R/99275

Anthony Protas Consulting Pty Ltd
BUILDING REGULATIONS CONSULTANTS

18 October, 2002

Our Ref:021008

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

Dear Sir,

Re: 27c Alexandra Crescent, Bayview
Construction Certificate

Pursuant to the requirements of the Environmental Planning and Assessment Act please find attached a copy of our Construction Certificate, plans and specifications to which the Construction Certificate has been issued and other relevant documents.

Should you have any questions, please do not hesitate to contact the undersigned.

Yours faithfully

Anthony Protas
Anthony Protas Consulting Pty Ltd

N 0687/02

RECEIVED
23 OCT 2002
PITTWATER COUNCIL

SCANNED
25 OCT 2002
PITTWATER COUNCIL

Level 3 Suite 303 84 Pitt Street Sydney NSW 2000 Ph 02 9223 7158 Fax 02 9223 9492
Email mail@protas.net.au Web www.protas.net.au ABN 37 079 830 756

COPY

Construction Certificate – 27C Alexandra Crescent, Bayview

"Proposed construction of a new 3 storey dwelling"

1. Details of the applicant

Mr ☒ Ms ☐ Mrs ☐ Dr ☐ Other

First name: Alfredo

Family name: Marrocco

Flat/street no.: 4

Street name: Lane Cove Road

Suburb or town: Ingleside

State: NSW

Postcode: 2101

Daytime telephone: (02) 9693 9200

Fax: (02) 9669 6715

Mobile: 0419 666 040

Email: alf.marrocco@belcadar.com.au

2. Details of the development consent

Development application no.: N0687/01

Date the consent was issued: 25 January, 2002

3. Decision of the certifying authority

This certificate is issued:

☒ without any conditions

☐ subject to conditions of the kind referred to in clauses 187 or 188 of the Environmental Planning and Assessment Regulation 2000

Conditions have been placed on the certificate for the following reasons:

☒ the issue of this certificate has been endorsed on the plans and specifications that were lodged with the application.

Plan no.s approved: Refer to the attached plan schedule

Date of this decision: 18 October, 2002

4. Information attached to this decision

- ☐ A fire safety schedule
- ☒ Schedule of approved plans & specifications

5. Certification

Anthony Protas certifies that

if the work is completed following the plans and specifications which have been approved, it will comply with the requirements of the Environmental Planning and Assessment Regulation 2000 as referred to in section 81A(5) of the *Environmental Planning and Assessment Act 1979*.

Construction certificate no.

1008/02

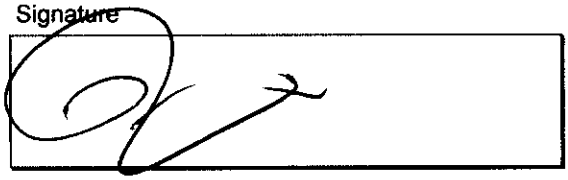
Date of this certificate

18 October, 2002

6. Signature

For this certificate to be valid, it must be signed by the certifying authority.

Signature



Name

Anthony Protas

Flat/Street no.

Level 3, 84

Street name

Pitt Street

Suburb or town

Sydney

State

NSW

Postcode

2000

Telephone

9223 7158

Fax

9223 9492

If the certifier is an accredited certifier:

Accreditation body of the certifier

BSAP

Accreditation no. of the certifier

2442

7. Applicant's right of appeal

If the certifying authority is a council, a Minister or a public authority and the certifying authority has issued a construction certificate subject to conditions, you can appeal against these conditions to the Land and Environment Court within 12 months from the date of the decision.

Anthony Protas Consulting Pty Ltd
BUILDING REGULATIONS CONSULTANTS

Application for construction certificate

1. Details of the applicant

Mr ☒ Ms ☐ Mrs ☐ Dr ☐ Other ☐

First name: ALFREDO
Family name: MARROCCO

Flat/street no.: 4
Street name: LANE COVE ROAD

Suburb or town: INGLESIDE
State: NSW
Postcode: 2101

Daytime telephone: (02) 9693-9200
Fax: (02) 9669-6715
Mobile: 0419-666-040

Email: alf.marrocco@belmadar.com.au

2. Identify the land

Flat/street no.: 27C
Street name: ALEXANDRA CRES.

Suburb or town: BAYVIEW
Postcode: 2104

Lot no.: 33
Section: PITTWATER, PARISH OF NARRABEEN, COUNTY OF CUMBERLAND

DP/MPS no.: 876610
Volume/folio: 33/876610

You can find the lot no., section, DP/MPS no. and volume/folio details on a map of the land or on the title documents for the land. If you need additional room, please attach a schedule and/or a map with these details.

3. Estimated cost of the development

$ 492,107.50 including GST

Level 3 Suite 303 84 Pitt Street Sydney NSW 2000 Ph 02 9223 7158 Fax 02 9223 9492
Email mail@protas.net.au Web www.protas.net.au ABN 37 079 830 756

4. Describe the development

What type of work do you propose to carry out?

Building work ☒

Subdivision work ☐

Describe the work

CONSTRUCTION OF A NEW 3 STOREY DWELLING & INTERNAL DRIVEWAY AT 27C ALEXANDRIA CRES. BANVIEW NSW 2104.

For building work, what is the class of the building under the Building Code of Australia?

CLASS 1a

This can be found on the development consent

Has development consent been granted for the development?

No ☐

Yes ☒➤ What is the development application no.?

N0687/01

What date was development consent granted?

25 MARCH 2002

5. Information to be attached to the application

You need to provide material with your application that is relevant to the type of work you propose to do. Please indicate the material you have attached by placing a cross in the appropriate boxes ☐:

1. If you are going to carry out **building work**:

☐ a copy of any compliance certificates on which you rely

☐ detailed plans of the building (4 copies)

The plans 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 each elevation of the building
- show the level of the lowest floor, the level of any yard or unbuilt area on that floor and the level of the ground
- indicate the fire safety and fire resistance measures (if any), and their height, design and construction

Where you propose to alter, add to or rebuild a building that is already on the land, or modify plans that have already been approved, please mark the general plan (by colour or otherwise) to show the change you propose to make.

☐ detailed specifications of the building (4 copies)

The specifications are to:

- describe the construction (including the standards that will be met), the materials which will be used to construct the building and the methods of drainage, sewerage and water supply
- state whether the materials proposed to be used are new or second hand and give details of any second-hand materials to be used.

Where you propose to modify specifications that have already been approved, please mark the approved specifications (by colour or otherwise) to show the modification.

☐ a plan of the existing building, drawn to scale, where the application involves building work to alter, enlarge or extend that building

This plan will assist the certifying authority to assess whether the work will reduce the fire protection capacity of the building.

5. continued

☐ where you propose to meet the performance requirements of the Building Code of Australia (BCA) by using an alternative solution to the deemed-to-satisfy provisions of the BCA:
- a list of the performance requirements you will meet by using the alternative solution
- the details of the assessment methods you will use to meet those performance requirements
- a copy of any compliance certificates on which you rely

☐ evidence of any accredited component, process or design on which you seek to rely

Components, processes or designs that relate to the erection or demolition of a building are accredited under the Environmental Planning and Assessment Regulation 2000.

☐ details of the fire safety measures, unless you are building a single dwelling or a non-habitable building or structure (such as a private garage, carport, shed, fence, antenna, wall or swimming pool). These details are to include:
- a list of any fire safety measures you propose to include in the building or on the land
- if you propose to alter, add to or rebuild a building that is already on the land, a list of the fire safety measures that are currently used in the building or on the land

The lists must describe the extent, capability and the basis of design of each measure.

☐ the attached schedule, completed for the development

The information in the schedule will be used by the Australian Bureau of Statistics to report each quarter on the building activity that occurs in the economy. Building statistics allow governments and businesses to accurately identify main areas of population growth and demand for products and services.

You may also need to pay a long service levy under section 34 of the *Building and Construction Industry Long Service Payments Act 1986* (or where such a levy is payable by instalments, the first instalment of the levy) before the certifying authority can issue a certificate to you.

2. If you are going to **carry out work to do a subdivision** (eg building roads or a stormwater drainage system):

☐ the details of the existing and proposed subdivision pattern (including the number of lots and the location of roads)

☐ the details of the consultation you have carried out with the public authorities who provide or will increase the services you will need (like water, road, electricity, sewerage)

☐ the existing ground levels and the proposed ground levels when the subdivision is completed

☐ copies of any compliance certificates on which you rely

☐ detailed engineering plans (4 copies). The detailed plans might include the following:
- earthworks
- roadworks
- road pavement
- road furnishings
- stormwater drainage
- water supply works
- sewerage works
- landscaping works
- erosion control works

Where you propose to modify plans that have already been approved, please mark the approved plans (by colour or otherwise) to show the modification.

5. continued

3. If you are going to **change the use of a building** or the classification of a building under the Building Code of Australia and you are doing building work (unless the building will now be used as a single dwelling or a non-habitable building or structure (such as a private garage, carport, shed, fence, antenna, wall or swimming pool)):

- ☐ a list of any fire safety measures you propose to include in the building or on the land
- ☐ if you propose to alter, add to or rebuild a building that is already on the land, a list of the fire safety measures that are currently used in the building or on the land
- ☐ details as to how the building will comply with the Category One fire safety provisions of the Building Code of Australia

The lists of fire safety measures must describe the extent, capability and the basis of design of each measure.

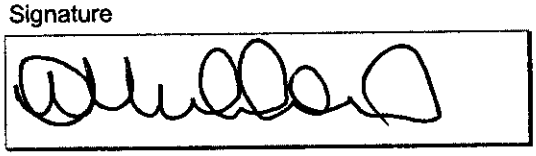
6. Signatures

The owner(s) of the land must sign this application if:

- at the time the owner signed the development application, the owner did not give consent to the applicant to lodge a construction certificate, or
- the owner of the land has changed since the owner signed the development application.

As the owner(s) of the above property, I/we consent to this application:

Signature



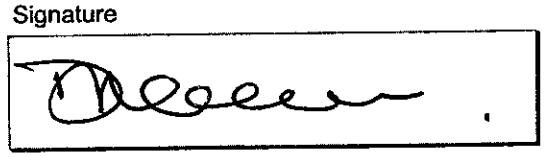
Name

ALFREDO MARROCCO

Date

16 OCTOBER 02

Signature



Name

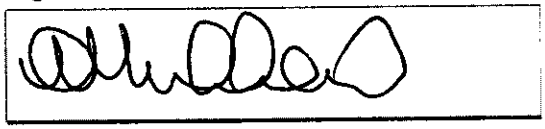
DANIELLA MARROCCO

Date

16 OCTOBER 02

The applicant, or the applicant's agent, must sign the application.

Signature



Name, if you are not the applicant

Date

16 OCTOBER 2002

In what capacity are you signing if you are not the applicant?

7. Privacy policy

The information you provide in this application will enable your application to be assessed by the certifying authority. If the information is not provided, your application may not be accepted. Please contact the council if the information you have provided in your application is incorrect or changes.

Schedule to application for a construction certificate

Please complete this schedule. The information will be sent to the Australian Bureau of Statistics.

All new buildings

Please complete the following:

- Number of storeys (including underground floors): THREE (3)
- Gross floor area of new building (m²): 645
- Gross site area (m²): 2833.62

Residential buildings only

Please complete the following details on residential structures:

- Number of dwellings to be constructed: ONE (1)
- Number of pre-existing dwellings on site: NIL
- Number of dwellings to be demolished: NIL
- Will the new dwelling(s) be attached to other new buildings? Yes ☐ No ☒
- Will the new building(s) be attached to existing buildings? Yes ☐ No ☒
- Does the site contain a dual occupancy? (NB dual occupancy = two dwellings on the same site) Yes ☐ No ☒

Materials – residential buildings

Please indicate the materials to be used in the construction of the new building(s):

Walls		Code	Roof		Code	Floor		Code	Frame		Code
Brick (double)	☒	11	Tiles	☐	10	Concrete or slate	☒	20	Timber	☒	40
Brick (veneer)	☐	12	Concrete or slate	☐	20	Timber	☐	40	Steel	☒	60
Concrete or stone	☐	20	Fibre cement	☐	30	Other	☐	80	Aluminium	☐	70
Fibre cement	☐	30	Steel	☒	60	Not specified	☐	90	Other	☐	80
Timber	☐	40	Aluminium	☐	70				Not specified	☐	90
Curtain glass	☐	50	Other	☐	80						
Steel	☐	60	Not specified	☐	90						
Aluminium	☐	70									
Other	☐	80									
Not specified	☐	90									

/

Pittwater Council

OFFICIAL RECEIPT

26/09/2002 Receipt No 97096

To CONSTRUCTRITE P/L

Applic	Reference	Amount
GL Re	QLSL-Buil	$984.20
	LSL @ 27C ALEXANDRA;DA NO	

Total:	$984.20
Amounts Tendered	
Cash	$0.00
Cheque	$984.20
Card	$0.00
Money Order	$0.00
Agency Rec	$0.00
Total	$984.20
Rounding	$0.00
Change	$0.00
Nett	$984.20

Printed 26/09/2002 12:43:50
Cashier sbrown

MHDAK 02 9317 3918 P.01/02

cil ABN 61 340 837 871
) General Manager

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

DA No: N0687/01

Thursday

ROCCO

or a new dwelling and driveway at 27C ALEXANDRA
I 2104.

's application has been approved and I attach for your
lopment Consent, the conditions of approval and a copy of
nder of the plans have been retained for the purposes of
ficate.

d, prior to proceeding with the proposal, it will be necessary
n Certificate Application with either Council or an accredited

t your attention to Section B of the Consent which details the
issue of the Construction Certificate.

ovisions of Section 80(10A), of the Environmental Planning
ne Long Service Levy payable under Section 34 of the
ustry Long Service Payments Act, 1996, must be paid prior
ertificate.

of development ie $492107.5 the Long Service Levy payable

id this levy direct to the Building Services Corporation, I will
yment.

You will also be required to furnish a copy of the Builders Warranty Insurance Certificate OR an Owner/Builder's permit from the Department of Fair Trading must be forwarded to Council prior to release of the Construction Certificate.

If an Owner/Builder's permit is to be applied for, application must be made direct to the Department of Fair Trading. You must quote Development Application No. N0687/01 and supply an unstamped plan with your application. The permit must then be presented to Council when collecting your plans.

Please note that some sections of the Consent may require the lodgement of Building Component Certificates at various stages of the development. These Certificates must be

Attachment M1
Mechanical Ventilation Design Certificate
Ventilation, Acoustics, Fire Precautions, Smoke Hazard Management

ADDRESS: 27C ALEXANDRA CRES BAYVIEW

DEVELOPMENT APPLICATION NUMBER: _____

CONSTRUCTION CERTIFICATE NUMBER: _____

Pursuant to the provisions of Section 93 of the Local Government Act 1993 [i], **I hereby certify** that the design of the new/altered mechanical ventilation system meets the current requirements of the Building Code of Australia [ii] and in particular is designed in accordance with the following:

(a) Council approved architectural plans, (nominate drawing numbers and attach a list); [iii]
(b) AS 1668 Parts 1 and 2; and Sydney Ventilation Code where appropriate;
(c) All conditions based on recommendations of the NSW Fire Brigade. [iii]

I am an appropriately qualified and competent person in the area of mechanical ventilation and as such can certify that the design and performance of mechanical ventilation systems comply with the Building Code of Australia, AS 1668 and other relevant Codes.

I possess Indemnity Insurance to the satisfaction of the building owner or my principal.

Date of Development Consent (Compulsory): _____
Date/s of Construction Certificate (Compulsory): _____
Full Name of Certifier COLIN SHEARS
Qualifications & Experience [iv] BE(MECH) CPENG MIEAUST MAIRAH 24YRS CONSULTING ENGINEER
Address of Certifier 29 YARALLA CRES THORNLEIGH
Phone Numbers Bus 99450193 **Mobile** 0419015453 **Fax** 99451224
Signature _____ **Date** 29/5/02
Name of Employer, (Self or Company) COLIN SHEARS & ASSOCIATES

Certified Mechanical Drawing numbers and revision list (attach a separate list if necessary):

M02B, M03B, M04B

- **The Public Health Act requires Council registration of cooling towers and certain water systems. Proof of Registration is required on Attachment M2.**

Notes:

(i) The Local Government Act 1993 absolves Council from liability by relying on this Certificate;
(ii) Departures from the prescribed design provisions of the BCA must be justified herein and validated when the Certificate of Performance (Attachment M2) is submitted. (eg: smoke test);
(iii) Where compliance with the prescribed or deemed provisions of the Building Code of Australia is not possible reasons must be submitted with this Certificate, together with evidence of any dispensation granted by Council or the NSW Fire Brigade.
(iv) Please submit Curriculum Vitae with your first Certification.

GDK
KEIGHRAN GEOTECHNICS
Geotechnical • Pavements • Materials • Consulting Engineers

Greg D. Keighran Pty Ltd (Inc NSW)
A.B.N. 84 073 692 387
P.O. Box 2325
North Parramatta NSW 1750
5/25 Isabella Street,
North Parramatta NSW 1750
Telephone: (02) 9890 7873
Facsimile : (02) 9890 7874
Email: mail@gdkgeo.com

Principal
G.D. Keighran BE P.Eng

Date: 15th October 2002 Your Ref: Our Ref: 00153/GK/3

Mr A & Mrs D Marrocco
4 Lane Cove Road
INGLESIDE NSW 2101

Dear Sir and Madam,

Re: Geotechnical Review
Stormwater Disposal Drawings
Residential Development
27C Alexandria Crescent
Bayview

At your request, our principal engineer, Mr G. Keighran has reviewed the following Hydraulic Services Drawings prepared by Sparkes and Partners Pty Ltd.

Drawing 01473-SW-01	Plan/Legend
Drawing 01473-SW-02	Ground and Bedroom Level

The above drawings include details for the catch drains and subsoil drainage recommended in our Geotechnical Report and show that the proposed detention tank is suitably located and will be founded either close to the level of the sandstone bedrock on in the stable residual clay soils.

We recommend that the base of the detention tank should be inspected during construction to confirm suitable bearing conditions.

We confirm that the above drawings do meet the requirements of our geotechnical report No. 00153/GK/2 dated 5th June 2001.

Yours faithfully,
KEIGHRAN GEOTECHNICS
per:

G.D. KEIGHRAN
Director - Principal Engineer

GDK KEIGHRAN GEOTECHNICS
Geotechnical. Pavements. Materials. Consulting Engineers

Greg D. Keighran Pty Ltd (Inc NSW)
A.B.N. 84 073 692 387
P.O. Box 362
PENDLE HILL NSW 2145
117 Magowar Road,
GIRRAWEEN NSW 2145
Telephone: (02) 9631 6596
Facsimile : (02) 9631 7642
Email: gregk@gdkgeo.com

Principal
G.D. Keighran BE P.Eng

Date: 5th June 2001 Your Ref: Our Ref: 00153/GK/2

Mr A & Mrs D Marrocco
4 Lane Cove Road
INGLESIDE NSW 2101

Dear Sir and Madam,

Re: Geotechnical Assessment
Residential Development
27C Alexandria Crescent
Bayview

1. Introduction

At your request, our Mr. G. Keighran has further inspected the above property on the 28th April 2001. The subject property is in a residential area and is proposed to be developed with a residential dwelling as detailed on the Drawings No. DA01-DA12 Rev 0 prepared by TA Design & Construction Pty Ltd.

The inspection was undertaken in order to assess:

* the site stability and the necessity for any site stabilisation works;
* the foundation and retaining wall recommendations for the proposed residential dwelling.
* any other pertinent geotechnical aspect of the proposed development

Our inspection is predominantly deductive, based on visual assessment, combined with excavation of test pits and also incorporates judgement based on experience with other sites within Pittwater and the Sydney Basin Region. The surface features, rock outcrops and vegetation of the site and adjoining land were carefully inspected and interpreted to assess the geological profile and natural stability of the land in relation to the construction of the proposed residence.

2. Site Conditions and Proposed Development

The subject property, 27C Alexandria Crescent is located at the end of a long concrete driveway off the southern side Alexandria Crescent west of the intersection with Fermoy Avenue at Bayview. The driveway comes directly up the slope for some 100 metres past the original dwelling on No. 27 on the left and stops at a double mini crib retaining wall totalling four (4) metres in height.

On the right hand side of the driveway in front of the retaining wall , a double storey dwelling under construction. The driveway continues to the left (east) finishing at an excavation face which marks the beginning of the subject property No. 27C. This excavation ranges in height from about 3 metres on the uphill side to 1.0 metres on the downhill side of the driveway and exposes colluvial soils with some floating boulders.

The subject property beyond is covered in blackberry bushes with widespread mature trees including a very large straight blue gum located in the south western corner above the existing mini crib retaining wall lining the driveway. The property has a cross slope in the range of 1V:3H to 1V:2.5H in an northerly direction and at the southern boundary the property rises up to form an escarpment of Hawkesbury sandstone outcrops.

A small timber landing exists centrally surrounded by the blackberry bushes. The property falls fairly uniformly to north east along the length of the property.

All mature trees on the subject and surrounding properties were straight and the uniform slopes across the length of the property indicating stable conditions have existed for a considerable time.

3. Site Geology and Subsurface Conditions

The subject property is shown on the Sydney 1:100,000 Geological Series Map as being underlain by the Newport Formation of the Narrabeen Sandstone Group with the Hawkesbury Sandstone Group outcropping above.

The Newport Peninsula area is underlain principally by the Narrabeen Group comprising interbedded laminites, shales and sandstones, capped at higher elevations by the more massive Hawkesbury Sandstones. The weathering and erosion of these strata has created slopes covered with a mantle of residual soils overlain by transported soils (talus and colluvium).

The major influences on slope instability in the Newport Peninsula are related to:

a) instability within the colluvial and talus soils which can be typically 3 to 5m in thickness
b) groundwater seepage concentration over shale and claystone beds
c) the tendency of the shales, siltstones, claystones and some sandstones to weather to predominantly clay soils
d) the jointed nature of the sandstone bedrock which allows the ingress of surface water into the slopes.

In general, slope instability has occurred in the form of localised sliding of colluvium on slopes typically 25 degrees or steeper. Such instability has usually been initiated by construction of cuts and fills for subdivision development.

On the 28th April 2001 , a series of four (4) test pits were excavated in the building area to assess the subsurface conditions. The subsurface conditions detailed in our test pits logs provided in Appendix A comprise:-

COLLUVIAL : sandstone boulders in a sandy clay and clayey sand matrix , grey brown and yellow, dry to moist and firm to depths ranging from 1.0 to 1.2 metres in TP 1 and TP 2 only.

TOPSOIL: sand, dark grey, moist and loose to a depth of 0.2 to 0.5 metres in TP 3 and TP 4 only.

RESIDUAL: sandy silty clay, low to medium plasticity, yellow, white and red, moist and stiff. Encountered below the above profiles in all test pits to depths ranging from 1.2 to 2.3 metres below the surface.

BEDROCK: sandstone, extremely weathered to moderately weathered, light grey , white , yellow and red, moist and very stiff to hard. Encountered below the residual soils at depths 1.2 to 2.3 metres below the existing surface.

4. Site Stability

No evidence of major or surficial land instability was noted on the property or immediately adjacent land at the time of inspection. The surficial soils are susceptible to localised soil erosion and instability could occur if the proposed development is not carried out with care, and if areas of the land disturbed by building activities are not subsequently suitably landscaped.

In regard to the present stability of the subject property, it is considered that:

a) the subject property is suitable for construction of a residential dwelling provided that the various recommendations of this report are implemented;

b) the subject property presently has a **medium risk** of experiencing instability as defined by the classification system adopted by the Australian Geomechanics Society (refer Appendix A), due to the presence of shallow colluvial soils overlying residual soils to depths ranging from relatively shallow depth to weathered bedrock.

However, it should be noted that the proposed excavations required for the dwelling construction will increase the risk of instability, at least for the limited construction period.

Providing appropriate retaining walls are implemented to support / batter the proposed excavation faces as soon as possible after excavation as discussed/recommended in this report, then it is considered that no greater than the presently assessed risk of instability would be applicable in the long term;

5. Site Classification

In view of the site geology and hillside location, the proposed earthworks for the development and the stability aspects of the land, it is considered inappropriate to classify the site in terms of the reactivity (shrink/swell) behaviour of the surficial soils alone, which is the basis of AS 2870 - 1996 "Residential Slabs and Footings". The inferred soil profile at this property will generally have a moderate potential for reactive behaviour (consistent with equivalent Class M site conditions), however, the geotechnical aspects associated with slope instability will govern the site development.

With the relatively steep ground surface and presence of shallow colluvial and residual soils, we recommend that all footings be taken to the sandstone bedrock. The competence of the bedrock is to be confirmed by a suitably qualified geotechnical or structural engineer.

6. Development Recommendations

6.1 Excavations

The architectural drawings indicate that excavations up to approximately four and a half (4.5) metres in height are proposed for the garage and stairwell within the proposed dwelling. The proposed excavations will expose colluvial and residual soils in the upper 1.2 to 2.3 metres with the remainder being in weathered sandstone bedrock.

As a result, the excavation batter should be excavated at a maximum temporary slopes detailed below or in situ shoring or covering and meshing of the batter slopes will be required to prevent slumping of the soils in time of wet weather.

Any excavation for the dwelling should be inspected by an engineer from this firm during the course of the construction to assess the temporary stability of the faces and confirm the temporary and permanent batter slopes recommended below.

Unsupported permanent excavations in the in situ material and/or fill batters should be sloped back at gradients not steeper than 2H:1V (soil and extremely weathered rock) and 1.5H:1V (highly weathered rock). Steeper batters may be allowable if more competent (less weathered) bedrock is exposed and subject to inspection of the strata exposed in the excavation faces by an engineer from this firm.

Temporary excavations (for construction purposes only) may be sloped back at 1H:1V (soil and extremely weathered bedrock) and 0.5H:1V (highly weathered or better quality rock).

6.2 House Footings

In view of the need to support the house on a uniform bearing stratum and the likely 'sensitivity' of the structure to small differential movements, it will be necessary to support the all footing for the dwelling on the sandstone bedrock.

The present slope of the property will result in competent (weak to medium strong sandstone or better quality) weathered sandstone bedrock occurring at a range of depths from 2.5 metres in TP 1 on the higher side to 1.5 metres in TP 4 on the lower side property . As a result, it is recommended that all footings are socket into the sandstone bedrock.

Piered footings should be founded at least 500 mm into highly weathered, weak (or better quality) bedrock. An allowable design bearing pressure of 500 kPa is recommended but higher bearing pressures may be adopted subject to assessment of the foundation stratum by this firm. Additional guidelines for the construction of rock-socketted piers are provided in Appendix D.

6.3 Retaining Walls

The retaining wall design should also allow for any additional surcharge loads, e.g. due to sloping backfill, these loads should be calculated separately.
The following soil/rock parameters are considered appropriate for assessing the design loads on the permanent retaining walls:-

	Active Earth Pressure Coefficients		Bulk
	Temporary	Permanent	Density
residual and colluvial sandy clays and clayey sands	0.4	0.5	21 kN/m^3
extremely to highly weathered rock	0.15	0.25	22 kN/m^3
moderately weathered to fresh rock	0	0.15	24 kN/m^3

Appropriate drainage systems and free draining backfill should be provided to prevent the build-up of hydrostatic pressures behind all retaining walls. Backfill behind walls should be adequately compacted where the backfill is required to support floor slabs, perimeter paths etc.

Any proposed excavation in the future greater than 1.0 metres depth should not be undertaken without further assessment by an experienced geotechnical engineer.

6.4 Drainage

A combined stormwater catch-drain/subsoil drain system should be installed to intercept and divert surface flow and seepage away from the high side of the building area.

The property due to the high percentage of colluvial soils, the property is not suitable for onsite absorption and all house roofwater and stormwater should be collected and piped to the Council stormwater system. Household effluents, and other liquid wastes should be removed from the site by the mains sewer.

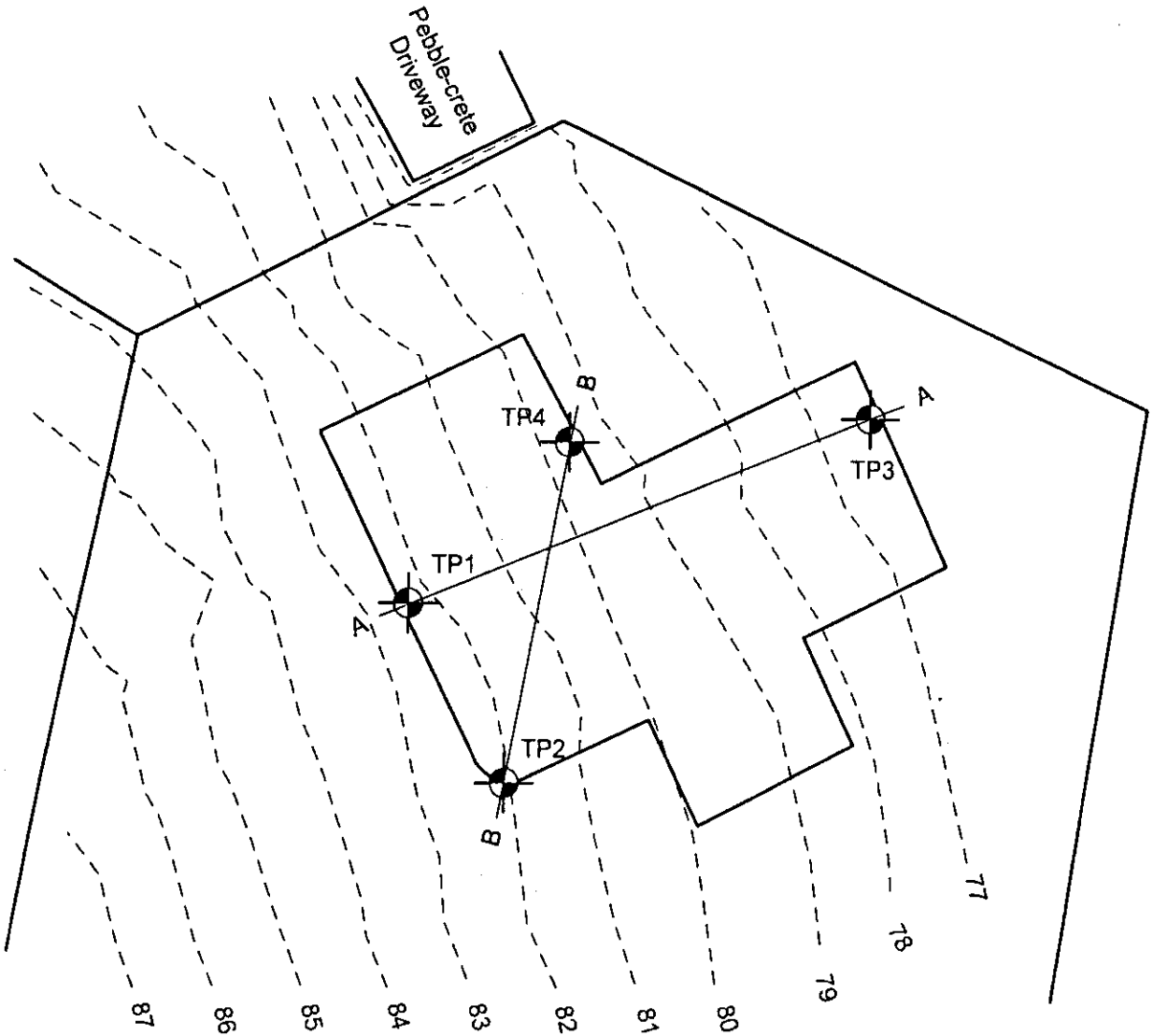
7. General

It is to be noted that the recommendations, comments and opinions expressed in this report are based on predominantly visual assessment with test pits to reveal the subsurface conditions. Should subsurface conditions be encountered which differ markedly from those inferred in the report, or should the scope of the development works planned vary significantly from the residential structure anticipated, then further geotechnical advice should be obtained.

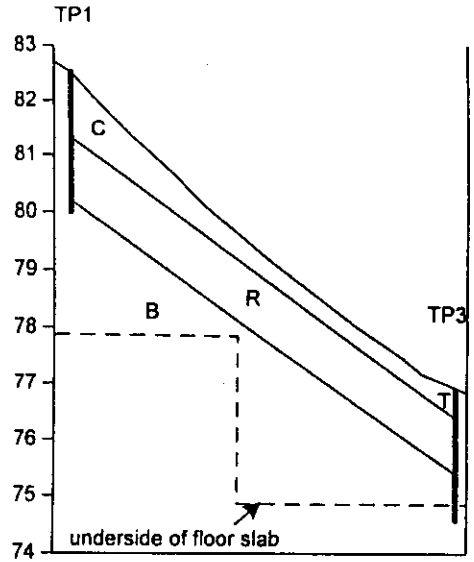
Yours faithfully,
KEIGHRAN GEOTECHNICS
per:

G.D. KEIGHRAN
Director - Principal Engineer

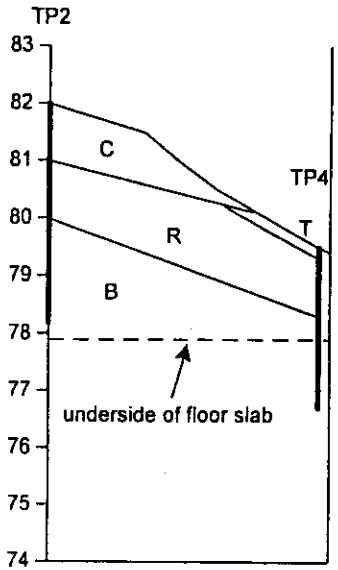
Attached:
Drawing No. 00153/2A
Appendix A - Important Information about your Stability Assessment Report
Appendix B - Guidelines for Hillside Construction
Appendix C - Drainage Details and Notes
Appendix D - Guidelines for the Construction of Rock - Socketted Piers
Appendix E - Engineering Test Pit Logs



Test Pit Locations



Section A-A



Section B-B

T - Topsoil
C - Colluvial
R - Residual
B - Bedrock

GDK KEIGHRAN GEOTECHNICS
Geotechnical . Pavements . Materials . Consulting Engineers
P.O. Box 362, PENDLE HILL NSW 2145
117 Magowar Road, GIRRAWEEN NSW 2145
Ph : (02) 9631 6596
Fax: (02) 9631 7642

Scale	
Plan	
Section	
Drawn	SHP
Checked	GDK

MR & MRS A. MARROCCO
RESIDENTIAL DEVELOPMENT - GEOTECHNICAL ASSESSMENT
27C ALEXANDRIA CRESCENT
BAYVIEW

Drawing No.
00153/1A

1. Introduction.

In the Sydney Basin, which includes Wollongong to Newcastle and inland to Lithgow, there are many naturally occurring slopes which are often the result of weathering and downslope transport of a mantle of soil and rock fragments. These may be unstable or potentially unstable, which may have a significant effect upon hillside development. Natural factors that effect the stability geology, nature and extent of the mantle of soil and rock fragments, groundwater, slope gradient and topography and vegetation. Further, the stability of these sites are often affected by both subdivision and individual lot development, where the impact of cutting, filling and drainage can be substantial.

2. Assessment Procedure

The risk of slope instability should be assessed by an experienced geotechnical engineer and has been based upon:-

* study of geological and topographic maps supplemented by the consultant's experience in the areas
* consideration of information made available by the client about the site and its surrounding areas (including previous instability, building distress and drainage problems) and development proposals.
* visual appraisal of the site and surrounding area including signs of instability, soil and rock exposures, seepage and vegetation.
* collection of basic geological measurements from the site to produce a geological sketch model.
* consideration of possible effects of high rainfall.

The assessment applies to the site at the time of the Inspection.

Although the assessment is predominantly deductive and incorporates judgement based on experience, in most very low to medium risk sites it will be sufficient to enable development to proceed. However, on very high and some medium risk sites geotechnical investigation will be required to confirm the assessment and define development options. The scope of such investigation depends upon the risk of instability and the proposed development and will involve subsurface investigations and possibly soil testing to improve the geotechnical consultant's understanding of the site.

3. Development

Whilst some sites may be unsuitable for economic development.Building techniques are available to enable development of many higher risk sites. Inappropriate development on the site and neighbouring properties can cause slope failure and serious damage. Inappropriate development includes:

* unsupported excavation or placement of fill.
* excessive clearing of vegetation.
* introduction of water to the slope.
* surface footings founded on the mantle of soil and rock fragments.

The owner's decision to develop the site involves an acceptance of a level of risk following development as assessed by the consultant. Even with suitable hillside construction techniques some minor cracking may occur. Other engineering constraints unrelated to slope instability may apply.

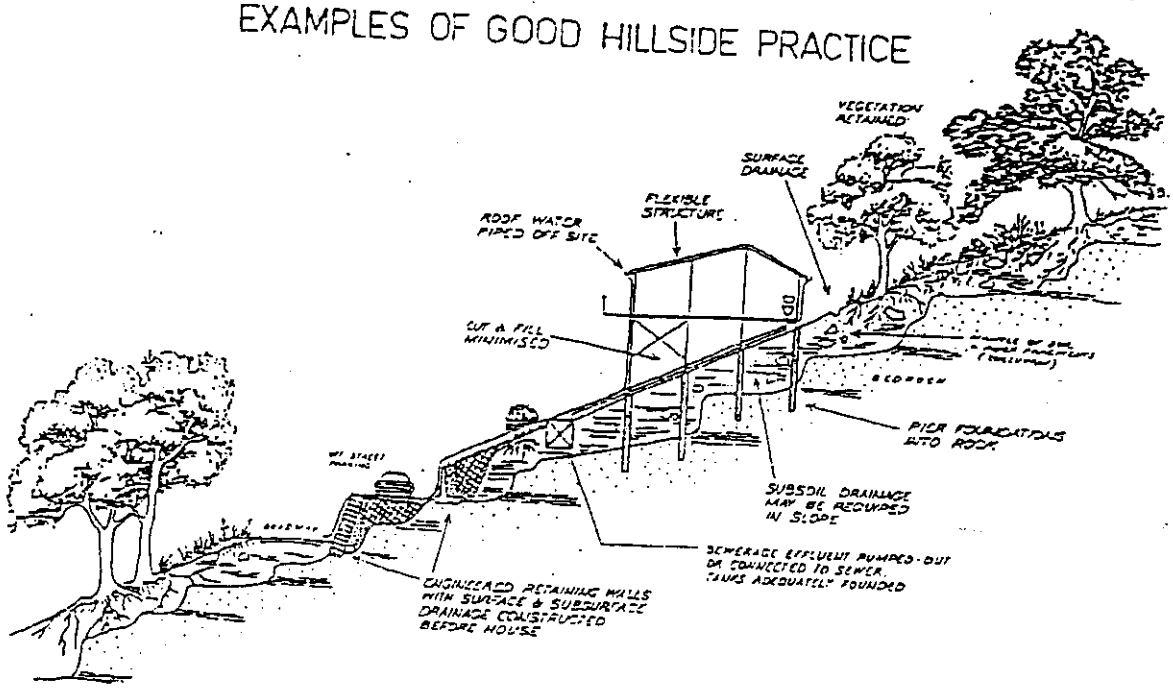
4. Classification of Risk Slope Instability

This table is an extract from GEOTECHNICAL RISKS ASSOCIATED WITH HILLSIDE DEVELOPMENT as presented in Australian Geomechanics News, Number 10, December, 1985. It provides a simplified classification allowing a uniform language for geotechnical consultants.

RISK OF INSTABILITY	EXPLANATION	IMPLICATIONS FOR DEVELOPMENT
VERY HIGH	Evidenive of active or past landslips or rockface failure, instability may occur.	Unsuitable for development unless major geotechnical extensive work can satisfactorily improve the instability. Extensive geotechnical investigation necessary Risk after development may be higher than usually accepted.
HIGH	Evidence of active soil creep or minor slips or rockface instability; significant instability may occur during and after extreme climatic conditions.	Development restrictions and/or geotechnical works required. Geotechnical investigation usually necessary. Risk after development may be higher than usually accepted.
MEDIUM	Evidence of possible soil creep or a steep soil covered slope; significant instability can be expected if the development dies not have due regard for the site conditions.	Development restrictions may be required. Engineering practices suitable to hillside construction necessary. Geotechnical investigation may be needed. Risk after development generally no higher than usually accepted.
LOW	No evidence of instability observed, instability not expected unless major site changes occur.	Good engineering practices suitable for hillside construction required. Risk after development normally acceptable.
VERY LOW	Typically shallow soil cover with flat to gently sloping topography	Good engineering practices should be followed

APPENDIX

EXAMPLES OF GOOD HILLSIDE PRACTICE



EXAMPLES OF POOR HILLSIDE PRACTICE

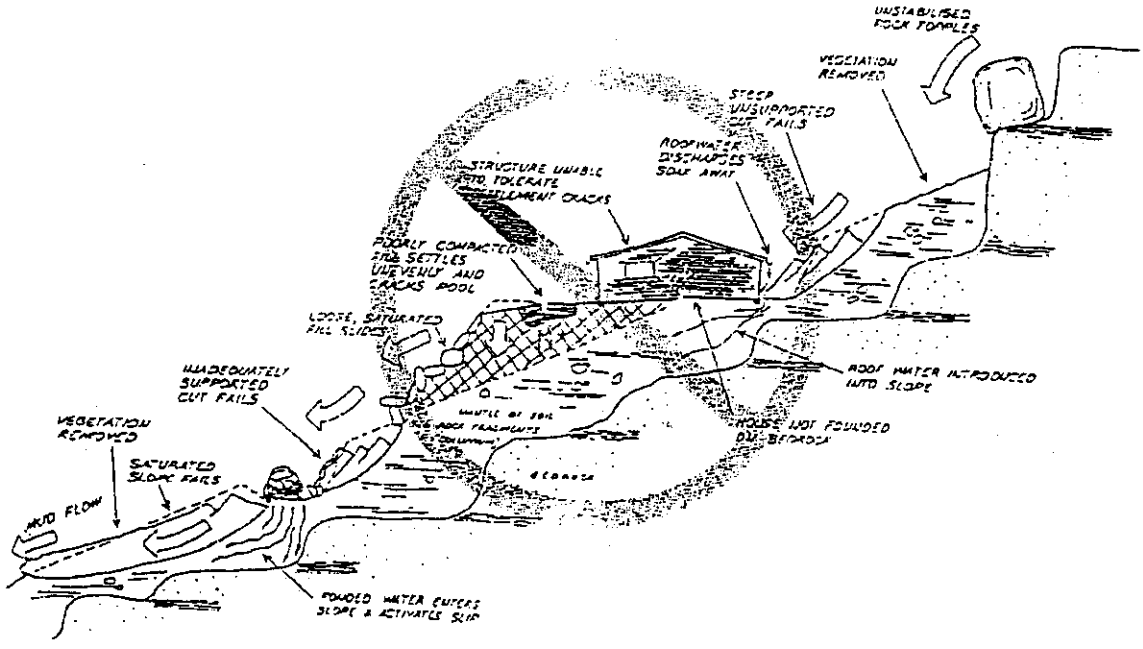


FIGURE 2 Illustrations of Good and Poor Hillside Practice

This figure is an extract from GEOTECHNICAL RISKS ASSOCIATED WITH HILLSIDE DEVELOPMENT as presented in Australian Geomechanics News, Number 10, December, 1985, which discusses the matter more fully.

SOME GUIDELINES FOR HILLSIDE CONSTRUCTION

APPENDIX IV

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

This table is an extract from GEOTECHNICAL RISKS ASSOCIATED WITH HILLSIDE DEVELOPMENT as presented in Australian Geomechanics News, Number 10, 1985 which discusses the matter more fully.

Each building block has its own particular topographic and subsurface features. Drainage design (surface and subsurface) can only be assessed after detailed inspection of the block and often only after several inspections during heavy rain periods. However, the following general principals should prove helpful in reviewing drainage requirements on most blocks. They are provided as guidelines only and specific drainage designs should be reviewed by an engineer.

SUBSURFACE DRAINS

Drain Pipes Available for Use in Subsurface Drains

A slotted PVC pipe or slotted corrugated/flexible pipe is preferred. The purpose is to let water in but to exclude soil solids Such drains increase the rate of flow of water from the drained area.

Filter/Fill Material in Trench

The basic purpose is to let water seep through it without allowing migration of fines into the pipe (causing clogging). Because most natural soils are very fine grained (often clayey) it is often necessary to use a two stage filter system, with coarse fill around pipe (which won't pass into pipe through holes or slots) surrounded by a finer fill between the coarse fill and the natural soil. Water will pass through the soil zones/layers but soil migration into the filter is minimised, avoiding clogging.

A more recent innovation is to enclose the granular fill within a subsurface drainage trench in a geofabric which prevents the migration of fines into the granular fill used Alternatively geocomposites have been developed which perform the function of the filter drain.

A common misconception of many builders is that a very coarse mixture of bricks, rocks,etc will act as a good drainage material in a subsurface drain. Although initially very pervious, such coarse filling is unsatisfactory over the long term because of "silting up" or blockage due to the migration of clay and fines into the large voids in the material.

Seal Surface

Subsurface drains are designed to pick up and remove subsurface seepage. They should be isolated from surface water drainage systems. The quantity of subsurface drainage in most instances will be quite small. Provide a surface layer of clayey soil, concrete slab, patio stones or equivalent above subsurface drains to prevent ingress of surface water. Do not divert surface interceptor drains, roof drains, etc. to subsurface system. This will simply recharge the groundwater in the area of the subsurface drains.

Slope of Pipe

0.5% grade minimum, that is, 500mm drop for a 100m run of 250mm drop for a 50m run. If the subsurface drain does not have a pipe but consists simply of a trench backfilled with a filter material ("French Drain") then the fall should be increased to about 3%

Clean Outs

Where the subsurface drains are critical, say around a basement being used as living space, then clean outs should be provided to allow long term maintenance These should be provided at connections or corners in the system.

SURFACE DRAINS

The basic purpose of surface drains is to collect, control and dispose of surface water flow and thus prevent washouts, saturation of soil mass, etc. Mostly, they will be installed on the uphill side of block to prevent flow towards and into the soil mass in the house area

After interception and collection above the house, the water should be carried to the lower side of the block in sealed pipes (These may be buried but should not be slotted, perforated, to avoid re-charge of the subsoil).

The base of open surface drains should be sealed to prevent seepage into the soil. The use of concrete, half round pipes or similar will allow easy cleaning of these drains.

The collected water will be diverted to sealed pipes. The opening to the sealed pipes should be provided with a coarse screen to prevent blockage by large objects. Periodic cleaning of screen will be required.

Discharge at Lower Side of Block

Where a street, storm drain, natural water course, etc. are not located on the downhill side of the block, the concentrated discharge of collected water could in itself create problems for neighbours downhill. Where no inter-allotment drainage is provided liaisson with the downhill neighbour will be required.

1. Bored piles socketed into sandstone and shale are presently being designed on the basis of parameters detailed in Reference 1 below, provided that the sidewalls are substantially free of crushed and/or smeared rock or soil and that the bases are free of debris. Crushed rock or soil smeared on the sidewalls of piers may attain a thickness of 20mm or more and will form an infill on the grooves and undulations in the rock. The presence of sidewall smear will limit skin friction on the sidewall of the pier socket such that it may be less than that assumed in design. Similarly debris on the base of the pile will alter load-deflection characteristics and may result in working deflections greater than assumed in design.

2. The creation of sidewall smear is usually worst when drilling in moist weathered shale or sandstone using a flight auger. Consequently adequate cleanliness is not usually achieved and special measures must be undertaken to remove the sidewall smear. The problem is usually minimised by drilling under water. Adequate socket sidewall cleanliness and roughness can usually be easily achieved in sockets excavated by hand. The desired sidewall roughness has grooves at least 5mm deep and 5mm width at spacings up to 200mm.

3. Base cleanliness will depend on the design of the base cleaning tool used. Buckets or flight augers fitted with drag picks do not usually remove sufficient base debris and final cleaning by hand or a special bucket is required. The addition of limited quantities of water during base cleaning operations may assist in achieving an acceptable degree of cleanliness. The base of the socket should be free of all loose debris and natural rock should be exposed over at least 80% of the base area.

4. In order to determine that the design assumptions have been achieved in construction, inspection of rock socketted pier excavations should be undertaken or supervised by appropriately experience and qualified geotechnical personnel. The assessment should be based on knowledge from nearby boreholes or by cored or percussion holes drilled in the base of the pier excavation.

5. To assist in the construction techniques we recommend that:-

   * drilling contractors have on-site cleaning buckets and sidewall clearing tools for the appropriate pile diameters.

   * piers of diameter less than 500mm should not be designed for sidewall friction since it is not generally possible to inspect the excavation.

   * pier inspection for deep sockets require adequate protective casing to standards acceptable to the relevent statutory authority. Appendix B of the Piling Code (AS 2159 - 1978) provides a guide to safe working practices.

   * piers excavated under drilling mud should not be designed for side shear and end bearing parameters applicable for piles formed in the dry or underwater.

   * pier excavations should be pumped dry before placing concrete or concrete poured by tremie pipe underwater. For piles with less than 50mm water in the base, concrete should be poured via a funnel so that concrete can drop to the base without impact on the reinforcing cage. If more than 50mm water will be present at the time of pouring, the tremie method should be used. This is a specialist operation and experienced contractors should be used.

Source: Draft Specifications for Socketted Bored Piers by P.J.N. Pells & B.F. Walker, May, 1986.

Reference 1: Design Loadings for Foundations on Shale & Sandstone in the Sydney Region by Pells, P.J.N., Douglas D.J., Rodway B., Thorne C.P., and McMahon B.J. (Aust. Geomech. Jnl. G.B., 1976,pp31-39)

DATE SAMPLED: 28/04/01 | OUR REF: 00153 / GK / 1 | APPENDIX: E

DEPTH (m) From	To		MATERIAL DESCRIPTION	SAMPLING DATA Depth (m)	Type
Test Pit No. 1			**RL 82.5 metres**		
0.0	1.2	COLLUVIAL:	sandstone boulders to 500mm in sandy clay and clayey sand grey brown and yellow dry to moist and firm		
1.2	2.3	RESIDUAL:	sandy clay, low to medium plasticity yellow, red and white moist and stiff		
2.3	2.5	BEDROCK:	sandy clay and extremely weathered sandstone yellow, white and red moist and very stiff		
2.5	Discontinued				
Test Pit No. 2			**RL 82.0 metres**		
0.0	1.0	COLLUVIAL:	clayey sand, some sandstone boulders to 300mm dark grey wet and loose		
1.0	2.0	RESIDUAL:	sandy clay, low to medium plasticity yellow, red and white moist to wet and stiff		
2.0	3.8	BEDROCK:	extremely weathered shale / sandstone light grey and red moist and stiff to very stiff		
3.8	Discontinued				
Test Pit No. 3			**RL 77.0 metres**		
0.0	0.5	TOPSOIL:	sand dark grey moist to wet and loose		
0.5	1.5	RESIDUAL:	sandy silty clay yellow, some grey moist to wet and firm to stiff		
1.5	2.3	BEDROCK:	weathered sandstone yellow and red moist and stiff		
2.3	Discontinued				

DATE SAMPLED: 28/04/01 | OUR REF: 00153 / GK / 1 | APPENDIX: E

DEPTH (m) From	To	MATERIAL DESCRIPTION	SAMPLING DATA Depth (m)	Type
Test Pit No. 4		**R.L.79.5 metres**		
0.0	0.2	TOPSOIL: sand dark grey moist and loose		
0.2	1.2	RESIDUAL: sandy silty clay yellow, some grey moist to wet and stiff		
1.2	2.8	BEDROCK: weathered sandstone yellow, red and white moist and stiff to very stiff		
2.8	Discontinued			

T. A. Design and Construction Pty Ltd

191a Copeland Rd Beecroft 2119 NSW
Telephone 02 9484 0870
Facsimile 02 9484 0758
A.C.N. 003 579 262 A.B.N. 25 003 579 262

16th September 2002

Anthony Protas Consulting Pty Ltd
Level 3, Suite 303
84 Pitt Street
Sydney NSW

Dear Sir

Re: Residence for Mr & Mrs A Marrocco
27C Alexandria Crescent, Bayview NSW 2104
Lot 33, DP 876610 DA No. 687/01

I certify that the proposed means of access to and within the site complies with the requirements of Councils policy DCP No.3 " Driveways and Internal Roads" and AS 2890.1-1993 Parking facilities-Off Street Parking.

Yours faithfully

Theodorus Gofers
Architect
Registration Number 3567

BioDesign

ENVIRONMENTAL PTY LTD

ACN 093 518 935 ABN 37 093 518 935

PO Box 294 Church Point NSW 2105

FAX: (02) 9973 1649 MOB: 0403 074 075

email: biodesign@pacific.net.au

Detailed Landscape Plan Certificate

Property 27c Alexandra Crescent Bayview

I, Julia Stanton of BioDesign Environmental Pty Ltd (P.O. Box 294 Church Point) am a qualified Environmental Horticulturist. I hold the following qualifications
B.Sc. (Environmental and Urban Horticulture) MAABR, MAIH, MAILDM

I hereby state that the Detailed Landscape Working Drawing and Site Protection Details prepared for 27c Alexandra Crescent Bayview dated June 2002 provides full details of the conditions of Development consent (B45 and 45a), and complies with Pittwater Council's DCP 23 Landscape and Vegetation Management. The plan contains full details of screen planting along eastern boundary. Plant species have been selected to comply with conditions of development consent to reach a minimum mature height of 4-5m.

Further, I am appropriately qualified and experienced to provide the certification for this component of the project.

Julia Stanton 16/9/2002

SPARKS
AND PARTNERS
HYDRAULIC, CIVIL & FIRE SERVICES CONSULTANTS

Hydraulic Design Certificate
Stormwater System

Address:
27C Alexandria Crescent, Bayview
Type of building work:
Residential
Building Application no:
Drawing(s) the subject of this Certificate are: SW-01, SW-02, SW-03
drawings numbered

We certify that all of the engineering works have been designed in accordance with the terms and conditions of Pittwater Councils Stormwater Policy and Guidelines dated February 1996, the approved engineering drawings and that all assumptions made for the design were not rendered invalid by the conditions of the site.

The basis on which this certificate is given and the extent to which relevant specifications, rules, codes of practice or other publications have been relied upon is as follows: (eg. AS 3500 Stormwater installations etc....)

We are a member of the Association of Hydraulic Services Consultants Inc, or am eligible to become a Corporate Member of that organisation and have appropriate experience and competence in the relevant field.

Name (block letters): G J SPARKS of G J SPARKS AND PARTNERS PTY LTD

Address (block letters): 107 George Street, Parramatta

Telephone number: 9891 5033 Mobile: Fax: 9891 3898

Signature: Membership No: C4000 Date: 18-09-2002

PO Box 979, Parramatta NSW 2124
107 GEORGE ST PARRAMATTA
NEW SOUTH WALES 2150
TEL 02) 9891 5033 FAX 02) 9891 3898
EMAILmail@gjsparks.com.au
GJSPARKS AND PARTNERS PTY LTD ABN 83 003 690 908
QUALITY ASSURED TO ISO 9001:1994

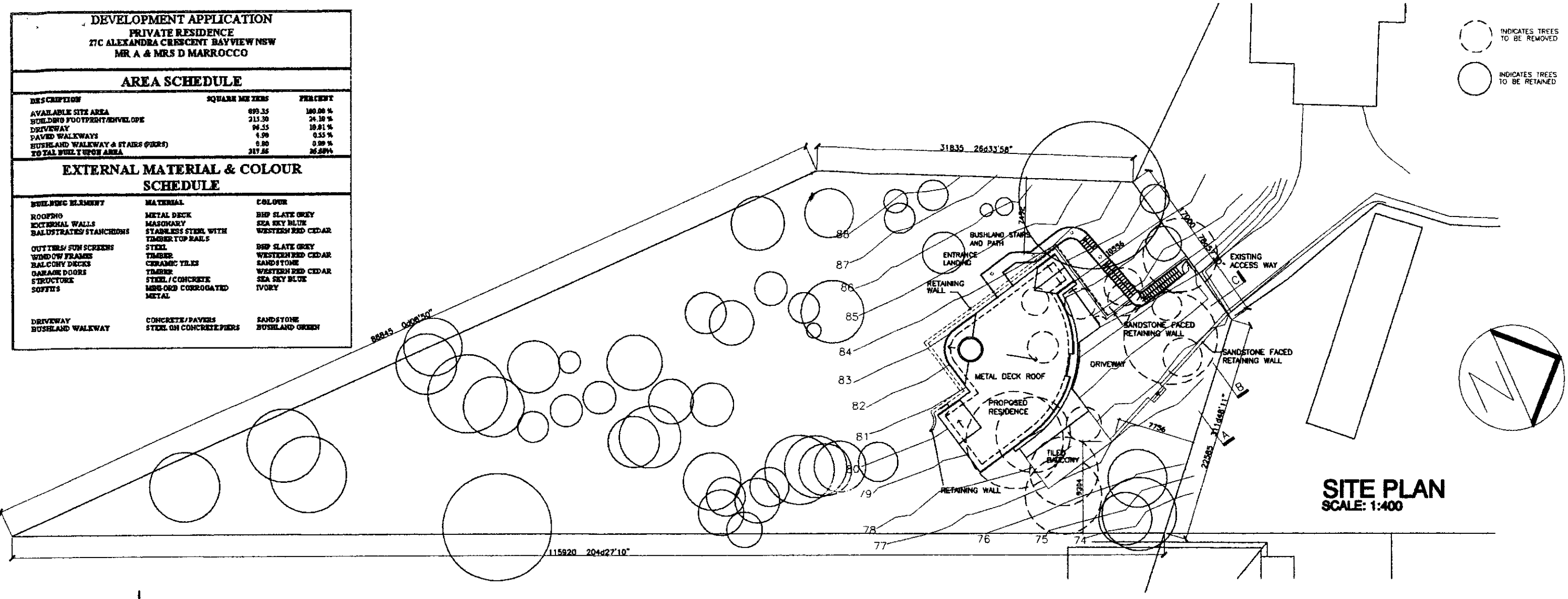
DEVELOPMENT APPLICATION
PRIVATE RESIDENCE
27C ALEXANDRA CRESCENT BAYVIEW NSW
MR A & MRS D MARROCCO

AREA SCHEDULE

DESCRIPTION	SQUARE METERS	PERCENT
AVAILABLE SITE AREA	899.35	100.00 %
BUILDING FOOTPRINT/ENVELOPE	213.30	24.10 %
DRIVEWAY	96.55	10.81 %
PAVED WALKWAYS	4.90	0.55 %
BUSHLAND WALKWAY & STAIRS (PIERS)	0.80	0.09 %
TOTAL BUILT UPON AREA	317.55	35.59%

EXTERNAL MATERIAL & COLOUR SCHEDULE

BUILDING ELEMENT	MATERIAL	COLOUR
ROOFING	METAL DECK	BHP SLATE GREY
EXTERNAL WALLS	MASONARY	SEA SKY BLUE
BALUSTRATES/ STANCHIONS	STAINLESS STEEL WITH TIMBER TOP RAILS	WESTERN RED CEDAR
GUTTERS/ SUN SCREENS	STEEL	BHP SLATE GREY
WINDOW FRAMES	TIMBER	WESTERN RED CEDAR
BALCONY DECKS	CERAMIC TILES	SANDSTONE
GARAGE DOORS	TIMBER	WESTERN RED CEDAR
STRUCTURE	STEEL / CONCRETE	SEA SKY BLUE
SOFFITS	MINI-ORB CORROGATED METAL	IVORY
DRIVEWAY	CONCRETE/ PAVERS	SANDSTONE
BUSHLAND WALKWAY	STEEL ON CONCRETE PIERS	BUSHLAND GREEN



SITE PLAN
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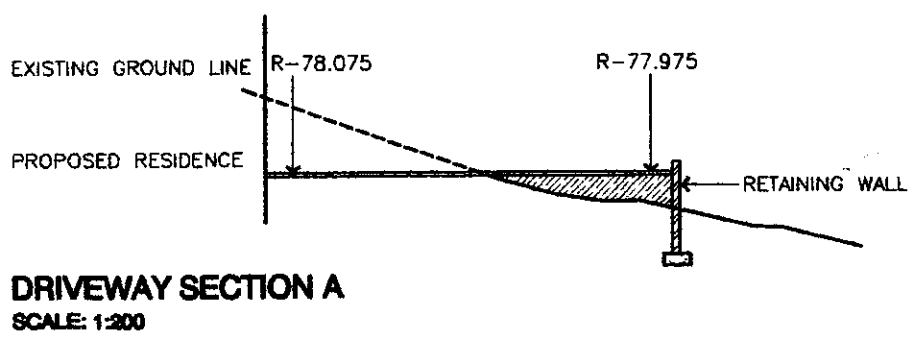

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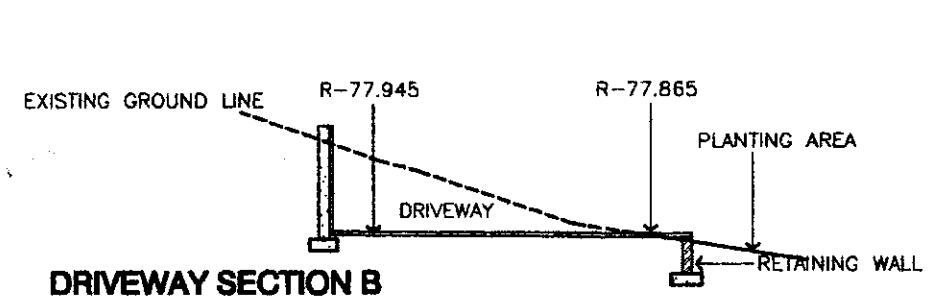

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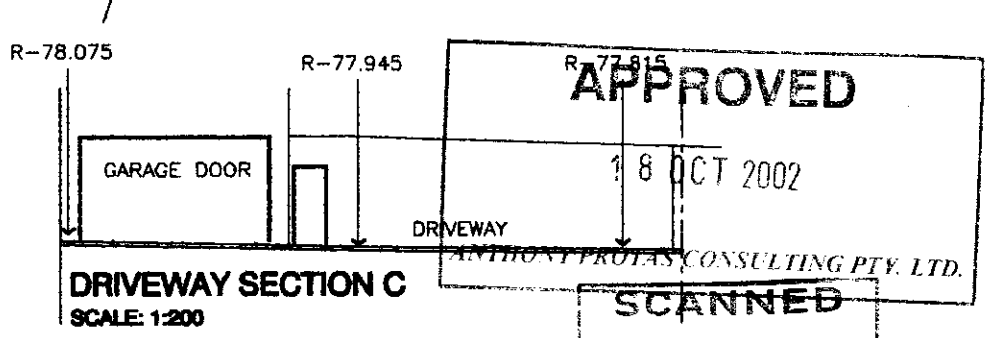

DRIVEWAY SECTION C
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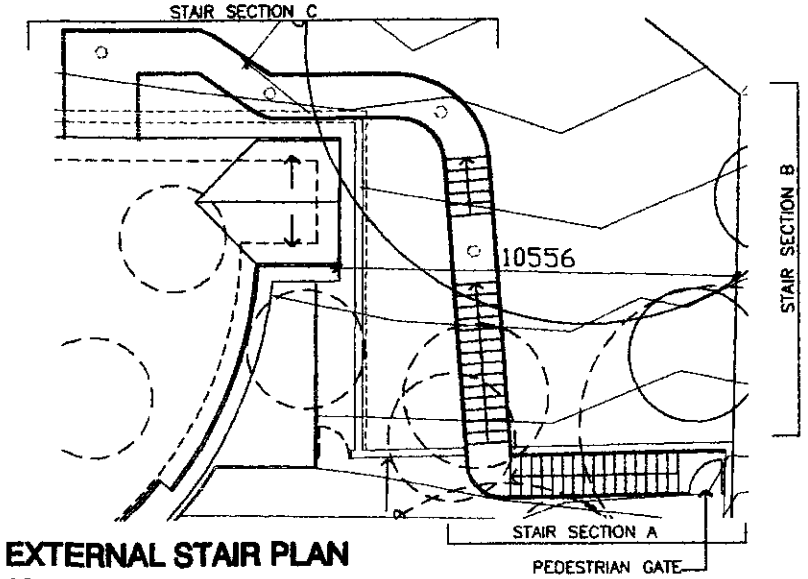
APPROVED
18 OCT 2002
ANTHONY PROTAS CONSULTING PTY. LTD.

SCANNED
08 NOV 2002
WATER COUNCIL



EXTERNAL STAIR PLAN
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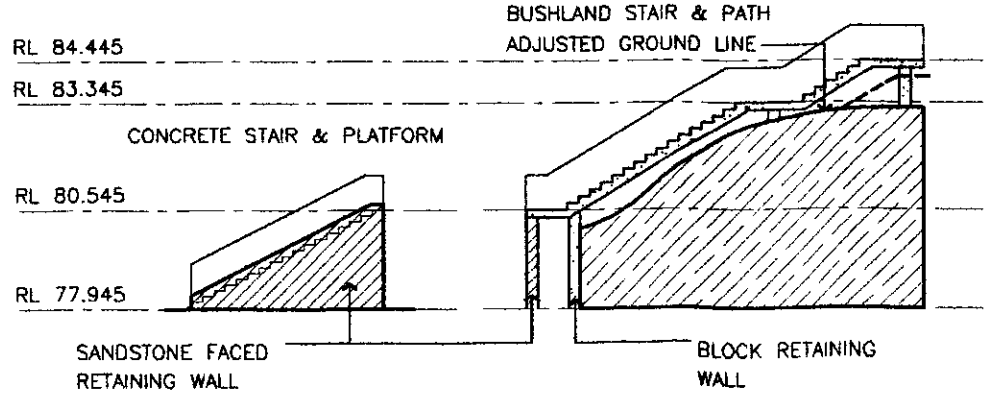
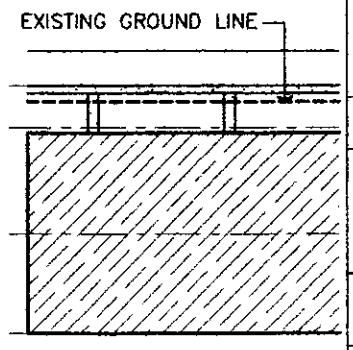


EXTERNAL STAIR SECTION A
SCALE: 1:200

EXTERNAL STAIR SECTION B
SCALE: 1:200



EXTERNAL STAIR SECTION C
SCALE: 1:200

CONSTRUCTION CERTIFICATE DOCUMENTS

PRIVATE RESIDENCE
27C ALEXANDRA CRESCENT BAYVIEW NSW
MR A & MRS D MARROCCO

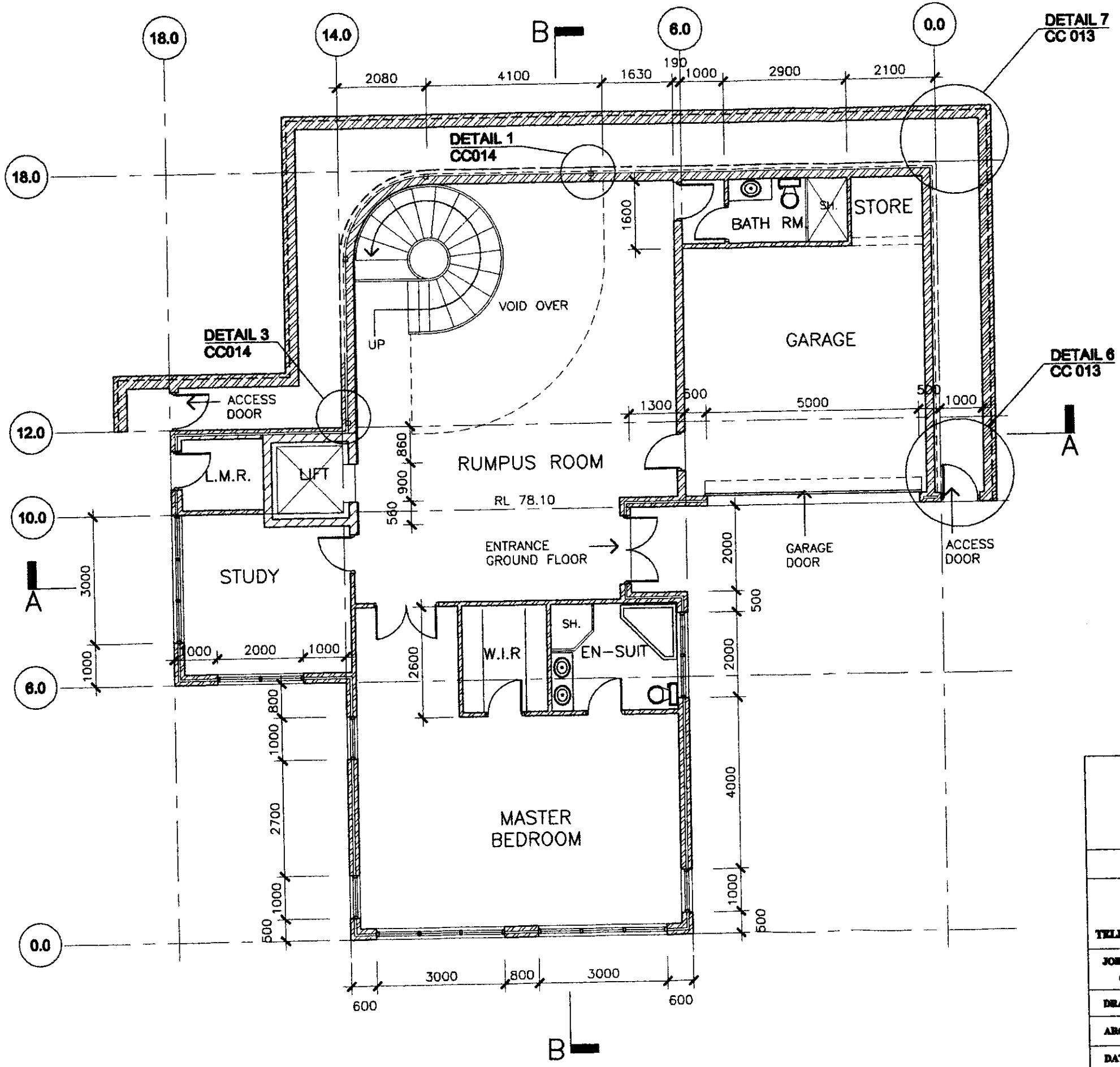
SITE PLAN

TA DESIGN AND CONSTRUCTION PTY LTD
191A COPELAND ROAD (EAST) BEECROFT NSW 2119
TELEPHONE 02 9484 0870 EMAIL tgofers@tig.com.au

JOB NUMBER	SCALE	REVISION	DRAWING No
61299	1:200 / 1:400	R-0	CC 001
DRAWN BY	Digital Design Duo (M. Lasper)		
ARCHITECT	Tao Gofers		
DATE	July 2002		

AMENDMENTS:

SCANNED
08 NOV 2002
WATER COUNCIL



APPROVED

1 8 OCT 2002

ANTHONY PROTAS CONSULTING PTY. LTD.

CONSTRUCTION CERTIFICATE DOCUMENTS

PRIVATE RESIDENCE
27C ALEXANDRA CRESCENT BAYVIEW NSW
MR A & MRS D MARROCCO

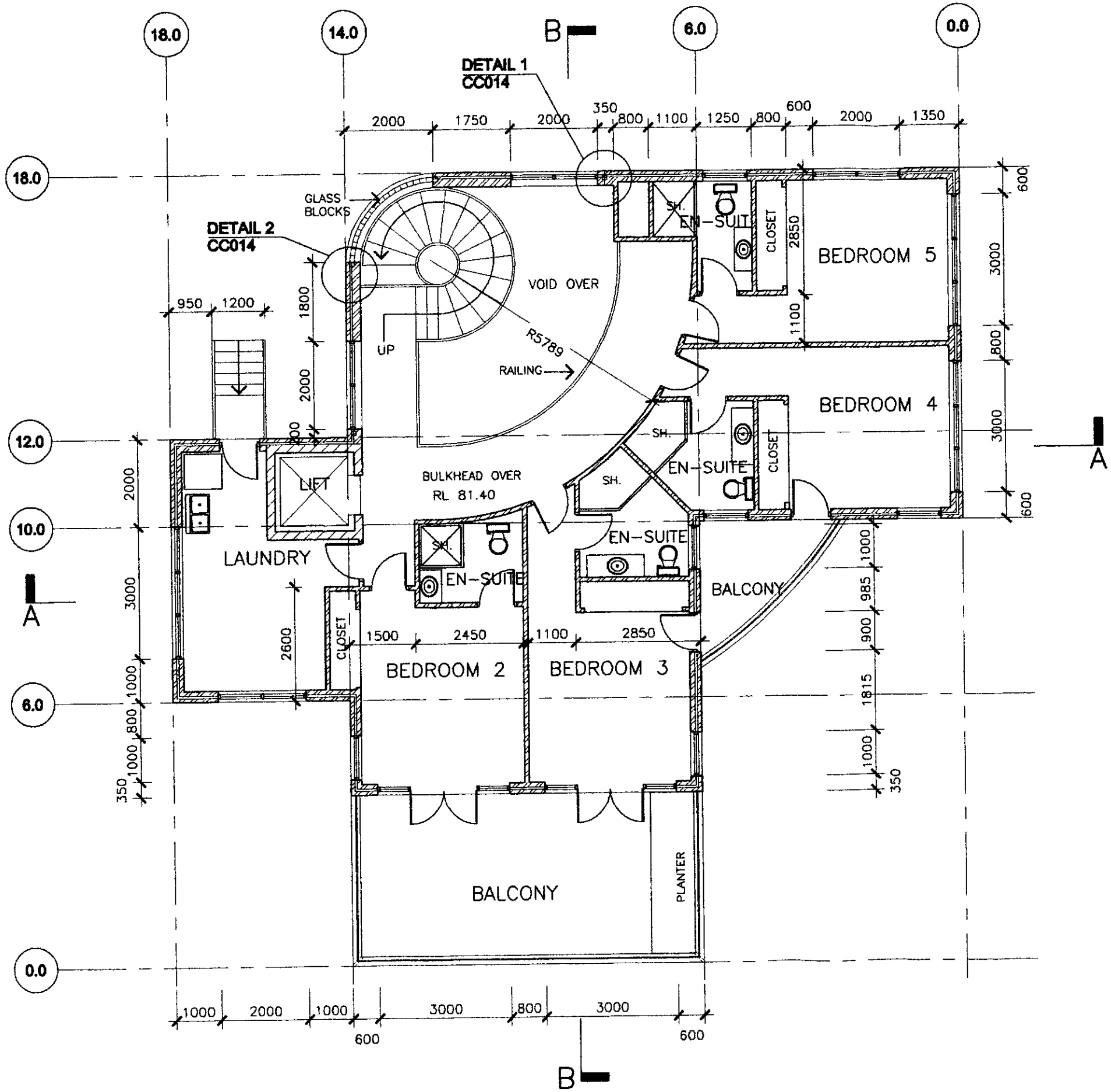
GROUND FLOOR

TA DESIGN AND CONSTRUCTION PTY LTD
191A COPELAND ROAD (EAST) BEECROFT NSW 2119

TELEPHONE 02 9484 0870 **EMAIL tagofers@tig.com.au**

JOB NUMBER	SCALE	REVISION	DRAWING No
61299	1:100	B-0	CC 003

DRAWN BY	Digital Design Duo (M. Leaper)	AMENDMENTS:
ARCHITECT	Tas Gofers	
DATE	July 2002	



APPROVED

18 OCT 2002

ANTHONY PROTAS CONSULTING PTY. LTD.

CONSTRUCTION CERTIFICATE DOCUMENTS

PRIVATE RESIDENCE
27C ALEXANDRA CRESCENT BAYVIEW NSW
MR A & MRS D MARROCCO

BEDROOM LEVEL

TA DESIGN AND CONSTRUCTION PTY LTD
191A COPELAND ROAD (EAST) BEECROFT NSW 2119
TELEPHONE 02 9484 0870 **EMAIL tgofers@tdc.com.au**

JOB NUMBER	SCALE	REVISION	DRAWING No
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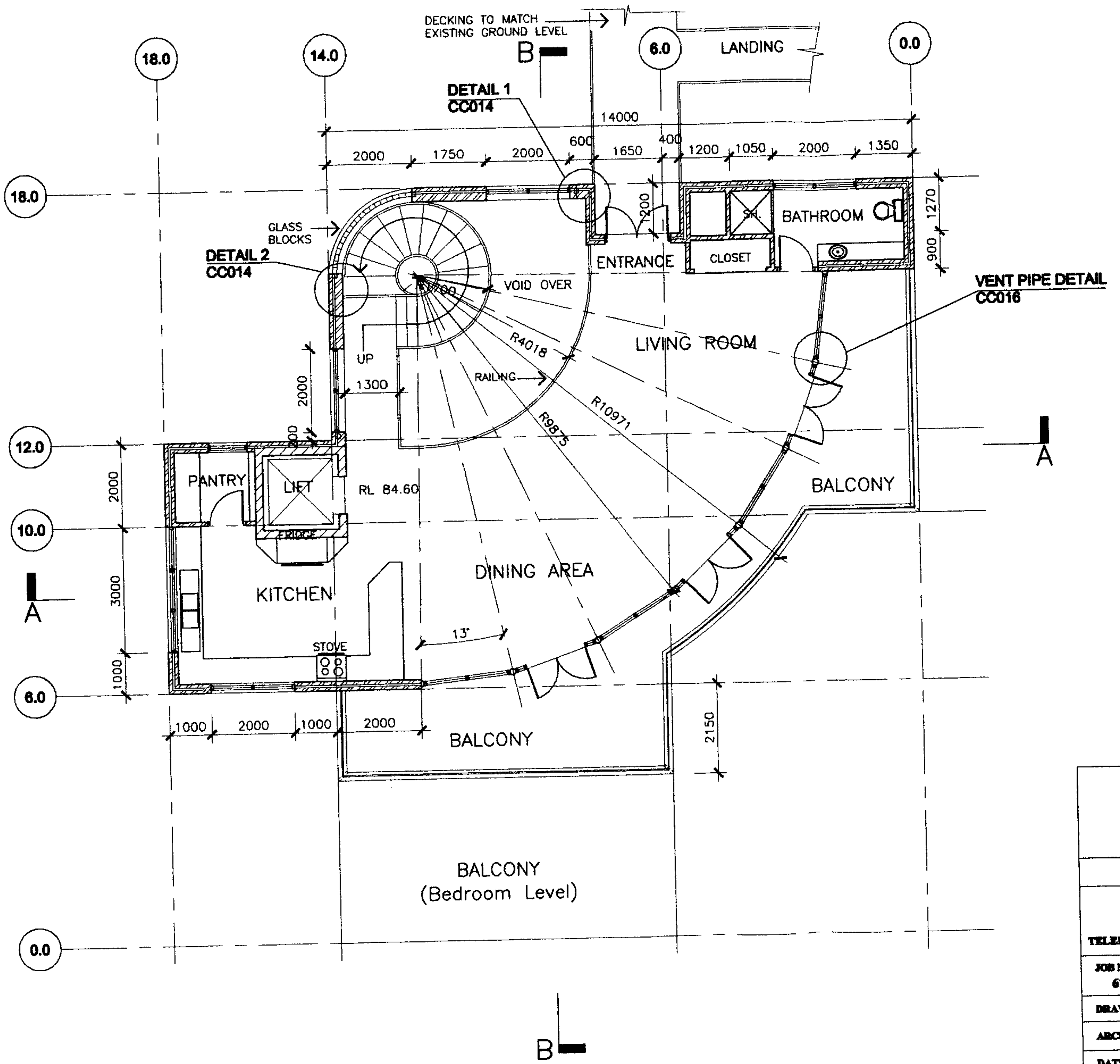
DRAWN BY	Digital Design Duo (M. Leaper)	AMENDMENTS:	
ARCHITECT	Tao Gofers		
DATE	July 2002		



APPROVED
1 8 OCT 2002
ANTHONY PROTAS CONSULTING PTY. LTD.

CONSTRUCTION CERTIFICATE DOCUMENTS

PRIVATE RESIDENCE
27C ALEXANDRA CRESCENT BAYVIEW NSW
MR A & MRS D MARROCCO

MAIN ENTRANCE LEVEL

TA DESIGN AND CONSTRUCTION PTY LTD
191A COPELAND ROAD (EAST) BEECROFT NSW 2119

TELEPHONE 02 9484 0870 EMAIL tgollers@tig.com.au

JOB NUMBER	SCALE	REVISION	DRAWING No
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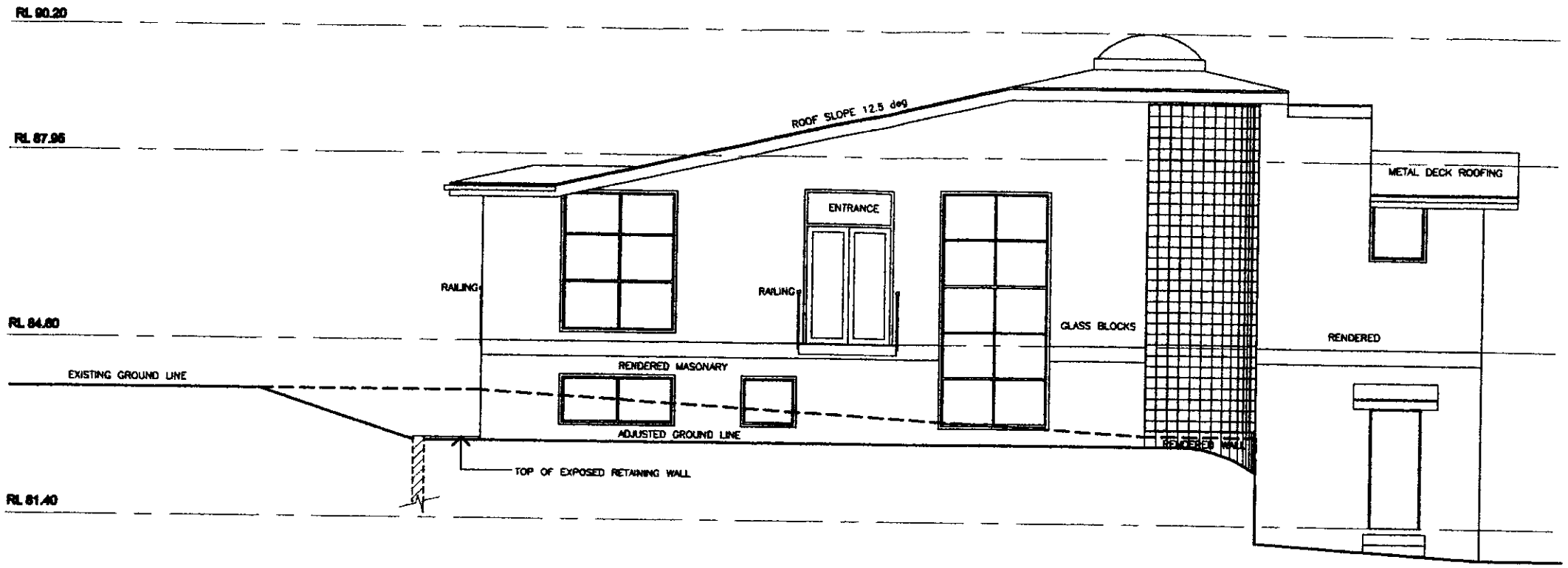
ARCHITECT	Tao Gollers		
DATE	July 2002		



RL 78.10

APPROVED

18 OCT 2002

ANTHONY PROTAS CONSULTING PTY. LTD.

CONSTRUCTION CERTIFICATE DOCUMENTS

PRIVATE RESIDENCE
27C ALEXANDRA CRESCENT BAYVIEW NSW
MR A & MRS D MARROCCO

WEST ELEVATION

TA DESIGN AND CONSTRUCTION PTY LTD
191A COPELAND ROAD (EAST) BEECROFT NSW 2119

TELEPHONE 02 9484 0870 **EMAIL tgofers@tig.com.au**

JOB NUMBER	SCALE	REVISION	DRAWING No
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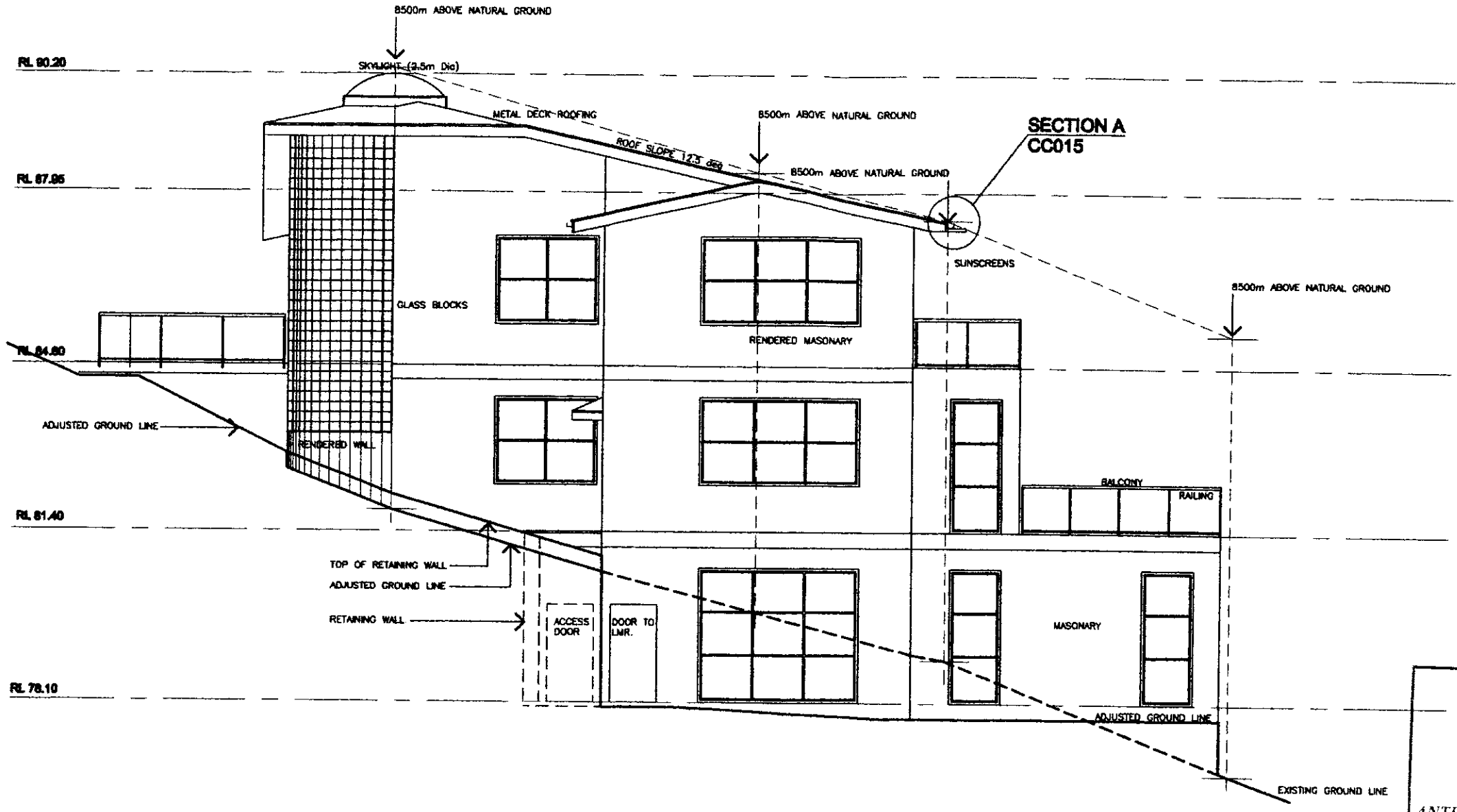
DRAWN BY	Digital Design Duo (J. Fredericks)	AMENDMENTS:
ARCHITECT	Tas Gofers	
DATE	July 2002	



APPROVED

18 OCT 2002

ANTHONY PROTAS CONSULTING PTY. LTD.

CONSTRUCTION CERTIFICATE DOCUMENTS

PRIVATE RESIDENCE
27C ALEXANDRA CRESCENT BAYVIEW NSW
MR A & MRS D MARROCCO

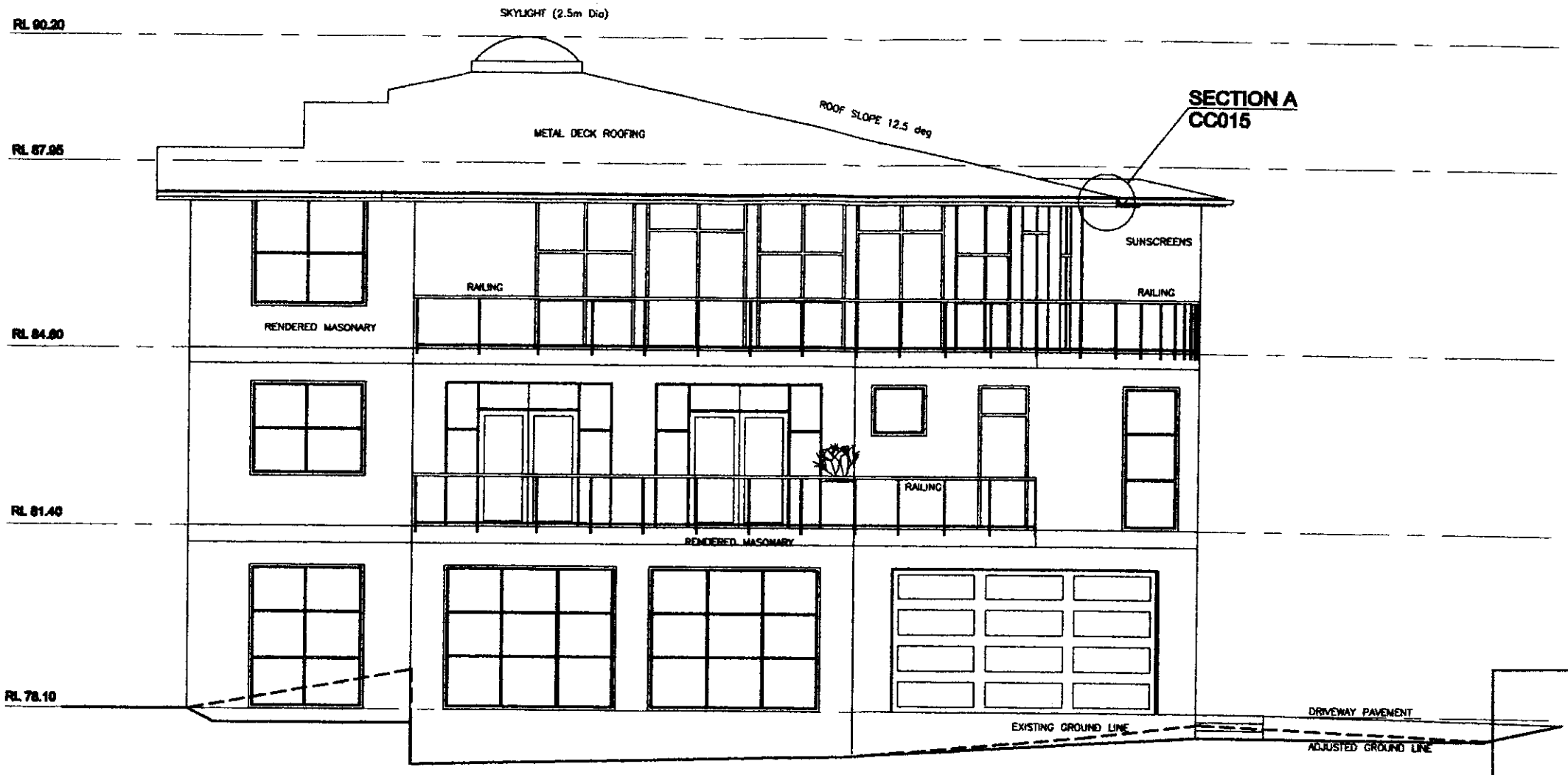
SOUTH ELEVATION

TA DESIGN AND CONSTRUCTION PTY LTD
191A COPELAND ROAD (EAST) BEECROFT NSW 2119

TELEPHONE 02 9484 0870 **EMAIL tgofers@tig.com.au**

JOB NUMBER	SCALE	REVISION	DRAWING No
61299	1:100	R-0	CC 009

DRAWN BY	Digital Design Duo (J. Fredericks)	AMENDMENTS:
ARCHITECT	Tao Gofers	
DATE	July 2002	



APPROVED

1 8 OCT 2002

ANTHONY PROTAS CONSULTING PTY. LTD.

NOTE: RETAINING WALLS NOT SHOWN FOR CLARITY

CONSTRUCTION CERTIFICATE DOCUMENTS

PRIVATE RESIDENCE
27C ALEXANDRA CRESCENT BAYVIEW NSW
MR A & MRS D MARROCCO

EAST ELEVATION

TA DESIGN AND CONSTRUCTION PTY LTD
191A COPELAND ROAD (EAST) BEECROFT NSW 2119
TELEPHONE 02 9484 0070 **EMAIL tagolers@tdg.com.au**

JOB NUMBER	SCALE	REVISION	DRAWING No
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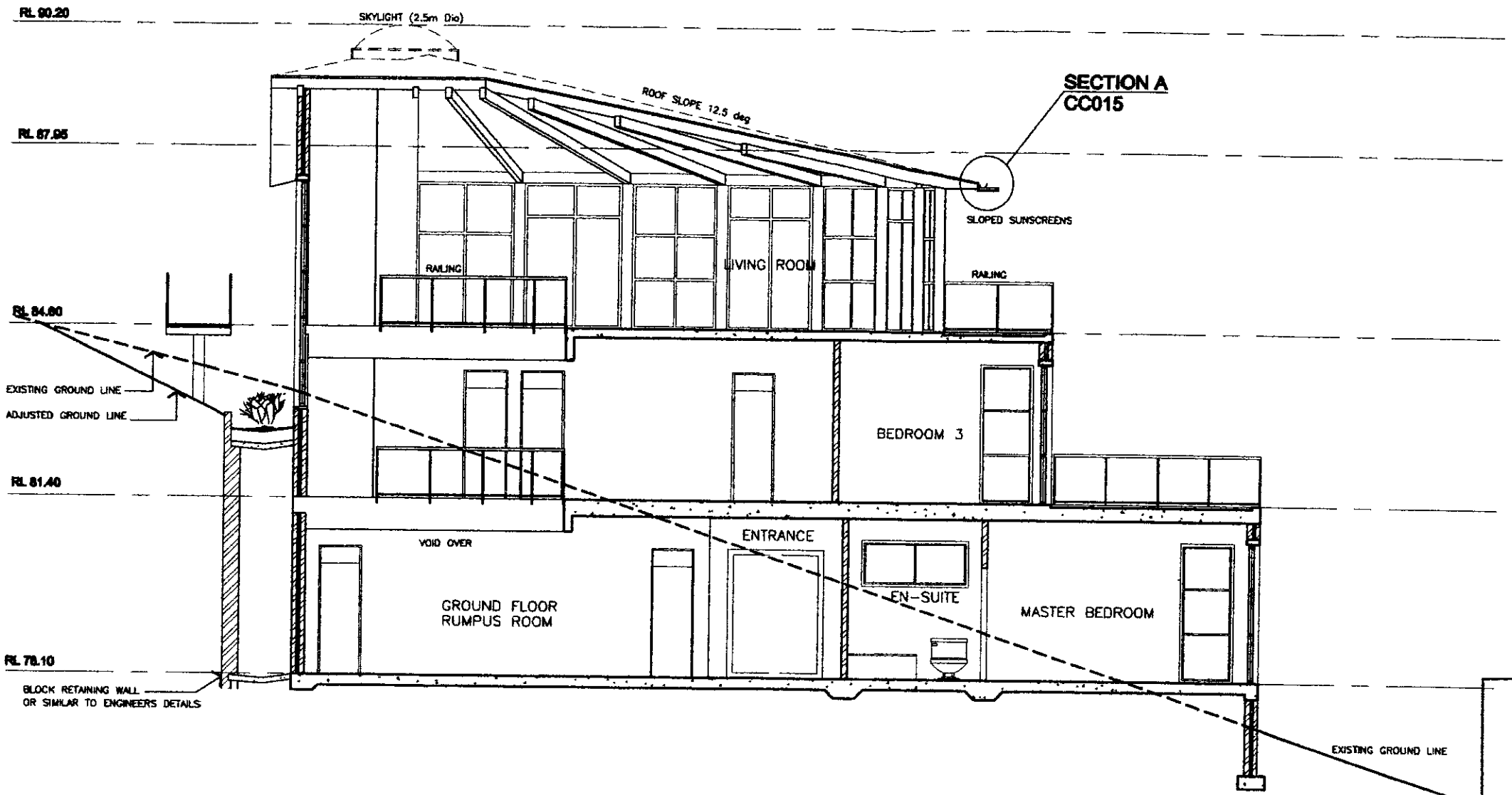
DRAWN BY	Digital Design Duo (J. Fredericks)	AMENDMENTS:
ARCHITECT	Tao Golers	
DATE	July 2002	



APPROVED

18 OCT 2002

ANTHONY PROTAS CONSULTING PTY. LTD.

CONSTRUCTION CERTIFICATE DOCUMENTS

PRIVATE RESIDENCE
27C ALEXANDRA CRESCENT BAYVIEW NSW
MR A & MRS D MARROCCO

SECTION B-B

TA DESIGN AND CONSTRUCTION PTY LTD
191A COPELAND ROAD (EAST) BEECROFT NSW 2119
TELEPHONE 02 9484 0870 **EMAIL tgofers@tig.com.au**

JOB NUMBER	SCALE	REVISION	DRAWING No
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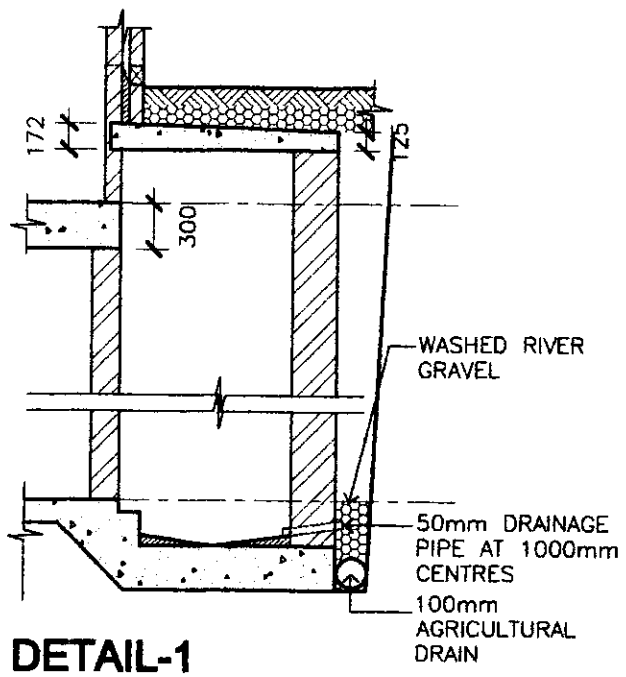
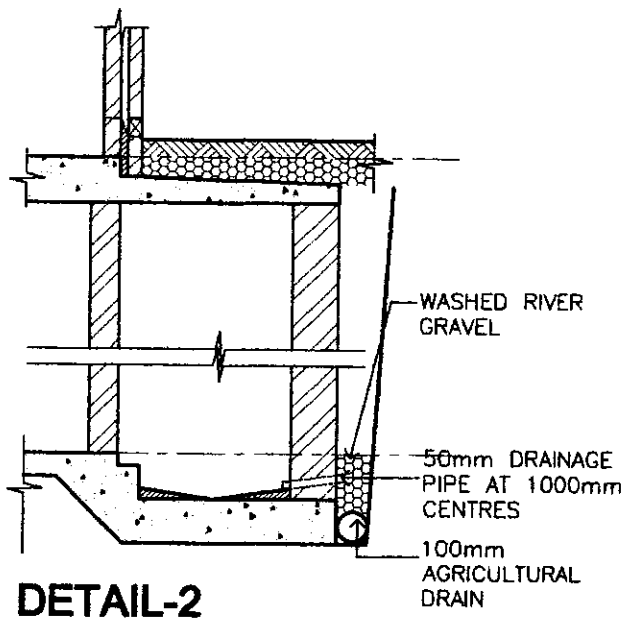
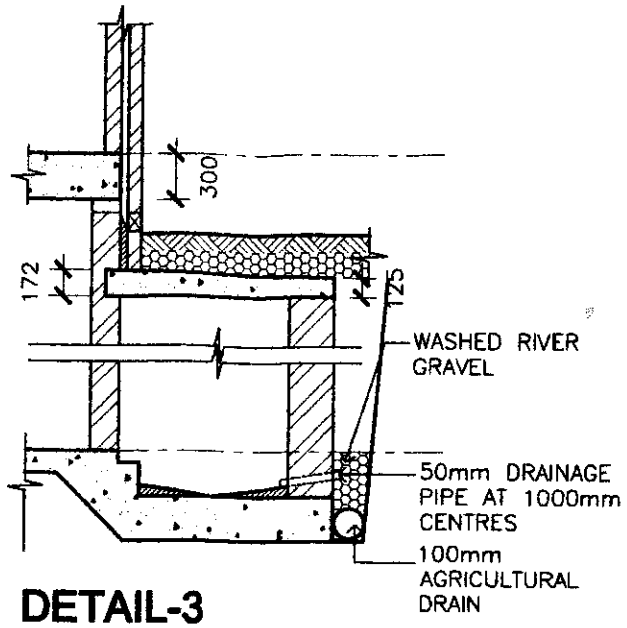
DRAWN BY	Digital Design Duo (J. Fredericks)	AMENDMENTS:
ARCHITECT	Tas Gofers	
DATE	July 2002	



DETAIL-1
Scale 1:50



DETAIL-2
Scale 1:50



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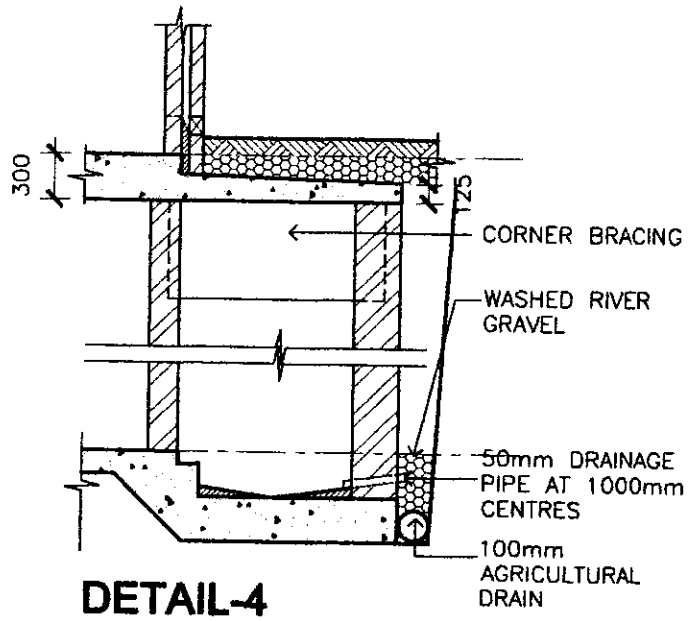

DETAIL-4
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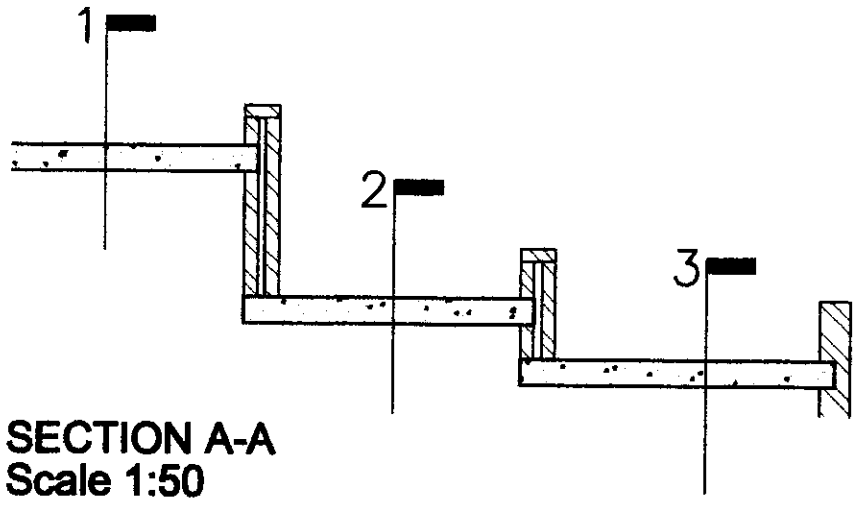
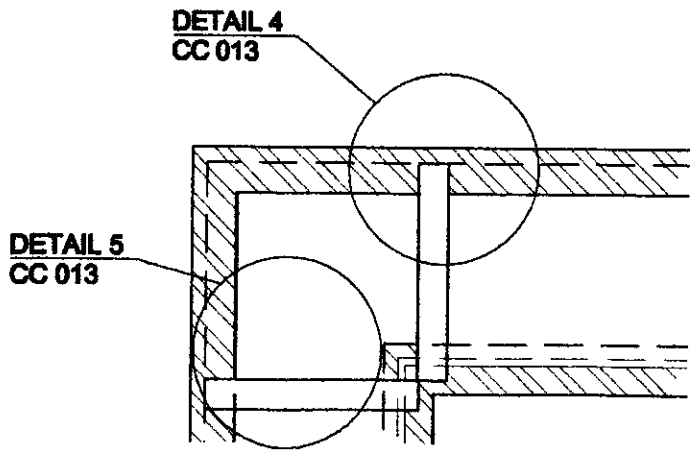


SECTION A-A
Scale 1:50



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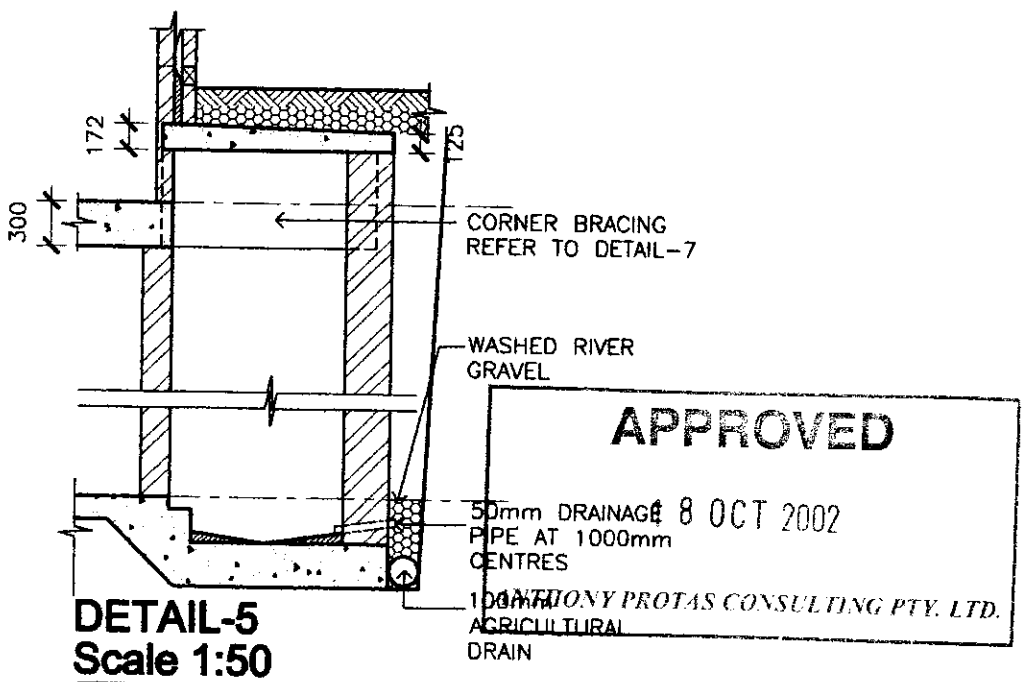

DETAIL-5
Scale 1:50

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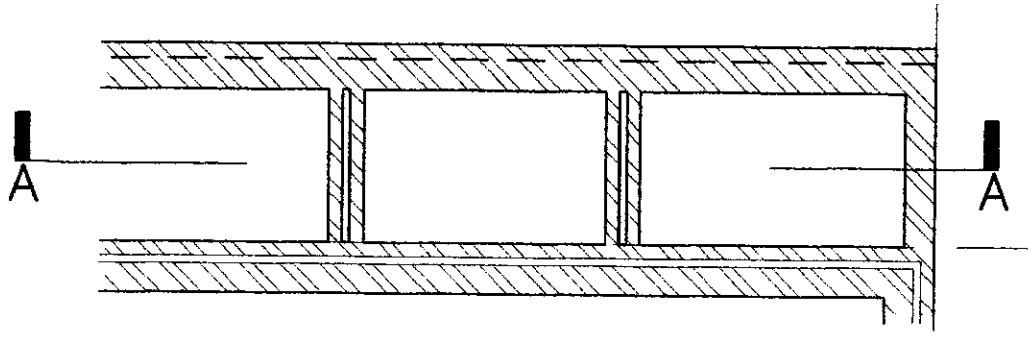
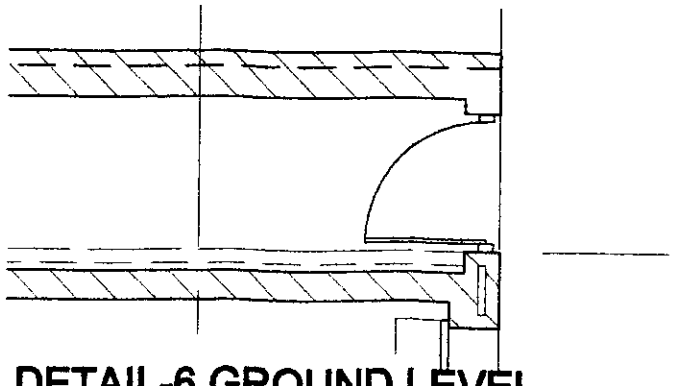
8 OCT 2002
ANTHONY PROTAS CONSULTING PTY. LTD.



DETAIL-6 BEDROOM LEVEL
Scale 1:50



DETAIL-6 GROUND LEVEL
Scale 1:50

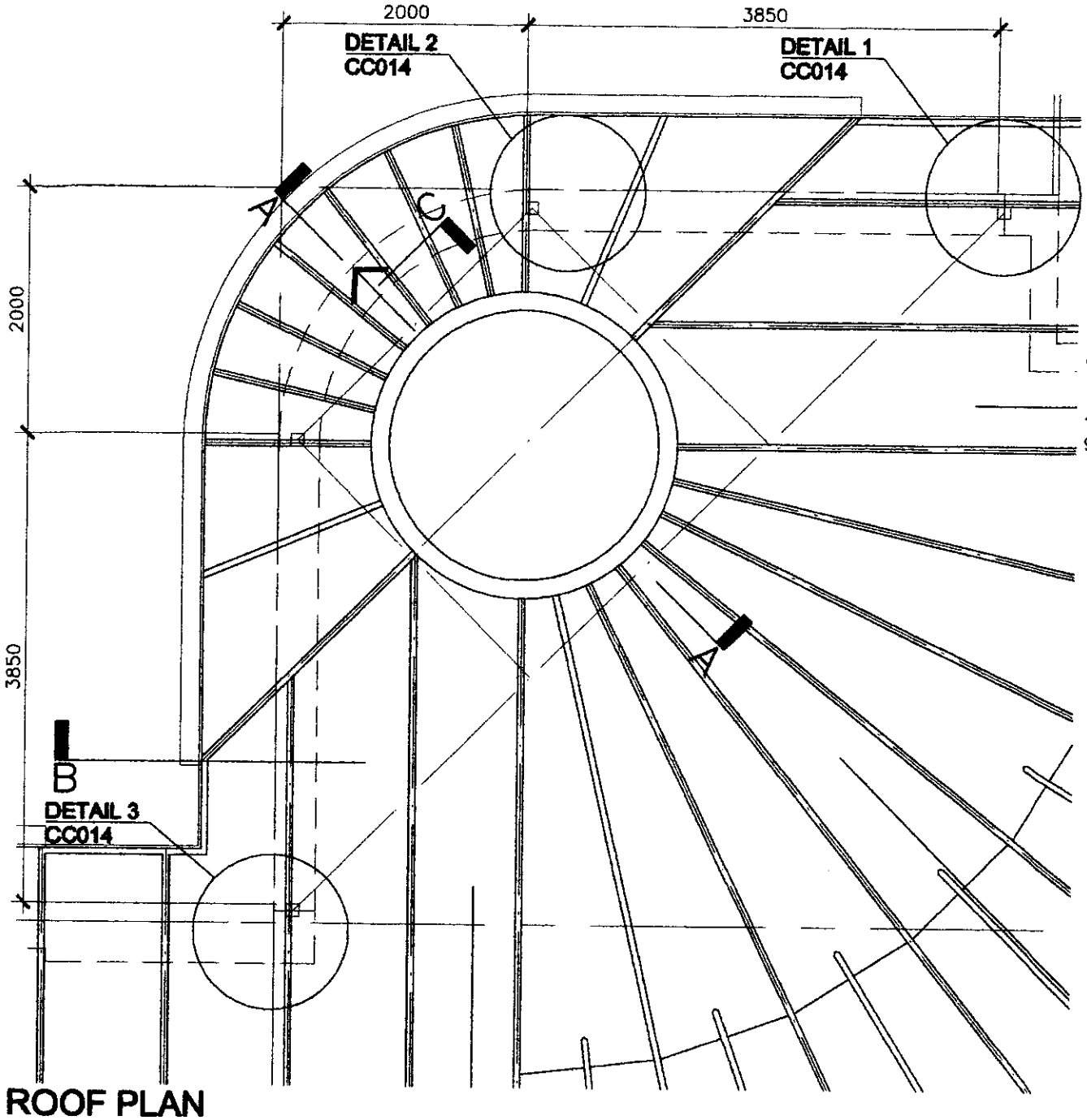
CONSTRUCTION CERTIFICATE DOCUMENTS

PRIVATE RESIDENCE
27C ALEXANDRA CRESCENT BAYVIEW NSW
MR A & MRS D MARROCCO

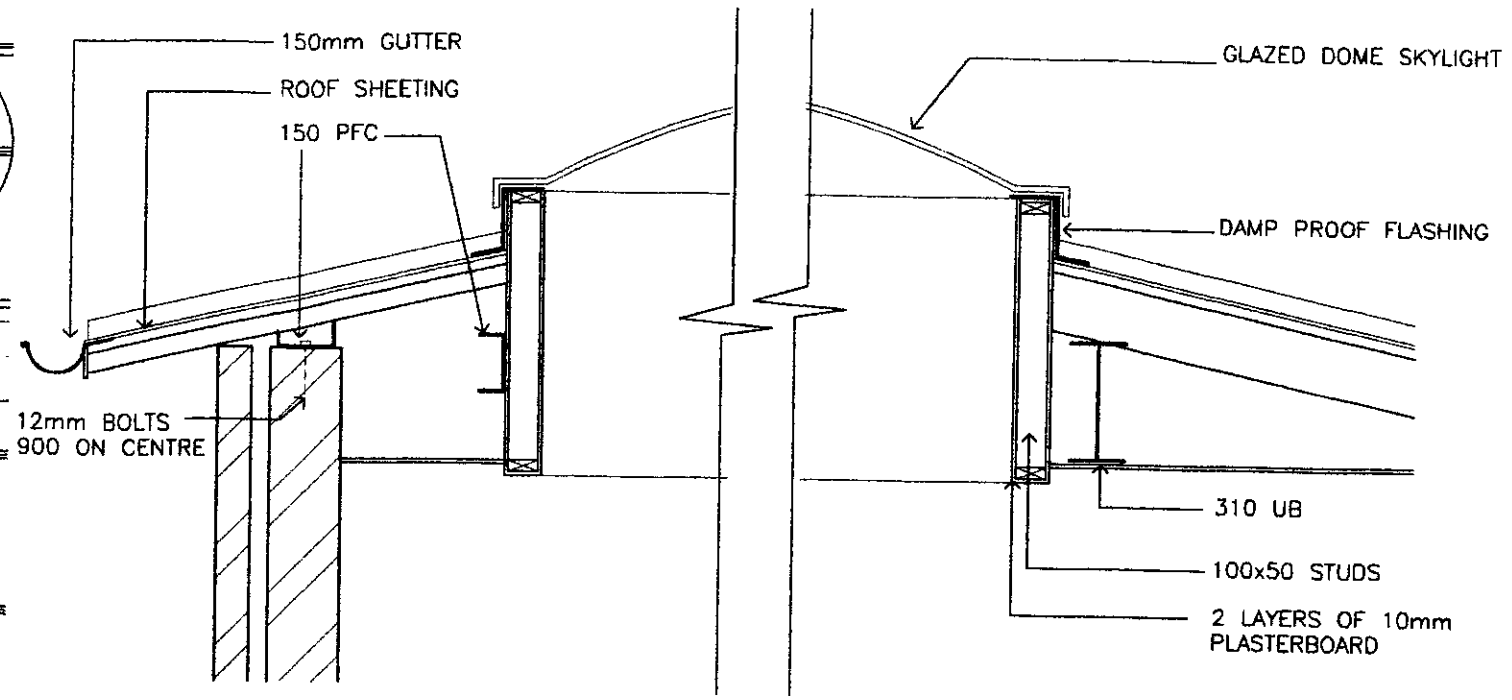
RETAINING WALL DETAILS

TA DESIGN AND CONSTRUCTION PTY LTD
191A COPELAND ROAD (EAST) BEECROFT NSW 2119
TELEPHONE 02 9484 0870 **EMAIL tagofers@tig.com.au**

JOB NUMBER	SCALE	REVISION	DRAWING No
61299	1:50	R-0	CC 013
DRAWN BY	Digital Design Duo (M. Leaper)	AMENDMENTS:	
ARCHITECT	Tao Gofers		
DATE	July 2002		



ROOF PLAN
Scale 1:50



SECTION A-A
Scale 1:20

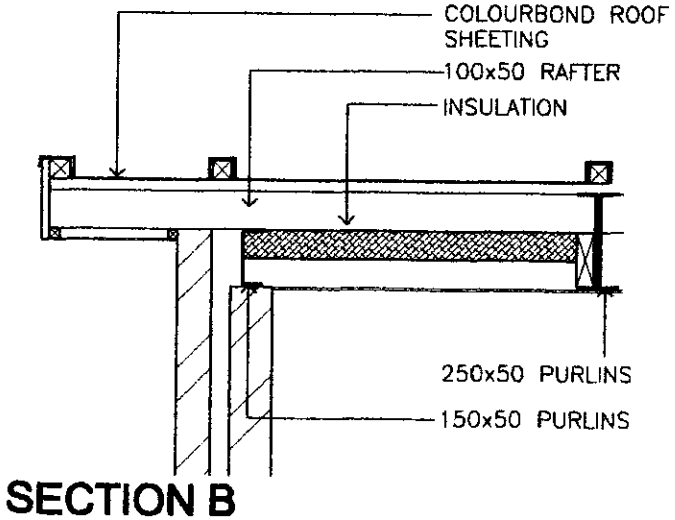
DETAIL 1 - CC 005
Scale 1:20

DETAIL 2 - CC 005
Scale 1:20

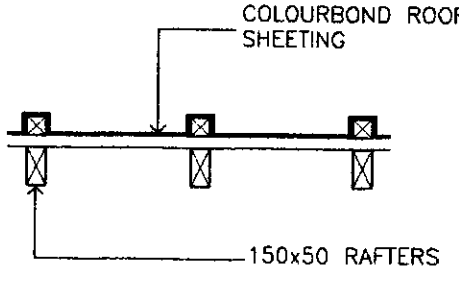
APPROVED

DETAIL 1 - CC 003
Scale 1:20

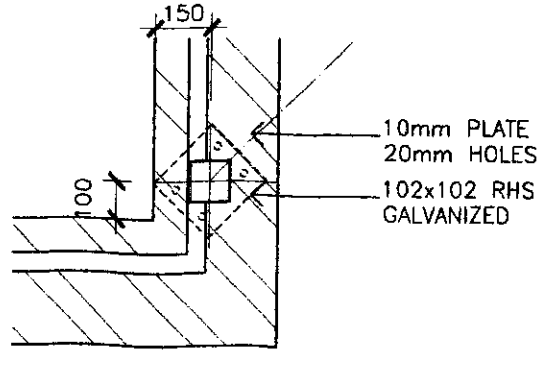
ANTHONY PROTAS CONSULTING PTY. LTD.



SECTION B
Scale 1:20



SECTION C
Scale 1:20



DETAIL 3 - CC 003
Scale 1:20

CONSTRUCTION CERTIFICATE DOCUMENTS

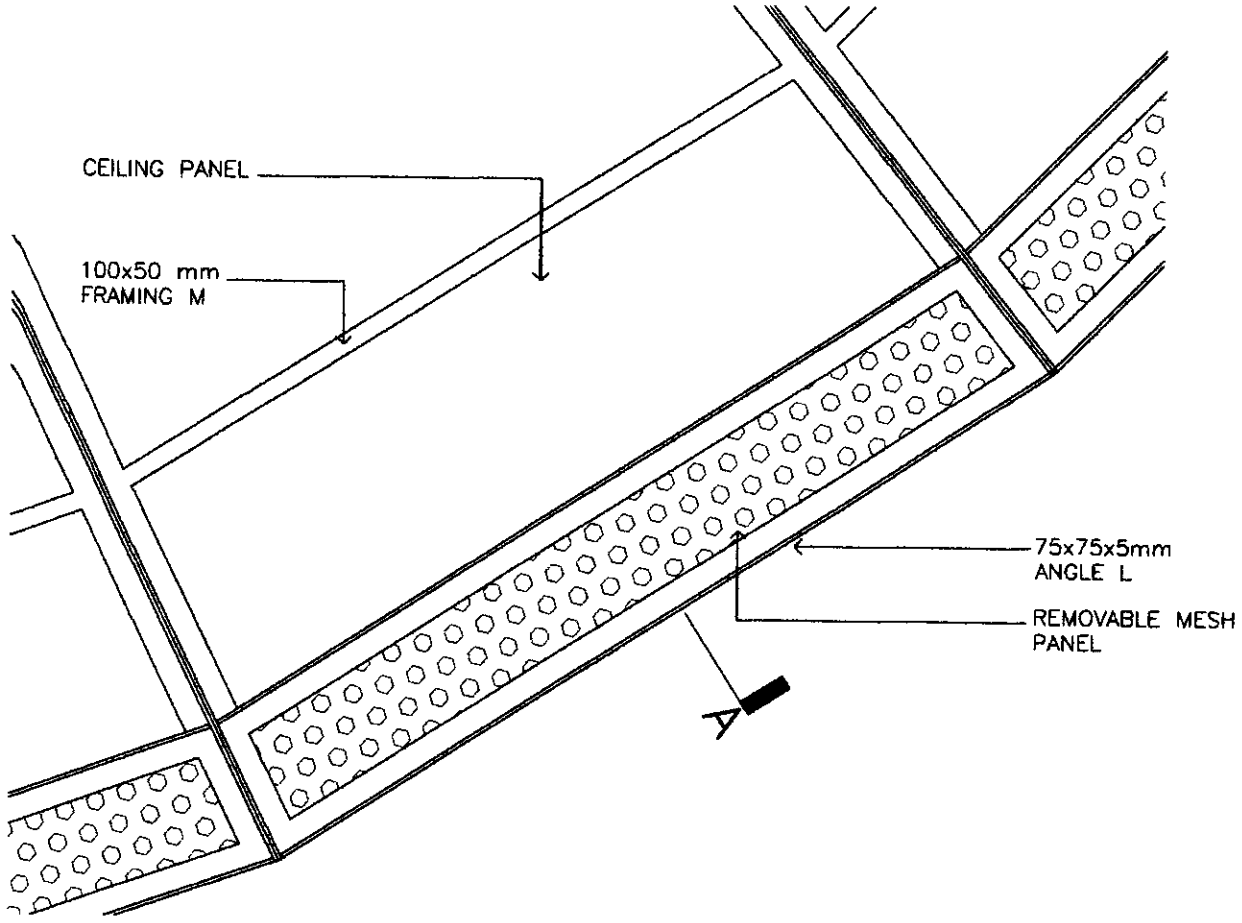
PRIVATE RESIDENCE
27C ALEXANDRA CRESCENT BAYVIEW NSW
MR A & MRS D MARROCCO

ROOF DETAILS

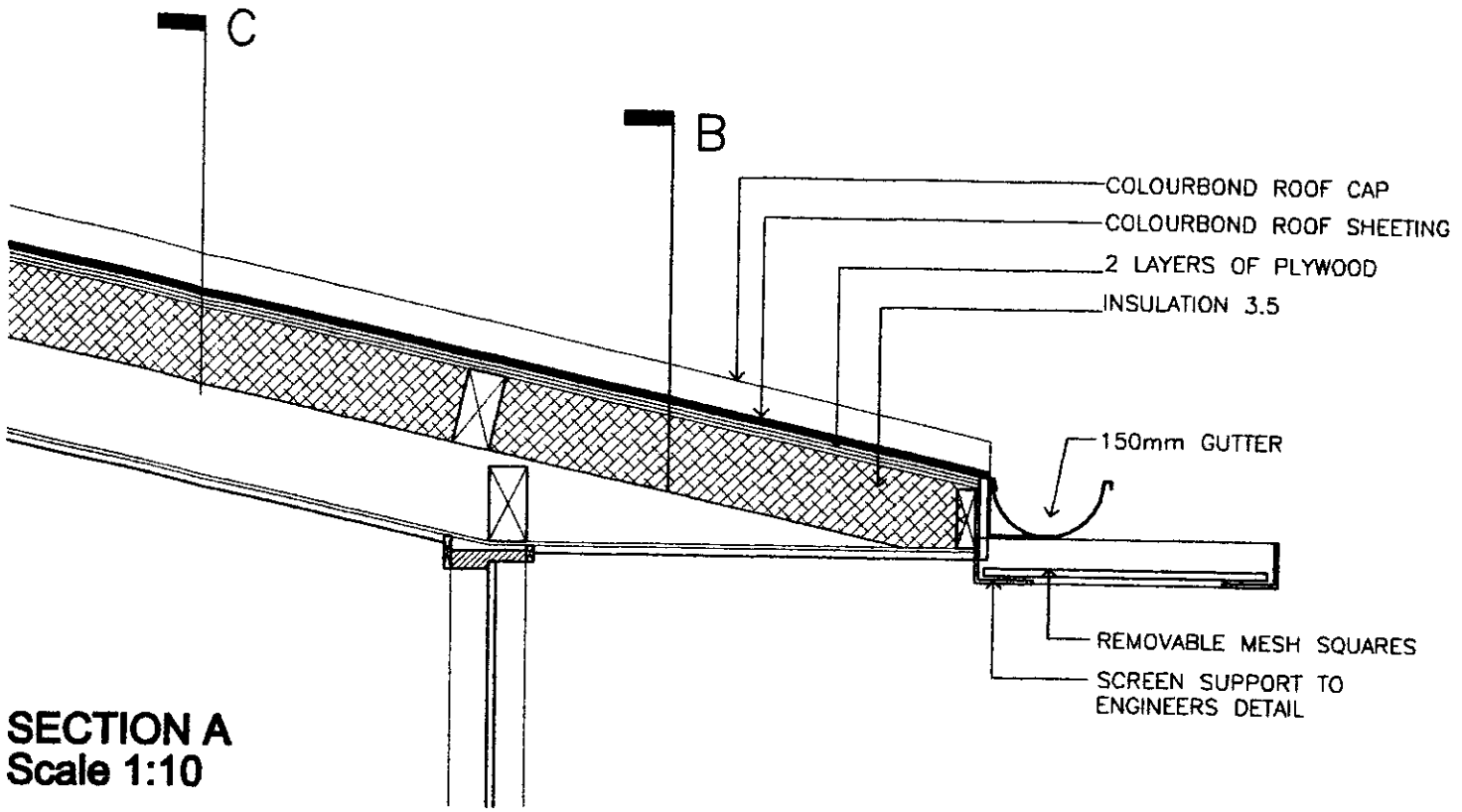
TA DESIGN AND CONSTRUCTION PTY LTD
191A COPELAND ROAD (EAST) BEECROFT NSW 2119

TELEPHONE 02 9484 0870 **EMAIL tgofers@tig.com.au**

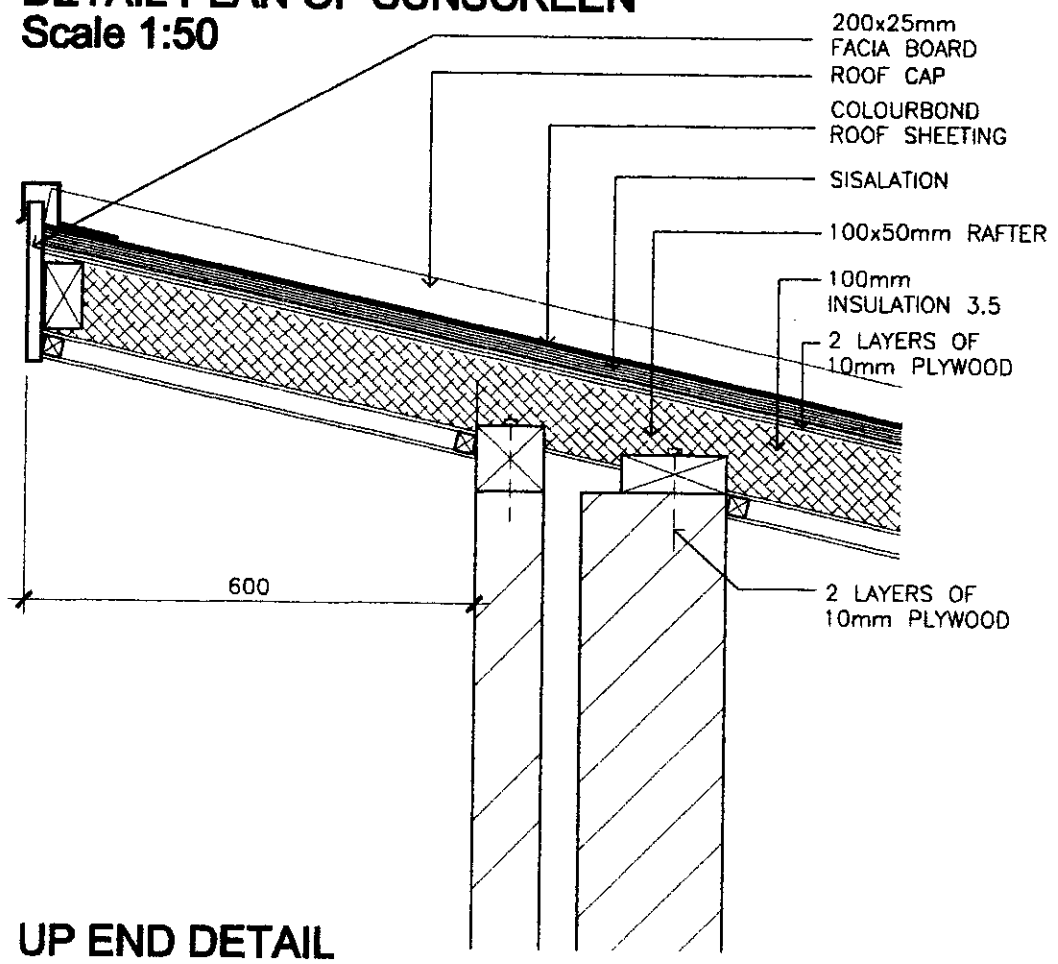
JOB NUMBER	SCALE	REVISION	DRAWING No
61299		R-0	CC 014
DRAWN BY	Digital Design Duo (M. Lasper)	AMENDMENTS:	
ARCHITECT	Tas Gofers		
DATE	July 2002		



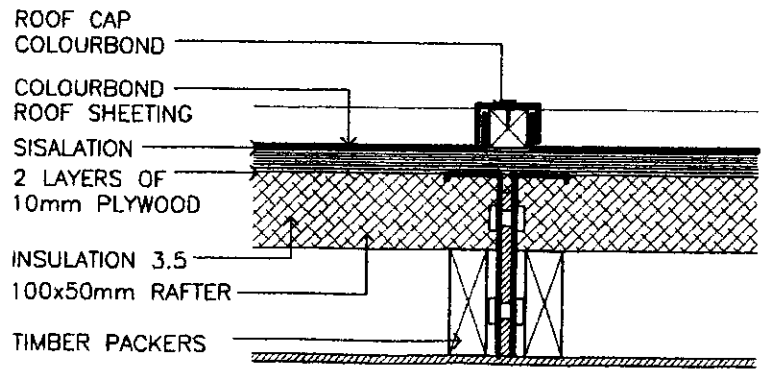
DETAIL PLAN OF SUNSCREEN
Scale 1:50



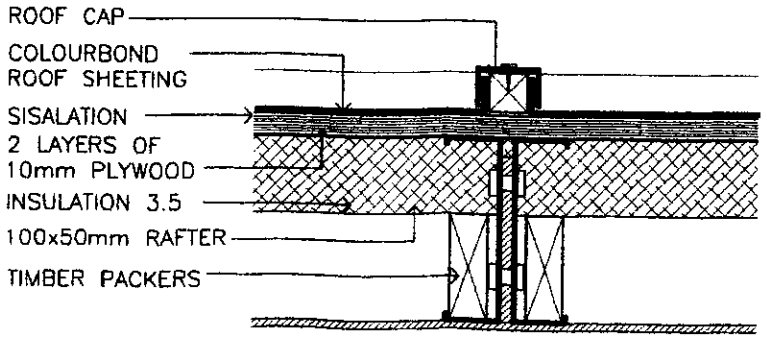
SECTION A
Scale 1:10



UP END DETAIL
Scale 1:10



SECTION B
Scale 1:10



SECTION C
Scale 1:10

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1 8 OCT 2002

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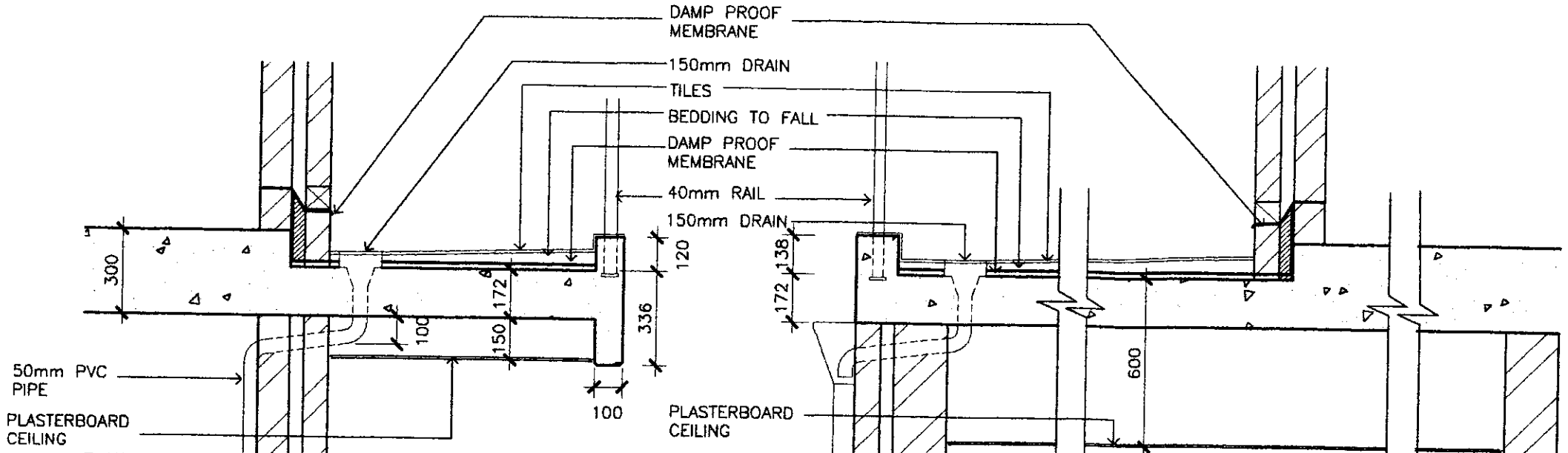
CONSTRUCTION CERTIFICATE DOCUMENTS

PRIVATE RESIDENCE
27C ALEXANDRA CRESCENT BAYVIEW NSW
MR A & MRS D MARROCCO

ROOF DETAILS

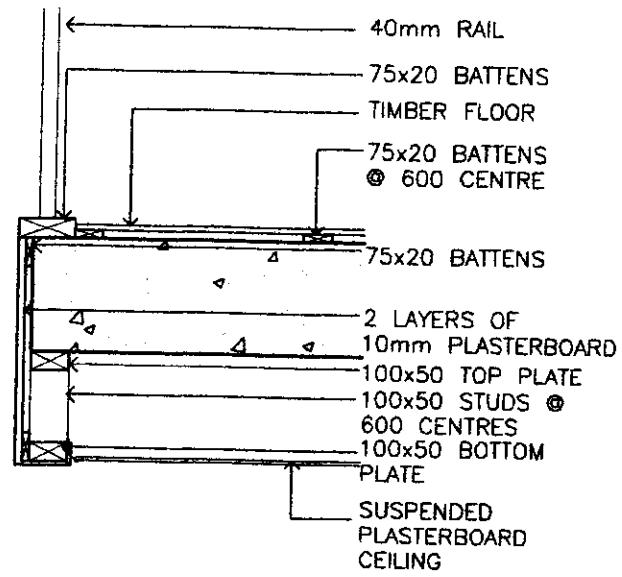
TA DESIGN AND CONSTRUCTION PTY LTD
191A COPELAND ROAD (EAST) BEECROFT NSW 2119
TELEPHONE 02 9484 0870 **EMAIL tgofers@tig.com.au**

JOB NUMBER	SCALE	REVISION	DRAWING No
61299		R-0	CC 015
DRAWN BY	Digital Design Duo (M. Lasper)	AMENDMENTS:	
ARCHITECT	Tao Gofers		
DATE	July 2002		

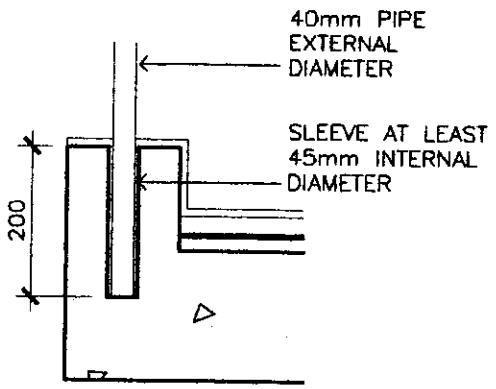


DETAIL OF BALCONY TO BEDROOM 3 & 4
Scale 1:20

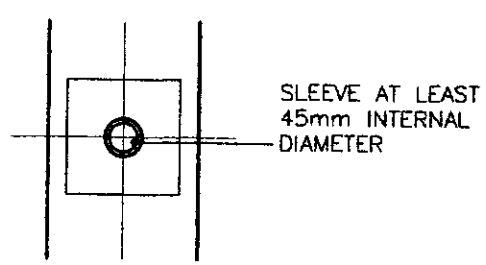
DETAIL OF BALCONY TO BEDROOM 2 & 3
Scale 1:20



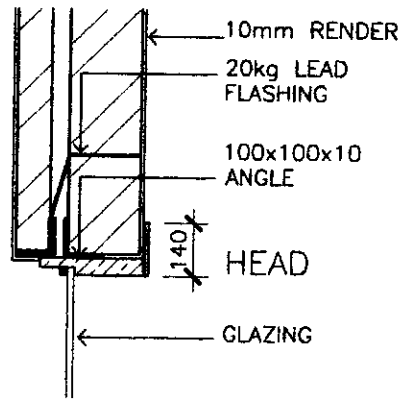
DETAIL OF EDGE TO VOID
Scale 1:20

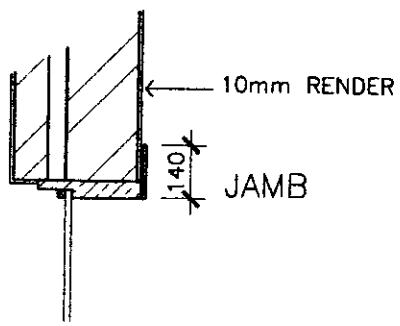


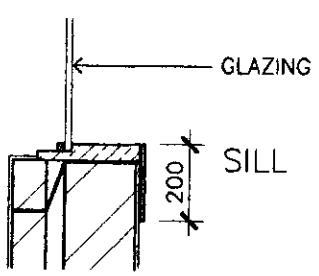
SLEEVE DETAIL
Scale 1:10



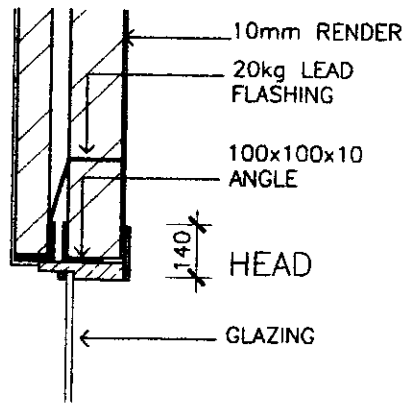
PLAN OF SLEEVE
Scale 1:10

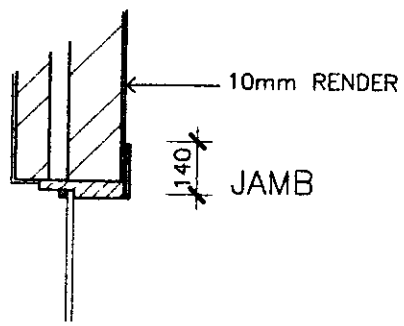


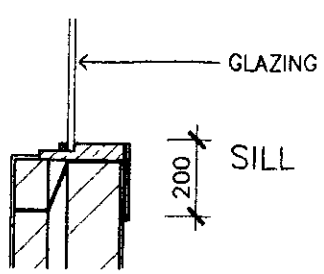




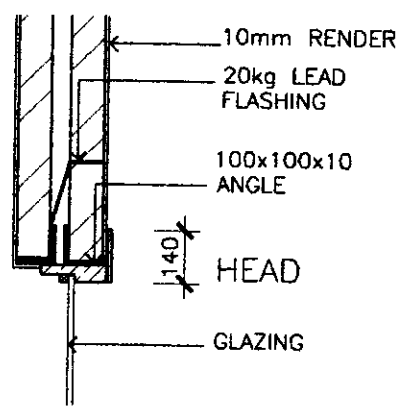
WINDOW DETAIL
230mm Wall
Scale 1:20

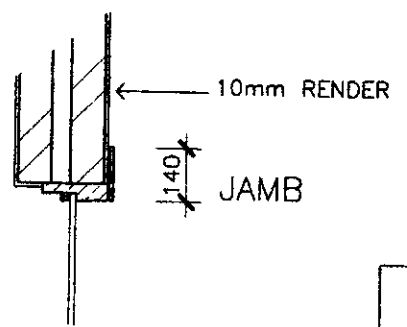


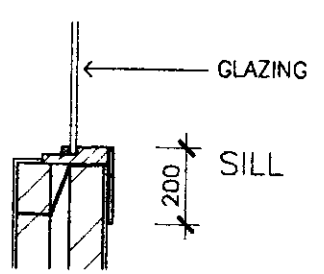




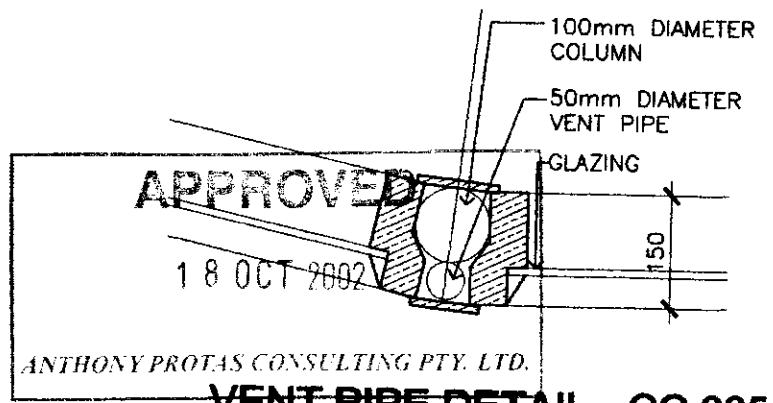
WINDOW DETAIL
145mm Wall
Scale 1:20







WINDOW DETAIL
110mm Wall
Scale 1:20



VENT PIPE DETAIL - CC 005
Scale 1:10

CONSTRUCTION CERTIFICATE DOCUMENTS

PRIVATE RESIDENCE
27C ALEXANDRA CRESCENT BAYVIEW NSW
MR A & MRS D MARROCCO

BALCONY & WINDOW DETAILS

TA DESIGN AND CONSTRUCTION PTY LTD
191A COPELAND ROAD (EAST) BEECROFT NSW 2119
TELEPHONE 02 9484 0870 **EMAIL tgoders@tig.com.au**

JOB NUMBER	SCALE	REVISION	DRAWING No
61299		R-0	CC 016
DRAWN BY	Digital Design Duo (M. Leaper)	AMENDMENTS:	
ARCHITECT	Tao Goders		
DATE	July 2002		

ROOF GABLE EDGE

LE END

RIDGE LINE

WALL OUTLINE OF KITCHEN, LAUNDRY & STUDY SHOWN DOTTED

PART ROOF PLAN

SCALE 1:40

GRID 18.0

GRID 14.0

1000 1000 1000 1000 854 854 892

FLAT COLOURBOND ROOF SHEETING

2 LAYERS 10MM PLYWOOD

100 X 50 RAFTERS @ 500MM ON CENTER

200 x 25 FASCIA BOARD

6 MM FC LINING

100 X 50 STUD GABLE WALL

METAL CAP

150 X 50 BEARER BOLTED TO 250 PFC

75 X 50 ROOF BATTENS

SECTION AA

SCALE 1:40

75 X 50 ROOF BATTENS

METAL CAP FIXED WITH 50 X 8 MM HEX HEAD SCREW WITH RUBBER WASHER

ALL STRUCTURE TO ENGINEERS DETAILS

200 x 25 FASCIA BOARD

GRID 12.0

6 MM FC LINING

ROOF OVERHANG EDGE

A

100 X 50 TOP PLATE BOLTED TO WALL WITH 12MM ANCHOR BOLT AT 1000 M O/C

FLAT COLOURBOND ROOF SHEETING

SISULATION

2 LAYERS 10MM PLYWOOD

100 X 50 RAFTERS @ 500MM ON CENTER

150 X 50 BEARER BOLTED TO 250 PFC

150 MM HALF ROUND STAINLESS STEEL GUTTER

150 MM CONCRETE SLAB

RL 87

6 MM FC LINING

100 X 50 CEILING JOIST @ 450 MM O/C

12 MM PLASTERBOARD

3300

EMPTY PERPENDS FOR WALL DRAINAGE AT MINIMUM 400 SPACING

190 MM CONCRETE WALL

10-15 MM RENDER

KITCHEN

RL 84.6

2KG LEAD FLASHING

DROPPED CEILING PLASTERBOARD

WATER PROOF MEMBRANE

LIFT SHAFT

LAUNDRY

RL 81.4

BACKFILL WITH CLEAN MATERIAL

10-15 MM RENDER

DRAINAGE PASSAGE WAY

50 MM PVC PIPES AT 1000M O/C

STUDY

RL 78.1

50 MM SAND BLINDING

FINAL GRADE

WASHED RIVER GRAVEL

100 MM AGG LINE

1600

LIFT WELL

LIFT WELL SUMP

2MM FORTICON MEMBRANE

50 MM SAND BLINDING

LIFT WELL SECTION

SCALE 1:40

APPROVED

18 OCT 2002

ANTHONY PROTAS CONSULTING PTY. LTD.

CONSTRUCTION CERTIFICATE DOCUMENTS

PRIVATE RESIDENCE

27C ALEXANDRIA CRESCENT BAYVIEW

MR A & MRS D MARROCCO

LIFT AND ROOF DETAILS

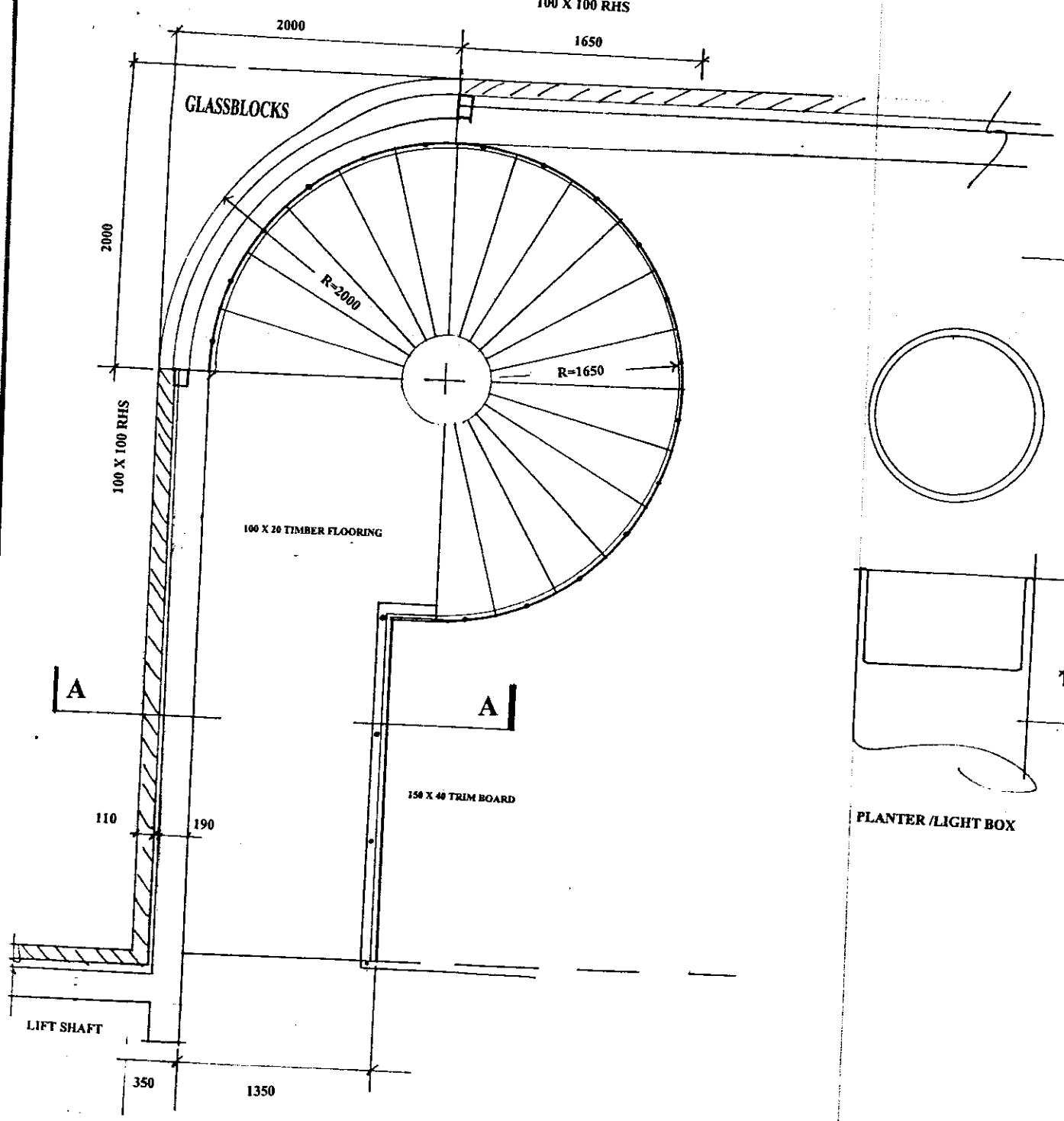
TA DESIGN AND CONSTRUCTION PTY LTD

191A COPELAND RD (EAST) BEECROFT 2119

TELEPHONE 02 9484 8978

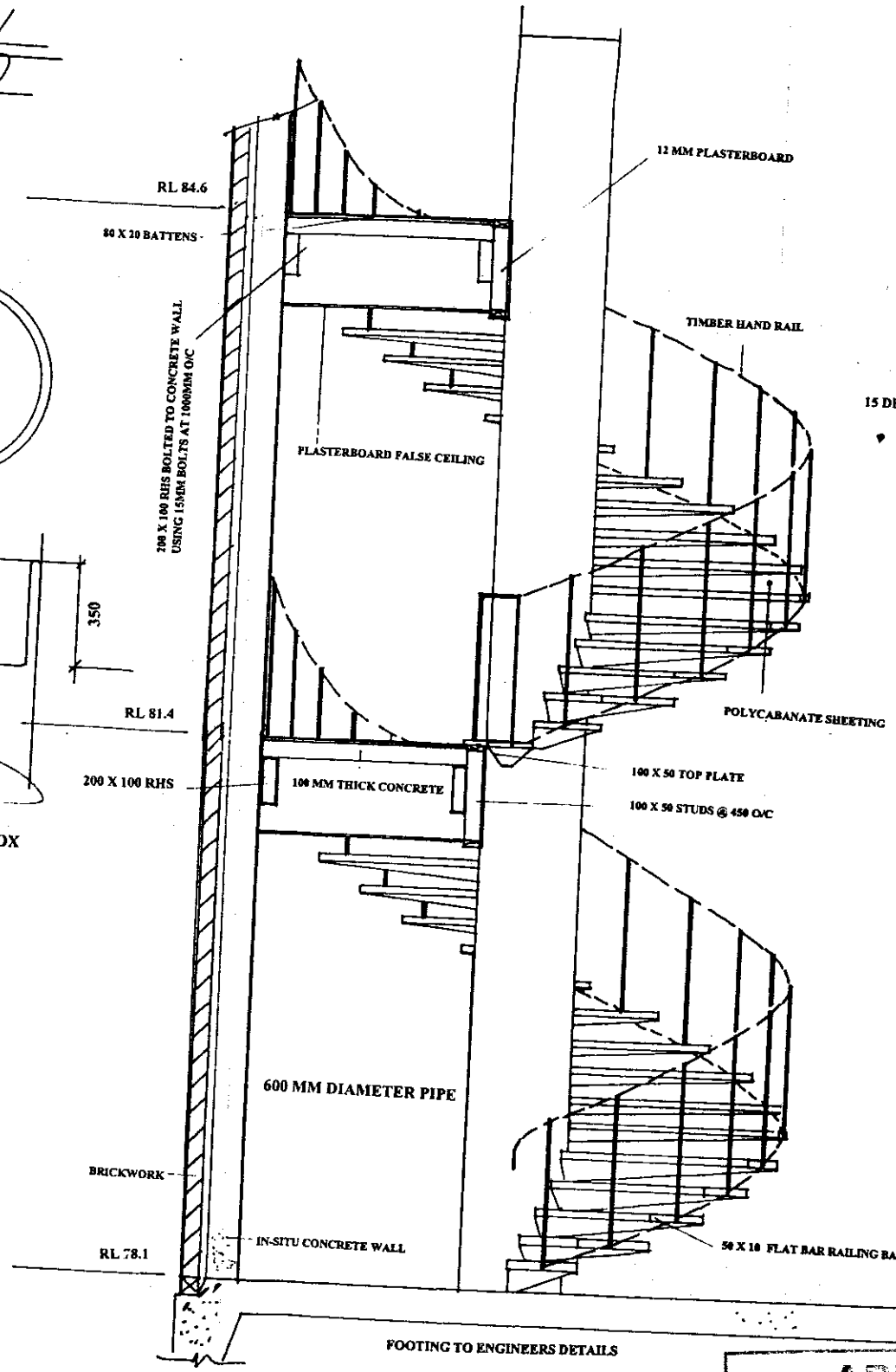
EMAIL tgofers@tg.com.au

JOB NUMBER	SCALE	REVISION	CC	DRAWING NUMBER
01299	AS SHOWN	001		CC 017
DRAWN BY			TG	AMENDMENTS
ARCHITECT			Tao Gofers	The location, spacing of the roof battens have been adjusted to accommodate the roof and overhang dimensions.
DATE			27-Jul-02	



CIRCULAR STAIR PLAN

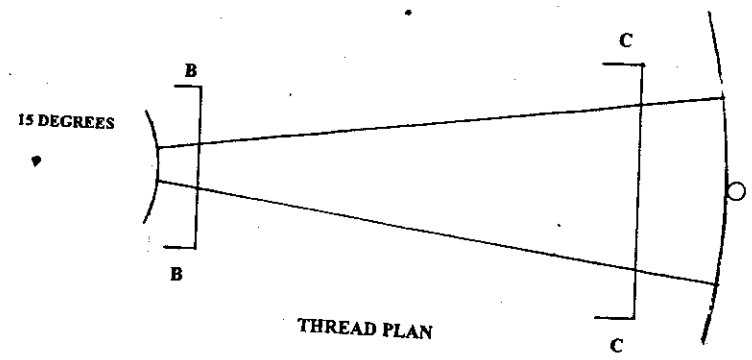
SCALE 1:40

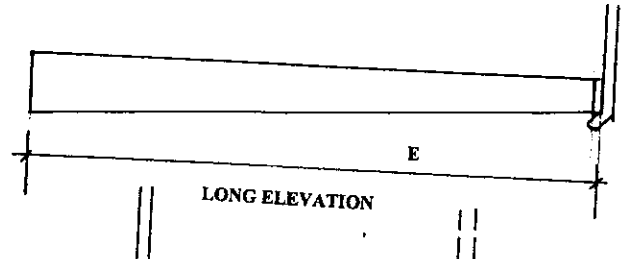


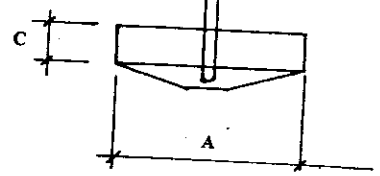
SECTION AA

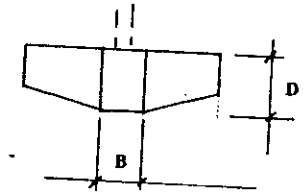
SCALE 1:40

ACTUAL DIMENSION OF THE STAIR ARE DETERMINED FROM THE SCHEDULE AND FINAL SITE DIMENSIONS





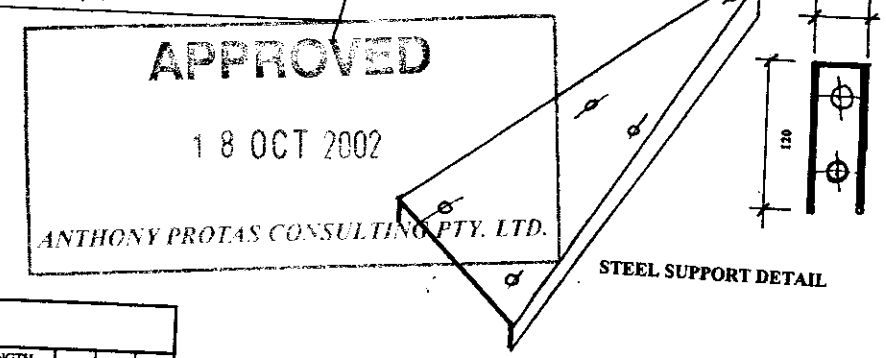





SECTION CC


SECTION BB

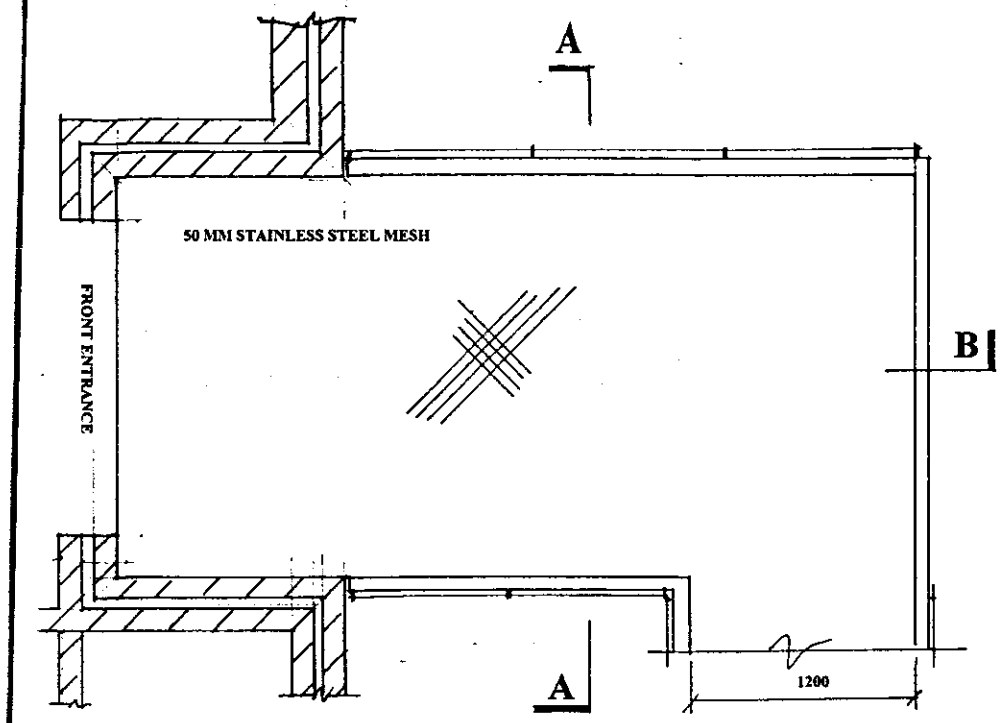
CONSTRUCTION CERTIFICATE DOCUMENTS			
PRIVATE RESIDENCE			
27C ALEXANDRIA CRESCENT BAYVIEW			
MR A & MRS D MARROCCO			
CIRCULAR STAIR DETAILS			
TA DESIGN AND CONSTRUCTION PTY LTD			
191A COPELAND RD (EAST) BEECROFT 2119			
TELEPHONE 02 9484 8870			EMAIL tadesign@ihug.com.au
JOB NUMBER 01799	SCALE AS SHOWN	REVISION 001 CC	DRAWING NUMBER CC 018
DRAWN BY	tg		
ARCHITECT	Tao Gofers		
DATE	27-Jul-02		



STAIR DIMENSIONS SCHEDULE										
	HEIGHT	NUMBER OF RISERS	RISE IN HEIGHT	NUMBER OF THREADS	ANGLE IN DEGREES	LENGTH OF ARC A	LENGTH OF ARC B	C	D	E
R 84.6										
SECOND LEVEL	3200	19	168.4	18	15	432.0	78.5	80	150	1350
R 81.4										
GROUND FLOOR	3300	19	173.7	18	15	432.0	78.5	80	150	1350
R 78.1										

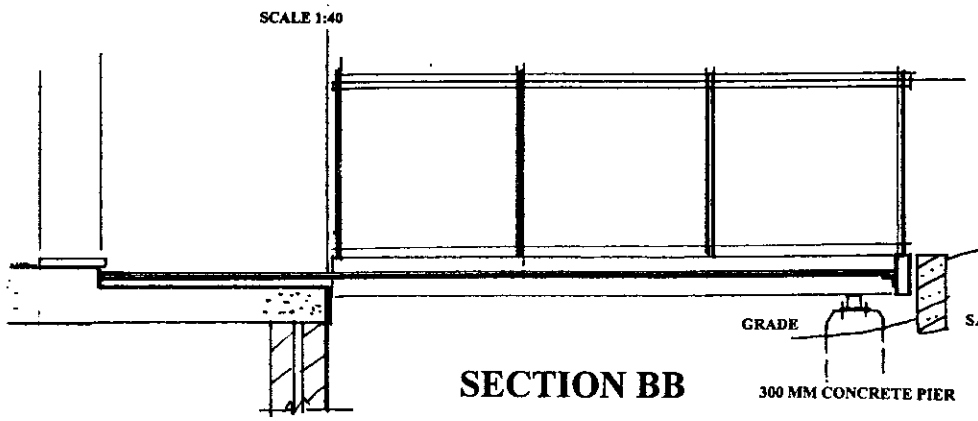
THREAD DETAILS

SCALE 1:20

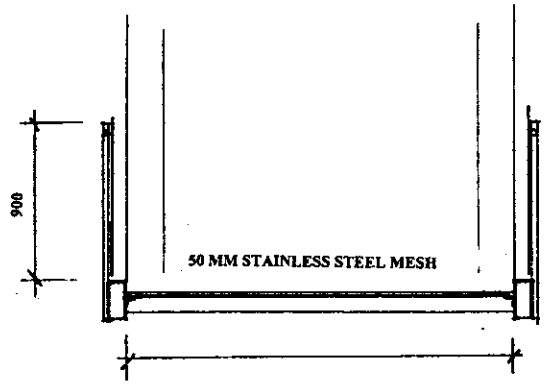


ENTRANCE LANDING PLAN

SCALE 1:40

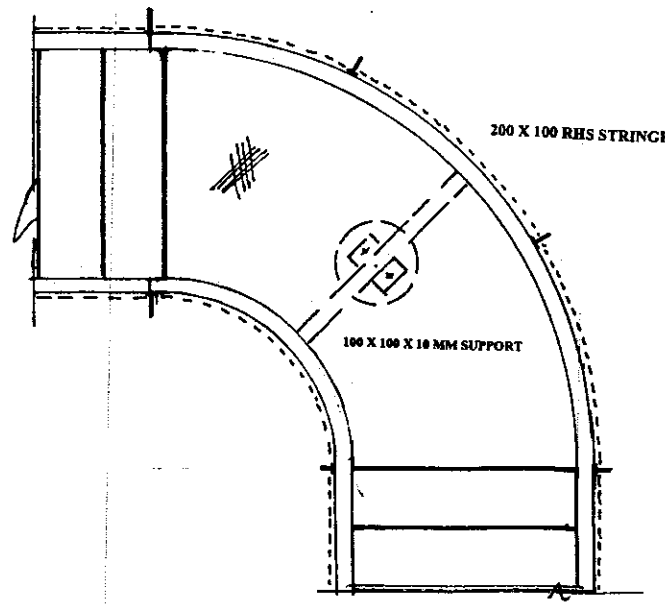


SECTION BB



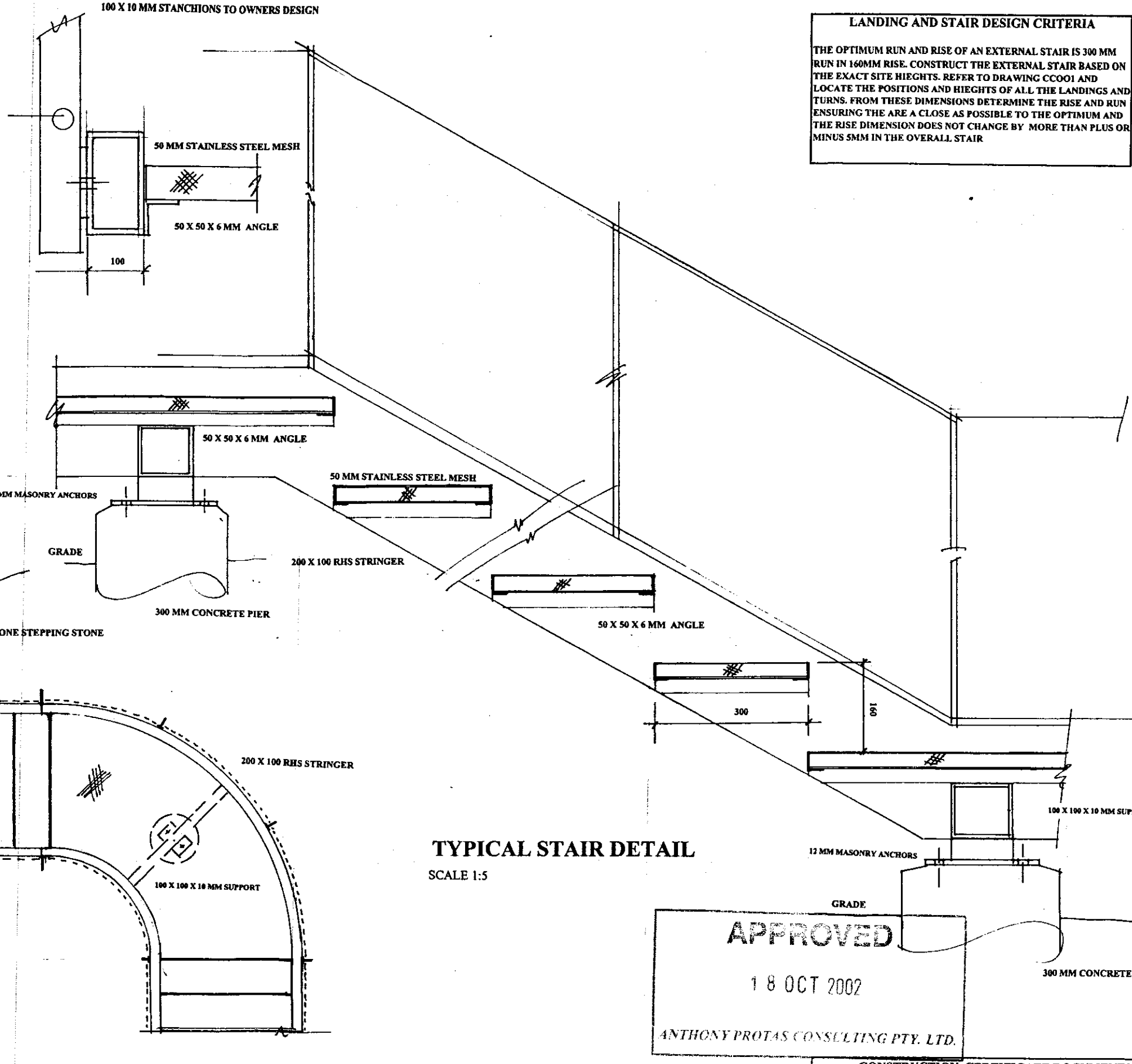
SECTION AA

SCALE 1:40



TYPICAL LANDING PLAN

SCALE 1:40



TYPICAL STAIR DETAIL

SCALE 1:5

LANDING AND STAIR DESIGN CRITERIA

THE OPTIMUM RUN AND RISE OF AN EXTERNAL STAIR IS 300 MM RUN IN 160MM RISE. CONSTRUCT THE EXTERNAL STAIR BASED ON THE EXACT SITE HIEGHTS. REFER TO DRAWING CC001 AND LOCATE THE POSITIONS AND HIEGHTS OF ALL THE LANDINGS AND TURNS. FROM THESE DIMENSIONS DETERMINE THE RISE AND RUN ENSURING THE ARE A CLOSE AS POSSIBLE TO THE OPTIMUM AND THE RISE DIMENSION DOES NOT CHANGE BY MORE THAN PLUS OR MINUS 5MM IN THE OVERALL STAIR

APPROVED

18 OCT 2002

ANTHONY PROTAS CONSULTING PTY. LTD.

ALL STRUCTURE TO ENGINEER DETAILS

DO NOT SCALE DRAWINGS USE ONLY SITE DIMENSIONS FOR CONSTRUCTION

CONSTRUCTION CERTIFICATE DOCUMENTS

PRIVATE RESIDENCE

27C ALEXANDRIA CRESCENT BAYVIEW

MR A & MRS D MARROCCO

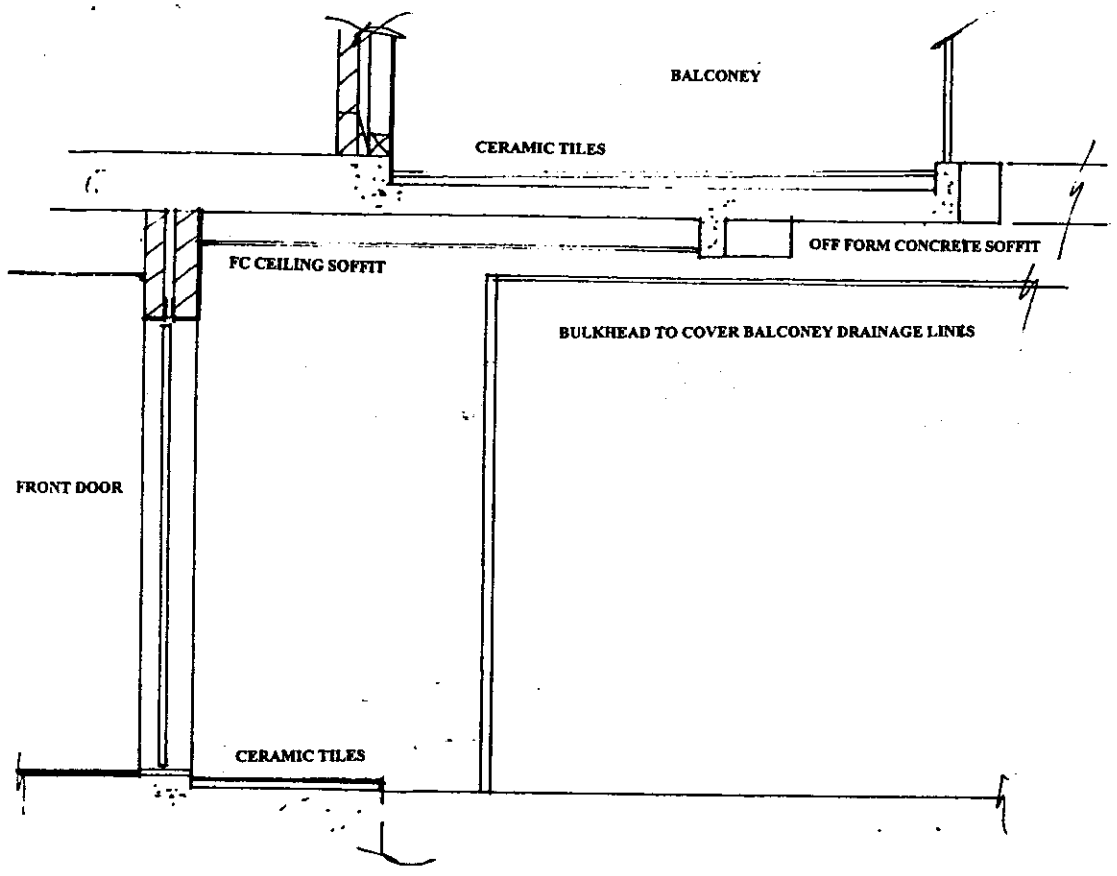
EXTERNAL STAIR DETAILS

TA DESIGN AND CONSTRUCTION PTY LTD

191A COPELAND RD (EAST) BEECROFT 2119

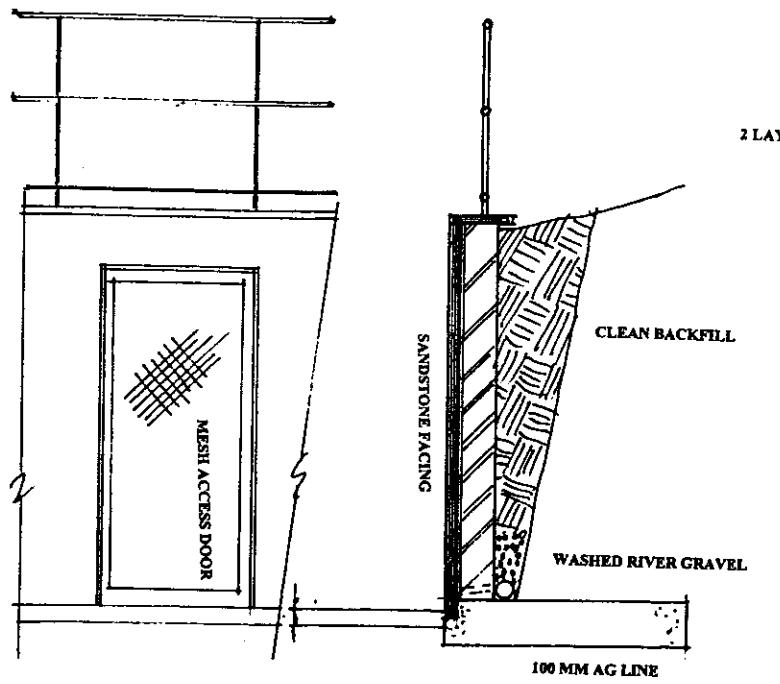
TELEPHONE 02 9484 0870 EMAIL tgofers@tg.com.au

JOB NUMBER	SCALE	REVISION	CC	DRAWING NUMBER	CC 019
61299	AS SHOWN	001			
DRAWN BY		tg		AMENDMENTS	
ARCHITECT		Tas Gofers			
DATE		27-Jul-02			



FRONT ENTRANCE SECTION

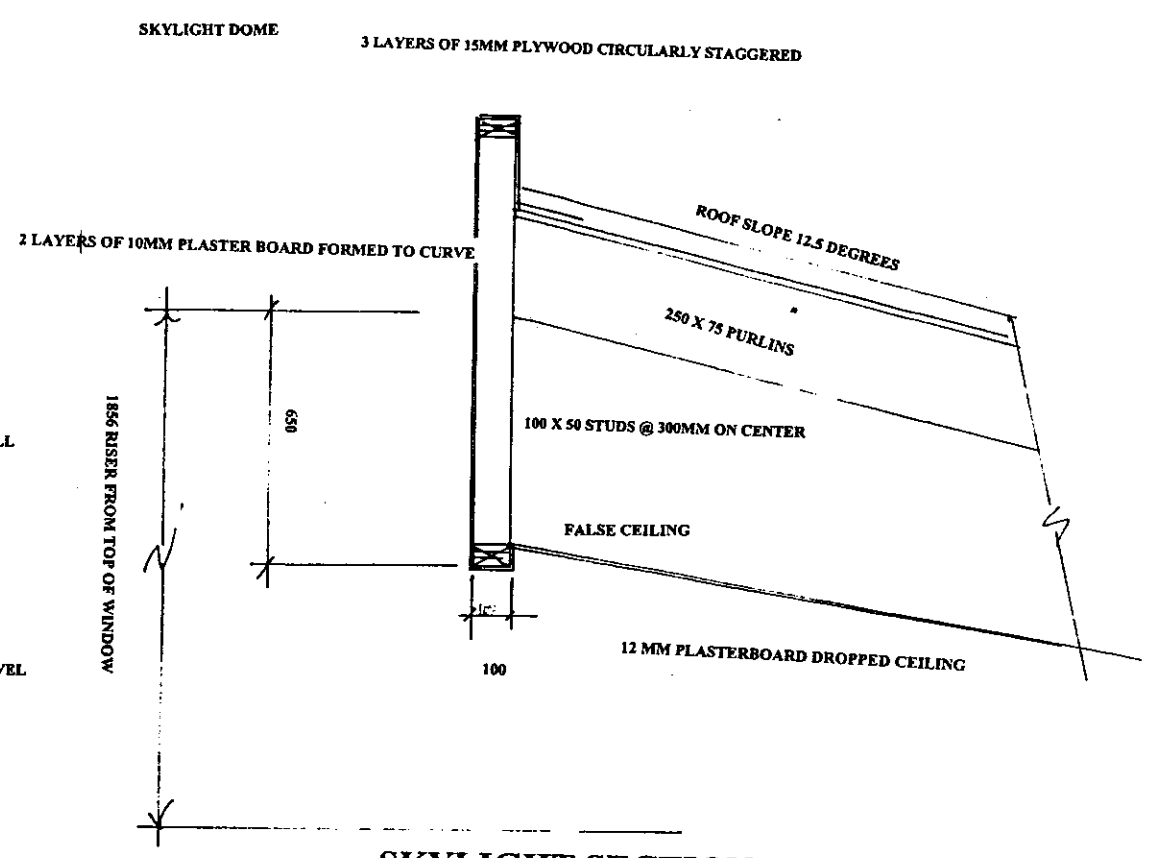
SCALE 1:40



DRIVEWAY RETAINING WALL

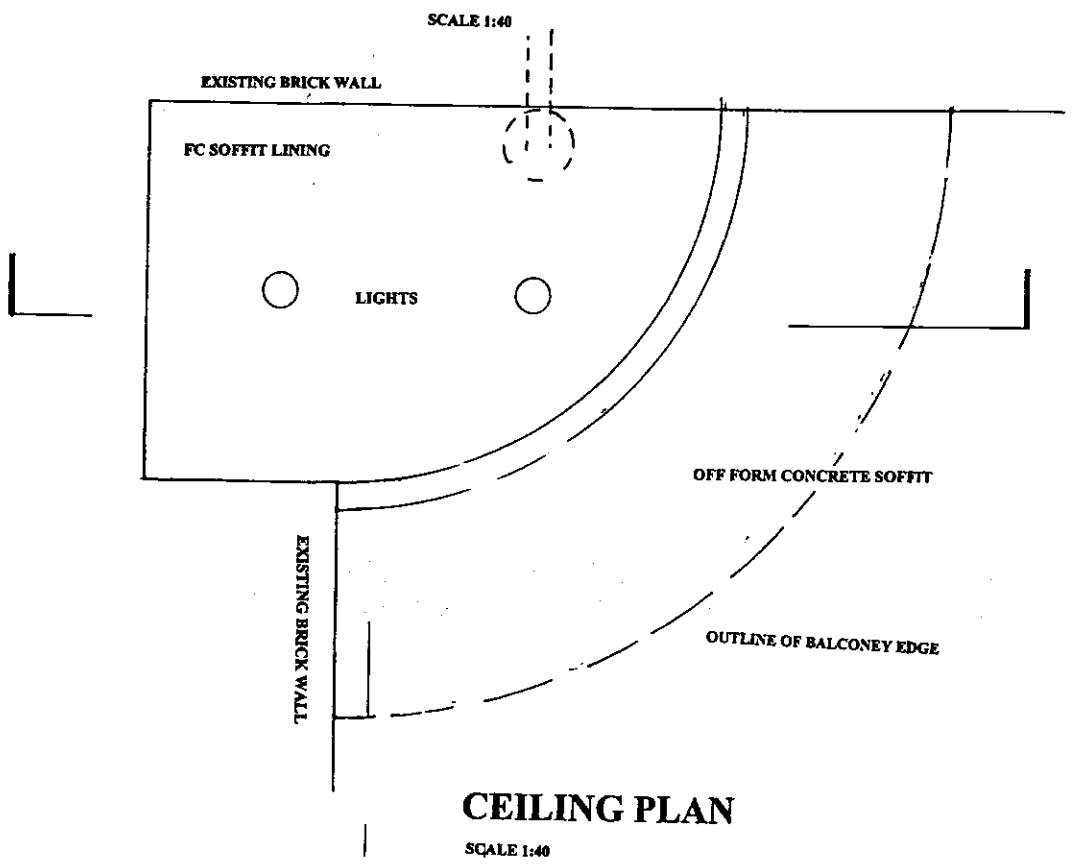
SCALE 1:40

ALL STRUCTURES TO ENGINEER DRAWINGS



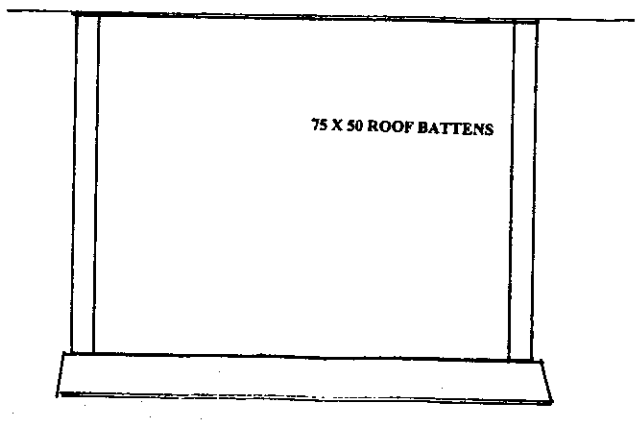
SKYLIGHT SECTION

SCALE 1:20



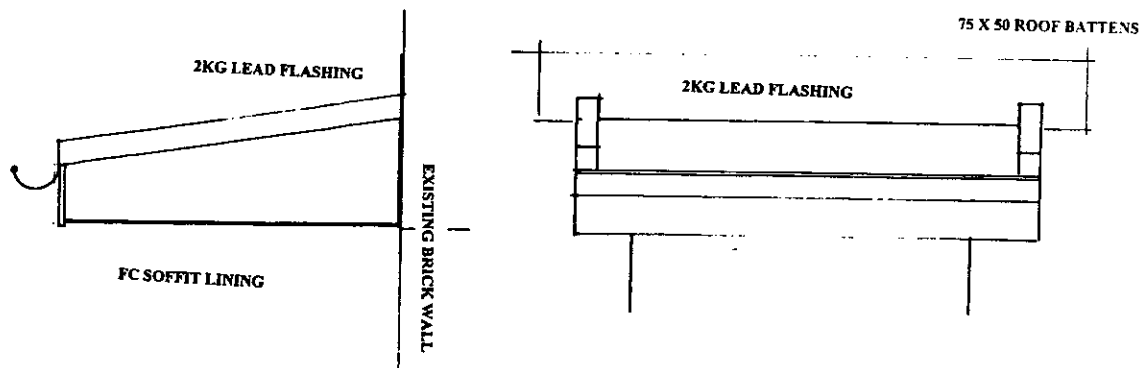
CEILING PLAN

SCALE 1:40



PLAN OF REAR DOOR COVER

SCALE 1:20



SIDE ELEVATION

SCALE 1:20

FRONT ELEVATION

SCALE 1:20

APPROVED
18 OCT 2002
ANTHONY PROTAS CONSULTING PTY. LTD.

CONSTRUCTION CERTIFICATE DOCUMENTS

PRIVATE RESIDENCE

27C ALEXANDRIA CRESCENT BAYVIEW

MR A & MRS D MARROCCO

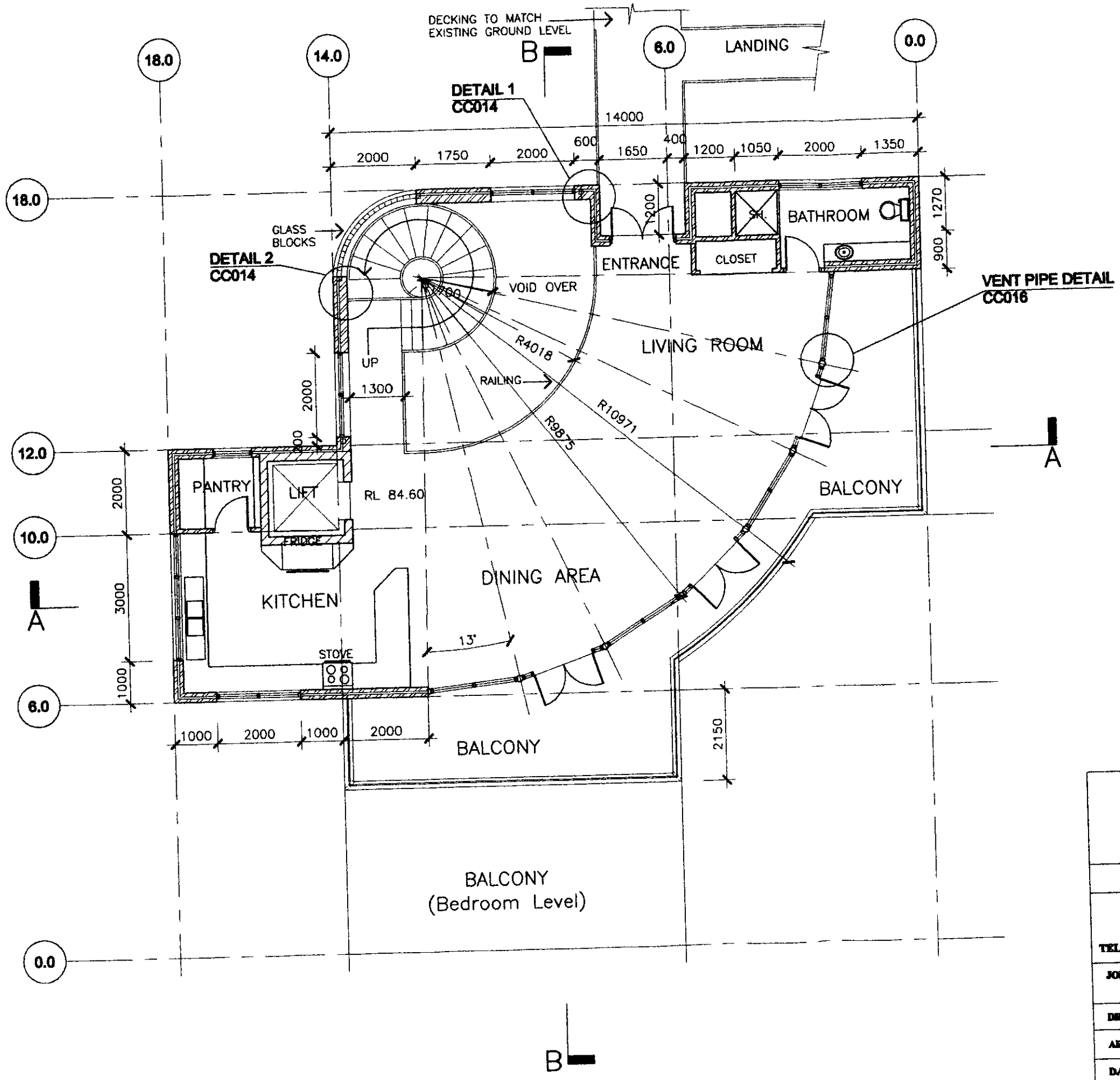
MISCELLANEOUS DETAILS

TA DESIGN AND CONSTRUCTION PTY LTD

191A COPELAND RD (EAST) BEECROFT 2119

TELEPHONE 02 9484 0070 EMAIL tgofers@tig.com.au

JOB NUMBER	SCALE	REVISION	CC	DRAWING NUMBER	CC 020
61299	AS SHOWN	001			
DRAWN BY		TG		AMENDMENTS	
ARCHITECT		Tao Gofers			
DATE		27-Jul-02			



APPROVED

1 8 OCT 2002

ANTHONY PROTAS CONSULTING PTY. LTD.

CONSTRUCTION CERTIFICATE DOCUMENTS

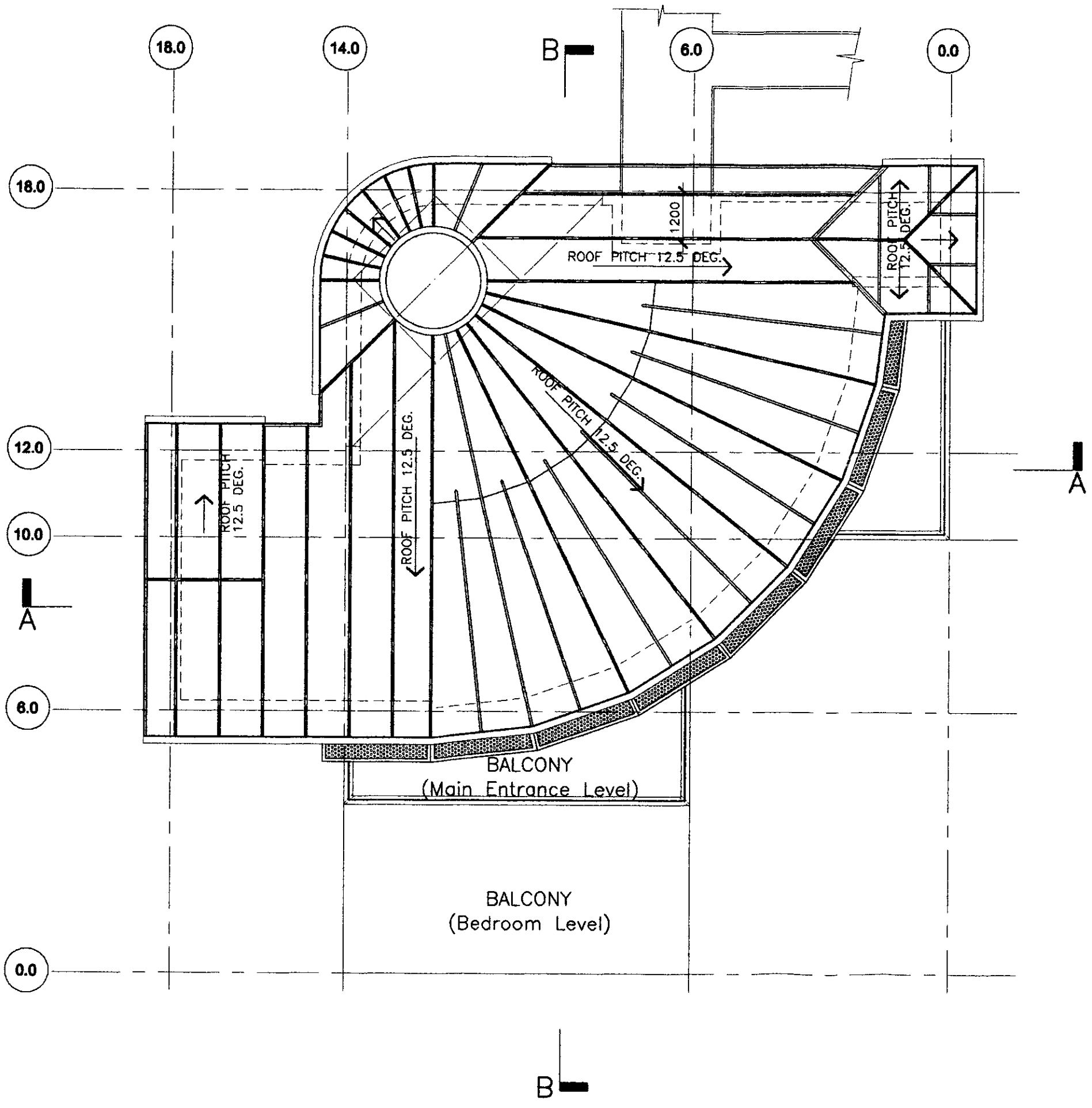
PRIVATE RESIDENCE
27C ALEXANDRA CRESCENT BAYVIEW NSW
MR A & MRS D MARROCCO

MAIN ENTRANCE LEVEL

TA DESIGN AND CONSTRUCTION PTY LTD
191A COPELAND ROAD (EAST) BEECROFT NSW 2119
TELEPHONE 02 9484 0870 **EMAIL tgofers@tdc.com.au**

JOB NUMBER	SCALE	REVISION	DRAWING No
61299	1:100	R-0	CC 005

DRAWN BY	Digital Design Duo (M. Leaper)	AMENDMENTS:
ARCHITECT	Tas Gofers	
DATE	July 2002	



APPROVED

18 OCT 2002

ANTHONY PROTAS CONSULTING PTY. LTD.

CONSTRUCTION CERTIFICATE DOCUMENTS

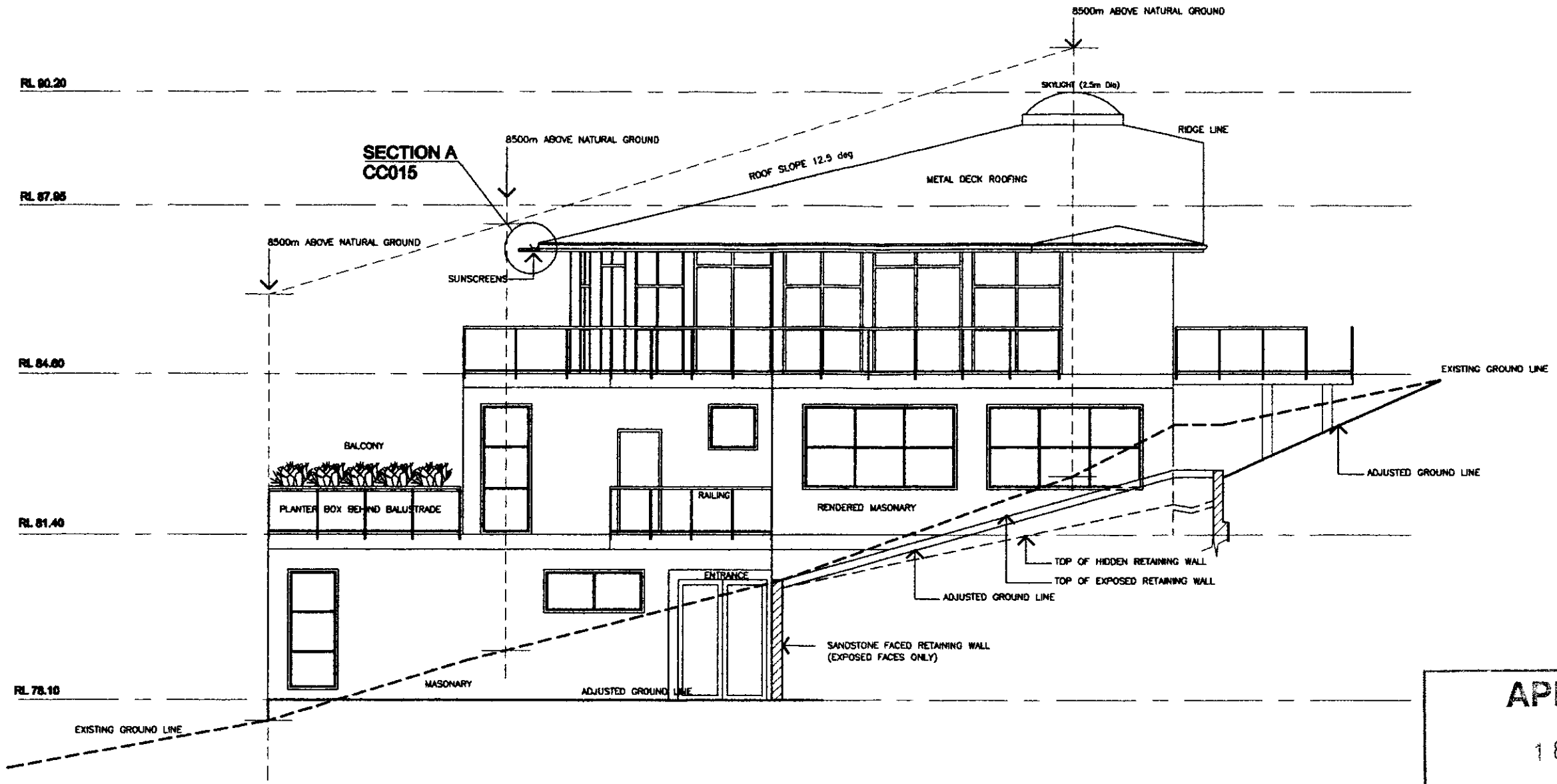
PRIVATE RESIDENCE
27C ALEXANDRA CRESCENT BAYVIEW NSW
MR A & MRS D MARROCCO

ROOF PLAN

TA DESIGN AND CONSTRUCTION PTY LTD
191A COPELAND ROAD (EAST) BEECROFT NSW 2119
TELEPHONE 02 9484 0870 EMAIL tgofers@tig.com.au

JOB NUMBER	SCALE	REVISION	DRAWING No
61299	1:100	R-0	CC 006

DRAWN BY	Digital Design Duo (M. Leaper)	AMENDMENTS:
ARCHITECT	Tas Gofers	
DATE	July 2002	



APPROVED

18 OCT 2002

ANTHONY PROTAS CONSULTING PTY. LTD.

CONSTRUCTION CERTIFICATE DOCUMENTS

PRIVATE RESIDENCE
27C ALEXANDRA CRESCENT BAYVIEW NSW
MR A & MRS D MARROCCO

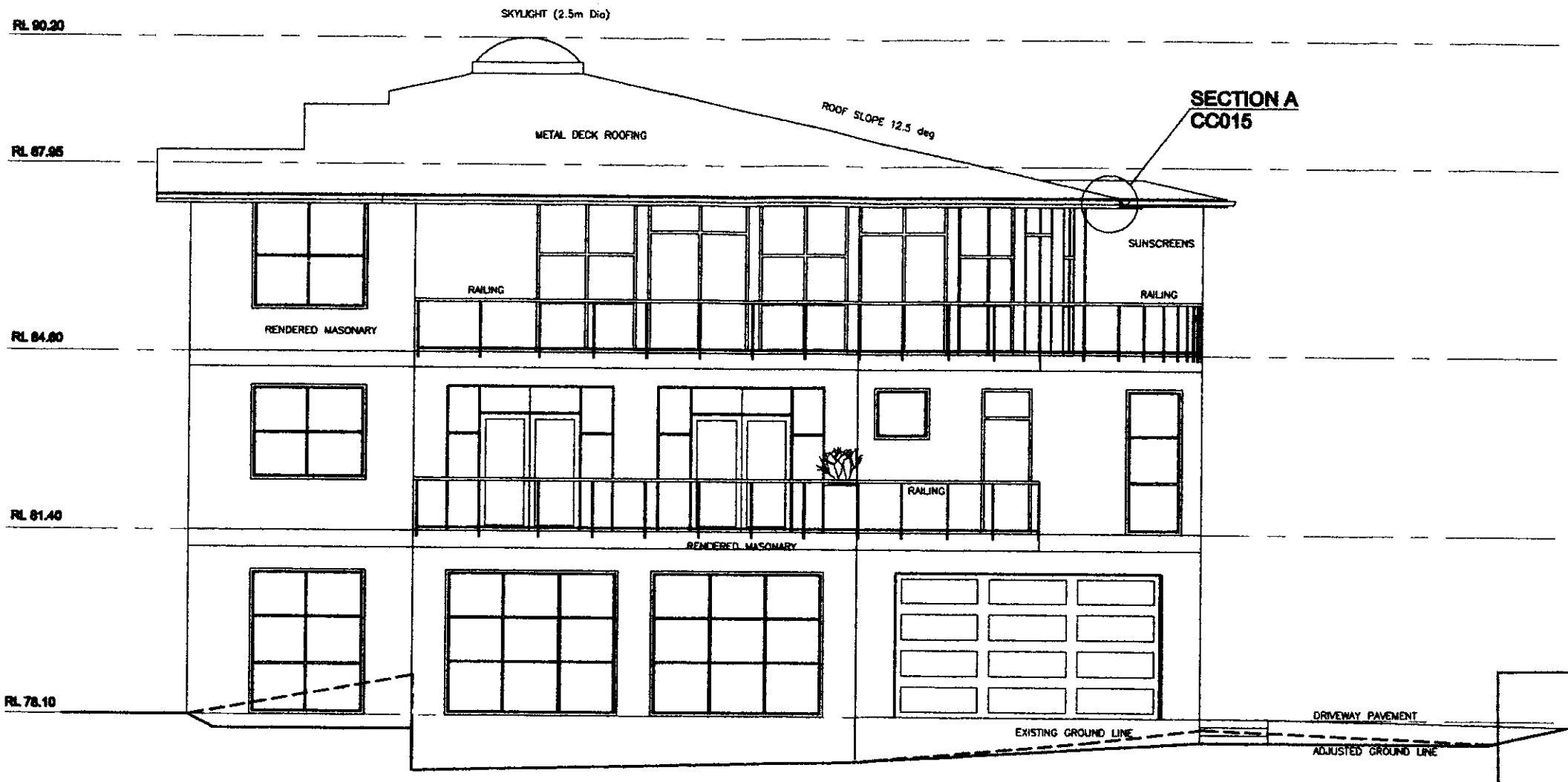
NORTH ELEVATION

TA DESIGN AND CONSTRUCTION PTY LTD
191A COPELAND ROAD (EAST) BEECROFT NSW 2119

TELEPHONE 02 9484 0870 **EMAIL tagafers@tig.com.au**

JOB NUMBER	SCALE	REVISION	DRAWING No
61299	1:100	R-0	CC 007

DRAWN BY	Digital Design Duo (J. Fredericks)	AMENDMENTS:
ARCHITECT	Tao Gafers	
DATE	July 2002	



APPROVED

1 8 OCT 2002

ANTHONY PROTAS CONSULTING PTY. LTD.

NOTE: RETAINING WALLS NOT SHOWN FOR CLARITY

CONSTRUCTION CERTIFICATE DOCUMENTS

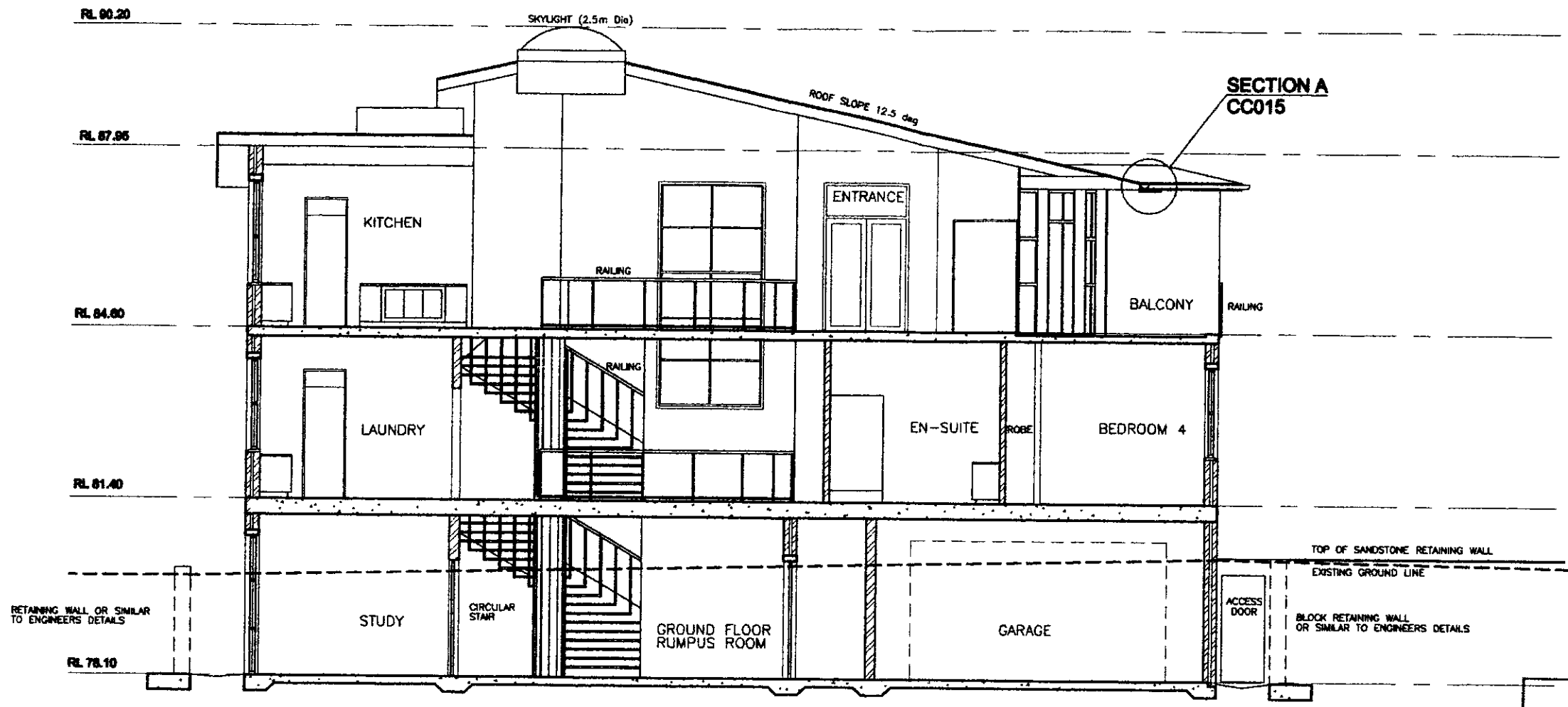
PRIVATE RESIDENCE
27C ALEXANDRA CRESCENT BAYVIEW NSW
MR A & MRS D MARROCCO

EAST ELEVATION

TA DESIGN AND CONSTRUCTION PTY LTD
191A COPELAND ROAD (EAST) BEECROFT NSW 2119
TELEPHONE 02 9484 0870 **EMAIL tgofers@tdg.com.au**

JOB NUMBER	SCALE	REVISION	DRAWING No
61299	1:100	R-0	CC 010

DRAWN BY	Digital Design Duo (J. Fredericks)	AMENDMENTS:
ARCHITECT	Tao Gofers	
DATE	July 2002	



APPROVED

18 OCT 2002

ANTHONY PROTAS CONSULTING PTY. LTD.

CONSTRUCTION CERTIFICATE DOCUMENTS

PRIVATE RESIDENCE
27C ALEXANDRA CRESCENT BAYVIEW NSW
MR A & MRS D MARROCCO

SECTION A-A

TA DESIGN AND CONSTRUCTION PTY LTD
191A COPELAND ROAD (EAST) BEECROFT NSW 2119

TELEPHONE 02 9484 0870 **EMAIL tgafers@tig.com.au**

JOB NUMBER	SCALE	REVISION	DRAWING No
61299	1:100	R-0	CC 011
DRAWN BY	Digital Design Duo (J. Frederiks)	AMENDMENTS:	
ARCHITECT	Tao Gafers		
DATE	July 2002		

GENERAL

G1 U.N.O. DENOTES UNLESS NOTED OTHERWISE.
N.S.O.P. DENOTES NOT SHOWN ON PLAN.
N.S.O.E. DENOTES NOT SHOWN ON ELEVATION
VBW DENOTES VEE BUTT WELD
NTS DENOTES NOT TO SCALE
FGL DENOTES FINISHED GROUND LEVEL

G2 READ THESE DRAWINGS IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. U.N.O. OBTAIN ALL DIMENSIONS FROM THE ARCHITECTURAL DRAWINGS. REFER ANY DISCREPANCIES IN THESE DOCUMENTS TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

G3 CHECK AND BE RESPONSIBLE FOR THE CORRECTNESS OF ALL DIMENSIONS AND REPORT ANY DISCREPANCY IMMEDIATELY TO THE PRINCIPAL. DO NOT SCALE DIMENSIONS FROM THE DRAWINGS.

G4 ENSURE STABILITY OF THE WORKS DURING CONSTRUCTION, INCLUDING EXCAVATIONS IN THE VICINITY.
TEMPORARILY BRACE ALL STRUCTURAL STEELWORK UNTIL ALL WALLS AND AND ROOF MEMBERS HAVE BEEN ERECTED. ENSURE NO PART OF THE STRUCTURE IS OVERSTRESSED.

G5 ENSURE ALL WORKMANSHIP AND MATERIALS ARE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT SAA CODES WITH AMENDMENTS AND THE BY-LAWS AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITY AND THE SPECIFICATION.

FOUNDATIONS

F1 FOUNDATIONS HAVE BEEN DESIGNED FOR THE FOLLOWING ALLOWABLE BEARING PRESSURE. OBTAIN APPROVAL FROM A QUALIFIED GEOTECHNICAL [redacted]
500 kPa END BEARING ON HIGHLY WEATHERED BEDROCK.
SUPPLY TO THE PRINCIPAL A CERTIFICATE ISSUED BY THE GEOTECHNICAL ENGINEER.

CONCRETE

C1 ENSURE ALL WORKMANSHIP AND MATERIALS ARE IN ACCORDANCE WITH THE CURRENT SAA CODE AS3600, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.

C2 CONCRETE QUALITY

ELEMENT:	ALL U.N.O.
GRADE (MPa):	40
MAX. SLUMP (MM):	80
MAX. AGG. (MM):	20
CEMENT TYPE:	GP
ADMIXTURE:	NONE

C3 U.N.O PROVIDE CLEAR CONCRETE COVER TO REINFORCEMENT, AS PER AS3600 OR AS BELOW, WHICHEVER IS THE MORE SEVERE REQUIREMENT:

(i) EXTERNAL MEMBERS (CLASS B1)	40mm
(ii) INTERNAL MEMBERS (CLASS A2)	25mm
(iii) MEMBERS CAST AGAINST GROUND	65mm
(iv) MEMBERS CAST AGAINST GROUND WITH MEMBRANE	30mm

C4 MECHANICALLY VIBRATE ALL CONCRETE. DO NOT USE THE VIBRATOR TO SPREAD CONCRETE.

C5 REINFORCEMENT IS SHOWN DIAGRAMMATICALLY AND IS NOT NECESSARILY SHOWN IN TRUE PROJECTION.

C6 DO NOT WELD REINFORCEMENT UNLESS SHOWN ON STRUCTURAL DRAWINGS.

C7 U.N.O. PROVIDE 350mm MINIMUM END LAPS TO FABRIC AND LAP BARS AS NOTED BELOW. SECURELY TIE REINFORCEMENT AT ALL LAPS AND INTERSECTIONS WITH 1.25mm BLACK ANNEALED WIRE.

BAR DIA.	LAP LENGTH	BAR DIA.	LAP LENGTH
Y12	400	Y24	1050
Y16	600	Y28	1300
Y20	800	Y32	1600

C8 SUPPORT REINFORCEMENT ON APPROVED PLASTIC OR PLASTIC TIPPED WIRE STOOLS ON FLAT PLATES AT NOT MORE THAN 1 METRE CENTRES BOTHWAYS IN SLABS.

C9 ╪ DENOTES MAIN WIRES OF RECTANGULAR FABRIC TO AS1304 IS IN THE HORIZONTAL DIRECTION

╬ DENOTES SQUARE FABRIC TO AS1304

F DENOTES HARD DRAWN WIRE REINFORCING FABRIC TO AS1304.
R DENOTES GRADE 250R HOT ROLLED ROUND BARS TO AS1302.
Y DENOTES 'TEMPCORE' HIGH YIELD STRENGTH DEFORMED BAR, GRADE 400Y TO AS1302.

C10 SUPPLY FABRIC IN FLAT SHEETS. DO NOT USE ROLLS.

C11 CURE CONCRETE FOR A MINIMUM OF 7 DAYS.

C12 LOCATE ALL HOLDING-DOWN BOLTS CORRECTLY BEFORE POURING CONCRETE.

C13 NOTIFY THE PRINCIPAL 24 HOURS BEFORE PLACING OF REINFORCEMENT IS COMPLETED. ENGAGE A QUALIFIED STRUCTURAL ENGINEER TO INSPECT THE REINFORCEMENT. DO NOT ORDER CONCRETE UNTIL REINFORCEMENT IS APPROVED BY THE ENGINEER AND THE PRINCIPAL INFORMED. SUPPLY TO THE PRINCIPAL A CERTIFICATE ISSUED BY THE ENGINEER.

C14 MINIMUM STRIPPING TIMES :-

Member Type	Member	• Effective span (m)	Minimum stripping time (days) for average air temperature during the period prior to stripping			
			21°C & ABOVE	10°-20°C	5°-10°C	< 5°C
Vertical and unloaded	Beam sides	-	2	2	5	7
Vertical and loaded	Walls, columns or load bearing structure	-	5	6	7	9
Horizontal	Slabs	< 3 m	10	10	14	21
		3 - 6	10	14	21	28
		> 6	14	21	28	28
Horizontal	Beams	< 3 m	10	10	14	21
		3 - 6	10	14	21	28
		> 6	14	21	28	28

• Effective span is the maximum distance between supports.
Note :- This table is based on superimposed construction loads not exceeding 1.0 kPa
If load is over 1.0 kPa and less than design load, add 7days to minimum times to a maximum of 28 days. Do not load slab more than design load.

MASONRY

B1 ENSURE ALL WORKMANSHIP AND MATERIALS ARE IN ACCORDANCE WITH THE CURRENT SAA CODE AS3700 EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.

B2 MASONRY QUALITY:

ELEMENT:	WALLS	WALLS
MATERIAL:	CLAY	CONCRETE
STRENGTH (C) OR CLASS	20 MPa	15 MPa
MORTAR TYPE	1:1:6	1:1:6
GROUT	—	20 MPa
CHARACTERISTIC EXPANSION 'e_m'	0.8mm/m MAX.	

B3 FOR UNREINFORCED WALLS SUPPORTING A CONCRETE SLAB OR BEAM PLACE A LAYER OF MORTAR ON TOP AND TROWEL SMOOTH, AND A SLIP JOINT OF 2 LAYERS OF SUPER ALCORE.

B4 ENSURE WALL TIES COMPLY WITH THE RELEVANT CLAUSES OF AS3700 AND HAVE CORROSION RESISTANCE RATING R3 AS IN TABLE 5.1 AND APPENDIX F OF AS3700.

B5 U.N.O. PROVIDE HEAD RESTRAINT TIES EQUAL TO 'M.E.T.4 - 1' AT 800 CRS., FOR NON-LOAD BEARING WALLS.

B6 U.N.O PROVIDE FLEXIBLE TIES EQUAL TO 'M.E.T.3-1' AT 400 CRS. BETWEEN STEEL COLUMNS AND MASONRY WALLS.

STRUCTURAL STEELWORK

SS1 ENSURE ALL WORKMANSHIP AND MATERIALS ARE IN ACCORDANCE WITH CURRENT SAA CODES AS4100 AND AS1554 EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.

SS2 U.N.O. ENSURE ALL STEEL IS IN ACCORDANCE WITH :

AS1163	STRUCTURAL STEEL HOLLOW SECTIONS
AS3678	STRUCTURAL STEEL HOT-ROLLED PLATES FLOOR PLATES AND SLABS
AS3679	STRUCTURAL STEEL
AS3679.1	HOT-ROLLED BARS AND SECTIONS
AS3679.2	WELDED SECTIONS
AS1538	COLD FORMED STEEL STRUCTURES CODE

SS3 U.N.O. USE 6mm CONTINUOUS FILLET WELD, ALL BOLTS 20mm DIAMETER GRADE 8.8/S.

SS4 WHERE BUTT WELDS ARE INDICATED IN THE DRAWINGS USE COMPLETE PENETRATION BUTT WELDS AS DEFINED IN AS1554 AND GRIND SMOOTH.

SS5 U.N.O. USE WELD CATEGORY GP TO AS1554.1.

SS6 ENSURE HIGH STRENGTH BOLTS, NUTS AND WASHERS COMPLY WITH AS1252, ARE INSTALLED IN ACCORDANCE WITH AS4100 AND TIGHTENED TO THE CORRECT TENSION USING APPROVED LOAD INDICATING WASHERS.

SS7 SUPPLY BOLTS, NUTS & WASHERS, ETC., GALVANISED IN ACCORDANCE WITH AS1214 OR AS4680.

SS8 U.N.O. PROVIDE PLATES AND CLEATS 10mm THICK.

SS9 PROVIDE ALL CLEATS AND DRILL ALL HOLES NECESSARY IN STRUCTURAL STEEL TO STEEL AND TIMBER TO STEEL WHETHER OR NOT DETAILED IN THE DRAWINGS.

SS10 PROVIDE STEELWORK NOT CONCRETE ENCASED WITH THE SURFACE TREATMENT IN ACCORDANCE WITH THE FOLLOWING SPECIFICATION.

element	surface cleaning	protection treatment
All	In accordance with AS1650	Hot-dip [redacted] (after [redacted] and without distortion) and finishing coat to arch's spec. Provide vent holes as required.
Repair	To su' original	

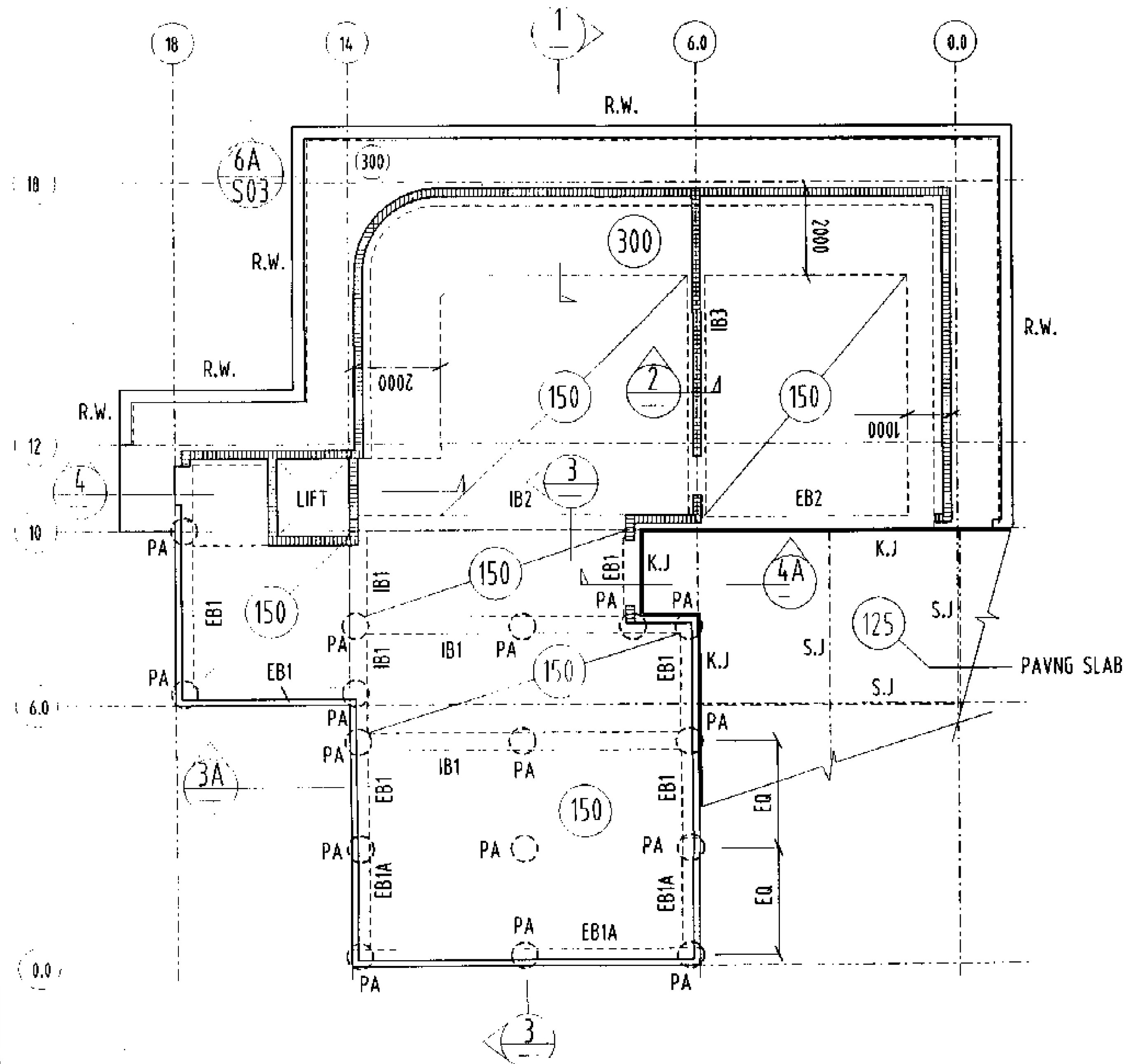
ANTHONY PROTAS CONSULTING PTY LTD
DETAILS NOTED

GDK
KEIGHRAN GEOTECHNICS
Greg D. Keighran Pty Ltd (Inc NSW)
P.O.Box 2325, North Parramatta NSW 1750
Ph: 02 9890 7873 Fax: 02 9890 7874
Email: gregk@gdkgeo.com
Drawings have been reviewed and comply with the requirements detailed in the Geotechnical Report No. 20153/240/2
G.D. Keighran BE (Civil)
Principal Engineer
16/8/2002
Date

TITLE: GENERAL NOTES Reference: 2020 Date: 8/8/02	AMENDMENTS:	Designed by: Nakhoul Harb (B.E. Hons; MIEAust CPEng) Structural Engineer 2 Mons Street Canterbury NSW 2193	Signature: N. Harb Date: 8/8/02	STRUCTURAL DRAWINGS FOR PROPOSED PRIVATE RESDENCE AT 27C ALEXANDRA CRESCENT BAYVIIEW NSW FOR MR A & MRS D MARROCCO

Drg. Number S01
Sheet 1 of 5

SCANNED
- 8 NOV 2002
PITTWATER COUNCIL



GROUND FLOOR SLAB
1: 100

U.N.O 150 THICK SLAB WITH F82 **TOP & BOTTOM N.S.O.P**

(150) DENOTES 150 THICK SLAB

PA- DENOTES 600 DIA PIERS

U.N.O ALL WALLS SHALL BE 190 CORE FILLED BLOCKWORK.

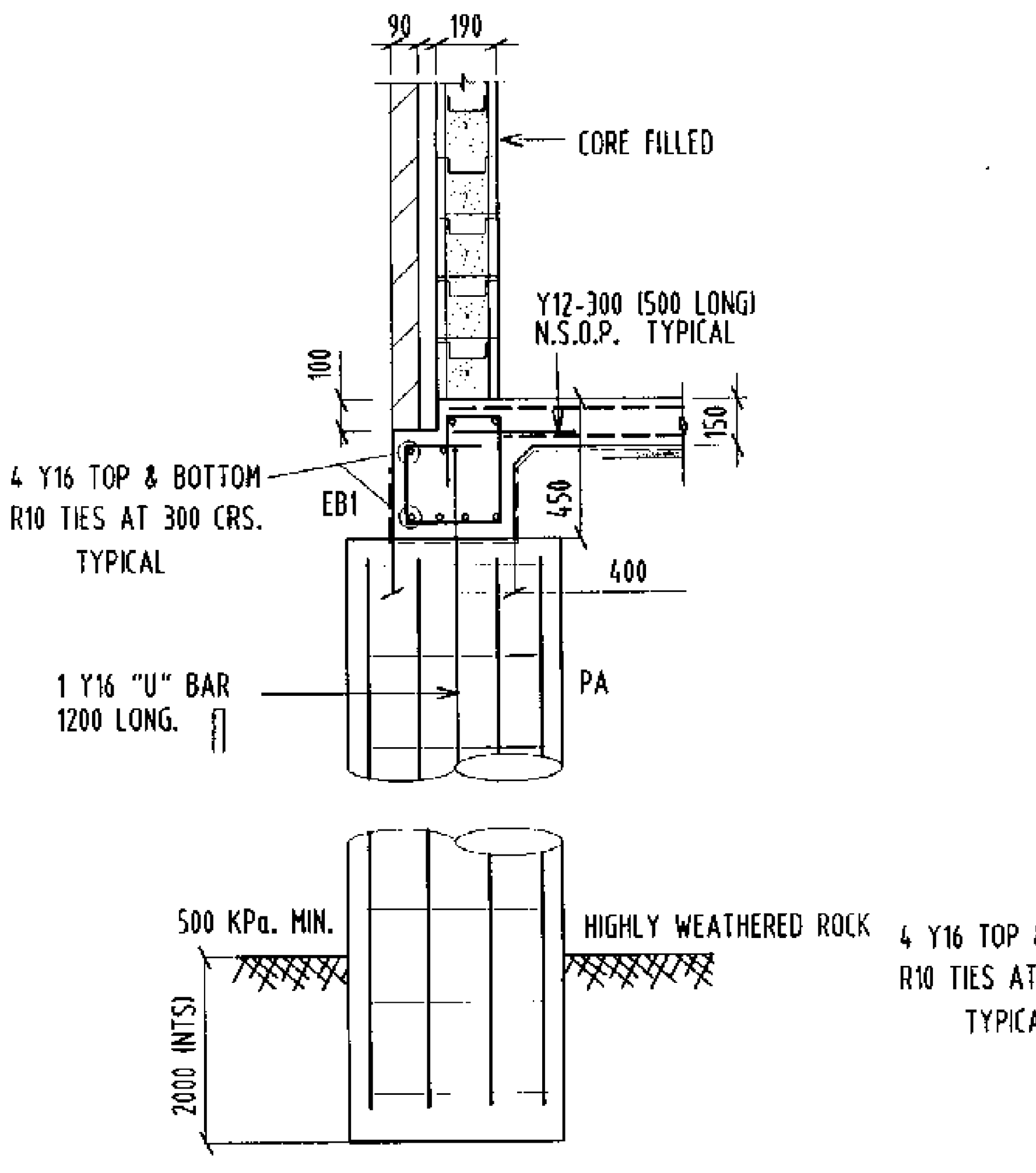
WALLS SHOWN THUS ▭ ARE 190 IN-SITU REINFORCED CONCRETE WALLS.

R.W- DENOTES 275 THICK REINFORCED RETAINING WALL

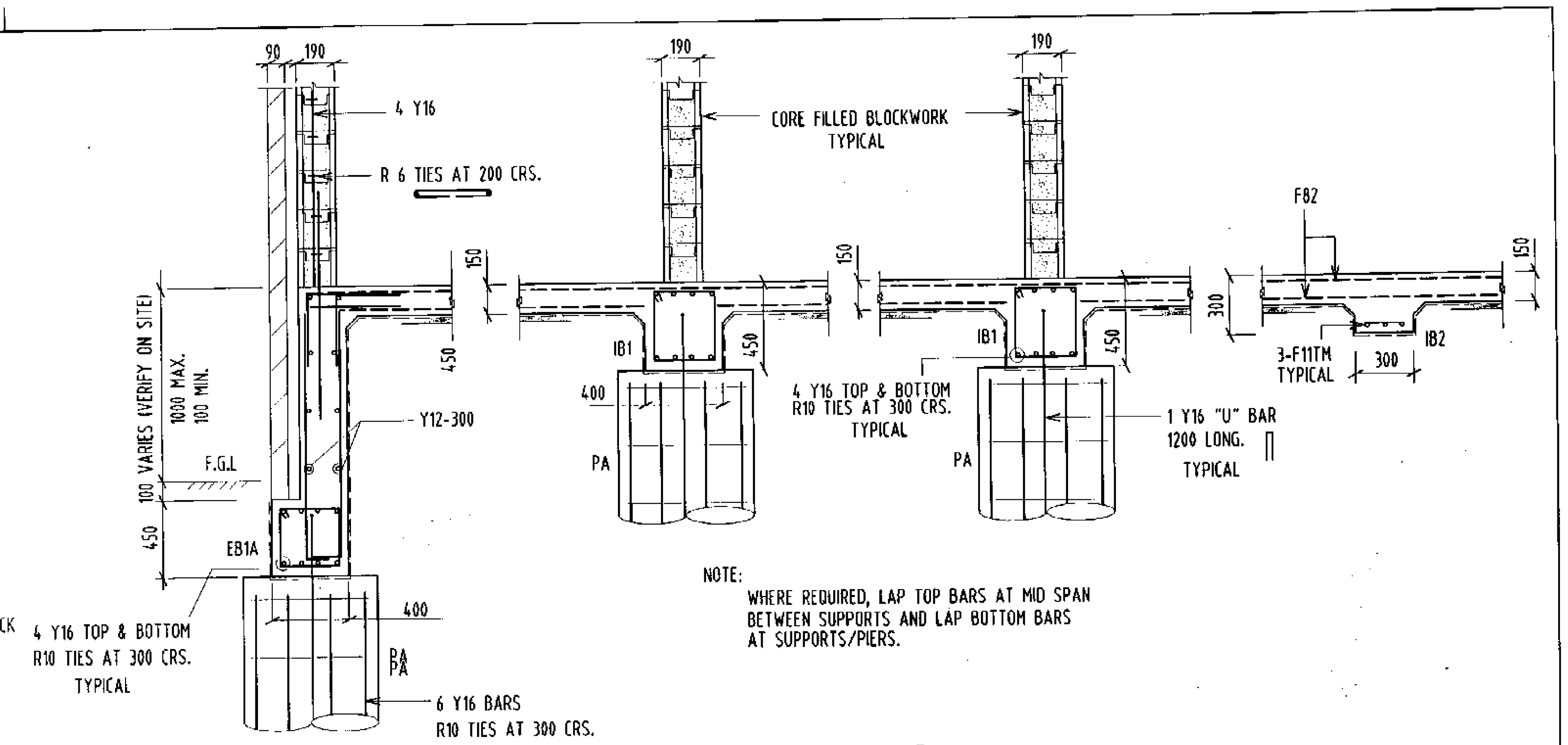
S.J- DENOTES SAW CUT JOINT

BEAM SCHEDULE U.N.O.

MARK	SIZE
IB1	450x400
IB2	300x300
IB3	300x450
EB1	450x400
EB2	300x350
EB1A	450x400

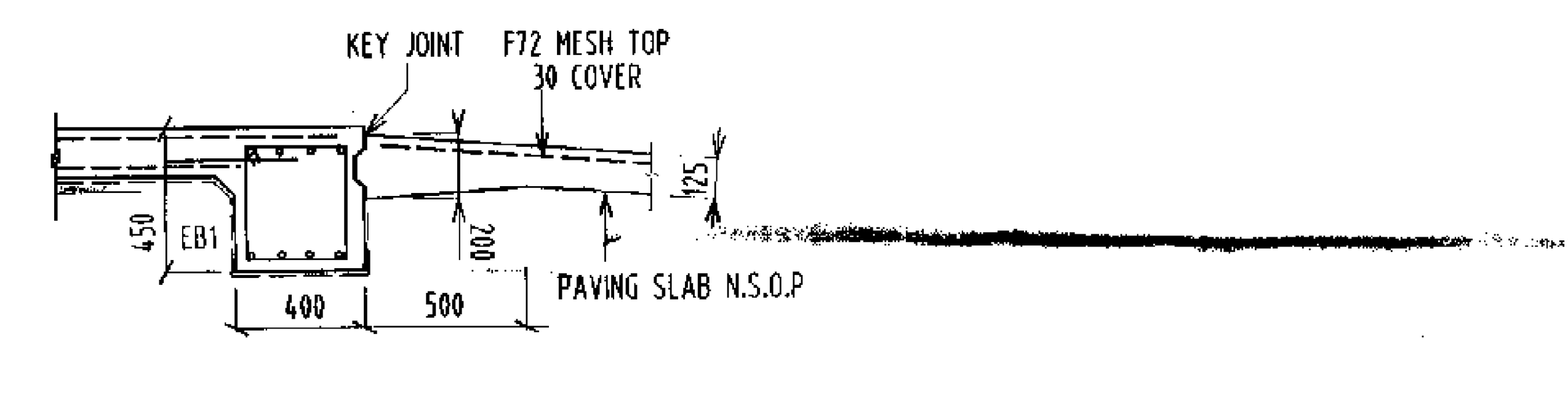


SECTION 3A
SCALE 1:20



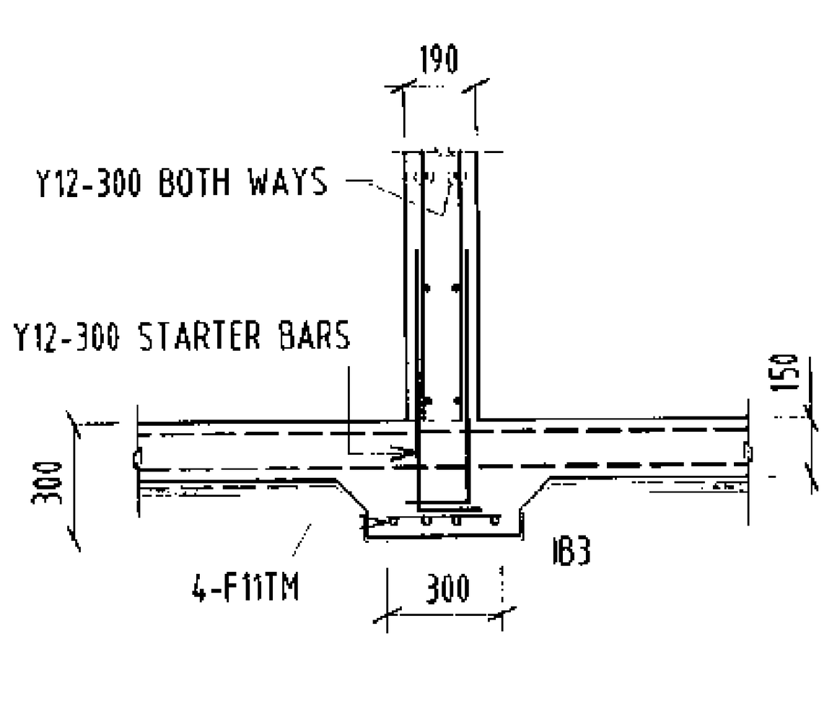
NOTE:
WHERE REQUIRED, LAP TOP BARS AT MID SPAN BETWEEN SUPPORTS AND LAP BOTTOM BARS AT SUPPORTS/PIERS.

SECTION 3
SCALE 1:20

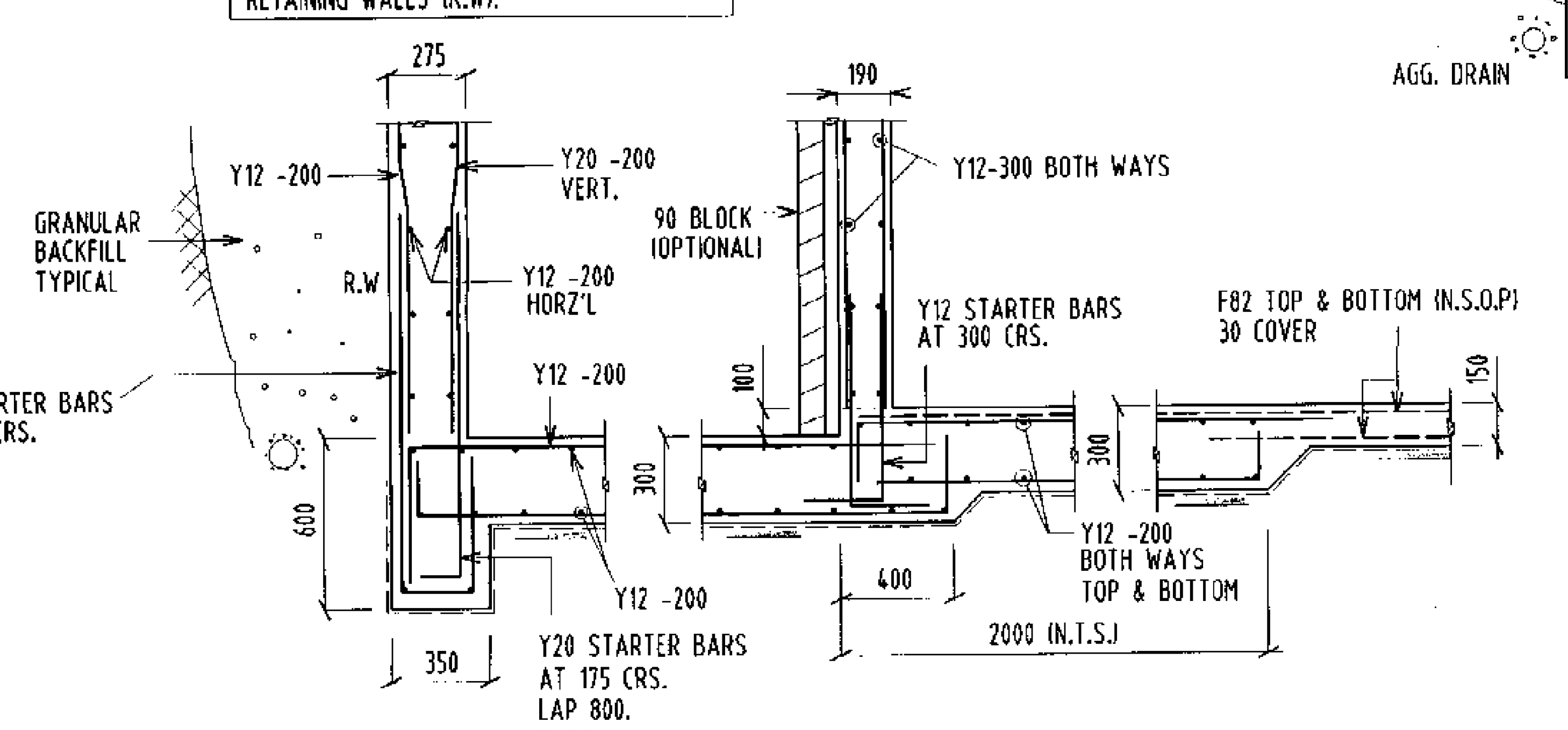


SECTION 4A
SCALE 1:20

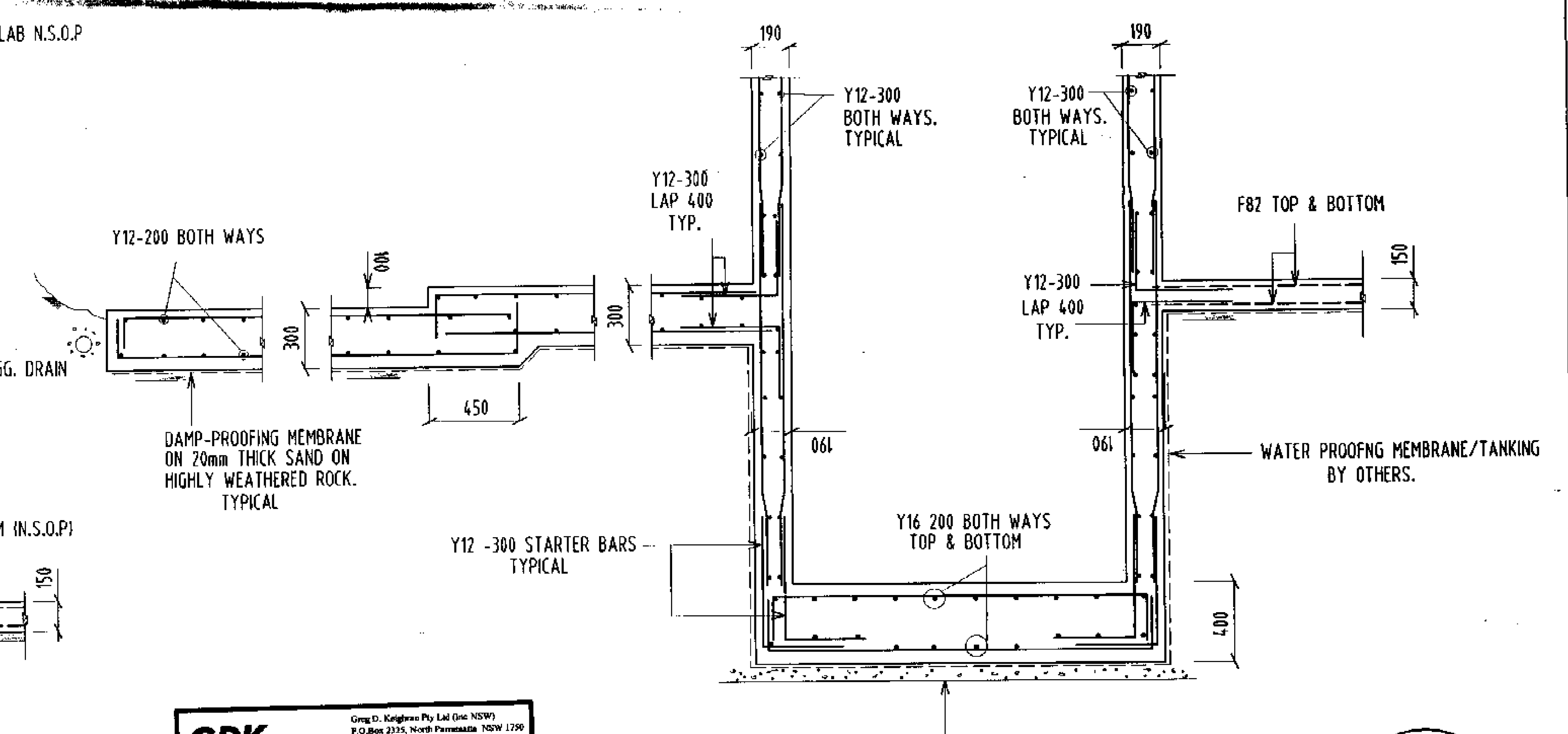
NOTE:
U.N.O TYPICAL REINFORCEMENT DETAILS FOR RETAINING WALLS (R.W).



SECTION 2
SCALE 1:20



SECTION 1
SCALE 1:20



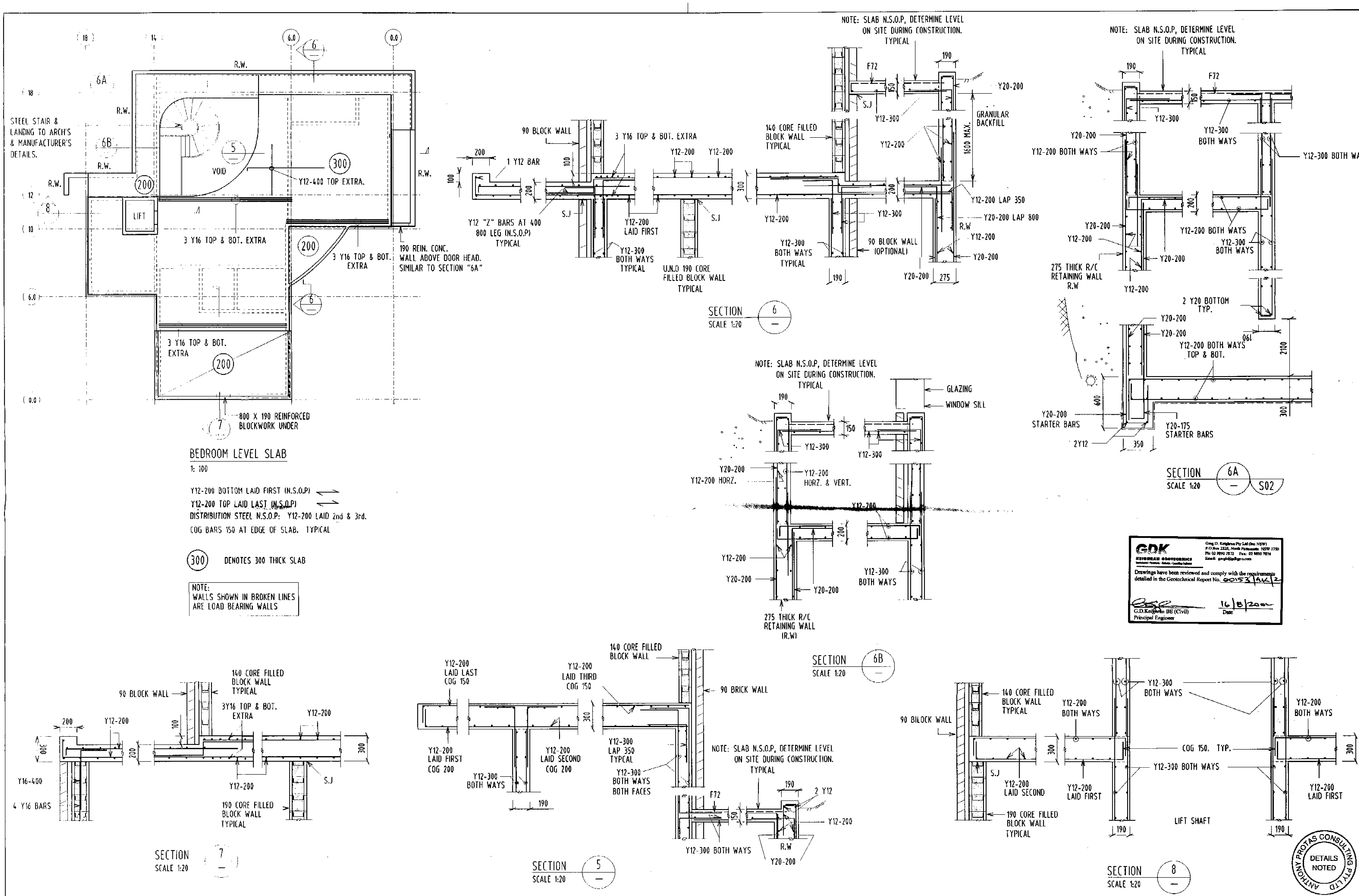
GDK KEIGHRAN GEOTECHNICS
Drawings have been reviewed and comply with the requirements detailed in the Geotechnical Report No. 90153KK/2
G.D.Keighran BE (Civil) Principal Engineer
Date 16/8/2002

ANTHONY PROTAS CONSULTING PTY LTD
DETAILS NOTED

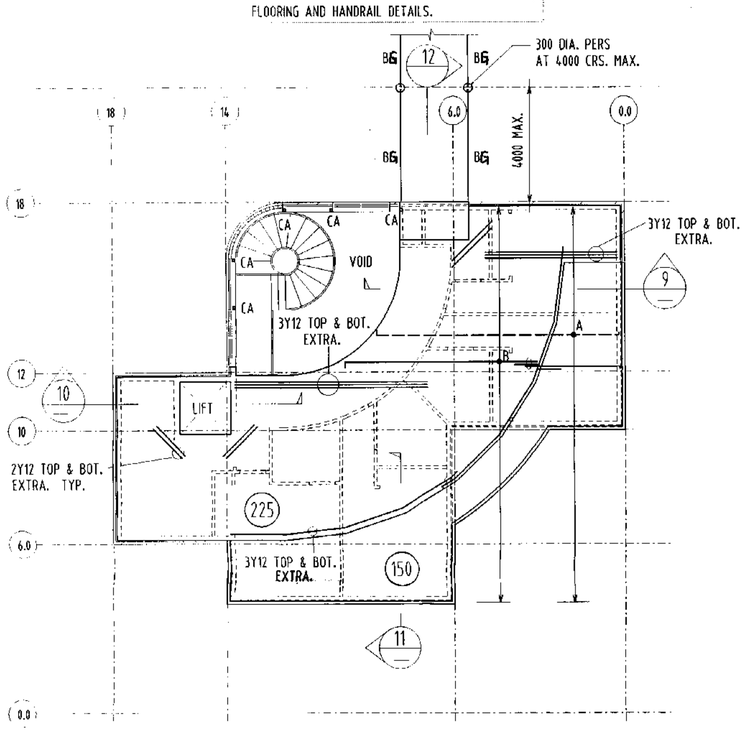
SECTION 4
SCALE 1:20

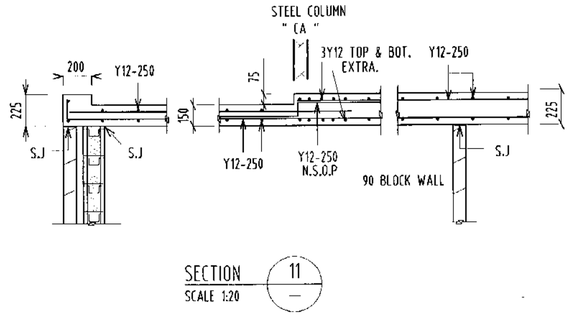
TITLE: GROUND FLOOR PLAN AND SECTIONS	AMENDMENTS:	Designed by: Nakhoul Harb (B.E. Hons; MIEAust CPEng) Structural Engineer, 2 Mons Street, Canterbury NSW 2193	Signature: Date: 8/8/02	STRUCTURAL DRAWINGS FOR PROPOSED PRIVATE RESDENCE AT 27C ALEXANDRA CRESCENT BAYVIIEW NSW FOR MR A & MRS D MARROCCO	Drg. Number S02 Sheet 2 OF 5
Reference: 2020 Date: 8/8/02					

FIGURED DIMENSIONS TO BE USED IN PREFERENCE TO SCALING. ALL DIMENSIONS TO BE CHECKED ON SITE

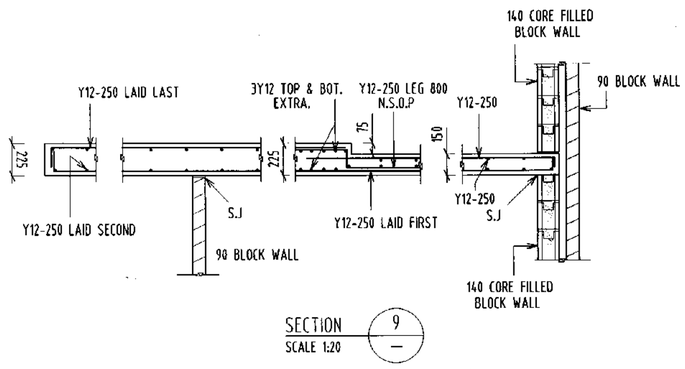

BEDROOM LEVEL SLAB
1: 100
Y12-200 BOTTOM LAID FIRST (N.S.O.P)
Y12-200 TOP LAID LAST (N.S.O.P)
DISTRIBUTION STEEL N.S.O.P: Y12-200 LAID 2nd & 3rd.
COG BARS 150 AT EDGE OF SLAB. TYPICAL
300 DENOTES 300 THICK SLAB
NOTE:
WALLS SHOWN IN BROKEN LINES ARE LOAD BEARING WALLS
STEEL STAIR & LANDING TO ARCH'S & MANUFACTURER'S DETAILS.
VOID
Y12-400 TOP EXTRA.
LIFT
3 Y16 TOP & BOT. EXTRA
190 REIN. CONC. WALL ABOVE DOOR HEAD. SIMILAR TO SECTION "6A"
800 X 190 REINFORCED BLOCKWORK UNDER
NOTE: SLAB N.S.O.P, DETERMINE LEVEL ON SITE DURING CONSTRUCTION. TYPICAL
SECTION 6
SCALE 1:20
SECTION 6A
SCALE 1:20
S02
SECTION 6B
SCALE 1:20
SECTION 7
SCALE 1:20
SECTION 5
SCALE 1:20
SECTION 8
SCALE 1:20
LIFT SHAFT
275 THICK R/C RETAINING WALL
GRANULAR BACKFILL
GLAZING
WINDOW SILL
90 BLOCK WALL
140 CORE FILLED BLOCK WALL TYPICAL
190 CORE FILLED BLOCK WALL TYPICAL
90 BRICK WALL
GDK
Drawings have been reviewed and comply with the requirements detailed in the Geotechnical Report No.
Principal Engineer
ANTHONY PROTAS CONSULTING PTY LTD
DETAILS NOTED

TITLE: BEDROOM LEVEL SLAB AND SECTIONS	AMENDMENTS:	Designed by: Nakhoul Harb (B.E. Hons; MIEAust CPEng) Structural Engineer 2 Mons Street Canterbury NSW 2193	Signature: Date: 8/8/02	STRUCTURAL DRAWINGS FOR PROPOSED PRIVATE RESDENCE AT 27C ALEXANDRA CRESCENT BAYVIIEW NSW FOR MR A & MRS D MARROCCO	Drg. Number S03 Sheet 3 OF 5
Reference: 2020 Date: 8/8/02					

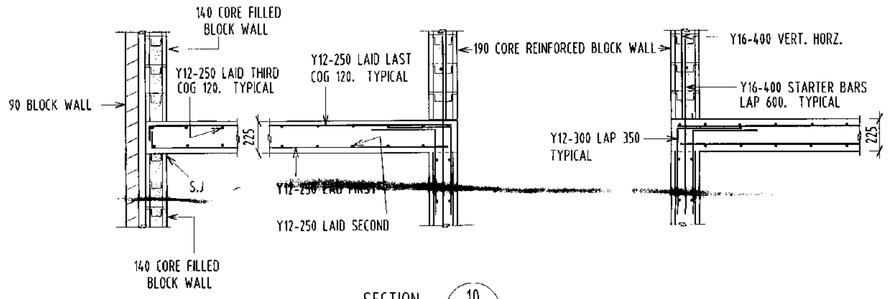




SECTION 11
SCALE 1:20



SECTION 9
SCALE 1:20



SECTION 10
SCALE 1:20

MAIN ENTRANCE LEVEL PLAN

(225) DENOTES 225 THICK SLAB U.N.O.

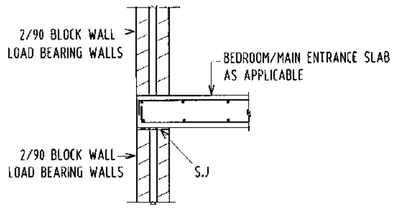
NOTE:
WALLS SHOWN IN BROKEN LINES ARE LOAD BEARING WALLS

A Y12-250 BOTTOM LAID FIRST

B Y12-250 TOP LAID LAST

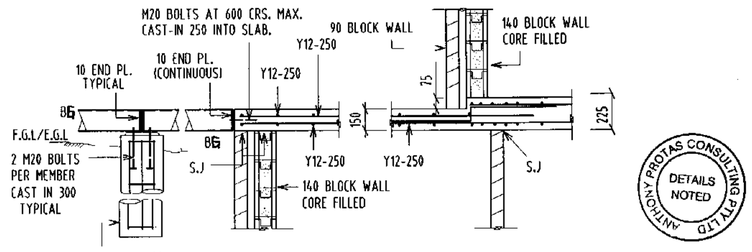
DISTRIBUTION BARS Y12-250 LAID SECOND & THIRD N.S.O.P

COG ENDS. TYPICAL



NOTE:
190 & 140 CORE FILLED LOAD BEARING WALLS SUPPORTING BEDROOM SLAB & MAIN ENTRANCE SLAB (ALONG THE PEREMITER WALLS AS APPLICABLE) MAY BE REPLACED WITH 2/90 SOLID BLOCK WALLS. (OBTAIN WRITTEN APPROVAL FROM THE ENGINEER PRIOR TO ANY MODIFICATIONS)

ALTERNATIVE DETAIL AT EDGE OF BEDROOM SLAB AND MAIN ENTRANCE SLAB WHERE APPLCABLE.



NOTE: PIER TO EXTEND TO A MINIMUM 500 EMBEDMENT INTO HIGHLY WEATHERED ROCK. TYPICAL

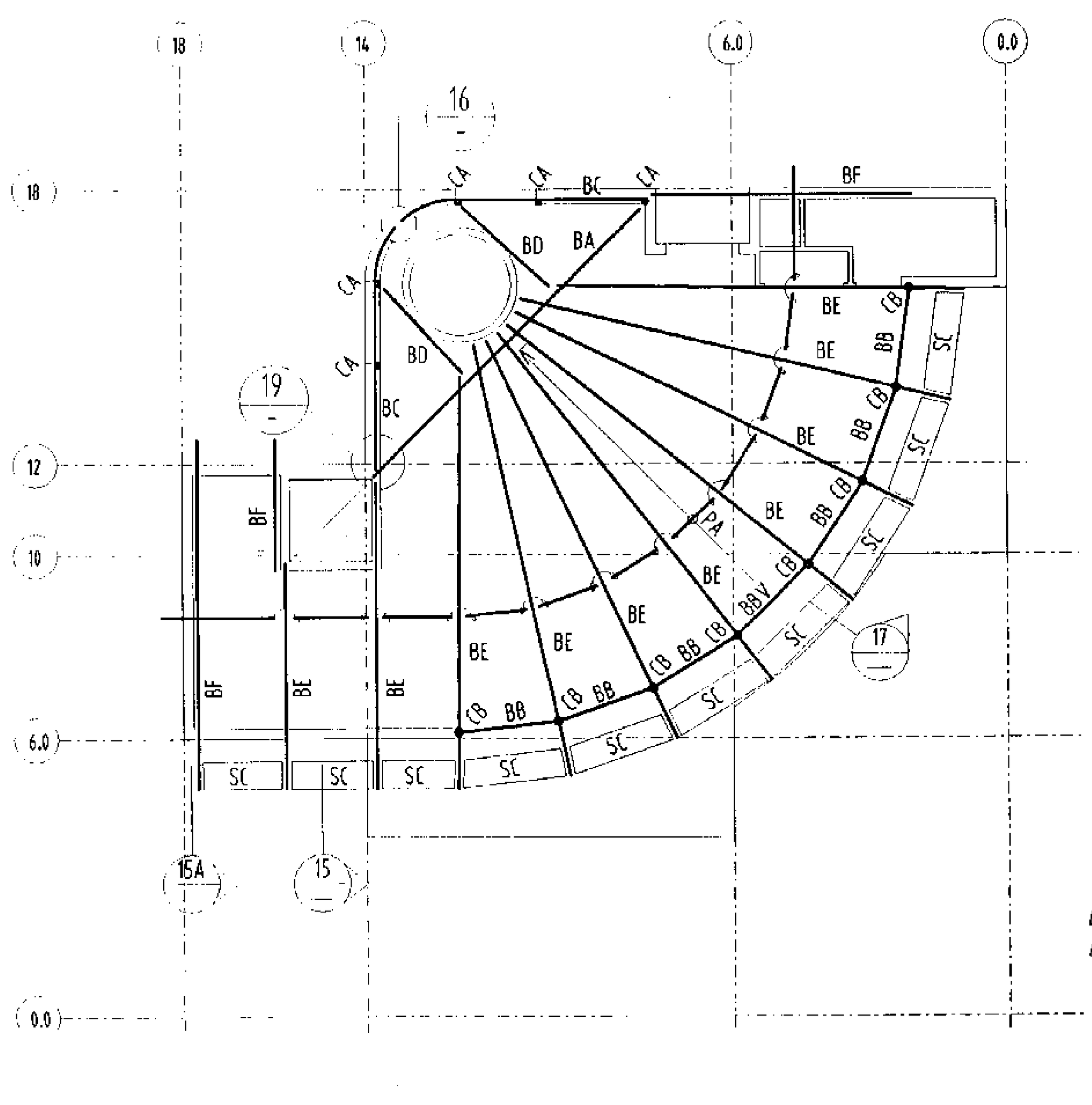
SECTION 12
SCALE 1:20

ANCHOR PROTAS CONSULTING PTY LTD
DETAILS NOTED

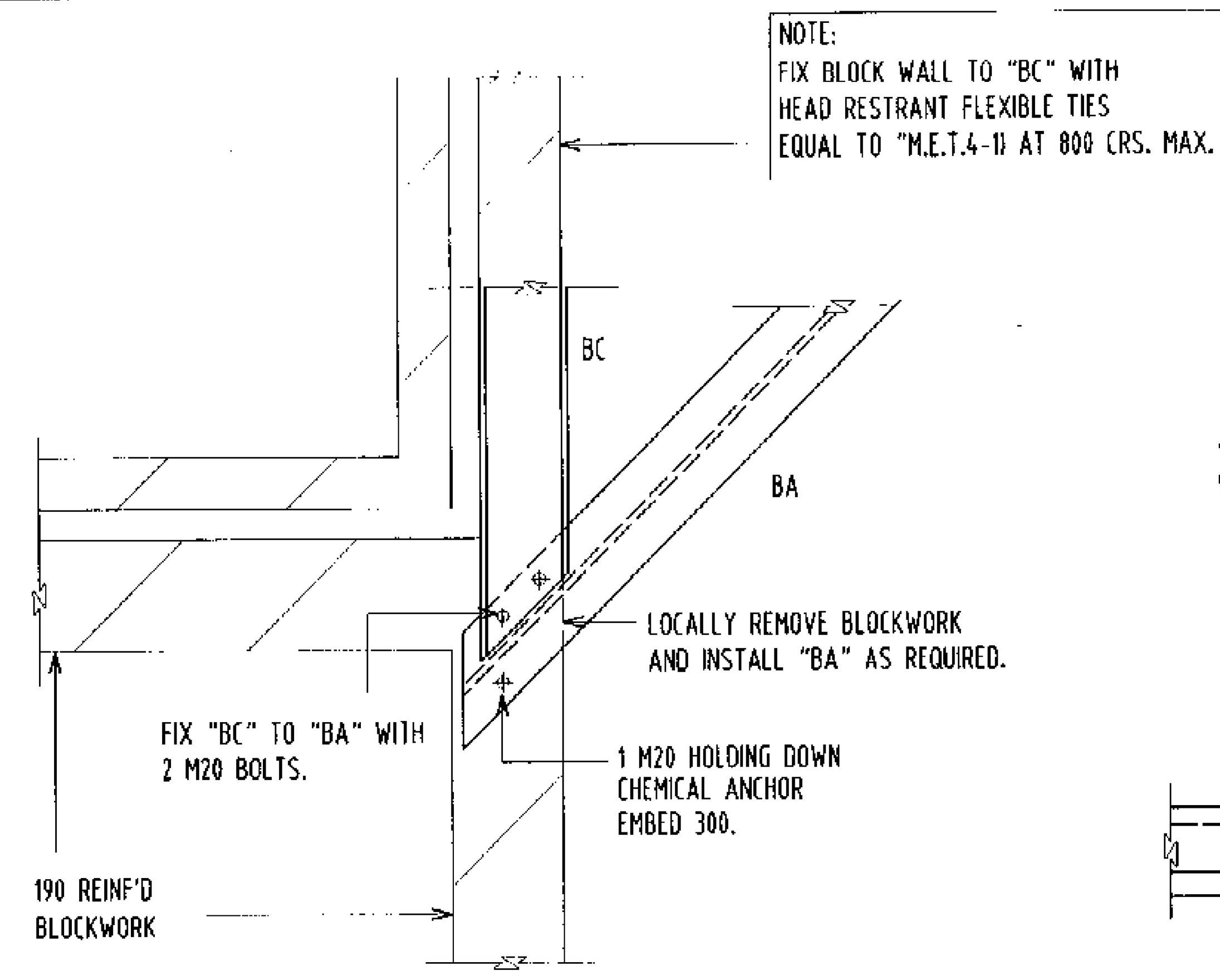
GDK GEOTECHNICS
Greg D. Knights Pty Ltd (Inc NSW)
P.O.Box 2335, North Parramatta NSW 1750
Ph: 02 9890 7875 Fax: 02 9890 7874
Email: gregk@gdkgeo.com
Drawings have been reviewed and comply with the requirements detailed in the Geotechnical Report No. 02153/2e/2
G.D.Knights BE (Civil) Principal Engineer
16/8/2002 Date

TITLE: MAIN ENTRANCE SLAB AND SECTIONS Reference: 2020 Date: 8/8/02	AMENDMENTS:	Designed by: Nakhoul Harb (B.E. Hons; MIEAust CPEng) Structural Engineer 2 Mons Street Canterbury NSW 2193	Signature: Date: 8/8/02	STRUCTURAL DRAWINGS FOR PROPOSED PRIVATE RESDENCE AT 27C ALEXANDRA CRESCENT BAYVIIEW NSW FOR MR A & MRS D MARROCCO	Drg. Number S04 Sheet 4 OF 5

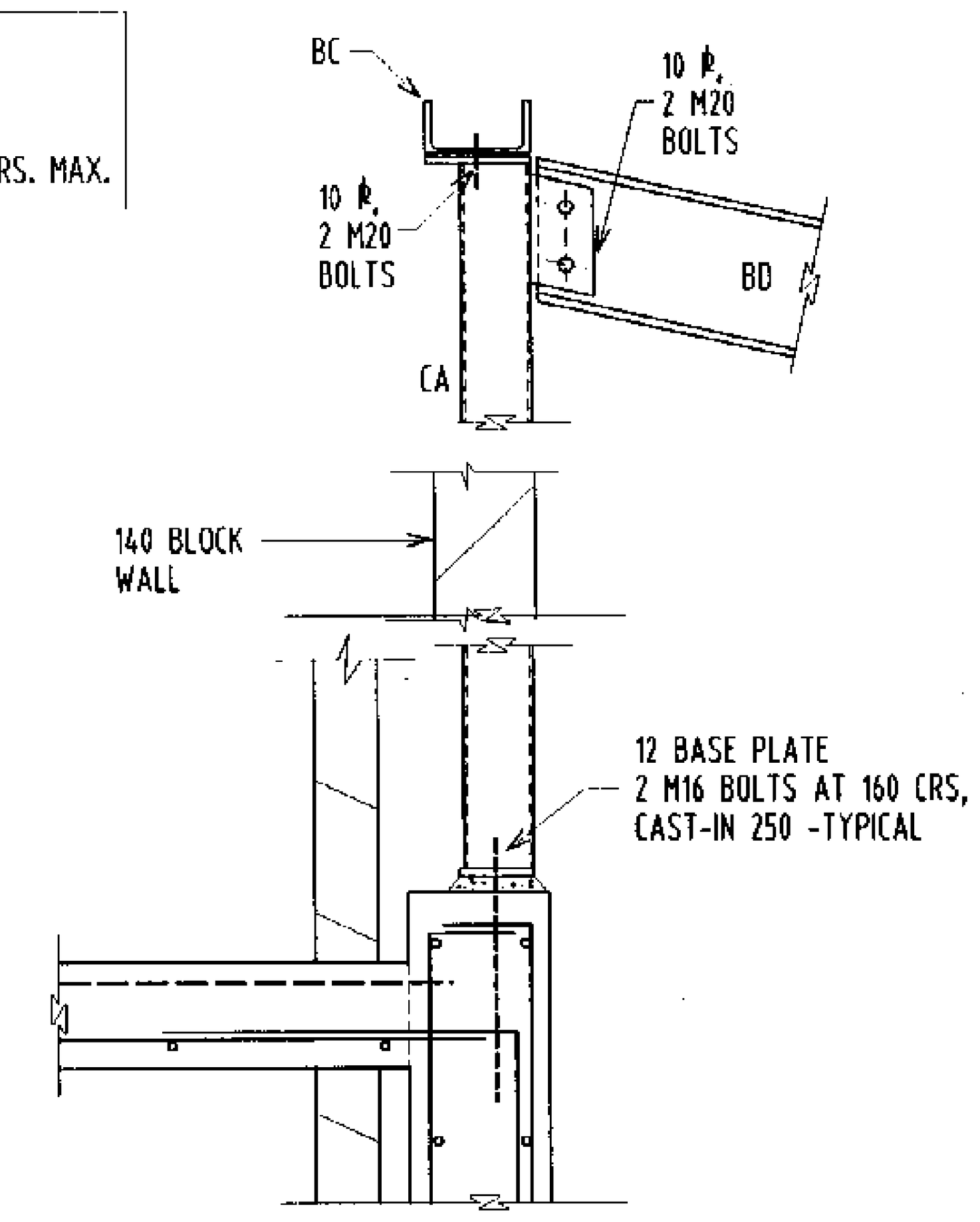
FIGURED DIMENSIONS TO BE USED IN PREFERENCE TO SCALING
ALL DIMENSIONS TO BE CHECKED ON SITE



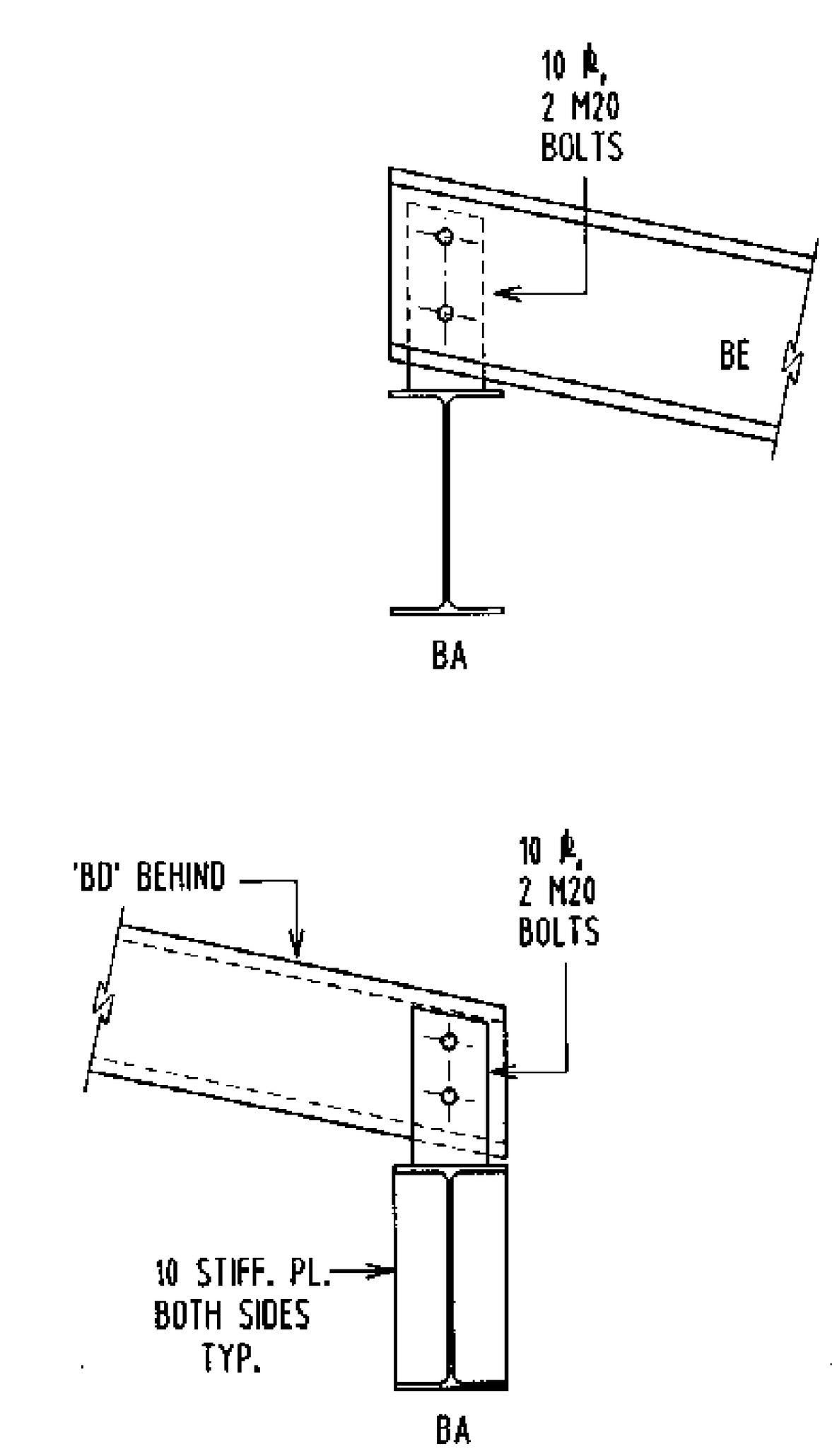
ROOF MARKING PLAN



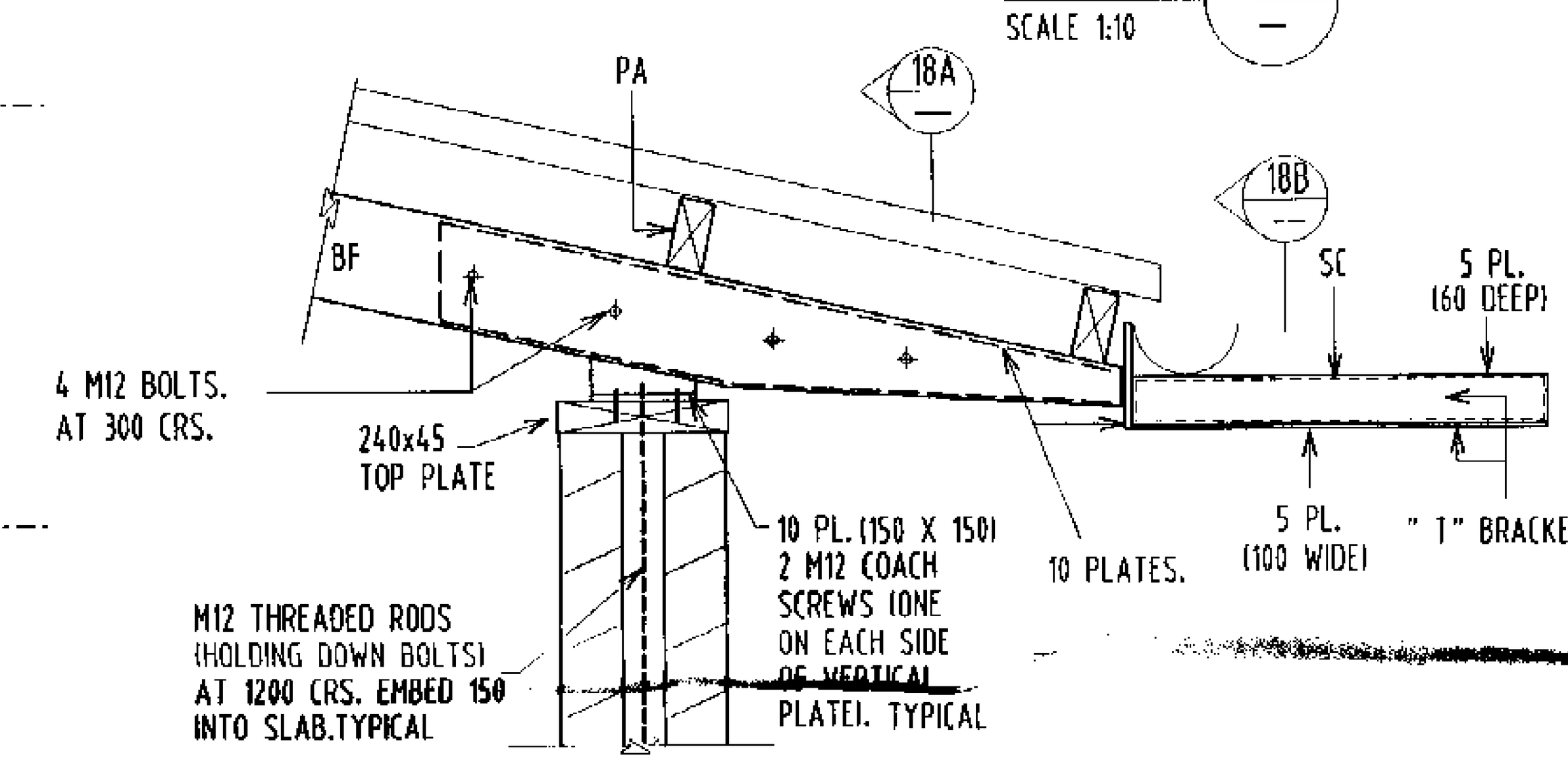
SECTION 19
SCALE 1:10



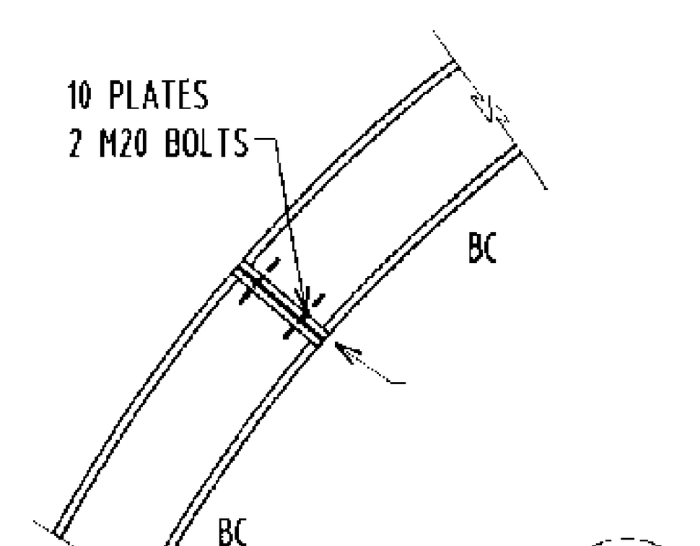
SECTION 14
SCALE 1:10



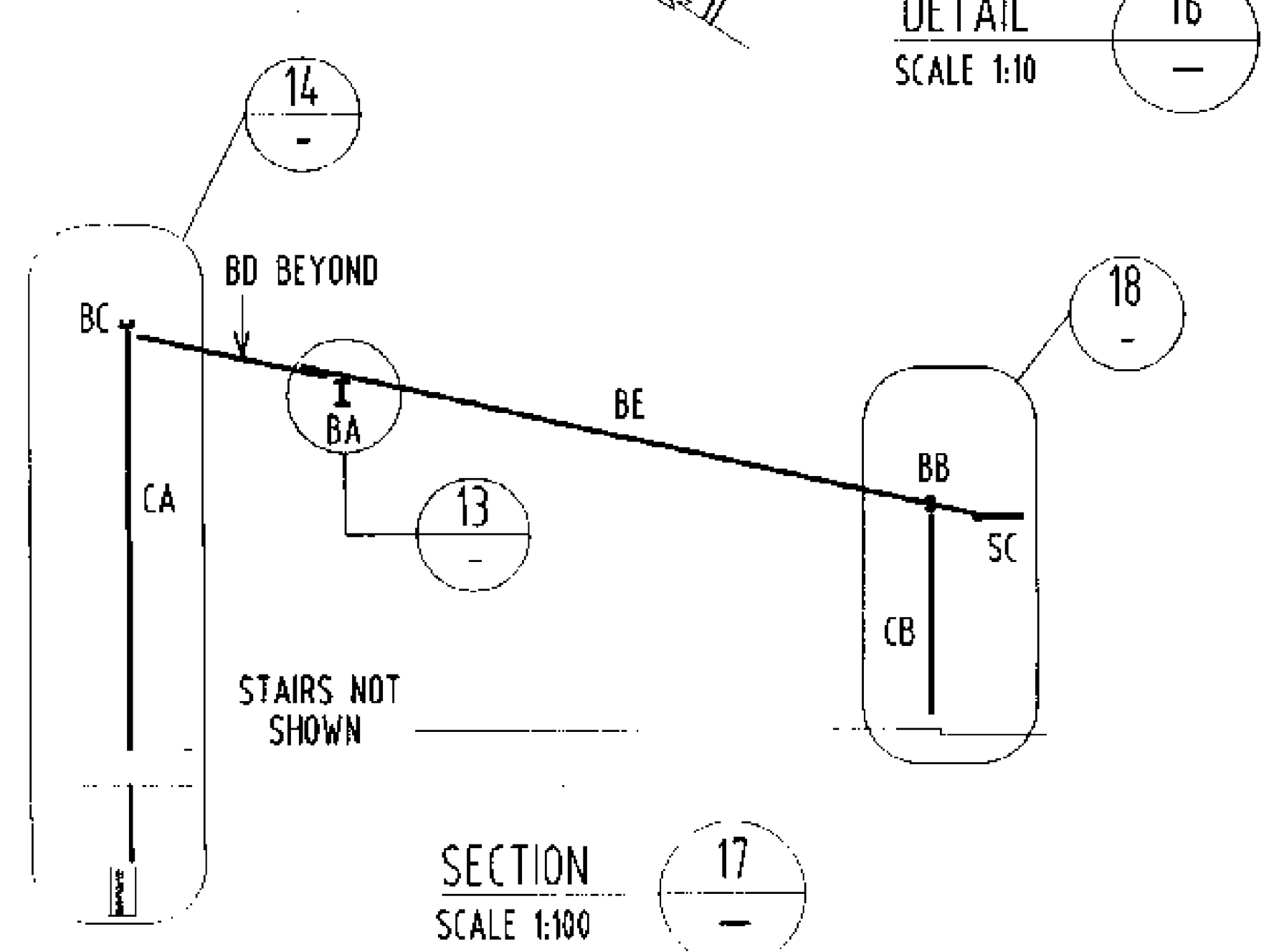
DETAIL 13
SCALE 1:10



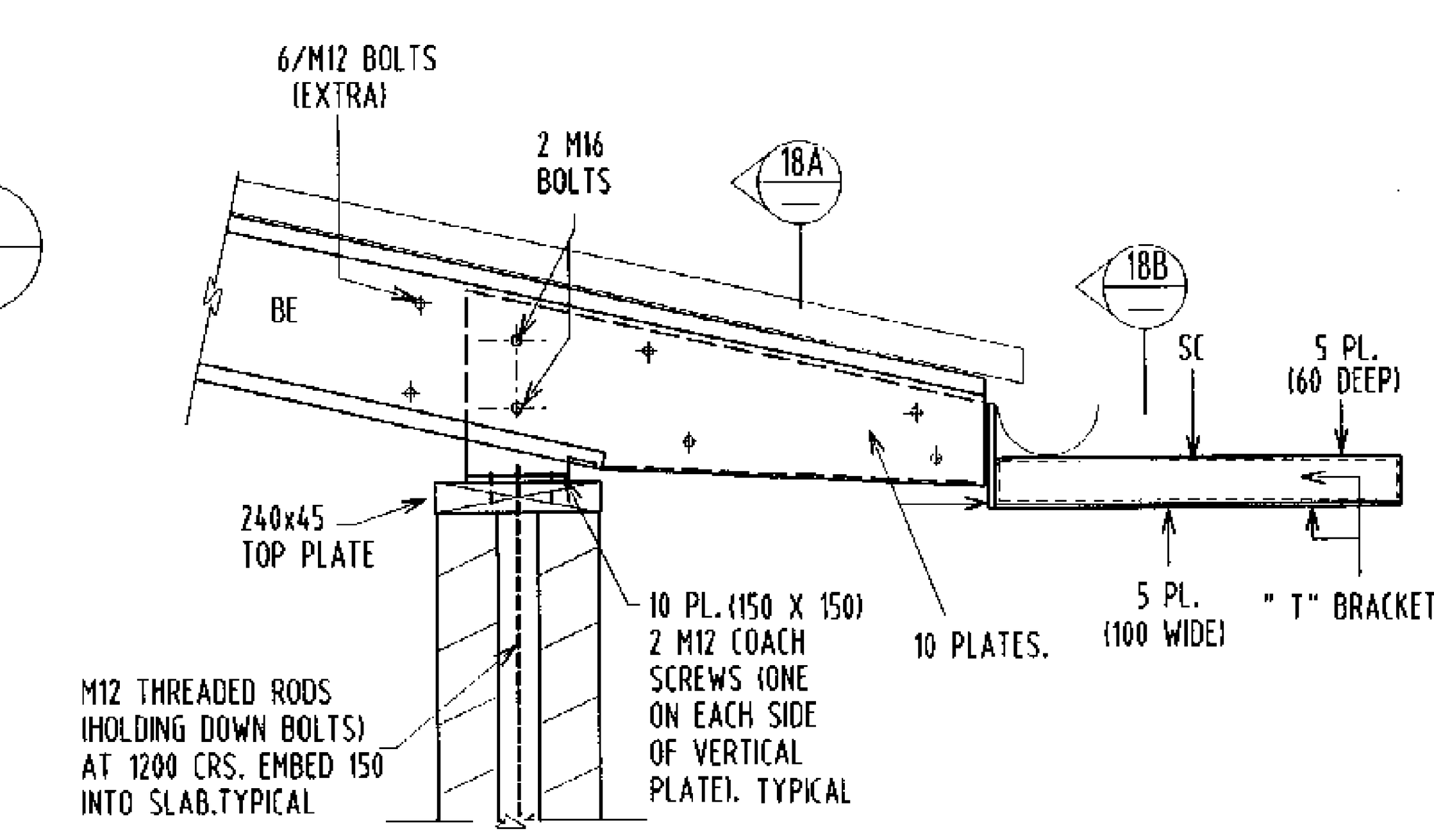
DETAIL 15A
SCALE 1:10



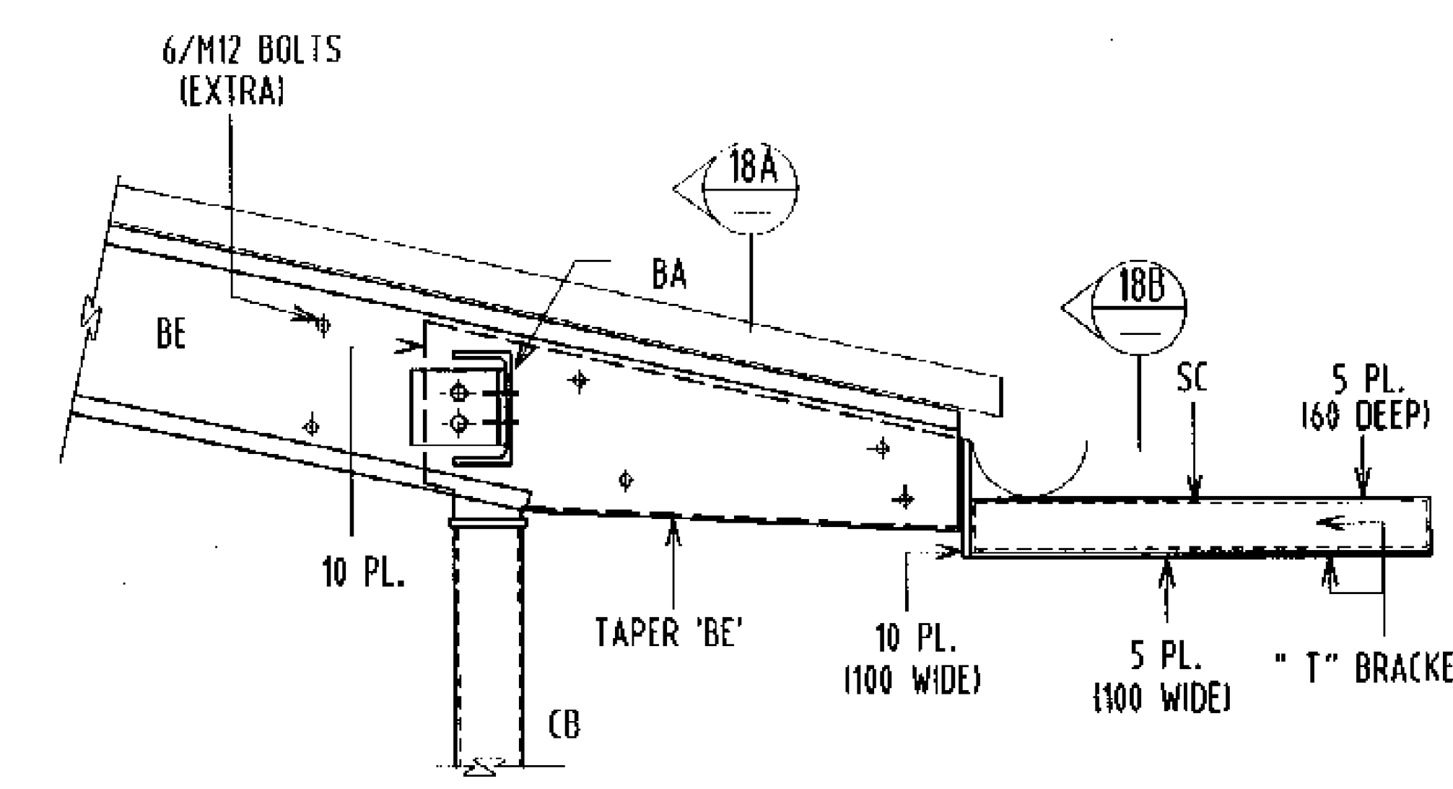
DETAIL 16
SCALE 1:10

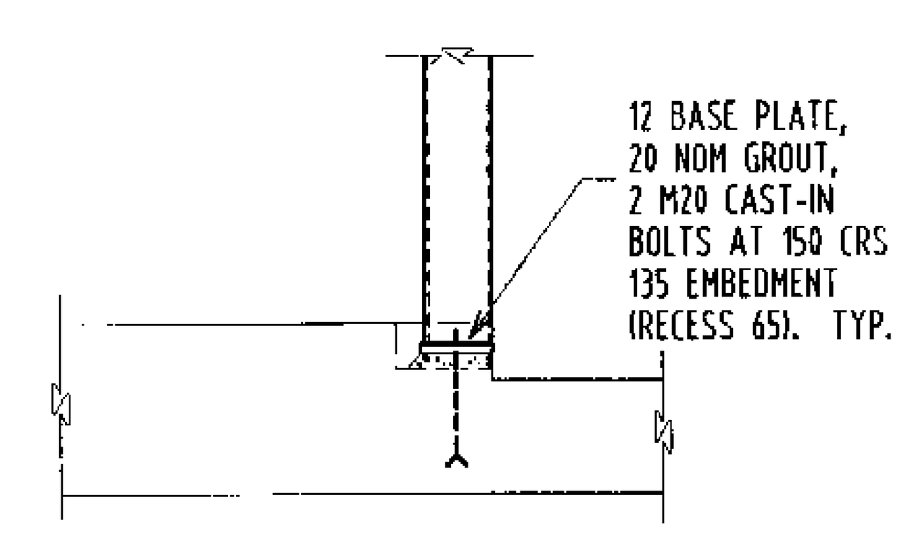


SECTION 17
SCALE 1:100

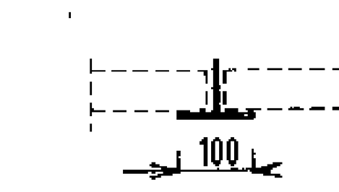


DETAIL 15
SCALE 1:10

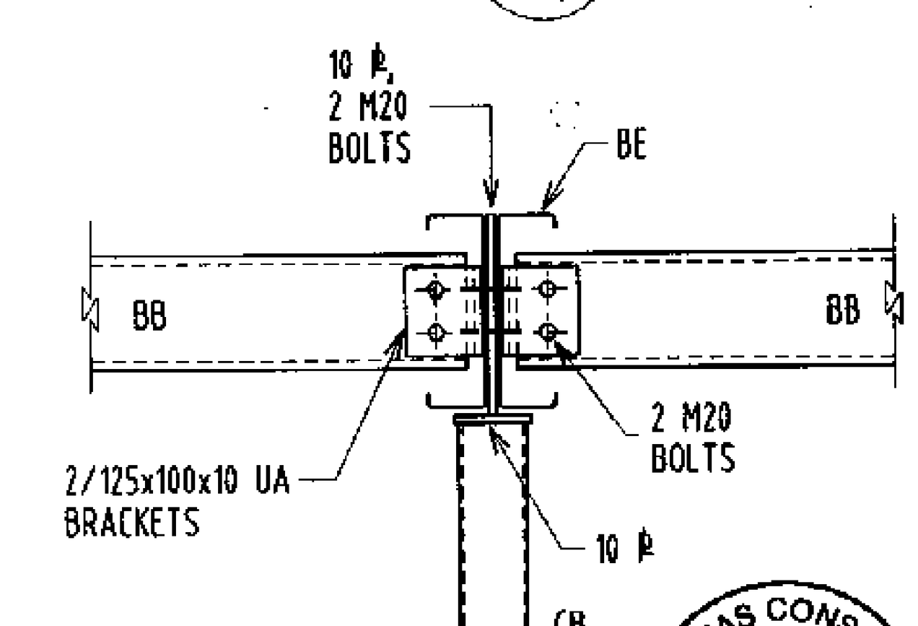




DETAIL 18
SCALE 1:10



DETAIL 18B
SCALE 1:10



DETAIL 18A
SCALE 1:10

GDK
KEIGHRAN GEOTECHNICS
Drawings have been reviewed and comply with the requirements detailed in the Geotechnical Report No. 80173/6/2
G.D.Keighran BE (Civil)
Principal Engineer
16/8/2002
Date

ANTHONY PROTAS CONSULTING PTY LTD
DETAILS NOTED

MEMBER SCHEDULE

MARK	SIZE
CA	100x100x5.0 SHS
CB	89x4.0 CHS
BA	310 UB 32.0
BB	150 PFC [CURVED
BC	150 PFC ⊔ CURVED
BD	200 PFC [
BE	2/C25016][(2 ROWS OF M12 BOLTS AT 1200 CRS. STAGGER TOP & BTM ROWS. PROVIDE 10mm THICK SPACER/WASHER (IN BETWEEN) PER BOLT.
BF	150X50 F7
PA	100x50 F7 TIMBER PURLINS AT 600 CRS MAX'M
SC	LIGHT WEIGHT SUNSCREEN FRAME TO MANUFACTURER'S DETAILS

NOTE: WHERE "PA" SPAN IS MORE THAN 1800, PROVIDE ADDITIONAL "PA" AT 600 CRS. MAX.

TITLE:

ROOF MARKING PLAN, SECTIONS & DETAILS

Reference: 2020 Date: 8/8/02

AMENDMENTS:

Designed by:
Nakhoul Harb (B.E. Hons; MIEAust CPEng)
Structural Engineer
2 Mons Street
Canterbury NSW 2193

Signature:

Date: 8/8/02

STRUCTURAL DRAWINGS FOR PROPOSED PRIVATE RESDENCE AT 27C ALEXANDRA CRESCENT BAYVIIEW NSW
FOR MR A & MRS D MARROCCO

Drg. Number
S05

Sheet 5 OF 5

FIGURED DIMENSIONS TO BE USED IN PREFERENCE TO SCALING
ALL DIMENSIONS TO BE CHECKED ON SITE

MARROCCO RESIDENCE

27C ALEXANDRA CRES BAYVIEW

MECHANICAL SERVICES DESIGN

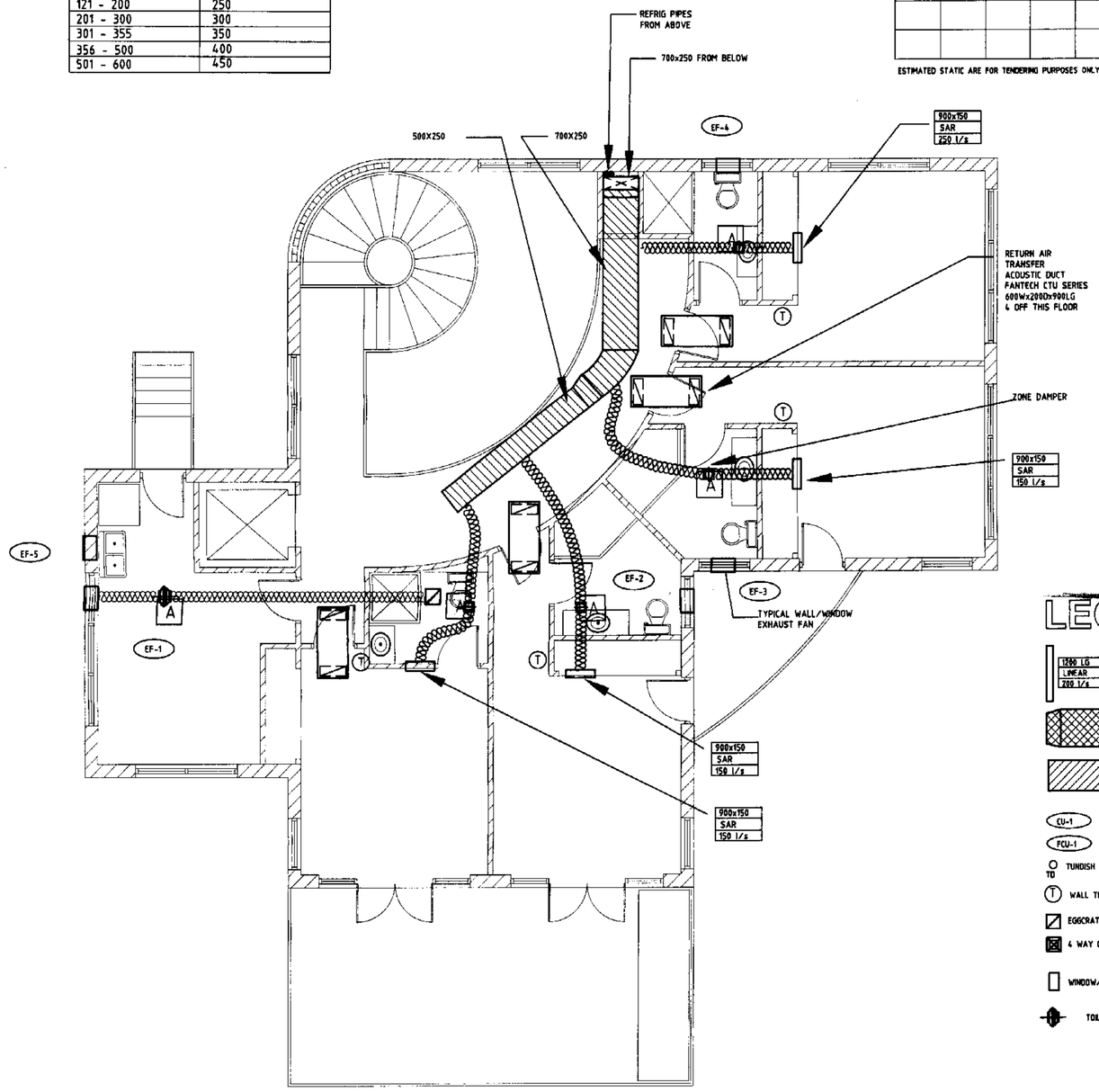
SCA
- 8 NOV 2002
PITTWATER COUNCIL

FLEX SCHEDULE	
AIRFLOW	FLEX DIA
L/S	MM
0 - 55	150
56 - 120	200
121 - 200	250
201 - 300	300
301 - 355	350
356 - 500	400
501 - 600	450

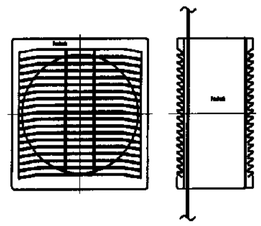
AIR CONDITIONING UNIT SCHEDULE — MINIMUM PERFORMANCE ONLY — AIR ON CONDENSER=35°CDB

ITEM No.	DESCRIPTION	GTH (kW)	TSH (kW)	AIRFLOW HI SPD L/S	OUTDOOR AIR	EVAPORATOR AIR ON °CDB/°CWB	NO. OFF	MAX NOISE LEVELS: INDOOR OUTLET DUCT SWL(dB) dBA	63	125	250	500	1K	2K	4K	8K	OUTDOOR RADIATED SWL(dB) dBA	63	125	250	500	1K	2K	4K	8K	EST. EXT. STATIC PRESSURE Pa	TYPE	ELECTRICAL PHASE/kW	MAKE & MODEL No.	COMMENT
AC - 1	LIVING	16.7	13.1	1000	NAT VENT	25/18	1	74	81	77	72	68	68	66	65	57	73	-	79	73	70	68	64	60	53	200	SPLIT R/C DUCTED	3Ø	APAC CARRIER S SERIES 50Pa ESP AXIAL SIDE DISCHARGE COND FAN	COMFORT ONE CONTROLS
AC - 2	GND. BEDRM	16.7	13.1	1000	NAT VENT	25/18	1	74	81	77	72	68	68	66	65	57	73	-	79	73	70	68	64	60	53	200	SPLIT R/C DUCTED	3Ø	APAC CARRIER 38/40 SERIES 50Pa ESP AXIAL SIDE DISCHARGE COND FAN	COMFORTZONE CONTROLS

ESTIMATED STATIC ARE FOR TENDERING PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE TO ADJUST TO ACHIEVE THE DUTY FLOWS



BEDROOM LEVEL



WINDOW/WALL MTD EXHAUST FAN

LEGEND

- 1200 LG LINEAR 200 l/s — SUPPLY AIR BOOT AND 3 SLOT LINEAR DIFFUSER EQUAL TO AIR GRILLES LSA 25 mm MODEL
- 50MM INTERNALLY LINED DUCT — DUCT SIZES ARE CLEAR INTERNAL
- 25MM EXTERNALLY LINED DUCT — DUCT SIZES ARE CLEAR INTERNAL
- CU-1 — OUTDOOR CONDENSING UNIT
- FCU-1 — FAN COIL UNIT
- TD — TUNDISH BY BLDR
- T — WALL TEMPERATURE SENSOR
- EGGCRATE RETURN AIR GRILLE
- 4 WAY CEILING DIFFUSER C/W PLENUM BOX
- WINDOW/WALL MTD EXHAUST FAN — EF-9
- TOILET/AMENITY MINI AXIAL EXHAUST FAN C/W EGGCRATE GRILLE — EF-9

BUILDER TO PROVIDE

1. ROOF, WALL, CEILING PENETRATIONS AND MAKE GOOD
2. ACCESS TO PLANT THRU CEILINGS,(TO CONTRACTORS REQUIREMENTS)
3. TEMPORARY POWER, OHS ISSUES, SOUND LAGGING OF PLUMBING
4. POWER FROM LIGHTING CIRCUIT FOR EXHAUST FANS, C/W SWITCHING
5. 3 PH POWER FROM ESB TO AC UNITS,
6. UNDERCUTS AND MESH DOOR
7. TUNDISHED ADJACENT TO AIR CONDITIONING UNITS, FLOOR WASTES
8. MIN 100mm INSULATION AND SISALATION UNDER ROOF
9. PENETRATIONS FOR WALL/WINDOW EXH FAN

SCOPE OF WORK AND GENERAL NOTES

1. REVIEW THE ARCHITECTURAL STRUCTURAL HYDRAULICS AND ELECTRICAL DRAWINGS, PRIOR TO SUBMITTING THE TENDER.
2. ALL WORKS TO BE DONE TO RELEVANT CODES, STANDARDS AND COUNCIL REQUIREMENTS.
3. PAY ALL NECESSARY AUTHORITIES FEES AND CHARGES ASSOCIATED WITH THE MECHANICAL WORKS
4. PROVIDE SHOP DRAWINGS INDICATING PROPOSED LAYOUT, EQUIPMENT AND DEMONSTRATE CO-ORDINATION HAS OCCURRED WITH OTHER TRADES, PRIOR TO INSTALLATION. NO VARIATION WILL BE APPROVED DUE TO FAILURE TO TO THIS. DO NOT USE THESE DWGS AS SHOP DGWS FOR CONSTRUCTION
5. ALTERNATIVES FROM THE INTENT SHALL BE IDENTIFIED AT TENDER TIME AND IS SUBJECT TO CLIENT APPROVAL
6. FLEX TO BE ACOUSTIFLEX, BOTH AC AND TE
7. RUN CONDENSATE TO NEAREST TUNDISH. TUNDISH BY BUILDER.
8. PROVIDE CARRIER COMFORT ONE AIR CONDITIONING CONTROLS INSTALLATION OF THE CARRIER INTEGRATED COMFORTZONE CONTROLS SYSTEM TO BE DONE BY APPROVED CARRIER INSTALLER
9. PROVIDE ALL ITEMS NECESSARY TO MAKE A FULLY WORKING AIR CONDITIONING AND VENTILATION SYSTEM, WHETHER OR NOT THEY ARE SHOWN OR SPECIFICED ON THE DRAWINGS
10. PROVIDE AV MOUNTS AND FLEX TO ALL PLANT
11. PROVIDE LOCAL ISOLATING SWITCH FOR ALL PLANT, SUITABLY LABELLED
12. COMPLY WITH AS3000
13. DIFFUSERS TO BE AIR GRILLES OR BRADFLO. DUCTS TO BE BRADFLO SUBMIT SAMPLES FOR APPROVAL
14. GRILLES AND DIFFUSERS TO BE BAKED ENAMEL C/W BLACKED OUT ACOUSTIC PLENUM BEHIND.
15. DIFFUSERS TO BE AIR GRILLES 3 WAY BLOW BAKED ENAMEL C/W BLACKED OUT ACOUSTIC PLENUM BEHIND
16. EXHAUST GRILLES TO BE EGGCRATE AIR GRILLES OR BRADFLO BAKED ENAMEL C/W BLACKED OUT ACOUSTIC PLENUM BEHIND
17. PROVIDE WALL MOUNTED SENSOR AC CONTROL PANELS FINAL LOCATION TO ARCH APPROVAL
18. INSTALL AIR CONDITIONERS AND REFRIGERANT PIPING TO MANUFACTURERS APPROVAL INCL LONG REFRIG RUNS AND ACCESS REQUIREMENTS
19. DUCTS AND FITTINGS TO BE AIR TIGHT
20. PROVIDE DRAINED SAFE TRAY UNDER ALL FAN COIL UNITS AND CONDENSER UNITS
21. PROVIDE 25mm FILTERS IN AC-1,2
22. ALLOW TO DEMONSTRATE FINAL AIR TEST RESULTS AND COMMISSIONING TO CLIENTS REPRESENTATIVE
23. PROVIDE M2 CERTIFICATE OR EQUIVALENT INSTALLATION COUNCIL CERTIFICATE
24. PROVIDE COIL CORROSION PROTECTION TO CONDENSER COILS
25. PROVIDE 12 MONTHS DEFECTS LIABILITY AND WARRANTY TO THE WORKS AND ANY EXTENDED MANUFACTURERS WARRANTIES ON AC UNITS WARRANTY TO BEGIN AT PRACTICAL COMPLETION, AS DEFINED BY COLIN SHEARS & ASSOCIATES
26. PROVIDE AS INSTALLED DRAWINGS AND OPERATING AND MAINTENANCE INSTRUCTIONS INCLUDING SUPPLIER INFO AND WARRANTY INFO.
27. AC-1&2 CAPACITIES ARE BASED ON TINTED GLAZING, EXTERNAL SHADING AND INTERNAL DRAPES
28. UNDERFLASHINGS AND OVERFLASHINGS FOR DUCTS & PIPES
29. EXTERNAL WALL GRILLES AND BIRDWIRE MESH.
30. FOR CONDITIONS OF CONTRACT, REFER TO HEAD CONTRACTOR

BROOKAIR
PAUL McDONALD
139 WYRALLA ROAD
MIRANDA, NSW 2228
02-95 25 91 11
02-95 25 73 01
paulmcdonald@brookair.com.au

EASTWOOD AIR CONDITIONING
DEAN NOWLAND
PO BOX 276
KENTHURST NSW 2156
02-98 58 34 44
02-98 58 28 73
nowland@optus.com.au

AMPLE AIR PTY LTD
STEVE OVINGTON
P O BOX 368
ST. MARYS, NSW 2760
02-96 23 77 44
02-96 73 32 24

ANTHONY PROTAS CONSULTING PTY LTD
DETAILS NOTED

FAN SCHEDULE — MINIMUM PERFORMANCE ONLY

ITEM	DESCRIPTION	AIR QTY l/s	EST STATIC (Pa)	SPEED R/S	FAN TYPE	NUMBER OFF	ELECTRICAL PHASE/kW	MAKE OR MODEL No.	MAX NOISE	POWER SOURCE
TE-2,3,4, 5,7,8,9	TYPICAL TOILET EXH	50	50	21	WALL/WINDOW STYLEVENT	9	1	FANTECH	42 dBA @3M IN DUCT	LIGHTING
TE-1 & 6	TYPICAL TOILET EXH	90	60	17	MINITUBE AXIAL c/w SPEED CONTROLLER	2	1	FANTECH	40 dBA @3M IN DUCT	LIGHTING

ESTIMATED STATIC ARE FOR TENDERING PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE TO ADJUST TO ACHIEVE THE DUTY FLOWS

RECEIVED - 8 NOV 2002 PITTWATER COUNCIL

No	DATE	DRAWN	REVISION
B	29/5/02	CS	TENDER
A	14/4/02	CS	ISSUED FOR COMMENT
P1	8/3/02	CS	ISSUED FOR COMMENT

COLIN SHEARS & ASSOCIATES
CONSULTING ENGINEERS
29 Yaralla Cres Thornleigh 2120
CSA
Telephone (02) 9845 0193 fax (02) 9845 1224
e-mail: colins @ tig.com.au A.B.N. 57633461867

TA DESIGN AND CONSTRUCTION PTY LTD
191A COPELAND RD (EAST) BEECROFT 2119
Telephone (02) 9484 0870 tgofers@tig.com.au
ARCHITECT
TAO GOFERS

CLIENT
Mr A & Mrs D MARROCCO

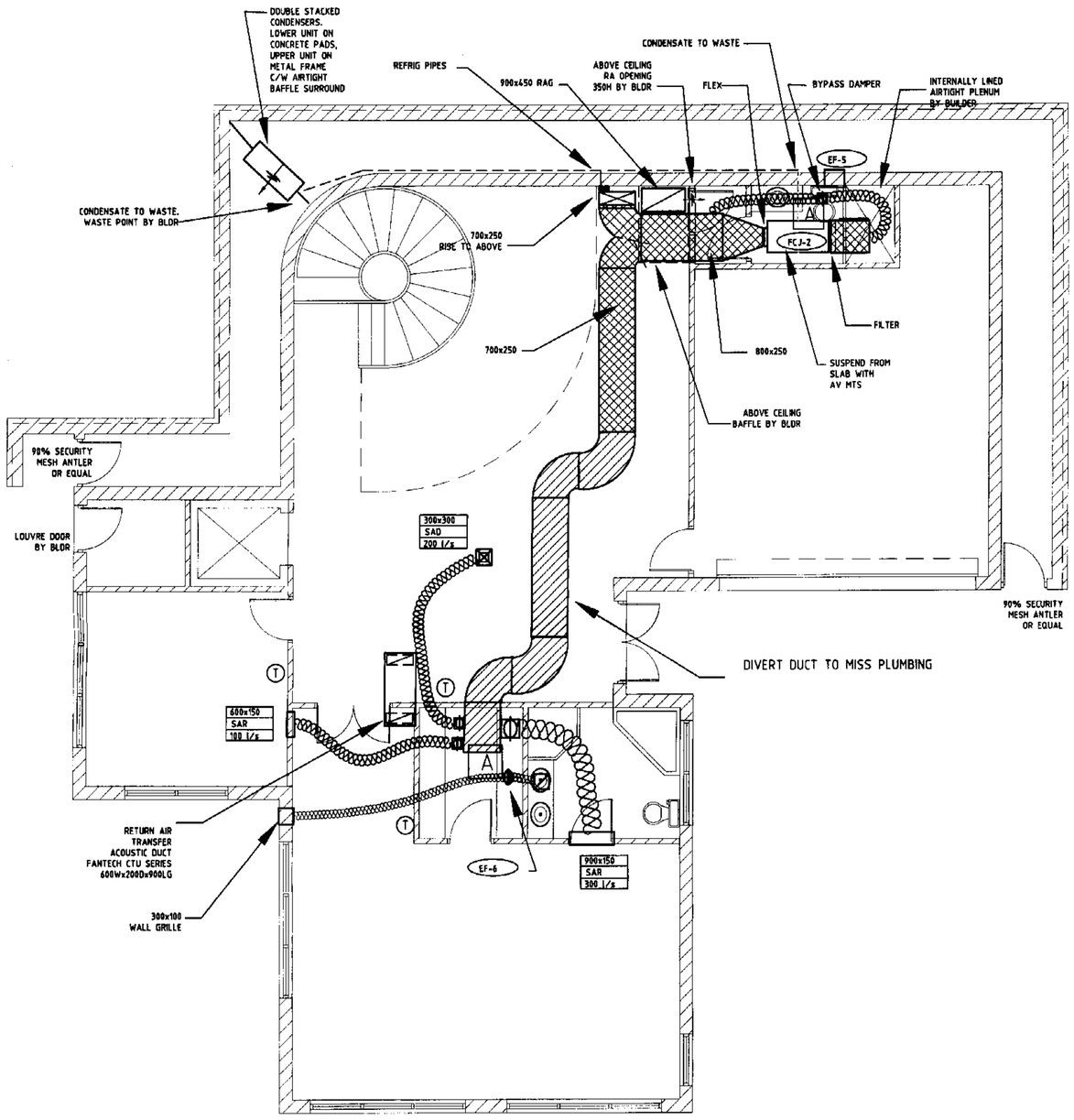
PROJECT
27C ALEXANDRA CRES BAYVIEW

MECHANICAL SERVICES
BEDROOM LEVEL

DRAWN	ENGINEER	CHECKED
CS	CS	

SCALE 1:50 — DATE 7 MARCH 2002

JOB NUMBER	DRAWING NUMBER	REVISION
J13	M03	B



GROUND FLOOR

N

ANTHONY PROTAS CONSULTING P/L LTD
DETAILS NOTED

No	DATE	DRAWN	REVISION
B	29/5/02	CS	TENDER
A	23/4/02	CS	ISSUED FOR COMMENT
P1	8/3/02	CS	ISSUED FOR COMMENT

COLIN SHEARS & ASSOCIATES
CONSULTING ENGINEERS
29 Yarralla Cres Thornleigh 2120
CSA
Telephone (02) 9945 0193 fax (02) 9945 1224
e-mail: colin.s @ tig.com.au A.B.N 57632481867

TA DESIGN AND CONSTRUCTION PTY LTD
191A COPELAND RD (EAST) BEECROFT 2119
Telephone (02) 9484 0870 tgofers@tig.com.au
ARCHITECT
TAO GOFERS

CLIENT
Mr A & Mrs D MARROCCO

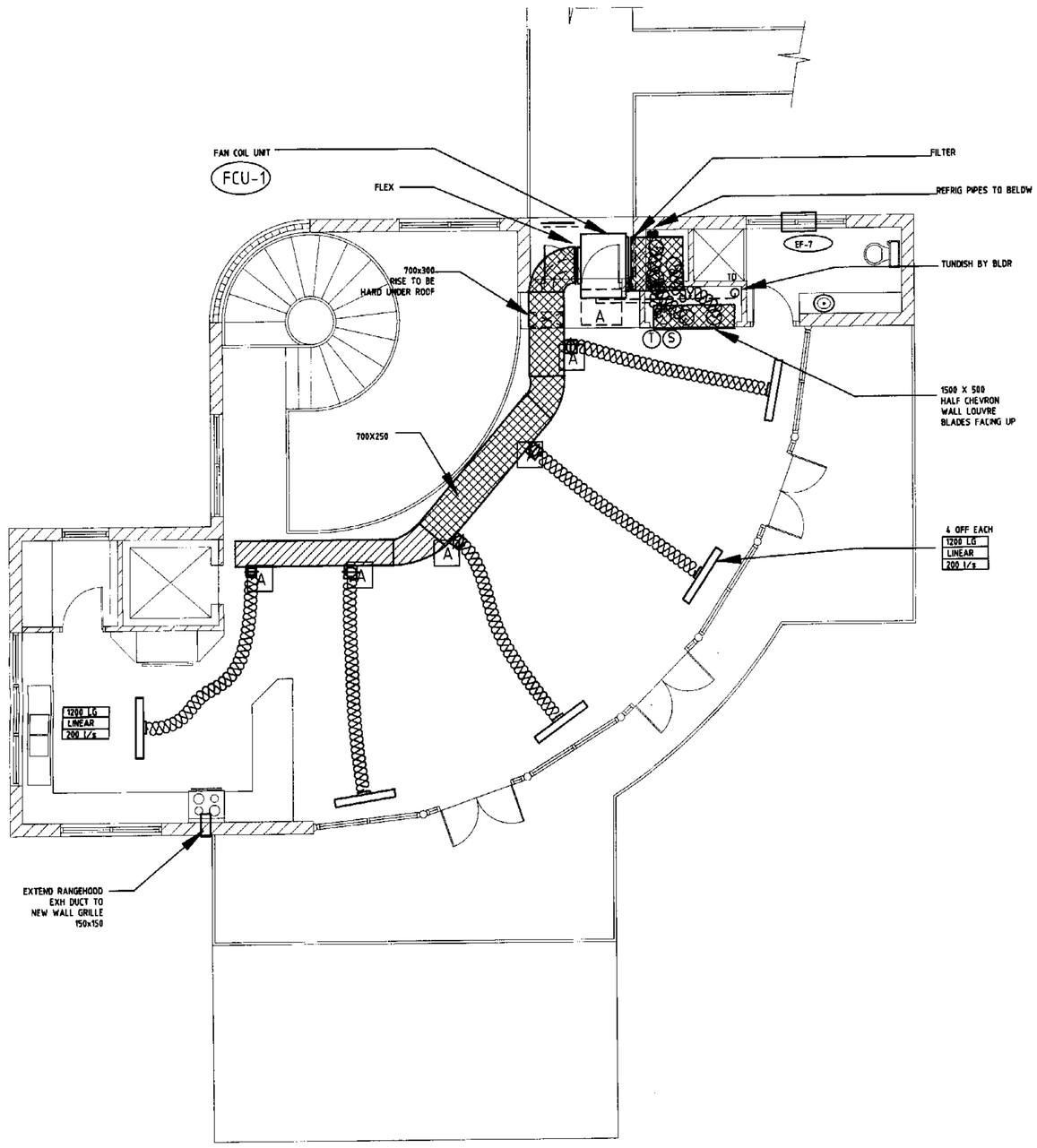
PROJECT
27C ALEXANDRA CRES BAYVIEW

MECHANICAL SERVICES
GROUND FLOOR

DRAWN	ENGINEER	CHECKED
CS	CS	

SCALE	DATE
1:50	7 MARCH 2002

JOB NUMBER	DRAWING NUMBER	REVISION
J13	M02	B



MAIN ENTRANCE LEVEL

ANTHONY PROTAS CONSULTING PTY LTD
DETAILS NOTED

No	DATE	DRAWN	REVISION
B	26/9/02	CS	TENDER
A	14/4/02	CS	ISSUED FOR COMMENT
P1	8/3/02	CS	ISSUED FOR COMMENT

COLIN SHEARS & ASSOCIATES
CONSULTING ENGINEERS
29 Yaralla Cres Thornleigh 2120
CSA
Telephone (02) 9845 0193 fax (02) 9845 1224
e-mail: colins @ tig.com.au A.B.N 57632461667

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Telephone (02) 9484 0870 tgofers@tig.com.au
ARCHITECT
TAO GOFERS

CLIENT
Mr A & Mrs D MARROCCO

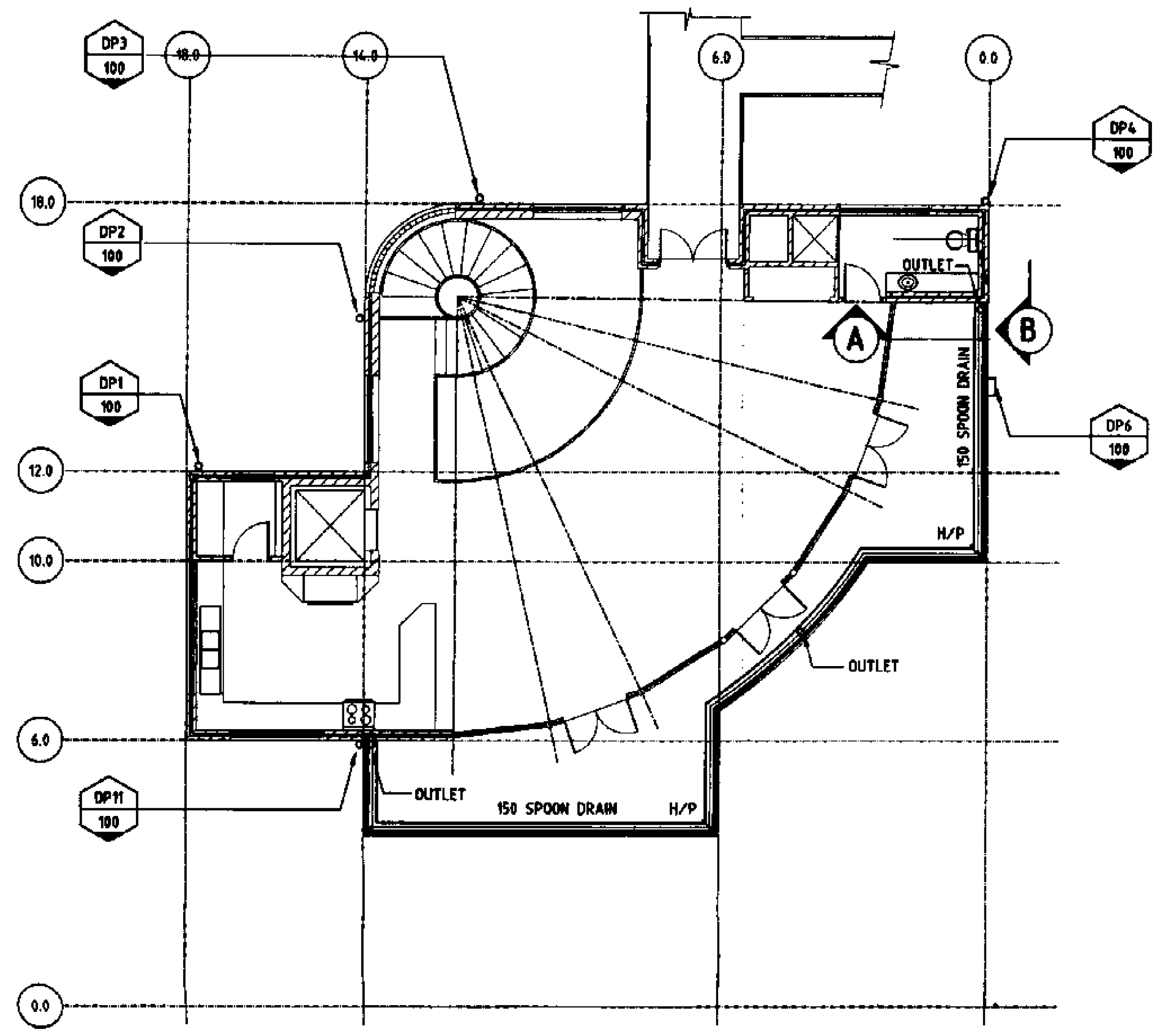
PROJECT
27C ALEXANDRA CRES BAYVIEW

MECHANICAL SERVICES
MAIN ENTRANCE LEVEL

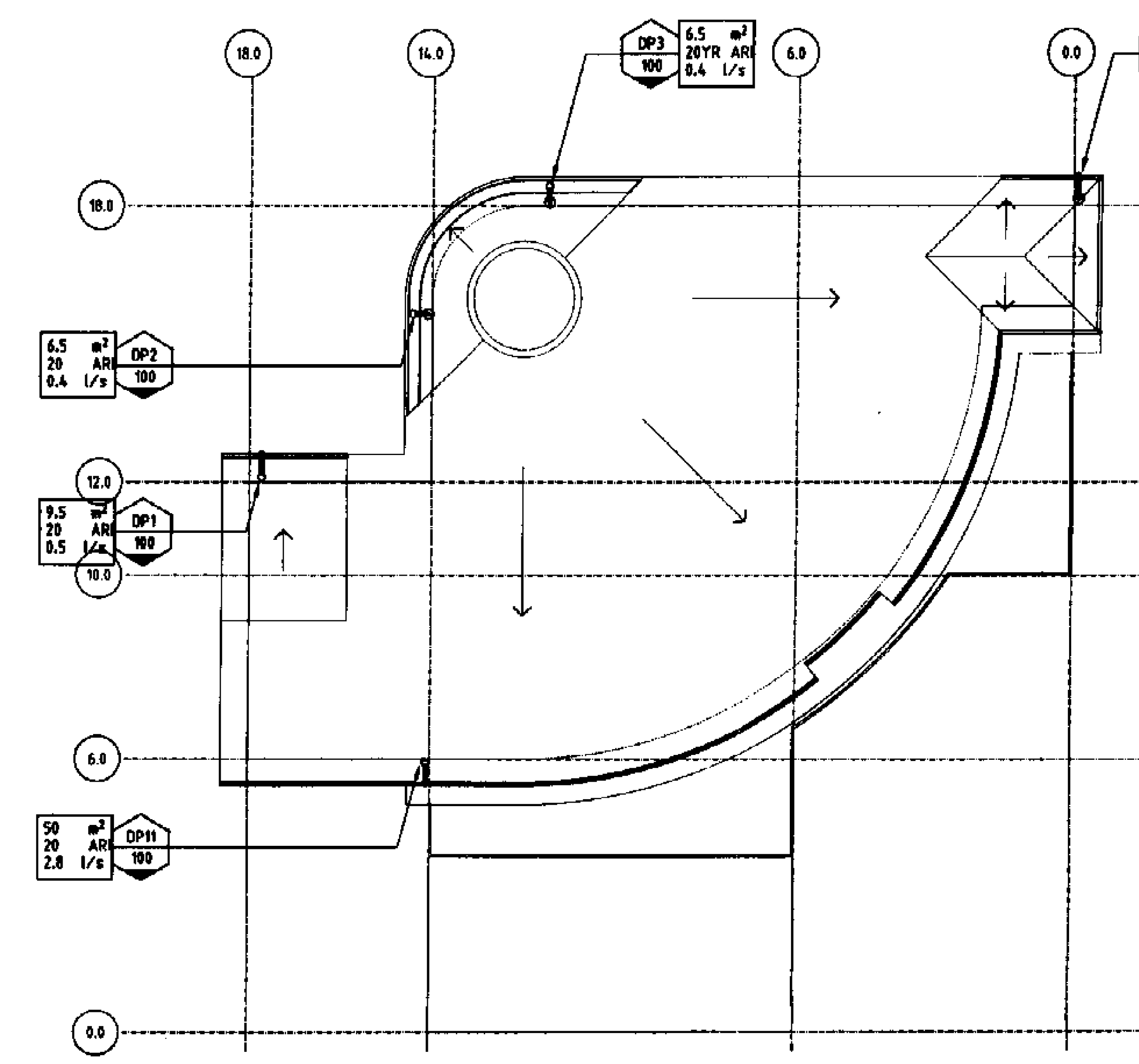
DRAWN	ENGINEER	CHECKED
CS	CS	

SCALE 1:50 | DATE 7 MARCH 2002

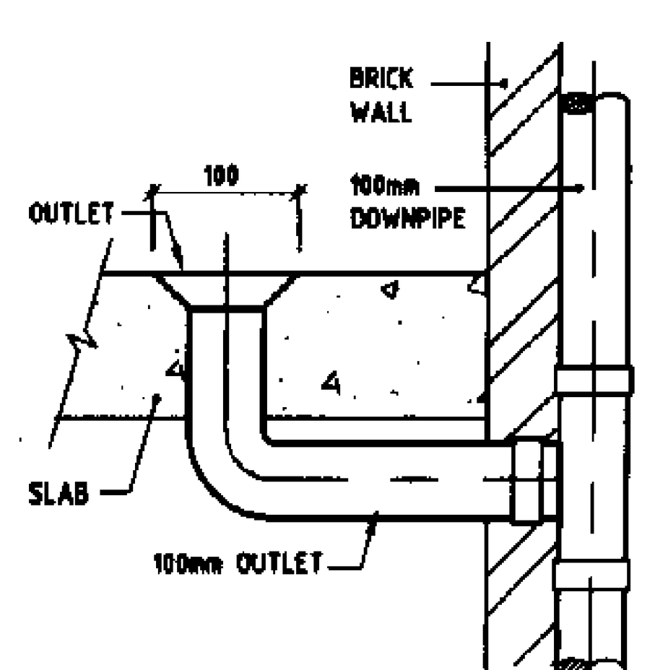
JOB NUMBER	DRAWING NUMBER	REVISION
J13	M04	B



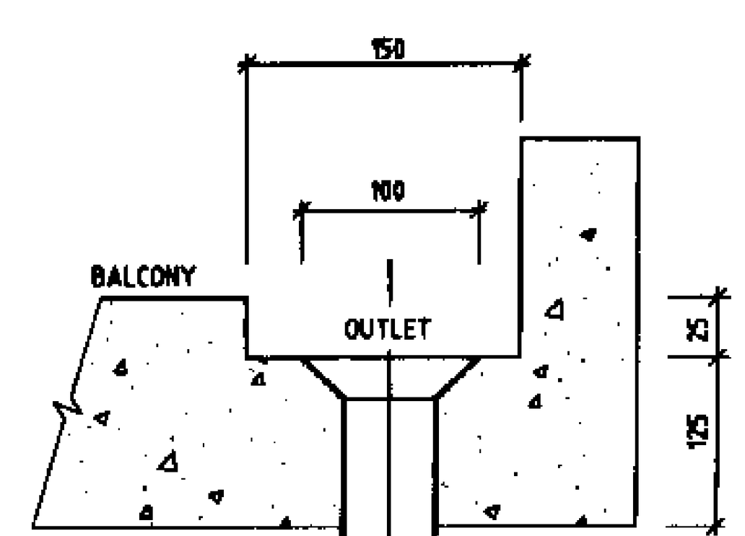
MAIN ENTRANCE LEVEL
SCALE 1:50



ROOF PLAN
SCALE 1:50



SECTION-B



SECTION - A

TYPICAL SPOON DRAIN DETAIL

ANTHONY PROTAS CONSULTING PTY LTD
DETAILS NOTED

NOT FOR CONSTRUCTION

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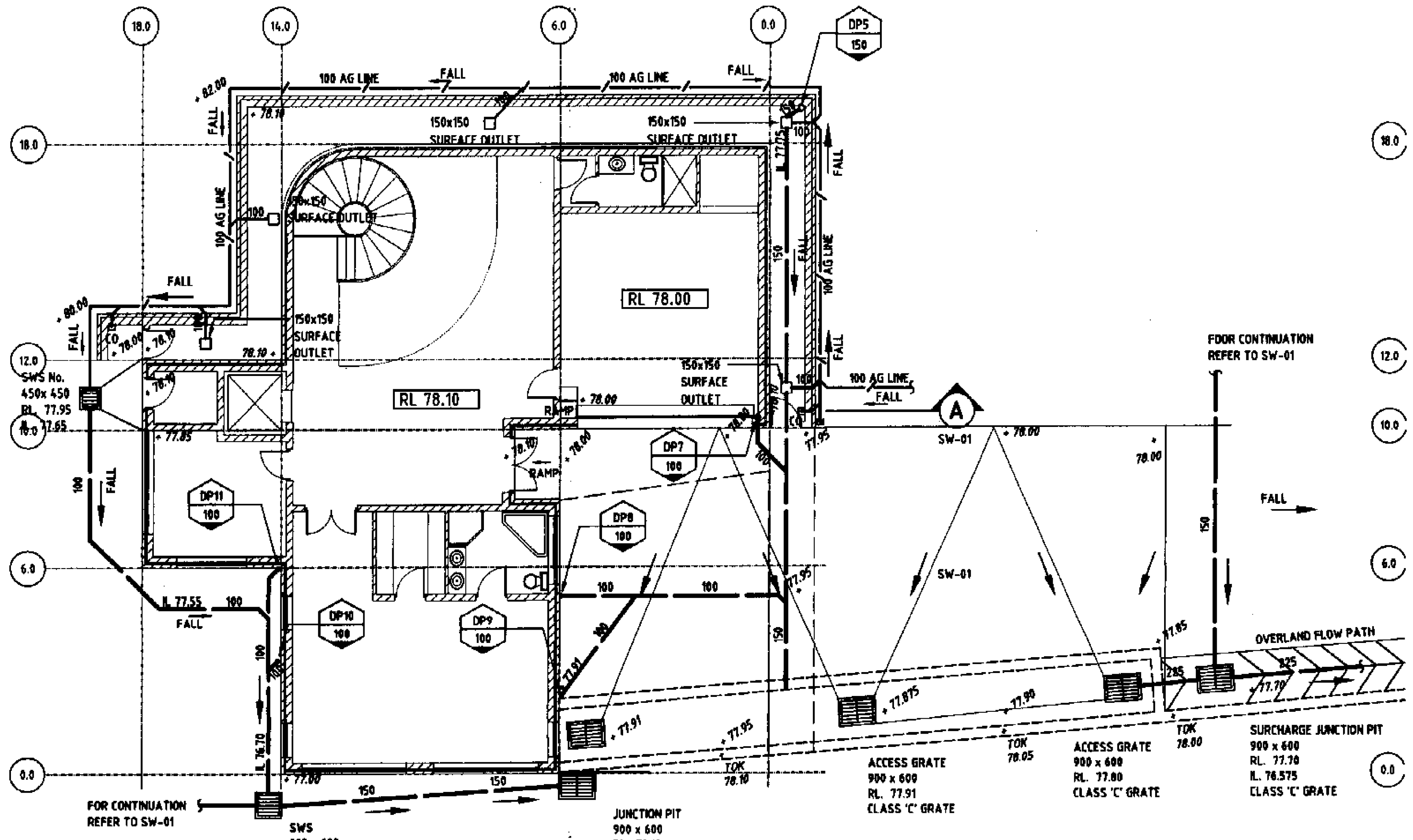
DRAWING STATUS	INITIAL	DATE
PRELIMINARY		
FOR INFORMATION ONLY		
FOR CLIENT APPROVAL		
FOR TENDER		
FOR CONSTRUCTION		

DATE	No	AMENDMENT	INIT.	ISSUE	DATE	No	AMENDMENT	INIT.	ISSUE
01.07.02		DA SUBMISSION	CT	A					

SPARKS AND PARTNERS
HYDRAULIC CIVIL & FIRE SERVICES CONSULTANTS

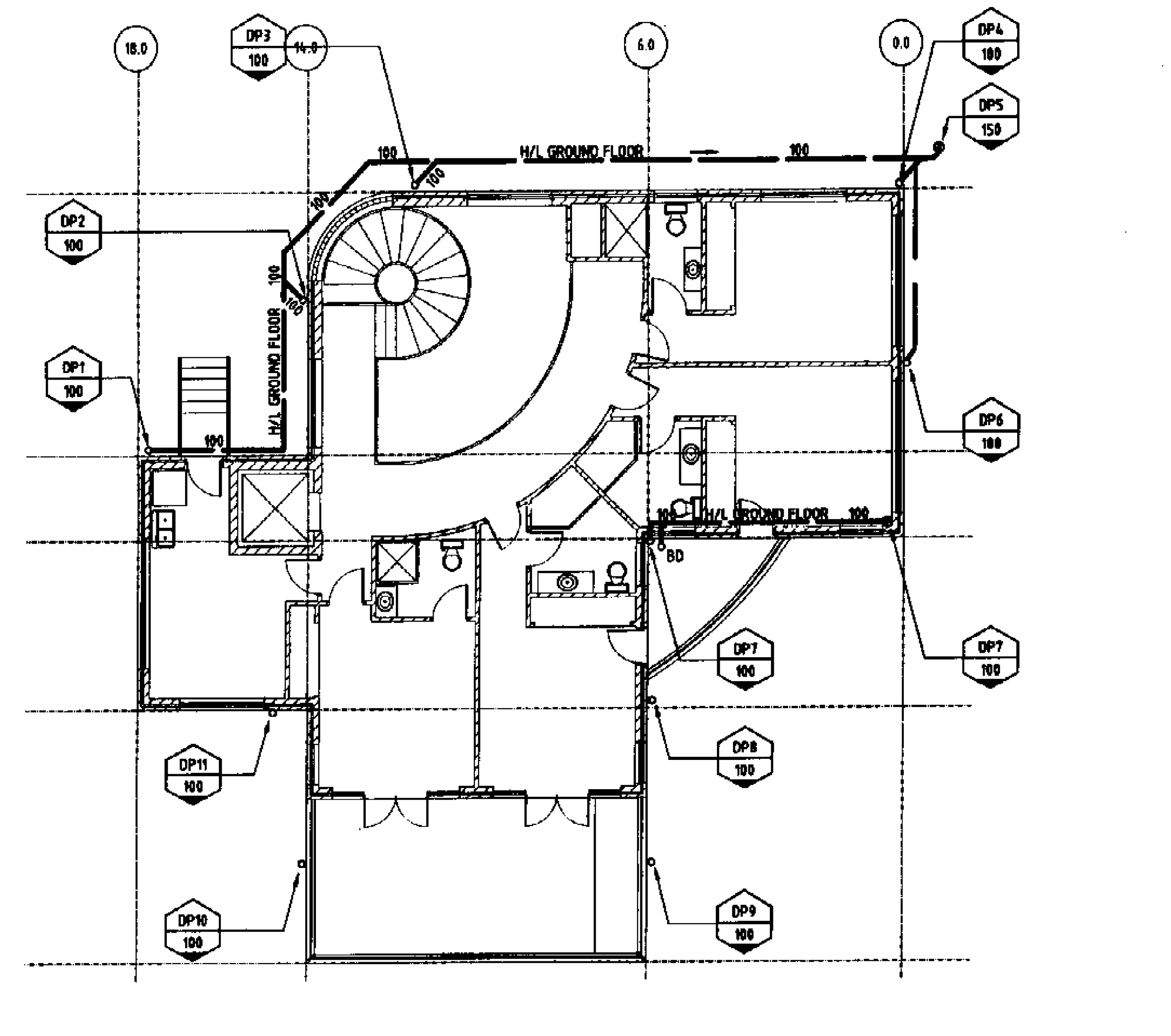
QUALITY ASSURED COMPANY
ISO 9001 : 1994

PROJECT	PRIVATE RESIDENCE 27c ALEXANDRA CRESCENT BAYVIEW
CLIENT	MR & MRS A MARROCCO 4 LANE COVE ROAD, INGLESIDE
TITLE	HYDRAULIC SERVICES MAIN ENTRANCE / ROOF LEVEL
DESIGNED BY	PDW
DATE	05.04.02
CHECKED BY	
DATE	
SCALE	1 : 50
DRAWN BY	CT
DATE	APRIL 2002
JOB NO	01473
DRAWING No.	SW-03
No. IN SET	3 of 4
ISSUE	A



GROUND FLOOR

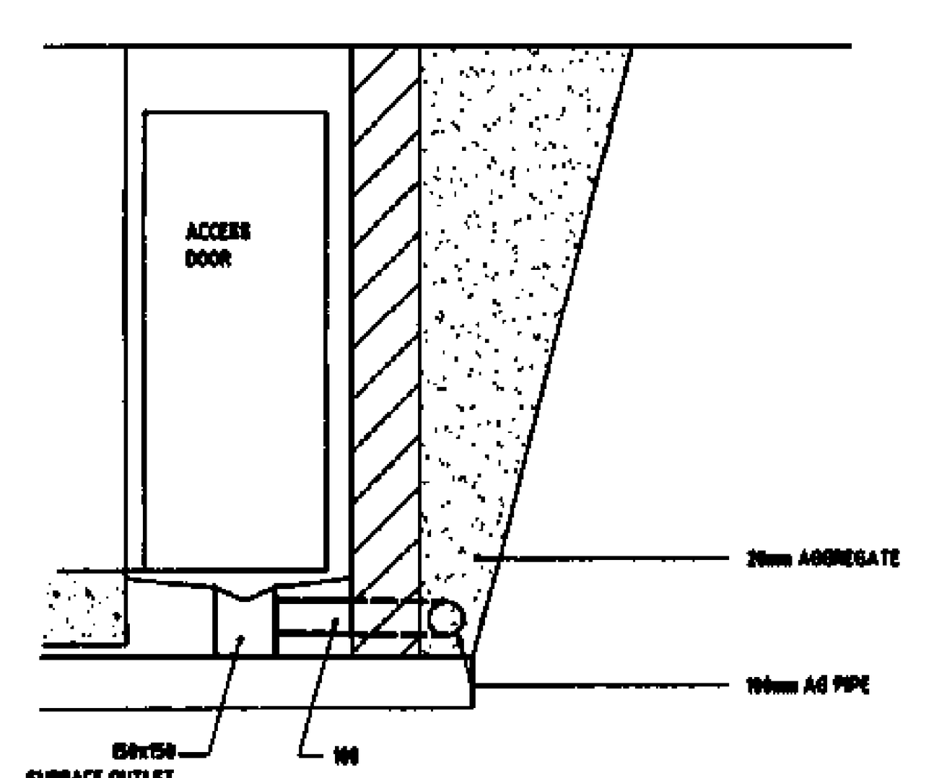
SCALE 1:100



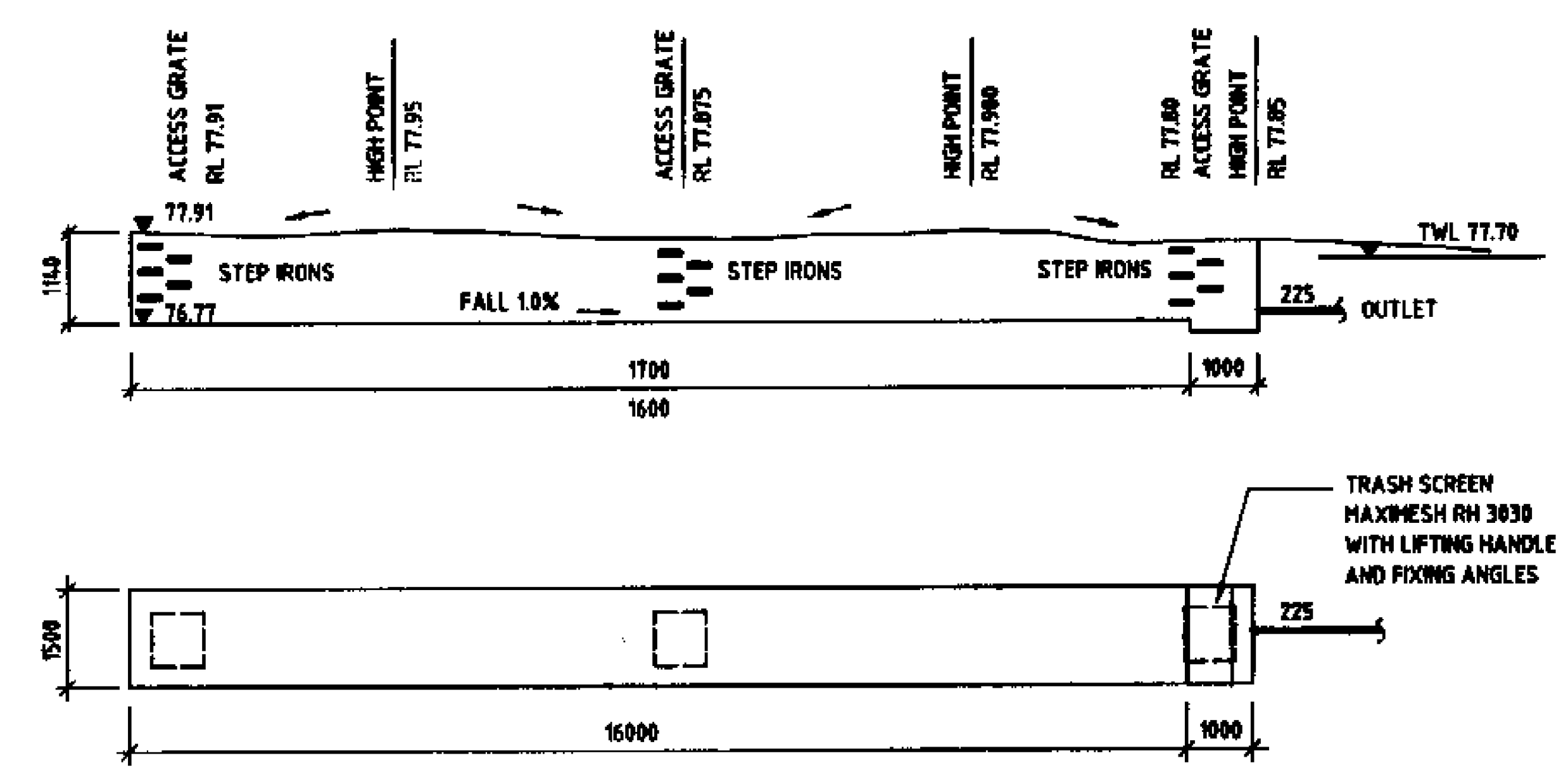
BEDROOM LEVEL

SCALE 1:100

SCALE 1 : 100

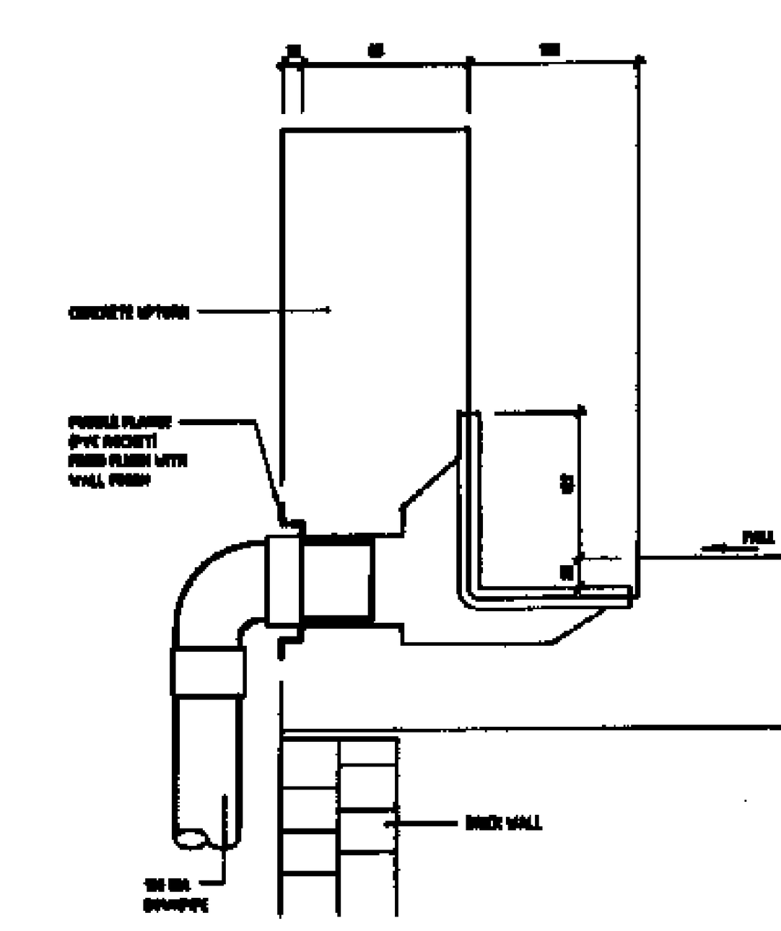


SECTION - A



DETENTION TANK DETAILS

SCALE 1 : 100



SPOON DRAIN DETAIL

(PARAPET DRAIN OUTLET)

ANTHONY PROTAS CONSULTING PTY LTD — DETAILS NOTED

NOT FOR CONSTRUCTION

DATE	No	AMENDMENT	INIT.	ISSUE
07.05.02		DA SUBMISSION	CT	A

SPARKS AND PARTNERS — HYDRAULIC, CIVIL & FIRE SERVICES CONSULTANTS

107 GEORGE STREET PARRAMATTA NEW SOUTH WALES 2150

QUALITY ASSURED COMPANY ISO 9001 : 1994

PROJECT	PRIVATE RESIDENCE 27c ALEXANDRA CRESCENT BAYVIEW
CLIENT	MR & MRS A MARROCCO 4 LANE COVE ROAD, INGLESIDE
TITLE	HYDRAULIC SERVICES GROUND/BEDROOM LEVEL
DESIGNED BY	PDW
DATE	05.04.02
CHECKED BY	
SCALE	AS SHOWN
DRAWN BY	CT
DATE	APRIL 2002
JOB NO	01473
DRAWING No.	SW-02
No. IN SET	2 of 4
ISSUE	A

Pittwater Council
Stormwater Detention Requirements

Job No: 01473	Date: 10-Apr-02	Designer: PDW

Storage Requirements

SSR = [0.083-(100-T(%))x2.4x10^-4]x I (m³)

Total Site Area.		2833.68	(m²)		(%)
Total Site Area Considered:		1069.00	(m²)	37.72	(%)
Pre Developed Imp' Area.		100	(m²)	9.35	(%)
Post Developed Imp' Area:		417.55	(m²)	39.06	(%)
Total Site Draining Thru OSD:	[T]	974	(m²)	91.11	(%)
Increase in Impervious Area:	[I]	317.55	(m²)	29.71	(%)
Site Storage Required:		25.7	m³		
Min' Below Ground Storage (20%)		5.14	m³		

Discharge Requirements

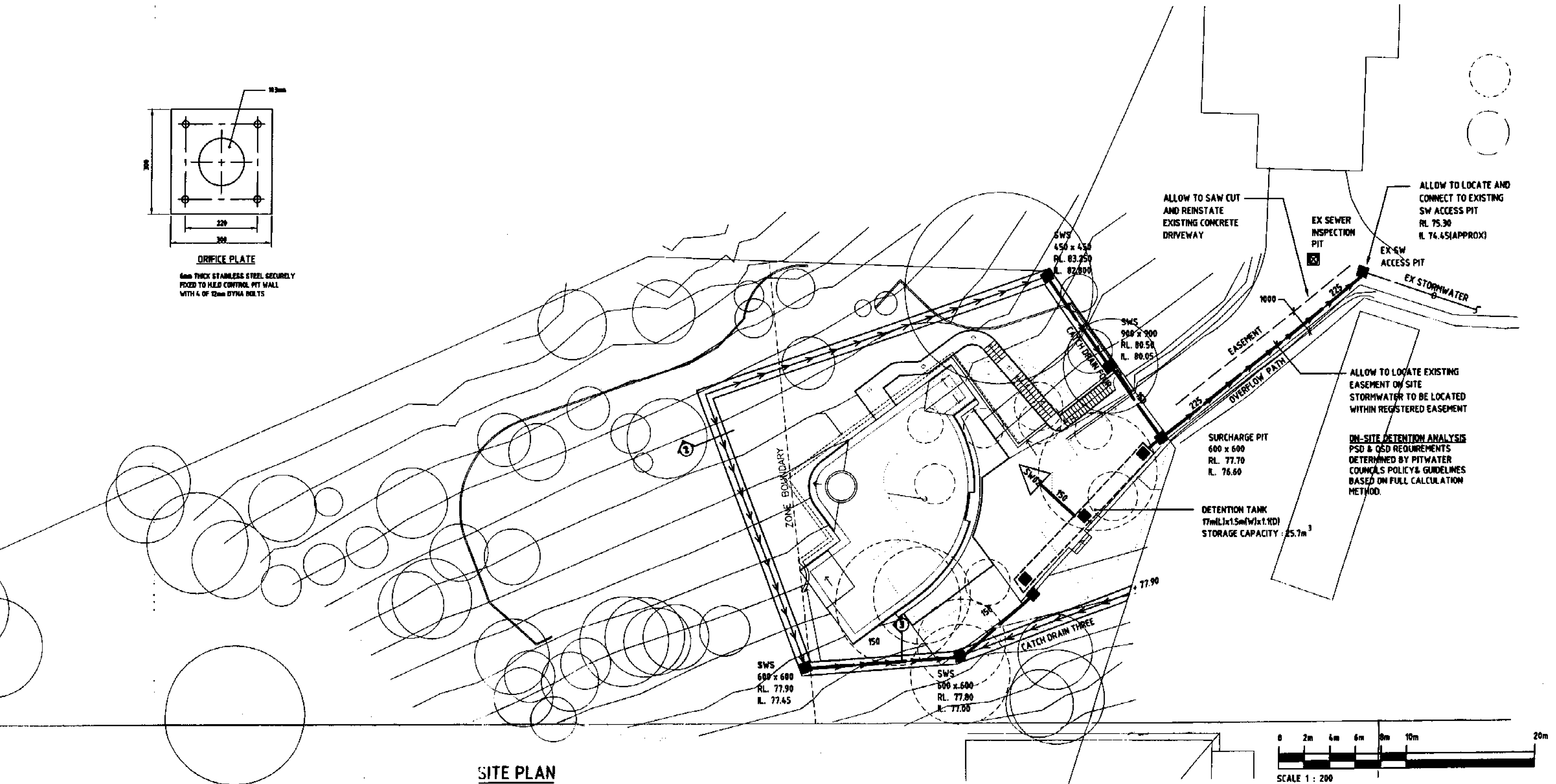
PSD = (A + (P(%) x B) - (D(%) x C] x Area(m²)

Total Site to Drain to OSD	[A]	91.11	(%)	0.0311	[Table 4.1]
Total Site to Drain to OSD	[B]	91.11	(%)	0.00048	[Table 4 1]
Total Site to Drain to OSD	[Area]	974	(m²)		
Pre Developed Imp'/ Perv'	[C]			0.00040	[Fig' 4 1]
Pre Developed Imp' Area:	[P]	100	(m²)	9.35	(%)
Post Developed Imp' Area:		417.55	(m²)	39.06	(%)
Increase in Impervious Area:	[D]	317.55	(m²)	29.71	(%)
Permissible Site Discharge:		23.09	l/s		

Outlet Orifice Plate Diameter

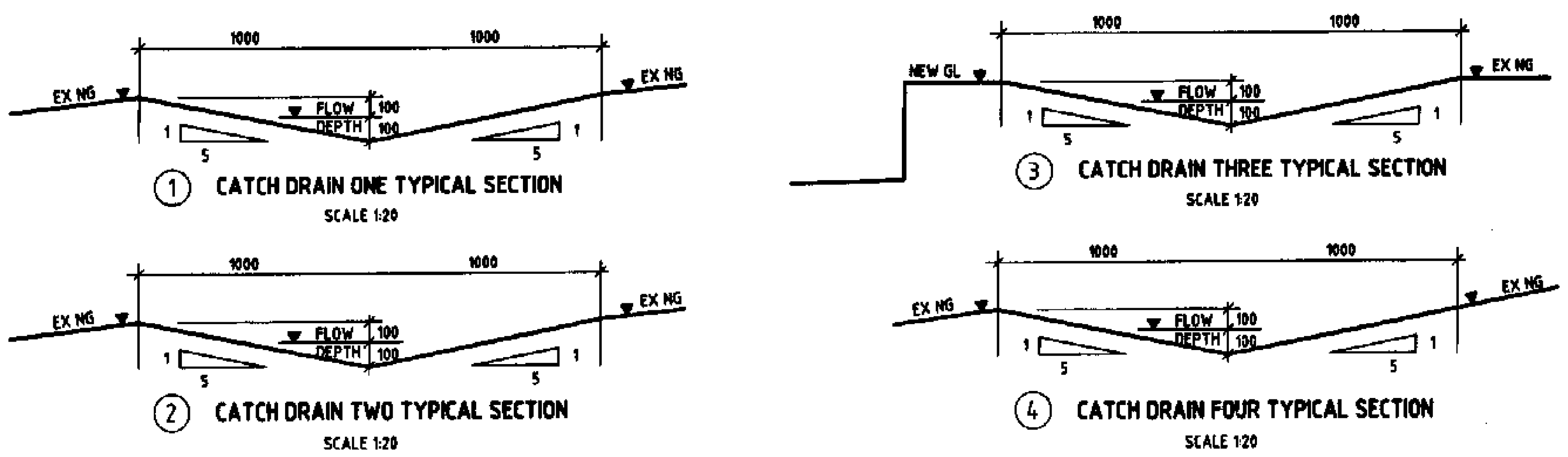
Formula Dia = ((0.48 x 0.0118)/sqrt1.525)^0.5

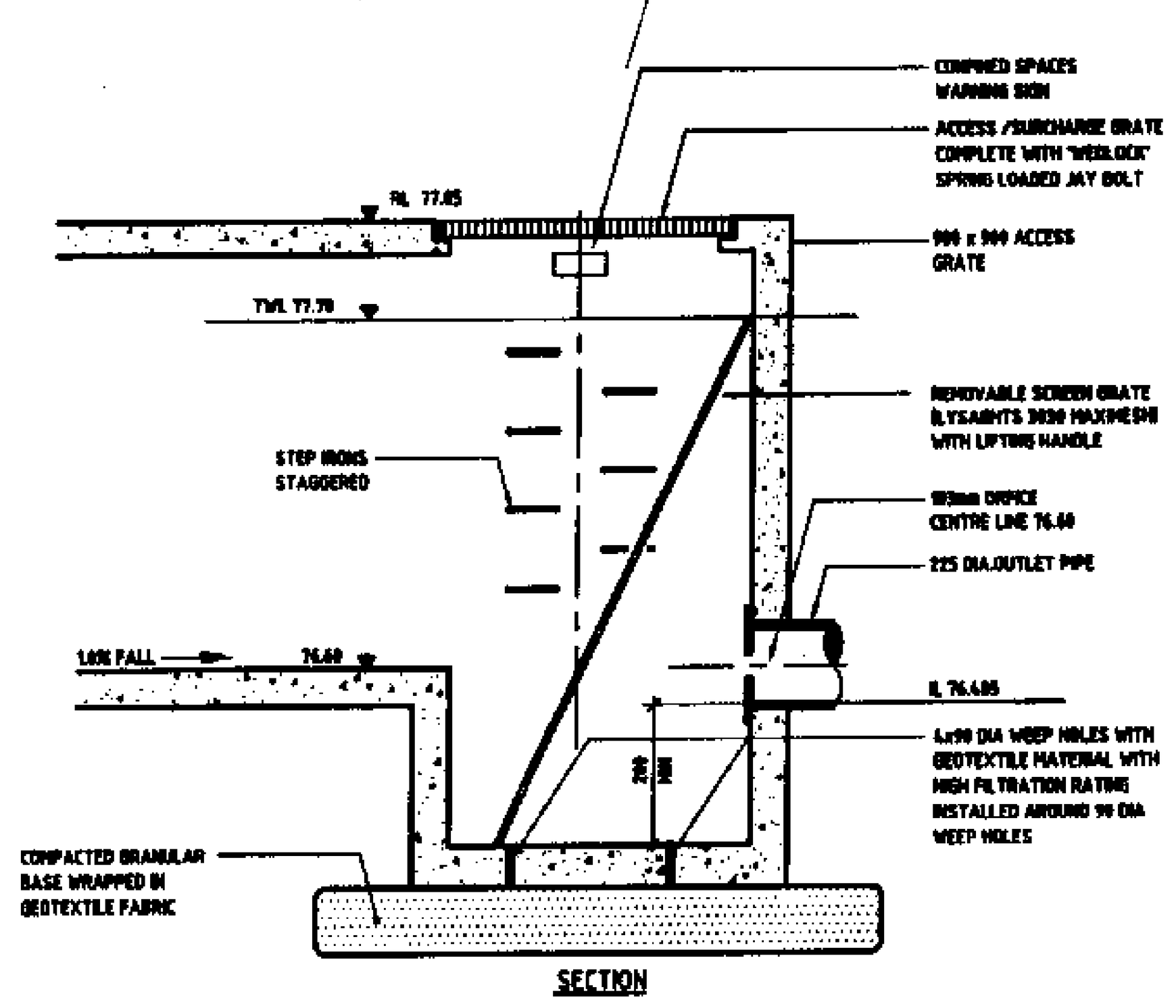
Top Water Level RL:	AHD	77.7	m
Centre line of orifice RL:	AHD	76.6	m
Head over orifice	AHD	1.1	m
Permissable discharge through orifice		23.09	l/s
Orifice Diameter =		0.103	m
		103	mm



LEGEND

- STORMWATER DRAINAGE
- SUB-SOIL DRAINAGE
- TO BE RETAINED
- CONDUIT
- THROUGH DROPPER/RISER
- BEND UP
- BEND DOWN
- TEE UP
- TEE DOWN
- AC — ACCESS CHAMBER
- SIP — SEWER INSPECTION PIT
- SWS — STORMWATER SUMP
- RISER / SERVICE TYPE / SERVICE SIZE / DROPPER
- DETAIL No. / DRG No. — DETAIL REFERENCE
- FOR CONTINUATION REFER DWG No.H-...





DETENTION TANK OUTLET

NOT TO SCALE

A NOTICE PLATE SHALL BE FIXED ADJACENT TO THE DETENTION TANK AND HEAD PIT ADVISING "THIS SEDIMENT/SILT ARRESTOR SHALL BE REGULARLY INSPECTED AND CLEANED"

SITE ANALYSIS

SITE AREAS = 2833.68

PRE DEVELOPED
PERVIOUS = 2733.68
IMPERVIOUS = 100.00

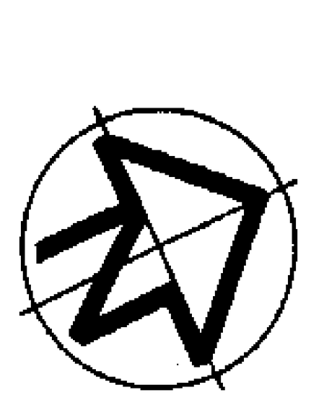
DEVELOPMENT SITE AREA
NET SITE AREA = 1069.00 (37.7%)

POST DEVELOPMENT
PERVIOUS = 651.45 (61%)
IMPERVIOUS = 417.55 (39%)

BASIN CATCHMENT
CATCHMENT AREA = 974.00 (91.0%)
IMPERVIOUS = 417.55

ANTHONY PROTAS CONSULTING PTY LTD — DETAILS NOTED

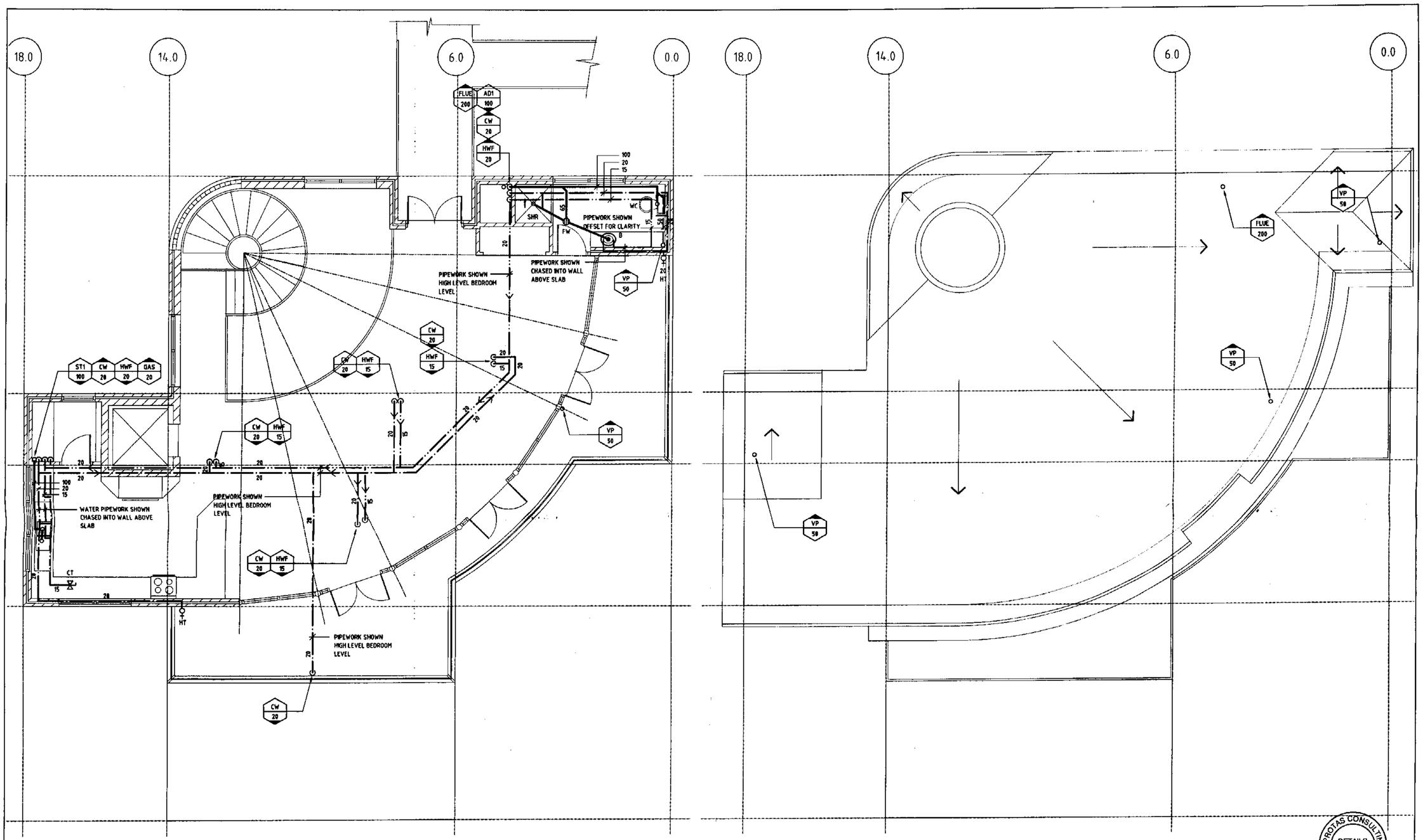
NOT FOR CONSTRUCTION



DATE	No	AMENDMENT	INIT.	ISSUE
01.07.02		DA-SUBMISSION	LN	A

SPARKS AND PARTNERS
HYDRAULIC, CIVIL & FIRE SERVICES CONSULTANTS
107 GEORGE STREET PARRAMATTA NEW SOUTH WALES 2150
QUALITY ASSURED COMPANY ISO 9001 : 1994

PROJECT	PRIVATE RESIDENCE 27c ALEXANDRA CRESCENT BAYVIEW
CLIENT	MR & MRS A MARROCCO 4 LANE COVE ROAD, INGLESIDE
TITLE	HYDRAULIC SERVICES SITE PLAN/LEGEND
DESIGNED BY	PDW
DATE	05.04.02
CHECKED BY	
SCALE	1 : 200
DRAWN BY	CT
DATE	APRIL 2002
JOB NO	01473
DRAWING No.	SW-01
No. IN SET	1 of 4
ISSUE	A



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7. Completion of the Quality Record is evidence that the design and drawing have been verified.

VERIFICATION
Completion of this Drawing Status is evidence that the design has been verified as conforming to the requirements of the Project Quality Plan

DRAWING STATUS	INITIAL	DATE
PRELIMINARY		
FOR INFORMATION ONLY		
FOR CLIENT APPROVAL		
FOR TENDER		
FOR CONSTRUCTION		

DATE	No	AMENDMENT	INIT.	ISSUE	DATE	No	AMENDMENT	INIT.	ISSUE
01.07.02		FOR CONSTRUCTION	LN	A					

0 0.5m 1m 1.5m 2m 2.5m 5m
SCALE 1 : 50

S.J. SPARKS & PARTNERS PTY. LTD. A.C.N. 000 000 000
107 CROMWELL STREET PARRAMATTA
NEW SOUTH WALES 2150
TEL. (02) 9891 3033 FAX (02) 9891 3090
EMAIL mail@sjsparks.com.au

SPARKS AND PARTNERS
HYDRAULIC CIVIL & FIRE SERVICES CONSULTANTS

QUALITY ASSURED COMPANY ISO 9001 : 1994

PROJECT
PRIVATE RESIDENCE
27c ALEXANDRA CRESCENT
BAYVIEW

TITLE
HYDRAULIC SERVICES
MAIN ENTRANCE /
ROOF LEVEL

CLIENT
MR & MRS A MARROCCO
4 LANE COVE ROAD, INGLESIDE

DESIGNED BY	PDW	CHECKED BY	
DATE	05.04.02	DATE	
SCALE	1 : 50	DRAWN BY	CT
DATE	JUNE 2002		
JOB NO	01473	DRAWING No.	H-03
No. IN SET	3 of 4	ISSUE	A

ANTHONY PROTAS CONSULTING PTY LTD
DETAILS NOTED

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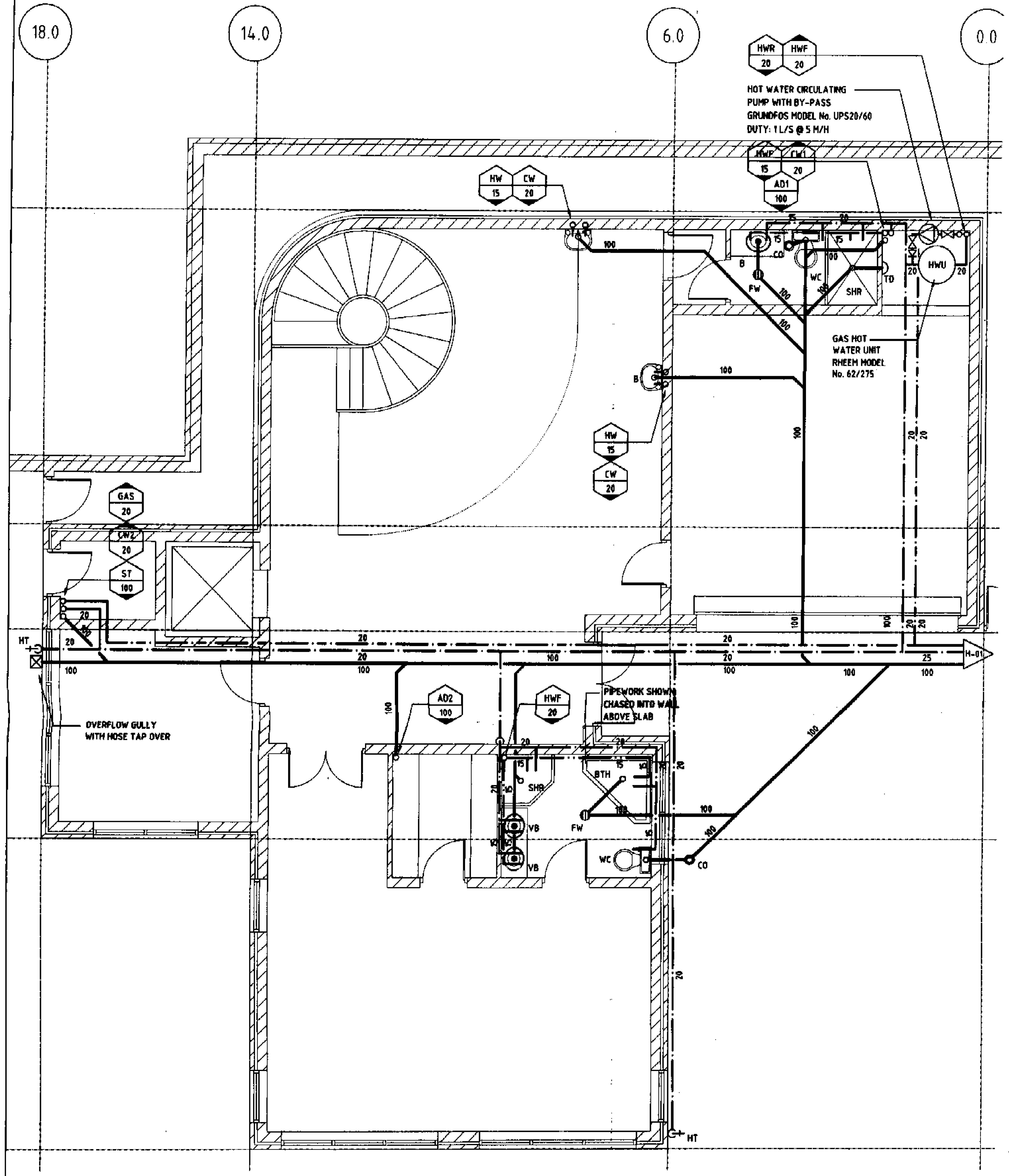
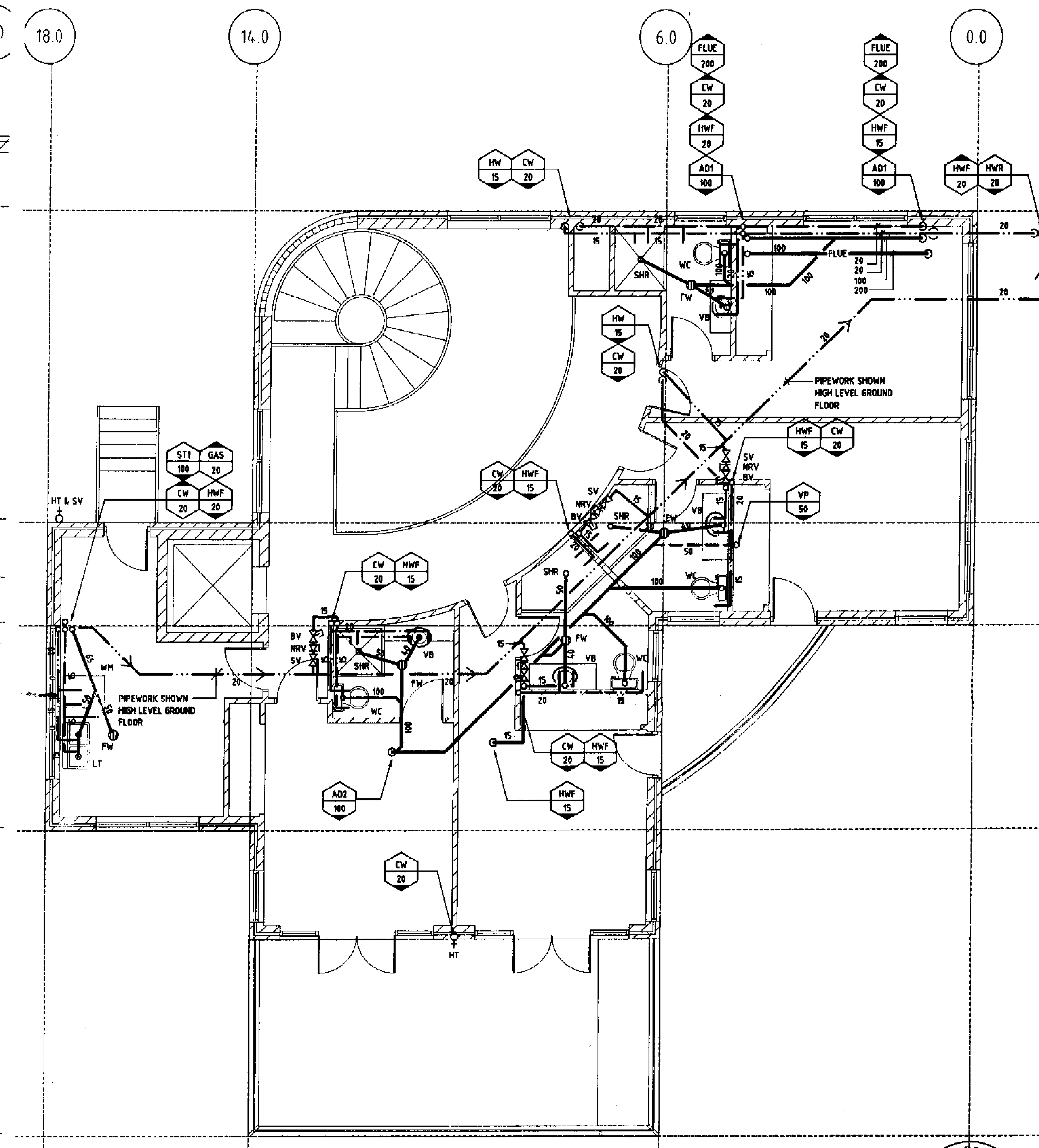


GROUND FLOOR



BEDROOM LEVEL

ANTHONY PROTAS CONSULTING PTY LTD — DETAILS NOTED

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VERIFICATION
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DRAWING STATUS	INITIAL	DATE
PRELIMINARY		
FOR INFORMATION ONLY		
FOR CLIENT APPROVAL		
FOR TENDER		
FOR CONSTRUCTION		

DATE	No	AMENDMENT	INIT.	ISSUE	DATE	No	AMENDMENT	INIT.	ISSUE
12.07.02		FOR CONSTRUCTION	LN	A					

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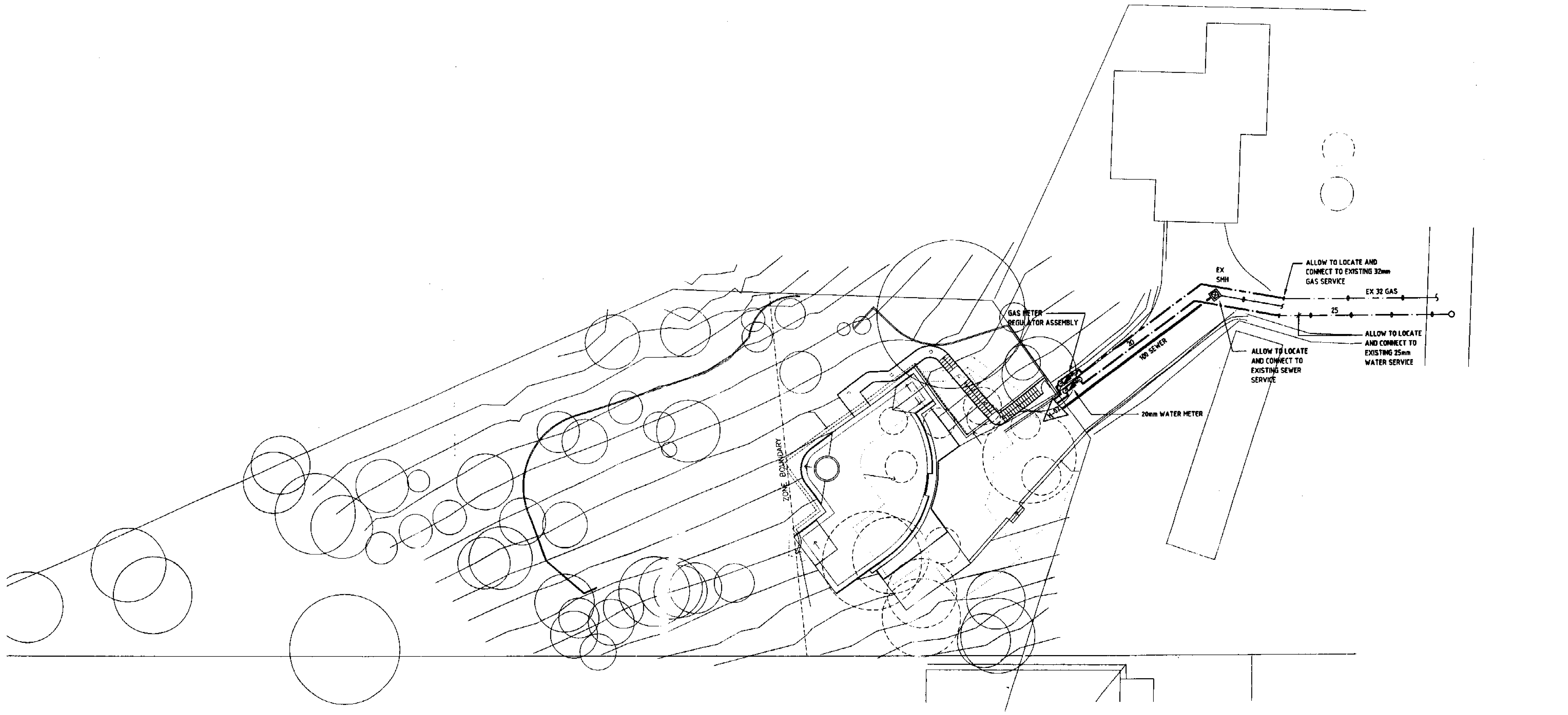
HYDRAULIC, CIVIL & FIRE SERVICES CONSULTANTS
G.J. SPARKS & PARTNERS PTY. LTD.
107 GEORGE STREET PARRAMATTA NEW SOUTH WALES 2150
QUALITY ASSURED COMPANY ISO 9001 : 1994

PROJECT PRIVATE RESIDENCE 27c ALEXANDRA CRESCENT BAYVIEW	CLIENT MR & MRS A MARROCCO 4 LANE COVE ROAD, INGLESIDE
TITLE HYDRAULIC SERVICES GROUND LEVEL & BEDROOM LEVEL	DESIGNED BY PDW, DATE 05.04.02; CHECKED BY, DATE SCALE 1 : 50; DRAWN BY LN; DATE JUNE 2002 JOB NO 01473; DRAWING No. H-02; No. IN SET 2 of 4; ISSUE A

S:\work\01473\HYDRAULIC\01473-H02.dwg Tue Jul 16 11:41:52 2002



0 2m 4m 6m 8m 10m 20m
SCALE 1 : 200

LEGEND

- WASTE/SOIL
- STORMWATER DRAINAGE
- COLD WATER (CW)
- HOT WATER FLOW (HW)
- HOT WATER RETURN (HWR)
- VENT PIPE (VP)
- TO BE DISUSED
- TO BE RETAINED
- THROUGH DROPPER/RISER
- BEND UP
- BEND DOWN
- TEE UP
- TEE DOWN
- FW — FLOOR WASTE
- CV — CONTROL VALVE
- HT — HOSE TAP
- NON RETURN VALVE
- REFLUX VALVE
- BALANCING VALVE
- GV — GATE VALVE
- TD — TUNDISH
- WM — WATER METER
- SIP — SEWER INSPECTION PIT
- OVERFLOW GULLY
- SERVICE SIZE — RISER / SERVICE TYPE / SERVICE SIZE / DROPPER
- DETAIL No. / DRG No. — DETAIL REFERENCE
- H- — FOR CONTINUATION REFER DWG No.H-...
- WC — WATER CLOSET
- BTH — BATH
- B — BASIN
- VB — VANITY BASIN
- SHR — SHOWER

ANTHONY PROTAS CONSULTING PTY LTD — DETAILS NOTED

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4. Authorities mains and/or existing services are to be located and checked prior to commencement of any works
5. The information on this drawing is to be used for site hydraulic and/or fire protection services only.
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7. Completion of the Quality Record is evidence that the design and drawing have been verified.

VERIFICATION
Completion of the Drawing Status is evidence that the design has been verified as conforming to the requirements of the Project Quality Plan

DRAWING STATUS	INITIAL	DATE
PRELIMINARY		
FOR INFORMATION ONLY		
FOR CLIENT APPROVAL		
FOR TENDER		
FOR CONSTRUCTION		

DATE	No	AMENDMENT	INIT.	ISSUE	DATE	No	AMENDMENT	INIT.	ISSUE
01.07.02		FOR CONSTRUCTION	LN	A					

SPARKS AND PARTNERS
HYDRAULIC, CIVIL & FIRE SERVICES CONSULTANTS
QUALITY ASSURED COMPANY ISO 9001 : 1994

PROJECT	PRIVATE RESIDENCE 27c ALEXANDRA CRESCENT BAYVIEW
CLIENT	MR & MRS A MARROCCO 4 LANE COVE ROAD, INGLESIDE
TITLE	HYDRAULIC SERVICES SITE PLAN & LEGEND
DESIGNED BY	PDW
DATE	05.04.02
CHECKED BY	
DATE	
SCALE	1 : 200
DRAWN BY	LN
DATE	JUNE 2002
JOB NO	01473
DRAWING No.	H-01
No. IN SET	1 of 4
ISSUE	A

S:\work\01473\HYDRAULIC\01473-H01.dwg Mon Jul 01 18:35:34 2002

PLAN OR DOCUMENT CERTIFICATION

I am a qualified Environmental Horticulturalist

I hold the following qualifications. BSc. (Environmental & Urban Horticulture)
MAILDM MAIH MAABR

Further I am appropriately qualified to certify this component of the project.

I hereby state that this Landscape Plan & Site Protection Details complies with the conditions of Development consent , DCP 23 Landscape and Vegetation Management and is in accordance with the requirements of the NSW Department of Land and Water Conservations "Urban Erosion and Sediment Control" Manual

Julia Stanton	19/04/02	
Name	Date	Signature

PLANTING SCHEDULE

Botanical Name	Syn	Common Name	Size	No	Pot Size
Groundcovers					
Scaevola sp (N)	Sc	Scaveloa	Groundcover	7	Tubez
Shrubs					
Acmena smithii (I)	As	Lilly pilly	4-6m	5	200mm
Banksia integrifolia (I)	Bi	Coast Banksia	4-6m	5	200mm
Ceratopetalum gummiferum (I)	Cg	NSW Christmas Bush	4-6m	5	200mm
Elaeocarpus reticulatus (I)	Er	Blueberry Ash	4-6m	5	200mm
Eremophila nivea (Grafted) (N)	En	Emu Bush	0.5-1.0m	3	150mm
Eriostemon myoporoides (N)	Em	Wax Flower	0.5-1.0m	5	150mm
Syzygium luehmannii (N)	Sl	Weeping Lilly Pilly	5-6m	20	25l
Trees					
Angophora costata (I)	Ac	Sydney Red Gum	15-20m	1	150mm
Corymbia maculata (I)	Cm	Spotted Gum	15-20m	1	150mm
Syncarpia glomulifera (I)	Sg	Turpentine	15-20m	1	150mm

I = Indigenous to the Pittwater Spotted Gum Forest

EXISTING VEGETATION
REMNANT PITTWATER SPOTTED GUM FOREST

REGENERATION AREA 2
WEED CONTROL TO COMMENCE ON COMPLETION OF PRIMARY & SECONDAY WEED CONTROL IN AREA 1
SEE BUSHLAND MANAGEMENT PLAN FOR DETAILS

REPLACEMENT CANOPY PLANTING
Corymbia maculata
Angophora costata
Syncarpia glomulifera

REGENERATION AREA 1
WEED CONTROL REQUIRED
PRIMARY, SECONDARY & MAINTENANCE
SEE BUSHLAND MANAGEMENT PLAN FOR DETAILS

SCREEN DWELLING FROM ADJACENT PROPERTIES

5 *Elaeocarpus reticulatus*
5 *Ceratopetalum gummiferum*
5 *Acmena smithii*
5 *Banksia integrifolia*

PLANTER BOX
5 *Eriostemon myoporoides*
3 *Eremophila nivea* (Grafted)
7 *Scaevola sp*

SCREEN DWELLING FROM ADJACENT PROPERTIES

20 *Syzygium luehmannii*

SERVICE EASEMENT (STORMWATER & SEWERAGE)

LEGEND

EXISTING TREES

TREES TO BE REMOVED

TREES TO BE RETAINED

PROPOSED PLANTINGS

PROPOSED CANOPYTREES

PROPOSED SHRUBS

PROPOSED GROUND COVERS

SITE PROTECTION DETAILS

EXCLUSION FENCING

SILT FENCE

HAY BALE FILTER

DIVERSION MOUND

NOTES

EXCLUSION FENCING IS TO BE IN PLACE PRIOR TO THE COMMENCEMENT OF WORK.

SILT AND SEDIMENT CONTROLS ARE TO BE IN PLACE PRIOR TO THE COMMENCEMENT OF WORK

THERE SHOULD BE NO INCREASE OR DECREASE OF SOIL LEVELS, COMPACTION OF SOIL OR DISPOSAL OF BUILDING WASTE IN THE EXCLUSION ZONES.

SITE PREPARATION PRIOR TO PLANTING:

- WEEDS ARE TO BE CONTROLLED IN SCREEN PLANTING AREAS
- IF EXTRA SOIL IS REQUIRED FOR PLANTING PREMIUM QUALITY NATIVE (LOW PHOSPHOROUS) SOIL OR PLANTING MIX IS TO BE USED.
- PLANTER BOX TO CONTAIN NATIVE PLANTER BOX SOIL MIX
- PLANTER BOX TO INCLUDE AN APPOVED DRAINAGE SYSTEM
- PLANTER BOX TO BE MULCHED TO A DEPTH OF 75MM.

PLANTING

- SCREEN ON NORTH EAST BOUNDARY 20 X *Syzygium luehmannii* PLANTED AT 1.25M CENTRES
- INFORMAL SCREEN ON EAST BOUNDARY 20 PLANTS (5 X *Elaeocarpus reticulatus* 5 X *Ceratopetalum gummiferum*, 5 X *Acmena smithii* and 5 X *Banksia integrifolia*) AT 1.5 - 2M CENTRES
- SCREEN PLANTINGS TO BE MULCHED TO A DEPTH OF 75MM. THE MULCHED IS TO COVER THE LENGTH OF THE SCREEN AND COVER A MINIMUM WIDTH OF 500MM OUT FROM THE CENTRE OF THE PLANTINGS

N

Landscape Plan & Site Protection Details

Mr and Mrs Marrocco
27c Alexandra Crescent Bayview

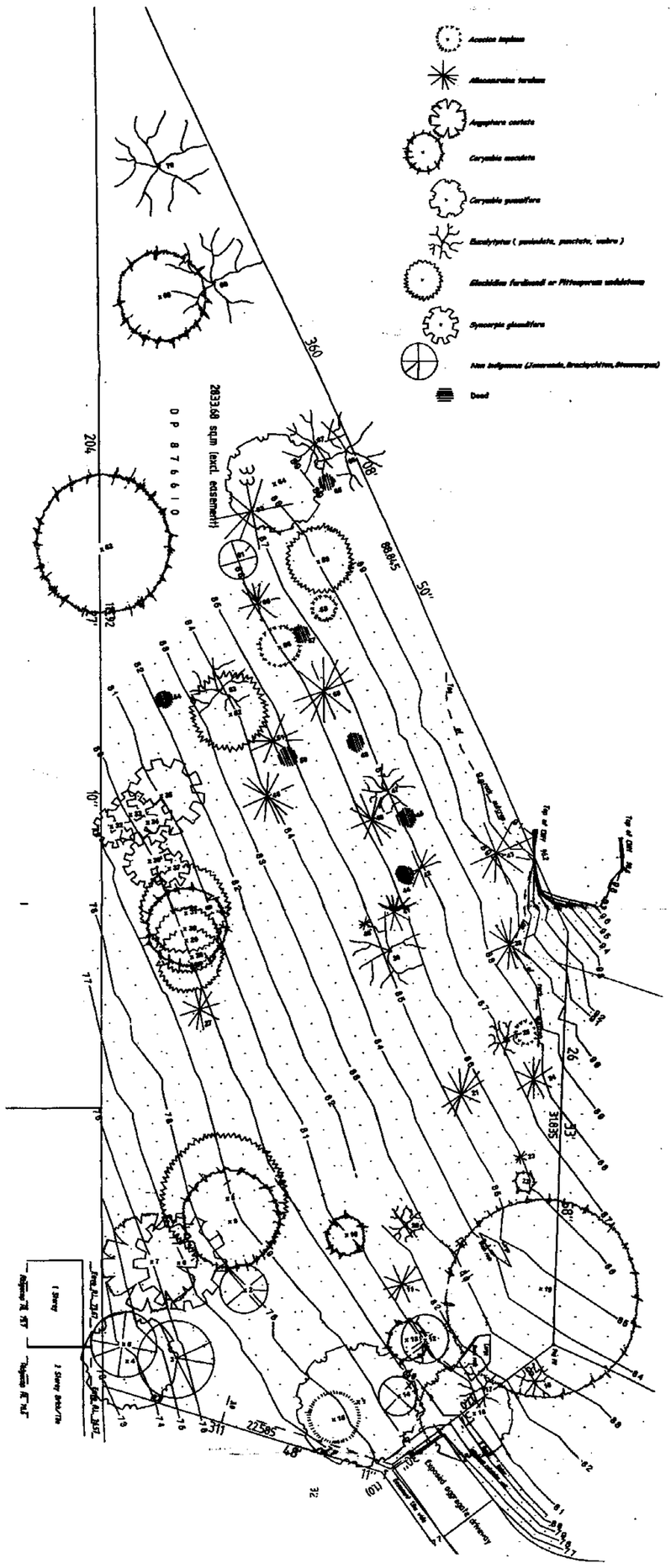
Date: 19/4/02

Scale 1:200

Drawing No: 1 of 2

BioDesign Environmental Pty Ltd
P.O Box 294 Church Point 2105
PH: (02) 99798267 MOB: 0403074075

ANTHONY PROTAS CONSULTING PTY LTD
DETAILS NOTED



Tree No.	Botanical Name	Common Name	DBH mm	Height (Metre)	Canopy (Metre)	Existing Condition	Proposed Action
1	*Corymbia gummifera*	Red Bloodwood	450	16m	10m	Fair/Good-25% dead wood, small branch & twig die back.	Remove- building envelope
2	*Stenocarpus sinuatus*	Fire Wheel Tree	180	9m	4m	Good/Excellent	Retain/Protect
3	*Brachychiton acerifolium*	Illawarra Flame	250	12m	6m	Fair- Insect damage	Retain/Protect
4	*Corymbia gummifera*	Red Bloodwood	270	15m	8m	Fair /Good -15% dead wood, small branch & twig die back	Retain / Protect/ Dead wood
5	*Eriobotrya japonica*	Loquat	150	8m	5m	Good-10% dead wood	Retain
6	*Syncarpia glomulifera*	Turpentine	400	12m	8m	Good /Excellent 5% dead wood	Remove- building envelope
7	*Angophora costata*	Sydney Red Gum	350	16m	8m	Fair /Good 25% deadwood, some epicormic growth	Remove- building envelope
8	*Glochidion ferdinandi*	Cheese Tree	300	10m	9m	Fair/Good- 15% dead wood, insect attack	Remove- building envelope
9	*Corymbia maculata*	Spotted Gum	350	15m	8m	Fair/Good -20% dead wood, some epicormic growth, branch & twig die back	Remove - building envelope
10	*Corymbia maculata*	Spotted Gum	150	10m	3m	Good-15% dead wood	Remove -building envelope
11	*Allocasuarina torulosa*	She-oak	250	8m	3m	Fair/Good 10% dead wood, some epicormic growth	Remove- building envelope
12	*Jacaranda mimosaefolia*	Jacaranda	200	8m	4m	FairDamage to trunk	Remove- building envelope
13	*Corymbia maculata*	Spotted Gum	150	9m	3m	Good-10% dead wood	Remove- building envelope
14	*Syzygium leuhmannii*	Lilly Pilly	150	4.5m	3m	Good	Remove- building envelope
15	*Persoonia linearis*	Geebung	200	4m	4m	Excellent	Remove -building envelope
16	*Corymbia gummifera*	Red Bloodwood	250	16m	8m	Good,- some damage to main trunck	Retain/Protect
17	*Eucalyptus umbra*	White Mahogany	200	10m	3m	Good	Retain/Protect
18	*Eucalyptus umbra*	White Mahogany	200	10m	4m	Excellent	Reatin/Protect
19	*Corymbia maculata*	Spotted Gum	1100	35m	15m	Good	Retain/Protect
20	*Eucalyptus umbra*	White Mahogany	220	6m	3m	Good	Remove, building envelope
21	*Allocasuarina torulosa*	She-oak	300	10m	4m	Excellent	Retbin/Protect
22	*Corymbia maculata*	Spotted Gum	80	6m	1.5m	Fair -significant trunk damage, kino	Retain/ Protect
23	*Allocasuarina torulosa*	She-oak	60	4.5m	1m	Fair -damage to main leader	Retain/ Protect
24	*Allocasuarina torulosa*	She-oak	140	6m	3m	Fair - 40% dead wood	Retain/Protect
25	*Acacica implexa*	Hickory	110	10m	2m	Good 15% dead wood	Retain/Protect
26	*Eucalyptus paniculata*	Grey Iron Bark	110	10m	3m	Fair - 30% dead wood, small branch & twig die back	Retain/Protect
27	*Allocasuarina torulosa*	She-oak	250	14m	3m	Poor - 50% dead wood	Retain/Protect
28	*Glochidion ferdinandi*	Cheese Tree	120	7m	5m	Fair/Good - 20% dead wood, insect damage	Retain/Protect
29	*Glochidion ferdinandi*	Cheese Tree	180	8m	5m	Fair/Good - 20% dead wood, insect damage	Retain /Protect
30	*Corymbia maculata*	Spotted Gum	320	18m	6m	Fair - 30% dead wood thinning canopy, branch & twig die back	Retain/Protect/ Dead wood
31	*Glochidion ferdinandi*	Cheese Tree	270	13m	7m	Fair/Good- 20% dead wood, insect damage	Retain/Protect
32	*Syncarpia glomulifera*	Turpentine	180	4m	3m	Fair - damge to terminal leader	Retain/Protect
33	*Syncarpia glomulifera*	Turpentine	200	8m	4m	Good	Retain/Protect
34	*Syncarpia glomulifera*	Turpentine	175	8m	4m	Good	Retain/Protect
35	*Syncarpia glomulifera*	Turpentine	300	10m	6m	Good	Retain/Protect
36	*Syncarpia glomulifera*	Turpentine	200	8m	4m	Good	Protect/Retain
37	*Syncarpia glomulifera*	Turpentine	130	5m	3m	Good	Protect /Retain
38	*Allocasuarina torulosa*	She-oak	320	12m	4m	Fair/Good, termites nest, good habitat	Retain/Protect
39	*Eucalyptus paniculata*	Grey Iron Bark	300	15m	6m	Fair/Good- 15% dead wood, twig die back	Retain/Protect
40	*Allocasuarina torulosa*	She-oak	185	6m	1m	Fair, 10% dead wood, damaged terminal Branch	Retain/Protect
41	*Allocasuarina torulosa*	She-oak	175	10m	3m	Good	Retain/Protect
42	*Allocasuarina torulosa*	She-oak	150	10m	3m	Fair/Good, epicormic growth, damaged terminal leader	Retain/Protect
43	*Allocasuarina torulosa*	She-oak	300	10m	5m	Fair/Good, 10% dead wood, lower trunk damage, damaged terminal leader	Retain/Protect
44		Dead				Habitat	Retain
45		Dead				Habitat	Retain
46	*Allocasuarina torulosa*	She-oak	220	12m	4m	Excellent	Retain/Protect
47	*Eucalyptus paniculata*	Grey Iron Bark	200	13m	4m	Fair -15% dead wood, failure of significant branch, uneven canopy	Retain/Protect
48	*Allocasuarina torulosa*	She-oak	200	10m	4m	Fair/Good, growing at an angle	Retain/Protect
49		Dead				Habitat	Retain
50		Dead				Habitat	Retain
51	*Allocasuarina torulosa*	She-oak	170	8m	4m	Good/Excellent	Reatin/Protect
52	*Pittosprum undulatum*	Pittosporum	250	7m	6m	Excellent	Retain/Protect
53	*Eucalyptus umbra*	White Mahogany	110	8m	5m	Poor, 40%dead wood	Reatian /Protect
54		Dead				Habitat	Retain
55	*Allocasuarina torulosa*	She-oak	175	7m	5m	Excellent	Retain/Protect
56	*Acacica implexa*	Hickory	155	8m	3m	Excellent	Retain/Protect
57		Dead				Habitat	Retain
58	*Acacia implexa*	Hickory	60	4m	2m	Excellent	Retain/Protect
59	*Glochidion ferdinandi*	Cheese Tree	175	7m	5m	Fair - 20% dead wood, insect attack	Retain/Protect
60	*Allocasuraina torulosa*	She-oak	160	6m	3m	Fair/Good, terminal branch failure	Retain Protect
61	*Brachichiton acerifolius*	Illawarra Flame	180	7m	3m	Good	Retain/Protect
62	*Corymbia maculata*	Spotted Gum	400	20m	10m	Good-10% dead wood	Retain/Protect
63	*Allocasuarina torulosa*	She-oak	180	8m	6m	Excellent	Retain/Protect
64	*Corymbia gummifera*	Red Blood wood	600	22m	8m	Good-15% dead wood	Retain/Protect
65		Dead				Habitat	Retain
66	*Eucalyptus paniculata*	Grey Iron Bark	290	10m	6m	Good-20% dead wood, twig die back	Retain/Protect
67	*Eucalyptus punctata*	Grey Gum	220	10m	5m	Fair- 25% dead wood, twig 7 small branch die back	Retain/Protect
68	*Corymbia maculata*	Spotted Gum	310	16m	7m	Good/Excellent	Retain/Protect
69	*Eucalyptus paniculata*	Grey Iron Bark	500	18m	8m	Poor- 80% dead wood, die back of main branches	Retain, habitat
70	*Eucalyptus punctata*	Grey Gum	400	18m	8m	Fair/Good-15% dead wood	Retain/dead wood

Tree Survey

Mr and Mrs Marrocco
27c Alexandra Crescent Bayview

Date: 19/4/02

Scale 1:200

Drawing No: 2 of 2

BioDesign Environmental Pty Ltd
P.O Box 294 Church Point 2105
PH: (02) 99731649 MOB: 0403074075

ANTHONY PROTAS CONSULTING PTY LTD
DETAILS NOTED

SCANNED
- 8 NOV 2002
PITTWATER COUNCIL

SPECIFICATION FOR BUILDING WORK

THE WORK

The building work is the excavation of the site and construction of a three storey brick an concrete residence including a garage and a three story lift with full air-conditioning and security services.

No/street	27c Alexandria Crescent
Suburb/town	Bayview
Municipality/shire/city	Pittwater
Reference to title	
Lot/position	Lot 33
Deposited Plan (DP)	D P 876610

THE PARTIES

Owner(s)	Mr & Mrs A Marrocco
Address	1/8 Lagoon St Narrabeen NSW 2101
Builder	Owner Builder
Address	As Above
Licence/registration number	

INDEX

APPROVED
18 OCT 2002
ANTHONY PROTAS CONSULTING PTY. LTD.

SCANNED
08 NOV 2002
PITTWATER COUNCIL

GENERAL REQUIREMENTS

GENERAL

Interpretation

Owner: Means the same as "principal" or "proprietor".
Builder: Means the same as "contractor".
Supply: Means "supply only" - do not install.
Provide: Means "supply and install".
Required: Means required by the contract documents or by the local council or statutory authorities.
Proprietary: Means identifiable by naming the manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.

Standards

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

Manufacturers' or suppliers' recommendations

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

Bushfire protection

If required, provide protection to AS 3959-1999 (*Construction of buildings in bushfire prone areas*).

CONTRACTS AND FINANCE

Payment and adjustment of contract sum

At commencement of the building work, submit a schedule of anticipated progress claims, which will be made throughout the contract.
Progress claims break-down: With each progress claim, submit a statement of amounts claimed in respect of each worksection or trade heading designated in the specification. **NOT APPLICABLE**

AUTHORITIES AND ESTABLISHMENT

Prior applications and approvals **DEVELOPMENT APPROVAL**

Existing services

Attend to existing services as follows:

- If the service is to be continued, repair, divert or relocate as required. If such a service crosses the line of a required trench, or will lose support when the trench is excavated, provide permanent support for the existing service.
- If the service is to be abandoned, cut and seal or disconnect, and make safe.

Temporary services and works

Provide temporary toilet accommodation. Connect to the sewer main if required by the Local Authority.

Use of existing services

Existing services may be used as temporary services for the performance of the contract.

Signs

Provide a signboard displaying the owners name, the lot number and the owner builder's licence number.

EXECUTION AND COMPLETION

Survey marks

Preserve and maintain the owners survey marks in their true positions.
Rectification: If the proprietor's survey marks are disturbed or obliterated, immediately give notice and rectify the disturbance or obliteration.

Hours of work

AS PER COUNCIL DA CONDITIONS

Removal of temporary work, services and plant

Remove temporary work services and construction plant within 10 working days after practical completion.
Rectification: Clean and repair damage caused by the installation or use of temporary work and services and restore existing facilities used during construction to original condition.

Final cleaning

Remove rubbish and surplus material from the site and clean the work throughout.

Warranties

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

Instruction manuals

Give the owner manufacturers' instruction manuals.

Operation

Ensure moving parts operate safely and smoothly.

Termite barriers

Provide a durable notice permanently fixed and located in or near the meter box as required by Part 3.1.3 of BCA Volume 2.

Surveyor's certificate

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

Services layout

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

Authorities' approvals

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

Keys

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

TERMITE PROTECTION

General

Standard: To AS 3660.1-1995 (*Protection of buildings from subterranean termites - Prevention, detection and treatment of infestation - New buildings*).

Termite protection schedule

Location	Method
Slab	TO AS3660.1-1995 Physical P
Slab penetrations	TO AS3660.1-1995 Physical P

	Slab control joint and footing joints	TO AS3660.1-1995 Physical P
	Under slabs	TO AS3660.1-1995 Physical P
	Building perimeters	TO AS3660.1-1995 Physical P

Chemical soil barriers - reticulation systems: Submit evidence that the system has been type tested to AS 3660.1-1995 (*Protection of buildings from subterranean termites - Prevention, detection and treatment of infestation - New buildings*) Appendix D.

TIMBER GENERALLY

Unseasoned timber

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

Durability

General: Provide timbers with natural durability appropriate to the conditions of use, or preservative-treated timbers of equivalent durability.
Natural durability classification: To AS 1604-1997 (*Timber - Preservative-treated* - ***Sawn and round***) **Table F2.**

Minimum requirements:

- Class 1: Timbers in contact with the ground.
- Class 2: Timbers above ground, not in continuous contact with moisture, well ventilated, protected from moisture but exposed to the weather.
- Class 3: Timbers above ground, not in continuous contact with moisture, well ventilated, protected with a finish, and well maintained.
- Class 4: Timbers fully protected from moisture, indoor, above ground, and well ventilated.

Preservative treatment

Standard: To AS 1604-1997 (*Timber – Preservative treated – Sawn and round*).
Hazard classification: To AS 1604-1997 (*Timber – Preservative treated – Sawn and round*) Table D1.
CCA (copper chrome arsenic) preservative: Type 1.

SITE PREPARATION

GENERAL

Standard

Groundworks for slabs and footings: To AS 2870-1996 (*Residential slabs and footings – Construction*).

Interpretation

Rock: Monolithic material with volume greater than 0.5 m^3 which cannot be removed until broken up by mechanical means such as rippers or percussion tools.

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

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

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

Immediate notice

If rock or bad ground is encountered, advise the owner immediately.

Explosives

Do not use explosives.

TREES TO BE RETAINED

Existing trees, plants and shrubs

AS SHOWN ON THE LANDSCAPE DRAWINGS

Trees, plants and shrubs to be retained:

AS PER LANDSCAPE DRAWINGS

Trees, plants and shrubs to be removed:

AS PER LANDSCAPE DRAWINGS

Marking

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

Protection

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

Excavation

If excavating near trees required to be retained, use hand methods to locate, expose and cleanly remove the roots on the line of excavation.

ENVIRONMENTAL PROTECTION

Erosion control

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

Dewatering

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

SITE CLEARING

Extent

Limit clearing to areas to be occupied by construction, paving or landscaping.

Clearing operations

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

Grubbing

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

Removal of topsoil

General: Remove the topsoil layer of the natural ground which contains substantial organic matter over the areas to be occupied by construction and paving.
Maximum depth: 100 mm.

Topsoil stockpiles

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

Surplus material

Take possession of surplus material and remove it from the site.

EXCAVATION

Extent

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

Foundations

After excavation, have the engineer confirm that the bearing capacity is adequate.

Bearing surfaces

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

Reinstatement

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

Existing footings

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

Grading

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

SURFACE PREPARATION

General

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

Placing fill

Place fill in layers and compact each layer to achieve the required density.

Moisture content

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

PILING

Bored piers

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

SERVICE TRENCHES

Excavation

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

Trench widths

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

Backfilling

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

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

- Next to services: Do not place any particles greater in size than 25 mm within 150 mm of services.
- Under paved areas: Coarse sand, controlled low strength material or fine crushed rock.
- In reactive clay sites classified M, H or E to AS 2870-1996 (*Residential slabs and footings – Construction*): Impervious material.

CONCRETE CONSTRUCTION

GENERAL

Cross reference

Refer to the *General requirements* worksection for termite protection.

Standards

Concrete structures generally: To AS 3600-1994 (*Concrete structures*).
Ground slabs and footings: To AS 2870-1996 (*Residential slabs and footings - Construction*).

GROUND SLAB VAPOUR BARRIER

Material

General: Provide a proprietary vapour barrier which consists of high impact resistant polyethylene film minimum 0.2 mm thick which has been pigmented and branded by the manufacturer.
Type: AS PER ENGINEERS DRAWINGS

Base preparation

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

REINFORCEMENT

ALL AS PER ENGINEERS DOCUMENTS

CONCRETE

ALL AS PER ENGINEERS DOCUMENTS
Standard: To AS 1379-1997 (*Specification and supply of concrete*).

Concrete placing

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

Compaction

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

Curing

Protection: Protect concrete from premature drying and from excessive hot, cold and/or windy conditions.
Method: Cure concrete by

- keeping it covered and moist for the following periods:
  - In-ground footings: 2 days.
  - Exposed footings, beams and slabs: 7 days.

Stripping times

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

- Vertical surfaces: 2 days.
- Bottom surfaces: 7 days with shoring and backprops left in position for 21 days.

JOINTS

Construction joints

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

Slip joints

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

TIMBER AND STEEL CONSTRUCTION

GENERAL

Cross references

Refer to the following worksections:

- ***General requirements***, for termite protection and timber durability.
- ***Concrete construction***, for concrete bearer supports.
- ***Brick and block construction***, for clearance for timber frame shrinkage and masonry bearer supports.
- ***Block and tile finishes***, for waterproofing of wet areas.
- ***Painting***, for priming of steel and timber before fixing, and repair of zinc-coated steel after cutting and welding.

Standards

Timber framing and flooring: To AS 1684.4-1999 (*Residential timber-framed construction - Simplified - Non-cyclonic*) or AS 1720.1-1997 (*Timber structures – Design methods*).
Structural steelwork: To AS 4100-1998 (*Steel structures*).
Cold-formed steel framing: Provide a proprietary system designed to AS 3623-1993 (*Domestic metal framing*).
Preparation of metal surfaces: To AS 1627- Various (*Metal finishing - Preparation and pretreatment of surfaces*).

MATERIALS AND COMPONENTS

Cold-formed steel framing

Cold-form sections from zinc-coated steel or aluminium/zinc alloy coated steel to AS 1397-1993 (*Steel sheet and strip - Hot-dipped zinc-coated or aluminium/zinc-coated*)/Z200 or AZ175.

Self-drilling screws

Standard: To AS 3566-1988 (*Screws - Self-drilling - For the building and construction industries*) corrosion resistance class 2.

Flashings and damp-proof courses

Standard: To AS/NZS 2904-1995 (*Damp-proof courses and flashings*).

Timber fasteners

Metal washers: Provide washers to the heads and nuts of all bolts and coach screws.
Steel straps: Zinc-coated steel to AS 1397-1993 (*Steel sheet and strip - Hot-dipped zinc-coated or aluminium/zinc-coated*)/Z275, minimum size 25 x 1 mm or 30 x 0.8 mm.

Galvanizing

Galvanize mild steel components (including fasteners) to AS 1214-1983 (Hot-dip galvanized coatings on threaded fasteners (ISO metric coarse thread series)) or AS/NZS 4680-1999 (*Hot-dip galvanized (zinc) coatings on fabricated ferrous articles*), as appropriate, if

- exposed to weather;
- embedded in masonry; or
- in contact with chemically treated timber.

CONSTRUCTION GENERALLY

Welding

Standard: To AS/NZS 1554.1-1995 (*Structural steel welding - Welding of steel structures*).

Grommets

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

Swarf

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

Priming steel

Before fixing, prime steel, which is not galvanized or zinc-coated.

FLOORS

Damp-proof courses

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

Flashings

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

ROOF AND CEILING FRAMING

Wall plates

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

Steel zinc-coated straps: In cavities. Build bottom end 75 mm into brickwork, 1200 mm below plate. Bend top end over plate and fix with galvanized fastenings.

- Coating class: Z275.
- Size: 25 x 1 mm or 30 x 0.8 mm.

Bolts: 10 mm diameter hot dip galvanized steel, embedded at least 150 mm into the wall structure of solid masonry external walling or the top bond beam of load-bearing hollow block external walling.

Nailing strips

Where timber joists, rafters or purlins bear on steel members, provide 50 mm thick nailing strips bolted to the flange of the steel member at 450-mm maximum centres.

Purlin framing

General: Construct framing for pitched curved roofs where the ceiling does not follow the roof line, consisting of rafters or purlins acting as beams to support both ceiling and roof covering.

Blocking: Where the depth of rafters or purlins is at least 4 x width, provide solid blocking between them at the support points and at 1.8 mm maximum intervals between supports.

Plywood roofing

Standard: To AS/NZS 2269-1994 (*Plywood – Structural*), bond type A, tongue and grooved.

Minimum thickness (F8):

- Rafter spacing up to 450 mm: 14 mm.

Minimum thickness (F11):

- Rafter spacing up to 450 mm: 13 mm.

TIMBER ROOF TRIM

Priming timber

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

Fascia, valley gutter and barge boards

Minimum thickness:

- Fixed at up to 600 mm centres: 19 mm.
- Fixed at 600 - 900 mm centres: 32 mm.

BRICK AND BLOCK CONSTRUCTION

GENERAL

Cross references

Refer to the following worksections:

- *General requirements*, for termite protection.
- *Timber and steel construction*, for structural steelwork.

Standard

Masonry generally: To AS 3700-1998 (*Masonry structures*).
Masonry units: To AS/NZS 4455-1997 (*Masonry units and segmental pavers*).

MATERIALS AND COMPONENTS

Steel components

Galvanizing: Galvanize mild steel components (including fasteners) to AS 1214-1983 (*Hot-dip galvanized coatings on threaded fasteners (ISO metric coarse thread series)*), or AS/NZS 4680-(*Hot-dip galvanized (zinc) coatings on fabricated ferrous articles*), as appropriate.

Masonry units

Type: HOLLOW CORE CONCRETE BLOCKS
Manufacturer: BORAL
Size: 390 X190 X190 AND 390 X 190 X 90
Colour: NATURAL

Flashings and damp-proof courses

Standard: To AS/NZS 2904-1995 (*Damp-proof courses and flashings*).

Mortar materials

Sand: Fine aggregate with a low clay content and free from efflorescing salts,
Additives: Do not provide additives unless required.

Mortar mix table

Provide mortar mixes as follows:

Mortar proportions (cement:lime:sand)	Location	Mortar type to AS 3700
1:0:5 + water thickener	Concrete masonry	M3
1:0:4 + water thickener	Grouted and reinforced masonry	M4
1:0 - 0.25:3	Underpinning, high strength masonry	M4

CONSTRUCTION GENERALLY

Joints and cutting

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

Joints

Externally: Rake to give a key as wall is to be plastered
Internally: Rake to give a key as wall is to be plastered.

Rod 190 mm high blocks: 3 courses to 600 mm.

Bond Single leaf construction: Stretcher bond.

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

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

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

DAMP-PROOF COURSES

Location

Provide damp-proof courses in the following locations:

- Walls adjoining infill floor slabs on membranes: In the course above the underside of the slab in internal walls and inner leaves of cavity walls. Project 40 mm and dress down over the membrane turned up against the wall.
- Cavity walls built off slabs on ground: In the bottom course of the outer leaf, continuous horizontally across the cavity and up the inner face bedded in mortar, turned 30 mm into the inner leaf one course above; or, in masonry veneer construction, fastened to the inner frame 75 mm above floor level.
- Internal walls built off slabs on ground: In the first course above floor level.
- At timber floors: In the first course below the level of the underside of ground floor timbers in internal walls and inner leaves of cavity walls.

Installation

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

CAVITY MASONRY WALLS

Minimum cavity width

Masonry walls: 50 mm ± 10 mm.
Masonry veneer walls: 25 mm between the masonry leaf and the load-bearing frame and 40 mm between the masonry leaf and sheet bracing, if any.

Cavity flashings

Location: Provide flashings in the following locations:

- Floors: Full width of outer leaf immediately above slab, continuous across cavity and up the inner face bedded in mortar, turned 30 mm into the inner leaf two courses above.
- Under sills: 30 mm into the outer leaf bed joint one course below the sill, extending up across the cavity and under the sill in the inner leaf or the frame. Extend at least 150 mm beyond the reveals on each side of the opening.
- Over lintels to openings: Full width of outer leaf immediately above the lintel, continuous across cavity, 30 mm into the inner leaf two courses above or turned up against the frame and fastened to it. Extend at least 150 mm beyond the ends of the lintels.
- At abutments with structural frames or supports: Vertical flashing in the cavity from 150 mm wide material, wedged and grouted into a groove in the frame opposite the cavity.
- At roof abutments with cavity walls: Cavity flashing immediately above the roof and over-flash the roof apron flashing.

Installation: Sandwich flashings between mortar except where on lintels.
Pointing: Point up joints around flashings to fill voids.

Weepholes

General: At ground floors, provide weepholes in the form of open perpends to external leaves of cavity walls in the course above cavity flashings.
Maximum spacing: Every third perpend.

WALL TIES

Tie spacing table

Space ties to the following maximum intervals:

Masonry	Generally	Around openings and join
190 mm high blocks		
- vertically	3 courses	Alternate 1 and 2 courses
- horizontally	1 block	½ block

Embedment

Embed at least 50 mm into mortar and ensure mortar cover is 15 mm minimum to the outside face of the mortar.

Wall tie application table

Provide wall ties as follows:

Category to AS/NZS 2699.1	Application
Light duty	Masonry veneer
Medium duty	Normal cavity block construction

CONTROL OF MOVEMENT

Ageing of bricks and concrete Minimum age of concrete blocks: 21 days.

Control joints for calcium silicate and concrete masonry

Maximum length of continuous wall: 8 m.
Minimum width of control joint: 10 mm.

Flexible ties and anchors

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

Joint material

Installation: Clean the joints thoroughly and insert an easily compressible backing material before sealing.
Sealant depth: Fill the joints with a gun-applied flexible sealant for a depth of at least two-thirds the joint width.

STEEL LINTELS

Cold formed lintels

General: Proprietary cold-formed flat-based type designed to AS/NZS 4600-1996 (*Cold-formed steel structures*).
Material: Mild steel galvanized to AS/NZS 4680-1989 ((*Hot-dip galvanized (zinc) coatings on fabricated ferrous articles*), minimum coating mass 600 g/m^2. Do not cut after galvanizing.

Installation

General: Install with the longest leg vertical. Keep lintels 5 mm clear of heads and frames. Pack mortar between the angle upstand and supported masonry units.
Propping: To prevent deflection or excessive rotation, temporarily prop proprietary cold-formed lintels until the masonry reaches its required strength.
Minimum propping period: 3 days.

INSULATION AND SARKING

GENERAL

Interpretation

Sarking-type material: Flexible membrane material normally used for waterproofing, vapour retarding or thermal reflective insulation.

MATERIALS AND COMPONENTS

Bulk insulation

Cellulosic fibre: To AS 2462-1981 (*Cellulosic fibre thermal insulation*).
Mineral wool batts and blankets: To AS 3742-1990 (*Mineral wool thermal insulation - Batt and blanket*).
Mineral wool in loose fill: To AS 2461-1981 (*Mineral wool thermal insulation - Loose fill*).
Polystyrene: To AS 1366.4-1989 (*Rigid cellular plastics sheets for thermal insulation - Rigid cellular polystyrene - Extruded (RC/PS-E)*).
Wool: To AWRAP/A202-1993 (*Mandatory Woolmark Specifications for building insulation material*).

Sarking material

Standard: To AS/NZS 4200.1-1994 (*Pliable building materials and underlays – Materials*).
Floor insulation: Provide perforated material.

Insulation types and ratings

Wall: R2.5
Roof: R 3.5
Ceiling: R 3.5

INSTALLATION

Bulk insulation

Standard: To AS 3999-1992 (*Thermal insulation of dwellings - Bulk insulation - Installation requirements*).
Batts: Fit tightly between framing members. If support is not otherwise provided, secure nylon twine to the framing and stretch tight.
Loose fill: Provide boxing to retain loose fill on external edges, cavities and penetrations, and to prevent spilling.

Sarking material

Standard: To AS/NZS 4200.2-1994 (*Pliable building materials and underlays – Installation requirements*).
Wall sarking

Roof sarking

General: Provide sarking to all roof areas

ROOFING

GENERAL

Cross reference

Refer to the *Insulation and sarking* worksection for roof sarking requirements.

MATERIALS AND COMPONENTS

Flashing material

Standard: To AS/NZS 2904-1995 (*Damp-proof courses and flashings*).
All roofs: 20 kg/m^2 lead.

Fasteners

Self-drilling screws: To AS 3566-1988 (*Screws - Self-drilling - For the building and construction industries*), corrosion resistance Class 3.
Exposed fasteners: Provide fasteners, which are premonished with a coating to match the roofing material, or provide matching purpose-made plastic caps.

Roof lights

Type: 2500 MM DIAMETER ROOF DOME

METAL ROOFING

Design and installation

Standard: To AS 1562.1-1992 (*Design and installation of sheet roof and wall cladding – Metal*).
Roof material: COLORBOND FLAT SHEETING
Manufacturer: BHP/LYSAGHTS
Roof colour: SLATE GREY
Ridge capping colour: AS ABOVE

Visible accessories

Provide material with the same finish as roofing sheets.
Eaves Treat ends of sheets as follows:

- Generally: Close off ribs at tops and bottoms of sheets by mechanical means or with purpose-made fillers or end caps.
- At gutters: Project sheets 50 mm into gutters.

ROOF PLUMBING

Selection and installation of rainwater goods

Standard: To AS/NZS 3500.3.2 (*National Plumbing and Drainage - Stormwater drainage - Acceptable solutions*).
PVC rainwater goods and accessories: To AS/NZS 2179.2 (Int) -1998 (*Specifications for rainwater goods, accessories and fasteners - PVC rainwater goods and accessories*)
Sealing: Seal fasteners and mechanically fastened joints with silicone sealant.

Flashings and capping

General: Flash projections above or through the roof with two part flashings consisting of an apron flashing and an over-flashing, with at least 100 mm vertical overlap. Provide for independent movement between the roof and the projection.
Wall abutments: Where a roof abuts a wall, provide overflashings as follows:

- Masonry: Stepped and built into the full width of the leaf.
- Planked cladding: Stepped.

Gutters

Minimum slope of eaves gutters: 1:200.
Minimum width overall of valley gutters: 400 mm.
Guttering and downpipe pre-finish colour: BHP/LYSAGHT SLATE GREY

DOORS AND WINDOWS

GENERAL

Cross references

Refer to the following worksections

- *Lining*, for architraves.
- *Painting*, for priming of frames and doors before installation.

MATERIALS AND COMPONENTS

Flashings

Standard: To AS/NZS 2904-1995 (*Damp-proof courses and flashings*).

Metal finishes

Zinc plating: To AS 1789-1984 (*Electroplated coatings - Zinc on iron or steel*), at least service condition number 2.
Anodising: To AS 1231-1985 (*Aluminium and aluminium alloys - Anodized coatings for architectural applications*), at least class AA10.
Thermoset powder coating: To AS 3715-1989 (*Metal finishing - Thermoset powder coatings for architectural applications*), or AS 4506-1998 (*Metal finishing – Thermoset powder coatings*) as appropriate.

Glass

Selection and installation: To AS 1288-1994 (*Glass in buildings - Selection and installation*).

Doorsets

Timber doors: To AS 2688-1984 (*Timber doors*).
Timber frames and jamb linings: To AS 2689-1984 (*Timber doorsets*).
Security screen doors: To AS/NZS 2803.1-1994 (*Doors - Security Screen – Hinged*) or AS/NZS 2803.2- (*Doors - Security Screen – Sliding*).

Windows

Selection: To AS 2047-1999 (*Windows in buildings - Selection and installation*).

Pre-glazing

If possible, pre-glaze doors and windows.

ALL Windows and sliding external doors

Manufacturer:	PURPOSE BUILT
Material:	CEDAR
Pre-finish type:	TO BE TO OWNERS REQUIREMENTS
Pre-finish colour:	TO BE TO OWNERS REQUIREMENTS
Glass:	AS PER THERMAL REQUIREMENTS
Insect screen:	YES

CONSTRUCTION GENERALLY

Standards

Doorset installation: To AS 1909-1984 (*Installation of timber doorsets*).
Window installation: To AS 2047-1999 (*Windows in buildings - Selection and installation*).

Flashings and weatherings

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

Installation

Install doorsets and windows so they

- are plumb, level, straight and true;
- are adequately fixed or anchored to the building structure; and

- will not carry building loads, including loads caused by structural deflection or shortening.

Fixing

Packing: Pack behind fixing points with durable full width packing.
Prepared masonry openings: If fixing of timber windows to prepared anchorages is by fastening from the frame face, conceal the fasteners by sinking the heads below the surface and filling the sinking flush with a material compatible with the surface finish.

Linings

Provide reveal and jamb linings as necessary.

TIMBER DOORS

Door thickness Generally: 35 mm. External doors and doors over 900 mm wide: 40 mm.

Door construction

All doors: Solid construction.
Medium density fibreboard doors: Board designated by the manufacturer as having a moisture resistance, which is suitable for the exposure of the door.

Priming Prime timber doors on top and bottom edges before installation.

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

Wardrobe doors and frames All to owners requirements

GARAGE DOORS

General Standard: To AS/NZS 4505 (Domestic garage doors).

Motorised operation

Provide a proprietary operator with a limit switch, manual safety stop and reversing mechanism, and overload cutout operated by a battery-powered radio remote controller and by a direct push-button or key switch. Locate operating switch 1.5 m above floor level.

Garage doors

Manufacturer:	PURPOSE BUILT
Type:	TIMBER FOLDING DOORS
Pre-finish type:	PAINT
Pre0finish colour:	TO OWNERS REQUIREMENTS

LOCKSETS

External doors

Provide a push-button key and knob set and a double-cylinder dead bolt to each door.

Internal doors

Generally: Passage sets.
Bathrooms, showers and toilets: Privacy sets.
Sliding patio doors and windows: Provide key-lockable surface mounted bolts.

Door lockset mounting heights

To centreline of spindle: 1 m above finished floor.

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

LINING

GENERAL

Cross reference

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

MATERIALS AND COMPONENTS

Plasterboard

Standard: To AS/NZS 2588-1998 (*Gypsum plasterboard*).
Sheet thickness: 13 mm

SHEET LINING

Supports

Install timber battens or proprietary cold-formed galvanized steel furring channels

- if framing member spacing exceeds the recommended spacing;
- if direct fixing of the sheeting is not possible due to the arrangement or alignment of the framing or substrate; and
- to support fixtures.

Installation

Plasterboard: To AS/NZS 2589.1-1997 (*Gypsum linings in residential and light commercial construction - Application and finishing - Gypsum plasterboard*).
Framed construction: Screw or nail or combine with adhesive.
Masonry construction: Adhesive-fix direct to masonry.
Wet areas: Do not use adhesive.

Joints

General: Provide recessed edge sheets and finish flush with perforated reinforcing tape.
External corner joints: Make over zinc-coated steel corner beads.
Wet areas: Provide the flashings, trim and sealants necessary to ensure wet areas are waterproofed.
Joints in tiled areas: Do not apply a topping coat after bedding perforated paper tape in bedding compound.
Control joints: Install purpose-made zinc-coated control joint beads in walls and ceilings at the following maximum centres and to coincide with structural movement joints:

- Plasterboard: 12 m.
- Fibre cement: 7.2 m.

TONGUE AND GROOVE FLOORING

Installation

Stained or clear finished boards: Select board to give a random pattern. At corners, return the same board to give a continuous grain pattern.
Fixing: Nail twice to each crossing except for secret nailed profiles.
Nailheads: Treat visible nailheads as follows:

- In stained or clear finishes: Drive flush.
- In opaque finishes: Punch below surface and fill flush with putty after the surface has been primed.

Joints

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

TRIM

General

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

Cornice Types: PURPOSE BUILT

TROWELLED COATINGS

GENERAL

Cross references

Refer to the following worksections:

- *Block and tile finishes*, for waterproofing of wet areas.
- *Painting*, for priming of embedded steel.

MATERIALS AND COMPONENTS

Plaster materials

Cement: To AS 3972-1997 (*Portland and blended cements*), type GP.
Lime: To AS 1672.1-1997 (*Limes and limestones - Limes for building*).
Sand: Fine aggregate with a low clay content, selected for grading.
Gypsum plaster: To AS 2592-1983 (*Gypsum plaster for building purposes*).
Metal lath: Expanded metal to AS 1397-1993 (*Steel sheet and strip - Hot-dipped zinc-coated or aluminium/zinc-coated*)/Z275.

Lime putty mixes

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

Gauged mixes

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

Autoclaved aerated concrete walls

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

SUBSTRATE

Correction of substrate

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

Untrue substrate

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

Cleaning

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

Embedded items

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

Chases

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

Metal backgrounds

Fix metal lath to provide a key for plaster.

Concrete

Apply a proprietary bonding agent before plastering.

PLASTERING

Thickness limits

One-coat work: 12 - 15 mm.
Multi-coat work:

- First coat: 9 - 15 mm.
- Floating coat (if any): 9 - 15 mm.
- Finishing coat (except setting coat): 6 - 9 mm.
- Setting coat: 2 - 3 mm.

Cement rendering

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

- Clay and dense concrete brick: 1:0.25:4.

Two or three-coat set plaster

Proportions by volume:

- Undercoats: 1:1:6 cement:lime putty:sand.
- Setting coat: 1:1 lime putty:gypsum plaster.

Tolerances

Finish plane surfaces within a tolerance of 6 mm in 3 m, determined using a 3 m straight edge placed anywhere in any direction. Finish corners, angles, edges and curved surfaces within equivalent tolerances.

Curing

Do not allow rapid or uneven drying out.

V-joints

Provide V-joints at the following locations:

- Junctions between different substrate materials.
- Abutments with other finishes.
- Joints in the structure.

Edge trim

Provide purpose-made zinc-coated steel sections as corner beads and stop beads.

CEMENT BASED FLOOR TOPPINGS (GRANO)

Preparing hardened surfaces

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

Placing

General: Spread the topping mix, compact and float.
Thickness: 20 ± 5 mm.
Monolithic placing: Spread the topping mix as soon as surface water has disappeared from the base.

Curing

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

Granolithic topping

Mix proportions: 1:1:1.5 (cement : fine aggregate : 5 mm coarse aggregate).
Water:cement ratio: 0.5 maximum.
Slump: 50 mm maximum.

Margins to toppings

Integral margins: Form margins to cementitious toppings integrally in the topping material.
Coved skirtings: Form the cove in topping material, and finish the top to a neatly struck line. Mitre internal and external angles.

BLOCK AND TILE FINISHES

GENERAL

Standards

Follow the guidance given in AS 3958.1-1991 (*Ceramic tiles - Guide to the installation of ceramic tiles*) and AS 3958.2-1992 (*Ceramic tiles - Guide to the selection of a ceramic tiling system*).

MATERIALS AND COMPONENTS

Exposed edges

If available, provide purpose-made border tiles with the exposed edge (whether round, square or cushion) glazed to match the tile face.

Accessories

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

Adhesives

Standard: To AS 2358-1990 (*Adhesives - For fixing ceramic tiles*).
PVA (polyvinyl acetate)-based adhesives: Do not use in wet areas or externally.

Mortar materials

Cement: To AS 3972-1997 (*Portland and blended cements*), type GP.
Sand: Fine aggregate with a low clay content selected for grading.

Bedding mortar

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

Grout

Cement-based proprietary grout: Mix with water. Fine sand may be added as a filler in wider joints.
Portland cement-based grout: Mix with fine sand. Provide minimum water consistent with workability.
Proportioning:

- For joints up to 3 mm: 1:2 cement:sand.
- For joints over 3 mm: 1:3 cement:sand.

Preparation

Prepare the substrates, including the following:

- Remove deleterious and loose material and leave the surface dust-free and clean.
- For mortar bedding, wet the substrate as necessary to achieve suitable suction. Alternatively, apply a proprietary bonding agent to the substrate to improve adhesion.

Block and tile schedule

ALL TILES TO BE SELECTED AND PROVIDED BY THE OWNERS
ALLOW FOR FIXING AS PER DRAWINGS

WATERPROOFING WET AREAS

Standard

General: To AS 3740-1994 (*Waterproofing of wet areas within residential buildings*).

Membrane

Provide a proprietary liquid applied or sheet membrane system which

- has a current Australian Building Products and Systems Certification Scheme certificate; or
- has a current appraisal report issued by the CSIRO Building Products and Systems Appraisals stating that the system is suitable for use as a waterproofing system for use

in wet areas, shower recess bases and associated floors and wall/floor junctions which are to be tiled.

Installation

Floor wastes: Turn membrane down onto the floor waste puddle flanges, and adhere.
Hobs: Extend membrane over the hob and into the room at least 50 mm. For hobless showers extend 1800 mm into the room.
External tiling: Provide a waterproof membrane under external floor tiling, to balconies and over habitable rooms, which forms a drained tank suitable for continuous immersion. Do not run under bounding walls.
Curing: Allow membrane to cure fully before tiling.

TILING

Cutting and laying

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

Variations

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

Protection

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

Setting out

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

- Internal ceramic tiling: 1.5 - 3 mm.
- Mosaic tiling: As dictated by pattern.
- Vitrified floor tiles: 3 - 5 mm.

Joint alignment: Set out tiling with joints accurately aligned in both directions and wall tiling joints level and plumb.
Joint position: Set out tiles from the centre of the floor or wall to be tiled and, if possible, ensure cut tiles are a half tile or larger.
Fixtures: If possible, position tiles so that holes for fixtures and other penetrations occur at the intersection of horizontal and vertical joints or in the centre of tiles.

Falls and levels

General: Grade floor tiling to even and correct falls generally, and to floor wastes and elsewhere as required. Make level junctions with walls. If falls are not required, lay level.
Minimum fall generally: 1:100.
Minimum fall in shower areas: 1:60.

Preparation of tiles

Adhesive bedding: Fix tiles dry.
Mortar bedding: Soak porous tiles in water for half an hour and then drain until the surface water has disappeared.

Floor finish dividers

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

Sealed joints

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

FLOOR COATINGS AND COVERINGS

GENERAL

Cross reference

Refer to the *Painting* worksection for finishing of sanded timber floors and cork tiles.

MATERIALS AND COMPONENTS

Hardboard underlay

Standard: To AS/NZS 1859.4-1997 (*Reconstituted wood-based panels – Hardboard*), standard hardboard Type RD, manufactured as flooring underlay.

Resilient underlay alternatives

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

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

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

Hot-melt adhesive tape

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

Carpet

Minimum class: Domestic Medium Duty under the Australian Carpet Classification Scheme.

Manufacturer: **TO BE SELECTED**

SUBSTRATE

Substrate preparation

Prepare the substrate including the following:

- Stripping and cleaning: Remove deleterious and loose material, including existing floor coverings and any surface treatment which could adversely affect adhesion.
- Repairs: Make good to the surface finish as necessary. Fill depressions with a suitable filler, and remove high spots and projections. If necessary lay a steel-trowelled underlay to concrete substrate.
- Fixtures and fittings: Remove door stops and other fixtures, and refix in position undamaged on completion of the installation.
- Basic sanding: Produce an even plane sanded surface on strip flooring to be covered with carpet or resilient sheet or tile. Lightly sand the junctions of sheet flooring.
- Fine sanding: If flooring is to be clear finished, stop with matching filler and produce a smooth sanded surface free from irregularities and suitable to receive the finish.

LAYING CARPET

Standard

General: To AS/NZS 2455.1-1995 (*Textile floor coverings - Installation practice – General*).

Setting out

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

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

Seaming methods

Woven carpet: Machine or hand sew.

Tufted carpet: Provide hot-melt adhesive tapes.

Fixing

Gripper strip: Provide preformed gripper strip and tackless edge strip. Space fixings at 150 mm maximum centres.
Permanent stick method: Immediately after laying, and again one hour later, roll the carpet from the centre diagonally towards each edge using a 65 kg multi-wheeled roller. Do not roll foam-backed carpet.
Edge strip

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

LAYING RESILIENT FINISHES

Standard

General: To AS 1884-1985 (*Floor coverings - Resilient sheet and tiles - Laying and maintenance practices*).
Sheet set out

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

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

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

Scribe neatly up to returns, edges, fixtures and fittings. Finish flush with adjoining surfaces.
Cleaning and protection

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

PAINTING

GENERAL

Standards

Follow the guidance given in AS 2311-1992 (*The painting of buildings*) and AS/NZS 2312-1994 (*Guide to the protection of iron and steel against exterior atmospheric corrosion*).

MATERIALS AND COMPONENTS

Combinations

Do not combine paints from different manufacturers in a paint system.

Delivery

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

Autoclaved aerated concrete walls

Do not apply oil-based paints.

PAINTING

Order of work

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

Protection

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

Restoration

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

Substrate preparation

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

Paint application

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

Priming before fixing

Timber: Apply a first coat (two coats to end grain) to exposed roof trim, timber doors and window frames, tops and bottoms of doors, associated trims and glazing beads before fixing in position.
Steel: Apply a priming coat of zinc-rich organic binder to GPC C-29/16-1997 (*Long life protective systems for steel - Organic zinc rich coatings*).

Repair of galvanizing

If galvanized or zinc-coated surfaces have been cut or welded after galvanizing, prime the affected area with a zinc-rich organic binder to GPC C-29/16-1997 (*Long life protective systems for steel - Organic zinc rich coatings*).

Finishing timber floors

After sanding, finish with 3 coats of clear floor sealer to GPC P-205-1996 (*One pack clear moisture cured polyurethane finish for timber floors*).

Paint system description

If a system is referred to only by its final coat (for example by the manufacturer's brand name, the APAS specification code or the generic name)

provide stains, primers, sealers and undercoats which are suitable for the substrate and are compatible with the finish coat and each other.

Paint final coat table

Provide paints as follows:

Final coat	Use paint to APAS specification
Interior	
Full gloss sol borne	GPC E-15/4-1995 (*Full gloss enamel (buildin For interior use*)
Flat latex	GPC L-26/6-1995 (*Latex paint, interior exterior (buildings) - Washable flat finish interior use*)
Low gloss latex	GPC L-26/5-1995 (*Latex paint, interior exterior (buildings) - Low gloss finish for int use*)
Semi-gloss latex	GPC L-27-1995 (*Semi gloss interior latex (Buildings)*)
Gloss latex	GPC L-164-1995 (*Interior Gloss Latex (Buildings)*)
Exterior	
Full gloss sol borne	GPC E-15/3-1995 *(Full gloss enamel (buildin Exterior quality*)
Flat latex	GPC L-26/3-1995 (*Latex paint, interior exterior (buildings) - Flat or low gloss finis exterior use*)
Low gloss latex	GPC L-26/3-1995 (*Latex paint, interior exterior (buildings) - Flat or low gloss finis exterior use*)
Gloss latex	GPC L-28-1995 (*Gloss exterior latex (buildings)*)
Stain, li pigmented	GPC V-115/1-1997 (*Ranch finish for ext timber - Lightly pigmented solvent borne finis*
Latex stain, opaq	GPC V-115/3-1997 (*Ranch finish for ext timber -Heavily pigmented latex finish - low gl*
Semi-gloss latex	GPC L-169-1995 (*Semi Gloss Latex P Exterior (Buildings)*)
Paving	
Semi gloss	GPC P-200/1-1996 (*One pack pigmented so borne paving paint – Semigloss*)
Gloss	GPC P-200/2-1996 (*One pack pigmented so borne paving paint – Gloss*)

Exterior painting schedule

Item	Manufacturer and paint type	Colour
Fascia	BHP/LYSAGHTS	SLATE GREY
Guttering	BHP/LYSAGHTS	SLATE GREY
Downpipes	BHP/LYSAGHTS	SLATE GREY
Under eaves		
Balustrades	SIKKENS	CEDAR
Gable barge	DULUX	SLATE GREY
Masonry Render		

Interior painting schedule

ALL TO OWNER REQUIREMENTS

TIMBER FIXTURES

GENERAL

Cross references

Refer to the following worksections:

- *General requirements*, for timber durability.
- *Doors and windows*, for timber doors and reveal and jamb linings.

MATERIALS AND COMPONENTS

Moisture content

Make milled products from timbers seasoned

- to within 3% of the equilibrium moisture content appropriate to the timber and its intended conditions of use; and
- with no more than 3% difference between any 2 pieces in any one group.

Finished sizes

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

Medium density fibreboard

Standard: To AS/NZS 1859.2-1997 (*Reconstituted wood-based panels - Medium density fibreboard (MDF)*).

High pressure decorative laminate sheets

Standard: To AS/NZS 2924.1-1987 (*High pressure decorative laminates - Sheets made from thermosetting resins - Classification and specifications*).

High pressure decorative laminate sheet application table

Provide classes as follows:

Class to AS/NZS 2924-1987 (High press decorative laminates - Sheets made fro thermosetting resins)	**Application**
VGS or VGP	Kitchen front panels
VLS	Other locations

CONSTRUCTION GENERALLY

General

Construction: Build components square and install plumb.

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

Fasteners and adhesives

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

Visibility: Do not provide visible fixings except in the following locations:

- Inside cupboards and drawer units.
- Inside open units, in which case provide proprietary caps to conceal fixings.

Finishing

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

STAIRS AND BALUSTRADES

Cut circular strings Refer to drawing for location and geometry of stairs

Treads Dress nosings to a pencil-round. Return nosings at cut strings. Groove for riser tongue in closed riser stair.

Top tread
Flush with finished floor, otherwise to match stair treads. Provide similar tread section as nosing to floor edges around stair well.
Joints

Glue joints in internal work. In closed riser stairs, wedge treads and risers to strings. Trim floors to carry ends of stairs and around stairwell.
Newels Halve and bolt to strings.

Handrail Stub tenon to newels.

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

DOMESTIC KITCHEN ASSEMBLIES
Standard

General: To AS/NZS 4386.1-1996 (*Domestic kitchen assemblies – Kitchen units*).

CUPBOARD AND DRAWER UNITS
Plinths, carcasses, drawer fronts, shelves and doors

Material: Provide melamine overlaid high moisture-resistant particleboard or melamine overlaid high moisture-resistant medium density fibreboard.
Minimum thickness: 16 mm.
Finish: Provide decorative laminated sheet if necessary
- to conceal fasteners; or
- to provide selected colours.

Installation: Secure plinths and carcasses to floors, walls, or both at not more than 600 mm centres.
Drawer fronts: Rout for drawer bottoms.
Adjustable shelves: Support on proprietary pins in holes bored at 32 mm centres vertically.
Drawer and door hardware

Hinges: Provide concealed all-metal hinges with the following features:
- Adjustable for height, side and depth location of door.
- Self-closing action.
- Hold-open function.
- Nickel plated.

Slides: Provide metal runners and plastic rollers with the following features:
- 30 kg loading capacity.
- Closure retention.
- White thermoset powder coating or nickel plated.

BENCHTOPS
Re-constituted Granite benchtops

Installation: Fix to carcass at least twice per 600 mm length of benchtop.
Joint sealing: Fill joints with sealant matching the finish colour and clamp with proprietary mechanical connectors.
Edge sealing: Seal to walls and carcasses with a sealant which matches the finish colour.

CEILING ACCESS
Ceiling

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

PLUMBING AND DRAINAGE

GENERAL

Cross references

Refer to the following worksections:

- *Site preparation*, for service trenches.
- *Roofing*, for roof plumbing and rainwater tanks.
- *Block and tile finishes*, for waterproofing of wet areas.
- *Painting*, for priming steel or iron before installation and exposed piping required to be painted.

Standard

Plumbing and drainage products: To SAA MP52-1997 (*Manual of authorization procedures for plumbing and drainage products*).

Connections

Excavate to locate and expose the connection points and connect to the authorities' mains. On completion, backfill and compact the excavation and reinstate surfaces and elements which have been disturbed such as roads, pavements, kerbs, footpaths and nature strips.

MATERIALS AND COMPONENTS

FUNCTIONAL AND REGULATORY ASPECTS ALL TO ENGINEERE DRAWINGS AND SPECIFICATION BUT ENSURE THAT WORKMANSHIP IS AT LEAST TO STANDARDS BELOW

Finish exposed piping, including fittings and supports as follows:

- Internal locations such as toilet and kitchen areas: Bright chrome plate.
- Externally: Paint.
- Concealed but accessible spaces (including cupboards and non-habitable enclosed spaces): Leave unpainted except for required identification marking.

CONSTRUCTION GENERALLY

General

Install piping in straight lines and to uniform grades. Arrange and support the piping so that it remains free from vibration and water hammer, while permitting thermal movement. Keep the number of joints to a minimum. Prevent direct contact between incompatible metals.

Concealment

If practicable, conceal piping and fittings requiring maintenance or servicing so that they are accessible within non-habitable enclosed spaces such as roof spaces, subfloor spaces and ducts. Keep pipelines in subfloor spaces at least 150 mm above ground and ensure access can be provided throughout for inspection. Provide at least 25 mm clearance between adjacent pipelines (measured from the piping insulation where applicable).

Building penetrations

If piping passes through building elements provide purpose-made metal or plastic sleeves formed from pipe sections. Prime steel or iron before installation.

Pipe supports

Materials: The same as the piping, or galvanized or non-ferrous metals, with bonded PVC or glass fibre woven tape sleeves where needed to separate dissimilar metals.

Cover plates

Where exposed piping emerges from wall, floor or ceiling finishes, provide cover plates of non-ferrous metal, finished to match the piping, or of stainless steel.

STORMWATER

Standard

ALL TO ENGINEERS DRAWING AND SPECIFICATION

General: To AS/NZS 3500.3.2-1998 (*National Plumbing and Drainage - Stormwater drainage - Acceptable solutions*).

Cleaning

During construction, use temporary covers to openings and keep the system free of debris. On completion, flush the system using water and leave it clean.

Pipelaying

Lay pipelines with the spigot ends in the direction of flow.

Downpipe connections

Turn up drain branch pipelines to finish 50 mm above finished ground or pavement level.

Subsoil drains

Connection: Connect subsoil drains to the stormwater drainage system.
Trench width: Minimum 450 mm.
Subsoil drains: Provide proprietary perforated plastic pipe.
Filter fabric: Provide a polymeric fabric formed from a plastic yarn containing stabilisers or inhibitors to make the filaments resistant to deterioration due to ultraviolet light.
Filter sock: Provide a polyester permeable sock capable of retaining particles of 0.25 mm size. Securely fit or join the sock at each joint.
Backfilling: Backfill with 20 mm nominal size washed screenings, to the following depths:

- To the underside of the bases of overlying structures such as pavements, slabs and channels.
- To within 75 mm of the finished surface of unpaved or landscaped areas.

Pits

Cover levels: Locate the top of covers or gratings, including frames as follows:

- In paved areas: Flush with the paving surface.
- In landscaped areas: 25 mm above finished surface.
- Gratings taking surface water runoff: Set to receive the runoff without ponding.

WASTEWATER

Standard

General: To AS/NZS 3500.2.2-1996 (*National Plumbing and Drainage - Sanitary plumbing and sanitary drainage - Acceptable solutions*).

Cleaning

During construction, use temporary covers to openings and keep the system free of debris. On completion, flush the system using water and leave it clean.

FRESHWATER

General: To AS/NZS 3500.1.2-1998 (National Plumbing and Drainage - Water supply – Acceptable solutions) and AS/NZS 3500.4.2-1997 (National Plumbing and Drainage - Hot water supply systems – Acceptable solutions).

ALL TO ENGINEERS DRAWING AND SPECIFICATION

Accessories

Provide the accessories and fittings necessary for the proper functioning of the plumbing systems, including taps, valves, outlets, pressure and temperature control devices, strainers, gauges and pumps.

Heater installation

Location: Locate water heaters where they can be maintained or replaced without damaging adjacent structures, fixtures or finishes.
Oil-fired heaters: To AS 1691-1985 (*Domestic oil-fired appliances – Installation*).
Solid fuel heaters: To AS 2918-1990 (*Domestic solid fuel burning appliances – Installation*).
Temperature

Maximum temperature at ablution outlets: 50°C.
Isolating valves

Provide isolation valves to water heaters.
Cleaning

On completion, flush the pipelines using water and leave them clean.

GAS
Standard

General: To AG 601-1998 (*Gas Installation Code*).
ALL TO ENGINEERS DRAWING AND SPECIFICATION
Buried pipes

Warning tape: During backfilling, lay plastic warning tape above and for the full length of buried gas pipes.

- Type: Minimum 100 mm wide, with "GAS PIPE UNDER" marked continuously.

Commissioning

On completion of installation and testing, turn on isolating and control valves and purge and charge the installation.

LIFT INSTALLATIONS
GENERAL
Cross reference

Refer to the *Site preparation* worksection for client requirements.

STRUCTURE ALL TO ENGINEERS DRAWING AND SPECIFICATION
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SPECIFICATION AND DRAWINGS

ELECTRICAL AND MECHANICAL INSTALLATIONS

GENERAL

Cross reference

Refer to the *Site preparation* worksection for service trenches.
ALL TO ENGINEERS DRAWING AND SPECIFICATION

Standards

Domestic electrical installations: To AS/NZS 3018-1997 (*Electrical installations - Domestic installations*).
Mechanical ventilation: To AS 1668.2-1991 (*The use of mechanical ventilation and air-conditioning in buildings - Mechanical ventilation for acceptable indoor-air quality*).

Definition

Switchboards: Low voltage switchgear and controlgear assemblies.

COMPONENTS

Power

Circuit breakers: To AS 3947.2-1997 (*Low voltage switchgear and controlgear - Circuit-breakers*).
Switchboards: To AS 3439.1-1993 (*Low-voltage switchgear and controlgear - Type-tested and partially type-tested assemblies*) or AS 3439.3-1995 (*Low-voltage switchgear and controlgear - Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution, as appropriate*).
Standard: To AS 3137-1992 (*Approval and test specification - Luminaires (lighting fittings)*).
Lamps and luminaires schedule

Item	Location/code	Type	Details
All	ALL TO ENGINEERS DRAWING AND SPECIFICATION AND OWNERS REQUIREMENT		

Electrical appliances schedule

Item	Location/code	Type	Details
All	ALL TO ENGINEERS DRAWING AND SPECIFICATION AND OWNERS REQUIREMENT		

Telecommunications cables

Standard: To ACA TS 008-1997 (*Requirements for Authorised Cabling Products*).
Telecommunications accessories schedule

Item	Location/code	Type	Details
All	ALL TO ENGINEERS DRAWING AND SPECIFICATION AND OWNERS REQUIREMENTS		

Television

Antennae: To AS 1417.1-1987 (*Receiving antennas for radio and television in the frequency range 30 MHz to 1 Ghz - Construction and installation*) and AS 1417.2-1991 (*Receiving antennas for radio and television in the frequency range 30 MHz to 1 Ghz - Performance*).
Central vacuum system: ALL TO ENGINEERS DRAWING AND SPECIFICATION AND OWNERS REQUIREMENT >
Intercom system: ALL TO ENGINEERS DRAWING AND SPECIFICATION AND OWNERS REQUIREMENT >

Security system: ALL TO ENGINEERS DRAWING AND SPECIFICATION AND OWNERS REQUIREMENT >
Smoke alarms Standard: To AS 3786-1993 (Smoke alarms).

Smoke alarm type: ALL TO ENGINEERS DRAWING AND SPECIFICATION AND OWNERS REQUIREMENT >
Airconditioning units ALL TO ENGINEERS DRAWING AND SPECIFICATION AND OWNERS REQUIREMENT >
INSTALLATION

Consumer mains General: Provide a consumer mains and connect to the main service. ALL TO ENGINEERS DRAWING AND SPECIFICATION AND OWNERS REQUIREMENT

Switchboards

General: Provide control switchgear, circuit breakers and earth leakage protection devices (RCDs) on a wall-mounted switchboard enclosed in a case with a hinged door. Make provision for the authority's equipment and have it installed.
Electrical wiring

General: Conceal cables and conduits, including underground cable or conduit entering the building, in a manner that will allow wiring replacement without structural work or the removal of cladding or lining. Do not penetrate damp-proof courses.
Connection of fixed and stationary appliances: Provide connecting devices with socket outlet and flush blank plate.
Electrical accessories

General: Install flush-mounted accessories in wall boxes in masonry and in mounting brackets in stud walls.
Telecommunications cabling

Standards: To AUSTEL TS 009-1997 (*Installation Requirements for Customer Cabling (Wiring Rules)*) and AS/NZS 3086-1996 (*Telecommunications installations - Integrated communications cabling systems for small office/home office premises*).
Wiring: Conceal cables and conduits, including underground cable or conduit entering the building, in a manner that will allow wiring replacement without structural work or the removal of cladding or lining. Do not penetrate damp-proof courses.
Pre-wiring: Have pre-wiring of telephone, data, TV and telecommunications services carried out before installation of linings, paving and landscaping.
Connection of fixed and stationary appliances: Provide connecting devices with socket outlet and flush blank plate.
Smoke alarms

Standard: To AS 1670.6-1997 (*Fire detection, warning, control and intercom systems – System design, installation, and commissioning – Smoke alarms*).
Power: Connect to consumer mains power.
Air-conditioning pipework insulation

Protection against ultra-violet light and mechanical damage: Sheath external insulated pipework.
Completion tests

General: Test the electrical installation, smoke alarms, and the air-conditioning system.

LANDSCAPING

GENERAL

ALL TO LANDSCAPE ARCHITECTS DRAWING AND SPECIFICATION AND OWNERS REQUIREMENT

Cross reference

Refer to the *General requirements* worksection for timber durability.

MATERIALS AND COMPONENTS

Concrete

Standard: To AS 1379-1997 (*Specification and supply of concrete*) or proprietary packaged mix.

PREPARATION

Weed eradication

Eradicate weeds using a non-residual glyphosate herbicide in any registered formulae, at the recommended maximum rate.

Surplus spoil

Remove surplus spoil from site. Do not burn vegetative material.

SUBSOIL

Ripping

General: If practicable, rip parallel to the final contours. Do not rip when the subsoil is wet or plastic. Do not rip within the dripline of trees and shrubs to be retained.

Ripping depths: Rip the subsoil to the following typical depths:

- Compacted subsoil: 300 mm.
- Heavily compacted clay subsoil: 450 mm.

Cultivation

Cultivate to a minimum depth of 100 mm. Do not disturb services or tree roots; if necessary, cultivate these areas by hand. During cultivation, thoroughly mix in materials required to be incorporated into the subsoil. Remove stones exceeding 25 mm, clods of earth exceeding 50 mm, and weeds, rubbish or other deleterious material brought to the surface during cultivation. Trim the surface to the required design levels after cultivation.

Additives

General: Apply additives after ripping or cultivation and incorporate into the upper 100 mm layer of the subsoil.

Gypsum: Incorporate at the rate of 0.25 kg/m^2.

TOPSOIL

General

Provide topsoil, which is free from unwanted matter and is suitable for reuse on site as topsoil.

Source

If it is available, provide site topsoil.

Placing topsoil

Spread the topsoil on the prepared subsoil and grade evenly, making the necessary allowances so that:

- required finished levels and contours are achieved after light compaction; and
- grassed areas may be finished flush with adjacent hard surfaces such as kerbs, paths and mowing strips.

Consolidation

Compact lightly and uniformly in 150 mm layers. Avoid differential subsidence and excess compaction and produce a finished topsoil surface which is:

- finished to design levels;
- smooth and free from stones or lumps of soil;
- graded to drain freely, without ponding, to catchment points;
- graded evenly into adjoining ground surfaces; and
- ready for planting.

Topsoil depths

Spread topsoil to the following typical depths:

- Planting areas: 225 mm.
- Irrigated grassed areas generally: 150 mm.
- Grass areas: 100 mm.

PLANTING

Excavation

Excavate a plant hole for each plant large enough to accept the root ball plus 0.1 m^3 of backfilling with topsoil.

Plants

General: Provide plants which

- have large healthy root systems, with no evidence of root curl, restriction or damage;
- are vigorous, well established, free from disease and pests, of good form consistent with the species or variety; and
- are hardened off, not soft or forced, and suitable for planting in the natural climatic conditions prevailing at the site.

Trees: Provide trees which, unless required to be multi-stemmed, have a single leading shoot.

Labelling

Label at least one plant of each species or variety in a batch using a durable, readable tag.

Planting conditions

Do not plant in unsuitable weather conditions such as extreme heat, cold, wind or rain. In other than sandy soils, suspend excavation when the soil is wet, or during frost periods.

Watering

Thoroughly water plants before planting and immediately after planting.

Fertilising

In planting beds and individual plantings, place fertiliser pellets around plants at the time of planting.

MULCHING

Mulch

General: Provide mulch which is free of deleterious and extraneous matter such as stones, soil, weeds and sticks.

Application: Place mulch clear of plant stems, and rake to an even surface flush with the surrounding finished levels.

Depth: 75 mm.

PAVING AND ROADS
GENERAL

ALL TO ENGINEERS DRAWING AND SPECIFICATION AND OWNERS REQUIREMENT

Cross reference

Refer to the *General requirements* worksection for timber durability.

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MATERIALS AND COMPONENTS

Mortar materials

Sand: Use a fine aggregate with a low clay content selected for grading.
Cement: To AS 3972-1997 (*Portland and blended cements*), type GP.

Mortar

Mix proportions: 1:3 cement:sand.

CONSTRUCTION GENERALLY

Grading

General: Grade paving to even falls to drain away from buildings to drainage outlets without ponding. Minimum fall for drainage: 1:100.

BASE COURSE

Preparation

Prepare the subgrade to suit the thickness of the base course and paving. If necessary, loosen the ground to a depth of 200 mm and adjust the moisture content before compaction. Compact the ground to a firm, even surface using at least 2 passes of a vibrating plate compactor or roller. Remove and replace soft areas.

Base course material

Provide well-graded crushed rock or gravel, free of deleterious material, with a maximum particle size of 26.5 mm, uniformly graded and with a maximum clay content of 6% by mass.

Placing

Spread and compact the base course to a firm, tight, close textured surface using at least 3 passes of a vibrating plate compactor or roller. Adjust the moisture content as needed to facilitate compaction.

Base course minimum thickness table

UNIT PAVING

Masonry and segmental pavers

General: Provide paving units of clay, natural stone or concrete masonry, purpose-made for use as paving, or units made for bonded masonry construction but suitable for paving.
Standard: To AS/NZS 4455-1997 (*Masonry units and segmental pavers*).
Minimum thickness:

- Foot and bicycle traffic: 40 mm.
- Light domestic traffic occasionally up to 3 tonne gross: 50 mm.

Cutting units: Cut paving units to maintain sharp edges and accurate joints and margins.
Manufacturer: ALL TO ENGINEERS DRAWING AND SPECIFICATION AND OWNERS REQUIREMENT >

Laying unit paving

General: Over the base course, lay the units on bedding sand screeded to a uniform thickness not exceeding 30 mm, and to the required falls and levels. Do

not disturb the screeded sand bedding before the units are laid. Provide a gap of 1-3 mm wide between adjoining units. After laying, tamp the units using a vibrating plate compactor.
Dry joints: Fill the joints flush with clean, fine sand or screened bedding sand passing a 1.2 mm sieve, vibrate into the joints and then make 2 further passes of the vibrating plate compactor.
Edge restraint

Provide edge restraint where needed to support the sand bedding and maintain the paving shape. Bed units in mortar at least 40 mm thick.

IN SITU CONCRETE PAVING

Concrete

ALL TO ENGINEERS DRAWING AND SPECIFICATION AND OWNERS REQUIREMENT

Standard: To AS 1379-1997 (*Specification and supply of concrete*).
Minimum thickness

Foot and bicycle traffic: 75 mm.
Light domestic traffic occasionally up to 3 tonne gross: 100 mm.
Preparation

Trim the ground to suit the required thickness of concrete and compact to a firm, even surface.
Control joints

Form tooled joints at maximum 2 m spacing.
Expansion joints

Cast-in 10 mm thick bitumen impregnated fibreboard joint filler at maximum 6 m spacing.
Abutment with building

Where concrete paving more than 1.5 m wide abuts the wall of a building, provide a strip of 10 mm thick bitumen impregnated fibreboard between the paving and the wall.
Finishing methods

Broom finishing: Wood float and broom to an even textured slip-resistant surface with steel tooled margins. On gradients steeper than 10%, roughen the surface by scoring.
Exposed aggregate finish: Steel trowel to a smooth surface. After final set use clean water and brushes to remove the surface film of mortar until the aggregate is uniformly exposed without under cutting of the matrix.
Sponge finish: After floating, produce an even textured sand finish by wiping the surface using a damp sponge.

REFERENCED DOCUMENTS

AS 1214	1983	Hot-dip galvanized coatings on threaded fasteners (ISO metric coarse thread series)
AS 1231	1985	Aluminium and aluminium alloys - Anodized coatings for architectural applications
AS 1288	1994	Glass in buildings - Selection and installation
AS 1366.4	1989	Rigid cellular polystyrene - Extruded (RC/PS-E)
AS 1379	1997	Specification and supply of concrete
AS 1397	1993	Steel sheet and strip - Hot-dipped zinc-coated or aluminium/zinc-coated
AS 1417		Receiving antennas for radio and television in the frequency range 30 MHz to 1 Ghz
AS 1417.1	1987	Construction and installation
AS/NZS 1554		Structural steel welding
AS/NZS 1554.1	1995	Welding of steel structures
AS 1562		Design and installation of sheet roof and wall cladding
AS 1562.1	1992	Metal
AS 1604	1997	Timber - Preservative-treated - Sawn and round
AS 1627	Various	Metal finishing - Preparation and pretreatment of surfaces
AS 1668		The use of mechanical ventilation and air-conditioning in buildings
AS 1668.2	1991	Mechanical ventilation for acceptable indoor-air quality
AS 1670		Fire detection, warning, control and intercom systems – System design, installation, and commissioning
AS 1670.6	1997	Smoke alarms
AS 1720		Timber structures
AS 1720.1	1998	Design methods
AS 1789	1984	Electroplated coatings - Zinc on iron or steel
AS/NZS 1859		Reconstituted wood-based panels
AS/NZS 1859.2	1997	Medium density fibreboard (MDF)
AS/NZS 1859.3	1996	Decorative overlaid wood panels
AS/NZS 1859.4	1997	Hardboard
AS 1860	1998	Installation of particleboard flooring
AS 1861		Air-conditioning units - Methods of assessing and rating performance
AS 1861.2	1991	Refrigerated package air-conditioners
AS 1884	1985	Floor coverings - Resilient sheet and tiles - Laying and maintenance practices
AS 1909	1984	Installation of timber doorsets
AS 2047	1999	Windows in buildings - Selection and installation
AS 2159	1995	Piling - Design and installation
AS/NZS 2179		Specification for rainwater goods, accessories and fasteners
AS/NZS 2179.2		
S/NZS 2269	1994	Plywood - Structural
AS 2311	1992	The painting of buildings
AS/NZS 2312	1994	Guide to the protection of iron and steel against exterior atmospheric corrosion
AS 2358	1990	Adhesives - For fixing ceramic tiles
AS/NZS 2455		Textile floor coverings - Installation practice
AS/NZS 2455.1	1995	General
AS 2461	1981	Mineral wool thermal insulation - Loose fill
AS 2592	1983	Gypsum plaster for building purposes
AS 2601	1991	The demolition of structures
AS 2688	1984	Timber doors
AS 2689	1984	Timber doorsets
AS/NZS 2699		Built in components for masonry construction
AS/NZS 2699.1	2000	Wall ties
AS/NZS 2728	1997	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
AS/NZS 2803		Doors - Security Screen
AS/NZS 2803.1	1994	Hinged
AS/NZS 2803.2	1995	Sliding
AS/NZS 2804		Installation of security screen doors
AS/NZS 2804.1	1995	Hinged
AS/NZS 2804.2	1996	Sliding
AS 2870	1996	Residential slabs and footings - Construction
AS/NZS 2904	1995	Damp-proof courses and flashings
AS/NZS 2908.2	2000	Flat sheets
AS 2913	1987	Evaporative air-conditioning equipment

AS/NZS 2924		High pressure decorative laminates - Sheets made from thermosetting resins
AS/NZS 2924.1	1998	Classification and specifications
AS/NZS 3018	1997	Electrical installations - Domestic installations
AS/NZS 3086	1996	Telecommunications installations - Integrated communications cabling systems for small office/home office premises
AS 3137	1992	Approval and test specification - Luminaires (lighting fittings)
AS 3439		Low-voltage switchgear and controlgear
AS 3439.1	1993	Type-tested and partially type-tested assemblies
AS 3439.3	1995	Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution
AS/NZS 3500		National Plumbing and Drainage
AS/NZS 3500.1.2	1998	Water supply – Acceptable solutions
AS/NZS 3500.2.2	1996	Sanitary plumbing and sanitary drainage - Acceptable solutions
AS/NZS 3500.3.2	1998	Stormwater drainage - Acceptable solutions
AS/NZS 3500.4.2	1997	Hot water supply systems - Acceptable solutions
AS 3566	1988	Screws - Self-drilling - For the building and construction industries
AS 3600	1994	Concrete structures
AS 3623	1993	Domestic metal framing
AS 3660		Protection of buildings from subterranean termites - Prevention, detection and treatment of infestation
AS 3660.1	1995	New buildings
AS 3700	1998	Masonry structures
AS 3715	1989	Metal finishing - Thermoset powder coatings for architectural applications
AS 3740	1994	Waterproofing of wet areas within residential buildings
AS 3742	1990	Mineral wool thermal insulation - Batt and blanket
AS 3786	1993	Smoke alarms
AS/NZS 3823		Performance of household electrical appliances – Room airconditioners
AS/NZS 3823.1.1	(1998)	Testing and rating for performance
AS 3947		Low voltage switchgear and controlgear
AS 3947.2	1997	Circuit-breakers
AS 3958		Ceramic tiles
AS 3958.1	1991	Guide to the installation of ceramic tiles
AS 3958.2	1992	Guide to the selection of a ceramic tiling system
AS 3959	1999	Construction of buildings in bushfire prone areas
AS 3972	1997	Portland and blended cements
AS 3999	1992	Thermal insulation of dwellings - Bulk insulation - Installation requirements
AS 4100	1998	Steel structures
AS/NZS 4200		Pliable building materials and underlays
AS/NZS 4200.1	1994	Materials
AS/NZS 4200.2	1994	Installation requirements
AS/NZS 4256		Plastic roof and wall cladding materials
AS/NZS 4256.3	1994	Glass fibre reinforced polyester (GRP)
AS/NZS 4256.4	1995	Unplasticized polyvinyl chloride (uPVC) wall cladding boards
AS/NZS 4256.5	1996	Polycarbonate
AS/NZS 4386		Domestic kitchen assemblies
AS/NZS 4386.1	1996	Kitchen units
AS 4440	1997	Installation of nailplated timber trusses
AS/NZS 4455	1997	Masonry units and segmental pavers
AS/NZS 4456		Masonry units and segmental pavers – Method of test
AS/NZS 4456.10	1997	Method 10: Determining resistance to salt attack
AS/NZS 4600	1996	Cold-formed steel structures
AS/NZS 4680	1999	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
SAA HB33	1992	Domestic open fireplaces
SAA MP52	1997	Manual of authorization procedures for plumbing and drainage products
ACA TS 008	1997	Requirements for Authorised Cabling Products
AG 601	1998	Gas Installation Code
AUSTEL TS 009	1997	Installation Requirements for Customer Cabling (Wiring Rules)
AWRAP/A 202	1993	Mandatory Woolmark Specifications for building insulation material

BCA 3.1.3		Acceptable construction – Site preparation – Termite risk management
BCA 3.3.3.5		Acceptable construction – Masonry – Masonry accessories – Lintels supporting roofs and masonry walls
CBPI TN 21A	1985	The Design of Freestanding Clay-Brick Walls
CBPI TN 21B	1985	Brick Beam Garden Fences
GPC-E-15		Full gloss enamel (buildings)
GPC-E-15/3	1995	Exterior quality
GPC-E-15/4	1995	For interior use
GPC-L-26		Latex paint, interior and exterior (buildings)
GPC-L-26/3	1995	Flat or low gloss finish for exterior use
GPC-L-26/5	1995	Low gloss finish for interior use
GPC-L-26/6	1995	Washable flat finish for interior use
GPC-L-27	1995	Semi gloss interior latex paint (Buildings)
GPC-L-28	1995	Gloss exterior latex paint (buildings)
GPC-C-29		Long life protective systems for steel
GPC-C-29/16	1997	Organic zinc rich coatings
GPC-V-115		Ranch finish for exterior timber
GPC-V-115/1	1997	Lightly pigmented solvent borne finish
GPC-V-115/3	1997	Heavily pigmented latex finish - low gloss
GPC-L-164	1995	Interior Gloss Latex Paint (Buildings)
GPC-L-169	1995	Semi Gloss Latex Paint, Exterior (Buildings)
GPC-P-200		One pack pigmented solvent borne paving paint
GPC-P-200/1	1996	Semigloss
GPC-P-200/2	1996	Gloss
GPC-P-205	1996	One pack clear moisture cured polyurethane finish for timber floors