

22 NOV 2004

The General Manager
Pittwater Council
PO Box 882
MONA VALE NSW 1660

Dear Sir/Madam

1148-1152 BARRENJOEY ROAD, PALM BEACH
DEVELOPMENT APPLICATION NO. N1232/00
CONSTRUCTION CERTIFICATE NO. 24-655

City Plan Services have 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. CC 24-655
- Copy of application for Construction Certificate.
- Documentation used to determine the application for the Construction Certificate as detailed in Schedule 1 of the certificate.
- Notice of Appointment of Principal Certifying Authority.
- 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 Project Building Surveyor Brendan Bennett on 8270-3500.

Yours Sincerely,



Brendan Bennett
Managing Director
encl

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)

PROPOSAL

Address of land on which the work is to be carried out:

**1148-1152 Barrenjoey Road,
Palm Beach (Site 3)**

Description of building works covered by this Notice:

Excavation/ Stabalisation Works

APPLICANT

Name of person having benefit of the development consent:

Raypond P/L

Address:

PO Box 1346 Dee Why 2099

Contact Details:

Phone: 0412 226 044

Fax: 9944 0316

The applicant has appointed Brendan Bennett as the Principal Certifying Authority as stated in the Construction Certificate Application lodged with City Plan Services for the building works identified in this Notice.

RELEVANT CONSENTS

Development Consent No:

N1232/00

Date of Development Consent:

24.01.02

Construction Certificate No:

CC 24655

Date of Construction Certificate:

2 2 NOV 2004

CERTIFYING AUTHORITY

**Brendan Bennett for and on behalf of
City Plan Services**


ACCREDITATION BODY

**Planning Institute Australia NSW
Accreditation Scheme
Registration No. 3004**

That I, Brendan Bennett, of City Plan Services located at Level 1, 364 Kent Street, Sydney 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.

2 2 NOV 2004

DATED THIS


Brendan Bennett
Director

1148-1152 Barrenjoey Road, Palm Beach
Construction Certificate No. 24655

CONSTRUCTION CERTIFICATE NO. 24655

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

APPLICANT

Name of person having benefit of the development consent: **Raypond P/L**
Address: **PO Box 1346 Dee Why 2099**
Contact Details: **Phone: 0412 226 044 Fax: 9944 0316**

OWNER

Name: **Raypond P/L**
Address: **PO Box 1346 Dee Why 2099**
Contact Details: **Phone: 0412 226 044 Fax: 9944 0316**

DEVELOPMENT CONSENT

Consent Authority/Local Government Area: **Pittwater Council**
Development Consent No: **N1232/00**
Date of Development Consent: **24.01.02**

PROPOSAL

Address of land on which the work is to be carried out: **1148-1152 Barrenjoey Road, Palm Beach (Lot 4)**
Building Classification: **Class 1a**
Type of Construction: **N/A**
Scope of building works covered by this Notice: **Excavation/Stabalisation Works**
Value of Construction Certificate (Incl GST): **\$650,000.00**
Plans and Specifications approved: **Schedule 1**
Fire Safety Schedule: **N/A**
Critical stage inspections: **See attached Notice**
Exclusions: **Construction of dwelling**
Conditions (Clause 187 or 188 of the Environmental Planning & Assessment Regulation 2000): **Nil**

PROJECT BUILDING SURVEYOR

Please contact **Brendan Bennett** for any inquiries

CERTIFYING AUTHORITY

Brendan Bennett for and on behalf of **City Plan Services Pty Ltd**

ACCREDITATION BODY

Planning Institute Australia NSW Accreditation Scheme
Registration No. 3004

That I, Brendan Bennett, 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

22 NOV 2004

Brendan Bennett
Managing Director

NB: Prior to the commencement of work S81A(2)(b)(i) and (ii) and (b2)(i) and (ii) and (iii) and (c) of the Environment Planning and Assessment Act 1979 must be satisfied.

SCHEDULE 1 APPROVED PLANS AND SPECIFICATIONS

1. Endorsed Bushland Management plans prepared by Urban Bushland Management Consultants Pty Ltd

Plan Title	Drawing No	Revision	Date
Native Vegetation under 3m and Weed assessment	Diagram A	-	-
Revegetation and regeneration zones	Diagram B	-	-

2. Endorsed landscape plan prepared by Selena Hannan Landscape Design

Plan Title	Drawing No	Revision	Date
Landscape Plan	LP11	A	11.11.04

3. Approved Council plans prepared by Crone Associates

Plan Title	Drawing No	Revision	Date
On-Site Detention Tank DT3 Plan & Drainage Details	C17	C	23.08.04
Drainage Plan	C14	B	09.09.04

4. Endorsed stormwater plans prepared by Northern Beaches Consulting Engineers P/L

Plan Title	Drawing No	Revision	Date
Site plan	ADA4 0100	C	16.10.00
Floor plans – Sheet 1	ADA4 1001	B	16.10.00
Floor plans – Sheet 2	ADA4 1002	B	16.10.00
Floor plans – Sheet 3	ADA4 1003	B	16.10.00
Site coverage	ADA4 1701	-	16.10.00
Elevations	ADA4 2001	B	29.09.00
Sections	ADA4 3001	B	30.10.00

5. Endorsed structural plans prepared by Northern Beaches Consulting Engineers P/L

Plan Title	Drawing No	Revision	Date
General Notes & Drawing Index	S01	-	Aug 2003
Level 1 – Footing, Slab Plan & Details	S02	-	Aug 2003
Level 1 – Footing and slab detail sheet	S03	-	Aug 2003
Level 2 – Slab framing and reinforcement plans	S04	-	Aug 2003
Level 2 – Slab detail sheet	S05	-	Aug 2003
Level 4 – Floor framing plan and miscellaneous details	S07	-	Aug 2003
Level 4 – Upper roof framing plan and details	S08	-	Aug 2003

6. Other documents relied upon

Title	Prepared By	Reference	Date
Long Service Levy Receipt		-	22.11.04
CC Application form	Darren Leete	-	16.11.04
Letter of seed collection	GIS Environmental Consultants		25.01.02
Natural Resources Unit and Landscape Site Inspection	Pittwater Council		10.11.04
Conditions of consent letter	Raypond Pty Ltd	-	15.11.04
Proposed Method Statement for Excavation	Douglas Partners	35515C	16.03.04
Conditions of Consent Letter	Selena Hannan Landscape Design	-	13.11.04
Stormwater, sitation and sediment control and structural design certificate	Northern Beaches consulting engineers	030705	15.11.04
Pre-Construction Arboricultural Assessment	Urban Forestry Australia	-	November 2004
Construction Management Plan	Raypond Pty Ltd	-	16.11.04
Landscape Softworks Specification	Selena Hannan Landscape Design	-	November 2004
Bushland Management Plan	Urban Bushland Management Consultants	-	12.11.04

NOTICE TO APPLICANT OF CRITICAL STAGE INSPECTIONS

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

PROPOSAL

Address of land on which the work is to be carried out: **1148-1152 Barrenjoey Road,
Palm Beach (Lot 4)**

Description of building works covered by this Notice: **Excavation/ Stabalisation Works**

APPLICANT

Name of person having benefit of the development consent: **Raypond P/L**

Address: **PO Box 1346 Dee Why 2099**

Contact Details: **Phone: 0412 226 044 Fax: 9944 0316**

RELEVANT CONSENTS

Development Consent No: **N1232/00**

Date of Development Consent: **24.01.02**

Construction Certificate No: **CC 24-655**

Date of Construction Certificate: **22 NOV 2004**

INSPECTION TELEPHONE NUMBER

Please telephone the following number to book a critical stage inspection: **Ph8270 3500**

A minimum period of 48 hours is to be provided

CERTIFYING AUTHORITY

Brendan Bennett for and on behalf of CPS

ACCREDITATION BODY

**Planning Institute Australia NSW
Accreditation Scheme
Registration No. 3004**

MANDATORY CRITICAL STAGE INSPECTIONS

That I, Brendan Bennett, of City Plan Services located at Level 1, 364 Kent Street, Sydney 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)(iii) 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 THIS

22 NOV 2004


Brendan Bennett
Managing Director

B1	Construction Mangement Plan Prepared by Raypond Pty Ltd
B2	Bushland Management Plan Report prepared by Urban Bushland Management Consultants
	Landscape Plan prepared by Selena Hannan Landscape Design
B4	GIS Environamental Seed Collection letter
B5	Landscape Plan prepared by Selena Hannan Landscape Design
B7	Letter of evidence of site inspection by an officer from Natural resources and a Pittwater Council Landscape officer
	Landscape Plan prepared by Selena Hannan Landscape Design
B8	Pre construction arborcultural assessment prepared by Urban Forestry Australia
	Letter of evidence of site inspection by an officer from Natural resources and a Pittwater Council Landscape officer
B15	Bushland Management Plan Report prepared by Urban Bushland Management Consultants
B15a	Bushland Management Plan Report prepared by Urban Bushland Management Consultants
	Bushland Management Plans prepared by Urban Bushland Management
B16	Pre construction arborcultural assessment prepared by Urban Forestry Australia
	Landscape Plan prepared by Selena Hannan Landscape Design
B17	Bushland Management Plan Report prepared by Urban Bushland Management Consultants
	Landscape Plan prepared by Selena Hannan Landscape Design
B18	Bushland Management Plan Report prepared by Urban Bushland Management Consultants
	Pre construction arborcultural assessment prepared by Urban Forestry Australia
	Landscape Plan prepared by Selena Hannan Landscape Design
B19	Stormwater, siltation & sediment control and structural engineering design compliance letter prepared by Northern Beaches Consulting Engineers
	Stormwater plans prepared by Northern Beaches Consulting Engineers
B20	Stormwater, siltation & sediment control and structural engineering design compliance letter prepared by Northern Beaches Consulting Engineers
	Stormwater plans prepared by Northern Beaches Consulting Engineers
B22	Bushland Management Plan Report prepared by Urban Bushland Management Consultants
	Bushland Management Plans prepared by Urban Bushland Management
B23	Bushland Management Plan Report prepared by Urban Bushland Management Consultants
	Pre construction arborcultural assessment prepared by Urban Forestry Australia
B24	Landscape Plan prepared by Selena Hannan Landscape Design
B27	Landscape Plan prepared by Selena Hannan Landscape Design
B28	Landscape Plan prepared by Selena Hannan Landscape Design
B29	Stormwater plans prepared by Northern Beaches Consulting Engineers
B45	Landscape Plan prepared by Selena Hannan Landscape Design
B45a	Landscape Plan prepared by Selena Hannan Landscape Design
B60	Stormwater, siltation & sediment control and structural engineering design compliance letter prepared by Northern Beaches Consulting Engineers
B60a	Stormwater, siltation & sediment control and structural engineering design compliance letter prepared by Northern Beaches Consulting Engineers
	Structural Plans stamped by Douglas Partners
B61	Stormwater, siltation & sediment control and structural engineering design compliance letter prepared by Northern Beaches Consulting Engineers
	Letter of excavation method by Douglas Partners
B61a	Letter NBC
B62	To be covered in CC2
B63	To be covered in CC2

FAXED

LEVY PAYMENT FORM

FORM NO.

OFFICE USE ONLY

DETAILS OF PERSON/COMPANY/ORGANISATION LIABLE TO PAY

PLEASE PRINT ALL DETAILS USING CAPITALS

Name (if person) **ZATPOND P/L**
 Company/Organisation name
 Names (if person)
 If applicable
 L ADDRESS **PO BOX 1364**
 and street or PO Box **DEE WAY**
 Suburb **NSW** Postcode **2099** Bus. hours phone **0412226049**

ADDRESS OF BUILDING TO BE INSTALLED

Number and street **1148 BARRENJOEY PI**
 Suburb **PALM BEACH**
 State **NSW** Postcode **2108**
 Estimated start date **19 M 11 Y 2004** Estimated finish date **19 M 1 Y 2005**

DETAILS OF WORK - To be completed by consenting/certifying authority with whom plans lodged for approval

Council Area **PITWATER**
 CC/DC No. **1232/00**
 Estimated value **\$ 750,000.00** Levy payable **\$ 750,000.00**
 Work (see note on back)
 You have provided a CC above, please provide DA number here **24-655**

Signature of Officer/Private Certifier **Graef Herringto** Date **19 M 11 Y 2004**
 Business hours phone **22003522**

D - DETAILS - To be completed by Dept/Authority where applicable - see reverse

Department/Authority
 Contract/DA No (circle which)
 Contract amount \$
 payable
 Contact person (Print)
 Contact person (Signature)
 Phone number
 Date

E - DECLARATION - To be signed by person liable to pay/levy or authorised officer of company/organisation

False or misleading information provided on this form may result in prosecution under Section 58A.
 I hereby declare that the information provided on this form is true and correct to the best of my knowledge
 Signature **DARREN LEETE** Date **16 M 11 Y 2004**

F - TO BE COMPLETED WHERE APPLICABLE - SEE REVERSE

Competition Approval Certificate No.

CONSTRUCTION CERTIFICATE APPLICATION

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

IDENTIFICATION OF BUILDING

Address 1148-1152 BARRENSDEY RD

Lot, DP/MPS etc 4

Suburb or town PALM BEACH Post Code

DESCRIPTION OF DEVELOPMENT

Detailed Description:

EXCAVATION / CIVIL WORKS

APPLICANT

Name DARREN LEE Company RAYMOND P/L

Address P.O. Box 1364

Suburb or town DEE WHY Post Code 2099

Phone B/H Fax No 9944 0316

Mobile 0412 226044 Email darrenlee@ozemail.com.au

As the applicant, I/we hereby submit this Construction Certificate Application under the *Environmental Planning & Assessment Act 1979*, with City Plan Services Pty Ltd.

Signature of applicant:

Sign [Signature] Date 16/11/04

CONSENT TO ALL OWNER(S)

Name Company RAYMOND P/L

Address CF PO Box 1364

Suburb or town DEE WHY Post Code 2099

Phone B/H Fax No 9944-0316

Mobile Email darrenlee@ozemail.com.au

As the owner of the above property:

- I/we consent to this application; and
- I/we appoint Brendan Bennett of City Plan Services Pty Ltd as the Principal Certifying Authority for the building work identified in this application.

Signature of Owner

Sign [Signature] Date 16/11/04

VALUE OF WORK

Estimated Cost of work:

\$

\$

GST:

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.

Date of Determination

Date

BUILDING CODE OF AUSTRALIA BUILDING CLASSIFICATION

Nominated on the Development Consent

Class

RESIDENTIAL BUILDING WORK

Relevant only to residential building work

Owner-builder Permit No.

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.

Module 1 information to be
lected for ABS Particulars of the proposal

DESCRIPTION

What is the area of the land (m²) _____

Gross floor area of existing building (m²) _____

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

(If vacant state vacant) _____

Location	Use
_____	_____
_____	_____

Does the site contain a dual occupancy? _____

What is the gross floor area of the proposed addition or new building (m²) _____

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

Location	Use
_____	_____

Number of pre-existing dwellings _____

Number of dwellings to be demolished _____

How many dwellings are proposed? _____

How many storeys will the building consist of? _____

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/ masonry	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

Schedule 2 – Existing Essential Fire Safety Measures
Part 1 of 2

Item No.	Existing Measure	Is this measure installed in the Building? Yes / No	If yes, enter the current standard of performance (eg: ORD 70 Clause 19.2 or BCA Clause E1.5 & AS 2118.1-1999)
	Access Panels, doors and hoppers to fire resisting shaft		
	Automatic fail safe devices		
	Automatic fire detection and alarm system		
	Automatic fire suppression system (sprinkler)		
	Automatic fire suppression system (others – specify)		
	Emergency lighting		
	Emergency lifts		
	Emergency warning and intercommunication system		
	Exit signs		
0	Fire control centres and rooms		
1	Fire dampers		
2	Fire doors		
3	Fire hydrant systems		
4	Fire seals (protecting openings in fire resisting components of the building)		
5	Fire shutters		
6	Fire windows		
7	Hose reel system		
8	Light weight construction		
9	Mechanical air handling systems		
20	Paths of travel stairways passageways or ramps		
21	Perimeter vehicle access for emergency vehicles		
22	Portable fire extinguishers		
23	Pressurising system		
24	Required (automatic) exit doors		
25	Safety curtains in proscenium openings		
26	Smoke and Heat Vents		
27	Smoke Control System		
28	Smoke dampers		
29	Smoke detectors and heat detectors		
30	Smoke doors		
31	Solid-Core doors		
32	Stand-By Power Systems		
33	Wall wetting sprinkler and drencher systems		
34	Warning and operational signs		
35	OTHERS - Specify		

This is an accurate statement of all existing Fire Safety Measures implemented in the whole building.

Signed (Owner/ Agent) Name Date

Schedule 3 – Proposed Essential Fire Safety Measures
Part 2 of 2

Proposed New Measure	Is this measure Installed in the Building? Yes or No	If yes, enter the current standard of performance (eg: BCA Clause E1.5 & AS2118.1-1999)
Access Panels, doors and hoppers to fire resisting shaft		
Automatic fail safe devices		
Automatic fire detection and alarm system		
Automatic fire suppression system (sprinkler)		
Automatic fire suppression system (others – specify)		
Emergency lighting		
Emergency lifts		
Emergency warning and intercommunication system		
Exit signs		
Fire control centres and rooms		
Fire dampers		
Fire doors		
Fire hydrant systems		
Fire seals (protecting openings in fire resisting components of the building)		
Fire shutters		
Fire windows		
Hose reel system		
Light weight construction		
Mechanical air handling systems		
Paths of travel stairways passageways or ramps		
Perimeter vehicle access for emergency vehicles		
Portable fire extinguishers		
Pressurising system		
Required (automatic) exit doors		
Safety curtains in proscenium openings		
Smoke and Heat Vents		
Smoke Control System		
Smoke dampers		
Smoke detectors and heat detectors		
Smoke doors		
Solid-Core doors		
Stand-By Power Systems		
Wall wetting sprinkler and drencher systems		
Warning and operational signs		
OTHERS - Specify		

is an accurate statement of all proposed Fire Safety Measures to be installed/ modified in the whole building.

ed (Owner/ Agent) Name Date

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.

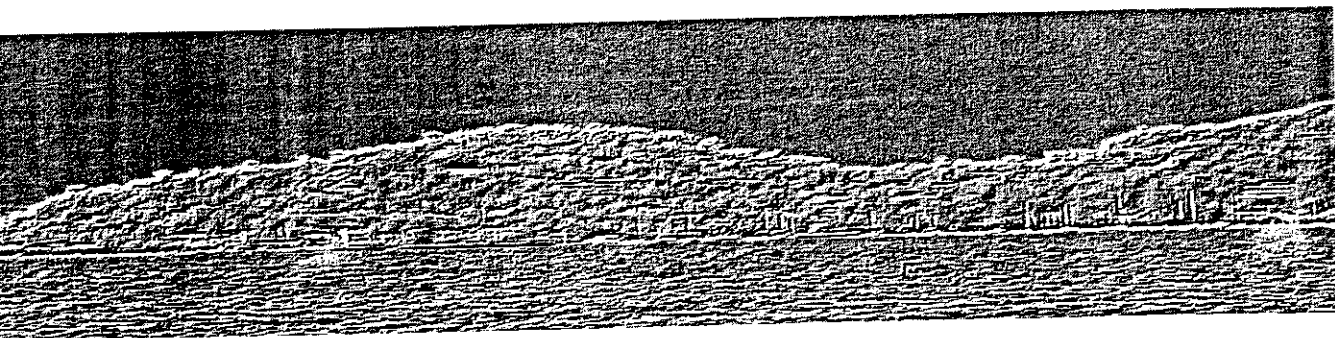
Note 2

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.



CONSTRUCTION MANAGEMENT PLAN
for
HOUSE 4
OBSERVATION POINT
at
1148-1152 Barrenjoey Road
56 Palm Beach Road
Palm Beach

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Revision History

Revision	Date	Comment
Draft	23 August 2002	Draft issued for comment
0	24 September 2002	Issued to Client
A	19 November 2002	Issued for Council submission
B	16 November 2004	issued for House 4

16-11-2004

1.0 INTRODUCTION

1.1 Purpose

The following Construction Management Plan (CMP) has been prepared by the owner Raypond Pty Ltd. It is provided at the request of Council and sets out the approach for the management of the works for the erection of A dwellings at 1148 – 1152 Barrenjoey Road, and 56 Palm Beach Road, Palm Beach.

This plan is proposed to satisfy Condition B4 of Development Consent No. N1232/00 dated 24 JANUARY 2002 which grants approval for the construction of a dwelling at 1148 Barrenjoey Road Palm Beach.

The plan will outline other documents to be considered and implemented in conjunction with this plan, the sequence of works, and material delivery, handling and storage.

A further Construction Management Plan shall be developed by the successful building contractor, in consultation with Council and/or the independent certifier.

1.2 Controls

The following documents have been considered in the preparation of this construction management plan;

- ~~URBAN BUSHLAND MANAGEMENT CONSULTANTS P/L~~ NOV 2004
~~Bushland Management Plan (Dated September 2004) by Footprint Green~~
- Geotechnical Report (December 2000) by Shirley Engineering
- Geotechnical Site Investigation Report (29 July 2002) by Shirley Engineering
- Approved DA Consent No. N1232/00 to be issued by Pittwater Council on 24 January 2002.
- Landscape Works Specification (Dated ~~September~~ NOV 2004) by Selena Hannan Landscape Design
- Hydraulic Engineers temporary & permanent stormwater drainage works by Northern Beaches Engineers.
- Hydraulic Engineers Soil & Erosion Control Plan by Northern Beaches Engineers.
- Civil drawings by Northern Beaches Engineers.
- Sewerage diagram by Michael Bell & Partners.
- Architectural Drawings prepared by Crone Associates.

1.3 Final Setout Plan

The final setout plan is attached in Appendix 1.

2.0 STAGING

2.1 Sequence

Site establishment will require final surveying and identification of trees to be removed and the erection of all exclusion fencing of areas to remain undisturbed during the works. The site appointed arborist shall certify the erection of the protective fencing prior to the commencement of any other works.

Site procurement works shall be undertaken such as the provision of a site shed for staff, an ablution block and temporary power. The location of these facilities shall be in accordance with the plan to be prepared by the successful tenderer and submitted to Council prior to commencement of works.

Existing services shall be surveyed to determine if any services diversions are to occur to facilitate the proposed works. Any service diversion works shall be programmed as a specific task and where possible and practicable shall be undertaken prior to the commencement of any other works. Disruption to services shall be kept to a minimum and where necessary as a last resort temporary services shall be provided to maintain the provision of the utility.

The construction of the driveway including the associated earthworks will be the first stage of the works and will be used for the main point of access during construction.

2.2 Construction Programme

The successful contractor shall provide a detailed construction programme that shall identify time allocation to each task involved in this process and the sequencing of the tasks.

2.3 Construction Methodology Statement

A detailed Construction Methodology Statement shall be provided by the successful contractor that shall stipulate the process involved in each task.

2.4 Construction Working Hours

The hours of construction are restricted to between the hours of 7.00am and 5.00pm Monday – Friday and 7.00am to 1.00pm on Saturdays. No works are to be carried out on Sunday or Public Holidays.

Construction works to the public road shall be undertaken outside peak traffic periods and in strict accordance with the requirements of the Roads & Traffic Authority requirements.

3.0 MATERIALS – DELIVERY AND HANDLING

3.1 Site Access

All suppliers and subcontractors shall be notified of the intended route for offsite and onsite traffic. The supply of materials to the site shall be strictly controlled to minimize the storage.

Materials will generally be delivered via the driveway access from Palm Beach Road. All vehicular traffic is to enter & leave the site in a forward direction, with the exception of heavy delivery vehicles and during initial excavation phase. The construction access to the site shall be via the approved driveway only.

A temporary concrete pump shall be located just beyond the driveway widening when required allowing concrete trucks to reverse from Palm Beach Road into the driveway crossing.

Other materials can be unloaded in a similar manner with delivery vehicles reversing into the base of the driveway. All delivery vehicles shall be co-ordinated with the site manager. Traffic management strategies shall be implemented during the delivery of heavy materials or concrete that would require reversing onto the site. Queuing of delivery vehicles shall not be permitted within 100m of the intersection between Palm Beach Road & Barrenjoey Road.

All vehicles leaving the site shall have any clay or debris removed from the wheels in accordance with the Erosion & Sediment Management Plan.

3.2 Materials Storage & Handling

Three options to move the materials up the site exist and the successful tender will confirm their preferred option. (alternatively any other low impact method proposed by a successful contractor)

These options include the use of a small utility to run materials up and down the driveway, the usage of four wheel ride-on front loading wheel borrows, or the erection of a lightweight boom crane positioned near house 2 to lift materials from the delivery location and place them directly on the individual driveway zones in front of each dwelling proposed for materials holding.

As described it is proposed to store materials on the individual driveway crossing for each dwelling, and later in the garages of each dwelling. This process is to be confirmed by the successful contractor.

No storage of building materials, waste, excavated fill or topsoil storage shall occur within the drip line of trees. All storage of materials shall occur within the designated locations. The site manager shall be responsible to supervise and enforce this requirement.

3.3 Site Shed & Facilities

The site shed shall be positioned on the existing disturbed zone at the top of the driveway during the construction of the driveway or any other location as set out on drawing required by Section 2.1 of this report. Site toilets shall be provided between dwellings 2 – 3 and one between dwellings 1 – 4 at the edge of driveway and within identified disturbance zones.

3.4 Contractor Parking

There will be opportunity for contractors to use the proposed visitor spaces and available space on the driveway crossing outside each dwelling not used for materials storage. Parking opportunities also exists further along Palm Beach Road and down at the community carpark approximately 150m from the site.

Due to the complex nature of the site, sub-contractors will be strategically co-ordinated on site, potentially limiting numbers on site, thus minimising impact of tradesmen's vehicles. Most should be accommodated on site.

4.0 SITE RESPONSIBILITY

The following people have responsibility for the effective implement the Construction Management Plan;

Applicant	Company:	Raypond Pty Ltd
	Contact :	Darren Leete
	Address;	PO Box 1364
	Numbers	0412 226 044
		Fx 9944 0316

Architect Company: Crone Nation Architects
 Contact: Simon Thorne
 Address: Level 2, 364 Kent Street, Sydney NSW 2000
 Numbers: Ph 8295 5300
 Fx 8295 5301

Structural Engineer Company: NBC
 Contact: Rick Wray
 Address; 207/30 Fisher Road, Dee Why NSW 2099
 Numbers Ph 9984 7000
 Fx 9984 7444

Geotechnical Engineer Company: Douglas & Partners
For Works Contact: John Braybrooke
 Address; 96 Hermitage Road West Ryde NSW 2144
 Numbers Ph 9809 0666
 Fx 9809 4095

Arborist Company: Urban Forestry Australia
 Contact: Catronia Mackenzie
 Address; PO BOX 151, Newport NSW 2106
 Numbers Ph 9918 9833
 Fx 9918 9844

Traffic Consultant Company: John Hewitt Traffic Planning Assoc
 Contact: John Hewitt
 Address; 7 Vincent Pl, Davidson NSW 2085
 Numbers Ph 9451 2629
 Fx 9453 3349

Traffic Management Company: HVS Services
Consultant Contact: Bill Ralston
 Address; 11 Arkley St Bankstown NSW 2200
 Numbers Ph 9790 5077
 Fx 9790 6799

Environ Consultant	Company:	JBMC Footprint Green
	Contact:	Mark Couston JUDY RAWLINSON
	Address:	5 Watkins Road, Avalon NSW 2107 111 SHOWGROUND RD,
	Numbers	Ph 0018-8877 9894-2255 CASTLE HILL NSW 2154 Fx 0018-8876 9894 2215
Driveway Contractor	Company:	To be advised
	Contact:	XXXXXXXXXX
	Address:	XXXXXXXXXXXXXXXXXX
	Numbers	XXXXXXXXXX XXXXXXXXXX
Driveway Contractor (Site Manager)	Company:	To be advised
	Contact:	XXXXXXXXXX
	Address:	XXXXXXXXXXXXXXXXXX
	Numbers	XXXXXXXXXX XXXXXXXXXX
Building Contractor	Company:	To be advised
	Contact:	XXXXXXXXXX
	Address:	XXXXXXXXXXXXXXXXXX
	Numbers	XXXXXXXXXX XXXXXXXXXX
Building Contractor (Site Manager)	Company:	To be advised
	Contact:	XXXXXXXXXX
	Address:	XXXXXXXXXXXXXXXXXX
	Numbers	XXXXXXXXXX XXXXXXXXXX
Authority	Company:	Pittwater Council
	Contact:	John Raven
	Address:	9, 11 & 12/5 Vuko Pl, Warriewood NSW 2102
	Numbers	Ph 9970 1111 Fx 9970 7150
Roads	Company:	RTA
	Contact:	Lyn Van Putten
	Address:	PO Box 558, Blacktown NSW 2148
	Numbers	Ph 9672 2536 Fx 9831 0932

Accredited Certifier	Company:	City Plan Services
	Contact:	Brendan Bennett
	Address:	Level 1, 364 Kent St, Sydney NSW 2000
	Numbers	Ph 8270 3500
		Fx 8270 3501

5.0 SAFETY PROCEDURES

5.1 Emergency Procedure

The Site Manager shall be responsible for implementation of the Site Emergency Procedure.

- Appropriate first aid supplies shall be kept on site within the site shed.
- All accidents and near accidents shall be reported.

Ambulance / Police / Fire Brigades 000	Workcover Authority 9370 5029
Pittwater Council (Environ Officer) 9970 1111	State Emergency Services 9517 1107
EPA 13 15 55	Poisons Information Centre 13 11 26
Sydney Water 13 30 90	Energy Australia 13 13 88
AGL 13 19 09	

5.2 Site Hoarding / Barricade

The site shall be secured from the public by the erection of a Type A hoarding or equivalent for the staging and location of works. An application for the approval of a hoarding shall be lodged with Council prior to the commencement of work.

The works on the public road are to be suitable barricaded to protect the public. A detailed Pedestrian & Traffic Management Plan Shall be prepared and implemented. RTA approval is to be obtained where required. (See Appendix 3)

6.0 OPERATIONAL MATTERS

6.1 Legislative Requirements

The construction team shall be aware of their legislative requirements in respect to the follow legislation and any other relevant legislative requirements.

General NSW Legislation

- Environmental Planning & Assessment Act 1979
- Heritage Act 1977
- Local Government Act 1993
- Occupational Health & Safety Act 1983
- Soil Conservation Act 1983

NSW Environmental Legislation

- Environmentally Hazardous Chemicals Act 1985
- Protection of the Environment Administrations Act 1991
- Protection of the Environment Operations Act 1997
- Resources & Recovery Act 2001

Regulations

- Environmentally Hazardous Chemicals Regulation 1994
- Protection of the Environment Administrations Regulation 1997
- Protection of the Environment Operations (General) Regulation 1998
- Protection of the Environment Operations (Amendments & Repeals) Regulation 1998
- Protection of the Environment Operations (Amendment) Regulation 1999
- Protection of the Environment Operations (Further Amendment) Regulation 1998
-

6.2 Water

Objectives

- To ensure water pollution is not caused by construction activities;
- To develop preventative measures to mitigate water pollution during construction activities;
- To minimize generation of contaminated stormwater;
- To appropriately dispose of excess water pooling on the site, particularly in the excavated areas.

Responsibility: Site Manager & Site Team

Procedures

- 6.2.1 Implement the Erosion & Sediment Management Plan on site before the commencement of any works
- 6.2.2 Implement the recommendations of the Hydraulic Engineer on site to minimize stormwater run-off.
- 6.2.3 Differential between clean & dirty stormwater.
- 6.2.4 Temporary stormwater management system will be installed before land disturbance activities commence. Divert upstream clean stormwater from the works area as much as possible.
- 6.2.5 Sweep the roads and footpaths every day before finishing work. Do not hose down footpaths and roads. Do not allow silt laden stormwater to escape and pollute surface water.
- 6.2.6 Conduct routine site inspections to review the effectiveness of protection measures.

6.3 Air

Objectives

- To manage construction activities so as not to prejudice air quality;
- To ensure no health risk or environmental risk occurs due to emission of exhaust gases, fumes or dust.

Responsibility; Site Manager & Site Team

Procedures

- 6.3.1 All construction plant & equipment with access to the site will be properly maintained.
- 6.3.2 Mufflers, plant and machinery will be in good working order.
- 6.3.3 Equipment emitting visible smoke for longer than 10 seconds while operational on site will be taken out of service and corrected to ensure smoke is no longer visible in accordance with the EPA Guidelines.
- 6.3.4 Trucks transporting materials to & from the site, such as soil, will be covered and tailgates secured.
- 6.3.5 There will be no incineration or open burning on site of waste materials.
- 6.3.6 Prompt action will be taken to extinguish fires.
- 6.3.7 Water spray or dust retardant will be used on exposed areas to prevent dust lift off.
- 6.3.8 All endeavours will be used to ensure the use of materials of a non-toxic nature

6.4 Noise & Vibration

Objectives

- Ground vibrations as a result of construction activities will not exceed the objectives of relevant legislation; and Construction and demolition activities will not cause undue or annoyance, and will comply with time limitations imposed by the relevant authorities.;

Responsibility; Site Manager & Site Team

Procedures

- 6.4.1 No demolition or construction noise should be discernible from a habitable room of a sensitive use between 10pm and 7am Monday to Sunday.
- 6.4.2 Activities that cause a nuisance to noise sensitive activities will not occur outside the approved work hours for the site.
- 6.4.3 If noise emitting activities are likely to happen in sensitive areas, noise monitoring devices will be used to measure db levels emitted.
- 6.4.4 Only silenced air compressors with noise cables attached indicating L(A) maximum sound pressure level not exceeding 75 db(A) will be used on site. Any equipment exceeding this level will be taken out of service and repaired before operating on site again.
- 6.4.5 During operation, if equipment is likely to cause excessive vibration, it will be monitored for vibration levels.
- 6.4.6 Rock breaking times will be limited to comply with the consent.
- 6.4.7 Where vibration is an issue consideration will be given to implementing a notification plan for nearby residents.
- 6.4.8 The road cut shall be undertaken strictly in accordance with the instructions provided within the geotechnical reports.

6.5 Waste Minimisation & Management

Objectives

- To reduce waste sent to landfill by reduction, redirection and management of waste materials. Waste can be avoided through design, reducing waste at the source, reusing waste both on and off site and to recycle waste on-site through separation.

Responsibility; Site Manager & Site Team

Procedures

- 6.5.1 Develop a waste minimization and management plan for the site.

- 6.5.2 Sub-contractors to develop a waste minimization plan for their scope of work. Sub-contractors will undertake as part of their contract to minimise the packaging they bring onto the site and to reuse off-cuts where possible.
- 6.5.3 Pallets and reels will be returned with reusable packaging to the suppliers.
- 6.5.4 Stockpile materials (clean fill) on site will be reused for back fill or landscaping as approved by the consent. NB: Stockpiles are to be restricted in accordance with the Geotechnical Report and Bushland Management Plan.
- 6.5.5 Supplies and deliveries will be monitored to reduce overestimating.

6.6 Excavation

Bulk excavation of the driveway shall be carried out under the direct supervision of the Geotechnical Engineer and shall be undertaken in strict accordance with the requirements of the Geotechnical Report and the Construction Methodology Statement.

The successful tenderer shall identify duration of the excavation and the average volume of material that will need to be removed each day. Some material may be retained on site and be stored in an approved location for backfilling of the building platforms. All other material shall be removed to an approved landfill site. Details of the approved landfill site shall be provided to the Principal Certifying Authority prior to removal of any material from site.

No excavation shall commence until all environmental works including but not limited to vegetation exclusion fencing, weed removal, silt fences, stormwater management devices, silt fences etc have been install.

During excavation all necessary environmental controls will be carried out in accordance with the relevant EPA guidelines for the following;

- Site Plant
- Stormwater runoff
- Dust Generation
- Truck Movements

6.7 Archeological Relics

All works shall cease immediately if any Aboriginal Engravings or Relics are unearthed during the excavation works. The Metropolitan Local Aboriginal Land Council (MLALC) and National Parks and Wildlife Services (NPWS) are to be contacted immediately.

7.0 CONCLUSION

This Construction Management Plan has been prepared to confirm a viable set of options existing for the management and co-ordination of the works and handling of materials as part of the works. The Construction Management Plan will be developed prior to application for the Construction Certificate for the houses and in response to any conditions council impose as part of the development consent.

No works are to commence on site until the following documents have been lodged to the satisfaction of the private accredited certifier;

- Site shed & facilities plan
- Construction programme
- Detailed Construction Methodology Statement
- Details on dumping of materials

Appendix 1 – Final Setout Plan

SELENA HANNAN LANDSCAPE DESIGN

Landscape Design and Horticultural Consultation

Date: 13 November 2004
To: City Plan Services
Attention: Brendan Bennett
From: Selena Hannan
Re: **House 4, Observation Point, Palm Beach
Construction Certificate Documentation**

Dear Brendan,

To hopefully make it easier for you to find where the information is with regards to the Conditions of Consent, please find the following:

Refer to: Selena Hannan Landscape Design Landscape Plan LP11A and Landscape Softworks Specification for House 4, dated November 2004.

B1. Darren to provide

B2. Required planting is in a revegetation zone, therefore info. is shown on BMP and Landscape Plan.

B4. Darren to provide

B5. Planting locations only are shown on Landscape Plan LP11. B7. Done. Letter attached to demonstrate compliance

B8. Refer to Urban Forestry Australia Arboricultural Assessment House 4, dated November 2004 (hereon referred to as UFAAAH4).

B15. Refer to Bushland Management Report by Urban Bushland Management, dated November 2004 (hereon referred to as BMP).

B15a. As above

B16. Refer Landscape Plan and UFAAAH4.

B17. Refer to Landscape Plan and BMP.

B18. Refer Landscape Plan and UFAAAH4.

B19. Darren to provide

1/59 Central Road, Avalon, NSW 2107
Phone 02 9973 3247 Fax 02 9973 3247 Mobile 0403 041 187
Email selena@tech2u.com.au
ABN 33 990 514 397

B20. Darren to provide

B22. Refer BMP

B23. Refer to Landscape Plan and BMP and UFAAAH4.

B24. Refer to Landscape Plan.

B29. Darren to provide.

B45 and B45a. Refer Landscape Plan and Landscape Softworks Specification. Note:

B60. Darren to provide

B60a. Darren to provide

B61. Darren to provide

B61a. Darren to provide

B62. Darren to provide

B63. Darren to provide

Note: (C20. This is not an issue as there is no nominated palm species to be transplanted. Must be a Council standard clause.)

Also note that Conditions B16 and D206 are in conflict with Plan TP11B that shows that T409 may be removed. Due to this conflict T409 has been retained. This is discussed in UFAAAH4 and shown on Landscape Plan.

Please call me if you have any questions,

Yours sincerely,

Selena Hannan

SELENA HANNAN LANDSCAPE DESIGN

Landscape Design and Horticultural Consultation

LANDSCAPE SOFTWARES SPECIFICATION

HOUSE 4

**LOT 4, OBSERVATION POINT
1148 – 1152 BARRENJOEY ROAD
AND 56 PALM BEACH ROAD
PALM BEACH**

NOVEMBER 2004

To be read in conjunction with Landscape Plan,
Selena Hannan Landscape Design, LP11

1/59 Central Road, Avalon, NSW 2107
Phone 02 9973 3247 Fax 02 9973 3247 Mobile 0403 041 187
Email selena@tech2u.com.au

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APPENDICES

1. SOILS TECHNICAL DATA SHEET Benedict SmartMix No 6, W117, Native Garden Mix

Note: VEGETATION PROTECTION AND REMOVAL SPECIFICATION (dated 18 November 2002, by PITTENDRIGH SHINKFIELD BRUCE, was issued as part of contract set for CC for subdivision. Pages 2 – 5 inclusive have been referenced for use in this document for sections 2 to 9).

1.0 GENERAL

SCOPE

Planting works including tree and vegetation protection, soils, edging, plant and associated materials, planting, mulches, irrigation and establishment.

REFERENCED DOCUMENTS

AS 4419 (1981) Soils for Landscaping and Garden Use
AS 4454 (1997) Composts, Soil Conditioners and Mulches
AS 4373 (1996) Pruning of Amenity Trees

2.0 INSPECTION

NOTICE: Give sufficient notice so that inspection may be made of the following:

- Supervision of installation of protective fencing, tree trunk protection, root/ground protection and protection of natural rock features as shown on Landscape Plans.
- Supervision of all excavation works around trees to be retained and protected.

3.0 WORK NEAR TREES

GENERAL

All existing trees that are to remain undisturbed are indicated on the drawings and shall be adequately protected for the duration of the building works.

REQUIREMENTS

Storage of materials, mixing of materials, vehicle parking, disposal of liquids, machinery repairs and refuelling, site office and sheds, and the lighting of fires, stockpiling of soil, rubble or any debris shall not be carried out within the dripline of trees. No excavation or backfilling shall occur within the dripline of existing trees unless approved by qualified arborist. Trees shall not be removed or pruned unless specific instruction is given in writing by Superintendent. Should a tree or trees listed for retention be damaged or removed without prior consent in writing, a penalty may be applied. All tree protection works shall be carried out before excavation, grading and site works commence.

Contractor to refer to specific DA Conditions of Consent regarding consultants and others required to attend site to approve installation of tree protection measures, and ensure adequate notice is given for them to attend.

PROTECTION

Protect trees specified or shown to be retained from damage by groundworks with temporary Protective Fencing (Refer **PROTECTIVE FENCING, TRUNK PROTECTION, GROUND PROTECTION**). Take necessary precautions, including the following:

- Harmful materials: Do not store or otherwise place bulk materials and harmful materials under or near trees. Do not place spoil from excavations against tree trunks. Prevent wind-blown materials such as cement from harming trees and plants.
- Damage: Prevent damage to tree bark. Do not attach stays, guys and the like to trees, unless specifically instructed to do so as a temporary stability measure.
- Work under trees: Do not add or remove topsoil within the dripline of trees. If it is necessary to excavate within the dripline, use hand methods such that root systems are preserved intact and undamaged. Open up excavations under tree canopies for as short a period as possible.
- Roots: Do not cut tree roots exceeding 50mm diameter unless permitted by qualified consulting arborist. Where it is necessary to cut tree roots, use means such that cutting does not unduly disturb the remaining root system. Immediately after cutting with a clean sharp instrument, the tree should be watered and treated with a liquid rooting hormone to stimulate the production of new roots. Examples include Formula 20® or Hormone 20®.

- Compacted ground: Avoid compaction of the ground underneath trees.

WARNING SIGN

Display a sign in a prominent position near the entrance to the site warning that trees and plantings are to be protected during the Contract period. Lettering shall be road sign-type sans-serif letters, 100mm high in red or black on a white background, to AS 1744. Remove sign on completion of works.

4. PROTECTIVE FENCING

Refer Landscape Plan for location. Trees and vegetation to be retained throughout the site must be protected by stout fencing or have trunk protection installed, enclosing a sufficient area so as to prevent damage to the critical root zone and the trunk. Fencing should be erected before any materials are brought onto the site or before any site works, civil works or construction is commenced and shall remain in place for the duration of the building works. The fences are to be erected as indicated on plans and should be erected to enclose the Primary Root Zones, where practicable. (Primary Root Zone = $DCH \times 9$ (Diameter at Chest Height) expressed as a radius from the trunk).

The fence should comprise:

- 2.1m high steel star pickets, driven 0.4m into the ground.
- Run three strands of fencing wire through top, central and lower positions of pickets.
- Fix hinged ring lock wire mesh to stranded wires already in place through star pickets.
- Fix orange safety mesh to hinged ring lock mesh to full height of fence.
- No storage of building materials, tools, paint, fuel or contaminants shall occur within the fenced area.
- Ropes or ties shall not be attached to any part of the trees.

Where construction works are to be carried out upslope of protected, fenced areas, the protective fencing shall incorporate sediment control fencing installed to manufacturer's instructions (ie silt/sedimentation cloth partially buried and securely attached to base of wire mesh fencing) to create a barrier at ground level to potentially contaminated run-off or excess silt).

Advise contractors and visitors to the site of the purpose for fencing and protecting the trees by the placement of suitable warning signs on fences.

5.0 TRUNK PROTECTION

Where space does not permit the placement of protective fencing as instructed by arborist or as shown on plans, install trunk protection to individual trees. Trunk protection shall be by the placement of 2.0 metre lengths of 50mm x 100mm hardwood timbers spaced at 150mm centres and secured by 10-gauge wires on steel straps at 300mm centres. Place hessian padding to ends of battens to prevent damage to bark. The trunk protection shall be maintained intact until the completion of building works.

6.0 GROUND PROTECTION

Where construction occurs close to or beneath the dripline of trees to be retained, or as instructed by arborist, it shall be necessary to install ground protection to avoid compaction of the ground surface, lateral and absorbing roots. Where machinery is used close to or beneath the dripline of trees to be retained the ground is to be protected by way of an elevated timber platform supported clear of the ground on horizontal timber planks or scaffolding.

7.0 PROTECTION OF ROCKS

Where rocks to be retained and protected are located outside of the line of Protective Fencing, place recycled carpet or carpet underlay over faces of rock outcrops to prevent mechanical damage or surface defacement by accidental spillage of paints, concrete etc.

Weight protective material temporarily with concrete blocks to prevent movement. Carpet may then be pegged into adjacent ground if this will not cover or damage vegetation. Fix into ground by means of U-shaped steel pegs, minimum 450mm long, as many as required to fix in place.

8.0 VEGETATION TO BE REMOVED

MARKING

Trees to be removed are to be marked with yellow spray paint on tree trunk approx. 1000mm above ground level. All other trees are to be retained for the duration of the works. **Do not confuse yellow spray paint with the yellow tape with tree identification number written on it.**

Trees to be retained are marked with green tape.

Trees to be retained and bonded are marked with both green tape and CAUTION tape.

REMOVAL

All felling, root removal and pruning is to be carried out in strict accordance with **Australian Standard AS4373 –Pruning of Amenity Trees** and **Occupational Health and Safety Act 2001**. The arborist should be fully insured. No tree or trees are to be removed or pruned unless written approval/permission is given by Council.

No work is to commence until all works as specified in Bush Management Plan as having to be done prior to construction are completed, ie translocation of tagged plants.

WORK ON TREES

If it is necessary to perform any work on trees to be retained, notify Superintendent.

REPAIR

Should existing trees to be retained be damaged by the works, make good any damage and undertake tree surgery. All work shall be carried out under the supervision of an approved tree surgeon.

REMOVAL

If repair work is impracticable, or is attempted and is rejected, remove the tree and root system if directed, make good, and either replace the tree with a replacement tree of the same species and similar size, or pay damages.

DAMAGES

If replacement is not approved, damages may be liable to be paid. Refer to the specific DA Conditions of Consent.

9.0 CLEARING AND GRUBBING

GENERAL

The work to be executed under this specification consists of the clearing of vegetation both living and dead, all man-made structures, all rubbish and other materials that are unsuitable for use in the works and the grubbing of trees and stumps, from the areas to be landscaped, unless otherwise noted on Landscape Plan. It does not include any work in any areas that are located behind the Protective Fencing, eg areas of bush revegetation or bush regeneration.

The work includes the disposal of all material that has been cleared and grubbed.

In advance of clearing works, effective erosion and sedimentation control measures shall be implemented as required, as per documentation by others.

CLEARING

The area to be cleared is defined as being enclosed by the line of Protective Fencing shown on the drawings, (generally incorporating the building footprint, an area adjacent to the building footprint for construction access, and an area to the north of the footprint). All operations shall be planned, and protective measures to be taken as itemised elsewhere in this specification, to ensure that there is no damage to trees and vegetation outside the approved limits of clearing.

GRUBBING

All trees and stumps within the limits of clearing, that are unable to be felled and removed by the clearing methods used by the Contractor without threatening to, or directly damaging trees or tree root systems of trees to be retained, shall be removed by use of a manually portable stump grinder.

Grubbing operations are to be carried out to a depth of 500mm below the natural surface. Promptly backfill grubbed holes with inert sand where the hole is located in an area subject to landscaping.

DISPOSAL OF MATERIALS

Unless otherwise specified, all materials cleared and grubbed shall become the property of the Contractor and shall be removed from the site, and disposed of in an approved manner. Vegetation and other waste shall not be burnt. **Note that leaf litter mulch may be able to be made from removed trees.** Refer Mulch.

10.0 SOILS

GENERAL

Where existing soil quantity or quality is insufficient use imported topsoil and subsoil. These soils may be used in 'on-grade' or planter box situations.

SOIL DEPTH

Minimum total soil depth for areas to be turfed to be 400mm, being min. depth 100mm of subsoil and min. depth 300mm of topsoil.

Minimum total soil depth for areas where shrubs and trees are to be planted to be 500mm, being min. depth 200mm of subsoil and min. depth 300mm of topsoil.

DEFINITIONS

Imported Topsoil

Soil and compost or other additives defined as loamy sand or equivalent which complies generally with the texture classifications and typical uses of AS 4419 and thoroughly mixed before placing.

To contain approximately:

80% crushed Hawkesbury Sandstone, gap-graded to replicate a well-structured natural soil (free from soluble salts, neutral pH),

20% Nutrihumus Compost (aged, no toxins, free from seeds and reproductive parts of weeds)

The product is to be equivalent to Benedict SmartMix No 6, W117, Native Garden Mix. Refer Technical Data Sheet in Appendix.

Soil shall comply generally with the texture classifications and typical uses of AS4419 and be free from unwanted matter such as:

Stones over 75mm diameter,

Clay lumps over 75mm diameter,

Weeds,

and tree roots greater than 75mm in size.

Imported Subsoil

To contain approximately:

40% crushed Hawkesbury Sandstone,

60% washed medium sand,

Organic content of subsoil mix to be <1% by mass.

<10mm graded, silt and clay content maximum 15%.

The product is to be equivalent to Benedict Subsoil Mix W110.

11.0 SOIL PREPARATION AND SUBSOIL DRAINAGE

11.1 SUBSOIL

PREPARATION

Remove all weeds, roots, builders rubbish and other debris.

EXCAVATION

Excavate to bring subsoil to a minimum of 300mm below finished design levels. Shape the subsoil to fall to subsoil drains where applicable. Break up

SELENA HANNAN LANDSCAPE DESIGN

the newly excavated subsoil surface to a further depth of 100mm. Should the subsoil base be rock, excavate rock as necessary to ensure adequate drainage.

CULTIVATION

Cultivate subsoil to all grass and planting areas ongrade to a depth of 100mm. Do not disturb services or tree roots, if necessary cultivate these areas by hand. During cultivation thoroughly mix in any materials required by testing, eg gypsum. Hand-cultivate within 300mm of structures. Trim the surface to required levels after cultivation.

IMPORTED SUBSOIL

Where required, place imported subsoil to required depths to finish 300mm below finished design levels.

11.2 SUBSOIL DRAINAGE

REQUIREMENT

Install subsoil drains where required to intercept ground water seepage and prevent surface water build-up. Connect subsoil drains to surface drains or to stormwater drainage system as applicable. All retaining walls are to be provided with subsurface drains located behind walls.

MATERIALS

Drainage line shall be perforated plastic piping 100mm diameter, with geofabric sock. Joints, couplings, elbows, tees and end plugs shall conform to manufacturer's specification.

Sand shall be clean, coarse, washed river sand, free from deleterious material.

Filter fabric shall be to AS 3705 and be either, or equivalent to Terram 700 by Nylex Co Pty Ltd or Propex 4545 by Humes Concrete.

Drainage aggregate shall be 20mm blue metal.

INSTALLATION

Subsoil drains shall be installed to the rear of all retaining walls and excavated to the required line and depth, providing clearance for laying and jointing of pipes (approx. 200mm wide trench). Grade of trench behind wall to be approx 1:100. Lay pipes to the required line and grade, bedded with drainage aggregate, connect pipes to stormwater and backfill with drainage aggregate to within 300mm of surface. The top 300mm shall be sandy topsoil.

11.3 SITE TOPSOIL

Where existing soil horizon is unaffected by building works, and there is no requirement to preserve existing vegetation, cultivate topsoil by hand to a depth of 300mm.

Where landscaping works require alterations to levels, use **imported topsoil** as defined in SOILS.

INSTALLATION

Install 300mm depth of topsoil over prepared subsoil (refer SUBSOILS). Compact lightly and uniformly in 150mm layers. Prevent areas of excess compaction from being caused by construction machinery or traffic.

SELENA HANNAN LANDSCAPE DESIGN

The finished topsoil surface should be:

- At design levels,
- Smooth and free from lumps of stone or soil,
- Graded to freely drain, without ponding, to catchment points,
- Graded evenly into adjoining ground surfaces and,
- Ready for planting.

CONTAMINATION

Where diesel oil, cement, paint or other phytotoxic material has been spilt on the topsoil, excavate the contaminated soil and dispose of it offsite. Replace with appropriate topsoil to required levels.

12.0 PLANTS AND PLANTING

SCOPE

Provide and install plants to garden beds and other areas as per Landscape Plan.

GENERAL REQUIREMENTS

Supply plants which:

- have well formed, healthy root systems, with no evidence of girdling, restriction or damage
- are vigorous, well established and true-to-type
- are of good form, and have foliage size, texture and colour consistent with that shown in healthy specimens of the species
- have pests or diseases to less than 10% of the foliage, such that potential for long term success of the plant is not affected
- shrubs or small trees are self-supporting unstaked
- comply with the recommendations of AS 4373
- are hardened off, not soft or forced, and suitable for planting in the natural climatic conditions of the site
- trees, unless specified to be multi-stemmed, to have single leader, the terminal shoot should be healthy

SUBSTITUTIONS

Make no substitutions. Contractor must apply in writing to the Superintendent with available substitutions for approval.

LABELLING

At least one plant of each species or cultivar in a batch should have a readable tag.

REPLACEMENTS

Replace any plants that are damaged or fail under the terms of the Contract, with plants of the same type, quality and size.

STORAGE

Plants should be delivered on a day-to-day basis, and planted immediately. Do not store plants on site unless authorised.

LOCATIONS

SELENA HANNAN LANDSCAPE DESIGN

Do not vary the locations from those indicated. Should the need arise to vary for any reason, eg to avoid service lines, apply for directions to the Superintendent.

PLANTING CONDITIONS

Do not plant in extreme cold, heat, wind or rain.

PLANTING

Dig planting hole to twice the diameter of the root ball and at least 100mm deeper than the root ball. Do not dig the holes into clay subsoil where there is no free drainage. Roughen the sides of the planting hole. Remove pot and place the root ball into the hole, keeping the soil level at the base of the stem equal to the finished level of the garden bed topsoil. Backfill with topsoil from planting hole, do not compact. Create watering saucer with backfill to minimum 200mm diameter around base of plant.

WATERING

Thoroughly water plants in containers immediately before planting and immediately after planting. Maintain stress-free growth rates of the plant with watering as required.

FERTILISING

Provide Aboska Native Plant Food, N(8):P(1):K(5), or product with similar N:P:K ratio, suitable for use on native plants. Place fertiliser pellets around the plants on the soil at the time of planting, before the mulch is laid, to manufacturer's recommended dose (50g/sq. metre for sandy soils).

STAKES AND TIES

Install timber stakes and hessian ties to shrubs and trees with Superintendent's approval only if it is deemed not sufficiently self-supporting, or if it is in an area of high traffic. Stakes and ties to be regularly checked and removed as soon as tree is self-supporting.

13.0 MULCH

SCOPE

Mulch all garden beds in landscaped areas as shown on Landscape Plan. Refer to Bush Management Plan for mulching in revegetation and regeneration areas.

REQUIREMENTS

Generally, use mulch that conforms to AS 4454, that is free of deleterious material such as soils, weeds, sticks and stones.

MATERIAL

Leaf Litter Mulch

Leaf mulch processed from native trees, to pieces not larger than 75 x 50 x 15mm. Mulch to be free of weed species such as Privet, Camphor Laurel, Coral Tree.

PLACING

Spread evenly to thickness nominated, after planting and fertilising. Leaf litter mulch to be placed to a thickness of 75mm. Ensure that mulch is not placed in

contact with plant stems. Apply mulch to all bare soil so that after settling it is smooth and evenly graded between design surface levels, and flush with adjacent finished levels of paving, etc.
Note that gravel mulch where indicated as path surface on plan is to be laid over uncompacted soil for water and air permeability.

14.0 STEPPING STONES WITH PLANTING

MATERIALS

Sandstone flagging stepping stones to be approx. 400 x 400 x 40mm to 600 x 500 x 40mm.

Mulch to be leaf litter. Refer **MULCH** for mulch details.

Bedding sand to be clean and sharp, free from impurities.

LAYING

Excavate soil to establish required levels. All of the areas shown to be 'stepping stone and planting' are to be permeable to water.

Lightly compact subgrade (topsoil, or topsoil over rock, to required levels) allowing for stepping stones to be laid on 50mm thick sand bed over topsoil, with sand level to finish 40mm below top of stone. Install sand bed to 50mm depth, screed and compact. Lay stepping stones on sand.

Planting of Dichondra between stepping stones:

Provide 20mm topsoil between stepping stones. (Soil levels to be approx. 20mm below top of stepping stone). Plant into soil. Top up with mulch to level of stepping stone. The plant will spread through the mulch.

Where planting is shown between stones, note that it is the intention that the groundcovers will grow and spread through the mulch. As the mulch breaks down over time the soil level between the pavers will rise. Additional top-up mulching will be required periodically to ensure that there is always either mulch or plant material filling the gaps between stones.

15.0 IRRIGATION

GENERAL

Manual or automatic irrigation systems are not to be installed. Watering to establish plants is to be by hand, and is to be undertaken by the contractor. The contractor is to ensure that water supply of suitable pressure is available at the time of planting and throughout the Plant Establishment Period.

WATERING

From the time of planting, and throughout the first six (6) months of plant establishment, all newly planted areas, including lawn areas, are to receive a minimum of one (1) complete watering per week, so that soil is soaked to a depth of 150mm, irrespective of natural rainfall. NOTE: Should it be observed that the plants are under stress, ie if the planting works occur in the summer months, a once-weekly watering as described may not be adequate to maintain healthy plants. The contractor shall be responsible for adjusting the frequency of watering required to maintain healthy plant growth.

16.0 ESTABLISHMENT AND MAINTENANCE

GENERAL

The contractor shall maintain the contract areas for a set period after the date of Practical Completion, with any maintenance of the works prior to the date of Practical Completion not to be included as part of this period.

PRACTICAL COMPLETION

Practical Completion of all works shall include, but not be limited to, the installation of soils and subsoil drainage, of establishment of turfed areas and garden areas, replacement of plants that have failed and/or died, been damaged or stolen during the Contract.

PLANTING ESTABLISHMENT PERIOD

Twenty six (26) weeks. Throughout the Planting Establishment Period, the Contractor is to continue to carry out recurrent works of a maintenance nature including, but not limited to, watering, mowing, weeding, rubbish removal, fertilising, pest and disease control, returfing, staking and tying, replanting, topping-up mulch, cultivation, pruning, hedge clipping, aerating, renovating, top dressing, and keeping the site neat and tidy.

DEFECTS LIABILITY PERIOD

The Contractor shall be liable for defects for all works undertaken within this contract for a period of twenty six (26) weeks to run after the date of Practical Completion, to run concurrently with the nominated Plant Establishment Period.

MAINTENANCE LOGBOOK

The Contractor is to supply a maintenance logbook, to include a proposed maintenance program, and record what has been done and what materials, including toxic materials have been used, and when.

PLANTING

The Contractor is to continue to ensure that the general appearance and presentation of the landscape and the quality of the plant material at date of Practical Completion is maintained for the full Planting Establishment Period.

Existing planting: Where existing planting is within the landscape contract area, maintain it as if for new planting.

Replacements: Continue to replace failed, dead and/or damaged plants at minimum 2 to 3 week intervals as necessary throughout the Plant Establishment Period.

Pruning: Pruning of shrubs will be required during Spring and may be necessary at other times of the year. Pruning should reflect the natural growth, flowering habits and regrowth habit of individual species. Refer to Landscape Plan for intent of hedging and other specialised pruning requirements. Generally prune shrubs after flowering.

Generally trees are to be pruned to remove diseased or damaged growth, rubbing branches, or to be directionally or formatively pruned. Work on trees, even young trees, should be performed by an experienced horticulturist/arborist/tree surgeon with advanced knowledge of trees. Young trees that are showing signs of unhealthy or poor development, or are damaged (for instance damage to terminal leader, development of included

bark at branch junctions, or damage at root crown) should be replaced while young. Good initial stock selection is vital to help avoid these and other problems. No topping, lopping, flush cuts or overthinning to be performed.

FERTILISING

Fertilising should be done at periods as indicated by soil testing results and in response to plant performance. Soil should be tested every two years, more frequently if conditions require it or where specific problems exist. Generally, a twelve-month all-purpose slow release fertiliser of N:P:K ratio appropriate to the plant material may be applied at manufacturer's recommended rates, normally in early Spring.

PEST AND DISEASE CONTROL

The Contractor shall be responsible for control of any pest or disease which may affect plants or turf. Correct identification and treatment will be required, with strict adherence to manufacturer's recommended rates, and safe handling and application practices.

STAKES AND TIES

Adjust stakes and ties where necessary. Remove stakes and ties when plants are sufficiently robust, or if stakes and ties have been provided as protection measures, when the protection is no longer required.

WEEDING

Remove all weed growth by hand or spray with approved herbicide throughout all planting and mulched areas. Execute regularly, minimum monthly intervals. Vigorous ground covers to be maintained 200mm away from the base of any shrub or tree.

RUBBISH REMOVAL

Any bottles, papers, etc shall be removed from site.

LEAF LITTER

Leaf litter shall be removed from turf and pavement areas and re-distributed over mulched garden beds.

MULCHED AREAS

Depth of shall be inspected and maintained at approx. 75mm cover to ensure weed suppression. Keep mulch away from base of plants.

DRAINS

Drainage structures shall be inspected and cleaned out at minimum six-monthly intervals to ensure that they are in proper working order.

WATERING

From the time of planting, and throughout the six (6) months of plant establishment, all newly planted areas, including lawn areas, are to receive a minimum of one (1) complete watering per week, so that soil is soaked to a depth of 150mm, irrespective of natural rainfall. NOTE: Should it be observed that the plants are under stress, ie if the planting works occur in the summer months, a once-weekly watering as described may not be adequate to maintain healthy plants. The contractor shall be responsible for adjusting the frequency of watering required to maintain healthy plant growth.

Benedict *SmartMix*™ No. 6 Native Garden Mix

Product Code (s): W117 (N/MIX)
Source: Belrose

Description: A well balanced mix based on a minus 25mm gap graded Hawkesbury sandstone. Low phosphorous and good drainage makes this ideal for most native plantings. Fertiliser additions will improve the suitability of this mix for exotic plants.

80% Crushed Hawkesbury Sandstone
20% Nutrihumus Compost

Uses: W117 is designed to meet the needs of phosphorous sensitive plants preferring a low pH. The high permeability makes this mix suitable for both on-grade and slab applications.

Benefits:

- gap graded sandstone replicates a well structured natural soil.
- sandstone to sandstone contact buffers the soil mix from excessive compaction.
- high porosity allows for easy root expansion, good aeration and drainage.

Handling/
Transport/
Storage: Native Garden Mix is a gap-graded blend. It is important that the mix is well turned prior to placement. There may be some particle segregation if the mix is allowed to dry out. Install at a maximum depth of 300mm in lifts not exceeding 200mm. Where planter depth

Native Garden Mix (cont.)

Handling/
Transport/
Storage: (cont.)

exceeds 300mm, we recommend a sub-soil mix such as our W110 (40% crushed sandstone : 60% washed medium sand) be installed. The organic matter content of this sub-soil mix should be <1% by mass

Characteristics:

(a) Chemical Properties:

	<u>Result</u>	<u>Ideal Range</u>
pH in water (1:2)	5.8	5.0 - 6.0
pH in CaCl (1:2)	5.5	5.0 - 6.0
Electrical conductivity	0.17mS/cm	

<u>Soluble Cations</u>	<u>mg/kg</u>	<u>% ECEC</u>	<u>Ideal Range</u>
Sodium	34.5	7.35	<5
Potassium	70.2	6.97	5 - 15
Calcium	154.0	58.17	60 - 75
Magnesium	46.7	18.4	5 - 25
Calcium:magnesium ratio	3.3	-	3 - 6

<u>Nutrient</u>	<u>mg/kg</u>	<u>Ideal Range</u>
Phosphate	7.23	10 - 50
Ammonium	5.15	<100
Nitrate	3.55	<100
Sulphate	19.85	>40<100

Characteristics:

(b) Physical Properties

	<u>Result</u>	<u>Ideal Range</u>
Permeability	27cm/hour	2 - 80cm/hour
Water holding capacity	40 to 45%	
Air filled porosity	18 to 23%	
Organic matter (% by mass)	13.23	5 - 15%

Alternative Products:

See BS133, W13, R111, R101

Technical Enquiries:

BENEDICT SAND & GRAVEL
PH: 02 99863500 FAX: 02 99863555
CONTACT: MURRAY FRASER BSc (Ag)



15th November 2004

Attention Eva Twarkowski
Natural Resources
Pittwater Council
2nd Floor, Unit 11,
No. 5 Vuko Place
Warriewood

Dear Eva

Consent conditions for House four at 1148-1152 Barrenjoey road Palm Beach.

In regards to the above consent there are a number conditions that require certain information to be sent to natural resources. Those conditions and detail in relation to those are as follows:

1. Condition B4. Please find a copy of evidence of collection.
2. Condition B5. Details contained in relation to condition in our Landscape plan.
3. Condition B18. Details contained in relation to condition in our Aborist report/Landscape plan.
4. Condition B24. Details contained in relation to condition in our Landscape plan.

Should you require any further information please don't hesitate to contact the Undersigned.

Yours Faithfully,

Darren LEETE
Director
Raypond

RAYPOND PTY LTD

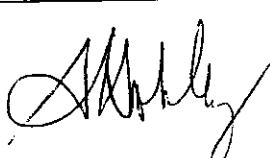
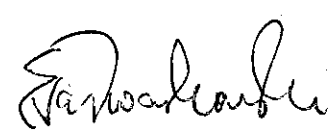

A.B.N. 92 090 921 314

P.O.BOX 1364, DEE WHY NSW 2099 – TELEPHONE (0412) 226-044 FACSIMILE (02) 9944-0316

10 November 2004

Re: 1148 – 1152 Barrenjoey Road, Palm Beach, NSW
DCN1229/00 Lot 1 (House 1)
DCN1233/00 Lot 2 (House 2)
DCN1232/00 Lot 4 (House 4)
Development Consent for Construction of dwelling houses on
proposed Lots 1, 2 and 4 (Houses 1, 2 and 4).

This is to confirm that an Officer from Natural Resources and a Landscape Officer from Pittwater Council have attended a site inspection with regards to item B7 of the above Conditions of Consent.

<u>Attendees</u>	<u>Name, Signature and Date</u>
Pittwater Council Landscape Officer	 S. Hobley 11/11/04
Pittwater Council Natural Resources Officer	Eva Twarkonski,  10/11/04
Client	
Consultants	Seleni Hannah,  10 & 11/11/04

Note: Eva ^{file} took note of dead, bonded trees:
T477, T489

Raypond
C/O PO Box 1364
Dee Why NSW 2099


Job N° 030705

The above designs are in compliance with DA conditions :-
B19, B20, B29, B60, & B61 paragraph 1 & 2.

Note : The stormwater discharge from House 4 is detained in the OSD tank DT3, which is detailed on the drawings for job No 030963.

Yours Sincerely,

Sincerely,


R. Wray
Deputy Attorney General

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TREE MANAGEMENT CONSULTING ARBORICULTURISTS

**PRE- CONSTRUCTION
ARBORICULTURAL ASSESSMENT**

**A Report on the Potential Development
Impacts on Trees to Be Retained**

for

RAYPOND PTY LTD
PO Box 1364
DEE WHY NSW 2099

SITE ADDRESS

LOT 4 (HOUSE FOUR)
1148 – 1152 BARRENJOEY ROAD
PALM BEACH NSW

NOVEMBER 2004



URBAN FORESTRY AUSTRALIA

Correspondence:

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PO Box 151

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1 INTRODUCTION

- 1.1** This Arboricultural Assessment was commissioned by Mr Darren Leete of Raypond Pty Ltd, owners of the subject site.
- 1.2** The subject site is identified as Lot 4, and known as House 4 at 1148 -1152 Barrenjoey Road, Palm Beach, New South Wales.
- 1.3** This Arboricultural Assessment addresses Pittwater Council Development Consent DA N1232/00. This assessment intends to meet the arboricultural requirements for the issue of the Construction Certificate for House 4, specifically addressing Conditions B8, B18, B23, C5, C19 and C20.
- 1.4** This Arboricultural Assessment briefly assesses the health and condition of trees to be retained, and examines the possible development impacts on trees in proximity to the approved development.
- 1.5** This assessment is not a tree audit and uses the previous Tree Report dated April 2003 by Pittendrigh Shinkfield Bruce Pty Ltd for tree details. All trees referenced in this assessment use the numbers accorded them in the Tree Report by Pittendrigh Shinkfield Bruce Pty Ltd.
- 1.6** This Arboricultural Assessment gives recommendations as to the retention or removal of trees on the site, and gives recommendations to minimize any identified impacts from the proposed development.
- 1.7** Care has been taken to obtain all information from reliable sources. All data has been verified as far as possible; however, I can neither guarantee nor be responsible for the accuracy of information provided by others.
- 1.8** This Arboricultural Assessment is not intended as an assessment of any impacts on trees by any proposed future development of the site other than the current development application.

2 METHODOLOGY

- 2.1** In preparation for this report site meetings were attended by Mr Darren Leete (Raypond Pty Ltd), Ms Selena Hannan (Selena Hannan Landscape Design), and myself on 25 October and 3 November 2004.
- During the site visit on 3 November 2004 Ms Hannan and myself identified all trees for removal, retention, or as bonded trees by tagging them in colour coded tape.
- During this visit any trees which needed further investigation were also addressed.
- 2.2** The inspection was limited to generally brief examination of some trees, relying on the previous report (April 2003) by Pittendrigh Shinkfield Bruce Pty Ltd for specific tree details.
- 2.3** No aerial (climbing) inspections, woody tissue testing, dissection, excavation, probing, coring or tree root investigation was undertaken as part of this site or tree inspection.
- 2.4** Plans and/or documentation used for the preparation of this Arboricultural Assessment include:
- Pittwater Development Consent (modified 2003) DA No: N01232/00;
 - Pre-Construction Tree/Vegetation Report, dated 10 April 2003, prepared by Pittendrigh Shinkfield Bruce Pty Ltd (PSB);
 - Bushland Management Plan, dated May 2003, prepared by GIS Environmental Consultants;
 - Tree Survey - House Four Plan TP07B and Tree Protection Plan -House Four TP11B, prepared by Pittendrigh Shinkfield Bruce Pty Ltd;
 - Landscape Plan LP11A, dated November 2004 prepared by Selena Hannan Landscape Design;
 - Pre-construction Arboricultural Assessments for Houses 1,2 and 3, 1148 – 1152 Barrenjoey Road, Palm Beach, August and November 2004, prepared by Urban Forestry Australia; and
 - Sewerage plans, File No. 13701WW, prepared by Sydney Water.

3 DISCUSSION

3.1 Current health and condition of trees to be retained.

3.1.1 The health of trees currently growing on the site can only be described as fair, and is likely to be due in some part to the unfavourable soil moisture content resulting from prolonged drought conditions.

The structure and form of many trees is compromised by suppression from other trees, and competition for root space, soil moisture, etc. Secondary problems are evident, such as poor extension growth and foliage density of Cheese Trees due to repeated defoliation by insects. Storm damage, stem and branch inclusions, and high amounts of deadwood are also noted in Forest Oaks.

These problems are typical of a dense woodland/rainforest community, particularly when affected by drought.

3.2 Potential impacts on trees within 5 metres of House 4.

3.2.1 In accordance with Consent Condition B8, the potential impacts of works on trees within 5 metres of the dwelling stormwater/sewerage lines and private driveway were assessed.

Note: For impacts on trees in proximity to the main driveway, please refer to the Pre-construction Tree/Vegetation Report by Pittendrigh Shinkfield Bruce, 10 April 2003, which deals with subdivision works (DA N1228/00).

The following trees have been identified as being located within the nominated 5 metre setback, and were shown on plans to exist at the time of Development Application.

Trees in bold are bonded trees as per Condition C7.

Trees **14, 16, 18, 89, 90, 94, 106, 107, 389, 398, 399, 409, 413, 416, 418, 419**, and 503.

3.2.2 The proposed works are outside the Critical Root Zone (CRZ) of Trees 14 and 16 (Forest Oaks). No impacts on tree health or stability are expected.

3.2.3 The driveway cut is outside the Primary Root Zone (PRZ) of Tree 18 (Forest Oak). The batter of this cut will most likely finish at the outer edge of the tree's CRZ (estimated at 1.5 metres from the center of the tree). Major support roots are not expected to be in this area downslope of the tree, however supervision by an arborist is required to ensure any potential damage to significant roots is avoided, or minimised.

3.2.4 Tree 89 (*Pittosporum undulatum*) is sufficiently setback from the work, and is not expected to suffer any impacts.

3.2.5 Trees 90 and 409 (Forest Oak and Black Plum) are close to the proposed driveway and battered wall. These trees are not bonded, indicating that their retention close to the driveway was questionable at the time of initial assessment by PSB. Tree 409 is within 0.5 metre of the driveway and within the expected area of disturbance. Works may damage roots and destabilise the tree, however this would need to be confirmed by the supervising arborist. Tree 90 is likely to have impacts within its CRZ which may result in unacceptable root losses leading to stability problems. The retention of this tree would also be subject to specific assessment by the arborist during the proposed works. Both the above trees will require trunk protection.

3.2.6 Tree 94 (*Pittosporum undulatum*) is located within the adjacent property, and within 1 metre of the common boundary. The tree is in generally poor condition. The proposed works are outside the tree's CRZ, but within the PRZ of the tree. The proposed works are not expected to have any appreciable impact on this tree, as it is already in a state of decline, with secondary insect attack and subsequent branch and canopy loss.

3.2.7 Trees 106 and 107 (Black Plums) are adequately setback from the proposed works.

Works will not require an incursion into the PRZ of either tree.

3.2.8 Tree 389 (Blueberry Ash) has a PRZ of 1metre. The proposed works are between 5 – 6 metres from the tree and not expected to have any impact on tree health.

3.2.9 The proposed boulder wall at the east side of the dwelling is located outside the PRZ of both trees 398 and 399 (Black Plums). No changes to existing contours are proposed within the Primary Root Zone (PRZ) of these trees. No impacts are expected on tree health or stability.

3.2.10 Trees 413 (Black Plum), 416 (Pittosporum), 418 (Dead), and 419 (Port Jackson Fig) are all located at a setback which places proposed works outside their PRZ's. No impacts to tree health or stability are expected.

3.2.11 Tree 503 (Apple Tree), located in the adjacent property, is setback at a distance where impacts would not be expected to affect the tree.

3.2.12 Tree 702 (Black Plum) is well away from any proposed works. No impacts are expected to this tree.

3.2.13 In consideration of Condition B8 and B18.

The client has advised that sewer and stormwater lines are to be located under the driveway. However, if there are any alterations to this intention, then the following is to be observed.

The drainlines are to be laid in an excavated trench. The actual location will be decided on site, from information to be gathered with project arborist in attendance. The method of determining the location of pits and lines is proposed to be thus: All roots over 50mm in diameter of potentially affected trees in the area are to be located by hand excavation at the depths required for the trench and pits. The most appropriate trench and pit location will be determined from this information. The arborist will make informed decisions as to which roots, if any, may be cut so as to minimise

impacts on the trees. The trench is to be backfilled by firstly replacing site subsoil to equal previous depth, then site topsoil to equal previous depth. The locations of these trees, tanks, pits and lines has been shown on the Landscape Plan LP11A and it is not considered necessary to repeat this information on a separate plan.

3.2.14 With reference to Condition B23, the requirement for tree protection /exclusion fencing is detailed on Landscape Plan LP11A.

3.2.15 With reference to condition C5 and C19, these requirements will be met by the arborist prior to commencement of works.

3.2.16 In consideration of condition C20 the following is noted. No palm species have been nominated for relocation or transplanting on the site. This condition does not contain any relevance to the proposal.

3.3 Tree removal

3.3.1 Tree 418 is a bonded tree but is dead and should be removed.

4 CONCLUSIONS

4.1 Most of the trees within this area are of average to poor condition with identifiable defects, suppressed growth, storm damage, effects of ongoing drought conditions and the secondary problems associated with these factors.
Several of these trees are bonded.

4.2 The majority of trees to be retained will experience little, if any, impacts on their current health and condition as a result of the approved works.
Impacts on trees close to the development can be minimized, if not avoided entirely, by the presence and supervision of an experienced arborist during works in proximity to trees.

Some potential damage may occur to Trees 90 and 409. Close supervision and appropriate protection measures would avoid further unnecessary impacts on the root system of these trees.

4.3 At least one bonded tree (T418) should be considered for removal as it is dead.

5 RECOMMENDATIONS

5.1 Tree Protection Zones (TPZ)

5.1.1 Provide a Tree Protection Zone (TPZ) to all trees to be retained.

This may be in the form of extended protective fencing, individual tree guards and other protective devices, depending on the specific requirements of each tree or group of trees to be retained.

Refer to Landscape Plan LP11A for general protection fencing locations.

5.1.2 The most appropriate procedure for protecting trees to be retained is to firstly arrange a site meeting with the arborist and fencing contractor. This must be carried out prior to erecting any fencing or other tree protection devices.

It is important to remember that there may be many surface roots which could be damaged or crushed during site works and this issue needs to be addressed at the time of the site meeting with the contractor. This will require very specific and individual assessment of the protection devices used for each tree or group of trees.

To ensure the contractor has met with the arborist, and understands the requirements for protection of each tree as directed by the arborist, it is recommended the contractor provide written confirmation of that meeting and their understanding of those tree protection requirements.

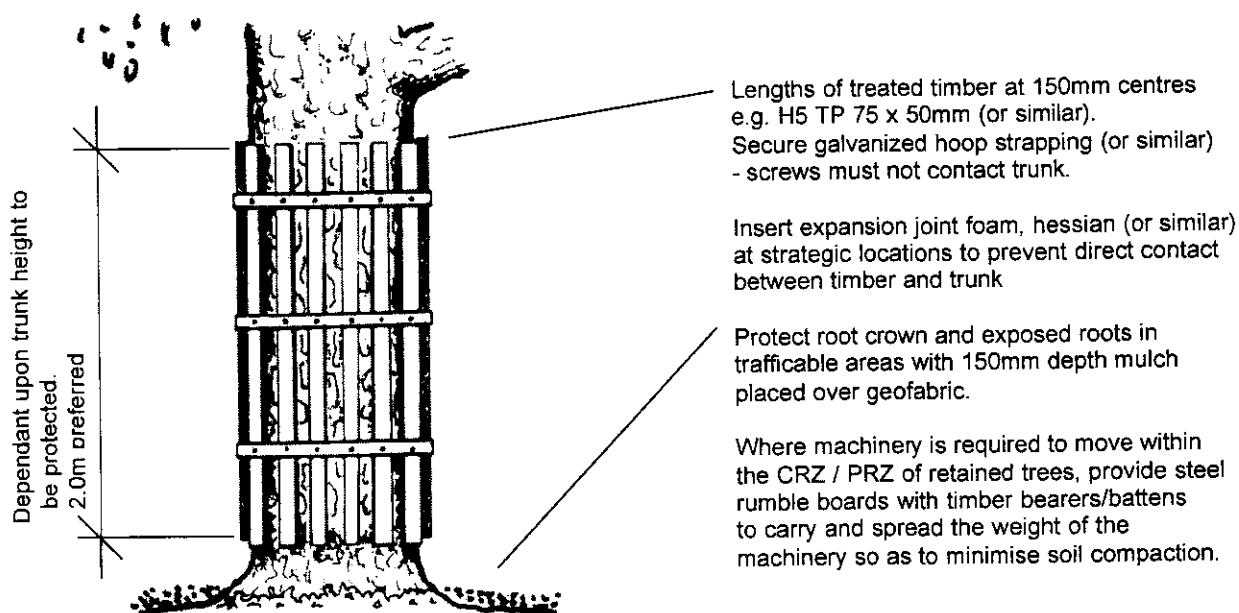
Alternatively, the arborist is to supervise the erection of Tree Protection Zones and other tree protection devices.

Where trees cannot be fenced adequately due to the proximity to the dwelling or deck the arborist must specify the type of protective measures e.g. fabrics, mulches, tree guards, etc to ensure that these trees are well protected before any tree removal or other site works are undertaken.

The arborist must also take into account the requirement for access for construction activities and provide a reasonable space for work between protective fencing and those activities.

- 5.1.3 Trees 90 and 409 require individual trunk protection. Refer to Figure 1 for details.

Figure 1 TREE GUARD DETAIL



- 5.1.5 The following recommendations for protection of trees to be retained are:
- Tree Protection Zones must be established and installed before any site works are carried out including any clearing or grading or approved tree removals;
 - Provide Tree Protection devices to all trees to be retained;
 - Provide Protection fencing as far as practicable from the trunk of the trees, and preferably outside the PRZ of the tree. Where possible the fencing should be placed to encircle the whole tree;

- The most appropriate fencing is 1.8m chainlink with 50mm metal pole supports. During installation care must be taken to avoid damage to significant roots;
- Nothing should occur inside the TPZ of the tree, so therefore all access to personnel and machinery, and storage of fuel, chemicals, cement or site sheds is prohibited;
- Signage should explain exclusion from the fenced off areas and carry a contact name for access or advice; and
- The TPZ may only be removed, altered, replaced or relocated with the authorisation of the project arborist.

5.2 Bonded Trees

5.2.1 Bonded trees should be photographed prior to works commencing on the site; during works; at completion of works; and prior to application for the release of the bond. A written record of their health and condition during all works phases must be kept by the project arborist and forwarded to the project supervisor.

5.3 Minimising impacts on tree to be retained.

5.3.1 Arboricultural supervision

The arborist must supervise all works, particularly demolition, excavation, trenching, subgrade preparations, foundations and other associated procedures within the *Primary Root Zone* (PRZ) of the trees.

Each site visit and all observations, details etc, must be recorded by the project arborist.

5.3.2 Construction access

Where practicable construction access for all vehicles must be located outside the Primary Root Zone (PRZ) of trees to be retained.

5.3.3 Landscape plantings

Any proposed planting locations within the PRZ of trees to be retained must remain flexible so as to avoid damage to existing roots.

In some cases, tubestock container size may be the only suitable size for planting within the root zone of a tree.

Mattocks and similar digging instruments must not be used within the dripline of trees to be retained. Planting holes should be dug by hand with a garden trowel, or similar small tool.

5.3.4 Mulching

The inclusion of a temporary mulch layer of composted leaf and woodchip to a depth of 75mm within TPZ will help retain soil moisture, protect soil from contaminants and reduce soil compaction.

5.4 Hand digging near trees.

5.4.1 With reference to Condition B18 the requirement for detailing of methods of hand digging within canopy driplines to be provided on plans is not practical. The following should be carried out under the supervision of an arborist:

- Determine the required depth of soil and/or rock removal to accommodate works;
- Carefully remove the organic layer (leaf litter and other organic material) by hand, and place aside;
- Using a small hand tool such as a trowel, carefully remove topsoil along the proposed location for construction, and place aside outside the canopy dripline of the tree (Do not mix topsoil with organic layer);
- Any subsoil encountered may require the use of a narrow spade (e.g trenching or post-hole shovel) to remove it. Place aside and away from stockpiled topsoil.
- If rock is encountered, expose required area. A 'kanga' rock breaker can be used to remove rock to the required levels;
- If significant roots are encountered do not cut them. The project arborist is to determine which, and how many, may be cut without impacts on the trees health or stability;
- Wrap or cover exposed roots with damp fabric to minimise root moisture losses;
- Any soil to be reused as backfill must be placed as it was removed i.e. subsoil first, followed by topsoil and organic layer on top

5.4.2 Where significant tree roots are encountered which coincide with the desired location for a pier or deck posts, the location should be moved so as to avoid the root/s. In the event this is not possible to achieve, the

arborist should be consulted to assess the impacts of the removal of further significant roots on the trees health and stability.

5.5 Tree Pruning

5.5.1 Pruning methods and techniques

Contracted tree workers must have a minimum Level 2 qualification in Tree Surgery to carry out any pruning works on this site.

Pruning methods and techniques used are to be in accordance with these written specifications complying with Australian Standard AS 4373 – 1996 *Pruning of Amenity Trees*.

A copy of this document must be available and held on site by the supervisor.

5.5.2 Safe work practices

When pruning trees the following are to be complied with:

- Australian Standard AS4373 – 1996 *Pruning of Amenity Trees*;
and
- The Workcover Authority's *Code of Practice for the Amenity Tree Industry*, No. 34, May, 1998.

5.5.3 Supervision of pruning works

Pruning work is to be carried out under the direct supervision of a nominated qualified tree worker or the project arborist.

5.4.4 During all pruning works any defective or diseased tree parts encountered by tree workers are to be reported to the site supervisor.

5.6 General

5.6.1 General recommendations during development, construction and post-construction are as follows:

- No stock-piling should take place around the root zone of trees.
Providing a regular supply of water to the trees during the period of works is recommended.

- Do not allow excavation vehicles or equipment to rip at, or remove the roots along the face of any excavation adjacent to a tree. In the event the vehicles 'grab' at roots during works, the machine operator must stop work immediately and allow the roots to be cut before continuing.
- Regular monitoring of the tree during development works for unforeseen changes or decline will help maintain the tree in a healthy state.
- Irrigation – An arborist should determine whether irrigation should be carried out during extended periods of drought.
- Mulching - removal of mulch after construction to remove any contaminants. Replacement with a good quality mulch and addition of 10% organic matter will improve beneficial soil micro-organisms, retain moisture and improve aeration and water infiltration.
- Pest management – Monitoring is required as trees under stress are more prone to insect attack.
- Hazard Management – monitoring and management of the trees and re-assessment by a qualified arborist is required for adequate long-term safety of site users.

Should you require further assistance with this matter, or require my liaison with Council officers, please do not hesitate to contact me.



Catriona Mackenzie
Consulting arborist and landscape designer.
Member Australian Institute of Horticulture
Member Institute of Australian Consulting Arboriculturists

APPENDIX A - TERMS AND DEFINITIONS



TERMS AND DEFINITIONS

The following relates to terms or abbreviations that may have been used in this report and provides the reader with a detailed explanation of those terms.

Age classes

- (I) = immature and refers to a well established but juvenile tree.
- (S) = semi-mature and refers to a tree at growth stages between immaturity and full size.
- (M) = mature and refers to a full sized tree with some capacity for further growth.
- (O) = over-mature and refers to a tree about to enter decline or already declining.

Condition refers to the tree's form and growth habit, as modified by its environment (aspect, suppression by other trees, soils) and the state of the scaffold (ie trunk and major branches), including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health and it is possible for a tree to be healthy but in poor condition.

Critical Root Zone (CRZ) refers to a radial offset of five (5) times the trunk DBH measured from the center of the trunk. Excavation within this area may seriously destabilize the tree. Fully elevated construction within this area is possible with specific root zone assessment.

Footprint refers to the area occupied by structures including dwellings driveways and paths.

Hazard refers to anything with the potential to harm health, life or property.

Health refers to the tree's vigour as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion, and the degree of dieback.

Primary Root Zone (PRZ) refers to a radial offset of ten (10) times the trunk DBH measured from the center of the trunk. Excavation is possible within one offset only with this area and subject to specific rootzone assessment.

Scaffold branch A primary structural branch of the crown.

Stem/bark inclusion, a genetic fault and potentially a weak point of attachment.

Tree Protection Zone (TPZ), generally the minimum distance from the center of the tree trunk where protective fencing or barriers are to be installed to create an exclusion zone.

Within Building Footprint (WBF) refers to those trees within the footprint of the proposed development.

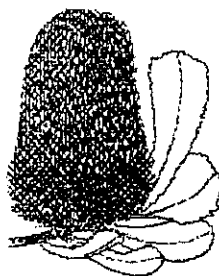
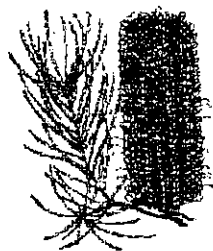
JCB:ss
Project 35515C
16 March, 2004

OBSERVATION POINT PROPOSED METHOD STATEMENT FOR EXCAVATION AND SUPPORT OF BATTERS

1. Clear Site. Contractor (Pan Civil)
2. Peg top of batter. Surveyor (Bowdens)
3. Excavate test holes at 5 – 10 m centres (closer if necessary) to determine depth to extremely to highly weathered rock. Hold Point Contractor + DP
4. If colluvium/residual soil \leq 2.5 m thick to be supported by mesh reinforcement, shotcrete and M28 dowels at 2 m spacings.

If colluvium/residual soil $>$ 2.5 m thick design soil nailed (dowelled) or other support to be advised.
5. Depending on profile identified and 3 day weather forecast, open up to 10 m length (or such a length as can be supported on the same day) of face to a maximum depth of 2 m, cut at 1 horizontal to 5 vertical.
6. Douglas Partners to inspect during/following excavation.
7. Depending on exposed conditions either:
 - install strip drains (as per above Drawings),
 - apply 80 mm shotcrete (if unstable face only),
 - stand and fix mesh,
 - install dowels/rock bolts,
 - install shotcrete depth pins,
 - apply remaining shotcrete.
8. Douglas Partners/Northern Beaches Consulting Engineers to inspect during and following installation.
9. Repeat process to top of very low to low strength rock (if necessary).
10. HOLD POINT – Douglas Partners to inspect and sign off on Form 35515C, if correctly stabilised at this point the probability of failure of the colluvium slope will be 'Unlikely' (i.e. the event might occur under very adverse circumstances with indicative annual probability of about 1×10^{-4}) Note: At this point continue to next stage of excavations if applicable.
11. HOLD POINT released – repeat items 6 to 9.

12. For cuttings which extend into very low to low strength rock, excavate a further 2 m – HOLD POINT.
13. Douglas Partners to inspect for adversely oriented joints/faults. If present, requiring dowels/bolts additional to those designed for joints dipping out of face at 60° specific additional bolting on Form 35515C/2 – HOLD POINT released.
14. Repeat Items 6 and 7.
If satisfactory repeat 11 to 13.
15. HOLD POINT on reaching base of cutting.
16. Douglas Partners/Northern Beaches to carry out final inspection for sign off on each cutting (Form 35515C/2).



GIS Environmental Consultants

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Darren Leete
Raypond Developments, Salga Pty Ltd.
C/o Simon Thorne
Crone Associates
364 Kent St, Sydney

Date: 25 January 2002

Dear Darren,

I spoke to Grayham Mc Donald from Toona Rainforest Nursery in Mudgeeraba North NSW coast and Sally at Burringbah Rainforest Nursery. He said this species propagates from seed readily, and will germinate in 3-4 months. We will need to clean the flesh off the fruit and this is the only treatment needed.

In this species there is only one seed in each drupe (fruit). Birds are known to take the fruit. In good conditions the trees are likely to be 8 cm high after 1 year. I can get 4 plants that are 30 cm high that are grown from local stock from a local nursery. It is my opinion that this species is unlikely to be able to be propagated by cuttings.

On the 23 of January we bagged unripe Black Plum fruit in situ and collected 200 fruit. See Photo 1. The bagging was to catch the fruit as they ripens and to prevent bird predation. See Photo 2. Some of the trees did not have any fruit. There is not viable seed in many of the fruit. The trees with bags were 102, 105 and 402. The trees where fallen seed was collected were 182 105 and 402.

We will harvest the bagged fruit and collect more fallen fruit in 2 weeks and send this new fruit to Tharwa.

This initial collection of fruit was divided into 2 parts and taken the next day to two nurseries, Wirreanda Nursery and Tharwa Propagation Nursery with instructions to grow the seed and phone GIS Environmental Consultants when they germinate.

When we are informed of the germination we will instruct the nurseries to transfer a total of approximately 100 plants to pricked to tube stock, then 90 tube stock to be potted up to 8 inch pots when ready.

I will ring you to let you know of progress at each stage of the process.

Yours sincerely

Nick Skelton



The first harvest of seed



Bagged branches with unripe fruit.



Bushland Management Plan
For Proposed Lot 1
Observation Point
1148-1152 Barrenjoey Road, Palm Beach

12 November 2004

Prepared for

Raypond Developments Pty Ltd

Prepared by

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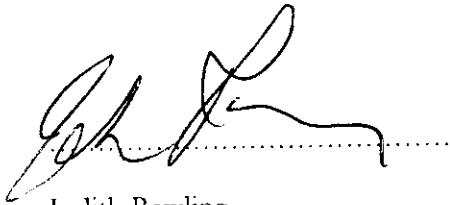
ubmc@urbanbushland.com.au

www.urbanbushland.com.au

Certification

I, Judith Rawling Managing Director Urban Bushland Management Consultants and UBM Projects hereby state that the Bushland Management Plan for Lot 1, Observation Point Palm Beach has been prepared in accordance with Department of Urban Affairs & Planning's Urban Bushland Management Guidelines, Pittwater Development Control Plan #25 - Conservation of Biodiversity, the management of Threatened Flora and Fauna in Pittwater IGA and other relevant planning instruments. The guidelines and requirements of draft Pittwater 21 DCP have also been addressed.

This Bushland Management Plan has also been prepared in accordance with Pittwater Council's consent requirements, as set out the Modification of Development Consent No N1232/00) for Lot 1 Observation Point, Palm Beach (correspondence 5 May 2003 – see Appendix 1).

A handwritten signature in black ink, appearing to read 'Judith Rawling', is written over a horizontal dotted line.

Judith Rawling
12 November 2004



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1 INTRODUCTION

1.1 BACKGROUND INFORMATION

This Bushland Management Plan (the '**BMP**') has been prepared in accordance with Pittwater Council's consent requirements, as set out the Modification of Development Consent No N1232/00) for Lots 1, 2, 3 and 4 Observation Point, Palm Beach (correspondence 5 May 2003 – see Appendix 1).

The proposed development at Observation Point comprises the construction of four (4) new residences on approximately 0.6 hectares of land (the '**subject site**') zoned for residential use at Palm Beach, within Pittwater Local Government Area (see Figure 1.1).

The Development Application was submitted by Raypond Developments Pty Ltd (the '**proponents**') and approved by Pittwater Council ('**Council**') on 24 January 2002, with Modified Conditions of Development Consent issued on 5 May 2003.

Several earlier reports predate this BMP. A Flora and Fauna Impact Assessment was prepared in support of the original development application (GIS Environmental Consultants November 2000), and subsequently, a Bushland Management Concept Plan was prepared in response to the Modified Conditions (GIS Environmental Consultants May 2003). Council has accepted these reports.

However, the BMP submitted by GIS Environmental Consultants (2003) was a 'generic plan', covering all parts of the subject site, and did not deal with the rehabilitation and management of remnant vegetation in each of the four (4) Lots individually. Council has therefore required the proponent to prepare separate Plans for each of the four (4) Lots within the development area.

In response to the Modified Conditions set by Council, a separate BMP for Lot 3 was prepared and approved (Footprint Green August 2004). Subsequently, UBMC was commissioned by the proponents to prepare BMPs for each of the remaining Lots 1, 2 and 4.

1.2 DEVELOPMENT PROPOSAL

The subject site is known as 1148-1152 Barrenjoey Road (Lots 16 DP 6746 and 17 DP 651987) and 56 Palm Beach Road (Lot 181 DP 534139), Palm Beach. Together these Lots form a property approximately 0.6 hectares in size.

The development proposal approved by Council (May 2003) involves the subdivision of three (3) existing Lots into four (4) new Lots with an access easement. A new residence is proposed for each of these Lots, with access from a common driveway off Palm Beach Road (see Figure 1.1).

Construction of the common driveway has commenced (under a separate DA). It is anticipated that construction of the new residences will commence as soon as the BMP is approved and Construction Certificates are issued. The proponent intends to construct the new residences in the following order: first Lot 3, then Lot 2, Lot 1, and finally Lot 4.

1.3 REPORT PURPOSE

This BMP has been prepared by Urban Bushland Management Consultants ('**UBMC**') to comply with Council's Modified Development Consent Conditions – i.e. to provide separate BMPs for each of the four (4) Lots at Observation Point.

The BMP for 1148-1152 Barrenjoey Road (this report) deals only with bushland management within Lot 1. BMPs for each of Lots 2 and 4 are presented under separate cover.

Information contained in this BMP relating to the biophysical characteristics of the subject site has been summarised from the previous Flora and Fauna Assessment (GIS Environmental Consultants November 2000), the Bushland Management Concept Plan (May 2003), while other background



information has been taken from the recently prepared BMP for Lot 3, (Footprint Green August 2004).

It is intended that this BMP should be read in conjunction with the Landscape Plan developed for Lot 1 Observation Point (Drawing #LP 12A – Hannan, 2004).

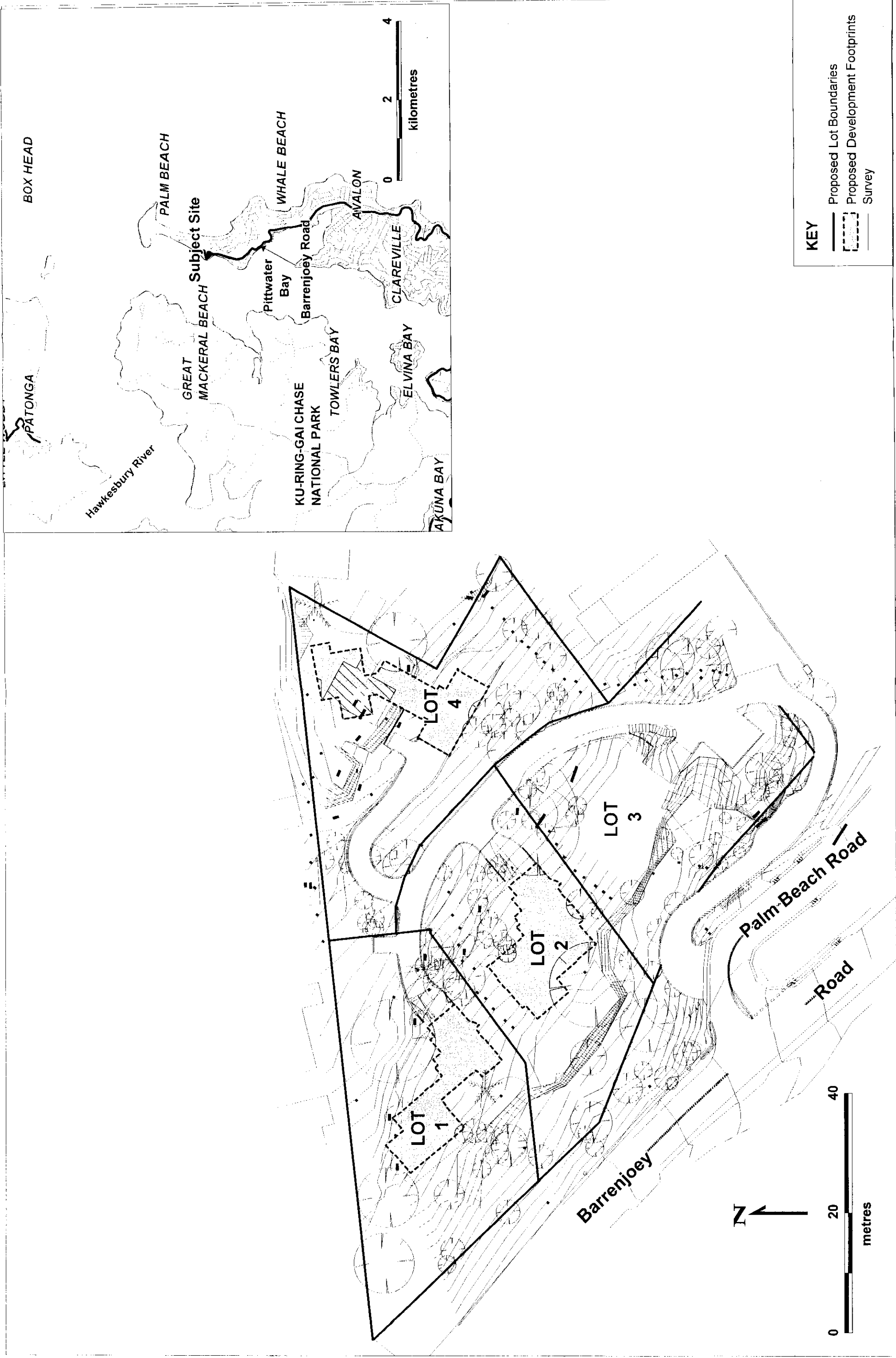


Figure 1.1
Site Details





1.4 PROJECT OBJECTIVES

The objectives of the BMP for Lot 1 are broadly:

- To maintain and enhance habitat for native flora and fauna;
- To provide a continuous band of predominantly native vegetation on the slopes and crests of hills adjoining Pittwater;
- To control noxious and environmental weeds, and encourage the natural regeneration of the native plant community, of which elements remain in parts of the subject site;
- To identify any potential impacts of the proposed subdivision on the plant community and its representative species;
- To enhance local landscape values (screening/aesthetics); and
- To fulfil the applicant's legal obligations in terms of local planning controls, State and Federal environmental legislation.

1.5 SCOPE OF WORKS

The project methodology and the scope of works are set out as follows:

- Background research including other local flora and fauna surveys, Pittwater Council LEP 1993, DCP 25 - Conservation of Biodiversity, and other relevant documentation, site drawings, maps and aerial photographs;
- Preparation of a revegetation (planting) strategy including a list of suitable species, plant numbers, densities and distribution over the subject site;
- Preparation of specifications for weed control, site preparation and planting, watering, staking and fertilising; and
- Preparation of a maintenance program (including a simple monitoring regime).

As part of the requirements of the development established by Council in preliminary discussions, the proponents have also been required to undertake a tree survey and an archaeological study of the property. These reports are presented under separate covers, but where relevant, their recommendations have been incorporated into this BMP.

1.6 COMPLIANCE WITH PITTWATER PLANNING INSTRUMENTS

This BMP has been prepared in accordance with the guidelines outlined in both *Development Control Plan 25 – Conservation of Biodiversity* and the Department of Urban Affairs and Planning's (DUAP)¹ *Guidelines for Preparing Management Plans for Urban Bushland* (Pittwater Council 2000, DUAP 1991).

It is recognised that *DCP 25 - Conservation of Biodiversity* has since been replaced with *Pittwater 21 DCP*, which among other environmental measures, provides for the:

- Conservation of core habitat, flora and fauna conservation areas (clause B4.2);
- Protection of wildlife corridors (clause B4.4);
- Protection of native wildlife (clause B4.5); and
- Protection of the endangered ecological community Pittwater Spotted Gum Forest (clause B4.6).

Since the development application for Observation Point was submitted and approved when DCP 25 was in effect, this BMP has been prepared in accordance with those requirements and guidelines.

Nevertheless, UBMC has taken four (4) relevant clauses of Pittwater 21 DCP (as set out above) into account when preparing this BMP. Each of the clauses is addressed in turn within the relevant section of the Report.

¹ DUAP is now part of the NSW Department of Environment & Conservation



The BMP prepared for Lot 1 Observation Point identifies the natural conservation values of the subject Lot, and recommends a range of management strategies to protect the remnant native vegetation, which may be impacted by development and construction works.

A timetable of works is proposed and a monitoring program designed to assess the progress of bushland rehabilitation works.

1.6.1 Development Control Plan 25 – Conservation of Biodiversity

DCP 25 guides development within the Local Government Area to ensure that it is compatible with the conservation of biodiversity, and that development complies with the objectives and requirements of the *Threatened Species Conservation Act 1995* and the *NW Biodiversity Strategy*.

Pittwater DCP 25 aims to:

- Conserve and rehabilitate remnant bushland in Pittwater that provides habitat for threatened species, populations and ecological communities listed under the *Threatened Species Conservation Act 1995*;
- Conserve and rehabilitate remnant bushland in Pittwater that provides important habitat for other species, populations and ecological communities that are native to the area;
- Maintain and re-establish native vegetation links between major bushland areas as wildlife corridors;
- Promote retention and replanting of native trees and shrubs throughout the developed areas of Pittwater; and
- Provide a clear guide for persons wishing to develop land to achieve ecologically sustainable development.

DCP 25 applies to all lands within Pittwater LGA, excluding Ku-ring-gai Chase National Park.

Under the DCP 25, Development Applications on properties containing core bushland and fragmented bushland, (such as the subject site) must include a Flora and Fauna Assessment and requires the preparation of a Bushland Management Concept Plan.

The Flora and Fauna Assessment was prepared by GIS Environmental Consultants (2000), and the Bushland Management Concept Plan by GIS Environmental Consultants (2003). The BMP (this report) deals with bushland management specifically in Lot 1.

1.6.2 Pittwater 21 Development Control Plan

Corridors and Connectivity

Pittwater 21 DCP B4.4 Protection of Wildlife Corridors requires the retention of the existing wildlife corridors, which basically means that the tree canopy and sub-canopy on the subject site must remain intact. As this part of the suburb of Palm Beach has been developed for many years, most residents have cleared the native understorey and planted exotic species, although some gardens have retained selected local plants such as Cabbage Palms, Tree Ferns and some Eucalypts.

'Filter corridors' used by birds and arboreal mammals are generally limited to the canopy and sub-canopy strata. Within the subject site, native trees and shrubs have been retained on the ridgetop and the lower slopes, below the rock ledges. The Bushland Management Concept Plan (GIS Environmental Consultants 2003) and Landscape Drawing (Hannan 2004), identifies areas within each Lot for 'indigenous revegetation' and 'landscaping'. Specifications include the replanting of native canopy and sub-canopy trees, which will enhance connectivity between the lower slopes and the ridgetop.

Rockeries and garden beds within the subject site and in adjacent gardens also provide habitat for small animals, particularly insectivorous birds and small reptiles. Long-nosed Bandicoots are known to regularly utilise the gardens in the locality, including those in the subject site.



Recommendations

- 1) Retain as many of the existing native tree canopy and sub canopy on the slopes in order to facilitate movement by birds and arboreal mammals.
- 2) Where native trees must be removed for construction, for improved access, or due to poor health, a similar tree (i.e. same species) should be planted elsewhere on the Lot to avoid further fragmentation of the already tenuous wildlife corridor.
- 3) Retention and or creation of some areas of 'untidy' native grasses, dense ground covers and small shrubs are recommended to provide protective habitat for small animals. Such habitat features are best sited in the designated 'bush regeneration' areas.
- 4) In other parts of the property designated as 'landscape areas' a range of small to medium sized flowering shrubs should be included in the planting design to provide food resources for native birds.
- 5) In re-creating native habitat, consideration must be given to the bushfire legislation² and the need to retain an appropriate Asset Protection Zone around the new residence and other built structures.

Protection of Native Vegetation

Clause B4.6 of *Pittwater 21 DCP* requires protection of the endangered ecological community – Pittwater Spotted Gum Forest and the representative species contained therein. However, the vegetation community in the locality of the subject site has NOT been identified as Pittwater Spotted Gum Forest (GIS Environmental Consultants 2000). It is likely that the original vegetation was the Narrabeen Slopes Forest Type (community type 9hii, after Benson & Howell 1994).

Nevertheless, the protection of any remnant native vegetation within Pittwater is highly desirable. Accordingly, Council has required the proponent to protect all native vegetation outside the development footprint(s) on the property, and to retain a significant number of native trees.

Further, there are areas within each Lot identified for 'bush regeneration'. Such areas will be rehabilitated to provide habitat for native flora and fauna. This will be achieved by the removal of weeds and introduced plants, thereby encouraging the (natural) regeneration of local native species.

There are also areas within each Lot identified for 'indigenous revegetation'. These areas (cleared or badly degraded sites) will be weeded and planted with a range of local native species grown by a specialist native plant nursery from seeds collected within a 5-kilometre radius of the subject site.

Recommendations

- 1) The placement of the new residences, driveways and other structures must comply with the Masterplan prepared in support of the development application to Council.
- 2) Prior to the commencement of construction works, the development footprint (construction zone) must be fenced off from adjoining areas of native vegetation. No incursion into the reserved area must occur at any time.
- 3) Trees to be retained inside and immediately outside the development footprint must be protected by the erection of tree guards around the trunk and/or protective fencing that should be erected on the outside edge of the drip line of each specimen.
- 4) Trees in poor health or damaged trees should be examined by a qualified arborist, and removed if they pose a threat to public safety.
- 5) Only suitably qualified and experienced bush regenerators (or landscapers with experience in native landscapes) should be employed to carry out weed control and planting.

² Planning for Bushfire Protection RFS 2001



2 OBSERVATION POINT - SITE DESCRIPTION

2.1 PHYSICAL ENVIRONMENT

2.1.1 Location and Setting

The subject site is located on the corner of Palm Beach and Barrenjoey Roads, Palm Beach. The property is an irregular shape, with a road frontage on both Palm Beach and Barrenjoey Roads.

The property forms a triangle between the two (2) roads, with land generally sloping to the west, towards Pittwater. Observation Point is within 100 metres of Pittwater (west) and 300 metres from the ocean at Palm Beach (east). Co-ordinates are Easting 344055 and Northing 6281318.

There is an existing house (circa 1950) located on the crest (or ridgetop), with views to Barrenjoey and Pittwater. Two (2) houses in neighbouring properties are located in close proximity. The access driveway (now under reconstruction) is from Palm Beach Road.

2.2 TOPOGRAPHY, GEOLOGY AND SOILS

The physical characteristics of the subject site and locality are summarised in Table 2.1, below.

Table 2.1: Summary of Physical Characteristics in the Locality of the Subject Site.

Feature	Description
Topography	Locally rolling to steep low hills and side slopes, with associated rocky headlands, bluffs and rocky outcrops. Site topography comprises northerly sloping land (mean slope angle approximately 40%), with a number of sandstone outcrops occurring.
Geology	The under-lying geology is characterised by Triassic Narrabeen Group Sediments of inter-bedded laminite, shale, quartz sandstone and lithic sandstone (Chapman and Murphy, 1989). Observable features – a group of sandstone ‘floaters’, with other outcrops occurring on adjoining Lots. Natural terraces have been enhanced with sandstone retaining walls.
Soils	The parent (or native) soil is derived from Narrabeen Group sediments. These are shallow to deep (30-200 cm) Lithosols/Siliceous Sands and Yellow Podzolics on sandstone, while Brown, Red and Gleyed Podzolics occur on shale geology. Site soil characteristics are consistent with those described for sandstone geology (above). <u>Limitations:</u> very high soil erosion hazard, impermeable plastic low wet-strength subsoil, localised run-on and seasonal waterlogging of footslopes (Chapman & Murphy 1989).
Soil Landscape	The soil landscape is classified as ‘Watagan’. Local relief is 60-120 metres, with slopes generally >25 degrees. There are narrow convex crests and ridges, steep colluvial side slopes, and occasional sandstone boulders and benches. <u>Limitations:</u> mass movement hazard, steep slopes, severe soil erosion hazard and occasional rock outcrop (Chapman & Murphy 1989).
Climate	Mean daily maximum temperature is 22.5°C, with highest temperatures recorded in Dec, Jan and Feb. The mean daily min. temperature 13.3°C, with lowest temperatures in June, July and Aug. Mean annual rainfall is 1220.6 mm; with April, May and June recording the highest mean levels (Bureau of Meteorology 2004, Manly Town Hall #066035).
Local Hydrology	No natural drainage lines occur within the site. Two constructed drainage lines have been identified on the construction drawing to service the development.



2.3 BIOLOGICAL ENVIRONMENT

2.3.1 Flora

The native vegetation at Observation Point is highly disturbed and comprises an introduced (exotic) mid-storey and understorey under a predominantly native tree canopy. The canopy is discontinuous, and tree height is variable across the site³.

The understorey supports a number of species commonly described as 'rainforest' plants, although these are more representative of the mesic or 'closed forest' vegetation type, which is commonly found in gullies and on sheltered slopes.

Terraced garden beds and steps have been constructed around the old house and on the steep upper slopes, and exotic trees and shrubs have been planted elsewhere on the property. Neighbouring gardens in the locality have been similarly landscaped. Many of these early planting have spread downslope into the 'bushland' sector of the subject site.

The lower slopes of the subject site retain significantly more native plants in each of the canopy, sub-canopy and understorey strata, although this area has also been degraded by weeds invasion and garden escapes.

GIS Environmental Consultants (2000) have prepared a species list for the subject site. This list (replicated in Appendix 2) identifies all remnant native species, and most of introduced plantings and weed species extant on the site in November 2000.

The original (pre-disturbance) vegetation of the subject site has been described by GIS Environmental Consultants (2000) as **Narrabeen Slopes Forest Type** (community 9bii, after Benson & Howell, 1994). GIS Environmental Consultants states that although the site supports "a few elements of the threatened Pittwater Spotted Gum Forest ecological community", these elements are too few in occurrence, and the vegetation is too disturbed to be described as such.

2.3.2 Fauna

A fauna survey carried out by GIS Environmental Consultants (2000) identified 28 fauna species utilising the subject site, including 14 bird species (11 native and 3 introduced), one (1) amphibian, three (3) reptile and eight (8) mammal species.

Although a number of threatened fauna species (*Threatened Species Conservation Act 1995*) occur within the Pittwater area, none have been recorded within the subject site.

GIS Environmental Consultants describe fauna habitat on the site as 'moderate to good' because of the large amount of cover provided by the overgrown garden and weed thickets. Such habitat would favour small birds, reptiles and small mammals. Invertebrate populations are expected to be high.

Habitat for arboreal mammals and birds is provided by the canopy and sub-canopy trees extant on site; and the property forms part of a discontinuous 'filter corridor' through the Palm Beach area, connecting to bushland on the shores of Pittwater and beyond. However, there are no canopy trees with hollows or caves on the site that could potentially provide habitat for micro bats and other specialised fauna.

³ It should be noted that many of the existing native canopy trees in this area are in poor condition, with a high % of dieback in the canopy. Termite nests and tunnels are clearly visible on some of the trees that have been identified for retention.



2.4 PLANNING AND LEGISLATIVE FRAMEWORK

A number of local planning policies, State and Commonwealth Acts and policies are relevant to the management of remnant bushland in Pittwater Local Government Area. A summary of the planning and legislative framework has been provided in Table 2.2

Table 2.2: Summary of Policies, Local Planning & Legislative Requirements

Level	Relevant policy / legislation	Relevance to subject site
LOCAL	<i>Pittwater Local Environmental Plan (LEP) 1993</i>	Controls the zoning of land and land uses within the Council area. Currently zoned 2(a) Residential
	<i>LEP 1993 – Clause 41 (Preservation of Trees)</i>	Council consent required for removal of trees within study area, via <i>Tree Preservation Order 1997</i> .
	<i>Development Control Plan 25 – Conservation of Biodiversity</i>	DCP 25 guides development within the LGA to ensure that it is compatible with the conservation of biodiversity, and that it complies with the objectives of the <i>Threatened Species Conservation Act 1995</i> and the <i>NSW Biodiversity Strategy</i> . According to DCP 25, Development Applications on properties containing core bushland and fragmented bushland must include a Flora and Fauna Assessment, and requires the preparation of a Bushland Management Concept Plan. Both documents have been prepared for the subject site (GIS Environmental Consultants 2000 and 2003).
STATE	<i>Threatened Species Conservation Act 1995</i>	There is no threatened ecological community present. No threatened flora or fauna species or populations were recorded within the subject site.
	<i>Noxious Weeds Act 1993</i>	There are 13 noxious weed species within the study area (see Appendix 3). The landowner has a legal responsibility to control weeds and prevent spread to adjoining land. Noxious weeds (including Pampas Grass) occur on the road boundary (Palm Beach Road) – on Council land. Control is Council's responsibility.
	<i>Rural Fires Act 1997 and Rural Fires and Environmental Assessment Legislation Amendment Act 2002</i>	The subject site is not identified as 'bushfire prone land' on Pittwater Council's bushfire risk map. However, there is still the potential for the site to be fired accidentally or through vandalism. Any proposed new dwelling should conform to the provisions of <i>Planning for Bushfire Protection 2001</i> (NSW Rural Fire Service and PlanningNSW).
	<i>SEPP 19 – Bushland in Urban Areas</i>	Pittwater is not listed in Schedule 1 of the SEPP. Therefore this Policy does not apply to the subject site. According to the definition provided by SEPP-19 the remnant bushland is too fragmented and too simplified to be described as 'urban bushland'.
	<i>SEPP 44 – Koala Habitat Protection</i>	The subject site is not identified as existing or potential koala habitat. Proposed subdivision will not have a significant impact on any Koala populations or their habitats. Therefore, the preparation of a Plan of Management for areas of Koala Habitat is not required.
	<i>Sydney Regional Environmental Plan No 20--Hawkesbury-Nepean River</i>	SREP 20 requires that the impacts of future land uses on the Hawkesbury-Nepean River System be considered in a regional context. Pittwater LGA is listed in Section 2, and therefore the aims and objectives of the Plan must be applied when planning the development.
	<i>Native Vegetation Conservation Strategy</i>	To adhere to the strategy, options should be identified to allow for the retention of areas with the highest concentration of indigenous species, and a planting program utilising locally indigenous species should be adopted. This is being addressed by reserving areas for bush regeneration works.
	<i>NSW Biodiversity Strategy</i>	As for the Native Vegetation Conservation Strategy, above.
FEDERAL	<i>Environment Protection and Biodiversity Conservation Act 1999</i>	No threatened flora species or ecological communities were recorded within the subject site.



3 LOT 1 - BUSHLAND MANAGEMENT PLAN

3.1 SITE DESCRIPTION

Lot 1 is sited at the northern end of the subject site, and comprises land on a steep west-facing slope overlooking Pittwater. A neighbouring property and residence is located immediately to the north, and a second property is located upslope (north-east).

Lot 1 is 0.14 hectares in size (1,390 sq metres). Of this total area, 521 sq metres have been identified for bush regeneration works and 149234 sq metres are for revegetation with locally indigenous species (Bushland Management Concept Plan, GIS Environmental Consultants 2003) (Figure 3.1).

3.2 MANAGEMENT ISSUES & RECOMMENDATIONS

3.2.1 Retention of Native Vegetation & Weed Control

There are very few native plants remaining in Lot 1. Noted during site investigations were a small number of individuals of *Banksia integrifolia* (Coast Banksia), *Acacia sophorae* (Coast Wattle), *Glochidion ferdinandi* (Cheese Tree), a single *Livistona australis* (Cabbage Palm), a *Ficus* sp. (Fig Tree) and several *Pittosporum undulatum* (Sweet Pittosporum). These native plants occur mainly below the rock ledges on the lower slopes, well below the proposed dwelling footprint and in an area proposed for 'bush regeneration' works (see Figure 3.1).

A number of native plants also occur within the development footprint. These include Coast Banksia, Coast Wattle and several Cheese Trees. However, these plants are far too large to transplant successfully. Due to the dense weed growth over most of the development footprint, it was not possible to locate any juvenile or native seedlings for translocation.

These native plants described in the development footprint and immediately surrounding areas are growing out of a dense weed thicket (to approximately 1.5 m in height), which comprises *Lantana camara* (Lantana) overgrown with *Lonicera japonica* (Japanese Honeysuckle), *Ipomoea indica* (Morning Glory) and other weeds. The site is boggy and difficult to access for survey purposes. There is a dense growth of *Ageratina adenophora* (Crofton Weed) and *Ageratina repens* (Mist Flower) in these boggy areas, with a large stand of *Arundo donax* (Giant Reed) occurring near the northern Lot boundary.

Recommendations

- 1) Clear all vegetation within the development footprint¹ using a bobcat or small backhoe. Hand removal of weeds is not an option in the development footprint due to weed density, difficulty of access and steepness of the slope.
- 2) Clear weeds around rock outcrops within the development footprint by hand where machine access is not possible.
- 3) Stockpile weed debris in a pre-designated site for collection and disposal off-site.
- 4) A qualified bush regenerator should supervise weed clearance.
- 5) Fence off the development footprint (as per Modified Conditions) to ensure no machine access to or construction impact on the remaining native vegetation.
- 6) Identify and clearly mark all native plants to be retained immediately outside the development footprint to ensure that these are protected from accidental damage.
- 7) Ensure that these native plants are protected during construction by the erection of tree guards around the trunk and/or protective fencing that should be erected on the outside edge of the drip line of each specimen.

¹ The development footprints have been staked and flagged on all four (4) corners.



- 8) In the designated 'bush regeneration' area, commence a targeted weeding program to remove all keystone weeds – i.e. environmental and declared noxious weeds. The bush regeneration program is to extend over a minimum period of 12 months from completion of construction.
- 9) For the designated 'indigenous revegetation' areas, select species from the list provided in Appendix 5, which comprises locally indigenous species and complements the landscape values of the locality. Also see Landscape Drawings (Hannan, 2004). At least four (4) months lead-time will be required for propagation of tubestock.
- 10) The bush regeneration and indigenous revegetation programs are to be carried out by trained bush regenerators⁵. All works involving on-ground works in area supporting native vegetation are to be supervised by a trained bush regeneration supervisor or ecological consultant with experience in bushland management.

3.2.2 Weed Control Methods

There are numerous methods used to control weeds on private and public lands. In the remnant urban environment.

bushland, the bush regeneration approach - which includes hand weeding, the careful use of selective herbicides, and planting with local species - has become accepted practice. However, the use of machinery, broad-scale application of herbicides (boom or aerial spraying) or the use of fire to control weeds may also be appropriate on cleared or badly degraded land, or in rural situations.

The most commonly used methods of weed control are:

- Hand weeding (minimal impact);
- Herbicides;
- Mowing and slashing;
- Mechanical clearing;
- Burning;
- Weed matting and mulching; and
- Biological control.

The most appropriate weed control methods for Lot 1 will be mechanical clearing (within the development footprint on the mid to upper slopes), with hand weeding and the selective use of herbicides suitable for work in the remainder of the Lot.

Recommendations

A list of weeds and non-indigenous native species to be removed and their recommended methods of control has been included as Appendix 4. The recommended control methods are based on current 'best-practice' techniques currently used in the bush regeneration industry.

Table 3.1: List of Keystone Weeds to be removed from Lot 1 *

Botanic Name	Common Name	Status
<i>Acetosa sagittata</i>	Turkey Rhubarb	W4b noxious weed
<i>Ageratina adenophora</i>	Crofton Weed	Environmental weed
<i>Ageratina riparia</i>	Mist Flower	Environmental weed
<i>Araujia hortorum</i>	White Moth Plant	W4c noxious weed
<i>Arundo donax</i>	Giant Reed	W4a noxious weed
<i>Asparagus densiflorus</i>	Asparagus 'Fern'	W4c noxious weed

⁵ A trained bush regenerator is one who has successfully completed the Natural Area Restoration Certificate II at NSW TAFE (or interstate equivalent).



Botanic Name	Common Name	Status
<i>Cotoneaster pannosus</i>	Cotoneaster	Environmental weed
<i>Chlorophytum comosum</i>	Spider Lily	Environmental weed
<i>Crocosmia x crocosmiiflora</i>	Montbretia	Environmental weed
<i>Ipomoea indica</i>	Morning Glory	W4c noxious weed
<i>Lantana camara</i>	Lantana	W2 noxious weed
<i>Ligustrum lucidum</i>	Large-leaf Privet	W4c noxious weed
<i>Ligustrum sinense</i>	Small-leaf Privet	W4c noxious weed
<i>Nephrolepis cordifolia</i>	Fishbone Fern	Environmental weed
<i>Ochna serrulata</i>	Ochna	W4b noxious weed
<i>Rubus fruticosus</i>	Blackberry	W2 noxious weed
<i>Phoenix canariensis</i>	Canary Island Palm	Garden Escape
<i>Senna pendula</i>	Cassia	Environmental weed
<i>Strelitzia parviflora</i>	Bird of Paradise	Garden Escape

* this weed list is not meant to be exhaustive as more species may be recorded once bush regeneration work gets underway

3.3 BUSH REGENERATION PROGRAM

3.3.1 General Guiding Principles

The management of any natural area (which includes native bushland and wetlands) should be guided by the following broad principles:

- To **protect** bushland remnants from further loss and the effects of existing and future threatening processes;
- To **identify** all biodiversity and geo-diversity elements;
- To **conserve** significant items/areas by mitigating or removing threatening process and promoting those natural processes required to ensure long-term viability;
- To **enhance** species diversity in highly simplified or degraded remnants not capable of restoration and in non-remnant areas;
- To **provide** corridors and linkages between remnants to facilitate movement and to encourage the flow of genetic material; and
- To **provide** opportunities for passive recreation in a controlled manner consistent with its ecological values.

This approach to bushland management has been adopted in the BMP for the subject site.

3.3.2 Definition of Urban Bushland

According to *SEPP-19*, bushland means “land on which there is vegetation which is either a remainder of the natural vegetation of the land or, if altered, is still representative of the structure and floristics of the natural vegetation”.

In order to determine whether a stand of vegetation may be regarded as ‘bushland’ in terms of the legislation (*SEPP-19*), it should exhibit all of the attributes set out below:

- Indigenous native species should comprise the canopy (i.e. the upper stratum);
- The understorey stratum (a natural characteristic of the bushland type), and the ground cover stratum, should comprise indigenous native species, or if disturbed, will retain sufficient resources (i.e. seed or standing biomass) to re-establish those strata when disturbance is arrested or ameliorated; and



- The structure of the vegetation should be recognisably a remnant of a natural bushland type, or a regrowth form that has achieved a near natural structure, or is a seral stage towards that structure⁶.

The native vegetation within the subject site is highly degraded and structurally simplified, and although there are some emergent canopy trees, shrubs and some discrete areas of native understorey remaining, the vegetation on Lot 1 cannot be described as 'bushland' in terms of SEPP-19⁷. Rather the site can be described as a neglected or overgrown garden, with some native species remaining in situ.

3.3.3 Determining Bushland Condition

Assessing Bushland Health & Regenerative Potential

Before commencing a bush regeneration project, the condition or health of the native plant community must be assessed, quantified and mapped. A 'condition of bushland' map is usually prepared to provide an indication of the regenerative potential or site resilience. There are four (4) categories in common use, explained below in Table 3.2.

Table 3.2: Assessment of Bushland Condition or Health

Category	Quantification	Description
Very good/excellent	> 70% native plants remaining	High quality
Good to fair	50-70% native plants remaining	High to moderate quality
Poor / degraded	30-50% native plants remaining or canopy trees only w native understorey absent	Moderate to degraded quality
Chronically degraded	< 30% native plants remaining, mostly cleared, or scattered native trees over pasture / introduced grassland	Non-bushland

In determining categories of bushland 'health' or condition, and thereby selecting the best approach to the rehabilitation of the plant community, the following points must be considered:

- The ratio of cover provided by native and weed species, and the height of both canopies;
- The diversity and number of native plants remaining;
- The life forms of the native plants (woody plants, herbs, ground covers);
- Target weed species present (determining techniques, time-frame for action, costs); and
- The proximity of nearby bushland (to provide seed and other propagative material).

Using the above-listed criteria, the condition of the (remaining) native vegetation in Lot 1 can be described as 'chronically degraded' or 'non-bushland: i.e. there are fewer than 30% native plants remaining. However, there are some small trees/large shrubs over a weedy understorey occurring below the rock ledges on the lower part of the Lot (designated as a 'bush regeneration area'): condition of this area is described as 'poor to moderately degraded'.

Site Resilience

Regenerative potential (site resilience) will be determined in large part by the distribution and abundance of native plants remaining on the site (or occurring close-by), and by the presence of native seed remaining in the soil seed bank. Where site resilience is judged to be 'moderate to high', the methods and techniques used by the bush regeneration industry will assist to re-establish the native plant community from *in-situ* sources.

Conversely, where for some reason site resilience is likely to be low (or absent), revegetation (or 'restoration') using local species ('indigenous revegetation') is the most practical and economical way to proceed.

Site resilience in Lot 1 is expected to be 'low to absent' on the middle to upper parts of the Lot, and 'low to moderate' on the lower slopes, where some native canopy and sub-canopy species remain in situ.

⁶ NSW Department of Urban Affairs & Planning, Circular No B13, 17 March 1989

⁷ Although it is noted that GIS (2000) describe the vegetation as 'bushland', although highly simplified and degraded.



3.3.4 Application of Bush Regeneration Principles

The bush regeneration approach usually concentrates on the rehabilitation of sites categorised as 'good to fair', relying on natural regeneration from *in situ* sources (i.e. existing native plants, seeds/root or rhizome fragments in the soil). Bushland in the 'good to fair' categories will retain sufficient regenerative potential (or resilience) to re-establish the native plant community once weeds have been removed.

In areas identified as 'poor quality' or 'degraded' – eg. rubble or till soils, or where the native vegetation has been cleared for many years - there are usually few native plants remaining on the site. In such areas, it is likely that the soil seed bank is depleted (or absent entirely), thereby greatly reducing the potential for 'natural regeneration'. For such areas, alternate bushland rehabilitation methods must be used. In chronically degraded or extensively cleared areas, the plant community must be re-created - not regenerated. This usually involves broad scale and often-expensive revegetation programs.

3.3.5 Bush Regeneration

The most commonly used approach to the rehabilitation of native plant communities (bushland) is bush regeneration, which is defined as:

"...the practice of restoring bushland by focusing on reinstating and reinforcing the system's on-going natural regeneration processes" (Australian Association of Bush Regenerators, nd).

The bush regeneration approach (removing weeds and encouraging native plant regeneration from *in situ* seed sources) is suitable only for those high resilience sites where the soil seed bank is intact, where native plants still occur, and where there is enough species diversity to restore the major structural components of the vegetation community.

Representative species of each layer (or stratum) – the canopy, mid-storey and understorey – must be present or (potentially) be present in the above-ground biomass or in the soil seed bank for natural regeneration to function as the primary rehabilitation process. Such bushland is described as 'structurally intact', and conforms to the definition provided by *VI/PP-19*. Regeneration of the native plant community from soil seed sources cannot occur where the potential for regeneration (resilience) is very low or absent.

The bush regeneration approach incorporates a number of methodologies, or strategies – the most commonly used are:

- **Natural Regeneration** – consists of removing weeds using a mixture of hand weeding methods and the use of selective herbicides, and caring for the native seedlings which subsequently colonise the site.
- **Assisted Natural Regeneration** – combines traditional bush regeneration methods (e.g. weeding) with seed collection, propagation and planting of locally indigenous tubestock to supplement natural (unassisted) regeneration.
- **Reconstruction or Restoration** – is used where a native plant community has been completely lost, but where the biophysical attributes of the site (e.g. soil type, soil nutrient status, hydrological regime) are still within levels which remain tolerable by the original plant community. Reconstruction techniques centre on the planting of locally indigenous species in the proportions, range and densities representative of those found in the original plant community.
- **Fabrication** – is used where the original native plant community is no longer present, and where biophysical attributes have changed to the point where the original plant community cannot be reconstructed or recreated (i.e. where site conditions have changed so dramatically that simply replanting with local native species is impractical). Fabrication of a new plant community will necessarily take place over a long period of time (up to and possibly greater than 10 years). The time frame will depend heavily on the feasibility of ameliorating site impacts and of course, on the resources available for on-ground works.



The rehabilitation of native bushland in those parts of Lot 1 identified for bush regeneration works will be managed using strategies described as 'Natural Regeneration' and 'Assisted Natural Regeneration'.

Degraded or cleared sites will be 'Reconstructed' or 'Restored' through a program of indigenous revegetation (see Figure 3.1). A list of species suitable for revegetation works on Lot 1 has been included in Appendix 5.

3.4 REVEGETATION PROGRAM

Revegetation works in bushland usually involves 'enrichment' or supplementary planting in areas of low species diversity; and more comprehensive 'bush landscaping' on edge sites, buffer zones, or landscaped garden beds to create an extended native habitat.

Enrichment planting is usually carried out in order to increase species diversity by planting small shrubs, herbs, grasses and occasionally, a new canopy tree. Enrichment planting can also be used to increase habitat potential for native fauna, and/or to re-introduce species which are known to have once been a component of the local plant community, but for some reason have now been lost.

The term 'bush landscaping' refers to more extensive plantings, which are used to in-fill clearings or gaps, to link remnants, establish buffer zones at the interface between bushland and developed areas, or to create complementary native 'gardens' on adjoining sites.

Both approaches to the restoration of a native landscape are appropriate to the restoration of native bushland within the subject site.

With respect to Observation Point, enquiries have been made to three (3) specialist native plant nurseries – Wirreander, Toolijooa and Hills Native Plant Nurseries. Each of these commercial nurseries has indicated that they are able to collect seed and propagate the majority of species list in Appendix 5. As soon as sites and plant numbers are finalised, a pre-order will be lodged with one of these nurseries for the supply of indigenous tubestock.

Revegetation techniques are discussed in Section 3.4. A list of locally indigenous species suitable for landscaping and bushland regeneration has been included as Appendix 5 and provided with planting densities on Figure 3.1 (B).

3.4.1 Densities and Spatial Arrangement

The final density and height of any species planted must be considered with regards to maintaining views for neighbours, screening, and adhering to Pittwater 21 DCP and other planning guidelines.

Planting arrangements should be clumped (i.e. based on likely natural configurations and densities) in order to replicate the pre-disturbance plant community. Planting densities will depend on the number and type of native plants remaining after weeds are removed. If the site is effectively denuded after weed removal, and it is considered unlikely that natural regeneration will provide the desirable result, tubestock can be planted to replicate the pre-disturbance community structure.

Planting densities should be based on the final size of the relevant species used. For example, small-sized plants (generally less than 500 millimetres in height) should be planted in groups at a density of approximately three (3) to five (5) units per sq metre. Larger species may also be planted in groups of three (3), five (5) or seven (7), but should be placed sufficiently close together to enable a dense cover to form (where this is appropriate, and where it will not suppress light-demanding groundcovers, or obscure views for neighbours).



3.4.2 Planting Aids

Plant Fertilisers

A specially formulated native plant fertiliser (low in phosphorus) should be used when planting native tubestock on cleared or disturbed land. Regular applications of dilute fertiliser should be used twice yearly (spring and early autumn) or when plants show signs of yellowing or spindly growth (at least until the plants become established and drought hardy).

The use of a native plant fertiliser will promote plant establishment in the first 6-12 months of the planting program. As the vegetation cover is re-established and organic matter is re-cycled into the topsoil, there will be less need for supplementary nutrient input. Complete native plant fertilisers are available in granular form or as tree tablets. Soluble fertilisers are preferable to granular forms, although tree tablets (or pellets) are useful at planting time.

Water Retaining Granules/Soil Wetters

Soil wetters such as Debco, Saturaid, Terracottem (or similar) should be used in harsh conditions and/or where post-planting watering may be a problem, and they are particularly useful in free-draining sandy soils.

These products are inert, and do not react with fertilisers or herbicides. If used at planting time, watering times can be reduced by up to 50%. Experience in bush regeneration sites has allowed a much greater survival rate than previously achieved.

3.4.3 Staking & Plant Bags

As tubestock will be used for both enrichment planting and bush landscaping (indigenous revegetation), staking will not be necessary. There is no evidence of rabbits, hares or wallabies grazing on the subject site, so the use of protective plant bags will not be necessary.

Where advanced trees or shrubs are placed into the designated 'landscaped areas', stakes will be required to protect against high winds. This will be particularly important, as the soils on many parts of the site are very shallow.

3.4.4 Mulching and Weed Matting

Mulch is crucial to the success of most planting projects as it keeps the soil cool and moist and suppresses weed growth. Mulching around planted tubestock can utilise chipped eucalypt mulch (if this is available), or if costs allow, commercial 'leaf mulch' may be used.

Chipped or mulch from woody weed sources are never acceptable. All imported mulch must be of known provenance and free of weeds. Alternately, it is possible to foliar spray dense weed grasses with a selective herbicide (eg Fusilade) and to leave the dead thatch in place as mulch.

Mulch must be applied at the time of planting, after thorough soil wetting. When planting in large open areas, plants should be grouped to allow mulch to be applied around each 'planting island' or cluster. This reduces the edge effect (weed invasion, drying) and makes plant maintenance easier.

Weed Matting (such as Jutemaster, Enviromat, coconut fibre) is also useful for retaining soil moisture and suppressing weed growth. Individual weed mats may be used around each plant at planting time, or broad-scale weed matting can be placed over a large area. If the latter approach is used, the matting must be firmly anchored with long metal pins.

Note that weeds will grow well in most types of mulch and on the surface of weed matting, but seeds beneath are usually prevented from germinating. Note that grasses and bulbs, which have very sharp leading shoots (new growth), can pierce loosely spun weed mats and grow up through them.



3.4.5 Irrigation

It may not be possible to water new plantings over a long period, therefore the planting program should be planned to coincide with the period of maximum (and regular) rainfall. In most of the Sydney Region, optimal planting times are autumn and spring (respectively).

It is also important to ensure adequate watering at placement, applying 1-1.5 litres of water to each new plant immediately after planting. Additionally, the use of a water-retaining compound and some form of surface mulch are strongly recommended to retain soil moisture and decrease the need for on-going watering.

Plants should be soaked for at least 30 minutes prior to planting (before being removed from their pots), watered thoroughly at planting and thereafter, watered once each week for a period of four (4) weeks (weather conditions dictating frequency).

After this period, watering comprising one (1) litre of water/plant each month will be required until the plants have established. If drought conditions prevail, the watering period may have to be extended to ensure plant survival. Watering is best carried out in the early morning, as watering at dusk encourages fungal attack in some species.

Irrigation following planting in bush garden settings is most effective using a 'dripper system', which delivers water to the plant roots rather than spraying it into the air. The existing irrigation system in the subject site could economically be converted from a spray system to a dripper system.

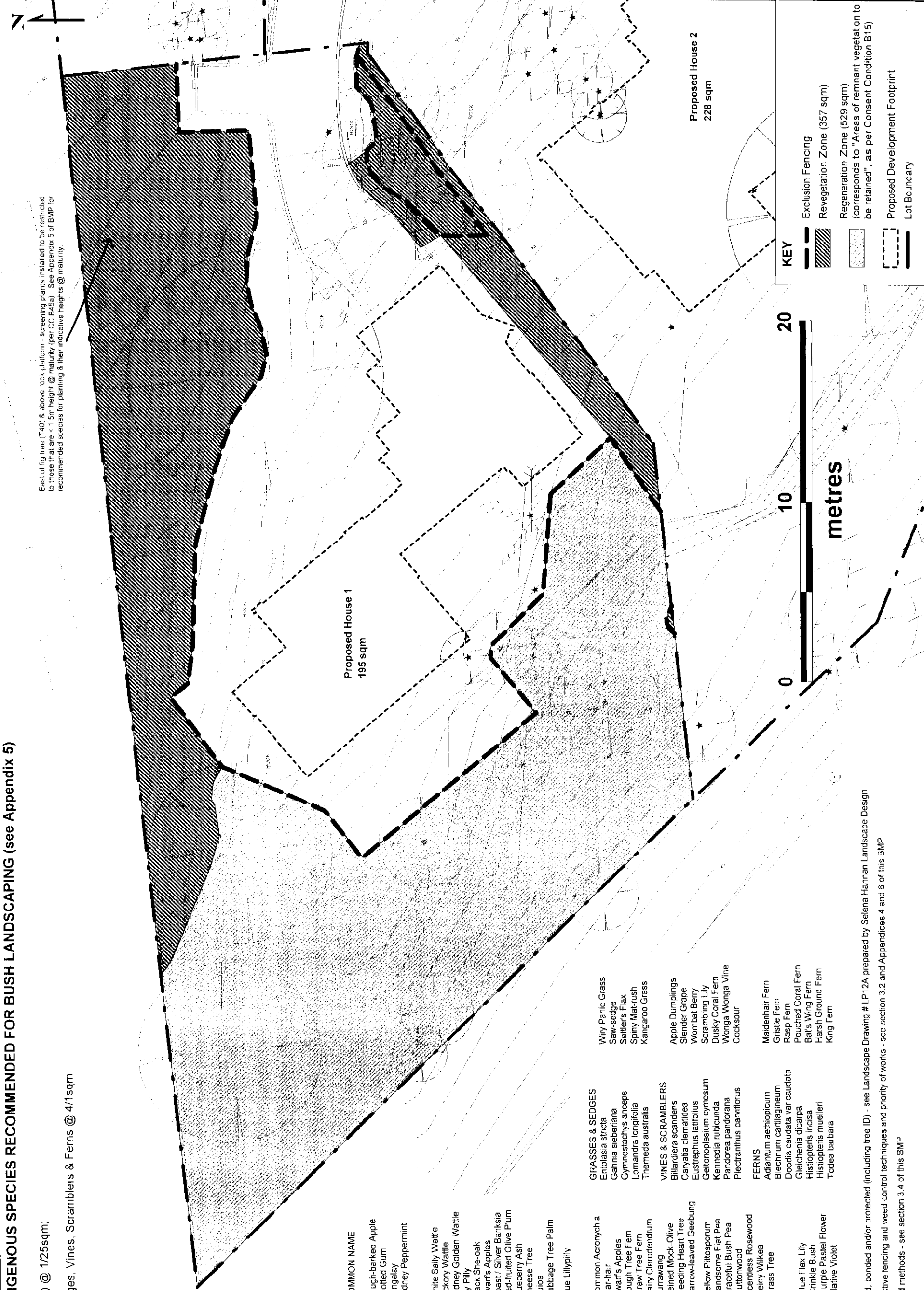
LIST OF LOCALLY INDIGENOUS SPECIES RECOMMENDED FOR BUSH LANDSCAPING (see Appendix 5)

Planting densities:
Trees (Canopy & Sub-canopy) @ 1/25sqm;
Shrubs @ 1/2sqm;
Groundcovers, Grasses, Sedges, Vines, Scramblers & Ferns @ 4/1sqm

SPECIES	COMMON NAME
CANOPY (> 20m)	
Angophora floribunda	Rough-barked Apple
Corymbia maculata	Spotted Gum
Eucalyptus botryoides	Bangalay
Eucalyptus piperita	Sydney Peppermint
SUB-CANOPY (8-20m)	
Acacia floribunda	White Sally Wattle
Acacia implexa	Hickory Wattle
Acacia longifolia	Sydney Golden Wattle
Acmena smithii	Lily Pilly
Allocasuarina littoralis	Black She-oak
Backhousia myrtifolia	Dwarf's Apples
Banksia integrifolia	Coast / Silver Banksia
Cassine australis	Red-fruited Olive Plum
Eleocharis reticulatus	Blueberry Ash
Glochidion ferdinandi	Cheese Tree
Guioa semiglaucula	Guioa
Livistona australis	Cabbage Tree Palm
Syzygium oleosum	Blue Lillypilly
SHRUBS (< 8m)	
Acronychia oblongifolia	Common Acronychia
Astrotiche divaricata	Star-hair
Bryonia oblongifolia	Dwarf's Apples
Cyathia australis	Rough Tree Fern
Cyathia cooperi	Straw Tree Fern
Clerodendrum tomentosum	Hairy Clerodendrum
Macrozamia communis	Burrawang
Notelaea venosa	Veined Mock-Olive
Omalanthus populifolius	Bleeding Heart Tree
Persea linearis	Narrow-leaved Geebung
Pittosporum revolutum	Yellow Pittosporum
Platylabus formosum	Handsome Flat Pea
Pultenaea flexilis	Gracetul Bush Pea
Rapanea variabilis	Muttonwood
Synoum glandulosum	Scentless Rosewood
Wikiea huegeliana	Veiny Wilkiea
Xanthorrhoea macronema	Grass Tree
GROUNDCOVERS	
Dianella caerulea, D. producta	Blue Flax Lily
Lomatia myricoides	Crinkle Bush
Pseudanthurum varibile	Purple Pastel Flower
Viola hederacea	Native Violet

GRASSES & SEDGES	Wiry Panic Grass
Entolasia stricta	Saw-sedge
Gahnia sieberiana	Settler's Flax
Gymnostachys anceps	Spiny Mat-rush
Lomandra longifolia	Kangaroo Grass
Themeda australis	
VINES & SCRAMBLERS	
Billardiera scandens	Apple Dimpplings
Caryatia clematidea	Slender Grape
Eustrephus latifolius	Wombat Berry
Geitonoplesium cymosum	Scrambling Lily
Kennedia rubicunda	Dusky Coral Fern
Pandorea pandorana	Wonga Wonga Vine
Plectranthus parviflorus	Cockspur
FERNS	
Adiantum aethiopicum	Maidenhair Fern
Blechnum cartilagineum	Gristle Fern
Doodia caudata var caudata	Rasp Fern
Gleichenia dicarpa	Pouched Coral Fern
Histiopteris incisa	Bat's Wing Fern
Histiopteris muelleri	Harsh Ground Fern
Todea barbara	King Fern

NOTES:
* For locations of trees to be retained, banded and/or protected (including tree ID) - see Landscape Drawing # LP12A prepared by Selena Hannan Landscape Design
* For details re: exclusion and protective fencing and weed control techniques and priority of works - see section 3.2 and Appendices 4 and 6 of this BMP
* For details re: planting sources and methods - see section 3.4 of this BMP
* Approximate Scale @ A1 - 1:100





4 IMPLEMENTATION

4.1 WORKS PROGRAM

The long-term nature of re-establishing and maintaining a bush garden is strongly emphasised. Priority actions set out in the BMP have been limited to a 12-month year timeframe (depending on climatic conditions), with a recommendation for review (and adjustment) at this time. However all gardens require regular maintenance, even bush gardens. This will be on going.

An indicative works program has been set out in Figure 4.1. Indicative costings are shown in Table 4.1.

4.2 SITE MAINTENANCE

A regular maintenance program will be required for all planted areas after the completion of initial works. During the initial works and establishment phase (to 12-months), this will be the responsibility of the proponent.

Actions embedded within the plant maintenance program are:

- Weeding to remove competitive exotic plant species and control invasive natives;
- Care of planted areas (including watering, disease control, application of native plant fertilisers and replacement of lost or failed plants);
- Maintenance of plant bags and stakes (with removal once plants overtop the bags); and
- Rubbish removal and care of edges and buffer zones.

Monitoring is an integral part of the maintenance program (see Section 4.4).

4.3 LABOUR AND RESOURCES

The appointment of a supervising Project Manager is recommended. The Project Manager will be responsible for implementation of each element of the BMP, and will act as liaison officer between the proponent and Council.

The Project Manager will also be responsible for 'sign off' at each stage (milestone) of the project.

The bush regeneration or landscape contractor appointed to carry out on-ground works should be suitably qualified and experienced bush regenerators or horticulturalists with experience in bushland rehabilitation and restoration.

4.4 MONITORING AND ASSESSMENT

A simple monitoring program is recommended to assess the on-going success of the program. Monitoring may be carried out by the Project Manager and/or the bush regeneration contractor, and should continue for a period at least equal to the maintenance period determined by the BMP (set at 12 months).

Monitoring procedures should be simple and straightforward, as well as inexpensive to implement. Monitoring should provide both qualitative (visual/photographs) and quantitative (statistical/quadrats) assessment. Reports should provide findings in a manner that is readily interpreted by all stakeholders.

Monitoring procedures, frequency and duration of survey, and reporting format should be agreed between the contractor and the client at the outset of the restoration project.



4.5 PERFORMANCE INDICATORS AND MILESTONES

Performance indicators and milestones (or 'targets') are used to demonstrate that the program of implementation for the strategies outlined has been achieved.

The BMP has, as one of its primary goals, the restoration and maintenance of the native plant community in selected parts of the subject site. Other goals include the retention of native canopy trees and other within the subject site in order to retain the existing wildlife corridor through the locality.

The following indicators have been developed to serve as a general guide to monitoring the progress of revegetation works.

- An increase in the % cover of indigenous vegetation in each of the designated bush regeneration areas;
- An increase in the number of indigenous plant species (i.e. > species diversity);
- No net loss of canopy trees (i.e. replacement of trees removed for construction); and
- Eradication of all listed keystone weeds by the end of a 12-month period of primary and secondary weeding (bush regeneration works).



Figure 4.1: Timetable of Works

TASK									
	34-36	37-39	40-42	43-45	46-48	49-51	52-54	55-57	58-60
Pre-construction									
Identify appropriate native species for post-construction revegetation and source a tubestock supplier.									
Treat introduced (weed) grasses and other weed species located within the identified construction zone.									
Patches of native vegetation identified for retention are to be weeded prior to construction works commencing.									
Identify native vegetation for retention, and protect these using temporary barriers and exclusion fencing.									
Install appropriate erosion and sediment controls.									
Trees to be retained and/or patches of native vegetation clearly identified on site maps.									
Identify sites for service areas and access routes and fence to prevent accidental incursion into vegetation to be retained.									
During Construction									
Reserve cleared native vegetation for re-use in rehabilitation works.									
Ongoing maintenance of exclusion fencing, tree guards, erosion control measures, access routes and stockpile sites.									
Post-construction									
Remove exclusion fencing and tree guards.									
Planting in revegetation and regeneration areas									
Weed control throughout entire Lot (includes primary and follow-up treatments)									
Maintenance and replacement planting (as needed).									
On-going weed control program.									
Remove erosion and sediment fencing									

Table 4.1: Indicative Costing for the Works

Please note that the below costing is indicative only, and should be used as a guide only.

Activity	Unit Rate	Quantity	Cost
On-going implementation of BMP, during construction	500.00	5	2,500.00
Primary weed control in revegetation and regeneration areas, as indicated on Drawing (521 sq.m approx)	32.00	60	1,920.00
On-going implementation of BMP, post construction (5 years) Year 1 - 4 visits	525.00	4	2,100.00
Year 2 - 4 visits	550.00	4	2,200.00
Year 3 - 3 visits	580.00	3	1,740.00
Year 4 - 3 visits	605.00	3	1,815.00
Year 5 - 2 visits	640.00	2	1,280.00
Supply and plant Tubestock Approx	3.80	114	433.20
Supply and plant Hikos/virocells Approx	1.80	880	1,584.00
Establishment & maintenance of plantings. 10 sess over 3 months	240.00	10	2,400.00
Quarterly reporting on status of relocated plants (per DA)	185.00	4	740.00
Project Management & reporting	\$500 Lump sum per annum	5	2,500.00
Subtotal			\$21,212.20
GST			\$1,869.30
GST			\$2,121.22
Total			\$20,562.30
Total			\$23,333.42

Variation Rates

Annual reports	Item	750.00	Variation rates do not include GST, add at the rate of 10%.
Bush regeneration supervision	Hour	38.00	
Bush regeneration labour	Hour	32.00	
Supply & install tubestock	Each	3.80	
Supply & install hiko/virocells	Each	0.90	
Exclusion fencing	Lin.m	13.50	
Sediment fencing	Lin.m	13.50	
Mulch	Cu.m	52.00	
Jute matting, supply & lay	Sq.m	8.93	
Nurse crop, as specified	Sq. m	5.93	

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6 APPENDICES

APPENDIX 1: SAMPLE MODIFIED CONDITIONS OF CONSENT (PITTWATER COUNCIL MAY 2003)

Bushland Management Plan House 1, Observation Point, 1148-1152 Barrenjoey Road, Palm Beach

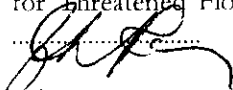
Development consent was given by Pittwater Council for construction of a dwelling on Lot 1 subject to a number of conditions. Included in these were the following:

- B15. Three copies of a detailed **Bushland Management Plan** covering the regeneration/revegetation/restoration of the site are to be submitted prior to the release of the Construction Certificate. The Bushland Management Plan is to be accompanied by a certification by an appropriately qualified and experienced Bushland Management Consultant stating that the Bushland Management Plan is consistent with Department of Urban Affairs and Planning's Urban Bushland Management Guidelines, the Conservation of Biodiversity DCP, the management for Threatened Flora and Fauna in Pittwater and any relevant requirements.
- B15a. In particular, the following matters are to be addressed:
1. Define each project task to be undertaken during regeneration/revegetation/restoration; how each task will be done; the duration of each task; the priority order for each task; and who will be responsible for undertaking each task.
 2. Prepare a time frame for all tasks involved.
 3. Local native to be used - identify local native plant stock.
 4. Prepare maps/diagrams and plant species lists including existing vegetation, site constraints and trees, vegetation, habitat, bush rock and other natural features to be retained.
 5. Prepare maps/diagrams including proposed vegetation (species/communities), density of planting, size of plants (virocells, long stems, tubestock etc), sediment and erosion control to protect the vegetation etc.
 7. Specify techniques to be used for domestic and feral animal control.
 9. Detail site preparation including:
 - a. Protection of trees, vegetation, habitat, bush rock or other natural feature to be retained;
 - b. Installation of sediment and erosion control devices.
 - c. Completion of any site works.
 - d. Weed control prior to disturbance (techniques and sequences of removal).
 - e. Weed control immediately following completion of site works (techniques and sequence of removal).
 - f. Application of herbicides (if any) prior to site disturbance.
 - g. Application of herbicides (if any) immediately following completion of site works.
 - h. Top soil/litter layer.
 - i. Soil remediation.
 - j. Surface preparation (including levelling, deep ripping, scarifying, mulching).
 - k. Surface stabilisation (must be suitable for the site vegetation) - matters including erosion matting, mulch brush-matting, sterile cover crops, binding sprays, and
 - l. Site drainage.

10. Planting program and method including installation of weed matting, mulch, stakes and ties, tree guards, use of fertilizer and type (including justification of the use of fertilizer), use of water retaining crystals.
11. Site and vegetation maintenance including sediment and erosion control, watering, replacement of plant loss, disease and insect control, mulch, maintenance for a period of 18 months commencing at date of issue of Occupation Certificate.
12. Site management to prevent the placement of soil or storage of any materials in the drip line of trees or native vegetation or habitat to be retained on the site.
13. Monitoring and review (develop method for performance evaluation, replacement of plant losses and other relevant matters).
14. Other issues including public safety, signage, relevant legislation, planning instruments/guidelines, OH&S, community involvement, liaison with Department of Land and Water Conservation and other government departments, how other areas of the property and adjacent areas can be managed to complement the vegetation strategy (weed control, drainage, planting of indigenous canopy).
15. Detail the enhancement and regeneration of retained remnants. Where thickets of noxious or environmental weeds are to be removed, such removal is to be gradual and staged to prevent sudden complete loss of habitat.
16. Identification of protection of trees, vegetation, habitat, bush rock or other natural features, prior to works commencing on the site to prevent damage or injury during development.
17. Materials, stockpiles and vehicle stockpile areas are to be located on already cleared and disturbed land well away from creek line, trees, vegetation, habitat, bush rock or other natural features.

Whilst there are a number of certifications required as part of the development consent the following certifications are directly relevant to this plan.

Prior to issue of Construction Certificate

- B15. This Bushland Management Plan is consistent with the Department of Urban Affairs and Planning's Urban Bushland Management Guidelines, the Conservation of Biodiversity DCP, the management for Threatened Flora and Fauna in Pittwater and any relevant requirements (date and signature)  15/11/04
- C4. Prior to commencement of works a qualified bushland management consultant is to certify that adequate tree protection/exclusion fencing has been adequately installed as detailed in the approved plans prior to issuer of the construction certificate. (date and signature)

Prior to Commencement of Work

- C1. Prior to commencement of site works, a qualified experienced bushland management consultant is to certify that they have been engaged to conduct a program of Bushland Management covering the regeneration/revegetation/restoration of the site. All details of the Bushland Management Program are to be in accordance with the Bushland Management Plan approved and/or nominated on the Construction Certificate. (date and signature)
- C2. See C1.
- C2a1. Pre-order or evidence of supply of plant material to be used identifying local native plant stock is to be submitted to Council or the accredited certifier. Failure to submit will involve breach of this consent/approval. (date and signature)

- C2a3. A qualified ecologist is to certify that protective fencing has been installed around the trees, vegetation, habitat, bush rock or other natural features to be retained. (date and signature)
- C2a4. The Site Manager is to certify that sediment and erosion control devices have been installed. (date and signature)
- C2a5. A qualified experienced bushland management consultant is to certify that application of herbicides required prior to disturbance of the site has been completed. (date and signature) *JAK* 15.11.04
- C2a6. A qualified experienced bushland management consultant is to certify that the weed control required prior to disturbance of the site has been completed in accordance with the techniques and sequences of removal weed control. (date and signature) *JAK* 15.11.04
- C2a7. A qualified experienced bushland management consultant is to certify that application of herbicides required prior to disturbance of the site has been completed. (date and signature) *JAK* 15.11.04
- C2a8. The Site Manager is to certify that top soil/litter storage has been completed. (date and signature) *N/A*
- C2a9. The Site Manager is to certify that soil remediation has been completed. (date and signature) *N/A*
- C2a10. The Site Manager is to certify that surface preparation has been completed. (date and signature) *N/A*
- C2a11. A qualified experienced bushland management consultant is to certify that surface stabilization suitable for site vegetation has been completed. (date and signature) *N/A*
- C2a12. A qualified bushland management consultant is to certify that site drainage has been completed. (date and signature) *N/A*
- C2a13. The Site Manager is to certify that no soil or storage has been placed in the drip line of trees or native vegetation or habitat to be retained on the site. (date and signature)
- C2a14. The Project Manager is to certify that other issues including public safety, signage, relevant legislation, planning instruments/guidelines, OH&S, community involvement, liaison with Department of Land and Water Conservation and other government departments, how other areas of the property and adjacent areas can be managed to complement the vegetation strategy (Weed control, drainage, planting of indigenous canopy) have been addressed.

APPENDIX 2: LIST OF FLORA SPECIES RECORDED AT OBSERVATION POINT

* from GIS Environmental Consultants (November 2000)

Flora Species List for Observation Point, Palm Beach

By Nicholas Skelton, GIS Environmental Consultants, 45 Austin Ave North Curl Curl, Ph: 041 943 8672

Species list for the site not just a quadrat or a sub sample. The list is ordered by abundance then genus then species.

This list may not be copied or reproduced without the permission of the author Nicholas Skelton, Ph: 041 943 8672.

October 2000

Location AMG Easting 344055 and Northing 6281318

Vegetation Type 9h ii

Survey Area 0.5843 ha

Plants in the More Disturbed Areas

Abundance	Genus and Species	Family	Habit	Common Name	Status
1 Common	Asparagus plumosus	ASPARAGACEAE	Herb	Climbing asparagus	Nox W4c
2 Frequent	Adiantum aethiopicum	ADIANTACEAE	Fern	Maidenhair Fern	Protected
3 Frequent	Ageratina riparia	ASTERACEAE	Herb	Crofton Weed	Weed
4 Frequent	Banksia integrifolia ssp. integrifolia	PROTEACEAE	Tree	Coastal Banksia	
5 Frequent	Diospyros australis	EBENACEAE	Tree		Significant
6 Frequent	Ficus rubiginosa	MORACEAE	Tree	Port Jackson Fig	
7 Frequent	Glochidion ferdinandi var. ferdinandi	EUPHORBIACEAE	Tree	Cheese Tree	
8 Frequent	Imperata cylindrica var. major	POACEAE	Grass	Blady Grass	
9 Frequent	Ipomea indica	CONVOLVULACEAE	Vine	Morning glory	Nox W4c
10 Frequent	Lantana camara	VERBENACEAE	Shrub	Lantana	Nox W2
11 Frequent	Ligustrum lucidum	OLEACEAE	Shrub	Privet - broad leaved	Nox W4b
12 Frequent	Pittosporum undulatum	PITTOSPORACEAE	Tree	Sweet Pittosporum	
13 Frequent	Pteridium esculentum	DENNISTAEIACEAE	Fern	Bracken	
14 Frequent	Tradescantia albiflora	COMMELINACEAE	Herb	Wandering Jew	Weed
15 Widespread	Cissus antarctica	VITACEAE	Vine	Kangaroo Vine	
16 Widespread	Commelina cyanea	COMMELINACEAE	Herb	Creeping Christian	

17	Widespread	Dichondra repens	CONVOLVULACEAE	Herb	Kidney Weed	
18	Widespread	Kennedia rubicunda	FABACEAE	Vine		
19	Widespread	Ligustrum sinense	OLEACEAE	Shrub	Privet - narrow leaved	Nox W4b
20	Widespread	Lonicera japonica	CAPRIFOLIACEAE	Vine	Japanese Honeysuckle	Weed
21	Widespread	Pandorea pandorana	BIGNONIACEAE	Vine	Wonga Wonga Vine	
22	Widespread	Pennisetum clandestinum	POACEAE	Grass	Kikuyu	Planted
23	Widespread	Senna floribunda	CAESALPINIOIDEAE	Shrub	Cassia	Weed
24	Widespread	Sida rhombifolia	MALVACEAE	Shrub	Paddy's Lucerne	Weed
25	Widespread	Strelitzia sp.	MUSACEAE	Shrub	Bird of Paradise	Planted
26	Widespread	Verbena officinalis	VERBENACEAE	Herb	Common Verbena	Weed
27	Widespread	Viola hederacea	VIOLACEAE	Herb	Native Violet	
28	Widespread	Allocasuarina torulosa	CASUARINACEAE	Tree	Forest She-oak	
29	Scattered	Acacia longifolia	FABACEAE	Shrub	Sydney Golden Wattle	
30	Scattered	Acetosa sagittata	POLYGONACEAE	Vine	Turkey Rhubarb	Nox W4b
31	Scattered	Ageratina riparia	ASTERACEAE	Herb	Mistflower	Weed
32	Scattered	Angophora floribunda	MYRTACEAE	Tree	Rough-barked Apple	
33	Scattered	Bidens pilosa	ASTERACEAE	Herb	Cobbler's Pegs, Pitchforks	Weed
34	Scattered	Briza maxima	POACEAE	Grass	Quaking Grass	Weed
35	Scattered	Briza minor	POACEAE	Grass	Shivery Grass	Weed
36	Scattered	Canna indica	CANNACEAE	Herb	Canna Lily	Weed
37	Scattered	Coryza albidia	ASTERACEAE	Shrub	Fleabane	Weed
38	Scattered	Dendrobium linguliforme	ORCHIDACEAE	Herb	Tongue Orchid	
39	Scattered	Gnaphalium sp.	ASTERACEAE	Herb	Cud weed	weed
40	Scattered	Hibiscus sp.	MALVACEAE	Shrub	Hibiscus	Planted
41	Scattered	Hypochoeris glabra	ASTERACEAE	Herb	Smooth Cats Ear	Weed
42	Scattered	Ipomea calica	CONVOLVULACEAE	Vine	Morning Glory	Nox W4c
43	Scattered	Livistona australis	ARECACEAE	Palm	Cabbage Tree Palm	Significant
44	Scattered	Nephrolepis cordifolia	DAVALLIACEAE	Fern	Fishbone Fern	Weed

Plants in the Less Disturbed Areas

Abundance On Site	Genus and Species	Family	Habit	Common Name	Status
71 Common	Allocasuarina torulosa	CASUARINACEAE	Tree	Forest She-oak	
72 Common	Pittosporum undulatum	PITTOSPORACEAE	Tree	Sweet Pittosporum	
73 Frequent	Acmena smithii	MYRTACEAE	Tree	Lily Pilly	
74 Frequent	Adiantum aethiopicum	ADIANTACEAE	Fern	Maidenhair Fern	Protected
75 Frequent	Banksia integrifolia ssp. integrifolia	PROTEACEAE	Tree	Coastal Banksia	
76 Frequent	Backhausia myrtifolia	MYRTACEAE	Tree	Grey Myrtle	
77 Frequent	Diospyros australis	EBENACEAE	Tree		
78 Frequent	Eucalyptus piperita	MYRTACEAE	Tree	Sydney Peppermint	
79 Frequent	Ficus rubiginosa	MORACEAE	Tree	Port Jackson Fig	
80 Frequent	Glochidion ferdinandi var. ferdinandi	EUPHORBIACEAE	Tree	Cheese Tree	
81 Frequent	Ligustrum lucidum	OLEACEAE	Shrub	Privet - broad leaved	Nox W4b
82 Widespread	Acacia longifolia	FABACEAE	Shrub	Sydney Golden Wattle	
83 Widespread	Briza minor	POACEAE	Grass	Shivery Grass	Weed
84 Widespread	Cissus antarctica	VITACEAE	Vine	Kangaroo Vine	
85 Widespread	Commelina cyanea	COMMELINACEAE	Herb	Creeping Christian	
86 Widespread	Elaeocarpus reticulatus	ELAEOCARPACEAE	Tree	Blueberry Ash	
87 Widespread	Imperata cylindrica var. major	POACEAE	Grass	Blady Grass	
88 Widespread	Ipomea indica	CONVOLVULACEAE	Vine	Morning glory	Nox W4c
89 Widespread	Lantana camara	VERBENACEAE	Shrub	Lantana	Nox W2
90 Widespread	Notelaea venosa	OLEACEAE	Shrub	Native Olive	
91 Widespread	Pandorea pandarana	BIGNONIACEAE	Vine	Wonga Wonga Vine	
92 Widespread	Pteridium esculentum	DENNSTAEDTIACEAE	Fern	Bracken	
93 Widespread	Rapanea variabilis	MYRSINACEAE	Tree	Brush Muttonwood	
94 Widespread	Strelitzia sp.	MUSACEAE	Shrub	Bird of Paradise	Planted
95 Widespread	Tradescantia albiflora	COMMELINACEAE	Herb	Wandering Jew	Weed
96 Scattered	Acacia implexa	FABACEAE	Shrub	Hickory	

97	Scattered	Acacia parramattensis	FABACEAE	Tree	Paramatta Green Wattle	
98	Scattered	Ageratina riparia	ASTERACEAE	Herb	Crofton Weed	Weed
99	Scattered	Angophora floribunda	MYRTACEAE	Tree	Rough-barked Apple	
100	Scattered	Calochlaena dubia	DICKSONIACEAE	Fern	False Bracken Fern	
101	Scattered	Cassine australis var. australis	CELASTRACEAE	Tree		Sig Pitt
102	Scattered	Cissus hypoglauca	VITACEAE	Vine	Native Grape	
103	Scattered	Cortaderia sp.	POACEAE	Grass	Pampas Grass	Nox W2
104	Scattered	Corymbia maculata	MYRTACEAE	Tree	Spotted Gum	
105	Scattered	Dianella caerulea	PHORMIACEAE	Herb	Blue Flax Lily	
106	Scattered	Dichondra repens	CONVOLVULACEAE	Herb	Kidney Weed	
107	Scattered	Entolasia stricta	POACEAE	Grass		
108	Scattered	Eucalyptus botryoides	MYRTACEAE	Tree	Bangalay	
109	Scattered	Eustrephus latifolius	LUZURIAGACEAE	Vine	Wombat Berry	
110	Scattered	Geltonoplesium cymosum	LUZURIAGACEAE	Vine	Scrambling Lily	
111	Scattered	Geranium homeanum	GERANIACEAE	Herb		
112	Scattered	Gleichenia dicarpa	GLEICHENIACEAE	Fern		
113	Scattered	Glycine clandestina/microphylla	FABACEAE	Vine	Love Creeper	
114	Scattered	Hypochaeris glabra	ASTERACEAE	Herb	Smooth Cats Ear	Weed
115	Scattered	Livistona australis	ARECACEAE	Palm	Cabbage Tree Palm	Significant
116	Scattered	Opismenus aemulus	POACEAE	Grass	Basket Grass	
117	Scattered	Senna floribunda	CAESALPINIOIDEAE	Shrub	Cassia	Weed
118	Scattered	Smilax glyciphylla	SMILACACEAE	Vine	Native Sarsaparilla	
119	Scattered	Trifolium repens	FABACEAE	Herb	White Clover	Weed
120	Scattered	Viola hederacea	VIOLACEAE	Herb	Native Violet	
121	Uncommon	Acacia ulicifolia	FABACEAE	Shrub	Pickly Moses	
122	Uncommon	Angophora costata	MYRTACEAE	Tree	Smooth-barked Apple	
123	Uncommon	Asparagus densiflorus	ASPARAGACEAE	Herb	Asparagus Fern	Nox W4c
124	Uncommon	Asparagus plumosus	ASPARAGACEAE	Herb	Climbing asparagus	Nox W4c
125	Uncommon	Blechnum ambiguum	BLECHNACEAE	Fern		
126	Uncommon	Brachychiton acerifolius	STERCULIACEAE	Tree	Flame Tree	
127	Uncommon	Breynia oblongifolia	EUPHORBIACEAE	Shrub	Breynia	

Bushland Management Plan, Observation Pt, Palm Beach

128	Uncommon	Cyathea cooperi	CYATHEACEAE	Fern	Straw Tree Fern	
129	Uncommon	Eriobotrya japonica	ROSACEAE	Shrub	Loquat	Planted
130	Uncommon	Histiopteris incisa	DENNSTAEDTIACEAE	Fern	Batwing Fern	
131	Uncommon	Lilium formosum	LILIACEAE	Herb	Roadside Lilly	Weed
132	Uncommon	Ochna serrulata	OCHNACEAE	Shrub	Ochna, Mickey Mouse Plant	Nox W4b
133	Uncommon	Persoonia linearis	PROTEACEAE	Shrub	Narrow-leaved Geebung	
134	Uncommon	Petroselinum crispum	PLATYSTACEAE	Herb	Parsley	Weed
135	Uncommon	Pittosporum revolutum	PITTOSPORACEAE	Tree	Rough-fruit Pittosporum	
136	Uncommon	Rubus fruticosus (agg. sp.)	ROSACEAE	Scrambler	Blackberry	Nox W2 or Nox W3
137	Uncommon	Todea barbara	OSMUNDACEAE	Fern		

Noxious weed classifications	
W1	The presence of the weed on land must be notified to the local control authority and the weed must be fully and continuously suppressed and destroyed.
W2	The weed must be fully and continuously suppressed and destroyed.
W3	The weed must be prevented from spreading and its numbers and distribution reduced.
W4a	The weed must not be sold, propagated or knowingly distributed and any part of the weed must be prevented from growing within 3 metres of the boundary of a property.
W4b	The weed must not be sold, propagated or knowingly distributed and any existing weed must be prevented from flowering and fruiting.
W4c	The weed must not be sold, propagated or knowingly distributed and the weed must be prevented from spreading to an adjoining property.
W4d	The weed must not be sold, propagated or knowingly distributed and the weed must be removed if it is: 3 metres in height or less, or within half a kilometre of remnant urban bushland, as defined by SEPP 19, and is not deemed by Council as having historic
W4e	The weed must be fully and continuously suppressed and destroyed. All reasonable precautions must be taken to ensure produce, soil, livestock, equipment and vehicles are free of the weed before sale or movement from an infested area of the property.
W4f	The weed must not be sold, propagated or knowingly distributed. Any biological control or other control program directed by a local control authority must be implemented.
W4g	The weed must not be sold, propagated or knowingly distributed.

APPENDIX 3: NOXIOUS WEEDS LISTED IN PITTWATER LOCAL CONTROL AREA

Those species in **bold** were recorded in the subject site at Observation Point (GIS Environmental Consultants 2003). The actions required are described below.

Botanical Name	Common Name	Category
<i>Acacia karroo</i>	Karoo Thorn	W1
<i>Acetosa sagittata</i>	Turkey Rhubarb	W4b
<i>Alternanthera philoxeroides</i>	Alligator Weed	W1
<i>Anredera cordifolia</i>	Madeira Vine	W4c
<i>Araujia sericifera</i>	Moth Vine	W4c
<i>Arundo donax</i>	Giant Reed / Elephant Grass	W4a
<i>Asparagus densiflorus</i>	Asparagus Fern	W4c
<i>Asparagus plumosus</i>	Climbing Asparagus	W4c
<i>Cabomba</i> spp. (except <i>C. furcata</i>)	Cabomba (except Pink Cabomba)	W4g
<i>Centaurea maculosa</i>	Spotted Knapweed	W1
<i>Centaurea nigra</i>	Black Knapweed	W1
<i>Cestrum parqui</i>	Green Cestrum	W2
<i>Chromolaena odorata</i>	Siam Weed	W1
<i>Chrysanthemoides monilifera</i>	Bitou Bush/Boneseed	W2
<i>Cortaderia</i> spp.	Pampas Grass	W2
<i>Eichhornia crassipes</i>	Water Hyacinth	W1
<i>Equisetum</i> spp.	Horsetail	W1
<i>Gymnocoronis spilanthoides</i>	Senegal Tea Plant	W1
<i>Harrisia</i> spp.	Harrisia Cactus	W4f
<i>Hieracium</i> spp.	Hawkweeds	W1
<i>Hypericum perforatum</i>	St John's Wort	W2
<i>Ipomea cairica</i>	Morning Glory	W4c
<i>Ipomea indica</i>	Morning Glory	W4c
<i>Kochia scoparia</i> (except <i>K. scoparia</i> ssp. <i>tricophylla</i>)	Kochia (except Summer or Mock Cypress)	W1
<i>Lagarosiphon major</i>	Lagarosiphon	W1
<i>Lantana camara</i>	Lantana (Pink Flowered)	W2
<i>Lantana camara</i>	Lantana (Red Flowered)	W2
<i>Ligustrum lucidum</i>	Privet - broadleaf	W4b
<i>Ligustrum sinense</i>	Privet - narrow-leaf	W4b
<i>Ludwigia peruviana</i>	Ludwigia	W2
<i>Miconia</i> spp.	Miconia	W1
<i>Nassella tenuissima</i> syn <i>Stipa tenuissima</i>	Mexican Feather Grass	W1
<i>Ochna serrulata</i>	Ochna	W4b
<i>Opuntia</i> spp. (except <i>O. ficus indica</i>)	Prickly Pears (except Indian Fig)	W4f
<i>Orobancha</i> spp. (except <i>O. minor</i> and <i>O. cernua</i> var. <i>Australiana</i>)	Broomrape	W1
<i>Parietaria judaica</i>	Pellitory	W3
<i>Parthenium hysterophorus</i>	Parthenium Weed	W1
<i>Phyllostachys</i> spp.	Rhizomatous Bamboo	W4a
<i>Pistia stratiotes</i>	Water Lettuce	W1
<i>Ricinus communis</i>	Castor Oil Plant	W2

APPENDIX 4: KEYSTONE WEEDS IN THE SUBJECT SITE AND RECOMMENDED CONTROL METHODS

Species	Common Name	Status / Comments	Method of Control							Other Methods & Comments	
			Hand Weeding		Herbicide Application						
			Hand removal	Rake & pile	Dig out	Cut stump & poison	Drill & poison	Scrape & poison	Spot spray		
Woody Weeds											
<i>Cestrum parqui</i>	Green Cestrum	Noxious (W2)			✓ seedling < 0.5 m			✓			Few plants only
<i>Cotoneaster pannosus</i>	Cotoneaster	Garden escape / Environmental	✓ seedling < 0.5 m			✓					Few plants, mainly Lots 2 and 4
<i>Lantana camara</i>	Lantana	Noxious (W2)			✓	✓					Mainly Lot 4, with isolated clumps elsewhere
<i>Ligustrum sinense</i> , L. <i>lucidum</i>	Privets	Noxious (W4b)	✓ seedling < 5 cm		✓ seedling < 0.05	✓	✓ > 1m	✓ sapling 0.05 - 1m	✓ seedling < 5 cm		Widespread, some very large Privet trees (Lots 2 & 4)
<i>Ligustrum sinense</i> , L. <i>lucidum</i>	Privets	Noxious (W4b)	✓ seedling < 5 cm		✓ seedling < 0.05	✓	✓ > 1m	✓ sapling 0.05 - 1m	✓ seedling < 5 cm		Widespread, some very large Privet trees (Lots 2 & 4)
<i>Ochna serrulata</i>	Ochna	Noxious (W4b)			✓ seedling < 0.25 m			✓			Scattered throughout
<i>Olea europaea</i> var <i>africana</i>	African Olive	Garden escape / Environmental			✓ seedling < 0.5 m	✓					Few plants, mainly Lots 2 & 4
<i>Phoenix canariensis</i>	Canary Island Palm	Ornamental garden plant			✓ seedling < 0.25 m	✓					Remove seedlings only – keep mature specimens
<i>Rubus fruticosus</i>	Blackberry	Noxious (W2).			✓	✓		✓	✓		Mainly Lots 1 & 2. Use Garlon spray
<i>Senna pendula</i>	Cassia / Arsenic Bush	Environmental Weed			✓	✓					
Herbaceous Weeds											
<i>Arundo donax</i>	Giant Reed	Noxious (W4a)				✓					Large infestation Lot 1 only
<i>Agave</i> sp. <i>Aloe</i> sp	Succulents	Garden escape			✓ Bobcat						Large specimen Lot 2, plus seedlings

Species	Common Name	Status / Comments	Method of Control							Other Methods & Comments		
			Hand Weeding			Herbicide Application						
			Hand removal	Rake & pile	Dig out	Cut stump & poison	Drill & poison	Scrape & poison	Spot spray			
<i>Ageratina adenophora</i> , <i>A. riparia</i>	Crofton Weed, Mist Flower	Environmental	✓							✓	Lots 1, 2 & 4 colonising damp soils	
<i>Bryophyllum tubiflora</i>	Resurrection Plant	Garden escape / Environmental	✓		✓					✓	In garden of old fibro house – Lot 4	
<i>Chlorophytum comosum</i>	Spider Lily	Garden escape/ Environmental			✓					✓	Remove all roots	
<i>Nephrolepis cordifolia</i>	Fishbone Fern	Garden escape/ Environmental			✓					✓	Mainly Lot 4 – around old house	
<i>Ehrharta erecta</i>	Panic Grass	Environmental								✓	Spray and oversow with native grasses or mulch.	
<i>Protasparagus plumosus</i>	Asparagus Fern	Noxious (W4c)			✓						Scattered but few plants	
<i>Strelitzia</i> sp.	Fan Palm	Garden escape/ Environmental			✓ young plants	✓					Widespread – throughout site	
<i>W. atonia bulbilifera</i>	Pink Bugle Lily	Garden escape/ Environmental			✓ isolated plants					✓	Lot 4 – garden of old house	
Vines / Scramblers												
<i>Aetosa sagittata</i>	Turkey Rhubarb	Noxious (W4c)			✓					✓	Scattered: minor	
<i>Delairea odorata</i>	Cape Ivy	Environmental			✓					✓		
<i>Hedera helix</i>	English Ivy	Environmental weed			✓	✓					One occurrence Lot 4	
<i>Ipomoea indica</i>	Morning Glory	Noxious (W4c)			✓ isolated plants					✓	Widespread but light infestations except for Lot 2	
<i>Jasminum polyanthum</i>	Chinese Jasmine	Environmental weed/ Garden escape			✓ isolated plants			✓		✓	In Lot 4, garden of old house	
<i>Lonicera japonica</i>	Honeysuckle	Environmental weed/ Garden escape			✓ isolated plants			✓		✓	Major weed, widespread, especially Lots 1 & 2	
<i>Protasparagus densiflorus</i>	Ground Asparagus	Noxious (W4c).			✓					✓	Spray w Brushhoff. Forms dominant groundcover in Lots 2 & 3.	

APPENDIX 5: LIST OF LOCALLY INDIGENOUS SPECIES RECOMMENDED FOR BUSH LANDSCAPING AT LOTS 1, 2, 3 & 4 OBSERVATION POINT, PALM BEACH

Species	Common Name	Height (m) *	Comments
Canopy (> 20m)			
<i>Angophora floribunda</i>	Rough-barked Apple	15-20	Small to medium sized tree: needs deep moist soils (eg sheltered position).
<i>Corymbia maculata</i>	Spotted Gum	To 45	Large canopy tree - locally significant
<i>Eucalyptus botryoides</i>	Bangalay	30	Pockets of deep sandy soils preferred
<i>Eucalyptus piperita</i>	Sydney Peppermint	20	Frequent occurrence on site
Sub-canopy (8-20m)			
<i>Acacia floribunda</i>	White Sally Wattle	15	Pale yellow flowers for late winter colour
<i>Acacia implexa</i>	Hickory Wattle	4-10	Extant on site in sub-canopy – suffers from galls
<i>Acacia longifolia</i>	Sydney Golden Wattle	3-4	Short-lived – suffers from galls & borers.
<i>Acmena smithii</i>	Lilly Pilly	To 20	Common on site, but needs shelter
<i>Allocasuarina littoralis</i>	Black She-oak	5-6	Plant in groups of 3+ near top of slope
<i>Backhousia myrtifolia</i>	Dwarf's Apples	3-4	Will sucker in damp sites: drainage easement
<i>Banksia integrifolia</i>	Coast / Silver Banksia	6-16	Common on site: feature plant
<i>Cassine australis</i>	Red-fruited Olive Plum	6-10	Council requirements to propagate
<i>Elaeocarpus reticulatus</i>	Blueberry Ash	10	Ornamental species w/ blue berries: attracts birds.
<i>Glochidion ferdinandi</i>	Cheese Tree	15	Suckering habit: good for slope retention.
<i>Guioa semiglauc</i>	Guioa	8-15	Attracts fruit bats and birds
<i>Livistona australis</i>	Cabbage Tree Palm	15	Common species in the area but only a few specimens on site.
<i>Syzygium oleosum</i>	Blue Lillypilly	3-8	Common in the area
Shrubs (< 8m)			
<i>Acronychia oblongifolia</i>	Common Acronychia	2-8	Needs a very sheltered site
<i>Astrotricha divaricata</i>	Star-hair	2-5	Common early pioneer species in understorey
<i>Breynia oblongifolia</i>	Dwarf's Apples	2	Suckers well & will stabilise banks
<i>Clerodendrum tomentosum</i>	Hairy Clerodendrum	2-4	Needs a moist, sheltered position
<i>Macrozamia communis</i>	Burrawang	2	Large fern-like plant with spiky leaves & red fruit bodies – extant on site
<i>Notelaea venosa</i>	Veined Mock-Olive	2.5-8	Widespread on site.
<i>Omalanthus populifolius</i>	Bleeding Heart Tree	2-4	Opportunistic pioneer species: short lived
<i>Persoonia linearis</i>	Narrow-leaved Geebung	3	Common in area in understorey
<i>Pittosporum revolutum</i>	Yellow Pittosporum	1-3	Needs a moist, sheltered location
<i>Platylobium formosum</i>	Handsome Flat Pea	1	Plant in groups in open drier sites
<i>Pultenaea flexilis</i>	Graceful Bush Pea	4	Dry sheltered locations: good pioneer species
<i>Rapanea variabilis</i>	Muttonwood	2-3	Suckering habit: good bank stabiliser
<i>Synoum glandulosum</i>	Scentless Rosewood	1.5-3	Attractive species useful in landscaping/screening
<i>Wilkiea huegeliana</i>	Veiny Wilkiea	1-2	
<i>Xanthorrhoea macronema</i>	Grass Tree	1 - 2	Specimen plant or use in groups of 3+
Groundcovers			
<i>Dianella caerulea</i> , <i>D. producta</i>	Blue Flax Lily	0.5	Strap-like foliage, blue flowers: hardy

Species	Common Name	Height (m) *	Comments
<i>Lomatia myricoides</i>	Crinkle Bush	0.5-1	
<i>Pseuderanthemum variable</i>	Purple Pastel Flower	0.1-0.3	Delicate ground cover. Will volunteer into site from adjacent bushland in any case.
<i>Viola bederacea</i>	Native Violet	0.25-0.3	Creeping ground cover useful in moist locations
Grasses & Sedges			
<i>Entolasia stricta</i>	Wiry Panic Grass	< 0.25	Will volunteer from adjacent bushland
<i>Gahnia sieberiana</i>	Saw-sedge	2	Good plant for drainage easements: plant in groups of 3+
<i>Gymnostachys anceps</i>	Settler's Flax	2	Tufted herb common in sheltered sites
<i>Lomandra longifolia</i>	Spiny Mat-rush	1.5	Common sedge: variety of uses: cluster plant
<i>Themeda australis</i>	Kangaroo Grass	1	High light levels required- open sites
Vines/Scramblers			
<i>Billardiera scandens</i>	Apple Dumplings	~ 1	Shade needed
<i>Cayratia clematidea</i>	Slender Grape	< 1	Rainforest scrambler: needs support
<i>Eustrephus latifolius</i>	Wombat Berry	Up to 2	Delicate scrambler over small shrubs
<i>Geitonoplesium cymosum</i>	Scrambling Lily	> 2	Hardy wiry scrambler: may need cutting back
<i>Kennedia rubicunda</i>	Dusky Coral Fern	> 2	Hardy but rampant vine/scrambler
<i>Pandorea pandorana</i>	Wonga Wonga Vine	> 2	Occurs on site – can become very large (cut back to contain growth)
<i>Plectranthus parviflorus</i>	Cockspur	0.3-0.6	Weak scrambling herb: moist sheltered location
Ferns			
<i>Adiantum aethiopicum</i>	Maidenhair Fern	< 0.5	Sheltered sites, needs ample moisture
<i>Blechnum cartilagineum</i>	Gristle Fern	0.6-1	As above
<i>Cyathea australis</i>	Rough Tree Fern	2.5-6	Sheltered sites, rock ledges. Plant in groups
<i>Cyathea cooperi</i>	Straw Tree Fern	2.5-6	As above
<i>Doodia caudata</i> var <i>caudata</i>	Rasp Fern	< 0.25-0.3	Erect or drooping fronds: moist, sheltered sites
<i>Gleichenia divarpa</i>	Pouched Coral Fern	1.5-2	Best in well irrigated sites: below rock ledges
<i>Histiopteris incisa</i>	Bat's Wing Fern	1-2	Moist sheltered sites
<i>Histiopteris muelleri</i>	Harsh Ground Fern	0.3-1	Moist sheltered sites
<i>Todea barbara</i>	King Fern	< 1	Best in well irrigated sites: below rock ledges

* Height at maturity depends on micro-site characteristics, eg. soil type & depth, sub-surface drainage and soil moisture levels, nutrient availability and shelter from prevailing winds.

Note: it is not intended that all the species listed above be used at Observation Point. This list provides a choice of local native species that may be used in revegetation and/or indigenous landscaping.

APPENDIX 6: PROTOCOL FOR PROTECTION OF BUSHLAND DURING CONSTRUCTION

The following recommendations, while 'generic in nature', have been included in this BMP to guide any future construction works, and ensure that there is minimal damage to extant native vegetation.

To guard against inadvertent damage to extant native vegetation and geological features (rock ledges, sandstone 'floaters'), UBMC makes the following recommendations.

Pre-construction

- 1) Identify individuals or patches of native vegetation for retention in and adjacent to the construction zone, and protect these using temporary barriers and exclusion fencing.
- 2) Protect native canopy trees identified for retention in the construction zone by the erection of tree guards around the trunk and/or protective fencing that should be erected on the outside edge of the drip line of each specimen, and by restricting parking or stockpiling of construction material.
- 3) Protective measures must be erected prior to commencement of construction and maintained in good order for the duration of construction works.
- 4) Trees to be retained and/or patches of native vegetation are to be clearly identified on the engineer's drawings and other site maps.
- 5) Patches of native vegetation identified for retention should be weeded prior to construction works commencing. Seed-bearing weed debris and weeds/exotics with fragments (rootstock, rhizomes) capable of regeneration are to be removed and taken to an approved landfill site. The area of native vegetation should be clearly marked on all site maps.
- 6) Introduced (weed) grasses and other weed species located within the identified construction zone should be treated with a foliar herbicide (eg Roundup or Glyphosate 340) or a grass-specific herbicide (eg. Fusilade) at least 4 weeks prior to construction works. If the soil within the construction site is to be re-used elsewhere on the Lot, it is important to ensure that weeds are completely dead before the reserved soil is spread ⁸.
- 7) Identify appropriate native species for post-construction revegetation and source a tubestock supplier. Allow at least four (4) months for propagation of required species.
- 8) Construction huts, parking lots, stockpiles, access routes and the like are not to be located within areas of vegetation to be retained. Identify appropriate sites for service areas and access routes and fence to prevent accidental incursion by vehicles etc.

NB: the Bushland Management Concept Plan (GIS Environmental Consultants 2003) requires pre-weeding of areas 'to be disturbed'. This has been interpreted as the 'development footprint'.

NNB: As the topsoil is predominantly weedy, the BMCP calls for removal of excavated topsoil from the site. No topsoil is to be stockpiled for reuse.

During Construction

- 1) Install appropriate erosion and sediment controls (as determined by a site-specific Soil and Water Management Plan) and ensure runoff from construction site does not affect the native canopy trees on the neighbouring Lots.
- 2) Any fill soil imported onto the site should be sourced from non-contaminated sites. Imported fill should be certified as 'free of noxious plants', including their seed. Fill soils should be stockpiled in a reserved area and contained with sediment barriers until such time as they are required for use.

⁸ It is envisaged that much of the weedy topsoil will be removed mechanically during preparation for construction.

-
- 3) Cleared native vegetation (timber, small branches, leaf litter) should be reserved and stockpiled for re-use in the rehabilitation works undertaken post-construction, where it can be utilised for mulch, fauna habitat and a potential seed source. Ideally, stockpiled native vegetation should be stored on a tarpaulin so that any seed dropped during storage can be collected. **Note** that timber from woody weeds should never be chipped to use as mulch unless the material can be completely composted.
 - 4) Ongoing maintenance of exclusion fencing, tree guards, erosion control measures, access routes and stockpile sites is required throughout the construction period to ensure no undue impacts are caused on the vegetation to be retained. If required, stabilise any areas of exposed soil on steep slopes using heavy-duty black plastic or erosion control matting.

Post Construction

- 1) Once construction works have been completed and the site is stabilised, remove exclusion fencing and tree guards.
 - 2) Bush regeneration works are to commence in the areas identified for 'bush regeneration' (see Figure 3.1) and should be completed within 12 months.
 - 3) Revegetation works must be carried as quickly as possible post-construction, using a planting mix that should be predominantly local native species. Areas for indigenous vegetation are identified on Figure 3.1.
 - 4) The developer must ensure no net loss of native canopy species, and must consider the provision of suitable habitat for flora and fauna in all landscaping works.
 - 5) A qualified bush regeneration company should undertake weed control and (ideally) indigenous revegetation within the identified bush area.
 - 6) Maintenance and replacement planting within the bush area should be undertaken over a (minimum) 12-month period to ensure a tubestock survival rate of at least 80%.
 - 7) An on-going weed control program should be an integral part of site management. Noxious and environmental weeds are to be controlled throughout the subject site on a regular basis (as per *Noxious Weeds Act 1993*).
-



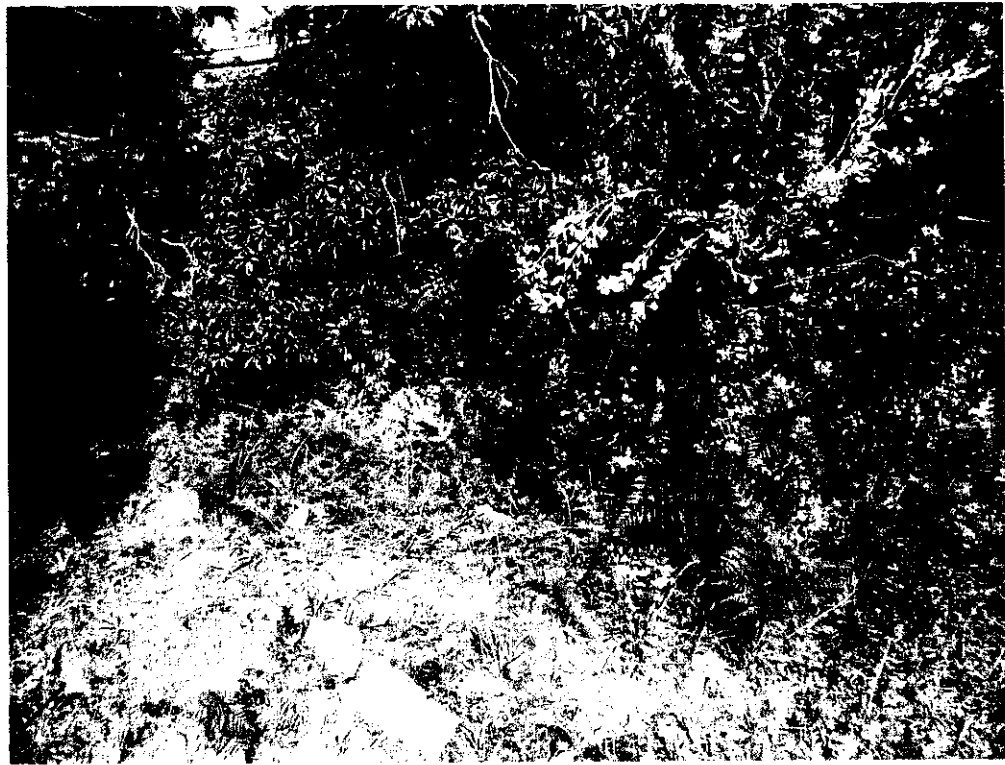
APPENDIX 7: PLATES



View west of dense weed growth in proposed development footprint – this section is classed as a ‘revegetation’ area



View north upslope above proposed development footprint – this section is classed as a ‘revegetation’ area



View of vegetation below the rock platform (western end of Lot), classed as a 'regeneration' area. Note presence of noxious weed Asparagus Fern in understorey



View west of boundary between Lots 1 (RHS) and 2 (LHS). The stormwater line will be installed in this approximate location

APPENDIX 8: JUDITH RAWLING, *CURRICULUM VITAE*

CURRICULUM VITAE

JUDITH LOUISE RAWLING

BA • DipEd • MEnvStud • MAIBiol • MELA • MRAIPR • ECA (NSW)



PERSONAL DETAILS

Name: Judith Louise Rawling
Citizenship: Australian/Canadian
Health: Excellent
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CASTLE HILL NSW 2154
Home: "St Clements", 1238 Bells Line of Road
KURRAJONG HEIGHTS NSW 2758
Telephone: Home: (02) 4567 7979
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Fax: Home: (02) 4566 7979
Business: (02) 9894 2215

CURRENT POSITION

- 1990 – present *Managing Director* – Urban Bushland Management Consultants Pty Ltd and *Principal* – Urban Bushland Management Projects Pty Ltd.
- Set up *Urban Bushland Management Consultants* in 1990 – a company specialising in planning and consultancy in the field of natural resource management along with "hands-on" contractual work rehabilitating degraded bushland remnants in the urban environment.
- Management of consultancy and contracting services.
- 2000 Winner of Hills Excellence in Business Award for Excellence in Environmental Management & Contribution.
- Provision of consultancy services on bushland management. This includes survey design and implementation, mapping, report writing, advice on the impact of government policies, etc.
- Planning and supervision of the work of 60 field staff, on an average of 30 concurrent projects in Sydney/Wollongong/Central Coast/Blue Mountains.
- Liaison and negotiation with municipal and shire councils and other landholders on contracts and continuing work.
- Preparation and implementation of project budgets, including salaries, equipment purchase, costing of special tasks, etc.
- Course design, field exercise planning and teaching, and other participation in training courses for bush regenerators.
- Publicity activities – preparation of newsletter and other publications, displays, speeches to community groups.
- Nominee for the Eureka Prizes (Excellence in Scientific Research), an honour which recognises contribution to the field of Restoration Ecology.
- Extensive experience teaching biology and environmental studies in Australia, Canada and Britain and part-time lecturing at a number of universities in Australia.

- Author of numerous publications and conference papers.
- Employed as a specialist associate–consultant for a number of large firms, including Landscan, EDAW (Australia), Hyder Consulting, Gutteridge Haskins & Davey, AMBS and Pittenridgh, Shinkfield and Bruce, Colin Ging & Partners, Carson Group.

COMMITTEE AND OTHER MEMBERSHIPS

Professional Memberships

- Member, Royal Australian Institute Parks & Recreation, 1994 – present
- Member, Environment Institute of Australia, 1993 – present
- Member, Australian Institute of Biology, 1991 – present
- Member, Municipal Conservation Association, 1995 – present
- Member, Weed Society (NSW) 1986 – present
- Member, National Trust of Australia (NSW) 1986 – 1995, 1999 – present
- Ecological Consultants Association (NSW), Council Member 1999–present, Member of the Executive 2003 and 2004.

Committee Memberships

- Member, Hawkesbury–Nepean Catchment Trust: Revegetation Steering Committee 1994 – 1996
- Member, Lane Cove Catchment Management Committee – 1990 – 1996
- Member Cattai Catchment Management Committee 1998 – 2000
- Discovering Alternatives to Garden Escapes – Committee Member 2003 – present
- Member, Hawkesbury Rainforest Network – Executive Member 2001–2004
- Member, NSW Noxious Weeds Advisory Committee (NSW Agriculture), 1993 – present
- Member Noxious Weeds Technical Advisory Committee (NSW Agriculture), 1993 – present.

EMPLOYMENT HISTORY

1989 – present Various TAFE colleges

Guest Lecturer

1995 University of Western Sydney

Part Time Teacher

1993 – 1995 University of Sydney

Part–time Teacher, Continuing Education

1986 – 1990 National Trust of Australia (NSW Division)

Bush Management Officer

- Responsible for the planning and management of the Trust's Bush Management Program B.A., Business Administration and Computer Science.

1989 University of Technology

Guest Lecturer, School of Biological Sciences

1989 University of Technology Sydney

Guest Lecturer, School of Biological Sciences

1985–86 and 1988–89 Macquarie University

Part–time Tutor Environmental Studies.

1964–1985 Sydney, Canberra, Oxford, London and Montreal

Teacher, Senior Biology and Science

- Design and implementation of new courses in the ACT secondary system, including those for tertiary accreditation
- Environmental education field trips throughout the ACT and the Sydney region, and to the Barrier Reef, the Snowy Mountains area, and Central Australia
- Supervision of graduate teacher trainees. Mentor program.

EDUCATIONAL QUALIFICATIONS

1989 Macquarie University Sydney

- **Master of Environmental Studies**
- Thesis title: The Ecology and Distribution of Pampas Grass (*Cortaderia selloana*) in Sydney Bushland
- Concurrently with Masters Degree studies (1984–87) undergraduate courses at Macquarie University: Introductory Statistics, Plant Structure and Function, Introductory Ecology.

1982 – 1983 Macquarie University Sydney

- **Diploma in Environmental Studies**
- Courses completed: Principles of Environments, Chemicals in the Environment, Aspects of Urban Ecology, Natural and Managed Ecosystems, Environmental Impact Assessment, Environmental Policy and Law, Social Impact on Environments, Australian Ecosystems

1971–72 Canberra College of Advanced Education

- **Graduate Diploma in Education**

1969–70 and 1976 Australian National University

- Courses completed: Vertebrate Ecology, Animal Ecology, Theoretical Zoology, Animal Behaviour, Human Ecology.

(NOTE: *All the above studies were completed part-time while in full-time employment*)

1961 – 1964 University of Ottawa Canada

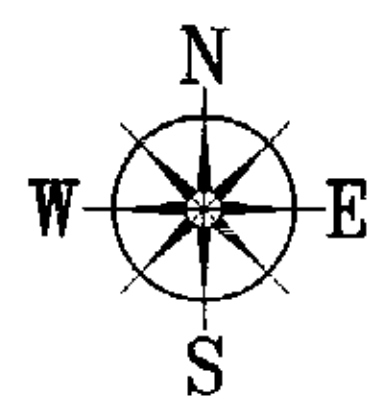
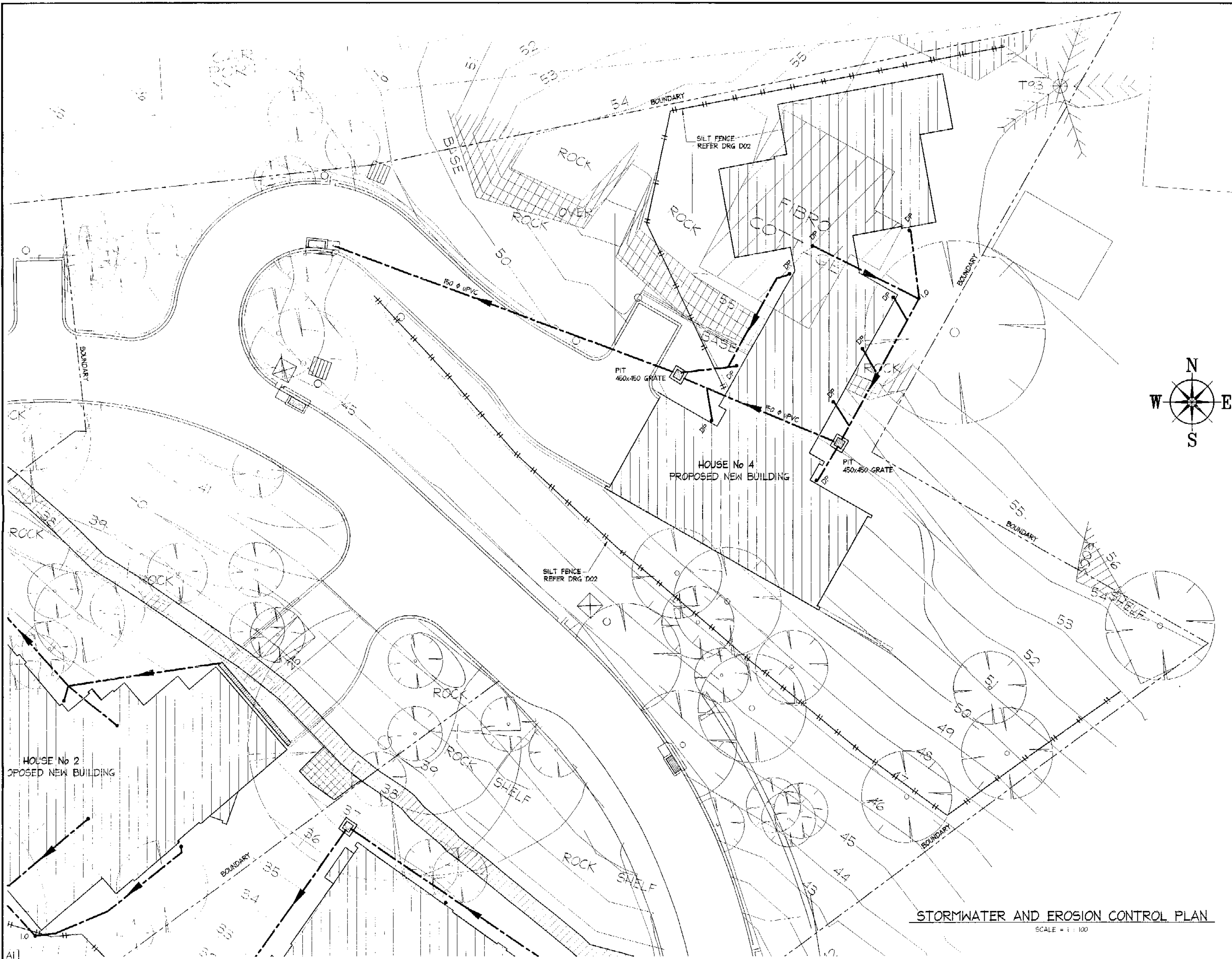
- **Bachelor of Arts**
- Studies in English, French, Philosophy, Biology, Classics, Mathematics

LICENSES

- National Parks & Wildlife Scientific License Section 132C, NP Act 1974. Licence No. S10411
- Class A Drivers License

ADDITIONAL TRAINING

- Bush Fire Personnel Basic Training Program – ACT Bush Fire Council
- Alpine Ecology Course – Department of Conservation and Natural Resources, Falls Creek, Victoria
- Human Resource Management – University of Sydney, Centre for Continuing Education, 1991
- Botany and Ecology of the Sydney Region – University of Sydney, Centre for Continuing Education, 1991
- Chainsaw Use and Maintenance
- Seed Collection Workshop, Ku-ring-gai Municipal Council
- Grasses and Sedges Identification Workshop



CITYPLAN SERVICES
 Construction Drawing Approval
 27/09/04 22/09/04
 Drawing Authority: Brandon Bennett
 Approval Number: 1462004

ISSUED FOR
 CONSTRUCTION
 CERTIFICATE
 SUBMISSION ONLY

STORMWATER AND EROSION CONTROL PLAN
 SCALE = 1 : 100

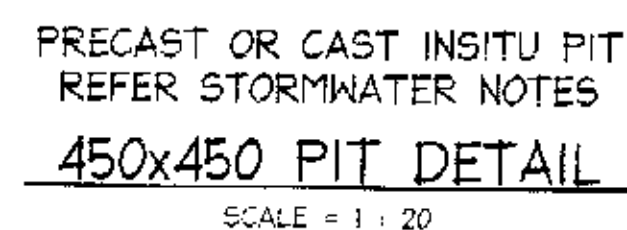
			DOCUMENT CERTIFICATION				Project: PROPOSED NEW DWELLING AT BARRENJOEY & PALM BEACH ROADS PALM BEACH for: RAYPOND DEVELOPMENT		Drawing Title: HOUSE No.4 STORMWATER AND EROSION CONTROL PLAN		Date: SEPT 2004	Design: RGW	Drawn: MC	Checked:
			I am a qualified Structural/Civil Engineer I hold the following qualifications: BE(Civil), CPENG, NIEAust, NPER Institute of Engineers Membership No. 803958 I hereby state that this drawing is in compliance with the provisions of the Building Code of Australia and/or relevant Australian Industry Standards.		ACN 076 121 616 ABN 24 076 121 616 Suite 207, 30 FISHER ROAD DEE WHY N.S.W. 2099 Ph: (02) 9984 7000 Fax: (02) 9984 7444 e-mail: nb@nbrocons.com.au				The copyright of this drawing remains with Northern Beaches Consulting Engineers P/L.		Job No: 030705	Drawing No: D01	Rev:	
Date:	Rev:	Amendment:	Date: <i>Noted</i> Rick G Wray (Director Northern Beaches Consulting Engineers)											

1. INSTALL SEDIMENT CONTROL STRUCTURES IN LOCATIONS INDICATED ON DRAWINGS AND AS OTHERWISE REQUIRED TO CONTROL SEDIMENT DURING ALL EXCAVATIONS AND UNSTABLE AREAS OF THE SITE ARE EXPOSED TO EROSION.
2. CONTROL STRUCTURES TO BE AS DETAILED OR AS OTHERWISE REQUIRED BY CERTIFYING AUTHORITY.
3. REVIEW CONTROL MEASURES AND MAINTAIN STRUCTURES DURING CONSTRUCTION.
4. IF ADDITIONAL MEASURES ARE REQUIRED FOR EROSION CONTROL OR BY COUNCIL REQUIREMENTS REFER TO "URBAN EROSION" AND "SEDIMENT CONTROL" GUIDELINES PREPARED BY THE DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT.

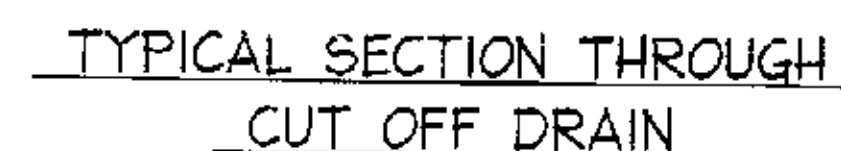


ANCHOR BLOCKS TO BE LOCATED AT THE
BEND OR JUNCTION AT THE TOP AND BOTTOM
OF THE INCLINED SITE STORMWATER DRAIN
AND AT INTERVALS NOT EXCEEDING 3.0m

SCALE = 1 : 20



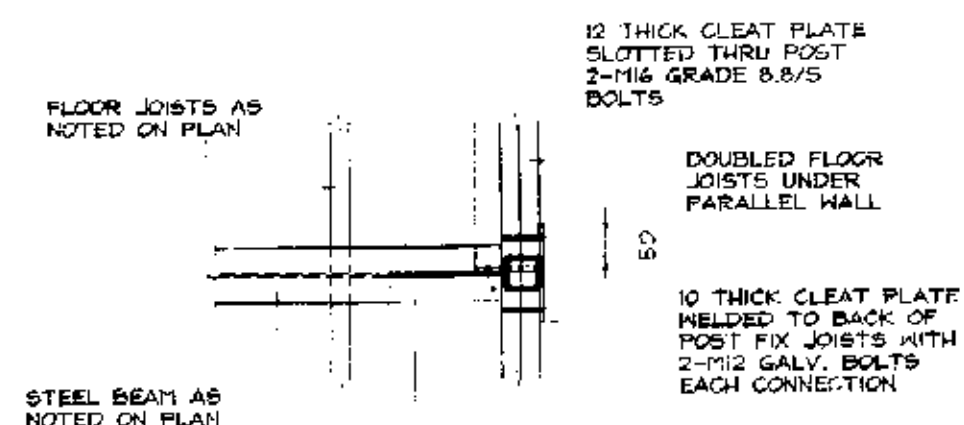
1. SILT FENCE AND ASSOCIATED WORKS INCLUDING INTERCEPTOR DRAIN IS TO BE INSTALLED BEFORE THE COMMENCEMENT OF ANY EXCAVATION.
2. CUTS TO BE EXECUTED TO THE REQUIRED LEVEL USING CONVENTIONAL EXCAVATION MACHINERY. INITIALLY THE DEPTH OF FILL/CLAY IS TO BE ESTABLISHED TO ENSURE NEIGHBOURING PROPERTIES ARE NOT ADVERSELY AFFECTED. EARTH BATTERS TO BE A MAXIMUM SLOPE OF 1.0 m VERT. TO 1.7 m HORIZ. (AS PER GEOTECHNICAL REPORT). ANY BATTERS GREATER THAN 1.0 m VERT. TO 1.7 m HORIZ. ARE TO BE ADEQUATELY SHORED IN ACCORDANCE WITH THE ENGINEERS DETAILS AND INSTRUCTIONS.
3. ANY PERMANENT RETAINING STRUCTURE IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE ENGINEERS DETAILS AND INSTRUCTIONS.
4. ALL PERMANENT RETAINING STRUCTURES ARE TO BE COMPLETED WITH MINIMUM DELAY FOLLOWING EXCAVATION.



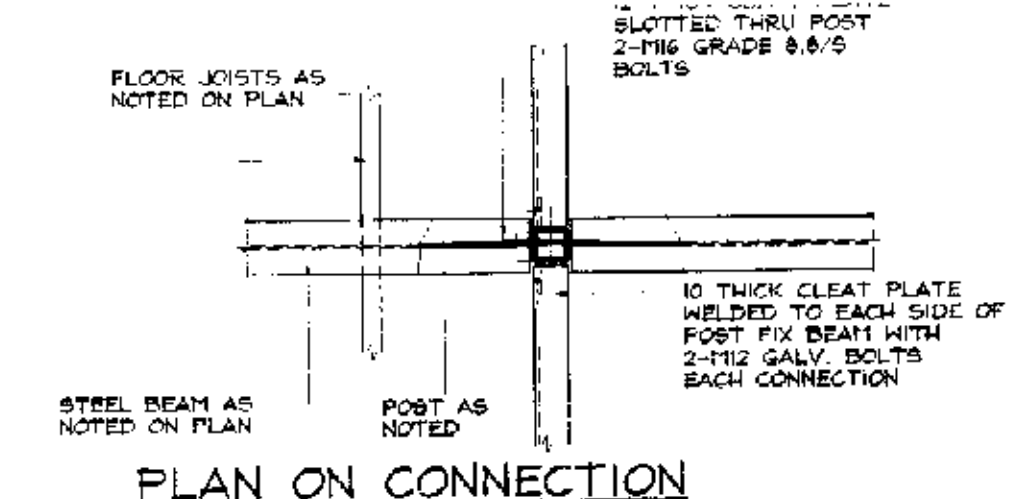
SCALE N.T.S. IN SERVICES
Contract No. Approved
74-500 77 NOV 78
Issuing Authority: Benjamin Borneo
FAC-61

ISSUED FOR
CONSTRUCTION
CERTIFICATE
SUBMISSION ONLY

			DOCUMENT CERTIFICATION		 NORTHERN BEACHES Consulting Engineers P/L A/CN 075 125 618 A/BN 24 578 121 616 July 2017, 30 FISHER ROAD DEE WHY N.S.W. 2099 Ph. (02) 9984 7000 Fax: (02) 9984 7444 e-mail: nb@nbhconsulting.com.au	Project: PROPOSED NEW DWELLING AT BARRENJOEY & PALM BEACH ROADS PALM BEACH for: RAYPOND DEVELOPMENT	Drawing Title: HOUSE No.4 STORMWATER AND EROSION CONTROL DETAILS	Date: SEPT 2004	Design: RGW	Drawn: Paul R Bruce CME Aust.	Checked:		
			Date: Nov 04' <i>R. Wray</i>	Job No.								Drawing No.	Rev.
			Rick G. Wray (Director Northern Beaches Consulting Engineers)	030705								D02	-
Date:	Rev:	Amendment:	<small>This copyright C of a drawing remains with Northern Beaches Consulting Engineers P/L</small>										



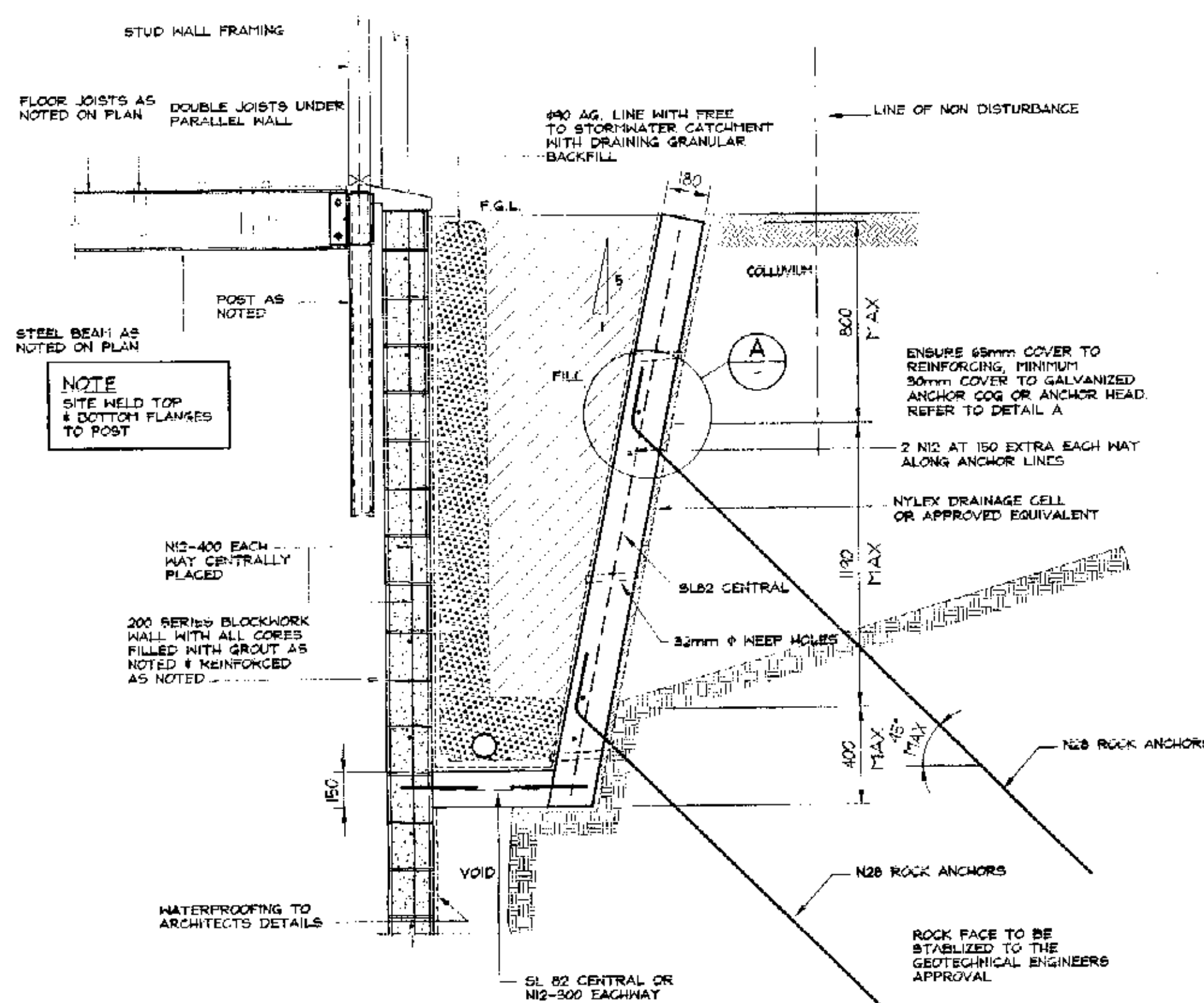
PLAN ON CONNECTION



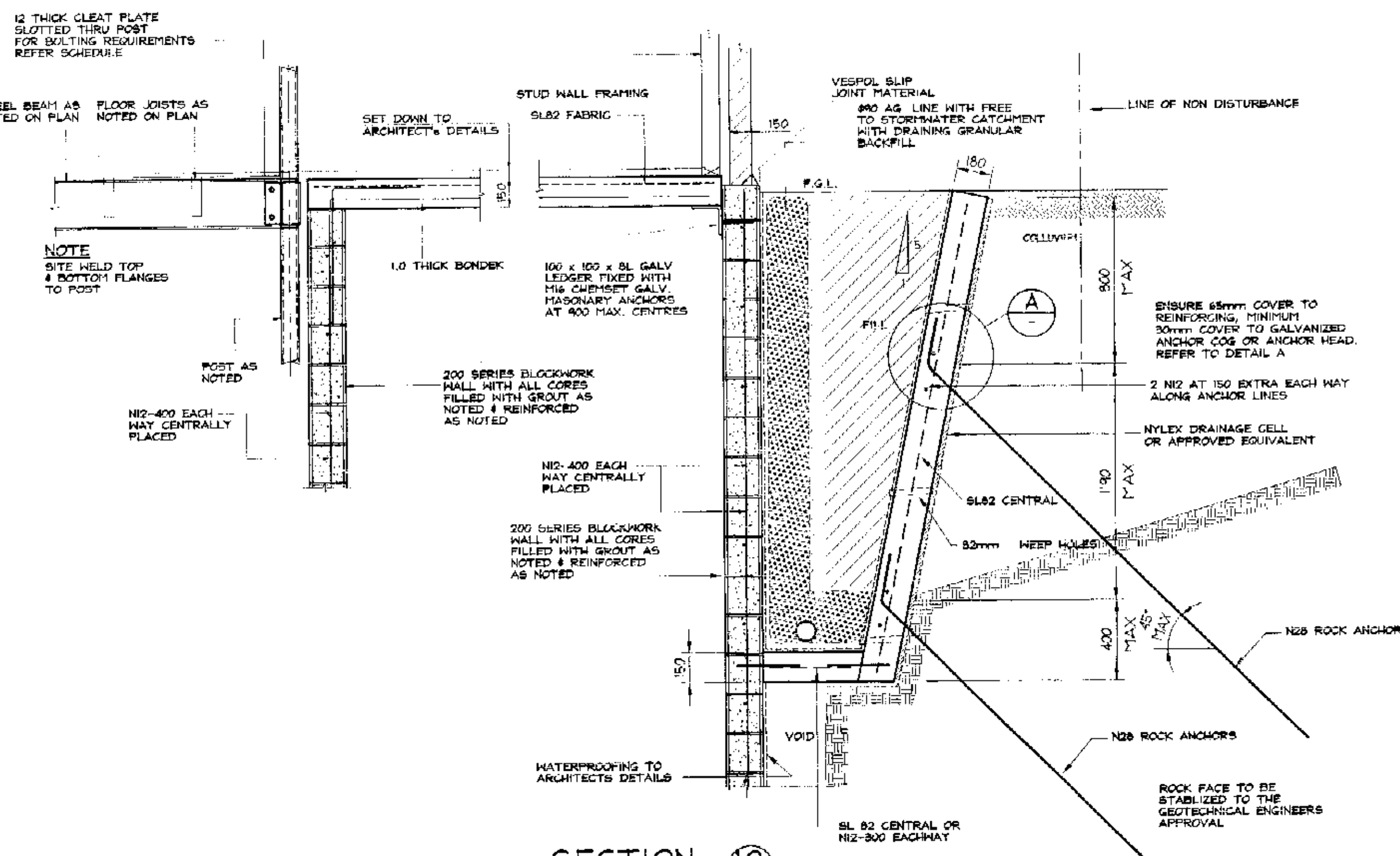
PLAN ON CONNECTION

NOTES:

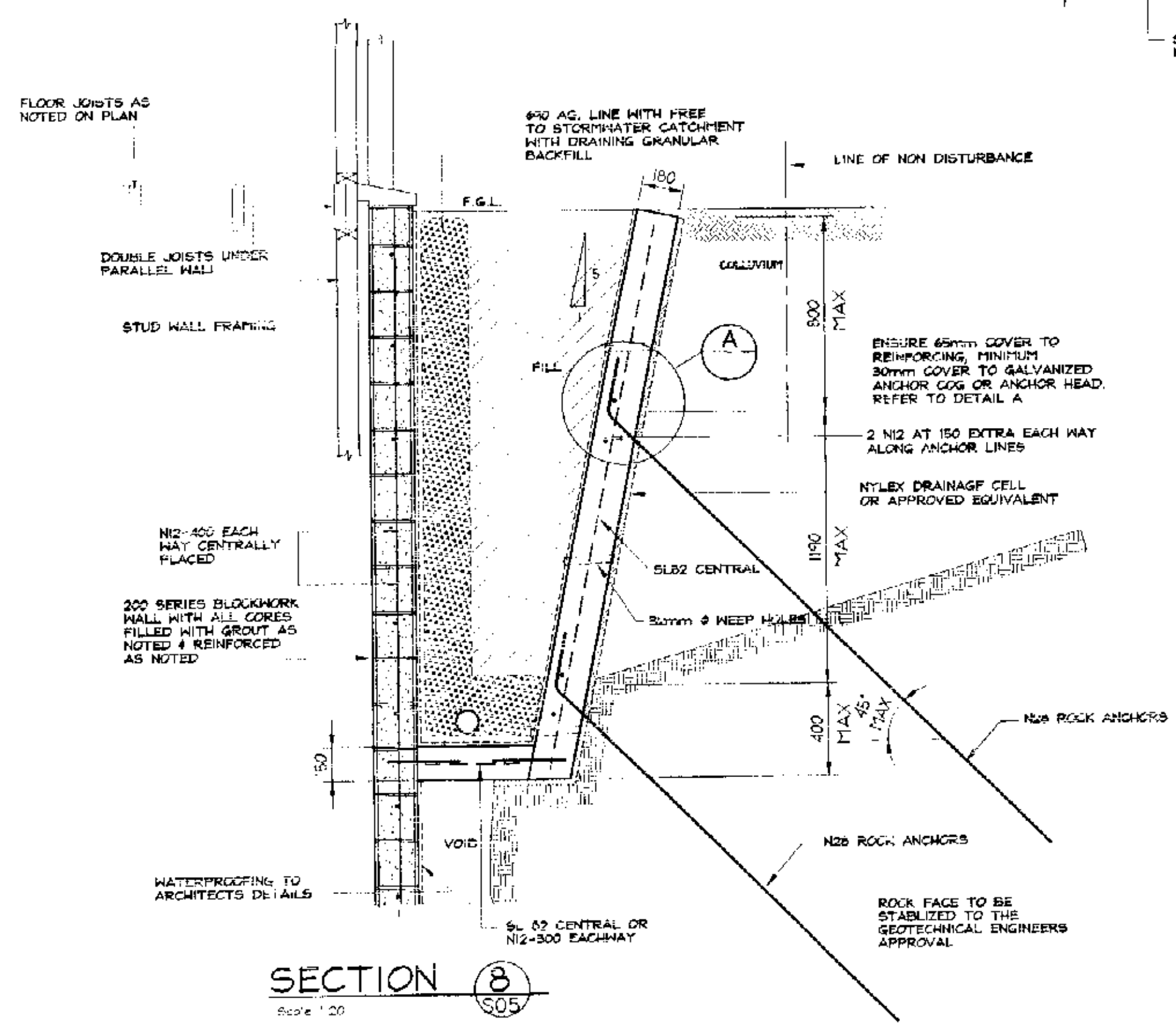
1. ALL DIMENSIONS TO BE VERIFIED
ON SITE BEFORE COMMENCING
WITH WORK.
2. FOR GENERAL NOTES AND
DRAWING SCHEDULE REFER
TO DRAWING NUMBER: S01.



SECTION 9
Scale 1:20



SECTION 10
Scale 1:20




SECTION 8
Scale 1:20

CITY PLAN SERVICES
Construction Cert. No. Approved Detail
74 855 27 Nov 2003
Qualifying Authority: Brandon Bennett
Approval Sign No. P180084

ISSUED FOR
CONSTRUCTION
CERTIFICATE
SUBMISSION ONLY

16/11/09

AI			DOCUMENT CERTIFICATION		<p>I am a registered Structural/Civil Engineer. I hold the following qualifications: BEng (Civil), CPREng, MIEAust, NPER, Institute of Engineers Membership No. 809238</p> <p>I hereby state that this drawing is in compliance with the conditions of the development consent, the provisions of the Building Code of Australia and/or relevant Australian Industry Standards.</p>		 <p>NORTHERN BEACHES Consulting Engineers P/L</p> <p>A.C.N. 076 121 616 A.B.N. 24 076 121 616 Suite 207, 39 FISHER ROAD DEE WHY N.S.W. 2099 Ph: (02) 9964 7000 Fax: (02) 9964 7444 e-mail: nb@nbconsulting.com.au</p>		<p>Project:</p> <p>PROPOSED NEW DWELLING AT BARRENJOEY & PALM BEACH ROADS PALM BEACH for: RAYPOND DEVELOPMENT</p>		<p>Drawing Title:</p> <p>HOUSE No.4 SHORING SECTIONS</p> <p>The copyright of this drawing remains with Northern Beaches Consulting Engineers P/L.</p>		<p>Date:</p> <p>AUG. 2003</p>		<p>Design:</p> <p>R.G.W.</p>		<p>Drawn:</p> <p>MC</p>		<p>Checked:</p>	
Date: 16/04/09 Rick G. Wray (Director Northern Beaches Consulting Engineers)											<p>Job No.</p> <p>030705</p>		<p>Drawing No.</p> <p>509</p>		<p>Rev.</p> <p>-</p>					
Date:			Rev:		Amend:															

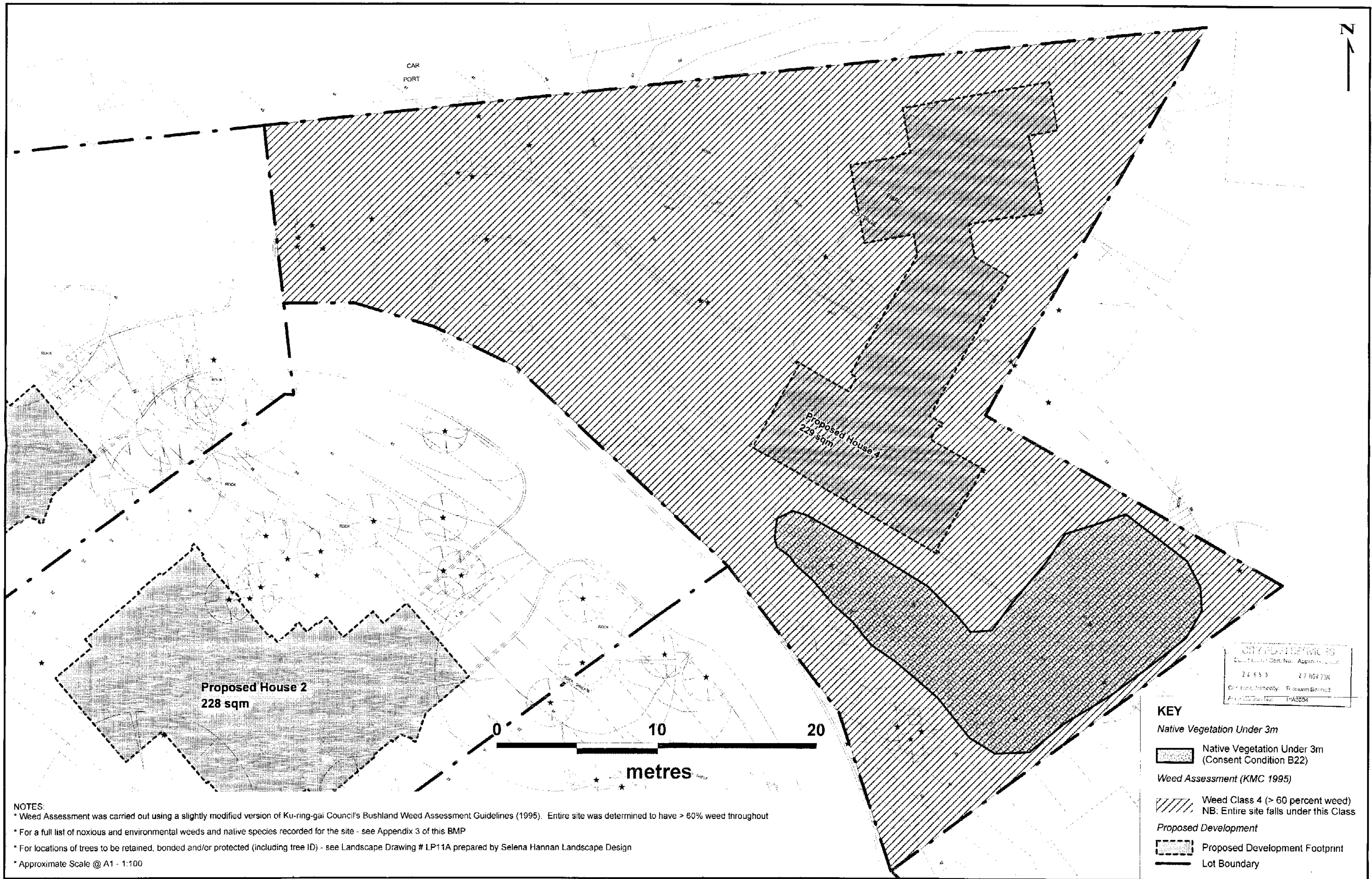


Figure 3.1
Action Plan - Lot 4
Diagram A - Native Vegetation Under 3m & Weed Assessment

LIST OF LOCALLY INDIGENOUS SPECIES RECOMMENDED FOR BUSH LANDSCAPING (see Appendix 5)

Planting densities:
Trees (Canopy & Sub-canopy) @ 1/25sqm;
Shrubs @ 1/2sqm;
Groundcovers, Grasses, Sedges, Vines, Scramblers & Ferns @ 4/1sqm

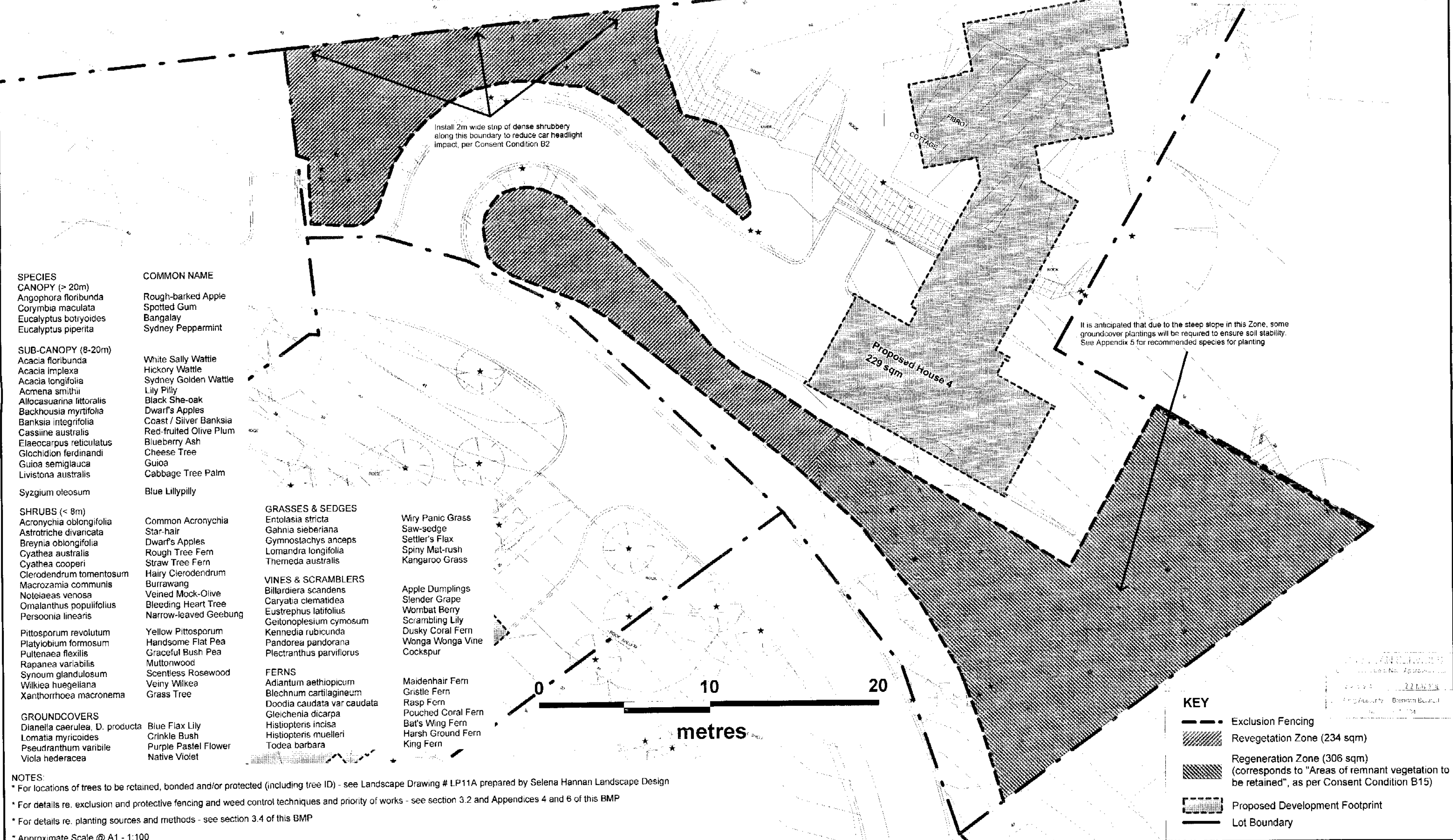


Figure 3.1
Action Plan - Lot 4
Diagram B - Revegetation and Regeneration Areas

Disclaimer: I am a qualified Horticulturist, Landscape Technician and Landscape Designer, holding the following qualifications:
Assoc. Dip. App. Sc. (Landscape) and Adv. Cert. Urban Hort. MAH, MAILOM. Further I am appropriately qualified to certify this component of the project. I hereby state that these plans and specifications comply with the Conditions of Development Consent and Pittwater Council DCP 23.
Selena Hannan, 12 November 2004

HOUSE 4 CC TREE SUMMARY

All previously numbered and surveyed trees within Lot 4 boundaries are listed below, with the exception of some weed species. List compiled with reference to:
o Pitwater Council DA Conditions 88, 816, 824, & C7
o PSB Tree Protection Plan TP11B dated 15/11/2002
o PSB Landscape Planting Plan 001371/DA, dated 25/05/2001
o PSB Tree Survey TP07B, dated 10/01/2002
o PSB Pre-Construction Tree/Vegetation Report, Subdivision Works, dated 10 April 2003
o Urban Forestry Arboricultural Assessment dated November 2004.

1. Trees that have been approved for removal for the subdivision works due to their location within, or proximity to, the road. These trees are not shown on Landscape Plan LP11. Previous issues of Tree Plans/Surveys, may be referred to if required.
111, T77, T85, T86, T87, T88, T81, T377B, T408, T412, T415, T420, T432, T433, T434, T436, T532.

2. Trees to be retained, protected and bonded as part of the subdivision, as per DA Condition C7:
T18, T389, T702

3. Trees to be retained and bonded which are located within 5 metres of dwelling and private driveway, as per DA Condition C7:
To be shown on Landscape Plan:
T14, T16, T108, T107, T413, T418, T419, T399, T398
(T418 is dead)

5. Trees to be removed for House 4
Not shown on Landscape Plan LP10A:
T4 (dead), T7, T8, T9, T12 (dead), T15, T17, T81, T82, T83, T85, T392, T393, T394, T387, T388, T390, T397, T401, T402, T403, T415, T504, T505, T506.

5. Trees to be retained, not bonded
Shown on Landscape Plan LP11:
A. Trees located within 5 metres of house, and private driveway, refer Urban Forestry Arboricultural Assessment as per Condition 5B for impacts:
T89, T90, T94, T416 (Ptilosporum), T409, T503.
B. Trees located outside 5 metre zone:
T5, T6, T93, T96, T400.

7. Tree to be retained, not bonded, as per amendments noted on TP11B, (approved plan). Arborist Report to be provided to show that all efforts to retain tree have been implemented, and specify protection measures taken to reduce impact.
T90

8. Trees under which contours are to be shown to be retained as existing situation, as per Condition B18:
T389, T388, T409.
(Note that T409, as referred to on approved plan TP11B, should, to be removed, is in contradiction with Conditions of Consent B16. Tree therefore to be retained.)

LANDSCAPE MATERIALS SCHEDULE

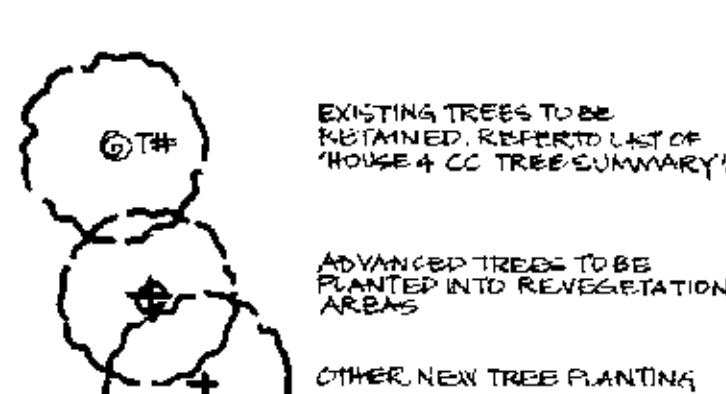
Material	Location	Colour/Description
Fences	No inter-plot fencing	
Mulch	All landscaped garden areas, and around building footprint, as shown on Landscape Plan.	Leaf Litter Mulch Refer to Landscape Software Specification.
Paving	Entry path and patios/terraces	Masonry pavers, of dimension, colour, and laying pattern to future spec. To be specified by Architect.
Planter Boxes	As shown on Landscape Plan	Sandstone block walls, mortared joints.
Protection Fencing	As shown on Landscape Plan and BMP	Refer to Landscape Software Specification.
Retaining Walls	To heights as shown on Landscape Plan	Sandstone boulder walls to details by Engineer.
Soils	Landscaped areas and planter boxes	Refer to Landscape Software Specification for depths and type.
Stepping stones with planting	As shown on Landscape Plan	Sandstone flagging stepping stones in soil and planting. Refer Landscape Software Specification.
Steps and Landings	From turning bay up to rock platform on west side of house	Sandstone flagging, mortared joints.
Street	No Council footpath is located adjacent to this lot.	No provision made for Street Tree planting.
Trees		

PLANT SCHEDULE

Botanical Name	Common Name	Height x Spread at Maturity (mm)	Pot Size	Quantity/Spacing
TREES				
Trees to be planted in bush revegetation areas (additional to those in Bush Management Plan)				
Allocasuarina torulosa	Forest Oak	8000 x 4000	300mm	5
Banksia integrifolia	Coastal Banksia	8000 x 6000	400mm	5
Diospyros australis	Black Plum	6000 x 3000	Tube or 150mm	12
TREES AND PALMS				
Banksia integrifolia	Coastal Banksia	8000 x 6000	400mm	3
Ficus rubiginosa	Port Jackson Fig	10000 x 8000	100L bag	1
Livistona australis	Caloogy Tree Palm	10000 x 5000	2 metre clear trunk	1
SHRUBS				
Agave attenuata	Agave	1000 x 1000	150mm	10
Agave attenuata	Agave	1000 x 1000	200mm	5
Banksia ericoides	Heath Banksia	2000 x 2000	200mm	5
Cycas revoluta	Sago Palm	1000 x 1500	300mm	2
Dorothy's excelsa	Gymea Lily	2000 x 2000	300mm	14
Escallonia 'Ivey'	White-flowering Escallonia	2000 x 2000	200mm	13
Leptospermum laevigatum	Tea Tree	4000 x 3000	200mm	11
Phoradendron tenax	Purple-leaved NZ Flax	1500 x 1500	200mm	6
Strelitzia reginae	Bird of Paradise	1000 x 1500	300mm	8
GROUNDCOVERS				
Carpetobrotus glaucosens	Native Pig Face	400 x 1000	150mm	70
Dianella caerulea var. producta	Flax Lily	500 x 400	150mm	65
Dichondra repens	Kidney Weed	100 x 1000	tubes	200
Imperata cylindrica	Blady Grass	400 x 500	tubes	70
Lomandra longifolia	Mat Rush	1000 x 1000	150mm	75

NOTE: QUANTITIES OF SHRUBS AND GROUNDCOVERS TO BE CONFIRMED ON SITE AFTER CONSTRUCTION OF HARDWORKS IS COMPLETE.

LEGEND



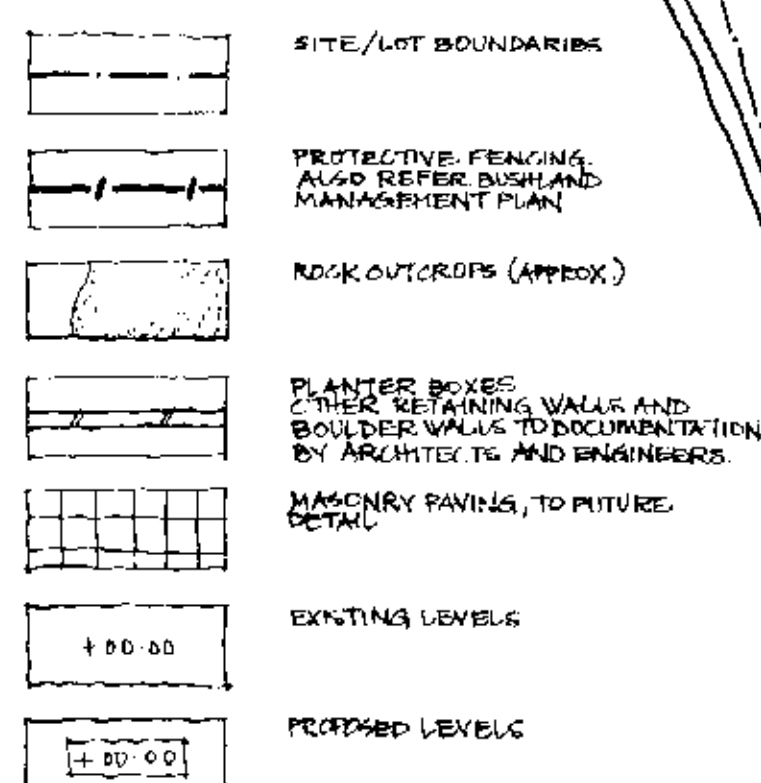
REFERENCED DOCUMENTS

1. House 4 DA-issue documentation:
 - o Architectural plans for House 4, Crane Nation Architects, 2000/06/ADA4-1001, -1002, -1003, -2001, -3001
 - o Tree Survey House 4, PSB00137, TP07B, dated 10/01/02
 - o Pitwater Council stamped, approved, coloured, marked-up, A3-size Tree Survey PSB00137, TP07B, dated 10/01/02
 - o Landscape Plan House 4, PSB00137, L04A, dated 25/05/01
 - o Landscape Plan House 4, PSB00137, L04A, dated 25/05/01, stamped, approved, and marked up by Pittwater Council DU on 17/11/02.
2. Site Subdivision CC-issue documentation:
 - o Architectural plans by Crane Nation Architects, 2000/06/ADA4-1001, -1002, -1003, -2001, -3001
 - o Landscape Plans for subdivision works, PSB00137B, L04B, dated 12/11/02
 - o Tree Protection Plan for subdivision works, PSB00137, TP11B, dated 15/11/02
 - o Landscape Specification for subdivision works, PSB00137B, dated 18 November 2003
 - o Pre-Construction Tree/Vegetation Report, PSB00137B, dated 10 April 2004
 - o Sydney Water Sewerage Plan, #13701/VW
 - o Bushland Management Plan by GIS Environmental Consultants, dated May 2003

CC-ISSUE DOCUMENTATION

- This plan to be read in conjunction with:
- o Architectural plans for House 4, Crane Nation Architects, 2000/06/ADA4-1001, -1002, -1003, -2001, -3001
 - o Landscape Software Specification, Selena Hannan Landscape Design, dated November 2004
 - o Arboricultural Assessment by Urban Forestry, dated November 2004
 - o Bushland Management Plan by Urban Forestry, dated November 2004

LEGEND



Client	RAYPOND PTY LTD		
Project	HOUSE 4, OBSERVATION POINT		
	1148 - 1152 BARRENJOEY ROAD AND 56 PALM BEACH ROAD, PALM BEACH, NSW		
Title	LANDSCAPE PLAN		
Date of Issue 11/11/2004	Scale 1:100 @A1	Drawing No LP11 A	
Reason for Issue CONSTRUCTION CERTIFICATE			

SELENA HANNAN LANDSCAPE DESIGN
Landscape Design and Horticultural Consultation

1/59 Central Road, Avalon, NSW, 2107
Phone 02 9973 3247 Fax 02 9973 3247 Mobile 0403 041 187

GENERAL NOTES:

GENERAL

- G1. The drawings are to be read together with all Architects drawings and specifications.
- G2. Dimensions shall not be obtained by scaling from the drawings. All setting out dimensions shall be verified and discrepancies shall be referred to the Engineer prior to commencement of work.
- G3. Care is required during construction so that structural elements are not over stressed and that the works and excavations required therefore are kept stable at all times.
- G4. Design, materials and workmanship are to be in accordance with current S.A.A standards and statutory authority regulations except where varied by these documents.
- G5. Design live loads are in accordance with AS 1170.1

FOOTINGS

- F1. Foundation strata is assumed for design purposes in accordance with AS 2870. See footnote. Classification to be verified by a Geotechnical Engineer commissioned by the client if certification of foundation is required.
- F2. Footings to be constructed and back filled as soon as possible following excavation to avoid softening by rain or drying out by exposure.
- F3. Footings must bear into undisturbed natural ground clear of organic material. Refer to details.
- F4. If rock or variable bearing strata is encountered during excavation of the footings all footings/piers are to be excavated to similar material of greater bearing capacity. The Engineer is to be contacted at that time for approval or review.
- F5. Footings to be cast in approved material having an allowable capacity as follows:

Sand Foundations:

- SA1. Required bearing capacity 100 kPa.
- SA2. Trenches must be cleaned of all debris and hand compacted prior to placement of reinforcement.

Clay Foundations:

- CL1. Required bearing capacity 150 kPa.
- CL2. Trenches must be cleaned of all debris. Soft spots must be cut out and filled as per compacted fill notes, prior to placement of reinforcement.

Shale Foundations:

- SH1. Required bearing capacity 400 kPa.
- SH2. Excavation for footings into shale must be cast or capped with plain concrete on the same day as excavation.

Sandstone Foundations:

- SS1. Required bearing capacity 650 kPa.
- SS2. Scrape weathered surface to remove cleaved sandstone under footings.

Refer adjacent for assumed Design bearing strata.

CONCRETE

- C1. All workmanship and materials shall be in accordance with AS 3600.
- C2. Concrete quality shall be as follows and shall be verified by tests.
- C3. All concrete unless otherwise noted shall have a slump of 80mm at point of placement, a max. aggregate size of 20 mm, and a min. cement content of 280 kg/cubic metre. No water shall be added to the mix prior to or during placement of concrete.
- C4. Clear concrete cover to reinforcement shall be as follows unless otherwise shown:-

ELEMENT	INTERIOR	EXTERIOR	EXTERIOR CAST AGAINST GROUND
FOOTINGS	-	-	50
COLUMNS/PEDESTALS	30 UNO	REFER TO PLAN	-
SLABS/WALLS	25	REFER TO PLAN	40 ON MEMBRANE
BEAMS	25 UNO	REFER TO PLAN	50
BLOCKWORK	55 FROM APPROPRIATE FACE		

- C5. Sizes of concrete elements do not include thickness of applied finishes.
- C6. All Construction Joints locations shall be approved by the Structural Engineer.
- C7. Beam depths are written first and include slab thickness, if any.
- C8. No holes or chases other than those shown on the structural drawings shall be made in concrete elements without the prior approval of the engineer.
- C9. Shrinkage reducing admixtures such as 'Eclipee' or approved equivalent, if specified, must be added to mix prior to pour.
- C10. Water reducing agents, if specified, must be added to mix prior to pour. No extra water is to be added to increase slump.
- C11. Where vertical slab/beam surfaces are formed against a masonry (or other) wall, provide 10 mm styrene separation material.
- C12. Water must not be added to concrete mix prior to placement of concrete.
- C13. Above covers may have to be adjusted if fire rating is a requirement.

REINFORCEMENT

- R1. All reinforcement specified is Grade D500 unless noted otherwise.
- R2. Reinforcement is represented diagrammatically it is not necessarily shown in true projection.
- R3. Top reinforcement is to be continuous over supports. Bottom reinforcement to be lapped at supports.
- R4. Welding of reinforcement shall not be permitted unless shown on the structural drawings.
- R5. Pipes or conduits shall not be placed within the zone of concrete cover to the reinforcement without the approval of the engineer.
- R6. All reinforcing bars and fabric shall comply with AS 4671-2001.
- R7. Reinforcement symbols:
N - Grade 500N deformed bar (D500) Normal Ductility
R - Grade 250N plain round bar (R250) Normal Ductility.
SL - Grade 500L welded deformed ribbed mesh (D500) Square Low Ductility.
RL - Grade 500L welded deformed ribbed mesh (D500) Rectangular Low Ductility.
The number immediately following these symbols is the number of millimeters in the bar diameter.
Example:
8 N12-250, denotes 8, Grade 500N deformed bars, 12 mm diameter at 250 cts.
R8. Fabric reinforcement to be lapped 1 complete square + 25 mm unless noted otherwise.
- R9 All reinforcement shall be firmly supported on bar chairs spaced at a maximum of 750 centres both ways under rod and fabric reinforcement. Reinforcement shall be tied at alternate intersections.

FORMWORK

- FW1. Formwork must be cleaned of all debris prior to casting of concrete.
- FW2. Minimum stripping times for form work shall be as recommended in AS 1509 or as directed by the engineer.
- FW3. The finished concrete shall be a dense homogeneous mass, completely filling the form work, thoroughly embedding the reinforcement and free of stone pockets. All concrete elements including slabs on ground and footings shall be compacted with mechanical vibrators.
- FW4. Curing of all concrete is to be achieved by keeping surfaces continuously wet for a period of 3 days, followed by prevention of loss of moisture for seven days followed by a gradual drying out. Approved sprayed on curing compounds may be used where no floor finishes are proposed. Polythene sheeting or wet hessian may be used if protected from wind and traffic.

BRICKWORK

- BR1. Brickwork is to be constructed to AS 3700.
- BR2. Two layers of approved greased metal based slip material shall be used over all load bearing walls that support concrete slabs and placed on smooth brickwork or trowelled mortar finish. Non load-bearing walls shall have 10 mm compressible material and ties to the slab soffit.
- BR3. No brickwork shall be constructed on suspended slabs until all propping has been removed from the underside of the slab and the concrete has the specified 28 day cylinder strength verified by tests.
- BR4. Control joints to be placed at a maximum of 8m centres or in accordance with AS 3700.
- BR5. Exposure grade bricks to be used below damp proof course.
- BR6. Vertical control joint material where specified on plan between slabs and brick walls shall be: 10 mm Spandex External UNO. Bitumastic fibreboard internal UNO.
- BR7. Provide stainless steel wall ties below DPC to AS 3700. Provide galvanized wall ties above DPC to AS 3700 & Local Council Specifications.

BLOCKWORK

- BL1. Concrete blocks shall have a minimum compressive strength of 15 MPa and conform to AS 1500. Masonry to be constructed to AS 3700.
- BL2. Where cores of hollow blocks are to be filled, properly compacted 20MPa concrete with 10 mm aggregate and 230 mm slump shall be used. Clean out openings must be utilized for all cores.
- BL3. Location of actual starters is critical to suit block cores, allow 55 mm cover from the outside face of blockwork. All reinforcement lap lengths to conform to AS 3600.
- BL4. Control joints to be placed at a maximum of 8 m centres or in accordance with AS 3700.
- BL5. Vertical control joint material where specified on plan between slabs and brick walls shall be: 10 mm Spandex External UNO. Bitumastic fibreboard internal UNO.
- BL6. Retaining walls or any reinforced and concrete core filled block walls to be of Double 'U' Block Construction.
- BL7. No blockwork shall be constructed on suspended slabs until all propping has been removed from the underside of the slab and the concrete has the specified 28 day cylinder strength verified by tests. unless approved by the Structural Engineer.
- BL8. Max. pour height for unrestrained blockwork is 2000.

STEEL

- S1. All Structural steelwork to be Grade 300 or greater. Design, fabrication and erection to be in accordance with AS 4100.
- S2. Materials and workmanship shall comply with AS 1250 - 1981, SAA Steel Structures Code and the specification for Structural Steel.
- S3. Rolled steel sections including steel plates shall comply with AS 3678 - 1990.
- S4. Cold formed steel sections shall be Grade 450 Zinc coated in accordance with AS 1538-1988.
- S5. Welded and seamless steel hollow sections shall comply with AS 1163. Grade 350.
- S6. Bolt Designation:
4.6S - Commercial bolts Grade 4.6, snug tightened.
8.8S - High Strength structural bolts Grade 8.8, snug tightened.
8.8TB - High Strength structural bolts Grade 8.8, fully tightened to AS 1511 and acting as a Bearing Joint.
8.8TF - High Strength structural bolts Grade 8.8, fully tensioned to AS 1511 and acting as a Bearing Joint.
Unless noted otherwise, all bolts will be 8.8S.
- S7. Unless shown otherwise, minimum connection shall be 2M16 bolts, 10 thick gusset plates, 6mm continuous fillet welds.
- S8. Load indicating washers shall be used in all fully tensioned joints. (8.8TF & 8.8TB).
- S9. All welding shall be carried out in accordance with AS 1554 SAA Structural Steel Welding Code.
- S10. Unless noted otherwise all welds shall be category SP using E41xx Electrodes. All butt welds shall be complete penetration butt welds category SP.
- S11. Grouting of anchor bolt sleeves and base plates shall be completed by the contractor using High Strength, Non-Shrink grout.
- S12. Fabrication and erection tolerances for Structural Steelwork shall be in accordance with AS 4100.
- S13. Purlin bolts shall be M12 - 4.6S galvanised.
- S14. Steel work shall have one of the following grades of corrosion protection:-
INTERNAL
 - a. Thoroughly cleaned wire brushing, followed by two coats of zinc phosphate primer equivalent to Dulux Luxaprime applied by hand using brushes to achieve a total dry film thickness of 70 microns.
EXTERNAL ELEMENTS, & ELEMENTS WITHIN EITHER SKIN OF EXTERNAL CAVITY WALLS
 - b. Preparation Blast clean to a minimum standard Class 2.5 in accordance with AS 1627 Part 4.
Primer 2-pack epoxy phosphate at dft 75 microns (Dulux Durepon P14).
Barrier Coat 2-pack epoxy micaeous iron oxide, dft 100 microns
Finish Coat 2-pack epoxy high gloss acrylic to dft 75 microns (e.g. Dulux Acathane 1 F) in an approved colour.
 - c. Hot dipped galvanized to AS 4680.
Where galvanized coating is broken on site make good with two coats of zinc rich epoxy primer equivalent to Dulux Zinc anode 202 or Hot Metal Spray in accordance with AS 4680.
- S15. Workshop drawings shall be prepared and two copies submitted to the engineer for review prior to fabrication commencement.

TIMBER

- T1. All workmanship and materials to be in accordance with AS 1684 and AS 1720. All soft wood to be Grade F7 unless noted otherwise. All hardwood to be minimum Grade F14 unless otherwise noted. Exposed timber to be CCA treated (to AS 1604) redried after full impregnation, or durability class 1 or 2.
- T2. All joists deeper than 150 to have blocking over support bearers and at a maximum 3000 centres.
- T3. Roof trusses to be designed by the manufacturer to the relevant standards. Pre camber to be an amount equal to dead load deflection v.m.e.
- T4. All holes for bolts to be exact size. Washers to be used under all heads and nuts and to be at least 2.5 times the bolt diameter. Bolts to be M16 grade 4.6 unless noted otherwise.
- T5. Treat all exposed cut ends with Resol by Protim to manufacturers specification to achieve required Hazard Level Exposure Classification.
- T6. Battens for T & G to be Kiln Dried to 12 %
38mm minimum deep treated pine or as recommended by supplier. Flooring to be installed no sooner than 28 days after slab pour.
- T7. Hot dip galvanized nails/clouts/screws to be used with all timber connections.
- T8. Continuous nailing must not be used for any timber connections.

COMPACTED FILL

- CF1. Only to be used with approval Engineer & to be certified by a geotechnical Engineer.
- CF2. Clear organic material and topsoil under proposed slabs/footings.
- CF3. Filling shall be granular material compacted in not more than 200 mm layers to a minimum dry density ratio (AS 1289/E4.2 1982) of 98 percent.
- CF4. During clearing and excavation for slabs and footings cut out soft spots and fill as above.

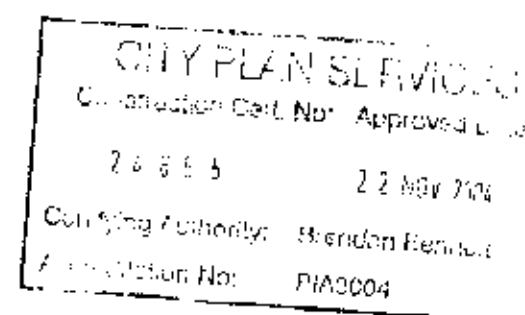
INSPECTIONS BY ENGINEER

- 24 HOURS NOTICE IS REQUIRED BEFORE ANY SITE INSPECTION
1. Bearing strata of all footings prior to concrete pour.
2. Any reinforcement prior to concrete pour.
3. Timber and Steel framing prior to cladding or lining.
4. Steel lintels after installation.

ASSUMED FOUNDATION CLASSIFICATION FOR DESIGN PURPOSES - 'A'
ASSUMED BEARING STRATA FOR DESIGN PURPOSES - ROCK, 1000kPa.

DRAWING SCHEDULE:

- S01 - GENERAL NOTES AND DRAWING SCHEDULE
- S02 - LEVEL 1 FOOTING, SLAB PLAN AND DETAILS
- S03 - LEVEL 1 FOOTING & SLAB DETAIL SHEET
- S04 - LEVEL 2 FRAMING AND REINFORCEMENT PLANS
- S05 - LEVEL 2 SLAB DETAIL SHEET
- S06 - LEVEL 3 FLOOR FRAMING, LOWER ROOF PLAN AND DETAILS
- S07 - LEVEL 4 FLOOR FRAMING PLAN AND MISCELLANEOUS DETAILS
- S08 - UPPER ROOF FRAMING PLAN AND DETAILS



NOT FOR
CONSTRUCTION
ISSUED FOR TENDER

NOTES:

1. ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WITH WORK.
2. FOR GENERAL NOTES AND DRAWING SCHEDULE REFER TO DRAWING NUMBER: S01.

DOCUMENT CERTIFICATION

Date: Aug 05
Rick G. Wray
(Director Northern Beaches Consulting Engineers)

I am a qualified Structural/Civil Engineer.
I hold the following qualifications:
BE(Civil), CPEng, MIEAust, NPER,
Institute of Engineers Membership No. 803938
I hereby state that this drawing is in compliance
with the conditions of the development consent,
the provisions of the Building Code of Australia
and/or relevant Australian/Industry Standards.



NORTHERN BEACHES
Consulting Engineers P/L
A.C.N. 076 121 816 A.B.N. 24 076 121 816
Suite 207, 30 FISHER ROAD
DEE WHY N.S.W. 2099
Ph: (02) 9984 7000 Fax: (02) 9984 7444
e-mail: nb@nbconsulting.com.au

Project:

PROPOSED NEW DWELLING AT
BARRENJOEY & PALM BEACH ROADS
PALM BEACH
for: RAYPOND DEVELOPMENT

Drawing Title:

HOUSE No.4
GENERAL NOTES AND
DRAWING INDEX

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Date: AUG. 2003

Design: R.G.W.

Drawn: HENK.

Checked:

Job No:

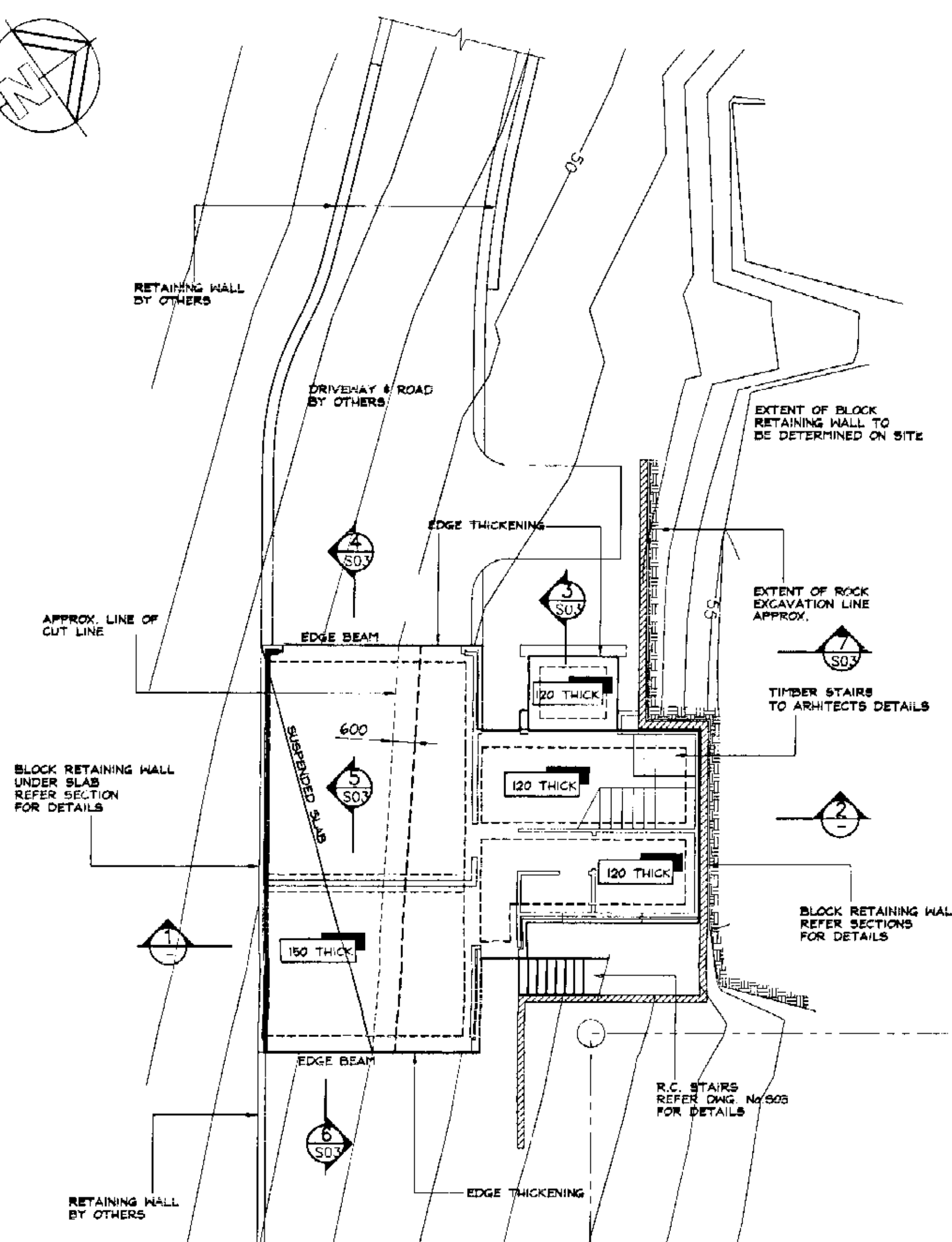
030705

Drawing No:

S01

Rev:

-



CONCRETE
F'c = 40 MPa EXPOSED
F'c = 25 MPa ON GRADE
F'c = 32 MPa SUSPENDED
COVER
45m.m. EXPOSED
30m.m. NOT EXPOSED

TYPICAL BRICKWALL FOOTING DETAILS

Scale 1:20

CONCRETE PIERS:

- PIERS TO BE 300mm DIAMETER FOUNDED
- FOR DEPTH LESS THAN 1200mm UNREINFORCED.
- FOR DEPTH GREATER THAN 1200mm AND LESS THAN 2400mm.
1 Y16 U-BAR.
- FOR DEPTH GREATER THAN 2400mm
4 Y16, R10 TIES AT 300.

CONCRETE PIERS:

1. PIERS TO BE 300mm DIAMETER
FOUNDED
2. FOR DEPTH LESS THAN 1200mm
UNREINFORCED.
3. FOR DEPTH GREATER THAN 1200mm
AND LESS THAN 2400mm, Y16 L
1 Y16 U-BAR.
4. FOR DEPTH GREATER THAN 2400mm
4 Y16, 10 TIES AT 300.

25

F72 FABRIC

STOP REINFORCEMENT
25mm EACH SIDE
OF JOINT

1

1

450

450


15 x 15

KEYED JOINT DETAIL

DENSED K.J. ON PLAN

KEYED JOINT DETAIL
 DETAILED K.J. ON PLAN

STOP FABRIC AT JOINT
REFER SAW CUT NOTE BELOW



SAW CUT NOTE: 48 DEEP x 8mm WIDE SAW BE MADE AS SHOWN AS CONCRETE HAS CURED SUFFICIENTLY SO AS NOT TO DAMAGE THE SURFACE OF THE FLOOR SLAB.

SAW CUT JOINT
DETENTED S. ON PLAN

SURFACE OF THE FLOOR SLAB
SAW CUT JOINT
DENOTED S.I. ON PLAN

DOWEL JOINT DETAIL
DENOTED D.J. ON PLAN

24055 22 Nov 2004
Co-Training Authority: Brendan E. Smith
Assignment No: PIA0004

20 x 20 APPROVED
JOINT SEALANT

STOP REINFORCEMENT
25 mm EACH SIDE OF JOINT

EXPANSION JOINT DETAIL
 DETAIL E - 1 ON PLAN

NOT FOR
CONSTRUCTION
ISSUED FOR TENDER

SECTION

Scale 1:20

NOT FOR
CONSTRUCTION
ISSUED FOR TENDER

20 x 20 APPROVED
JOINT SEALANT

STOP REINFORCEMENT
25 mm EACH SIDE OF JOINT

EXPANSION JOINT DETAIL
 DETAIL E - 1 ON PLAN

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BE(Civil), CPEng, MIEAust., NPFR.
Institute of Engineers Membership No. 803938
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DEE WHY N.S.W. 2099
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e-mail: nbf@nbcconsulting.com.au

Project

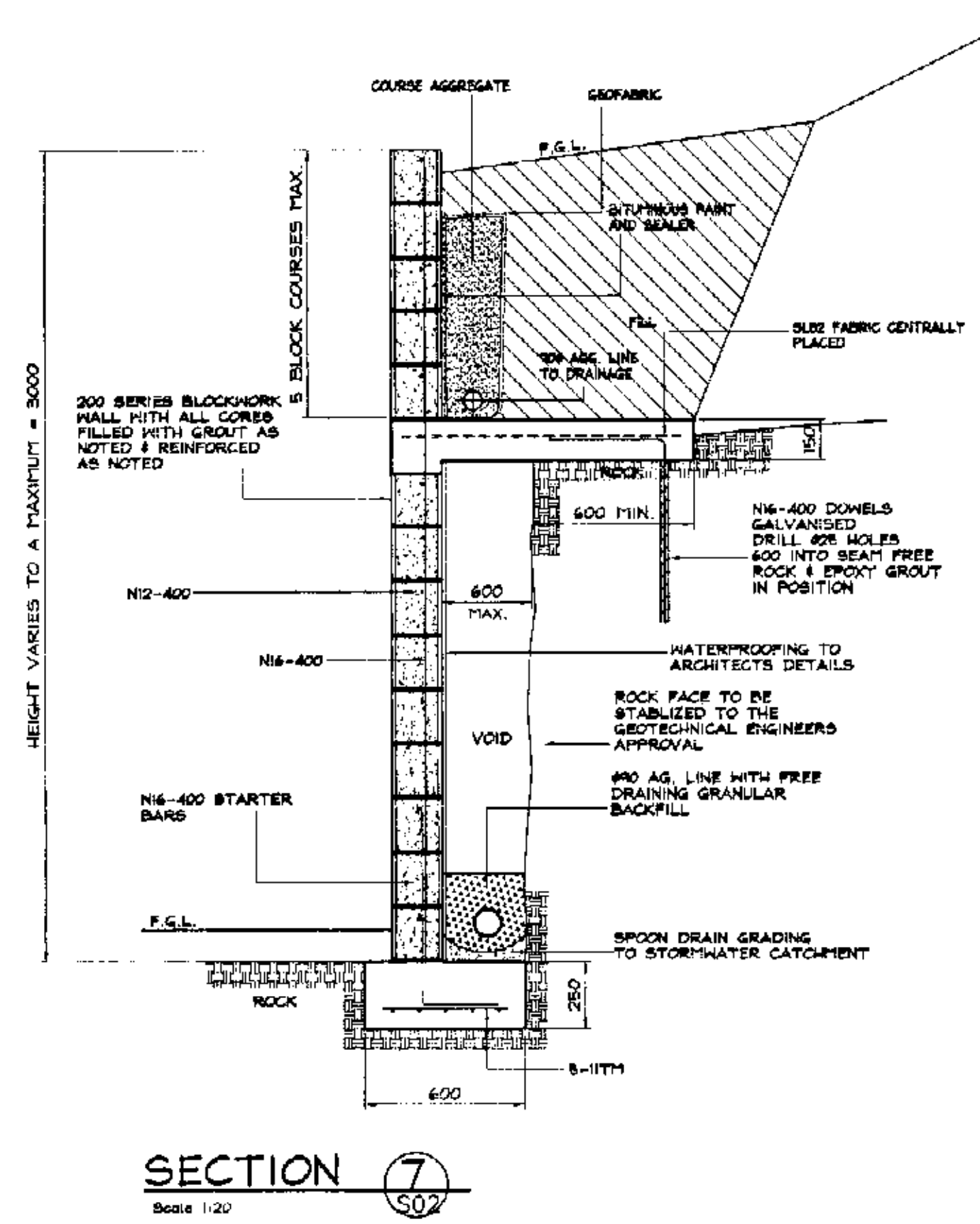
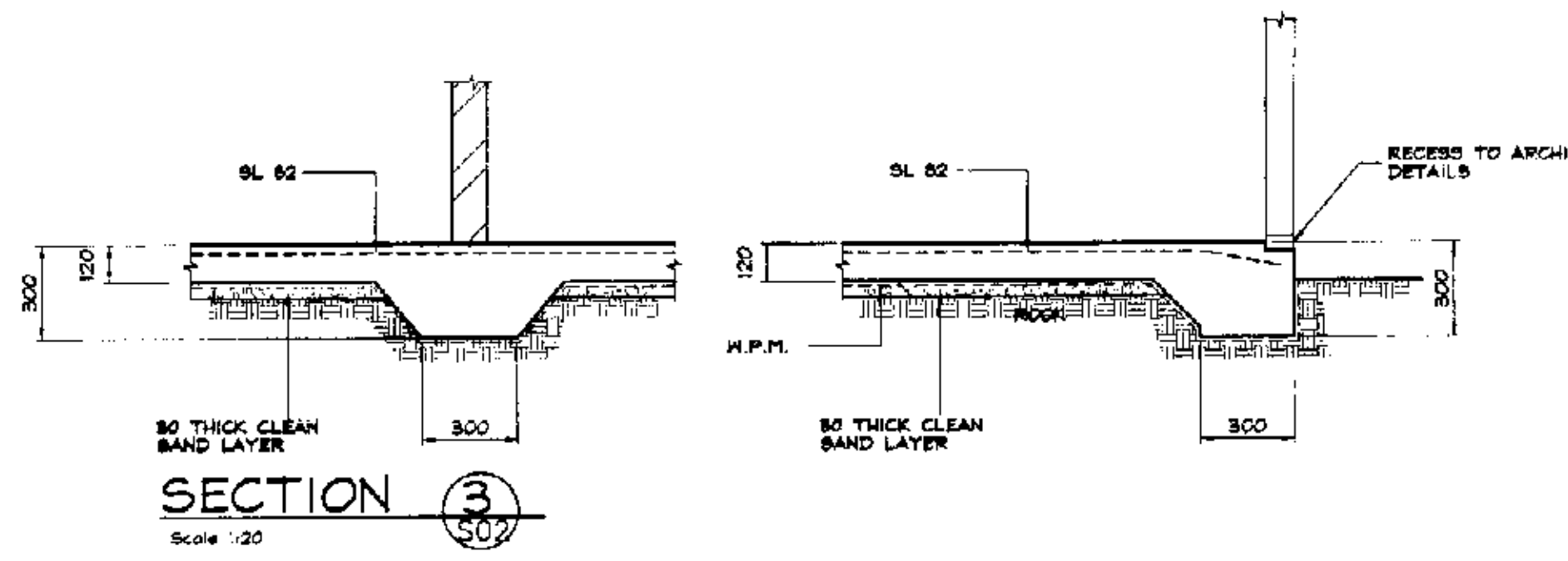
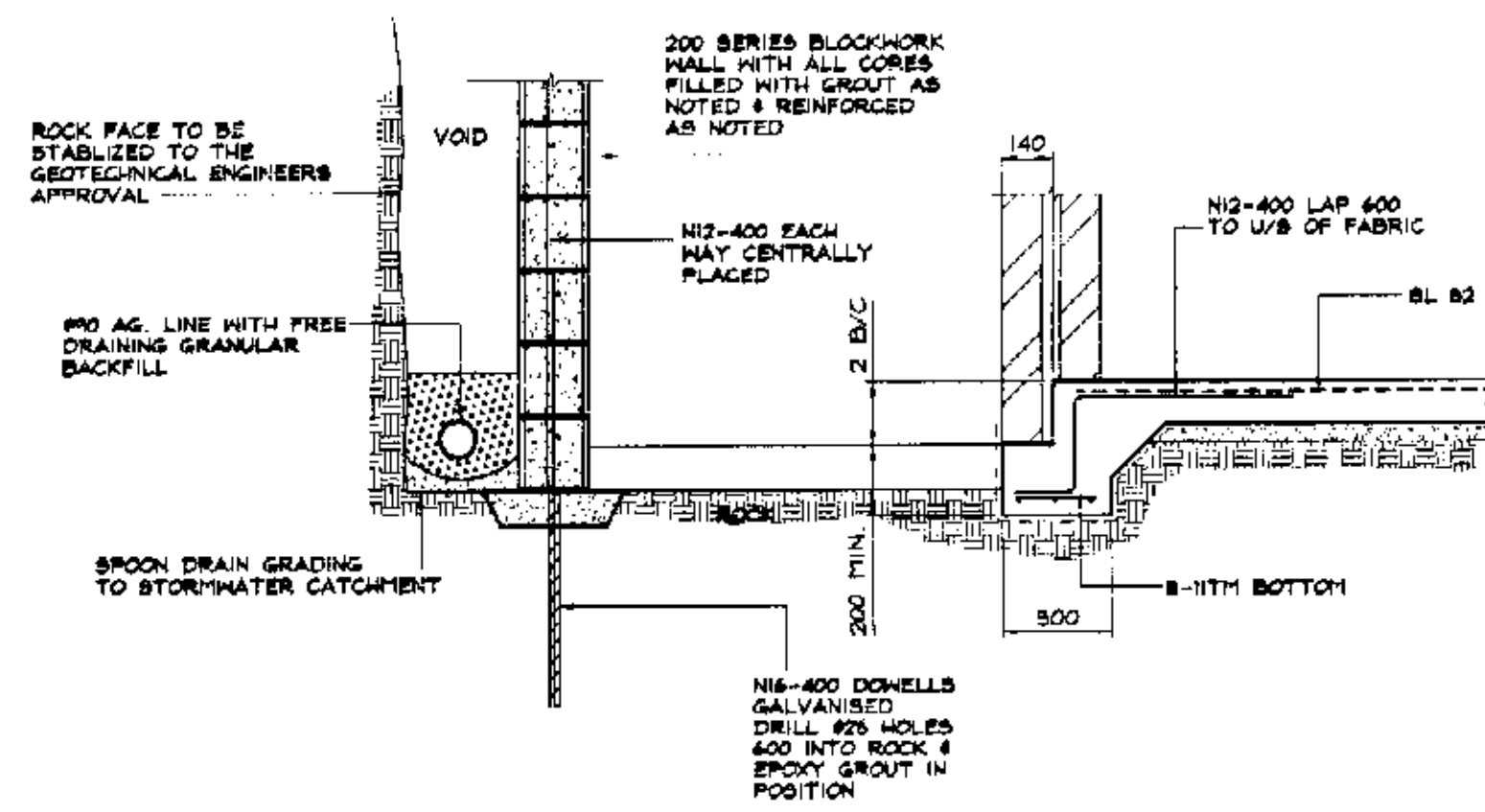
PROPOSED NEW DWELLING AT
BARRENJOEY & PALM BEACH ROADS
PALM BEACH
for: RAYPOND DEVELOPMENT

Drawing Title:

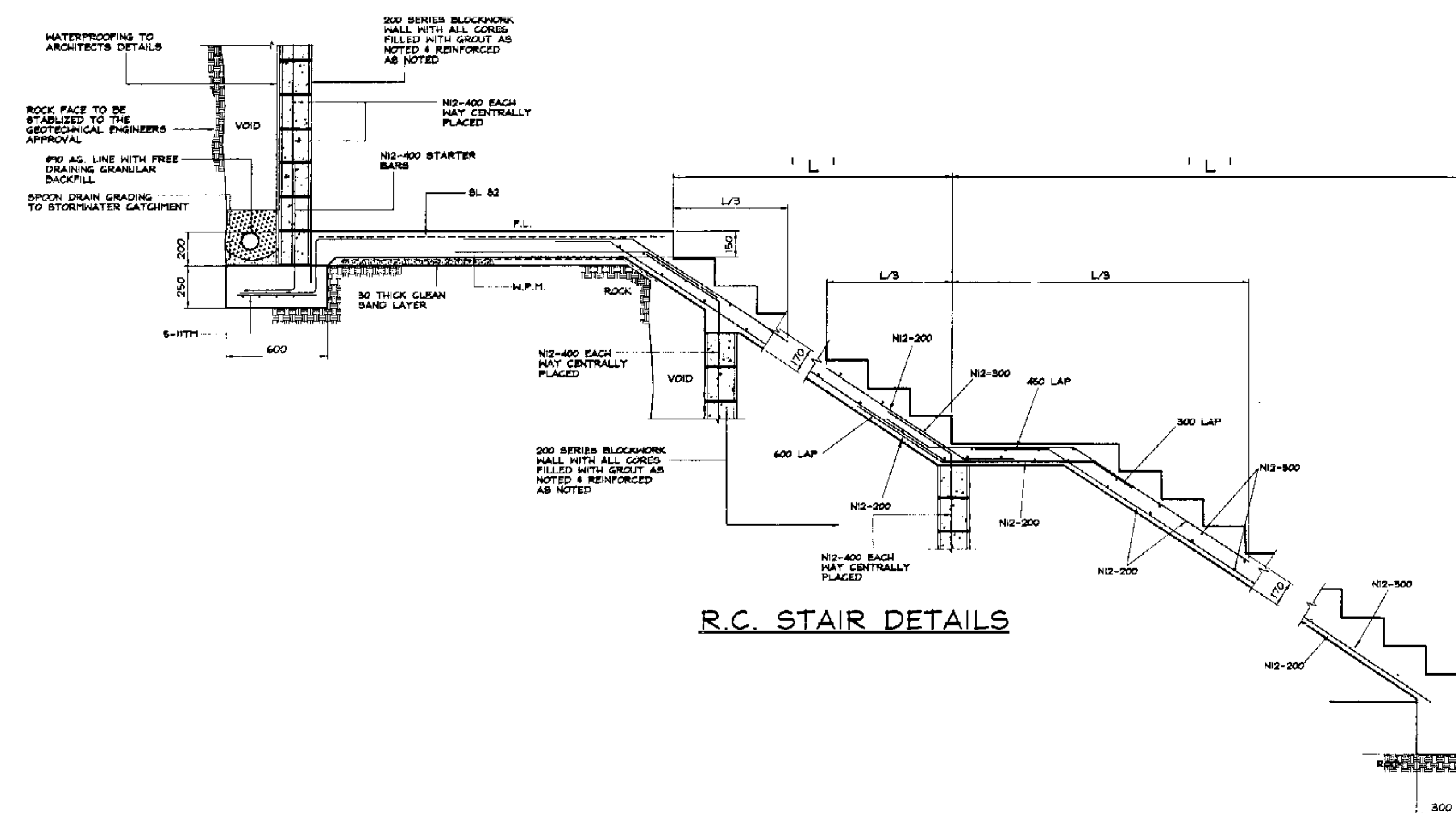
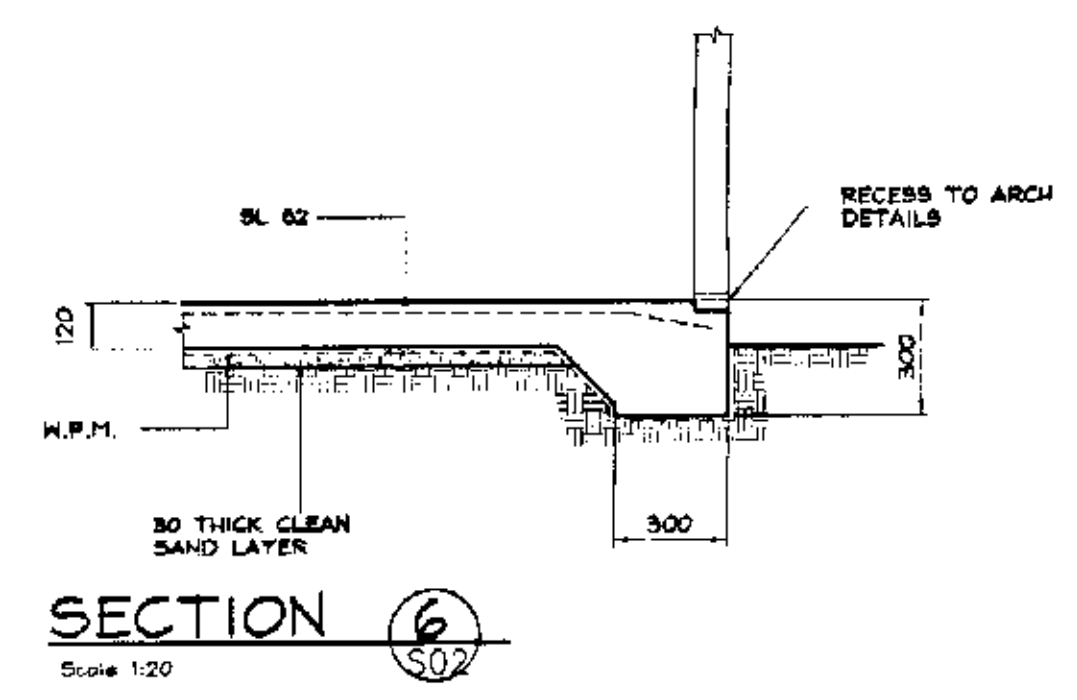
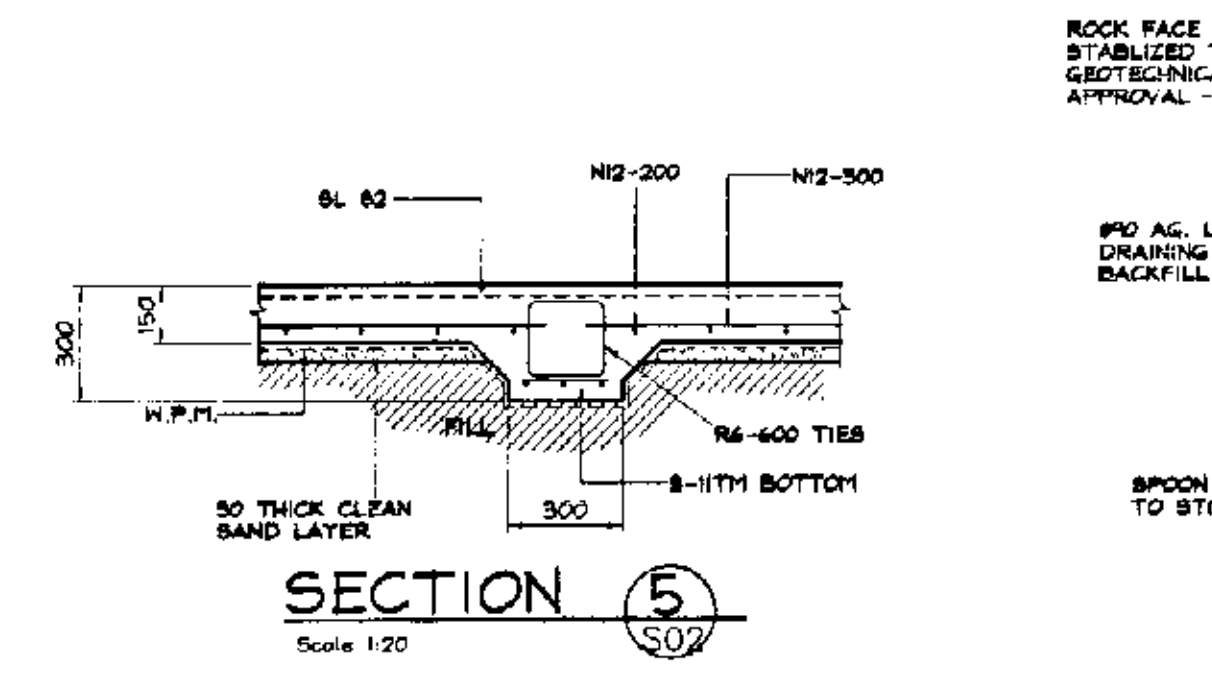
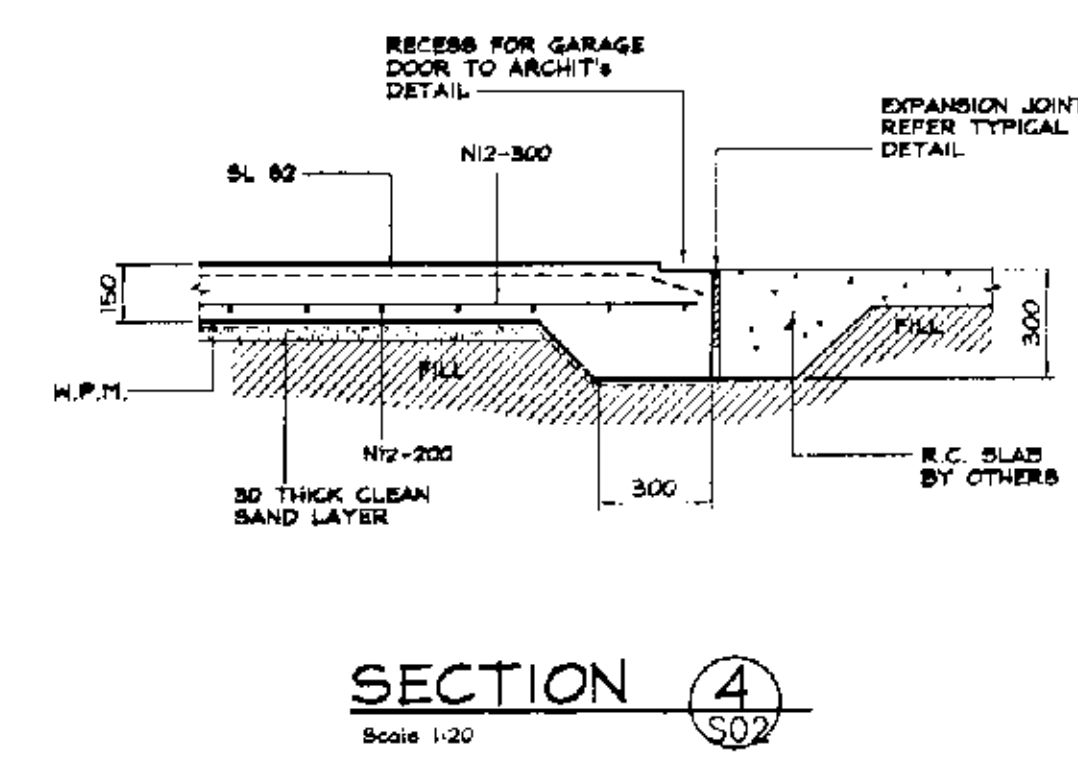
HOUSE No.4
LEVEL 1-FOOTING, SLAB PLAN
AND DETAILS

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Date: AUG. 2003	Design: R.G.W.	Drawn: HENK.	Checked:
Job No: 030705		Drawing No: 502	Rev: -



- NOTES:**
1. ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WITH WORK.
 2. FOR GENERAL NOTES AND DRAWING SCHEDULE REFER TO DRAWING NUMBER: S01.



CONCRETE
 F/c = 40 MPa EXPOSED
 F/c = 25 MPa ON GRADE
 F/c = 32 MPa SUSPENDED
 COVER
 45mm. EXPOSED
 30mm. NOT EXPOSED

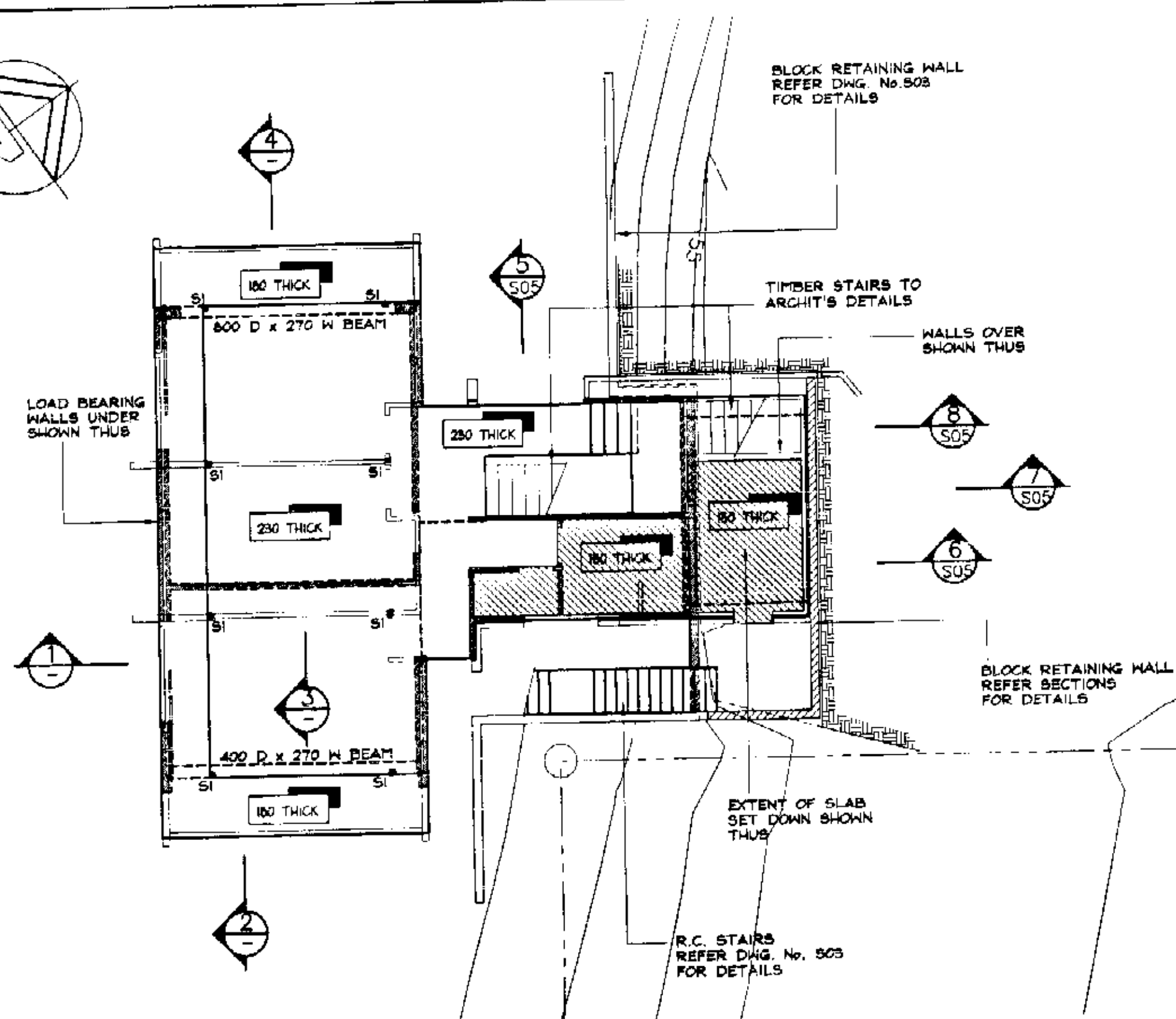
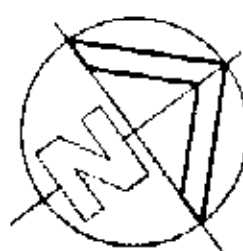
NOTE:-
 GEOTECHNICAL ENGINEER TO APPROVE ALL FOOTING MATERIAL

CITY PLAN SERVICES
 Construction Cert. No. Approved
 24/03/03 22/04/03
 Confirming Authority: Brandon Davies
 Registration No. 1143604

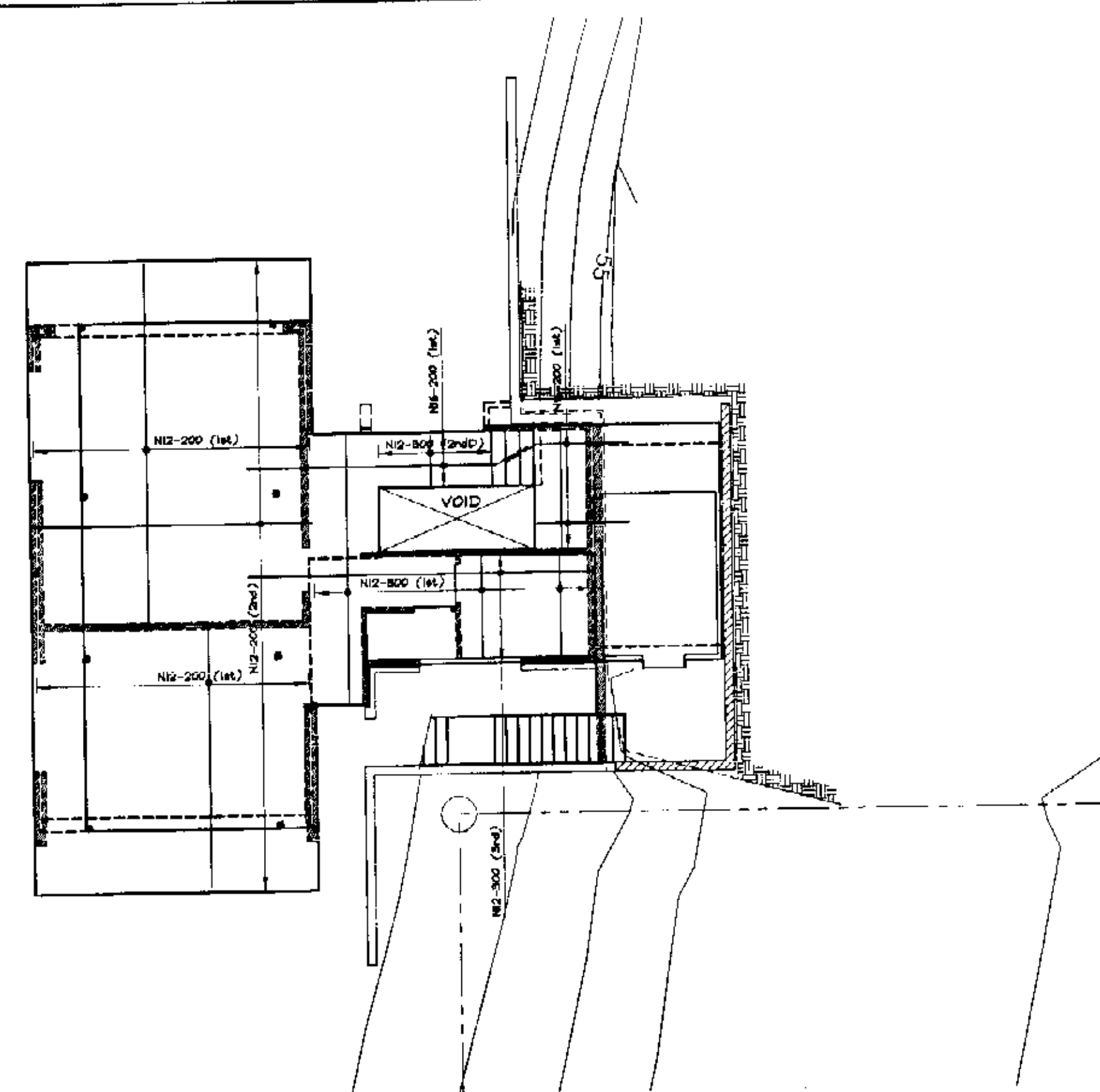
Raypond
 17/10/04

NOT FOR CONSTRUCTION
ISSUED FOR TENDER

DOCUMENT CERTIFICATION			 <div>NORTHERN BEACHES Consulting Engineers P/L. A.C.N. 076 121 616 A.B.N. 24 076 121 616 Suite 207, 30 FISHER ROAD DEE WHY N.S.W. 2099 Ph: (02) 9984 7000 Fax: (02) 9984 7444 e-mail: nb@nbconsulting.com.au</div>	Project:	Drawing Title:	Date:	Design:	Drawn:	Checked:
I am a qualified Structural/Civil Engineer. I hold the following qualifications: BE(Civil), CPENG, MIEAust., NPER, Institute of Engineers Membership No. 803938 I hereby state that this drawing is in compliance with the conditions of the development consent, the provisions of the Building Code of Australia and/or relevant Australian/Industry Standards.				PROPOSED NEW DWELLING AT BARRENJOEY & PALM BEACH ROADS PALM BEACH for: RAYPOND DEVELOPMENT	HOUSE No.4 LEVEL 1-FOOTING & SLAB DETAIL SHEET	AUG. 2003	R.G.W.	HENK.	
Date: 14/06/03 Rick G. Wray (Director Northern Beaches Consulting Engineers)						Job No: 030705	Drawing No: S03	Rev: -	
Date:	Rev:	Amendment:	The copyright of this drawing remains with Northern Beaches Consulting Engineers P/L.						



LEVEL 2 - SLAB FRAMING PLAN

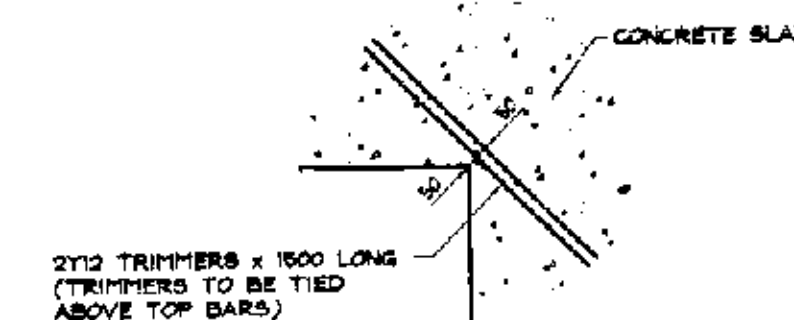


BOTTOM REINFORCEMENT PLAN

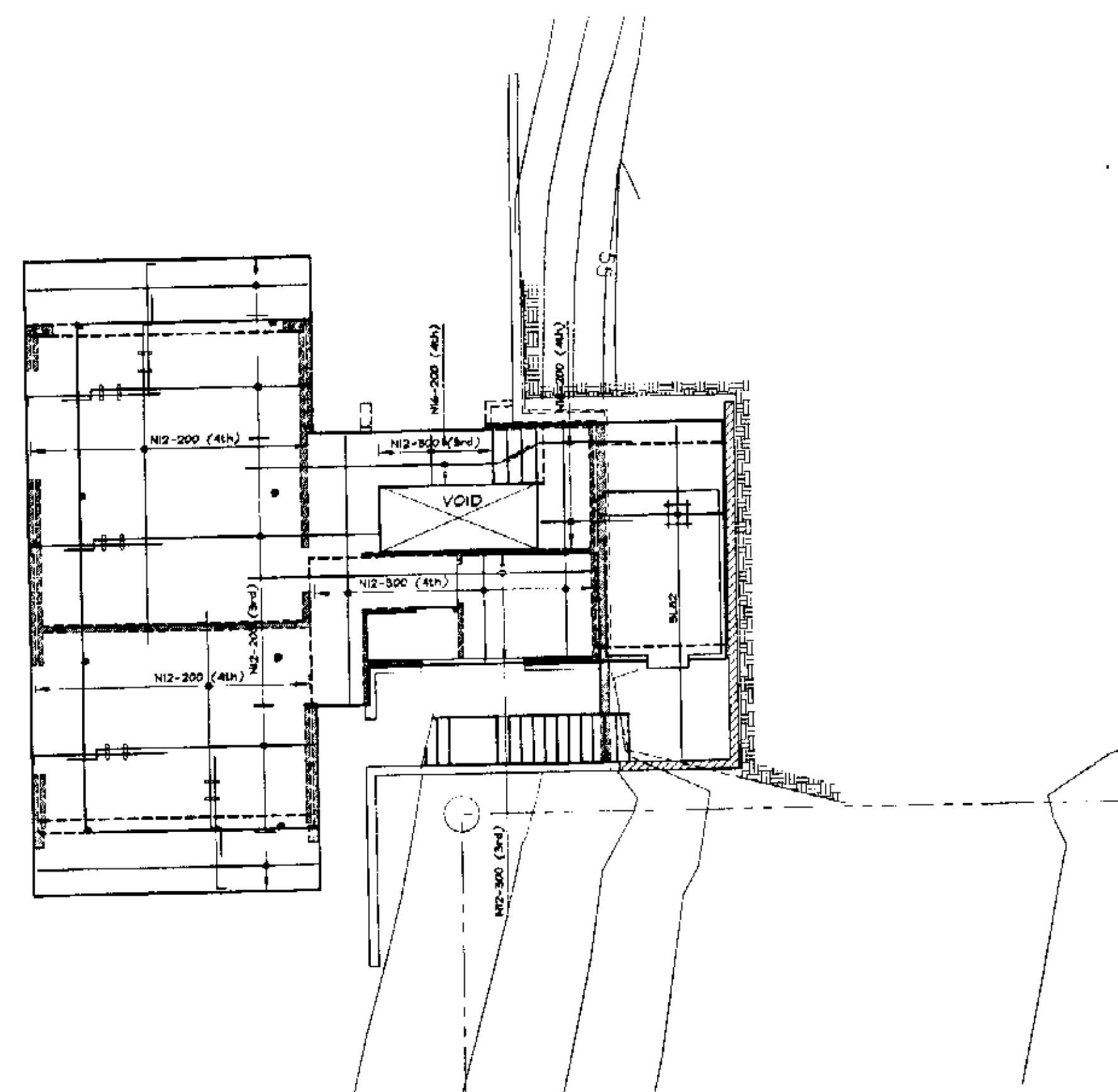
- NOTES:**
1. ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WITH WORK.
 2. FOR GENERAL NOTES AND DRAWING SCHEDULE REFER TO DRAWING NUMBER: S01.

CONCRETE
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F_{ck} = 25 MPa ON GRADE
F_{ck} = 32 MPa SUSPENDED
COVER
45m.m. EXPOSED
30m.m. NOT EXPOSED

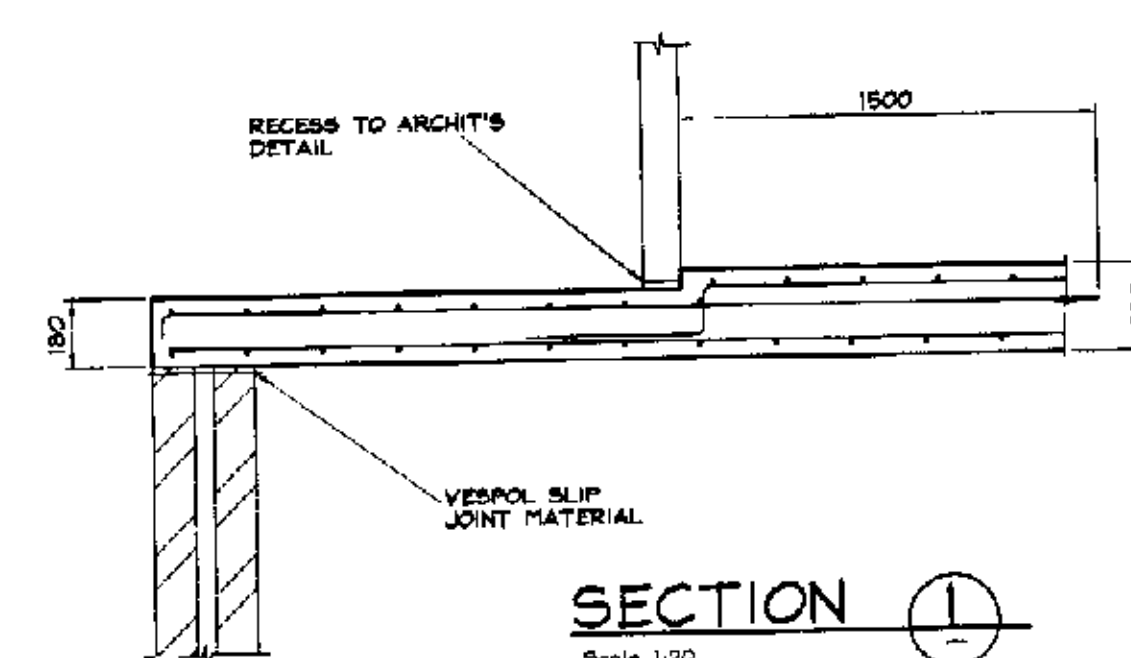
NOTE:-
GEOTECHNICAL ENGINEER TO
APPROVE ALL FOOTING MATERIAL



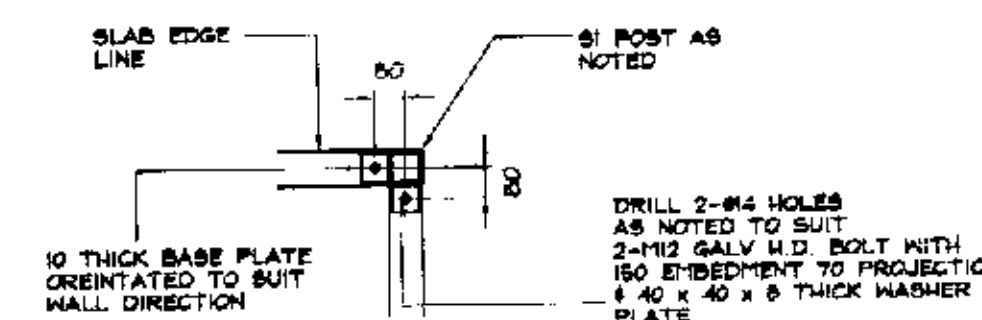
TYPICAL SLAB RE-ENTRANT
CORNER DETAIL



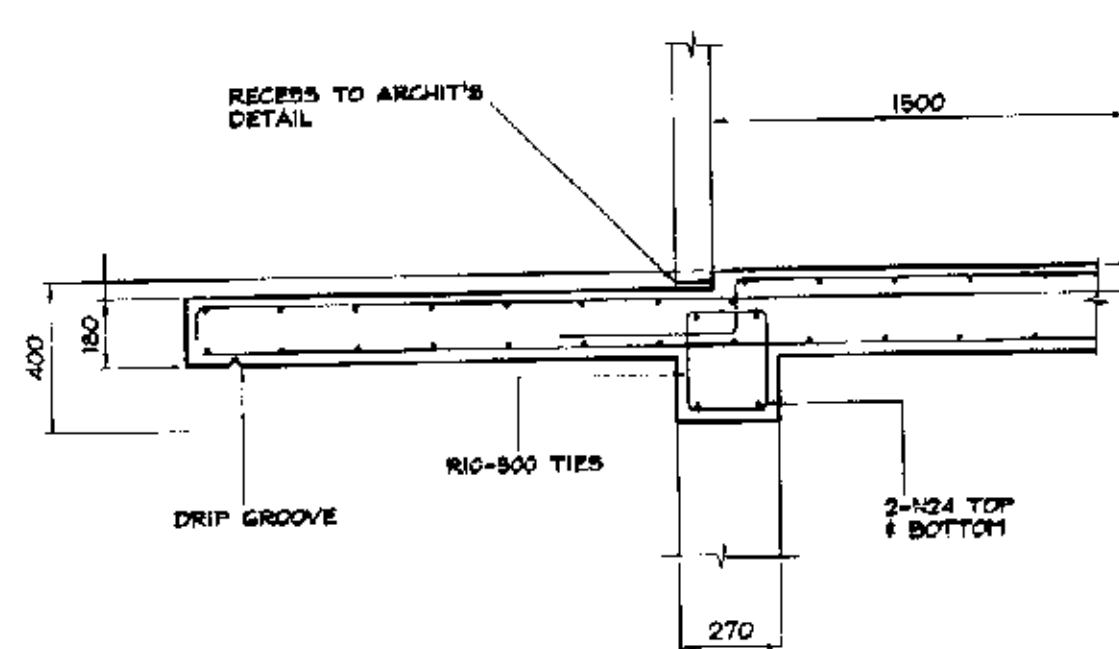
TOP REINFORCEMENT PLAN



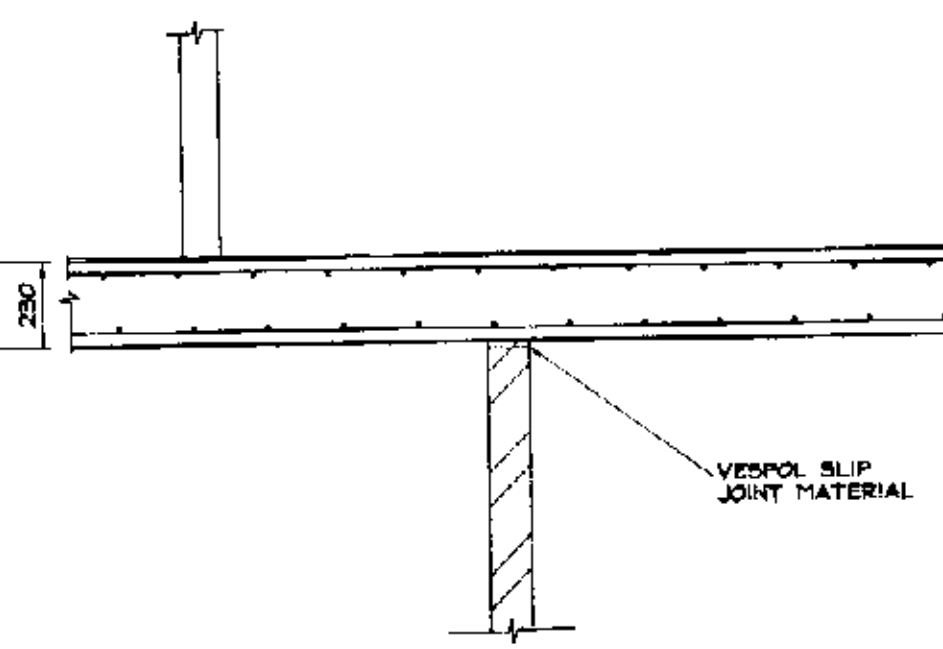
SECTION 1
Scale 1:20



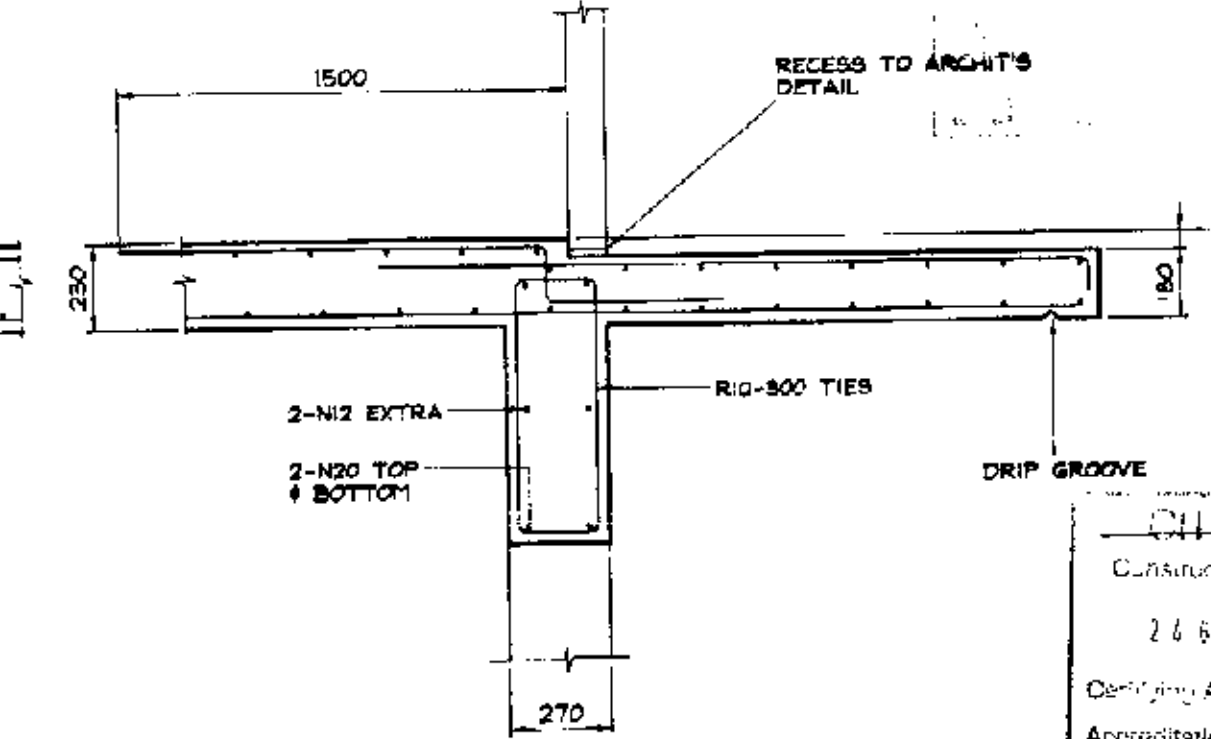
SI POST BASE DETAIL



SECTION 2
Scale 1:20



SECTION 3
Scale 1:20



SECTION 4
Scale 1:20

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CHAPMAN SERVICES
Construction Cost Est. Approved: 24.6.5.5
22 NOV 2003
Certified Authority: Brendon Reineke
Accreditation No: PIAG004

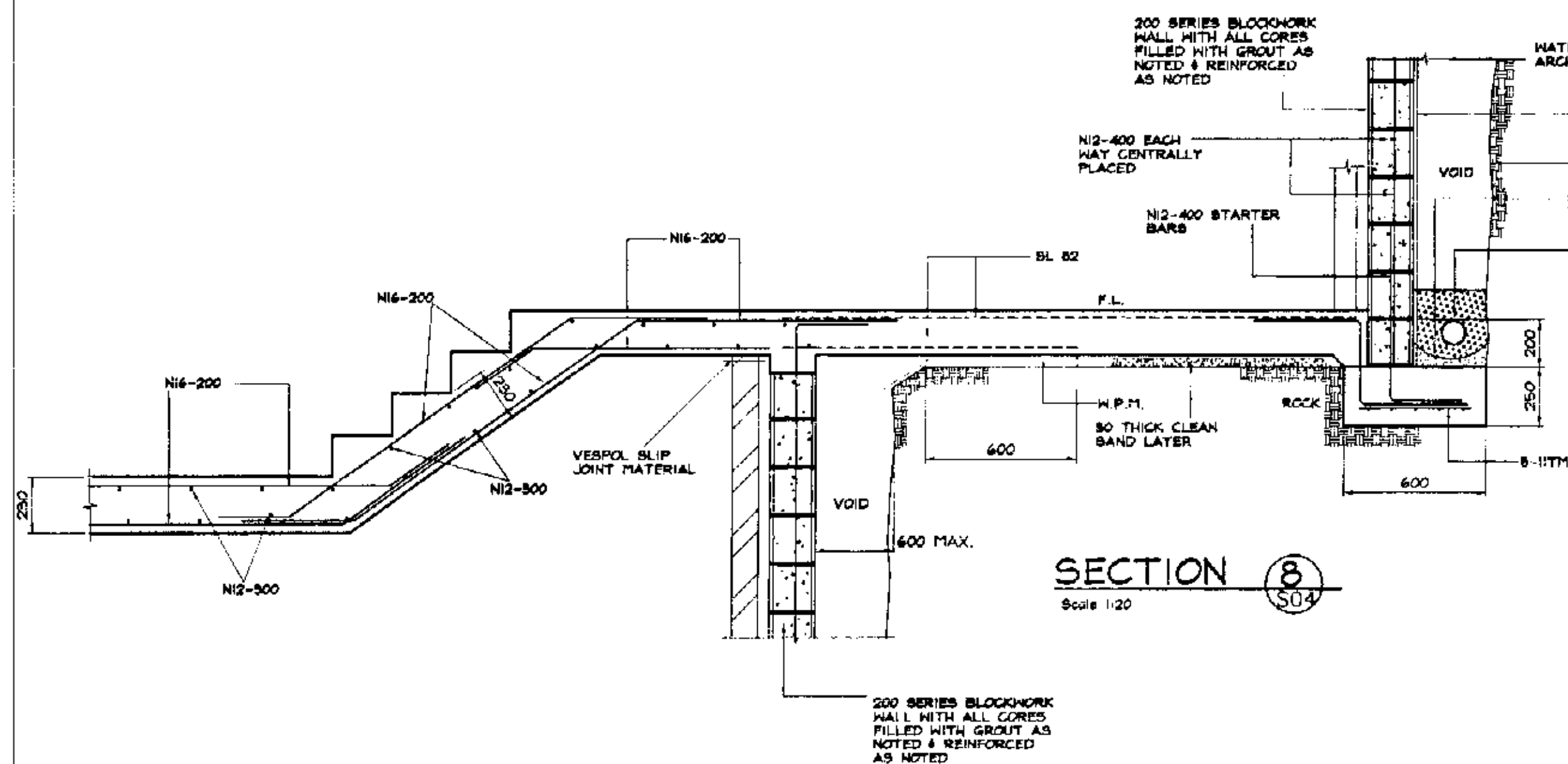
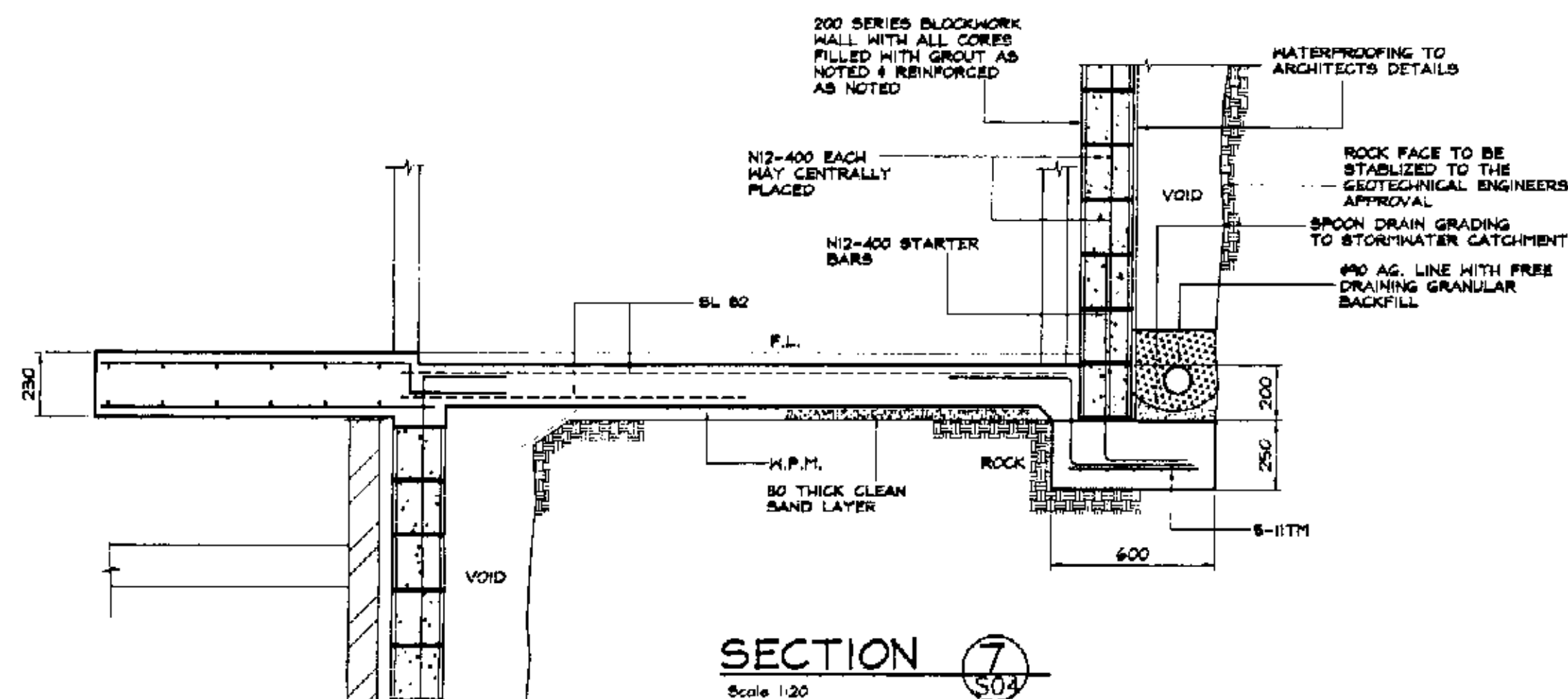
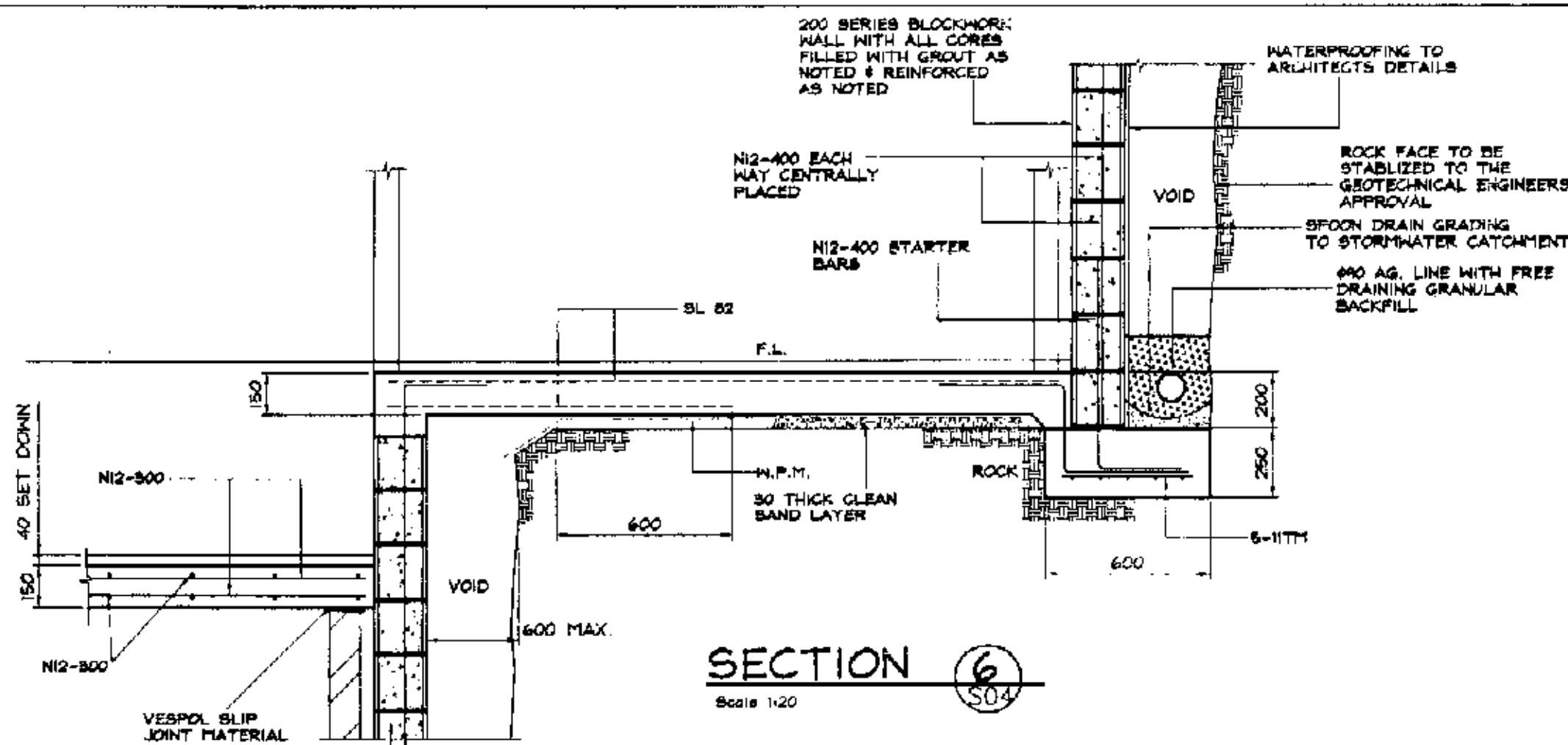
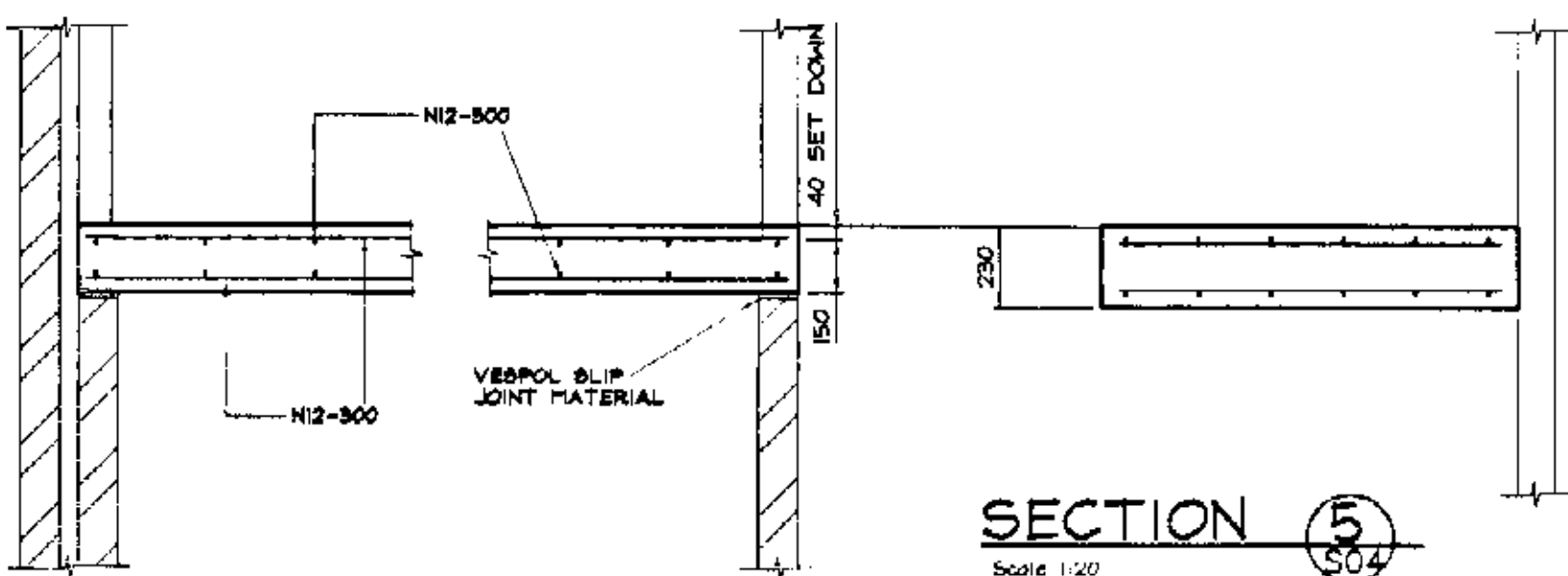
A1			DOCUMENT CERTIFICATION		 NORTHERN BEACHES Consulting Engineers P/L. A.C.N. 078 121 618 A.B.N. 24 078 121 618 Suite 207, 30 FISHER ROAD DEE WHY N.S.W. 2099 Ph: (02) 9984 7000 Fax: (02) 9984 7444 e-mail: nb@nbconsulting.com.au	Project: PROPOSED NEW DWELLING AT BARRENJOE & PALM BEACH ROADS PALM BEACH for: RAYPOND DEVELOPMENT	Drawing Title: HOUSE No.4 LEVEL 2-SLAB FRAMING AND REINFORCEMENT PLANS <small>The copyright of this drawing remains with Northern Beaches Consulting Engineers P/L.</small>	Date: AUG. 2003	Design: R.G.W.	Drawn: HENK.	Checked:	
Date		Rev:		Amendment				Job No: 030705	Drawing No: S04		Rev: -	
Date		Rev:		Amendment								

NOTES:

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 COVER
 45m.m. EXPOSED
 30m.m. NOT EXPOSED

NOTE:-
 GEOTECHNICAL ENGINEER TO APPROVE ALL FOOTING MATERIAL



CITY PLAN SERVICES
 Construction Cert. No: Approved Date:
 24 555 27 Nov 2004
 Issuing Authority: Pradeep Bhandari
 License No: FIA3004

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 CONSTRUCTION
 ISSUED FOR TENDER

DOCUMENT CERTIFICATION

Date: 10/01/03
 Rick G. Wray
 (Director Northern Beaches Consulting Engineers)

I am a qualified Structural/Civil Engineer.
 I hold the following qualifications:
 BE(Civil), CPEng, MIEAust., NPER,
 Institute of Engineers Membership No. 803938
 I hereby state that this drawing is in compliance
 with the conditions of the development consent,
 the provisions of the Building Code of Australia
 and/or relevant Australian/Industry Standards.

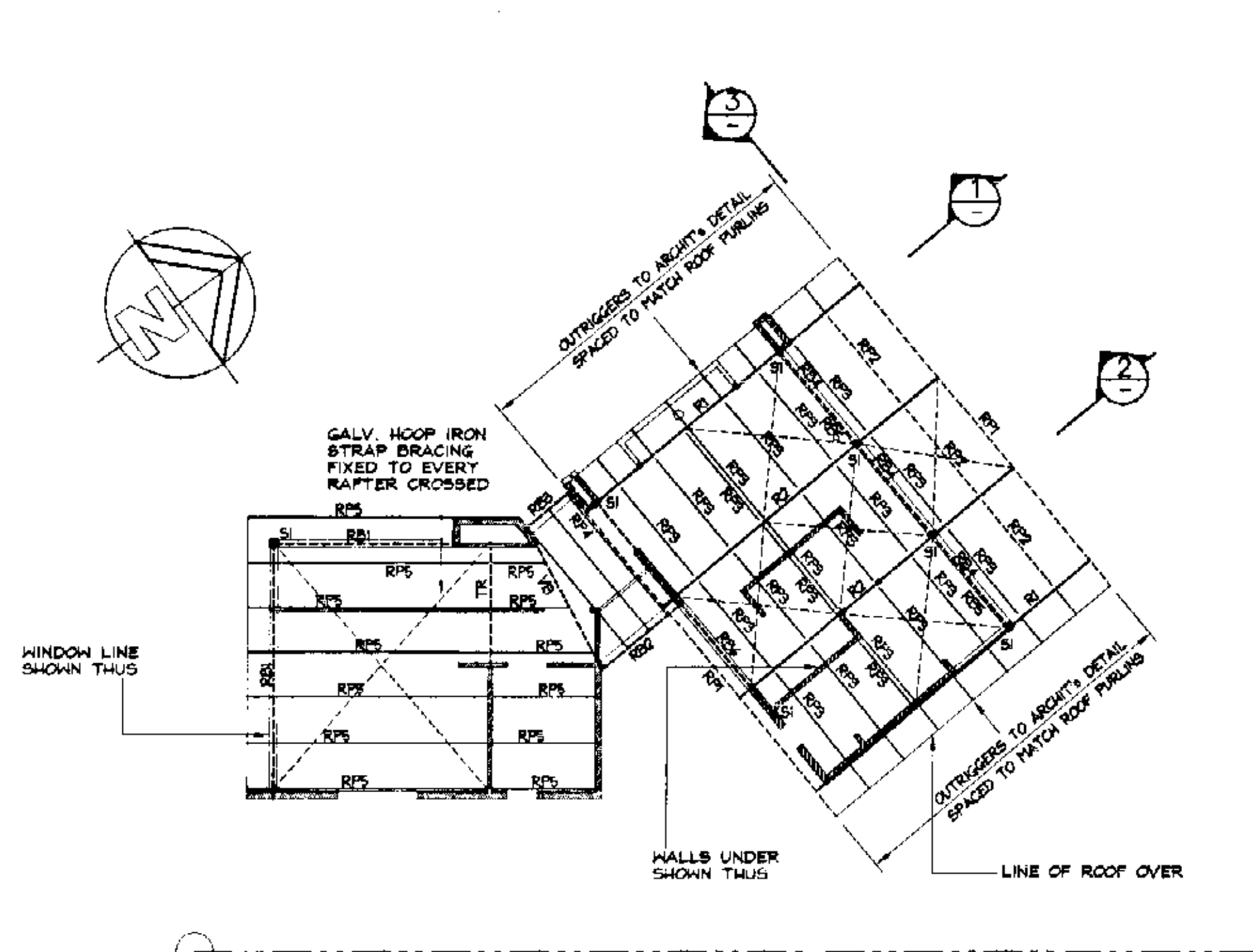


NORTHERN BEACHES
 Consulting Engineers P/L
 A.C.N. 075 121 616 A.B.N. 24 075 121 616
 Suite 207, 30 FISHER ROAD
 DEE WHY N.S.W. 2099
 Ph: (02) 9884 7000 Fax: (02) 9884 7444
 e-mail: nb@nbconsulting.com.au

Project:
 PROPOSED NEW DWELLING AT
 BARRENJOEY & PALM BEACH ROADS
 PALM BEACH
 for: RAYPOND DEVELOPMENT

Drawing Title:
 HOUSE No.4
 LEVEL 2-SLAB DETAIL
 SHEET

Date:	Design:	Drawn:	Checked:
AUG. 2003	R.G.W.	HENK.	
Job No.	Drawing No.	Rev.	
030705	S05	-	

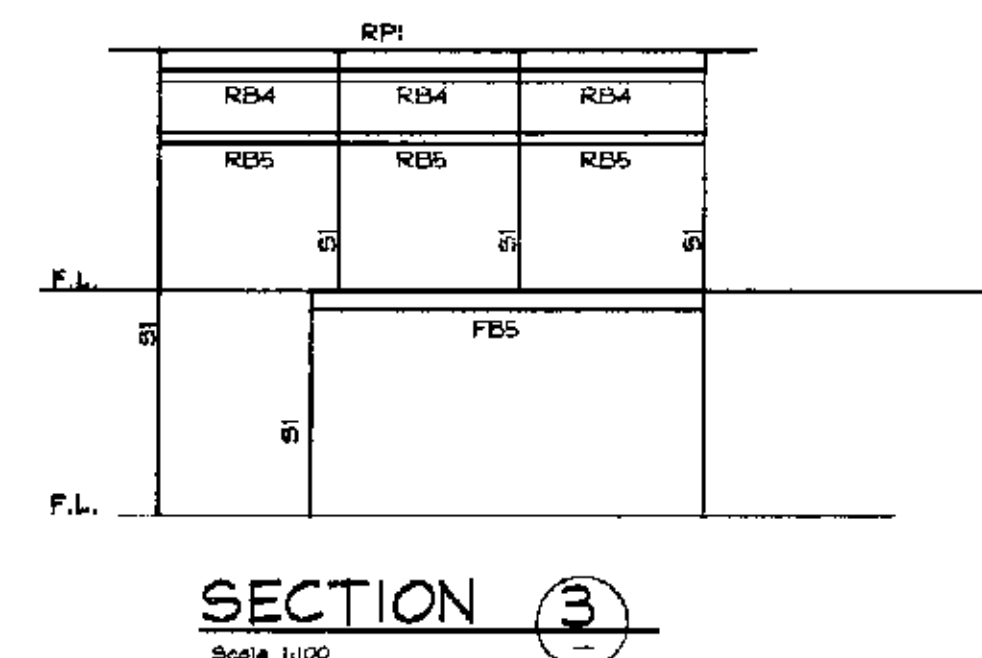
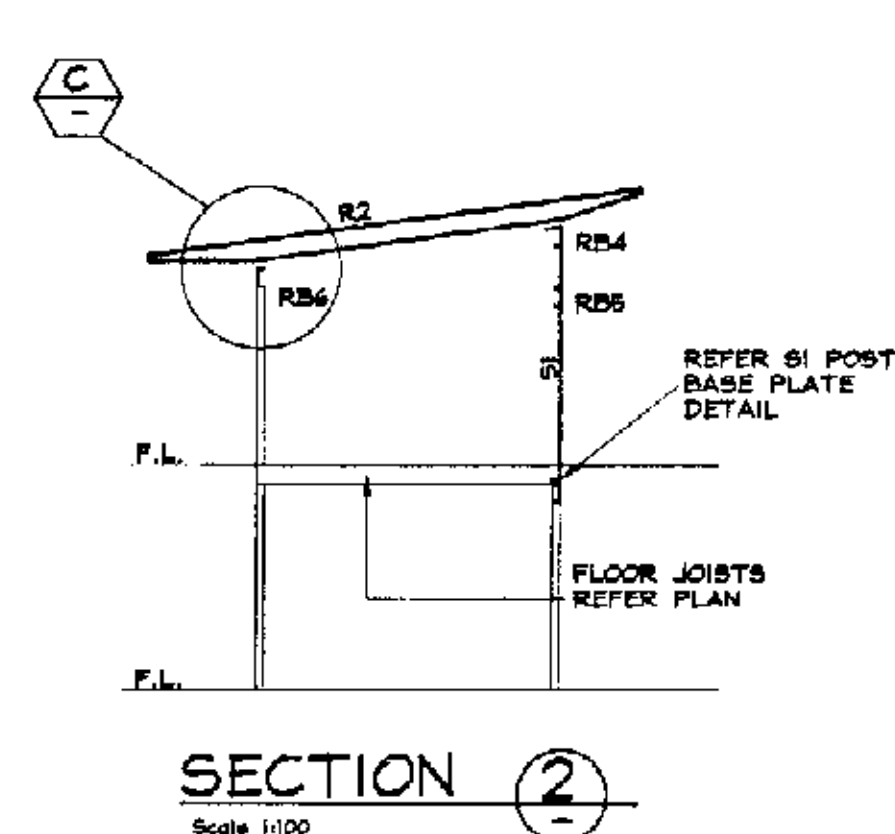
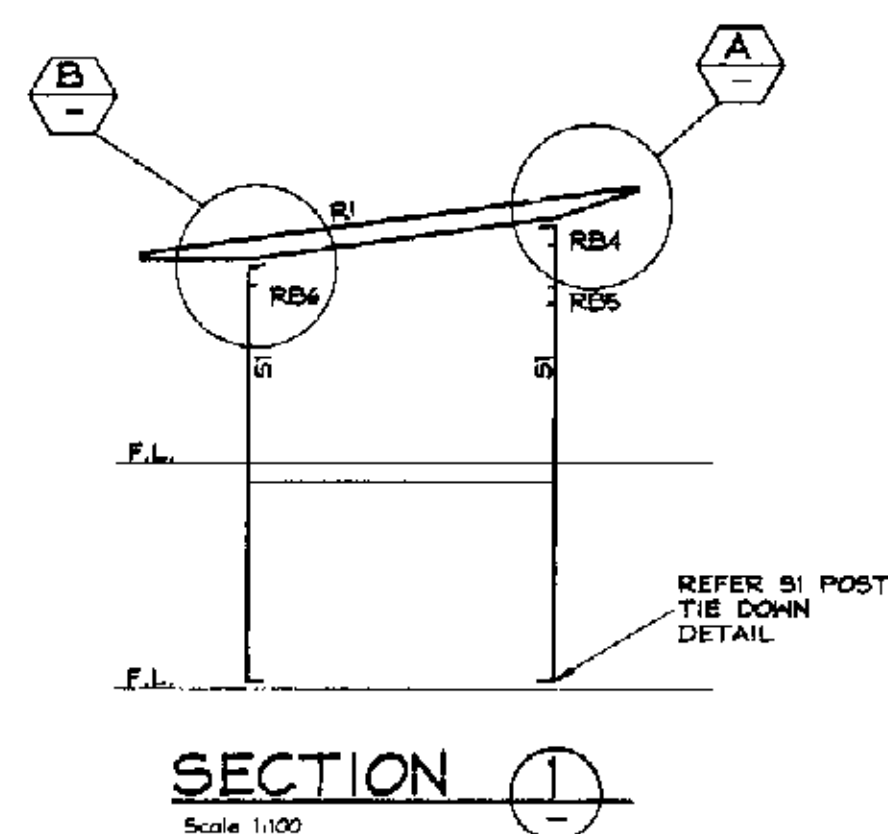


LEVEL 4 - ROOF FRAMING PLAN

MEMBER SCHEDULE

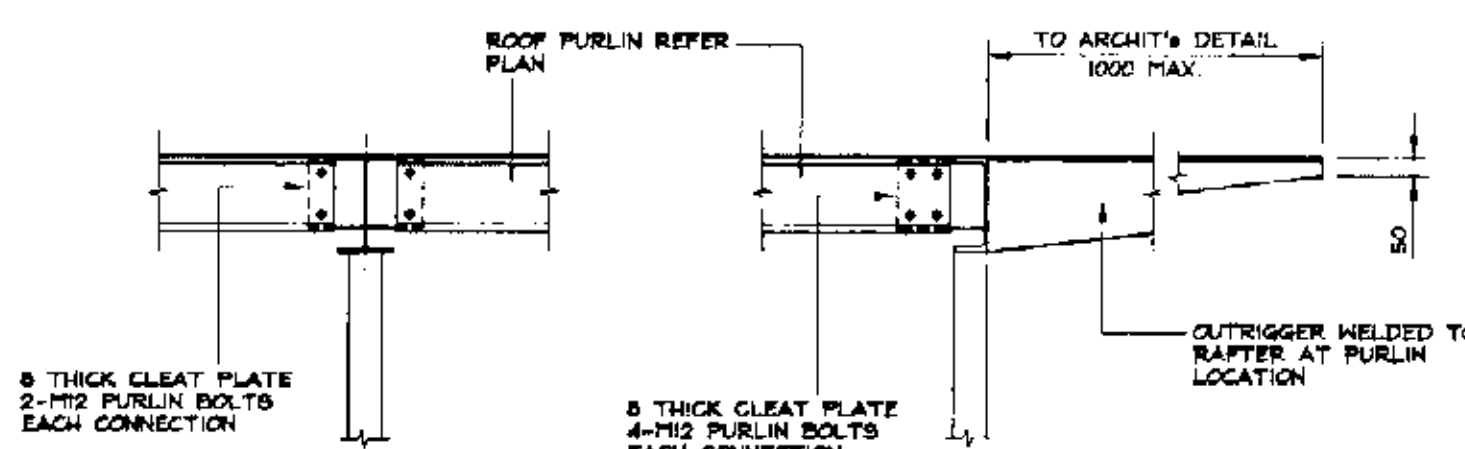
COLUMNS	
SI	90 x 90 x 4.0 S.H.S.
ROOF PURLINS	
RP1	75 x 50 x 8L
RP2	100 x 75 x 8L
RP3	150 x 50 F7 PURLINS AT 600 MAX. CENTRES (OR C15015 PURLINS AT 600 MAX. CENTRES)
RP4	200 x 50 F7 PURLINS AT 600 MAX. CENTRES (OR C20015 PURLINS AT 600 MAX. CENTRES)
RP5	250 x 50 F7 PURLINS AT 600 MAX. CENTRES (OR C25024 PURLINS AT 600 MAX. CENTRES)
ROOF RAFTERS	
R1	200 P.F.C.
R2	200 UB 22
ROOF BEAMS	
RB1	200 x 63 LVL HYSPAN
RB2	200 x 75 F7
RB3	200 x 75 F7
RB4	150 P.F.C.
RB5	150 P.F.C.
RB6	250 P.F.C.
VB	200 x 63 LVL HYSPAN
TR	TRIMMER TO MATCH PURLIN SIZE

NOTE:-
ALL STRUCTURAL STEEL MEMBERS & BOLTS TO BE GALVANISED

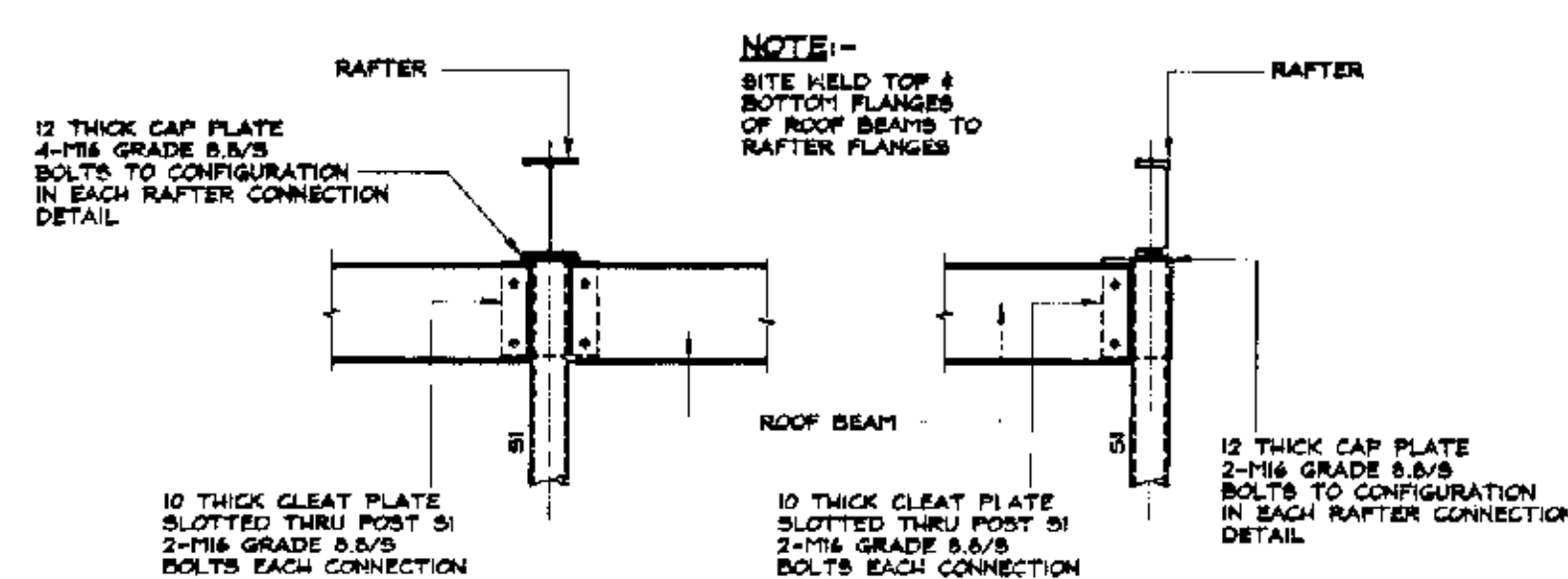


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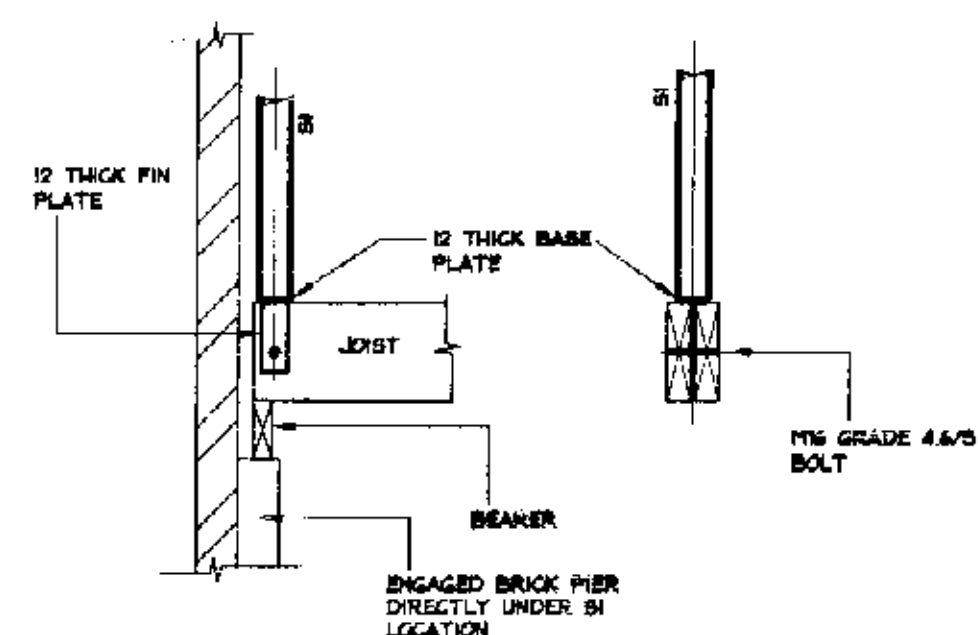
1. ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WITH WORK.
2. FOR GENERAL NOTES AND DRAWING SCHEDULE REFER TO DRAWING NUMBER: S01.



TYPICAL PURLIN TO RAFTER CONNECTION DETAIL

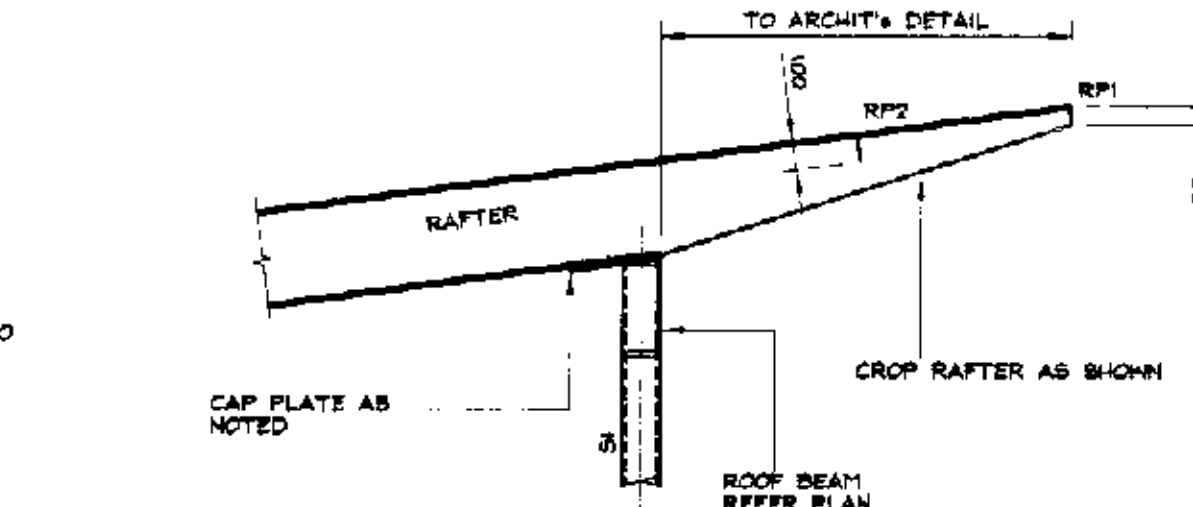


TYPICAL ROOF BEAM TO RAFTER CONNECTION DETAIL



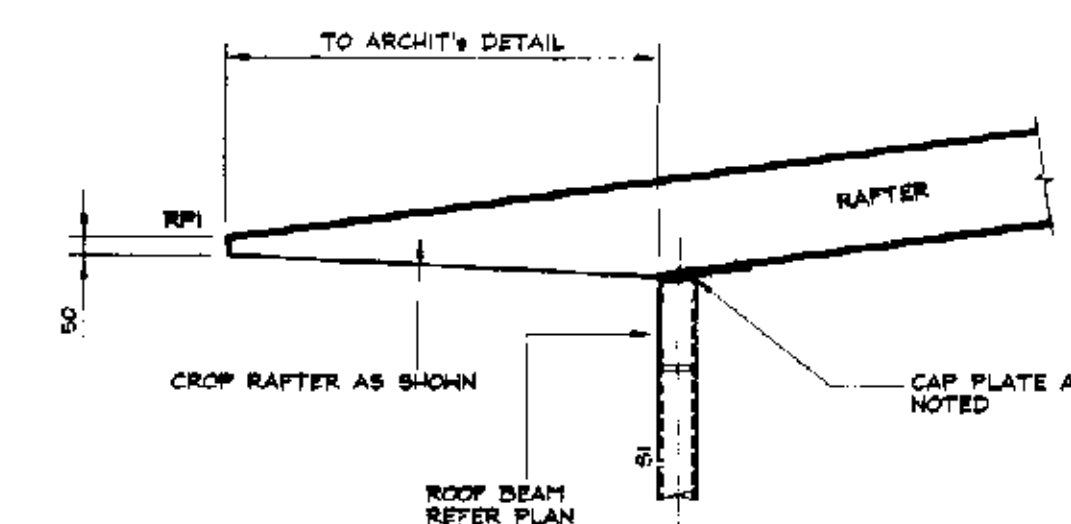
SI TIE DOWN DETAIL

Scale 1:20



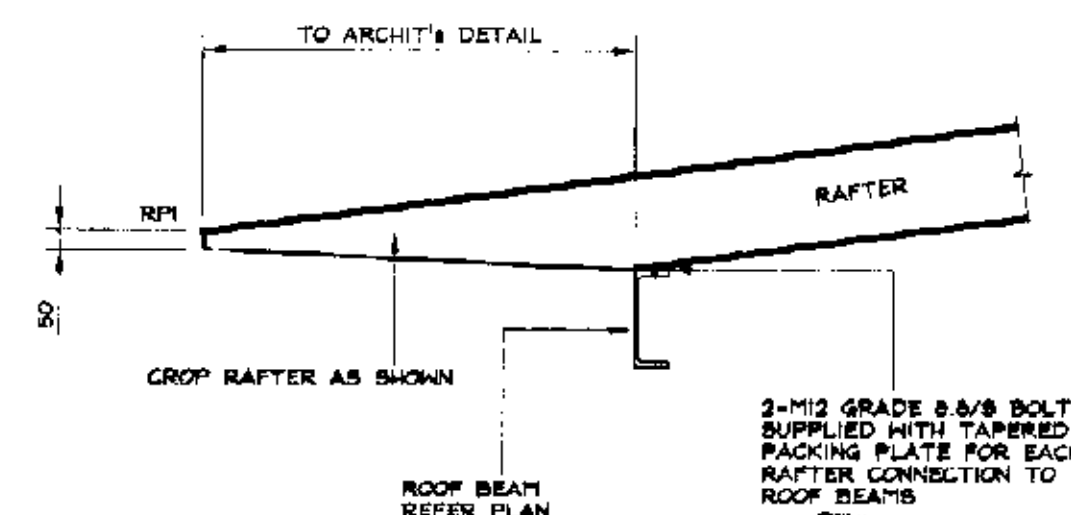
DETAIL A

Scale 1:20



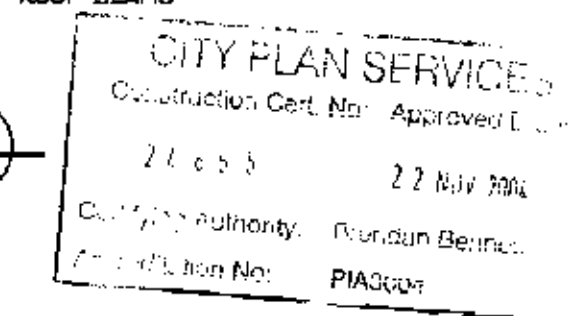
DETAIL B

Scale 1:20



DETAIL C

Scale 1:20



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DOCUMENT CERTIFICATION

Date: 21/03/03
Rick G. Wray
(Director Northern Beaches Consulting Engineers)

I am a qualified Structural/Civil Engineer.
I hold the following qualifications:
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**NORTHERN BEACHES
Consulting Engineers P/L**
A.C.N. 078 121 816 A.B.N. 24 078 121 816
Suite 207, 30 FISHER ROAD
DEE WHY N.S.W. 2099
Ph: (02) 9984 7000 Fax: (02) 9984 7444
e-mail: nb@nbconsulting.com.au

Project

**PROPOSED NEW DWELLING AT
BARRENJOEY & PALM BEACH ROADS
PALM BEACH
for: RAYPOND DEVELOPMENT**

Drawing Title:

**HOUSE No.4
LEVEL 4-UPPER ROOF FRAMING
PLAN AND DETAILS**

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Date:

AUG. 2003

Design:

R.G.W.

Drawn:

HENK.

Checked:

-

Job No:

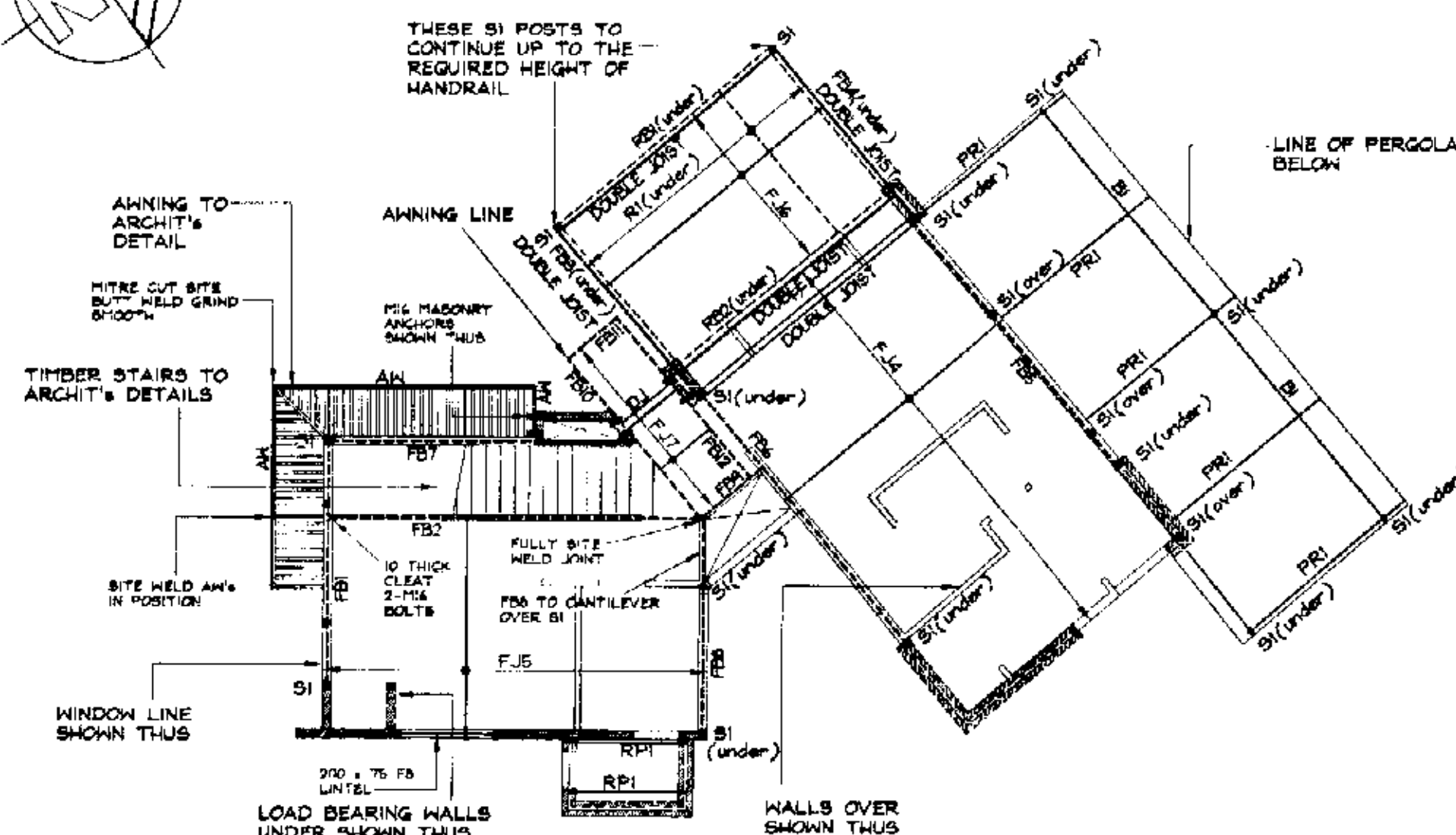
030705

Drawing No:

S08

Rev:

-



LEVEL 4 - FLOOR FRAMING PLAN

NOTE:-
FLOOR JOISTS ARE TO BE DOUBLED UNDER
PARALLEL WALLS & LOAD POINTS

METAL TENSION STRAP BRACING:

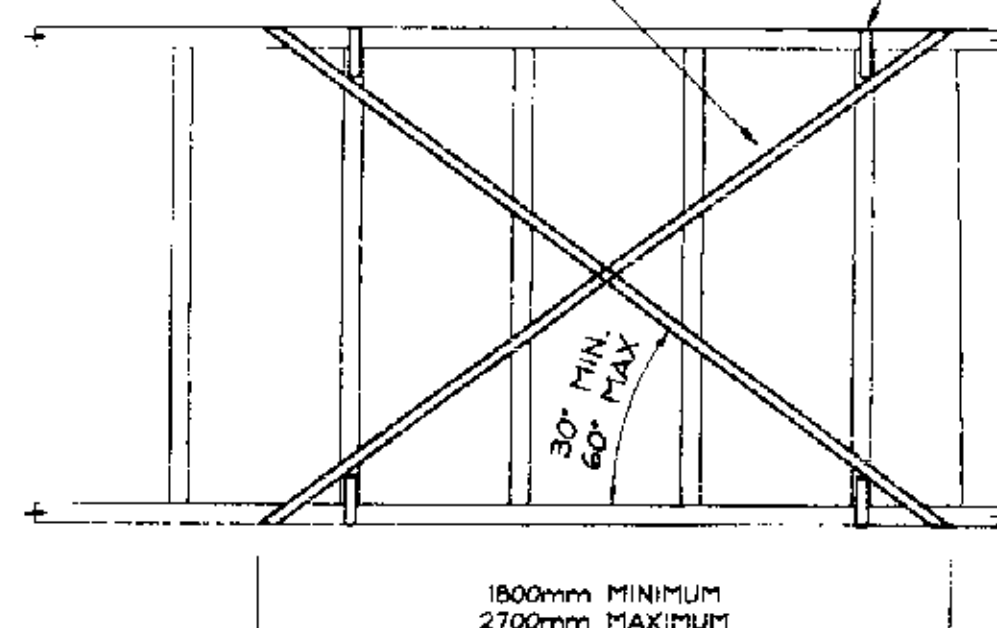
PRYDA STRAP BRACING WITH TENSIONERS
FIXED WITH TWO GALVANISED FLATHEAD NAILS
Ø3.15mm x 30mm LONG TO EACH STUD, AND THE
FACE OF THE TOP AND BOTTOM PLATE
AND FOUR GALVANISED FLATHEAD NAILS
Ø3.15mm x 30mm LONG TO THE STRAP RETURN
OVER THE TOP PLATE AND UNDER THE BOTTOM PLATE.

PLYWOOD THICKNESS	
PLYWOOD THICKNESS	MAXIMUM STUD SPACING
GRADE	250mm
F8	7.0mm
F11	6.0mm
F14	4.0mm
F27	4.0mm

PLYWOOD BRACING:

FIX PLYWOOD PANELS WITH GALVANISED FLATHEAD NAILS
Ø2.8mm x 30mm LONG MINIMUM OR EQUIVALENT AT 50mm
CENTRES ALONG TOP AND BOTTOM PLATES, 150mm CENTRES
ALONG VERTICAL EDGES AND 800mm CENTRES ALONG
INTERMEDIATE STUDS.
NAILS SHALL BE LOCATED A MINIMUM OF 7mm FROM PANEL EDGES.
POWER DRIVEN GALVANISED NAILS OR COATED STAPLES MAY BE
USED WHERE THEY PROVIDE AT LEAST THE EQUIVALENT STRENGTH
TO HAND DRIVES Ø2.8mm x 30mm LONG GALVANISED CLOUTS
OR FLATHEAD NAILS. IN THE CASE OF POWER DRIVEN STAPLES,
STAPLE SPACING SHALL BE 35mm CENTRES AT TOP AND BOTTOM
PLATES, 100mm CENTRES AT VERTICAL PLYWOOD EDGES AND
200mm CENTRES ALONG INTERMEDIATE STUDS.

PRYDA STUD TIES

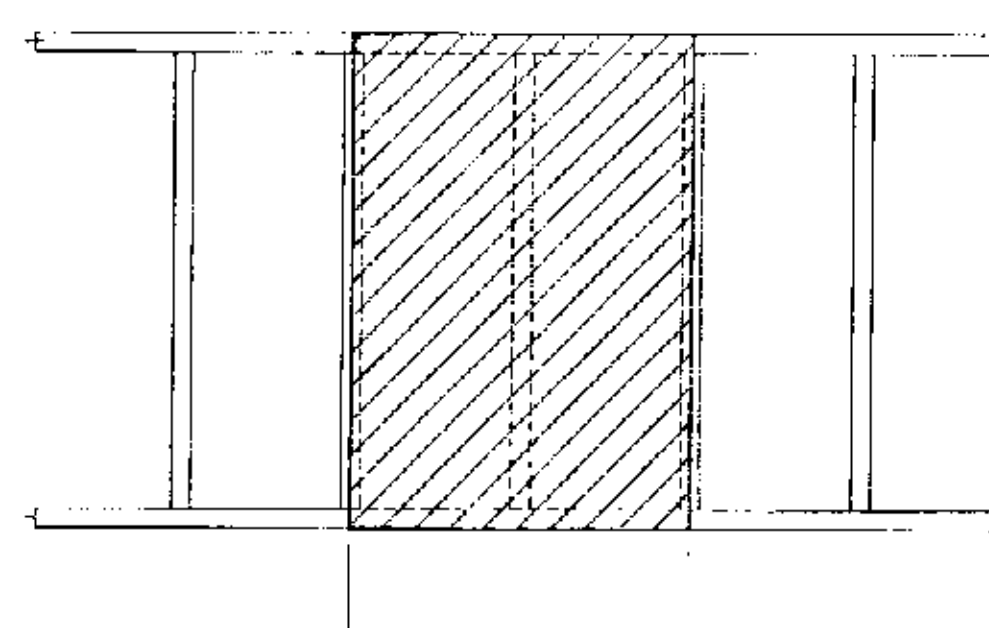


NOTES:

1. FOR POWER DRIVEN NAILS AND STAPLES REFER ABOVE.
2. NOGGINGS HAVE BEEN OMITTED FOR CLARITY.

TYPE A - WALL BRACING UNIT

SCALE = 1 : 20



NOTES:

1. FOR PLYWOOD THICKNESS REFER TO TABLE.
2. FOR POWER DRIVEN NAILS AND STAPLES REFER ABOVE.
3. PANEL EDGES SHALL BE SUPPORTED BY STUDS.
4. NOGGINGS HAVE BEEN OMITTED FOR CLARITY.

TYPE B - WALL BRACING UNIT

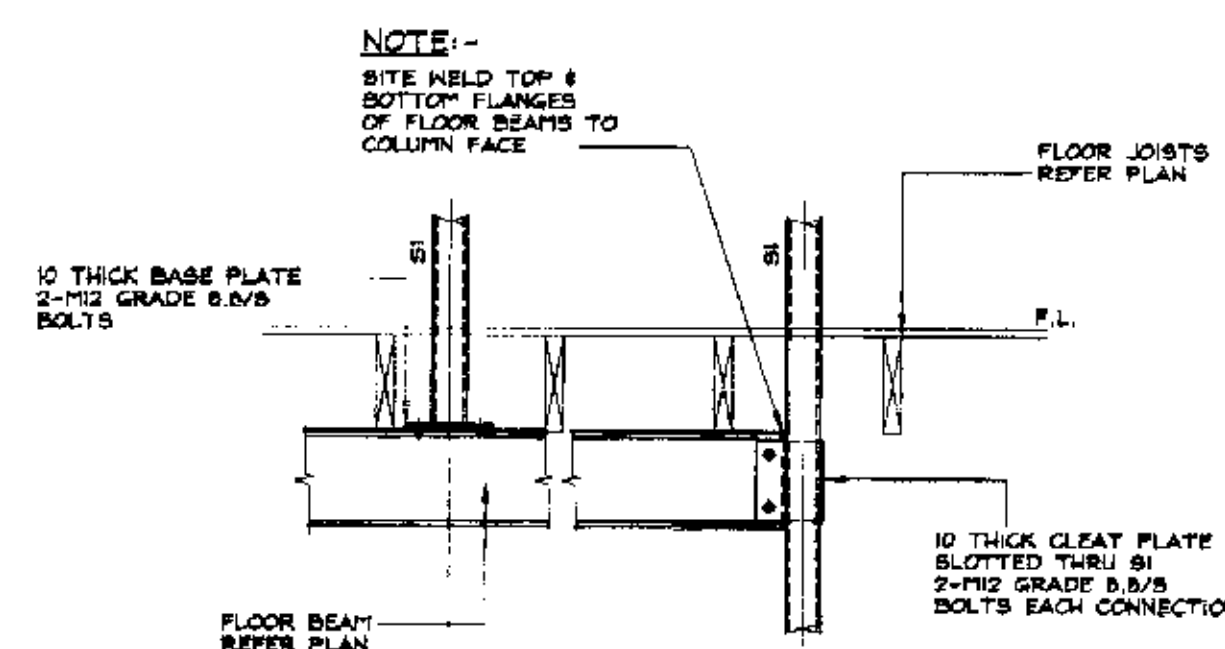
SCALE = 1 : 20

MEMBER SCHEDULE

COLUMNS	90 x 90 x 4.0 S.H.S.
SI	90 x 90 x 4.0 S.H.S.
FLOOR JOISTS	90 x 45 HYSPAN LVL JOISTS
FJ4	AT 450 MAX. CENTRES
FJ6	250 x 50 F7 JOISTS
FJ6	AT 450 MAX. CENTRES
FJ7	300 x 45 HYSPAN LVL JOIST H3 TREATED
FJ7	JOISTS AT 450 MAX. CENTRES
FJ7	100 x 50 F7 JOISTS
FJ7	AT 450 MAX. CENTRES
FLOOR BEAMS	150 P.F.C.
FB1	250 P.F.C.
FB2	250 P.F.C.
FB3	200 P.F.C.
FB4	200 P.F.C.
FB5	250 P.F.C.
FB6	250 P.F.C.
FB7	250 x 75 F7
FB8	250 P.F.C.
FB9	250 P.F.C.
FB10	95 x 63 LVL HYSPAN
FB11	95 x 63 LVL HYSPAN
FB12	95 x 63 LVL HYSPAN
SI	150 P.F.C.
PR1	150 P.F.C.
RP1	100 x 50 F7
RB1	200 P.F.C.
RB2	200 P.F.C.
RI	200 x 50 F7 RAFTERS
RI	AT 600 MAX. CENTRES

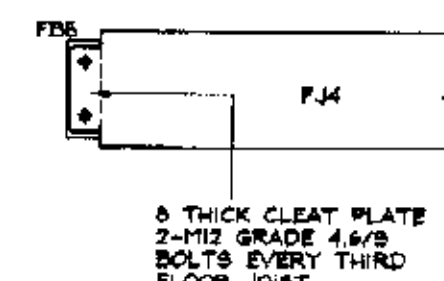
NOTE:-

ALL STRUCTURAL STEEL MEMBERS & BOLTS TO BE GALVANISED



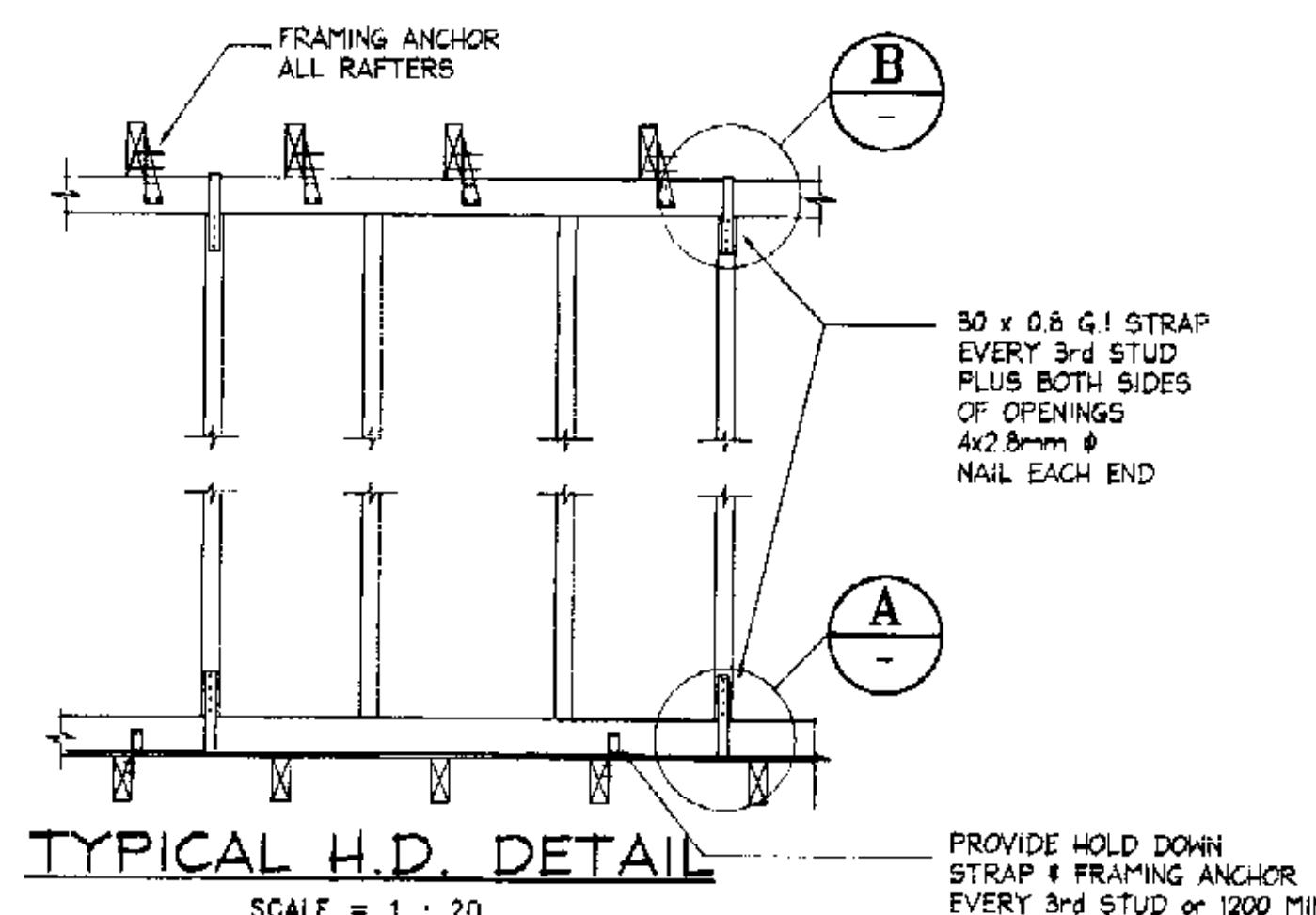
TYPICAL FLOOR BEAM TO
POST CONNECTION DETAIL

Scale 1:20



TYPICAL FLOOR JOIST FJ4
TO FB5 CONNECTION DETAIL

Scale 1:20



TYPICAL H.D. DETAIL

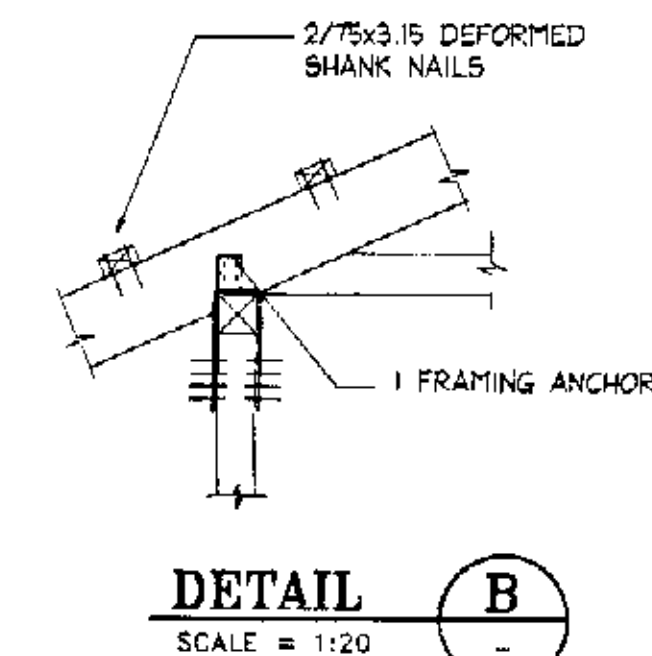
SCALE = 1 : 20

NOTES:

1. ORGANIC TERMITE TREATMENT TO BE CARRIED OUT TO PERIMETER OF ENTIRE BUILDING AND SUB-FLOOR AREAS. ANNUAL INSPECTIONS AND TREATMENT AS REQUIRED SHALL BE THE RESPONSIBILITY OF THE PROPRIETOR.
2. WALL FRAMING SHALL BE IN ACCORDANCE WITH AS 1684 TIMBER FRAMING CODE AND NSW TIMBER FRAMING MANUAL.
3. BRACE WALLS AND ROOF IN ACCORDANCE WITH AS 1684 TIMBER FRAMING CODE AND NSW TIMBER FRAMING MANUAL.
4. PROVIDE DOUBLE JOISTS BELOW ALL LOAD BEARING WALLS UNLESS NOTES OTHERWISE.
5. HOLD DOWN TO ROOF RAFTERS AND BEAMS SHALL BE IN ACCORDANCE WITH AS 1684 TIMBER FRAMING CODE AND AS 1170.2 WIND LOADING CODE.
6. TRIM FLOOR/ROOF OPENINGS WITH EQUIVALENT JOIST/RAFTER SIZES UNLESS NOTED OTHERWISE.
7. CLADDING OF ANY FORM IS NOT TO BE INSTALLED UNTIL ALL BRACING AND TIE DOWNS ARE COMPLETE AND CERTIFIED.
8. TIE DOWNS ARE TO BE INSTALLED AT THE TIME OF CONSTRUCTION OF WALL FRAMES.

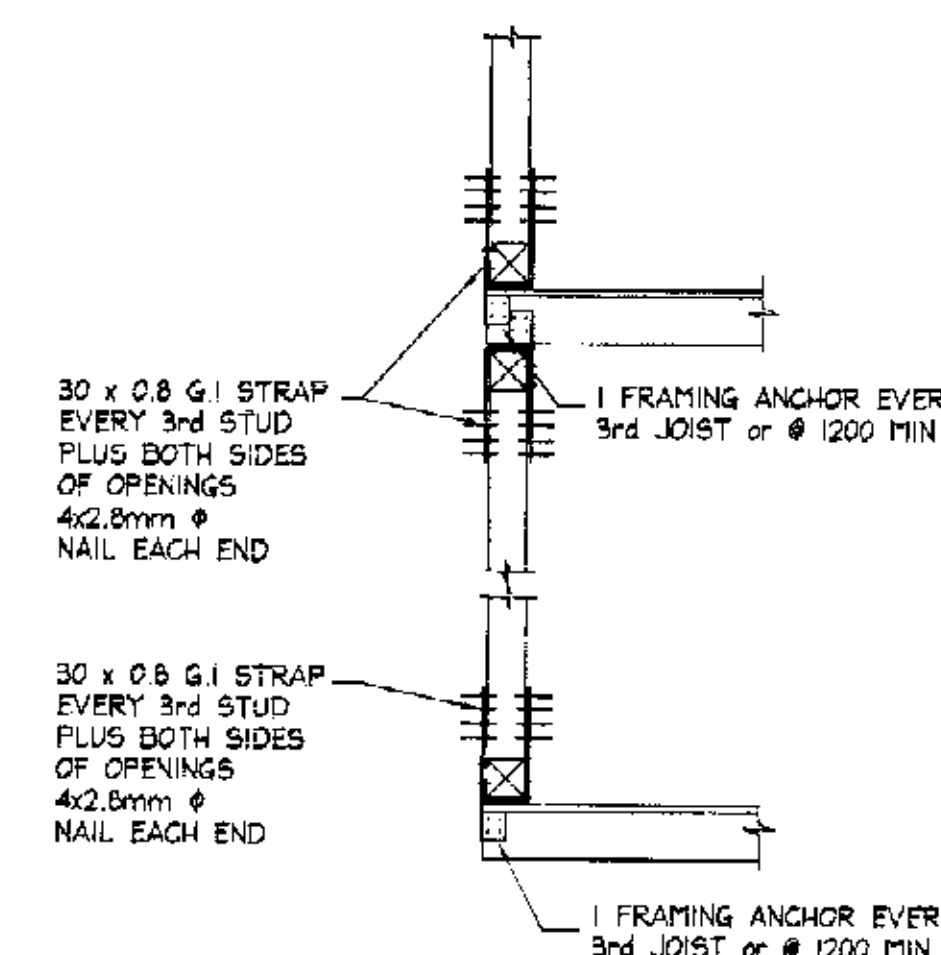
NOTES:

1. ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WITH WORK.
2. FOR GENERAL NOTES AND DRAWING SCHEDULE REFER TO DRAWING NUMBER: S01.



DETAIL B

SCALE = 1:20



DETAIL A

SCALE = 1:20

STRUCTURAL SERVICES

22 Nov 2002

22 Nov 2002

22 Nov 2002

22 Nov 2002

22 Nov 2002

22 Nov 2002

22 Nov 2002

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22 Nov 2002

CRONE ASSOCIATES
Architects • Planning Consultants • Interior Designers

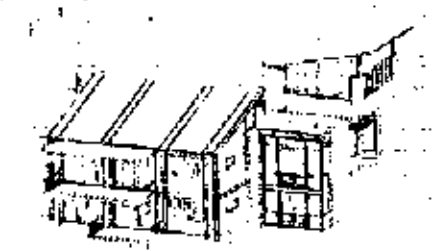
1148 1152 BARRENJOEY ROAD
60 PALM BEACH ROAD, PALM BEACH

1:200 @ A1
1:400 @ A3

20006 / ADA4 0100

3

HOUSE 4 E PLAN

[illegible]

CITY PLAN SERVICES
Construction Cert. No: Approved
26000 12 Nov 2016
Carrying Authority: Brendan Gault
Accreditation No: PIA3094

- 1 EACH HOUSE IS THE SUBJECT OF A SEPARATE DA
- 2 REFER TO ARBCRIST REPORT FOR FULL TREE REPORT
- 3 ALL SERVICES TO BE PROVIDED UNDERGROUND ALONG
- 4 ACCESS DRIVE EASEMENT
- 5 REFER TO DRAWING 8727-C1 PREPARED
- 6 BY "TIERNEY CONSULTING ENGINEERS"
- 7 FOR STORMWATER MANAGEMENT PROPOSAL

EXISTING CONTOUR
TO BE ALTERED

FINISHED CONTOUR

SIGNIFICANT TREES
IDENTIFIED BY SURVEYOR
TO BE RETAINED

TREES TO BE REMOVED

TREES CLASSIFIED AS NOXIOUS WEED TO BE REMOVED

LOCATION OF EROSION & SEDIMENTATION
CONTROL DEVICES DURING CONSTRUCTION.
DETAIL TO BE SUBMITTED FOR CONSTRUCTION CERTIFICATE.

STORMWATER DETENTION TANK

AREA PROPOSED BUSHLAND REGENERATION

AREA PROPOSED REVEGETATION

O B S E R V A T I O N P O I N T

THE COUNCIL OF PITTSWATER
APPROVED
DEVELOPMENT CONSENT PLAN

CRONE ASSOCIATES
Architects • Planning Consultants • Interior Designers

RAYPOND DEVELOPMENT

1148 1152 BARRENJOEY ROAD
58 PALM BEACH ROAD, PALM BEACH

1:100 @ A1
1:200 @ A2

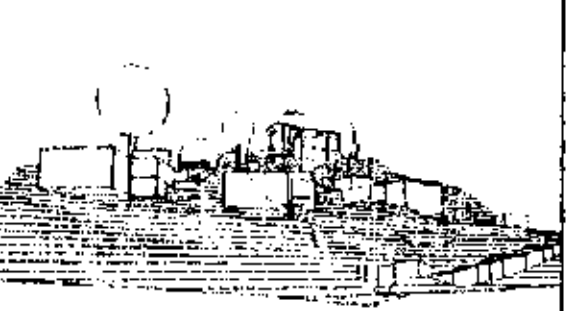
DEVELOPMENT APPLICATION

20006 : ADA4 1001

© 2000 The McGraw-Hill Companies

DATE 18 OCT 2003

**HOUSE 4
FLOOR PLANS
SHEET 1**

[illegible]

CITY PLAN SERVICES
Construction Cert. No.: Approved
24000 22 April 2014
Certifying Authority: Brendan Burnett
Accreditation No. PIA2000

O B S E R V A T I O N P O I N T

ADU

THE COUNCIL OF PITTSWATER
APPROVED
DEVELOPMENT CONSENT PLAN

ARCHITECT	CRONE ASSOCIATES Architects • Planning Consultants • Interior Designers
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CLIENT	RAYPOND DEVELOPMENT
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PROJECT	1148 1152 BARRENJOEY ROAD 50 PALM BEACH ROAD, PALM BEACH.
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SCALE

1:1000

STATUS	DEVELOPMENT APPLICATION
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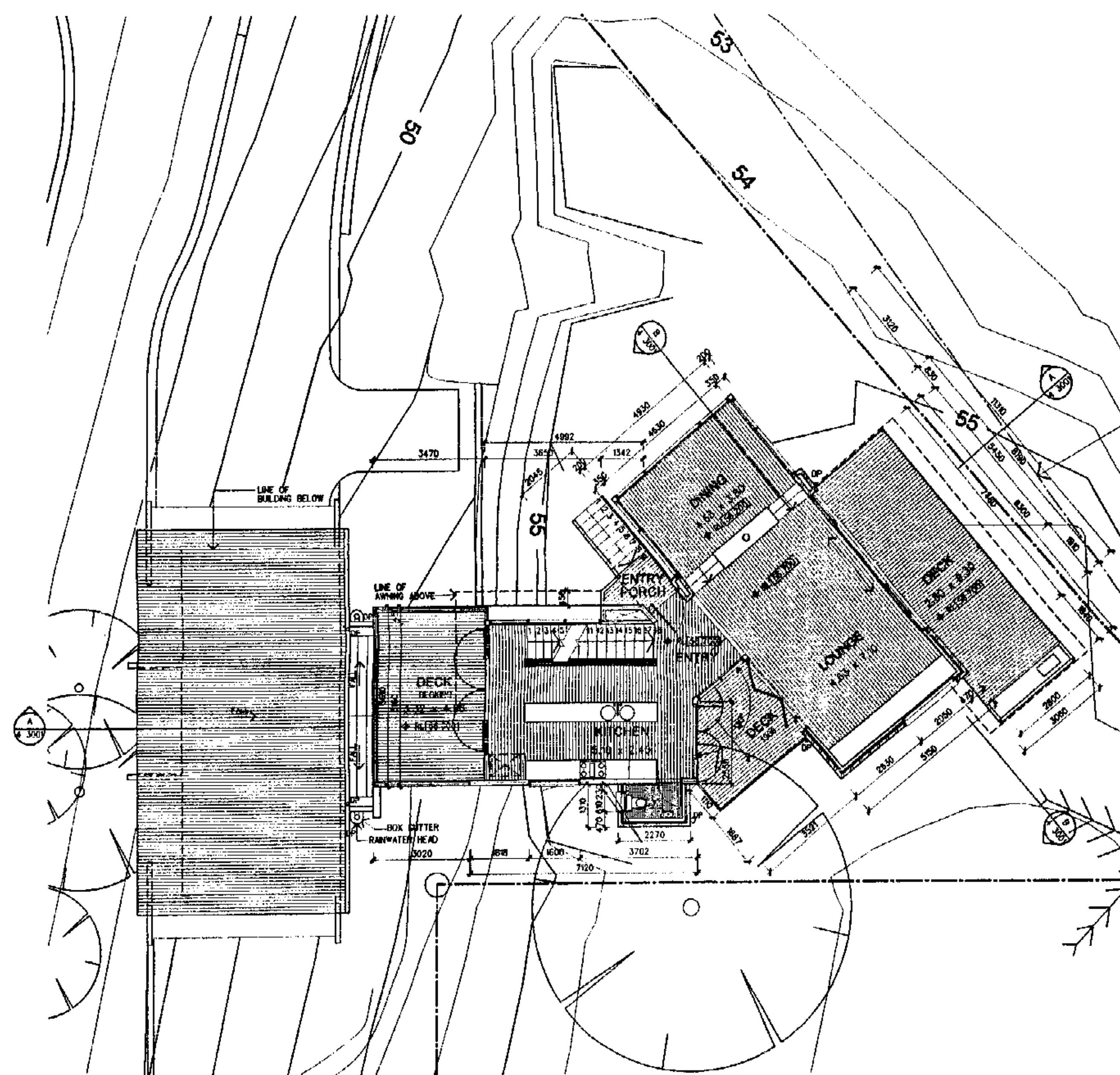
DRAWING 20006 / ADA4 1002

REVISION: _____ DATE: 18 OCT 2000

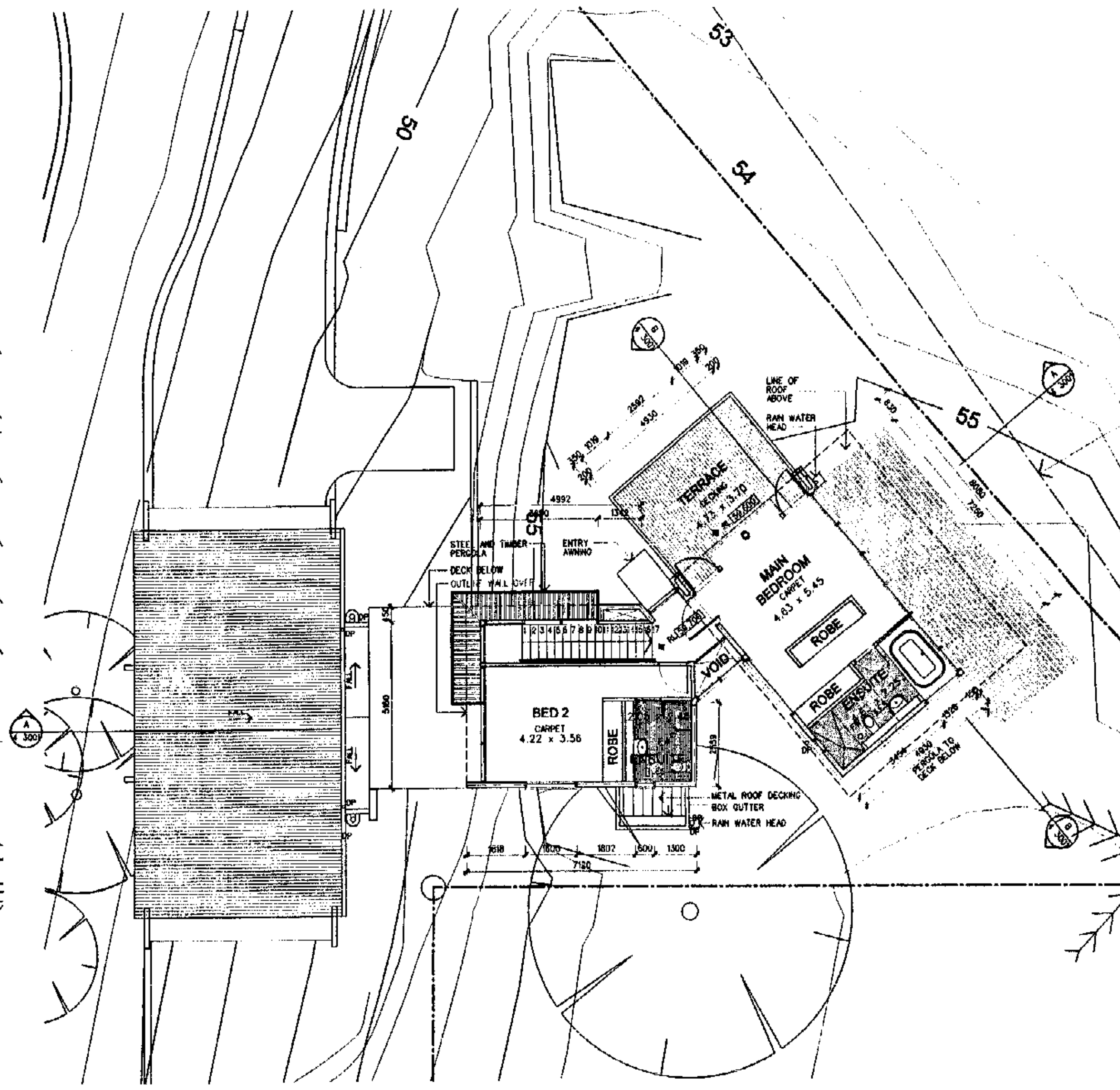
TITLE	HOUSE 4 FLOOR PLANS SHEET 2
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CITY PLAN SERVICES
Construction Cart. No: Approved Date:
22653 22 Jul 2004
Certifying Authority: Brendon Bennett
Accreditation No: PIAS04

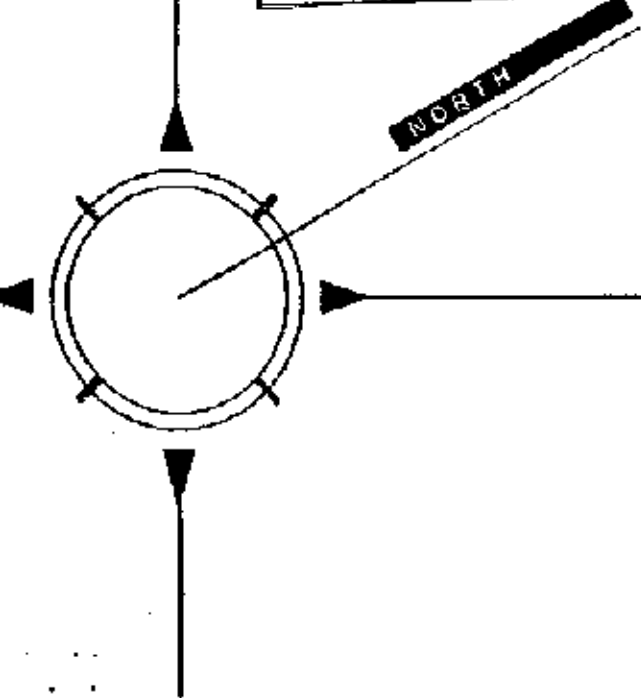


LEVEL 3 PLAN
RL 58.700



LEVEL 4 PLAN
RL 59.700

O B S E R V A T I O N P O I N T

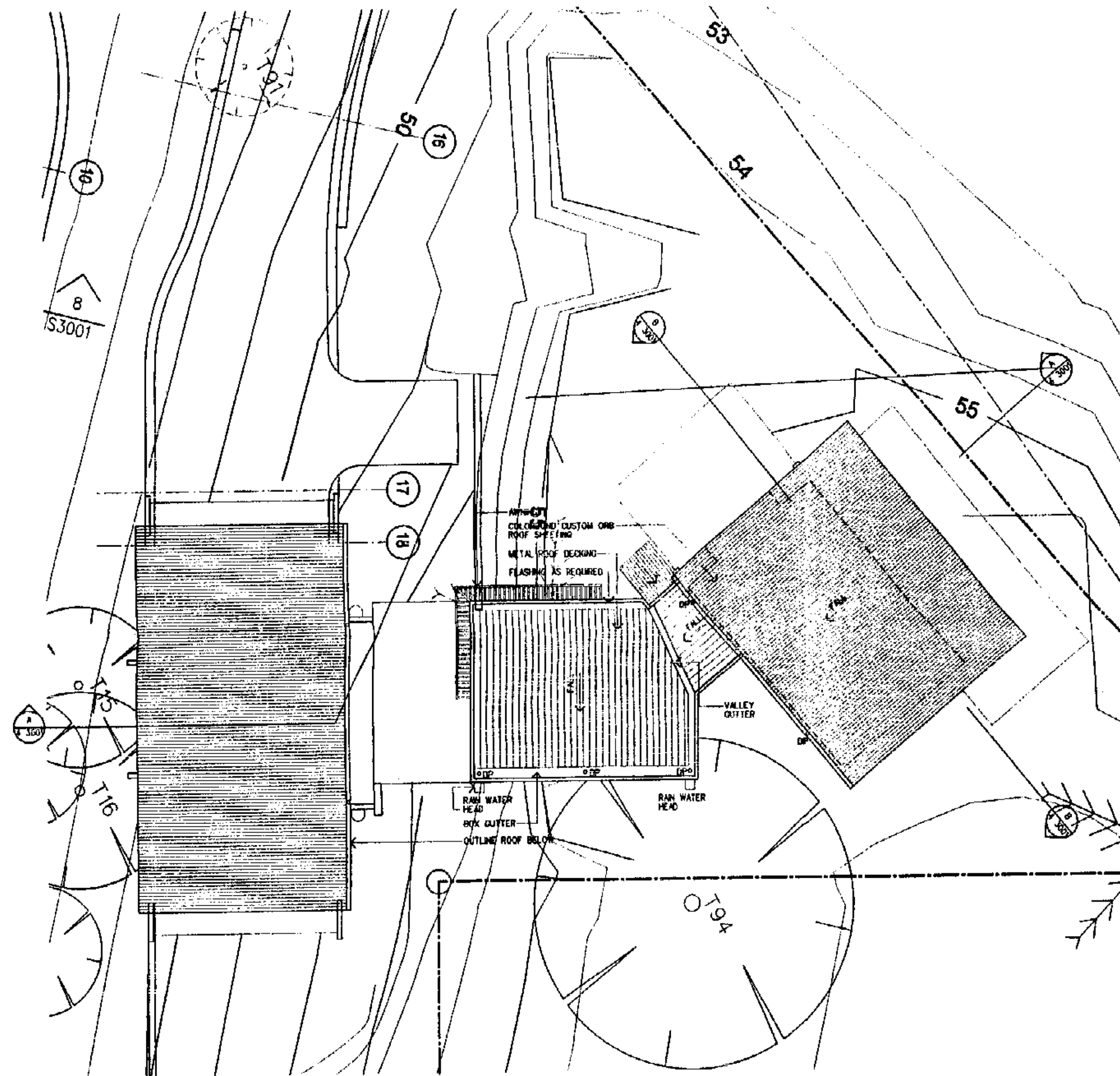


THE COUNCIL OF PITTSWATER
APPROVED
DEVELOPMENT CONSENT PLAN

ARCHITECT	CRONE ASSOCIATES Architects • Planning Consultants • Interior Designers
CLIENT	RAYPOND DEVELOPMENT
PROJECT	1148 1152 BARRENJULY ROAD 56 PALM BEACH ROAD, PALM BEACH
SCALE	1:100 @ A1 1:200 @ A2
STATUS	DEVELOPMENT APPLICATION
DRAWING	200006 / ADA4 1003
REVISION	18 OCT 2006 DATE: 18 OCT 2006 BY: JACOB FOR: RAYPOND DEVELOPMENT
TITLE	HOUSE 4 FLOOR PLANS SHEET 3

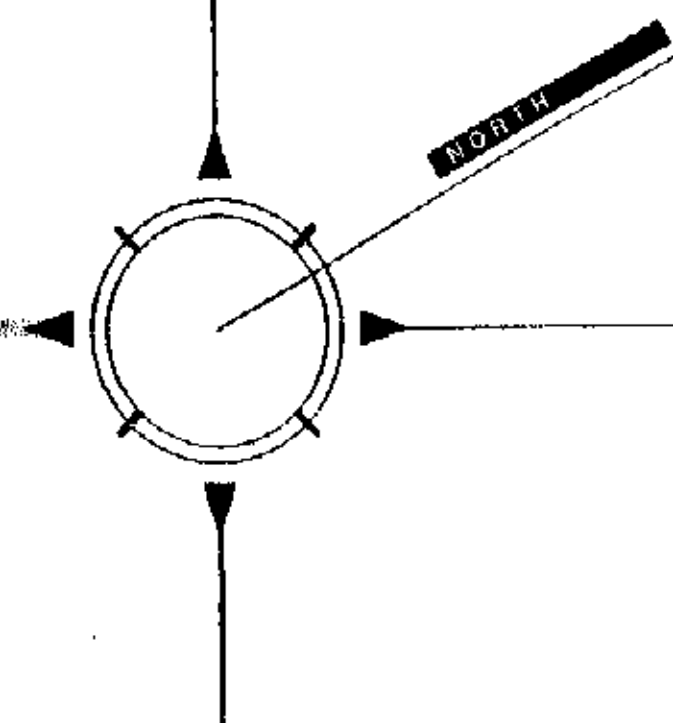
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CITY PLAN SERVICES
Construction Cert. No. 22655 Approved Date: 22 July 2006
Certifying Authority: Brandon Brown
Accreditation No: PIA2004



ROOF PLAN

O B S E R V A T I O N P O I N T



THE COUNCIL OF PITTWATER
APPROVED
DEVELOPMENT CONSENT PLAN

FUTURE BOUNDARY

HOUSE 4
TOTAL BUILT UPON AREA
APPROX 324.28 sq m
SITE COVERAGE 27.11%

LOT AREA 1564.71 sq m
(SHOWN HATCHED)

ARCHITECT
CRONE ASSOCIATES
Architects - Planning Consultants - Interior Designers

CLIENT
RAYPOND DEVELOPMENT

PROJECT
1148 1152 BARRENJOEY ROAD
88 PALM BEACH ROAD, PALM BEACH

SCALE
1:500 @ A1
1:400 @ A3

STANDARD
DEVELOPMENT APPLICATION

DRAWING
200006 / ADA4 1701

REVISION

DATE 18 OCT 2000

PROJECT
RAYPOND DEVELOPMENT

TITLE
**HOUSE 4
SITE COVERAGE**

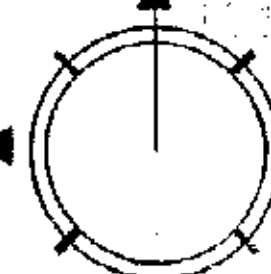


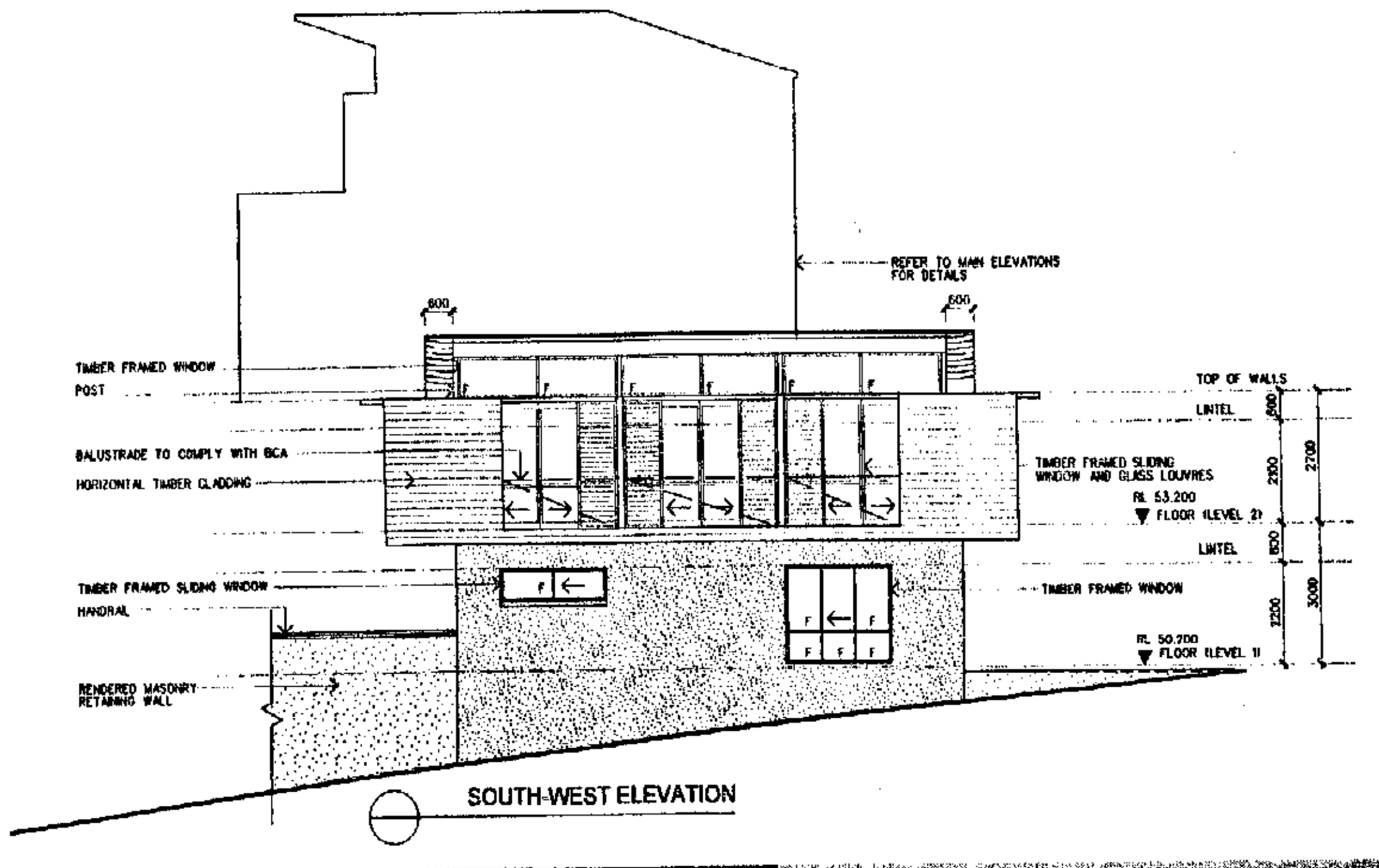
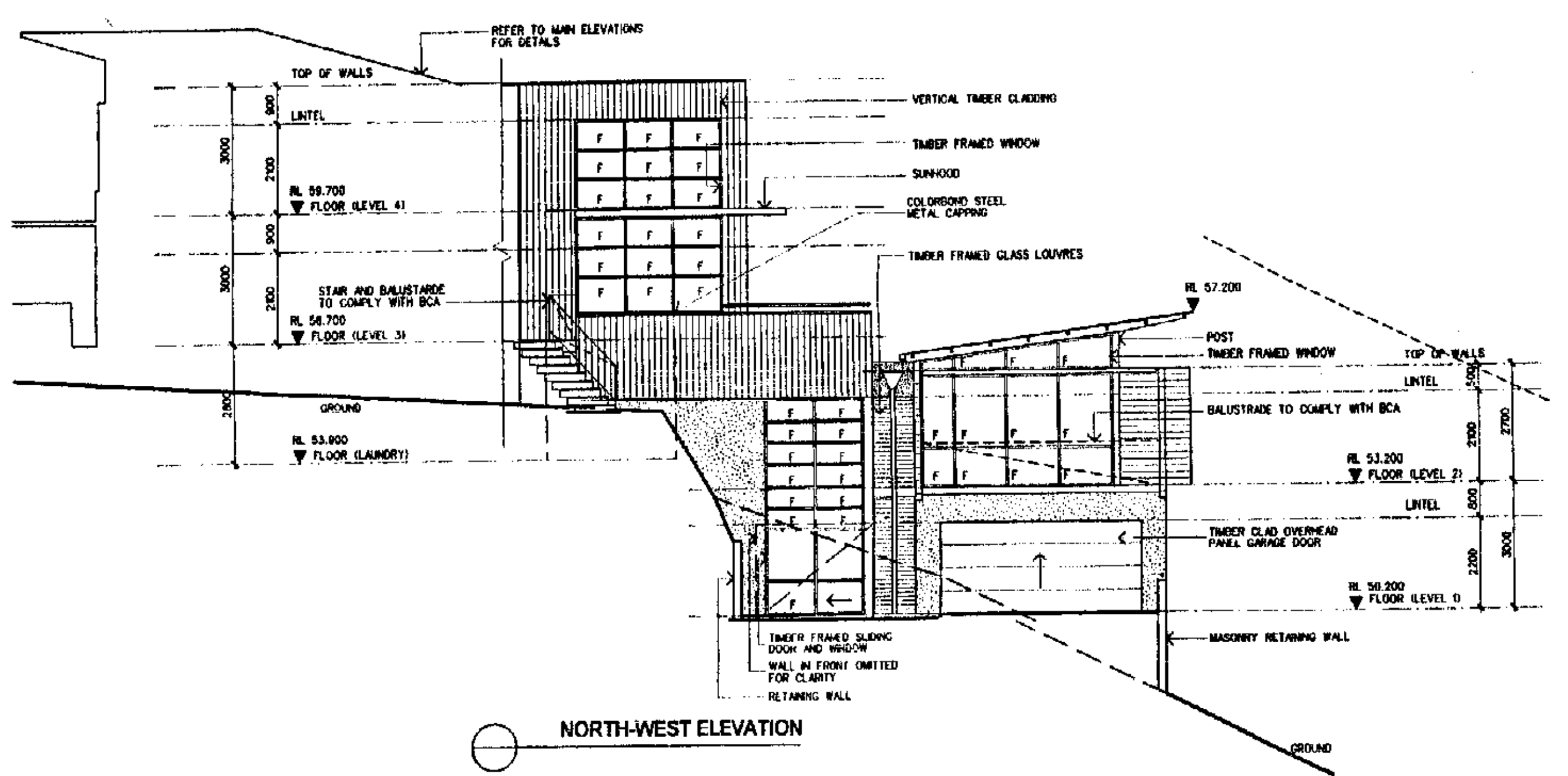
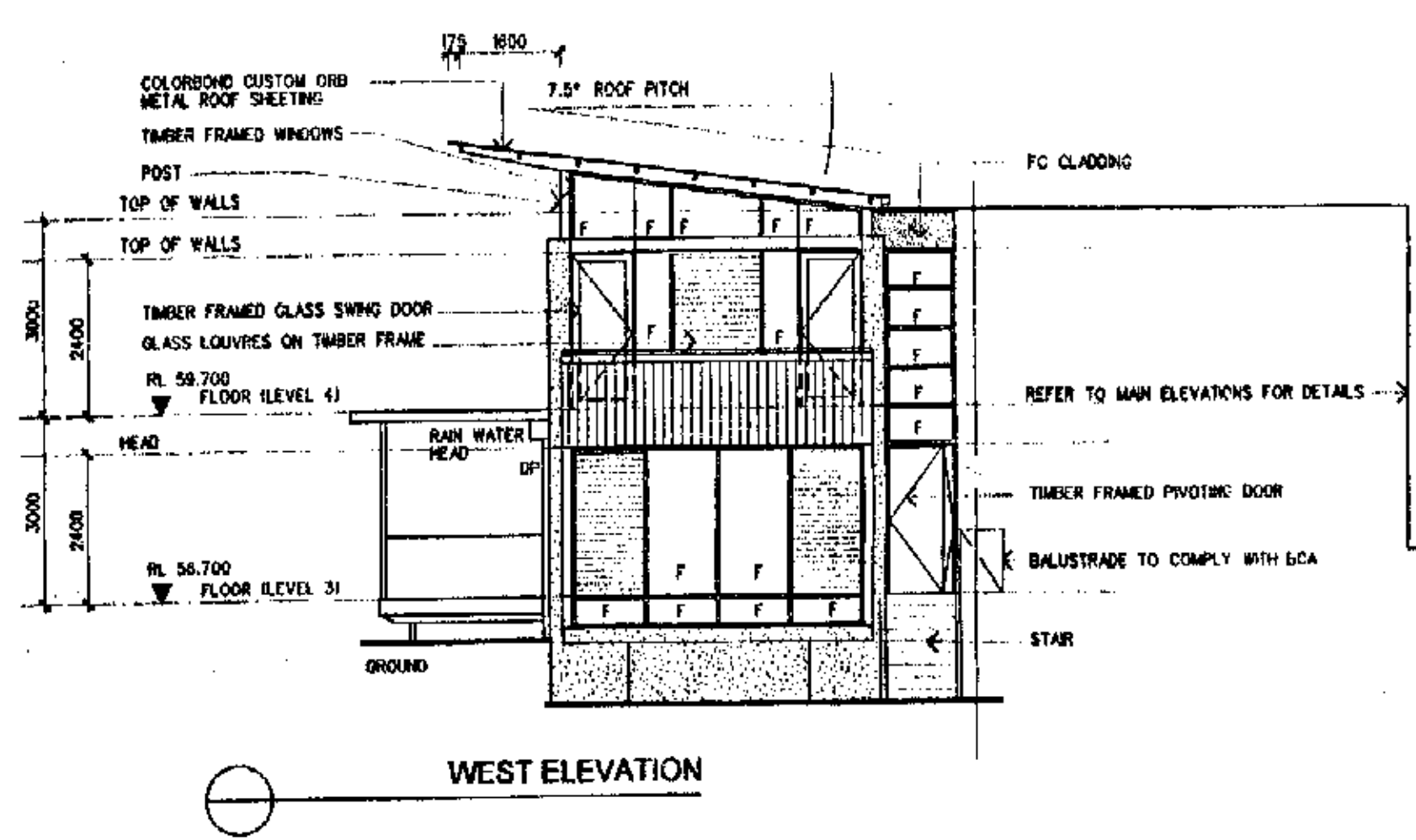
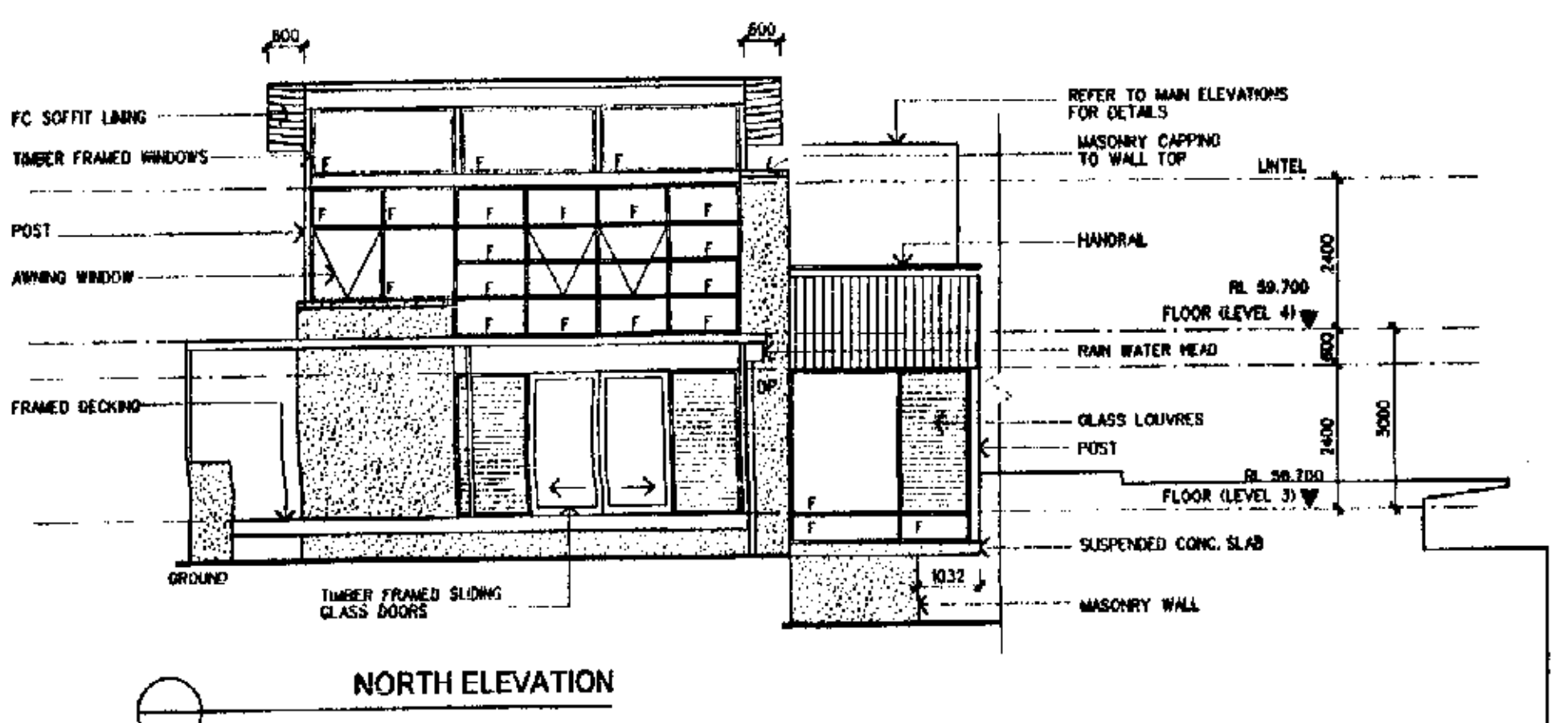
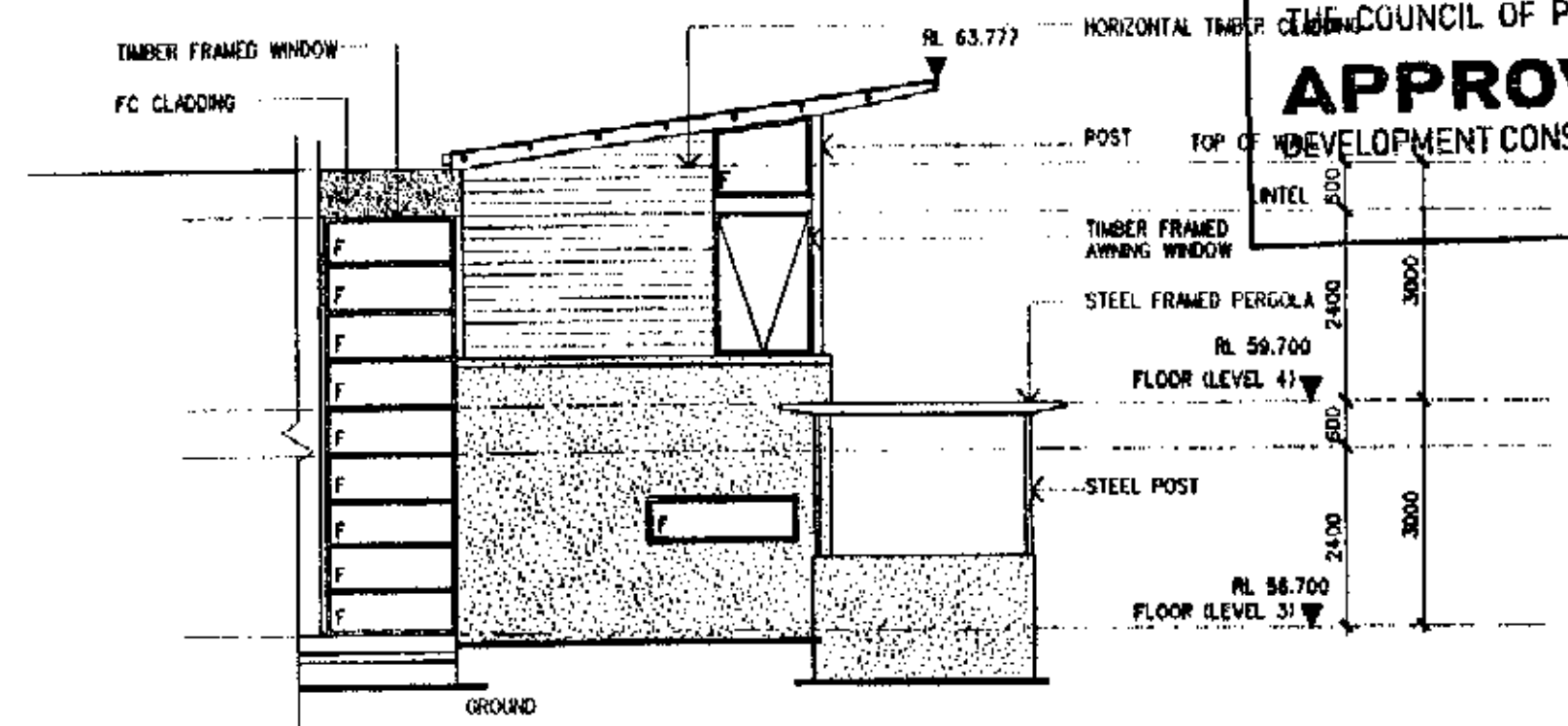
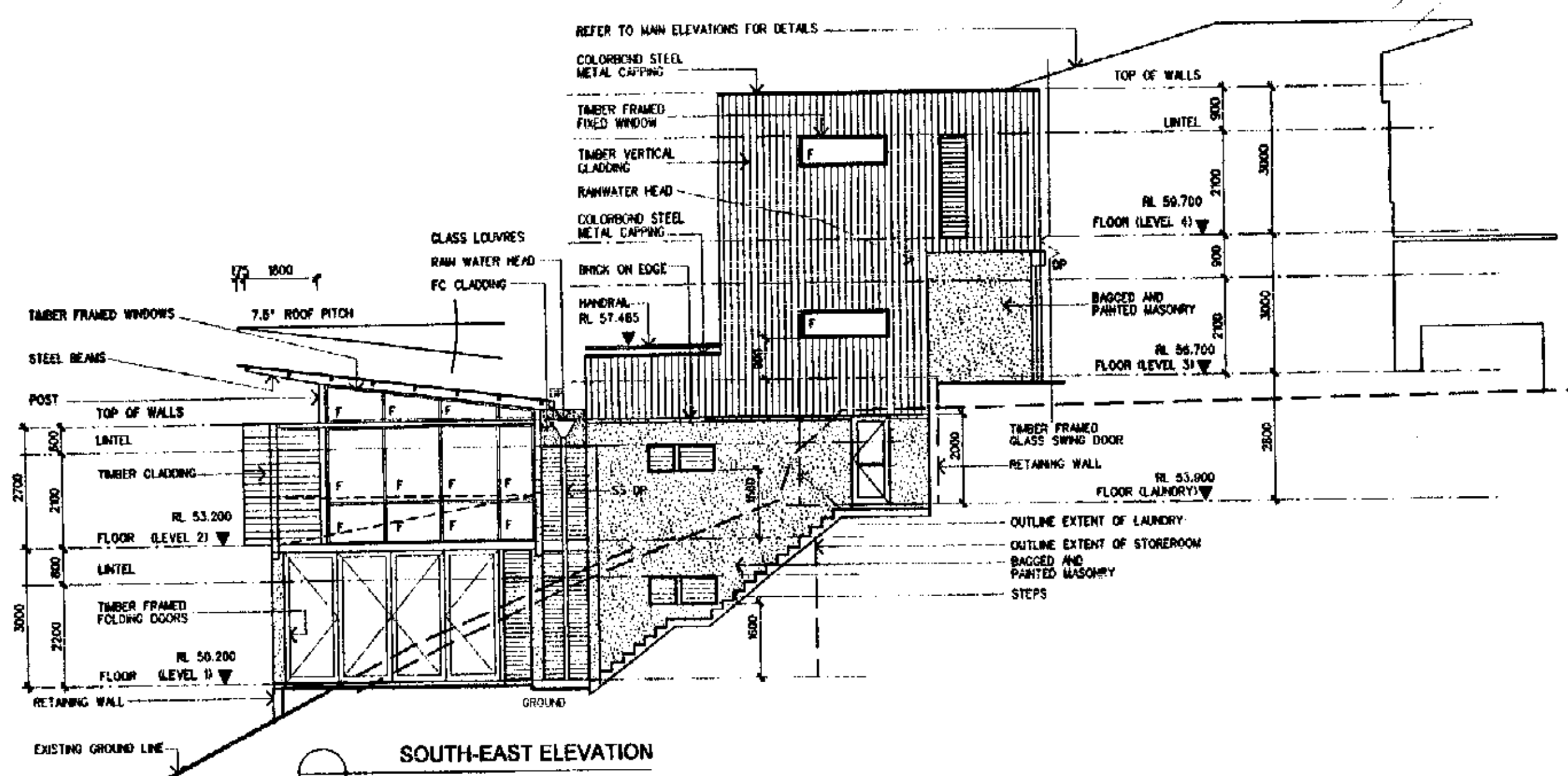
ALL DIMENSIONS & SETOUTS TO BE VERIFIED
PRIOR TO COMMENCEMENT. OMISSIONS OR
DISCREPANCIES TO BE NOTIFIED TO THE ARCHITECT.

REV	DATE	BY	DESCRIPTION
A	12/11/00	BT	ISSUE TO CONSULTANT
B	20/11/00	BT	DEVELOPMENT APPLICATION
C	20/00/01	BT	SITE COVERAGE AMENDED
D	09/10/01	BT	SITE COVERAGE CALCULATIONS AMENDED AS ABOVE

Checked by: [Signature]
Approved by: [Signature]
Date: 27 Nov 2004
Drawing Authority: Brendan Bonnet
Drawing No: PWA5004

O B S E R V A T I O N P O I N T





OBSERVATION POINT

CITY COUNCIL OF PITTSBURGH
APPROVED
DEVELOPMENT CONSENT PLAN

ARCHITECT
CRONE ASSOCIATES
Architects Planning Consultants Interior Designers

CLIENT
RAYPOND DEVELOPMENT

PROJECT
1148 1152 BARRENJOEY ROAD
58 PALM BEACH ROAD, PALM BEACH

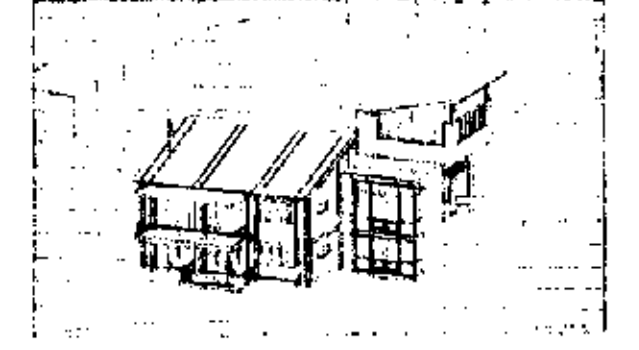
SCALE
1:1000 @ A1
1:200 @ A2

STATUS
DEVELOPMENT APPLICATION

DRAWINGS
20006 / ADA4 2001

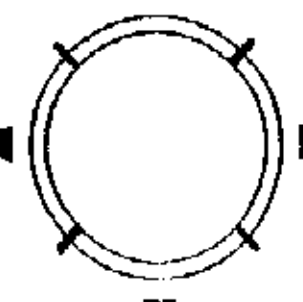
REVISION
B
40 SEP 2002

TITLE
**HOUSE 4
ELEVATIONS**



REV	DATE	BY	DESCRIPTION
A	12/11/00	ST	ISSUE TO CONSULTANTS
B	09/11/02	ST	DEVELOPMENT APPLICATION

CITY PLAN SERVICES
Construction Cert. No. Approved C...
24653 22 Nov 2004
Drawing Authority: American Institute
Architectural Reg. P153004



THE COUNCIL OF PITTSWATER
APPROVED
DEVELOPMENT CONSENT PLAN

CRONE ASSOCIATES
Architects • Planning Consultants • Interior Designers

RAYPOND DEVELOPMENT

1148 - 1152 BARRENJOEY ROAD
56 PALM BEACH ROAD, PALM BEACH

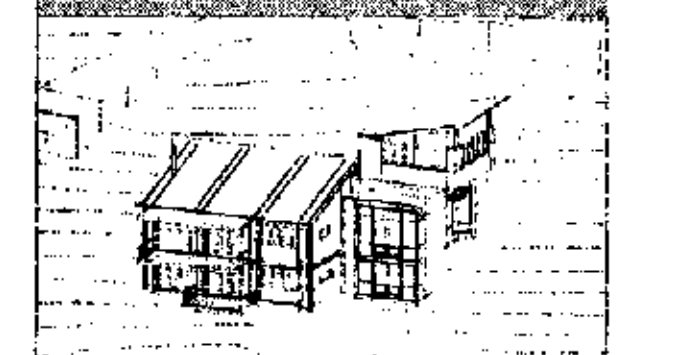
1100 @ A1
1200 @ A3

US DEVELOPMENT APPLICATION

2G096 / ADA4 3001

ON THE EFFECTS OF THE 1997-1998 EL NIÑO ON THE
WATER RESOURCES OF THE YAMALO-NENETS Autonomous
District, Russia

HOUSE 4 SECTIONS

[illegible]

CITY PLAN SERVICES
 Certificate No: Approved Date:
 24-655 22 April 2004
 Issuing Authority: Brandon, D. M. J.
 Approval No: PIA30G

OBSERVATION POINT

