

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

Development Application for _____
Name of Applicant

Address of site 45 Park Avenue, Avalon

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 9/12/20 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 45 Park Avenue, Avalon
Report Date: 9/12/20
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>45 Park Avenue, Avalon</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>45 Park Avenue, Avalon</u>
Report Date: <u>9/12/20</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 19/11/20
(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 19/11/20
- ☒ 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:

Alterations and Additions at 45 Park Avenue, Avalon

1. Proposed Development

- 1.1 Widen the driveway on the uphill side of the property.
- 1.2 Extend the existing deck on the downhill side of the house.
- 1.3 Demolish the existing outbuilding on the downhill side of the property and construct a secondary dwelling in the same location.
- 1.4 Various other internal and external alterations.
- 1.5 Details of the proposed development are shown on 12 drawings prepared by Andy Lehman Design, drawings numbered DA09 to DA20, dated December 2020.

2. Site Description

- 2.1 The site was inspected on the 19th November, 2020.
- 2.2 This residential property is on the low side of the road has a SW aspect. The block is located on the gentle to moderately graded upper SW flank and crest of a NW to SE trending ridge. The natural slope falls across the property from the road frontage at gentle angles that gradually increase to moderate angles across the downhill side of the property. The slope below the property continues at gradually decreasing angles for ~150m to the toe of the slope.
- 2.3 At the road frontage, a concrete and brick-paved driveway runs to a parking area on the uphill side of the house (Photo 1). Between the road frontage and the house is a gently sloping garden area (Photo 2). The part two-storey brick and timber framed and clad house is supported on brick walls and brick piers (Photo 3). No

significant signs of movement were observed in the supporting brick walls and the supporting brick piers stand vertical. A timber deck that extends off the downhill side of the house was observed to be supported directly onto outcropping competent Medium Strength Sandstone bedrock (Photo 4). The outcrop steps down the slope. The maximum rock face height at a step is ~1.5m. No significant geological defects were observed in the outcropping rock and it is considered to be stable. An excavation has been made in the slope below the outcrop for a pool (Photo 5). The water level of the pool indicates no ground movement has occurred in the shell of the pool since its construction. Filling has been placed around the downhill side of the pool to form a level lawn area. The fill is supported by a stable ~0.7m high treated timber retaining wall (Photo 6). A small outbuilding below the pool will be demolished as part of the proposed works (Photo 7). A lawn area falls from the downhill side of the retaining wall and outbuilding (Photo 8) to a moderately sloping garden that extends to the lower common boundary.

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. A band of Medium Strength Sandstone underlies the location of the proposed works and extends through the otherwise shale-dominated profile.

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 bedrock. 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:

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 (~RL40.5)	DCP 2 (~RL37.8)	DCP 3 (~RL37.6)	DCP 4 (~RL34.4)	DCP 5 (~RL32.8)	DCP 6 (~RL31.1)
0.0 to 0.3	6	2F	Rock Exposed at Surface	5	3	4
0.3 to 0.6	7	7		5F	6	#
0.6 to 0.9	14	22		4	#	
0.9 to 1.2	#	14		6		
1.2 to 1.5		#		5		
1.5 to 1.8				#		
	Refusal on Rock @ 0.8m	Refusal on Rock @ 1.1m		Refusal on Rock @ 1.3m	Refusal on Rock @ 0.5m	Refusal on Rock @ 0.1m

#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 @ 0.8m, DCP bouncing off rock surface, clean dry tip.

DCP2 – Refusal on rock @ 1.1m, DCP bouncing off rock surface, white impact dust on dry tip.

DCP3 – Rock exposed at surface.

DCP4 – Refusal on rock @ 1.3m, DCP bouncing off rock surface, wet muddy tip, brown clay in collar above tip.

DCP5 – Refusal on rock @ 0.5m, DCP bouncing off rock surface, white impact dust on damp tip.

DCP6 – Refusal on rock @ 0.1m, DCP bouncing off rock surface, white and brown sandstone fragments on dry tip.

5. Geological Observations/Interpretation

The surface features of the block are controlled by the outcropping and underlying sandstone bedrock that steps down the property forming sub-horizontal benches between the steps. Where the grade is steeper, the steps are larger and the benches, narrower. Where the slope eases, the opposite is true. Where the rock is not exposed, it is overlain by soils and clays that fill the bench step formation. Filling has been placed across the downhill side of the property for landscaping. In the test locations where rock was not exposed at the surface, it was encountered at depths of between 0.1 to 1.3m below the current surface, being variable due to the presence of fill and the stepped nature of the underlying bedrock. The outcropping sandstone on the property is estimated to be medium strength or better and similar strength rock is expected to underlie the majority of the site. 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 significant surface flows were observed on the property during the inspection. Normal sheet wash from the slope above will be intercepted by the street drainage system for Park Avenue above.

8. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed above or beside the property. The gentle to moderately graded slope that falls across the property and continues below is a potential hazard (**Hazard One**).

Risk Analysis Summary

HAZARDS	Hazard One
TYPE	The gentle to moderate slope that falls across the site and continues below failing and impacting on the house and proposed works.
LIKELIHOOD	'Unlikely' (10^{-4})
CONSEQUENCES TO PROPERTY	'Medium' (12%)
RISK TO PROPERTY	'Low' (2×10^{-5})
RISK TO LIFE	5.5×10^{-7} /annum
COMMENTS	This level of risk is 'ACCEPTABLE'.

(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

The fall is away from the street. As the lower portion of the property is bushland, a dispersal system is considered suitable for the site provided it is designed and considered in accordance with council stormwater policy.

11. Excavations

Apart from those for footings and minor levelling, no excavations are required.

12. Foundations

Piers supported off Medium Strength Sandstone are suitable footings for the proposed deck extension and secondary dwelling. Over the footprint of the deck, this material is expected from the surface to a maximum depth of ~1.3m below the current surface. Where footings

are over an exposed sloping rock surface, they may be supported off level pads cut into the rock. Assume a maximum allowable bearing pressure of 800kPa for footings supported off Medium Strength Sandstone.

Naturally occurring vertical cracks (known as joints) commonly occur in sandstone. These are generally filled with soil and are the natural seepage paths through the rock. They can extend to depths of several metres and are usually relatively narrow but can range between 0.1 to 0.8m wide. If a footing falls over a joint in the rock, the construction process is simplified if with the approval of the structural engineer the joint can be spanned or alternatively the footing can be repositioned so it does not fall over the joint.

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 inspections as well as council geotechnical policy. We cannot provide geotechnical certification for the owner or the regulating authorities 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

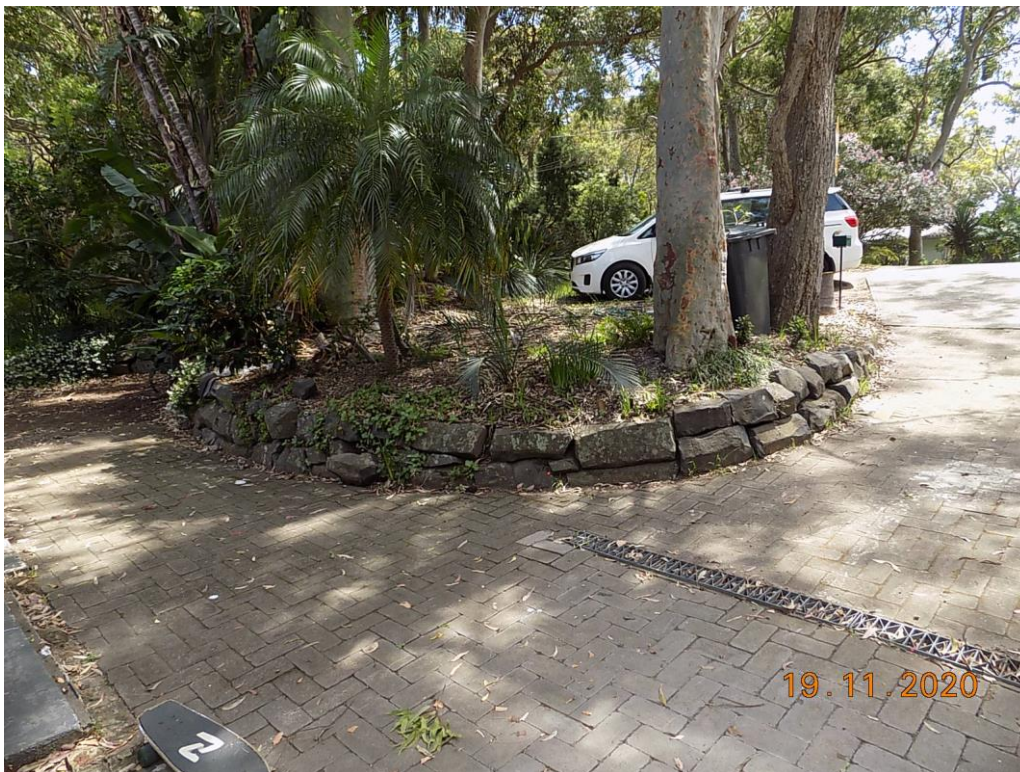


Photo 2



Photo 3



Photo 4



Photo 5

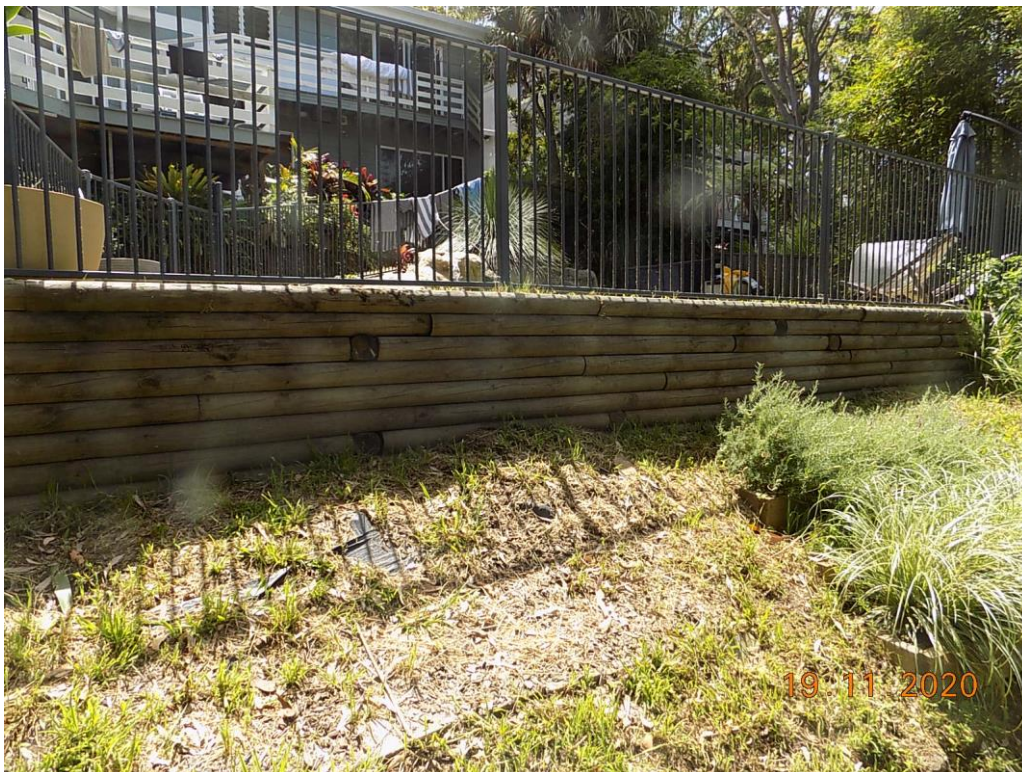


Photo 6



Photo 7



Photo 8

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.

W N S E

WINTER SOUTH-WESTERLY WINDS.

NOTE: ALL EXISTING CANOPY TREES & LANDSCAPING TO THE REAR TO BE RETAINED.

EXISTING STUDIO TO BE DEMOLISHED. DASHED.

NEW SECONDARY DWELLING

ALTS & ADDS TO EX DWELLING

NEW DRIVEWAY

CARPORT

BOUNDARY 82.40

BOUNDARY 76.48

EX SWIMMING POOL

VALLEY VIEWS

EXISTING TREES TO BE REMOVED. REFER ARBORIST REPORT. EXISTING DRIVEWAY TO BE ALTERED. DASHED.

EXISTING DRIVEWAY

EX CROSSOVER TO BE RETAINED.

PARK AVENUE

SUMMER SUN PATH

WINTER SUN PATH

DCP1

DCP2

DCP3

DCP4

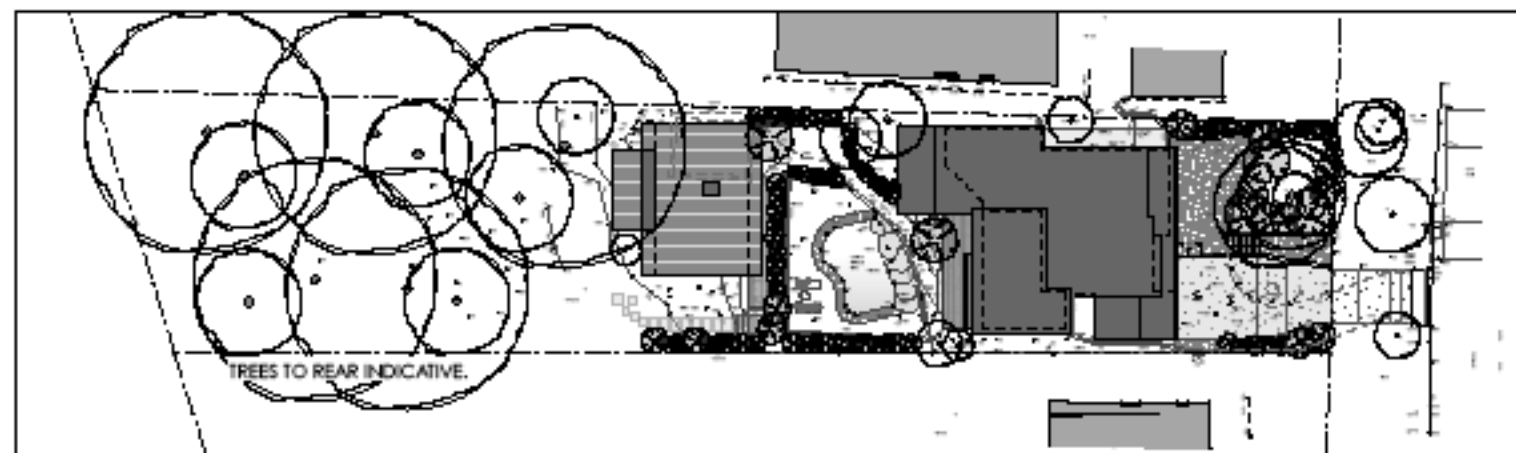
DCP5

DCP6

PROPOSED SITE / ROOF / ANALYSIS PLAN 1:200

TREES TO REAR INDICATIVE.

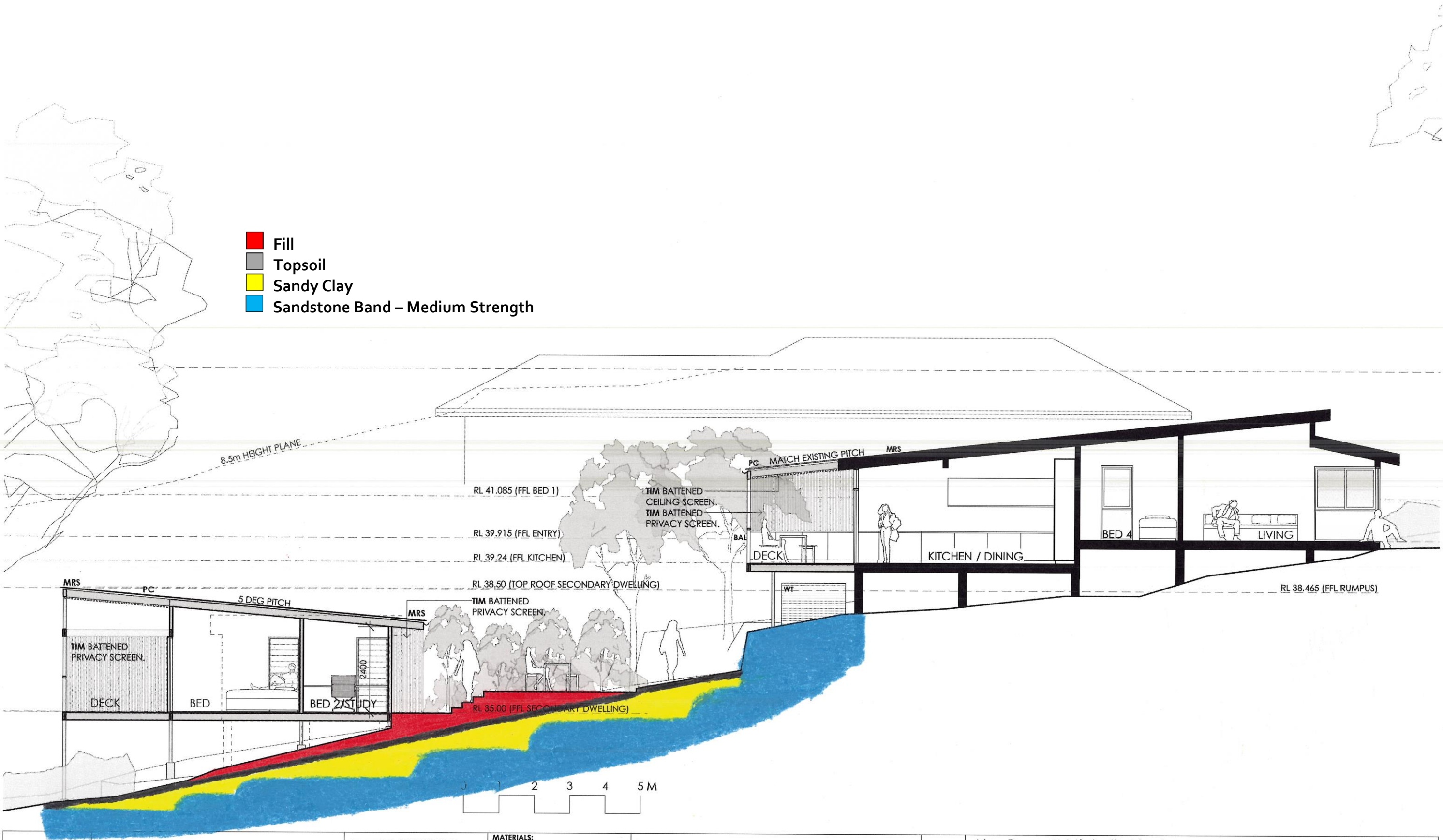
PROPOSED SITE / ROOF / ANALYSIS PLAN 1:500



PROPOSED SITE / ROOF / ANALYSIS PLAN 1:500

		<p>LEGEND:</p> <p>———— EXISTING WALL</p> <p>----- TO BE REMOVED</p> <p>===== NEW WALL</p>	<p>MATERIALS:</p> <p>SAL BRICKWORK</p> <p>SP DOWNPIPE</p> <p>PD ROOF CLADDING</p> <p>VC LIGHTWEIGHT CLADDING</p> <p>UN LOCATED WINDOW</p> <p>AWS AERIAL ROOF DRAINING</p> <p>NOL NATURAL GROUND LEVEL</p> <p>PC POLYCARBONATE ROOF DRAINING</p> <p>ST STONE</p> <p>TW TIMBER</p> <p>WT WHITE WASH</p>	<p>Alex Pace & Michelle Houtman 45 Park Avenue Avalon Beach NSW 2107 LOT 55 DP 13325 SITE AREA = 1290m²</p>			
				<p>PROJECT Alterations & Additions</p>	<p>ANDY LEHMAN DESIGN</p>		<p>DATE: 12/01/2020</p>
<p>DRAWING Proposed Site/Roof/Analysis Plan</p>		<p>TITLE: 00704-000-000</p> <p>SCALE: 1:200 @ A3</p>		<p>DATE: DEC. 2019</p>			
<p>NOTES</p> <p>Please refer to A2 or A3, this drawing is copyright and is for Development Application purposes only. Do not measure off drawings.</p> <p>Drawn: andy@andylehman.com.au</p> <p>Site checked: andy</p>							

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials



		EXISTING WALL		MATERIALS:		Alex Pace & Michelle Houtman	
		TO BE REMOVED		BAL BALUSTRADE		45 Park Avenue Avalon Beach NSW 2107 LOT 55 DP 13325 SITE AREA = 1290m ²	
		NEW WALL		DP DOWNPIPE		ANDY LEHMAN DESIGN	
				FG FIXED GLAZING		PROJECT Alterations & Additions	DWG. NO. DA. 20
				LC LOUVER CLADDING		DRAWING Proposed Section AA	SCALE 1:100@A3
				LW LOUVER WINDOW		NOTES Please print in A3 or A1. This drawing is copyright and is for Development Application purposes only. Do not measure off drawings.	DATE DEC. 2020
				MRS METAL ROOF SHEETING		Tel. 0414 466 665	ISSUE
				NGL NATURAL GROUND LEVEL		Email: andy@andylehman.com.au	
				PC POLYCARBONATE ROOF SHEETING			
				ST STONE			
				TIM TIMBER			
				WT WATER TANK			

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE

