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

Development Application for _____
Name of Applicant

Address of site 34 Plateau Road, Bilgola Plateau

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 30/05/24 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 **34 Plateau Road, Bilgola Plateau**
Report Date: 30/05/24

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 MScGEOL AIG., RPGeo

Membership No. 10306

Company **White Geotechnical Group Pty Ltd**

REGISTERED PROFESSIONAL GEOSCIENTIST
AUSTRALIAN INSTITUTE OF GEOSCIENTISTS
BENJAMIN WHITE
RPGeo No: 10306

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 **34 Plateau Road, Bilgola Plateau**

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 **34 Plateau Road, Bilgola Plateau**

Report Date: 30/5/24

Author: BEN WHITE

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

Please mark appropriate box

- ☒ Comprehensive site mapping conducted **22/5/24** (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 **22/5/24**
- ☒ 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 MScGEOL AIG., RPGeo

Membership No. 222757

Company **White Geotechnical Group Pty Ltd**

GEOTECHNICAL INVESTIGATION:

House Extension and New Carport at **34 Plateau Road, Bilgola Plateau**

1. Proposed Development

1.1 Add a new floor above the existing house.

1.2 Construct a new suspended carport and driveway on the uphill side of the property requiring fill to a maximum height of ~1.4m.

1.3 Details of the proposed development are shown on 8 drawings prepared by J.D. Evans and Company. Drawings numbered 2156-1 to 2156-8. All dated 19/04/2024.

2. Site Description

2.1 The site was inspected on the 22nd May, 2024. And previously on the 27th October, 2021.

2.2 This residential property is on the low side of the road and has a NE aspect. It is located on the moderate to steeply graded upper reaches of a hillslope. The natural slope falls from the uphill property boundary to the downhill side of the house at an average angle of ~15° before reaching the top of a sandstone rock face that is estimated to be up to ~5m high. The slope below the property continues at steep angles for some 160m before easing. The slope above the property continues at moderate angles before easing at the crest of the slope.

2.3 At the road frontage, a bitumen driveway runs to a parking area on the S side of the house (Photo 1). A Hawkesbury Sandstone rock face that is estimated to be up to ~5m high is located on the downhill side of the driveway and house (Photos 2 to 4). A portion of the rock face near the S end has detached (Photo 5) but appears to be currently stable and is set back sufficiently from the driveway/parking area. A portion of the rock face near the downhill side of the house is undercut by up to ~1.5m (Photo

6). The timber deck on the downhill side of the house is constructed over the undercut (Photos 7). However the undercut has a thick cantilever arm in relation to its overhang length and is considered to be stable.

The single storey timber clad house is supported by brick walls, brick piers, and timber posts, (Photos 8 & 9). Some of the supporting walls and piers were observed to be supported on outcropping competent Medium Strength Sandstone from within the foundation space of the house. No significant signs of movement were observed in the supporting walls, and the supporting piers stand vertical. Stable Sandstone bedrock outcrops on the uphill side of the house (Photo 10). Low fill terraces a lawn area uphill of the rock (Photo 11). A fibre cement, steel clad and concrete block garage/workshop is located near the uphill property boundary (Photo 12). No signs of slope instability were observed on the property that could have occurred since the property was developed. The adjoining neighbouring property was observed to be in good order as seen from the street and subject property.

3. Geology

The Sydney 1:100 000 Geological sheet indicates the site is underlain by Hawkesbury Sandstone. It is described as a medium to coarse grained quartz sandstone with very minor shale and laminite lenses.

4. Subsurface Investigation

One hand Auger Hole (AH) was put down to identify the soil materials. Eight 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 have been an issue for this site. But 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:

AUGER HOLE 1 (~RL107.5) – AH1 (Photo 13)

Depth (m)	Material Encountered
0.0 to 0.5	**CLAYEY TOPSOIL**, dark brown, Very Soft, damp, fine to medium grained.
0.5 to 0.9	**SANDY CLAY**, dark to light grey, Firm, damp, fine to coarse grained, texture becomes sugary prior to refusal.

Refusal @ 0.9m on rock. Auger grinding. No water table encountered.

DCP TEST RESULTS – Dynamic Cone Penetrometer

Equipment: 9kg hammer, 510mm drop, conical tip. Standard: AS1289.6.3.2 - 1997

Depth(m) Blows/0.3m	DCP 1 (~RL110.0)	DCP 2 (~RL108.4)	DCP 3 (~RL108.6)	DCP 4 (~RL107.7)	DCP 5 (~RL107.7)	DCP 6 (~RL107.5)	DCP 7 (~RL107.4)	DCP 8 (~RL106.4)
0.0 to 0.3	2	17	4	6	14	2	1	Rock Exposed at Surface
0.3 to 0.6	7	31	16	7	41	7	3	
0.6 to 0.9	#	32	#	#	#	3	#	
0.9 to 1.2		#				#		
	Refusal on rock @ 0.6m	Refusal on rock @ 0.8m	Refusal on rock @ 0.6m	Refusal on rock @ 0.5m	Refusal on rock @ 0.6m	Refusal on rock @ 0.7m	Refusal on rock @ 0.5m	

#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 @ 0.6m, DCP bouncing off rock surface, white sandstone fragments on dry tip.

DCP2 – Refusal on rock @ 0.8m, DCP bouncing off rock surface, white sandstone fragments on dry tip.

DCP3 – Refusal on rock @ 0.6m, DCP bouncing off rock surface, white sandstone fragments and dark brown soil on dry tip.

DCP4 – Refusal on rock @ 0.5m, DCP bouncing off rock surface, white sandstone fragments and dark brown soil on moist tip.
DCP5 – Refusal on rock @ 0.6m, DCP bouncing off rock surface, white sandstone fragments on dry tip.
DCP6 – Refusal on rock @ 0.7m, DCP bouncing off rock surface, grey sandy clay on wet tip.
DCP7 – Refusal on rock @ 0.5m, DCP bouncing off rock surface, white impact dust on wet tip.
DCP8 – Medium Strength Sandstone exposed at surface.

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. The rock is overlain by a clayey topsoil and sandy clay that fills the bench step formation. Fill to a maximum depth of ~0.6m provides level lawn and garden areas above the natural profile. In the test locations, the depth to rock ranged from between ~0.5m to ~0.9m below the current surface. The sandstone underlying the property is estimated to be Medium Strength or better. See Type Section attached for a diagrammatical representation of the expected ground materials.

6. Groundwater

Seepage was observed moving over the exposed sandstone outcrops during the inspection. This is considered to be normal ground water seepage that 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 works.

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 Plateau Road above.

8. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed beside the property. The moderate to steep slope that falls across the property and continues above and below is a potential hazard (**Hazard One**). The large sandstone cliff below the house is a potential hazard (**Hazard Two**).

Geotechnical Hazards and Risk Analysis - Risk Analysis Summary

HAZARDS	Hazard One	Hazard Two
TYPE	The moderate to steep slope that falls across the property and continues above and below failing and impacting on the property.	A mass failure of the cliff on the downhill side of the house (Photos 2 to 6) impacting on the property.
LIKELIHOOD	'Unlikely' (10^{-4})	'Unlikely' (10^{-4})
CONSEQUENCES TO PROPERTY	'Medium' (12%)	'Medium' (30%)
RISK TO PROPERTY	'Low' (2×10^{-5})	'Low' (2×10^{-5})
RISK TO LIFE	8.3×10^{-7}/annum	8.3×10^{-7}/annum
COMMENTS	This level of risk is 'ACCEPTABLE'.	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. The stormwater engineer is to refer to council stormwater policy for suitable options for stormwater disposal.

11. Excavations

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

12. Fill

Fill is shown to be placed beneath the proposed driveway. We recommend the fill be used as formwork only and the structures above be suspended, and not supported on the fill. This simplifies the building process as the fill does not require compaction. If it is desired to support structures on fill, it is to be laid as an engineered fill. Our office can be contacted for advice on this procedure.

13. Foundations

The proposed works are to be supported on pads or piers taken to Medium Strength Sandstone. This material is expected at depths of between ~0.5m and ~0.9m below the current surface.

A maximum allowable bearing pressure of 1000kPa can be assumed for footings on 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.

14. Geotechnical Review

The structural plans are to be checked and certified by the geotechnical engineer as being in accordance with the geotechnical recommendations. On completion, a Form 2B will be issued. This form is required for the Construction Certificate to proceed.

15. Inspection

The client and builder are to familiarise themselves with the following required inspection as well as council geotechnical policy. We cannot provide certification for the Occupation Certificate or the owner 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 and contractors are still onsite and before steel reinforcing is placed or concrete is poured.

White Geotechnical Group Pty Ltd.

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

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

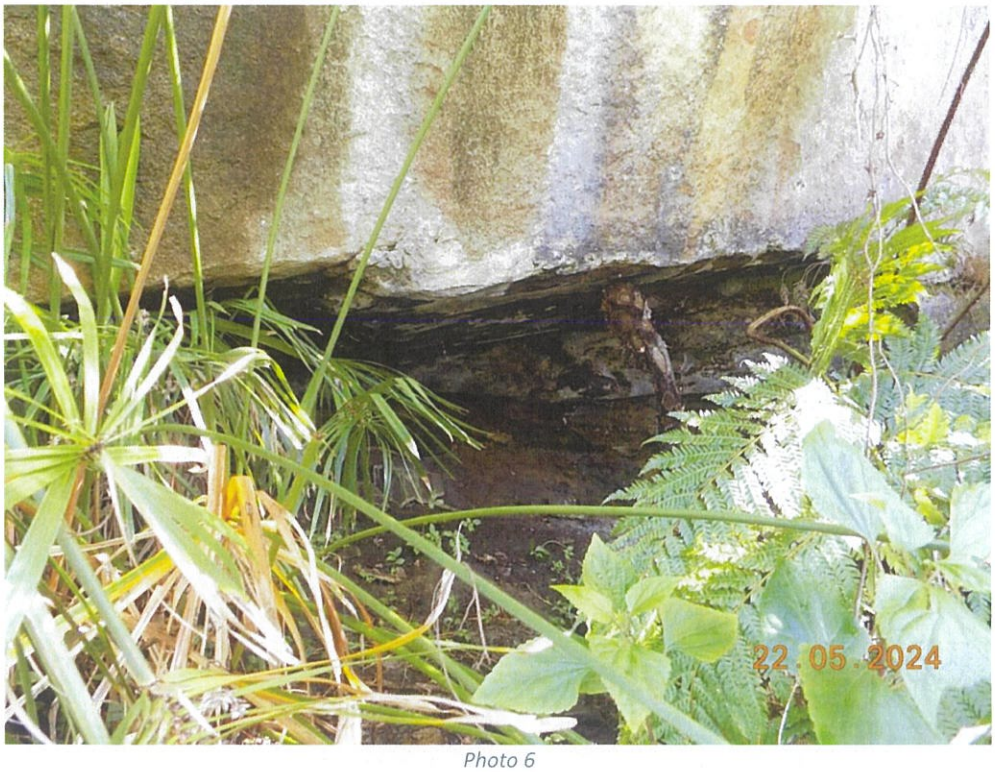


Photo 6

Photo 7

Photo 8

Photo 9

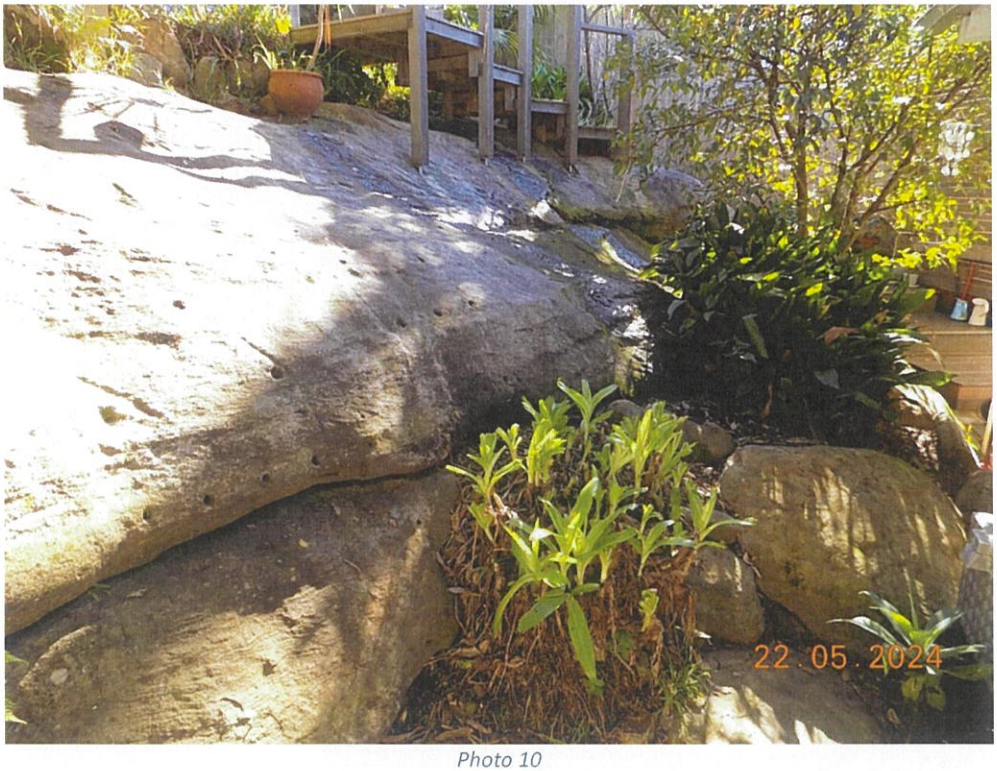


Photo 10

Photo 11

Photo 12

Photo 13 – AH1 – downhole is 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.

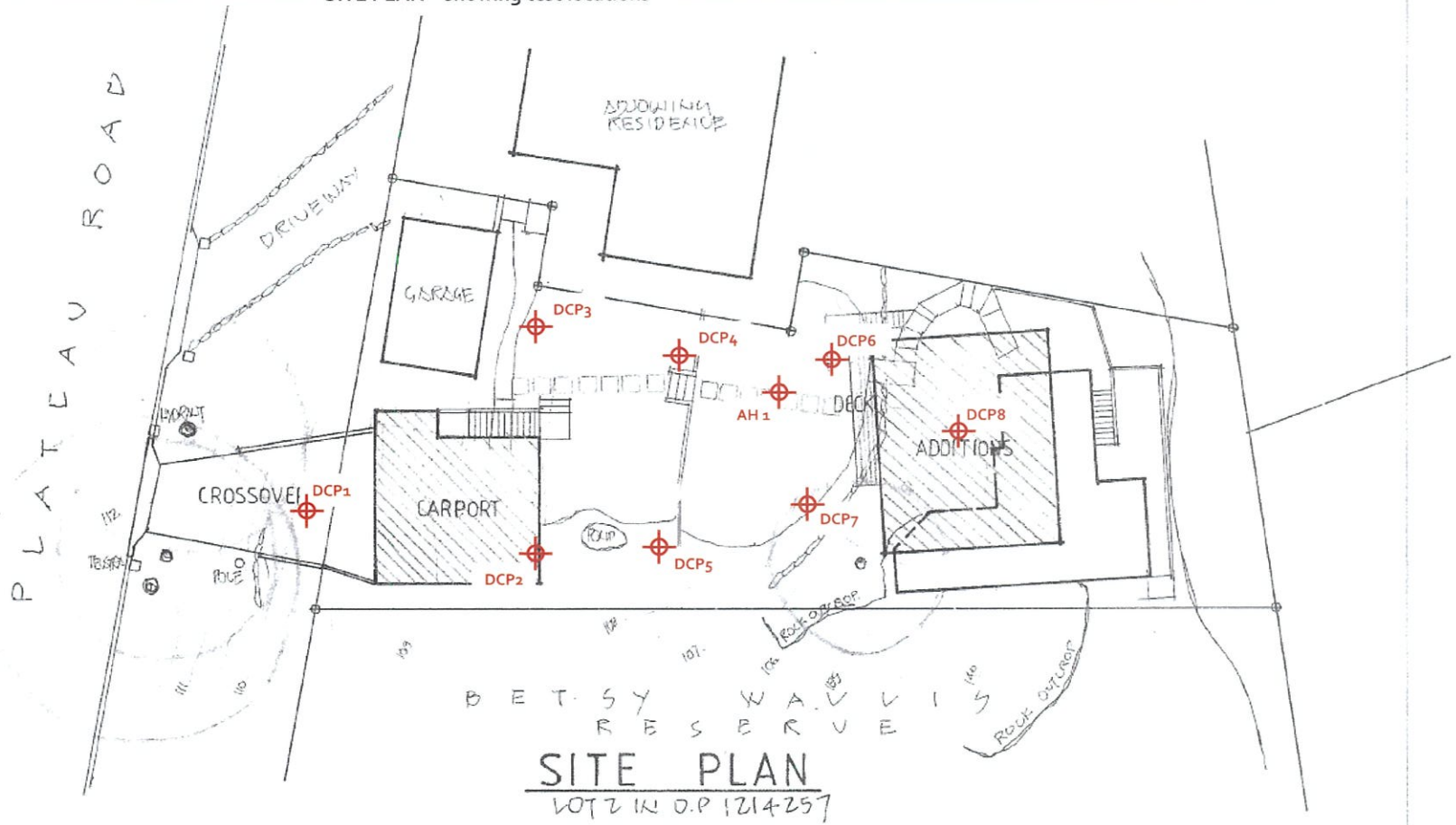
- The report addresses issues relating to your specific design and site. If the proposed project design changes, aspects of the report may no longer apply. Contact White Geotechnical if this occurs.

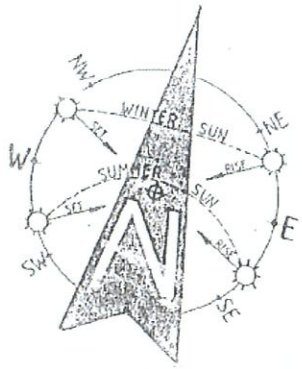
- This report should not be applied to any other project other than that outlined in section 1.0.

- 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





NOTES:

1. THE BUILDER IS TO CHECK AND CONFIRM ALL NECESSARY DIMENSIONS AND LEVELS ON SITE PRIOR TO ORDERING MATERIALS AND COMMENCING CONSTRUCTION. DO NOT SCALE OFF THE DRAWING.
2. SHOULD ANY DEVELOPMENT OR CONSTRUCTION OCCUR ON OR NEAR BOUNDARIES, THE BOUNDARIES SHOULD BE CLEARLY MARKED ON SITE BY THE REGISTERED LAND SURVEYORS.

CONSTRUCTION NOTES

ALL BUILDING WORKS MUST BE CARRIED OUT WITH THE REQUIREMENTS OF THE NATIONAL CONSTRUCTION CODE (NCC 2022) & THE ABCB HOUSING PROVISIONS.

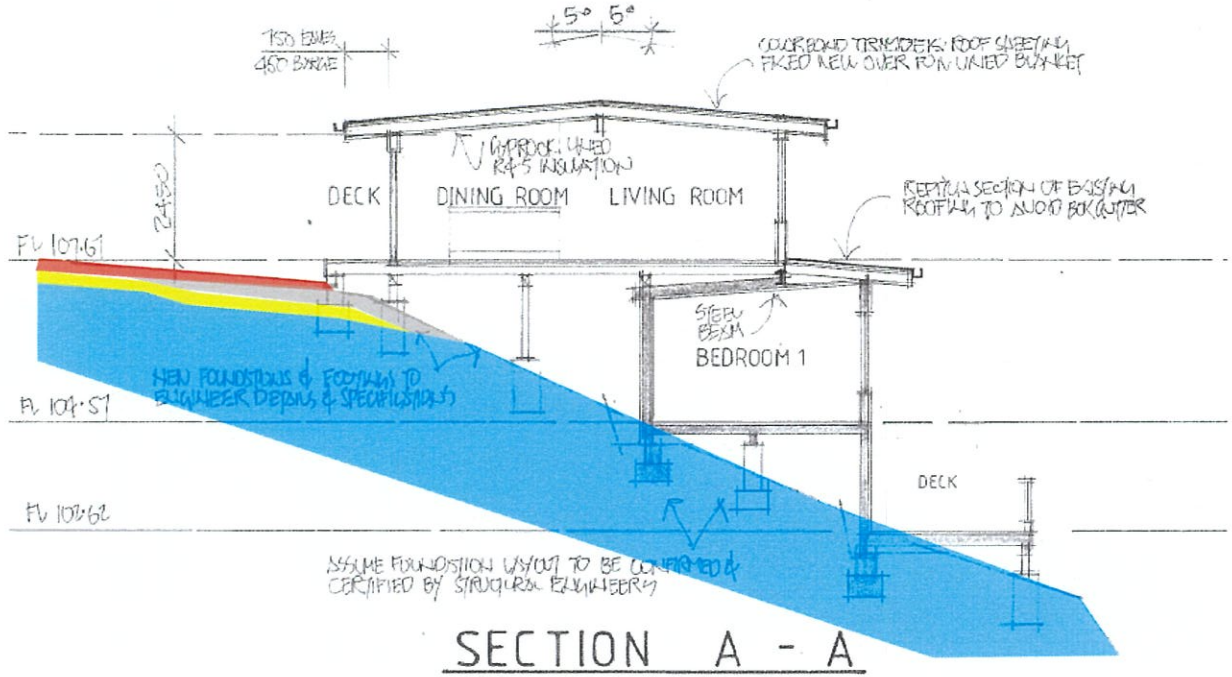
No.	AMENDMENT	DATE

J.D. EVANS and COMPANY
DESIGN AND BUILDING CONSULTANTS
No. 5 ELAINE AVENUE, AVALON BEACH 2107
EMAIL JDECO.AVALON@GMAIL.COM
MOBILE 0418 976 596

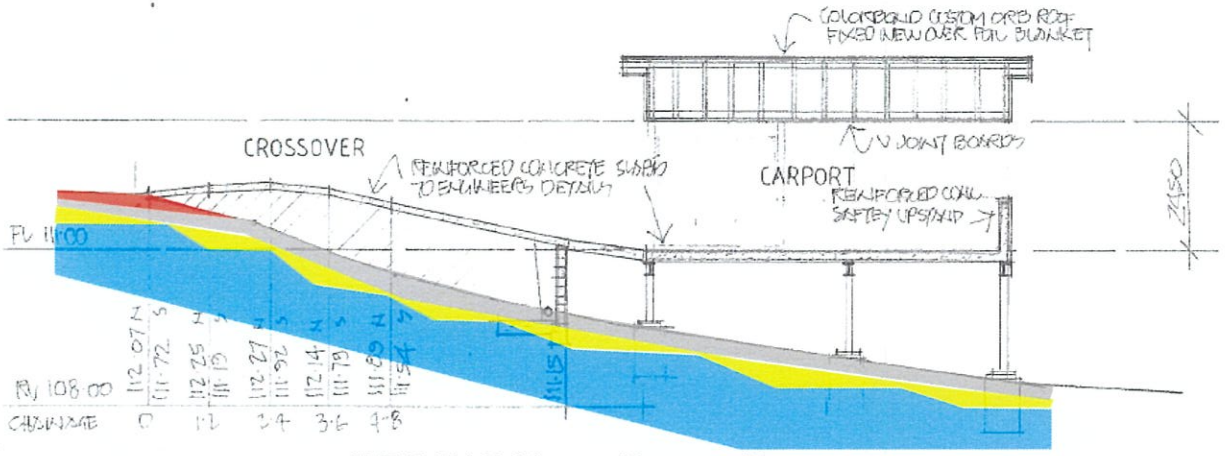
PROJECT
PROPOSED ALTERATIONS/ADDITIONS
No. 34 PLATEAU ROAD
BILGOLA PLATEAU N. S. W. 2107
CLIENT
CRAIG & NICOLE LESTER

DATE 19/04/2024 SCALE 1:200
DRAWN JDE. CHECKED
DRAWING No. 2156-1 ISSUE

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials



SECTION A - A



SECTION B - B

Expected Ground Materials

- Fill
- Topsoil
- Clay
- Hawkesbury Sandstone – Medium Strength

CONSTRUCTION NOTES

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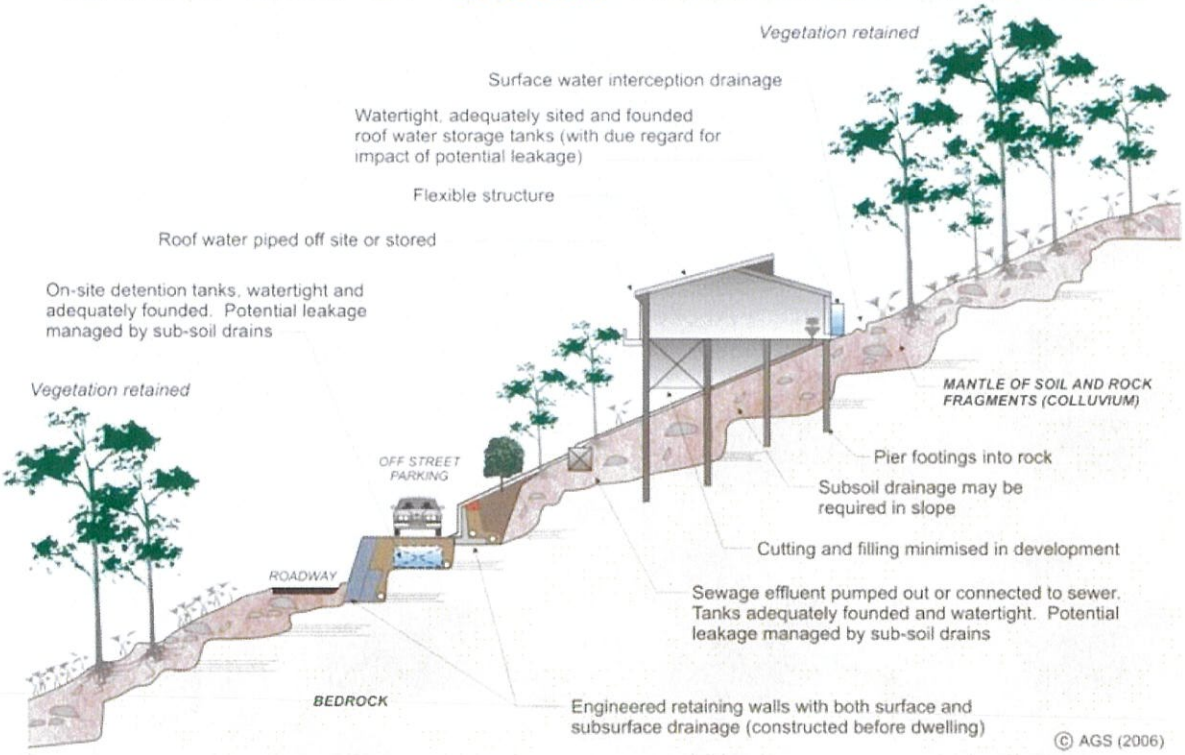
DATE 19/04/2024 | SCALE 1:100
DRAWN JDE | CHECKED

DRAWING No. 2156-8 | ISSUE

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE