taylor
MIEAust CPEng
Chartered Professional Engineer
Membership No 2145895

Pittwater [illegible]

OFFICIAL [illegible]

[illegible] Receipt [illegible]

[illegible] [illegible]

115 MCCARRS CREEK ROAD
CHURCH POINT

Prof c	Reference	Amount
LL Re	NLSL-80[illegible] 1 [illegible]	$7[illegible]

Total	$7[illegible]

Amounts Tendered

Cash	$[illegible]
Cheque	$[illegible]
Db/Cr Card	$[illegible]
Money Order	$[illegible]
Agency Rec	$[illegible]
Total	$[illegible]
Rounding	$[illegible]
Change	$[illegible]
Net	$[illegible]

[illegible] [illegible]

Cashier [illegible]

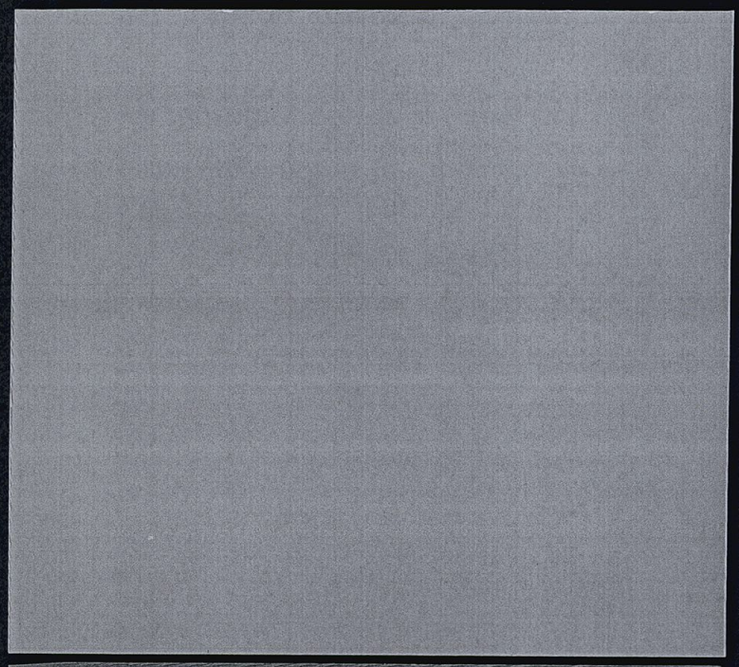
SYDNEY WATER
APPROVED

1 Position of structure in relation to S
Water s assets is satisfactory
2 Connections to Sydney Water exist
services may only be made following the
of a permit to a licensed plumber/drain
3 It is the owner s responsibility to ensure
all proposed fittings will drain to Syd
Water s sewer
4 Any Plumbing and/or Drainage Work
carried out in accordance with the Sy
Water Act 1994 AS 3500 and the NSW C
of Practice
5 Gullies Inspection Shafts and Bounda
shall not be placed under any Roo Ba
Verandah Floor or other cover u
otherwise approved by Sydney Water
6 Property No 3432500

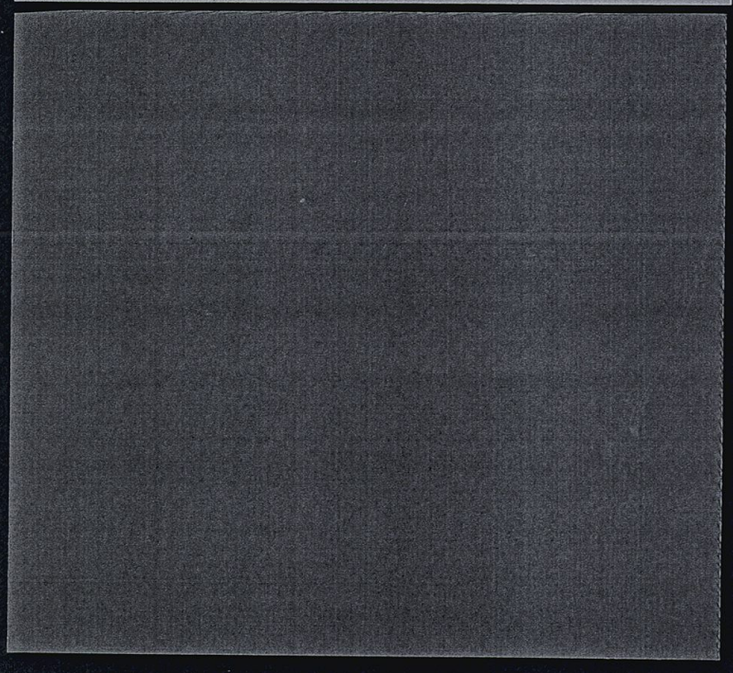
Reece, Mona Vale
Quick Check Agent on behalf of
SYDNEY WATER

Per reece 7/10/08

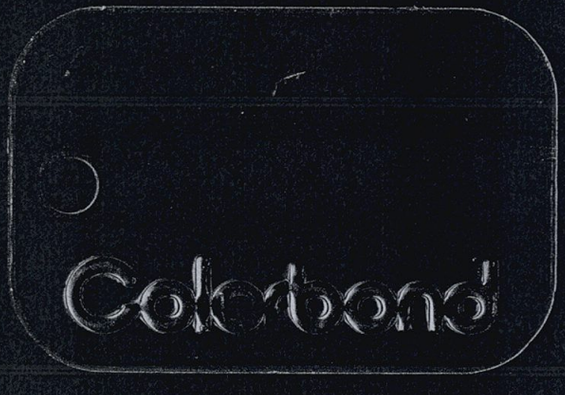
115 MCCARRS CREEK ROAD CHURCH POINT



DULUX CALF SKIN



DULUX BOGART



COLORBOND IRONSTONE

BASIX Certificate

Building Sustainability Index www.basix.nsw.gov.au

Alterations and Additions

Certificate number: A26603

This certificate confirms that the proposed development will meet the NSW government's requirements for sustainability, if it is built in accordance with the commitments set out below. Terms used in this certificate, or in the commitments, have the meaning given by the document entitled "BASIX Alterations and Additions Definitions" dated 29/9/2006 published by Department of Planning. This document is available at www.basix.nsw.gov.au

Director-General
Date of issue: Thursday, 24, January 2008

NSW GOVERNMENT
Department of Planning

Project address	
Project name	115 McCarrs Creek Road
Street address	115 McCarrs Creek Road Church Point 2105
Local Government Area	Pittwater Council
Plan type and number	Deposited Plan 11691
Lot number	59
Section number	0
Project type	
Dwelling type	Separate dwelling house
Type of alteration and addition	My renovation work is valued at $50,000 or more, and does not include a pool (and/or spa).

Fixtures and systems	Show on DA Plans	Show on CC/CDC Plans & specs	Certifier Check
Hot water			
The applicant must install the following hot water system in the development: solar (electric-boosted) system that is eligible to create Renewable Energy Certificates under the (Commonwealth) Renewable Energy (Electricity) Regulations 2001 (incorporating Amendment Regulations 2005 (No. 2)).	✓	✓	✓
Lighting			
The applicant must ensure a minimum of 40% of new or altered light fixtures are fitted with fluorescent, compact fluorescent, or light-emitting-diode (LED) lamps.		✓	✓
Fixtures			
The applicant must ensure new or altered showerheads have a flow rate no greater than 9 litres per minute or a 3 star water rating.		✓	✓
The applicant must ensure new or altered toilets have a flow rate no greater than 4 litres per average flush or a minimum 3 star water rating.		✓	✓
The applicant must ensure new or altered taps have a flow rate no greater than 9 litres per minute or minimum 3 star water rating.		✓	

Construction	Show on DA Plans	Show on CC/CDC Plans & specs	Certifier Check

Insulation requirements

The applicant must construct the new or altered construction (floor(s), walls, and ceilings/roofs) in accordance with the specifications listed in the table below, except that a) additional insulation is not required where the area of new construction is less than 2m2, b) insulation specified is not required for parts of altered construction where insulation already exists.

Construction	Additional insulation required (R-value)	Other specifications
concrete slab on ground floor.	nil	
floor above existing dwelling or building.	nil	
external wall: framed (weatherboard, fibro, metal clad)	R1.30 (or R1.70 including construction)	
internal wall shared with garage: plasterboard (R0.36)	nil	
flat ceiling, pitched roof	ceiling: R1.45 (up), roof: foil backed blanket (55 mm)	medium (solar absorptance 0.475 - 0.70)
raked ceiling, pitched/skillion roof: structural panel >125 mm	ceiling: nil (up), roof: none	medium (solar absorptance 0.475 - 0.70)
flat ceiling, flat roof: structural panel >125 mm	ceiling: nil (up), roof: none	medium (solar absorptance 0.475 - 0.70)

Glazing requirements	Show on DA Plans	Show on CC/CDC Plans & specs	Certifier Check
Windows and glazed doors			
The applicant must install the windows, glazed doors and shading devices, in accordance with the specifications listed in the table below. Relevant overshadowing specifications must be satisfied for each window and glazed door.	✓	✓	✓
The following requirements must also be satisfied in relation to each window and glazed door:		✓	✓
Each window or glazed door with standard aluminium or timber frames and single clear or toned glass may either match the description, or, have a U-value and a Solar Heat Gain Coefficient (SHGC) no greater than that listed in the table below. Total system U-values and SHGCs must be calculated in accordance with National Fenestration Rating Council (NFRC) conditions.		✓	✓
For projections described in millimetres, the leading edge of each eave, pergola, verandah, balcony or awning must be no more than 500 mm above the head of the window or glazed door and no more than 2400 mm above the sill.	✓	✓	✓
Pergolas with polycarbonate roof or similar translucent material must have a shading coefficient of less than 0.35.		✓	✓
External louvres and blinds must fully shade the window or glazed door beside which they are situated when fully drawn or closed.		✓	✓
Pergolas with fixed battens must have battens parallel to the window or glazed door above which they are situated, unless the pergola also shades a perpendicular window. The spacing between battens must not be more than 50 mm.		✓	✓
Overshadowing buildings or vegetation must be of the height and distance from the centre and the base of the window and glazed door, as specified in the 'overshadowing' column in the table below.	✓	✓	✓

Windows and glazed doors glazing requirements

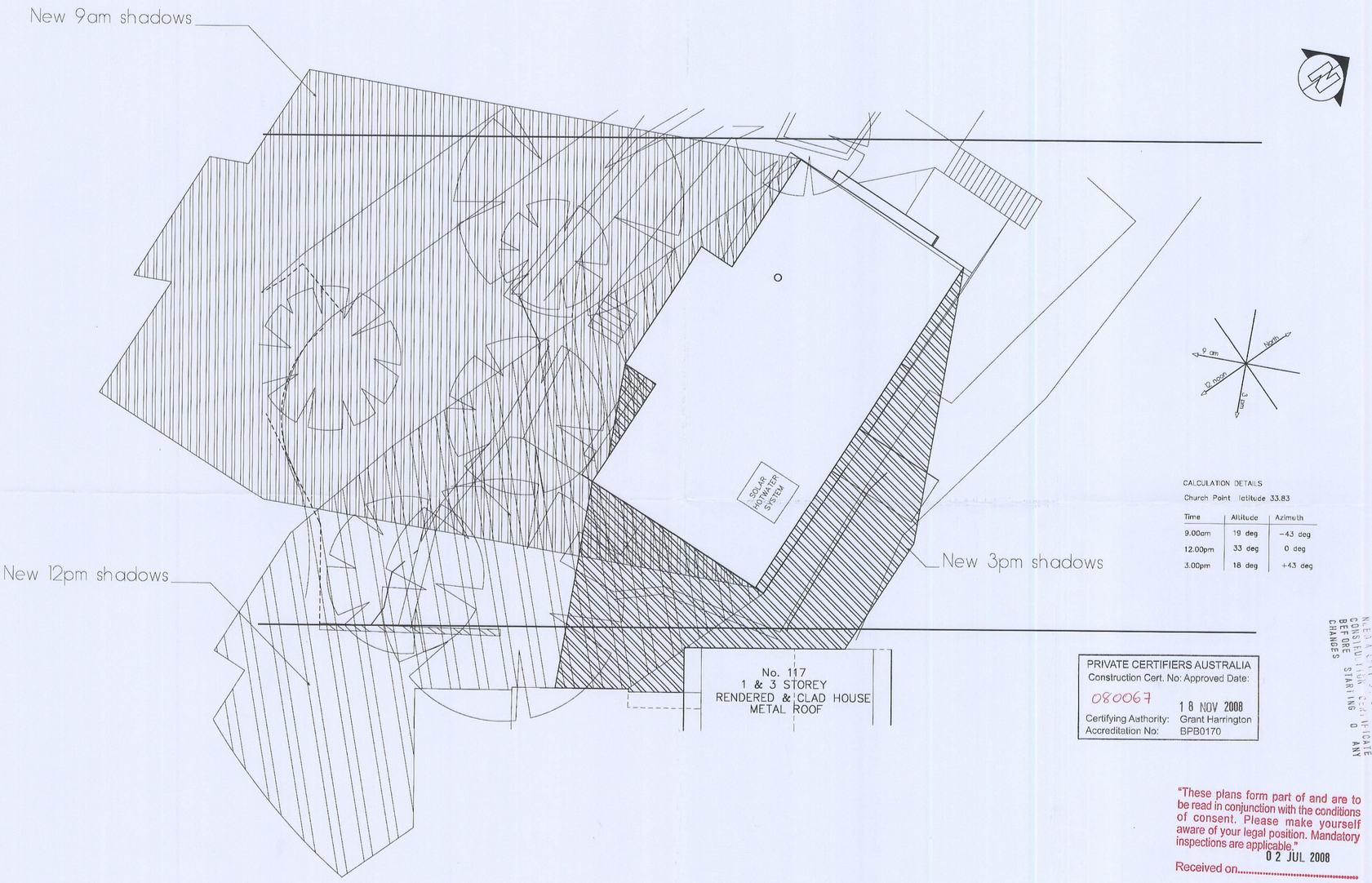
Window / door no.	Orientation	Area of glass inc. frame (m2)	Overshadowing Height (m)	Overshadowing Distance (m)	Shading device	Frame and glass type
W1	S	0.732	0	0	none	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)
W2	W	0.732	10	3	none	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)
W3	W	0.732	8	3	none	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)
W4	N	0.732	0	0	eave/verandah/pergola/balcony	timber or uPVC, single clear, (or U-value:

Glazing requirements							Show on DA Plans	Show on CC/CDC Plans & specs	Certifier Check
Window / door no.	Orientation	Area of glass inc. frame (m2)	Overshadowing Height (m)	Overshadowing Distance (m)	Shading device	Frame and glass type			
					>=900 mm	5.71, SHGC: 0.66)			
W5	W	3.15	0	0	eave/verandah/pergola/balcony >=900 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W6	W	1	5	3	eave/verandah/pergola/balcony >=600 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W7	E	0.742	2	1.3	eave/verandah/pergola/balcony >=600 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W8	E	0.742	2	1.2	eave/verandah/pergola/balcony >=600 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W9	E	1.68	2	1	eave/verandah/pergola/balcony >=600 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W10	E	0.742	1.3	1.2	awning (fixed) >=900 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W11	E	1.378	1	2.7	awning (fixed) >=900 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W12	N	4.74	0	0	eave/verandah/pergola/balcony >=900 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W13	N	3.03	0	0	eave/verandah/pergola/balcony >=750 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W14	W	1.51	0	0	external louvre/blind (adjustable)	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W15	E	3.47	0	0	eave/verandah/pergola/balcony >=900 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W16	W	3.03	0	0	external louvre/blind (fixed)	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W17	W	0.96	0	0	external louvre/blind (adjustable)	timber or uPVC, single clear, (or U-value:			

Glazing requirements							Show on DA Plans	Show on CC/CDC Plans & specs	Certifier Check
Window / door no.	Orientation	Area of glass inc. frame (m2)	Overshadowing Height (m)	Overshadowing Distance (m)	Shading device	Frame and glass type			
						5.71, SHGC: 0.66)			
W18	S	1.51	0	0	none	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W19	S	1.73	0	0	eave/verandah/pergola/balcony >=900 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W20	S	1.02	0	0	eave/verandah/pergola/balcony >=600 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W21	E	1.32	0	0	external louvre/blind (fixed)	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W22	E	1.32	0	0	external louvre/blind (fixed)	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W23	E	2.04	0	0	eave/verandah/pergola/balcony >=750 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W24	N	2.04	0	0	eave/verandah/pergola/balcony >=900 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W25	E	0.97	0	0	external louvre/blind (adjustable)	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W26	N	6.88	0	0	eave/verandah/pergola/balcony >=750 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W27	W	0.97	0	0	external louvre/blind (adjustable)	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W28	N	0.888	0	0	eave/verandah/pergola/balcony >=900 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W29	N	0.732	0	0	external louvre/blind (adjustable)	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W30	W	0.732	5	3	none	timber or uPVC, single clear, (or U-value:			

Glazing requirements							Show on DA Plans	Show on CC/CDC Plans & specs	Certifier Check
Window / door no.	Orientation	Area of glass inc. frame (m2)	Overshadowing Height (m)	Overshadowing Distance (m)	Shading device	Frame and glass type			
						5.71, SHGC: 0.66)			
W31	E	4.356	0	0	eave/verandah/pergola/balcony >=900 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W32	W	6.194	0	0	eave/verandah/pergola/balcony >=900 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W33	W	0.732	7	3	none	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W34	E	1.378	2	1	none	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W35	E	1.378	1	2.5	awning (fixed) >=900 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W36	E	3.225	0	0	eave/verandah/pergola/balcony >=900 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			
W37	E	4.356	0	0	eave/verandah/pergola/balcony >=900 mm	timber or uPVC, single clear, (or U-value: 5.71, SHGC: 0.66)			

Legend
In these commitments, "applicant" means the person carrying out the development.
Commitments identified with a "✓" in the "Show on DA plans" column must be shown on the plans accompanying the development application for the proposed development (if a development application is to be lodged for the proposed development).
Commitments identified with a "✓" in the "Show on CC/CDC plans & specs" column must be shown in the plans and specifications accompanying the application for a construction certificate / complying development certificate for the proposed development.
Commitments identified with a "✓" in the "Certifier check" column must be certified by a certifying authority as having been fulfilled, before a final occupation certificate for the development may be issued.



CALCULATION DETAILS

Church Point latitude 33.83

Time	Altitude	Azimuth
9.00am	19 deg	−43 deg
12.00pm	33 deg	0 deg
3.00pm	18 deg	+43 deg

PRIVATE CERTIFIERS AUSTRALIA
Construction Cert. No: Approved Date:
080067 18 NOV 2008
Certifying Asthority: Grant Harrington
Accreditation No: BPB0170

MONITOR ON SITE PRIOR TO CONSTRUCTION TO CERTIFICATE NCEBA NOTICE BEFORE STARTING ANY CHANGES

"These plans form part of and are to be read in conjunction with the conditions of consent. Please make yourself aware of your legal position. Mandatory inspections are applicable."

Received on 02 JUL 2008

REV NO.	DESCRIPTION	DATE

NOTE:
All dimensions are to be confirmed on site.
Do not scale dimensions
Report discrepancies to your abode

your abode
po box 260, avalon, nsw 2107
p/f : 9973 2756
www.yourabode.com.au

PROJECT
115 McCarrs Creek Road
CHURCH POINT

CLIENT
Murray & Beverley McKenzie

DRAWN/DESIGNED
S . R / D . P

DATE
Jan 08

DRAWING
SHADOW DIAGRAM

SCALE
1 : 100

DRAWING NUMBER
2006 - 015 - 08

REVISION

58
D.P.11691

No. 111
1 & 2 STOREY
RENDERED & STONE CLAD
HOUSE FLAT CONCRETE
ROOF

SILT FANCE LINE

Prevailing wind

VIEW

ROAD

(BITUMEN SURFACE)

MINKARA (NOT FORMED) ROAD

1 & 2 STOREY
BLOCK & CLAD HOUSE
CURVE ROOF

59
D.P.11691
2957 m

30"
148.07

125°

19.455

09'

30"

155.96

35°

16°

15'

20.98

30"

CREEK

MCCARRS

No. 117
1 & 3 STOREY
RENDERED & CLAD HOUSE
METAL ROOF

12
D.P.794043

11
D.P.794043

2
D.P.775223

"These plans form part of and are to be read in conjunction with the conditions of consent. Please make yourself aware of your legal position. Mandatory inspections are applicable."

Received on 02 JUL 2008

PRIVATE CERTIFIERS AUSTRALIA
Construction Cert. No: 080067 Approved Date: 18 NOV 2008
Certifying Authority: Grant Harrington
Accreditation No: BPB0170

** NOTE: Existing connections to the storm water tank to be retained.

SCANNED
27 NOV 2008
PITTWATER COUNCIL

Rev No.	Description	Date

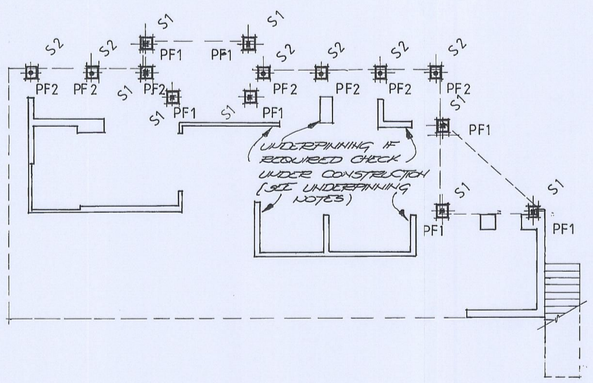
your abode
po box 240, avalon, nsw 2107
p/f 1 9973 3756
www.yourabode.com.au

Client
Murray & Beverley McKenzie

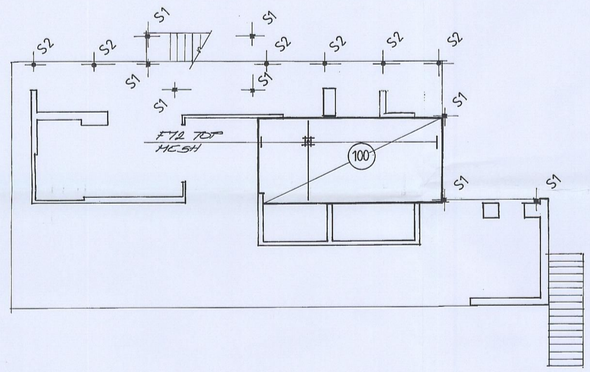
Project
55 McCarrs Creek Road
CHURCH POINT

Drawn/designed	Date
B.B / D.P	Jun 08
Description	Scale
SITE PLAN	1:100
Drawing number: 2006 - 08 - 09	Revision

THE WORK SHOWN THESE DRAWINGS IS BASED ON INFORMATION DERIVED FROM AN INSPECTION OF THE EXISTING BUILDING. OR OPENING UP, SHOULD THE BUILDER ASCERTAIN THAT CONDITIONS ARE NOT AS HAVE BEEN ASSUMED, HE SHALL INFORM THE CONSULTING ENGINEER AND OBTAIN FURTHER INSTRUCTIONS BEFORE PROCEEDING.



FOOTING LAYOUT



BASEMENT FLOOR PLANT

UNDERPINNING PROCEDURE

1. THE BUILDER SHALL BE RESPONSIBLE AT ALL TIMES FOR MAINTAINING THE BUILDING IN A STABLE AND SAFE CONDITION. NOTHING SHOWN OR CALLED FOR ON THIS DRAWING RELIEVES THE BUILDER OF HIS RESPONSIBILITIES IN THIS REGARD.
2. UNDERPINNING SHALL BE INSTALLED IN 600MM (MAX.) WIDTH, LEAVING 1200MM (MIN.) WIDTH IN BETWEEN INTACT AT ANY TIME.
3. UNDERPINNING SHALL GO DOWN TO A MINIMUM 200kPa BEARING CAPACITY SOIL AND UNDERSIDE OF ADJACENT NEW FOOTINGS AND/OR SLABS RESPECTIVELY.
4. TOP OF UNDERPINNING SHALL BE DRY PACKED WITH NON SHRINK GROUT.
5. A MINIMUM OF THREE DAYS SHALL ELAPS BETWEEN THE INSTALLATION OF ANY ONE SERIES OF UNDERPINNING.

STRUCTURAL STEEL

S1 All workmanship and material shall be in accordance with AS4100. Fabrication shall be in accordance with Section 14,. erection shall be in accordance with Section 15 of AS4100.

S2 The Contractor shall provide all cleats and drill all holes necessary for fixing steel, timber and other members, architectural elements, fixtures, temporary & final bracing, whether or not detailed on the structural drawings.

S3 Unless noted otherwise all bolts shall be M16 category 4.6/S. with 10mm thick cleats, min. 2 bolts per connection.

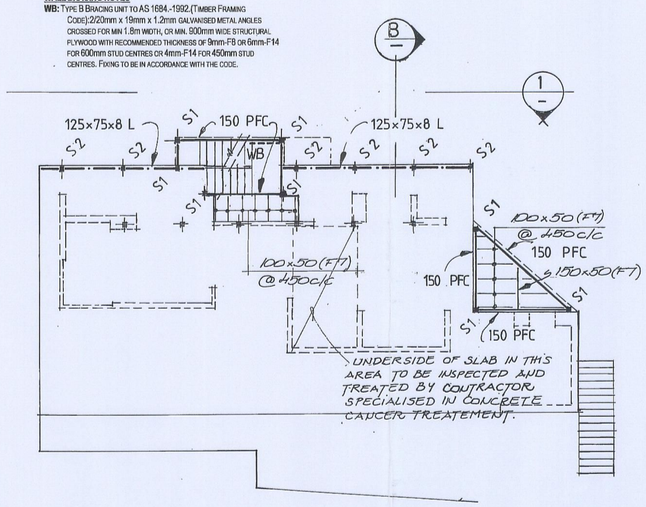
S4 Unless noted otherwise all welds shall be 6mm continuous fillet weld or butt weld, category SP, using E48XX electrodes.

S5 Structural steelwork not encased in concrete shall have:

Element:	Preparation:	Protection:
Steelwork exposed to weather, wall cavity or water, bolts, holding down bolts, anchors	pickle or abrasive blast clean to Class 3 to AS 1650	hot dip galvanising to AS4680(min. 550 g/m² zinc)
Steelwork not listed above and protection not otherwise specified	hand or power tool cleaned to Class 2 to AS 1650	two coats of red oxide zinc chromate primer in shop

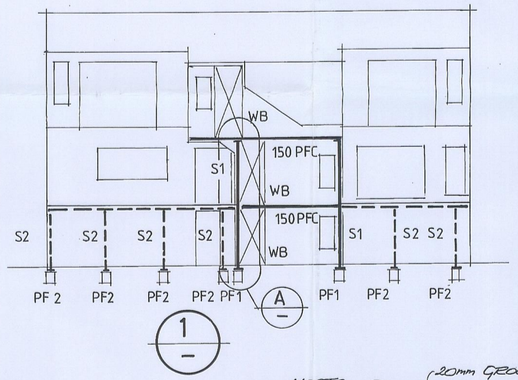
WALL BRACING NOTES

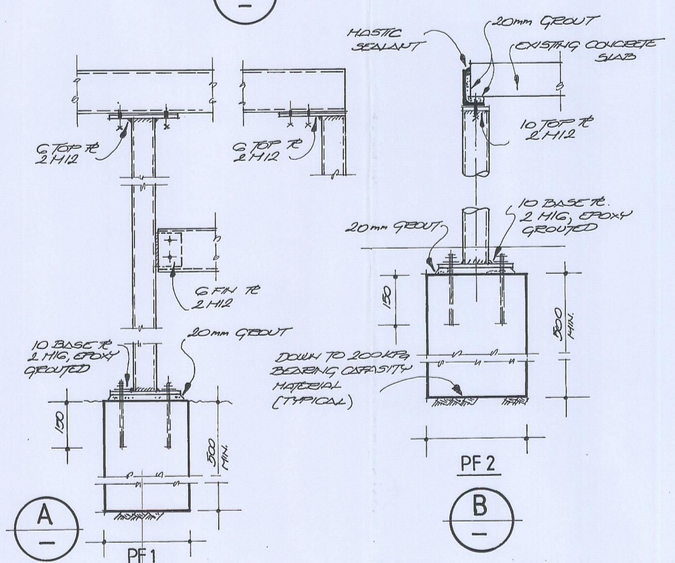
WB: Type B Bracing unit to AS 1684.-1992.(Timber Framing Code):2/20mm x 19mm x 1.2mm galvanised metal angles crossed for min 1.8m width, or min. 900mm wide structural plywood with recommended thickness of 9mm-F8 or 6mm-F14 for 600mm stud centres or 4mm-F14 for 450mm stud centres. Fixing to be in accordance with the code.



GROUND FLOOR PLAN

STEEL COLUMNS: S1 - 75×75×4 SHS
S2 - 89×4.0 CHS





CONSTRUCTION NOTES

GENERAL

1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANT'S DRAWINGS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ALL DISCREPANCIES SHALL BE REFERRED TO THE SUPERVISING OFFICER FOR DECISION BEFORE PROCEEDING WITH THE WORK.
2. NO RESPONSIBILITY WILL BE TAKEN BY THE CONSULTING ENGINEER FOR DIMENSIONS OBTAINED BY SCALING THE STRUCTURAL DRAWINGS
3. ALL DIMENSIONS SHALL BE VERIFIED ON SITE BY THE CONTRACTOR, WHO SHALL BE RESPONSIBLE FOR THEIR CORRECTNESS.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STRUCTURE AND NEIGHBOURING STRUCTURES IN SAFE AND STABLE CONDITIONS DURING CONSTRUCTION. NO PART SHALL BE OVERSTRESSED.
5. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT EDITIONS OF THE BUILDING CODE OF AUSTRALIA, SAA CODES (WITH AMENDMENTS), AND BY-LAWS AND ORDINANCES OF THE RELEVANT GOVERNMENT AUTHORITIES.
6. THE STRUCTURAL WORK SHOWN ON THESE DRAWINGS HAS BEEN DESIGNED FOR THE FOLLOWING LIVE LOADS:
   GENERALLY (UNO): ....1.5.....kPa
   STAIRS/BALCONIES: ....3.0.....kPa
   ROOF: ....0.25.....kPa
   .....:.....kPa
   .....:.....kPa
   .....:.....kPa
   DRIVE WAY: .....ESA
6. THE STRUCTURAL WORK SHOWN ON THESE DRAWINGS HAS BEEN DESIGNED FOR THE DESIGN WIND LOAD OF REGION ..A.. TERRAIN CATEGORY 2
   DESIGN EARTHQUAKE LOAD FOR SEISMIC ZONE ..A..

FOUNDATION:

1. FOUNDATION MATERIAL SHALL BE APPROVED FOR AN ALLOWABLE BEARING INTENSITY OF ..400..kPa IMMEDIATELY PRIOR TO PLACING CONCRETE. NOT WITHSTANDING THIS, THE UNDERSIDE OF ALL FOOTINGS SHALL BE AS DETAILED, AND IN NATURAL RESIDUAL.
2. FOOTINGS HAS BEEN DESIGNED FOR SITE CLASSIFICATION ..A.. IN ACCORDANCE WITH AS2870. SHALL BE CONFIRMED BY QUALIFIED GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION, AND HIS INSTRUCTIONS SHALL BE FOLLOWED.
3. FOOTING HAS BEEN DESIGNED IN ACCORDANCE WITH THE GEOTECHNICAL REPORT NO.....
   BY .....
   COPY OF THE REPORT SHALL BE KEPT ON SITE AND ALL RECOMMENDATIONS IN IT SHALL BE FOLLOWED.

CONCRETE

C1 All workmanship and materials shall be in accordance with AS3600 current edition with amendments (unless otherwise specified).

C2 Ready-mix concrete supply shall comply with AS1379.

C3 Concrete Quality (unless otherwise specified):
Cement: Type A Normal Portland Cement
Maximum size of coarse aggregate: 20mm
Maximum slump during placing: 80mm

C4 Project control testing shall be carried out in accordance with AS1379, Clause B7.

C5 No admixtures shall be used in concrete unless approved in writing.

C6 Concrete grade and clear concrete cover to reinforcement including ties and stirrups (excluding tendons) for durability shall be as follows unless shown otherwise.

Exposure Classification:	A1 & A2	B1	B2
Concrete grade f'c:	25MPa	32MPa	40MPa
Members cast against ground:	50mm	60mm	65mm
Exposed slabs and walls in forms or on membrane:	30mm	40mm	45mm
Not exposed slabs and walls in forms up to 90minutes FRL	20mm	N.A.	N.A.
Beams and columns in forms up to 120 minutes FRL	40mm	40mm	45mm

Unreinforced mass concrete F'c: 20MPa

For cover requirements over 90 minutes Fire Resistance Levels refer to AS 3600 and specification.

Exposure classification shall be determined on site in accordance with Table 4.3 in AS 3600. Most common categories (for guide only) listed below:

-Surfaces in interior environment or exposed to non aggressive ground or weather further than 50km from coast line, not in industrial area: A1
-Members exposed to weather 1 km to 50km from coast line: B1
-Members exposed to weather less than 1 km from coast line: B2
-For Members in tidal or splash zone, water or other corrosive environment see specification and drawings.

C7 All reinforcement shall be firmly supported on mild steel plastic tipped chairs, plastic chairs or concrete chairs at not greater than 1 metre centres both ways. Bars shall be tied at alternate intersections. In exposure condition B2 or C use only plastic chairs.

C8 Concrete sizes shown and cover nominated to reinforcement do not include thicknesses of applied finishes.

C9 Depths of beams are given first and include slab thickness.

C10 For chamfers, drip grooves, regiets, etc., refer to Architect's details; maintain cover to reinforcement at these details.

C11 No holes, chases or embedment of pipes other than those shown on the structural drawings shall be made in concrete members without the prior written approval of the Structural Engineer.

C12 Construction joints where not shown shall be located to the approval of the Structural Engineer.

C13 Conduits, pipes etc. shall only be located in the middle one third of slab depth and spaced at not less than 3 diameters. Pipes or conduits shall not be placed within the cover to reinforcement.

C14 Slabs and beams shall be constructed to bear only on the beams, load-bearing walls, columns, etc. shown on the drawing. All other building elements shall be kept 15mm minimum clear from the structure.

C15 Reinforcement:
All reinforcing bars shall be Grade D500N to AS4671 unless noted otherwise. All mesh shall be Grade 500L to AS4671 and shall be supplied in flat sheets.

Reinforcement notation shall be as follows:
number of bars in group - bar grade and type- nominal bar size in mm - spacing in mm
Example: 17 N20-250

The figures following the fabric symbol F are the reference numbers for the fabric to AS4671.

Reinforcement is represented diagrammatically and not necessarily in true projection, therefore must not be scaled from drawings.

Slab reinforcement shall extend at least 65mm onto masonry support walls.

Splices in reinforcement shall be made only in positions shown or otherwise approved in writing by the Structural Engineer. Laps shall be in accordance with AS3600 and not less than the development length for each bar.

Site bending of deformed reinforcing bars shall be done without heating using mechanical bending tools.

Welding of reinforcement shall not be permitted unless shown on the structural drawings or approved by the Structural Engineer in writing.

unless otherwise noted on the drawings, all unsupported bars shall be tied in the transverse direction to Y12 @ 300mm distribution bars which shall have minimum 400mm lap where required.

Fabric shall be lapped 2 transverse wires plus 50mm. Bundled bars shall be tied together at 30 bar diameter centres with 3 wraps of tie wire.

C16 The Structural Engineer shall be given 24 hours notice for reinforcement inspection and concrete shall not be delivered until final approval obtained.

C17 The finished concrete shall be a dense homogeneous mass, completely filling the formwork thoroughly embedding the reinforcement and free of stone pockets. All concrete shall be compacted using high frequency vibrators.

C18 Curing of all concrete is to be achieved by keeping surfaces continuously wet for a period of 3 days, or by prevention of loss of moistire for a total of 7 days followed by a gradual drying out. Approved sprayed on curing compounds that comply with AS3799 may be used where floor finishes will not be affected (refer Manufacturers Specification). Polythene sheeting or wet hessian may be used to retain concrete moisture where protected from wind and traffic.

C19 Construction support propping is to be left in place where needed to avoid overstressing the structure due to construction loading. Stripping and backpropping time shall be approved by the Structural Engineer. No brickwork or partition walls are to be constructed on suspended levels until all propping is removed.

C20 The Builder shall obtain certification from an appropriately qualified structural engineer for the adequacy of the slab formwork and false-work for each suspended slab being poured, and of back-propping of lower slabs, prior to pouring each suspended slab above.

"These plans form part of and are to be read in conjunction with the conditions of consent. Please make yourself aware of your legal position. Mandatory inspections are applicable."

Received on 02 JUL 2008

PRIVATE CERTIFIERS AUSTRALIA
Construction Cert. No: 080067 Approved Date: 18 NOV 2008
Certifying Authority: Grant Harrington
Accreditation No: BPB0170

REV.	DATE	DESCRIPTION	BY	APPR.

REVISIONS

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNLESS SIGNED HERE: T. Tihanyi M.I.Eng. Aust. C.P.Eng. 8.8.08

ARCHITECT: YOUR ABODE

PROJECT: ADDITIONS AND ALTERATIONS TO 115 McCARRS CREEK ROAD CHURCH POINT

TITLE: **STRUCTURAL DETAILS I.**

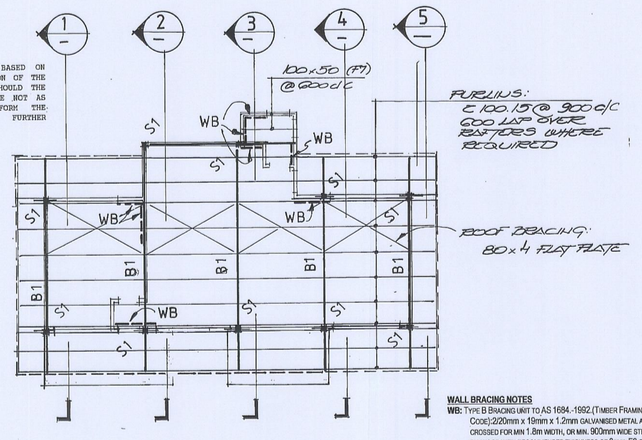
SCANNED 27 NOV 2008

Tihanyi CONSULTING ENGINEERS
ACN: 054 338 706 PTY LTD
Structural and Civil Designers • Project Managers
6 Suzanne Rd Mona Vale 2103 • Phone9997 8821 • Fax9997 8940

DESIGNED: L.T.	DRAWN:	CHECKED: E.T.	
DATE: 07.08.	DWG No: AYAA-1288/1		REV.
SCALE: 1:20,1:100			

Document Transmission To:	No. of Copies:
Date: 8.8.08	FINAL
ARCHITECT.	C

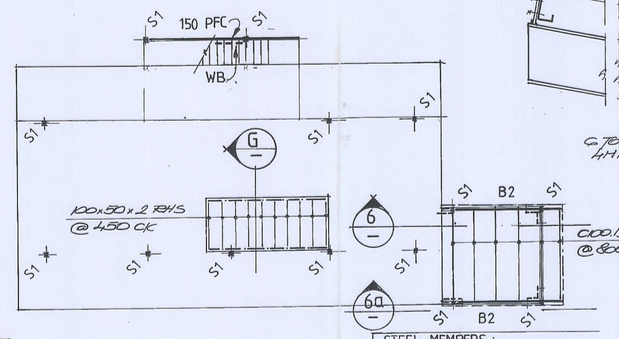
THE WORK SHOWN THESE DRAWINGS IS BASED ON INFORMATION DERIVED FROM AN INSPECTION OF THE EXISTING BUILDING. ON OPENING UP, SHOULD THE BUILDER ASCERTAIN THAT CONDITIONS ARE NOT AS HAVE BEEN ASSUMED, HE SHALL INFORM THE CONSULTING ENGINEER AND OBTAIN FURTHER INSTRUCTIONS BEFORE PROCEEDING.



WALL BRACING NOTES

WB: TYPE B BRACING UNIT TO AS 1684.-1992.(TIMBER FRAMING CODE):220mm x 19mm x 1.2mm GALVANISED METAL ANGLES CROSSED FOR MIN 1.8m WIDTH, OR MIN. 900mm WIDE STRUCTURAL PLYWOOD WITH RECOMMENDED THICKNESS OF 9mm F8 OR 6mm F14 FOR 600mm STUD CENTRES OR 4mm F14 FOR 450mm STUD CENTRES. FIXING TO BE IN ACCORDANCE WITH THE CODE.

ROOF FRAMING (UPPER) PLAN

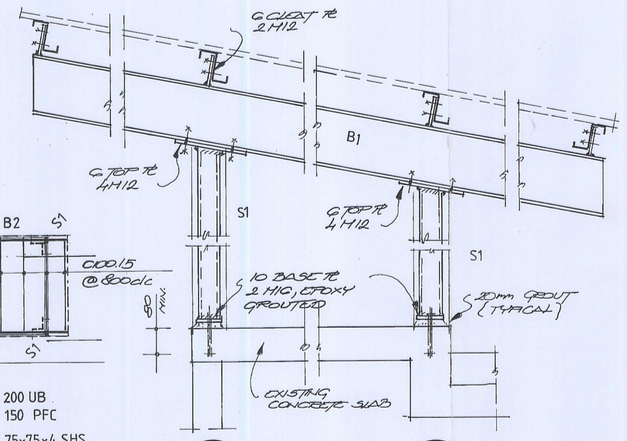


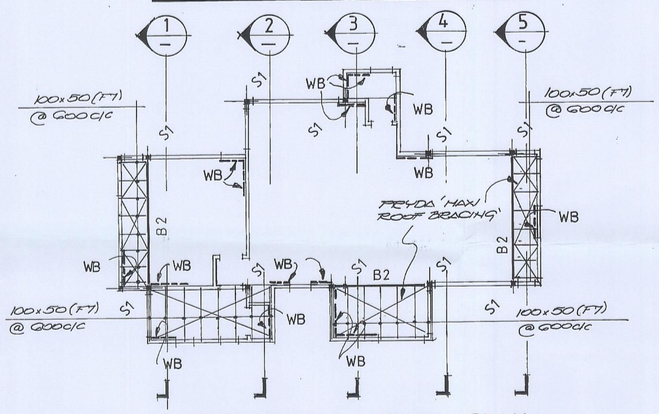
FIRST FLOOR PLAN

STEEL MEMBERS :

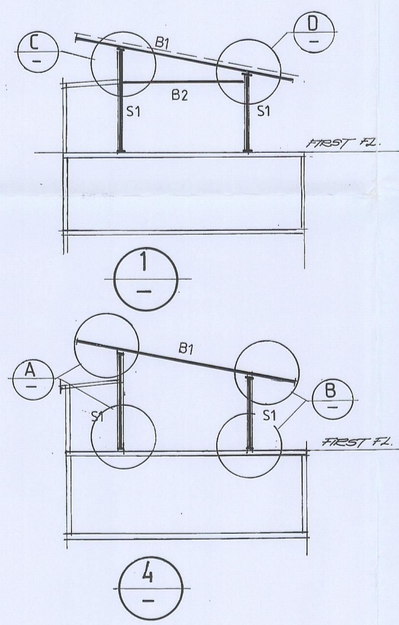
BEAMS B1 : 200 UB
B2 : 150 PFC

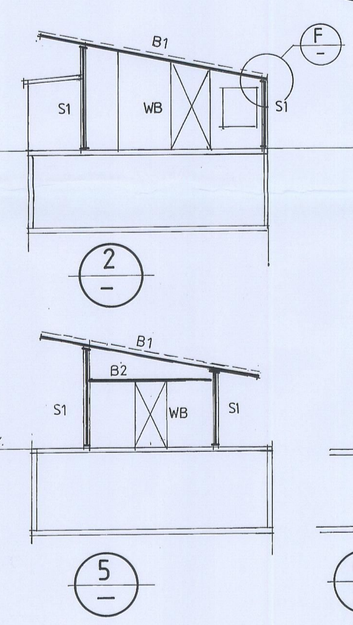
COLUMNS S1 : 75x75x4 SHS

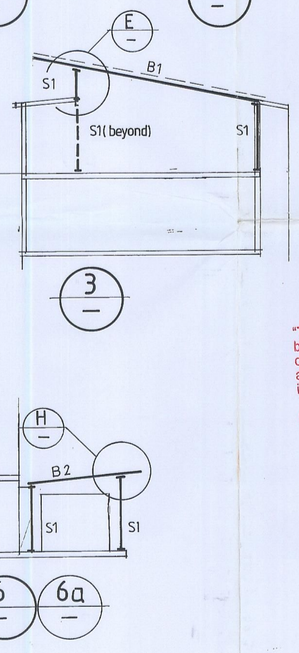


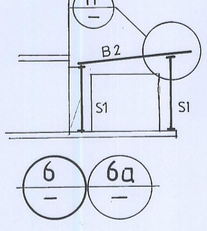


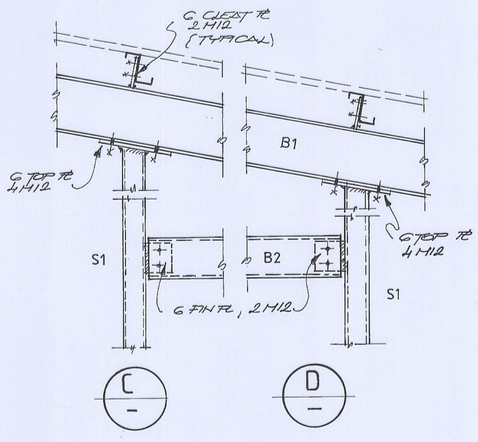
ROOF FRAMING (LOWER) PLAN

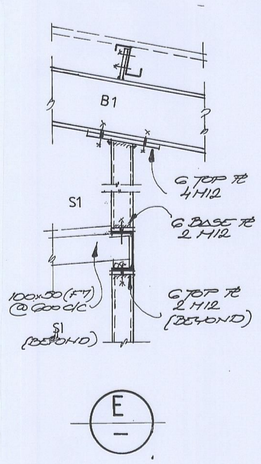


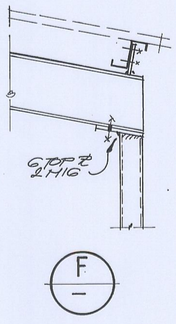


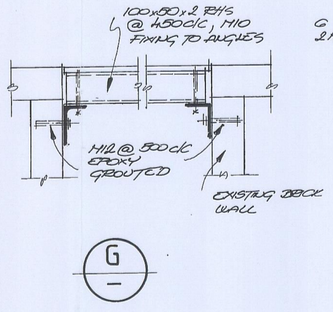


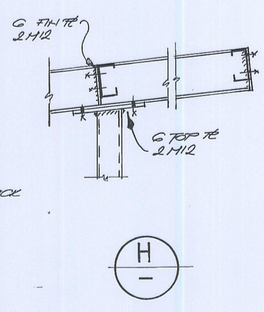












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ALL DIMENSIONS MUST BE OBTAINED FROM ARCHITECTURAL DRAWINGS OR ACTUAL WORK. ENGINEERING DRAWINGS MUST NOT BE SCALED AND MUST BE READ IN CONJUNCTION WITH ARCHITECTURAL AND GENERAL SPECIFICATION.

STRUCTURAL STEEL

S1 All workmanship and material shall be in accordance with AS4100. Fabrication shall be in accordance with Section 14., erection shall be in accordance with Section 15 of AS4100.

S2 The Contractor shall provide all cleats and drill all holes necessary for fixing steel, timber and other members, architectural elements, fixtures, temporary & final bracing, whether or not detailed on the structural drawings.

S3 Unless noted otherwise all bolts shall be M16 category 4.6/S. with 10mm thick cleats, min. 2 bolts per connection.

S4 Unless noted otherwise all welds shall be 6mm continuous fillet weld or butt weld, category SP, using E48XX electrodes.

S5 Structural steelwork not encased in concrete shall have:

Element:	Preparation:	Protection:
Steelwork exposed to weather, wall cavity or water, bolts, holding down bolts, anchors	pickle or abrasive blast clean to Class 3 to AS 1650	hot dip galvanising to AS4680(min. 550 g/m² zinc)
Steelwork not listed above and protection not otherwise specified	hand or power tool cleaned to Class 2 to AS 1650	two coats of red oxide zinc chromate primer in shop

S6 Roof bracing members shall be screw fixed or hung by hooks from purlins at maximum 3m centres. Steel columns and tie beams shall be connected to adjacent masonry with stainless steel wall ties at max. 400mm centres unless shown otherwise

TIMBER FRAMING NOTES

1. ALL TIMBER WORK, TIMBER SIZES AND DETAILS NOT SHOWN ON THIS DRAWING, SHALL BE IN ACCORDANCE WITH THE RELEVANT REQUIREMENTS OF AS 1684-LIGHT TIMBER FRAMING CODE, AND AS 1720-TIMBER ENGINEERING CODE.
2. THE STUD WALL SUPPLIER/ERECTOR SHALL BE RESPONSIBLE FOR THE ADEQUACY OF THE WALLS FOR LATERAL WIND LOADS.ADEQUATE PROVISION FOR HOLDING DOWN ROOF SHALL BE MADE IN CONJUNCTION WITH AS 1684-1992.
3. NAILING PLATES (REFER TO ARCHITECT'S DETAILS) SHALL BE M10 BOLTED OR GUN-FIXED TO STEEL BEAMS AT 900 mm MAX. CENTRES
4. ROOF, AND WALL FRAMING SHALL BE FULLY BRACED IN ACCORDANCE WITH AS-1684-1992

"These plans form part of and are to be read in conjunction with the conditions of consent. Please make yourself aware of your legal position. Mandatory inspections are applicable."

Received on 02 JUL 2008

PRIVATE CERTIFIERS AUSTRALIA
Construction Cert. No: 080067 Approved Date: 18 NOV 2008
Certifying Aethority: Grant Harrington
Accreditation No: BPB0170

REV.	DATE	DESCRIPTION	BY	APPR.

REVISIONS

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNLESS SIGNED HERE: E.T. Cert. M.I.Eng Aust. 8.8.08

ARCHITECT: YOUR ABODE

PROJECT: ADDITIONS AND ALTERATIONS TO 115 McCARRS CREEK ROAD CHURC POINT

TITLE: **STRUCTURAL DETAILS II.**

Tihanyi CONSULTING ENGINEERS
ACN: 054 338 706 PTY LTD
Structural and Civil Designers • Project Managers
6 Suzanne Rd Mona Vale 2103 • Phone9997 8821 • Fax9997 8940

SCANNED 27 NOV 2008 PITTWATER COUNCIL

DESIGNED: L.T.	DRAWN:	CHECKED: E.T.
DATE: 07.08.	DWG No: AYAA 1288/2	REV.
SCALE: 1:10, 1:20, 1:100		

TGE

Geotechnical Civil Engineers & Project Managers

REPORT ON GEOTECHNICAL INVESTIGATION

PROPOSED RESIDENTIAL DEVELOPMENT

115 McCARRS CREEK ROAD CHURCH POINT

CLIENT: Mr. MURRAY McKENZIE

PROJECT: TGE2753

DATE: 20 DECEMBER 2007

TABLE OF CONTENTS

1 0	INTRODUCTION	Page 1
2 0	SITE DESCRIPTION	Page 1
3 0	FIELD WORK METHODS	Page 3
4 0	FIELD WORK RESULTS	Page 3
5 0	PROPOSED DEVELOPMENT	Page 3
6 0	COMMENTS	Page 4
6 1	Stability Risk Assessment	Page 4
6 2	Excavation	Page 5
6 3	Foundations	Page 5
6 4	Retaining Walls	Page 6
6 5	Design Life of Structure	Page 6
7 0	CONDITIONS RELATING TO MONITORING OF DESIGN AND CONSTRUCTION	Page 7

APPENDICIES

1 Drawing 1 – Site Plan
2 Test Bore Report Sheets & Dynamic penetrometer test results
3 Photos 1-4
4 Tables A and B
5 Appendices A & G from Landslide Risk Management Concepts and Guidelines' May 2002
6 Appendix J from 'Landslide Risk Management Concepts and Guidelines' May 2002
7 CSIRO BTF 18 (Information Sheet 10/91)
8 Table 3 – Recommended Maintenance Program

TGE Geotechnical Civil Engineers & Project Managers

Taylor Geotechnical Engineering Pty Ltd *ABN 22 120 426 155*
PO Box 1906 *Phone (02) 9972 9238*
Dee Why NSW 2099 *Fax (02) 9972 9239*
taylorgeotec@bigpond com *Mobile 0407 984 128*

LRT
Project TGE2753
20 December 2007

REPORT ON GEOTECHNICAL INVESTIGATION PROPOSED RESIDENTIAL HOUSE DEVELOPMENT 115 McCARRS CREEK ROAD CHURCH POINT

1 INTRODUCTION

This report details the results of a geotechnical investigation undertaken on the site of proposed residential development at 115 McCarrs Creek Road Church Point Your Abode architects for the project requested the investigation on behalf of Mr Murray McKenzie, property owner

The proposed development comprises internal alteration to the existing basement and ground floor levels and construction of a new first floor level The aim of the investigation was to provide information on subsurface and site conditions for assessment of slope stability and to assist with planning and design

The investigation comprised visual and photographic survey and inspection of exposed strata drilling of test bores, in-situ testing of the subsurface strata and engineering assessment and analysis Details of the fieldwork are given in the report together with comments relating to design and construction practice

2 SITE DESCRIPTION

The site is located on the north eastern side of McCarrs Creek Road in Church Point and consists of a single block with an area of approximately 2957 m^2 and the shape and dimensions as shown on Drawing 1 in Appendix 1 The site accesses McCarrs Creek Road via a common elevated concrete driveway An embankment is located between McCarrs Creek Road and the front (south western) boundary of the site Minkara Road (not formed) reserve bounds the site to the north while neighbouring properties are located to the south, east and north east

The site is located in moderately to steeply sloping terrain with ground slopes falling to the south west and west The embankment between the front boundary of the site and McCarrs Creek road is at an angle of approximately 25 degrees and ground slopes are generally 20-25 degrees across the front sections of the site between the house and front site boundary A level platform has been formed for the original construction of the house On the north western side of the house ground slopes rise generally at approximately 20 degrees to the rear of the site where a cliff line is formed by numerous sandstone boulders/outcrops (see Photos 3 and 4 in Appendix 3) The site as viewed from the concrete driveway is shown in Photo 1 in Appendix 3

The existing house consists of a one and two level concrete and timber clad structure with a concrete roof located towards the front of the site The site is well vegetated with terraced garden beds located on the south western side of the house between the driveway and house Natural bushland covers much of the site on the north eastern side of the house with numerous large gum trees observed and several sandstone boulders/outcrops scattered across the site and southern neighbouring site (see Photo 2 in Appendix 3)

Reference to the Sydney 1 100,000 Geological Sheet indicates that the site is located close to the geological boundary between Hawkesbury Sandstone from the Triassic Period and Newport Formation from the Narrabeen Group, of the Triassic Period

The Hawkesbury Sandstone formation typically comprises medium to coarse grained quartz sandstone with very minor shale and laminite lenses The rocks of this formation typically weather to form low and moderately reactive sandy clay soils but highly reactive clay soils are possible

The Newport Formation typically comprises interbedded laminite, shale and quartz to lithic-quartz sandstone The rocks of this formation typically weather to form moderately reactive sandy and silty clay soils but highly reactive clay soils are possible

The geological mapping was confirmed with sandstone outcropping at various locations on the site and sandstone outcrops and boulders observed on the adjacent properties

3 FIELD WORK METHODS

The field work for this investigation comprised drilling a single test bore, insitu testing of the sub-surface strata and a geotechnical inspection and photographic survey of the site detailing the location of any geological features that may affect site stability and pose a risk of landslide

Dynamic penetrometer tests (DPT's) were conducted at the bore location, testing from the surface to a maximum depth of 2 4 m or prior refusal The penetrometer was conducted in order to determine the depth to bedrock (if within 2 4 m) and the strength of the near surface strata

4 FIELD WORK RESULTS

Details of the conditions encountered in the test bore is given in the test bore report sheet in Appendix 2 and are summarised below The bore was drilled with a Dingo mounted drilling rig fitted with 100 mm diameter continuous flight augers to a depth of 2 0 m The location of the test bore and DPT is shown on Drawing 1 in Appendix 1

Bore 1 encountered silty sand topsoil to a depth of 0 1 m overlying stiff sandy clay to a depth of 1 0 m then clayey sandstone to 1 7 m where very low strength siltstone was encountered The bore was terminated at a depth of 2 0 m due to auger refusal in low strength siltstone

The results of the DPT indicate that the residual sandy clay soils underlying the site are generally in a stiff condition

Groundwater seepage was not observed in the bore at the time of drilling, however, allowance should be made for runoff and groundwater seepage during construction

5 PROPOSED DEVELOPMENT

It is understood that the proposed development for this site comprises alteration and modification of the existing basement and ground floor levels and the addition of a first floor level with works including extension of the house by approximately 2 0 m on the western side Based on review of architectural drawings by Your Abode Pty Ltd Drawing No 2006-015-02 to 2006-015-07, it is

understood that the basement floor level will remain at RL 52 48, the ground floor level will remain at RL 54 87 and the first floor level will be at RL 57 69

6 COMMENTS

6 1 Stability Risk Assessment

The results of the geotechnical investigation indicated that the site is currently performing well but there is some evidence of past and possibly ongoing soil creep movement Existing landslide hazards and possible hazards identified as a result of the proposed development and the assessment of their likelihood, consequence and risk to property and life are presented in Tables A and B in Appendix 4 A description of the terms used in Tables A and B is given in Appendix 5

Assessment of the site has been made in accordance with the methods and requirements as outlined by the Australian Geomechanics Society, Sub-Committee on Landslide Risk Management paper titled Landslide Risk Management Concepts and Guidelines' May 2002, and Pittwater Council Interim Geotechnical Risk Management Policy, 16 June 2003

The results in Table A indicate that the assessed risk to property ranges between Very Low – Low and Low - Moderate for existing site conditions and site conditions resulting from the proposed development which is considered acceptable given property owners responsibility to maintain and lower risk to their property We have also calculated the risk to life based on the indicative annual probabilities associated with the likelihood of instability and found that the risk to life is acceptable for all hazards considered

The proposed development for this site, when assessed in accordance with the requirements of the Interim Geotechnical Risk Management Policy, is considered to have achieved the 'Acceptable Risk Management' criteria for both property and life and that the site is suitable for the proposed development to be carried out provided that the recommendations provided in this report are adopted

Some guidelines for hillside construction and examples of both good and poor hill side construction practice are given in Appendix 6

6 2 Excavation

It is understood that minimal if any excavation will be required for this development If any excavation is required then if the excavation faces not to be retained they should be trimmed to a gradient that will ensure stability in both the short term during construction and the long term The following table lists suggested batter slopes for materials likely to be encountered during excavation

Table 1 - Batter Slopes

Material	Safe Batter Slope (H V)	
	Short Term/ Temporary	Long Term/ Permanent
Compacted filling	1 5 1	2 5 1
Residual Sandy soils	1 5 1	2 1
Clayey Sandstone (extremely low strength)	1 1	1 5 1
Sandstone (very low & low strength)	0 5 1	0 75 1 *
Sandstone (medium or higher strength)**	Vertical *	0 25 1 *

* Dependent upon jointing and the absence of unfavourably oriented joints

** Bedrock of this quality was not encountered in the test bores but may be present below the refusal level encountered in the test bores

6 3 Foundations

Weathered bedrock is likely to be at shallow depth below the proposed founding level It is recommended that the foundations for the extensions found directly on the weathered sandstone/siltstone bedrock The use of shallow piers, founding in the weathered bedrock would be appropriate, with the foundation dimensioned based on the very low strength sandstone/siltstone having an allowable bearing pressure (for serviceability) of 800 kPa Settlement is expected to be less than 1% of the footing width for footings founded on the very low strength sandstone/siltstone bedrock In order to avoid excessive differential settlement it is recommended that all new foundations be founded on the sandstone/siltstone bedrock

A geotechnical engineer should inspect and verify the founding strata for any footings at the time of construction

6 4 Retaining Walls

It is understood that some retaining walls may be required for this development Pressures acting on retaining walls can be calculated based on the parameters listed in Table 2 for the materials likely to be retained

Table 2 - Retaining Structures Design Parameters

Material	Unit Weight (kN/m^3)	Long Term (Drained)	Earth Pressure Coefficients		Passive Earth Pressure Coefficient *
			Active (K_a)	At Rest (K_o)	
Residual sandy soils and filling	20	$\phi' = 25°$	0 35	0 5	3 0
Very low and low strength sandstone (jointed)	22	$\phi' = 20°$	0 25	0 4	400 kPa
Low strength sandstone	22	$\phi = 20°$	0 20		2000 kPa
Medium or better strength sandstone	22	$\phi' = 30°$	0 1		6000 kPa

* Ultimate design values

Retaining walls should be designed for free draining granular backfill and appropriate surface and subsoil drains to either divert or intercept groundwater flow which otherwise could provide surcharging on the walls and additional pressures which may cause damage or failure of the walls

6 5 Design Life of Structure

We have interpreted the design life requirements specified within Councils Interim Risk Management Policy to refer to structural elements designed to support house and the adjacent slope, control stormwater and maintain the risk of instability within acceptable limits

Specific structures that may affect the maintenance and stability of the site in relation to the proposed development are considered to comprise

- Retaining structures to support cuts on the eastern side of the house,
- Stormwater and subsoil drainage systems,
- Maintenance of trees and boulder toe areas on this and adjacent properties

These features should be designed and maintained for a design life consistent with surrounding structures (as per AS2870 – 1966 (70 years)) In order to attain a design life of 100 years as required by the Councils Interim Risk Management Policy, it will be necessary for the structural and geotechnical engineers to incorporate appropriate design and inspection procedures during the construction period and the property owner adopt and implement a maintenance and inspection program A recommended program is given below and includes those in Table 3 enclosed in Appendix 7

- The site is inspected 12 months after the development is complete to verify that there have been no changes to the site stability by both the Structural Engineer and Geotechnical Consultant (at the same time same day)
- The conditions on the block don't change from those present at the time this report was prepared, except for the changes due to this development
- There is no change to the property due to an extraordinary event external to this site, and the property is maintained in good order and in accordance with the guidelines set out in,
    a) CSIRO BTF 18 (Information Sheet 10/91) (see Appendix 8) and,
    b) The Australian Geomechanics article Geotechnical Risk Associated with Hillside Development Number10 December 1985

Where changes to site conditions are identified during the maintenance and inspection program, reference should be made to a relevant professional (e g structural engineer or geotechnical engineer)

7 0 CONDITIONS RELATING TO MONITORING OF DESIGN AND CONSTRUCTION

In order to comply with Pittwater Council conditions and to allow the completion of Forms 2, 3 and 4 required as part of the construction and post construction certification requirements of the Interim Geotechnical Risk Management Policy, it will be necessary for Taylor Geotechnical Engineering Pty Limited to carry out the following

1 Review the structural design drawings for compliance with the geotechnical recommendations in this report

2 Inspect any excavations for every 1 5 m depth interval to assess the need for specific stabilisation requirements

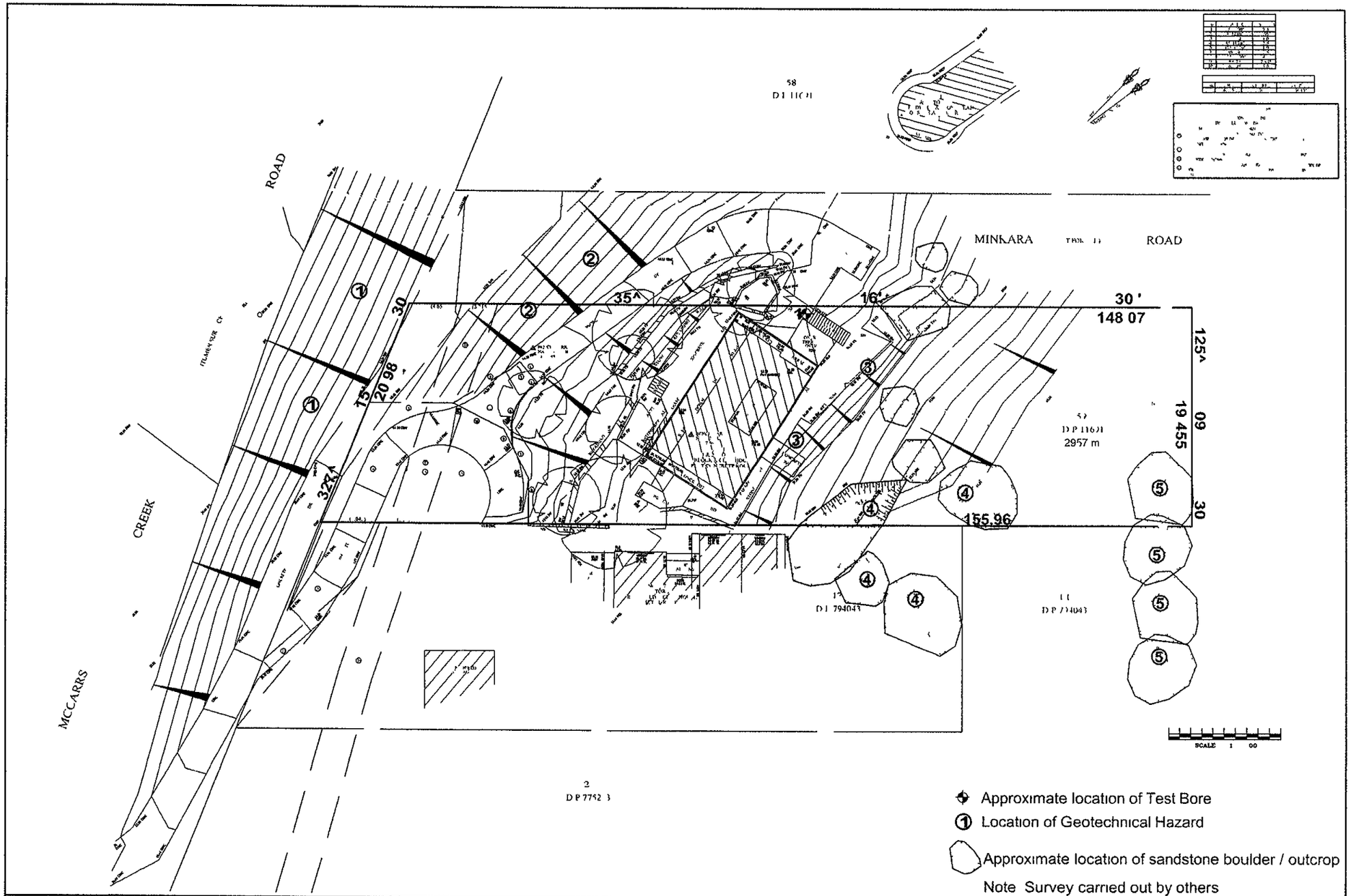
3 Inspect any retaining wall construction (<1 2 m high) to ensure compliance with recommendations made in this report

4 Inspect all footings prior to the placement of steel and concrete

TAYLOR GEOTECHNICAL ENGINEERING PTY LIMITED,

Lachlan Taylor MIEAust CPEng NPER
Principal Geotechnical Engineer

Appendix 1



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Mobile 0407 984 128

Drawing 1 - Site Plan
Proposed Residential Development
115 McCarrs Creek Road Church Point

Project TGE2753
Scale As Shown
Date 20 December 2007

Appendix 2

TEST BORE REPORT

CLIENT	Murray McKenzie	DATE 29-Nov-2007	Bore No **1**
PROJECT	Proposed Residential Development	PROJECT No TGE2753	1 of 1
LOCATION	115 McCarrs Creek Road Church Point	SURFACE LEVEL RL = 52 3*	

Depth (m)	Description of Strata	Sampling & In Situ Testing			
		Type	Depth (m)	Blows/150mm N Value	Core Recovery%
0 00	TOPSOIL - Dark Brown silty sand				
0 10	SANDY CLAY Stiff orange brown and yellow brown fine to medium grained sandy clay (decomposed sandstone)				
1 00	CLAYEY SANDSTONE Extremely low strength red brown yellow brown and orange brown fine to medium grained clayey sandstone				
1 70	SILTSTONE - Extremely to very low strength grey siltstone				
2 00	TEST BORE DISCONTINUED AT 2 0 METRES Auger refusal on siltstone				

RIG Dingo Mounted
DRILLER Crozier

TYPE OF BORING 100mm diameter CFA
LOGGED Taylor

GROUND WATER OBSERVATIONS No free groundwater observed
CHECKED

REMARKS * RL interpolated from survey plan provided by client

SAMPLING & IN SITU TESTING LEGEND

D = Disturbed auger sample
B = Bulk sample
Ux = x mm dia Tube Sample

Taylor Geotechnical Engineering

RESULTS OF DYNAMIC PENETROMETER TESTS

CLIENT Murray McKenzie

DATE 29 November 2007

PROJECT Proposed Residential Development

PROJECT No TGE2753

LOCATION 115 McCarrs Creek Road Church Point

SHEET 1 of 1

	PENETRATION RESISTANCE BLOWS / 150mm									
TEST LOCATION	1									
DEPTH (m)										
0 00 - 0 15	2									
0 15 - 0 30	4									
0 30 - 0 45	7									
0 45 - 0 60	4									
0 60 - 0 75	5									
0 75 - 0 90	9									
0 90 – 1 05	7									
1 05 – 1 20	26									
1 20 – 1 35	Refusal									
1 35 – 1 50										
1 50 – 1 65										
1 65 – 1 80										
1 80 – 1 95										
1 95 – 2 10										
2 10 – 2 25										
2 25 – 2 40										
2 40 – 2 55										
2 55 – 2 70										
2 70 – 2 85										
2 85 – 3 00										

TEST METHOD AS 1289 F3 2 CONE PENETROMETER YES TESTED BY Taylor

AS 1289 F3 3 FLAT END PENETROMETER

REMARKS

Taylor Geotechnical Engineering

Appendix 3

Photo 1 – View of house from driveway (looking north).

Photo 2 – View of sandstone boulders/outcrops immediately upslope, on eastern side of house.

Photo 3 – View of cliff line at rear of site and adjacent blocks to east.

Photo 4 – View of cliff line at rear of site and adjacent blocks to north east.

Appendix 4

Table A - Risk Assessment for Property

Hazard	Likelihood	Consequence	Risk	Comments
Failure of existing batter slopes adjacent to McCarrs Creek Road beyond south eastern site boundary	Unlikely	Minor	Very Low Low	Existing batter slopes are not excessively steep
Failure of existing batter slopes within Minkara Road Reserve and south western corner of site	Unlikely	Minor	Very Low Low	Existing batter slopes are not excessively steep although drainage must be controlled
Partial failure of stone block retaining walls on north eastern side of house	Unlikely	Minor	Very Low Low	Walls appear to be 30 plus years old and functioning well Should remain stable provided no additional surcharge loading and adequate drainage maintained
Movement of large sandstone boulders behind house and southern neighbours house	Rare	Major	Low-Moderate	Down slope drainage to be maintained
Movement of large boulders upslope of site in neighbouring property	Rare	Major	Low Moderate	Lower risk by rock bolting boulders and cliff line

Table B - Risk Assessment for Life

Hazard / Factor	Failure of existing batter slopes adjacent to McCarrs Creek Road beyond south eastern site boundary	Failure of existing batter slopes within Minkara Road Reserve and south western corner of site	Partial failure of stone block retaining walls on north eastern side of house	Movement of large sandstone boulders behind house and southern neighbours house	Movement of large boulders upslope of site in neighbouring property
Likelihood	Unlikely	Unlikely	Unlikely	Rare	Rare
Indicative Annual Probability	10^{-4}	10^{-4}	10^{-4}	10^{-5}	10^{-5}
Persons at risk	a) People accessing neighbours property b) passers by	a) People accessing neighbours property b) gardener in front area of site	a) Persons in eastern side of ground floor level and on eastern side of house	a) Persons in either house	People in houses down slope
Number of People Considered	a) 2 b) 2	a) 2 b) 1	a) 2	a) 4	16
Probability of Spatial Impact	a) 1 b) 1	a) 1 b) 1	a) 1 0	a) 0 8	0 1
Proportion of time affected area is used	a) 5min /day = $3\ 4x10^{-3}$ b) 1min / day = $7x10^{-4}$	a) 10 /week = $1x10^{-3}$ b) 5min / day = $3\ 4x10^{-3}$	a) 60min / day = $4\ 2x10^{-3}$	a) 12hrs / day = 0 5	12hrs / day = 0 5
Probability of not Evacuating	a) 0 1 warning likely b) 0 1 warning likely	a) 0 1 warning likely b) 0 1 warning likely	a) 0 1 warning likely	a) 0 2 warning likely	0 5 may have warning
Vulnerability	a) 1 may be struck or buried b) 1 may be struck or buried	a) 1 may be struck or buried b) 1 may be struck or buried	a) 0 5 may be struck	a) 0 5 may be struck or buried by collapsing structure	0 5 may be buried under collapsed structure
Risk of Person most at risk	a) $3\ 4x10^{-8}$ b) $1\ 4x10^{-8}$	a) $1x10^{-8}$ b) $3\ 4x10^{-8}$	a) $2\ 1x10^{-8}$	a) $4x10^{-7}$	$1\ 25 \times 10^{-7}$
Total Risk	$9\ 6x10^{-8}$	$5\ 4x10^{-8}$	$4\ 2x10^{-8}$	$1\ 6x10^{-6}$	$2\ 0 \times 10^{-6}$
Risk Evaluation	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable

Appendix 5

APPENDIX A

DEFINITION OF TERMS

INTERNATIONAL UNION OF GEOLOGICAL SCIENCES WORKING GROUP ON LANDSLIDES, COMMITTEE ON RISK ASSESSMENT

Risk – A measure of the probability and severity of an adverse effect to health property or the environment Risk is often estimated by the product of probability x consequences However, a more general interpretation of risk involves a comparison of the probability and consequences in a non-product form

Hazard – A condition with the potential for causing an undesirable consequence (*the landslide*) The description of landslide hazard should include the location volume (or area) classification and velocity of the potential landslides and any resultant detached material, and the likelihood of their occurrence within a given period of time

Elements at Risk – Meaning the population, buildings and engineering works, economic activities, public services utilities, infrastructure and environmental features in the area potentially affected by landslides

Probability – The likelihood of a specific outcome, measured by the ratio of specific outcomes to the total number of possible outcomes Probability is expressed as a number between 0 and 1, with 0 indicating an impossible outcome and 1 indicating that an outcome is certain

Frequency – A measure of likelihood expressed as the number of occurrences of an event in a given time See also Likelihood and Probability

Likelihood – used as a qualitative description of probability or frequency

Temporal Probability – The probability that the element at risk is in the area affected by the landsliding, at the time of the landslide

Vulnerability – The degree of loss to a given element or set of elements within the area affected by the landslide hazard It is expressed on a scale of 0 (no loss) to 1 (total loss) For property, the loss will be the value of the damage relative to the value of the property for persons, it will be the probability that a particular life (the element at risk) will be lost given the person(s) is affected by the landslide

Consequence – The outcomes or potential outcomes arising from the occurrence of a landslide expressed qualitatively or quantitatively, in terms of loss, disadvantage or gain damage, injury or loss of life

Risk Analysis – The use of available information to estimate the risk to individuals or populations, property or the environment, from hazards Risk analyses generally contain the following steps scope definition, hazard identification, and risk estimation

Risk Estimation – The process used to produce a measure of the level of health, property or environmental risks being analysed Risk estimation contains the following steps frequency analysis, consequence analysis, and their integration

Risk Evaluation – The stage at which values and judgements enter the decision process, explicitly or implicitly, by including consideration of the importance of the estimated risks and the associated social, environmental, and economic consequences, in order to identify a range of alternatives for managing the risks

Risk Assessment – The process of risk analysis and risk evaluation

Risk Control or Risk Treatment – The process of decision making for managing risk, and the implementation, or enforcement of risk mitigation measures and the re evaluation of its effectiveness from time to time, using the results of risk assessment as one input

Risk Management – The complete process of risk assessment and risk control (*or risk treatment*)

Individual Risk – The risk of fatality or injury to any identifiable (named) individual who lives within the zone impacted by the landslide or who follows a particular pattern of life that might subject him or her to the consequences of the landslide

Societal Risk – The risk of multiple fatalities or injuries in society as a whole one where society would have to carry the burden of a landslide causing a number of deaths, injuries, financial, environmental and other losses

Acceptable Risk – A risk for which, for the purposes of life or work, we are prepared to accept as it is with no regard to its management Society does not generally consider expenditure in further reducing such risks justifiable

Tolerable Risk – A risk that society is willing to live with so as to secure certain net benefits in the confidence that it is being properly controlled kept under review and further reduced as and when possible

In some situations risk may be tolerated because the individuals at risk cannot afford to reduce risk even though they recognise it is not properly controlled

Landslide Intensity – A set of spatially distributed parameters related to the destructive power of a landslide The parameters may be described quantitatively or qualitatively and may include maximum movement velocity, total displacement differential displacement depth of the moving mass peak discharge per unit width kinetic energy per unit area

Note Reference should also be made to Figure 1 which shows the inter-relationship of many of these terms and the relevant portion of Landslide Risk Management

APPENDIX G

LANDSLIDE RISK ASSESSMENT – EXAMPLE OF QUALITATIVE TERMINOLOGY FOR USE IN ASSESSING RISK TO PROPERTY

Qualitative Measures of Likelihood

Level	Descriptor	Description	Indicative Annual Probability
A	ALMOST CERTAIN	The event is expected to occur	$\geq\approx 10^{-1}$
B	LIKELY	The event will probably occur under adverse conditions	$\approx 10^{-2}$
C	POSSIBLE	The event could occur under adverse conditions	$\approx 10^{-3}$
D	UNLIKELY	The event might occur under very adverse circumstances	$\approx 10^{-4}$
E	RARE	The event is conceivable but only under exceptional circumstances	$\approx 10^{-5}$
F	NOT CREDIBLE	The event is inconceivable or fanciful	$<10^{-6}$

Note ≈ means that the indicative value may vary by say ± ½ of an order of magnitude or more

Qualitative Measures of Consequences to Property

Level	Descriptor	Description
1	CATASTROPHIC	Structure completely destroyed or large scale damage requiring major engineering works for stabilisation
2	MAJOR	Extensive damage to most of structure or extending beyond site boundaries requiring significant stabilisation works
3	MEDIUM	Moderate damage to some of structure, or significant part of site requiring large stabilisation works
4	MINOR	Limited damage to part of structure, or part of site requiring some reinstatement/stabilisation works
5	INSIGNIFICANT	Little damage

Note The Description may be edited to suit a particular case

Qualitative Risk Analysis Matrix – Level of Risk to Property

LIKELIHOOD	CONSEQUENCES to PROPERTY				
	1 CATASTROPHIC	2 MAJOR	3 MEDIUM	4 MINOR	5 INSIGNIFICANT
A – ALMOST CERTAIN	VH	VH	H	H	M
B – LIKELY	VH	H	H	M	L-M
C – POSSIBLE	H	H	M	L-M	VL-L
D – UNLIKELY	M-H	M	L-M	VL-L	VL
E – RARE	M-L	L-M	VL-L	VL	VL
F – NOT CREDIBLE	VL	VL	VL	VL	VL

Risk Level Implications

Risk Level		Example Implications(1)
VH	VERY HIGH RISK	Extensive detailed investigation and research, planning and implementation of treatment options essential to reduce risk to acceptable levels may be too expensive and not practical
H	HIGH RISK	Detailed investigation planning and implementation of treatment options required to reduce risk to acceptable levels
M	MODERATE RISK	Tolerable provided treatment plan is implemented to maintain or reduce risks May be accepted May require investigation and planning of treatment options
L	LOW RISK	Usually accepted Treatment requirements and responsibility to be defined to maintain or reduce risk
VL	VERY LOW RISK	Acceptable Manage by normal slope maintenance procedures

Note (1) The implications for a particular situation are to be determined by all parties to the risk assessment these are only given as a general guide

(2) Judicious use of dual descriptors for Likelihood Consequence and Risk to reflect the uncertainty of the estimate may be appropriate in some cases

Appendix 6

APPENDIX J

SOME GUIDELINES FOR HILLSIDE CONSTRUCTION

	GOOD ENGINEERING PRACTICE	*POOR ENGINEERING PRACTICE*
ADVICE		
GEOTECHNICAL ASSESSMENT	Obtain advice from a qualified experienced geotechnical consultant at early stage of planning and before site works	Prepare detailed plan and start site works before geotechnical advice
PLANNING		
SITE PLANNING	Having obtained geotechnical advice plan the development with the risk arising from the identified hazards and consequences in mind	Plan development without regard for the Risk
DESIGN AND CONSTRUCTION		
HOUSE DESIGN	Use flexible structures which incorporate properly designed brickwork timber or steel frames timber or panel cladding Consider use of split levels Use decks for recreational areas where appropriate	Floor plans which require extensive cutting and filling Movement intolerant structures
SITE CLEARING	Retain natural vegetation wherever practicable	Indiscriminately clear the site
ACCESS & DRIVEWAYS	Satisfy requirements below for cuts fills retaining walls and drainage Council specifications for grades may need to be modified Driveways and parking areas may need to be fully supported on piers	Excavate and fill for site access before geotechnical advice
EARTHWORKS	Retain natural contours wherever possible	Indiscriminant bulk earthworks
CUTS	Minimise depth Support with engineered retaining walls or batter to appropriate slope Provide drainage measures and erosion control	Large scale cuts and benching Unsupported cuts Ignore drainage requirements
FILLS	Minimise height Strip vegetation and topsoil and key into natural slopes prior to filling Use clean fill materials and compact to engineering standards Batter to appropriate slope or support with engineered retaining wall Provide surface drainage and appropriate subsurface drainage	Loose or poorly compacted fill which if it fails may flow a considerable distance including onto property below Block natural drainage lines Fill over existing vegetation and topsoil Include stumps trees vegetation topsoil boulders building rubble etc in fill
ROCK OUTCROPS & BOULDERS	Remove or stabilise boulders which may have unacceptable risk Support rock faces where necessary	Disturb or undercut detached blocks or boulders
RETAINING WALLS	Engineer design to resist applied soil and water forces Found on rock where practicable Provide subsurface drainage within wall backfill and surface drainage on slope above Construct wall as soon as possible after cut/fill operation	Construct a structurally inadequate wall such as sandstone flagging brick or unreinforced blockwork Lack of subsurface drains and weepholes
FOOTINGS	Found within rock where practicable Use rows of piers or strip footings oriented up and down slope Design for lateral creep pressures if necessary Backfill footing excavations to exclude ingress of surface water	Found on topsoil loose fill detached boulders or undercut cliffs
SWIMMING POOLS	Engineer designed. Support on piers to rock where practicable Provide with under-drainage and gravity drain outlet where practicable Design for high soil pressures which may develop on uphill side whilst there may be little or no lateral support on downhill side	
DRAINAGE		
SURFACE	Provide at tops of cut and fill slopes Discharge to street drainage or natural water courses Provide general falls to prevent blockage by siltation and incorporate silt traps Line to minimise infiltration and make flexible where possible Special structures to dissipate energy at changes of slope and/or direction	Discharge at top of fills and cuts Allow water to pond on bench areas
SUBSURFACE	Provide filter around subsurface drain Provide drain behind retaining walls Use flexible pipelines with access for maintenance Prevent inflow of surface water	Discharge roof runoff into absorption trenches
SEPTIC & SULLAGE	Usually requires pump-out or mains sewer systems absorption trenches may be possible in some areas if risk is acceptable Storage tanks should be water tight and adequately founded	Discharge sullage directly onto and into slopes Use absorption trenches without consideration of landslide risk
EROSION CONTROL & LANDSCAPING	Control erosion as this may lead to instability Revegetate cleared area	Failure to observe earthworks and drainage recommendations when landscaping
DRAWINGS AND SITE VISITS DURING CONSTRUCTION		
DRAWINGS	Building Application drawings should be viewed by geotechnical consultant	
SITE VISITS	Site Visits by consultant may be appropriate during construction/	
INSPECTION AND MAINTENANCE BY OWNER		
OWNER S RESPONSIBILITY	Clean drainage systems repair broken joints in drains and leaks in supply pipes Where structural distress is evident see advice If seepage observed, determine causes or seek advice on consequences	

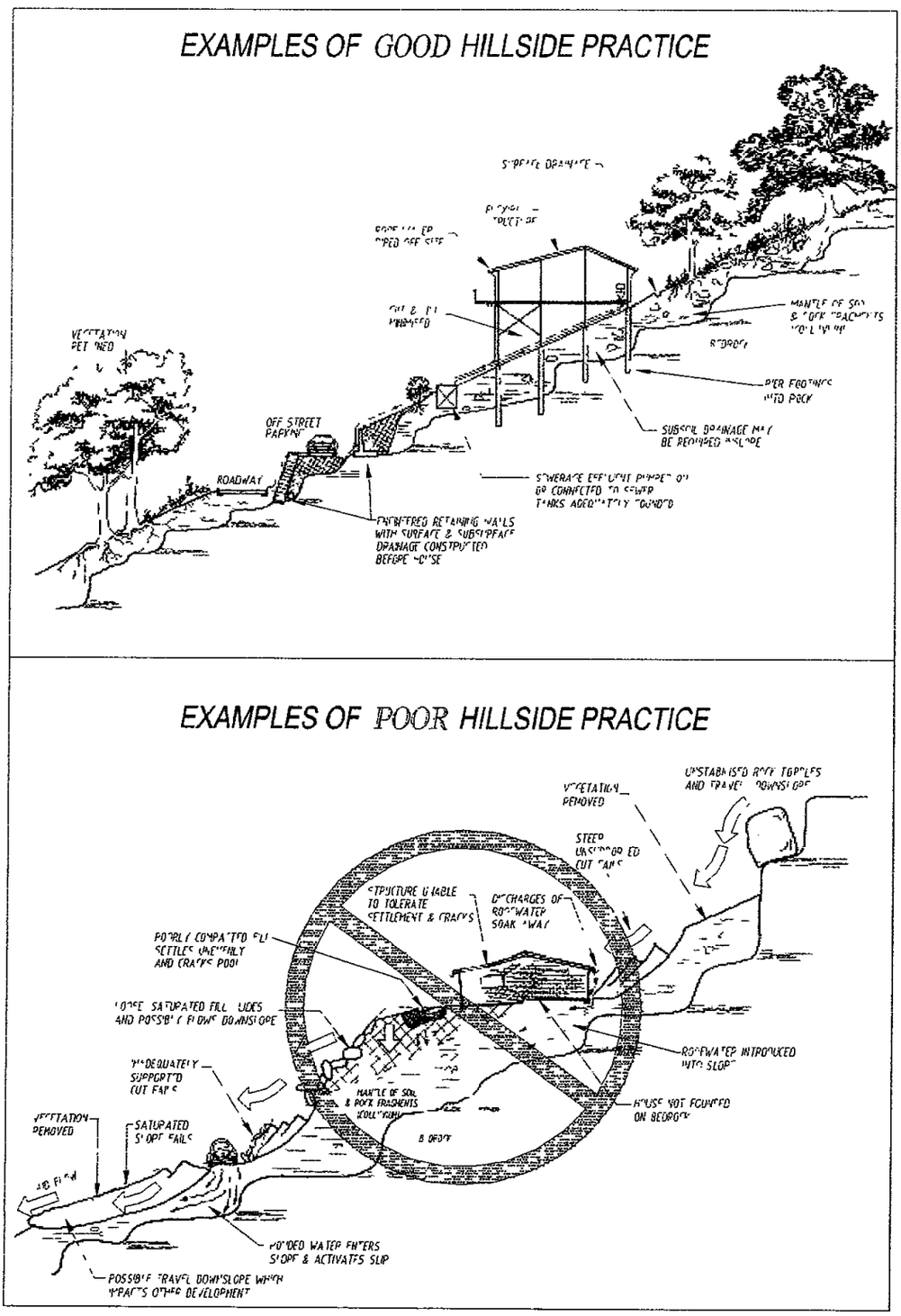


Figure J1 Illustrations of Good and Poor Hillside Practice

Appendix 7

Foundation Maintenance and Footing Performance:
A Homeowner's Guide

CSIRO

BTF 18
replaces
Information
Sheet 10/91

Buildings can and often do move This movement can be up down lateral or rotational The fundamental cause of movement in buildings can usually be related to one or more problems in the foundation soil It is important for the homeowner to identify the soil type in order to ascertain the measures that should be put in place in order to ensure that problems in the foundation soil can be prevented thus protecting against building movement

This Building Technology File is designed to identify causes of soil related building movement and to suggest methods of prevention of resultant cracking in buildings

Soil Types

The types of soils usually present under the topsoil in land zoned for residential buildings can be put into two approximate groups – granular and clay Quite often foundation soil is a mixture of both types The general problems associated with soils having granular content are usually caused by erosion Clay soils are subject to saturation and swell/shrink problems

Classifications for a given area can generally be obtained by application to the local authority but these are sometimes unreliable and if there is doubt a geotechnical report should be commissioned As most buildings suffering movement problems are founded on clay soils there is an emphasis on classification of soils according to the amount of swell and shrinkage they experience with variations of water content The table below is Table 2 1 from AS 2870 the Residential Slab and Footing Code

Causes of Movement

Settlement due to construction
There are two types of settlement that occur as a result of construction

Immediate settlement occurs when a building is first placed on its foundation soil as a result of compaction of the soil under the weight of the structure The cohesive quality of clay soil mitigates against this but granular (particularly sandy) soil is susceptible

Consolidation settlement is a feature of clay soil and may take place because of the expulsion of moisture from the soil or because of the soils lack of resistance to local compressive or shear stresses This will usually take place during the first few months after construction but has been known to take many years in exceptional cases

These problems are the province of the builder and should be taken into consideration as part of the preparation of the site for construction Building Technology File 19 (BTF 19) deals with these problems

Erosion
All soils are prone to erosion but sandy soil is particularly susceptible to being washed away Even clay with a sand component of say 10% or more can suffer from erosion

Saturation
This is particularly a problem in clay soils Saturation creates a bog like suspension of the soil that causes it to lose virtually all of its bearing capacity To a lesser degree sand is affected by saturation because saturated sand may undergo a reduction in volume – particularly imported sand fill for bedding and blinding layers However this usually occurs as immediate settlement and should normally be the province of the builder

Seasonal swelling and shrinkage of soil
All clays react to the presence of water by slowly absorbing it making the soil increase in volume (see table below) The degree of increase varies considerably between different clays as does the degree of decrease during the subsequent drying out caused by fair weather periods Because of the low absorption and expulsion rate this phenomenon will not usually be noticeable unless there are prolonged rainy or dry periods usually of weeks or months depending on the land and soil characteristics

The swelling of soil creates an upward force on the footings of the building and shrinkage creates subsidence that takes away the support needed by the footing to return equilibrium

Shear failure
This phenomenon occurs when the foundation soil does not have sufficient strength to support the weight of the footing There are two major post construction causes

Significant load increase

Reduction of lateral support of the soil under the footing due to erosion or excavation

In clay soil shear failure can be caused by saturation of the soil adjacent to or under the footing

GENERAL DEFINITIONS OF SITE CLASSES

Class	Foundation
A	Most sand and rock sites with little or no ground movement from moisture changes
S	Slightly reactive clay sites with only slight ground movement from moisture changes
M	Moderately reactive clay or silt sites which can experience moderate ground movement from moisture changes
H	Highly reactive clay sites which can experience high ground movement from moisture changes
E	Extremely reactive sites which can experience extreme ground movement from moisture changes
A to P	Filled sites
P	Sites which include soft soils such as soft clay or silt or loose sands Landslip mine subsidence collapsing soils soils subject to erosion reactive sites subject to abnormal moisture conditions or sites which cannot be classified otherwise

Tree root growth
Trees and shrubs that are allowed to grow in the vicinity of footings can cause foundation soil movement in two ways

Roots that grow under footings may increase in cross sectional size exerting upward pressure on footings

Roots in the vicinity of footings will absorb much of the moisture in the foundation soil causing shrinkage or subsidence

Unevenness of Movement

The types of ground movement described above usually occur unevenly throughout the building's foundation soil Settlement due to construction tends to be uneven because of

Differing compaction of foundation soil prior to construction

Differing moisture content of foundation soil prior to construction

Movement due to non construction causes is usually more uneven still Erosion can undermine a footing that traverses the flow or can create the conditions for shear failure by eroding soil adjacent to a footing that runs in the same direction as the flow

Saturation of clay foundation soil may occur where subfloor walls create a dam that makes water pond It can also occur wherever there is a source of water near footings in clay soil This leads to a severe reduction in the strength of the soil which may create local shear failure

Seasonal swelling and shrinkage of clay soil affects the perimeter of the building, first then gradually spreads to the interior The swelling process will usually begin at the uphill extreme of the building or on the weather side where the land is flat Swelling gradually reaches the interior soil as absorption continues Shrinkage usually begins where the suns heat is greatest

Effects of Uneven Soil Movement on Structures

Erosion and saturation
Erosion removes the support from under footings tending to create subsidence of the part of the structure under which it occurs. Brickwork walls will resist the stress created by this removal of support by bridging the gap or cantilevering until the bricks or the mortar bedding fail Older masonry has little resistance Evidence of failure varies according to circumstances and symptoms may include

- Step cracking in the mortar beds in the body of the wall or above/below openings such as doors or windows

Vertical cracking in the bricks (usually but not necessarily in line with the vertical beds or perpends)

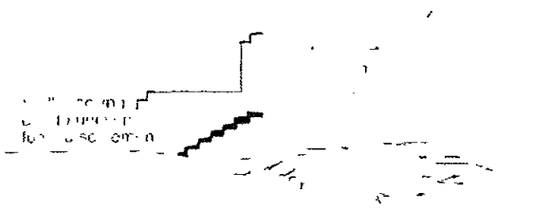
Isolated piers affected by erosion or saturation of foundations will eventually lose contact with the bearers they support and may tilt or fall over The floors that have lost this support will become bouncy sometimes rattling ornaments etc

Seasonal swelling/shrinkage in clay
Swelling foundation soil due to rainy periods first lifts the most exposed extremities of the footing system then the remainder of the perimeter footings while gradually permeating inside the building footprint to lift internal footings This swelling first tends to create a dish effect because the external footings are pushed higher than the internal ones

The first noticeable symptom may be that the floor appears slightly dished This is often accompanied by some doors binding on the floor or the door head together with some cracking of cornice mitres In buildings with timber flooring supported by bearers and joists the floor can be bouncy Externally there may be visible dishing of the hip or ridge lines

As the moisture absorption process completes its journey to the innermost areas of the building the internal footings will rise If the spread of moisture is roughly even it may be that the symptoms will temporarily disappear but it is more likely that swelling will be uneven creating a difference rather than a disappearance in symptoms In buildings with timber flooring supported by bearers and joists the isolated piers will rise more easily than the strip footings or piers under walls creating noticeable doming of flooring

Trees can cause shrinkage and damage



As the weather pattern changes and the soil begins to dry out the external footings will be first affected beginning with the locations where the suns effect is strongest This has the effect of lowering the external footings The doming is accentuated and cracking reduces or disappears where it occurred because of dishing but other cracks open up The roof lines may become convex

Doming and dishing are also affected by weather in other ways In areas where warm wet summers and cooler dry winters prevail water migration tends to be toward the interior and doming will be accentuated whereas where summers are dry and winters are cold and wet migration tends to be toward the exterior and the underlying propensity is toward dishing

Movement caused by tree roots
In general growing roots will exert an upward pressure on footings whereas soil subject to drying because of tree or shrub roots will tend to remove support from under footings by inducing shrinkage

Complications caused by the structure itself
Most forces that the soil causes to be exerted on structures are vertical – i e either up or down However because these forces are seldom spread evenly around the footings and because the building resists uneven movement because of its rigidity forces are exerted from one part of the building to another The net result of all these forces is usually rotational This resultant force often complicates the diagnosis because the visible symptoms do not simply reflect the original cause A common symptom is binding of doors on the vertical member of the frame

Effects on full masonry structures
Brickwork will resist cracking where it can It will attempt to span areas that lose support because of subsided foundations or raised points It is therefore usual to see cracking at weak points such as openings for windows or doors

In the event of construction settlement cracking will usually remain unchanged after the process of settlement has ceased

With local shear or erosion cracking will usually continue to develop until the original cause has been remedied or until the subsidence has completely neutralised the affected portion of footing and the structure has stabilised on other footings that remain effective

In the case of swell/shrink effects the brickwork will in some cases return to its original position after completion of a cycle however it is more likely that the rotational effect will not be exactly reversed and it is also usual that brickwork will settle in its new position and will resist the forces trying to return it to its original position This means that in a case where swelling takes place after construction and cracking occurs the cracking is likely to at least partly remain after the shrink segment of the cycle is complete Thus each time the cycle is repeated the likelihood is that the cracking will become wider until the sections of brickwork become virtually independent

With repeated cycles once the cracking is established if there is no other complication it is normal for the incidence of cracking to stabilise as the building has the articulation it needs to cope with the problem This is by no means always the case however and monitoring of cracks in walls and floors should always be treated seriously

Upheaval caused by growth of tree roots under footings is not a simple vertical shear stress There is a tendency for the root to also exert lateral forces that attempt to separate sections of brickwork after initial cracking has occurred

The normal structural arrangement is that the inner leaf of brick work in the external walls and at least some of the internal walls (depending on the roof type) comprise the load bearing structure on which any upper floors ceilings and the roof are supported In these cases it is internally visible cracking that should be the main focus of attention however there are a few examples of dwellings whose external leaf of masonry plays some supporting role so this should be checked if there is any doubt In any case externally visible cracking is important as a guide to stresses on the structure generally and it should also be remembered that the external walls must be capable of supporting themselves

Effects on framed structures
Timber or steel framed buildings are less likely to exhibit cracking due to swell/shrink than masonry buildings because of their flexibility Also the doming/dishing effects tend to be lower because of the lighter weight of walls The main risks to framed buildings are encountered because of the isolated pier footings used under walls Where erosion or saturation cause a footing to fall away this can double the span which a wall must bridge This additional stress can create cracking in wall linings particularly where there is a weak point in the structure caused by a door or window opening It is however unlikely that framed structures will be so stressed as to suffer serious damage without first exhibiting some or all of the above symptoms for a considerable period The same warning period should apply in the case of upheaval It should be noted however that where framed buildings are supported by strip footings there is only one leaf of brickwork and therefore the externally visible walls are the supporting structure for the building In this case the subfloor masonry walls can be expected to behave as full brickwork walls

Effects on brick veneer structures
Because the load bearing structure of a brick veneer building is the frame that makes up the interior leaf of the external walls plus perhaps the internal walls depending on the type of roof the building can be expected to behave as a framed structure except that the external masonry will behave in a similar way to the external leaf of a full masonry structure

Water Service and Drainage

Where a water service pipe a sewer or stormwater drainage pipe is in the vicinity of a building a water leak can cause erosion swelling or saturation of susceptible soil Even a minuscule leak can be enough to saturate a clay foundation A leaking tap near a building can have the same effect In addition trenches containing pipes can become watercourses even though backfilled particularly where broken rubble is used as fill Water that runs along these trenches can be responsible for serious erosion interstrata seepage into subfloor areas and saturation

Pipe leakage and trench water flows also encourage tree and shrub roots to the source of water complicating and exacerbating the problem
Poor roof plumbing can result in large volumes of rainwater being concentrated in a small area of soil

- Incorrect falls in roof guttering may result in overflows as may gutters blocked with leaves etc

Corroded guttering or downpipes can spill water to ground

Downpipes not positively connected to a proper stormwater collection system will direct a concentration of water to soil that is directly adjacent to footings sometimes causing large scale problems such as erosion saturation and migration of water under the building

Seriousness of Cracking

In general most cracking found in masonry walls is a cosmetic nuisance only and can be kept in repair or even ignored The table below is a reproduction of Table C1 of AS 2870

AS 2870 also publishes figures relating to cracking in concrete floors however because wall cracking will usually reach the critical point significantly earlier than cracking in slabs this table is not reproduced here

Prevention/Cure

Plumbing
Where building movement is caused by water service roof plumbing sewer or stormwater failure the remedy is to repair the problem It is prudent however to consider also rerouting pipes away from the building where possible and relocating taps to positions where any leakage will not direct water to the building vicinity Even where gully traps are present there is sometimes sufficient spill to create erosion or saturation particularly in modern installations using smaller diameter PVC fixtures Indeed some gully traps are not situated directly under the taps that are installed to charge them with the result that water from the tap may enter the backfilled trench that houses the sewer piping If the trench has been poorly backfilled the water will either pond or flow along the bottom of the trench As these trenches usually run alongside the footings and can be at a similar depth it is not hard to see how any water that is thus directed into a trench can easily affect the foundations ability to support footings or even gain entry to the subfloor area

Ground drainage
In all soils there is the capacity for water to travel on the surface and below it Surface water flows can be established by inspection during and after heavy or prolonged rain If necessary a grated drain system connected to the stormwater collection system is usually an easy solution

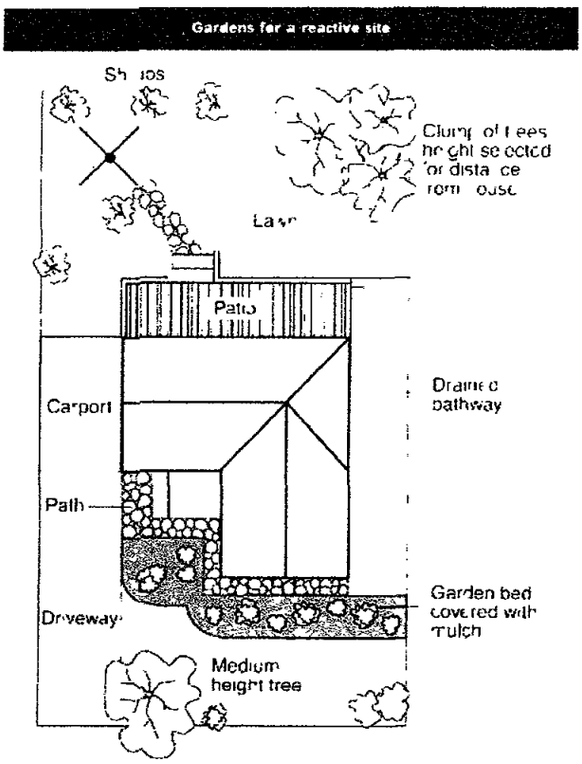
It is however sometimes necessary when attempting to prevent water migration that testing be carried out to establish watertable height and subsoil water flows This subject is referred to in BTF 19 and may properly be regarded as an area for an expert consultant

Protection of the building perimeter
It is essential to remember that the soil that affects footings extends well beyond the actual building line Watering of garden plants shrubs and trees causes some of the most serious water problems

For this reason particularly where problems exist or are likely to occur it is recommended that an apron of paving be installed around as much of the building perimeter as necessary This paving

CLASSIFICATION OF DAMAGE WITH REFERENCE TO WALLS

Description of typical damage and required repair	Approximate crack width limit (see Note 3)	Damage category
Hairline cracks	<0 1 mm	0
Fine cracks which do not need repair	<1 mm	1
Cracks noticeable but easily filled Doors and windows stick slightly	<5 mm	2
Cracks can be repaired and possibly a small amount of wall will need to be replaced Doors and windows stick Service pipes can fracture Weathertightness often impaired	5–15 mm (or a number of cracks 3 mm or more in one group)	3
Extensive repair work involving breaking out and replacing sections of walls especially over doors and windows Window and door frames distort Walls lean or bulge noticeably some loss of bearing in beams Service pipes disrupted	15–25 mm but also depend on number of cracks	4



should extend outwards a minimum of 900 mm (more in highly reactive soil) and should have a minimum fall away from the building of 1 60 The finished paving should be no less than 100 mm below brick vent bases

It is prudent to relocate drainage pipes away from this paving if possible to avoid complications from future leakage If this is not practical earthenware pipes should be replaced by PVC and backfilling should be of the same soil type as the surrounding soil and compacted to the same density

Except in areas where freezing of water is an issue it is wise to remove taps in the building area and relocate them well away from the building - preferably not uphill from it (see BTF 19)

It may be desirable to install a grated drain at the outside edge of the paving on the uphill side of the building If subsoil drainage is needed this can be installed under the surface drain

Condensation

In buildings with a subfloor void such as where bearers and joists support flooring insufficient ventilation creates ideal conditions for condensation particularly where there is little clearance between the floor and the ground Condensation adds to the moisture already present in the subfloor and significantly slows the process of drying out Installation of an adequate subfloor ventilation system either natural or mechanical is desirable

Warning Although this Building Technology File deals with cracking in buildings it should be said that subfloor moisture can result in the development of other problems notably

Water that is transmitted into masonry metal or timber building elements causes damage and/or decay to those elements

High subfloor humidity and moisture content create an ideal environment for various pests including termites and spiders

Where high moisture levels are transmitted to the flooring and walls an increase in the dust mite count can ensue within the living areas Dust mites as well as dampness in general can be a health hazard to inhabitants particularly those who are abnormally susceptible to respiratory ailments

The garden

The ideal vegetation layout is to have lawn or plants that require only light watering immediately adjacent to the drainage or paving edge then more demanding plants shrubs and trees spread out in that order

Overwatering due to misuse of automatic watering systems is a common cause of saturation and water migration under footings If it is necessary to use these systems it is important to remove garden beds to a completely safe distance from buildings

Existing trees

Where a tree is causing a problem of soil drying or there is the existence or threat of upheaval of footings if the offending roots are subsidiary and their removal will not significantly damage the tree they should be severed and a concrete or metal barrier placed vertically in the soil to prevent future root growth in the direction of the building If it is not possible to remove the relevant roots without damage to the tree an application to remove the tree should be made to the local authority A prudent plan is to transplant likely offenders before they become a problem

Information on trees plants and shrubs

State departments overseeing agriculture can give information regarding root patterns volume of water needed and safe distance from buildings of most species Botanic gardens are also sources of information For information on plant roots and drains see Building Technology File 17

Excavation

Excavation around footings must be properly engineered Soil supporting footings can only be safely excavated at an angle that allows the soil under the footing to remain stable This angle is called the angle of repose (or friction) and varies significantly between soil types and conditions Removal of soil within the angle of repose will cause subsidence

Remediation

Where erosion has occurred that has washed away soil adjacent to footings soil of the same classification should be introduced and compacted to the same density Where footings have been undermined augmentation or other specialist work may be required Remediation of footings and foundations is generally the realm of a specialist consultant

Where isolated footings rise and fall because of swell/shrink effect the homeowner may be tempted to alleviate floor bounce by filling the gap that has appeared between the bearer and the pier with blocking The danger here is that when the next swell segment of the cycle occurs the extra blocking will push the floor up into an accentuated dome and may also cause local shear failure in the soil If it is necessary to use blocking it should be by a pair of fine wedges and monitoring should be carried out fortnightly

This BTF was prepared by John Lewer FAIB MIAMA Partner Construction Diagnosis

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Appendix 8

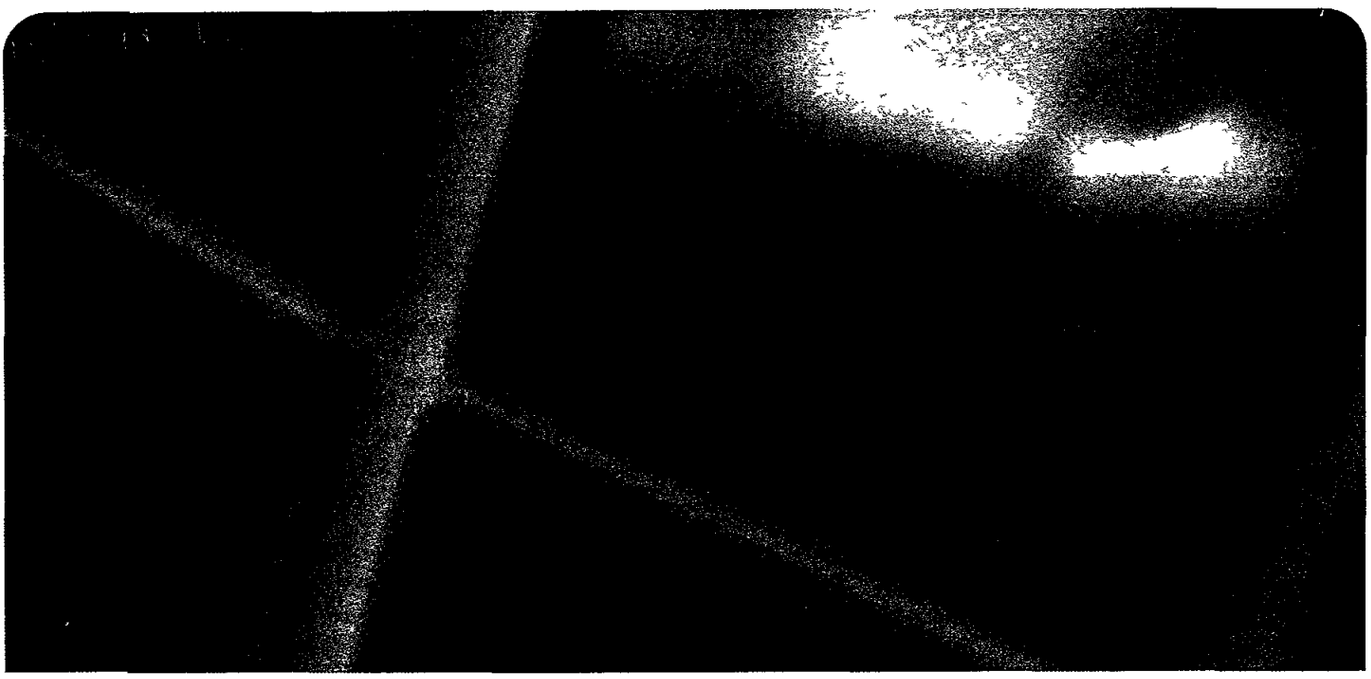
TABLE 3 - Recommended Maintenance and Inspection Program

Structure	Maintenance/ Inspection Item	Frequency
Stormwater drains	Owner to inspect to ensure that the drains and pipes are free of debris & sediment build up Clear surface grates and litter	Every year or following each major rainfall event
Retaining Walls	Owner to inspect walls for deveation from as constructed condition	Every two years or following major rainfall event
Stability of Boulders and Cliff line	Property owners to arrange for inspection to assess on going stability	Every five years
Large Trees on site	Arbourist to check condition of trees and remove branches as required	Every five years
Slope Stability	Hydraulics (stormwater) & Geotechnical Consultants to check on site stability at same time and provide report	One year after construction is completed

All exposed floors to be in accordance with Part 3 3 3 non combustible
All wall construction shall be in accordance with Part 3 5 3
All windows shall be in accordance with Part 3 6 3 toughened glass and screened with aluminum mesh screens
All external doors shall be as per 3 7 3 and or the practice note issued by the NSW fire brigade in the consent
All vents and weep holes shall be constructed in accordance with 3 8 3
All construction of roofs shall be in accordance with Roofs 3 9, roof sheeting shall have mineral wool under the roof capping, sheets at the gutters, roof and gutter guards
All eave construction shall be as per 3 10 and be non combustible and facia to be non combustible
Gutters and down pipes shall be as per 3 12 non combustible
All construction of the verandas and decks shall be as per 3 13 3, fire retardant timber, gaps of boards to be 5mm

All references are to AS 3959- 1999 Construction of buildings in bushfire – prone areas

This is to be treaded as a guide please refer to the above standard in order to understand full compliance with the standard



DOMESTIC SPECIFICATION 2005

When building or extending a house a well-prepared specification can save time, reduce uncertainty and help avoid disputes. Builders need a specification to work to, and councils normally require a specification to be attached to a building application.

NATSPEC DOMESTIC is a do-it-yourself specification that simply requires selections of materials, colours and components to be filled in. The completed specification can then be handed to councils and builders with the plans.

NATSPEC DOMESTIC has been produced by the publishers of the national building specification used by architects, building designers and engineers. Building owners and renovators can be confident it will provide a professional specification that has a good standard of work as its objective.

Each edition of NATSPEC DOMESTIC is aligned with the latest edition of the Building Code of Australia.

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Use the current edition
This specification is published annually and is aligned with BCA 2005 Volume 2 Housing Provisions

DOMESTIC overview

DOMESTIC is for homes of conventional construction those buildings covered by Class 1a and Class 10 of the Building Code of Australia i e single dwellings such as cottages villa units or townhouses The use of this specification will minimise misunderstanding and will make clear what is going to be delivered in terms of materials and quality construction

DOMESTIC is suitable for owner builders house builders architects and building designers whether building extending or renovating a home The selected building contract may have some conditions of contract that overlap General requirements in which case it is the specification that should be adapted This specification describes common construction practice It will need to be supplemented in areas subject to high winds snow earthquakes bushfire and/or marine exposure to comply with the Building Code of Australia In some areas there will be local techniques or statutory requirements which will take precedence

The specification is in two parts Part A is the Reference specification which describes general or standard construction requirements with a list of the reference standards at the end Part B the Selection schedules is designed to be completed to identify the owner s selections of materials and components (including colours) There is also provision for the parties to the contract to agree which parts of the Reference specification apply and which do not For example Paving and roads Fences and external walls and Landscaping might be excluded

As well as the project requirements set out in the Selection schedules many of the technical details of the project will be better described on the drawings Indeed the Selection schedules can be dispensed with and all the project information can be shown on the drawings if that approach is preferred And of course Selection schedules tailored to a selected builder s design can be substituted for those provided in this booklet

A key provision of this specification is that any information in the Selection schedules or on the drawings will if there is any difference override a requirement of the Reference specification This is important for several reasons

- It isn t necessary to edit the Reference specification to suit the work The Selection schedules and the drawings do this automatically
- References to Australian standards in the Reference specification can be overridden by specifying a brand or product in the Selection schedules or on the drawings However any non compliance with the Reference specification should be specified in the Selection schedules
- The Australian standards referenced are those which Are referenced in the Building Code of Australia and are relevant to domestic work have other statutory application are important to the quality of materials and work in terms of public safety and long term performance of the building and/or are widely accepted in the building industry

Some specification requirements embedded in standards that are primarily intended for non domestic projects have been incorporated in the Reference specification Examples may be found in Site preparation and Concrete construction Generally though requirements spelt out in the standards and which reflect normal practice have not been repeated in the Reference specification

Why a NATSPEC DOMESTIC 6 pack

NATSPEC Domestic Specification is provided in packs of six to satisfy the needs of the project generally three copies as required by your local council a copy for your records copies for tendering purposes

Completing this specification

In this specification some pages need to be completed with information about the project The Cover page opposite should be dated and signed by the owner(s) and the builder

THIS COVER CAN BE REMOVED

SPECIFICATION FOR BUILDING WORK

THE WORK

The building work described in the building contract dated

LOCATION

No/street: 115 McCarrs Creek Road

Suburb/town: Church Point

Municipality/shire/city: Pittwater

Reference to title

Lot/position: 59

Deposited Plan (DP)/Strata Plan (SP): 11691

THE PARTIES

Owners: Murray + Beverley McIntyre

Address: 115 McCarrs Creek Rd

Builder: your abode

Address: Po Box 260 Avalon 2107

Australian Business Number (ABN): 85 113 690 921

Licence/registration number: 177091 C

SIGNATURES

Owner(s)

Date

Builder

Date

REFERENCE SPECIFICATION – PART A

The *Reference specification* worksections attached are incorporated in the contract for the work as follows

Yes	No		
☑	☐	General requirements	A1
☑	☐	Site preparation	A3
☑	☐	Concrete construction	A5
☐	☑	Timber frame construction	A6
☑	☐	Steel frame construction	A8
☐	☐	Brick and block construction	A10
☑	☐	Insulation and sarking	A12
☑	☐	Roofing	A13
☑	☐	Cladding	A14
☑	☐	Doors and windows	A15
☑	☐	Lining	A17
☑	☐	Plastering and floor topping	A17
☑	☐	Tile finishes	A18
☑	☐	Floor coatings and coverings	A19
☑	☐	Painting	A21
☑	☐	Joinery	A22
☐	☑	Mechanical installations	A23
☑	☐	Plumbing installations	A25
☑	☐	Electrical installations	A27
☐	☑	Fences and external walls	A28
☐	☑	Landscaping	A29
☐	☑	Paving and roads	A31

About this specification

This specification is in two parts – the *Reference specification* (Part A) and the *Selection schedules* (Part B)

The requirements of the *Selection schedules* and the drawings override any different requirements in the *Reference specification*

Completing this specification

Show here by ticking boxes which *Reference specification* sections apply to the work

The *Reference specification* must not be copied or altered directly and an original must be attached to each copy of the contract

The *Selection schedules* may be used to set out alterations deletions or additions to the *Reference specification*

GENERAL REQUIREMENTS

1 GENERAL

Interpretation

Owner Means the same as principal or proprietor'

Builder Means the same as contractor'

Metallic coated Includes zinc coated steel zinc/iron alloy-coated steel and aluminium/zinc coated steel

Supply Means supply only – do not install

Provide Means supply and install

Required Means required by the contract documents or by the local council or statutory authorities

Proprietary Means identifiable by naming the manufacturer supplier installer trade name brand name catalogue or reference number

Standards

Use referenced Australian or other standards (including amendments) which are current one month before the date of the contract except where other editions or amendments are required

Manufacturers' or suppliers recommendations

Select store handle and install proprietary products or systems in accordance with the current published recommendations of the manufacturer or supplier

2 CONTRACTS AND FINANCE

Payment and adjustment of contract sum

At commencement of the building work submit a schedule of anticipated progress claims which will be made throughout the contract

Progress claims breakdown With each progress claim submit a statement of amounts claimed in respect of each section or trade heading designated in the specification

3 AUTHORITIES AND ESTABLISHMENT

Existing services

Attend to existing services as follows

If the service is to be continued repair divert or relocate as required If such a service crosses the line of a required trench or will lose support when the trench is excavated provide permanent support for the existing service

If the service is to be abandoned cut and seal or disconnect and make safe

Signs

Provide a signboard displaying the owners name the lot number and the builder s name address and licence number

Occupied premises

For the parts of the site which are occupied premises

Allow occupants to continue in secure possession and *occupancy of the premises for the required period*

Make available safe access for occupants

Arrange work to minimise nuisance to occupants and ensure their safety

Protect occupants against weather dust dirt water or other nuisance by such means as temporary screens

4 EXECUTION AND COMPLETION

Survey marks

Preserve and maintain the owners survey marks in their true positions

Certification If the owner s survey marks are disturbed or obliterated immediately give notice and rectify the disturbance or obliteration

Removal of temporary work, services and plant

Remove temporary work services and construction plant within 10 working days after occupation of the works

Rectification Clean and repair damage caused by the installation or use of temporary work and services and restore existing facilities used during construction to original condition

Final cleaning

Remove rubbish and surplus material from the site and clean the work throughout prior to the final progress payment

Warranties

Name the owner as warrantee and give the owner copies of manufacturers warranties

Instruction manuals

Give the owner manufacturers instruction manuals

Operation

Ensure moving parts operate safely and smoothly

Surveyor's certificate

Give the owner a certificate which confirms that the work including boundary fences has been correctly located

Services layout

Give the owner a plan which shows the location of underground services

Authorities approvals

Give the owner evidence of approval of the local council and statutory authorities whose requirements apply to the work

Keys

Give the owner two keys for each set of locks keyed alike and two keys for each lock keyed to differ

5 TERMITE MANAGEMENT

General

Standard To AS 3660 1

Chemical soil barriers – reticulation systems Submit evidence that the system has been type tested to AS 3660 1 Appendix E

Termite barrier notice Provide a durable notice permanently fixed in a prominent location to BCA Volume 2 clause 3 1 3 2(b)

6 TIMBER GENERALLY

Moisture content

Make milled products from timbers seasoned

To within 3% of the equilibrium moisture content appropriate to the timber and its intended conditions of use

With no more than 3% difference between any 2 pieces in any one group

Unseasoned timber

If unseasoned timber is provided or variations in moisture content is likely make allowance for shrinkage swelling and differential movement

Durability

General Provide timbers with natural durability appropriate to the conditions of use or preservative treated timbers of equivalent durability

Minimum requirement To the **Natural and treated timber durability table**

Natural durability class of heartwood To AS 5604

- Preservative treatment To the AS 1604 series

Natural and treated timber durability table

Exposure	Natural timber	Treated timber	Remarks
	Required durability class to AS 5604	Required hazard class to AS 1604 series	
Inside above ground Completely protected from the weather Well ventilated	Class 4	H1	Treated timber resistant to lyctids Untreated timber must be protected from termites
Inside above ground Protected from wetting with nil leaching Well ventilated	Class 3	H2	Treated timber resistant to borers and termites Untreated timber must be protected with a finish
Above ground exposed to weather Periodic moderate wetting and leaching	Class 2	H3	Treated timber resistant to borers termites and moderate decay Applicable to weatherboards fascias pergolas (above ground) window joinery framing and decking
In-ground	Class 1	H4 (Severe wetting and leaching)	Treated timber resistant to borers termites and severe decay Applicable to fence posts greenhouses pergolas (in-ground) and landscaping timbers
		H5 (Extreme wetting and leaching and/or critical applica tions)	Applicable to retaining walls piling house stumps building poles cooling tower fill

7 STEEL GENERALLY

Durability

General Provide metals with inherent durability appropriate to the conditions of use or proprietary metallic and/or organic coatings of equivalent durability

Minimum external requirements To the **Stainless and coated steel table**

Internal engineer designed steel members Remove mill scale rust moisture and oil Coat with a zinc phosphate primer to the manufacturer's instructions

Stainless and coated steel table

External environment includes cavity wall and roof spaces not protected from moisture penetration by sheathing or sarking	Heavy steel members including lintels more than 3 2 mm thick	Wall ties, connectors and accessories less than 3 2 mm thick	Steel cladding, lining trims and flashings
Low corrosivity More than 10 km from salt water with breaking surf More than 1 km from salt water without breaking surf	Galvanize after fabrication 300g/m^2	Galvanize after fabrication 300g/m^2 Metallic coated sheet Z600/AZ200	Metallic coated sheet AZ150
Medium corrosivity 1 – 10 km from salt water with breaking surf 100 – 1000 m from salt water without breaking surf Non heavy industrial areas	Galvanize after fabrication 600g/m^2	Galvanize after fabrication 470g/m^2 Galvanized wire 470g/m^2	Metallic-coated sheet AZ200
Severe marine 200 – 1000 m from salt water with breaking surf 0 – 100 m from salt water without breaking surf Heavy industrial areas	Stainless steel 316 or 316L	Stainless steel 316 Engineered polymer	Metallic-coated sheet AZ200 plus organic coating

- The Building Code of Australia (BCA) including State and Territory variations is enforced by local councils and along with the requirements of statutory authorities (e g electricity and water supply) controls domestic construction in Australia NATSPEC DOMESTIC has been aligned with BCA 2005 Volume 2 but any local requirements must take precedence
- AS 5604 gives a comprehensive table of the natural durability of timber species Clause 6 sets rules for the use of timber in relation to its natural durability class and for its preservative treatment if it does not have the required natural durability
- Survey marks The owner should obtain a block and peg survey
- Bushfire protection AS 3959 is incorporated in the BCA but many local councils have their own requirements which must also be complied with SAA HB36 published by Standards Australia is an invaluable aid to understanding bushfire protection and is designed to be read in conjunction with the standard which defines 3 levels of construction for medium high and extreme bushfire risk

SITE PREPARATION

1 GENERAL

Standard

Groundworks for slabs and footings To AS 2870

Interpretation

Rock Monolithic material with volume greater than 0 5 m^3 which cannot be removed until broken up by mechanical means such as rippers or percussion tools

Bad ground Ground unsuitable for the work including fill liable to subsidence ground containing cavities faults or fissures ground contaminated by harmful substances and ground which is or becomes soft wet or unstable

Line of influence A line extending downward and outward from the bottom edge of a footing slab or pavement and defining the extent of foundation material having influence on the stability or support of the footings slab or pavement

Subgrade *The trimmed or prepared portion of the* formation on which the pavement or slab is constructed

Immediate notice

If rock or bad ground is encountered advise the owner immediately

Explosives

Do not use explosives

2 DEMOLITION

Standard

Demolition To AS 2601

Demolished materials

Except for materials to be salvaged and retained by the owner or re used take possession of demolished materials and remove them from the site Do not burn or bury demolished materials on the site

Support

Provide temporary support for sections of existing buildings which are to be altered and which rely for support on work to be demolished

Weather protection

If walls or roofs are opened for alterations and additions or the surfaces of adjoining buildings are exposed provide temporary covers to prevent water penetration

Security

If walls or roofs are opened for alterations or additions provide security against unauthorised entry

Asbestos removal

Method Use wet removal methods recommended in the Code of Practice for the Removal of Asbestos (NOHSC 2002) including Part 4 for insulation and lagging and Part 9 for asbestos cement

Monitoring Have dust monitoring performed by an independent testing authority

3 TREES TO BE RETAINED

Marking

Mark trees which are required to be retained using suitable non injurious easily visible and removable means of identification Remove the identification on completion

Protection

Protect trees which are required to be retained from damage Do not remove topsoil from the area within the dripline of the trees and keep this area free of construction material and debris

Excavation

Excavating near trees required to be retained Use hand methods to locate, expose and cleanly remove the roots on the line of excavation

4 ENVIRONMENTAL PROTECTION

Erosion control

Avoid erosion contamination and sedimentation of the site surrounding areas and drainage systems

Dewatering

Keep the site free of water and prevent water flow over new work

5 SITE CLEARING

Extent

Limit clearing to the areas to be occupied by construction paving or landscaping

Clearing operations

Remove everything on or above the site surface including rubbish scrap grass vegetable matter and organic debris scrub trees noted for removal timber stumps boulders and rubble Remove grass to a depth just sufficient to include the root zone

Grubbing

Grub out or grind stumps and roots over 75 mm diameter *to a minimum depth of 500 mm below subgrade under* construction and 300 mm below the finished surface in unpaved areas

Removal of topsoil

General Remove the topsoil layer of the natural ground which contains substantial organic matter over the areas to be occupied by construction and paving

Maximum depth 100 mm

Topsoil stockpiles

Stockpile site topsoil required for re use Protect stockpiles from contamination by other excavated material weeds and building debris

Surplus material

Take possession of surplus material and remove it from the site

6 EXCAVATION

Extent

Excavate to give the levels and profiles required for construction site services paving and landscaping Allow for compaction or settlement

Foundations

After excavation confirm that the bearing capacity is adequate

Under floor access

Provide a minimum clearance to underside of timber bearers of 400 mm

Bearing surfaces

Provide even plane bearing surfaces for loadbearing elements including footings Step for level changes Make the steps to the appropriate courses if supporting masonry

Reinstatement

If excavation exceeds the required depth or deteriorates reinstate with fill to the correct depth level and bearing value

Existing footings

If excavation is required below the line of influence of an existing footing use methods which maintain the support of the footing and ensure that the structure and finishes supported by the footing are not damaged

Grading

Grade the ground surface externally and under suspended floors to drain ground or surface water away from buildings without ponding

7 SURFACE PREPARATION

General

Before placing fill ground slabs or load bearing elements remove loose material debris and organic matter and compact the ground to achieve the required density

Placing fill
Place fill in layers ≤ 200 mm and compact each layer to achieve the required density

Moisture content
If necessary to achieve the required density or moisture content adjust the moisture content of the fill before compaction

8 PILING

Bored piers
After excavating bored piers remove loose material and water from the base and confirm the bearing capacity Do not allow loose material to fall down the hole before or during concreting provide a liner if necessary

Timber piled footing system
Provide a proprietary system designed to AS 2870

Screw in foundations
Provide a proprietary system designed to AS 2159

9 SERVICE TRENCHES

Excavation
Generally make trenches straight between manholes inspection points and junctions with vertical sides and uniform grades

Trench widths
Keep trench widths to the minimum consistent with the laying and bedding of the relevant service and construction of manholes and pits

Backfilling
General Backfill service trenches as soon as possible after laying the service Place backfill in layers Compact each layer to a density sufficient to minimise settlement

Backfill material Excavated spoil or well graded inorganic material with maximum particle size of 75 mm

Next to services Do not place any particles greater in size than 25 mm within 150 mm of services

Under paved areas Coarse sand controlled low strength material or fine crushed rock

In reactive clay sites classified M M D H H-D or E to AS 2870 Impervious material

- If any demolished materials (e g basins doors) are to be salvaged and retained by the owner this must be stated in the Selection schedules
- Local councils often have detailed requirements for protection of trees and control of erosion which builders must comply with
- BCA Volume 2 clause 3 4 1 calls for a general clearance of 400 mm under suspended timber floors that can be reduced to 150 mm within 2 m of an external wall for sloping sites
- Requirements for load bearing fill and piling if any should be specified by an engineer AS 3798 gives general advice on earthworks The services of a professional engineer are recommended
- Inadequate backfilling can lead to differential settlement and damage to paving and landscaping In reactive clay soils it is important that service trenches do not act as a conduit to carry moisture into the ground next to the foundations so impervious material should be used for backfill
- Screw in foundations Requirements for piling if any should be specified by an engineer
- Treatment and design for highly reactive soils should be by a professional engineer
- A temporary fence or safety barrier may be required by the Local Council

CONCRETE CONSTRUCTION

1 GENERAL

Cross reference

Conform to the *General requirements* section for termite protection

Standards

Concrete structures generally To AS 3600

Ground slabs and footings To AS 2870

2 GROUND SLAB VAPOUR BARRIER

Material

General Provide a proprietary vapour barrier which consists of high impact resistant polyethylene film minimum 0 2 mm thick which has been pigmented and branded by the manufacturer

Base preparation

Blind the surface with sufficient sand to cover any hard projections Wet the sand just before placing the vapour barrier

3 REINFORCEMENT

Minimum lap

Splice as follows

Mesh generally 225 mm

Trench mesh 500 mm

Bars Greater of either 500 mm or 25 x bar diameter

Strip footing intersections and corners For full width of intersecting reinforcement

- Support reinforcement in its correct position on proprietary stools

Cover To the **Minimum cover to reinforcement table**

Minimum cover to reinforcement table

Concrete element	Location	Minimum concrete strength (MPa)	Minimum cover to reinforcement (mm)
Unreinforced concrete	Generally	20	
Reinforced concrete	Unless noted otherwise below	25	20
	Exterior temperate near coastal (1 km to 50 km) and on ground and protected by membrane (bottom cover)		30
	On ground and unprotected by membrane (bottom cover)		40
	Footings		50
	Exterior tropical near-coastal (1km to 50 km) and in contact with fresh water	32	40
	Exterior coastal (100 m to 1 km) and permanently submerged in salt water	40	45
	Exterior in tidal or splash zones	50	50

4 CONCRETE

Pre mixed supply

Standard To AS 1379 by the batch production process

Maximum slump 100 mm

Concrete placing

Depth If concrete is deeper than 350 mm place it in layers so that each succeeding layer is blended into the preceding one by the compaction process

Slabs and pavements Place concrete uniformly over the width of the slab so that the face is generally vertical and normal to the direction of placing

Compaction

Vibrate concrete to remove entrapped air but avoid over vibration that may cause segregation

Finish

Formed surfaces To AS 3610

- Visible Smooth to a 3 mm tolerance
- Not visible To a 6 mm tolerance

Unformed surfaces

Generally Machine floated finish to a 3 mm tolerance

Areas for tiling Screeded finish to a 6 mm tolerance

Tolerance Deviation from a 3 mm straight edge placed anywhere on the slab in any direction

Curing

Protection Protect concrete from premature drying and from excessive hot cold and/or windy conditions

Method Cure concrete by either of the following

Using a proprietary curing compound

Keeping it covered and moist for the following periods

In ground footings 2 days

Exposed footings beams and slabs 7 days

Formwork removal

Remove timber formwork

Stripping times

Leave formwork for suspended structures in place after pouring concrete for the following periods

Vertical surfaces 2 days

Bottom surfaces 7 days with shoring and backprops left in position for 21 days

5 JOINTS

Construction joints

Joint preparation Roughen and clean the hardened concrete joint surface remove loose or soft material free *water and foreign matter Dampen the surface before* placing the concrete

Slip joints

If concrete slabs are supported on masonry provide proprietary pre-lubricated slip joints

6 CONCRETE BEARER SUPPORTS

General

Provide proprietary precast stumps to support bearers at 1800 mm maximum centres

Concrete stumps

General Set stumps 25 to 50 mm into concrete pad footings

Marking Maker's name on one face

Bracing Brace stumps which project above the ground by more than 12 times the width of their smallest face

- Because ground conditions vary so much around Australia concrete structures are usually designed by a professional engineer but this is not always necessary
- The BCA Volume 2 clause 3 2 4 contains a table of soil classifications that are the basis for subsequent requirements for footing design The soil classification should be determined by the local council engineer or a geotechnical engineer
- However in the absence of a chemical soil barrier protection against termites design to ensure cracking of slabs does not occur may be essential Such design should be by an engineer
- SAA HB28 and SAA HB109 are also useful design guides

TIMBER FRAME CONSTRUCTION

1 GENERAL

Cross references

Refer to the following worksections

General requirements for termite management and timber durability

- *Concrete construction* for concrete bearer supports

Brick and block construction for clearance for timber frame shrinkage and masonry bearer supports

Tile finishes for waterproofing of wet areas

Painting for priming timber before fixing

Standards

Timber framing and flooring To AS 1684 4 or AS 1720 1

2 MATERIALS AND COMPONENTS

Self drilling screws

Standard To AS 3566 1

Corrosion resistance Class 2 to AS 3566 2 Table 1

Flashings and damp proof courses

Standard To AS/NZS 2904

Timber fasteners

Metal washers Provide washers to the heads and nuts of all bolts and coach screws

Steel straps Metallic-coated steel to AS 1397 minimum size 25 x 1 mm or 30 x 0 8 mm

Galvanizing

Galvanize mild steel components (including fasteners) to AS 1214 or AS/NZS 4680 as appropriate if

Exposed to weather

Embedded in masonry

In contact with chemically treated timber

3 CONSTRUCTION GENERALLY

CCA (copper chrome arsenic) treated timber

Greasing Before placing bolts in contact with CCA treated timber coat the shank of the bolt in grease or a bituminous coating

Priming steel

Before fixing prime steel which is not galvanized or metallic coated

4 FLOORS

General

Standard To AS 1684 4

Strip flooring

Weather Do not fix strip flooring until the work is weathertight

Acclimatise Acclimatise the flooring by stacking it inside with air circulation to all surfaces for two weeks prior to fixing

Particleboard flooring

Standards To AS/NZS 1860 1 and install to AS 1860

Junctions Sand junctions lightly to a smooth level surface

Fibre cement flooring

Compressed sheets To AS/NZS 2908 2 Type A Category 5

Plywood flooring

Standard To AS/NZS 2269 bond type A tongue and grooved

5 WALL FRAMING

Timber wall framing

Provide gauged timbers for studs noggings and plates in double-faced walls

Additional support

General Provide additional support in the form of noggings trimmers and studs for fixing lining cladding hardware accessories fixtures and fittings as necessary

Maximum spacing of noggings 1350 mm centres

Vermin barriers for suspended floors

Masonry veneer barrier Secure 10 mm galvanized wire mesh to the underside of the bottom plate of external stud walls extending across the cavity for building into brickwork

Damp proof courses

Clad-frame walls Provide damp proof courses under the bottom plate of external clad frame walls built off slabs or masonry dwarf walls

Flashings

Provide flashings to external openings sufficient to prevent the entry of moisture

6 ROOF AND CEILING FRAMING AND TRUSSES

Wall plates

Fixing Fix timber wall plates to masonry with either straps or bolts

Nailing strips

Where timber joists rafters or purlins bear on steel members provide 50 mm thick nailing strips bolted to the flange of the steel member

Strutted framing

General Construct traditional timber pitched roof framing consisting of rafters and ceiling joists supported at intermediated points by a system of underpurlins strutted off walls or strutting beams and braced by collar ties and ceiling hanging beams

Beam framing

General Construct framing for flat or pitched roofs where the ceiling follows the roof line consisting of rafters or purlins acting as beams to support both ceiling and roof covering

Roof trusses

General Factory-assemble trusses

Camber 10 mm upward in bottom chord

Connections Connector plates pressed to contact with the truss members No knots in plate area

Joints No gaps greater than 2 mm

Overhangs Free from spring or splits

Installation To AS 4440

Support Support trusses on bottom chord at two points only unless designed for additional support

Vertical movement Over internal walls provide at least 10 mm vertical clearance and use bracing methods which allow for vertical movements

Supports for water containers

Where a water container or heater is located in the roof space provide a support platform to AS/NZS 3500 4 clause 5 5

Additional support

Provide a frame member behind every joint in fibre cement sheeting or lining

Anti ponding boards

Standard To AS/NZS 4200 2

7 TIMBER ROOF TRIM

Priming timber

Prime exposed timber all round before fixing and re prime cut edges if trimmed in situ

Fascia valley gutter and barge boards

Minimum thickness

- Fixed at up to 600 mm centres 19 mm
- Fixed at 600 – 900 mm centres 32 mm

- For specifying sustainable use of timber refer to Timber in Context – a guide to sustainable use NATSPEC//Construction Information 1998
- Detailed requirements for timber framing in areas with design gust wind speeds up to 33 m/s are set out in AS 1684 4 *but other codes designed for local conditions* may be acceptable or mandatory For cyclonic areas refer to AS 1684 3
- Design of timber trusses must be to AS 1720 1
- Design of timber framing to AS 1720 1 and of structural steelwork and cold-formed steel framing will normally be by an engineer Wind loads are covered in AS 4055
- Member sizes should be scheduled on the drawings

STEEL FRAME CONSTRUCTION

1 GENERAL

Cross references

Refer to the following worksections

General requirements for steel coatings and durability

Concrete construction for concrete bearer supports

Brick and block construction for clearance for masonry bearer supports

Tile finishes for waterproofing of wet areas

Painting for priming of steel before fixing and repair of zinc coated steel after cutting and welding

Standards

Structural steelwork To AS 4100

Cold formed steel framing To AS 3623

Preparation of metal surfaces To AS 1627

2 MATERIALS

Cold formed steel framing

Cold form sections from metallic-coated steel to AS 1397

Corrosion protection To BCA Volume 2 clause 3 4 2 2

Self drilling screws

Standard To AS 3566 1

Corrosion resistance Class 2 to AS 3566 2 Table 1

Flashings and damp proof courses

Standard To AS/NZS 2904

Galvanizing

Galvanize mild steel components (including fasteners) to AS 1214 or AS/NZS 4680 as appropriate if

Exposed to weather

Embedded in masonry

In contact with chemically treated timber

3 COMPONENTS

Framing members

Cold-formed steel framing Provide a proprietary system designed to AS 3623

Structural steelwork

General Where the structural drawings define performance criteria submit independent design documentation and certification from a professional engineer

Reactions Provide location and magnitude of reactions to be accommodated by the support structure

Floor and wall frame member sizes Submit a schedule of proposed member sizes certified as meeting stated project and AS/NZS 4600 requirements for span spacings and loadings

Shop drawings Submit shop detail drawings certified by a professional engineer stating that the design has been carried out in accordance with stated project and AS/NZS 4600 requirements for the configurations and loadings

Roof trusses Prepare drawings to show

On a plan the truss layout

On elevations the arrangement of members allowing for the accommodation of in-roof services and the size and section type of each member

The method of assembly connection holding down and bracing

Wall frames If wall framing is to be pre-fabricated prepare drawings to show

On plan the wall layout

On elevations the arrangement of members and the size and section type of each member

The method of assembly connection holding down and bracing

4 CONSTRUCTION GENERALLY

Fabrication

Length Cut members accurately to length so that they fit firmly against abutting members

Service holes Form holes by drilling or punching

Bushes Provide plastic bushes or grommets to site cut holes

Swarf Remove swarf and other debris from cold formed steel framing immediately

Site work Do not fabricate on site where welded connections are required

Prefabricated frames

General Protect frames from damage or distortion during storage transport and erection

Metal separation

General Install lagging or timber noggings to separate non ferrous service pipes and accessories from the framing

Fastening

Type Select from the following

Bolting

Self drilling self-tapping screws

Blind rivets

Proprietary clinching system

Structural adhesives

Welding

Standard To AS/NZS 1554 1

Burning Avoid procedures that result in greater than localised burning of the sheets or framing members

Grommets

Provide grommets to isolate piping and wiring from cold formed steel framing

Swarf

Remove swarf and other debris from cold formed steel framing immediately after it is deposited

Unseasoned or CCA treated timber

General Do not fix in contact with framing without fully painting the timber and/or the steel

Earthing

Permanent earthing Required

Temporary earthing Provide temporary earthing during erection until the permanent earthing is installed

- The local authority may have requirements for permanent earthing of the frame
- Refer to AS/NZS 3000 Section 5 for earthing arrangements and earthing conductors

Protection

General Coatings which have been damaged by welding or other causes shall be restored Thoroughly clean affected areas to base metal and coat with zinc rich organic primer to APAS 2916

Before fixing prime steel which is not galvanized or metallic coated

Certification

General For components for which independent design certification has been required provide independent certification for the erected components confirming compliance with the design intent

5 WALL FRAMING

Wall studs

General Provide studs in single lengths without splices Place a stud under or within 40 mm from each structural

load point from roof or ceiling (except for openings)
Provide multiple studs at points of concentrated load

Maximum stud spacing 600 mm

Heads to openings
General Provide lintels appropriate to load and span

Additional support
General Provide additional support in the form of noggings trimmers and studs for support and fixing of lining cladding hardware accessories fixtures and fittings

Vermin barriers for suspended floors
Masonry veneer barrier Secure 10 mm galvanized wire mesh to the underside of the bottom plate of external stud walls extending across the cavity for building into brickwork

Damp proof courses
Clad frame walls Provide damp proof courses under the bottom plate of external clad-frame walls built off slabs or masonry dwarf walls

Flashings
Provide flashings to external openings sufficient to prevent the entry of moisture

6 TRUSSES

Fabrication
Assembly *Factory assemble trusses*

Supports for in roof services
Where a water container or heater is located in the roof space provide a support platform to AS/NZS 3500 4 clause 5 5

Marking
General *Permanently mark each truss to show*

- Project identification
- Manufacturer
- Tag or number
- Location
- Support points

Installation
General Fix to support structures plumb to within H/200 where H is the height at the apex

7 FLOOR FRAMING

General
Protection If floor framing is for ground floor construction ensure that it is protected from moisture

Construction loads If construction loading exceeds design loading provide additional support so as to avoid overstressing of members

8 FLOORS

General
Standard To AS 1684 4

Strip flooring
Weather Do not fix strip flooring until the work is weathertight

Acclimatise Acclimatise the flooring by stacking it inside with air circulation to all surfaces for two weeks prior to fixing

Particleboard flooring
Standards To AS/NZS 1860 1 and install to AS 1860

Junctions Sand junctions lightly to a smooth level surface

Fibre cement flooring
Compressed sheets To AS/NZS 2908 2 Type A Category 5

Plywood flooring
Standard To AS/NZS 2269 bond type A tongue and grooved

9 COMPLETION

Cleaning
On completion of framing remove debris from any gaps between members

BRICK AND BLOCK CONSTRUCTION

1 GENERAL

Cross references

Refer to the following sections

General requirements for termite management

Timber and steel construction for structural steelwork

Standard

Masonry generally To AS 3700

Masonry units to AS/NZS 4455

2 MATERIALS AND COMPONENTS

Steel components

Galvanizing Galvanize mild steel components (including fasteners) to AS 1214 or AS/NZS 4680 as appropriate

Durability requirements To AS/NZS 2699 2

Masonry durability

Requirement Conform to AS 3700 Table 5 1

Wall ties

Standard To AS/NZS 2699 1

Non seismic areas Type A

Seismic areas Type B

Flashings and damp proof courses

Standard To AS/NZS 2904

Mortar materials

Sand Fine aggregate with a low clay content and free from efflorescing salts selected for grading and colour for facework

Mortar mix table (cement, lime sand ratios)

Provide mortar mixes as follows

Mortar class to AS 3700	Bricks or blocks			Water thickener
	Clay	Concrete	Calcium silicate	
Masonry cement				
M3	1 0 4	1 0 4	n/a	No
Portland cement				
M3	1 1 6	1 1 6	n/a	Optional
	1 0 5	1 0 5	1 0 5	Yes

3 CONSTRUCTION GENERALLY

Joints and cutting

Set out masonry with joints of uniform width and the minimum cutting of masonry units

Joints

Externally Tool to give a dense water-shedding finish

Internally Rake to give a key if wall is to be plastered

Rod

76 mm high bricks 7 courses to 600 mm

90 mm high bricks 6 courses to 600 mm

190 mm high blocks 3 courses to 600 mm

Bond

Single leaf construction Stretcher bond

Perpends

Keep perpends in alternate courses vertically aligned and fill them completely with mortar

Colour mixing

In facework distribute the colour range of units evenly to prevent colour concentrations

Sills and thresholds

Solidly bed masonry sills and thresholds and lay them so that the top surfaces drain away from the building

Appearance

Leave facework clear of mortar smears stains and discolouration Do not clean using an acid solution and do not erode joints if using pressure spraying

Chimneys and fireplaces

Follow the guidelines given in SAA HB33

4 BEARER SUPPORTS

Bearer piers table

Provide engaged or free standing unreinforced masonry piers as follows to support bearers at 1800 mm maximum centres

Type	Minimum size (mm)
Engaged	230 x 110 bonded or tied to walls
Freestanding up to 1500 mm high	230 x 230
Freestanding 1500 to 2700 mm high	350 x 350

Access openings

In internal walls below suspended ground floors leave door width openings beneath doorways to give access to underfloor areas

Air vents

General Provide air vents to give adequate cross ventilation to the space under suspended ground floors In cavity walls provide an equal number of matching vents in the internal leaves located as near as practicable to the air vents in the external leaves

Minimum provision 6000 mm^2 net ventilation area per linear metre of wall

5 DAMP-PROOF COURSES

Location

Provide damp proof courses in the following locations

Walls adjoining infill floor slabs on membranes In the course above the underside of the slab in internal walls and inner leaves of cavity walls Project 40 mm and dress down over the membrane turned up against the wall

Cavity walls built off slabs on ground In the bottom course of the outer leaf continuous horizontally across the cavity and up the inner face bedded in mortar turned 30 mm into the inner leaf one course above or in masonry veneer construction fastened to the inner frame 75 mm above floor level

At timber floors In the first course below the level of the underside of ground floor timbers in internal walls and inner leaves of cavity walls

Installation

Lay in long lengths Lap the full width of angles and intersections and 150 mm at joints Step as necessary but not more than two courses per step Preserve continuity of damp proofing at junctions of damp-proof courses and waterproof membranes Install at least 150 mm above adjacent finished ground Sandwich damp-proof courses between mortar

6 CAVITY MASONRY WALLS

Minimum cavity width

Masonry walls 50 mm ±10 mm

Masonry veneer walls 25 mm between the masonry leaf and the load-bearing frame and 40 mm between the masonry leaf and sheet bracing insulation or any other element in the cavity

Openings
Do not close the cavity at the jambs of external openings

Cavity flashings
Location Provide flashings in the following locations

- Floors Full width of outer leaf immediately above slab continuous across cavity and up the inner face bedded in mortar turned 30 mm into the inner leaf two courses above

  Under sills 30 mm into the outer leaf bed joint one course below the sill extending up across the cavity and under the sill in the inner leaf or the frame Extend at least 150 mm beyond the reveals on each side of the opening

  Over lintels to openings Full width of outer leaf immediately above the lintel continuous across cavity 30 mm into the inner leaf two courses above or turned up against the frame and fastened to it Extend at least 150 mm beyond the ends of the lintels

  At abutments with structural frames or supports Vertical flashing in the cavity from 150 mm wide material wedged and grouted into a groove in the frame opposite the cavity

  At roof abutments with cavity walls Cavity flashing immediately above the roof and over flash the roof apron flashing

Installation Sandwich flashings between mortar except where on lintels

Pointing Point up joints around flashings to fill voids

Weepholes
General At ground floors provide weepholes in the form of open perpends to external leaves of cavity walls in the course above cavity flashings

Maximum spacing Every third perpend

Clearance for timber frame shrinkage
In seasoned timber frame brick veneer construction leave the following clearances between window frames and brick sill and between roof frames and the brick veneer

Single storey frames and ground floor windows (not for slab on ground) 10 mm

Two storey frames and upper floor windows 20 mm

Additional clearance Accommodate additional shrinkage of unseasoned floor timbers

7 WALL TIES

Wall tie application
Classification To AS/NZS 2699 1

Type To BCA Volume 2 clause 3 3 3 2

Spacing To BCA Volume 2 Figure 3 3 3 1

Corrosion protection To BCA Volume 2 Table 3 3 3 1

8 AUTOCLAVED AERATED CONCRETE WALLS

General
Provide a proprietary system which is as follows

Has a current Australian Building Products and Systems Certification Scheme certificate

Has a current appraisal report issued by the CSIRO Building Products and Systems Appraisals stating that the system is suitable for use in walls in buildings

9 CONTROL OF MOVEMENT

Ageing of bricks and concrete
Minimum age of clay bricks 7 days

Minimum age of concrete supports to clay bricks 28 days

Control joints for clay brickwork
Maximum length of continuous wall 12 m

Minimum width of control joint 15 mm

Control joints for calcium silicate and concrete masonry
Maximum length of continuous wall 8 m

Minimum width of control joint 10 mm

Flexible ties and anchors
If ties or anchors extend across control joints provide ties or anchors which maintain the stability of the masonry without impairing the effectiveness of the joint

Joint material
Installation Clean the joints thoroughly and insert an easily compressible backing material before sealing

Sealant depth Fill the joints with a gun applied flexible sealant for a depth of at least two thirds the joint width

10 STEEL LINTELS

Cold formed lintels
General Proprietary cold formed flat based type designed to AS/NZS 4600

Material Mild steel galvanized to AS/NZS 4680 Do not cut after galvanizing

Corrosion protection To AS/NZS 2699 3

Steel flats and angles
Sizes To BCA Volume 2 Figure 3 3 3 5

Material Mild steel galvanized to AS/NZS 4680 Do not cut after galvanizing

Corrosion protection To AS/NZS 2699 3

Installation
General Install with the longest leg vertical Keep lintels 5 mm clear of heads and frames Pack mortar between the angle upstand and supported masonry units

Propping To prevent deflection or excessive rotation temporarily prop proprietary cold formed lintels until the masonry reaches its required strength

Minimum propping period 3 days

11 BAGGING

Joints
Cut joints flush before bagging

Dry bagging
Apply laying mortar to the surface using a hessian bag or similar to a consistent thickness Flush up irregularities but leave the minimum possible amount of mortar on the masonry surface

- SAA HB33 is a detailed guide to the construction of chimneys and fireplaces Normally these should be shown in detail on the drawings
- Problems are being experienced with salt attack on brickwork below damp proof course level on sites which had once been heavily fertilised Exposure class bricks are normally readily available
- Admixtures in the form of proprietary air entraining agents should not be used as a substitute for lime because bond strength and durability can suffer particularly when excessive quantities are used
- Mortar joints are normally tooled weatherstruck or raked Mortar joints which are not completely filled and tooled may not provide adequate weatherproofing A flush joint which is cut with the trowel without compacting the mortar should not be used externally unless agreed between the builder and the owner
- The area for ventilation of 6000 mm^2 per linear metre of wall is based on the acceptable construction practice in BCA Volume 2 Table 3 4 1 2
- Walls retaining soil over 750 mm high should be designed by a consulting structural engineer
- Traditionally weepholes have been specified above and below windows and doors but these serve no useful purpose except where there are very large openings or extreme exposures
- Spacing of wall ties is often found on site to be inadequate – the values given here are a simplification of those in AS 3700
- Clay bricks grow after they have been fired and concrete slabs shrink after they have been poured The provision for movement joints specified here is based on a minimum age of bricks and supporting concrete If these ages cannot be complied with additional control joints may be necessary
- Energy efficiency requirements at BCA Volume 2 clause 2 6 Set out minimum insulation performance requirements for walls roofs floor slabs and external glazing depending on climate zone and orientation

INSULATION AND SARKING

1 GENERAL

Interpretation

Sarking type material Flexible membrane material normally used for waterproofing vapour retarding or thermal reflective insulation

2 MATERIALS AND COMPONENTS

Bulk insulation

Cellulosic fibre (loose fill) To AS/NZS 4859 1 Section 5

Mineral wool blankets and cut pieces To AS/NZS 4859 1 Section 8

Polystyrene (extruded rigid cellular sheets) To AS 1366 4

Polystyrene (moulded rigid cellular sheets) To AS 1366 3

Reflective insulation To AS/NZS 4859 1 Section 9

Wool To AS/NZS 4859 1 Section 6

Sarking material

Standard To AS/NZS 4200 1

Floor insulation Provide perforated material

3 INSTALLATION

Bulk insulation

Standard To AS 3999

Batts Fit tightly between framing members If support is not otherwise provided secure nylon twine to the framing and stretch tight

Loose fill Provide boxing to retain loose fill on external edges cavities and penetrations and to prevent spilling

Sarking material

Standard To AS/NZS 4200 2

Wall sarking

General Provide vapour permeable sarking under cladding which does not provide a permanent weatherproof seal including the following

Boards fixed vertically or diagonally

Boards or planks fixed in exposed locations where wind-driven rain can penetrate the joints

Unpainted or unsealed cladding

Installation Apply to the outer face of external stud walls from the top plate down over the bottom plate and flashing Run across the studs and lap at least 150 mm at joints

Roof sarking

Location Provide sarking under tile and shingle roofs

Anti ponding boards Provide 4 5 mm fibre cement anti ponding boards to eaves of tile roofs below 20° pitch

Ridge ventilation Finish sarking at least 50 mm clear of ridges

ROOFING

1 GENERAL

Cross reference

Refer to the *Insulation and sarking* section for roof sarking requirements

2 MATERIALS AND COMPONENTS

Flashing material

Standard To AS/NZS 2904

Tiled roofs 20 kg/m^2 lead

Fasteners

Self-drilling screws To AS 3566 1

Corrosion resistance Class 3 to AS 3566 2 Table 1

Exposed fasteners Provide fasteners which are prefinished with a coating to match the roofing material

3 ROOF TILING

Materials

Standard To AS 2049

Installation

Standard To AS 2050

Setting out Set out the roof to give an even tile gauge in each course with full tiles at verges

Bedding and pointing Bed and point accessories including ridges hips and verges in coloured mortar to match the accessories

Pointed verge Bed and point tiles on 100 x 5 mm fibre cement pointing strip

4 METAL SHEET ROOFING

Design and installation

Standard To AS 1562 1

Visible accessories

Provide material with the same finish as roofing sheets

Eaves

Treat ends of sheets as follows

- Generally Close off ribs at tops and bottoms of sheets by mechanical means or with purpose-made fillers or end caps

  At gutters Project sheets 50 mm into gutters

Swarf

Remove swarf and other debris as soon as it is deposited

5 PLASTIC SHEET ROOFING

Materials

Unplasticised polyvinyl chloride (uPVC) sheet used for roofing or cladding To AS/NZS 4256 2

Glass fibre reinforced polyester (GRP) sheet To AS/NZS 4256 3

Polycarbonate To AS/NZS 4256 5

Installation

Standard To AS/NZS 1562 3

6 ROOF PLUMBING

Selection and installation of rainwater goods

Standard To AS/NZS 3500 3

Sealing Seal fasteners and mechanically fastened joints with silicone sealant

Flashings and cappings

General Flash projections above or through the roof with two part flashings consisting of an apron flashing and an over flashing with at least 100 mm vertical overlap Provide for independent movement between the roof and the projection

Wall abutments Where a roof abuts a wall provide overflashings as follows

Masonry Stepped and built into the full width of the leaf

- Planked cladding Stepped

Other Raking

Gutters

Minimum slope of eaves gutters 1 200

Minimum width overall of valley gutters 400 mm

- See BCA Volume 2 clause 3 12 1 3 for thermal performance requirements of roof lights serving a habitable room

CLADDING

1 GENERAL

Cross references

Refer to the following sections

General requirements for timber durability

Insulation and sarking for wall sarking requirements

2 MATERIALS AND COMPONENTS

Flashing material

Standard To AS/NZS 2904

Fasteners

Steel nails Hot-dip galvanized to AS/NZS 4680

Self drilling screws To AS 3566 1

Corrosion resistance Class 3 to AS 3566 2 Table 1

3 HARDBOARD CLADDING

General

Standard To AS/NZS 1859 4

Exterior cladding Exterior hardboard

Sheltered exterior cladding Tempered hardboard

Plank cladding

General Provide a proprietary system of hardboard planks 9 5 mm thick

Joints and edges uPVC extrusions

External corners Preformed metal joining pieces

Internal corners Scribe

4 TIMBER BOARD CLADDING

Preparation

For cladding with a natural or stained finish finish the boards on both sides before installation by dipping or brushing with water repellent preservative Do not apply preservative if this is incompatible with a specified pigmented stain finish

Installation

General Whenever possible provide single lengths of boards when installed horizontally Provide single lengths when installed vertically

Fixing Nail twice to each crossing except for sawn weatherboard and secret nailed profiles

Nailheads Treat visible nailheads as follows

In stained or clear finishes Drive flush

In opaque finishes Punch below the surface and fill flush with putty after the surface has been primed

Joints

End grain joints Install boards so that butt joints are in compression

Internal and external corners Butt against a timber bead at least as thick as the cladding board

5 FIBRE CEMENT CLADDING

Standard

General To AS/NZS 2908 2 Type A Category 3

Plank cladding

Type Provide a proprietary system of single faced fibre cement planks 7 5 mm thick

Joints and edges uPVC extrusions

Corners Preformed metal joining pieces

Sheet cladding

Type Provide single faced fibre cement sheets 6 mm thick

Joints corners and edges uPVC extrusions

Eaves lining

Type Provide a proprietary system of single faced fibre cement sheets 4 5 mm thick nailed at minimum 200 mm centres to bearers at maximum 600 mm centres

Minimum bearer size For rafter overhang

300 – 600 mm 50 x 38 mm

600 – 1500 mm 75 x 38 mm

Joints uPVC extrusions

6 METAL CLADDING

Design and installation

Standard To AS 1562 1

Visible accessories

Provide materials with the same finish as cladding sheets

7 PLASTIC CLADDING

Standard

Unplasticised polyvinyl chloride (uPVC) sheet To AS/NZS 4256 4

Glass fibre reinforced polyester (GRP) sheet To AS/NZS 4256 3

Polycarbonate To AS/NZS 4256 5

Installation

Standard To AS/NZS 1562 3

8 PLYWOOD CLADDING

Durability

Treatment Hazard class H3 to AS 1604

Preparation

Seal all cut edges and place uppermost Prime or pre coat bottom edges

Installation

Layout Starting at a corner lay sheets to place laps facing away from prevailing weather

Movement

Allow minimum 2 mm gaps between sheets If square edges apply elastomeric sealant

Allow 5 mm gap between the bottom of sheets and flashings and profile flashings to avoid moisture traps

Fixings for 12 mm thick plywood

Nails in timber frames 40 x 2 5 mm

Screws in timber frames No 8 x 40 mm

Screws in 1 5 mm steel frames 10 gauge – 16 thread pitch x 45 mm

Screws in 2 8 mm steel 10 gauge – 16 thread pitch x 45 mm

Fixings materials

LOSP treated cladding Hot dipped galvanized steel

CCA treated cladding Stainless steel grade 316 or silicon bronze

9 MOISTURE PROTECTION

Damp proof course

General Provide damp proof courses under the bottom plate of stud walls built off slabs or masonry dwarf walls as follows

External walls (not brick veneer) Turn up at least 75 mm on the inside and tack Project 10 mm beyond the external slab edge or dwarf wall and turn down at 45°

Walls of bathrooms shower rooms and laundries Turn up at least 150 mm on the wet side and tack to studs

Installations Lay in long lengths Lap full width at angles and intersections and at least 150 mm at joints

Junctions Preserve continuity of damp proofing at junctions of damp-proof courses sarkings and waterproof membranes

Flashings
Location Provide flashings to external openings sufficient to prevent the entry of moisture Form trays at the ends of sill flashings

10 AAC CLADDING

Panel cladding
Type Provide a proprietary system of AAC panels

Joints Thin bed adhesive

Control joints At all external and internal corners adjacent to all openings and at maximum 6 m centres

DOORS AND WINDOWS

1 GENERAL

Cross references
Refer to the following sections

Lining for architraves

Painting for priming of frames and doors before installation

2 MATERIALS AND COMPONENTS

Flashings
Standard To AS/NZS 2904

Metal finishes
Zinc plating To AS 1789 at least service condition number 2

Anodising To AS 1231 at least class AA10

Thermoset powder coating To AS 3715

Glass
Selection and installation To AS 1288

Doors
Timber doors To AS 2688

Doorset An assembly comprising a door or doors and supporting frame guides and tracks including the hardware and accessories necessary for satisfactory operation

Timber frames and jamb linings To AS 2689

Security screen doors To AS 5039

Windows
Selection To AS 2047

Security window grilles To AS 5039

Preglazing
If possible preglaze doors and windows

Frameless glass partitions and doors
Glass To the following standards

Materials and installation To AS 1288

Quality requirements for cut to size and processed glass To AS/NZS 4667

Fixing Recessed aluminium channels top and bottom to AS 1288 built into the building fabric

Door hardware Proprietary items with matching patch fittings

Glass balustrades
Glass Grade A safety glass to AS 1288

Frame Proprietary system to BCA Volume 2 clause 3 9 2

3 CONSTRUCTION GENERALLY

Standards
Doorset installation To AS 1909

Window installation To AS 2047

Security screen doors and window grilles installation To AS 5040

Flashings and weatherings
Install flashings weather bars drips storm moulds caulking and pointing so that water is prevented from penetrating the building between frames and the building structure

Fixing
Packing Pack behind fixing points with durable full width packing

Prepared masonry openings If fixing of timber windows to prepared anchorages is by fastening from the frame face conceal the fasteners by sinking the heads below the surface and filling the sinking flush with a material compatible with the surface finish

Linings
Provide reveal and jamb linings as necessary

Window coverings
General Do not provide materials which when subject to fire conditions will emit excessive smoke or dangerous fumes

Fabrics
Uncoated woven and knitted fabrics To AS 2663 1

Coated woven and knitted fabrics To AS 2663 2

Performance classification (minimum) 2

4 TIMBER DOORS

Door thickness
Generally 35 mm

External doors and doors over 900 mm wide 40 mm

Door construction
Flush doors To be of balanced construction to AS 2688

Medium density fibreboard doors Board designated by the manufacturer as having a moisture resistance which is suitable for the exposure of the door

Priming
Prime timber doors on top and bottom edges before installation

Door stops
Install door stops to prevent door furniture striking the wall or other surface

Hinge table
Provide 3 hinges for external doors and door leafs over 2040 mm in height or 820 mm in width and as follows

Thickness of door (maximum)	Weight of door (maximum)	Number of hinges (per door leaf)	Size of hinges (steel)
35 mm	35 kg	2	85 x 60 1 6 mm
40 mm	68 kg	3	100 x 75 1 6 mm

5 SLIDING INTERNAL DOORS

Accessories
General Provide overhead track supports and head and jamb linings appropriate to the arrangement of the door and removable pelmets at the head to allow access to the wheel carriages for adjustment

Wheel carriages Fully adjustable precision ball race type providing smooth quiet operation

6 GARAGE DOORS

General
Standard To AS/NZS 4505

7 LOCKSETS

External doors
Provide a push button key and knob set and a double cylinder dead bolt to each door

Internal doors
Generally Passage sets

Bathrooms showers and toilets Privacy sets

Sliding patio doors and windows Provide key-lockable surface mounted bolts

Door lockset mounting heights
To centreline of spindle 1000 mm above finished floor

Keying
Key doors (excluding garage doors) alike and key windows alike

- Locksets have been specified to provide both convenience and a reasonable standard of security Privacy sets are important because they allow emergency access in the case of accident or illness
- See BCA Volume 2 clause 3 12 3 for sealing of windows and doors Clause 3 12 2 sets out thermal performance of external glazing

LINING

1 GENERAL

Cross reference

Refer to the *Block and tile finishes* section for *waterproofing of wet areas*

2 MATERIALS AND COMPONENTS

Plasterboard

Standard To AS/NZS 2588

Fibre cement

Standard To AS/NZS 2908 2 Type B Category 2

Fibrous plaster products

Standard To AS 2185

3 SHEET LINING

Supports

Install timber battens or proprietary cold formed galvanized steel furring channels as follows

If framing member spacing exceeds the recommended spacing

If direct fixing of the sheeting is not possible due to the arrangement or alignment of the framing or substrate

To support fixtures

Installation

Plasterboard To AS/NZS 2589 1 Level 4 finish

Wet areas Do not use adhesive

Joints

General Provide recessed edge sheets and finish flush with perforated reinforcing tape

External corner joints Make over zinc-coated steel corner beads

Wet areas Provide the flashings trim and sealants necessary to ensure wet areas are waterproofed

Joints in tiled areas Do not apply a topping coat after bedding perforated paper tape in bedding compound

Control joints Install purpose made zinc-coated control joint beads to coincide with structural movement joints

4 TONGUE AND GROOVE LINING

Installation

Stained or clear finished boards Select board to give a random pattern At corners return the same board to give a continuous grain pattern

Fixing Nail twice to each crossing except for secret nailed profiles

Nailheads Treat visible nailheads as follows

In stained or clear finishes Drive flush

In opaque finishes Punch below surface and fill flush with putty after the surface has been primed

Joints

End grain joints Install boards so that butt joints are in compression

5 TRIM

General

Provide timber or medium density fibreboard trim such as beads skirtings architraves mouldings and stops where necessary to make neat junctions between components and finishes

PLASTERING AND FLOOR TOPPING

1 GENERAL

Cross references

Refer to the following sections

Block and tile finishes for waterproofing of wet areas

Painting for priming of embedded steel

2 MATERIALS AND COMPONENTS

Plaster materials

Cement To AS 3972 type GP

Lime To AS 1672 1

Sand Fine aggregate with a low clay content selected for grading

Gypsum plaster To AS 2592

Metal lath Expanded metal to AS 1397

Lime putty mixes

Make a coarse mix of lime putty and sand 16 hours before use and do not allow to dry out

Gauged mixes

To improve workability mixes required to contain only cement and sand may be gauged by the addition of lime up to 25% of the cement content (i e not as a substitute for the cement)

Autoclaved aerated concrete walls

Provide a proprietary render or premixed plaster recommended by the wall system manufacturer

3 SUBSTRATE

Correction of substrate

Before plastering make good defects in the substrate *Hack off excessive projections Fill voids and hollows with* a mix not stronger than the substrate nor weaker than the first coat

Untrue substrate

If one coat application is required but the substrate is not sufficiently true to comply with the thickness limits for one coat or has excessively uneven suction resulting from variations in the composition of the substrate apply 2 coats

Cleaning

Remove loose material and leave the surface clean and dust-free

Embedded items

Sheath water pipes and other embedded items to permit thermal movement If ungalvanized steel items are to be embedded in plaster prime before fixing

Chases

If chases or recesses are more than 50 mm wide cover with metal lath extending at least 75 mm beyond each side of the recess

Metal backgrounds

Fix metal lath to provide a key for plaster

Concrete

Apply a proprietary bonding agent before plastering

4 PLASTERING

Thickness limits

One-coat work 12 – 15 mm

Multi coat work

First coat 9 – 15 mm

Floating coat (if any) 9 – 15 mm

Finishing coat (except setting coat) 6 – 9 mm

Setting coat 2 – 3 mm

Cement rendering
Proportions by volume (cement lime sand) for clay and dense concrete brick

Clay and dense concrete brick 1 0 25 4

Two or three coat set plaster
Proportions by volume

- Undercoats 1 1 6 cement lime putty sand

Setting coat 1 1 lime putty gypsum plaster

Tolerances
Finish plane surfaces within a tolerance of 6 mm in 3000 mm determined using a 3000 mm straight edge placed anywhere in any direction Finish corners angles edges and curved surfaces within equivalent tolerances

Curing
Do not allow rapid or uneven drying out

V joints
Provide V joints at the following locations

Junctions between different substrate materials

Abutments with other finishes

Joints in the structure

Edge trim
Provide purpose made zinc coated steel sections as corner beads and stop beads

5 CEMENT BASED FLOOR TOPPINGS

Preparing hardened surfaces
If toppings are to be applied to hardened concrete surfaces scabble the surface to expose the aggregate Thoroughly dampen and leave free of standing water Immediately before placing scrub a coat of neat cement grout into the surface or apply a suitable adhesive

Placing
General Spread the topping mix compact and float

Thickness 20 ± 5 mm

Monolithic placing Spread the topping mix as soon as surface water has disappeared from the base

Curing
Use a method which prevents cracking or crazing resulting from drying shrinkage without impairing the adhesion of subsequent finishes

Granolithic topping
Mix proportions 1 1 1 5 (cement fine aggregate 5 mm coarse aggregate)

Water cement ratio 0 5 maximum

Slump 50 mm maximum

Margins to toppings
Integral margins Form margins to cementitious toppings integrally in the topping material

Coved skirtings Form the cove in topping material and finish the top to a neatly struck line Mitre internal and external angles

TILE FINISHES

1 GENERAL

Standards
Follow the guidance given in AS 3958 1 and AS 3958 2

2 MATERIALS AND COMPONENTS

Exposed edges
If available provide purpose made ceramic border tiles with the exposed edge (whether round square or cushion) glazed to match the tile face

Accessories
If available provide tile accessories such as round edge ceramic tiles cove tiles step treads and nosings to stairs landings and thresholds skirtings sills copings and bath vents which match the surrounding tiles composition colour and finish

Adhesives
Standard To AS 2358

PVA (polyvinyl acetate)-based adhesives Do not use in wet areas or externally

Mortar materials
Cement To AS 3972 type GP

Sand Fine aggregate with a low clay content selected for grading

Bedding mortar
Proportioning Select proportions from the range 1 3 to 1 4 cement sand to obtain satisfactory adhesion Provide minimum water

Grout
Cement-based proprietary grout Mix with water Fine sand may be added as a filler in wider joints

Preparation
Prepare the substrates including the following

Remove deleterious and loose material and leave the surface dust-free and clean

For mortar bedding wet the substrate as necessary to achieve suitable suction Alternatively apply a proprietary bonding agent to the substrate to improve adhesion

3 WATERPROOFING WET AREAS

Standard
General To AS 3740

Membrane
Provide a proprietary liquid applied or sheet membrane system as follows

Has a current Australian Building Products and Systems Certification Scheme certificate

- Has a current appraisal report issued by the CSIRO Building Products and Systems Appraisals stating that the system is suitable for use as a waterproofing system for use in wet areas shower recess bases and associated floors and wall/floor junctions which are to be tiled

Installation
Floor wastes Turn membrane down onto the floor waste puddle flanges and adhere

Hobs Extend membrane over the hob and into the room at least 50 mm For hobless showers extend 1800 mm into the room

External tiling Provide a waterproof membrane under external floor tiling to balconies and over habitable rooms which forms a drained tank suitable for continuous immersion Do not run under bounding walls

Curing Allow membrane to cure fully before tiling

4 TILING

Cutting and laying

Cut tiles neatly to fit around fixtures and fittings and at margins where necessary Drill holes without damaging tile faces Rub edges smooth without chipping Return tiles into sills reveals and openings Butt up to returns frames fittings and other finishes

Variations

Distribute variations in hue colour or pattern uniformly by mixing tiles or tile batches before laying

Protection

Keep traffic off floors until the bedding has set and attained its working strength

Setting out

General Set out tiles to give uniform joint widths within the following limits

Internal ceramic tiling 1 5 – 3 mm

Mosaic tiling As dictated by pattern

- Quarry tiles 6 – 12 mm

Vitrified floor tiles 3 – 5 mm

Stone tiles 1 5 – 3 mm

Joint alignment Set out tiling with joints accurately aligned in both directions and wall tiling joints level and plumb

Joint position Set out tiles from the centre of the floor or wall to be tiled and if possible ensure cut tiles are a half tile or larger

Fixtures If possible position tiles so that holes for fixtures and other penetrations occur at the intersection of horizontal and vertical joints or in the centre of tiles

Falls and levels

General Grade floor tiling to even and correct falls generally and to floor wastes and elsewhere as required Make level junctions with walls If falls are not required lay level

Minimum fall generally 1 100

Minimum fall in shower areas 1 60

Change of finish Maintain finished floor level across changes of floor finish including carpet

Preparation of tiles

Adhesive bedding Fix tiles dry

Mortar bedding Soak porous tiles in water for half an hour and then drain until the surface water has disappeared

Floor finish dividers

Finish tiled floors at junctions with differing floor finishes with a corrosion resistant metal dividing strip fixed to the substrate If changes of floor finish occur at doorways make the junction directly below the closed door

Bath ventilation

Ventilate the space below fully enclosed baths with at least 2 *vermin proofed ventilating tiles*

Sealed joints

Fill joints with silicone sealant and finish flush with the tile surface where tiling joins sanitary fixtures and at corners of walls in showers

FLOOR COATINGS AND COVERINGS

1 GENERAL

Cross reference

Refer to the following sections

General requirements for timber moisture content

Painting for finishing of sanded timber floors and cork tiles

2 MATERIALS AND COMPONENTS

Hardboard underlay

Standard To AS/NZS 1859 4 standard hardboard Type RD manufactured as flooring underlay

Soft underlay alternatives

Needled underfelt Provide a felt composed of 60% animal fibre and 40% jute reinforced with polypropylene scrim with a minimum mass of 50 g/m^2 or hessian fabric with a minimum mass of 150 g/m^2

Synthetic foam underlay Provide a high density synthetic latex flat cushion foam sandwiched between reinforced carrier fabric

Rubber underlay Provide a heavy duty natural rubber waffle pattern with a backing of reinforcing fabric either hessian spun nylon or polyester

Hot melt adhesive tape

Provide a glass fibre and cotton thermoplastic adhesive coated tape 60 mm wide on a 90 mm wide metal foil base and backed with silicon coated release paper

Carpet

Minimum class Domestic Medium Duty under the Australian Carpet Classification Scheme

Flooring panels

General To be a proprietary flooring system nominated in Part B Selection schedule

Grade Hardwood to AS 2796 1 parquet clear

Floating floor underlay

General To be a proprietary closed cell foam sheeting that is integral to the flooring system

Parquet acoustic underlay

General Closed cell foam sheeting perforated to receive adhesive beads

Parquet adhesive

Generally Provide adhesives as follows

Compatible with the materials and surfaces to be adhered

Alkali resisting

Solvent and water content ≤ 40%

Shear strength when cured (average) ≥ 1 47 MPa

Elasticity Sufficient to withstand continuous expansion and contraction of boards

Will not break down under services

Ventilation Provide adequate ventilation appropriate for moisture curing

3 SUBSTRATE

Substrate preparation

Prepare the substrate including the following

- Stripping and cleaning Remove deleterious and loose material including existing floor coverings and any surface treatment which could adversely affect adhesion

Repairs Make good to the surface finish as necessary Fill depressions with a suitable filler and remove high spots and projections If necessary lay a steel trowelled underlay to concrete substrate

- Fixtures and fittings Remove door stops and other fixtures and refix in position undamaged on completion of the installation

Basic sanding Produce an even plane sanded surface on strip flooring to be covered with carpet or resilient sheet or tile Lightly sand the junctions of sheet flooring

Fine sanding If flooring is to be clear finished stop with matching filler and produce a smooth sanded surface free from irregularities and suitable to receive the finish

Moisture content

General Do not commence installation of flooring unless

Concrete substrate The moisture content of the concrete has been tested to AS/NZS 2455 1 Appendix B and values obtained as follows

≤ 5 5% when tested by the electrical resistance test

≤ 70% when tested by the hygrometer test

4 LAYING CARPET

Standard

General To AS/NZS 2455 1

Setting out

General Lay the carpet in continuous lengths without cross joins in the body of the area Make unavoidable cross joins at doorways under the closed door

Joints in underlay Ensure joints in underlay do not coincide with carpet joints Do not carry underlay over carpet grippers or edge strips

Seaming methods

Woven carpet Machine or hand sew

Tufted carpet Provide hot melt adhesive tapes

Fixing

Gripper strip Provide preformed gripper strip and tackless edge strip Space fixings at 150 mm maximum centres

Stairs Permanent stick method Immediately after laying and again one hour later roll the carpet from the centre diagonally towards each edge using a 65 kg multi-wheeled roller Do not roll foam backed carpet

Edge strip

Provide a proprietary edge strip at exposed edges of the carpet If edge strips occur at doorways make the junction underneath the closed door

5 LAYING RESILIENT FINISHES

Sheet set out

Set out sheets to give the minimum number of joints Run sheet joints parallel with the long sides of floor areas

Tile set out

Set out tiles from the centre of the area Match edges and align patterns Arrange the material so that variation in appearance is minimised

Joints

Butt edges together to form tight neat joints showing no visible open seam and cold weld

Junctions

Scribe neatly up to returns edges fixtures and fittings Finish flush with adjoining surfaces

Cleaning and protection

Keep traffic off floors until bonding has set or for 24 hours after laying whichever period is the longer Do not allow water in contact with the finish for 7 days

6 LAYING TIMBER FLOOR COVERINGS

Trial set out

General Prepare a trial panel set out to each area as follows to

Maximise the size of equal margins of cut panels

Locate movement joints

Movement control joints

General Provide joints

Against vertical building elements 12 mm wide cork filled

To divide floors into maximum dimensions of 6 m 4 mm wide silicone sealant filled

Parquet flooring

General Apply adhesive as follows

Evenly with a trowel toothed to the dimensions nominated by the adhesive manufacturer

With combing grooves at right angles to the general direction of the parquet pattern or at 45° to basket weave pattern

Contact between parquet and adhesive 75% Verify by lifting and examining 1 panel or block in 20

Spread as much adhesive as can be covered in 20 minutes

Dip individual parquet blocks to back face only

Lay parquet as follows

Position on to the adhesive and press without sliding

Clamp starting and finishing rows to prevent sideways movement

Ensure adhesive does not bleed through at joints

Remove excess adhesive progressively

Hold down in contact with the adhesive overnight

- If pins or nails are used as well as adhesive for parquet blocks punch below the surface without bruising Fill holes to match the blocks

Floating floor system

General Roll out underlay remove wrinkles and lay panels dry as determined in the trial set out

Timber strip flooring is covered in the *Timber frame construction* and *Steel frame construction* worksections

PAINTING

1 GENERAL

Standards

Follow the guidance given in AS/NZS 2311 and AS/NZS 2312

2 MATERIALS AND COMPONENTS

Combinations

Do not combine paints from different manufacturers in a paint system

Delivery

Deliver paints to the site in the manufacturers labelled containers Ensure containers are marked with the APAS (Australian Paint Approvals Scheme) specification number

Autoclaved aerated concrete walls

Do not apply oil based paints

3 PAINTING

Order of work

Complete clear timber finishes before commencing opaque paint finishes in the same area

Protection

Remove door furniture switch plates light fittings and other fixtures before starting to paint and refix in position on completion of painting

Restoration

Clean off marks paint spots and stains progressively Touch up damaged decorative paintwork or misses with the paint batch used in the original application

Substrate preparation

Provide a filler tinted to match the substrate if the finish is transparent

Paint application

Apply the first coat immediately after substrate preparation and before contamination of the substrate can occur Ensure each coat of paint or clear finish is uniform in colour gloss thickness and texture and free of runs sags blisters or other discontinuities

Priming before fixing

Timber Apply a first coat (two coats to end grain) to exposed roof trim timber doors and window frames tops and bottoms of doors associated trims and glazing beads before fixing in position

Steel Apply a priming coat of zinc rich organic binder to APAS-2916

Repair of galvanizing

If galvanized or zinc coated surfaces have been cut or welded after galvanizing prime the affected area with a zinc rich organic binder to APAS 2916

Finishing timber and cork floors

After sanding finish with 3 coats of clear floor sealer to APAS-0205

Paint system description

If a system is referred to only by its final coat (for example by the manufacturer's brand name the APAS specification code or the generic name) provide stains primers sealers and undercoats which are suitable for the substrate and are compatible with the finish coat and each other

Paint final coat table

Provide paints as follows

Final coat	Use paint to APAS specification
Interior	
Flat latex	APAS 0260/4
Low gloss latex	APAS 0260/3
Semi gloss latex	APAS-0260/2
Gloss latex	APAS-0260/1
Exterior	
Full gloss solvent borne	APAS 0015/1
Flat latex	APAS 0280/3
Low gloss latex	APAS 0280/3
Gloss latex	APAS-0280/1
Stain lightly pigmented	APAS-0115
Latex stain opaque	APAS-0280/5
Semi gloss latex	APAS 0280/2
Paving	
Paving paint semi gloss	APAS 0200/1
Paving paint gloss	APAS-0200/2

Timber floor coating system

Coating If edge bonding of strip flooring is known to occur apply a sealer compatible with the final coat

Final coats 2 coats of water based polyurethane applied with a continuous wet edge and to the manufacturer s instructions

- The Australian Paint Approvals Scheme (APAS) sets requirements for manufacture and performance of paint used on both government and private projects The use of an APAS specification is a convenient way of describing a paint of reasonable standard without restricting choice to a particular brand Most leading brands have paints to APAS specifications but many premium grade paints may exceed the APAS requirements
- It is recommended that the Painting schedule is completed with the manufacturer's paint code references inserted For a particular type of paint a manufacturer may produce different quality grades The quality of paint is generally reflected in its position on *that supplier s price list It is worth discussing the* selection of paint with a supplier familiar with local conditions

JOINERY

1 GENERAL

Cross references

Refer to the following sections

General requirements for timber durability and moisture content

Doors and windows for timber doors and reveal and jamb linings

2 MATERIALS AND COMPONENTS

Finished sizes

Provide milled timbers with actual dimensions which are at least the required dimensions except for dimensions qualified by a term such as nominal or out of to which industry standards for finished sizes apply

Hardboard

Standard To AS/NZS 1859 4

Particleboard

Standard To AS/NZS 1859 1

Medium density fibreboard

Standard To AS/NZS 1859 2

Decorative overlaid wood panels

Standard To AS/NZS 1859 3

High pressure decorative laminate sheets

Standard To AS/NZS 2924 1

High pressure decorative laminate sheet application table

Provide classes as follows

Class to AS/NZS 2924 1	Application
HGS or HGP	Kitchen work tops
VGS or VGP	Kitchen front panels
VLS	Other locations

Stone facings

General Provide stone slabs within the visual range of approved samples Repair mud veins or lines of separation that are integral to the selected pattern with resin fillers and back lining

Timber veneers

General Provide veneers slip matched and flitch batched and falling within the visual range of the approved samples

Splashbacks

Glass 6 mm toughened colourback glass with a factory applied opaque coating to the back

Standard To AS/NZS 2208

Stainless steel Grade 304 fine linished finish

3 CONSTRUCTION GENERALLY

General

Construction Build components square and install plumb

Joints Provide materials in single lengths whenever possible If joints are necessary make them over supports

Fasteners and adhesives

General Provide fasteners adhesives or both to transmit the loads imposed and ensure the rigidity of the assembly Do not split discolour or otherwise damage timber or sheets

Visibility Do not provide visible fixings except in the following locations

Inside cupboards and drawer units

Inside open units in which case provide proprietary caps to conceal fixings

Finishing

Junctions with structure Scribe plinths benchtops splashbacks ends of cupboards kickboards and returns to follow the line of floors or walls

4 TIMBER STAIRS AND BALUSTRADES

Closed strings

Trench for treads and risers

Cut strings

Profile for treads and risers Mitre riser ends

Treads

Dress nosings to a pencil-round Return nosings at cut strings Groove for riser tongue in closed riser stair Set riser 19 mm back from nosing

Top tread

Flush with finished floor otherwise to match stair treads Provide similar tread section as nosing to floor edges around stairwell

Risers

Tongue to tread Mitre to string in cut-string stairs

Joints

Glue joints in internal work In closed riser stairs wedge treads and risers to strings Plant 2 glue-blocks behind each tread to riser junction Trim floors to carry ends of stairs and around stairwell

Fascia

Of depth sufficient to overlap 19 mm below ceiling and fixed to floor joists hard up under nosing

Soffit lining

Fix to 38 x 38 mm nailing battens notched and nailed to the underside of treads and risers of closed rise stairs at the centre of flights and at each side

Newels

Halve and bolt to strings

Handrail

Stub tenon to newels

Balusters

Stub tenon to handrail at top and to tread or floor at the bottom

5 DOMESTIC KITCHEN ASSEMBLIES

Standard

General To AS/NZS 4386 1

6 CUPBOARD AND DRAWER UNITS

Plinths carcasses drawer fronts, shelves and doors

Material Provide melamine overlaid high moisture-resistant particleboard or melamine overlaid high moisture resistant medium density fibreboard

Minimum thickness 16 mm

Finish Provide decorative laminated sheet or veneer if necessary

To conceal fasteners

To provide selected colours

Installation Secure plinths and carcasses to floors walls or both at not more than 600 mm centres

Drawer fronts Rout for drawer bottoms

Adjustable shelves Support on proprietary pins in holes bored at 32 mm centres vertically

Finishes

Finish external surfaces in materials selected in Part B

Drawer and door hardware

Hinges Provide concealed all metal hinges with the following features

Adjustable for height side and depth location of door

Self closing action

Hold open function

Nickel plated

Slides Provide metal runners and plastic rollers with the following features

30 kg loading capacity

Closure retention

- White thermoset powder coating or nickel plated

7 WORKING SURFACES

Benchtops

Material Provide high moisture resistant particleboard or medium density fibreboard

Minimum thickness 32 mm

Sealing underside Laminate undersides of benchtops if

Likely to be subject to excessive moisture from equipment such as dishwashers

The benchtop is not restrained against warping by cupboard carcass or support framing

Installation Fix to carcass at least twice per 600 mm length of benchtop

Joint sealing *Fill joints with sealant matching the finish* colour and clamp with proprietary mechanical connectors

Edge sealing Seal to walls and carcasses with a sealant which matches the finish colour

Splashbacks

Glass Fix with non acidic silicone adhesive Apply at the rate recommended by the manufacturer

Installation Clean the back of the glass panel and apply 'wallnuts of adhesive together with double sided adhesive tape for temporary support and affix directly to the substrate

8 CEILING AND UNDER FLOOR ACCESS

Ceiling

Trim an opening and provide a loose access panel of minimum size 600 x 400 mm

Under floor

Provide a frame and a door minimum size 720 mm wide x 600 mm high complete with padbolt

- Modern cupboard construction is usually based on particleboard or medium density fibreboard The use of moisture-resistant grades is essential in kitchens and bathrooms In addition to the construction described *here other materials may be used and should be* specified by reference to samples that are big enough to represent the range of properties that will be found in the finished work

MECHANICAL INSTALLATIONS

1 GENERAL

Cross references

Refer to the *Electrical installations* worksection for electrical exhaust fan requirements

Refer to the *Windows* worksection for external louvres

Standards

Mechanical ventilation To AS 1668 2

Refrigeration systems To AS 1677 2 and the recommendations of SAA HB40 1 and HB40 2

2 AIRCONDITIONING DESIGN

Airconditioning load calculations

Calculate the cooling and heating loads using one of the following

Manual methods AIRAH DA9 ASHRAE or Carrier

Electronic methods ACADS-BSG Camel Carrier E20 or *Trane Trace*

Design basis

Outside design conditions Use outdoor design conditions listed in AIRAH DA9 Table 1 or Table 1A for the location geographically closest to the site and Comfort or non critical process conditions

Inside design conditions

Summer 24°C dry bulb 50% relative humidity

Winter 21°C dry bulb

Temperature variation Limit the temperature difference in airconditioned spaces served by the same zone or system to 3K

Between any 2 points in the space from floor level to 1500 mm above floor level > 2000 mm from cooking equipment and > 1000 mm from any other appliance

- When outside conditions are in the range specified above

After the plant has been operating for one hour

With the temperatures measured in the same 5 minute period

Zoning Divide the systems into temperature controlled zones to meet the specified permissible temperature variation and scheduled system divisions

Fresh air Supply fresh air to spaces with airconditioning systems via the air handling system

Heating Reverse cycle

Windows walls floors and roofs Refer to drawings for *construction and insulation*

Ambient noise emitted Lower than the level that can be heard within a habitable room in any neighbouring residential premises (regardless of whether any door or window to that room is open)

Duct design

Size ductwork on the following basis

- Rigid sheet metal duct ≤ 6 m/s and ≤ 1 2 Pa/m

Flexible duct ≤ 4 0 m/s

3 AIRCONDITIONING EQUIPMENT

Standards

Non-ducted airconditioners To AS/NZS 3823 1 1

Ducted airconditioners To AS/NZS 3823 1 2 and AS/NZS 3823 2

Equipment

Supply equipment that is as follows

- Made by a manufacturer with a demonstrated ability to provide spare parts and service promptly to the site

Will operate within the specified range of outdoor design conditions under the calculated loads without excessive head pressure or icing

Labelled to AS/NZS 3823 2

Reverse cycle units Provide effective outdoor coil defrost facility that prevents room temperature dropping more than 2°C during defrost

Cabinet Aluminium powder coated steel or moulded acrylonitrile-butadiene styrene (ABS) plastic with zinc-coated steel or stainless steel fasteners Insulate and vapour seal cabinet and drain trays to prevent external condensation under all operating conditions

Drain trays Aluminium stainless steel or plastic to collect all moisture inside unit indoor and outdoor units

Filters Washable panel type with minimum average efficiency to AS 1324 2 Test Dust No 4 of 85%

Coils Copper tube with aluminium plate fins

Controls

Provide the following functions

Temperature control for each zone located to accurately sense zone temperature

Fan speed selection for multi and variable speed fans

Day/night zone changeover if scheduled

Time switch for each system with ≤ 6 temperature programs per day separate programs for each day of the week manual set point over ride and Vacation temperature set back

4 REFRIGERATION PIPEWORK

General

Pipes To AS/NZS 1571

Deemed to comply Split system manufacturer's standard pre-charged piping kit

Pipe insulation

Insulate all refrigerant and drain piping that may sweat with chemically blown closed cell nitrile rubber in tubular form to ASTM C534 Protect insulation from sunlight and mechanical damage

Insulation thickness 13 mm for pipes < DN 20 19 mm otherwise

Condensate drains

Provide trapped ≥ DN 20 condensate drains to AS/NZS 3666 1 from each indoor coil and safety tray Provide drains from each reverse cycle outdoor coil unless casing freely drains to a roof or other location where condensate will not cause damage or pond

5 UNIT INSTALLATION

General

Outdoor equipment Provide clearance around units for condenser air flow and maintenance access Ensure discharge air does not short circuit to condenser intake

Equipment at ground level Mount on concrete plinth or similar impervious material

Duct connections Provide internal or external flexible duct connections at indoor unit

Vibration isolation

Suspended units Provide ≥ 4 metal spring or rubber in shear isolation mountings with ≥ 25 mm static deflection and 98% isolation efficiency

Floor mounted units Provide neoprene waffle pads Bolt in place

Safety trays

If leaks or condensation from equipment could cause nuisance or damage to the building or its contents provide a galvanized steel safety tray under the equipment

6 DUCTWORK

Standard

Ductwork To AS 4254

Insulation and sealing To BCA Volume 2 clause 3 12 5 3

Rigid duct

Material Zinc coated steel sheet to AS 1397 coating class Z275

Flexible duct

Material Aluminised fabric clamped on formed metal helix with insulation blanket wrapped around duct and covered with an outer vapour barrier

Installation Install flexible duct as straight as possible with minimum number of bends Maximise bend radius Check for and rectify crushed flexible duct

Supports To AS 4254 Limit sag to < 40 mm/m

Duct insulation

Insulate ducts to minimise heat gain and prevent condensation Provide continuous vapour barrier around ducts carrying conditioned air

Grilles and diffusers

Location To provide even air distribution and temperatures with no draughts

7 COMPLETION

Commissioning

Commission the systems to manufacturer s recommendations using recently calibrated instruments Check ductwork for leaks Submit signed commissioning check list on completion

Cleaning

Clean interior of ductwork progressively during installation Clean filters outdoor coils grilles and diffusers on completion

Operating and maintenance instructions

Provide written operating and maintenance instructions for the day to day operation of the installation and setting of time switches Include a schedule of recommended maintenance and drawing of the system as installed

Maintenance

Provide corrective and preventative maintenance on the installation

Maintenance period The greater of 12 months from the date of commissioning of the systems and the duration of the Defects Liability Period

Corrective maintenance Attend site and undertake corrective maintenance within 24 hours of receipt of verbal or written advice

Preventative maintenance Provide preventative maintenance recommended by the equipment manufacturer Provide all materials including consumable items and refrigerant

Summer preventative maintenance visit Provide at least one preventative maintenance visit during the months of December January or February Carry out preventative maintenance and provide electronic data logger or thermohydrograph to record temperatures at one location in each zone a period of 7 days Submit results If the temperature recorded is outside the specified tolerance identify and correct the cause and repeat test

Maintenance reports Provide a signed maintenance report setting out the work done and any measured values after each visit

- If mechanical installations are separately tendered it is recommended that the following be provided by tenderers for review before the mechanical tender is accepted
- Outside design conditions corresponding geographic location and source of data
- Calculated total and sensible cooling capacities and heating capacity
- Name of calculation method used
- Makes and model numbers of proposed equipment
- Total and sensible cooling capacities and heating capacity of the proposed equipment adjusted for the specified outdoor and indoor conditions and any effects of the proposed plant configuration
- Any assumptions on which the calculations are based
- Details of any departures from this specification
- A drawing of the proposed duct pipe and equipment layout showing proposed zoning
- Licence numbers and type of licences held by persons responsible for the installation
- Standards The BCA requires that where its requirements for natural ventilation are not satisfied mechanical ventilation must be provided Either identify areas requiring mechanical ventilation on the drawings or include in the specification If local exhaust fans are required (e g for a bathroom) include the fans in Electrical installations
- Requirements for maintenance are included along with a warranty as it prevents conflict over warranty liability if the manufacturer s recommended maintenance has not been followed
- The plant should have at least 12 months warranty and maintenance period to ensure it operates through the full range of cooling and heating seasons

PLUMBING INSTALLATIONS

1 GENERAL

Cross references

Refer to the following sections

Site preparation for service trenches

Roofing for roof plumbing and rainwater tanks

Tile finishes for waterproofing of wet areas

Painting for priming steel or iron before installation and exposed piping required to be painted

Authorised products

Standard Listed in the WaterMark Product Database unless otherwise required by the Network Utility Operator

Connections

Excavate to locate and expose the connection points and connect to the authorities mains On completion backfill and compact the excavation and reinstate surfaces and elements which have been disturbed such as roads pavements kerbs footpaths and nature strips

2 MATERIALS AND COMPONENTS

Finishes

Finish exposed piping including fittings and supports as follows

Internal locations such as toilet and kitchen areas Bright chrome plate

Externally Paint

Concealed but accessible spaces (including cupboards and non habitable enclosed spaces) Leave unpainted except for required identification marking

Valves

Finish valves to match connected piping

3 CONSTRUCTION GENERALLY

General

Install piping in straight lines and to uniform grades Arrange and support the piping so that it remains free from vibration and water hammer while permitting thermal movement Keep the number of joints to a minimum Prevent direct contact between incompatible metals

Concealment If practicable conceal piping and fittings requiring maintenance or servicing so that they are accessible within non habitable enclosed spaces such as roof spaces subfloor spaces and ducts Keep pipelines in subfloor spaces at least 150 mm above ground and ensure access can be provided throughout for inspection Provide at least 25 mm clearance between adjacent pipelines (measured from the piping insulation where applicable)

Pipes under pressure embedded in concrete Use only copper pipe with the minimum number of joints Pressure test and rectify leaks before concrete is poured

Building penetrations If piping passes through building elements provide purpose made metal or plastic sleeves formed from pipe sections Prime steel or iron before installation

Pipe supports Materials The same as the piping or galvanized or non ferrous metals with bonded PVC-U or glass fibre woven tape sleeves where needed to separate dissimilar metals

Cover plates Where exposed piping emerges from wall *floor or ceiling finishes provide cover plates of non ferrous* metal finished to match the piping or of stainless steel

4 STORMWATER

Standard

General To AS/NZS 3500 3 or AS/NZS 3500 5

Cleaning
During construction use temporary covers to openings and keep the system free of debris On completion flush the system using water and leave it clean

Pipelaying
Lay pipelines with the spigot ends in the direction of flow

Downpipe connections
Turn up drain branch pipelines to finish 50 mm above finished ground or pavement level

Subsoil drains
Connection Connect subsoil drains to the stormwater drainage system

Trench width Minimum 450 mm

Subsoil drains Provide proprietary perforated plastic pipe

Filter fabric Provide a polymeric fabric formed from a plastic yarn containing stabilisers or inhibitors to make the filaments resistant to deterioration due to ultraviolet light

Filter sock Provide a polyester permeable sock capable of retaining particles of 0 25 mm size Securely fit or join the sock at each joint

Backfilling Backfill with 20 mm nominal size washed screenings to the following depths

To the underside of the bases of overlying structures such as pavements slabs and channels

To within 75 mm of the finished surface of unpaved or landscaped areas

Pits
Cover levels Locate the top of covers or gratings including frames as follows

In paved areas Flush with the paving surface

In landscaped areas 25 mm above finished surface

Gratings taking surface water runoff Set to receive the runoff without ponding

5 WASTEWATER

Standards
General To AS/NZS 3500 2 or AS/NZS 3500 5

Waterless composting toilets To AS/NZS 1546 2

On-site domestic wastewater treatment units To AS/NZS 1546 3

Cleaning
During construction use temporary covers to openings and keep the system free of debris On completion flush the system using water and leave it clean

Septic tanks
Standard To AS/NZS 1546 1

Effluent disposal To AS 1547

Vent pipes
Staying to roof If fixings for stays penetrate the roof covering seal the penetrations and make watertight

Terminations Provide bird proof vent cowls made of the same material and colour as the vent pipe

6 COLD AND HEATED WATER

Standards
General To AS/NZS 3500 1 AS/NZS 3500 4 or AS/NZS 3500 5

Copper pipe To AS 4809

Tap positions
Locate hot tap to the left of or above the cold water tap

Accessories
Provide the accessories and fittings necessary for the proper functioning of the plumbing systems including taps valves outlets pressure and temperature control devices strainers gauges and pumps

Heater installation
Location Locate water heaters where they can be maintained or replaced without damaging adjacent structures fixtures or finishes

Solid fuel heaters To AS/NZS 2918

Temperature
Maximum temperature at ablution outlets 50°C

Isolating valves
Provide isolation valves to water heaters

Cleaning
On completion flush the pipelines using water and leave them clean

7 RAINWATER TANKS

General
Type Provide a proprietary reinforced concrete plastic or coated steel tank with flat base and pitched roof for storage of rainwater

Type Provide a proprietary reinforced concrete plastic or coated steel tank with flat base and pitched roof for storage of rainwater

Installation To AS/NZS 3500 1

Coated steel tank Hot dipped zinc coated steel or aluminium/zinc coated steel Fully support the tank above ground level

Polyethylene tank To AS/NZS 4766 (Int)

Reinforced concrete or plastic tank Trim and compact the ground and place a level bed of sand at least 50 mm thick to support the tank

8 GAS

Standard
General To AS 5601

Buried pipes
Warning tape During backfilling lay plastic warning tape above and for the full length of buried gas pipes

Type Minimum 100 mm wide with GAS PIPE UNDER marked continuously

Commissioning

- On completion of installation and testing turn on isolating and control valves and purge and charge the installation AS/NZS 3500 4 addresses the heat loss from pipes in Section 8 the requirements varying with geographic locations AS/NZS 3500 5 addresses the subject at clause 3 38
- A maximum temperature of 50°C is required by AS/NZS 3500 5 at clause 3 4 2 for all personal hygiene sanitary fixtures A maximum temperature of 60°C is recommended for kitchen sinks and laundry tubs This can be achieved by adjusting thermostats regulating flow e g with thermostatic mixing valves or by using special taps
- The AS/NZS 3500 series are referenced in the BCA and the Plumbing code of Australia

ELECTRICAL INSTALLATIONS

1 GENERAL

Cross references

Refer to the *Site preparation* worksection for service trenches

Standard

Electrical installation To AS/NZS 3000 AS/NZS 3008 1 1 and SAA HB301

Minimum energy performance standards To AS/NZS 4783 2 and AS/NZS 4782 2

Interpretation

ED S&IR The Electricity Distributor's Service and Installation Rules

RCD Residual Current Device

Telephony Speech and low band frequencies (= 100 kHz)

2 EXECUTION

General

Submit all necessary applications for electricity supply Liaise with the electricity distributor and comply with the ED S&IR

Consumers mains and metering

Provide consumers mains and connect them to the electricity distributor mains

Electricity distributor s requirements Provide metering protection and control equipment as required by the *ED S&IR*

Switchboards

Standard To AS/NZS 3439 3

Construction Enclosed type with a hinged lid Provide circuit breakers and RCDs

Maximum demand and spare capacity

Calculate the maximum demand of the installation in accordance with AS/NZS 3018 and give the owner a copy of the calculations

Spare capacity Provide the following

> 10% spare capacity in mains and submains

> 25% spare capacity in final subcircuits

Load balancing Spread electrical load equally across circuits to prevent overloading and inadvertent circuit breaker operation

Fixed and stationary appliances Treat socket outlets *supplying fixed or stationary appliances likely to cause an* RCD to trip due to earth leakage currents in accordance with AS/NZS 3000 Do not connect to circuits that supply socket outlets intended for hand held or portable appliances

Spare spaces Provide switchboards with ≥ 4 spare positions for future single phase circuit breakers

Accessories

Provide accessories necessary for a complete installation including but not limited to switches dimmers socket outlets and telecommunications outlets All accessories located in close proximity shall be of the same manufacture size and material

Mounting Flush mount accessories to the wall (or ceiling) unless noted otherwise Provide proprietary wall boxes in masonry and wall brackets in stud walls

Wet areas Position accessories in locations containing baths showers or other fixed water containers to comply with the requirements of AS/NZS 3000

Wiring

Conceal cables and conduits Provide conduits as necessary to allow wiring replacement without structural work or the removal of cladding lining plaster or cement rendering

Sequence of work Install conduits and cables before the installation of wall and ceiling linings and before any external landscaping works

Installation Do not penetrate damp proof courses Arrange wiring such that it does not bridge the cavity in external masonry

Conduit sizes Provide conduits of sufficient internal diameter and arranged so that cables are not subject to undue mechanical stress during installation

Minimum conduit diameter 20 mm

Conduits for future use Provide a non metallic drawstring *having a breaking strain > 100 kg*

Luminaires

Standard to AS 3137

Non specified luminaires Provide a bayonet cap batten holder at each lighting point location where no luminaire is specified

Lighting control systems

Locate grouped dimmers and control devices for future *access Provide ventilation and acoustic treatment to suit* the device characteristics

Appliances

Provide final subcircuits and terminate at fixed appliances hot water units packaged airconditioning and other plant and equipment

Telecommunications

Submissions Submit required applications for telecommunications services to the telecommunications services carrier and liaise with the carrier

Installations requiring telephony only To AS/ACIF S009

Small office/home office installations Category 6 to AS/ACIF S009 and AS/NZS 3086 and in accordance with the recommendations of SAA HB29

Television systems

Provide an analogue and digital television distribution system to AS/NZS 1367 and conforming to the recommendations of Digital Broadcasting Australia

Antennas Provide and locate antennas to receive all locally available free to air television stations suitable for satellite or cable network operators services Provide a coaxial cabling system

Conduits for future cabling ≥ 25 mm diameter with drawstrings

Intruder alarm system

Provide intruder alarm system

Standard To AS 2201 1

Smoke detection

Provide smoke detectors to the requirements of the *Building Code of Australia Connect smoke detectors* to mains power

3 COMPLETION

Testing and certification

Electrical installations Test to AS/NZS 3017 Give the owner a certificate showing test results and certifying compliance with AS/NZS 3000

Telecommunications cabling To AS/NZS 3086 and the recommendations of SAA HB29 Test the cable link performance in accordance with the recommendations of SAA HB29 at the maximum frequency and data rate for the cable class and the cable category Give the owner a certificate showing test results and certifying compliance with AS/NZS 3086

Submission Submit the Telecommunications Cabling Advice (TCA1) to the owner

Television and audio systems To AS/NZS 1367 Test the complete television and audio system Give the owner a certificate showing test results and certifying compliance

- Telecommunications installation Submissions Fees in respect of applications for electricity and telecommunications services are normally paid by the owner
- Switchboards AS/NZS 3018 describes prohibited locations for switchboards and the ED SI&R defines further prohibited locations for switchboards and metering equipment The contractor should verify that the location selected by the owner is compliant before proceeding with the contract

FENCES AND EXTERNAL WALLS

1 GENERAL

Cross reference

Refer to the *General requirements* section for timber durability

2 MATERIALS AND COMPONENTS

Galvanizing

Galvanize mild steel components as follows

Threaded fasteners To AS 1214

Other components To AS/NZS 4680

Concrete

Standard To AS 1379 or proprietary packaged mix

Steel panel fencing

Self drilling screws To AS 3566 corrosion resistant class 3

Steel framing Zinc coated or aluminium/zinc alloy coated steel to AS 1397 Z450 or Z150

Steel sheeting Prepainted to AS/NZS 2728

Steel posts

Galvanize to AS/NZS 4680

Concrete posts

Reinforce and precast from concrete to AS 1379

Timber fencing size table

Provide timber members as follows

Member	Preservative treated soft wood picket (mm)	Preservative treated soft wood paling/lap & cap (mm)	Hardwood or cypress pine paling/lap & cap (mm)
Maximum height	1200	1800	1800
End/corner gate posts	90 x 90	100 x 100	125 x 125 or 100 x 100
Intermediate posts	90 x 90	140 x 45 or 100 x 75	125 x 50 or 100 x 75
Maximum post spacing	2400	2400/2700*	2700
Rails	70 x 40	75 x 50 or 100x 38	75 x 50 or 100x 38
Picket/paling size	70 x 19	75 100 or 150 x 15*	100 or 150 x 13*
Capping		125 x 35	100 x 50

* three rail fences only

Steel tube picket fencing

Posts rails stays and pickets To AS 1163

Grade C350L0

3 CONSTRUCTION GENERALLY

Clearing

Clear vegetation on the fence alignment Grub out the stumps and roots of removed trees or shrubs and trim the grass to ground level but do not remove the topsoil

Excavation

Excavate footings so that they have vertical sides and a firm base

Minimum footing size

Generally 200 mm diameter x 600 mm deep

In loose material 250 mm diameter x 900 mm deep

In rock 250 mm diameter x 300 mm deep

Line and level
Erect posts vertically to follow the contours of the natural ground

Earth footings
Place 100 mm of gravel in the footing base under posts and backfill with earth around posts compacting firmly by hand or machine in 150 mm deep layers

Concrete footings
Place mass concrete around posts and finish with a weathered top falling from the post to ground level

Steel panel fencing
Ensure bottom rails have drain holes and are at least 50 mm clear of the ground

Timber fencing
General Mortice posts taper splice rails and nail twice in mortices Set pickets and palings clear of the ground

Picket fence Nail twice to each rail

Plain paling fence Use 2 rails for fences up to 1800 mm high Close butt palings and nail twice to each rail

Lap and cap paling fence Use 3 rails for fences up to 1800 mm high with the top rail located to receive the capping Close butt larger palings and nail twice to each rail Fix smaller palings over joints and nail twice to each rail Nail capping to the top rail

4 GATES

General
Construction Construct gates as follows

Ledges and braces To match fence rails

Pickets or palings To match fencing

Hardware Provide the following

Drop bolt and ferrule to each leaf of double gates

Latch to one leaf of double gates

- Provision for locking by padlock

Hinges to ensure smooth operation

Hand access Provide hand holes to give access from outside to reach locking provision

5 BRICK FENCES

Standards
Follow the guidance given in Clay Brick and Paver Institute Technical Notes 21A

Construction generally
Provide a structurally sound brickwork fence composed of the following

Footings

Brickwork panels

- Lateral support where necessary in the form of piers posts or return walls

- Swimming pool fences require special consideration and are not expressly covered here AS 1926 1 and AS 1926 2 are referenced in the BCA for safety fencing of swimming pools Child safety hazards such as fountains fish ponds incinerators barbecues and vehicle manoeuvring areas should also be fenced off or otherwise secured AS 2820 covers gate units for private swimming pools
- Preservative treated softwood palings may need three rails for fences over 1 5 m to prevent excessive twisting Three rails should be specified if there is concern about this possibility

LANDSCAPING

1 GENERAL

Cross reference
Refer to the *General requirements* section for timber durability

2 MATERIALS AND COMPONENTS

Concrete
Standard To AS 1379 or proprietary packaged mix

3 PREPARATION

Weed eradication
Eradicate weeds using a non residual glyphosate herbicide in any registered formulae at the recommended maximum rate

Surplus spoil
Remove surplus spoil from site Do not burn vegetative material

4 SUBSOIL

Ripping
General If practicable rip parallel to the final contours Do not rip when the subsoil is wet or plastic Do not rip within the dripline of trees and shrubs to be retained

Ripping depths Rip the subsoil to the following typical depths

Compacted subsoil 300 mm

Heavily compacted clay subsoil 450 mm

Cultivation
Cultivate to a minimum depth of 100 mm Do not disturb services or tree roots if necessary cultivate these areas by hand During cultivation thoroughly mix in materials required to be incorporated into the subsoil Remove stones exceeding 25 mm clods of earth exceeding 50 mm and weeds rubbish or other deleterious material brought to the surface during cultivation Trim the surface to the required design levels after cultivation

Additives
General Apply additives after ripping or cultivation and incorporate into the upper 100 mm layer of the subsoil

Gypsum Incorporate at the rate of 0 25 kg/m^2

5 TOPSOIL

General
Provide topsoil which contains organic matter will support plant life and is free from unwanted matter

Source
If it is available provide site topsoil

Placing topsoil
Spread the topsoil on the prepared subsoil and grade evenly making the necessary allowances so that

Required finished levels and contours are achieved after light compaction

Grassed areas may be finished flush with adjacent hard surfaces such as kerbs paths and mowing strips

Consolidation
Compact lightly and uniformly in 150 mm layers Avoid differential subsidence and excess compaction and produce a finished topsoil surface which is as follows

Finished to design levels

Smooth and free from stones or lumps of soil

Graded to drain freely without ponding to catchment points

Graded evenly into adjoining ground surfaces

Ready for planting

Topsoil depths
Spread topsoil to the following typical depths

Planting areas 225 mm

Irrigated grassed areas generally 150 mm

Grass areas 100 mm

6 TURFING

Turf
Obtain turf from a specialist grower of cultivated turf Provide turf of even thickness free from weeds and other foreign matter

Supply
Deliver the turf within 24 hours of cutting and lay it within 36 hours of cutting Prevent it from drying out between cutting and laying

Fertilising
Mix fertiliser thoroughly into the topsoil before placing the turf

Laying
Lay turf as follows

In stretcher" pattern with the joints staggered and close butted

Parallel with the long sides of level areas and with contours on slopes

To finish flush after tamping with adjacent finished surfaces of ground paving edging or grass seeded areas

Tamping
Lightly tamp to an even surface immediately after laying Do not use a roller

Watering
Water immediately after laying until the topsoil is moistened to its full depth

7 PLANTING

Excavation
Excavate a plant hole for each plant large enough to accept the root ball plus 0 1 m^3 of backfilling with topsoil

Plants
General Provide plants which are as follows

Have large healthy root systems with no evidence of root curl restriction or damage

Are vigorous well established free from disease and pests of good form consistent with the species or variety

Are hardened off not soft or forced and suitable for planting in the natural climatic conditions prevailing at the site

Trees Provide trees which unless required to be multi stemmed have a single leading shoot

Labelling
Label at least one plant of each species or variety in a batch using a durable readable tag

Planting conditions
Do not plant in unsuitable weather conditions such as extreme heat cold wind or rain In other than sandy soils suspend excavation when the soil is wet or during frost periods

Watering
Thoroughly water plants before planting and immediately after planting

Fertilising
In planting beds and individual plantings place fertiliser pellets around plants at the time of planting

8 MULCHING

Mulch
General Provide mulch which is free of deleterious and extraneous matter such as stones soil weeds and sticks

Application Place mulch clear of plant stems and rake to an even surface flush with the surrounding finished levels

Depth 75 mm

9 STAKES AND TIES

Stakes
Material Hardwood straight free from knots or twists pointed at one end

Installation Drive stakes into the ground at least one third of their length avoiding damage to the root system

Stake sizes

For plants 1 to 2500 mm high Two 50 x 50 x 1800 mm stakes per plant

For plants smaller than 1 m high One 38 x 38 x 1200 mm stake per plant

Ties
General Provide ties fixed securely to the stakes one tie at half the height of the main stem others as necessary to stabilise the plant

Webbing Provide 50 mm hessian webbing stapled to the stake

- For specifying trees refer to Ross Clark s Specifying Trees – a guide to assessment of tree quality" NATSPEC//Construction Information 2003

PAVING AND ROADS

1 GENERAL

Cross reference

Refer to the *General requirements* section for timber durability

Footpath crossing

Provide a footpath and kerb crossing to local council requirements

2 MATERIALS AND COMPONENTS

Mortar materials

Sand Use a fine aggregate with a low clay content selected for grading

Cement To AS 3972 type GP

Mortar

Mix proportions 1 3 cement sand

3 CONSTRUCTION GENERALLY

Grading

General Grade paving to even falls to drain away from buildings to drainage outlets without ponding Minimum fall for drainage 1 100

4 BASE COURSE

Preparation

Prepare the subgrade to suit the thickness of the base course and paving If necessary loosen the ground to a depth of 200 mm and adjust the moisture content before compaction Compact the ground to a firm even surface using at least 2 passes of a vibrating plate compactor or roller Remove and replace soft areas

Base course material

Provide well-graded crushed rock or gravel free of deleterious material with a maximum particle size of 26 5 mm uniformly graded and with a maximum clay content of 6% by mass

Placing

Spread and compact the base course to a firm tight close textured surface using at least 3 passes of a vibrating plate compactor or roller Adjust the moisture content as needed to facilitate compaction

Base course minimum thickness table

Comply with the following minimum thicknesses

	Site classification to AS 2870			
	Unit paving		Bituminous paving	
	A	S & M	A	S & M
Foot and bicycle traffic	0	0	50 mm	100 mm
Light domestic traffic occasionally up to 3 tonne gross	0	75 mm	100 mm	150 mm

5 ASPHALT PAVING

Hot mixed paving

Standard Place and compact asphaltic concrete paving over the prepared base course

Mix designation AC7

Bitumen binder class 170

Minimum thickness 25 mm

Tack coating Bituminous emulsion spray

6 UNIT PAVING

Masonry units and segmental pavers

General Provide paving units of clay natural stone or concrete masonry purpose made for use as paving or units made for bonded masonry construction but suitable for paving

Standard To AS/NZS 4455

Minimum thickness

Foot and bicycle traffic 40 mm

Light domestic traffic occasionally up to 3 tonne gross 50 mm

Cutting units Cut paving units to maintain sharp edges and accurate joints and margins

Laying unit paving

General Over the base course lay the units on bedding sand screeded to a uniform thickness not exceeding 30 mm and to the required falls and levels Do not disturb the screeded sand bedding before the units are laid Provide a gap of 1 – 3 mm wide between adjoining units After laying tamp the units using a vibrating plate compactor

Dry joints Fill the joints flush with clean fine sand or screened bedding sand passing a 1 2 mm sieve vibrate into the joints and then make 2 further passes of the vibrating plate compactor

Edge restraint

Provide edge restraint where needed to support the sand bedding and maintain the paving shape Bed units in mortar at least 40 mm thick

7 IN SITU CONCRETE PAVING

Concrete

Standard To AS 1379

Minimum thickness

Foot and bicycle traffic 75 mm

Light domestic traffic occasionally up to 3 tonne gross 100 mm

Preparation

Trim the ground to suit the required thickness of concrete and compact to a firm even surface

Control joints

Form tooled joints at maximum 2000 mm spacing

Expansion joints

Cast in 10 mm thick bitumen impregnated fibreboard joint filler at maximum 6 m spacing

Abutment with building

Where concrete paving more than 1500 mm wide abuts the wall of a building provide a strip of 10 mm thick bitumen impregnated fibreboard between the paving and the wall

Finishing methods

Broom finishing Wood float and broom to an even textured slip resistant surface with steel tooled margins On gradients steeper than 10% roughen the surface by scoring

Exposed aggregate finish Steel trowel to a smooth surface After final set use clean water and brushes to remove the surface film of mortar until the aggregate is uniformly exposed without under cutting of the matrix

Sponge finish After floating produce an even textured sand finish by wiping the surface using a damp sponge

Pattern paving After machine floating apply a proprietary treatment producing integral coloured and patterned surface

- The requirements for in situ concrete may be varied if it is reinforced AS 3727 can be used for design purposes

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AS/NZS 4505	1998	Domestic garage doors
AS/NZS 4667	2000	Quality requirements for cut-to-size and processed glass
AS/NZS 4600	1996	Cold-formed steel structures
AS/NZS 4680	1999	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
AS 4766 (Int)	2002	Polyethylene storage tanks for water and chemicals
AS/NZS 4782		Double-capped fluorescent lamps – performance specifications
AS/NZS 4782 2	2004	Minimum Energy Performance Standard (MEPS)
AS/NZS 4783		Performance of electrical lighting equipment – Ballasts for fluorescent lamps
AS/NZS 4783 2	2002	Energy labelling and minimum energy performance standards requirements
AS 4809	2003	Copper pipe and fittings – Installation and commissioning
AS/NZS 4859		Materials for the thermal insulation of buildings
AS/NZS 4859 1	2002	General criteria and technical provisions
AS 5039	2003	Security screen doors and security window grilles
AS 5040	2003	Installation of security screen doors and window grilles
AS 5601	2004	Gas Installation Code
AS 5604	2003	Timber – Natural durability ratings
AS/ACIF S008	2001	Requirements for authorised cabling products
AS/ACIF S009	2001	Installation Requirements for Customer Cabling (Wiring Rules)
SAA HB28	1997	The design of residential slabs and footings
SAA HB29	2000	Communications Cabling Manual Module 2 Communications Cabling Handbook
SAA HB33	1992	Domestic open fireplaces
SAA HB36	1993	Building in bushfire-prone areas – Information and advice
SAA HB40		The Australian Refrigeration and Air Conditioning Code of Good Practice

SAA HB40 1	2001	Reduction of Emissions of Fluorocarbon Refrigerants in Commercial and Industrial Refrigeration and Airconditioning Applications
SAA HB40 2	2001	Reduction of Emissions of Fluorocarbons in Residential Airconditioning Applications
SAA HB109	1998	Footings for reinforced masonry houses
SAA HB301	2001	Electrical installations - designing to the Wiring Rules
ACADS-BSG Camel		Manual for calculating cooling and heating loads – electronic method
AIRAH DA09	1998	Load estimation and psychrometrics
APAS-0015/1	2003	Full gloss alkyd enamel for exterior and interior use (buildings)
APAS-0115	2003	Lightly pigmented solvent borne ranch finish for exterior timber
APAS-0200/1	2003	One pack semi gloss pigmented solvent borne paving paint for concrete
APAS-0200/2	2003	One pack full gloss pigmented solvent borne paving paint for concrete
APAS-0205	2003	One pack clear moisture cured finish for timber
APAS-0260/1	2003	Interior gloss latex paint (buildings)
APAS-0260/2	2003	Semi gloss interior latex paint in MCR (buildings)
APAS-0260/3	2003	Low gloss interior latex paint in MCR (buildings)
APAS-0260/4	2003	Washable flat finish for interior use (buildings)
APAS-0280/1	2003	Gloss exterior latex paint in MCR (buildings)
APAS-0280/2	2003	Semi gloss latex paint exterior (buildings)
APAS-0280/3	2003	Flat or low gloss exterior latex finish in MCR (buildings)
APAS-0280/5	2003	Heavily pigmented low gloss latex ranch finish for exterior timber
APAS-2916	2001	Organic zinc rich coating for protection of steel
AREMA/CSIRO		Manual for calculating cooling and heating loads – manual method
ASHRAE	2001	ASHRAE fundamentals handbook
ASTM C534	2003	Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form
BCA 2 6		Energy efficiency
BCA 3 1 3 2(b)		Acceptable construction – Site preparation – Termite risk management – Installation of termite barriers
BCA 3 2 4		Site classification
BCA Figure 3 3 3 1		Typical brick ties spacings in cavity and veneer construction
BCA Table 3 3 3 1		Corrosion protection for wall ties
BCA 3 3 3 2		Acceptable construction – Masonry – Masonry accessories – Wall ties
BCA Figure 3 3 3 5		Lintels supporting roofs and masonry walls
BCA 3 4 1		Sub floor ventilation
BCA Table 3 4 1 2		Sub-floor ventilation and clearance
BCA 3 4 2 2		Acceptable construction – Framing – Steel framing – General
BCA 3 9 2		Acceptable construction – Safe movement and access – Balustrades
BCA 3 12 1		Acceptable construction – Energy efficiency – Building fabric
BCA 3 12 1 3		Acceptable construction – Energy efficiency – Building fabric – Roof lights
BCA 3 12 2		Acceptable construction – Energy efficiency – External glazing
BCA 3 12 3		Acceptable construction – Energy efficiency – Building sealing
BCA 3 12 5 3		Acceptable construction – Energy efficiency – Services – Heating and cooling ductwork
Carrier		Manual for calculating cooling and heating loads – manual method
Carrier E20		Manual for calculating cooling and heating loads – electronic method
CBPI TN 21A	1985	Design of Free-Standing Walls
Trane Trace		Manual for calculating cooling and heating loads – electronic method

SELECTION SCHEDULES – PART B

The *Selection schedules* sections attached are incorporated in the contract for the work as follows

Yes	No		
☑	☐	General requirements	B1
☑	☐	Site preparation	B2
☑	☐	Concrete construction	B3
☐	☑	Timber frame construction	B4
☑	☐	Steel frame construction	B5
☑	☐	Brick and block construction	B6
☑	☐	Insulation and sarking	B7
☑	☐	Roofing	B8
☑	☐	Cladding	B9
☑	☐	Doors and windows	B10
☑	☐	Lining	B13
☑	☐	Plastering and floor topping	B14
☑	☐	Tile finishes	B15
☑	☐	Floor coatings and coverings	B16
☑	☐	Painting	B17
☑	☐	Joinery	B19
☐	☑	Mechanical installations	B20
☑	☐	Plumbing installations	B21
☑	☐	Electrical installations	B22
☐	☑	Fences and external walls	B23
☐	☑	Landscaping	B25
☐	☑	Paving and roads	B26
☑	☐	Appliances and fixtures	B27

About this specification

This specification is in two parts – the Reference specification (Part A) and the Selection schedules (Part B)

The requirements of the Selection schedules and the drawings override any different requirements in the Reference specification

Completing this specification

Show here by ticking boxes which *Selection schedules* apply to the work

The *Selection schedules* should be completed as necessary to identify the owner s selection of materials colours products and equipment This is also the place to set out any alterations deletions or additions to the Reference specification

These pages can be removed for typing and/or copying or if different schedules are to be used

Only complete these schedules with information not shown on the drawings

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GENERAL REQUIREMENTS

Bushfire protection	☑ Yes ☐ No
Level of construction to AS 3959	☐ 1 ☐ 2 ☑ 3
Other	
Prior applications and approvals	☑ Yes ☐ No
List of applications made and approvals received	DA
Existing services	
Toilet	☑ Yes ☐ No
Power	☑ Yes ☐ No
Telephone	☑ Yes ☐ No
Conditions of use	
Site signs	☑ Yes ☐ No
Occupied premises	☑ Yes ☐ No
Period of occupation	TOTAL PROJECT
Restricted hours of work	See DA.
Order of work	As per programme.
Termite protection	☑ Yes ☐ No

Location	**Method**
Slab	Gordon
Slab penetrations	Gordon
Slab control joint and footing/slab joints	
Under slabs	
Building perimeters	
Under suspended floors	
Timber poles and posts	

Energy efficiency approval commitments

Steel generally Refer to **Stainless and coated steel table**

External environment	Tick as appropriate
Low corrosivity	☐
Medium corrosivity	☑
Severe marine	☐

Other requirements

Changes to Reference specification (Part A)

SITE PREPARATION

Demolition items

Fences and external walls

N C

External buildings

NIL.

Other items for demolition

As per drawings.

Materials to be salvaged

As much as possible.

Removal of asbestos products ☐ Yes ☑ No

Description

Temporary fence ☑ Yes ☐ No

Description

Existing trees, plants and shrubs

Trees plants and shrubs to be retained

All plants & trees retained

Existing trees, plants and shrubs to be removed

NIL

Other requirements

Changes to Reference specification (Part A)

CONCRETE CONSTRUCTION

Ground slab vapour barriers

Type

See engineers drawings.

Other requirements

Changes to Reference specification (Part A)

-

-

TIMBER FRAME CONSTRUCTION

Timber roof trusses

Type

Strip flooring

Type

Cyclonic area ☐ Yes ☐ No (If yes Standard To AS 1684 3)

Other requirements

Changes to Reference specification (Part A)

STEEL FRAME CONSTRUCTION

Cold formed steel framing

Product name — As per manufacturer

Steel roof trusses

Type — As per manufacturer.

Strip flooring

Type — N/A.

Other requirements

Changes to Reference specification (Part A)

BRICK AND BLOCK CONSTRUCTION

Type

- ❑ Brick
- ❑ Concrete
- ❑ Block
- ❑ AAC
- ❑ Clay
- ❑ Calcium silicate
- ❑ Concrete

Manufacturer

Type/size

Colour

Feature colour

Mortar colour

- ❑ Grey cement
- ❑ Other
- ❑ Off white cement

Mortar joints

- ❑ Tooled
- ❑ Raked
- ❑ Weatherstruck
- ❑ Other

Other requirements

Changes to Reference specification (Part A)

INSULATION AND SARKING

Insulation

☐ Roof	Type	As per drawings R
☐ Ceiling	Type	As per drawings R
☐ Walls	Type	As per drawings. R
☐ Floors (climate zones 6 7 and 8 as noted in the BCA)	Type	As per drawings R
☐ Pipes	Type	As per drawings R

Roof sarking ☑ Yes ☐ No

Wall sarking ☑ Yes ☐ No

Other requirements

Changes to Reference specification (Part A)

ROOFING

Roof covering

- ☐ Terracotta tiles
- ☑ Prefinished metal
- ☐ Aluminium/zinc alloy coated steel
- ☐ Concrete tiles
- ☐ Plastic sheet
- ☐ Other

Manufacturer	Bluescope
Type	Custom orb
Profile	-
Fire performance	-
Roofing colour	As per drawings.
Ridge capping colour	As per drawings.
Guttering and downpipe prefinish colour	As per drawings.
Roof lights	
Type	As per drawings.
Roof ventilators	
Type	As per drawings.
Other requirements	

Changes to Reference specification (Part A)

CLADDING

Cladding

- ☐ UPVC
- ☑ Fibre cement
- ☑ Prefinished metal
- ☐ Plywood
- ☐ Hardboard
- ☐ Timber
- ☐ AAC

Manufacturer	As per drawings
Type	As per drawings
Prefinish colour	As per drawings
Profile	As per drawings
Texture	As per drawings
Thickness	As per drawings
AAC panel thickness	N/A

Other requirements

Changes to Reference specification (Part A)

DOORS AND WINDOWS

Windows and sliding external doors

- [x] Aluminium
- [ ] Anodised
- [ ] Powder coated
- [ ] Timber
- [ ] Stain/clear
- [ ] Paint
- [ ] Insect screen

Manufacturer: TBC

Type: As per drawings

Prefinish colour: As per drawings

Glass: As per drawings

Main entrance door

Manufacturer: TBC

Type: TBC

Glass: TBC.

Other external doors

Manufacturer: TBC

Type: TBC

Glass: TBC

Security screen doors and window grilles

Manufacturer: NA

Type: NA

Prefinish colour: NA.

Timber internal doors

Manufacturer: TBC

Type: TBC

Wardrobe doors and frames

- [x] Aluminium framed
- [ ] Anodised
- [ ] Powder coated
- [ ] Sliding
- [ ] Hinged

Frame prefinish colour

Wardrobe door panels

- [ ] Mirrors
- [x] Paint
- [ ] Melamine surfaced
- [ ] Vinyl
- [ ] Stain/clear

Panel prefinish colour

Frameless glass partitions

Toughened laminated glass ~A

Interface (colour or frosted)

Door hardware

Glass balustrades

Manufacturer ~A

Material

Finish / colour

Window coverings

☐ Curtains ☐ Aluminium venetian blinds

☐ Plastic venetian blinds ☐ Timber venetian blinds

☐ Timber shutters ☐ Roller blinds

Manufacturer ~A

Type

Prefinish colour

External glazing systems

Total u-value ~A

Solar heat gain co efficient

Louvres

☐ Aluminium ☐ Timber

Manufacturer TBC

Prefinish colour AS per drawings.

Garage doors

☐ Roller ☑ Tilting

☐ Sectional ☐ Plywood

☐ Prefinished steel ☐ Stain/clear

☐ Paint ☐ Power-operated

Manufacturer

Type

Prefinish colour

Other requirements

Changes to Reference specification (Part A)

LINING

Lining

Types 10mm plasterboard.

Cornice

Type N/C

Sheet thickness

Skirtings

Types Timber.

Architraves

Types Timber.

Other requirements

Changes to Reference specification (Part A)

PLASTERING AND FLOOR TOPPING

Other requirements

-

Changes to Reference specification (Part A)

-

-

-

TILE FINISHES

Ceramic and stone tile schedule – nominate selections

Location	Floor	Wall/skirting	Accessories	Grout
Front entry				
Rear/side entry				
Kitchen/family				
Laundry				
Bathroom				
WC				
Ensuite				
Terrace				

TBC

Bath ventilation ☐ Yes ☑ No

Other requirements

Changes to Reference specification (Part A)

FLOOR COATINGS AND COVERINGS

Sanding

☐ Basic ☑ Fine

Underlay

☑ Underfelt ☐ Synthetic foam

☐ Rubber ☐ Hardboard

Carpet

Manufacturer TBC

Colour TBC

Edge strips

Manufacturer TBC

Material/colour

Resilient finish

Manufacturer NIL

Colour

Parquet

☐ Panels ☐ Block parquet

☐ Acoustic underlay

Manufacturer NIL

Timber species

Floating floor panels

☐ Timber finish ☐ Plastic laminate finish

Manufacturer NIL

Finish

Other requirements

Changes to Reference specification (Part A)

PAINTING

Other requirements

Changes to Reference specification (Part A)

Exterior painting schedule

Item	Manufacturer and paint type	Colour
Fascia		
Guttering		
Downpipe		
Under eaves		
Cladding		
Shutters		
Handrails		
Balustrades		
Posts and beams		
Gable barge		
Gable panels		
Gable battens		
Finials		
Frieze horizontals		
Frieze verticals		
Masonry		

Windows and external doors painting schedule

Location	Manufacturer and paint type	Internal	External	Mouldings
Front door panel				
Front door frame				
Other door panels				
Other door frames				
Garage door panel				
Garage door frame				
Windows				

Interior painting schedule

Room/item	Manufacturer and paint type	Walls	Ceiling	Cornice	Doors	Linings/trim
Front entry						
Rear/side entry						
Hall (ground floor)						
Lounge						
Dining						
Room dividers						
Kitchen						
Family						
Rumpus room						
WC						
Laundry						
Landing (first floor)						
Handrails						
Balustrades						
Bathroom						
Bedroom 1						
Ensuite						
Bedroom 2						
Bedroom 3						
Bedroom 4						
Bedroom 5						
Garage						
Store						

JOINERY

Joinery schedule

Location/item	Manufacturer	Finish material	Colour

Bench tops

- ❑ Laminated rolled edge
- ❑ Laminated with edgestrips
- ❑ Stone
- ❑ Synthetic (acrylic)

Splashbacks

- ❑ Laminated
- ❑ Colourback glass
- ❑ Ceramic mosaic tiles
- ❑ Glass mosaic tiles
- ❑ Stainless steel

Hardware

Handles

Locks

Other requirements

SEE DRAWING

Changes to Reference specification (Part A)

MECHANICAL INSTALLATIONS

Non ducted airconditioning system schedule

System designation		
Plant location and room served		
Split system or one-piece		
Outdoor plant location		

Ducted airconditioning system schedule

System designation		
Rooms served		
Split system or one piece		
Plant location		
Day/night zone changeover required?		
Rooms on day zone		
Rooms on night zone		

Internal window shading

Type

Supply diffusers

Type

Material

Return air grille

Type

Material

Other requirements

Changes to Reference specification (Part A)

PLUMBING INSTALLATIONS

Sinks, basins, baths, WC, shower trays and tapsets schedule

Location	Manufacturer	Type	Colour
TBC.			

Cold water

☐ Copper ☐ UPVC

☑ Polybutylene

Heated water

☑ Copper ☐ Polybutylene

Kitchen sink

☑ 3 tap hole ☐ 1 tap hole

☐ Waste disposal unit

Water heater

☐ Electric ☐ Natural gas

☐ LP gas ☑ Solar

☐ Heat pump ☐ Other

Manufacturer TBC

Model/capacity

Rainwater tank ☑ Yes ☐ No

Type See drawings

Size (litres)

Connect to

Other requirements

Changes to Reference specification (Part A)

ELECTRICAL INSTALLATIONS

Accessory schedule

Type	Manufacturer	Catalogue or model no
Socket outlet	TBC	
Light switches		
Dimmers		
Telecommunications outlet – telephony		
Telecommunications outlet – data		
Exhaust fan		
Circulating fan		
Fan controller		

Luminaire schedule

Type	Manufacturer	Catalogue or model no
	TBC	

Smoke detection system Yes to BCA.

Cable/satellite network operator N/A

Intruder alarm system N/A

Lighting control systems N/A.

Spare conduits

For future cable installation N/A

Other requirements

Changes to Reference specification (Part A)

FENCES AND EXTERNAL WALLS

Steel panel

Height

Prefinish colour

Steel tube picket fencing

Height

Product

Finish/colour

Timber

- ❑ Preservative treated softwood
- ❑ Hardwood
- ❑ Cypress pine
- ❑ Timber posts
- ❑ Steel posts
- ❑ Concrete posts
- ❑ Lap and cap
- ❑ Picket
- ❑ Paling

Height

Masonry

- ❑ Brick
- ❑ Clay
- ❑ Concrete
- ❑ Calcium silicate
- ❑ Block
- ❑ Concrete

Manufacturer

Type/size

Colour

Feature colour

Mortar colour

- ❑ Grey cement
- ❑ Off-white cement
- ❑ Other

Mortar joints

- ❑ Tooled
- ❑ Weatherstruck
- ❑ Raked
- ❑ Other

Footings

- ❑ Concrete
- ❑ Earth

Gates

Type

Size

Colour

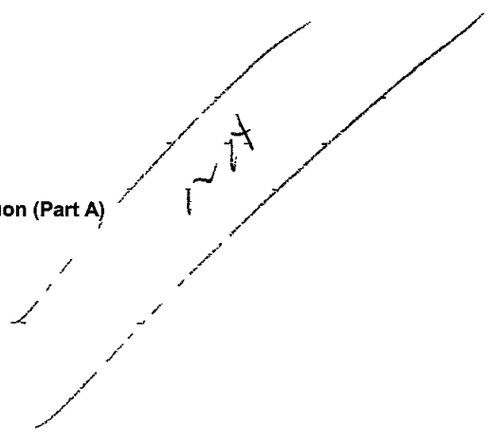
Other requirements

Changes to Reference specification (Part A)

LANDSCAPING

Other requirements

Changes to Reference specification (Part A)



PAVING AND ROADS

Type

- ❑ Brick paver
- ❑ In situ concrete
- ❑ Exposed aggregate
- ❑ Bituminous
- ❑ Concrete paver
- ❑ Broom finish
- ❑ Stamped finish

Manufacturer

Type/size

Colour

Aggregate

Other requirements

Changes to Reference specification (Part A)

APPLIANCES AND FIXTURES

Appliances and fixtures schedule

Item	Supplied by	Installed by
	TBC.	

Dishwasher ☐ Yes ☐ No

☐ Panel to match door

☐ Cold water ☐ Hot and cold water

Manufacturer

Type

Colour

Wall oven ☐ Yes ☐ No

☐ Natural gas ☐ LP gas

☐ Electric

Manufacturer

Type

Colour

Cooktop/stove

☐ Cooktop ☐ Stove

☐ Natural gas ☐ LP gas

☐ Electric

Manufacturer

Type

Colour

Range hood ☐ Yes ☐ No

☐ Ducted ☐ Recirculating

Manufacturer

Type

Colour

Microwave ☐ Yes ☐ No

Manufacturer

Type

Colour

TBC.

Waste disposal unit ☐ Yes ☑ No

Manufacturer

Type

Heating/airconditioning ☐ Yes ☑ No

☐ Natural gas ☐ LP gas

☐ Electric

Manufacturer

Type

Fixtures

Clothes line

Letter box

Street number

Towel rails

Clothes hooks

Toilet roll holders

Soap holders

Handrails

Mirrors

Shower screens

Blinds and curtains

Door chimes

TBC

Other requirements

CORPORATE INFORMATION

NATSPEC is the trading name of Construction Information Systems Australia Pty Limited, ABN 67 008 516 390.

NATSPEC, founded in 1975, is a not-for-profit organisation that is owned by the design, build, construct and property industry through the shareholdings of professional associations and government property groups. It is impartial and is not involved in advocacy or policy development. NATSPEC's major service is the comprehensive national specification system endorsed by government and professional bodies. The specification is for all building structures with specialist packages for architects, interior designers, landscape architects, structural engineers, service engineers and domestic owners.

NATSPEC's aims are to provide economies of scale for its shareholders and to improve the quality of construction in Australia via the provision of information, tools, products and services.

SHAREHOLDERS

// Air Conditioning and Mechanical Contractors' Association of Australia
// Association of Consulting Engineers Australia
// Australian Council of Building Design Professions
// Australian Elevator Association
// Australian Institute of Building
// Australian Institute of Quantity Surveyors
// Building Commission Victoria
// Construction Industry Engineering Services Group
// Department for Administrative and Information Services (SA)
// Department of Finance and Administration
// Department of Housing and Works (WA)
// Department of Public Works (QLD)
// Department of Treasury (ACT)
// Department of Treasury and Finance (TAS)
// Engineers Australia
// Master Builders Australia
// NSW Department of Commerce
// NT Department of Infrastructure, Planning and Environment
// Royal Australian Institute of Architects
// Standards Australia

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NATSPEC//

CONTROL OF BUILDING

The overall control of building construction in Australia is exercised by local councils under powers granted by state or territory legislation. This legislation incorporates the Building Code of Australia (BCA), which consists of a nationally agreed set of objectives and rules designed to control health and safety in new buildings.

Topics covered include structural adequacy, weatherproofing, drainage, fire resistance, escape from fire, fire fighting, sanitary facilities, ventilation, energy efficiency, termite risk lmanagement, and construction in alpine and bushfire-prone areas.

The BCA usually gives objectives, functional statements and performance requirements for the building and then states how this objective may be achieved by "deemed-to-satisfy" provisions. These commonly provide the option of compliance with an Australian standard. Sometimes, compliance with an Australian standard is mandatory.

For this reason, Australian standards are of great importance to the building industry because they provide a straightforward way of meeting BCA objectives. It is usually possible for other forms of construction to be used but this may require the submission of detailed evidence that it meets the BCA objectives.

Before any building work can start, local council approval is normally required for the construction details. Approval may also be required from other authorities, for example, for water supply and sewerage.

The requirements for energy efficiency and sustainability vary from state to state and advice from the local council should be obtained at an early stage.

Local council approval normally requires the payment of fees and the submission of drawings and a specification which are checked by council staff to establish that BCA (and any other council) requirements have been met.

Between them, the drawings and the specification describe what is to be built. Traditionally, the drawings give the information which is more easily represented pictorially; the specification gives the information which is best given in words.

The drawings show the relationships between component parts of the building; the specification describes the quality of these components and their installation.

The drawings and the specification are also the principal contract documents; they describe what the builder has agreed to build and the owner has agreed to pay for.

For these reasons, the specification has to cover a range of topics that are not addressed by the BCA or other statutory requirements.

For example, the BCA does not have a full set of objectives, much less detailed requirements, for doors, tiling, or painting to name just a few. Obviously, the specification must set down requirements for these and, as is the case with BCA compliance, what is required is often most conveniently described by reference to the appropriate Australian standard.

In many instances, there may not be an appropriate Australian standard or a different quality of performance or service may be required. Reference to a brand or product name may be the best way of incorporating a particular requirement about the quality that is required.

CLIENT : Murray & Beverlry McKenzie

PROJECT : ALTERATIONS AND ADDITIONS TO 115 McCarrs Creek Road, Church Point

"These plans form part of and are to be read in conjunction with the conditions of consent. Please make yourself aware of your legal position. Mandatory inspections are applicable."

Received on..... 02 JUL 2008

BUILDING NOTES

These works have been designed so that when constructed they will comply with the BCA

All dimensions to be confirmed on site

New rainwater storage tank to be connected to toilets and washing machine. Overflow to existing stormwater

Smoke alarms are to be fitted in accordance with the BCA

All new downpipes are to be fitted connected to either the new rainwater storage tank or existing stormwater system

Termite protection shall be installed in accordance with the BCA and A.S.

Roof and wall framing to engineers details

Roof, wall and floor insulation to be in compliance with BASIX certificate A266O3

Windows and glazing to be in accordance with BASIX certificate A266O3

External colours to be:
Colorbond Customorb roof sheeting: Colorbond Woodland Grey
Colorbond Customorb wall cladding: Colorbond Iron stone
F.C wall cladding: Dulux Calf Skin
Sandstone wall cladding
Painted Ground floor walls : Dulux Bogart

Construction shall comply with AS3959 – 1999 level3 'Constraction of Buildings in bushfire prone areas'.
Roofing shall be gutterless or have leafless guttering and valleys are to be screened to prevent the build up of flammable material.

Access to the rear of the property shall be provided for fire fighting purposes.

Any proposed external doors shall comply with Development Control Practice Note 3/O6' -Revised November 2007 (Release 2).

In recognition of the potentially unrelible reticulated water supply in residential areas a 5OOOlitre water supply tank shall be provided for fire fighting purposes. A minimum of 3kW (5hp) petrol or diesel powered fire fighting pump with sufficient hose to reach the building permimeter shall be provide. The water source may also be used for other purposes and allow for the circulation of fresh water to avoid health issues provided the tank (in this instance) is kept full.

All exposed/external timber used in the development shall be of a fire resistant timber species as identified in RFS Development Control Note OO1. These species include Blackbutt, Kwila (Merbau), Red River Gum, Silver top Ash, Spottrd Gum and Turpentine.

The solid fuel or wood burning appliances shall compy with Australian Standard AS 4O13-1992 or any subsequent amending standard.

The recommendation of the risk assessment required to manage the hazards as identified in Geotechnical Report prepared by Taylor Geotechnical will be incorporated into the construction plans.

DOOR SCHEDULE

D_1	21OOH X 82OW	EXTERNAL PAINT TRORE ROOM ENTRY DOOR
D_2	21OOH X 82OW	INTERNAL PAINT FINISH DOOR
D_3	21OOH X 82OW	EXTERNAL PAINT FINISH DOOR
D_4	21OOH X 1OOOW	EXTERNAL PAINT ENTRY DOOR
D_5	21OOH X 82OW	INTERNAL PAINT FINISH DOOR
D_6	21OOH X 82OW	GATE DOOR
D_7	21OOH X 2688W	SLIDING DOOR
D_8	21OOH X 232OW	INTERNAL BIFOLD DOOR
D_9	21OOH X 82OW	INTERNAL PAINT FINISH DOOR
D_1O	21OOH X 82OW	INTERNAL PAINT FINISH ENTRY DOOR
D_11	21OOH X 82OW	EXISTING ENTRY DOOR
D_12	21OOH X 82OW	INTERNAL PAINT FINISH DOOR
D_13	21OOH X 82OW	INTERNAL PAINT FINISH DOOR
D_14	21OOH X 3OOOW	PANEL LIFT GARAGE DOOR
D_15	21OOH X 82OW	INTERNAL PAINT FINISH DOOR
D_16	21OOH X 82OW	INTERNAL PAINT FINISH DOOR
D_17	21OOH X 82OW	INTERNAL PAINT FINISH DOOR
D_18	21OOH X 16OOW	INTERNAL PAINT FINISH DOOR
D_19	21OOH X 2515W	SLIDING DOORS
D_2O	21OOH X 82OW	INTERNAL PAINT FINISH DOOR
D_21	21OOH X 82OW	INTERNAL PAINT FINISH DOOR
D_22	21OOH X 1O7OW	INTERNAL PAINT FINISH DOOR
D_23	21OOH X 82OW	EXTERNAL PAINT FINISH DOOR
D_24	21OOH X 279OW	SLIDING DOORS
D_25	21OOH X 82OW	INTERNAL PAINT FINISH DOOR
D_26	21OOH X 279OW	SLIDING DOORS
D_27	21OOH X 2441W	SLIDING DOOR
D_28	21OOH X 2688W	SLIDING DOORS
D_29	21OOH X 2688W	SLIDING DOOR
D_3O	21OOH X 2688W	SLIDING DOORS

WINDOW SCHEDULE

W_1	12OOh X 61Ow	CASEMENT
W_2	12OOh X 61Ow	FIXED
W_4	12OOh X 61Ow	CASEMENT
W_5	Glass wall	
W_6	12OOh x 85Ow	CASEMENT
W_7	EXISTING FIXED WINDOW	
W_8	EXISTING FIXED WINDOW	
W_9	EXISTING FIXED WINDOW	
W_1O	EXISTING FIXED WINDOW	
W_11	EXISTING FIXED WINDOW	
W_12	REFER TO DRAWING FIXED	
W_13	12OOh X 253lw	SLIDING
W_14	13OOh x 77Ow	CASEMENT
W_15	1O53h X 241Ow	FIXED
W_16	12OOh X 253lw	SLIDING
W_17	16OOh X 61Ow	CASEMENT
W_18	13OOh X 1164w	CASEMENT
W_19	12OOh X 1442w	SLIDING
W_2O	6OOh X 17OOw	SLIDING
W_21	22OOh X 61Ow	DOUBLE HONG
W_22	22OOh X 61Ow	DOUBLE HONG
W_23	12OOh X 17OOw	SLIDING
W_24	12OOh X 17OOw	SLIDING
W_25	16OOh X 61Ow	CASEMENT
W_26	16OOh X 155Ow	SLIDING
W_26a	16OOh X 155Ow	SLIDING
W_27	16OOh X 61Ow	CASEMENT
W_28	12OOh X 74Ow	CASEMENT
W_29	12OOh X 61Ow	CASEMENT
W_3O	12OOh X 61Ow	FIXED
W_31	1O53h X 3O25w	FIXED
W_32	REFER TO DRAWING SLIDING	
W_33	12OOh X 61Ow	FIXED
W_34	EXISTING FIXED WINDOW	
W_35	EXISTING FIXED WINDOW	
W_36	1O53h X 224Ow	FIXED
W_37	1O53h X 3O25w	FIXED

Glass will have reflectivity less than 25%

PRIVATE CERTIFIERS AUSTRALIA
Construction Cert. No: Approved Date:
080067 18 NOV 2008
Certifying Authority: Grant Harrington
Accreditation No: BPB0170

MODIFICATION OF PLANS MAY NEED A SECTION 96 & A NEW CONSTRUCTION CERTIFICATE BEFORE STARTING O ANY CHANGES

REV NO.	DESCRIPTION	DATE
	DELETE W-3 AND RESIZE D-19	

NOTE:
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PROJECT
115 McCarrs Creek Road
CHURCH POINT

CLIENT
Murray & Beverley McKenzie

DRAWN/DESIGNED
S . R / D . P

DATE
Jan O8

DRAWING
COVER SHEET

SCALE
1 : 100

DRAWING NUMBER
2006 - O15 - O1

REVISION
JUNE O8-A

CERTIFICATE NUMBER: A266O3

DATE OF ISSUE: THURSDAY, 24, JANUARY 2008

MODIFICATION OF PLANS MAY NEED A SECTION 96 & A NEW CONSTRUCTION CERTIFICATE BEFORE STARTING O ANY CHANGES

PROJECT ADDRESS	
PROJECT NAME	115 MCCARRS CREEK ROAD
STREET ADDRESS	115 MCCARRS CREEK ROAD CHURCH POINT 2105
LOCAL GOVERNMENT AREA	PITTWATER COUNCIL
PLAN TYPE AND NUMBER	DEPOSITED PLAN 11691
LOT NUMBER	59
SECTION NUMBER	O
PROJECT TYPE	
DWELLING TYPE	SEPARATE DWELLING HOUSE
TYPE OF ALTERATION AND ADDITION	MY RENOVATION WORK IS VALUED AT $50,000 OR MORE, AND DOES NOT INCLUDE A POOL (AND/OR SPA).

FIXTURES AND SYSTEMS

HOT WATER

THE APPLICANT MUST INSTALL THE FOLLOWING HOT WATER SYSTEM IN THE DEVELOPMENT: SOLAR (ELECTRIC-BOOSTED) SYSTEM THAT IS ELIGIBLE TO CREATE RENEWABLE ENERGY CERTIFICATES UNDER THE (COMMONWEALTH) RENEWABLE ENERGY (ELECTRICITY) REGULATIONS 2001 (INCORPORATING AMENDMENT REGULATIONS 2005 (NO. 2)).

LIGHTING

THE APPLICANT MUST ENSURE A MINIMUM OF 40% OF NEW OR ALTERED LIGHT FIXTURES ARE FITTED WITH FLUORESCENT, COMPACT FLUORESCENT, OR LIGHT-EMITTING-DIODE (LED) LAMPS.

FIXTURES

THE APPLICANT MUST ENSURE NEW OR ALTERED SHOWERHEADS HAVE AFLOW RATE NO GREATER THAN 9 LITRES PER MINUTE OR A 3 STAR WATER RATING.
THE APPLICANT MUST ENSURE NEW OR ALTERED TOILETS HAVE A FLOW RATE NO GREATER THAN 4 LITRES PER AVERAGE FLUSH OR A MINIMUM 3 STAR WATER RATING.
THE APPLICANT MUST ENSURE NEW OR ALTERED TAPS HAVE A FLOW RATE NO GREATER THAN 9 LITRES PER MINUTE OR MINIMUM 3 STAR WATER RATING.

INSULATION REQUIREMENTS

THE APPLICANT MUST CONSTRUCT THE NEW OR ALTERED CONSTRUCTION (FLOORS), WALLS, AND CEILINGS/ROOFS) IN ACCORDANCE WITH THE SPECIFICATIONS LISTED IN THE TABLE BELOW, EXCEPT THAT :
A) ADDITIONAL INSULATION IS NOT REQUIRED WHERE THE AREA OF NEW CONSTRUCTION IS LESS THAN 2M2
B) INSULATION SPECIFIED IS NOT REQUIRED FOR PARTS OF ALTERED CONSTRUCTION WHERE INSULATION ALREADY EXISTS.

CONSTRUCTION	ADDITIONAL INSULATION REQUIRED (R-VALUE)	OTHER SPECIFICATIONS
CONCRETE SLAB ON GROUND FLOOR	NIL	
FLOOR ABOVE EXISTING DWELLING OR BUILDING	NIL	
EXTERNAL WALL: FRAMED (WEATHERBOARD, FIBRO, METAL CLAD)	R1.30 (OR R1.70 INCLUDING CONSTRUCTION)	
INTERNAL WALL SHARED WITH GARAGE: PLASTERBOARD (RO.36)	NIL	
FLAT CEILING, PITCHED ROOF (55 MM)	CEILING: R1.45 (UP), ROOF: FOIL BACKED BLANKET	MEDIUM (SOLAR ABSORPTANCE O.475 - O.70)
RAKED CEILING, PITCHED/SKILLION ROOF: STRUCTURAL PANEL >125 MM	CEILING: NIL (UP), ROOF: NONE	MEDIUM (SOLAR ABSORPTANCE O.475 - O.70)
FLAT CEILING, FLAT ROOF: STRUCTURAL PANEL >125 MM	CEILING: NIL (UP), ROOF: NONE	MEDIUM (SOLAR ABSORPTANCE O.475 - O.70)

WINDOWS AND GLAZED DOORS

THE APPLICANT MUST INSTALL THE WINDOWS, GLAZED DOORS AND SHADING DEVICES, IN ACCORDANCE WITH THE SPECIFICATIONS LISTED IN THE TABLE BELOW.
RELEVANT OVERSHADOWING SPECIFICATIONS MUST BE SATISFIED FOR EACH WINDOW AND GLAZED DOOR. THE FOLLOWING REQUIREMENTS MUST ALSO BE SATISFIED IN RELATION TO EACH WINDOW AND GLAZED DOOR:
EACH WINDOW OR GLAZED DOOR WITH STANDARD ALUMINIUM OR TIMBER FRAMES AND SINGLE CLEAR OR TONED GLASS MAY EITHER MATCH THE DESCRIPTION, OR, HAVE A U-VALUE AND A SOLAR HEAT GAIN COEFFICIENT (SHGC) NO GREATER THAN THAT LISTED IN THE TABLE BELOW. TOTAL SYSTEM U-VALUES AND SHGCS MUST BE CALCULATED IN ACCORDANCE WITH NATIONAL FENESTRATION RATING COUNCIL (NFRC) CONDITIONS FOR PROJECTIONS DESCRIBED IN MILLIMETRES, THE LEADING EDGE OF EACH EAVE, PERGOLA, VERANDAH, BALCONY OR AWNING MUST BE NO MORE THAN 500 MM ABOVE THE HEAD OF THE WINDOW OR GLAZED DOOR AND NO MORE THAN 2400 MM ABOVE THE SILL.
PERGOLAS WITH POLYCARBONATE ROOF OR SIMILAR TRANSLUCENT MATERIAL MUST HAVE A SHADING COEFFICIENT OF LESS THAN O.35. EXTERNAL LOUVRES AND BLINDS MUST FULLY SHADE THE WINDOW OR GLAZED DOOR BESIDE WHICH THEY ARE SITUATED WHEN FULLY DRAWN OR CLOSED.
PERGOLAS WITH FIXED BATTENS MUST HAVE BATTENS PARALLEL TO THE WINDOW OR GLAZED DOOR ABOVE WHICH THEY ARE SITUATED, UNLESS THE PERGOLA ALSO SHADES A PERPENDICULAR WINDOW. THE SPACING BETWEEN BATTENS
MUST NOT BE MORE THAN 50 MM. OVERSHADOWING BUILDINGS OR VEGETATION MUST BE OF THE HEIGHT AND DISTANCE FROM THE CENTRE AND THE BASE OF THE WINDOW ANDGLAZED DOOR, AS SPECIFIED IN THE 'OVERSHADOWING' COLUMN IN THE TABLE BELOW.

Window /door no.	Orientation	Area of glass inc. frame	OVERSHADOWING		SHADING DEVICE	FRAME AND GLASS TYPE
			Height (m)	Distance (m)		
W 1	S	O.732	O	O	None	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 2	W	O.732	1O	3	None	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 3	W	O.732	8	3	None	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 4	N	O.732	O	O	Eave/verandah/pergola/balcony>=900mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 5	W	3.15	O	O	Eave/verandah/pergola/balcony>=900mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 6	W	1	5	3	Eave/verandah/pergola/balcony>=600mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 7	E	O.742	2	1.3	Eave/verandah/pergola/balcony>=600mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 8	E	O.742	2	1.2	Eave/verandah/pergola/balcony>=600mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 9	E	1.68	2	1	Eave/verandah/pergola/balcony>=600mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 10	E	O.742	1.3	1.2	awning (fixed) >=900mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 11	E	1.378	1	2.7	awning (fixed)>=900mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 12	N	4.74	O	O	Eave/verandah/pergola/balcony>=900mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 13	N	3.O3	O	O	Eave/verandah/pergola/balcony>=750mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 14	W	1.51	O	O	external louvre/blind (adjustable)	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 15	E	3.47	O	O	Eave/verandah/pergola/balcony>=900mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 16	W	3.O3	O	O	external louvre/blind (Fixed)	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 17	W	O.96	O	O	externall louvre/blimd (adjustable)	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 18	S	1.51	O	O	None	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 19	S	1.73	O	O	Eave/verandah/pergola/balcony>=900mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 20	S	1.O2	O	O	Eave/verandah/pergola/balcony>=600mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 21	E	1.32	O	O	external louvre/blind (Fixed)	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 22	E	1.32	O	O	external louvre/blind (Fixed)	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 23	E	2.O4	O	O	Eave/verandah/pergola/balcony>=750mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 24	N	2.O4	O	O	Eave/verandah/pergola/balcony>=900mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 25	E	O.97	O	O	external louvre/blind (adjustable)	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 26	N	6.88	O	O	Eave/verandah/pergola/balcony>=750mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 27	W	O.97	O	O	external louvre/blimd (adjustable)	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 28	N	O.888	O	O	Eave/verandah/pergola/balcony>=900mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 29	N	O.732	O	O	externall louvre/blimd (adjustable)	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 3O	W	O.732	5	3	None	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 31	E	4.356	O	O	Eave/verandah/pergola/balcony>=900mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 32	W	6.194	O	O	Eave/verandah/pergola/balcony>=900mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 33	W	O.732	7	3	None	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 34	E	1.378	2	1	None	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 35	E	1.378	1	2.5	awning (fixed)>=900mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 36	E	3.225	O	O	Eave/verandah/pergola/balcony>=900mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)
W 37	E	4.356	O	O	Eave/verandah/pergola/balcony>=900mm	TIMBER OR UPVC, SINGLE CLEAR, (OR U-VALUE: 5.71, SHGC: O.66)

REV NO.	DESCRIPTION	

NOTE:

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Do not scale dimensions

Report discrepancies to your abode

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p/f : 9973 2756
www.yourabode.com.au

PROJECT
115 McCarrs Creek Road
CHURCH POINT

CLIENT
Murray & Beverley McKenzie

DRAWN/DESIGNED
S . R / D . P

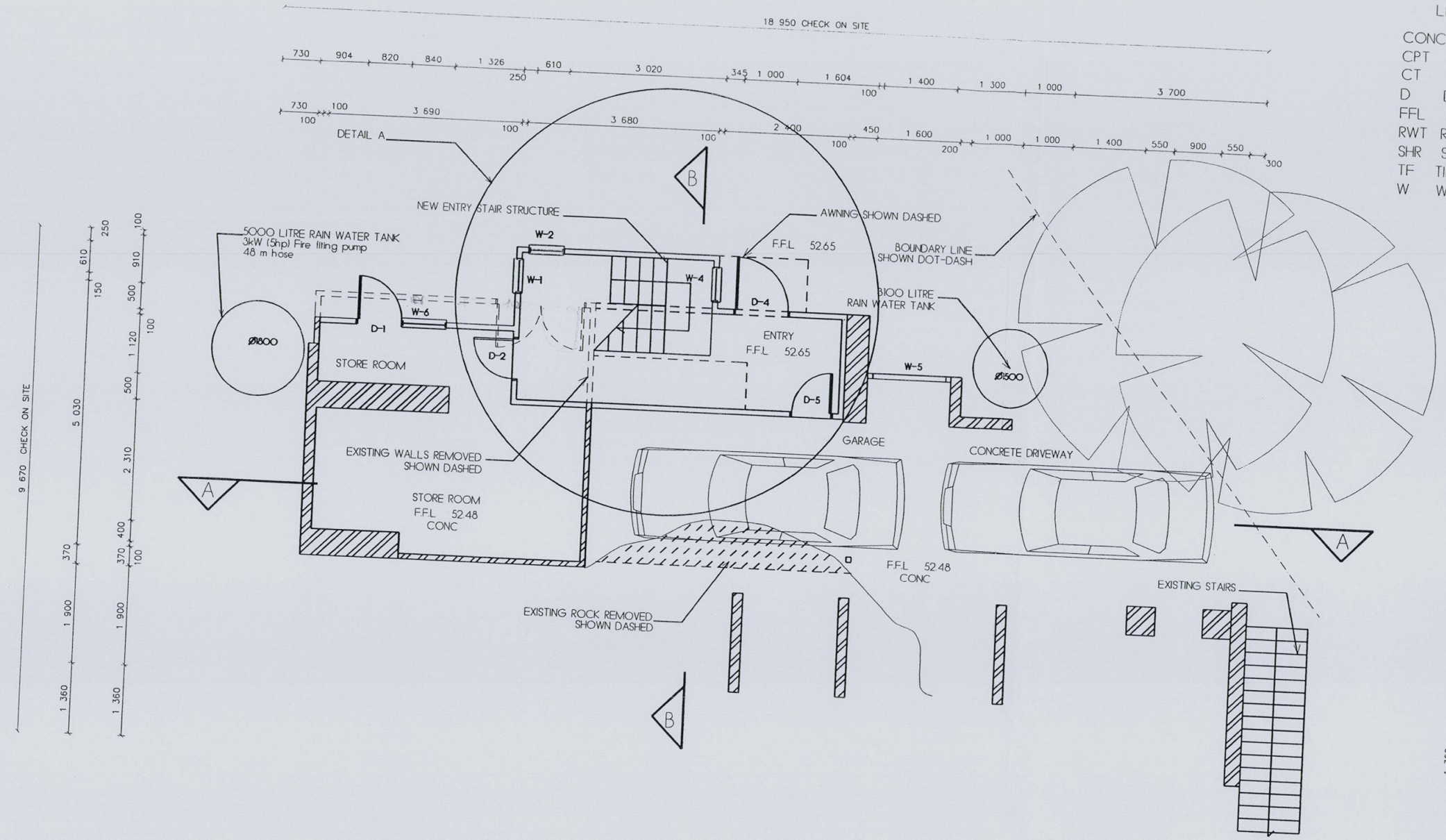
DATE
Jan O8

DRAWING
Basix requirements

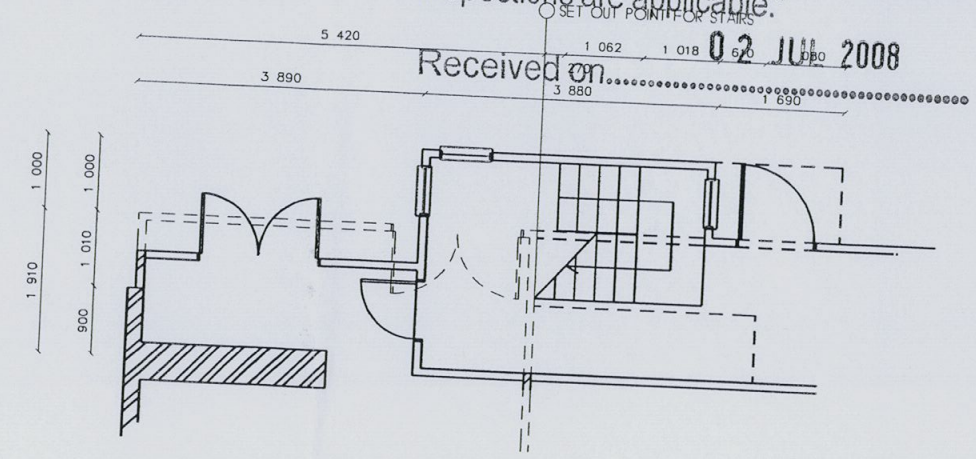
SCALE
1 : 100

DRAWING NUMBER
2006 - O15 - 10

REVISION
JULY O8-D



BASEMENT FLOOR PLAN



DETAIL A

LEGEND

CONC CONCRETE
CPT CARPET
CT CERAMIC TILES
D DOOR
FFL FINISHED FLOOR LEVEL
RWT RAINWATER TANK
SHR SHOWER
TF TIMBER FLOOR
W WINDOW

MODIFICATION OF PLANS MAY NEED A SECTION 96 & A NEW CONSTRUCTION CERTIFICATE BEFORE STARTING O ANY CHANGES

FIRE HOSE LENGHT CALCULATION

NORTH TO EAST 34.9 m — 24.8, 4.2, 5.9

EAST TO NORTH 47.5 m — 12.2, 10.5, 24.8

Fire hose length requared 48 m

PRIVATE CERTIFIERS AUSTRALIA
Construction Cert. No: Approved Date:
08007 18 NOV 2008
Certifying Authority: Grant Harrington
Accreditation No: BPB0170

"These plans form part of and are to be read in conjunction with the conditions of consent. Please make yourself aware of your legal position. Mandatory inspections are applicable."

Received on 02 JUL 2008

Coustuction to Comply with AS 3959

REV NO.	DESCRIPTION	DATE
	DELETE W-3	

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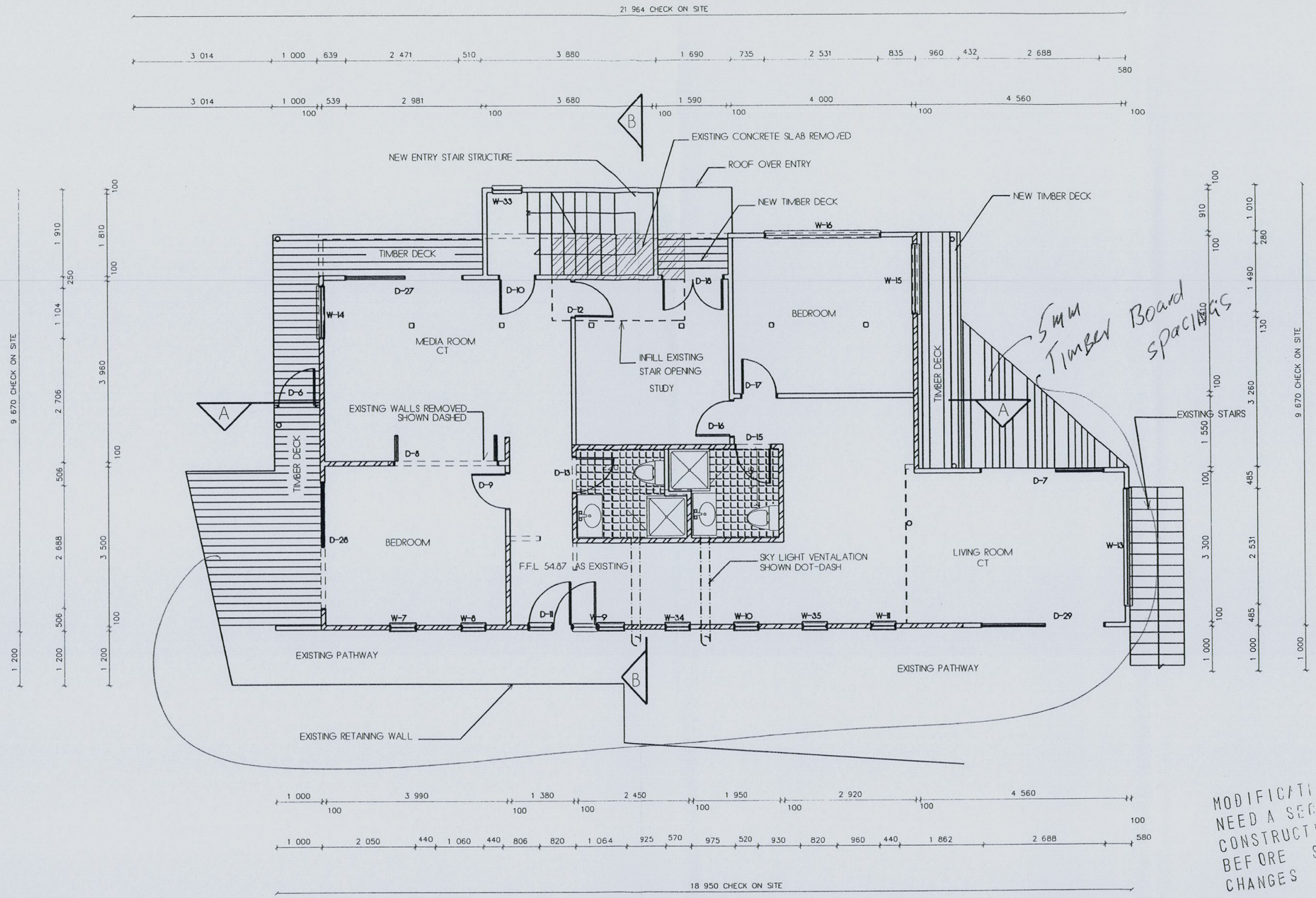
PROJECT: 115 McCarrs Creek Road, CHURCH POINT
CLIENT: Murray & Beverley McKenzie
DRAWN/DESIGNED: S.R / D.P
DATE: Jan 08
DRAWING: BASEMENT FLOOR PLAN
SCALE: 1 : 100
DRAWING NUMBER: 2006 - 015 - 02
REVISION: JUNE 08-A



LEGEND

CONC CONCRETE
CPT CARPET
CT CERAMIC TILES
D DOOR
FFL FINISHED FLOOR LEVEL
RWT RAINWATER TANK
SHR SHOWER
TF TIMBER FLOOR
W WINDOW

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EXISTING WALLS

NEW WALLS

GROUND FLOOR PLAN

Construction to comply with AS3959

REV NO.	DESCRIPTION	DATE

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PROJECT
115 McCarrs Creek Road
CHURCH POINT

CLIENT
Murray & Beverley McKenzie

DRAWN/DESIGNED
S . R / D . P

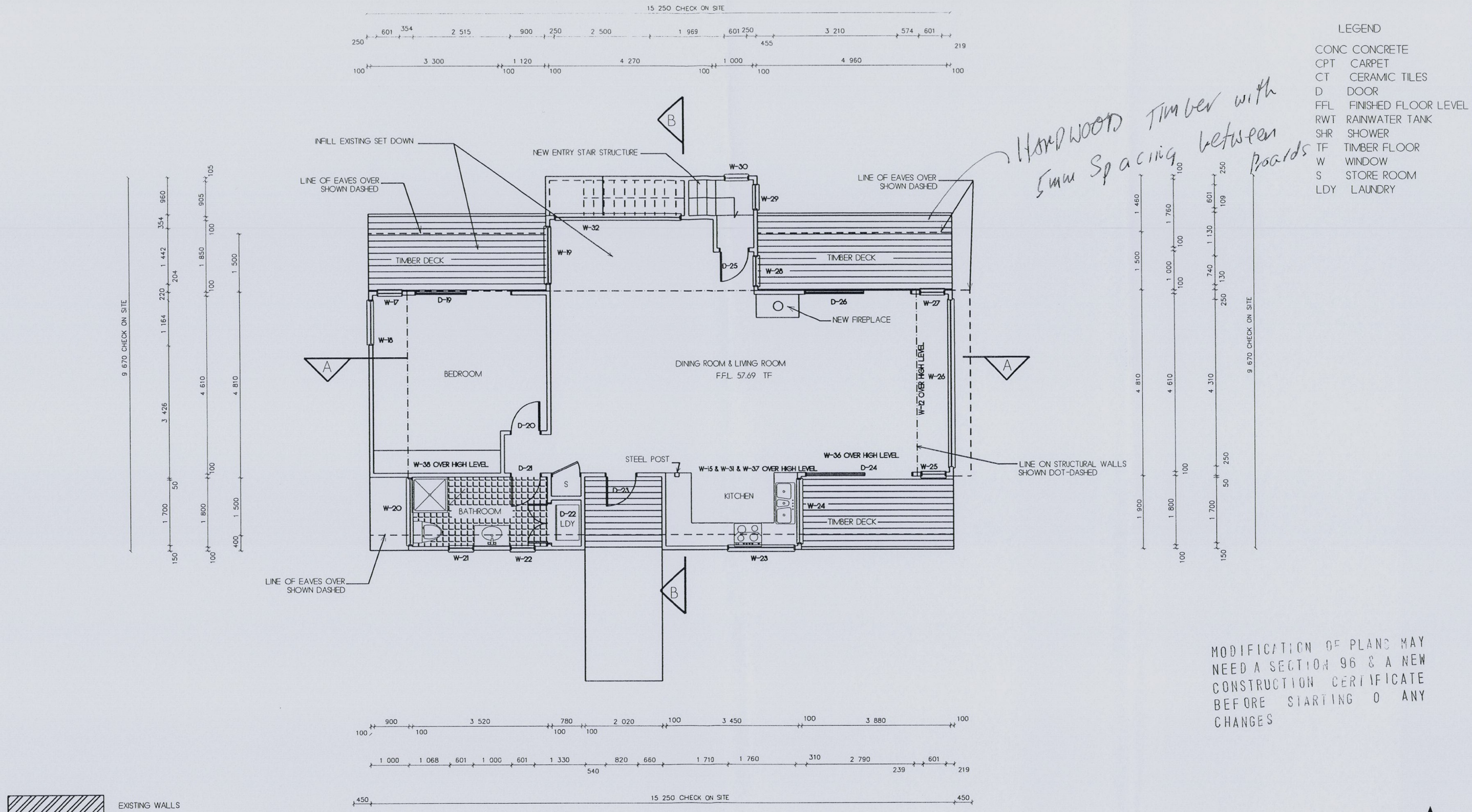
DATE
Jan 08

DRAWING
GROUND FLOOR PLAN

SCALE
1 : 100

DRAWING NUMBER
2006 - 015 - 03

REVISION



Hardwood Timber with 5mm Spacing between Boards

LEGEND

CONC	CONCRETE
CPT	CARPET
CT	CERAMIC TILES
D	DOOR
FFL	FINISHED FLOOR LEVEL
RWT	RAINWATER TANK
SHR	SHOWER
TF	TIMBER FLOOR
W	WINDOW
S	STORE ROOM
LDY	LAUNDRY

MODIFICATION OF PLANS MAY NEED A SECTION 96 & A NEW CONSTRUCTION CERTIFICATE BEFORE STARTING O ANY CHANGES

FIRST FLOOR PLAN

Construction to Comply with AS1684

REV NO.	DESCRIPTION	DATE
	CHANGING SIZE OF D-19 TO HAVE 900mm WALL SUPORT	

NOTE

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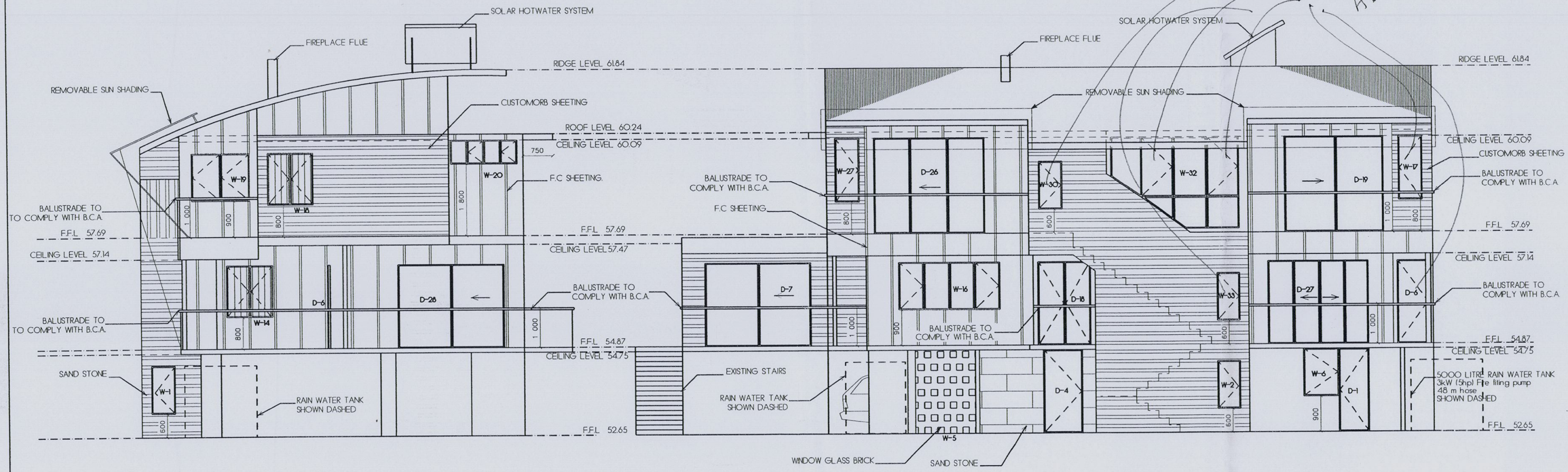
PROJECT	CLIENT	DRAWN/DESIGNED	DATE
115 McCarrs Creek Road CHURCH POINT	Murray & Beverley McKenzie	S.R / D.P	Jan 08
	DRAWING: FIRST FLOOR PLAN / SCALE: 1 : 100	DRAWING NUMBER: 2006 - 015 - 04	REVISION: JUNE 08-A



Check Bushfire Screen ABILITY TO FIX

SOUTH ELEVATION

WEST ELEVATION

MODIFICATION OF PLANS MAY NEED A SECTION 96 & A NEW CONSTRUCTION CERTIFICATE BEFORE STARTING O ANY CHANGES

Construction to Comply with AS3959

REV NO.	DESCRIPTION	DATE

NOTE:

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Report discrepancies to your abode

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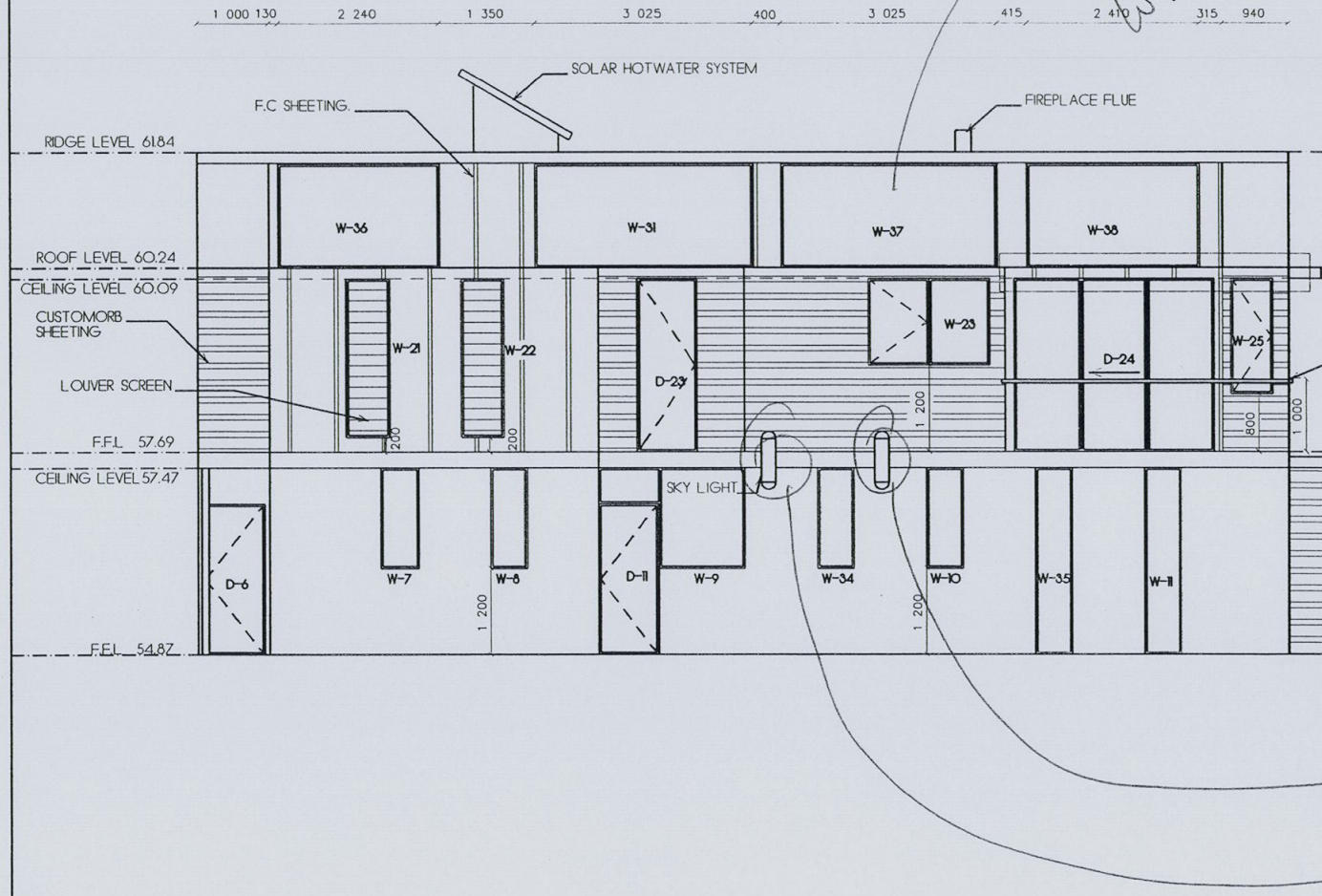
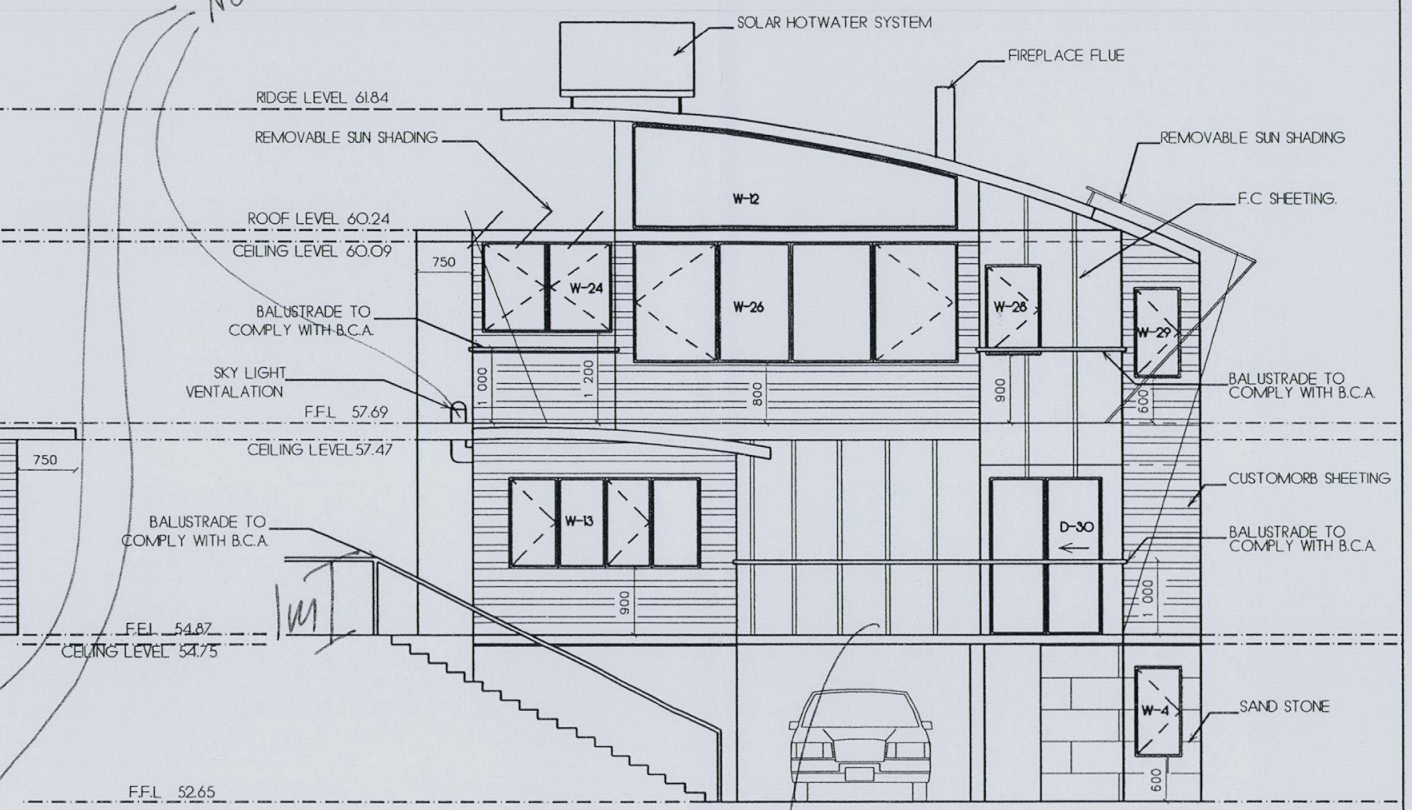
PROJECT: 115 McCarrs Creek Road CHURCH POINT	CLIENT: Murray & Beverley McKenzie	DRAWN/DESIGNED: S.R / D.P	DATE: Jan 08
	DRAWING: SOUTH & WEST ELEVATIONS	SCALE: 1 : 100	DRAWING NUMBER: 2006 - 015 - 05
			REVISION: JUNE 08-A

Toughened GLASS to ALL windows

Non combustible: AS 3959



EAST ELEVATION



NORTH ELEVATION

No openings Greater than 125mm

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Construction to comply with AS 3959

REV NO.	DESCRIPTION	DATE

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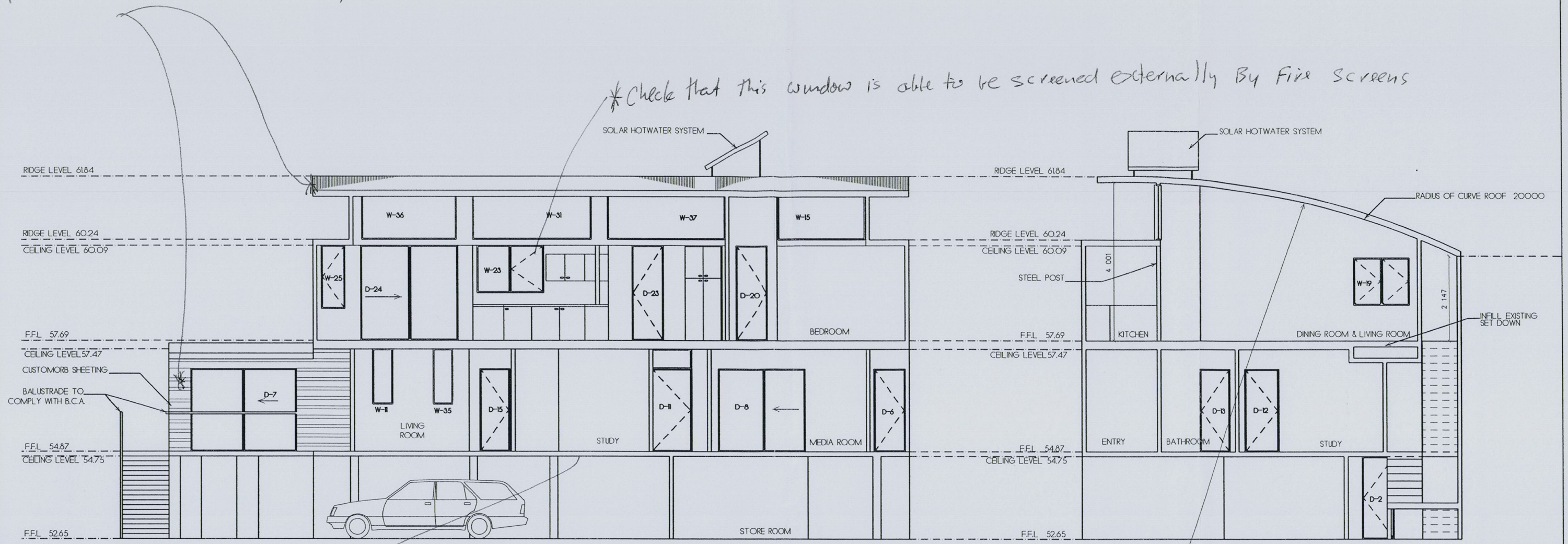
PROJECT	CLIENT	DRAWN/DESIGNED	DATE
115 McCarrs Creek Road CHURCH POINT	Murray & Beverley McKenzie	S.R / D.P	Jan 08
	DRAWING: NORTH & EAST ELEVATIONS — SCALE: 1 : 100	DRAWING NUMBER: 2006 - 015 - 06	REVISION

All Custom ORB end capings to have mineral wool to Prevent ember penetration



*Windows shown on the devices to be NON combustible.

BASIX certificate AS Required to be fitted with shading

SECTION A_A

SECTION B_B

Any Exposed floor to be non combustible to AS 3959-1999

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Construction to Comply with AS 3959.

REV NO.	DESCRIPTION	DATE

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115 McCarrs Creek Road
CHURCH POINT

CLIENT
Murray & Beverley McKenzie

DRAWN/DESIGNED
S.R / D.P

DATE
Jan 08

DRAWING
SECTIONES A-A & B-B

SCALE
1:100

DRAWING NUMBER
2006 - 015 - 07

REVISION

PCA
PRIVATE CERTIFIERS AUSTRALIA

Address	Suite 1a / 226 Condamine Street PO Box 907 Balgowlah Manly Vale NSW 2093
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Fax	02 9907 6344
Email	grant@pcaservices com au

NOTICE OF APPOINTMENT OF PRINCIPAL CERTIFYING AUTHORITY

Made under Part 4 of the Environmental Planning and Assessment Act 1979 Sections 81A(2)(b1)(i) & 86(1)(a1)(i)

OWNER DETAILS

Name of person having benefit of the development consent	Murray McKenzie
Address	115 McCarrs Creek Road Church Point NSW 2105
Contact Details	**Phone** xx

RELEVANT CONSENTS

Consent Authority/Local Government Area	Pittwater Council
Development Consent No	N0036/08 **Date issued** 16/05/2008
Construction Certificate Number 080067	**Date issued** 18/11/2008

PROPOSAL

Address of Development	115 McCarrs Creek Road Church Point NSW 2105
Scope of building works covered by this Notice	Alterations and Additions

PRINCIPAL CERTIFYING AUTHORITY

Certifying Authority	Grant Harrington
Accreditation Body	Building Professionals Board
	Registration No DPNR ACC BPB0170

The owner has appointed Grant Harrington as the Principal Certifying Authority as stated in the Construction Certificate Application lodged with Private Certifiers Australia for the building works identified in this Notice

I Grant Harrington Accredited Building Surveyor of Private Certifiers Australia located at Suite 1a / 226 Condamine Street PO Box 907 Balgowlah Manly Vale NSW 2093 accept the appointment as the Principal Certifying Authority for the building works identified and covered under the relevant Construction Certificate as stated in this Notice

Dated 18/11/2008

Grant Harrington
Principal Certifying Authority