3 Bakers Road, Church Point

Geotechnical Comments for Section 4.55.

We have reviewed the existing geotechnical report, the original plans, and the 17 amended plans by Northern Beaches Design, project number 1928, drawings numbered C4.55-1 to C4.55-17, dated 8/4/21.

The changes are as follows:

- Added a new store area requiring an excavation to a maximum depth of ~1.6m.
- Added a new retaining wall downhill of the proposed deck.
- Revisions to entry stair shape and privacy screens on deck.

The excavation for the storeroom has already been completed and the retaining walls have been constructed and inspected. The remaining works required for the proposed changes are considered minor from a geotechnical perspective and do not alter the recommendations or the risk assessment in the original report carried out by this firm numbered J2491 and dated the 29th November, 2019.

White Geotechnical Group Pty Ltd.

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

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

Development Application for _____
Name of Applicant

Address of site 3 Bakers Rd, Church Point

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 29/11/19 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 **3 Bakers Rd, Church Point**

Report Date: 29/11/19

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 3 Bakers Rd, Church Point

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 **3 Bakers Rd, Church Point**

Report Date: 29/11/19

Author: BEN WHITE

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

Please mark appropriate box

☒ Comprehensive site mapping conducted **22/11/19**
(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 **22/11/19**

☒ 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:

Alterations and Additions at **3 Bakers Road, Church Point**

1. Proposed Development

1.1 Construct a new carport on the downhill side of the property.

1.2 Construct an extension to the existing deck on the downhill side of the house.

1.3 Details of the proposed development are shown on 19 drawings by Northern Beaches Design, drawings numbered DA 01 to 19, Project Number 1928, dated November 2019.

2. Site Description

2.1 The site was inspected on the 22nd of November, 2019.

2.2 This residential property has a S aspect. The block is located on the gentle to moderately graded lower reaches of a hillslope. The natural surface falls at a moderate angle of ~12° from the road frontage before levelling out in the flat paved area at the downhill side of the house. The slope rises steeply in a short slope from the flat paved area to the house at an average angle of ~25°. The slope above the driveway increases in grade and the slope above the house continues at similar angles.

2.3 From the road frontage a concrete driveway runs down the slope to a level paved area (Photo 1). A low brick retaining walls lines the toe of the hillslope that rises to the house (Photo 2). A treated timber retaining wall in good condition terraces the hillslope and the cut batter for the driveway (Photos 3 & 4). The treated timber retaining wall extends from the level area up to the other side of the slope beside the house and extending to a paved parking area on the uphill side of the house. The retaining walls appear to be in good condition and show no significant signs of movement. The brick and timber clad house is supported on brick walls

(Photos 5 & 6). The external brick supporting walls show no significant signs of movement. A suspended concrete deck extends off the downhill side of the house and shows no significant signs of movement (Photos 4, 7 & 8).

3. Geology

The Sydney 1:100 000 Geological sheet indicates the site is underlain by the Newport Formation of the Narrabeen Group. This is described as interbedded laminite, shale, and quartz to lithic quartz sandstone.

4. Subsurface Investigation

One auger hole was put down to identify the soil materials. 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. This may have occurred in DCP4 but the other tests are expected to be a good representation of the natural profile. The results are as follows:

AUGER HOLE 1 (~RL9.2) **–** AH1 (photo 9)

Depth (m)	**Material Encountered**
0.0 to 0.3	**SANDY SOIL**, brown, fine grained.
0.3 to 0.9	**SAND**, grey brown, fine grained.
0.9 to 1.5	**SAND**, grey brown, medium grained.
1.5 to 1.8	**SANDY CLAY**, orange brown, firm, moist.

End of hole @ 1.8m in firm sandy clay. No watertable 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** (~RL7.4)	**DCP 2** (~RL9.2)	**DCP 3** (~RL5.9)	**DCP 4** (~RL5.5)
0.0 to 0.3	3	F	5	5
0.3 to 0.6	24	3	8	#
0.6 to 0.9	43	3	6	
0.9 to 1.2	#	5	6	
1.2 to 1.5		7	4	
1.5 to 1.8		19	23	
1.8 to 2.1		30	40	
2.1 to 2.4		34	#	
2.4 to 2.7		43		
2.7 to 3.0		#		
	End of Test @ 0.9m	End of Test @ 2.7m	End of Test @ 2.0m	Refusal @ 0.4m

#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 @ 0.9m, DCP still very slowly going down, nothing on moist tip.
DCP2 – End of test @ 2.7m, DCP still very slowly going down, nothing on moist tip.
DCP3 – End of test @ 2.0m, DCP still very slowly going down, nothing on moist tip.
DCP4 – Refusal @ 0.4m, DCP bouncing, white dust on dry tip.

5. Geological Observations/Interpretation

The slope materials are colluvial at the near surface and residual at depth. In the test locations, the ground materials consist of very loose to loose sands over sandy clays. Loose sand is expected to transition to sandy clay at a maximum depth of ~1.8m below the current surface. The clays merge into the weathered zone of the underlying rock at a maximum depth of ~2.1m below the current surface. DCP4 likely refused on an obstruction in the profile. The weathered zone is interpreted as Extremely Low Strength Shale. It is to be noted that this

material can appear as a mottled stiff clay when it is cut up by excavation equipment. 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 in the location is expected to be many metres below the base of the proposed excavation.

7. Surface Water

No evidence of significant 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 below or beside the property. The moderate to steep land surface that falls across the property and continues above is a potential hazard (**Hazard One**).

Geotechnical Hazards and Risk Analysis - Risk Analysis Summary

HAZARDS	Hazard One
TYPE	The moderate to steep land surface that falls across the property and continues above failing and impacting on the house and proposed development.
LIKELIHOOD	'Unlikely' (10^{-4})
CONSEQUENCES TO PROPERTY	'Medium' (15%)
RISK TO PROPERTY	'Low' (2×10^{-5})
RISK TO LIFE	9.6×10^{-7}/annum
COMMENTS	'ACCEPTABLE' level of risk.

(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

All stormwater from the proposed developments are to be piped through to the existing easement at the N boundary of the property, through any tanks that may be required by the regulating authorities.

11. Excavations

Apart from those for footings, no excavations are required.

12. Foundations

The proposed carport can be supported on a raft slab supported on the underlying loose sands of the natural profile. The footing walls are to be shored with timber to prevent collapse. A maximum allowable bearing pressure of 100kPa can be assumed for footing supported on the loose sands of the natural profile.

The base of the footing excavations in sand should be compacted as the excavation will loosen the upper sands. This can be carried out with a hand-held plate compactor. Water may be used to assist in compaction in sand but footing materials should be kept damp but not saturated. As a guide to the level of compaction required a density index of >85% is to be achieved.

The proposed deck extension can be supported on piers taken into Extremely Low Strength Shale. This ground material is expected at a depth of ~2.1m below the current surface. A maximum allowable bearing pressure of 600kPa can be assumed for footings on Extremely

Low Strength Shale. It should be noted that this material is a soft rock and a rock auger will cut through it so the builders should not be looking for refusal to end the footings.

As the bearing capacity of shale 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 shale 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 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.

13. Inspections

The client and builder are to familiarise themselves with the following required inspection as well as council geotechnical policy. We cannot provide geotechnical certification for the owners and Occupation Certificate if the following inspection has 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

Photo 3

Photo 4

Photo 5

Photo 6

Photo 7

Photo 8

Photo 9: AH1 – Downhole is from top to bottom

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.

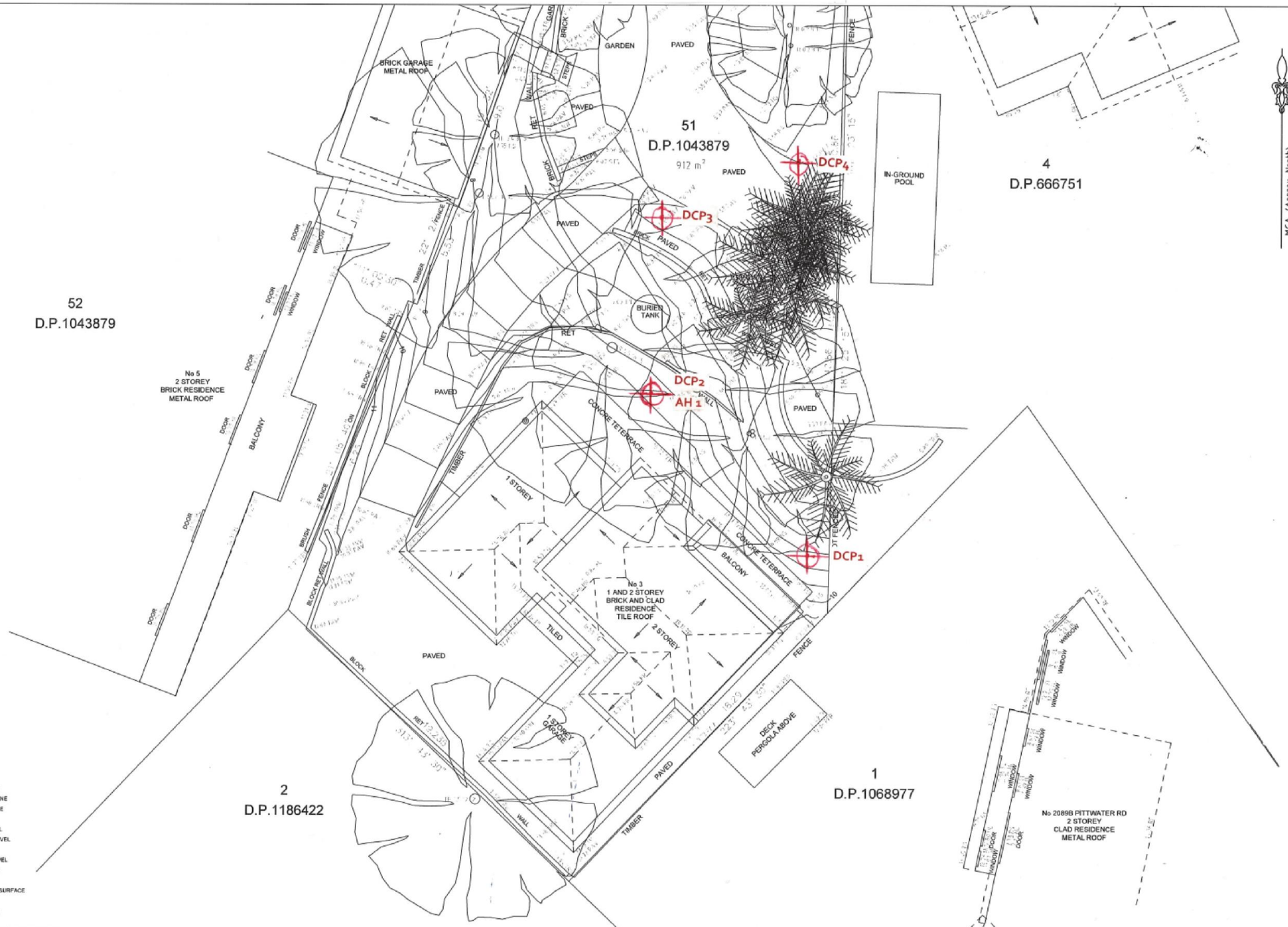
- The report addresses issues relating to your specific design and site. If the proposed project design changes, aspects of the report may no longer apply. Contact White Geotechnical if this occurs.

- 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



LEGEND

BL	BALCONY
CL	CENTERLINE
CON	CONCRETE
DK	DECK
DS	DOOR SILL
FL	FLOOR LEVEL
GRT	GRATE
HL	HOOD LEVEL
HYD	HYDRANT
LIN	LINTEL
NS	NATURAL SURFACE
PAV	PAVING
PER	PERGOLA
PL	POOL
PLM	TREE PALM-DIA,SPREAD,HEIGHT
RF	ROOF
RR	ROOF RIDGE
SIP	SEWER INSPECTION PIT
SL	SILL LEVEL
STR	STAIRS
TEL	TELSTRA
TER	TERRACE
TG	TOP OF GUTTER
TIL	TILE
TKB	TOP OF KERB
TNK	TANK
TR	TREE-DIA,SPREAD,HEIGHT
TRW	TOP OF RETAINING WALL
VC	VEHICLE CROSSING

0 1 2 3 4 5 6 7 8 9 10

SCALE 1:100

Northern beaches designs

Postal address: P O Box 870, Narrabeen NSW 2101
Office: 28 Cook Terrace, Mona Vale
M 0432 125 244

Project	Additions & Alterations DA 3 Bakers Road, Church Point Lot 52 in DP 1043879 - 912m2
Client :	Private Residence
Drawing :	- Survey

Drawn/Designed : PB/MW		Date : 081119	
Project Number :	1928	Scale : 1:200 @ A3	
Drawing No. :	DA3	Issue :	

A	FIRST ISSUE	17/09/19

- BOUNDARIES HAVE NOT BEEN DEFINED, A PRELIMINARY BOUNDARY SURVEY FOR DESIGN AND DA PURPOSES HAS BEEN UNDERTAKEN. LOT DIMENSIONS HAVE BEEN TAKEN FROM THE TITLE DIAGRAM. SITE AREA HAS BEEN CALCULATED FROM THESE DIMENSIONS – BOUNDARY DEFINITION IS SUBJECT TO FURTHER SURVEY.

- IF CONSTRUCTION ON OR NEAR BOUNDARIES IS REQUIRED IT IS RECOMMENDED THAT THE BOUNDARIES OF THE LAND BE MARKED.

- TREE SIZES ARE ESTIMATES ONLY.
- THIS PLAN HAS BEEN PREPARED FOR THE EXCLUSIVE USE OF SCOTT & ISABEL McCLENNAN
- RELATIONSHIP OF IMPROVEMENTS TO BOUNDARIES IS DIAGRAMMATIC ONLY. WHERE OFFSETS ARE CRITICAL THEY SHOULD BE CONFIRMED BY FURTHER SURVEY.
- EXCEPT WHERE SHOWN BY DIMENSION LOCATION OF DETAIL WITH RESPECT TO BOUNDARIES IS INDICATIVE ONLY.
- ONLY VISIBLE SERVICES HAVE BEEN LOCATED. UNDERGROUND SERVICES HAVE NOT BEEN LOCATED. DIAL BEFORE YOU DIG SERVICES (ph 1100) SHOULD BE USED AND A FULL UTILITY INVESTIGATION, INCLUDING A UTILITY LOCATION SURVEY, SHOULD BE UNDERTAKEN BEFORE CARRYING OUT ANY CONSTRUCTION ACTIVITY IN OR NEAR THE SURVEYED AREA.
- CRITICAL SPOT LEVELS SHOULD BE CONFIRMED WITH SURVEYOR.
- THIS PLAN IS ONLY TO BE USED FOR THE PURPOSE OF DESIGNING NEW CONSTRUCTIONS.
- CONTOURS SHOWN DEPICT THE TOPOGRAPHY. EXCEPT AT SPOT LEVELS SHOWN, THEY DO NOT REPRESENT THE EXACT LEVEL AT ANY PARTICULAR POINT. ONLY SPOT LEVELS SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION.
- CONTOUR INTERVAL = 1 metre. - SPOT LEVELS SHOULD BE ADOPTED.
- POSITION OF RIDGE LINES ARE DIAGRAMMATIC ONLY (NOT TO SCALE).
- THE INFORMATION IS ONLY TO BE USED AT A SCALE ACCURACY OF 1:100.
- DO NOT SCALE OFF THIS PLAN / FIGURED DIMENSIONS TO BE TAKEN IN PREFERENCE TO SCALED READINGS.
- IF ACCURATE TRUE NORTH IS REQUIRED A FURTHER SURVEY WOULD BE NECESSARY.
-
-
- ANY PERMITTED DOWNLOADING, ELECTRONIC STORAGE, DISPLAY, PRINT, COPY OR REPRODUCTION OF THIS SURVEY SHOULD CONTAIN NO ALTERATION OR ADDITION TO THE ORIGINAL SURVEY.
- THIS NOTICE MUST NOT BE ERASED.

Waterview
SURVEYING SERVICES

1A Mona Street Mona Vale NSW 2103
ACN 610 583 572
michael@wvsurveying.com.au
0414 843 180

Vertical Datum

DATUM: AUSTRALIAN HEIGHT DATUM (AHD)
B.M. PM 32079
R.L. 1.320
SOURCE: S.C.I.M.S. 13/9/2019

Client Details

SCOTT & ISABEL McCLENNAN
3 BAKERS ROAD
CHURCH POINT NSW 2105

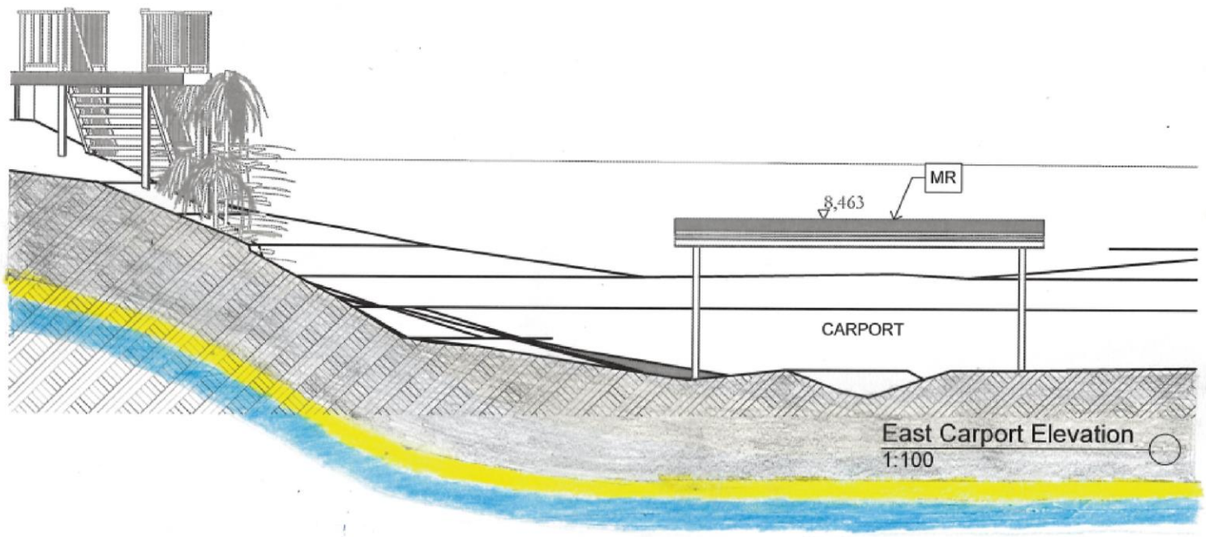
Drawing Title

DETAIL AND LEVELS OVER
3 BAKERS ROAD
CHURCH POINT NSW 2105
BEING LOT 52 IN DP.1043879

PROJECT: 1019	PAGE 2 OF 2
Date of survey 12/09/2019	Drawing No. 1019detail 1
Scale 1:100 @ A1	Rev. A

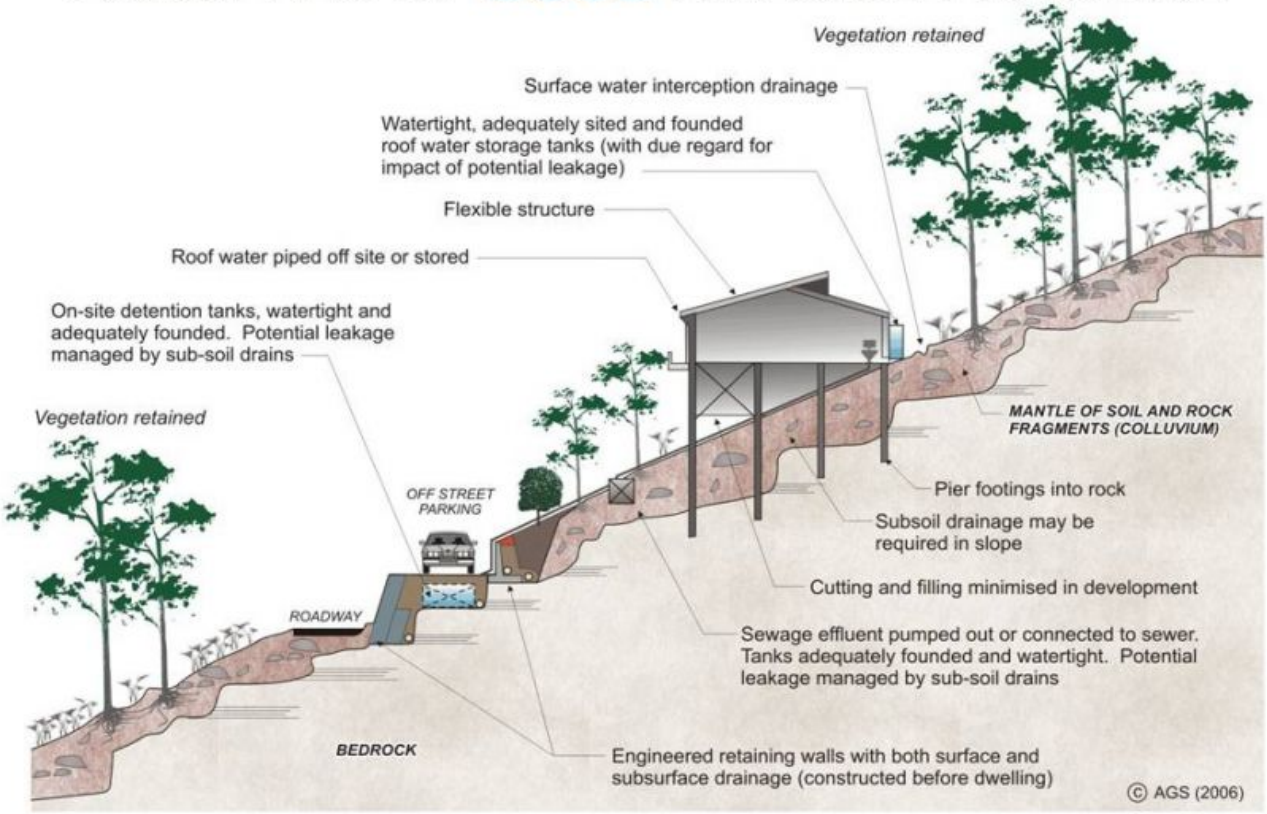
TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials

- Sand – Very Loose to Loose
- Sandy Clay – Firm to Stiff
- Narrabeen Group Rocks – Extremely Low Strength Shale - after being cut by excavation equipment can resemble a stiff to hard clay.



East Carport Elevation
1:100

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE