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

Development Application for _____
Name of Applicant

Address of site 9 Wandeen Road, Clareville

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 20/4/21 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 **9 Wandeen Road, Clareville**
Report Date: 16/04/21

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 9 Wandeen Road, Clareville

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 **9 Wandeen Road, Clareville**

Report Date: 16/4/21

Author: BEN WHITE

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

Please mark appropriate box

☒ Comprehensive site mapping conducted **15/4/21**
(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 **15/4/21**

☒ 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 House at **9 Wandeen Road, Clareville**

1. Proposed Development

1.1 Demolish the existing house and construct a new part three-storey house by excavating to a maximum depth of ~1.8m into the slope.

1.2 Details of the proposed development are shown on 20 drawings prepared by Action Plans, drawings numbered DA01 to DA20, Revision E, dated 13/4/21.

2. Site Description

2.1 The site was inspected on the 15th April, 2021.

2.2 This residential property is level with the road and has a W aspect. It is located on the gently graded lower middle reaches of a hillslope. The natural slope falls across the property at an average angle of ~7°. The land surface above the property continues at increasing angles. The slope below the property continues at gentle angles before increasing closer to the waterfront.

2.3 At the road frontage, a concrete driveway runs to a garage under the downhill side of the house (Photo 1). Between the road frontage and the house is a gently sloping lawn-covered fill (Photo 2). The fill is supported by a sleeper retaining wall reaching ~1.5m high (Photo 3). The wall was observed to be tilting downslope to a maximum angle of ~5° from the vertical. The plans show the wall is to remain as part of the proposed works. See **Section 16** for recommendations regarding this wall. Large sandstone floaters appear to be sitting in stable positions within the lawn area between the road frontage and the house (Photo 4). The single-storey timber framed and clad house will be demolished as part of the proposed works (Photo 5). Overgrown lawns and gardens surround the house in its current state. Another large sandstone

floater was observed to be sitting in a stable position between the S side of the house and the S common boundary (Photo 6).

3. Geology

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

4. Subsurface Investigation

Six 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 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:

GROUND TEST RESULTS ARE ON THE NEXT PAGE

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** (~RL28.9)	**DCP 2** (~RL28.1)	**DCP 3** (~RL28.9)	**DCP 4** (~RL28.4)	**DCP 5** (~RL26.4)	**DCP 6** (~RL25.9)
0.0 to 0.3	8	5	Floating Boulder Exposed at Surface	11	5	25
0.3 to 0.6	#	9		10	7	30
0.6 to 0.9		16		11	7	30
0.9 to 1.2		23		40	10	#
1.2 to 1.5		#		#	30	
1.5 to 1.8					#	
	Refusal on Rock @ 0.2m	Refusal on Rock @ 1.1m		End of Test @ 1.2m	End of Test @ 1.5m	End of Test @ 0.8m

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

DCP Notes:

DCP1 – Refusal on rock @ 0.2m, DCP bouncing off floater, white impact dust on dry tip.
DCP2 – Refusal on rock @ 1.1m, DCP thudding, brown and white shale fragments on dry tip, grey clay in collar above tip.
DCP3 – Rock exposed at surface.
DCP4 – Test taken between two exposed sandstone floaters. End of test @ 1.2m, DCP still very slowly going down, grey shale on dry tip.
DCP5 – End of test @ 1.5m, DCP still very slowly going down, brown shale on dry tip.
DCP6 – End of test @ 1.8m, DCP still very slowly going down, brown shale 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 a thin silty soil over firm to hard clays. The clays merge into the underlying weathered rock at an average depth of ~0.9m below the current surface across the property. The weathered zone is interpreted to be Extremely Low to Very Low Strength Shale. The sandstone boulders over the surface are interpreted to have historically moved down the slope from the Hawkesbury Sandstone that outcrops further

upslope. 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 excavations.

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 below or beside the property. The gently graded slope that rises across the property and continues above at increasing angles is a potential hazard (**Hazard One**). The treated timber retaining wall at the road frontage of the property is a potential hazard (**Hazard Two**). The proposed excavations are a potential hazard until retaining walls are in place (**Hazard Three**).

RISK ANALYSIS SUMMARY ON THE NEXT PAGE

Geotechnical Hazards and Risk Analysis - Risk Analysis Summary

HAZARDS	Hazard One	Hazard Two	Hazard Three
TYPE	The gentle slope that rises across the site and continues above at increasing angles failing and impacting on the proposed works.	Further movement of the sleeper tilting retaining wall at the road frontage of the property that causes failure (Photo 3).	The excavations (up to a depth of ~1.8m) collapsing onto the work site before retaining walls are in place.
LIKELIHOOD	'Unlikely' (10^{-4})	'Possible' (10^{-3})	'Possible' (10^{-3})
CONSEQUENCES TO PROPERTY	'Medium' (12%)	'Medium' (15%)	'Medium' (15%)
RISK TO PROPERTY	'Low' (2×10^{-5})	'Moderate' (2×10^{-4})	'Moderate' (2×10^{-4})
RISK TO LIFE	5.5×10^{-7}/annum	8.3×10^{-7}/annum	9.2×10^{-6}/annum
COMMENTS	This level of risk is 'ACCEPTABLE'.	This level of risk to life and property is 'TOLERABLE'. To move the risk to 'ACCEPTABLE' levels, the recommendations in **Section 16** are to be followed.	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

There is fall to Wandeen Road. Roof water from the proposed development is to be piped to the street drainage system through any tanks that may be required by the regulating authorities.

11. Excavations

An excavation to a maximum depth of ~1.8m is required to construct the ground floor of the house. Another excavation to a maximum depth of ~1.6m is required to construct the garage floor of the house. The excavations are expected to be through a thin silty soil over firm to hard clays with Extremely Low to Very Low Strength Shale expected to be encountered at an average depth of ~0.9m below the current surface.

Excavations through soil, clay, and Extremely Low to Very Low Strength Shale can be carried out with an excavator and bucket.

12. Vibrations

No excessive vibrations will be generated by excavation through soil, clay, and Extremely Low to Very Low Strength Shale.

13. Excavation Support Requirements

No structures or boundaries will be within the zone of influence of either excavation. Any large sandstone floaters within the footprint and zone of influence of either excavation are to be cut/broken down without the use of pneumatic hammers and removed prior to the commencement of the excavations (Photos 4 & 6).

The soil portions of the excavations are to be battered at 1.0 Vertical to 1.7 Horizontal (30°) and cut batters through clay and Extremely Low to Very Low Strength Shale or better will stand unsupported at near-vertical angles for short periods of time until retaining walls are installed, provided they are kept from becoming saturated.

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 retaining walls 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.

During the excavation process, the geotechnical consultant is to inspect the cuts when they reach depths of not more than 1.5m, while the machine/excavation equipment is on site, to ensure the ground materials are as expected and no temporary support is required.

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

14. Retaining Walls

For cantilever or singly-propped retaining walls, 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 Walls

Unit	Earth Pressure Coefficients		
	Unit weight (kN/m^3)	'Active' K_a	'At Rest' K_0
Soil and Residual Clays	20	0.40	0.55
Extremely Low Strength Rock	22	0.25	0.35
Rock Up to Low Strength Rock	24	0.25	0.35

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 wall, do not account for any surcharge loads, and assume retaining walls are fully drained. Rock strength and relevant earth pressure coefficients are to be confirmed on site by the geotechnical consultant.

All retaining walls are to have sufficient back-wall drainage and be backfilled immediately behind the wall 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 walls, the likely hydrostatic pressures are to be accounted for in the structural design.

15. Foundations

Spread footings and piers supported on the underlying Extremely Low to Very Low Strength Shale are suitable footings for the proposed house. This ground material is expected to be exposed across the majority of the bases of the proposed excavations. Where the slope falls away on the downhill side and where the footprint of the house is not over the proposed excavations, piers to Extremely Low to Very Low Strength Shale will be required to maintain a uniform bearing material across the structure. This ground material is expected at an average depth of ~0.9m below the current surface. A maximum allowable pressure of 600kPa can be assumed for Extremely Low to Very Low Strength Rock. 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 clay and 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 wet clay or 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.

16. Maintenance

The treated timber retaining wall along the road frontage of the property was observed to be tilting to a maximum of ~5° (Photo 3). To be prudent, we recommend the retaining wall be inspected by the owners on an annual basis or after heavy prolonged rainfall, whichever occurs first, keeping a photographic record of the inspections. We can carry out these inspections upon request. Should any new movement be observed, the retaining wall is to be remediated or rebuilt to current engineering standards.

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 2 Part B 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 certification for the regulating authorities or the owner if the following inspections have not been carried out during the construction process.

- The geotechnical consultant is to inspect the cuts as they are lowered to depths of not more than 1.5m, while the machine/excavation equipment is on site, to ensure the ground materials are as expected and no temporary support is required.

- 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

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

A1

TITLE INDICATES THAT LOT A IN D.P.393629 IS SUBJECT TO:
- RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S).

LEGEND:

BAL = BALCONY
BLD = EXTERNAL BUILDING
BMPL = BENCH MARK PLACED
BW = BOTTOM WALL
CL = CENTRELINE
CON = CONCRETE
DK = DECK
FCE = FENCE
FL = FLOOR LEVEL
GM = GAS METER
HL = HEAD LEVEL
MHU = MANHOLE UNKNOWN SPOT
NS = NATURAL SURFACE
PAT = PATIO
RK = ROCK
RR = ROOF RIDGE
SHED = SHED
SL = SOLL LEVEL
STR = STAIRS
TG = TOP OF GUTTER
TKB = TOP OF KERB
TOR = TOP OF ROCK
TR = TREE
TW = TOP OF WALL
WM = WATER METER

WM = WATER METER
——— = ELECTRICITY OVERHEAD
——— = SEWER UNDERGROUND

TREE
SPREAD-DIAMETER-HEIGHT

NOTES

- BOUNDARIES HAVE BEEN DEFINED.
- 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 SEBASTIAN WATKINS

- 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.
- SEWER MAIN PLOTTED FROM SYDNEY WATER SEWER DIAGRAM. LOCATION SHOULD BE MARKED ON SITE IF CRITICAL.
- 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. 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 – 0.5 metre. – SPOT LEVELS SHOULD BE ADOPTED.
- POSITION OF FENCE LINES ARE DIAGRAMMATIC ONLY AND 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.
- THIS PLAN HAS BEEN PREPARED UNDER THE SUPERVISION OF A REGISTERED SURVEYOR, S.W. HEWITT, REGISTRATION 2162.
- COPYRIGHT © CMS SURVEYORS 2019.
- NO PART OF THIS SURVEY MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM, WITHOUT THE WRITTEN PERMISSION OF THE COPYRIGHT OWNER EXCEPT AS PERMITTED BY THE COPYRIGHT ACT 1968.
- 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.

HORIZONTAL DATUM:
CO-ORDINATE SYSTEM: ASSUMED
MARKS ADOPTED: N/A

VERTICAL DATUM:
DATUM: AUSTRALIAN HEIGHT DATUM (AHD)
B.M. ADOPTED: PM 16279
R.L. 20.149 (ORDER L2)
SOURCE: S.C.I.M.S. 05/11/19

1	FIRST ISSUE	27/11/19

CLIENT:
SEBASTIAN WATKINS
LEVEL 9, 37 PITT STREET
SYDNEY NSW 2000

SURVEY PLAN
SHOWING DETAIL & LEVELS
OVER LOT A IN D.P.393629
9 WANDEEN ROAD
CLAREVILLE NSW 2107

C.M.S. Surveyors Pty Limited
ACN: 096 240 201
PO Box 483 Eve Way NSW 2089
2/1084 Pacific Highway Eve Way NSW 2089
Telephone: (02) 9971 4622
Facsimile: (02) 9971 4622
E-mail: info@cmssurveyors.com.au

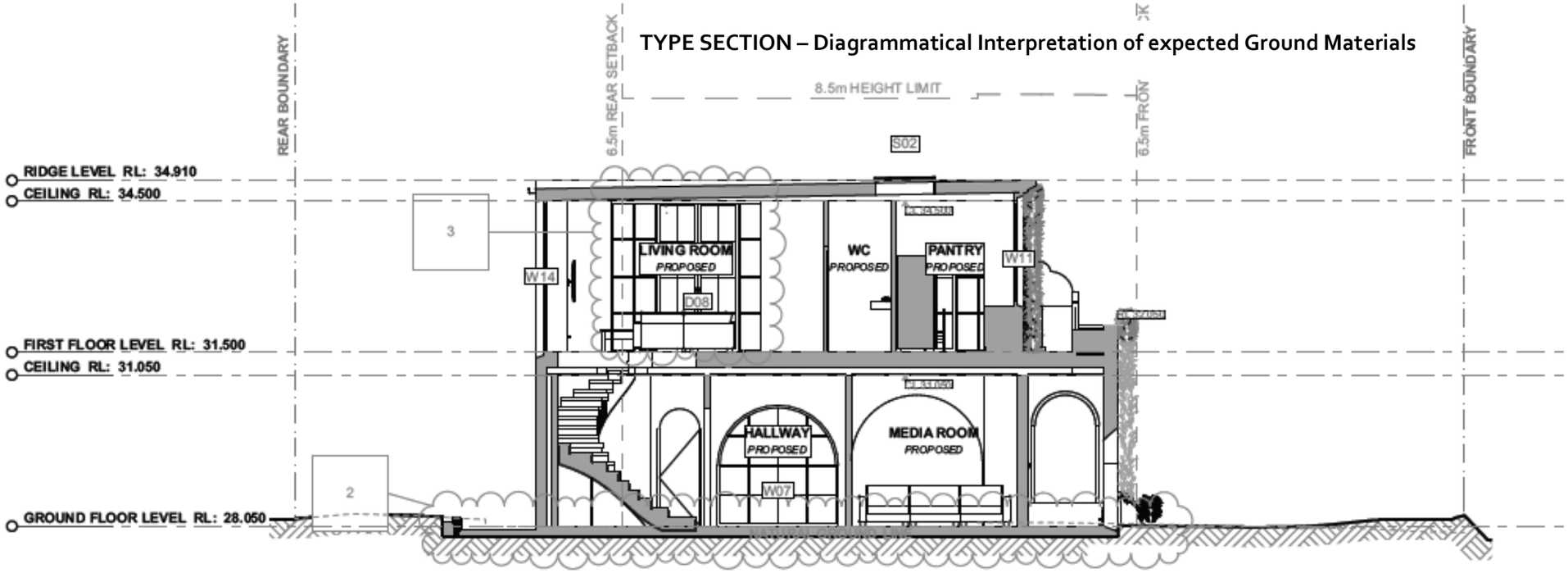
LGA: NORTHERN BEACHES | SHEET 1 OF 1

SURVEYED	DRAWN	CHECKED	APPROVED
ME	MC	ME	AF

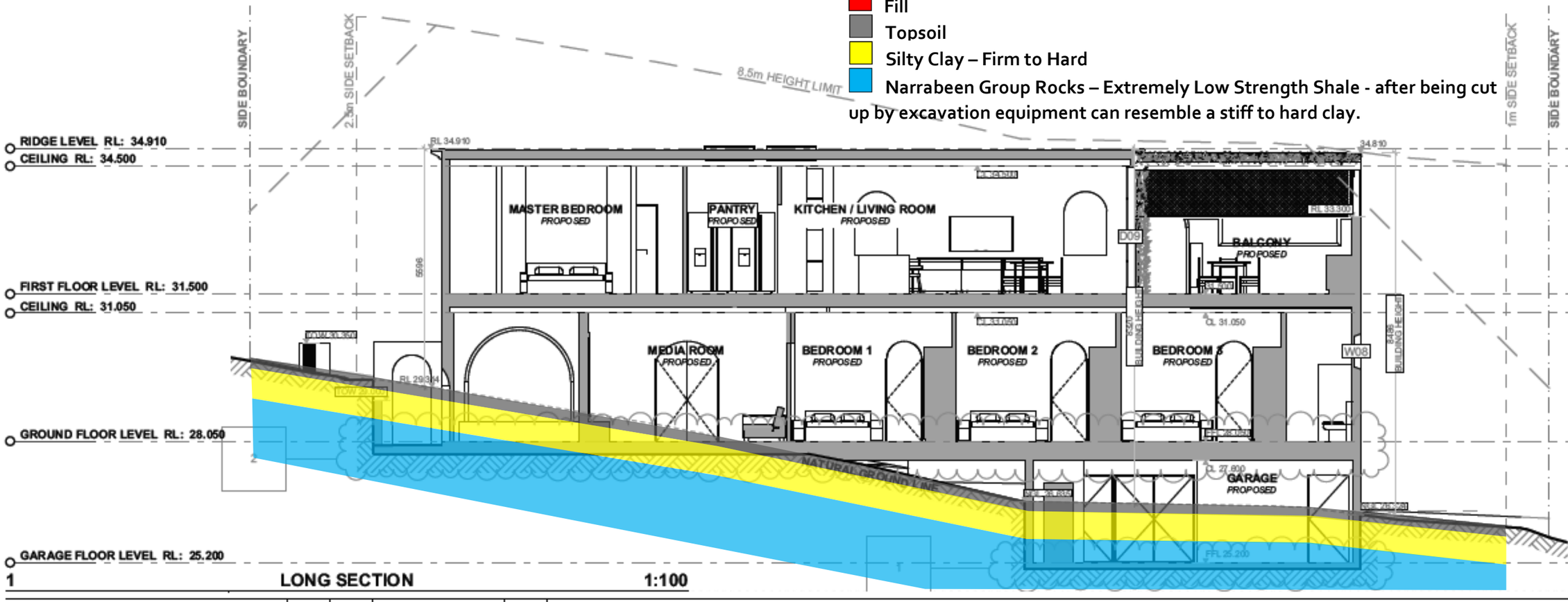
SURVEY INSTRUCTION	SCALE	DATE OF SURVEY
8470A	1:100 @ A1 1:200 @ A3	19/11/19

DRAWING NAME: 8470Adetail
CAD FILE: 8470Adetail.dwg
ISSUE: 1

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials



2 **CROSS SECTION** 1:100



1 **LONG SECTION** 1:100

Fill
Topsoil
Silty Clay – Firm to Hard
Narrabeen Group Rocks – Extremely Low Strength Shale - after being cut up by excavation equipment can resemble a stiff to hard clay.

ACTION PLANS
m: 0426 957 518
e:operations@actionplans.com.au
w: www.actionplans.com.au

REV.	DATE	COMMENTS	DRWN
A	15/10/2020	REVISED SITING PLAN	DLR
B	23/10/2020	DA SET	DLR
C	22/03/2021	DA SET - REV A	DLR
D	07/04/2021	DA SET - REV B	DLR
E	13/04/2021	DA SET - REV C	DLR

LEGEND
- NEW FLOOR AREA
- NEW WET FLOOR AREA
- METAL ROOFING
- TILED ROOFING
- TIMBER
- CONCRETE
- BRICKWORK
- METAL
- EXISTING
- DEMOLISHED

CLIENT
SEBASTIAN WATKINS & FRANCESCA HAMMOND

PROJECT ADDRESS
9 WANDEEN RD, CLAREVILLE 2107

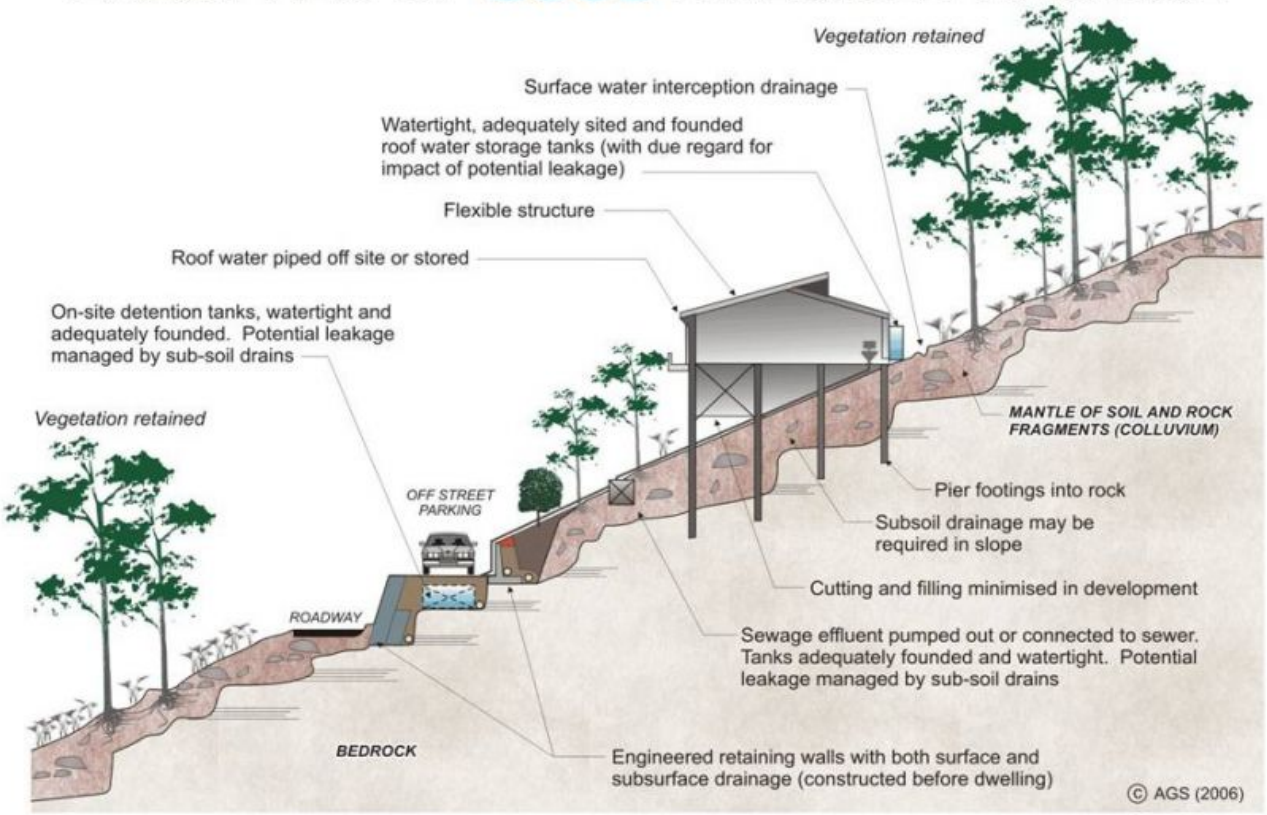
DRAWING NO.
DA10

DRAWING NAME
LONG / CROSS SECTION

DATE
Tuesday, 13 April 2021

SCALE
1:100 @A3

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE