GEOTECHNICAL RISK MANAGEMENT POLICY FOR PITTWATER FORM NO. 1 – To be submitted with Development Application

Develo	pment Applicati	n for Name of Applicant	
Address of site18		18 Baz Retreat, Warriewood	
		ers the minimum requirements to be addressed in a Geotechnical Risk Declaration made by engineering geologist or coastal engineer (where applicable) as part of a geotechnical	
I,	Ben White (Insert Name)	on behalf of White Geotechnical Group Pty Ltd (Trading or Company Name)	
coastal e organisa	ngineer as define	certify that I am a geotechnical engineer or engineering geol by the Geotechnical Risk Management Policy for Pittwater - 2009 and I am authorised by the sue this document and to certify that the organisation/company has a current professional incompany.	e above
l: Please n	nark appropriate	box	
		ne detailed Geotechnical Report referenced below in accordance with the Australia Geome de Risk Management Guidelines (AGS 2007) and the Geotechnical Risk Management Po	
	am willing to technically verify that the detailed Geotechnical Report referenced below has been prepared in accordance with the Australian Geomechanics Society's Landslide Risk Management Guidelines (AGS 2007) and the Geotechnical Risk Management Policy for Pittwater - 2009		
	have examined the site and the proposed development in detail and have carried out a risk assessment in accordance with Section 6.0 of the Geotechnical Risk Management Policy for Pittwater - 2009. I confirm that the results of the risk assessment for the proposed development are in compliance with the Geotechnical Risk Management Policy for Pittwater - 2009 and further detailed geotechnical reporting is not required for the subject site.		
	have examined Application only	ne site and the proposed development/alteration in detail and I am of the opinion that the Development Minor Development/Alteration that does not require a Geotechnical Report hence my Report is in accordance with the Geotechnical Risk Management Policy for Pittwate	or Risk
	have examined Hazard and doe the Geotechnica	ne site and the proposed development/alteration is separate from and is not affected by a Geote is not require a Geotechnical Report or Risk Assessment and hence my Report is in accordar Risk Management Policy for Pittwater - 2009 requirements. The coastal process and coastal forces analysis for inclusion in the Geotechnical Report	
Geotech	nical Report De	uils:	
	Report Title: Geo	echnical Report 18 Baz Retreat, Warriewood	
	Report Date: 13	10/21	
	Author: BEN W	IITE	
	Author's Compa	y/Organisation: WHITE GEOTECHNICAL GROUP PTY LTD	
Docume	ntation which re	ate to or are relied upon in report preparation:	
		eomechanics Society Landslide Risk Management March 2007.	
	White Geot	chnical Group company archives.	
Developr Risk Maı Manager	ment Application nagement aspect nent" level for the	e Geotechnical Report, prepared for the abovementioned site is to be submitted in support this site and will be relied on by Pittwater Council as the basis for ensuring that the Geote of the proposed development have been adequately addressed to achieve an "Acceptablife of the structure, taken as at least 100 years unless otherwise stated and justified in the Repal measures have been identified to remove foreseeable risk.	echnical ble Risk
		Felit	
		Signature	

Chartered Professional Status MScGEOLAusIMM CP GEOL

Company White Geotechnical Group Pty Ltd

Name

Membership No.

Ben White

222757

GEOTECHNICAL RISK MANAGEMENT POLICY FOR PITTWATER FORM NO. 1(a) - Checklist of Requirements for Geotechnical Risk Management Report for Development Application

Develo	pment Application			
Name of Applicant				
Addres	s of site	18 Baz Retreat, Warri	iewood	
Report. 1		ccompany the Geotechnical F	to be addressed in a Geotechnical Risk Management Geotechnical Report and its certification (Form No. 1).	
		Report 18 Baz Retreat, Wa	arriewood	
	Date: 13/10/21	,		
	BEN WHITE			
		nisation: WHITE GEOTECHN	NICAL GROUP PTY LTD	
Please II	nark appropriate b	DX		
\boxtimes	Comprehensive site	e mapping conducted 29/9/21 (date)		
\boxtimes	Mapping details pre Subsurface investig ☐ No	esented on contoured site plan v	with geomorphic mapping to a minimum scale of 1:200 (as appropriate)	
		Date conducted 29/9/21		
		· · ·	inferred subsurface type-section	
	Geotechnical hazar	ds identified e the site		
	⊠ Above ⊠ On the			
	⊠ Below			
		le the site		
\boxtimes	Geotechnical hazar	ds described and reported		
\boxtimes	Risk assessment co	onducted in accordance with the	e Geotechnical Risk Management Policy for Pittwater - 2009	
	⊠ Conse	equence analysis		
_	•	iency analysis		
\boxtimes	Risk calculation			
			ance with the Geotechnical Risk Management Policy for Pittwater - 2009	
			dance with the Geotechnical Risk Management Policy for Pittwater - 2009	
		e been compared to "Acceptabl / for Pittwater - 2009	e Risk Management" criteria as defined in the Geotechnical Risk	
\boxtimes	,		nieve the "Acceptable Risk Management" criteria provided that the	
	specified conditions			
\boxtimes	Design Life Adopted	d:		
	⊠ 100 y	ears		
	☐ Other			
\boxtimes			nases as described in the Geotechnical Risk Management Policy for	
	Pittwater - 2009 hav	•	and prosting the cook page identified and included in the remark	
		ithin Bushfire Asset Protection 2	and practical have been identified and included in the report.	
	IXISK assessifietit W	Milli Dustille Asset Flotection 2	LONG.	
that the g Managen	eotechnical risk ma nent" level for the li	nagement aspects of the prop fe of the structure, taken as a ctical measures have been id	unical Report, to which this checklist applies, as the basis for ensuring posal have been adequately addressed to achieve an "Acceptable Rist least 100 years unless otherwise stated, and justified in the Reposentified to remove foreseeable risk.	
		Signature	celul	
		Name	Ben White	
		Chartered Professional State	us MScGEOLAusIMM CP GEOL	
		Membership No.	222757	

Company White Geotechnical Group Pty Ltd



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GEOTECHNICAL INVESTIGATION:

New Pool at 18 Baz Retreat, Warriewood

1. Proposed Development

- 1.1 Install a Pool on the uphill side of the property by excavating to a maximum depth of ~2.0m.
- 1.2 Details of the proposed development are shown on 2 drawings by Rich Carr Architects, drawings numbered CDC1001 and CDC1101, dated 31.08.21.

2. Site Description

- **2.1** The site was inspected on the 29th September, 2021.
- 2.2 This vacant lot is on the high side of the road and has a SW aspect. It is located on the gently graded lower reaches of a hillslope. The slope rises across the property at angles averaging ~5°. The slopes above and below continue at similar angles.
- 2.3 A gently sloping lawn rises across the entire property (Photos 1 & 2). A fill on the neighbouring property above is supported by a stable concrete block retaining wall reaching ~1.0m high (Photo 3).

3. Geology

The Sydney 1:100 000 Geological sheet indicates the site is underlain by the Narrabeen Group of Rocks with the contact point of Alluvial Stream and Estuarine Sediment (Qha) in close proximity downslope of the property. However, manmade fill was encountered to the extent of the ground tests.

4. Subsurface Investigation

One hand Auger Hole (AH) was put down to identify the ground materials. Two Dynamic Cone Penetrometer (DCP) tests were put down to determine the relative density of the overlying



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soil and the depth to weathered rock. The locations of the tests are shown on the site plan attached. It should be noted that a level of caution should be applied when interpreting DCP test results. The test will not pass through hard buried objects so in some instances it can be difficult to determine whether refusal has occurred on an obstruction in the profile or on the natural rock surface. This is not expected to be an issue for the testing on this site. However, excavation and foundation budgets should always allow for the possibility that the interpreted ground conditions in this report vary from those encountered during excavations. See the appended "Important information about your report" for a more comprehensive explanation. The results are as follows:

AUGER HOLE 1 (~RL11.3) – AH1 (Photo 3)

Depth (m) Material Encountered

0.0 to 0.3 **FILL**, disturbed silty soil, brown, dense to very dense, dry, fine to medium grained with fine trace organic matter, rock fragments, and trace clay. AW Geotech describe the fill Clayey Sand fill with sandstone gravel and cobbles.

End of test @ 0.3m. No water table encountered.

DCP TEST RESULTS – Dynamic Cone Penetrometer			
Equipment: 9kg hammer	510mm drop, conical tip.	Standard: AS1289.6.3.2 - 1997	
Depth(m) Blows/0.3m	DCP 1 (~RL11.3)	DCP 2 (~RL11.3)	
0.0 to 0.3	45	46	
0.3 to 0.6	#	#	
	End of Test @ 0.3m	End of Test @ 0.3m	

#refusal/end of test. F=DCP fell after being struck showing little resistance through all or part of the interval.

DCP Notes:

DCP1 – End of Test @ 0.3m, DCP still going down very slowly, white impact dust on dry tip.

DCP2 – End of Test @ 0.3m, DCP still going down very slowly, white impact dust on dry tip.



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5. Geological Observations/Interpretation

The entire property is underlain by very well-compacted fill that was encountered to the

extent of the testing. Two bore holes were put down on the property by another firm. The

bore holes indicate that the fill extends to depths of between ~1.2m and ~1.8m below the

current surface before merging into the underlying Very Stiff Sandy Clays. This concurs with

the ground testing results carried out by this firm on the adjoining property, No. 20. The

Narrabeen Group of Rocks were not encountered during the testing done by us on site, nor

was it encountered during the bore holes put down by the other firm. See Type Section

attached for a diagrammatical representation of the expected ground materials.

6. Groundwater

Normal ground water seepage is expected to move over the buried surface of the rock and

through the cracks. Due to the slope and elevation of the block, the water table is expected

to be many metres below the base of the proposed excavation.

7. Surface Water

No evidence of surface flows were observed on the property during the inspection. It is

expected that normal sheet wash will move onto the site from above the property during

heavy down pours.

8. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed beside the property. The gently graded land surface

that rises across the property and continues above and below is a potential hazard

(Hazard One). The proposed excavation is a potential hazard until retaining walls are in place

(Hazard Two).

RISK ANALYSIS ON THE NEXT PAGE



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Risk Analysis Summary

HAZARDS	Hazard One	Hazard Two	
ТҮРЕ	The gentle slope that rises across the property and continues above and below failing and impacting on the proposed works.	The excavation (up to a maximum depth of ~2.0m) collapsing onto the work site before retaining structures are in place.	
LIKELIHOOD	'Unlikely' (10 ⁻⁴)	'Possible' (10 ⁻³)	
CONSEQUENCES TO PROPERTY	'low' (5%)	'Medium' (15%)	
RISK TO PROPERTY	'Low' (2 x 10 ⁻⁵)	'Moderate' (2 x 10 ⁻⁴)	
RISK TO LIFE	5.5 x 10 ⁻⁷ /annum	8.3 x 10 ⁻⁶ /annum	
COMMENTS	This level of risk is 'ACCEPTABLE'.	This level of risk to life and property is 'UNACCEPTABLE'. To move risk to 'ACCEPTABLE' levels, the recommendations in Section 13 and 14 are to be followed.	

(See Aust. Geomech. Jnl. Mar 2007 Vol. 42 No 1, for full explanation of terms)

9. Suitability of the Proposed Development for the Site

The proposed development is suitable for the site. No geotechnical hazards will be created by the completion of the proposed development provided it is carried out in accordance with the requirements of this report and good engineering and building practice.

10. Stormwater

No significant stormwater runoff will be generated by the proposed works.

11. Excavations

An excavation to a maximum depth of ~2.0m will be required to install the proposed pool. The excavation is expected to be mostly through fill. The sandy clays of the natural profile may be encountered near the base of the excavation. It is envisaged that excavations through fill and sandy clay can be carried out with an excavator and bucket.



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12. Vibrations

No excessive vibrations are expected to be generated by excavation through fill and sandy

clay. Any vibrations generated by a domestic machine and bucket up to 16 ton carrying out

excavation works will be below the threshold limit for infrastructure or building damage.

13. Excavation Support Advice

The proposed excavation for the proposed pool will reach a maximum depth of ~2.0m and

will be taken almost entirely through fill. The setbacks are as follows:

~1.0m from the NW common boundary.

• ~1.1m from the uphill retaining wall.

As such, the NW common boundary and the uphill retaining wall will be within the zone of

influence of the proposed excavation.

Where the retaining wall above falls within the zone of influence of the excavation,

exploration pits in this location will need to be put down by the builder to determine the

foundation depth and material. The pits are to be inspected by the geotechnical consultant.

If the wall is found to be supported below the base of the proposed excavation, the excavation

may commence. If it is not supported below the base of the proposed excavation, the wall

will need to be underpinned prior to the excavation commencing.

Underpinning is to follow the underpinning sequence 'hit one miss two'. Under no

circumstances is the bulk excavation to be taken to the edge of the wall and then

underpinned. Underpins are to be constructed from drives that should be proportioned

according to footing type and size. Allowances are to be made for drainage through the

underpinning to prevent a build-up of hydrostatic pressure.



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To ensure the integrity of the NW neighbouring property, we recommend the NW side of the excavation be temporarily supported with typical pool shoring such as sacrificial form ply, until the pool structure is in place.

The remaining cut batters for the pool may stand at near-vertical angles for a very short period of time until the pool structure is installed provided the cut batters are kept from becoming saturated. If the cut batters remain unsupported for more than a day before the shell is constructed, they are to be supported with typical pool shoring as above, until the pool structure is in place.

Upslope runoff is to be diverted from the cut faces by sandbag mounds or other diversion works. Unsupported cut batters are to be covered to prevent access of water in wet weather and loss of moisture in dry weather. The covers are to be tied down with metal pegs or other suitable fixtures so they can't blow off in a storm. The materials and labour to construct the pool structure are to be organised so on completion of the excavations they can be constructed as soon as possible. The excavations are to be carried out during a dry period. No excavations are to commence if heavy or prolonged rainfall is forecast.

All excavation spoil is to be removed from site following the current Environmental Protection Agency (EPA) waste classification guidelines.

14. Retaining Structures

For cantilever or singly-propped retaining structures, it is suggested the design be based on a triangular pressure distribution of lateral pressures using the parameters shown in Table 1.

Table 1 – Likely Earth Pressures for Retaining Structures

	Earth Pressure Coefficients			
Unit	Unit weight (kN/m³)	'Active' K _a	'At Rest' K₀	
Compacted Engineered Fill and Sandy Clays	20	0.35	0.45	



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For rock classes refer to Pells et al "Design Loadings for Foundations on Shale and Sandstone in the Sydney Region". Australian Geomechanics Journal 1978.

rastranan Geomeonames Journal 1970.

It is to be noted that the earth pressures in Table 1 assume a level surface above the structure,

do not account for any surcharge loads, and assume retaining structures are fully drained.

Rock strength and relevant earth pressure coefficients are to be confirmed on site by the

geotechnical consultant.

All retaining structures are to have sufficient back-wall drainage and be backfilled

immediately behind the structure with free-draining material (such as gravel). This material

is to be wrapped in a non-woven Geotextile fabric (i.e., Bidim A34 or similar), to prevent the

drainage from becoming clogged with silt and clay. If no back-wall drainage is installed in

retaining structures, the likely hydrostatic pressures are to be accounted for in the structural

design.

15. Foundations

The proposed pool is expected to be seated in either the dense engineered fill or the

underlying natural sandy clays. Both are suitable foundation materials. The shallow end of the

proposed excavation will likely be through engineered fill. The deep end of the proposed

excavation is likely to encounter sandy clays of the natural profile. If any of the footings

encounter this ground material, where it is not exposed, shallow piers will be required to

maintain a uniform bearing material across the structure. A maximum allowable bearing

pressure of 200kPa can be assumed for footings on either the dense engineered fill or natural

Firm to Stiff Sandy Clays.

As the bearing capacity of engineered fill and clay reduces when it is wet, we recommend the

footings be dug, inspected, and poured in quick succession (ideally the same day if possible).

If the footings get wet, they will have to be drained and the soft layer of fill/clay on the footing

surface will have to be removed before concrete is poured.



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If a rapid turnaround from footing excavation to the concrete pour is not possible, a sealing

layer of concrete may be added to the footing surface after it has been cleaned.

NOTE: If the contractor is unsure of the footing material required it is more cost-effective to

get the geotechnical consultant on site at the start of the footing excavation to advise on

footing depth and material. This mostly prevents unnecessary over-excavation in clay-like

shaly-rock but can be valuable in all types of geology.

17. Geotechnical Review

The structural plans are to be checked and certified by the geotechnical engineer as being in

accordance with the geotechnical recommendations. On completion, a Form 2B will be

issued. This form is required for the Construction Certificate to proceed.

18. Inspections

The client and builder are to familiarise themselves with the following required inspections

as well as council geotechnical policy. We cannot provide geotechnical certification for the

owners and Occupation Certificate if the following inspections have not been carried out

during the construction process.

• The geotechnical consultant is to inspect any test pits dug by the builder to verify

foundation depth and material of the existing footings for the retaining wall.

All footings are to be inspected and approved by the geotechnical consultant while

the excavation equipment and contractors are still onsite and before steel reinforcing

is placed or concrete is poured.

White Geotechnical Group Pty Ltd.

Ben White M.Sc. Geol., AuslMM., CP GEOL.

El 1 the

No. 222757

Engineering Geologist.



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Photo 1



Photo 2



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Photo 3 (Left is top of hole)



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Important Information about Your Report

It should be noted that Geotechnical Reports are documents that build a picture of the subsurface conditions from the observation of surface features and testing carried out at specific points on the site. The spacing and location of the test points can be limited by the location of existing structures on the site or by budget and time constraints of the client. Additionally, the test themselves, although chosen for their suitability for the particular project, have their own limiting factors. The testing gives accurate information at the location of the test, within the confines of the test's capability. A geological interpretation or model is developed by joining these test points using all available data and drawing on previous experience of the geotechnical consultant. Even the most experienced practitioners cannot determine every possible feature or change that may lie below the earth. All of the subsurface features can only be known when they are revealed by excavation. As such, a Geotechnical report can be considered an interpretive document. It is based on factual data but also on opinion and judgement that comes with a level of uncertainty. This information is provided to help explain the nature and limitations of your report.

With this in mind, the following points are to be noted:

- If upon the commencement of the works the subsurface ground or ground water conditions prove different from those described in this report, it is advisable to contact White Geotechnical Group immediately, as problems relating to the ground works phase of construction are far easier and less costly to overcome if they are addressed early.
- If this report is used by other professionals during the design or construction process, any questions should be directed to White Geotechnical Group as only we understand the full methodology behind the report's conclusions.
- The report addresses issues relating to your specific design and site. If the proposed project design changes, aspects of the report may no longer apply. Contact White Geotechnical if this occurs.
- This report should not be applied to any other project other than that outlined in section 1.0.
- This report is to be read in full and should not have sections removed or included in other documents as this can result in misinterpretation of the data by others.
- It is common for the design and construction process to be adapted as it progresses (sometimes to suit the previous experience of the contractors involved). If alternative design and construction processes are required to those described in this report, contact White Geotechnical Group. We are familiar with a variety of techniques to reduce risk and can advise if your proposed methods are suitable for the site conditions.





- SITE IMAGE OF THE REAR OF THE BLOC



IMAGE 03 - SITE IMAGE OF THE REAR RETAINING WALL



SITE IMAGES

DA DEVELOPMENT CALCS

ITEM	REQ	UIREMENTS	PROPOSED
SITE AREA			302.5 m2
LOT WIDTH AT BUILDING LINE			12.56 m
POOL HEIGHT ABOVE GL	max	0.6m	0.2 m
SIDE SETBACK TO POOL	min	1m to water	1.0
REAR SETBACK TO POOL	min	1m to water	1.09 m
LANDSCAPING AREA WITH MIN 4M DIMENSION	min	35%	12,1%
	total	105.875	36.5 ⊓2
LANDSCAPING AREA WITH MIN 2M DIMENSION	min	35%	26.4%
	total	105.875	80 n2
LANDSCAPING AREA WITH MIN 1M DIMENSION	min	35%	32,4%
	total	105.875	96 m2
PRIVATE OPEN SPACE	min.	20m2	20 n2

Wind Rose

Calm

04

PROPOSED POOL	NARELLAN POOLS -MADEIRA 6
POOL CAPACITY	22 ,000L

POOL PUMP IS TO BE CONTAINED WITHIN A SOUNDPROOFED ACOUSTIC ENGLOSURE TO POOL MINETS SPEC, LOCATION TBC ONSITE WITH BUILDER AND OWNER.

SWIMMING POOL INCLUDING THE SAFETY FENCING IS TO COMPLY WITH: - COUNCL CODES

CURRENT NATIONAL CONSTRUCTION CODE (NCC) (AT DATE OF APPROVAL) WITH SPECIFIC REFERENCE TO REQUIREMENTS IN NSW.

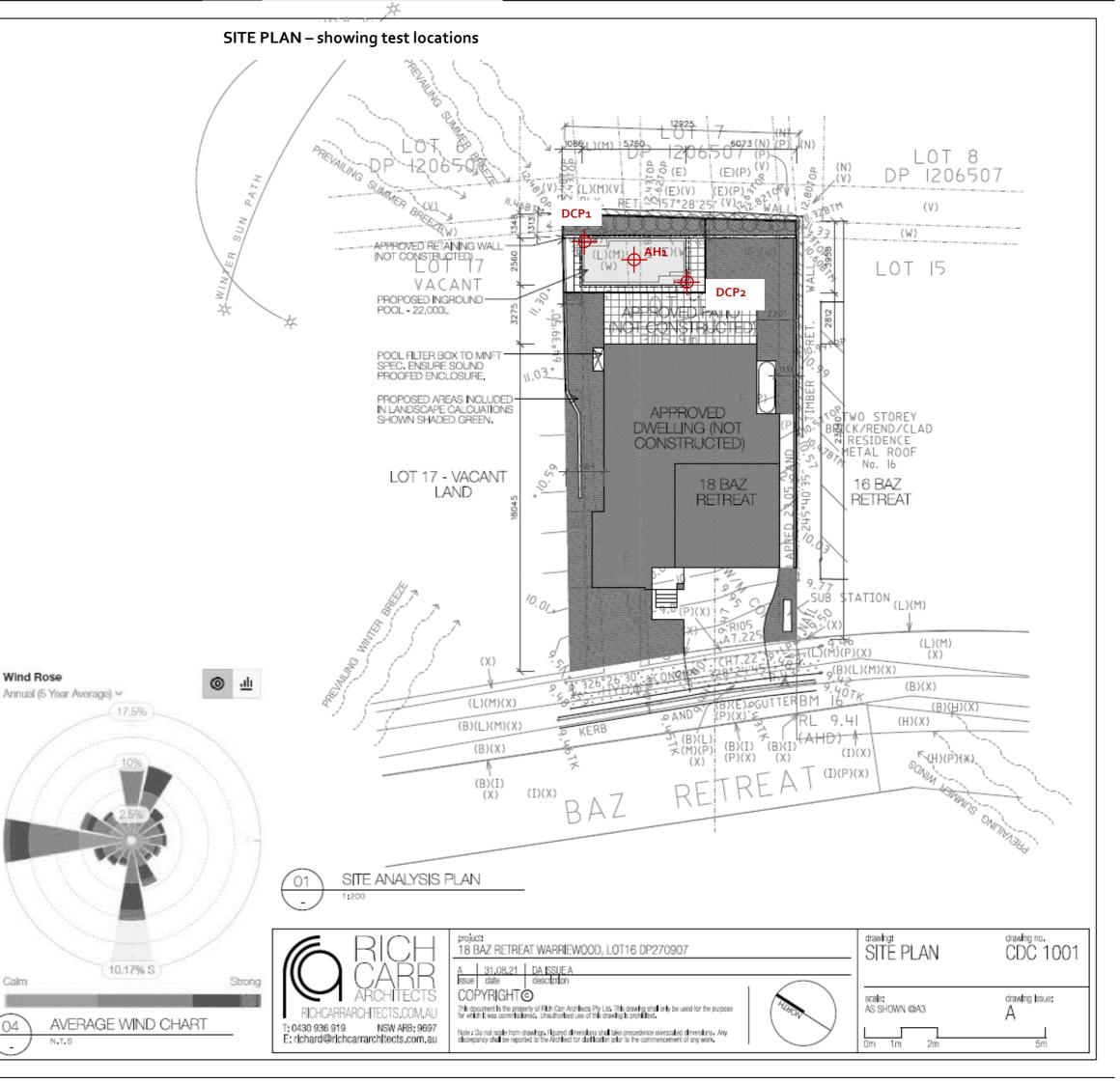
SWIMING POOLS ACT 1992-NO.49 SWIMING POOLS SAFETY AS1926.2-2007 SWIMING POOLS SAFETY AS1926.1-2012

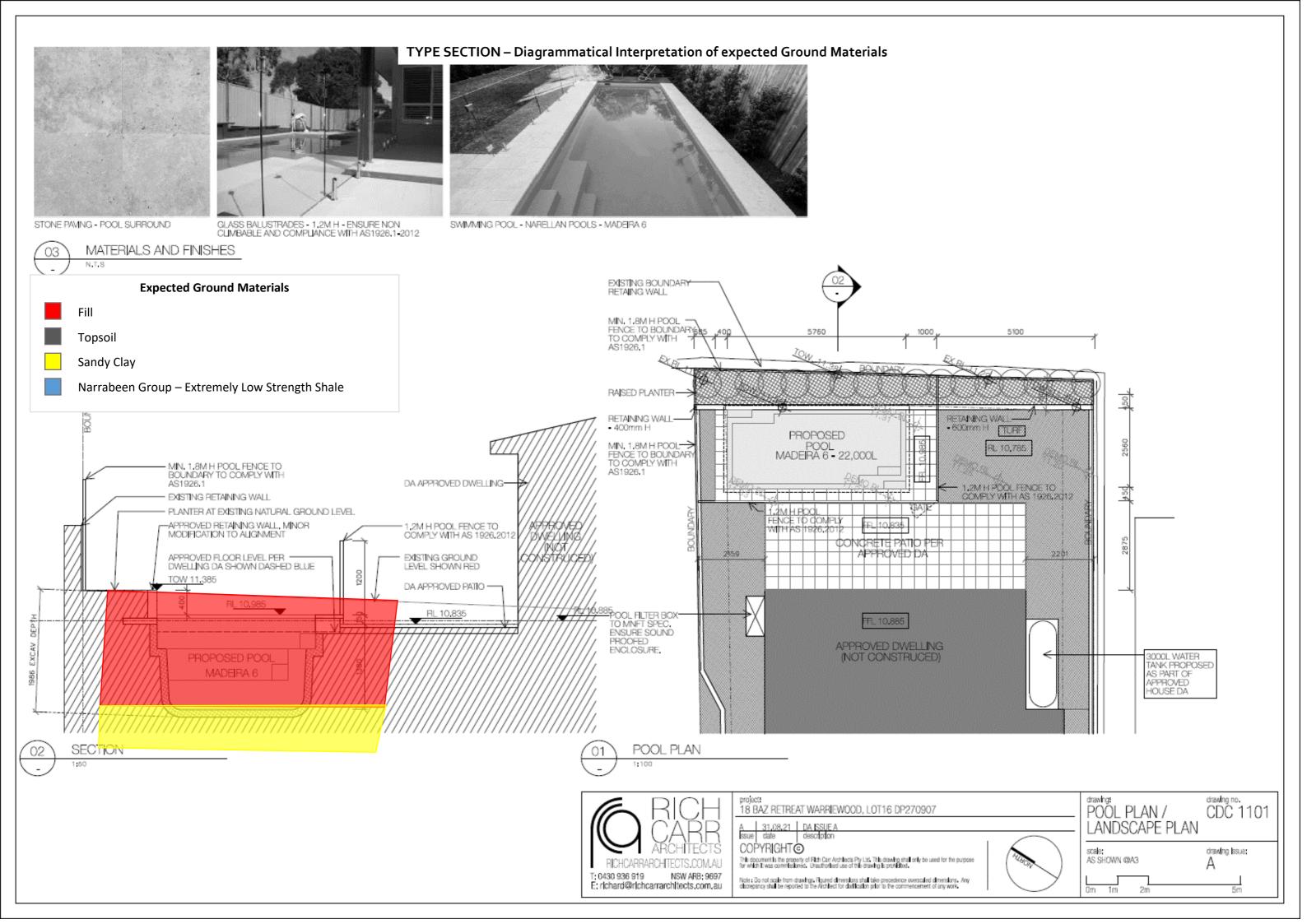
DIAL BEFORE YOU DIG AND REVIEW OF ALL ONSITE SERVICES IS TO BE CONDUCTED BY CONTRACTOR PRIOR TO CONSTRUCTION/EXCAVATION

UNO ALL DIMENSIONS ARE TAKEN FROM EXISTING PROPERTY FENCE LINES. NO DETAIL SURVEY OF BOUNDARIES HAVE BEEN UNDERTAKEN AS PART OF THIS APPLICATION. IT IS ASSUMED THAT THE EXISTING FENCE LINE IS THE PROPERTY BOUNDARY UNO BY THE PROPERTY OWNER.

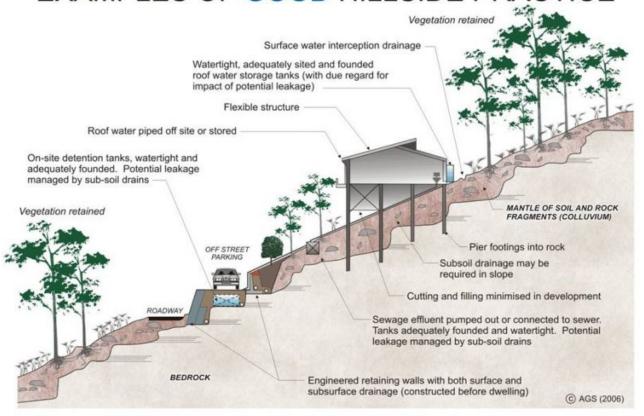
POOL TO BE INSTALLED TO MEET THE REQURIEMENTS OF AS1839:2021, POOL LEVEL SHOWN IS INDICATVE ONLY AND TO BE CONFIRMED ONSITE BY BUILDER TO ENSURE COMPLIANCE WITH

DEVELOPMENT CALCULATIONS





EXAMPLES OF GOOD HILLSIDE PRACTICE



EXAMPLES OF POOR HILLSIDE PRACTICE

