

R/158201

\$ 30.00

3 December 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. N1230/00 & S96 modification
CONSTRUCTION CERTIFICATE NO. 24687

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 24687
- 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
Director
encl

PLANNING
BUILDING
HERITAGE
LANDSCAPE
URBAN DESIGN

CITY PLAN SERVICES

1148-1152 Barrenjoey Road, Palm Beach (House 2)
Construction Certificate No. 24687

CONSTRUCTION CERTIFICATE NO. 24687

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:

Address:

Contact Details:

Raypond P/L

PO Box 1364 Dee Why 2099

Phone: 0412 226 044 Fax: 9944 0316

OWNER

Name:

Address:

Contact Details:

Raypond P/L

PO Box 1364 Dee Why 2099

Phone: 0412 226 044 Fax: 9944 0316

DEVELOPMENT CONSENT

Consent Authority/Local Government Area:

Development Consent No:

Date of Development Consent:

Pittwater Council

N1230/00 & S96 modification

24.01.02 & 24.08.04

PROPOSAL

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

Building Classification:

Type of Construction:

Scope of building works covered by this Notice:

Value of Construction Certificate (Incl GST):

Plans and Specifications approved:

Fire Safety Schedule:

Critical stage inspections:

Exclusions:

Conditions (Clause 187 or 188 of the Environmental Planning & Assessment Regulation 2000):

**1148-1152 Barrenjoey Road, Palm Beach
(House 2)**

Class 1a

N/A

Excavation/Civil Works

\$650,000.00

Schedule 1

N/A

See attached Notice

Construction of dwelling

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 3rd day of December 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 structural plans prepared by Northern Beaches Consulting Engineers Pty Ltd

Plan Title	Drawing No	Revision	Date
General Notes and Drawing Schedule	S01		Aug 2003
Footing Plan and Details	S02		Aug 2003
Footing and Retaining Wall Details	S03		Aug 2003
Lower Level Framing Plan	S04		Aug 2003
Lower Level Framing Details	S05		Aug 2003
Mid Level Slab and Framing Plan and Details	S06		Aug 2003
Mid Level Slab and Framing Details	S07		Aug 2003
Upper Level Slab and Lower Roof Framing Plan	S08		Aug 2003
Upper Level Slab and Lower Roof Framing Details	S09		Aug 2003
Upper Roof Framing Plan	S10		Aug 2003
Lower and Upper Roof Framing Details	S11		Aug 2003
House No. 2 Shoring Sections	S12		Aug 2003
House No. 2 Anchor Details	S13		Sept 2004

2. Endorsed stormwater plans prepared by Northern Beaches Consulting Engineers Pty Ltd

Plan Title	Drawing No	Revision	Date
House No. 2 Stormwater and Erosion Control Plan	D01		Sept 2004
House No. 2 Stormwater and Erosion Control Details	D02		Sept 2004
House No. 2 OSD Tank DT2 Details	D03		Sept 2004

3. Endorsed Bushland Management Plan prepared by Urban Bushland Management Consultants Pty Ltd

Plan Title	Drawing No	Revision	Date
Diagram A – Native Vegetation under 3m & Weed Assessment			
Diagram B – Revegetation and Regeneration Areas			

4. Endorsed landscape plan prepared by Selena Hannan Landscape Design

Plan Title	Drawing No	Revision	Date
Landscape Plan	LP13	A	08.11.04

5. Other documents relied upon

Title	Prepared By	Reference	Date
CC Application form	Darren Leete		16.11.04
Long Service Levy Receipt	LSPC	00032404	03.12.04
Deletion of consent conditions D205a and D205b letter	Pittwater Council		11.06.03
Consent condition B5, B7, B24, B28 letter	Raypond Pty Ltd		15.11.04
Conditions of consent letter	Selena Hannan Landscape Design		13.11.04
Consent conditions B4, B5, B24 letter	Raypond Pty Ltd		15.11.04
Structural Certificate	NB Consulting Engineers Pty Ltd		15.11.04
Design letter – Stormwater, siltation and sediment control	NB Consulting Engineers Pty Ltd		15.11.04
Landscape Softworks Specification	Selena Hannan Landscape Design		November 2004
Pre-Construction Arboricultural Assessment	Urban Forestry Australia		November 2004
Bushland Management Plan	Urban Bushland Management Consultants		12 November 2004
Tree bond requirements letter	Pittwater Council		30.11.04
Letter of seed collection	GIS Environmental Consultants		25.01.02
Natural Resources Unit and Landscape Site Inspection	Pittwater Council		10.11.04
Proposed Method Statement of Excavation	Douglas Partners	35515C	16.03.04

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 (House 2)

Description of building works covered by this Notice:

Excavation/Civil Works

APPLICANT

Name of person having benefit of the development consent:

Raypond P/L

Address:

PO Box 1364 Dee Why 2099

Contact Details:

Phone: 0412 226 044 Fax: 9944 0316

RELEVANT CONSENTS

Development Consent No:

N1230/00 & S96 modification

Date of Development Consent:

24.01.02 & 24.08.04

Construction Certificate No:

CC 24687

Date of Construction Certificate:

03.12.04

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

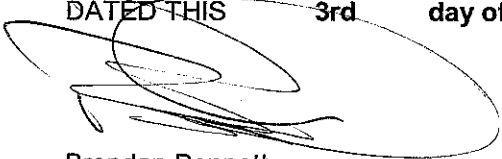
That I, Brendan Bennett, of City Plan Services located at Level 1, 364 Kent Street, Sydney acting as the principal certifying authority hereby give notice in accordance with Section 81A(2)(b1)(ii) of the Environmental Planning and Assessment Act 1979 to the person having the benefit of the development 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 3rd day of December 2004


**Brendan Bennett
Director**

SCHEDULE 1 MANDATORY CRITICAL STAGE INSPECTIONS

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

SCHEDULE 2 OTHER MANDATORY INSPECTION SPECIFIED BY THE PRINCIPAL CERTIFYING AUTHORITY

NO.	OTHER CRITICAL STAGE INSPECTIONS	INSPECTOR
	None have been specified in this instance	N/A

CONSTRUCTION CERTIFICATE APPLICATION

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

IDENTIFICATION OF BUILDING

Address 1148-1152 BARRONJOEY RD
Lot, DP/MPS etc 3
Suburb or town PALMBERTH Post Code

DESCRIPTION OF DEVELOPMENT

Detailed Description:

EXCAVATION / CIVIL WORKS

APPLICANT

Name DARREN LEETE Company RAYMOND P/L
Address PO Box 1304
Suburb or town DEE WHY Post Code 2099
Phone B/H Fax No 9944 0316
Mobile 0412 226094 Email darren.leete@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 41- PO- Box 1304
Suburb or town DEE WHY Post Code 2099
Phone B/H Fax No 9944-0316
Mobile Email darren.leete@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:

\$ 650,000

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. N1230/00

Date of Determination

Date 24/01/02
23 Aug 2004

BUILDING CODE OF AUSTRALIA
BUILDING CLASSIFICATION

S8 Mod. Resid

Nominated on the Development Consent

Class 1a

RESIDENTIAL BUILDING WORK

Relevant only to residential building work

Owner-builder Permit No.

or

Name of Builder PAN CIVIL PTY LTD

Address Unit 7, 33-35 Stanley St, Peakhurst

Telephone 9584 2122 Fax 9584 2209

Contractor License No. 125448C

REQUIRED ATTACHMENTS

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

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

DESCRIPTION

What is the area of the land (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)
1	Access Panels, doors and hoppers to fire resisting shaft		
2	Automatic fail safe devices		
3	Automatic fire detection and alarm system		
4	Automatic fire suppression system (sprinkler)		
5	Automatic fire suppression system (others – specify)		
6	Emergency lighting		
7	Emergency lifts		
8	Emergency warning and intercommunication system		
9	Exit signs		
10	Fire control centres and rooms		
11	Fire dampers		
12	Fire doors		
13	Fire hydrant systems		
14	Fire seals (protecting openings in fire resisting components of the building)		
15	Fire shutters		
16	Fire windows		
17	Hose reel system		
18	Light weight construction		
19	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

Item No.	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)
1	Access Panels, doors and hoppers to fire resisting shaft		
2	Automatic fail safe devices		
3	Automatic fire detection and alarm system		
4	Automatic fire suppression system (sprinkler)		
5	Automatic fire suppression system (others – specify)		
6	Emergency lighting		
7	Emergency lifts		
8	Emergency warning and intercommunication system		
9	Exit signs		
10	Fire control centres and rooms		
11	Fire dampers		
12	Fire doors		
13	Fire hydrant systems		
14	Fire seals (protecting openings in fire resisting components of the building)		
15	Fire shutters		
16	Fire windows		
17	Hose reel system		
18	Light weight construction		
19	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 proposed Fire Safety Measures to be installed/ modified in the whole building.

Signed (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.

LONG SERVICE
BUILDING & CONSTRUCTION

3 December 2004

BAYPOND DEVELOPMENTS P/L
PO BOX 1364
DEE WHY NSW 2099Building and Construction Industry
Long Service Payments Corporation
Ground Floor
cnr Donnison & Baker Streets
Gosford NSW 2250
Locked Bag 3000
Central Coast MC NSW 2252
Tel: 13 14 41
Fax: (02) 9287 5685
Email: info@lspc.nsw.gov.au
www.lspc.nsw.gov.au
ABN 93 646 090 808

Levy Receipt

Receipt No

00032404

Received from: (Name of person or organisation paying for levy)

BAYPOND DEVELOPMENTS P/L

the amount of

\$1,300.00

Payment details:

Direct Deposit \$1,300.00

being payment for Long Service Levy as detailed below

Levy Payment Form number	0273169
Council/Department/Authority	PITTWATER COUNCIL
C.C. Number	24687PCERT
Work address	LOT 2 1148-1152 BARRENJOEY ROAD PALM BEACH NSW 2108
Estimated value of work	\$650,000.00
Levy payable (No exemption)	\$1,300.00
Total levy paid	\$1,300.00

Signed: (Signature of authorised person)

Date

6 DEC 2004



Pittwater Council

ABN 61 340 837 871

All Correspondence to be addressed to General Manager

Units 9, 11 & 12/ 5 Vuko Place
WARRIEWOOD NSW 2102

Avalon Customer Service Centre
59A Old Barmenjoey Road, AVALON 2107

Postal Address
P.O. Box 882

MONA VALE NSW 1660
DX 9018 MONA VALE

Telephone (02) 9970 1111

Facsimile (02) 9970 7150

Internet www.pittwatercouncil.com.au

Email: pittwater_council@pittwater.nsw.gov.au

Matt Edmonds, Principal Officer - Development

8am to 6pm Mon - Thurs, 8am to 5pm Fri

Phone 9970 1162 Mobile 0417021314

30 November 2004

Darren Leete

Raypond

PO Box 1364

Dee Why NSW 2099

Dear Sir

Re: Tree Bond requirements – DA N1228/00; N1229/00; N1230/00; N1232/00; N1233/00

I refer to your letter dated 16 November 2004 and confirm that as the trees referred to in Condition C7 of Development Consents N1229/00; N1230/00; N1232/00; N1233/00 are the same trees as those referred to in Condition C1 of Development Consent N1228/00, and given you have already satisfied the bond requirement for these trees on 22/04/04 under Condition C1 (N1228/00) there is no need presently for you to submit further bonds for these trees. The existing bond paid on 22/04/04 will satisfy all tree bond requirements under these approvals whilst it is in place with Pittwater Council pursuant to Condition 1 of Consent N1228/00.

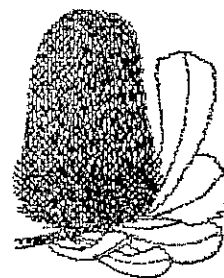
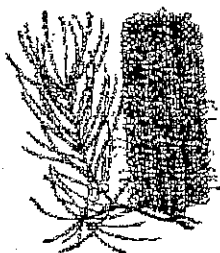
Yours faithfully



Matt Edmonds

Principal Officer – Development

Best & Most Progressive Council in NSW - Winner 2003 *Planet Award*



GIS Environmental Consultants

45 Austin Avenue, North Curl Curl 2099

Mobile Ph: 041 943 8672, Ph: (02) 9939 5129, Fax: 9401 715, Email: nicksk@mail.usyd.edu.au

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



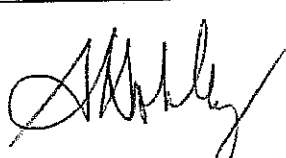
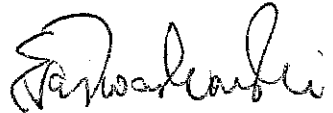
Bagged branches with unripe fruit.

Note: Eva took note of dead, bonded trees:
T471, T489

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 Twarkowski,  10/11/04
Client	
Consultants	Selen Hannon. Hannon 10 & 11/11/04

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



Douglas Partners
Geotechnics • Environment • Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
96 Hermitage Road
West Ryde NSW 2114, Australia

FACSIMILE TRANSMISSION

e-mail: sydney@douglaspartners.com.au

Our Fax No: (02) 9809 4095

Our Phone No: (02) 9809 0686

Organisation	Attention	Fax No
To RAYPOND PTY LTD	DARREN LEETE	9844 0316
cc WARREN LAVIS		9979 6174
From: JOHN BRAYBROOKE	Date: 18/2/04	Total pages: 3

The information contained in this document is CONFIDENTIAL and may also be LEGALLY PRIVILEGED, intended only for the addressee. If you are not the addressee, you are notified that any use or dissemination of the information, or any copying of the document is strictly prohibited. If you are not the addressee, please notify us immediately by telephone and we will arrange for return of this document to us.

Subject: OBSERVATION POINT

Project No:

COPY OF AMENDED PROPOSED METHOD STATEMENT FOLLOWS.

REGARDS.....JCB

Integrated Practical Solutions



Offices: Sydney, Newcastle, Brisbane, Melbourne, Perth, Wollongong, Campbelltown, Townsville, Cairns, Wollongong, Darwin
Principal: K A Seddie, J G Braybrooke, G Hargrave, J P Harvey, S R Jones, R W Lumsden, F MacGregor, P McDonald, G W McKeown, J M Nash, A J Taylor, M J Thon, R Tong, G A Warren, T J Wilson, A J Wilson
GR Wilson, G E Young
Senior Accountants: M Y Smith, G C Hawkins, B W Irie, J Lee, A N Lee, B J McPherson, C S Marks, J G Peck, K M Preston, B F Ripplinger
Associates: D Bell, C Bohnwald, A Gaudesdon, G M Dewar, G B W Edwards, R K Lloyd, D McInnes, D Martin, D E Murray, D L Oestrich, K R Smith, C J Stewart, P D Thomas, N P Weir

JOB: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 60 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).



Pittwater Council

ABN 61 340 837 871

All Correspondence to be addressed to General Manager

Units 9, 11 & 12/ 5 Vuko Place
WARRIEWOOD NSW 2102
Avalon Customer Service Centre
59A Old Barrenjoey Road, AVALON 2107

Postal Address
P.O. Box 882
MONA VALE NSW 1660
DX 9018 MONA VALE

Telephone (02) 9970 1111
Facsimile (02) 9970 7150
Internet www.pittwaterlga.com.au
Email: pittwater_council@pittwater.nsw.gov.au

Lindsay Dyce, Manager - Planning and Information
8am to 6pm Mon - Thurs, 8am to 5pm Fri
Phone 9970 1135 Mobile 0419 639 336

11 June 2003

Raypond P/L
PO Box 1364 DEE WHY
NSW 2099

Dear Sir

Re: DA N1229/00 - for construction of dwelling house on proposed Lot 1; DA N1230/00 for construction of dwelling house on proposed Lot 2; DA N1233/00 for construction of dwelling house on proposed Lot 3, and DA N1232/00 for construction of dwelling house on proposed Lot 4; respectively at 1148-1152 Barrenjoey Road, Palm Beach.

In regard to your request to delete condition D205a of Consent N1230/00 and condition D205b of Consent N1230/00, as being inconsistent with the subdivision consent N1228/00 which is to be implemented first, I am pleased to advise that Council is prepared to agree to the deletion of these void conditions, without the need for a formal Modification of the Consent, as follows:

Consent N1229/00

D205a. The driveway construction method within the portion of the driveways marked red on drawing No.TPO4B dated 8 January 2002 is to be designed and carried out so as to minimise the impact on the two Black Plum trees T42 and T45.

Consent 1230/00

D205b. The driveway construction method within the portion of the driveways marked red on drawing No.TPO5B dated 8 January 2002 is to be designed and carried out so as to minimise the impact on the Black Plum tree T104.

This is done within the terms of the Environmental Planning & Assessment Act, 1979, which allows Council to rectify minor errors and misleading expression by re-issuing the consent. I enclose copies of the re-issued Development Consents N1229/00 and N1230/00.

In regard to your request for an extension of time on the development consents for the dwelling houses, Council agrees to a final 12 month extension of the two year consents granted by Council on 24 January 2002 for N1229/00, N1230/00, N1233/00 and N1232/00, respectively, which will all now expire on 24 January 2005.

Yours faithfully

Lindsay Dyce

MANAGER - PLANNING AND ASSESSMENT

Raypond

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 two 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 B5. Please find a copy of evidence of collection.
2. Condition B7. Details contained in relation to condition in our Landscape plan.
3. Condition B24. Details contained in relation to condition in our Landscape plan/BMP.
4. Condition B28. 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

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 2, 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 LP13A and Landscape Softworks Specification for House 2, dated November 2004.

B1. Darren to provide

B4. Darren to provide

B5. Planting locations only are shown on Landscape Plan LP12.

B7. Done. Letter attached to demonstrate compliance

B8. Refer to Urban Forestry Australia Arboricultural Assessment House 2, dated November 2004 (hereon referred to as UFAAAH2).

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

B15a. As above

B16. Refer BMP. Refer Landscape Plan.

B17. Refer to Landscape Plan and UFAAAH2.

B18. Refer BMP

B19. Darren to provide

B20. 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

B22. Refer BMP

B23. Refer to Landscape Plan and BMP. Note that 'Plant Mix X' IS the revegetation mix contained in the BMP. 'Plant Mix Y' is shown on the Landscape Plan.

B24. Refer to Landscape Plan and BMP.

B26. Refer to Landscape Plan and UFAAAH2.

B27. Refer to Landscape Plan and BMP.

B28. Refer to BMP.

B29. Darren to provide

B30. Refer to Landscape Plan and BMP and UFAAAH2.

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

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

Please call me if you have any questions,

Yours sincerely,

Selena Hannan

Raypond

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 two 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 B24. Details contained in relation to condition in our Landscape plan/BMP.

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



DIRECTORS

Stewart McGeedy Rick Wray Lucas Molloy

Structural Certificate

Date: 15th November 2004 Job No. 030703
Engineer: Rick Wray

HOUSE 2 Barrenjoey and Palm Beach Roads Palm Beach

We hereby certify that the following structural drawings have been designed in accordance with the Architectural plans by Crone Associates Architects.

Structural Drawings:

- S01 - General Notes and Drawing Schedule
- S02 - Footing plan and details
- S03 - Footing & retaining wall details
- S04 - Lower level slab & framing plan
- S05 - Lower level framing details
- S06 - Mid level slab & framing plan and details
- S07 - Mid level slab & framing details
- S08 - Upper level slab & lower roof framing plan
- S09 - Upper level slab & lower roof framing details
- S10 - Upper roof framing plan
- S11 - Lower and upper roof framing details
- S12 - Shoring sections
- S13 - Anchor details

Architectural drawings:

- 20006 / ADA2 0100 / C
- 20006 / ADA2 1001 / B
- 20006 / ADA2 2002 / B
- 20006 / ADA2 1701 / C
- 20006 / ADA2 2001 / B
- 20006 / ADA2 3001 / B

We trust that this certificate meets with your requirements. Please contact the author if further clarification is required.

NB CONSULTING ENGINEERS P/L

Rick Wray
BE Cpeng NPER Director



DIRECTORS

Stewart McGeehy Rick Wray Lucas Molloy

15th November 2004

Raypond
C/O PO Box 1364
Dee Why NSW 2099

House 2, 1148 – 1152 Barrenjoey Rd, Palm Beach

Job N° 030703

With reference to the Stormwater design, Siltation and sediment control design, and the structural engineering design.

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

The above are also in compliance with the relevant Standards and BCA requirements.

I can be contacted as below, and would be happy to discuss any aspects of this project with you.

Yours Sincerely,

Rick Wray
B.E. C.P.Eng NPER Director

N:\ENG NBC\2003\030703\L001Certification.doc

SELENA HANNAN LANDSCAPE DESIGN

Landscape Design and Horticultural Consultation

LANDSCAPE SOFTWARES SPECIFICATION

HOUSE 2

**LOT 2, 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, LP13

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

CONTENTS

1.0	GENERAL	2
2.0	INSPECTION	2
3.0	WORK NEAR TREES	3
4.0	PROTECTIVE FENCING	4
5.0	TRUNK PROTECTION	4
6.0	GROUND PROTECTION	5
7.0	PROTECTION OF ROCKS	5
8.0	VEGETATION TO BE REMOVED	5
9.0	CLEARING AND GRUBBING	6
10.0	SOILS	7
11.0	SOIL PREPARATION AND SUBSOIL DRAINAGE	7
12.0	PLANTS AND PLANTING	9
13.0	MULCH	10
14.0	IRRIGATION	11
15.0	ESTABLISHMENT AND MAINTENANCE	11

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 x 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.

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.

Gravel Mulch

Gravel mulch to be 10 – 20mm graded quartz or river pebbles, no fines.

PLACING

Spread evenly to thickness nominated, after planting and fertilising. Leaf litter mulch to be placed to a thickness of 75mm. Gravel mulch to be placed to a thickness of 50mm. 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 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.

15.0 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)



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 2 (HOUSE TWO)
1148 – 1152 BARRENJOEY ROAD
PALM BEACH NSW

NOVEMBER 2004



URBAN FORESTRY AUSTRALIA

ABN 90 639 906 218
www.urbanforestry.com.au

Correspondence:

PO Box 151
NEWPORT NSW 2106

Telephone: (02) 9918 9833
0414 997 417

Facsimile: (02) 9918 9844
Email: cmackenzie1@bigpond.com

CONTENTS

	Page No.
1 INTRODUCTION	2
2 METHODOLOGY	3
3 DISCUSSION	3
3.1 Current health and condition of trees to be retained.	4
3.2 Potential impacts on trees within 5 metres of House 2.	4
3.3 Tree removal	9
4 CONCLUSIONS	10
5 RECOMMENDATIONS	11
5.1 Tree Protection Zones	11
5.2 Bonded Trees	13
5.3 Minimising impacts on trees to be retained	13
5.4 Hand digging near trees.	14
5.5 Tree Pruning	15
5.6 General	16
 Figure 1 - Tree Guard Detail	 12
 APPENDIX A – Terms and Definitions	

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 2, and known as House 2 at 1148 -1152 Barrenjoey Road, Palm Beach, New South Wales.
- 1.3 This Arboricultural Assessment addresses Pittwater Council Development Consent DA N1233/00. This assessment intends to meet the arboricultural requirements for the issue of the Construction Certificate for House 2, specifically addressing Conditions B8, B17, B26, B30, B31, 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: N01233/00;
 - Pre-Construction Tree/Vegetation Report, dated 10 April 2003, prepared by Pittendrigh Shinkfield Bruce Pty Ltd;
 - Bushland Management Plan, dated May 2003, prepared by GIS Environmental Consultants;
 - Tree Survey - House Two Plan TP05B and Tree Protection Plan -House Two TP13A, prepared by Pittendrigh Shinkfield Bruce Pty Ltd;
 - Landscape Plan LP13A, dated November 2004 prepared by Selena Hannan Landscape Design;
 - Pre-construction Arboricultural Assessment for House 3, 1148 – 1152 Barrenjoey Road, Palm Beach, August, 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 2.

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 (PSB), 10 April 2003, which deals with subdivision works (DA N1228/00).

The PSB report relates to trees to be retained, protected and bonded as part of subdivision relating to House 2 - Trees **103, 104, 182, 199, 200, 201, and 202.**

3.2.2 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 22, 23, 33, 35, 41, 47, 48, 55, 97, 102, 459, 461, 462, 463, 466, 470, 477, 480, 481, 482, 488, 496 and 498.

3.2.3 Tree 22 (Cheese Tree) is in close proximity to Tree 23. No impacts are expected to this tree as setbacks for Tree 23 adequately protect it from works.

3.2.4 The proposed driveway is approximately 3 metres west of Tree 23 (Bangalay). The driveway will be suspended above the root area of the tree. Piers for the driveway will need to be located and excavated by hand digging to ensure no woody roots greater than 50mm require cutting. Note that the majority of support roots are expected upslope of the tree and away from the driveway and dwelling areas. Proposed cut for dwelling footings will be 5 metres plus, and outside the CRZ. Supervision of these works by an arborist is critical to ensuring the retention of this tree.

Landscaping is proposed within the CRZ of the tree. This is to be a 1 metre wide strip along the east side of the suspended driveway. Final locations for plantings would be subject to the presence of woody roots, which cannot be damaged.

3.2.5 Tree 33 (Forest Oak) is located within 1.5 metres of the proposed dwelling. The lower floor level is indicated as being 100mm lower than the R.L. of the tree, and on the edge of the tree's CRZ of 1.5 metres. There is some possibility that significant roots may be encountered during excavation for the dwelling, and this will be determined during the excavation phase of works. It is likely the tree will require removal of at least two primary scaffold branches to accommodate the dwelling.

3.2.6 Trees 35 (Cheese Tree), 47(Black Plum), 48 (Cheese Tree), 459 (Lilly Pilly), 461 (Black Plum), 462 (Lilly Pilly), and 466 (Wilkiea) are a loose

group of trees near the proposed timber deck and steps. All are small trees with stem diameters of 50 – 250mm.

The deck is to be located 2 metres away from the largest tree (35), and 1 metre from Tree 461. This setback is outside the estimated CRZ of the tree 35 and outside the PRZ's of 461 and 466.

Existing grades will be maintained under the deck, with no fill within the CRZ and PRZ of the trees.

No significant damage to tree roots is expected at this setback, however it is critical that locations for posts must be determined by hand digging to ensure woody roots area not damaged.

Trees 47, 48, and 459 are even further away upslope of the wall and not expected to suffer any impacts from the development.

- 3.2.7 Tree 463 is close to the proposed stairs, and its canopy is oriented in the direction of the proposed dwelling.

The existing soil levels are to be retained under the stairs to minimise root disturbance. To avoid damage to woody roots the post locations for stairs would be determined by hand digging.

The cut for the dwelling is 1.5 metres east of the tree which is at the outer edge of the tree's PRZ. As there are no other works proposed to other setbacks from the tree, it is not expected to have an impact on tree health.

A large portion of the tree canopy will be removed to accommodate the dwelling. It is likely the tree would survive this treatment but it will not be a particularly attractive shape as a result.

- 3.2.7 Tree 462 is dead.

- 3.2.8 Tree 41 (Forest Oak) is well away from the proposed dwelling, but may sustain root damage during installation of sewer and/or other utilities.

The trench will need to be located at least 1 metre from the tree (i.e. the edge of the tree's CRZ) to minimise damage to woody roots. No other works are proposed to the remaining root zone area of the tree.

To further ensure that damage to the tree is minimised, trunk protection must be provided.

- 3.2.9 Tree 55 (*Pittosporum undulatum*) is setback approximately 3 metres from the proposed sewer line. This is at the outside edge of the tree's PRZ, and as no other works are proposed in proximity to the tree, is not expected to impact on the tree's current condition.
- 3.2.10 Tree 97 (Port Jackson Fig) is growing on a rock outcrop downslope of the dwelling. The setback is approximately 4.5 metres from the dwelling, however the dwelling will be elevated and approximately 4-5 metres above the R.L. of the tree. The actual setback to any excavated area is approximately 9 metres, and outside the CRZ/PRZ of the tree. No significant impacts are expected to affect the current health and condition of the tree.
- 3.2.11 Tree 102 (Black Plum) is well set back from proposed works. No development impacts are expected to this tree provided appropriate protection measures are implemented.
- 3.2.12A small group of bonded trees (T480, 481- Lilly Pillies and 482 – Coastal Banksia), are located more than 2 metres from the proposed dwelling. Stem diameter varies from 100 to 200mm. Construction is proposed outside the CRZ/PRZ of these trees and no significant impacts are expected to tree health or stability.
- Tree 477, located nearby, has a dead stem with a small side branch still living. It is not considered worthy of retention as it will mature into a poorly structured tree.
- 3.2.13 Tree 470 (Forest Oak) is located within 300 mm of the southeast deck. The deck and building will be approximately 3 metres above the R.L. of the tree. Some removal of branches may be required to clear deck rails and avoid

contact between tree parts and the structure. The tree was not bonded due to previously identified potential impacts.

Locations for deck posts would be determined by hand digging to avoid damage to woody roots. The tree should also be provided with trunk protection.

3.2.14 Tree 488 is a semi-mature Cheese Tree which is expected to survive both dwelling construction and utility installation provided adequate protection measures are undertaken.

The proposed sewer line is approximately 2 metres from the tree and well outside the estimated PRZ of 1 metre.

3.2.15 Trees 496 (Cheese Tree) and 498 (Lilly Pilly) are close to the proposed sewer line. The works are not expected to affect tree 496 which is a juvenile specimen of poor condition.

The trenching would be approximately 1 metre from the Lilly Pilly and at the edge of the tree's PRZ. As no other works are proposed within proximity to this tree, any impact on tree health or stability is expected to be negligible.

3.2.16 With reference to Condition B17 the proposed stairs alongside the southeastern areas of the dwelling have been deleted to maintain natural soil levels and reduce impacts on littoral rainforest species.

3.2.17 In consideration of Condition B26.

Stormwater and Sewer lines 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 this area (Trees 41 and 488) 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. Locations of trees, tanks, pits and utility lines have been shown on the Landscape Plan LP13A and it is not considered necessary to repeat this information on a separate plan.

3.2.18 With reference to Condition B30, the requirement for tree protection /exclusion fencing is detailed on Landscape Plan LP13A.

Note: B31 is addressed in Recommendations – *Hand digging near trees*.

3.2.19 Impacts on trees located within 5 metres of pathways and stairs located next to the main drive have been addressed in the subdivision tree report. These pathways and stairs do not impact on any additional trees to be retained.

However, in addition to this it is noted that Tree 104 is located within 1 metre of the proposed cut and shotcrete wall for the internal service driveway. The PRZ of the tree is 1 metre. Provided no overburden, materials etc, are stored within 1 metre of the tree it is expected to tolerate the proximity of the works. Trunk protection is required to ensure excavated rocks do not roll into the trunk.

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

3.2.21 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 Of the above bonded trees to be retained Tree 462 is dead and should be removed before works commence.

Tree 477 is a bonded tree, but should be removed as it is in very poor condition. This may be done as a separate application under Pittwater Council's Tree Preservation and Management Order.

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.
The majority of trees to be retained 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 23 and 41. Close supervision and appropriate protection measures would avoid further unnecessary impacts on the root systems of these trees.
- 4.3 At least two bonded trees (462 and 477) should be considered for removal as they are dead or of poor structural condition.

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 LP13A 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.

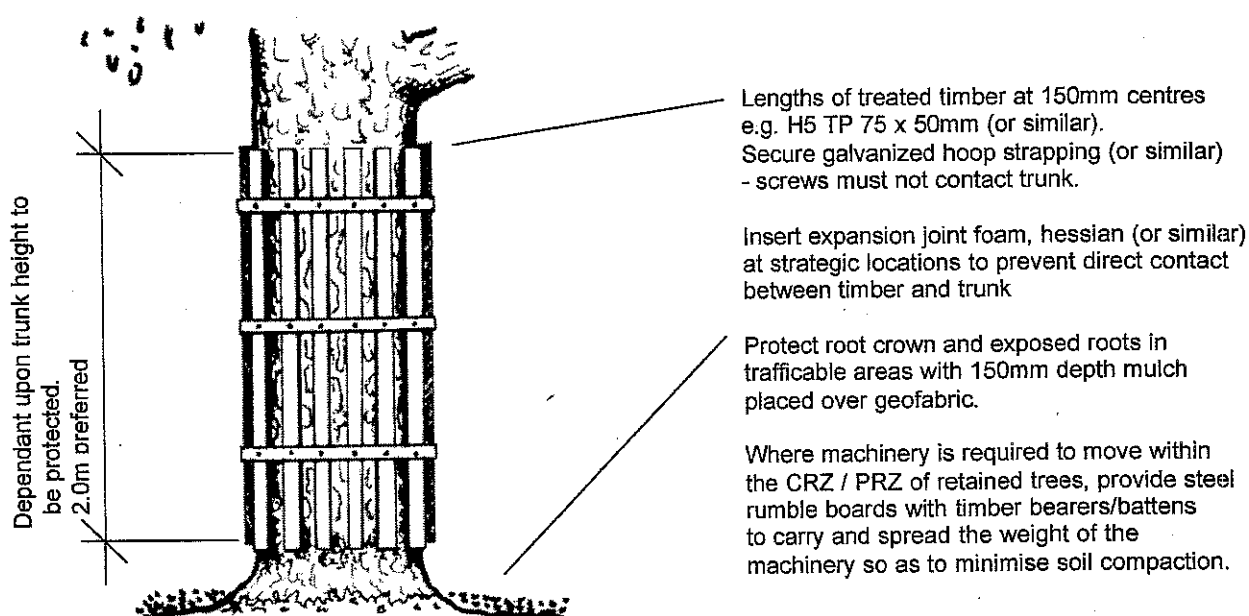
Alternatively, the arborist is to supervise the erection of Tree Protection Zones and other tree protection devices.

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 41, 470, 488 and 498 require individual trunk protection. Refer to Figure 1 for details.

Figure 1 TREE GUARD DETAIL



5.1.4 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 B31 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.

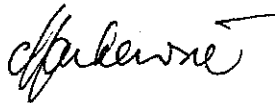
5.4.4 During all pruning works any defective or diseased tree parts encountered by tree workers are to be reported to the site supervisor.

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.



Bushland Management Plan
For Proposed Lot 2
Observation Point
1148-1152 Barrenjoey Road, Palm Beach

12 November 2004

Prepared for

Raypond Developments Pty Ltd

Prepared by

Urban Bushland Management Consultants Pty Ltd

111 Showground Rd, Castle Hill NSW 2154

Tel (02) 9894 2255 ~ Fax (02) 9894 2215

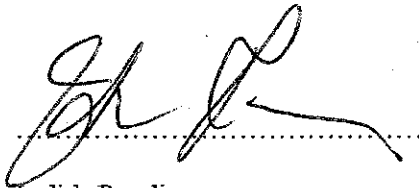
ubmc@urbanbushland.com.au

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 2, 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 LGA and other relevant planning instruments. The guidelines and requirements of draft Pittwater 21 DCP have also been addressed.

This Bushland Management Plan 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 & 4 Observation Point, Palm Beach (correspondence 5 May 2003 - see Appendix 1).

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

Judith Rawling
12 November 2004



TABLE OF CONTENTS

CERTIFICATION

1	INTRODUCTION	1
1.1	BACKGROUND INFORMATION	1
1.2	DEVELOPMENT PROPOSAL	1
1.3	REPORT PURPOSE	1
1.4	PROJECT OBJECTIVES	4
1.5	SCOPE OF WORKS	4
1.6	COMPLIANCE WITH PITTWATER PLANNING INSTRUMENTS	4
1.6.1	Development Control Plan 25 – Conservation of Biodiversity	5
1.6.2	Pittwater 21 Development Control Plan	5
2	OBSERVATION POINT - SITE DESCRIPTION	8
2.1	PHYSICAL ENVIRONMENT	8
2.1.1	Location and Setting	8
2.2	TOPOGRAPHY, GEOLOGY AND SOILS	8
2.3	BIOLOGICAL ENVIRONMENT	9
2.3.1	Flora	9
2.3.2	Fauna	9
2.4	PLANNING AND LEGISLATIVE FRAMEWORK	10
3	LOT 2 - BUSHLAND MANAGEMENT PLAN	11
3.1	SITE DESCRIPTION	11
3.2	MANAGEMENT ISSUES & RECOMMENDATIONS	11
3.2.1	Retention of Native Vegetation and Weed Control	11
3.2.2	Weed Control Methods	12
3.3	BUSH REGENERATION PROGRAM	13
3.3.1	General Guiding Principles	13
3.3.2	Definition of Urban Bushland	13
3.3.3	Determining Bushland Condition	14
3.3.4	Application of Bush Regeneration Principles	14
3.3.5	Bush Regeneration	15
3.4	REVEGETATION PROGRAM	16
3.4.1	Densities and Spatial Arrangement	16
3.4.2	Planting Aids	16
3.4.3	Staking & Plant Bags	17
3.4.4	Mulching and Weed Matting	17
3.4.5	Irrigation	17
4	IMPLEMENTATION	21
4.1	WORKS PROGRAM	21
4.2	SITE MAINTENANCE	21
4.3	LABOUR AND RESOURCES	21
4.4	MONITORING AND ASSESSMENT	21
4.5	PERFORMANCE INDICATORS AND MILESTONES	22
5	REFERENCES	25
6	APPENDICES	26
	Appendix 1: Sample Modified Conditions of Consent (Pittwater Council May 2003)	27
	Appendix 2: List of Flora Species Recorded at Observation Point	30
	Appendix 3: Noxious Weeds Listed in Pittwater Local Control Area	31
	Appendix 4: Keystone Weeds in the Subject Site and Recommended Control Methods	33



Appendix 5: List of Locally Indigenous Species Recommended for Bush Landscaping at Lots 1, 2, 3 & 4 Observation Point, Palm Beach	35
Appendix 6: Protocol for Protection of Bushland During Construction	37
Appendix 7: Plates	39
Appendix 8: Judith Rawling, <i>curriculum vitae</i>	40

LIST OF TABLES

Table 2.1: Summary of Physical Characteristics in the Locality of the Subject Site	8
Table 2.2: Summary of Policies, Local Planning & Legislative Requirements	10
Table 3.1: List of Keystone Weeds to be removed from Lot 2 *	12
Table 3.2: Assessment of Bushland Condition or Health	14
Table 4.1: Indicative Costing for the Works	24

LIST OF FIGURES

Figure 1.1: Site Details	3
Figure 3.1: Lot 2 Action Plan	19
Figure 4.1: Timetable of Works	23



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 2. BMPs for each of Lots 1 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 2 Observation Point (Drawing #LP 13A – Hannan, 2004).

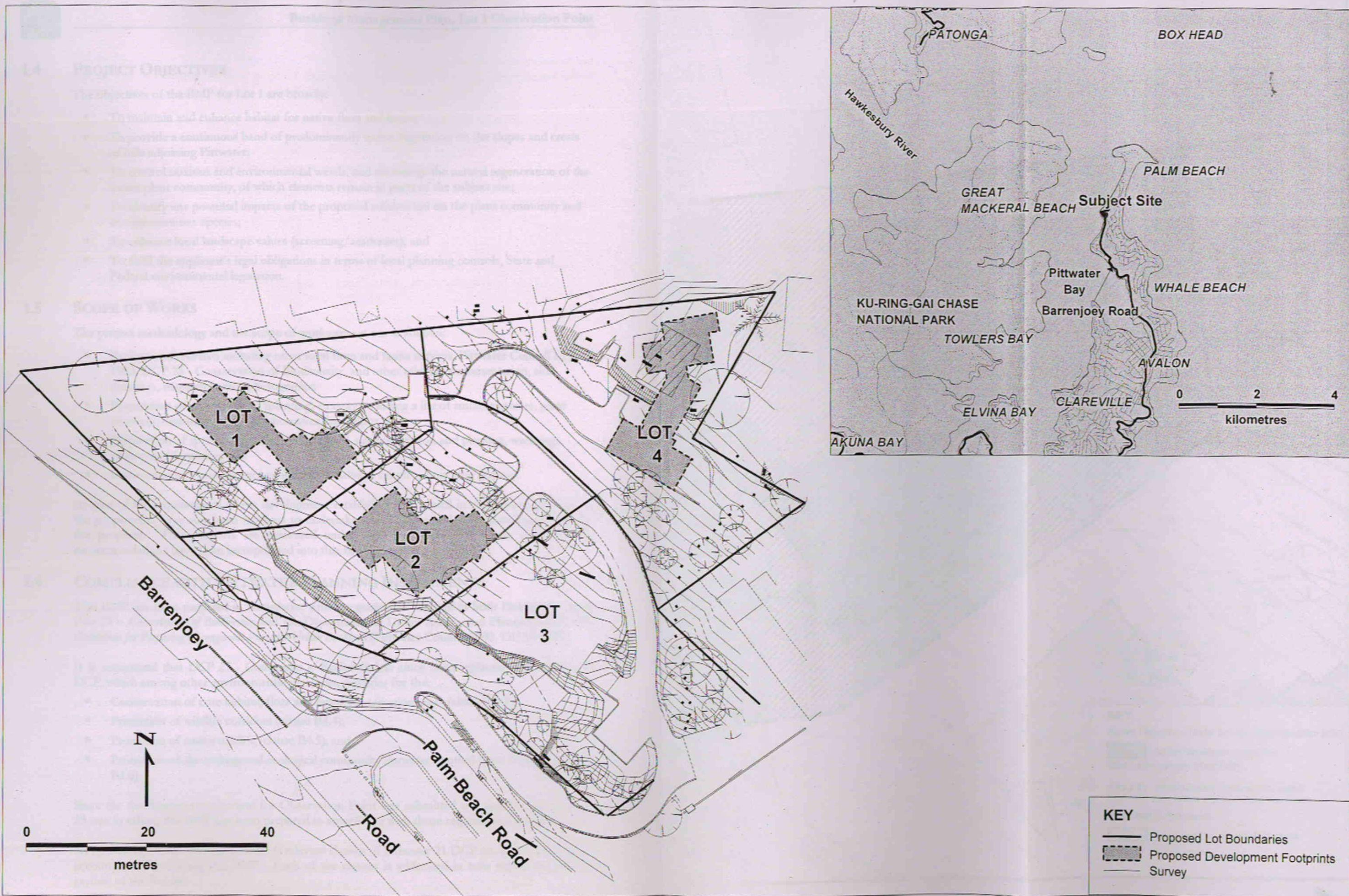


Figure 1.1
Site Details





1.4 PROJECT OBJECTIVES

The objectives of the BMP for Lot 2 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 (DUAP¹) *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 2 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 *NSW 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 Observation Point 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 2.

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 LP #13A (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



Impacts on Other Natural Features

The other natural features within the subject site are a number of large sandstone 'floaters' or rock ledges, which outcrop across the slopes. These rock ledges will be protected during construction works and these features will be incorporated into the landscape design.

Rocky outcrops on the higher slopes have already been impacted by the construction of the (original) dwelling, the formation of footpaths, a driveway and terraced gardens.

Recommendations

- 1) Site access roads, new dwelling (and associated structures) away from the large sandstone outcrops wherever possible.
- 2) Protect sandstone floaters within and immediately outside the development footprint during construction works by erecting temporary fencing (or placing 'mattresses') and maintaining these for the duration of works.

Protection of Native Wildlife

Pittwater 21 DCP B4.5 – Protection of Native Wildlife requires the protection of native fauna from predation by introduced animals such as dogs and cats. Therefore Council requires the proponent to show how native wildlife would be protected post-construction.

Native animals frequenting the subject site and surrounding properties have been documented by GIS Environmental Consultants (2000). All of the species recorded are urban-tolerant species, which commonly utilise domestic gardens and peri-urban bushland habitats. The redevelopment of this property at Observation Point is unlikely to have any significant impact on current fauna usage. In fact, Council requirements to enhance habitat through bush regeneration and indigenous revegetation is likely to greatly improve habitat availability.

Domestic pets are likely to impact on the native population if left unsupervised. It is possible to place a covenant on cat ownership and/or to require that domestic cats be contained within a 'cat run'. The control of dogs wandering outside private land is controlled by the requirements of the *Companion Animal Act 1998*. However, it must be noted that these safeguards do not affect the other neighbouring residences, where both dogs and cats are currently kept as domestic pets without restrictions of any kind.

Recommendations

- 1) That new dwellings at Observation Point be sold with a covenant to prohibit ownership of domestic cats or dogs unless it can be demonstrated that such pets can effectively be confined to the property.
- 2) When removing weed thickets outside the development footprint, inspect first for presence of possum drays, birds nests or other habitat features.
- 3) If any native fauna are found during weeding and/or construction works, notify the local chapter of WIRES and organise translocation of the animal to a more secure site.
- 4) That revegetation works focus on the restoration or protective habitat in the shrub stratum, while at the same time taking the requirements of the bushfire legislation into account (*Planning for Bushfire Protection*, RFS 2001).



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 9hii, 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, which 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 <u>and</u> 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 2 - BUSHLAND MANAGEMENT PLAN

3.1 SITE DESCRIPTION

Lot 2 is sited in the central part of the subject site and comprises land on a steep west-facing slope, overlooking Pittwater. Large sandstone 'floaters' or rock ledges outcrop across the slopes, particularly towards the lower part of the Lot. These geological features are to be retained and protected during construction.

Lot 2 is 0.13 hectares (1.290 sq metres) in size. Of this total area, 549 sq metres are reserved for bush regeneration and 149 sq metres are identified 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 and Weed Control

Because Lot 2 is located on steep, relative difficult terrain to access, there has been far less disturbance to the native vegetation. Some horticultural specimens have been planted into Lot 2, notably a very large *Agave americanum* (Century Plant), *Phoenix canariensis* (Canary Island Palm) and *Strelitzia parvifolia* (Bird of Paradise).

Exotic garden plants have spread from the original gardens upslope and have invaded the lower, where they have displaced a large proportion (60-80%) of the native understorey – i.e. the sub-canopy, shrub and ground covers strata. Occurring in large number are garden escapes such as the Asparagus 'ferns', Japanese Honeysuckle, Privet and Ochna. Drainage lines (swales) flowing through Lot 2 have been colonised by water-demanding species such as Crofton Weed, Mist Flower, Blackberry and Fishbone Fern.

There are more native plants remaining in Lot 2 than in other parts of the subject site: many of these grow in small groups in the protection of the rock ledges. The remaining bushland below the rock ledges on Lot 2 have been identified as a bush regeneration area (see Figure 3.1)

Recommendations

- 1) Clear all vegetation within the development footprint by hand, checking first to see if any small native plants suitable for transplanting are present.
- 2) Stockpile weed debris is a pre-designated site for collection and disposal off-site.
- 3) Only qualified and experienced bush regenerators should be employed to clear weeds and undertaken works in areas identified for bush regeneration works.
- 4) Fence off the development footprint (as per Modified Conditions) to ensure no machine access to, or construction impact on remaining native vegetation.
- 5) Identify and clearly mark all native plants to be retained immediately outside the development footprint to ensure that inadvertent damage does not occur.
- 6) 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.
- 7) In the designated 'bush regeneration area', commence a targeted weeding program to remove all keystone weeds – i.e. environmental and declared noxious weeds over a period of 12 months from completion of construction – as above (see Table 3.1).
- 8) For revegetation areas, select species for landscaping from the list provided in Appendix 5, which comprises locally indigenous species and complements the landscape values of the locality. Also see Landscape Drawing LP #13A (Hannan, 2004).



3.2.2 Weed Control Methods

There are numerous methods used to successfully control weeds on private and public lands. In recent years, public opinion has moved away from the use of machinery and the broad-scale application of herbicides to clear weeds in the urban environment.

In remnant bushland, bush regeneration strategies - which include hand weeding, the careful use of selective herbicides, mulching and replanting - have 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 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.

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 2 *

Botanic Name	Common Name	Status
<i>Acetosa sagittata</i>	Turkey Rhubarb	W4b noxious weed
<i>Agave americanum</i>	Century Plant	Horticultural specimen
<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
<i>Delairea odorata</i>	Cape Ivy	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>Olea europaea var africana</i>	African Olive	Environmental weed
<i>Rubus fruticosus</i>	Blackberry	W2 noxious weed
<i>Senna pendula</i>	Cassia	Environmental weed
<i>Strelitzia parviflora</i>	Bird of Paradise	Garden Escape

* this list is not meant to be exhaustive, and more weed 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 structure⁴.

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 2 cannot be described as 'bushland' in terms of SEPP-19⁵. Rather the site can be described as a neglected or overgrown garden, with some native species remaining in situ.

⁴ NSW Department of Urban Affairs & Planning, *Circular No B13*, 17 March 1989

⁵ Although it is noted that GIS (2000) describe the vegetation as 'bushland', although highly simplified and degraded.



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 2 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 2 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.

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 fill 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 *SEPP-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 2 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 2 has been included as 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

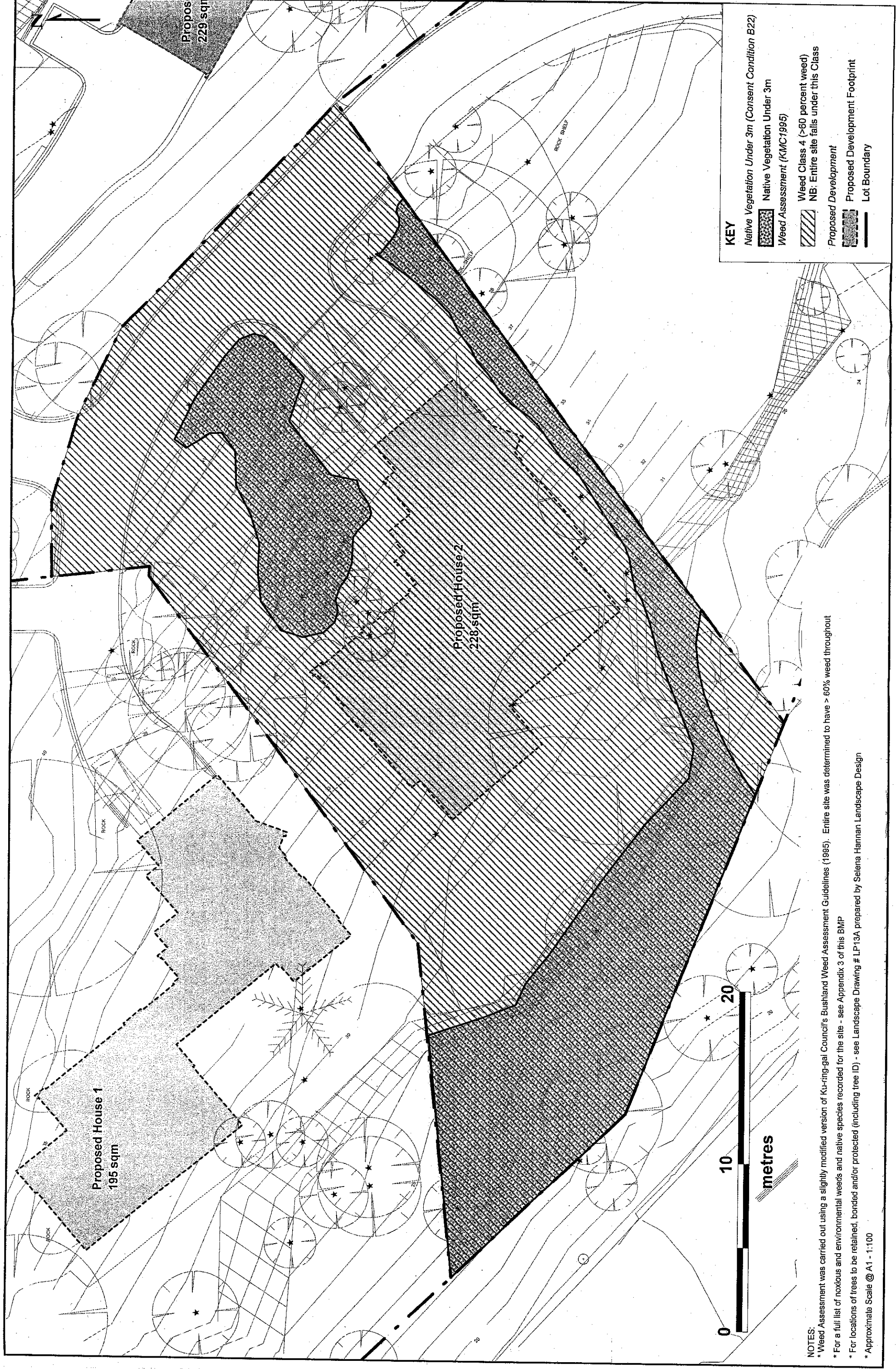


Figure 3.1
Action Plan - Lot 2
Diagram A - Native Vegetation Under 3m & Weed Assessment

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

SPECIES		COMMON NAME	
CANOPY (> 20m)		GRASSES & SEDGES	
Angophora floribunda		Eriolobos stricta	
Corymbia maculata		Gahnia sieberiana	
Eucalyptus botryoides		Gymnostachys anceps	
Eucalyptus piperita		Lomandra longifolia	
		Themedia australis	
SUB-CANOPY (8-20m)		VINES & SCRAMBLERS	
Acacia floribunda		Billardiera scandens	
Acacia implexa		Cayratia clematidea	
Acacia longicarpa		Eustrephus latifolius	
Acmena smithii		Gelonopisium cymosum	
Allocasuarina littoralis		Kennedia rubicunda	
Backhousia myrtifolia		Pandorea pandorana	
Banksia integrifolia		Red-fruited Olive Plum	
Cassia australis		Blueberry Ash	
Elaeocarpus reticulatus		Cheese Tree	
Glochidion ferdinandi		Guinea	
Guioa semiglaucia		Cabbage Tree Palm	
Livistona australis		Blue Lillypilly	
Syzgium oleosum		Common Acronychia	
SHRUBS (< 8m)		Star-hair	
Acronychia oblongifolia		Dwarf's Apples	
Astrotiche divaricata		Rough Tree Fern	
Beyntia oblongifolia		Straw Tree Fern	
Cyathea australis		Hairy Clerodendrum	
Cyathea cooperi		Burrawang	
Clerodendrum tomentosum		Veined Mock-Olive	
Macrozamia communis		Bleeding Heart Tree	
Notholaes venosa		Narrow-leaved Geebung	
Omalanthus populifolius		Yellow Pittosporum	
Persoonia linearis		Handsome Flat Pea	
Pittosporum revolutum		Graceful Bush Pea	
Platylabium formosum		Muttonwood	
Pultenaea flexilis		Scintless Rosewood	
Rapanea variabilis		Veiny Wilkiea	
Syracum glandulosum		Grass Tree	
Wilkiea huegeliana		Blue Flax Lily	
Xanthorrhoea macronema		Crimble Bush	
GROUNDCOVERS		Purple Pastel Flower	
Dianella caerulea, D. producta		Native Violet	
Lomelia myricoides			
Pseudanthurum variabile			
Viola hederacea			

Proposed House 1

Wiry Panic Grass
Saw-sedge
Settler's Flax
Spiny Mat-rush
Kangaroo Grass

Apple Dimpplings
Slender Grape
Wombat Berry
Scrambling Lily
Dusky Coral Fern
Wonga Wonga Vine
Cockspur

Adiantum aethiopicum
Blechnum cartilagineum
Doodia caudata var caudata
Gleichenia dicarpa
Histiopleris inclsa
Todea barbara

Maidenhair Fern
Gristle Fern
Rasp Fern
Pouched Coral Fern
Bat's Wing Fern
Harsh Ground Fern
King Fern

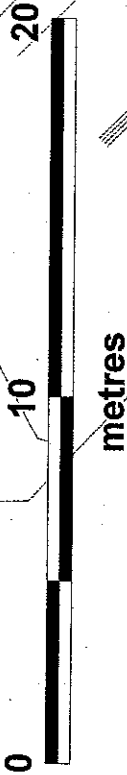
Proposed House 2
228 sqm

Additional 'Replacement Tree Plantings' to be installed here - per Condition Consent B27. Refer Landscape Plan (Drawing LP13 A)

Planting Mix Y (per Consent Condition B23) to be installed here. Refer Landscape Plan (Drawing LP13 A)

KEY

- Exclusion Fencing
- Revegetation Zone (148 sqm)
- Regeneration Zone (562 sqm) (corresponds to "Areas of remnant vegetation to be retained", as per Consent Condition B15)
- Proposed Development Footprint
- Lot Boundary



NOTES:
* For locations of trees to be retained, bonded and/or protected (including tree ID) - see Landscape Drawing # LP13A prepared by Selena Hamman 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

Figure 3.1
Action Plan - Lot 2
Diagram B - Revegetation and Regeneration Areas



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	MONTH																												
	Pre-construction				Construction	Post-construction																							
	4	3	2	1		1	2	3	4	5	6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	31-33	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																													

Sediment fencing	11.00
Stake	32.00
Tree marking, supply & lay	4.00
Native crop, as specified	5.00



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
Primary weed control in revegetation and regeneration areas, as indicated on Drawing (549 sq.m approx)	32.00	78	2,496.00
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	3.80	90	342.00
Supply and plant Hikos/virocells	1.80	600	1,080.00
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			\$18,693.00
			GST
			\$1,869.30
			Total
			\$20,562.30

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	



5 REFERENCES

- Benson, D.H. and Howell, J. (1994). The Natural Vegetation of the Sydney 1:100 000 Map Sheet. *Cunninghamia* 3: (4) 677-787.
- Briggs, J. and Leigh, J. (1996). *Rare or Threatened Australian Plants*. CSIRO Publishing, Collingwood.
- Bureau of Meteorology Online (2004). *Climate Averages for Australian Sites: Riverview Observatory #066131*. http://www.bom.gov.au/climate/averages/tables/cw_066131.shtml. [Accessed June 2004].
- Chapman, G.A. and Murphy, C.L. (1989). *Soil Landscapes of the Sydney 1:100 000 Sheet*. Soil Conservation Service of NSW, Sydney.
- GIS Environmental Consultants (November 2000). Flora and Fauna Impact Assessment for Proposed Development at Observation Point, 1148-1152 Barrenjoey Road, Palm Beach. Unpublished report prepared for Raypond Developments Pty. Ltd
- GIS Environmental Consultants (May 2003). Bushland Management Concept Plan for Observation Point, 1148-1152 Barrenjoey Road, Palm Beach. Unpublished report prepared for Raypond Developments Pty. Ltd.
- Herbert, C. (ed.) (1983). *Geology of the Sydney 1:100 000 Sheet*. NSW Department of Mineral Resources.
- Ku-ring-gai Municipal Council (1995). Bushland Weed Assessment Guidelines. Ku-ring-gai Council, Gordon.
- NSW Scientific Committee (2004). *Threatened Species - Final Determinations*. <http://www.nationalparks.nsw.gov.au/npws.nsf/Content/List+of+Scientific+Committee+determinations> [Accessed June 2004].
- Pittwater Council (2000) Development Control Plan #25 Conservation of Biodiversity. Pittwater Council, Dee Why.
- Rural Fire Service (NSW) (2001). Planning for Bushfire Control. RFS/DUAP, Sydney.



6 APPENDICES



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

**Bushland Management Plan
House 2, Observation Point, 1148-1152 Barrenjoey Road, Palm Beach**

Development consent was given by Pittwater Council for construction of a dwelling on Lot 2 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)

- 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)
[Signature] 15.11.04

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) 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) 15.11.03
- 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) 15.11.03
- 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	Ipomoea 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	PITOSPORACEAE	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 pandarana	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	Conyza albida	ASTERACEAE	Shrub	Fleabane	Weed
38	Scattered	Dendrobium linguiforme	ORCHIDACEAE	Herb	Tongue Orchid	
39	Scattered	Gnaphalium sp.	ASTERACEAE	Herb	Cud weed	weed
40	Scattered	Hibiscus sp.	MALVACEAE	Shrub	Hibiscus	Planted
41	Scattered	Hypochaeris glabra	ASTERACEAE	Herb	Smooth Cats Ear	Weed
42	Scattered	Ipomea calrica	CONVOLVULACEAE	Vine	Morning Glory	Nox W4c
43	Scattered	Livistana australis	ARECACEAE	Palm	Cabbage Tree Palm	Significant
44	Scattered	Nephrolepis cordifolia	DAVALLIACEAE	Fern	Fishbone Fern	Weed

45	Scattered	Ochna serrulata	OCHNACEAE	Shrub	Ochna, Mickey Mouse Plant	Nox W4b
46	Scattered	Opilismenus aemulus	POACEAE	Grass	Basket Grass	
47	Scattered	Paspalum dilatatum	POACEAE	Grass	Paspalum	Weed
48	Scattered	Rubus hillii	ROSACEAE	Scrambler	Broad-leaved Bramble	
49	Scattered	Solanum mauritianum	SOLANACEAE	Shrub	Wild Tobacco Tree	Weed
50	Scattered	Tropaeolum majus	TROPAEOLACEAE	Herb	Nasturtium	Weed
51	Scattered	Watsonia meriana cv. Bulbilifera	IRIDACEAE	Herb	Wild Watsonia, Bugle Lily	Weed
52	Uncommon	Arundo donax	POACEAE	Grass	Giant Reed / Elephant Grass	Nox W4a
53	Uncommon	Bougainvillea sp.	NYCTAGINACEAE	Shrub	Bougainvillea	Weed
54	Uncommon	Bryophyllum delagoense	CRASSULACEAE	Herb	Mother-of-millions	Weed
55	Uncommon	Cestrum parqui	SOLANACEAE	Shrub	Green Cestrum	Nox W2
56	Uncommon	Clivia miniata	AMARYLLIDACEAE	Herb	Kaffir Lily	Planted
57	Uncommon	Cotoneaster pannosus	ROSACEAE	Shrub	Cotoneaster	Weed
58	Uncommon	Dimorphanthea ecklonis	ASTERACEAE	Herb	Sailor Boy Daisy	Weed
59	Uncommon	Grevillea Hybrid	PROTEACEAE	Shrub	Grevillea	Planted
60	Uncommon	Monstera deliciosa	ARACEAE	Herb	Swiss Cheese Plant	Weed
61	Uncommon	Musa sp.	MUSACEAE	Herb	Banana	Planted
62	Uncommon	Nerium oleander	APOCYNACEAE	Shrub	Oleander	Planted
63	Uncommon	Phoenix canariensis	ARECACEAE	Palm	Canary Island Palm	Planted
64	Uncommon	Physalis peruviana	SOLANACEAE	Herb	Cape Gooseberry	Weed
65	Uncommon	Plantago lanceolata	PLANTAGINACEAE	Herb	Lamb's Tongues, Plantain	Weed
66	Uncommon	Plectranthus parviflorus	LAMIACEAE	Herb	Cocksfoot Flowers	
67	Uncommon	Protaspargus aethiopicus	ASPARAGACEAE	Herb	Asparagus Fern	Nox W4c
68	Uncommon	Solanum nigrum	SOLANACEAE	Herb	Black-berry Nightshade	Weed
69	Uncommon	Syzgium oleosum	MYRTACEAE	Tree	Blue Lillypilly	Significant
70	Uncommon	Tetragonia tetragonoides	AIZOACEAE	Herb	Warrigal Greens, Native Spinach	

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	Backhousia 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	Glacchidion ferdinandii var. ferdinandii	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 pandorana	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	Parramatta Green Wattle	
98	Scattered	Ageratina riparia	ASTERACEAE	Herb	Crofton Weed	Weed
99	Scattered	Angophora floribunda	MYRTACEAE	Tree	Rough-barked Apple	
100	Scattered	Calochloa 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	Hypochoeris glabra	ASTERACEAE	Herb	Smooth Cats Ear	Weed
115	Scattered	Livistona australis	ARECACEAE	Palm	Cabbage Tree Palm	Significant
116	Scattered	Opilsminus 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	Prickly 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	Breyntia oblongifolia	EUPHORBIACEAE	Shrub	Breyntia	

Bushland Management Plan, Observation Pt, Palm Beach

128	Uncommon	Cyathea cooperi	CYATHEACEAE	Fern	Straw Tree Fern	Planted
129	Uncommon	Eriobotrya japonica	ROSACEAE	Shrub	Loquat	
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	Pearsonia linearis	PROTEACEAE	Shrub	Narrow-leaved Geebung	
134	Uncommon	Petrasellum 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 setrulata</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



Botanical Name	Common Name	Category
<i>Rubus fruticosus</i> (agg. spp.)	Blackberry	W2
<i>Salix</i> spp.*	Willows	W4g
<i>Salvinia molesta</i>	Salvinia	W1
<i>Toxicodendron succedaneum</i>	Rhus Tree	W2

* with the exception of *S. babylonica*, *S. calodendron*, *S. reichardtii*.

Actions Required For Noxious Weed Categories

W1 must be notified to local Council then fully and continuously suppressed and destroyed.

W2 must be fully and continuously suppressed and destroyed.

W3 must be prevented from spreading and its numbers and distribution reduced.

W4a shall not be sold, propagated or knowingly distributed. No part of the plant can grow within 3m of boundary.

W4b shall not be sold, propagated or knowingly distributed. Established plantings must be prevented from flowering and fruiting.

W4c shall not be sold, propagated or knowingly distributed. Occupier must prevent spreading to adjoining property.

W4d shall not be sold, propagated or knowingly distributed. Any tree three (3) m in height or less must be removed. Any tree within half a kilometre (0.5 km) of remnant urban bushland, as defined by SEPP 19, and not deemed by Council as having historical or heritage significance shall be removed.

W4f shall not be sold, propagated or knowingly distributed. Occupier must implement biological control or other control program directed by the Local Control Authority.

W4g must not be sold, propagated or knowingly distributed.

(NSW Noxious Weeds Act 1993)

Note: *Cortaderia selloana* (Pampas Grass) occurs in the cement crib retaining wall on Palm Beach Road. This is public land and the control of noxious weeds in this area is the responsibility of Pittwater Council.



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, L. 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 var 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 sp, Aloe sp</i>	Succulents	Garden escape			✓ Bobcat					Large specimen Lot 2, plus seedlings
<i>Ageratina adenophora, 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



Bushland Management Plan, Lot 2 Observation Point

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>Chlorophytum comosum</i>	Spider Lily	Garden escape/ Environmental			✓					✓	Remove all roots	
<i>Neprolepis 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 sp.</i>	Fan Palm	Garden escape/ Environmental			✓ young plants	✓					Widespread -- throughout site	
<i>Watsonia bulbiflora</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 Brushoff. Forms dominant groundcover in Lots 2 & 3.	
<i>Tradescantia fluminensis</i>	Wandering Jew	Environmental weed/ Garden escape	✓							✓	Mostly in drainage lines. Garden of old house in Lot 4	



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, 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>Gabnia 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 gymosum</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 dicarpa</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 ⁶.
- 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.

⁶ 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

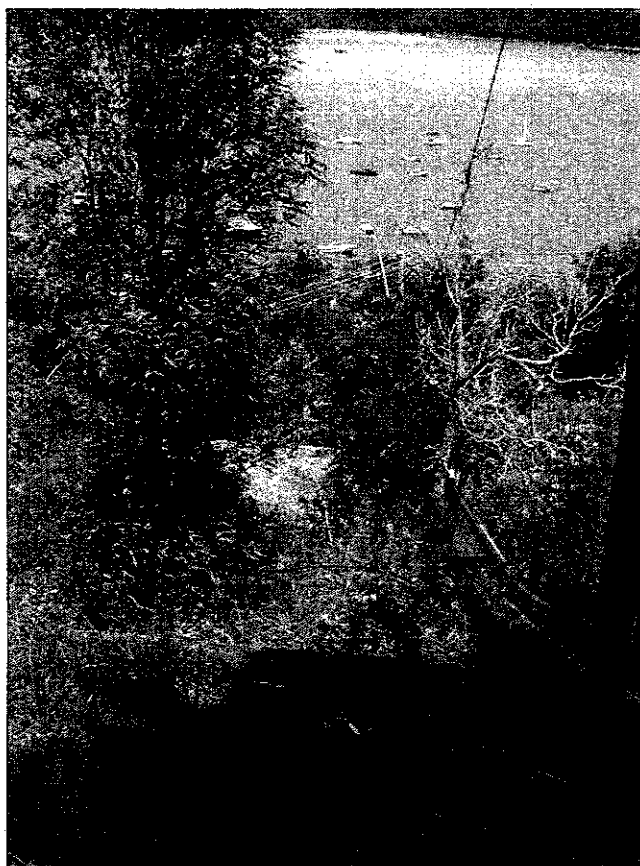
- 1) Once construction works have been completed and the site is stabilised, remove exclusion fencing and tree guards.
- 2) Bush regeneration works are to commence in the areas identified for 'bush regeneration' (see Figure 3.1) and should be completed within 12 months.
- 3) Revegetation works must be carried as quickly as possible post-construction, using a planting mix that should be predominantly local native species. Areas for indigenous revegetation 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 south-west of dense weed thickets and sparse native canopy, just above the rock platform. This section is part of the proposed development footprint.



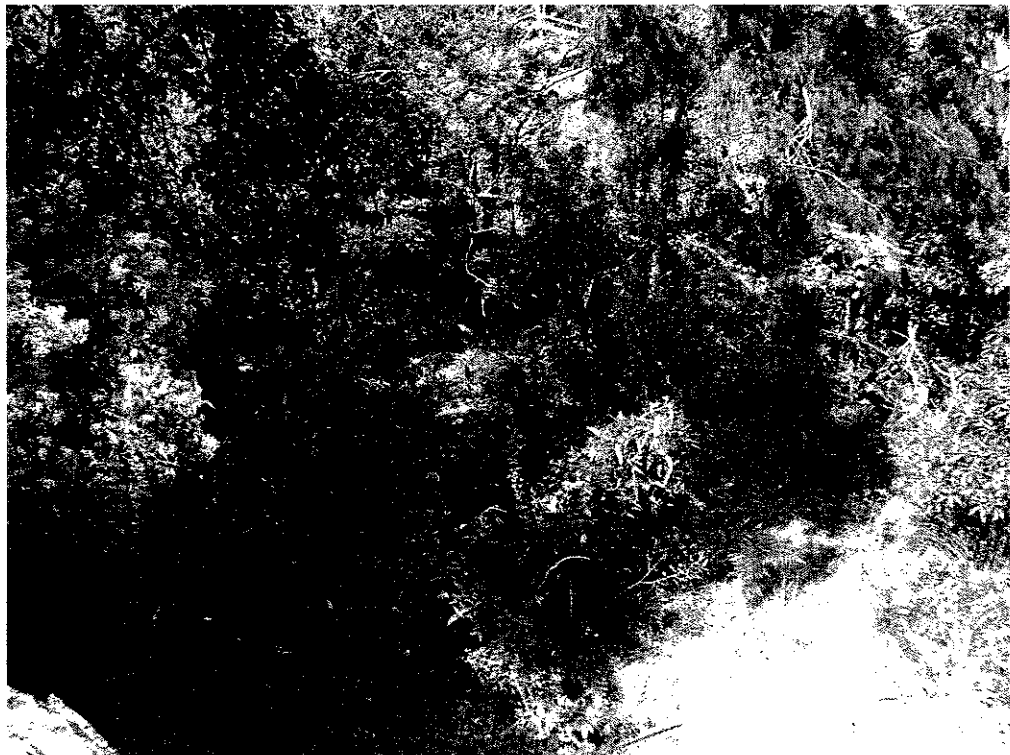
View west of the boundary of Lot 2. The stormwater alignment is proposed through this section, and it is classed for 'revegetation' following the stormwater works.



View upslope of tree (T83) located in the northeastern corner of the Lot – this tree is to be protected by fencing and retained. Note existing fibro cottage (to be demolished) in rear of plate.



View of vegetation in northern corner of Lot – this section is classed as a 'regeneration' area, and will require significant weed removal to eradicate the Asparagus Fern and Broad-leaved Privet evident.



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



APPENDIX 8: JUDITH RAWLING, *CURRICULUM VITAE*

CURRICULUM VITAE

JUDITH LOUISE RAWLING

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



PERSONAL DETAILS

Name: Judith Louise Rawling
Citizenship: Australian/Canadian
Health: Excellent
Address: Business: 111 Showground Road,
CASTLE HILL NSW 2154
Home: "St Clements", 1238 Bells Line of Road
KURRAJONG HEIGHTS NSW 2758
Telephone: Home: (02) 4567 7979
Business: (02) 9894 2255
Mobile: 0414 886 219
Fax: Home: (02) 4566 7979
Business: (02) 9894 2215

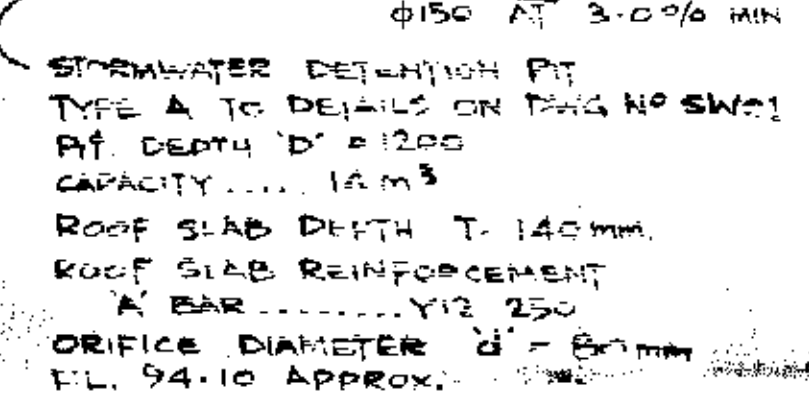
CURRENT POSITION


- 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.

General Manager

Engineering Design & Development Manager

1



DATE	REVISION	BY	T J TAYLOR CONSULTANTS PTY LIMITED Consulting Civil and Structural Engineers A/C No. 402/04/94 30 Fisher Road, Dee Why, NSW 2099 Telephone: 952 7092 Fax: 952 5896		
			STORMWATER DRAINAGE DETENTION DETAIL 51 BARDO ROAD NEWPORT FOR MR A ELLIS		
			DRAWN Ikw.	CHECKED <i>W. Ellis</i>	SCALE 1:100
			DEC 1993	1/11/93	DRAWING No. 29793

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 'Eclipse' 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 :
A N12-250 denotes A 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 dry 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

51. All Structural steelwork to be Grade 500 or greater.
Design, fabrication and erection to be in accordance with AS 4100.
52. Materials and workmanship shall comply with AS 1250 - 1981, SAA Steel Structures Code and the specification for Structural Steel.
53. Rolled steel sections including steel plates shall comply with AS 3678 - 1990.
54. Cold formed steel sections shall be Grade 450 Zinc coated in accordance with AS 1538-1988.
55. Welded and seamless steel hollow sections shall comply with AS 1163. Grade 350.
56. 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.
57. Unless shown otherwise, minimum connection shall be 2M16 bolts, 10 thick gusset plates, 6mm continuous fillet welds.
58. Load indicating washers shall be used in all fully tensioned joints. (8.8TF & 8.8TB).
59. All welding shall be carried out in accordance with AS 1554 SAA Structural Steel Welding Code.
510. Unless noted otherwise all welds shall be category SP using E41xx Electrodes.
All butt welds shall be complete penetration butt welds category SP.
511. Grouting of anchor bolt sleeves and base plates shall be completed by the contractor using High Strength, Non-Shrink grout.
512. Fabrication and erection tolerances for Structural Steelwork shall be in accordance with AS 4100.
513. Purlin bolts shall be M12 - 4.6S galvanised.
514. 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 Luxaprima applied by hand using brushes to achieve a total dry film thickness of 70 microns.EXTERNAL ELEMENTS, & ELEMENTS WITHIN EITHER SKIN OF EXTERNAL CAVITY WALL
 - 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 Acarathane I 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.
515. 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 u.n.o.
- 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 Reseal 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:

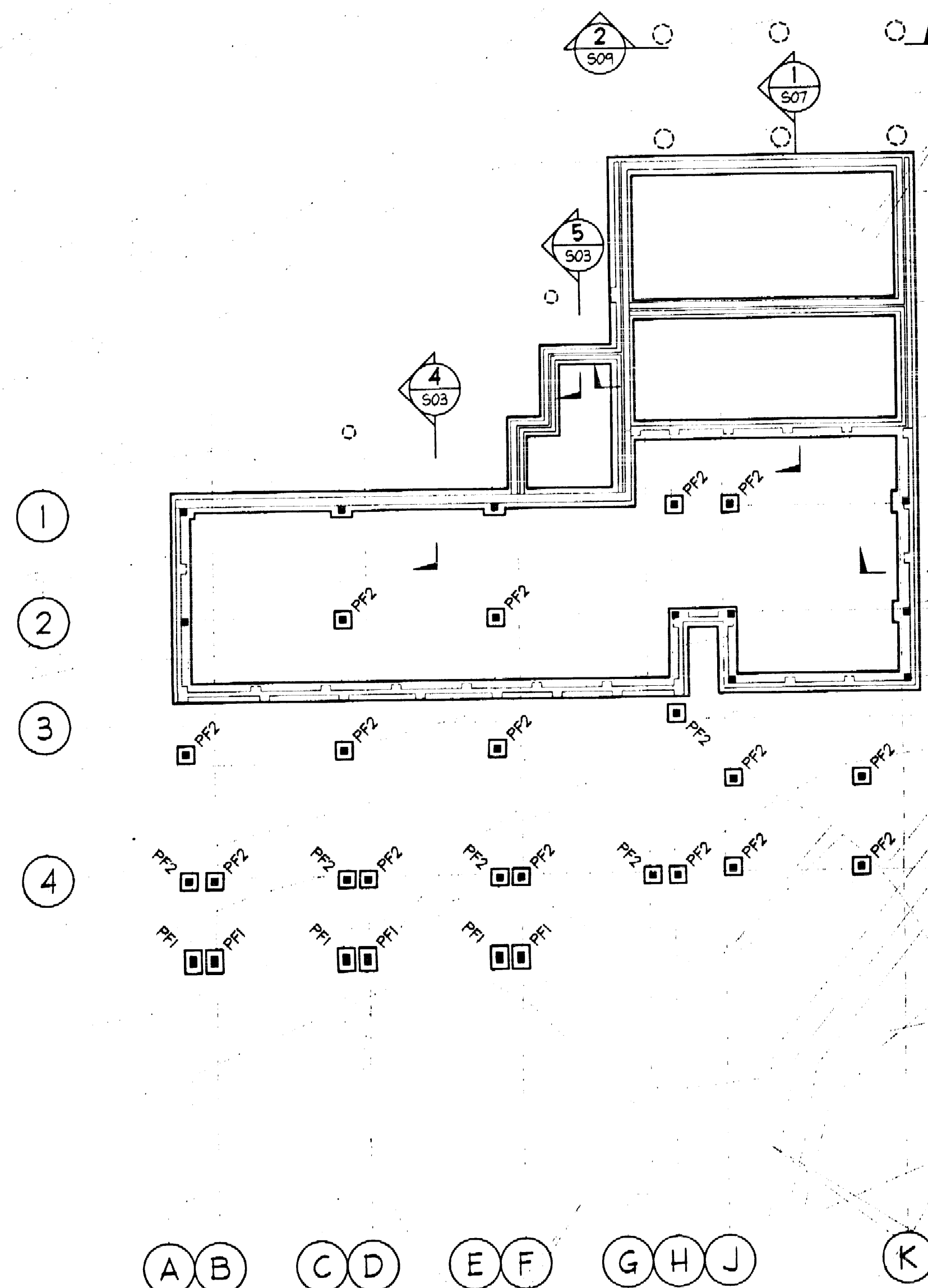
- S01 - GENERAL NOTES AND DRAWING SCHEDULE
- S02 - FOOTING PLAN AND DETAILS
- S03 - FOOTING AND RETAINING WALL DETAILS
- S04 - LOWER LEVEL SLAB AND FRAMING PLAN
- S05 - LOWER LEVEL FRAMING DETAILS
- S06 - MID LEVEL LEVEL SLAB AND
FRAMING PLAN AND DETAILS
- S07 - MID LEVEL SLAB AND FRAMING DETAILS
- S08 - UPPER LEVEL SLAB AND
LOWER ROOF FRAMING PLAN
- S09 - UPPER LEVEL SLAB AND LOWER
ROOF FRAMING DETAILS
- S10 - UPPER ROOF FRAMING PLAN
- S11 - LOWER AND UPPER ROOF FRAMING DETAILS

[illegible]

CITY PLAN SERVICES
Construction Cert. No.: Approved Date:
24687 03 DEC 2004
Certifying Authority: Brandon Bennett
Accreditation No: FIA3004

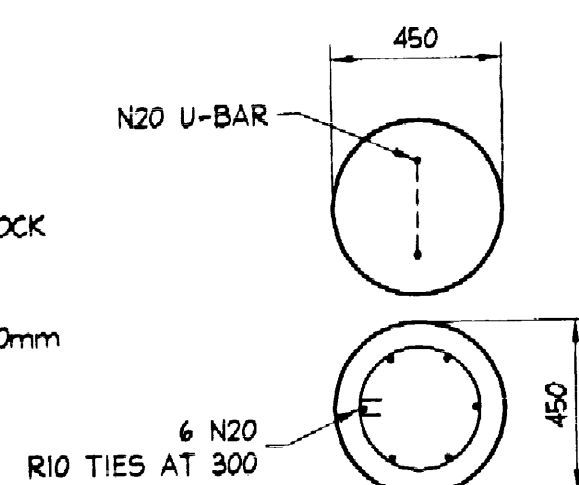
Graybrook
16/11/08

NOT FOR
CONSTRUCTION
ISSUED FOR TENDER



CONCRETE PIERS:

- PIERS TO BE 450mm DIAMETER
SOCKET 200mm INTO SOUND ROCK
- FOR DEPTH LESS THAN 1200mm
1 N20 U-BAR
- FOR DEPTH GREATER THAN 1200mm
6 N20, R10 TIES AT 300.

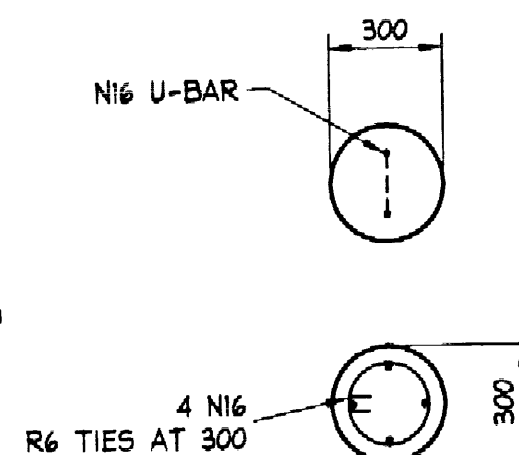


450mm Ø FOOTING PIER SECTION

SCALE = 1:20

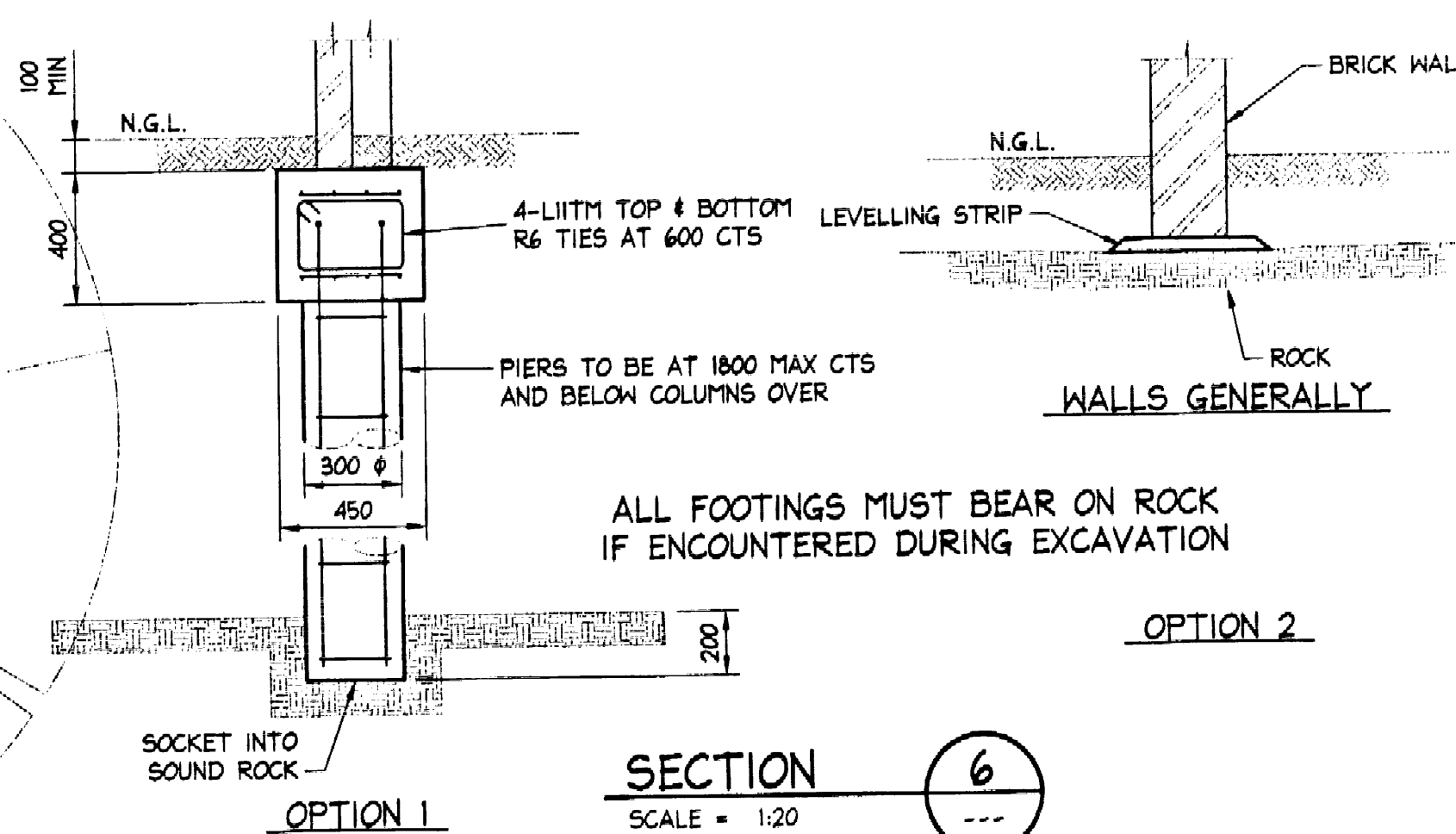
CONCRETE PIERS:

- PIERS TO BE 300mm DIAMETER
SOCKET 200mm INTO SOUND ROCK.
- FOR DEPTH LESS THAN 1200mm
1 N16 U-BAR
- FOR DEPTH GREATER THAN 1200mm
4 N16, R6 TIES AT 300.



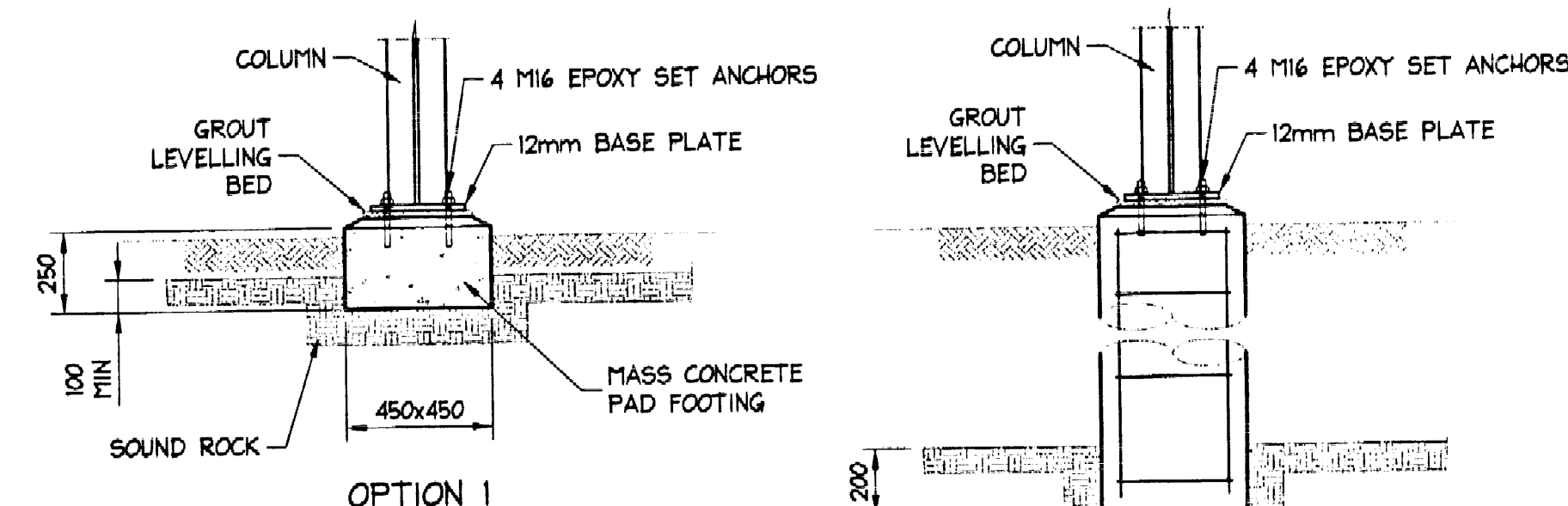
300mm Ø FOOTING PIER SECTION

SCALE = 1:20



TYPE PF1 PAD FOOTING

SCALE = 1:20

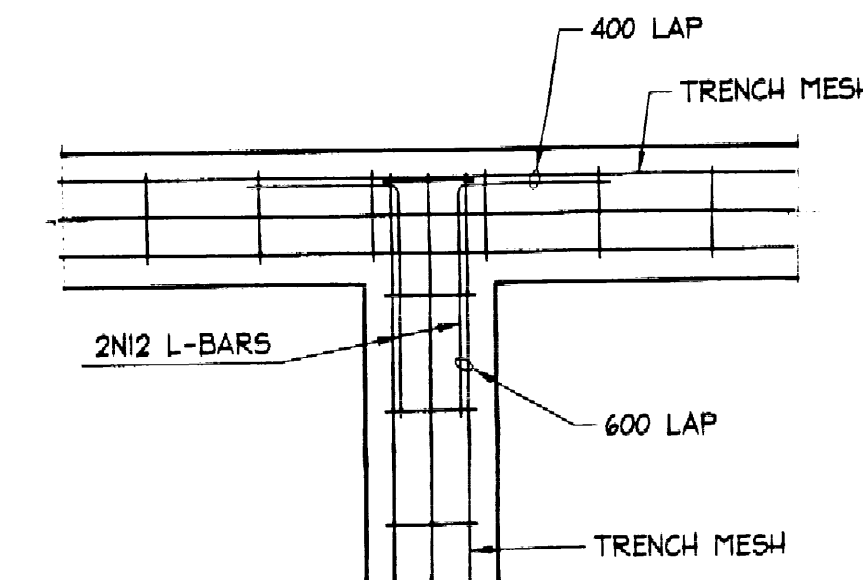
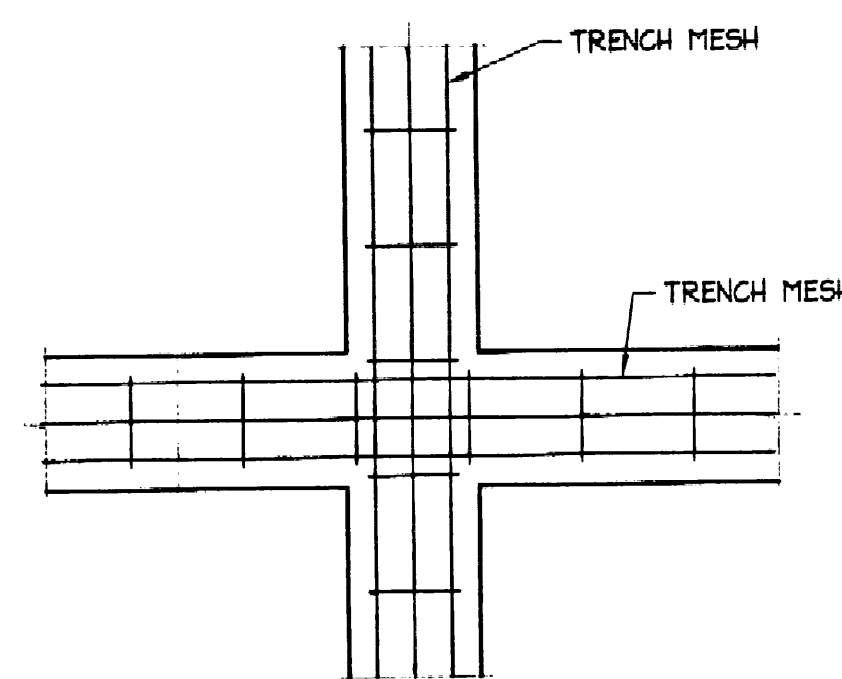


OPTION 1

OPTION 2

FOOTING 'X' JUNCTION

SCALE = 1:20

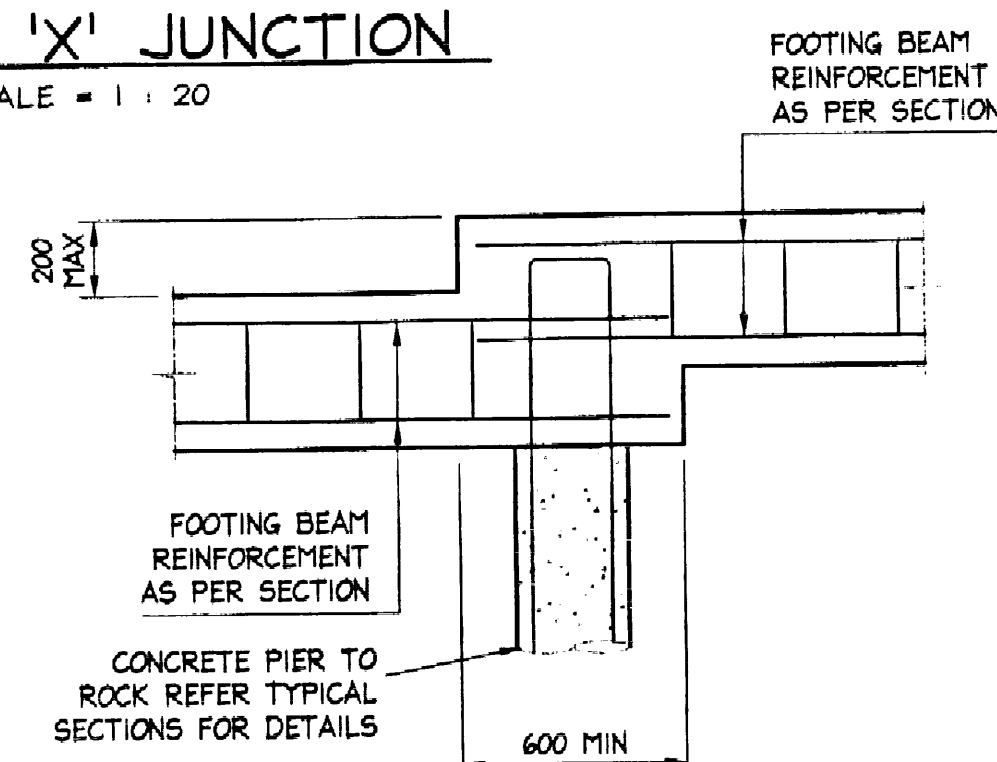
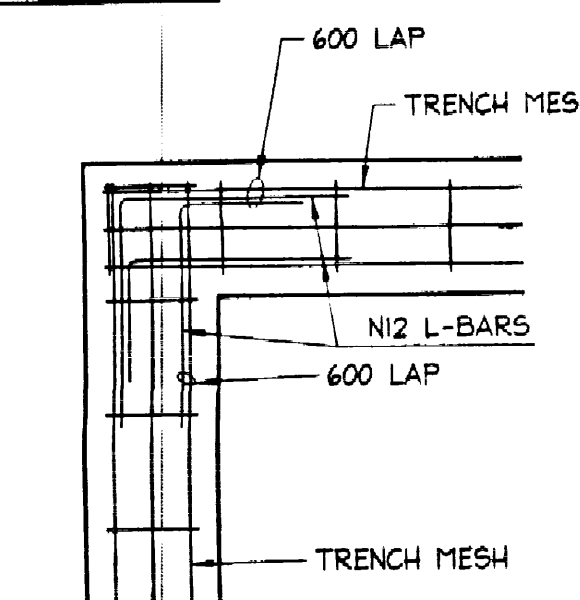


FOOTING 'T' JUNCTION

SCALE = 1:20

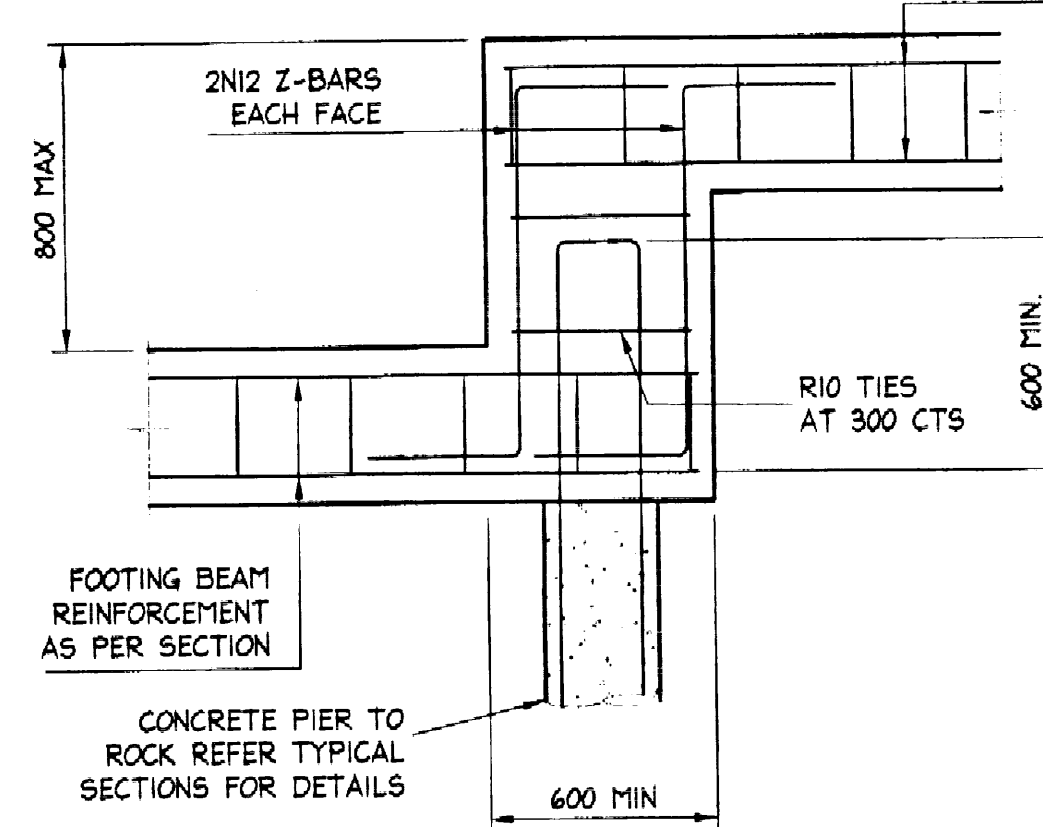
FOOTING CORNER

SCALE = 1:20



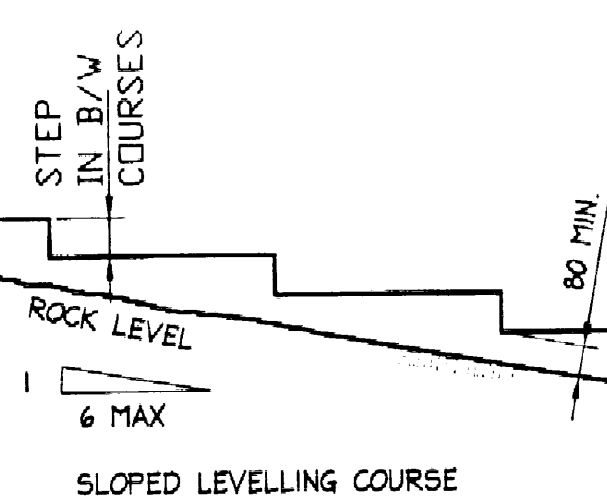
TYPICAL STEP FOOTING DETAILS

SCALE = 1:20



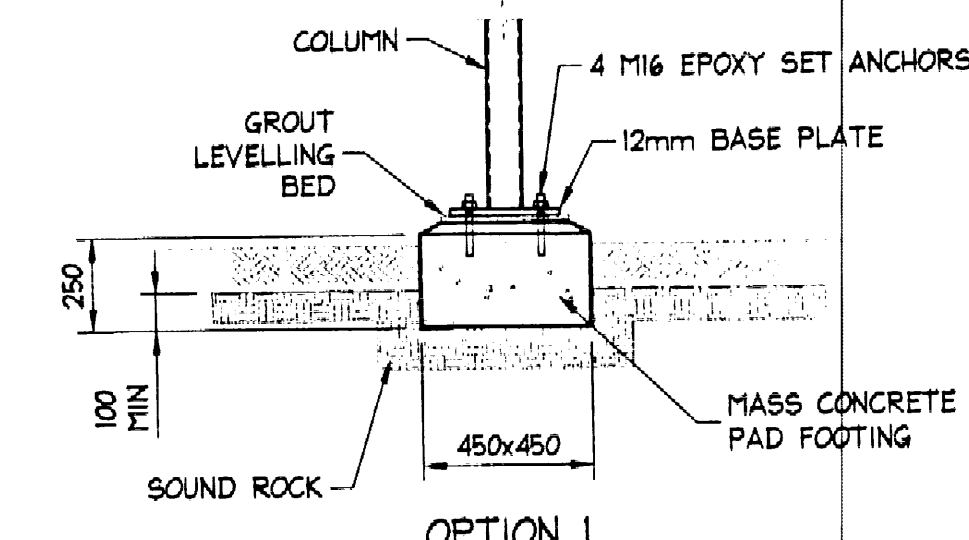
FOOTING BEAM REINFORCEMENT AS PER SECTION

SCALE = 1:20



STEP IN B/W COURSES

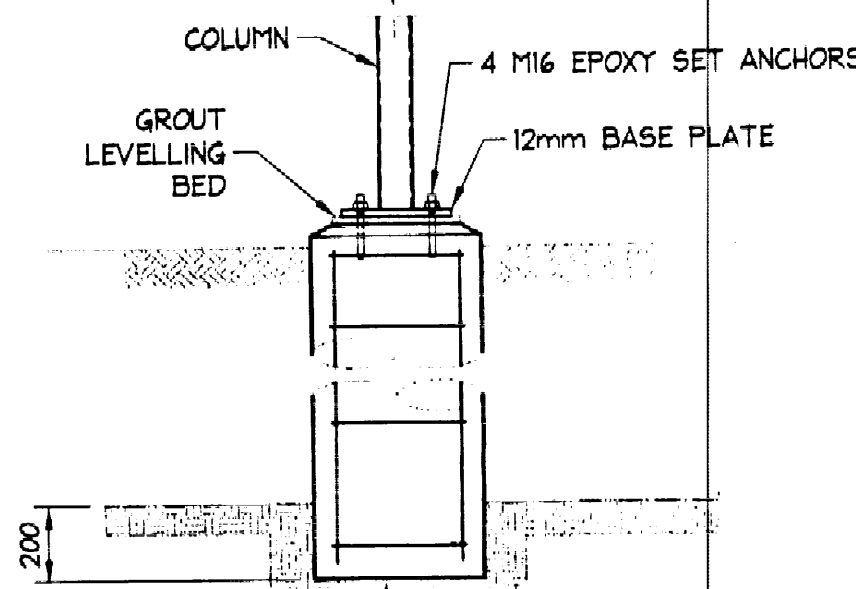
SCALE = 1:20



OPTION 1

TYPE PF2 PAD FOOTING

SCALE = 1:20



OPTION 2

FOOTING BEAM REINFORCEMENT AS PER SECTION

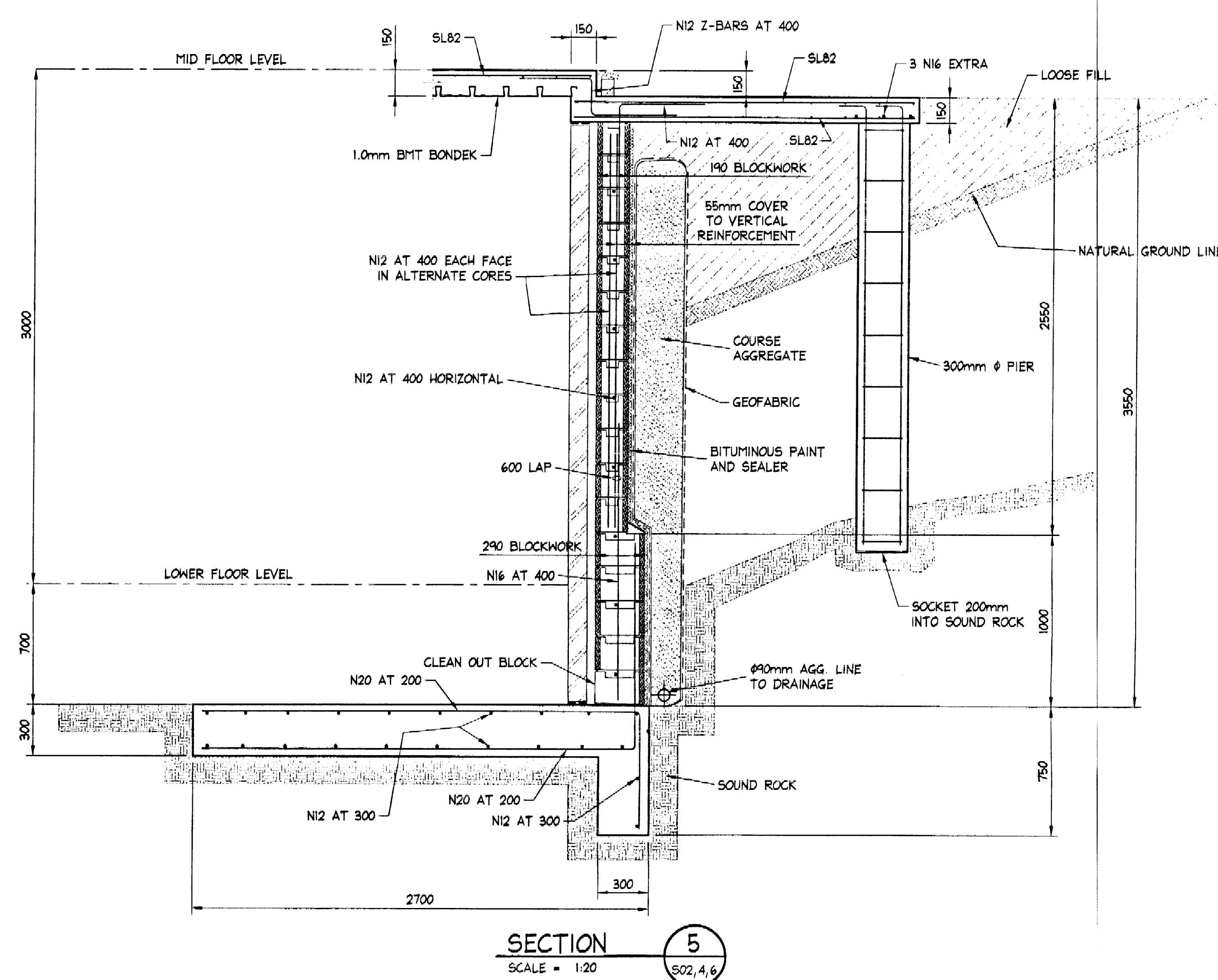
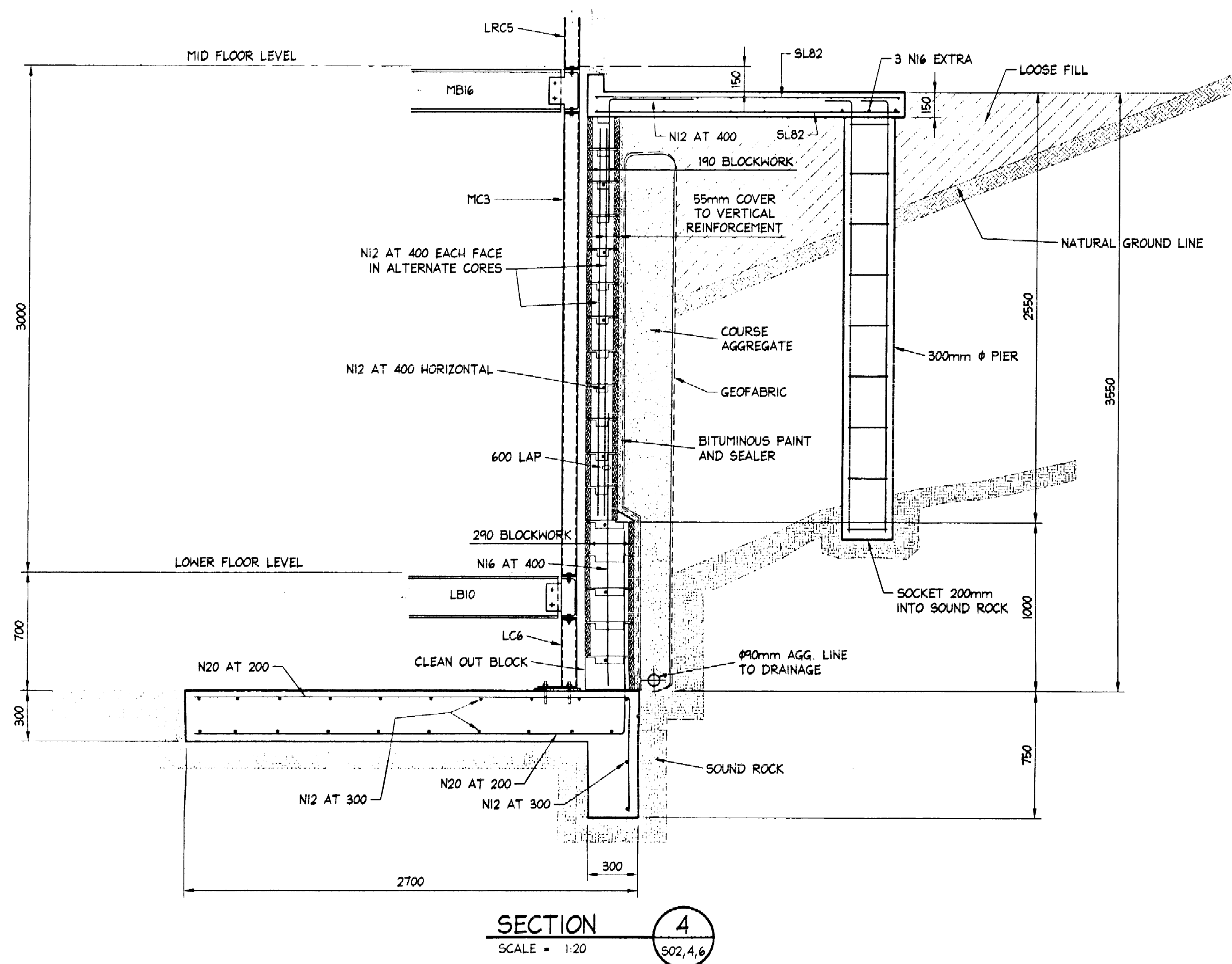
CITY PLAN SERVICES
Construction Cert. No. Approved Date:
24087 03 DEC 2004
Certifying Authority: Brendan Bennett
Accreditation No. PIAS304

NOT FOR
CONSTRUCTION
ISSUED FOR TENDER

<p>AI</p> <p>Date: Aug 03</p> <p>Rev: 1</p> <p>Amendment:</p>	<p>DOCUMENT CERTIFICATION</p> <p>Date: Aug 03</p> <p>Rick G. Wray</p> <p>(Director Northern Beaches Consulting Engineers)</p>	<p>I am a qualified Structural/Civil Engineer.</p> <p>I hold the following qualifications:</p> <p>BE(Civil), CPEng, MIEAust., NPER.</p> <p>Institute of Engineers Membership No. 803938</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. 076 121 816 A.B.N. 24 076 121 816</p> <p>Suite 207, 30 FISHER ROAD</p> <p>DEE WHY N.S.W. 2099</p> <p>Ph: (02) 9884 7000 Fax: (02) 9884 7444</p> <p>e-mail: nb@nbconsulting.com.au</p>	<p>Project: HOUSE 2</p> <p>1148-1152 Barrenjoey Road</p> <p>56 Palm Beach Road</p> <p>Palm Beach</p> <p>Raypond Development</p>	<p>Drawing Title: FOOTING PLAN AND DETAILS</p> <p>Date: Aug 2003</p> <p>Design: R.G.W.</p> <p>Drawn: Paul R Bruce</p> <p>Checked: Paul R Bruce</p> <p>Job No: 030703</p> <p>Drawing No: S02</p> <p>Rev: -</p>
---	---	--	--	---	---

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.



CITY PLAN SERVICES
Construction Cert. No: Approved L303
24887 03 DEC 2004
Certifying Authority: Brendan Bennett
Accreditation No: PIA3004

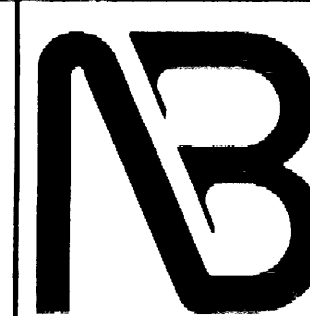
16/11/04

NOT FOR
CONSTRUCTION
ISSUED FOR TENDER

DOCUMENT CERTIFICATION

Date: 16/03/04
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.



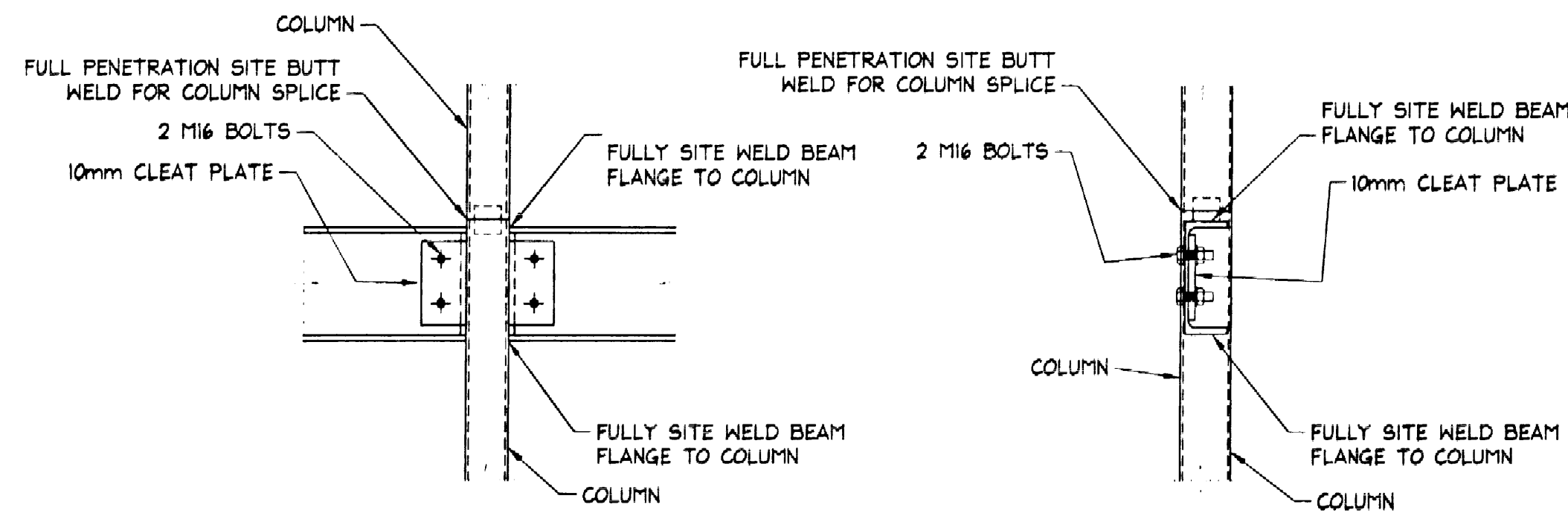
NORTHERN BEACHES
Consulting Engineers P/L.
A.C.N. 078 121 816 A.B.N. 24 078 121 816
Suite 207, 30 FISHER ROAD
DEE WHY N.S.W. 2099
Ph: (02) 9984 7000 Fax: (02) 9984 7444
e-mail: nb@nbconsulting.com.au

Project: HOUSE 2
1148-1152 Barrenjoey Road
56 Palm Beach Road
Palm Beach
Raypond Development

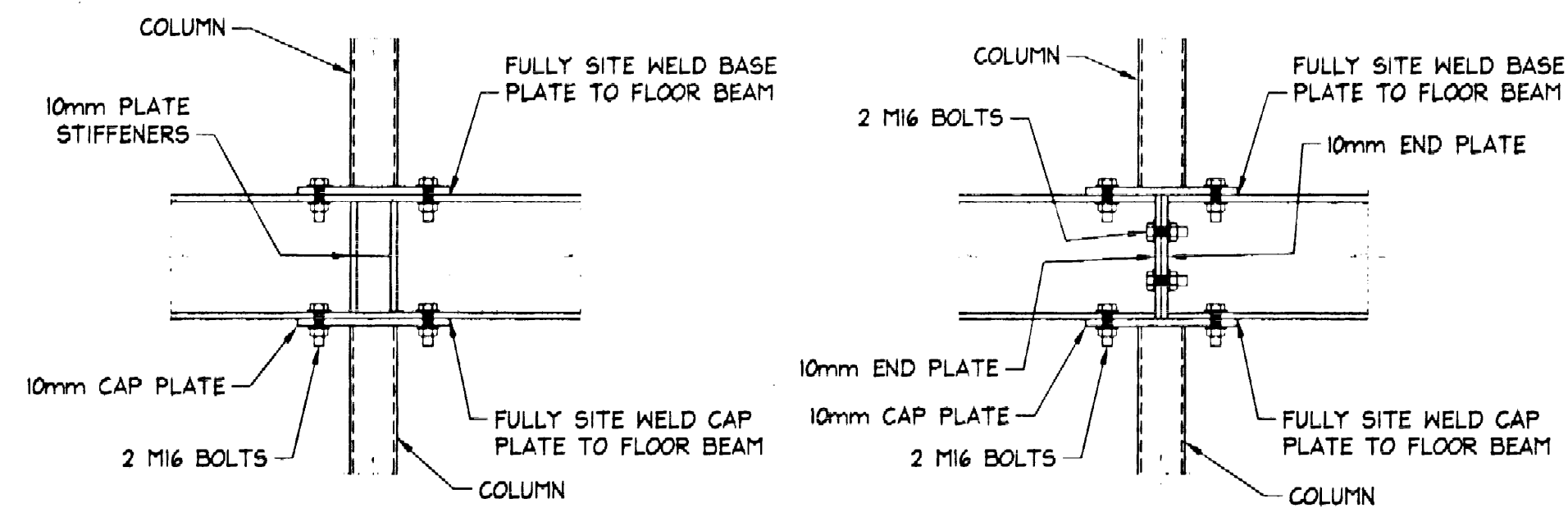
Drawing Title:
FOOTING AND RETAINING
WALL DETAILS

The copyright of this drawing remains with Northern Beaches Consulting Engineers P/L.

Date: Aug 2003	Design: R.G.W.	Drawn: Paul R Bruce MIEAust., MIDAust.	Checked:
Job No: 030703	Drawing No: S03	Rev:	-



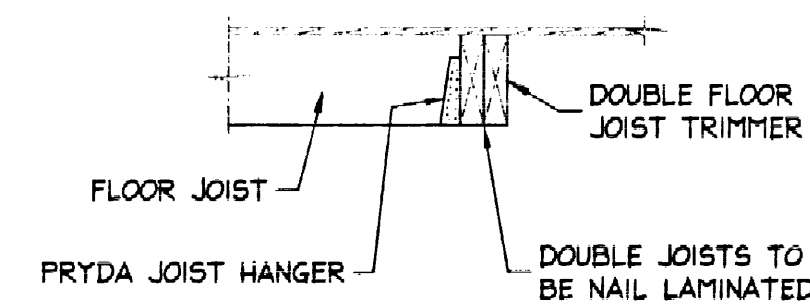
OPTION 1



OPTION 2

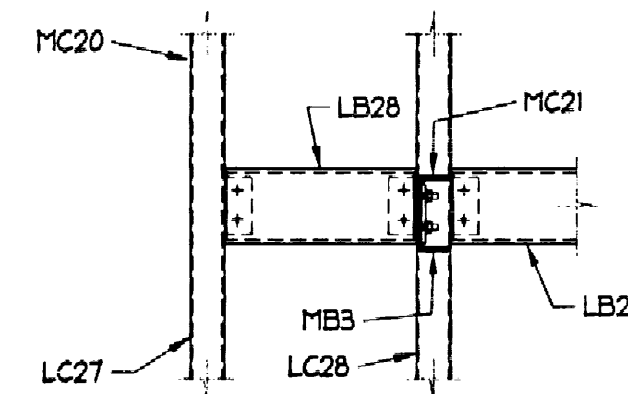
TYPICAL COLUMN TO BEAM CONNECTION DETAILS

SCALE = 1 : 10



TYPICAL FLOOR JOIST CONNECTION DETAILS

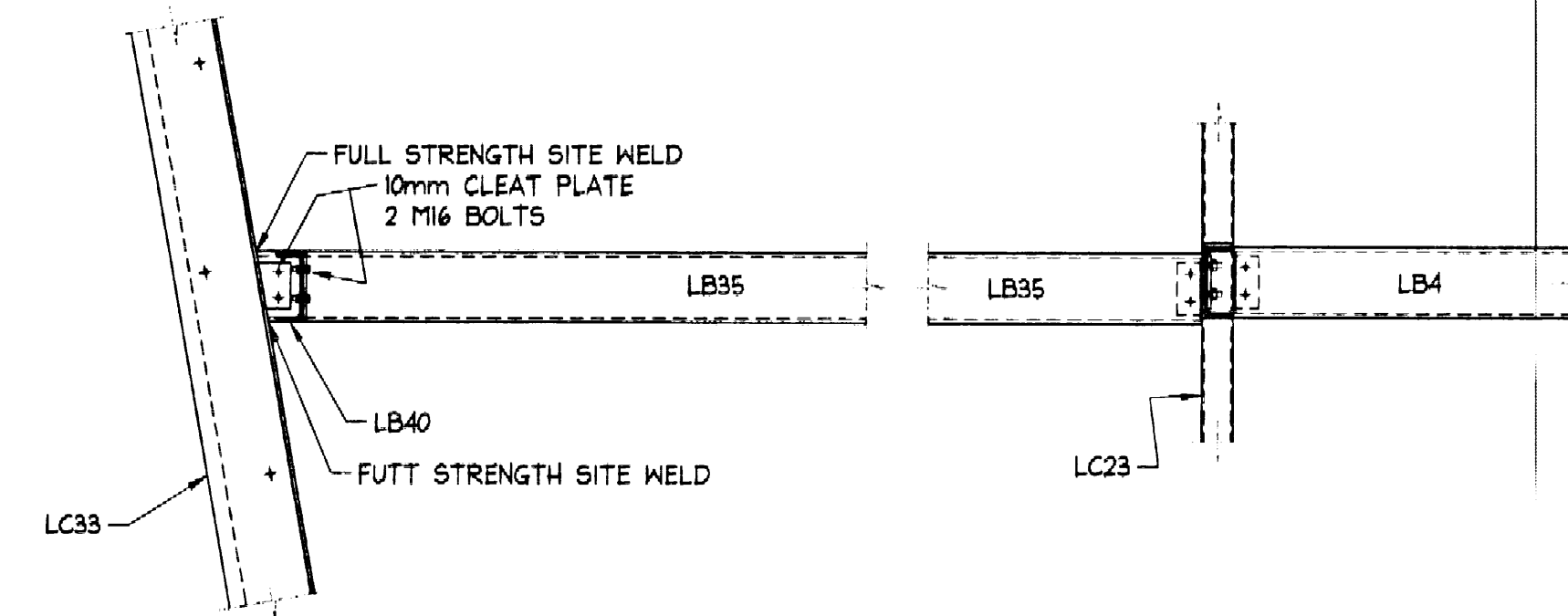
SCALE = 1 : 20



SECTION 6

SCALE = 1 : 20

506



NOTE: FLOOR JOISTS OMITTED FOR CLARITY

SECTION 7

SCALE = 1 : 20

506

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.

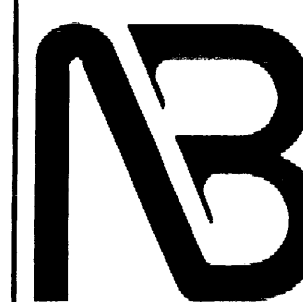
CITY PLAN SERVICES
Construction Cert. No. Approved Date:
24 6 8 7 03 DEC 7704
Certifying Authority: Brandon Belmont
Accreditation No. 11A3904

NOT FOR
CONSTRUCTION
ISSUED FOR TENDER

DOCUMENT CERTIFICATION

Date: Aug 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. 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

Project: HOUSE 2
1148-1152 Barrenjoey Road
56 Palm Beach Road
Palm Beach
Raypond Development

Drawing Title:
LOWER LEVEL
FRAMING DETAILS

The copyright of this drawing remains with Northern Beaches Consulting Engineers P/L.

Date: Aug 2003	Design: R.G.W.	Drawn: Paul R Bruce MIEAust., MIDAust.	Checked:
Job No: 030703		Drawing No: S05	Rev: -

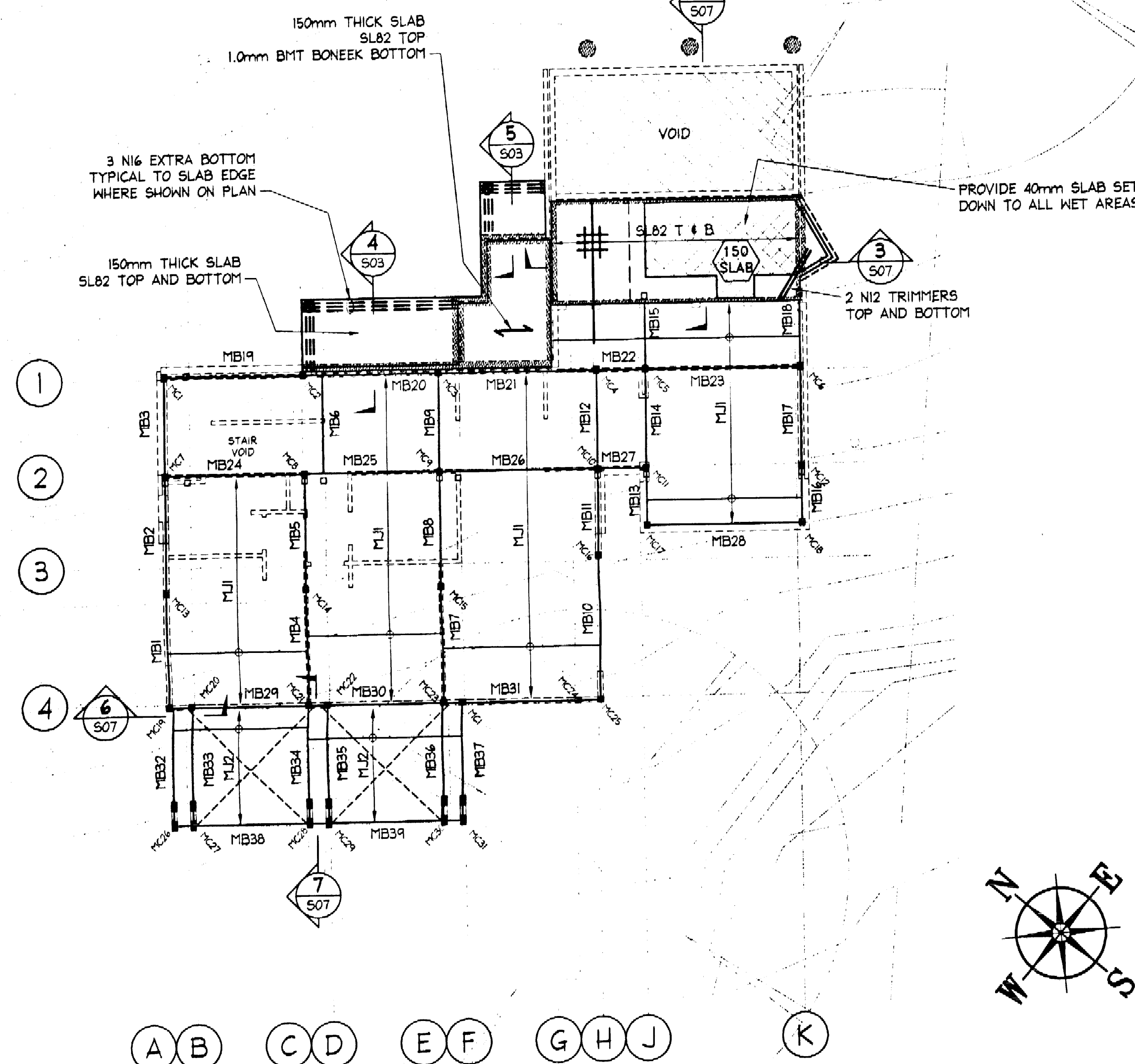
NOTES:

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

NOTES:

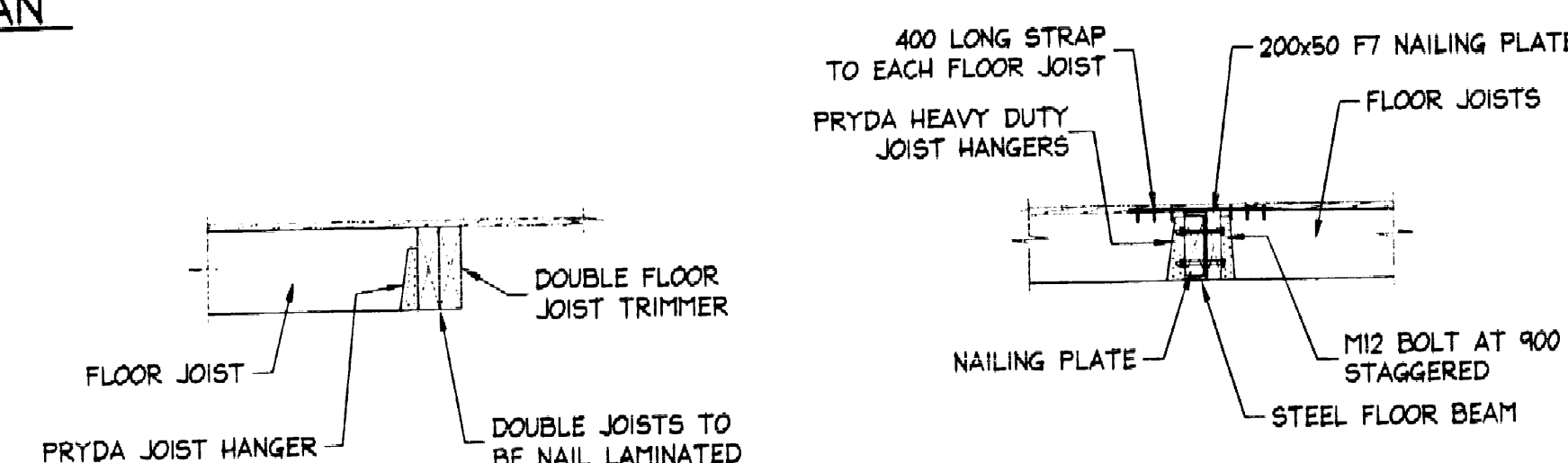
1. ORGANIC TERMITE TREATMENT TO BE CARRIED OUT TO PERIMETER OF ENTIRE BUILDING AND SUB-FLOOR AREAS. ANNUAL INSPECTIONS AND TREATMENT AS REQUIRED SHALL BE THE RESPONSIBILITY OF THE PROPRIETOR.
2. WALL FRAMING SHALL BE IN ACCORDANCE WITH AS 1684 TIMBER FRAMING CODE AND NSW TIMBER FRAMING MANUAL. 90x45 MGP 12 STUDS AT 450 CTS.
3. BRACE WALLS AND ROOF IN ACCORDANCE WITH AS 1684 TIMBER FRAMING CODE AND NSW TIMBER FRAMING MANUAL.
4. TIE DOWNS TO ROOF RAFTERS AND BEAMS SHALL BE IN ACCORDANCE WITH AS 1684 TIMBER FRAMING CODE AND AS 1170.2 WIND LOADING CODE.
5. TRIM ROOF OPENINGS WITH EQUIVALENT RAFTER SIZES UNLESS NOTED OTHERWISE.
6. EXTERNAL/EXPOSED HYSPAN LVL OR TAGBEAM MEMBERS TO BE SUITABLY PRESERVATIVE TREATED TO H3 LEVEL (AS 1604) THEN STAINED OR PAINTED.
7. EXTERNAL/EXPOSED HARDWOOD MEMBERS TO BE DURABILITY CLASS 2 OR BETTER (AS 1604) THEN STAINED OR PAINTED.
8. ENGINEER TO INSPECT AND CERTIFY ALL FRAMING AND BRACING PRIOR TO SHEETING.

MEMBER SCHEDULE		
MARK	MEMBER	REMARKS
MID LEVEL FLOOR FRAMING		
MC1 - MC25 incl	90x90x5 SHS	COLUMN
MC26 - MC31	205 BT 27 (CUT FROM 410 UB 54)	COLUMN
MB1 - MB31 incl	200 PFC	BEAM
MB32 - MB39 incl	200 PFC	BEAM
MJ1	200x45 HYSPAN LVL	FLOOR JOISTS AT 450 CTS
MJ2	200x50 F7 H3 TREATED	FLOOR JOISTS AT 450 CTS
GENERAL FRAMING		
SB	PRYDA STRAP BRACING WITH TENSIONERS TO UNDER SIDE OF FLOOR JOISTS AND RAFTERS WHERE INDICATED ON PLAN	
A	STRAP BRACING REFER TYPICAL DETAILS	
B	PLY BRACING REFER TYPICAL DETAILS	
DR	DOUBLE RAFTERS NAIL LAMINATED	
X	2 STUDS NAIL LAMINATED or 90x90 F7 POST	LOAD CONCENTRATION POINT
NOTE:		
1. ASTERISK (*) BESIDE MEMBER SIZE INDICATES MEMBERS DESIGNED TO SUIT ARCHITECTS REQUIREMENTS FOR MINIMUM SIZE, SPACING AND LOCATION OF MEMBERS.		
2. MGP 12 MAY BE SUBSTITUTED FOR F7 SOFTWOOD OR LESS. MGP 15 MAY BE SUBSTITUTED FOR F11 SOFTWOOD OR LESS. MGP MUST NOT BE USED AS A SUBSTITUTE WHERE HARDWOOD IS SPECIFIED.		
3. ALL HARDWOOD SHALL BE KILN DRIED, DO NOT USE GREEN HARDWOOD.		
4. ALL H3 AND H4 TREATED TIMBER TO BE KILN DRIED AFTER TREATMENT.		

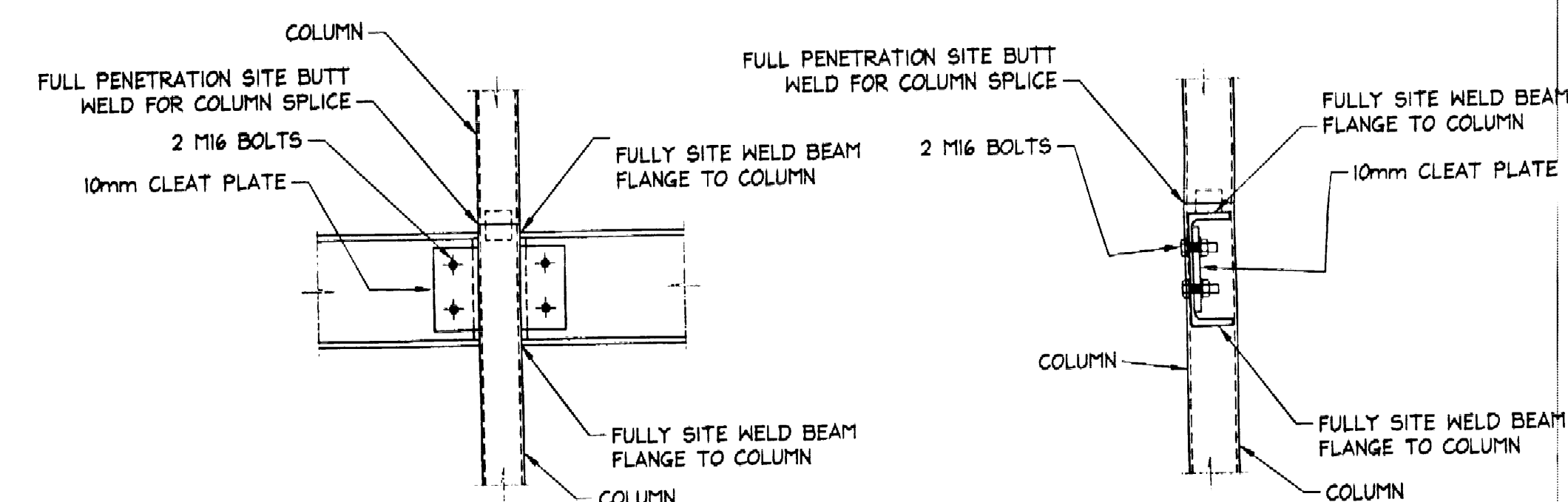


MID LEVEL SLAB AND FRAMING PLAN
SCALE = 1 : 100

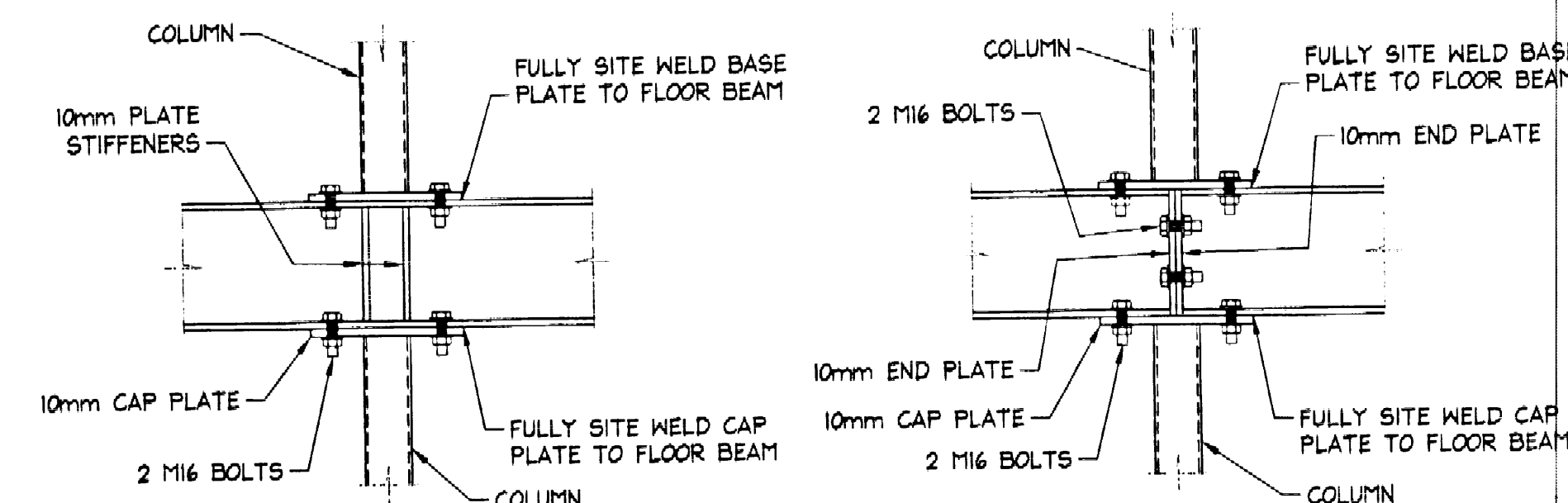
NOTE:
ALL COLUMN TO BEAM CONNECTIONS TO BE FULLY SITE WELDED AFTER ERECTION.



TYPICAL FLOOR JOIST CONNECTION DETAILS
SCALE = 1 : 20



OPTION 1



OPTION 2

TYPICAL COLUMN TO BEAM CONNECTION DETAILS
SCALE = 1 : 10

CITY PLAN SERVICE
Construction Cert. No. Approved
24 0 8 7 03 LEO 7004
Certifying Authority: Brennan Building
Accreditation No: FIA3004

NOT FOR
CONSTRUCTION
ISSUED FOR TENDER

AI			DOCUMENT CERTIFICATION						Project: HOUSE 2 1148-1152 Barrenjoey Road 56 Palm Beach Road Palm Beach Raypond Development			Drawing Title: MID LEVEL SLAB AND FRAMING PLAN AND DETAILS			Date: Aug 2003		Design: R.G.W.		Drawn: Paul R Bruce OMIEAust., MIDDANet		Checked: -		
			Date: 14/03/03			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.			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: nbe@nbeconsulting.com.au			The copyright of this drawing remains with Northern Beaches Consulting Engineers P/L			Job No: 030703		Drawing No: S06		Rev: -	
Date:			Rev:			Amendment:																	

FLOORING TO ARCHITECTS DETAILS

M12 EPOXY SET ANCHORS AT 900 MAXIMUM CTS

4 M12 EPOXY SET ANCHORS

STEEL PACKING PLATES AS REQUIRED

REFER TYPICAL SLAB PREPARATION TYPE B

N12 AT 400

190 BLOCKWORK

N12 AT 400

600 LAP

N12 AT 400 STARTER BARS HOT DIP GALVANIZED

3-11TH BOTTOM

SOUND ROCK

400

250

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SLB2

SECTION 1

SCALE = 1:20

506

SECTION 3

SCALE = 1:20

506

SECTION 6

SCALE = 1:20

506

NOTE: FLOOR JOISTS OMITTED FOR CLARITY

SECTION 7

SCALE = 1:20

506

REINFORCED CONCRETE SLAB REFER DETAILS.
0.2mm IMPERVIOUS MEMBRANE
30mm SAND BLINDING LAYER.
LOOSE FORM FILL MATERIAL SHALL BE FREE OF ALL DELETERIOUS MATTER.
SUB GRADE SHALL BE STRIPPED OF ALL TOPSOIL AND DELETERIOUS MATTER.

TYPICAL SLAB PREPARATION TYPE B
SUSPENDED SLAB ON LOOSE FORM FILL

N.T.S.

PROVIDE SLIPJOINT BY VESPOL OR APPROVED EQUIVALENT BELOW ALL LOAD BEARING BRICKWORK SUPPORTING CONCRETE FLOOR SLABS

PROVIDE SLIPJOINT BY VESPOL OR APPROVED EQUIVALENT ABOVE ALL LOAD BEARING BRICKWORK SUPPORTING CONCRETE FLOOR SLABS

TYPICAL SLIP JOINT DETAIL FOR LOAD BEARING BRICK WALLS

SCALE = 1:20

10mm FLEXIBLE SEPARATION MATERIAL APPLY TO ALL VERTICAL SURFACES WHERE CONCRETE AND BRICKWORK COME TOGETHER (UNLESS IMPLICITLY INSTRUCTED BY THE ENGINEER OR SPECIFIC DETAIL IS PROVIDED ELSEWHERE IN THE PLANS)

CONCRETE FLOOR SLAB REFER DETAILS

TYPICAL TRIMMER DETAIL

SCALE = 1:20

PROVIDE SLIPJOINT BY VESPOL OR APPROVED EQUIVALENT ABOVE ALL LOAD BEARING BRICKWORK SUPPORTING CONCRETE FLOOR SLABS

REFER NOTE C11 ON DRAWING NUMBER S01
TYPICAL VERTICAL SHRINKAGE CONTROL JOINT DETAIL FOR LOAD BEARING BRICK WALLS

SCALE = 1:20

13x13 CHAMFER

DRIP GROOVE DETAIL

SCALE = 1:5

CITY PLAN SERVICE
Construction Cert. No: Approved
24687 03121
Certifying Authority: Regional Council
Reference Number: P1A2014

NOT FOR CONSTRUCTION
ISSUED FOR TENDER

DOCUMENT CERTIFICATION

Date: 14/03/07

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.

NB

NORTHERN BEACHES
Consulting Engineers P/L

A.C.N. 078 121 616 A.B.N. 24 078 121 616
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

Project:

HOUSE 2
1148-1152 Barrenjoey Road
56 Palm Beach Road
Palm Beach
Raypond Development

Drawing Title:

MID LEVEL
SLAB AND FRAMING
DETAILS

The copyright of this drawing remains with Northern Beaches Consulting Engineers P/L

Date:

Aug. 2003

Design:

R.G.W.

Drawn:

Paul R Bruce

Checked:

Job No:

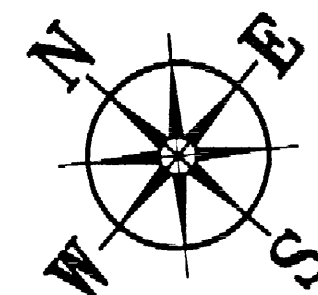
030703

Drawing No:

S07

Rev:

-



SCALE = 1 : 100

NOTES:

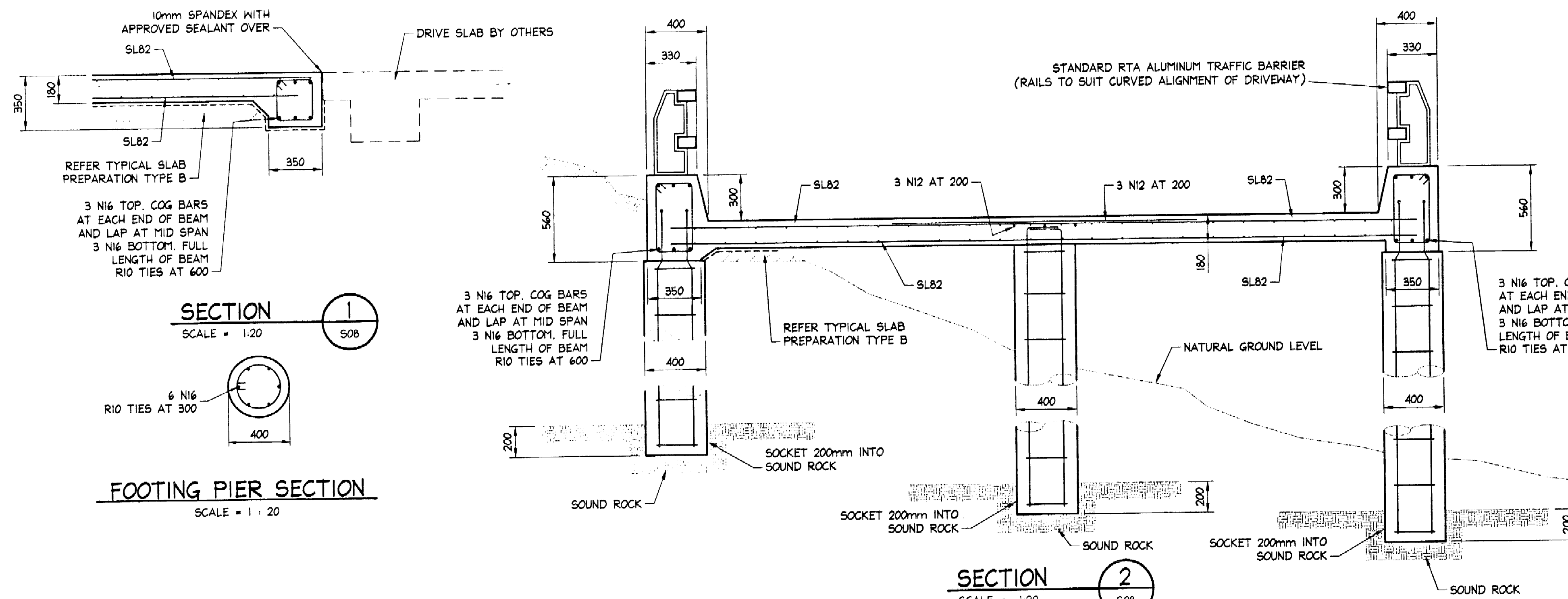
- | REINFORCEMENT SCHEDULE | | | |
|------------------------|-------------|----------------|-----------------------|
| MARK 'X'
(prefix) | BAR
SIZE | BAR
SPACING | LAYER 'Y'
(suffix) |
| A | N12 | 600 | 1 |
| B | N12 | 400 | 2 |
| C | N12 | 300 | 3 |
| D | N12 | 250 | 4 |
| E | N12 | 200 | |
| F | N12 | 150 | |
| G | N12 | 100 | |
| H | N16 | 400 | |
| J | N16 | 300 | |
| K | N16 | 250 | |
| L | N16 | 200 | |
| M | N16 | 150 | |
| N | N16 | 100 | |

NOTE:
THE REINFORCEMENT SHALL BE SPECIFIED ON PLAN USING THE XY (PREFIX/SUFFIX) e.g.
N16 AT 400
LAID SECOND
IN THE BOTTOM
WILL BE SPECIFIED ON PLAN AS - H2

CITY PLAN SERVICE
Construction Cert. No.: Approved
240887 03 Dec 2014
Certifying Authority: Brandon L. Smith
Accreditation No: FIA2004

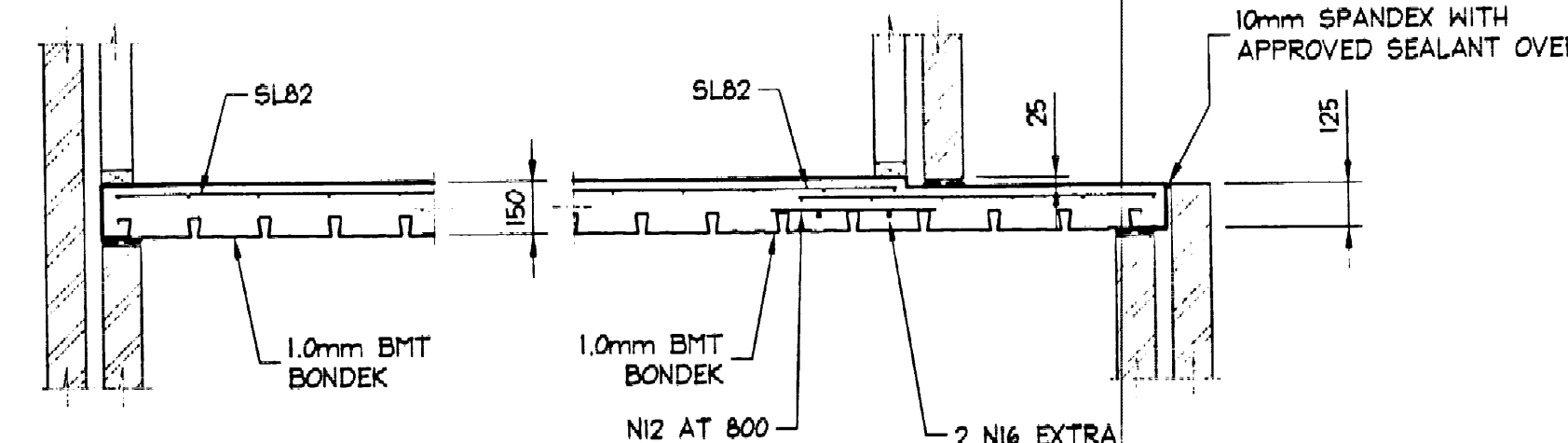
NOT FOR
CONSTRUCTION
ISSUED FOR TENDER

AI			DOCUMENT CERTIFICATION		<p>I am a qualified Structural/Civil Engineer. I hold the following qualifications: BE(Civil), CPEng, MIEAust., NPER. Institute of Engineers Membership No. 8093938</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>Date: <i>Aug 03'</i> <i>R.G. Wray</i> Rick G. Wray (Director Northern Beaches Consulting Engineers)</p>		 <p>NORTHERN BEACHES Consulting Engineers P/L</p> <p>A.C.N. 078 121 616 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@nbcconsulting.com.au</p>		<p>Project: HOUSE 2 1148-1152 Barrenjoey Road 56 Palm Beach Road Palm Beach Raypond Development</p>		<p>Drawing Title: UPPER LEVEL SLAB AND LOWER ROOF FRAMING PLAN</p> <p>The copyright of this drawing remains with Northern Beaches Consulting Engineers P/L</p>		<table><tr><td>Date:</td><td>Design:</td><td>Drawn:</td><td>Checked:</td></tr><tr><td>Aug 2003</td><td>R.G.W.</td><td>Paul R Bruce 011EAust., MIDAust.</td><td></td></tr><tr><td>Job No:</td><td colspan="2">Drawing No:</td><td>Rev:</td></tr><tr><td>030703</td><td colspan="2">S08</td><td>-</td></tr></table>		Date:	Design:	Drawn:	Checked:	Aug 2003	R.G.W.	Paul R Bruce 011EAust., MIDAust.		Job No:	Drawing No:		Rev:	030703	S08		-
Date:	Design:	Drawn:	Checked:																											
Aug 2003	R.G.W.	Paul R Bruce 011EAust., MIDAust.																												
Job No:	Drawing No:		Rev:																											
030703	S08		-																											
Date:	Rev:	Amendment:																												



DRIP GROOVE DETAIL

SCALE = 1 : 5



SECTION 5

SCALE = 1:20

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 1

SCALE = 1:20

FOOTING PIER SECTION

SCALE = 1 : 20

SECTION 2

SCALE = 1:20

SECTION 3

SCALE = 1:20

SECTION 4

SCALE = 1:20

SECTION 6

SCALE = 1:20

10mm FLEXIBLE SEPARATION MATERIAL. APPLY TO ALL VERTICAL SURFACES WHERE CONCRETE AND BRICKWORK COME TOGETHER (UNLESS IMPLICITLY INSTRUCTED BY THE ENGINEER OR SPECIFIC DETAIL IS PROVIDED ELSEWHERE IN THE PLANS)

CONCRETE FLOOR SLAB REFER DETAILS

PROVIDE SLIPJOINT BY VESPOL OR APPROVED EQUIVALENT ABOVE ALL LOAD BEARING BRICKWORK SUPPORTING CONCRETE FLOOR SLABS

REFER NOTE C11 ON DRAWING NUMBER S01

TYPICAL VERTICAL SHRINKAGE CONTROL JOINT DETAIL FOR LOAD BEARING BRICK WALLS

SCALE = 1 : 20

NOT FOR CONSTRUCTION ISSUED FOR TENDER

TYPICAL SLAB PREPARATION TYPE B SUSPENDED SLAB ON LOOSE FORM FILL

N.T.S.

TYPICAL TRIMMER DETAIL

SCALE = 1 : 20

TYPICAL SLIP JOINT DETAIL FOR LOAD BEARING BRICK WALLS

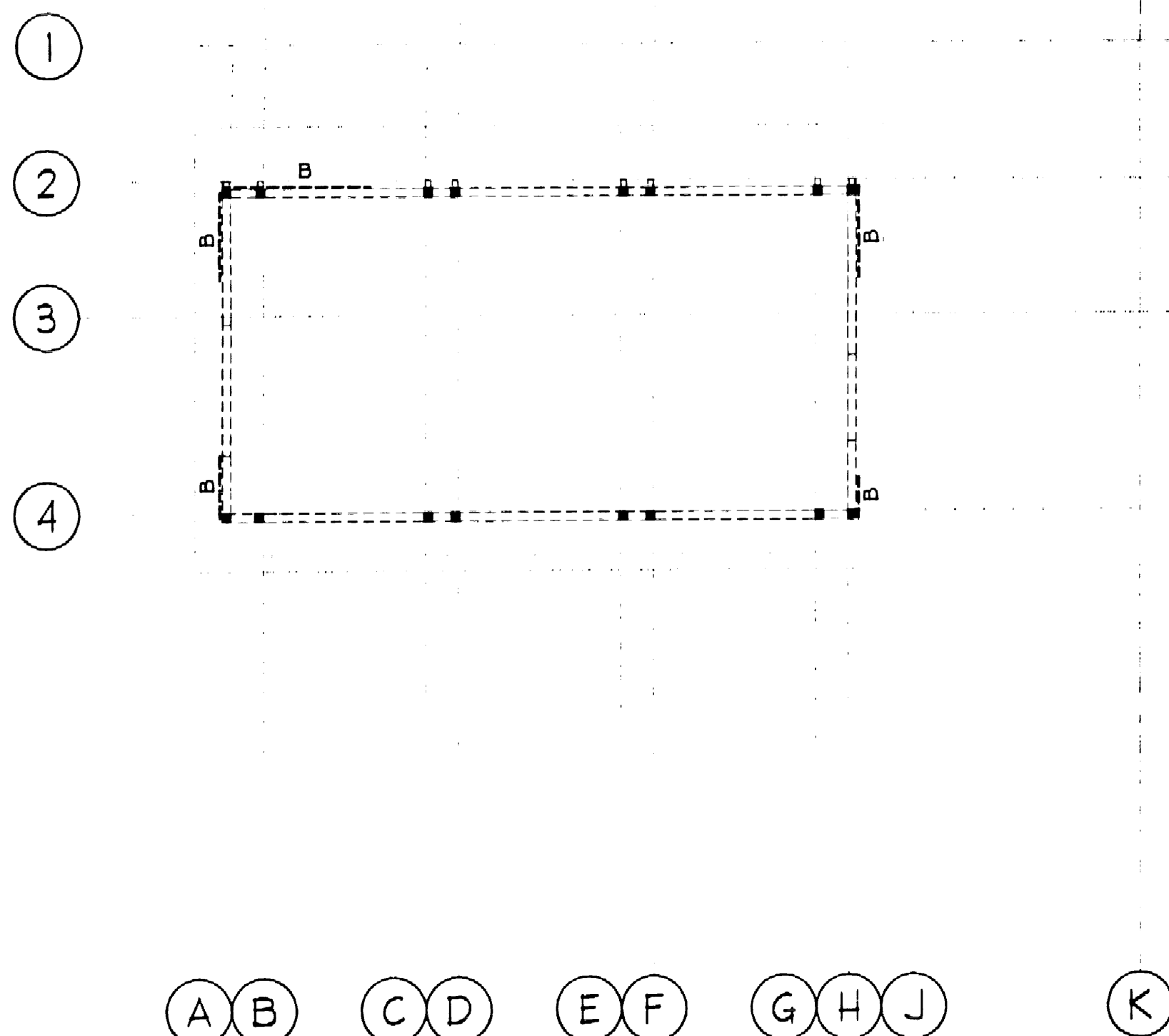
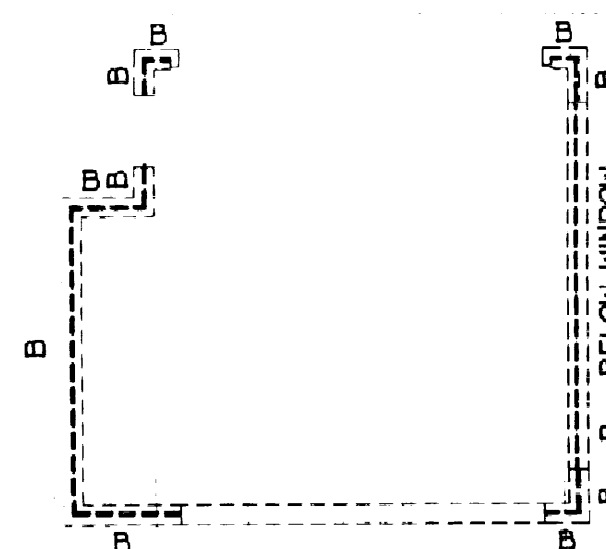
SCALE = 1 : 20

A1

DOCUMENT CERTIFICATION			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. 076 121 616 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			Project: HOUSE 2 1148-1152 Barrenjoey Road 56 Palm Beach Road Palm Beach Raypond Development			Drawing Title: UPPER LEVEL SLAB AND AND LOWER ROOF FRAMING DETAILS			Date: Aug 2003			Design: R.G.W.			Drawn: Paul R Bruce MIEAust., MIDAust.			Checked:		
Date: 16/08/03 Rick G. Wray (Director Northern Beaches Consulting Engineers)			Job No: 030703			Drawing No: S09			Rev: -			The copyright of this drawing remains with Northern Beaches Consulting Engineers P/L.														
Date:	Rev:	Amendment:																								

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. HALL FRAMING SHALL BE IN ACCORDANCE WITH AS 1684 TIMBER FRAMING CODE AND NSW TIMBER FRAMING MANUAL. 90x45 MGP 12 STUDS AT 450 CTS.
3. BRACE WALLS AND ROOF IN ACCORDANCE WITH AS 1684 TIMBER FRAMING CODE AND NSW TIMBER FRAMING MANUAL.
4. TIE DOWNS TO ROOF RAFTERS AND BEAMS SHALL BE IN ACCORDANCE WITH AS 1684 TIMBER FRAMING CODE AND AS 1170.2 WIND LOADING CODE.
5. TRIM ROOF OPENINGS WITH EQUIVALENT RAFTER SIZES UNLESS NOTED OTHERWISE.
6. EXTERNAL/EXPOSED HYPSPAN LVL OR TASBEAM MEMBERS TO BE SUITABLY PRESERVATIVE TREATED TO H3 LEVEL (AS 1604) THEN STAINED OR PAINTED.
7. EXTERNAL/EXPOSED HARDWOOD MEMBERS TO BE DURABILITY CLASS 2 OR BETTER (AS 1604) THEN STAINED OR PAINTED.
8. ENGINEER TO INSPECT AND CERTIFY ALL FRAMING AND BRACING PRIOR TO SHEETING.

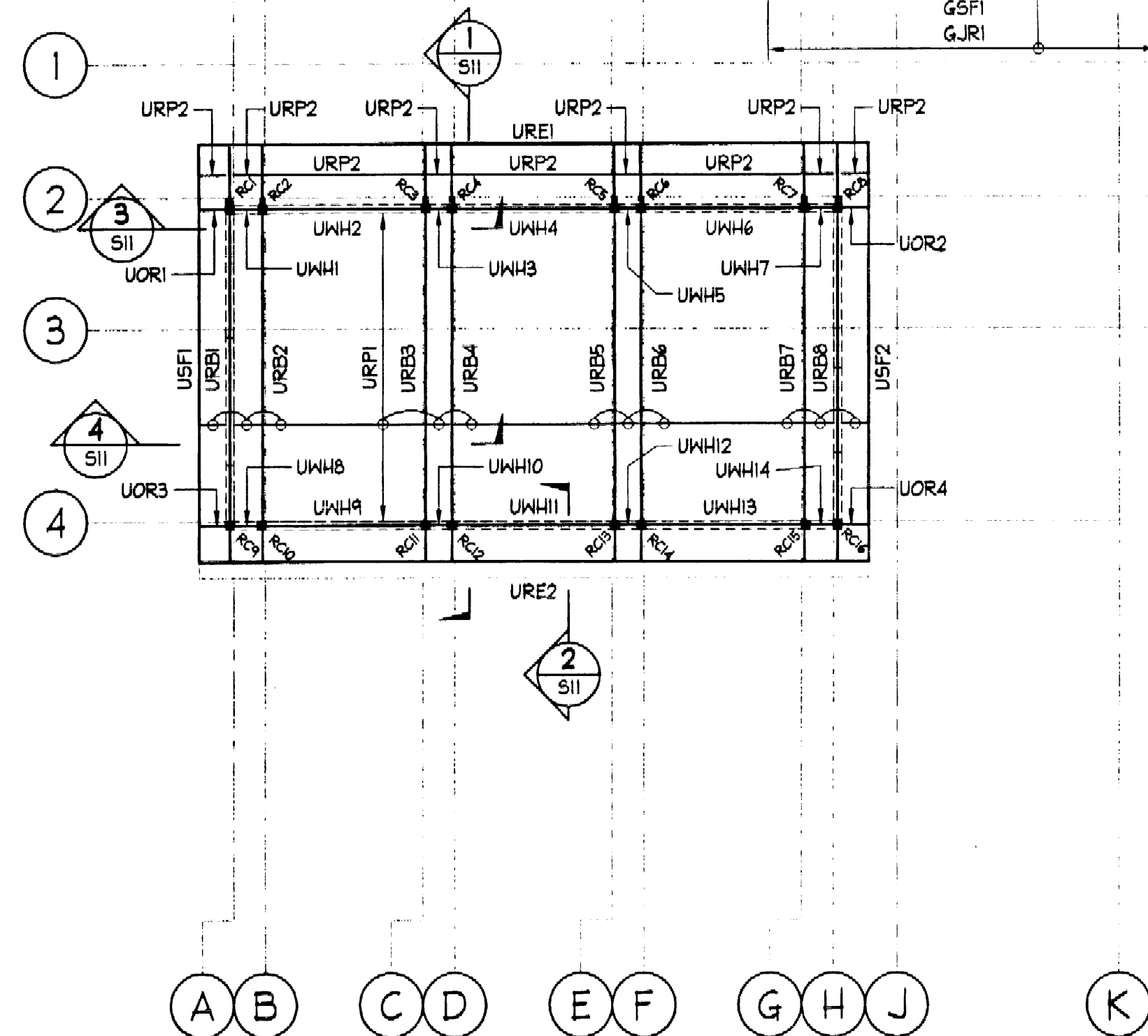
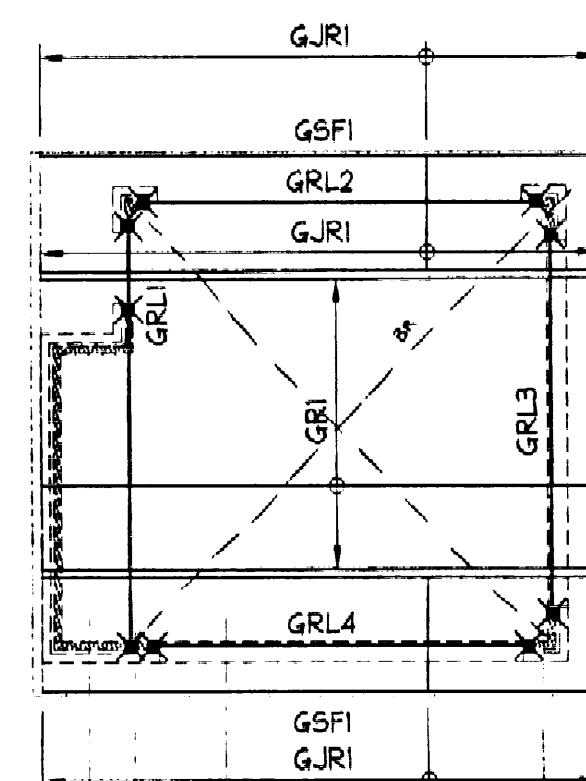


UPPER ROOF FRAMING PLAN

SCALE = 1 : 100

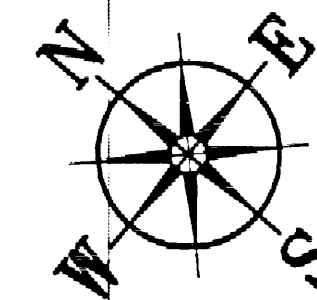


MEMBER SCHEDULE		
MARK	MEMBER	REMARKS
GARAGE ROOF FRAMING		
GRL1	180 PFC	LINTEL
GRL2, GRL4	240x63 HYPSPAN LVL	LINTEL
GRL3	230 PFC	LINTEL
GSF1, GSF2	300x50 F7	STRUCTURAL FASCIA
GR1	300x50 F7	RAFTERS AT 600 CTS
GJR1	300x50 F7	JACK RAFTERS AT 600 CTS
UPPER ROOF FRAMING		
RC1 - RC16 incl	90x90x6 SHS	COLUMN
URB1 - URB8 incl	200 UB 22	ROOF BEAM
UWH1 - UWH14 incl	200 PFC	WINDOW HEAD
UOR1 - UOR4	200 PFC	OUT RIGGER
USF1, USF2	200x50 F7 or C20016	STRUCTURAL FASCIA
URE1, URE2	100x75x6 UA	STRUCTURAL EAVES
URP1	200x50 F7 or C20016	PURLINS AT 600 CTS
URP2	150x50 F7 or C15016	PURLIN
GENERAL FRAMING		
SB	PRYDA STRAP BRACING WITH TENSIONERS TO UNDER SIDE OF RAFTERS WHERE INDICATED ON PLAN	
B	PLY BRACING REFER TYPICAL DETAILS	
X	2 STUDS NAIL LAMINATED or 90x90 F7 POST	LOAD CONCENTRATION POINT
NOTE:		
1. ASTERISK (*) BESIDE MEMBER SIZE INDICATES MEMBERS DESIGNED TO SUIT ARCHITECTS REQUIREMENTS FOR MINIMUM SIZE, SPACING AND LOCATION OF MEMBERS.		
2. MGP 12 MAY BE SUBSTITUTED FOR F7 SOFTWOOD OR LESS.		
MGP 15 MAY BE SUBSTITUTED FOR F11 SOFTWOOD OR LESS.		
MGP MUST NOT BE USED AS A SUBSTITUTE WHERE HARDWOOD IS SPECIFIED.		
3. ALL HARDWOOD SHALL BE KILN DRIED, DO NOT USE GREEN HARDWOOD.		
4. ALL H3 AND H4 TREATED TIMBER TO BE KILN DRIED AFTER TREATMENT.		



UPPER ROOF FRAMING PLAN

SCALE = 1 : 100



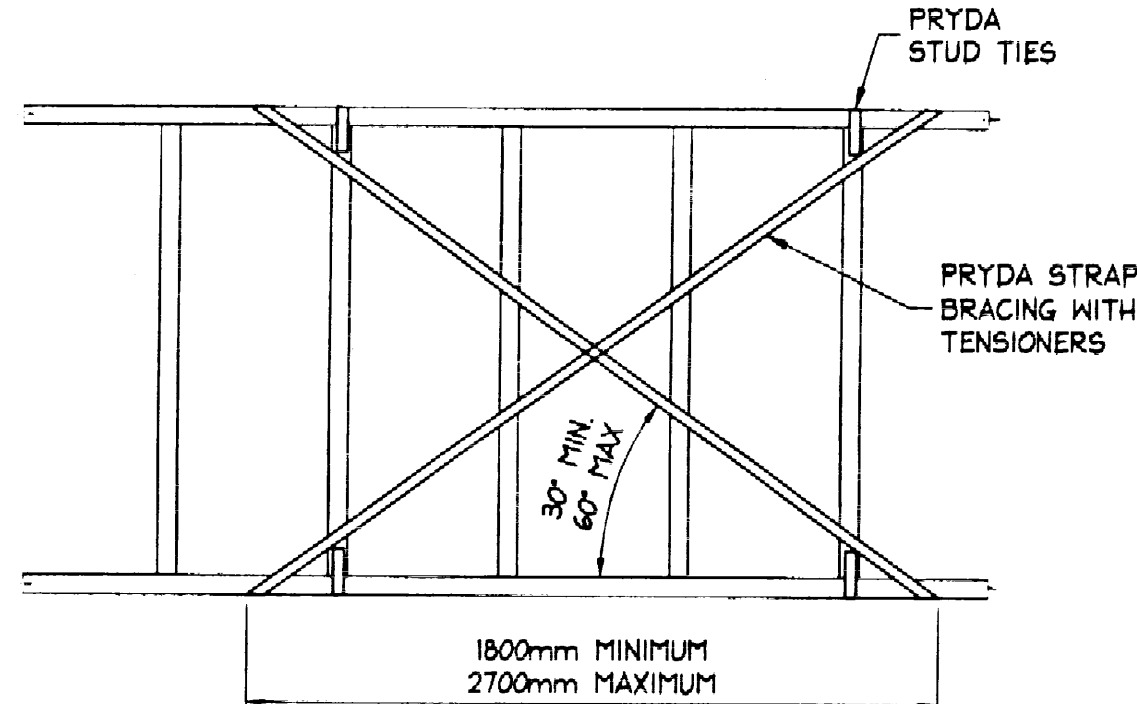
CITY PLAN SERVICE
Construction Cert. No: Approved
24 8 87 03 Env 7004
Certifying Authority: Brendan Blackwell
Accreditation No: PA0004

NOT FOR
CONSTRUCTION
ISSUED FOR TENDER

AI

DOCUMENT CERTIFICATION			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.		Project: HOUSE 2 1148-1152 Barrenjoey Road 56 Palm Beach Road Palm Beach Raypond Development		Drawing Title: UPPER ROOF FRAMING PLAN		Date: Aug 2003	Design: R.G.W.	Drawn: Paul R Bruce CPEAust, MIEAust	Checked:
Date:	Rev:	Amendment:	Date: Aug 03' Rick G. Wray (Director Northern Beaches Consulting Engineers)		Job No: 030703		Drawing No: S10		Rev: -			

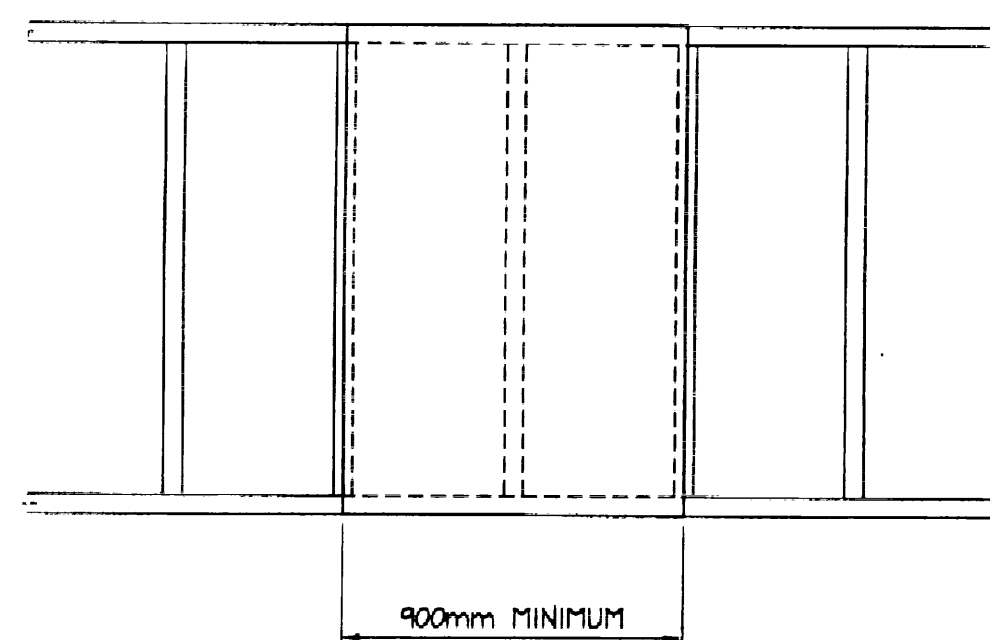
PRYDA STRAP BRACING WITH TENSIONERS
FIXED WITH TWO GALVANISED FLATHEAD NAILS
Ø3.15mm x 30mm LONG TO EACH STUD, AND THE
FACE OF THE TOP AND BOTTOM PLATE.
AND FOUR GALVANISED FLATHEAD NAILS
Ø3.15mm x 30mm LONG TO THE STRAP RETURN
OVER THE TOP PLATE AND UNDER THE BOTTOM PLATE.



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

SCALE = 1 : 20

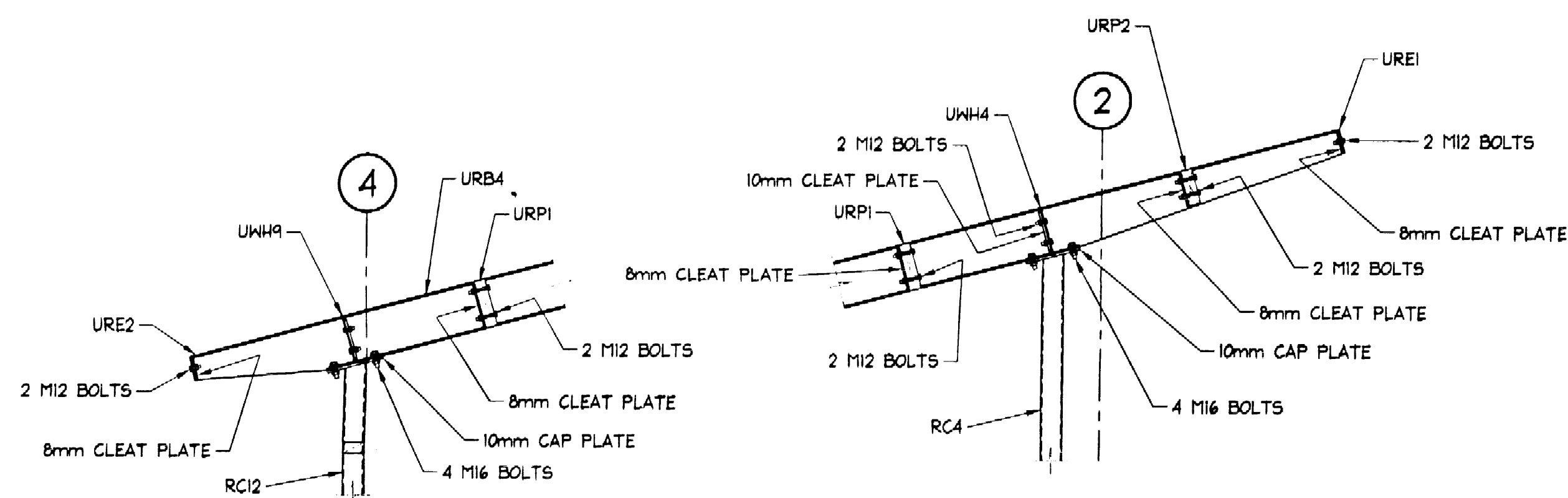
FIX PLYWOOD PANELS WITH GALVANISED FLATHEAD NAILS
 2.8mm x 30mm LONG MINIMUM OR EQUIVALENT AT 50mm CENTRES ALONG TOP AND BOTTOM PLATES, 150mm CENTRES ALONG VERTICAL EDGES AND 300mm CENTRES ALONG INTERMEDIATE STUDS.
 NAILS SHALL BE LOCATED A MINIMUM OF 7mm FROM PANEL EDGES.
 POWER DRIVEN GALVANISED NAILS OR COATED STAPLES MAY BE USED PROVIDED THEY ARE OF THE SAME MINIMUM TENSILE STRENGTH TO HAND DRIVES 2.8mm 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, 150mm CENTRES ALONG VERTICAL EDGES AND 200mm CENTRES ALONG INTERMEDIATE STUDS.



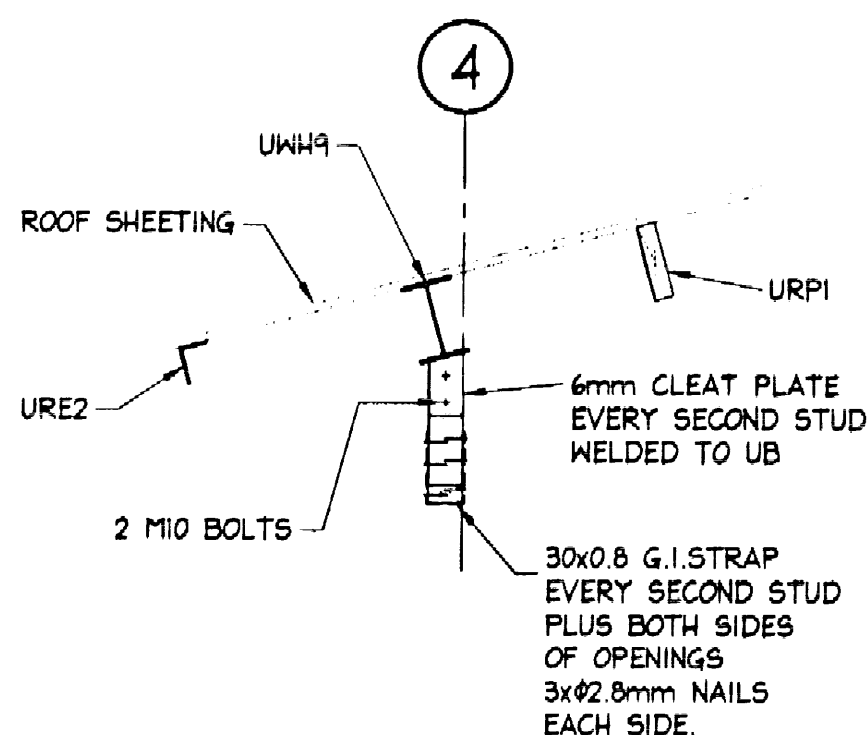
1. FOR PLYWOOD THICKNESS REFER TO TABLE.
2. FOR POWER DRIVEN NAILS AND STAPLES REFER ABOVE.
3. PANEL EDGES SHALL BE SUPPORTED BY STUDS.
4. NOGGINGS HAVE BEEN OMITTED FOR CLARITY.

SCALE = 1 : 20

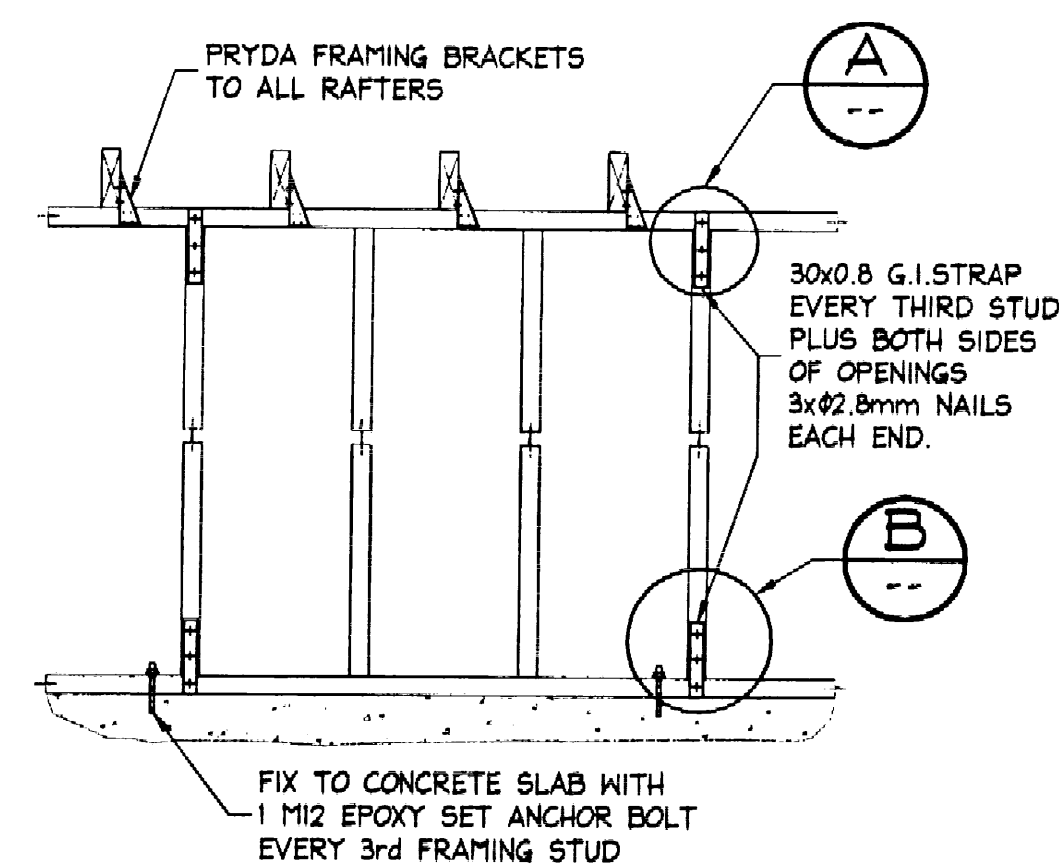
PLYWOOD THICKNESS		
PLYWOOD STRESS GRADE	PLYWOOD THICKNESS	
	MAXIMUM STUD SPACING	
	450mm	600mm
F8	7.0mm	9.0mm
F11	6.0mm	7.0mm
F14	4.0mm	6.0mm
F27	4.0mm	4.5mm



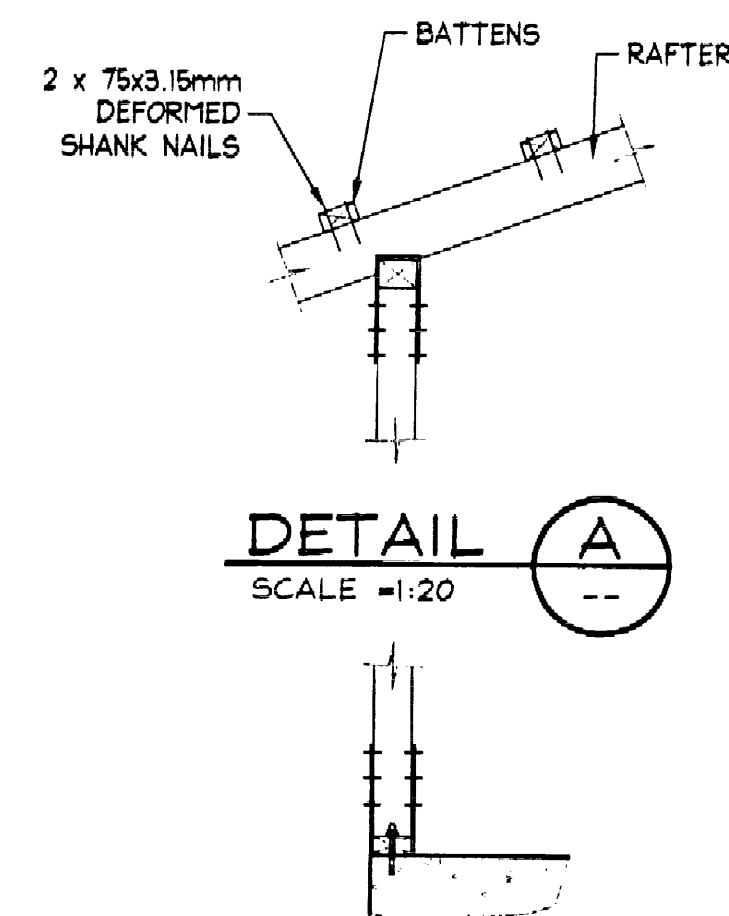
SCALE = 1:20



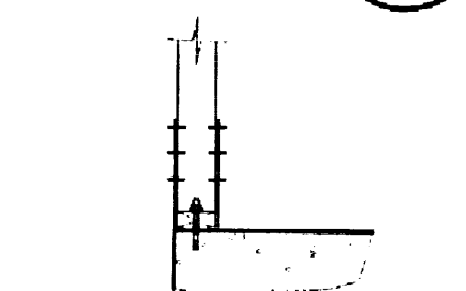
SCALE = 1:20



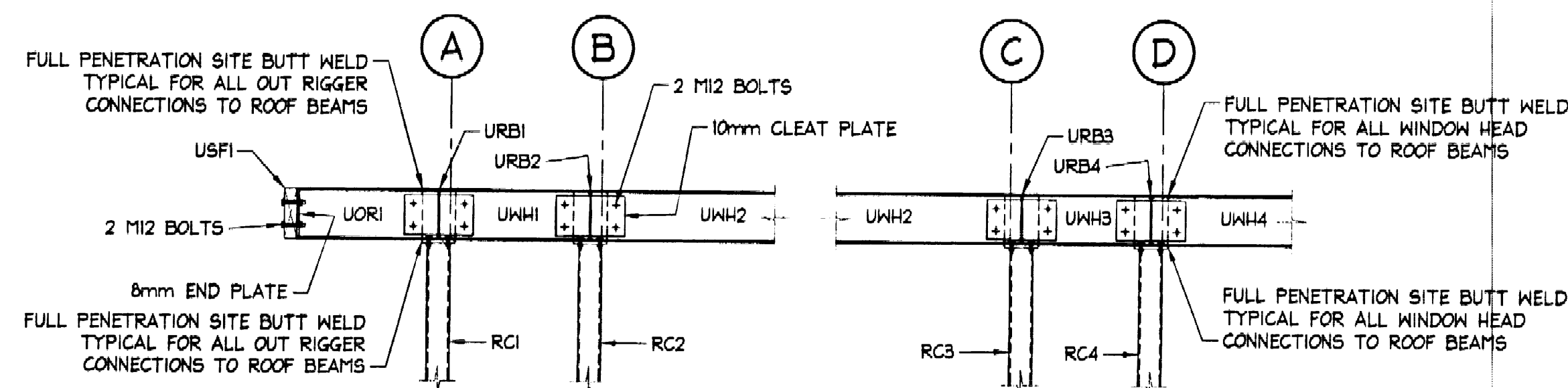
SCALE 1 : 20



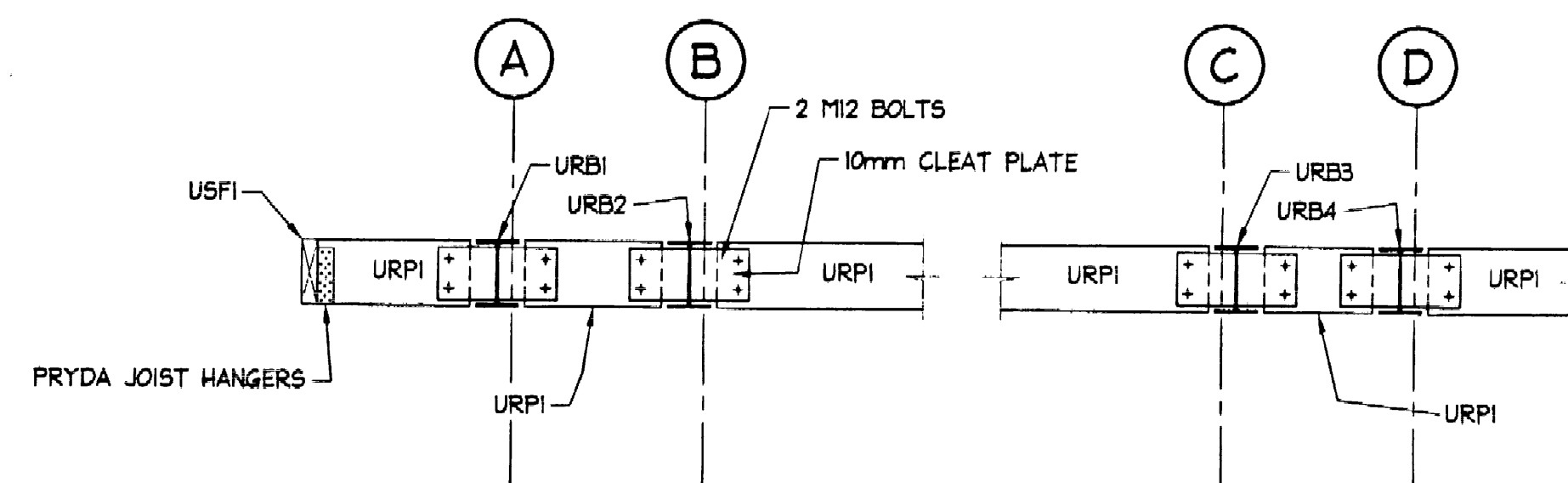
SCALE = 1:20



SCALE = 1:20



SCALE = 1:20



SCALE = 1:20

1. ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WITH WORK

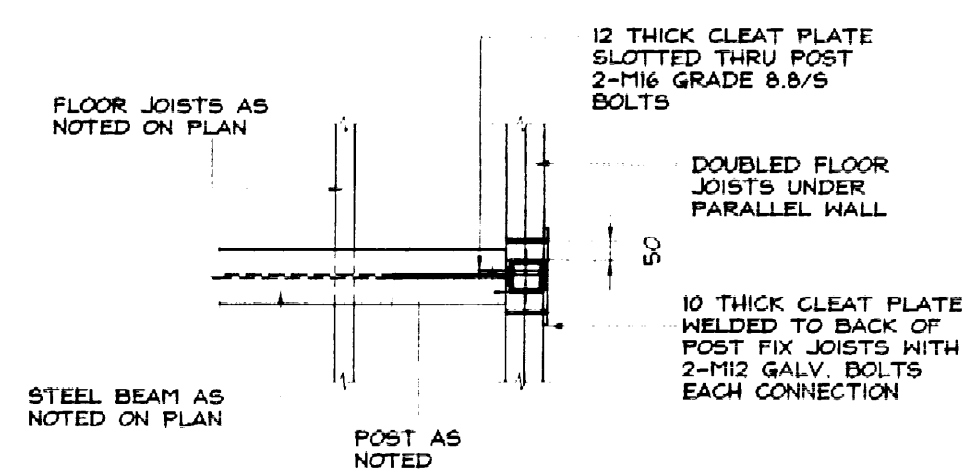
2. FOR GENERAL NOTES AND
DRAWING SCHEDULE REFER
TO DRAWING NUMBER: SOI.

CITY PLAN SERVICE
Construction Cert. No: Approved
24687 03 DEC 2004
Consulting Authority: Brandon Emmett
Accession No: PIA3004

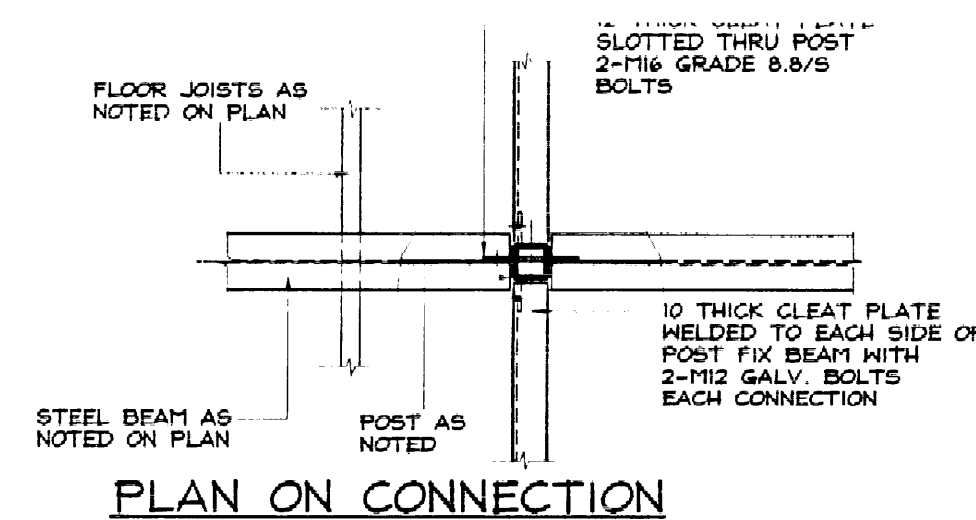
NOT FOR
CONSTRUCTION
ISSUED FOR TENDER

Date: Aug 2003	Design: R.G.W.	Drawn: Paul R Bruce OM1EAust., MIDAust.	Check:
Job No: 030703		Drawing No: S11	Rev: -

The copyright of this drawing remains with Northern Beaches Consulting Engineers P/L

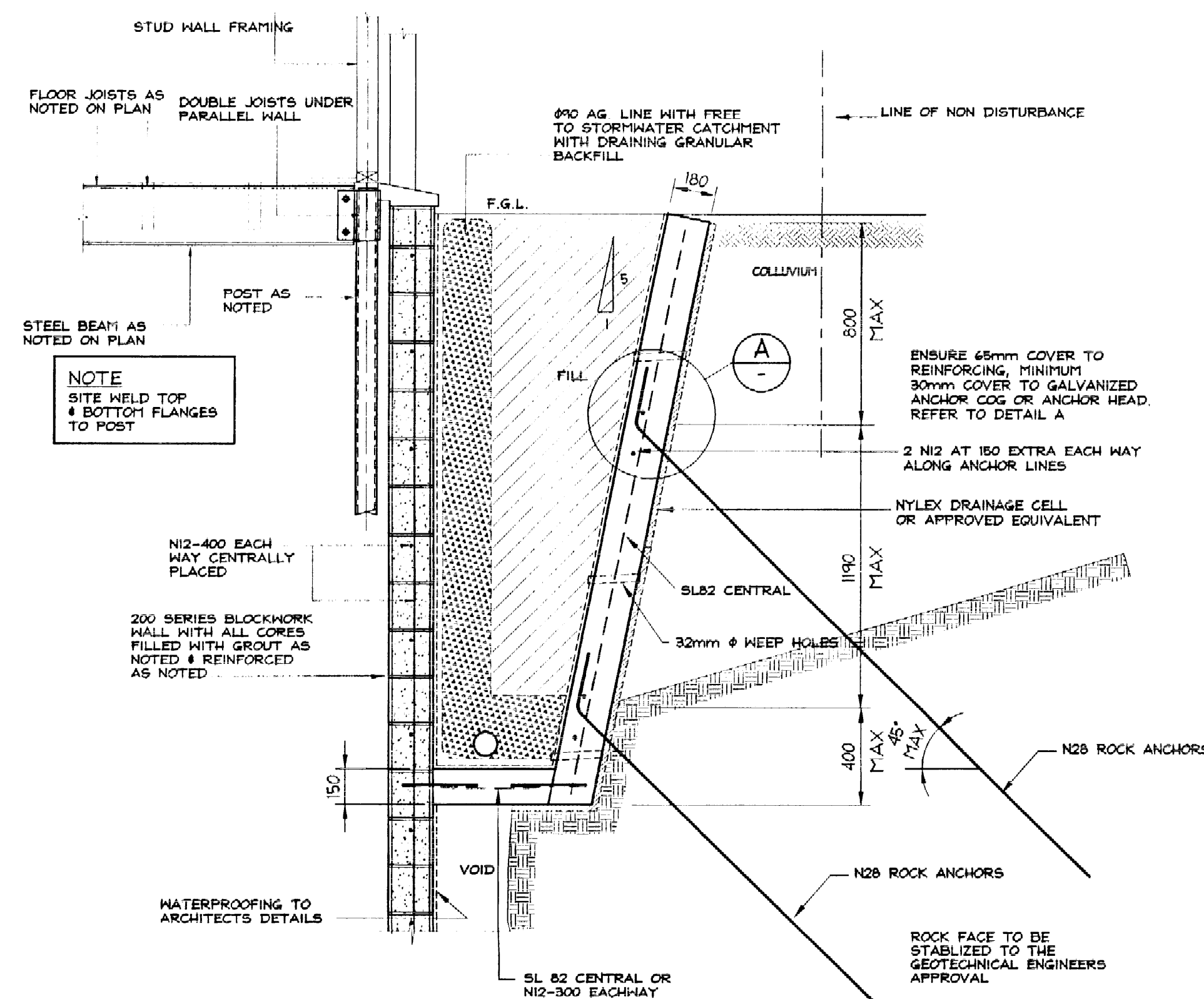


PLAN ON CONNECTION

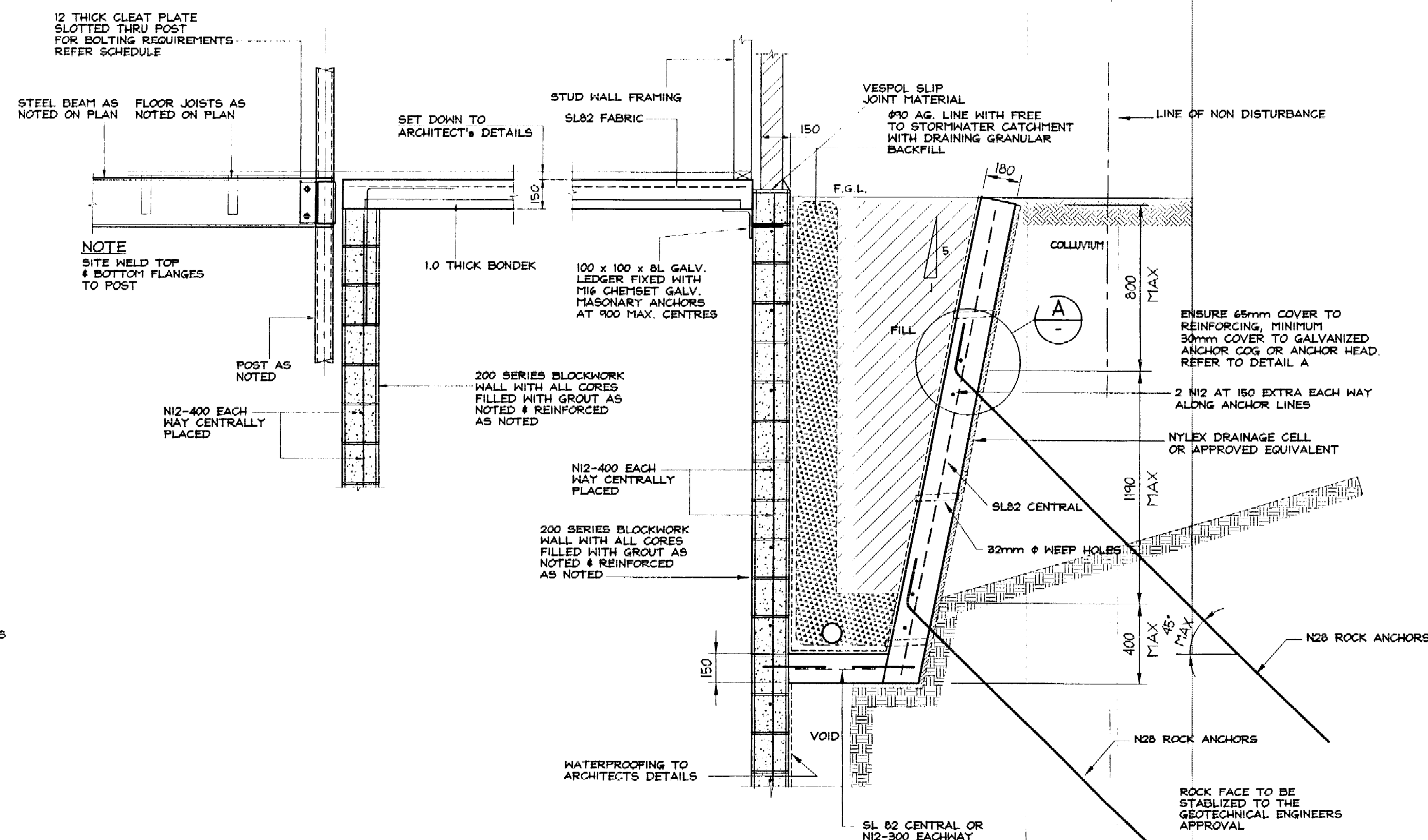


NOTES:

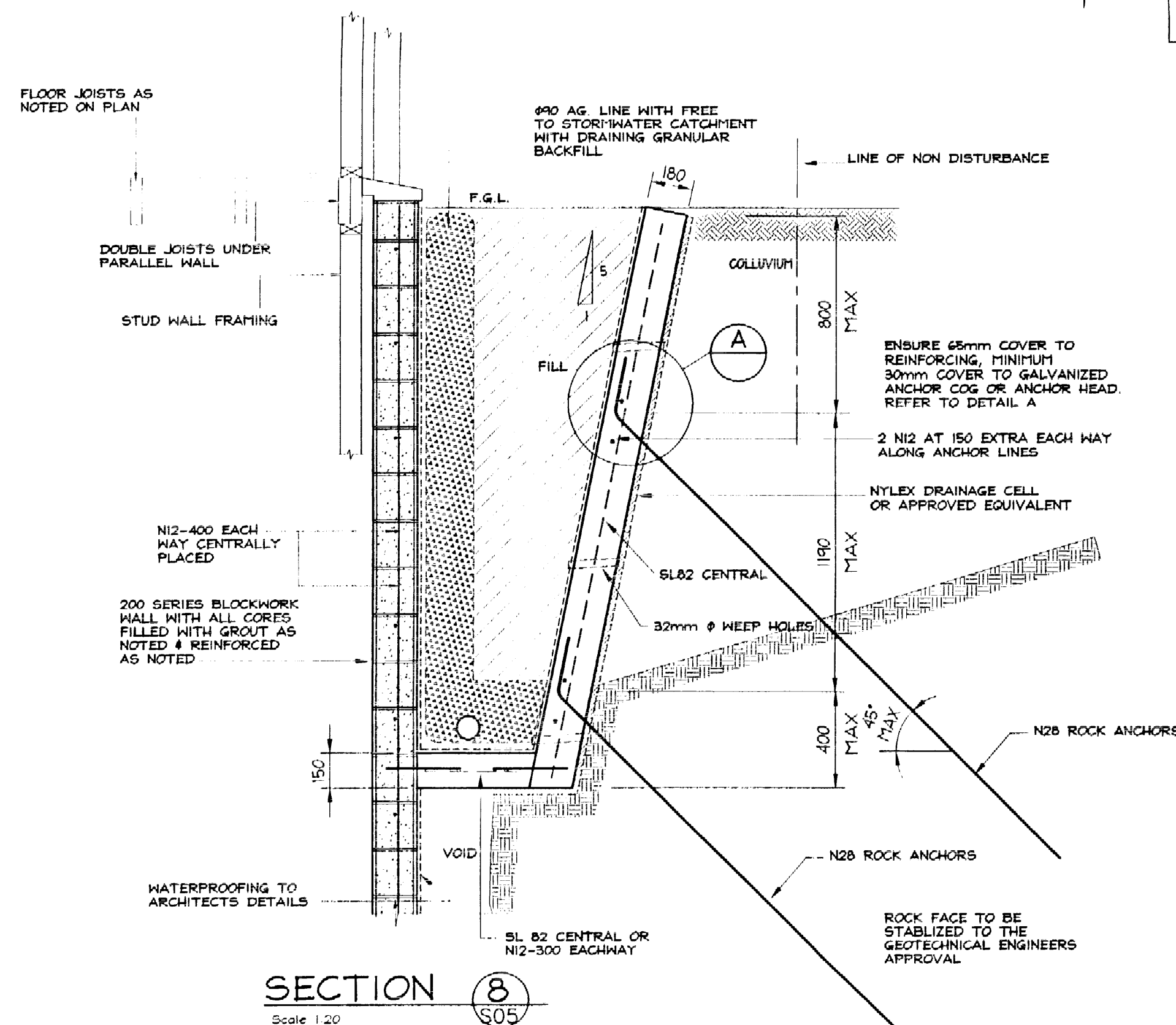
1. ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WITH WORK.
2. FOR GENERAL NOTES AND DRAWING SCHEDULE REFER TO DRAWING NUMBER: S01.



SECTION 9
Scale 1:20



SECTION 10
Scale 1:20



SECTION 8
Scale 1:20

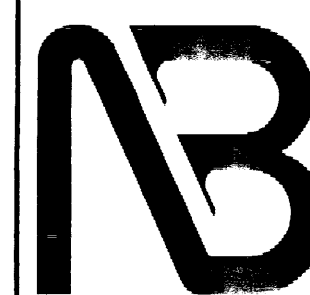
CITY PLAN
Contact: 02 9984 7444
21/11/09
Drawing No. 030703
Revision No. 1

ISSUED FOR
CONSTRUCTION
CERTIFICATE
SUBMISSION ONLY

DOCUMENT CERTIFICATION

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.

Date: 26/04/09
Rick G. Wray
(Director Northern Beaches Consulting Engineers)



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 NSW 2099
Ph: (02) 9984 7000 Fax: (02) 9984 7444
e-mail: nb@nbcconsulting.com.au

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

Drawing Title:
HOUSE No.2
SHORING SECTIONS

Date: AUG. 2003	Design: R.G.W.	Drawn: MC	Checked:
Job No: 030703	Drawing No: S12	Rev: -	

The copyright of this drawing remains with Northern Beaches Consulting Engineers P/L

DOWEL SCHEDULE		
MATERIAL	SLOPE HEIGHT (H)	BOLTING REQUIREMENTS
COLLUVIUM AND RESIDUAL SOIL	UP TO 1.5m	2.5m LONG GALV. N28 COGGED DOWEL SPACED AT 2.0m CENTRES HORIZONTALLY & DIPPING AT 45°. INSTALLED IN 75Ø HOLE BLOWN CLEAN & FULLY GROUTED.
	1.5m TO 2.0m	3.0m LONG GALV. N28 COGGED DOWEL SPACED AT 2.0m CENTRES HORIZONTALLY & DIPPING AT 45°. INSTALLED IN 75Ø HOLE BLOWN CLEAN & FULLY GROUTED.
SILTSTONE/SANDSTONE EXTREMELY WEATHERED, HIGHLY WEATHERED AND MODERATELY WEATHERED SILTSTONE	-	2.0m LONG GALV. N24 COGGED DOWEL SPACED AT 1.5m CENTRES BOTH HORIZONTALLY & VERTICALLY & DIPPING AT 10°. INSTALLED IN 75Ø HOLES BLOWN CLEAN & FULLY GROUTED.
SILTSTONE SLIGHTLY WEATHERED FRESH	-	1.0m LONG GALV. N24 COGGED DOWEL SPACED AT 1.5m CENTRES BOTH HORIZONTALLY & VERTICALLY & DIPPING AT 10°. INSTALLED IN 75Ø HOLES BLOWN CLEAN & FULLY GROUTED.

ANCHOR BOLTING SCHEDULE FOR BATTER IN ROCK		
MATERIAL	SLOPE HEIGHT (H)	BOLTING REQUIREMENTS
SANDSTONE/SILTSTONE MEDIUM TO HIGH STRENGTH WITH 60° DAYLIGHTING JOINTS	2.5m	2.5m LONG 24Ø CT BOLT (R24HT OR APPROVED EQUIVALENT) INSTALLED AT 2.0m CENTRES DIPPING AT 10°. INSTALLED IN 45Ø HOLES, BLOWN CLEAN & FULLY GROUTED & TENSIONED TO 50kN.
SANDSTONE/SILTSTONE MEDIUM TO HIGH STRENGTH WITH 60° DAYLIGHTING JOINTS	3.0m	2.5m LONG 24Ø CT BOLT (R24HT OR APPROVED EQUIVALENT) INSTALLED AT 1.5m CENTRES DIPPING AT 10°. INSTALLED IN 45Ø HOLES, BLOWN CLEAN & FULLY GROUTED & TENSIONED TO 50kN.
SANDSTONE/SILTSTONE MEDIUM TO HIGH STRENGTH WITH 60° DAYLIGHTING JOINTS	4.5m	3.0m LONG 24Ø CT BOLT (R24HT OR APPROVED EQUIVALENT) INSTALLED AT 1.5m CENTRES DIPPING AT 10°. INSTALLED IN 45Ø HOLES, BLOWN CLEAN & FULLY GROUTED & TENSIONED TO 50kN.
SANDSTONE/SILTSTONE MEDIUM TO HIGH STRENGTH WITH 60° DAYLIGHTING JOINTS	6.0m	3.0m LONG 24Ø CT BOLT (R24HT OR APPROVED EQUIVALENT) INSTALLED AT 1.5m CENTRES DIPPING AT 10°. INSTALLED IN 45Ø HOLES, BLOWN CLEAN & FULLY GROUTED & TENSIONED TO 50kN.
SANDSTONE/SILTSTONE MEDIUM TO HIGH STRENGTH WITH 60° DAYLIGHTING JOINTS	9.0m	3.0m LONG 24Ø CT BOLT (R24HT OR APPROVED EQUIVALENT) INSTALLED AT 1.3m CENTRES DIPPING AT 10°. INSTALLED IN 45Ø HOLES, BLOWN CLEAN & FULLY GROUTED & TENSIONED TO 50kN.

NOTE:
ELEVATION OF ROCK STRATUM, EXTENT OF SHOTCRETE AND STABILISATION OF CUT BATTERS, REPRODUCED FROM ADVICE PROVIDED BY 'DOUGLAS PARTNERS'.

CONSTRUCTION SEQUENCE FOR BATTER IN COLLUVIUM SOIL

- 1) EXCAVATE COLLUVIUM AND PIN STRIP DRAINS
- 2) PLACE 60mm THICK "SHOTCRETE"
- 3) INSTALL MESH AS DETAILED ON DRAWING No's C07 & C08.
- 4) APPLY SECOND PASS OF "SHOTCRETE" TO DEPTHS ON DRAWING No's C07 & C08.

NOTE: MINIMUM 180 THICK OVER TEMPORARY SHOTCRETE

NOTE:
GALVANIZED CT BOLTS COMPLETE WITH MECHANICAL ANCHOR, DIMPLED SHEATH AND GALVANIZED BALL WASHER, NUT AND PLATES

NOTE: ROCK ANCHORS

REFER TO : 'SPECIFICATION FOR PERMANENT ROCK ANCHORS' BY DOUGLES PARTNERS.

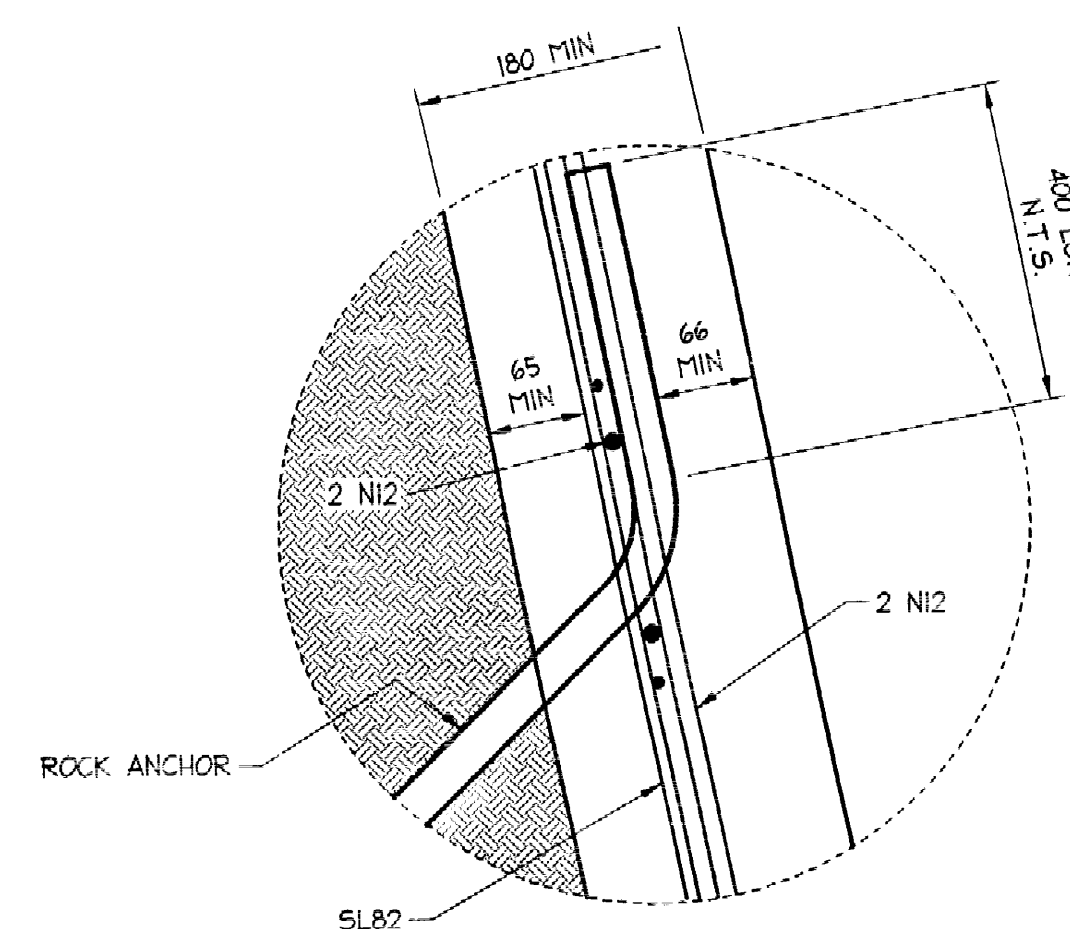
NOTES: SPRAYED CONCRETE WALLS

REINFORCEMENT:

Allowance to be made for texture application.
Minimum cover to all reinforcement to be:
65 mm to exposed face.
50 mm to face cast against ground.
All welded fabric shall be lapped as follows: 300mm minimum lap.
Mild steel rods denoted N12 are 12mm diameter D500 Grade deformed bars with 450mm minimum lap and 65mm minimum concrete cover.
Reinforcement to be held in its correct position at 800mm centres.

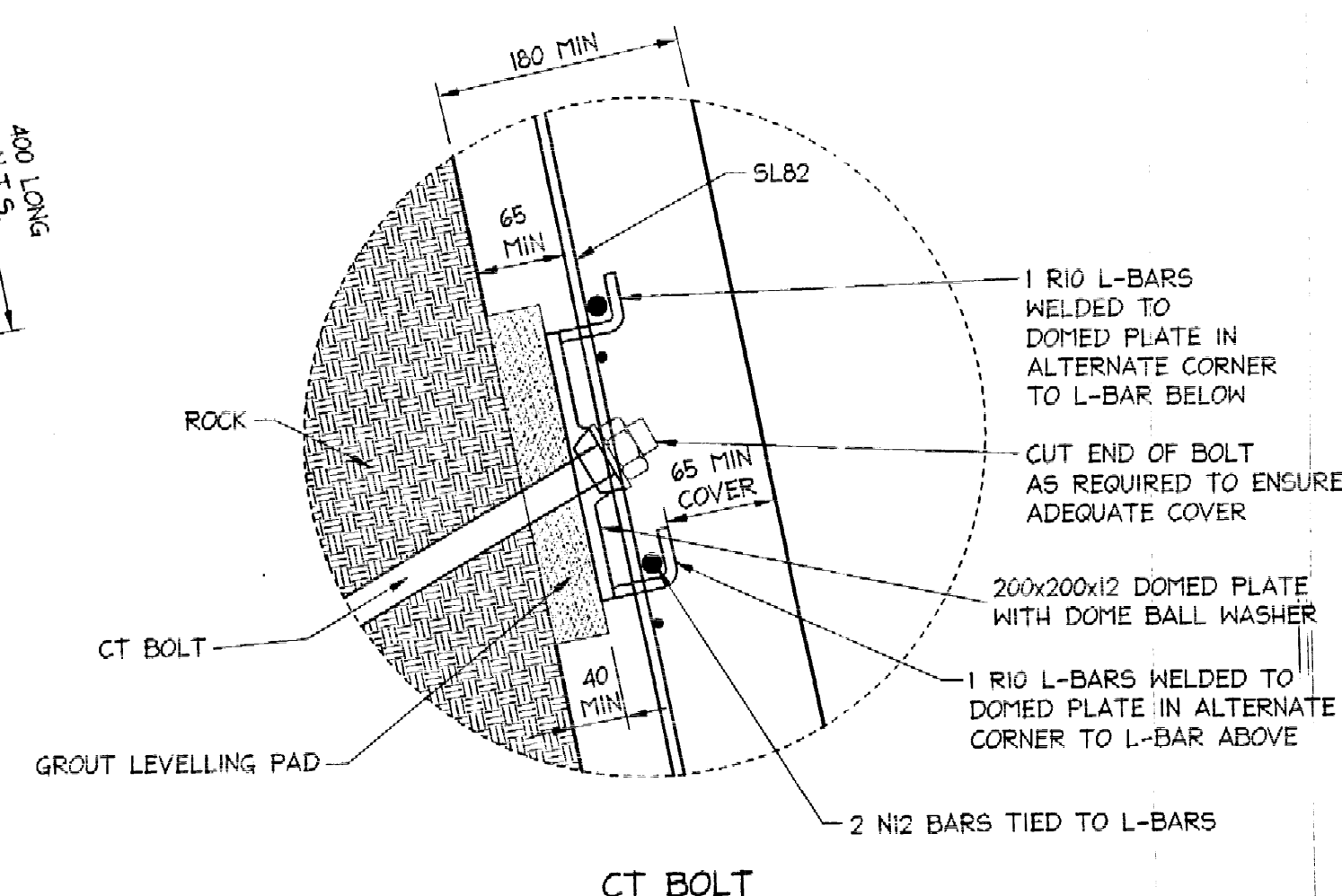
CONCRETE:

All workmanship and materials shall be carried out in accordance with AS 3600. Concrete design strength (F_c) at 28 days to be : 32 MPa.

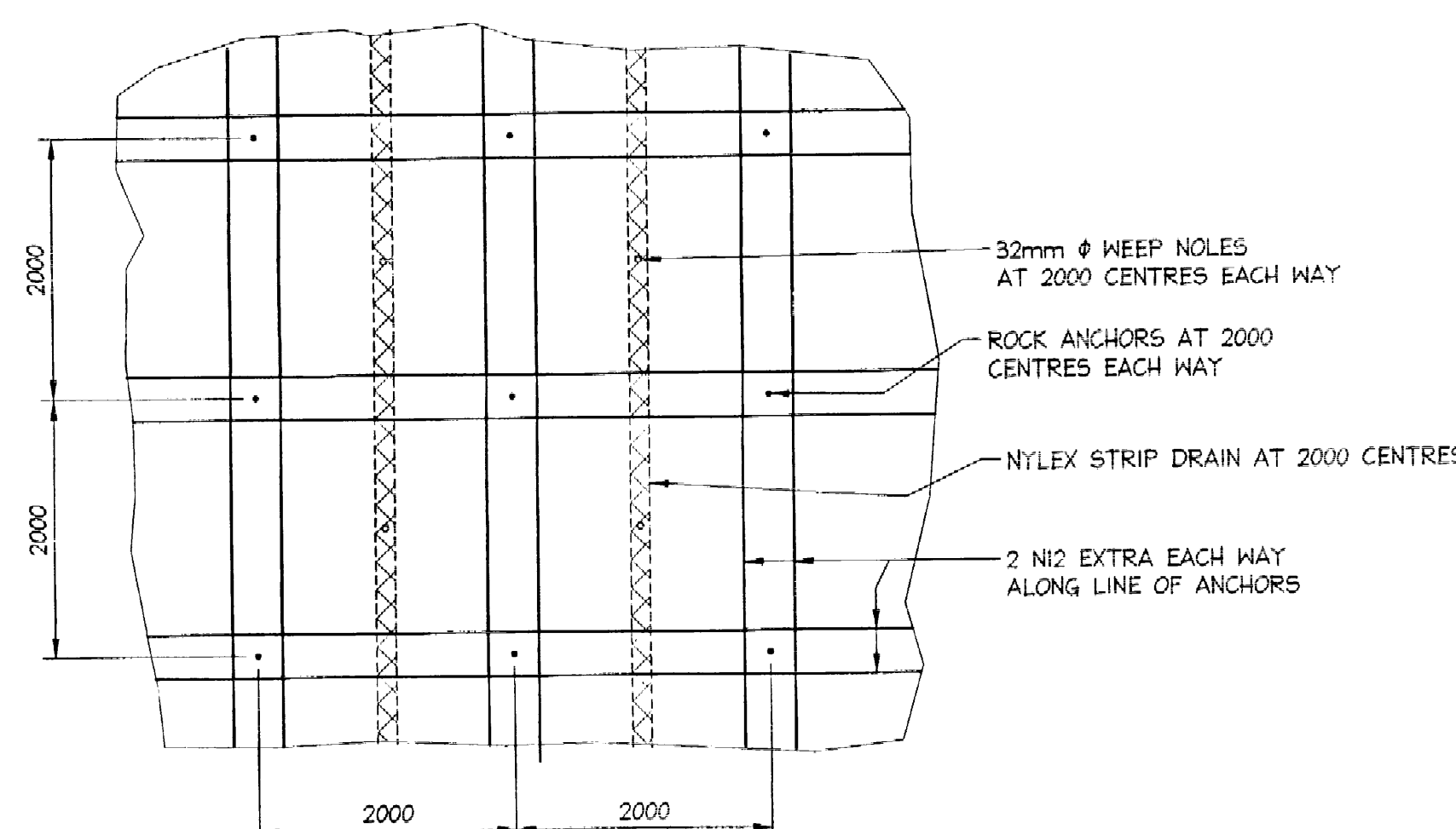


N24 ROCK ANCHOR

DETAIL A
SCALE = 1:5
C07,08

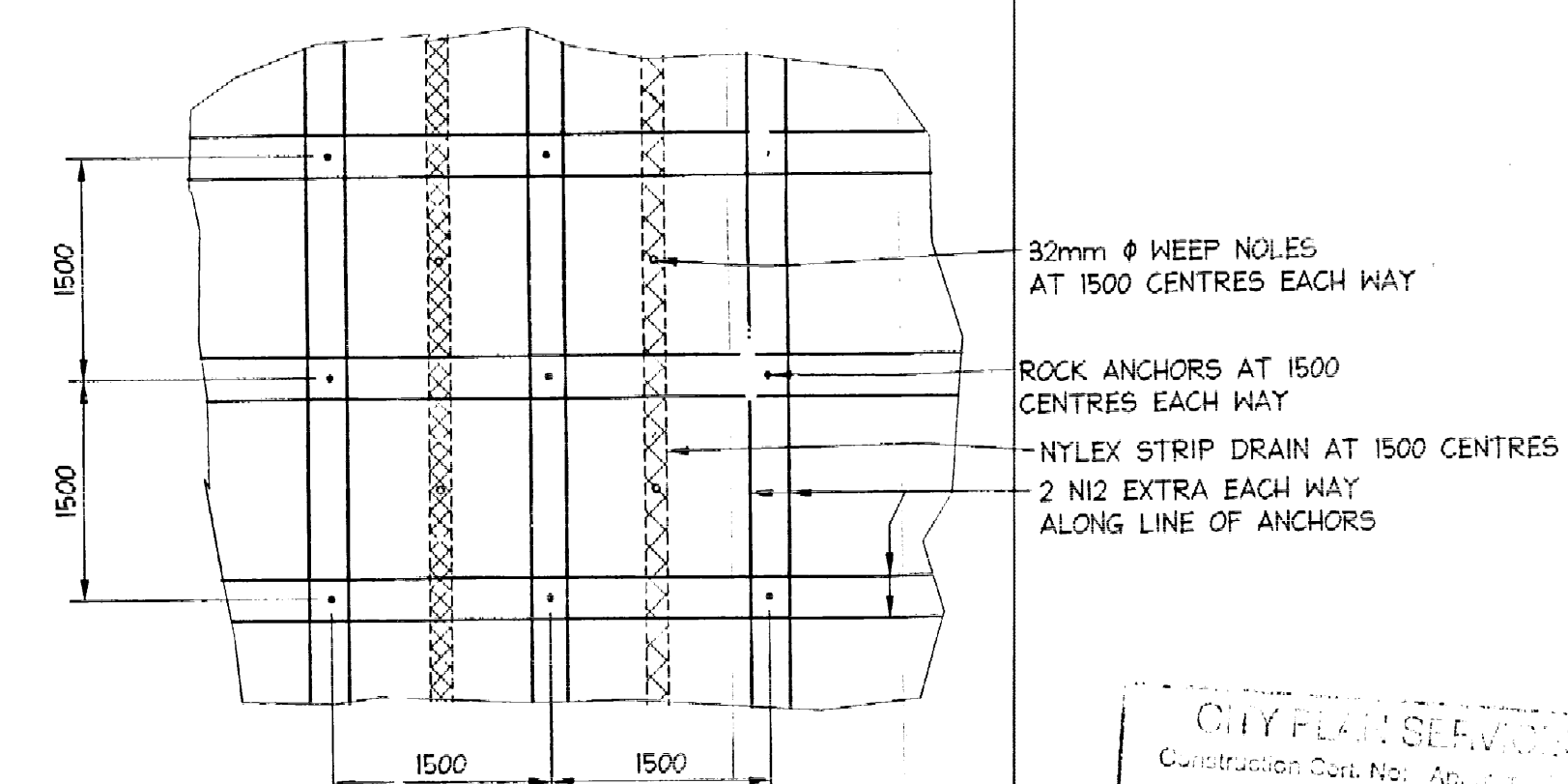


CT BOLT



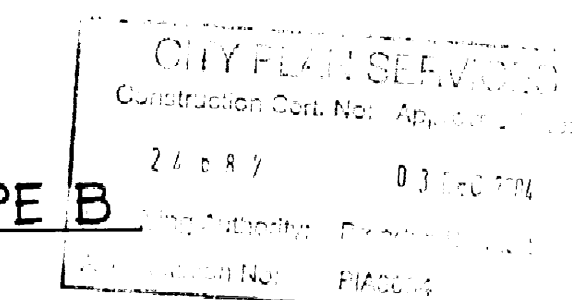
ANCHOR SETOUT ELEVATION TYPE A

SCALE = 1:50



ANCHOR SETOUT ELEVATION TYPE B

SCALE = 1:50

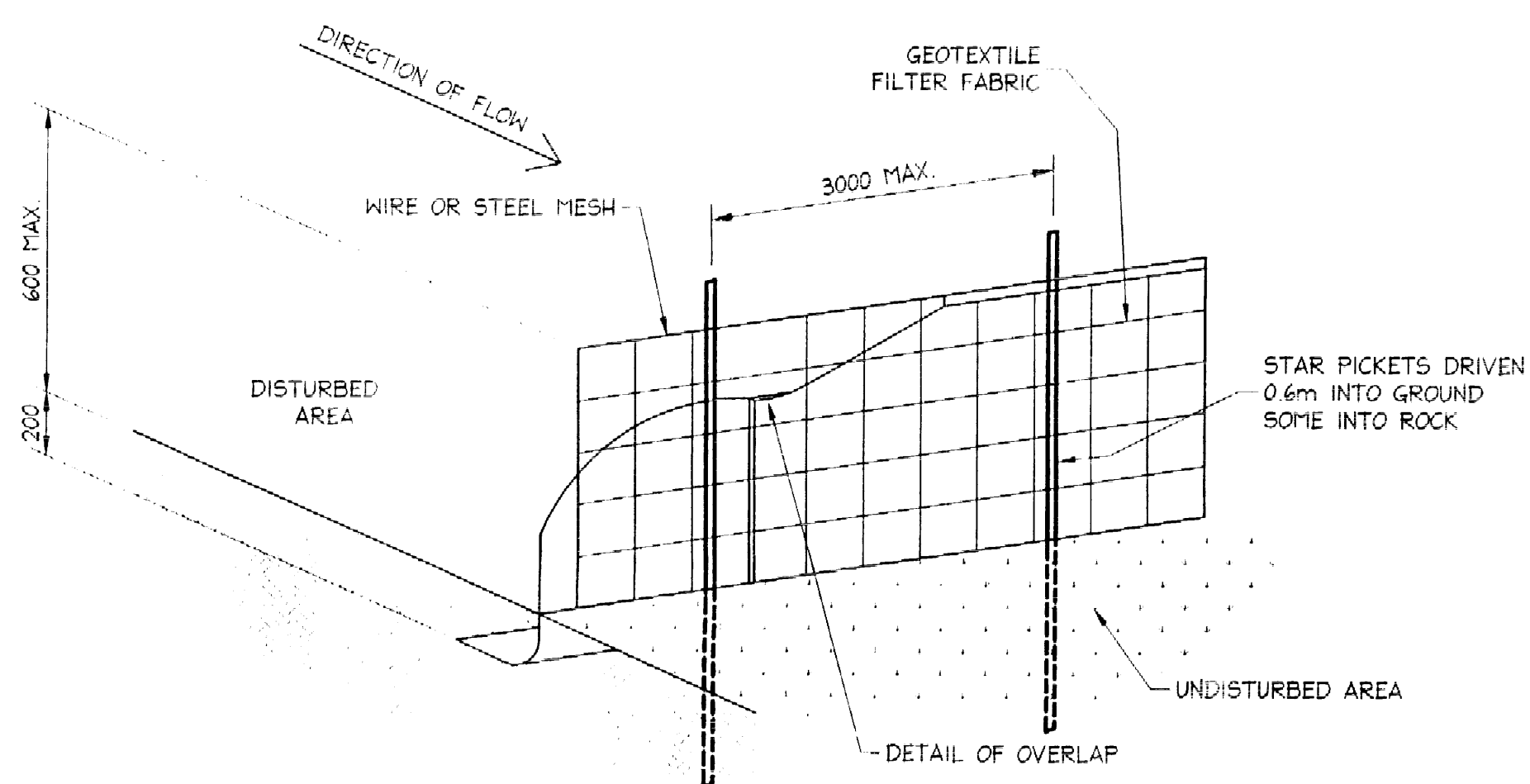


ISSUED FOR CONSTRUCTION CERTIFICATE SUBMISSION ONLY

DOCUMENT CERTIFICATION			NORTHERN BEACHES Consulting Engineers P/L		Project: PROPOSED NEW DWELLING AT BARRENJOEY & PALM BEACH ROADS PALM BEACH for: RAYPOND DEVELOPMENT		Drawing Title: HOUSE No.2 ANCHOR DETAILS		Date: SEPT 2004	Design: R.G.W.	Drawn: MC	Checked:
Date: 15/04/06 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.		Job No: 030703		Drawing No: S13		Rev: -			
Date:	Rev:	Amendment:										

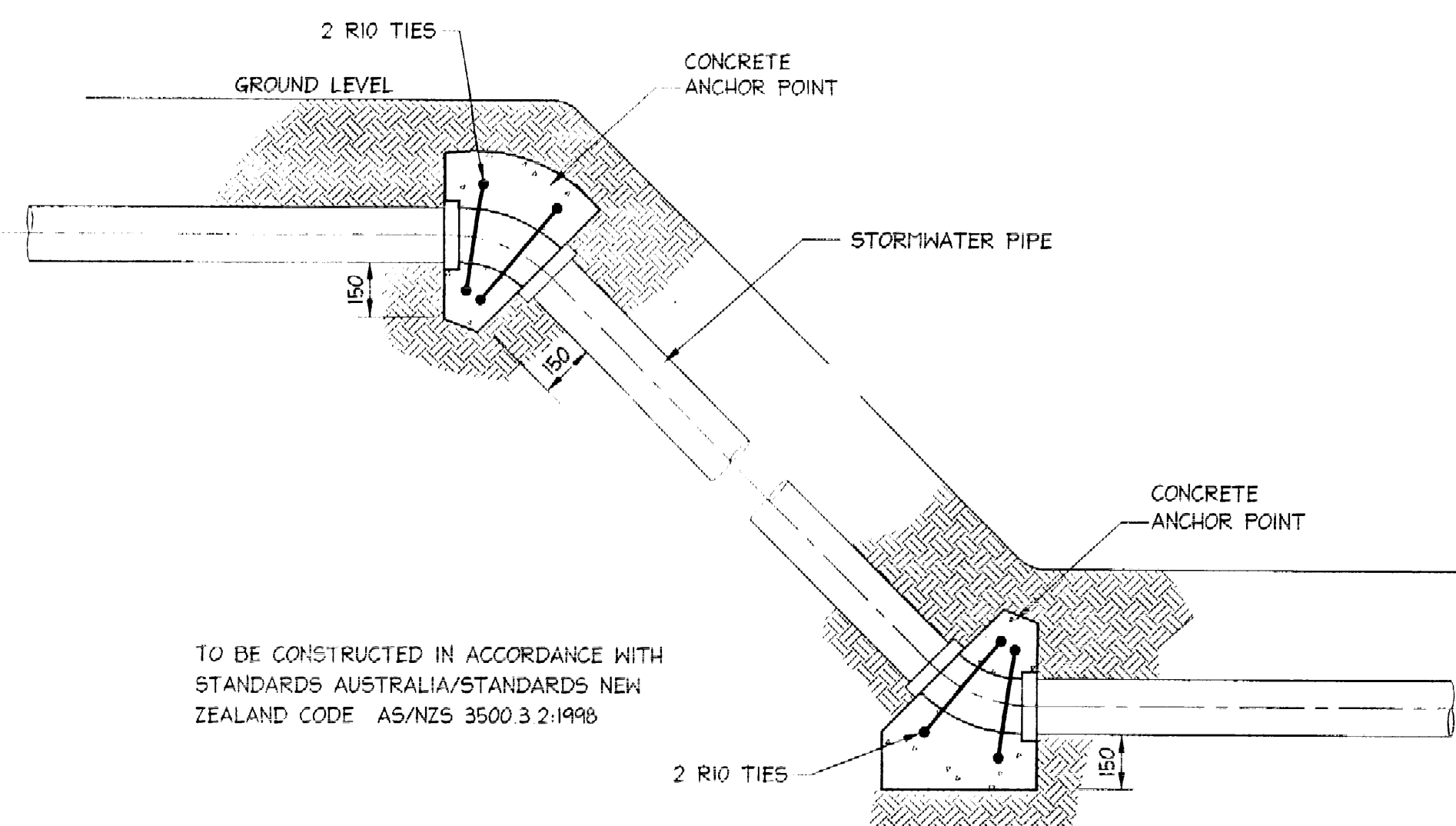
SEDIMENT CONTROL:

1. INSTALL SEDIMENT CONTROL STRUCTURES IN LOCATIONS INDICATED ON DRAWINGS AND AS OTHERWISE REQUIRED TO CONTROL SEDIMENT DURING ALL EXCAVATIONS AND WHILST 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.



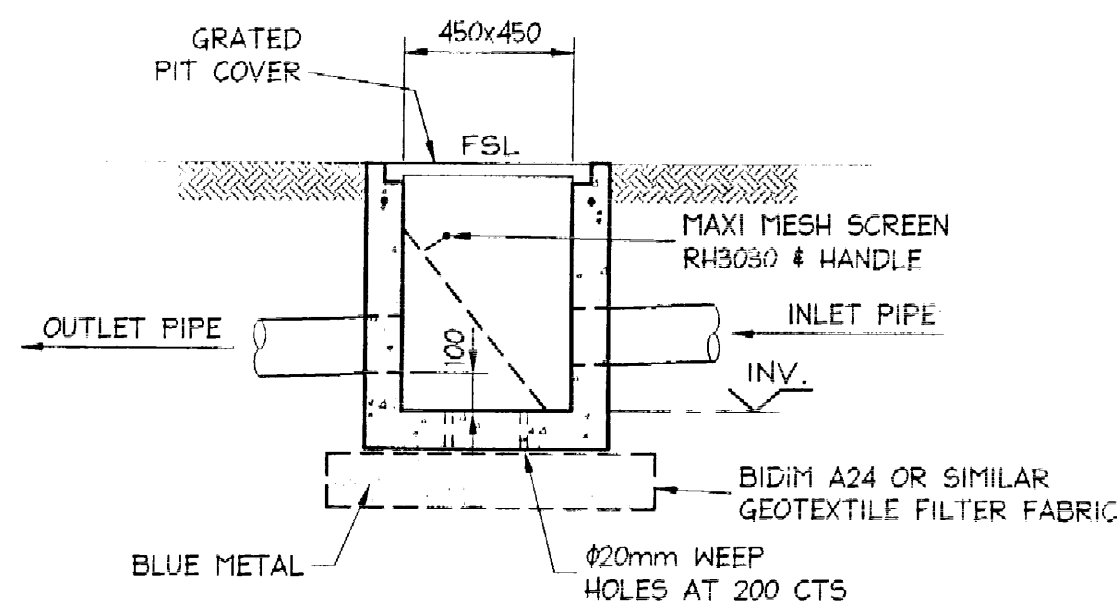
SILT FENCE DETAIL

SCALE = N.T.S.



**CONCRETE ANCHOR POINT DETAIL
FOR EARTH SLOPE GREATER THAN 1 V. TO 3 H.**

SCALE = 1 : 20

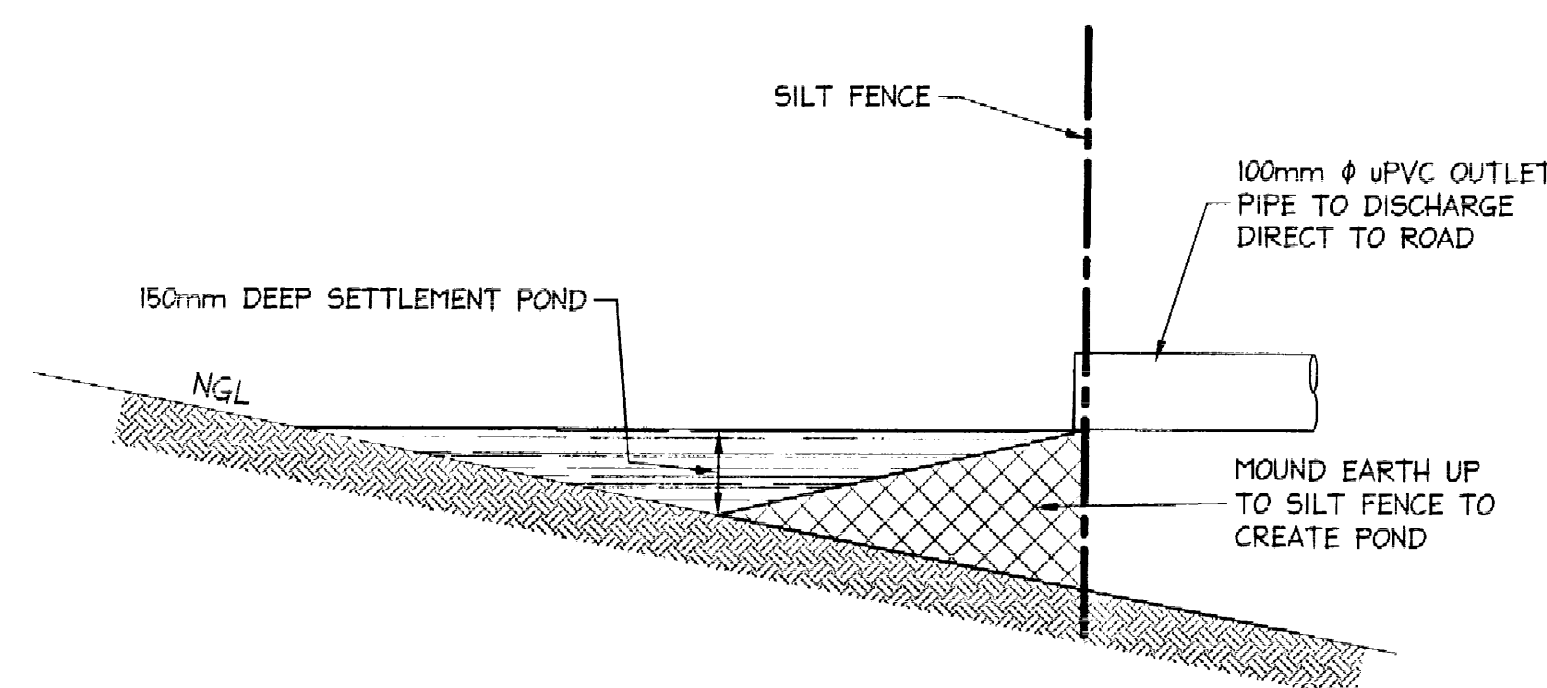


450x450 PIT DETAIL

SCALE = 1 : 20

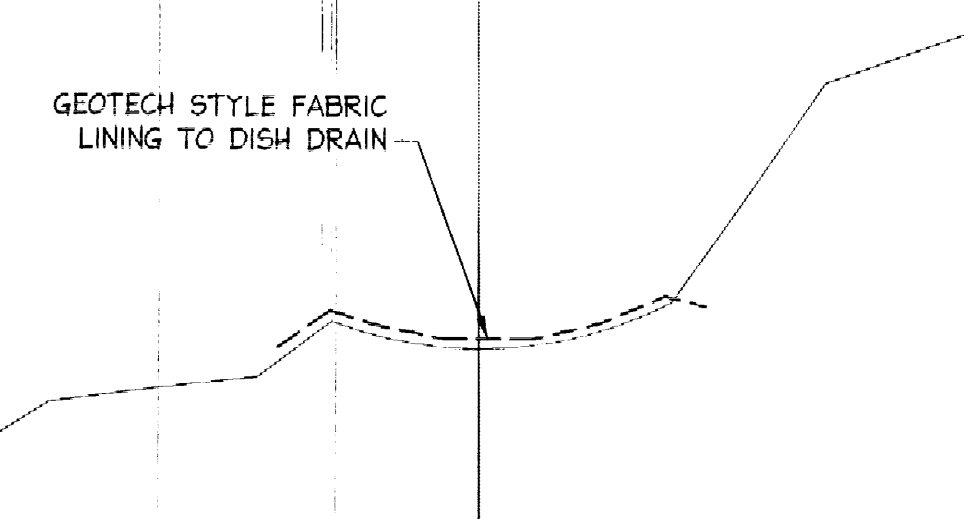
SCHEDULE OF WORKS:

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.



TYPICAL SECTION THROUGH SETTLEMENT POND

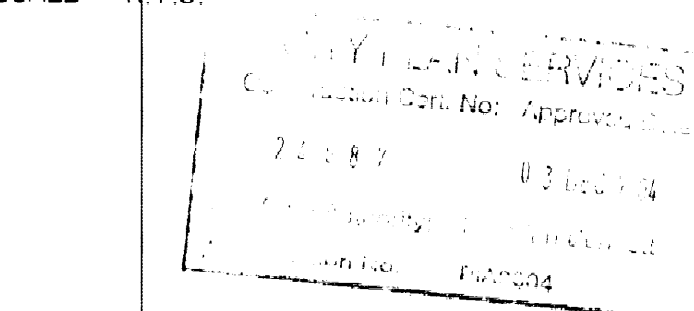
SCALE = N.T.S.



**TYPICAL SECTION THROUGH
CUT OFF DRAIN**

SCALE = N.T.S.

**ISSUED FOR
CONSTRUCTION
CERTIFICATE
SUBMISSION ONLY**

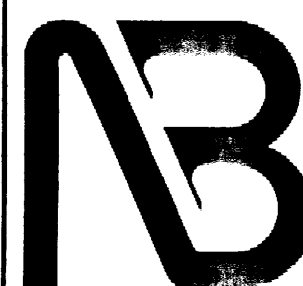


AI

DOCUMENT CERTIFICATION

Date: *Nov 04*
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. 803998
I hereby state that this drawing is in compliance
with 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.2
STORMWATER AND EROSION
CONTROL DETAILS**

The copyright of this drawing remains with Northern Beaches Consulting Engineers P/L.

Date:

SEPT 2004

Design:

RGW

Drawn:

Paul R Bruce
OMIEAust.

Checked:

Job No:

030703

Drawing No:

D02

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.

ISSUED FOR
CONSTRUCTION
CERTIFICATE
SUBMISSION ONLY

21/08/04
0310/04
0310/04
0310/04
0310/04

Raymond
R. Wray

Date:	Design:	Drawn:	Checked:
SEPT 2004	RGW	MC	
Job No:	Drawing No:	Rev:	
030703	D03	-	

Drawing Title:
HOUSE No.2
OSD TANK DT2 DETAILS
The copyright of this drawing remains with Northern Beaches Consulting Engineers P/L

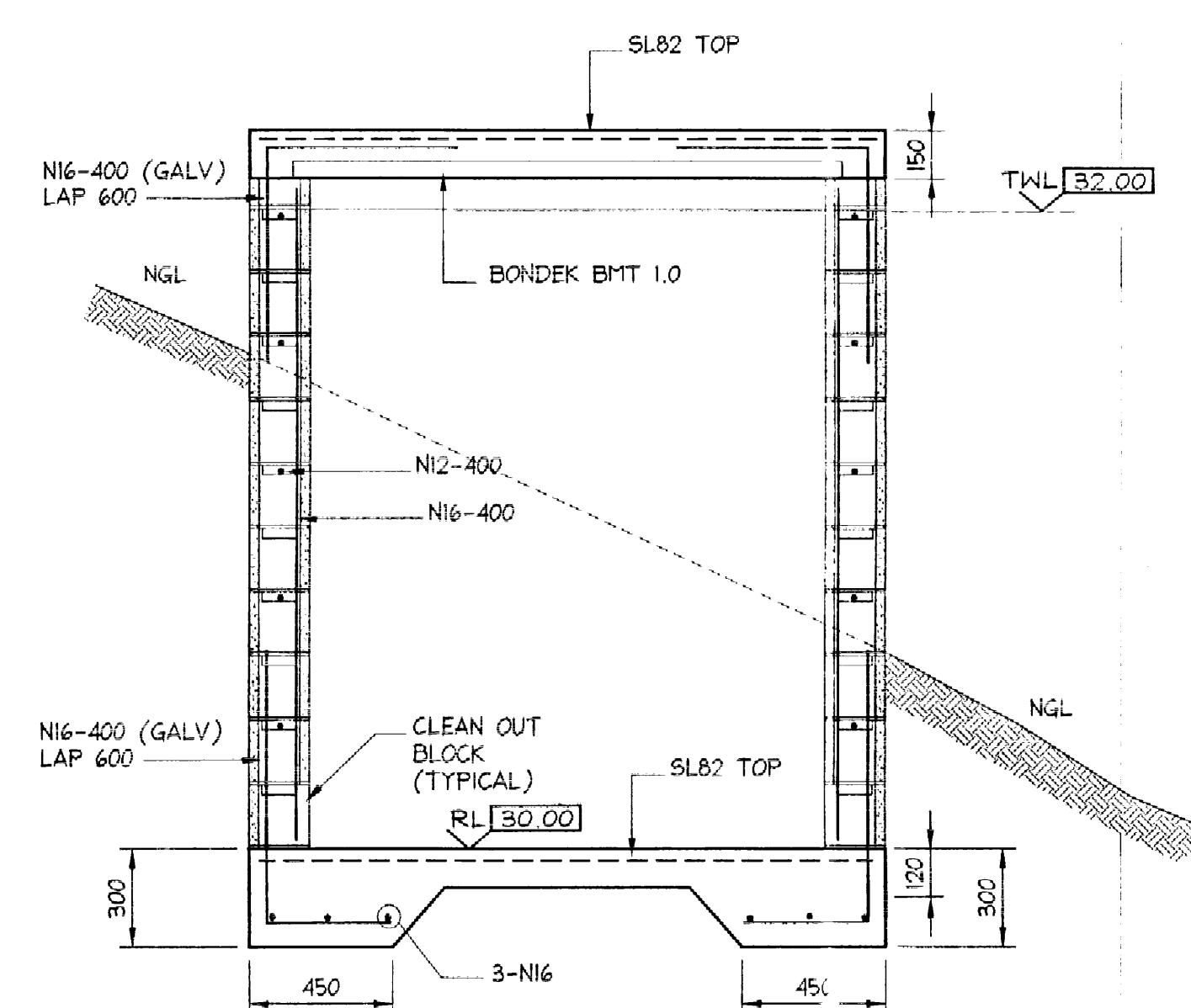
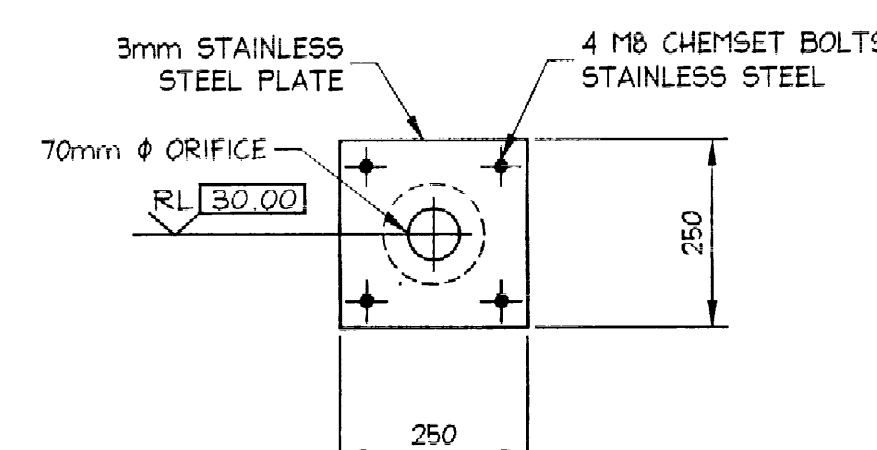
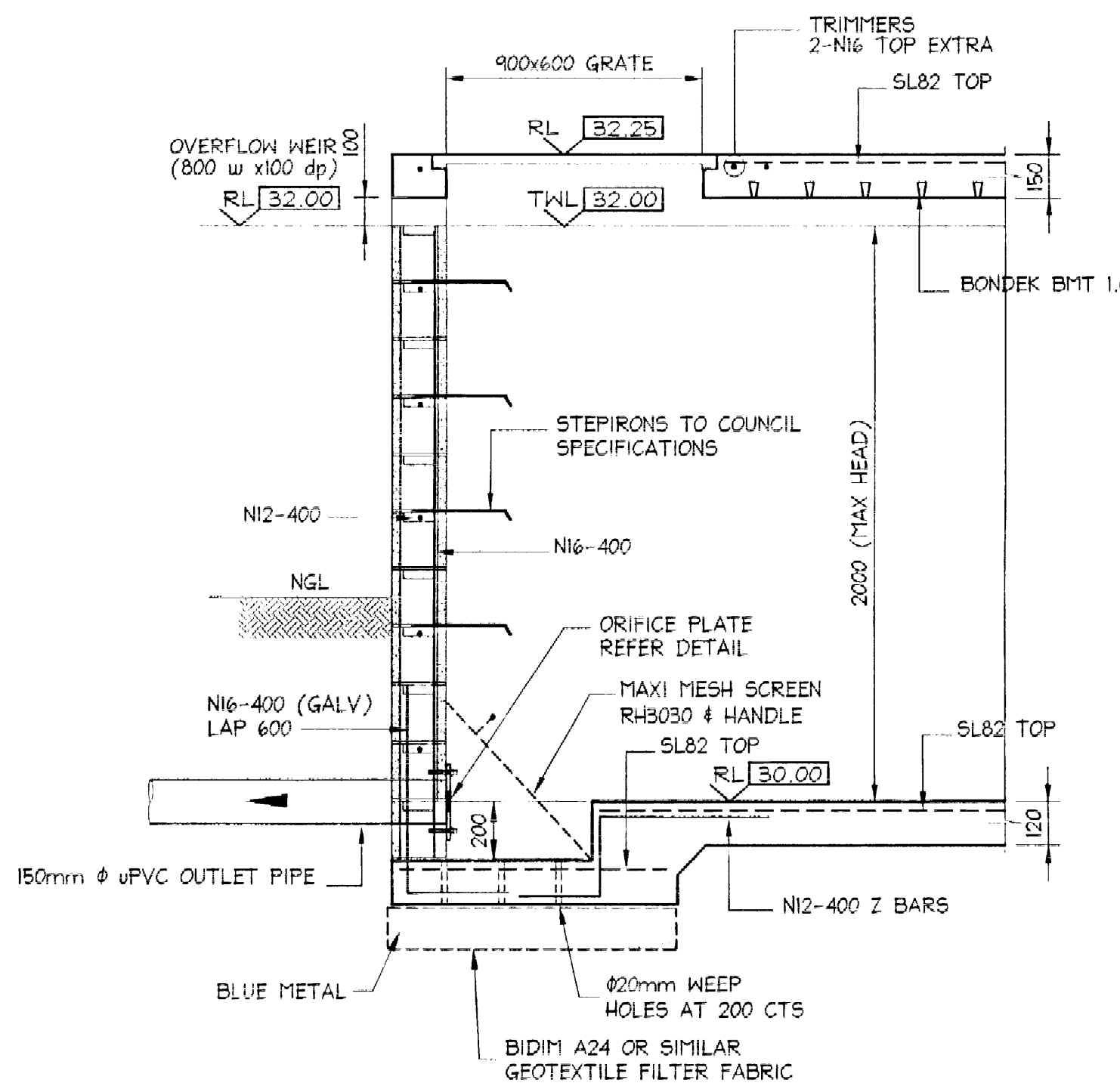
Project:
PROPOSED NEW DWELLING AT
BARRENJOEY & PALM BEACH ROADS
PALM BEACH
for: RAYPOND DEVELOPMENT

NORTHERN BEACHES
Consulting Engineers P/L
AC/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

I am a qualified Structural/Civil Engineer.
I hold the following qualifications:
BE(Civil), CPENG, MIEAust, NPER.
Institute of Engineers Membership No. 809938
I hereby state that this drawing is in compliance
with the provisions of the Building Code of
Australia and/or relevant Australian/Industry
Standards.

DOCUMENT CERTIFICATION
Date: 21/08/04
Rick G. Wray
(Director Northern Beaches Consulting Engineers)

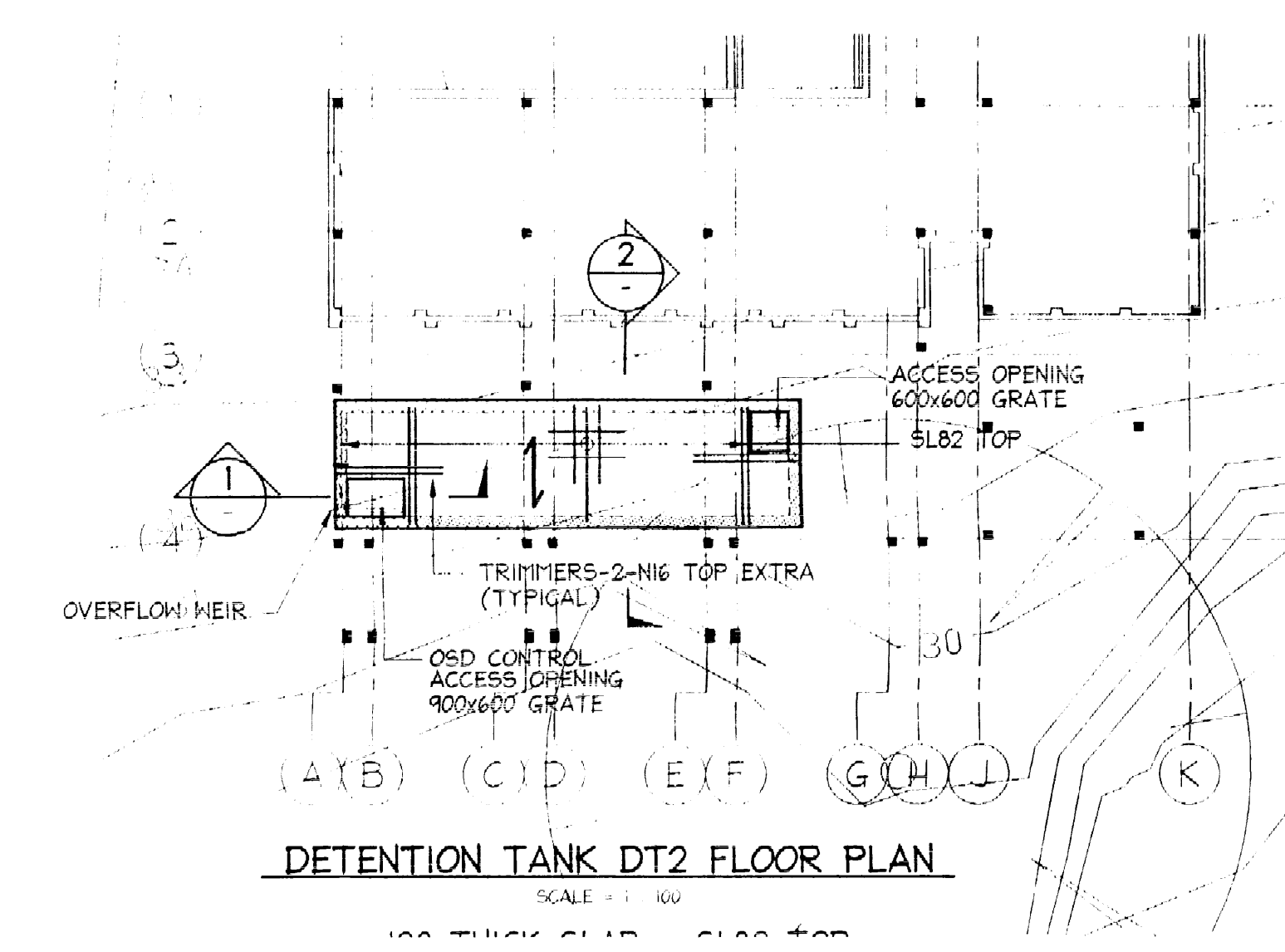
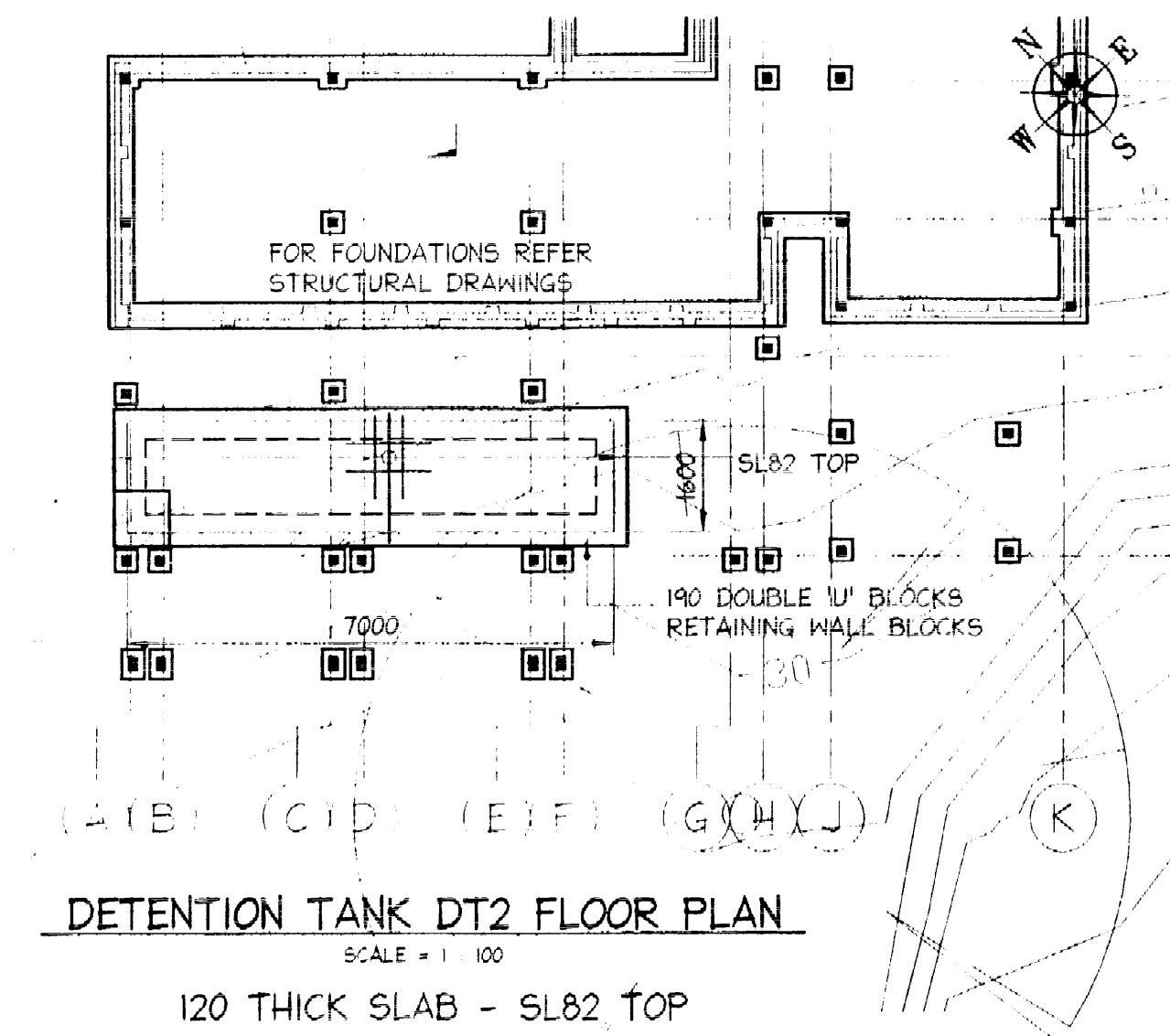
Date:	Rev:	Amendment:



SECTION 1
SCALE = 1:20

ORIFICE PLATE DETAIL

SECTION 2
SCALE = 1:20



DETENTION TANK DT2 FLOOR PLAN
SCALE = 1:100

DETENTION TANK DT2 FLOOR PLAN
SCALE = 1:100

HOUSE 2 CC TREE SUMMARY

All previously numbered and surveyed trees within Lot 2 boundaries are listed below, with the exception of some weed species. List compiled with reference to:

- Pittwater Council DA Conditions B8 & C7.
- PSB Tree Protection Plan TP13A dated 15/11/2002.
- PSB Landscape Plan 00137/L06A, dated 25/05/2001.
- Stamped, approved Tree Survey TP05B, dated 8/01/2002.
- PSB Pre-Construction Tree/Vegetation Report, Subdivision Works, dated 10 April 2003.
- 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 LP13A. Previous issues of Tree Plans/Surveys, may be referred to if required.

2. Trees to be retained, protected and bonded as part of the subdivision, as per DA Condition C7. T103, T104, T182, T199, T200, T201, T202. Shown on Landscape Plan LP13A.

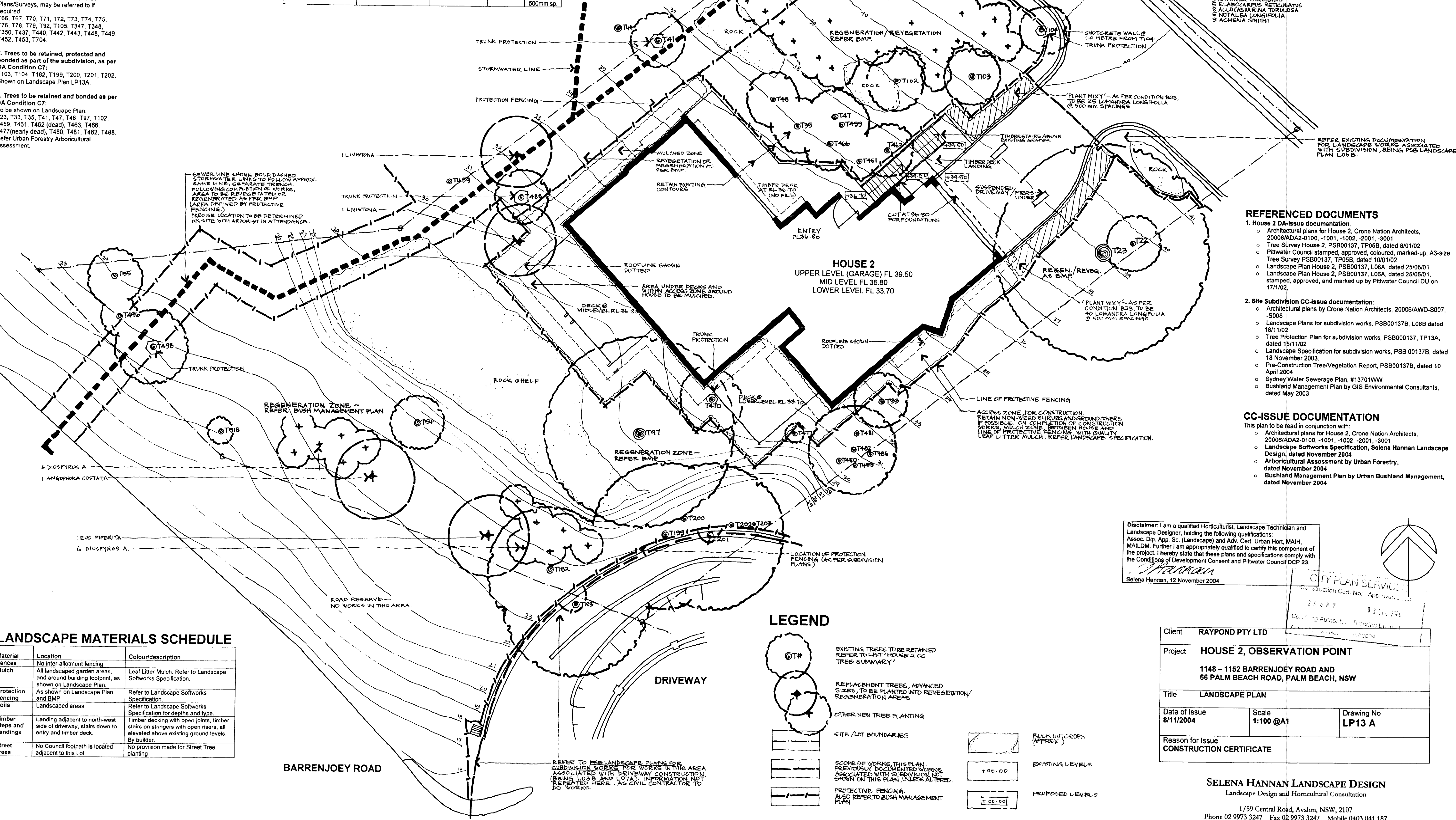
3. Trees to be retained and bonded as per DA Condition C7. To be shown on Landscape Plan. T23, T33, T35, T41, T47, T48, T97, T102, T459, T461, T462 (dead), T463, T468, T477 (nearly dead), T480, T481, T482, T488. Refer Urban Forestry Arboricultural Assessment.

5. Trees to be removed for House 2 Not shown on Landscape Plan LP13A. T32, T34, T36, T37, T38, T50, T51, T69, T355, T357, T358, T359, T360, T361, T362, T363, T457, T458, T460, T465A, T465B, T468, T471, T472, T473, T474, T475, T478, T479, T497, T515 (dead), T516 (dead).

6. Trees to be retained, not bonded Shown on Landscape Plan LP13A. A. Trees located within 5 metres of house, services, sewer, stormwater, pathways, stairs, patios and private driveway, refer Urban Forestry Arboricultural Assessment as per Condition B8: T22, T56, T470, T496, T498. B. Trees located outside 5 metre-zone: T54, T203, T483, T486, T518.

PLANT SCHEDULE

Botanical Name	Common Name	Height x Spread at Maturity (mm)	Pot Size	Quantity/ Spacing
'REPLACEMENT TREES' AS PER CONDITION B27				
To be planted in bush regeneration area as shown on this plan				
Acmena smithii	Lillypilly	8000 x 4000	Viro-tube	3
Allocasuarina torulosa	Forest Oak	8000 x 4000	Viro-tube	8
Elaeocarpus reticulatus	Blueberry Ash	8000 x 4000	Viro-tube	3
Notelaea longifolia	Mock Olive	4000 x 2000	Viro-tube	5
Rapanea variabilis	Mutton Wood	3000 x 1000	Viro-tube	5
Wikiea huegeliana	Wikiea	4000 x 2000	Viro-tube	5
TREES				
Trees to be planted in bush regeneration areas (additional to those in Bush Management Plan)				
Angophora costata	Sydney Red Gum	15000 x 12000	400mm Rocket Pot	1
Diospyros australis	Black Plum	6000 x 3000	Tube or 150mm Rocket Pot	12
Eucalyptus piperita	Sydney Peppermint	18000 x 8000	400mm Rocket Pot	1
GROUNDCOVERS				
Lomandra longifolia	Mat Rush	1000 x 1000	150mm	65 500mm sp.



LANDSCAPE MATERIALS SCHEDULE

Material	Location	Colour/description
Fences	No inter allotment fencing	
Mulch	All landscaped garden areas, and around building footprint, as shown on Landscape Plan	Leaf Litter Mulch. Refer to Landscape Softworks Specification.
Protection Fencing	As shown on Landscape Plan and BMP	Refer to Landscape Softworks Specification.
Soils	Landscaped areas	Refer to Landscape Softworks Specification for depths and type.
Timber Steps and Landings	Landing adjacent to north-west side of driveway, stairs down to entry and timber deck.	Timber decking with open joints, timber stairs on stringers with open risers, all elevated above existing ground levels. By builder.
Street Trees	No Council footpath is located adjacent to this Lot	No provision made for Street Tree planting.

LEGEND

- EXISTING TREES TO BE RETAINED REFER TO LIST 'HOUSE 2 CC TREE SUMMARY'
- REPLACEMENT TREES, ADVANCED SIZES, TO BE PLANTED INTO REVEGETATION/REGENERATION AREAS
- OTHER NEW TREE PLANTING
- LOT/BOUNDARIES
- SCOPE OF WORKS THIS PLAN: PREVIOUSLY DOCUMENTED WORKS ASSOCIATED WITH SUBDIVISION NOT SHOWN ON THIS PLAN UNLESS ALTERED.
- PROTECTIVE FENCING, ALSO REFER TO BUSH MANAGEMENT PLAN
- ROCK OUTCROPS (APPROX)
- EXISTING LEVELS
- PROPOSED LEVELS

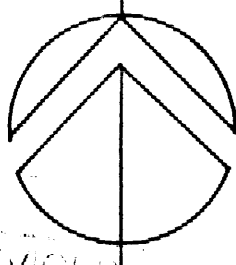
REFERENCED DOCUMENTS

- 1. House 2 DA-issue documentation:
 - Architectural plans for House 2, Crone Nation Architects, 2000/AD2-0100, -1001, -1002, -2001, -3001
 - Tree Survey House 2, PSB00137, TP05B, dated 8/01/02
 - Pittwater Council stamped, approved, coloured, marked-up, A3-size Tree Survey PSB00137, TP05B, dated 10/01/02
 - Landscape Plan House 2, PSB00137, L06A, dated 25/05/01
 - Landscape Plan House 2, PSB00137, L06A, dated 25/05/01, stamped, approved, and marked up by Pittwater Council DU on 17/1/02.
- 2. Site Subdivision CC-issue documentation:
 - Architectural plans by Crone Nation Architects, 2000/ADW-5007, -5008
 - Landscape Plans for subdivision works, PSB00137B, L06B dated 18/1/02
 - Tree Protection Plan for subdivision works, PSB000137, TP13A, dated 15/11/02
 - Landscape Specification for subdivision works, PSB 00137B, dated 18 November 2003.
 - Pre-Construction Tree/Vegetation Report, PSB00137B, dated 10 April 2004
 - Sydney Water Sewerage Plan, #13701WW
 - Bushland Management Plan by GIS Environmental Consultants, dated May 2003

CC-ISSUE DOCUMENTATION

- This plan to be read in conjunction with:
 - Architectural plans for House 2, Crone Nation Architects, 2000/AD2-0100, -1001, -1002, -2001, -3001
 - Landscape Softworks Specification, Selena Hannan Landscape Design, dated November 2004
 - Arboricultural Assessment by Urban Forestry, dated November 2004
 - Bushland Management Plan by Urban Bushland Management, dated November 2004

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, MAIH, MAILDM. 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



Client	RAYPOND PTY LTD		
Project	HOUSE 2, OBSERVATION POINT		
	1148 - 1152 BARRENJOEY ROAD AND 56 PALM BEACH ROAD, PALM BEACH, NSW		
Title	LANDSCAPE PLAN		
Date of Issue 8/11/2004	Scale 1:100 @A1	Drawing No LP13 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



Figure 3.1
Action Plan - Lot 2
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

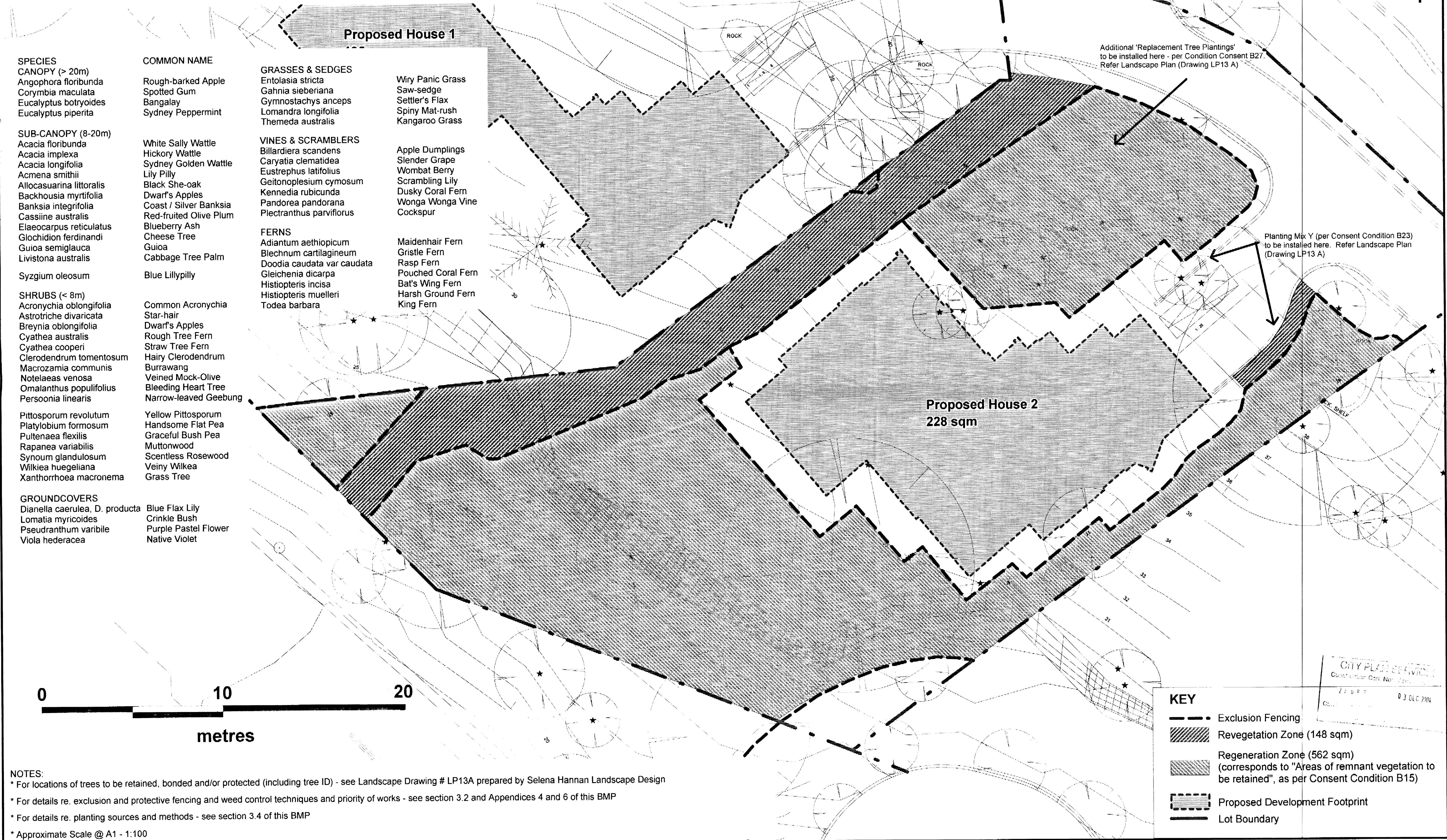
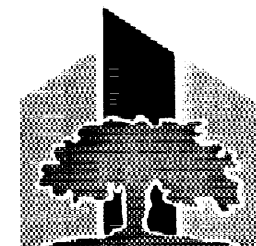


Figure 3.1
Action Plan - Lot 2
Diagram B - Revegetation and Regeneration Areas

URBAN BUSHLAND
MANAGEMENT CONSULTANTS PTY LTD



\\UBMC\Consultancy\Observation Point, Palm Beach\Mapping\Action Plan - Lot 2 WQR