

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

Development Application for _____
Name of Applicant

Address of site 14 Bubalo Street, Warriewood

The following checklist covers the minimum requirements to be addressed in a Geotechnical Risk Declaration made by geotechnical engineer or engineering geologist or coastal engineer (where applicable) as part of a geotechnical report

I, Ben White on behalf of White Geotechnical Group Pty Ltd
(Insert Name) (Trading or Company Name)

on this the 29/06/20 certify that I am a geotechnical engineer or engineering geologist or coastal engineer as defined by the Geotechnical Risk Management Policy for Pittwater - 2009 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 \$10million.

I:

Please mark appropriate box

- ☒ have prepared the detailed Geotechnical Report referenced below in accordance with the Australia Geomechanics Society's Landslide Risk Management Guidelines (AGS 2007) and the Geotechnical Risk Management Policy for Pittwater - 2009
- ☒ 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 the site and the proposed development/alteration in detail and I am of the opinion that the Development Application only involves Minor Development/Alteration that does not require a Geotechnical Report or Risk Assessment and hence my Report is in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009 requirements.
- ☐ have examined the site and the proposed development/alteration is separate from and is not affected by a Geotechnical Hazard and does not require a Geotechnical Report or Risk Assessment and hence my Report is in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009 requirements.
- ☐ have provided the coastal process and coastal forces analysis for inclusion in the Geotechnical Report

Geotechnical Report Details:

Report Title: Geotechnical Report 14 Bubalo Street, Warriewood

Report Date: 29/06/20

Author: BEN WHITE


Author's Company/Organisation: WHITE GEOTECHNICAL GROUP PTY LTD

Documentation which relate to or are relied upon in report preparation:

Australian Geomechanics Society Landslide Risk Management March 2007.

White Geotechnical Group company archives.

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.



Signature _____

Name Ben White

Chartered Professional Status MScGEOLAusIMM CP GEOL

Membership No. 222757

Company White Geotechnical Group Pty Ltd

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

Development Application for	_____
	Name of Applicant
Address of site	<u>14 Bubalo Street, 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: Geotechnical Report <u>14 Bubalo Street, Warriewood</u>
Report Date: <u>29/06/20</u>
Author: <u>BEN WHITE</u>
Author's Company/Organisation: <u>WHITE GEOTECHNICAL GROUP PTY LTD</u>

Please mark appropriate box

- ☒ Comprehensive site mapping conducted 23/06/20
(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 _____
 - ☒ Yes Date conducted 23/06/20
- ☒ Geotechnical model developed and reported as an inferred subsurface type-section
- ☒ Geotechnical hazards identified
 - ☐ Above the site
 - ☒ On the site
 - ☐ Below the site
 - ☐ Beside the site
- ☒ Geotechnical hazards described and reported
- ☒ Risk assessment conducted in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009
 - ☒ Consequence analysis
 - ☒ Frequency analysis
- ☒ Risk calculation
- ☒ Risk assessment for property conducted in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009
- ☒ Risk assessment for loss of life conducted in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009
- ☒ Assessed risks have been compared to "Acceptable Risk Management" criteria as defined in the Geotechnical Risk Management Policy for Pittwater - 2009
- ☒ Opinion has been provided that the design can achieve the "Acceptable Risk Management" criteria provided that the specified conditions are achieved.
- ☒ Design Life Adopted:
 - ☒ 100 years
 - ☐ Other _____
specify
- ☒ Geotechnical Conditions to be applied to all four phases as described in the Geotechnical Risk Management Policy for Pittwater - 2009 have been specified
- ☒ Additional action to remove risk where reasonable and practical have been identified and included in the report.
- ☐ Risk assessment within Bushfire Asset Protection Zone.

I am aware that Pittwater Council will rely on the Geotechnical Report, to which this checklist applies, as the basis for 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.



Signature

Name Ben White

Chartered Professional Status MScGEOLAusIMM CP GEOL

Membership No. 222757

Company White Geotechnical Group Pty Ltd

GEOTECHNICAL INVESTIGATION:

New Pool at **14 Bubalo St, Warriewood.**

1. Proposed Development

- 1.1** Install a new pool by excavating to a maximum depth of ~1.6m. Construct a new rainwater tank on the SW corner of the property.
- 1.2** Details of the proposed development are shown on 4 drawings prepared by Premier Pools, job number 6674, drawings numbered 1/3A to 3/3A and 1/1, dated 8/5/2020.

2. Site Description

- 2.1** The site was inspected on the 23rd of June, 2020.
- 2.2** This residential property is level with the road. It is located on fill that has been used to raise the property and neighbouring properties. The grade across the property is near level.
- 2.3** The property is a new development on a previously vacant lot on Bubalo Street. The new house being built is part of a separate development application. The property is accessed by a concrete driveway at the road frontage (Photo 1). Recently laid fill has been used to raise the property and neighbouring properties. The fill is supported by a stable ~1.8m high concrete retaining wall along the NW property boundary (Photo 2).

3. Geology

The Sydney 1:100 000 Geological sheet indicates the site is underlain by the Newport Formation of the Narrabeen Group although the contact of the Alluvial Stream and Estuarine Sediment (Qha) is close to the S boundary of the property and at a residential scale the map is not always accurate.

4. Subsurface Investigation

Four Dynamic Cone Penetrometer (DCP) tests were put down to determine the relative density of the overlying soil and the depth to weathered rock. The locations of the tests are shown on the site plan. 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. It is expected DCP2 to DCP4 hit refusal on dense engineered fill, but DCP1 penetrated through this material. Although unlikely, due to the possibility that the actual ground conditions vary from our interpretation there should be allowances in the excavation and foundation budget to account for this. We refer to the appended "Important Information about Your Report" to further clarify. The results are as follows:

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 (~RL20.4)	DCP 2 (~RL20.5)	DCP 3 (~RL20.6)	DCP 4 (~RL20.6)
0.0 to 0.3	24	46	50	45
0.3 to 0.6	30	34	40	#
0.6 to 0.9	18	#	#	
0.9 to 1.2	23			
1.2 to 1.5	18			
1.5 to 1.8	17			
1.8 to 2.1	28			
2.1 to 2.4	49			
2.4 to 2.7	40			
2.7 to 3.0	50			
3.0 to 3.3	#			
	End of Test @ 3.0m	Refusal @ 0.6m	Refusal @ 0.4m	Refusal @ 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 @ 3.0m, DCP still very slowly going down, brown and red sandy soil on damp tip.

DCP2 – Refusal @ 1.3m, DCP bouncing, white and brown dust on dry tip.

DCP3 – Refusal @ 2.4m, DCP thudding, brown and orange sandy soil on damp tip.

DCP4 – Refusal @ 2.4m, DCP thudding, brown and orange sandy soil on damp tip.

5. Geological Observations/Interpretation

In the test locations, the ground materials consist of well compacted engineered fill. DCP2 to DCP4 hit refusal on the fill at depths of between 0.3m to 0.6m. DCP1 penetrated through the fill and the test ended at a depth of 3.0m. The engineered fill is well compacted and ranged from very stiff to hard. Interpretation of DCP1 implies the fill may extend to depths of 1.8m before the natural profile is encountered. This is simply deducted from the uniformity of the blow count progression below this depth. However, this is somewhat academic as the blow count shows the material is of a suitable density to easily support the proposed structure regardless of its origin.

6. Groundwater

Normal ground water seepage is expected to move over the buried surface of the rock and through the cracks in the rock.

Due to the slope and elevation of the block, the water table in the location 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 above, below, or beside the property. The proposed pool excavation is a potential hazard until retaining structures are in place (**Hazard One**).

Geotechnical Hazards and Risk Analysis - Risk Analysis Summary

HAZARDS	Hazard One
TYPE	The proposed excavation for the pool collapsing onto the worksite and impacting neighbouring properties during the excavation process.
LIKELIHOOD	'Possible' (10^{-3})
CONSEQUENCES TO PROPERTY	'Medium' (15%)
RISK TO PROPERTY	'Moderate' (2×10^{-4})
RISK TO LIFE	8.3×10^{-6} /annum
COMMENTS	This level of risk to life and property is 'UNACCEPTABLE'. To move the risk to 'ACCEPTABLE' levels, the recommendations in Section 13 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 created by the proposed development.

11. Excavations

An excavation to a maximum depth of ~1.6m is required to construct the proposed new pool. The excavation is expected to be entirely through engineered fill. It is envisaged that excavations through fill can be carried out with an excavator and bucket.

12. Vibrations

It is expected the proposed excavation will be carried out with an excavator and bucket and the vibrations produced will be below the threshold limit for building or infrastructure damage.

13. Excavation Support Requirements

An excavation to a maximum depth of ~1.6m is required for the new pool. The excavation will be set back ~0.7m from the S common boundary. The excavation will be within the zone of influence of the S common boundary but with no existing structures in the zone of influence. In this instance, the zone of influence is the area above a theoretical 30° line from the base of the excavation towards the surrounding structures and boundaries.

To protect the integrity of the S neighbouring property it is recommended the S side be temporarily supported with typical pool shoring such as braced form ply or similar until the pool structure is in place.

Upslope runoff is to be diverted from the cut faces by sandbag mounds or other diversion works. All unsupported cut batters are to be covered to prevent access of water in wet weather and loss of moisture in dry weather. The materials and labour to construct the pool structure are to be organised so on completion of the excavation they can be constructed as soon as possible. The excavation is to be carried out during a dry period. No excavations are to commence if heavy or prolonged rainfall is forecast. If the cut batters remain unsupported for more than a few days before the pool construction commences, they are to be temporarily supported with typical pool shoring, such as sacrificial form ply.

All excavation spoil is to be removed from site or be supported by engineered retaining walls.

14. Retaining Structures

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

Table 1 – Likely Earth Pressures for Retaining Structures

Unit	Earth Pressure Coefficients		
	Unit weight (kN/m ³)	'Active' K _a	'At Rest' K ₀
Compacted Engineered Fill	20	0.35	0.45

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

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 full hydrostatic pressures are to be accounted for in the retaining structure design.

15. Foundations

The proposed pool is expected to be seated in the very stiff to hard engineered fill. This is a suitable foundation material. A maximum allowable bearing pressure of 200kPa can be assumed for footings on very stiff to hard engineered fill.

The proposed water tank adjacent to the Retaining wall along the W property boundary (Photo 2) is to be founded on piers taken to the base of the wall so no lateral loads act on the wall.

As the bearing capacity of engineered fill 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 on the footing surface will have to be removed before concrete is poured.

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 professional 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.

16. 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 Occupation Certificate if the following inspections have not been carried out during the construction process.

- All footings are to be inspected and approved by the geotechnical consultant while the excavation equipment is still onsite and before steel reinforcing is placed or concrete is poured.

White Geotechnical Group Pty Ltd.



Ben White M.Sc. Geol.,
AusIMM., CP GEOL.
No. 222757
Engineering Geologist



Photo 1



Photo 2

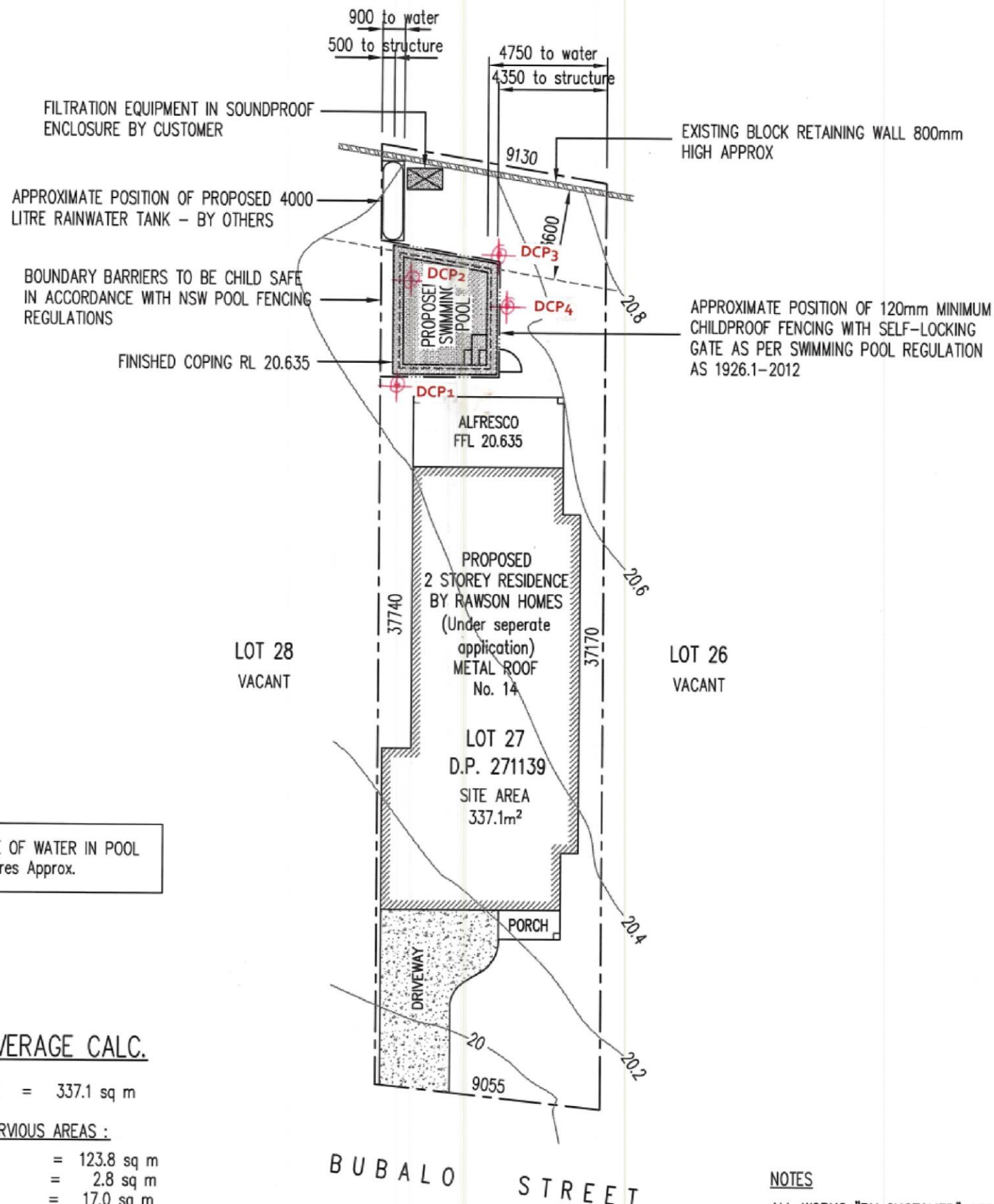
Important Information about Your Report

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 PLAN – showing test locations



TOTAL VOLUME OF WATER IN POOL
= 17.9 Kilolitres Approx.

SITE COVERAGE CALC.

AREA OF SITE = 337.1 sq m

EXISTING IMPERVIOUS AREAS :

RESIDENCE = 123.8 sq m
PORCH = 2.8 sq m
ALFRESCO = 17.0 sq m
DRIVEWAY = 25.1 sq m
IMPERVIOUS AREA = 168.7 sq m

PROPOSED POOL BY PREMIER POOLS:

POOL WATER = 13.4 sq m
POOL COPING = 6.5 sq m

TOTAL PROPOSED IMPERVIOUS AREA
= 188.6 sq m = 55.9%

AVAILABLE SOFT/LANDSCAPE AREA
= 148.5 sq m = 44.1%

SITE PLAN

1:200

NOTES

ALL WORKS "BY CUSTOMER" ARE NOT INCLUDED IN WORKS UNDER PREMIER POOLS CONTRACT OR CONSTRUCTION CERTIFICATE.

THIS DRAWING IS NOT TO BE SCALED. DIMENSIONS TO BE RECOGNISED OVER SCALING. ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE.

PROVIDE SEDIMENT CONTROL FENCING WHERE REQUIRED FENCING TO BE REMOVED UPON COMPLETION OF CONSTRUCTION

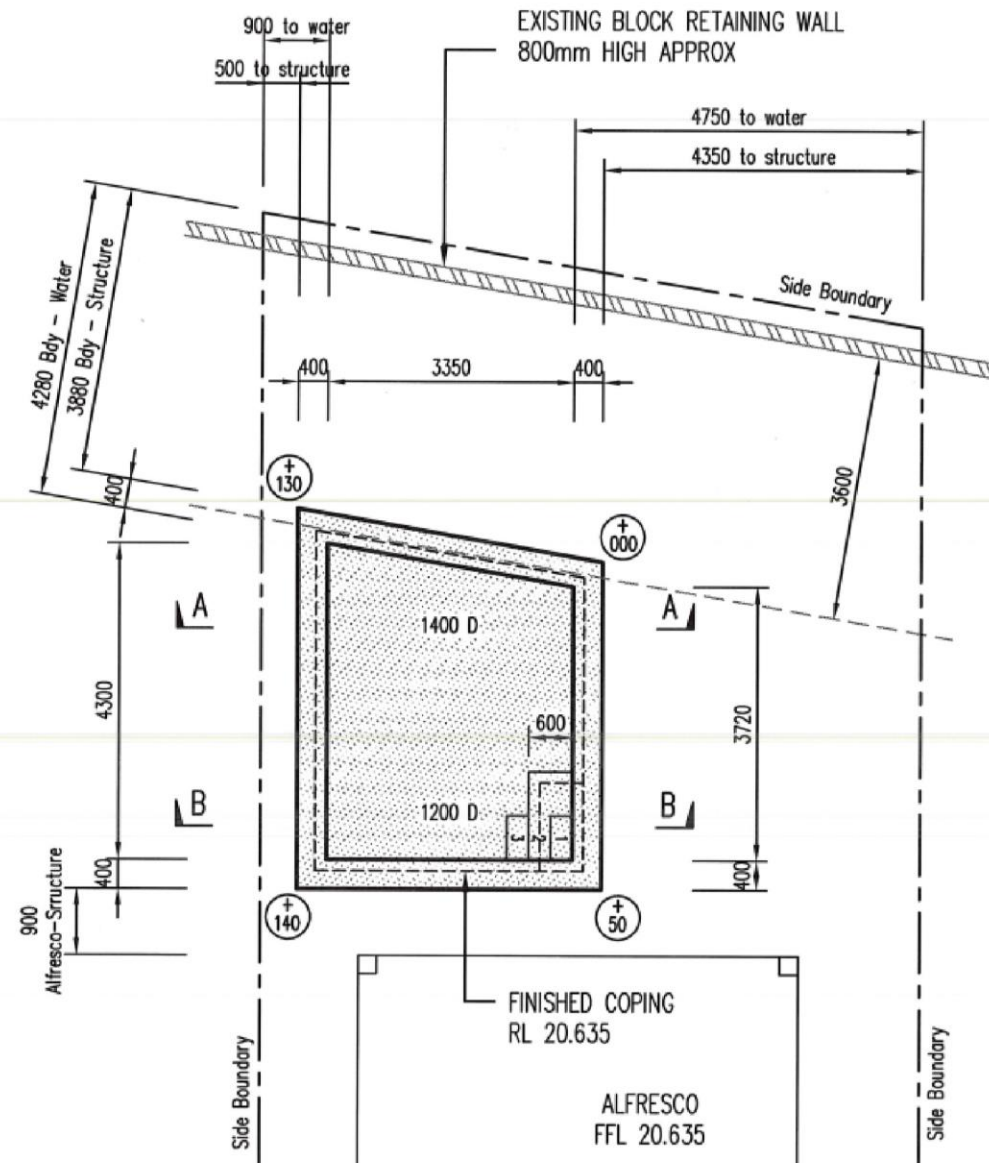
ANY ADDITIONAL PAVING AND LANDSCAPING IS BY CUSTOMER AND DOES NOT FORM PART OF THE CONTRACT WITH PREMIER POOLS

Premier Pools
THE POOL PROFESSIONALS

Builders Licence No. 34971
Premier Pools Pty Ltd A.C.N. 002 664048
9/303 Pacific Hwy Lindfield NSW 2070
Telephone: 9415 8888 Facsimile: 9415 8899

TITLE	DRAWN	KA
SITE ANALYSIS PLAN	DATE	8th May '20
CLIENT	SCALE	1:200
MARKUS & TANJA OSTERMAIER	DWG. NO.	1/3A
14 BUBALO STREET, WARRIEWOOD	JOB NO.	6674

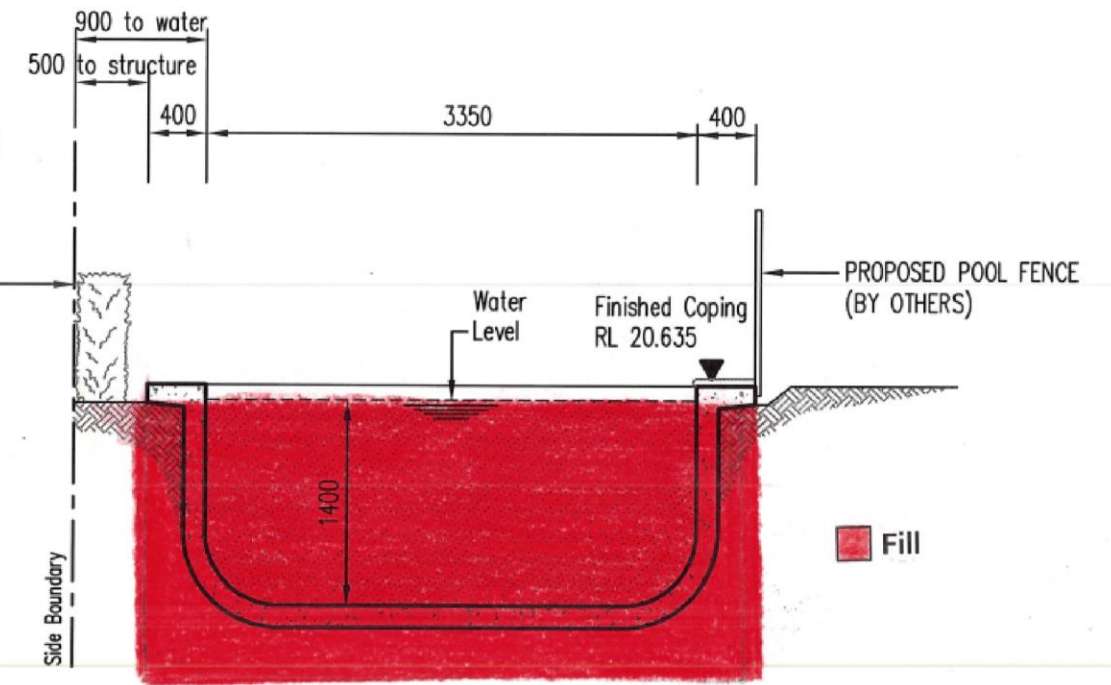
TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials



POOL PLAN

1 : 100

BOUNDARY BARRIERS TO BE CHILD SAFE
IN ACCORDANCE WITH NSW POOL FENCING
REGULATIONS



SECTION A - A

1 : 50

+100 DENOTES APPROXIMATE HEIGHT OF STRUCTURAL COPING
ABOVE/BELOW EXISTING GROUND LEVEL

NOTE: THIS DRAWING IS NOT TO BE SCALED
DIMENSIONS TO BE RECOGNISED OVER SCALING
ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE

VOLUME OF WATER IN POOL = 17.9 KL

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9/303 Pacific Hwy Lindfield NSW 2070
Telephone: 9415 8888 Facsimile: 9415 8899

TITLE	DRAWN	KA
POOL PLAN & SECTIONAL ELEVATIONS	DATE	8th May '20
CLIENT	SCALE	AS SHOWN
MARKUS & TANJA OSTERMAIER	DWG. NO.	2/3A
14 BUBALO STREET, WARRIEWOOD	JOB NO.	6674