



PITTWATER COUNCIL

CONSTRUCTION CERTIFICATE APPLICATION

Environmental Planning and Assessment Act 1979, Section 109C
EP&A Regulation 2000, Clauses 139 (1) and 148

PO Box 882 Mona Vale NSW 1660

Tel (612) 9970 1111

Fax (612) 9970 7150

Internet www.pittwaterlga.com.au

Email pittwater_council@pittwater.nsw.gov.au

Please tick one

- New Construction Certificate
- Modification of previously issued Construction Certificate

CC 0721/08

SITE DETAILS

Unit/Suite	Street No	Street
	5	FOREST ROAD
Suburb	Lot No	Deposit /Strata Plan
WARRIEWOOD	13	1083731

DEVELOPMENT CONSENT

Development Application No	Determination Date
NO 243/08	02/10/08

APPLICANT DETAILS

Name/Company	Contact Person
CSO BROKEN BAY	VICTOR WALKER
Postal Address	Contact Numbers
CAROLINE CHISHOLM CENTRE BDG 2/423 PENNANT HILLS RD PENNANT HILLS NSW 2120 P O BOX 967 PENNANT HILLS NSW 1715 PHONE 9847 0000	Phone (H/B) 9484 7979 Mobile 0422 408 066 Fax 9484 5559
Signature of Applicant	Date
<i>[Signature]</i> (JOHN MENDAY SENIOR FACILITIES OFFICER DIOCESE OF BROKEN BAY)	04/10/08

OWNERS DETAILS

Name	If Company, contact person
TRUSTEES OF CATHOLIC CHURCH DIOCESE OF BROKEN BAY	JOHN MENDAY (SENIOR FACILITIES OFFICER)
Postal Address	Contact Numbers
CAROLINE CHISHOLM CENTRE BDG 2/423 PENNANT HILLS RD PENNANT HILLS NSW 2120 P O BOX 967 PENNANT HILLS NSW 1715 PHONE 9847 0000	Phone (H/B) (02) 9847 0836 Mobile 0417 489 787 Fax (02) 9847 0001

As the owner of the land to which this application relates I consent to this application I also give consent to the authorised Council Officer to enter the land to carry out inspections

X *[Signature]* (REV J B HANNON) Date 28/10/2008
VICAR GENERAL
TRUSTEE OF CATHOLIC CHURCH - DIOCESE OF BROKEN BAY



If more than one owner every owner must sign If the owner is a company the form must be signed by the authorised director and the common seal must be stamped on this application
If the property has been recently purchased written confirmation from the purchaser's Solicitor must be provided
If the contracts have been exchanged for the purchase of the land, the current owner is to sign the application

Sign X *[Signature]* (BISHOP OF BROKEN BAY) Sign X *[Signature]* (VICAR GENERAL TRUSTEE - DIOCESE OF BROKEN BAY)

DEVELOPMENT DETAILS

Type of Work	<input checked="" type="checkbox"/> Building Work
	OR
	<input type="checkbox"/> Subdivision Work
Description of proposal – (Provide brief, concise details)	
ENERGY 2100 MOUNT SECURITY FENCE	

WHO WILL BE DOING THE BUILDING WORKS?

<input type="checkbox"/> Owner Builder		
Owner Builders Permit No		
Copy of Owner Builders permit attached	<input type="checkbox"/> Yes	<input type="checkbox"/> No – to be provided with Notice of Commencement Form
<p><i>If you are an Owner-Builder for the residential building work exceeding \$5000 you must apply for a permit at NSW Office of Fair Trading, 1 Fitzwilliam Street, Parramatta NSW 2150 Australia Tel 61 2 98950111 Fax 61 2 9895 0222</i></p>		

OR

<input type="checkbox"/> Licensed Builder	Builder's License Number	207161C	Contract Lic No
Name of Builder	FENWICK FABRICATIONS		Phone 9484-7979
Contact person	Victor Naimon		Mobile 0422-408-066
Address	UNIT 31 2-4 CENTRAL AVE TITONLEIGH		Fax 9484-5559
Insurance Company	Insurance Certificate attached		
VERO	<input checked="" type="checkbox"/> Yes		
	<input type="checkbox"/> No – to be provided with Notification of Commencement form		
<p><i>If you are using a licensed builder for residential building work exceeding \$12,000 you must obtain Home Building Act Insurance A certificate of insurance must be provided with this application or submitted with the Notification of Commencement form</i></p>			

VALUE OF PROPOSED DEVELOPMENT

Value of Works	\$ 106,000	(including full cost of labour and materials)
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DO YOU NEED TO PAY THE BUILDING INDUSTRY LONG SERVICE LEVY?

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
<i>Only required if the development involves building works exceeding \$25,000 00</i>	

OFFICE USE ONLY

Fee Type	Cashier's Code	Fee Amount
Construction Certificate Application Fee	TCER	\$1 140 70
Modification of Construction Certificate Fee	TCER	
Long Service Levy Fee	QLSL	\$ 350
Driveway/Street Levels	ESTR	
Sec 94 Contributions		
Bonds/Guarantees		
Other Fees		
TOTAL		\$1490 70
Date of Receipt 17-12-08	Receipt No 252141	Accepted By
New Application Number issued (not required for modification of CC)		cc0721108

PRIVACY AND PERSONAL INFORMATION PROTECTION NOTICE

Purpose of collection	To enable Council to assess your proposal
Intended recipients	Council Staff/Consultants and any other relevant government agency that may be required to assess the proposal
Supply	The information is required by legislation
Consequence of Non-provision	Your application may not be accepted not processed or rejected for lack of information
Storage	Pittwater Council will store details of the application and any subsequent decision in a register that can be viewed by the public
Retention period	Hard copies of the application will be destroyed after 7 years and electronic records will be kept indefinitely
Please contact Council if this information you have provided is incorrect or changes	

STATISTICAL RETURN FOR AUSTRALIAN BUREAU OF STATISTICS

What is the area of the land?	Area in square metres	<i>NA</i>	
Gross floor area of existing building? <i>If no existing building write "NIL"</i>	Area in square metres	<i>NA</i>	
What is the existing building or site used for at present?	Main uses	<i>Education</i>	
	Other uses		
Does the site contain a dual occupancy?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Gross floor area of proposed building?	Proposed floor area in square metres	<i>NA</i>	
What will the proposed building to be used for?	Main uses	<i>Dividing Fence</i>	
	Other uses		
How many dwellings			
Are pre-existing at this property?	Dwellings	<i>NA</i>	
Are proposed to be demolished?	Dwellings	<i>NA</i>	
Are proposed to be constructed?	Dwellings	<i>NA</i>	
How many storeys will building consist of?	Storeys	<i>NA</i>	
What are the main building materials?			
Walls		Roof	
Full Brick	<input type="checkbox"/>	Aluminium	<input type="checkbox"/>
Brick veneer	<input type="checkbox"/>	Concrete or slate	<input type="checkbox"/>
Concrete, masonry	<input type="checkbox"/>	Tile	<input type="checkbox"/>
Steel	<input checked="" type="checkbox"/>	Fibrous cement	<input type="checkbox"/>
Fibrous cement	<input type="checkbox"/>	Steel	<input type="checkbox"/>
Timber/weatherboard	<input type="checkbox"/>	Other	<input type="checkbox"/>
Cladding-aluminium	<input type="checkbox"/>	Unknown	<input type="checkbox"/>
Curtain glass	<input type="checkbox"/>		
Other	<input type="checkbox"/>		
Unknown	<input type="checkbox"/>		
Floor		Frame	
Concrete	<input type="checkbox"/>	Timber	<input type="checkbox"/>
Timber	<input type="checkbox"/>	Steel	<input type="checkbox"/>
Other	<input type="checkbox"/>	Other	<input type="checkbox"/>
Unknown	<input type="checkbox"/>	Unknown	<input type="checkbox"/>

APPLICANTS CHECK LIST

Note This list is intended as a guide to the type of information to be submitted Some items may not be required and Section B of the Conditions of Development Consent for the building works may specify further additional information required with submission of your Construction Certificate Application

Application Form –	<ul style="list-style-type: none"> <input type="checkbox"/> Owners Consent <input type="checkbox"/> Applicant's Signature <input type="checkbox"/> Long Service Levy <input type="checkbox"/> Driveway/Street levels Application
Supporting Documentation – (3 copies of each)	<ul style="list-style-type: none"> <input type="checkbox"/> Architectural Plans <input type="checkbox"/> Quick Check Plans endorsed by Sydney Water <input type="checkbox"/> Construction Specifications for Building Works <input type="checkbox"/> Structural Engineer's Plans <input type="checkbox"/> Structural/Geotechnical Certificates <input type="checkbox"/> Landscape Plans <input type="checkbox"/> Driveway Level Plans <input type="checkbox"/> On-site Stormwater Detention Plans <input type="checkbox"/> Drainage Plans on Site Storm Management <input type="checkbox"/> Erosion and Sediment Management Plan <input type="checkbox"/> Sydney Water Quick Check Plans <input type="checkbox"/> Subdivision Work Plans <input type="checkbox"/> Schedule of External Finishes/Colours <input type="checkbox"/> Fire Safety Measures Schedule <input type="checkbox"/> Form No 2 – "Geotechnical Risk Management Policy for Pittwater" <input type="checkbox"/> Details and location of fencing for Swimming Pool to comply with AS 1926-1986 "Fences and Gates for Private Swimming Pools" <input type="checkbox"/> Specifications for construction of buildings in Bushfire-prone areas <input type="checkbox"/> Security Deposit / Section 94 contributions <input type="checkbox"/> Building Code of Australia - Alternative solution report that has been peer reviewed by a separate suitably qualified person

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

Development Application for <u>SHADE STRUCTURE @ MATEA MARIA CATHOLIC COLLEGE</u>
Name of Applicant
Address of site <u>FOREST ROAD, WARRIEWOOD</u>

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

TODD HALLIDAY on behalf of NORTHROP ENGINEERS
(insert name) (trading or company name)

on this the 28/06/2007
(date)

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

Geotechnical Report Details

Report Title: <u>GEOTECHNICAL ASSESSMENT # 15427 SL2pt</u>
Report Date: <u>21 DECEMBER 2006</u>
Author: <u>L.J. SPEECHLEY</u>

Structural Documents list:

<u>1014 - SOL B Job # 06444</u>
<u>S00 A</u>


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


Todd Halliday (name)  (signature)

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

We prepared and/or technically verified the abovementioned Geotechnical Report as per Form 1 dated 21/12/06 and now certify that I have viewed the above listed structural documents prepared for the same development. **I am** **We are** satisfied that the recommendations given in the Geotechnical Report have been appropriate taken into account by the structural engineer in the preparation of these structural documents

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

Signature 
Name
Chartered Professional Status.. ..
Membership No

	<p>Paul Stubbs MIEAust CPEng Chartered Professional Engineer Membership No 130775</p>
---	--

CERTIFICATE OF CURRENCY



FENCING FABRICATIONS PTY LTD
UNIT B1 2 CENTRAL AVENUE
THORNLEIGH NSW 2120

Dear Sir/Madam,

1. STATEMENT OF COVERAGE

The following policy of insurance covers the full amount of the employer's liability under the Workers Compensation Act 1987

This Certificate is valid from 4/8/2008 to 1/7/2009

The information provided in this Certificate of Currency is correct at 04/08/2008

2. EMPLOYERS INFORMATION

POLICY NUMBER 20WOR0092180122
LEGAL NAME FENCING FABRICATIONS PTY LTD
TRADING NAME De Fence
ABN 30068518696
ACN/ARBN 068518696

WorkCover Industry Classification Number (WIC)	Industry	Numbers of Workers*	Wages**
274200	Archit. Alumin Prod Mfg	17	\$81 146 00

* Number of workers includes contractors/deemed workers
** Total wages estimated for the current period

3. IMPORTANT INFORMATION

Principals relying on this certificate should ensure it is accompanied by a statement under section 175B of the Workers Compensation Act 1987. Principals should also check and satisfy themselves that the information is correct and ensure that the proper workers compensation insurance is in place, ie compare the number of employees on site to the average number of employees estimated, ensure that the wages are reasonable to cover the labour component of the work being performed, and confirm that the description of the industry/industries noted is appropriate.

A principal contractor may become liable for an outstanding premium of the sub contractor if the principal has failed to obtain a statement or has accepted a statement where there was reason to believe it was false.

Yours Faithfully

LILY LIOTTA



CGU Workers Compensation (NSW) Ltd – Agent for the NSW WorkCover Scheme
ABN 83 564 379 108/007
Phone 1300 666 506 Fax 02 9088 9709

Business Insurance
Certificate of Currency



Issue Date 21 November 2007



FENCING FABRICATIONS PTY LTD
2 CENTRAL AVENUE
THORNLEIGH NSW 2120

Issuer

Vero Insurance Limited
ABN 48 005 297 807

Policy Number

SMX010550076

Policyholder

FENCING FABRICATIONS PTY LTD
TRADING AS DE FENCE

Policyholder

FENCING
FABRICATIONS PTY
LTD
TRADING AS DE
FENCE

Policyholder Address

2 CENTRAL AVENUE THORNLEIGH NSW 2120

Period of Insurance

30 October 2007 to 30
October 2008 at 4 00pm

Nature of Business

PROFESSIONAL OFFICES

The Business

FENCING COORDINATION OFFICE - INCLUDING MEASURING & ORDERING

Interested Parties

There are no Interested Parties noted

Policy Endorsement

Client is covered for manufacturing from 30/10/2006 & ceased
Manufacturing fencing as of 01/12/2006 at 7 DAVIDS ROAD SOMERSBY 2250
for Fire Theft & Liability

Vero Enterprise is a division of
Vero Insurance Limited
ABN 48 005 297 807



Business Insurance
 Certificate of Currency

The following cover applies across the policy for all premises

Legal Liability

	Insured Amount
Public Liability	\$20 000,000
Property in care, custody and control	\$100,000
Products Liability (any one Period of Insurance)	\$20 000,000
Pollution (any one Period of Insurance)	\$20 000,000

IBNA Gold Insurance Certificate of Currency



Issue Date 24 November 2008

DAVELCORP INSURANCE BROKERS UBI
Post Office Box 6526
BAULKHAM HILLS NSW 2153

Policy Number
SMX010550076

Issuer	Vero Insurance Limited ABN 48 005 297 807
Policyholder	FENCING FABRICATIONS PTY LTD TRADING AS DE FENCE
Policyholder Address	2 CENTRAL AVENUE THORNLEIGH NSW 2120
Period of Insurance	30 October 2008 to 30 October 2009 at 4 00pm
Nature of Business	PROFESSIONAL OFFICES
The Business	FENCING COORDINATION OFFICE - INCLUDING MEASURING & ORDERING
Interested Parties	There are no Interested Parties noted
Policy Booklet	IBNA Gold Insurance V7012 V1

Policy Endorsement

Client is covered for manufacturing from 30/10/2006 & ceased
Manufacturing fencing as of 01/12/2006 at 7 DAVIDS ROAD SOMERSBY 2250
for Fire Theft & Liability

Vero Enterprise is a division of
Vero Insurance Limited
ABN 48 005 297 807



IBNA Gold Insurance
Certificate of Currency

The following cover applies across the policy for all premises

Legal Liability

	Insured Amount
Public Liability	\$20 000,000
Property in care, custody and control	\$250 000
Products Liability (any one Period of Insurance)	\$20,000 000
Pollution (any one Period of Insurance)	\$20 000,000

**GEOTECHNICAL RISK MANAGEMENT POLICY FOR PITTWATER
FORM NO 1 - To be submitted with Development Application**

Development Application for <u>MATER MARIA CATHOLIC COLLEGE</u>	Name of Applicant
Address of site <u>FOREST ROAD WARRIEWOOD</u>	

Declaration made by geotechnical engineer or engineering geologist or coastal engineer (where applicable) as part of a geotechnical report

I PAUL STUBBS on behalf of JEFFERY AND KATNUSKAS
(Insert Name) (Trading or Company Name)

on this the 21st DECEMBER 2006 certify that I am a geotechnical engineer or engineering geologist or coastal engineer as defined by the Geotechnical Risk Management Policy for Pittwater and I am authorised by the above organisation/company to issue this document and to certify that the organisation/company has a current professional indemnity policy of at least \$2million
we have

Please mark appropriate box

- Prepared the detailed Geotechnical Report referenced below in accordance with the Australia Geomechanics Society's Geotechnical Risk Management Guidelines and the Pittwater Council Policy
- ^{are} Am willing to technically verify that the detailed Geotechnical Report referenced below has been prepared in accordance with the Australian Geomechanics Society's Geotechnical Risk Management Guidelines and the Pittwater Council Policy
- Have examined the site and the proposed development/alteration in detail and ^{are} am of the opinion that the Development Application only involves Minor Development/Alterations that do not require a Detailed Geotechnical Risk Assessment and hence my report is in accordance with the Policy requirements for Minor Development/Alterations _{our}

Provided the coastal process and coastal forces analysis for inclusion in the geotechnical report


Geotechnical Report Details


Report Title <u>GEOTECHNICAL ASSESSMENT</u>	
Report Date <u>21 DECEMBER 2006</u>	Report Ref No <u>15427SL2 (p)</u>
Author <u>MR L T SPEECHLEY</u>	

Documentation which relate to or are relied upon in report preparation

(1) PROPOSED SITE PLAN ELEVATION DRAWING No DD 101, REV DAI, DATED MARCH 2006 BY FULTON TROTTER AND PARTNERS ARCHITECTS (2) STRUCTURAL DRAWING No SCO A 1014-201, REV A DATED 23/12/05 & 5/12/06 BY NARTHROP CONSULTING ENGINEERS (3) STRUCTURAL DRAWING No 01, DATED SEPT 06 BY ANDREW JAMES NOTR

We are I am aware that the above geotechnical report prepared for the abovementioned site is to be submitted in support of a Development Application for this site and will be relied on by Pittwater Council as the basis for ensuring that the geotechnical risk management aspects of the proposed development have been adequately addressed to achieve an Acceptable Risk Management level for the life of the structure taken as at least 100 years unless otherwise stated and justified in the Report and that reasonable and practical measures have been identified to remove foreseeable risk *as discussed in the Report*

Signature 
Name
Chartered Professional Status
Membership No

	<p>Paul Stubbs MIEAust CPEng Chartered Professional Engineer Membership No 130775</p>
---	--

GEOTECHNICAL RISK MANAGEMENT POLICY FOR PITTWATER
FORM NO 1(a) - Checklist Of Requirements For Geotechnical Risk Management Report for Development
Application or Part V assessment

Development Application for <u>MATER MARIA CATHOLIC COLLEGE</u>	Name of Applicant
Address of site <u>FURESS ROAD WARRIEWOOD</u>	

The following checklist covers the minimum requirements to be addressed in a Geotechnical Risk Management Geotechnical Report. This checklist is to accompany the Geotechnical Report and its certification (Form No 1)


Geotechnical Report Details

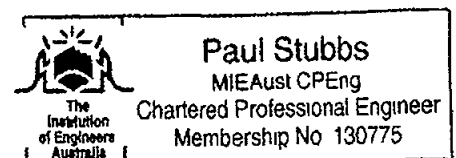
Report Title <u>GEOTECHNICAL ASSESSMENT</u>	Report Ref No <u>15427/2003</u>
Report Date <u>21 DECEMBER 2003</u>	
Author <u>MR L J SPECKHILL</u>	

Please mark appropriate box

- Comprehensive site mapping conducted 18 DECEMBER 2003
(date)
- Mapping details presented on ~~contoured~~ site plan with geomorphic mapping to a minimum scale of 1 200 (as appropriate)
- Subsurface investigation required
 - No Justification NOT CONSIDERED NECESSARY
 - Yes Date conducted
- Geotechnical model developed and reported as an inferred subsurface type section NOT CONSIDERED NECESSARY
 Geotechnical hazards identified NOT TO SMALL SCALE OF PROPOSED DEVELOPMENT
 - Above the sites
 - On the site
 - Below the site
 - Beside the site
- Geotechnical hazards described and reported
- Risk assessment conducted in accordance with Council's Policy
 - Consequence analysis
 - Frequency analysis
- Risk calculation
- Risk assessment for property conducted in accordance with Council's Policy
- Risk assessment for loss of life conducted in accordance with Council's Policy
- Assessed risks have been compared to Acceptable Risk Management criteria as defined in the Geotechnical Risk Management Policy for Pittwater
- Opinion has been provided that the design can achieve the Acceptable Risk Management criteria provided that the specified conditions are achieved recommendations presented in the Report are adopted
- Design Life Adopted
 - 100 years
 - Other specify
- Development Conditions to be applied to all four phases as described in Pittwater Geotechnical Risk Management Policy have been specified
- Additional action to remove risk where reasonable and practical have been identified and included in the report

We are I am aware that Pittwater Council will rely on the Geotechnical Report to which this checklist applies as the basis for *confirming* ensuring that the geotechnical risk management aspects of the proposal have been adequately addressed to achieve an Acceptable Risk Management level for the life of the structure taken as at least 100 years unless otherwise stated and justified in the Report and that reasonable and practical measures have been identified to remove foreseeable risk *as discussed in the Report*

Signature 
 Name
 Chartered Professional Status
 Membership No



For and on behalf of Jeffery & Kotauskas Pty Ltd

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

Development Application for <u>SHADE STRUCTURE @ MATER MARIA CATHOLIC COLLEGE</u>
Name of Applicant
Address of site <u>FOREST ROAD, WATLIEWOOD</u>

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

I TODD HALLIDAY on behalf of NORTHROP ENVIRONMENTS
(insert name) (trading or company name)

on this the 28/06/2007
(date)

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

Geotechnical Report Details

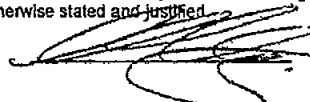
Report Title	<u>GEOTECHNICAL ASSESSMENT # 15427 SL2PT</u>
Report Date	<u>21 DECEMBER 2006</u>
Author	<u>L S SPECKLET</u>

Structural Documents list

<u>1014-S01B Job # 06444</u>
<u>S00A</u>

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

Todd Halliday
(name)



(signature)

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

We ~~I am~~ prepared and/or technically verified the abovementioned Geotechnical Report as per Form 1 dated 21/12/06 and now certify that ~~I have~~ viewed the above listed structural documents prepared for the same development. ~~I am~~ We are satisfied that the recommendations given in the Geotechnical Report have been appropriate taken into account by the structural engineer in the preparation of these structural documents.

We are ~~I am~~ aware that Pittwater Council relies on the processes covered by the Geotechnical Risk Management Policy including this certification as the basis for ensuring that the geotechnical risk management aspects of the proposed development have been adequately addressed to achieve an Acceptable Risk Management level for the life of the structure taken as at least 100 years unless otherwise stated and justified in the Report and that reasonable and practical measures have been identified to remove foreseeable risk.

Signature



Name

Chartered Professional Status

Membership No



Paul Stubbs
MIEAust CPEng
Chartered Professional Engineer
Membership No 130775

Jeffery and Katauskas Pty Ltd

CONSULTING GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS
ABN 17 003 550 801



Principals

E H FLETCHER BSc (Eng) ME

P STUBBS BSc MICE FGS

D TREWEEK Dip Tech

B F WALKER BE DIC MS

Consultant R P JEFFERY BE DIC MS

Senior Associates

L J SPEECHLEY BE(Hons) MEngSc

F A VEGA BSc(Eng) GDE

P C WRIGHT BE(Hons) MEngSc

A ZENON BSc(Eng) GDE

Associates

D BLISS BE(Hons) MEngSc

A JACKAMAN BE MEngSc

A KINGSWELL BSc(Hons) MSc

A B WALKER BE(Hons) MEngSc

115 WICKS ROAD

MACQUARIE PARK NSW 2113

POSTAL ADDRESS PO BOX 976

NORTH RYDE BC NSW 1670

Tel 02 9888 5000

Fax 02 9888 5001

REPORT

TO

MATER MARIA CATHOLIC COLLEGE

ON

GEOTECHNICAL ASSESSMENT

(IN ACCORDANCE WITH PITTWATER COUNCIL AMENDED INTERIM POLICY)

FOR

**PROPOSED SHADE STRUCTURE AND WATER
TREATMENT PLANT**

AT

**MATER MARIA CATHOLIC COLLEGE,
FOREST ROAD, WARRIEWOOD**

21 December 2006

Ref 15427SL2rpt



ENVIRONMENTAL INVESTIGATION SERVICES FOUNDATION AND SLOPE STABILITY INVESTIGATIONS
ENGINEERING GEOLOGY PAVEMENT DESIGN EXPERT WITNESS REPORTS DRILLING SERVICES
EARTHWORKS COMPACTION CONTROL MATERIALS TESTING ASPHALTIC CONCRETE TESTING
QA AND QC TESTING AUDITING AND CERTIFICATION NATA REGISTERED LABORATORIES





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1 INTRODUCTION

This report presents the results of our geotechnical assessment of relevant portions of the Mater Maria Catholic College, at Forest Road, Warriewood. The assessment was commissioned by Mr Mark Suters of Mater Maria Catholic College by Purchase Order Number 000695 dated 8 December 2006. Our geotechnical assessment has been carried out in accordance with our proposal (Ref P13585SL) dated 8 December 2006. The relevant portions of the site were inspected by the undersigned on 18 December 2006, in order to assess the existing stability and the effect on stability of the proposed development.

We understand that the proposed development comprises two separate structures, a shade structure and a water treatment plant. The location of these proposed structures is shown on the attached Figure 1. Figure 1 is an extract from the site plan prepared by Fulton Trotter and Partners Architects, Drawing Number DD-101, dated March 2006.

Shade Structure

We have been provided with the following drawings for the proposed shade structure,

- Layout Plan, Drawing Number DW6, undated, by Sunshade Australia
- Structural Drawing Number S00, Revision A, dated 23 February 2005 by Northrop Structural Engineers
- Structural drawing Number 1014-S01 Revision A, dated 5 December 2006 by Northrop Structural Engineers

From these drawings we understand that the shade structure will generally be located between Blocks A and F. The pole supports for the shade structure will be supported by piled footings.



Water Treatment Plant

We have been provided with Structural Drawing Number S1 dated 25 September 2006, by Bond James Norrie Marsden Consulting Engineers. From this drawing and the site plan, we understand that the proposed water treatment plant will be located to the east of the existing carpark, close to the eastern boundary of the College. The treatment plant will be constructed by excavating into an existing vegetated batter slope. Excavation will be to a maximum depth of about 1.8m and will be about 0.6m from the concrete kerb and gutter for the existing carpark. The excavation will be supported by a concrete block retaining wall.

This report has been prepared in accordance with the requirements of the Amended Interim Geotechnical Risk Management Policy for Pittwater (adopted 17 June 2003) as discussed in Section 4 below. It is understood that the report will be submitted to Council as part of the DA documentation. Our report is preceded by the completed Council Forms 1 and 1a.

2 ASSESSMENT METHODOLOGY

2.1 Walkover Survey

The geotechnical assessment of each area is based upon a detailed inspection of the topographic, surface drainage and geological conditions of the site and its immediate environs. These features were compared to those of other similar lots in neighbouring locations to provide a comparative basis for assessing the risk of instability affecting the proposed developments. The attached Appendix A defines the terminology adopted for the risk assessment together with a flow chart illustrating the Risk Management Process based on the guidelines given in AGS 2000 (Reference 1).



A summary of our observations is presented in Section 3 below. Our specific recommendations regarding the proposed developments are discussed in Section 5 following our geotechnical assessment.

The attached Figure 2 presents a geotechnical sketch plan of the area around the proposed shade structure, while the attached Figure 3 presents a typical section through the proposed water treatment plant. Figures 2 and 3 show some of the principal geotechnical features present at the sites. Features shown on Figures 2 and 3 have been measured by hand held inclinometer and tape measure techniques and hence are only approximate. Should any of the features be critical to the proposed developments, we recommend they be located more accurately using instrument survey techniques.

3 SUMMARY OF OBSERVATIONS

We recommend that the summary of observations which follows be read in conjunction with the attached Figures 2 and 3.

Shade Structure (Refer to Figure 2)

- The proposed shade structure will be located such that it covers an existing asphaltic concrete playground, with Block A to the south and Block F and another demountable classroom to the north.
- The overall topography of the area has an average slope down to the south at about 20°. However the site appears to have been cut and filled to create level building pads and playground areas.
- On the high (or northern) side of the proposed shade structure there is a rendered retaining wall about 1.1m high. This wall appears in good condition. Above this wall there is a garden area which contains a batter slope upto 2m high and as steep as an average of about 45°. Weathered bedrock was



- exposed in the batter slope. About 2.5m beyond the crest of the batter slope is a single storey metal demountable classroom.
- On the low (or southern) side of the proposed shade structure there is a concrete retaining wall which is 2.2m high and which retains the asphalt playground area. This wall is also in good condition and has weep holes at about 1.8m to 2.0m spacing at the base of the wall. Some seepage was evident from the weep holes. While we have no subsurface information, we surmise that the retaining wall supports at least a moderate depth of fill. A stormwater line also runs along the playground side of the retaining wall.
 - The adjoining Blocks A and F are three storey brick and concrete structures.

Water Treatment Plant (Refer to Figure 3)

- The proposed water treatment plant is to be located at the eastern end of the site on the low side of an existing asphalt carpark. The asphalt carpark has been recently constructed and we understand that it involved excavation into the hillside on the high side and filling on the low side.
- A batter slope exists on the low side of the existing carpark, and as discussed above we expect that this batter slope comprises an engineered fill. The batter slope is about 1.8m high and has an average gradient of about 26° or 1 Vertical in 2 Horizontal. At the toe of the batter slope there is a concrete cycleway and footpath.
- A stormwater pipe appears to run below the concrete kerb and gutter on the low side of the existing asphalt carpark. The invert of the stormwater pipe was measured to be at about 1.35m below the top of the concrete kerb.



4 GEOTECHNICAL ASSESSMENT

4.1 Potential Landslide Hazards

We consider that the potential landslide hazards associated with the site of the proposed shade structure to be the following

- Hazard A** Failure of the concrete retaining wall on the southern side of the playground
- Hazard B** Failure of the rendered retaining wall on the northern side of the playground
- Hazard C** Slump failure of the batter slope between the demountable classroom and the playground

We consider that the potential landslide hazards associated with the site of the proposed water treatment plant to be the following

- Hazard D** Slump of the cut face during excavation of the plant area We note that this is a temporary hazard during construction
- Hazard E** Failure of the concrete block retaining wall around the new water treatment plant

4.2 Risk Analysis

The attached Table A summarises our qualitative assessment of each potential landslide hazard and of the consequences to property should the landslide hazard occur. Based on the above, the qualitative risks to property have been determined. The terminology adopted for this qualitative assessment is in accordance with Table A1 given in Appendix A. Table A indicates that the assessed risk to property for hazards A, B, C and E is either Very Low or Low which would be considered 'Acceptable' in accordance with the criteria given in Reference 1 and the Pittwater Council Amended Interim Policy. Hazard D has been assessed as having a temporary risk to property of Moderate. The Moderate risk is considered to be 'Tolerable' in



accordance with the criteria given in Reference 1 and the Pittwater Council Amended Interim Policy. The Moderate risk for Hazard D assumes that the excavation for the water treatment plant is cut without providing any temporary support. If temporary support of the excavation is provided then we consider that the likelihood of failure could be reduced to 'Unlikely' and therefore the risk would be reduced to 'Low' and therefore 'Acceptable'. Reference should be made to Section 5 below for specific comments and recommendations.

We have also used the indicative probabilities associated with the assessed likelihood of instability to calculate the risk to life. The temporal and vulnerability factors that have been adopted are given in the attached Table B together with the resulting risk calculation. Our assessed risk to life for the person most at risk is about equal to or less than 1×10^{-6} for all hazards.

4.3 Risk Assessment

The Pittwater Amended Interim Policy requires suitable measures 'to remove risk'. It is recognised that, due to the many complex factors that can affect a site, the subjective nature of a risk analysis, and the imprecise nature of the science of geotechnical engineering, the risk of instability for a site and/or development cannot be completely removed. It is, however, essential that risk be reduced to at least that which could be reasonably anticipated by the community in everyday life and that landowners be made aware of reasonable and practical measures available to reduce risk as far as possible. Hence, where the policy requires that 'reasonable and practical measures have been identified to remove risk', it means that there has been an active process of reducing risk, but it does not require the geotechnical engineer to warrant that risk has been completely removed, only reduced, as removing risk is not currently scientifically achievable.



Similarly, the Pittwater Interim Policy requires that the design project life be taken as 100 years unless otherwise justified by the applicant. This requirement provides the context within which the geotechnical risk assessment should be made. The required 100 years baseline broadly reflects the expectations of the community for the anticipated life of a residential structure and hence the timeframe to be considered when undertaking the geotechnical risk assessment and making recommendations as to the appropriateness of a development, and its design and remedial measures that should be taken to control risk. It is recognised that in a 100 year period external factors that cannot reasonably be foreseen may affect the geotechnical risks associated with a site. Hence, the Policy does not seek the geotechnical engineer to warrant the development for a 100 year period, rather to provide a professional opinion that foreseeable geotechnical risks to which the development may be subjected in that timeframe have been reasonably considered.

Our assessment of the probability of failure of existing structural elements such as retaining walls (where applicable) is based upon a visual appraisal of their type and condition at the time of our inspection. Where existing structural elements such as retaining walls will not be replaced as part of the proposed development, where appropriate we identify the time period at which reassessment of their longevity seems warranted.

In preparing our recommendations given below we have adopted the above interpretations of the Interim Policy requirements. We have also assumed that no activities on surrounding land which may affect the risk on the subject site would be carried out. We have further assumed that all Council's buried services are, and will be regularly maintained to remain, in good condition.

We consider that our risk analysis has shown that the sites of the proposed development can achieve the 'Acceptable Risk Management' criteria in the Pittwater Interim Policy provided that the recommendations given in Section 5 below are



adopted These recommendations form an integral part of the Landslide Risk Management Process

5 COMMENTS AND RECOMMENDATIONS

We consider that the proposed developments may proceed provided the following specific design, construction and maintenance recommendations are adopted to maintain and reduce the present risk of instability of the site and to control future risks. These recommendations address geotechnical issues only and other conditions may be required to address other aspects.

5.1 Conditions Recommended to Establish the Design Parameters

Shade Structure

5.1.1 The structural drawings for the shade structure indicate the new shade structure supports to be founded on 600mm diameter pile footings extending into stiff clays to total depths ranging from 1.8m to 2.3m. From our visual assessment of the site, we expect that these soil conditions will probably be encountered on the northern side of the site. However, on the southern side of the site, we expect that there may be a moderate depth of fill adjacent to the existing concrete retaining wall and therefore piers will probably need to extend to greater depths. Currently we have no details of the existing concrete wall, or the stormwater pipe which extends along the back of the wall. It is possible that the concrete retaining wall may have a heel which extends back under the playground and therefore may affect piling. Also it is important to note that lateral loading of the piles from the shade structure supports will induce additional lateral loads on the existing concrete retaining wall and stormwater pipe. Therefore we recommend that the piles be located as far away from the retaining wall and stormwater pipe as possible, but at least 1.0m from both to reduce the risk of adversely impacting the wall or stormwater pipe. We also recommend that the piles



be founded at least 1.0m below the base of the concrete wall, or deeper should the structural design require

Water Treatment Plant

5.1.2 The structural drawings for the Water Treatment Plant by Bond James Norrie Marsden indicate the retaining wall surrounding the plant to be a concrete block wall up to about 1.6m high and founded on weathered rock. The rear of the wall will be 0.6m from the outside edge of the concrete kerb to the adjoining asphalt carpark. Construction of this wall as a gravity retaining wall will require a vertical or near vertical cut immediately below the kerb of the existing carpark. Our geotechnical risk assessment has indicated that the risk to property (i.e. the kerb, gutter and asphalt pavement, as well as the concrete stormwater pipe below the kerb) is 'Moderate' if the soil is cut without support. The Moderate risk rating is based on our judgement that the potential consequences for a slump of the excavation face during construction is Minor (i.e. limited damage to part of site requiring some reinstatement/stabilisation works). However in this case the consequences are quite subjective and others may consider that the consequences are far more insignificant. Therefore we consider that there are two options that may be adopted. It will be the responsibility of the client to consider the risks and the cost implications and nominate their preferred method. Option 1 is to support the excavation face, at least on the high side, by an insitu retention system. Option 2 is to excavate the soils vertically without temporary support and accept the risk that if damage to the pavement and stormwater pipe occurs from slumping or movement of the cut face, then it will need to be repaired.

5.1.3 For Option 1 discussed above, the insitu retention system could be utilised as part of the permanent support. The insitu retention system could include



a contiguous piled or semi contiguous piled (soldier pile) wall. The gaps between piles should not exceed 0.3m and would need to be filled by reinforcing mesh and shotcrete immediately after excavation. If the soils are found to be quite sandy during drilling then closer spacing of the piles will be necessary.

5.1.4 Option 2 would require construction of the concrete block retaining wall to be carried out as soon as possible after excavation. The probability of slumping and causing damage to the adjoining pavement and stormwater pipe will increase the longer the cut face is left unsupported. For this option a free draining durable granular drainage layer should extend up the entire rear of the wall (with the exception of the upper 0.3m which should be capped with a layer of clay). The granular drainage material should be surrounded by geotextile filter fabric (such as Bidim A34). An agricultural pipe should be located at the base and rear of the retaining wall to collect seepage and direct it to the stormwater system.

5.1.5 The proposed new retaining walls should be designed using the following parameters:

- For cantilever walls, adopt a triangular lateral earth pressure distribution and an 'active' earth pressure coefficient, (K_a) of 0.3, for the retained height, assuming a horizontal backfill surface.
- A bulk unit weight of 20kN/m^3 should be adopted for the soil profile.
- Any surcharge affecting the walls (eg traffic loading, live loading, etc) should be allowed in the design.
- The retaining walls should be provided with complete and permanent drainage of the ground behind the walls. This could include drainage cell placed between the piles for a semi contiguous piled wall.



- Rock may not be encountered at bulk excavation level. Therefore where applicable passive resistance should be based on a passive earth pressure co-efficient (K_p) of 3.0

5.1.6 Footings for the retaining wall may be founded on natural residual soils (depending on the load requirements of the wall footing) or weathered rock. Footings founded on weathered rock may be designed on the basis of a maximum allowable bearing pressure of 600kPa subject to inspection by a geotechnical engineer prior to pouring. Footings founded on residual soils would need specific assessment by the geotechnical engineers once the founding conditions are exposed.

5.1.7 The guidelines for Hillside Construction given in Appendix B should also be adopted.

5.2 Conditions Recommended to the Detailed Design to be Undertaken for the Construction Certificate

5.2.1 All structural design drawings must be reviewed by the geotechnical engineer who should endorse that the recommendations contained in this report have been adopted in principle.

5.2.2 The structural engineer must indicate on the structural drawings the design life of all structures and structural elements.

5.2.3 Any hydraulic design drawings must be reviewed by the geotechnical engineer who should endorse that the recommendations contained in this report have been adopted in principle.



5 3 Conditions Recommended During the Construction Period

- 5 3 1 The geotechnical engineer must inspect the drilling of all pile footings for the shade structure to confirm they have encountered material consistent with that assumed on the structural drawings
- 5 3 2 If excavation for the water treatment plant is to be excavated without temporary support then the geotechnical engineer must inspect the excavation face for any obvious signs of instability prior to personnel commencing block wall construction
- 5 3 3 If a contiguous pile or semi contiguous pile wall is adopted to provide temporary support for the water treatment plant excavation, then the drilling of piles should be inspected by a geotechnical engineer to confirm that the material encountered and depths of piles is consistent with assumptions made in the structural drawings
- 5 3 4 Granular backfill behind retaining walls must be approved by the geotechnical engineer prior to placement
- 5 3 5 The geotechnical engineer must confirm that the proposed works have been completed in accordance with the geotechnical reports

5 4 Conditions Recommended for Ongoing Management of the Site/Structure(s)

The following recommendations have been included so that the current and future owners of the subject property are aware of their responsibilities

- 5 4 1 All existing and proposed surface (including roof) and subsurface drains must be subject to ongoing and regular maintenance by the property owners
- 5 4 2 No cut or fill in excess of 0.5m (eg for landscaping, buried pipes, retaining walls, etc), is to be carried out on site without prior consent from Pittwater Council



- 5 4 3 Where the structural engineer has indicated a design life of less than 100 years then the structure and/or structural elements must be inspected by a structural engineer at the end of their design life, including a written report confirming scope of work completed and identifying the required remedial measures to extend the design life over the remaining 100 year period
- 5 4 4 There is minor undermining of the edge of the concrete footpath next to the demountable classroom This edge should be locally underpinned to reduce the risk of cracking of the concrete footpath with time

6 OVERVIEW

It is possible that the subsurface soil, rock or groundwater conditions encountered during construction may be found to be different (or may be interpreted to be different) from those inferred from our surface observations in preparing this report Also, we have not had the opportunity to observe surface run-off patterns during heavy rainfall and cannot comment directly on this aspect If conditions appear to be at variance or cause concern for any reason, then we recommend that you immediately contact this office

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Should you have any queries regarding this report, please do not hesitate to contact the undersigned

A handwritten signature in black ink, appearing to read 'LJ Speechley'.

LJ Speechley
Senior Associate

Reviewed By,

A handwritten signature in black ink, appearing to read 'P Stubbs'.

P Stubbs
Principal
For and on behalf of
JEFFERY AND KATAUSKAS PTY LTD

Reference 1 Australian Geomechanics Society (2000) *Landslide Risk Management Concepts and Guidelines* Australian Geomechanics, Vol 35, No 1 March 2000 pp49 92



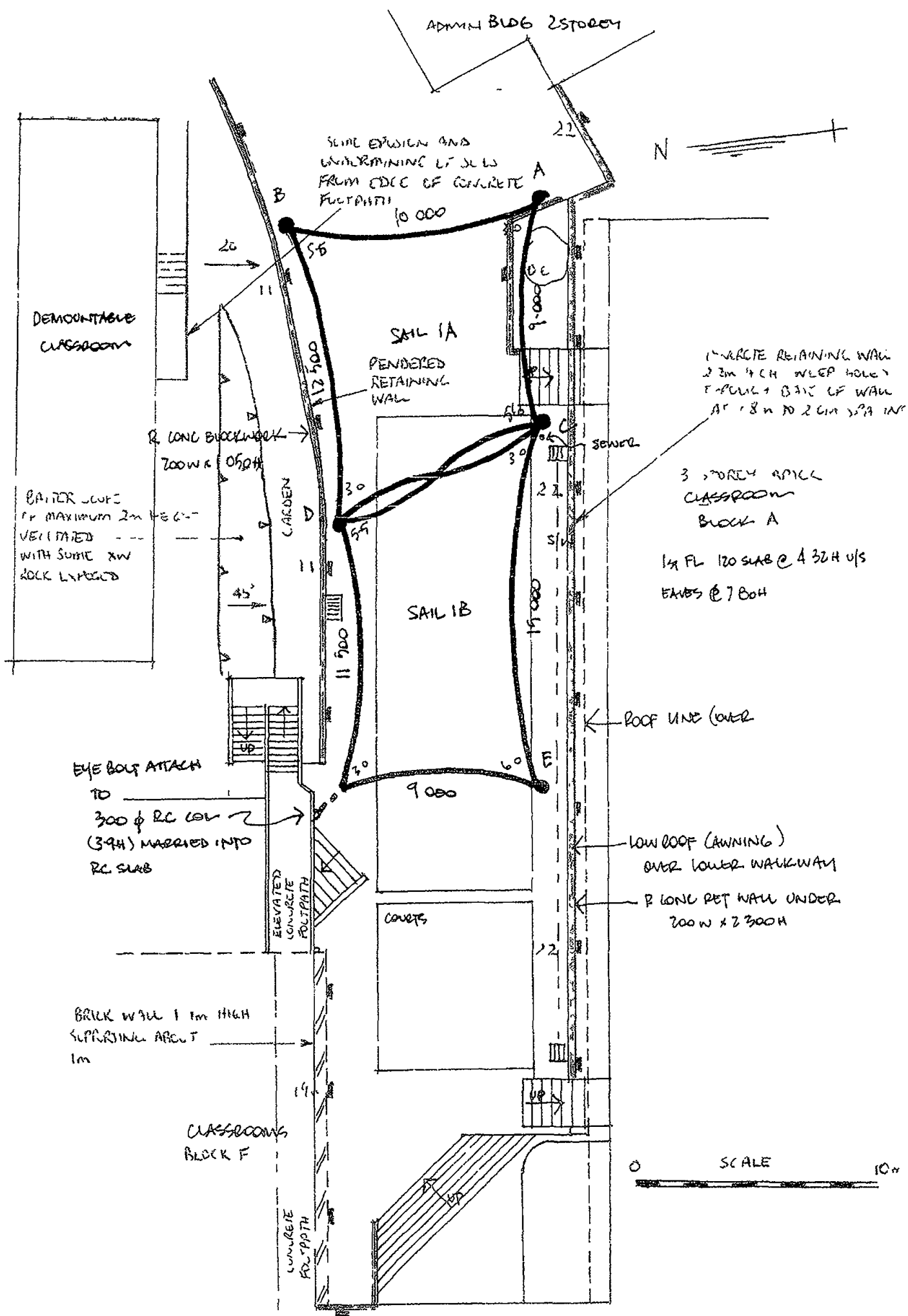
TABLE B
SUMMARY OF RISK ASSESSMENT TO LIFE

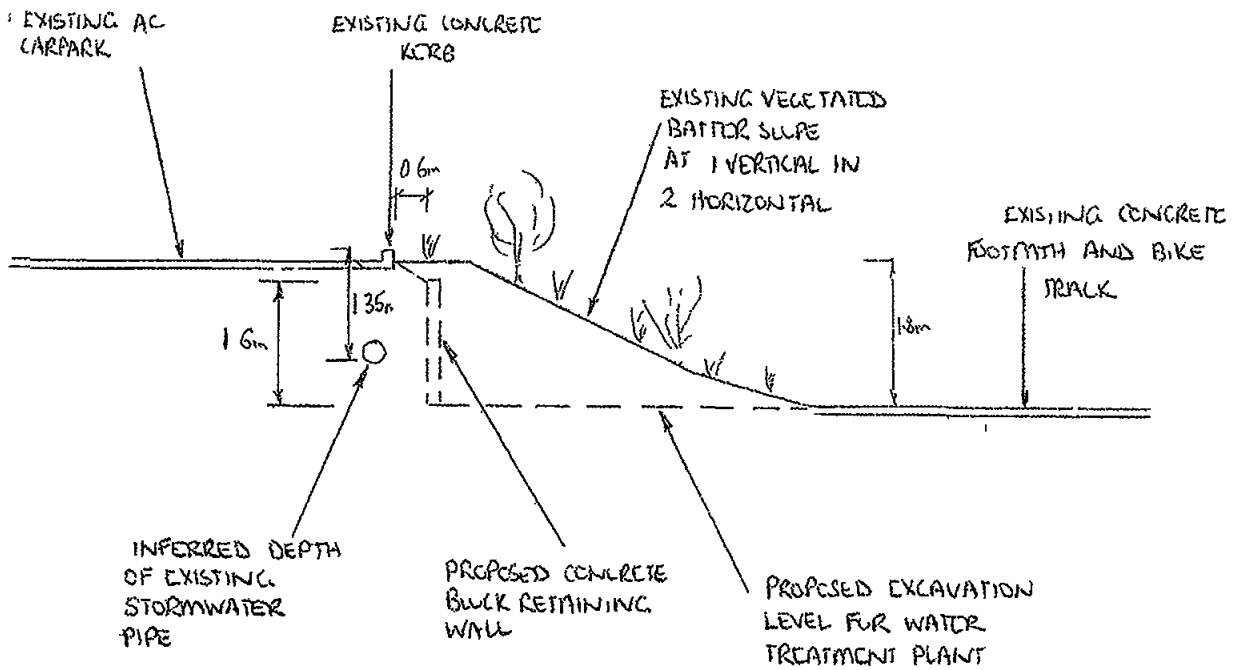
Potential Landslide Hazard	Hazard A Failure of the concrete retaining wall on the southern side of the playground	Hazard B Failure of the rendered retaining wall on the northern side of the playground	Hazard C Slump failure of the batter slope between the demountable classroom and the playground	Hazard D Slump of the cut face during excavation of the water treatment plant area (Temporary Hazard)	Hazard E Failure of the concrete block retaining wall around the new water treatment plant
Assessed Likelihood	Unlikely to Rare	Unlikely to Rare	Possible	Likely	Rare
Indicative Annual Probability	5x10 ⁻⁵	5x10 ⁻⁵	1x10 ⁻³	1x10 ⁻²	1x10 ⁻⁵
Persons at Risk	Persons in playground close to wall or in service corridor below wall	Persons in playground near wall	Persons in playground	Person in excavation or above crest of cut	Persons in the water treatment plant
Number of Persons Considered	4 (assumes 4 students near wall at any one time)	4 (assumes 4 students near wall at any one time)	4 (assumes 4 students within vicinity of failure)	2	1
Duration of Use of Area Affected (Temporal Probability)	3 hours/day (0.125)	3 hours/day (0.125)	3 hours/day (0.125) Assumes fencing restricts vehicular access to crest of cut)	4 hours/day (0.166) (during construction of block walls)	1 hour/month (0.001)
Probability of Not Evacuating Area Affected	0.01 (warning by cracking)	0.01 (warning by cracking)	0.1	0.1	0.1 Warning by cracking
Vulnerability to Life if Failure Occurs Whilst Person Present	0.3 (may be buried or trapped)	0.1 (unlikely to be buried)	0.01 (unlikely to be buried or struck with any significant volume of material)	0.01 (unlikely to be buried or struck with any significant volume of material)	0.3 (may be trapped)
Risk for Person Most at Risk	1.8x10 ⁻⁸	6x10 ⁻⁸	1.25x10 ⁻⁷	1.6x10 ⁻⁶	3x10 ⁻¹⁰
Total Risk	7.2x10 ⁻⁸	2.4x10 ⁻⁸	5x10 ⁻⁷	3.2x10 ⁻⁶	3x10 ⁻¹⁰



TABLE A
SUMMARY OF RISK ASSESSMENT TO PROPERTY

Potential Landslide Hazard	Assessed Likelihood	Assessed Consequences	Risk	Comments
Hazard A Failure of the concrete retaining wall on the southern side of the playground	Unlikely to Rare	Medium	Low	Wall currently appears in good condition Failure could impact Block A and shade structure footings Some warning would be likely by cracking
Hazard B Failure of the rendered retaining wall on the northern side of the playground	Unlikely to Rare	Minor	Very Low	Wall currently in good condition Some warning would be likely by cracking
Hazard C Slump failure of the batter slope between the demountable classroom and the playground	Possible	Insignificant	Low	Failure unlikely to reach playground or demountable classroom
Hazard D Slump of the cut face during excavation of the water treatment plant area We note that this is a temporary hazard during construction	Likely	Minor	Moderate	Damage could extend to kerb gutter and asphalt pavement and possibly stormwater pipe If insitu wall used to support cut during construction then likelihood would be Unlikely and risk would reduce to 'Low'
Hazard E Failure of the concrete block retaining wall around the new water treatment plant	Rare	Minor to Medium	Very Low	Retaining wall to be properly designed Damage from failure may extend to carpark





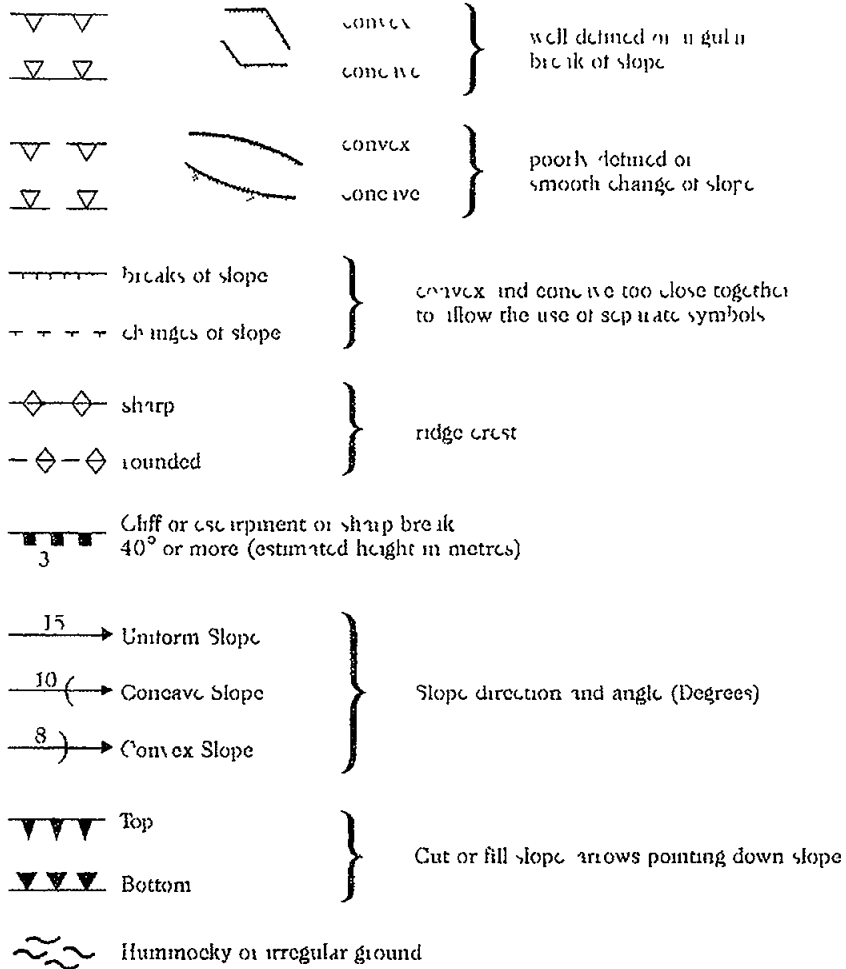
TYPICAL SECTION

PROPOSED WATER TREATMENT PLANT

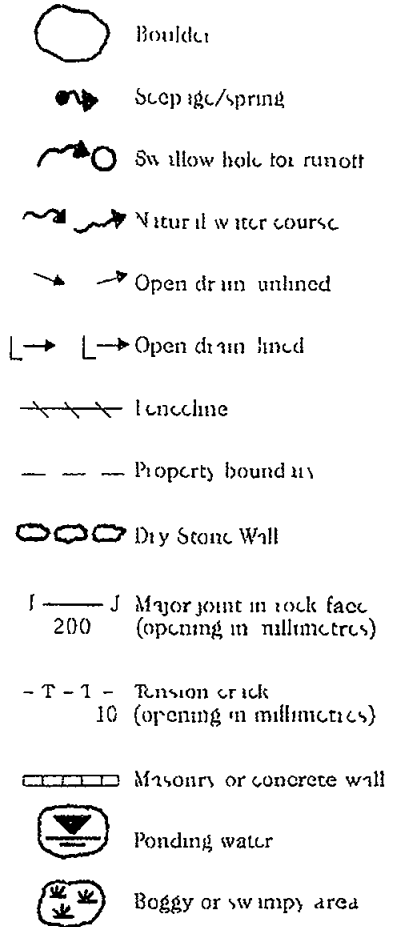
SCALE 1:100 AT A4 SIZE

TOPOGRAPHY

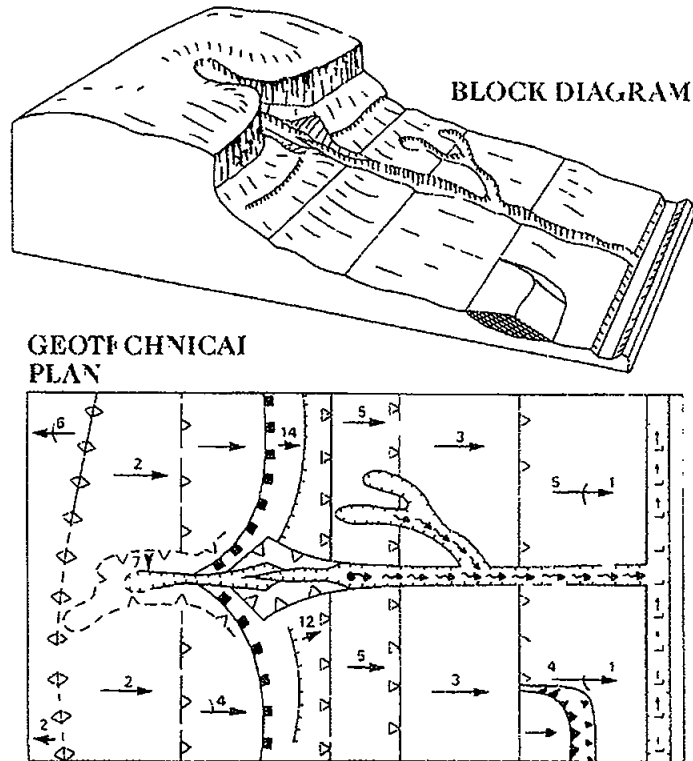
Symbol Ground Profile



OTHER FEATURES



EXAMPLE OF USE OF TOPOGRAPHIC SYMBOLS





APPENDIX A

LANDSLIDE RISK MANAGEMENT TERMINOLOGY



APPENDIX A

LANDSLIDE RISK MANAGEMENT

DEFINITION OF TERMS

Risk – A measure of the probability and severity of an adverse effect to health, property or the environment

Risk is often estimated by the product of probability x consequences. However, a more general interpretation of risk involves a comparison of the probability and consequences in a non-product form.

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

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

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

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

Likelihood – used as a qualitative description of probability or frequency.

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

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

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

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



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

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

Risk Assessment – The process of risk analysis and risk evaluation.

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

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

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

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

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

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

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

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

Note Reference should also be made to Figure A1 which shows the inter-relationship of many of these terms and the relevant portion of Landslide Risk Management.

Reference should also be made to the paper referenced below for Landslide Terminology and more detailed discussion of the above terminology.



**TABLE A1 LANDSLIDE RISK ASSESSMENT
QUALITATIVE TERMINOLOGY FOR USE IN ASSESSING RISK TO PROPERTY**

Qualitative Measures of Likelihood

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

Note \approx means that the indicative value may vary by say $\pm 1/2$ order of magnitude or more

Qualitative Measures of Consequences to Property

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

Note The Description may be edited to suit a particular case

Qualitative Risk Analysis Matrix – Level of Risk to Property

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

Risk Level Implications

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

Note (1) The implications for a particular situation are to be determined by all parties to the risk assessment these are only given as a general guide
 (2) Judicious use of dual descriptors for Likelihood Consequence and Risk to reflect the uncertainty of the estimate may be appropriate in some cases

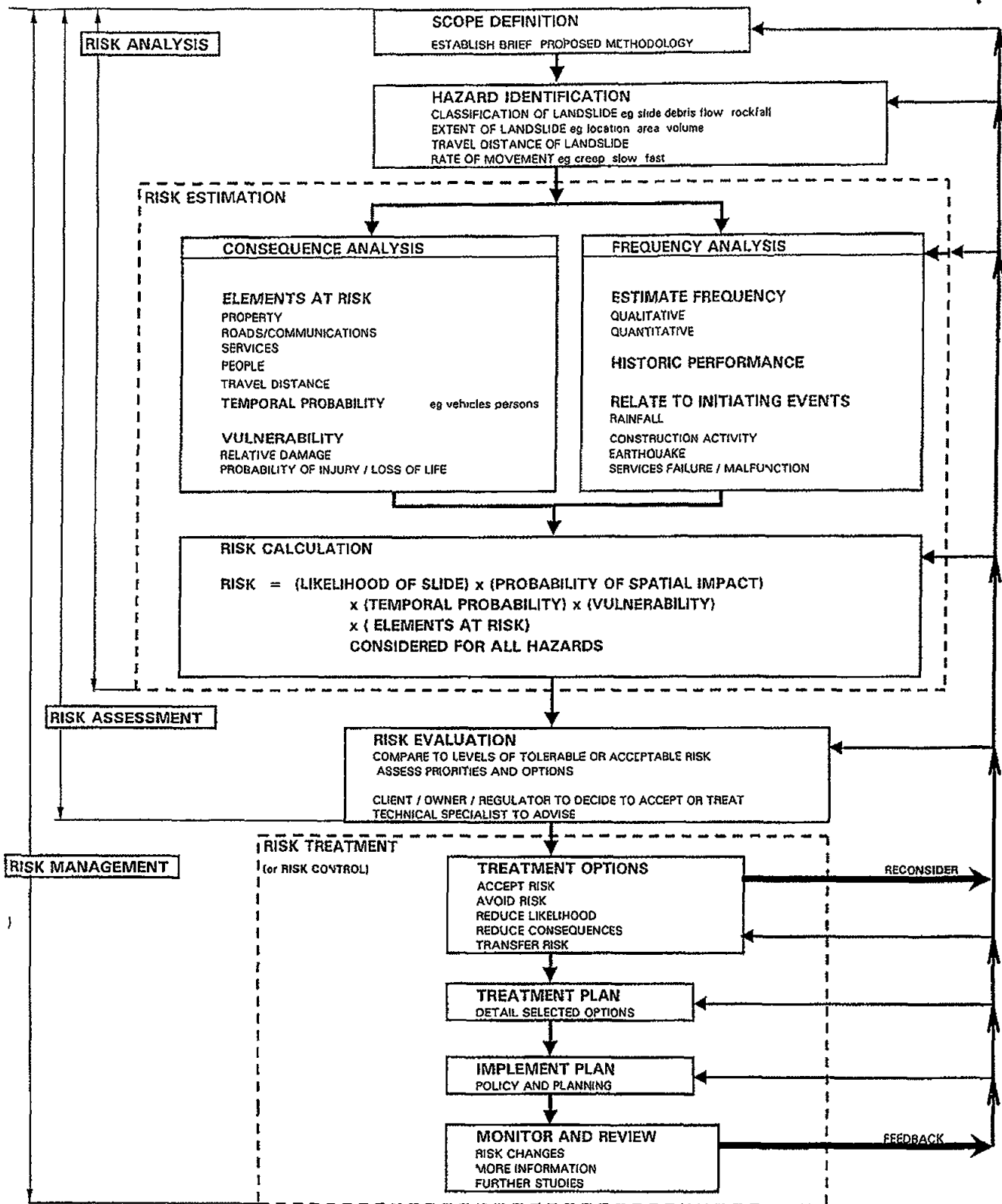


FIGURE A1. FLOWCHART FOR LANDSLIDE RISK MANAGEMENT

This figure is an extract from LANDSLIDE RISK MANAGEMENT CONCEPTS AND GUIDELINES as presented in Australian Geomechanics Vol35 No1 2000 which discusses the matter more fully

APPENDIX B

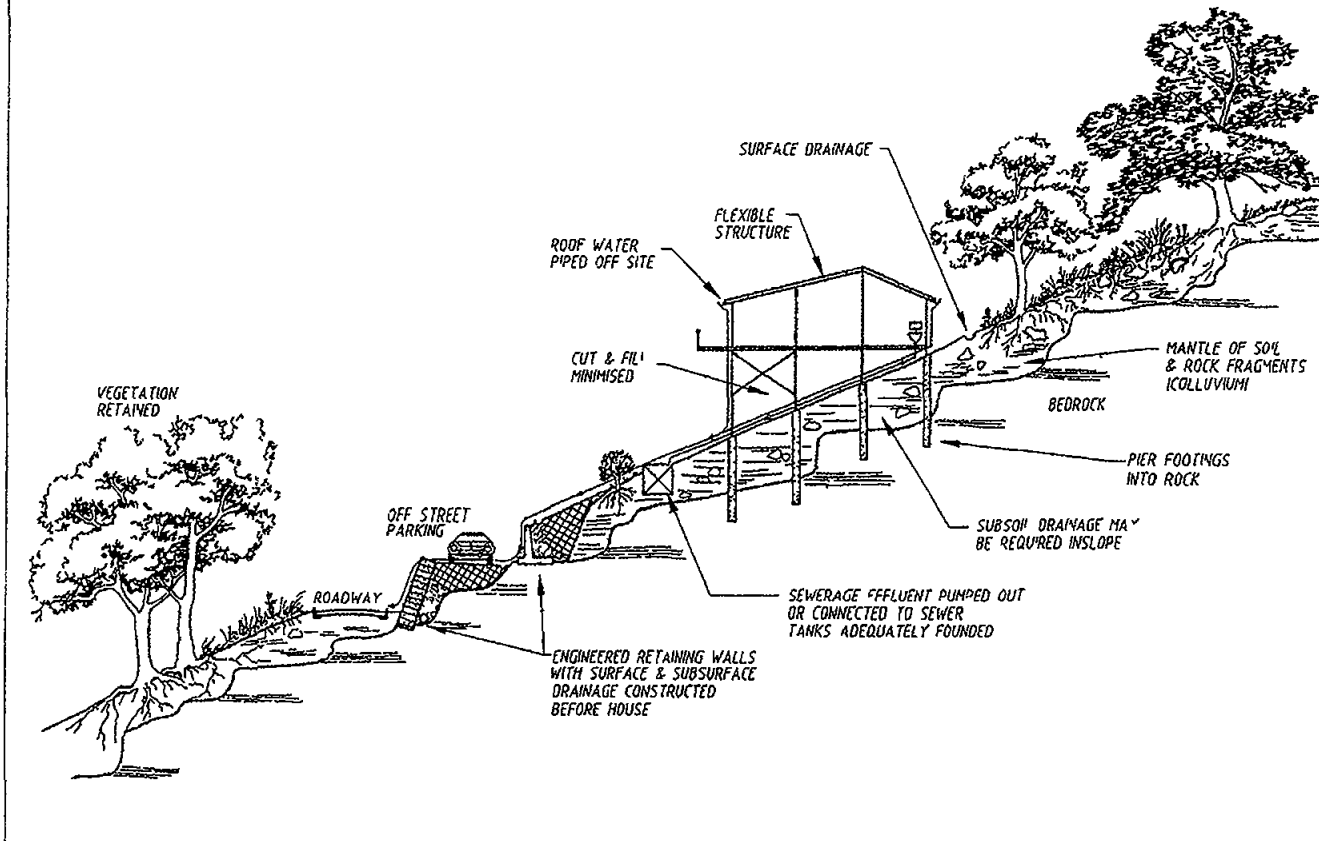


APPENDIX B – SOME GUIDELINES FOR HILLSIDE CONSTRUCTION

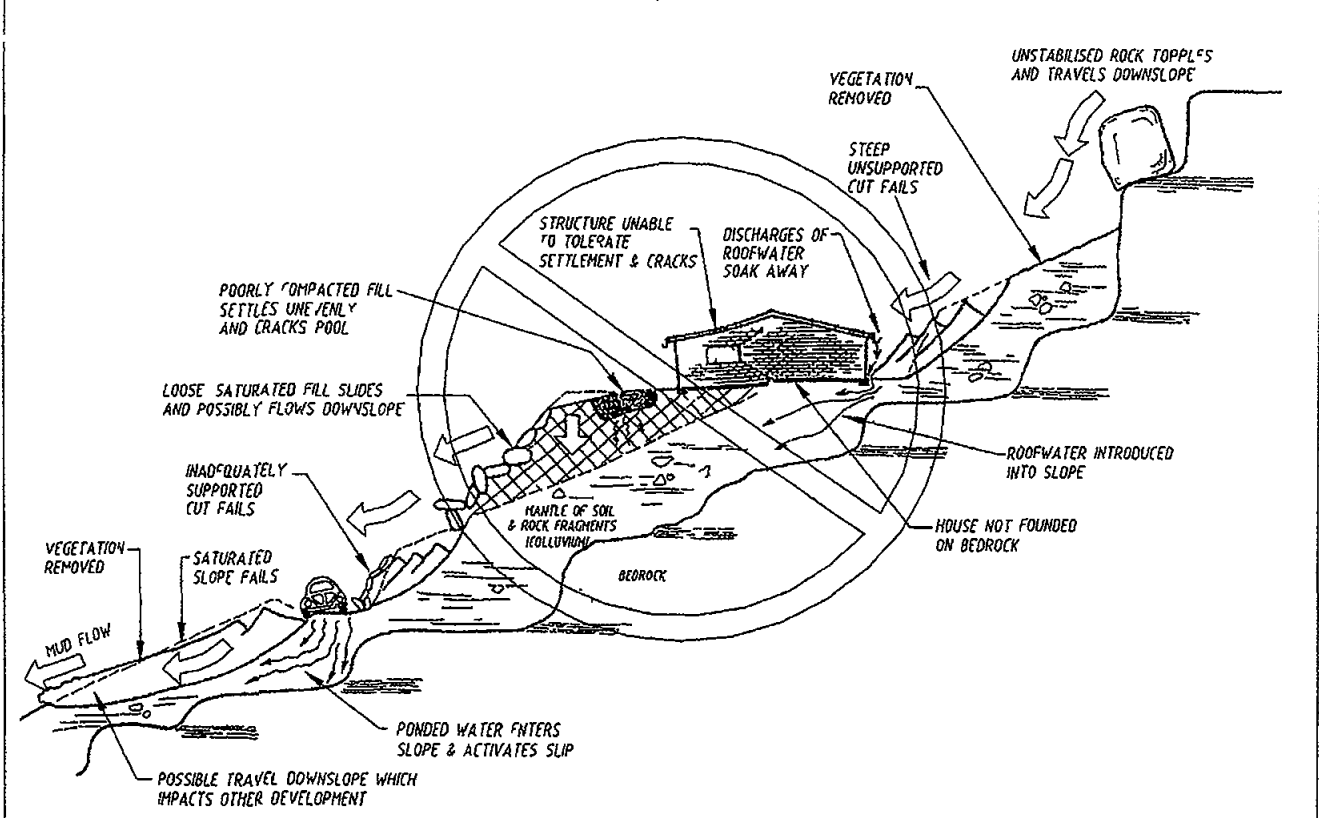
ADVICE	GOOD ENGINEERING PRACTICE	POOR ENGINEERING PRACTICE
GEOTECHNICAL ASSESSMENT	Obtain advice from a qualified experienced geotechnical consultant at early stage of planning and before site works	Prepare detailed plan and start site works before geotechnical advice
PLANNING		
SITE PLANNING	Having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

This table is an extract from LANDSLIDE RISK MANAGEMENT CONCEPTS AND GUIDELINES as presented in *Australian Geomechanics* Vol 25, No 1, March 2000 which discusses the matter more fully

EXAMPLES OF GOOD HILLSIDE PRACTICE

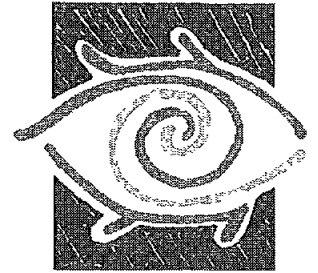


EXAMPLES OF POOR HILLSIDE PRACTICE



APPENDIX B1 - ILLUSTRATIONS OF GOOD AND POOR HILLSIDE PRACTICE

This figure is an extract from LANDSLIDE RISK MANAGEMENT CONCEPTS AND GUIDELINES as presented in *Australian Geomechanics*, Vol 35, No 1 2000 which discusses the matter more fully



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STATEMENT OF ENVIRONMENTAL EFFECTS

Project **ADDITIONAL SECURITY FENCING
MATER MARIA COLLEGE
5 FOREST ROAD
WARRIEWOOD**

Prepared on behalf of
**CATHOLIC SCHOOLS OFFICE,
DIOCESE OF BROKEN BAY**

1.0 Introduction

This statement of environmental effects is in support of the proposed new fencing and replacement of existing fencing at the Mater Maria College Warriewood

2.0 The Site

The site is identified as Lot 13, DP 1083731

The College is a year 7-12 co-educational systemic Catholic School. The College services the local community, enrolments are accepted from students along the Peninsula, and from catholic and government primary schools

The College is located on the lower Warriewood Escarpment at the western end of the Warriewood Valley. Vehicular access to the site is from the end of Forest Road

The site is an irregular shaped piece of land with an area of approximately 5 hectares. The southern portion of the site accommodates a natural creek line, Fern Creek, adjacent to the College's levelled playing fields. The College site is on sloping land, with slopes of up to 20%, and a flat area at the southeast corner accommodating playing fields. The site has a southeast aspect and enjoys views over the valley towards the ocean. Parts of the site are visible from few parts of the valley and surrounding hills. This view is of bushland and the tops of the taller buildings blending with the trees

3.0 The Proposal

The proposed fencing includes

- Installation of 2100mm high 'Diplomat' style fencing with black powder coat finish along the access pathway/cycle way at the east of the site
- Replacement of existing chain wire fence along the northern boundary of the site with 'Diplomat' style fencing
- Installation of 3000mm high chain wire fence to the southern side of the existing playing field and east of the existing games court

Mater Maria College Statement of Environmental Effects

P:\projects\7002_wv_02 MMC Fencing\Authorities\20061019_7002_wv_02 Statement Env Effects.doc

4.0 Environmental Effects and Compliance

The plans against which the proposal has been assessed are
Pittwater Local Environmental Plan 1993
Development Control Plan 21

4.1 LEP 1993

The site is zoned 1(b) NON URBAN B, is located within 40 metres of a river/stream/foreshore, Certified Pittwater LGA Bushfire Prone Land, Flood Prone Land, Landslip Hazard, Flora & Fauna Conservation Area Category 1, Flora & Fauna Conservation Area Category 2, Adjoining Bushland Reserves

Under the LEP the proposed work would require development consent

4.2 DCP 21

Section d14 16 – Fences – Flora and Fauna Conservation Areas

The site is considered Non-Urban and hence a 1.8m fence may be considered along the front boundary. The 2.1m fence proposed is considered reasonable given the use of the site is a school and that the proposed fence is visually permeable allowing for surveillance to and from the street and side boundaries

4.3 Additional Information

Proposed fences

- are to be constructed from non-combustible materials (powder coated steel) -
- are set back from the side and rear boundary and so do not set aside the Dividing Fences Act 1991,
- are not positioned within the existing fuel free/asset protection zone under the Rural Fires Act (This zone is uphill from the school),
- does not impact on site sewer or stormwater provision,
- does not alter or restrict vehicular or pedestrian access to or from the site,
- does not impact existing trees,
- does not contravene the recent major building and site work development consent N1038/00,
- are in accordance with community expectations for school security,

A Geotechnical Assessment prepared by Jeffery and Katauskas Pty Ltd is attached to this Statement of Environmental Effects. This Assessment was prepared for a recently proposed Shade Structure and Water Treatment Plant on the site. The proposed fencing in this application comprises a similar position and situation to that of the Water Treatment Plant proposal. For the fence construction, it is considered that replacement of existing soil with concrete footings for fence posts, surrounded and backfilled fully using existing soil would reinstate the site to existing conditions on the conditions that

- footings are placed as soon as possible after excavation to minimise the possibility of slumping of the excavation face,
- good practices are employed for soil erosion and sediment control during construction,

Mater Maria College Statement of Environmental Effects

- surrounding areas are revegetated with turf where disturbed,
- footings are installed of sufficient size as recommended by the manufacturer for this particular site, taking into account the sloping site condition,
- fencing is braced laterally and longitudinally as recommended by the fencing manufacturer for this height of fence,
- fencing remains of an open nature, with no enclosing fabric that could act as a wind break or detract from visual amenity

5 0 Conclusion

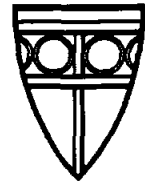
Relevant aspects of the natural environment have been analysed and the necessary measures to avoid or minimise adverse impacts incorporated in the proposed development

The proposed development generally meets the objectives of Council's planning instruments and the minor additional height of the fence above the recommended 1.8m is considered appropriate for the School security and operation. We recommend that this application be considered for approval.

Greg Isaac
Fulton Trotter and Partners Architects

Safe Work Method Statement – page 1 of 1

Work Activity/Task: Installation of Heavy Security Fencing		Project Name/No Mater Maria Catholic College.	
Codes/Standards applicable		Principal Contractor. Diocese of Broken Bay	
Prepared by. Victor Naiker		Representative Peter Patterson	
Signature.		Sub-contractor: Fencing Fabrications	
Date. 16/12/08		DFT Licence N° . 446155	
Item	Job Step	Identified Hazard and Assessment What can cause a high degree of harm?	Controls
1	Break the job down into steps -Unload fencing and posts into a clear area	-Remove obstacles in the path way of fence/materials	What you are going to do to make this step as safe as possible, include equipment to be used where appropriate -Clear pathway in front of fence/materials so that they are accessible with out any hazards
2	-Deliver materials to work area on a light vehicle	-Manual handling, over loading utility with fencing Driving to fast on site	-Manual handling materials in accordance with the Work Safe National Australia Code of Practice Keep an eye out for predestians Obey speed limits on site on parking requirements
3	-Dig holes for posts with post hole digger or core drill	-Digging/drilling without appropriate safety boots Power leads or drainage underground. Long power leads	-Wear safety boots at all times whilst on site Check site plans for underground power cables & drainage or ask site management, or check for services with other trades Leads are not to exceed 30 meters Ensure core drill used for coring holes are tagged Soil from holes to be evenly spread around the post where appropriate
4	-Erecting fence panels between post	-Steel shavings going into eye, whilst drilling tek screw into panels	-Wear eye protection
5	-Cleaning	-Panels, posts on ground in the way of other trades Power leads over 30mtrs, can cause hazard trip	-Do not leave panels, post in the way of other trades Power leads to be under 30mtrs Make sure at all times work area is clean neat and tidy



de Fence

16th December 2008

To Pittwater Council

The Catholic School Office Diocese of Broken Bay has requested Fencing Fabrications to supply & install a Heavy Duty Security and Chainwire fencing at Mater Maria Catholic College

Below are the material specifications on Heavy Duty Security & Chainwire fencing

Heavy Duty Security

Pre-Galvanised powdercoated black
2100mm high
40mm top & bottom rail
25mm square verticals with crimped top
140mm centres
115mm air gap between verticals
65mm gate frame for single and double gates

Chainwire Fencing

PVC Black
3000mm high
50mm diamond aperture
2.5mm wire + PVC black coating
50mm NB round end posts
32mm NB round intermediate posts
25mm NB round top, bottom & middle rails
32mm NB round stays

Below are the manufactures recommendations of installing Heavy Duty Security & Chainwire fencing

Heavy Security Fencing

65mm/100mm square posts

- 1 If installing posts into earth a pad footing of 300mm dia x 700mm depth is required

65mm/100mm square posts

- 1 Core depth into **concrete slab** is a minimum of 150mm to 350mm deep, (depending on thickness of concrete slab) Diameter of core is 100mm for 65mm posts, & 180mm for 100mm posts

Chainwire Fencing

32mm NB round post

- 1 If installing posts into earth a pad footing of 250mm dia x 600mm depth is required

50mm NB round posts

- 1 If installing posts into earth a pad footing of 250mm dia x 800mm depth is required

If you have any questions please contact me direct on (M) 0422-408-066

Kind Regards,



**Victor Naiker
Fencing Fabrications**



See reverse of form for instructions

PART A - DETAILS OF PERSON/COMPANY/ORGANISATION LIABLE TO PAY LEVY

PLEASE PRINT ALL DETAILS USING CAPITALS

Form fields for Part A: Surname (if person) or Company/Organisation name: FENCING FABRICATIONS; Given names (if person): PTX LTD; POSTAL ADDRESS: UNIT 5 30 LELIGANTON PLACE; Town/suburb: HORNSBY; State: NSW; Postcode: 2077; Bus hours phone: 0294847979

PART B - ADDRESS OF BUILDING/CONSTRUCTION WORK

Form fields for Part B: Number and street: 5 FOREST ROAD; Town/suburb: WARRIEWOOD; State: NSW; Postcode: 2126; Estimated start date: 12 M 01 Y 2009; Estimated finish date: 14 M 03 Y 2009

PART C - DETAILS OF WORK - To be completed by Local Council/DA or Council/DA Authority with whom work is due to be done

Form fields for Part C: Local Council Area: P1; 1 DA/CC/CDC No: []; Estimated value of work (see note on back): \$ [] 00; Levy payable \$ [] 00; 1 If you have provided a CC above, please provide DA number here: []; Name of Officer/Private Certifier: []; Business hours phone: []

PART D - DETAILS - to be completed by Local Authority where applicable - see reverse

Form fields for Part D: Department/Authority: []; Contract/DA No (circle which): []; Contract amount \$ [] 00; Levy payable \$ [] 00; Contact person (Print): []; Phone number: []; Contact person (Signature): []; Date: [] M [] Y []

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

Text: Any false or misleading information provided on this form may result in prosecution under Section 58A. I hereby declare that the information provided on this form is true and correct to the best of my knowledge. Name: []; Signature: []; Date: [] M [] Y []

Exemption Approval Certificate No []