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

Development Application for _____
Name of Applicant

Address of site 314 Hudson Parade, 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 18/12/19 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 **314 Hudson Parade, Clareville**

Report Date: 16/12/19

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 314 Hudson Parade, 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 **314 Hudson Parade, Clareville**

Report Date: 16/12/19

Author: BEN WHITE

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

Please mark appropriate box

☒ Comprehensive site mapping conducted **13/12/19**
(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 **13/12/19**

☒ 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 **314 Hudson Parade, Clareville**

1. Proposed Development

1.1 Slightly extend the uphill and downhill sides of the house.

1.2 Demolish and replace the existing entry bridge.

1.3 Various other internal and external alterations.

1.4 Details of the proposed development are shown on 13 drawings by Baxter & Jacobson Architects, Job number 346-09, drawings numbered DA 101 and 103 are Issue A, drawings numbered DA 102 and 140 to 142 are Issue B, drawing numbered DA 116 is Issue C, drawings numbered DA 115 and 122 are Issue D, and drawings numbered DA 123, 124, 151, and 152 are Issue E, all drawings dated 4/12/19.

2. Site Description

2.1 The site was inspected on the 13th December, 2019.

2.2 This waterfront residential property is on the low side of the road and has a W aspect. The block is located on the moderate to steeply graded lower reaches of a hillslope. The natural surface falls at an average angle of ~17° across the property. The slope above the property continues at steep angles.

2.3 The property is accessed by a bitumen Right of Carriageway (ROW) off Hudson Parade (Photo 1). A bitumen driveway diverts off the ROW and runs down and across the slope to a stable brick garage on the uphill side of the house and to a parking area on the uphill side of the garage (Photo 2). The cut for the parking area is supported by a stable ~1.0m high brick retaining wall. A steep, well-vegetated slope falls from the road frontage (Photo 3). A cut and fill has been made in this slope for a level lawn area (Photo 4). The cut is supported by a stable ~1.8m high stack rock retaining wall

(Photo 5). The fill is supported by a stable ~1.2m high brick retaining wall (Photo 6). The existing two-storey brick house is supported on brick walls (Photo 7). No significant signs of movement were observed in the supporting brick walls. The house was undergoing remediation at the time of the site visit. The builder on site informed us that the remediation works were due to a termite infestation in the timber supports and frame of the upper floor and internal walls. A cut and fill has been made in the slope to create a level platform for the house. The cut for the house is supported by a stable brick retaining wall reaching ~2.7m high (Photo 8). The fill is lawn-covered, battered to stable angles, and merges into the natural slope. The slope below the house is terraced with a series of stable treated timber retaining walls (Photo 9). A steep well-vegetated slope falls from the lowest of these walls to the waterfront (Photo 10). Competent Medium Strength Sandstone outcrops through this slope in places (Photo 11).

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. There is a band of sandstone at the waterfront that extends through the otherwise shale-dominated profile.

4. Subsurface Investigation

Two 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 is not expected to be an issue for the testing on this site and 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** (~RL19.0)	**DCP 2** (~RL16.9)
0.0 to 0.3	10	3
0.3 to 0.6	5	9
0.6 to 0.9	9	10
0.9 to 1.2	36	23
1.2 to 1.5	#	31
1.5 to 1.8		#
	End of Test @ 1.2m	End of Test @ 1.5m

#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 @ 1.2m, DCP still very slowly going down, orange and maroon shale on dry tip.

DCP2 – End of test @ 1.5m, DCP still very slowly going down, maroon shale on dry tip.

5. Geological Observations/Interpretation

The slope materials are colluvial at the near surface and residual at depth. In the location of the proposed works they consist of a thin topsoil over silty clays. In the test locations, the sandy clays merge into the weathered zone of the underlying shale at an average depth of ~1.1m below the current surface. 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 clay and rock and through the cracks in the rock. Due to the slope and elevation of the block, the water table in the location is expected to be many metres below the base of the proposed 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 Hudson Parade above.

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

No significant additional stormwater runoff will be created by the proposed development.

11. Excavations

Apart from those for footings, no excavations are required.

12. Foundations

The proposed works can be supported on piers taken to the underlying Extremely Low Strength Shale. This material is expected at an average depth of ~0.9m below the current surface. A maximum allowable bearing pressure of 600kPa can be assumed for footings on Extremely Low Strength Shale.

It is recommended 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 wet 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

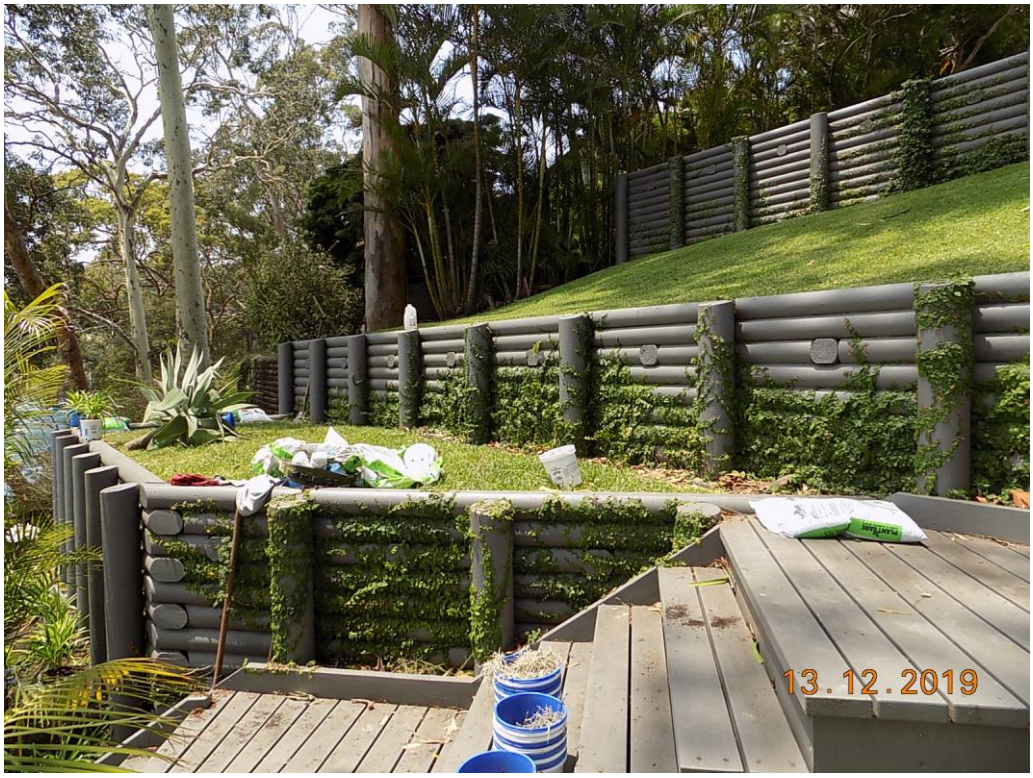


Photo 9

Photo 10

Photo 11

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

MGA

TN

33
D P 2 3 3 4 6 9

31
D P 2 3 3 4 6 9

32
DP 233469

5
D P 2 6 1 6 9 3

1
D P 8 2 7 7 3 3

No.312
2 STOREY
BRICK COTTAGE

No.314
2 STOREY
BRICK RESIDENCE

No.316
SPLIT LEVEL
BRICK DWELLING

DCP2

DCP1

10°52'25" 3.445

341°30" 27.14

278°28'30" 58.11

49.68
98°28'30"

10.945
209°54'05"

20.43
145°8'05"

PARADE

HUDSON

SEE SHEET 2 FOR
LEGEND AND NOTES

DIAL BEFORE YOU DIG
www.1100.com.au

REFER TO NOTES AND LEGEND

SCALE 1:100 @ A1

Revision	Date	Description	Reference
L	00/00/00	-	00
K	00/00/00	-	00
J	00/00/00	-	00
I	00/00/00	-	00
H	00/00/00	-	00
G	00/00/00	-	00
F	00/00/00	-	00
E	00/00/00	-	00
D	00/00/00	-	00
C	00/00/00	-	00
B	00/00/00	-	00
A	00/00/00	-	00

LTS CONFIDENCE TOGETHER
www.lts.com.au P 1300 657 000

THIS IS THE PLAN REFERRED TO IN MY LETTER DATED:

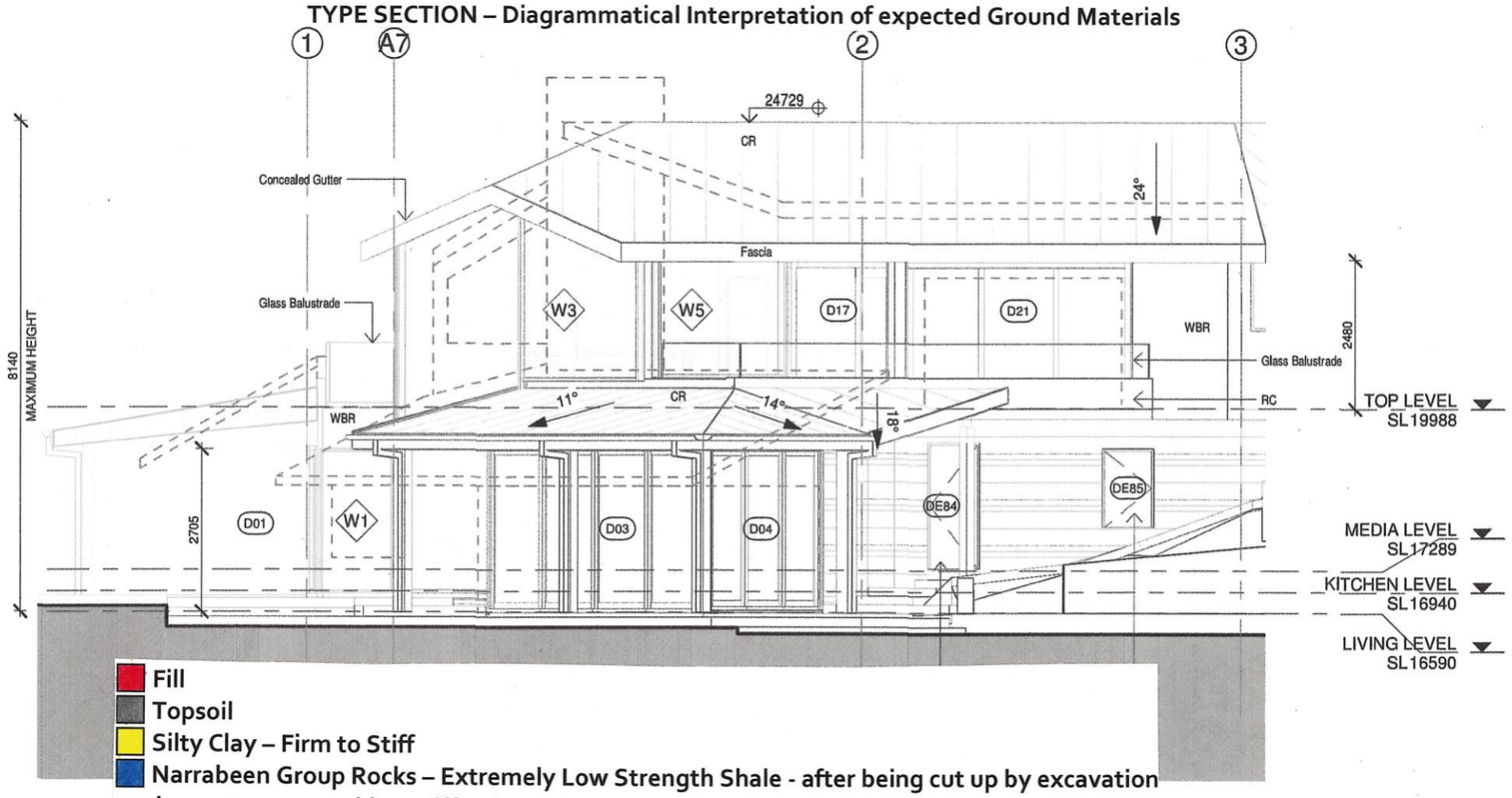
.....
Registered Surveyor NSW

Client TONY WALLS

Drawing title
PLAN OF DETAIL AND LEVELS OVER LOT 32 IN DP 233469
KNOWN AS 314 HUDSON PARADE, CLAREVILLE

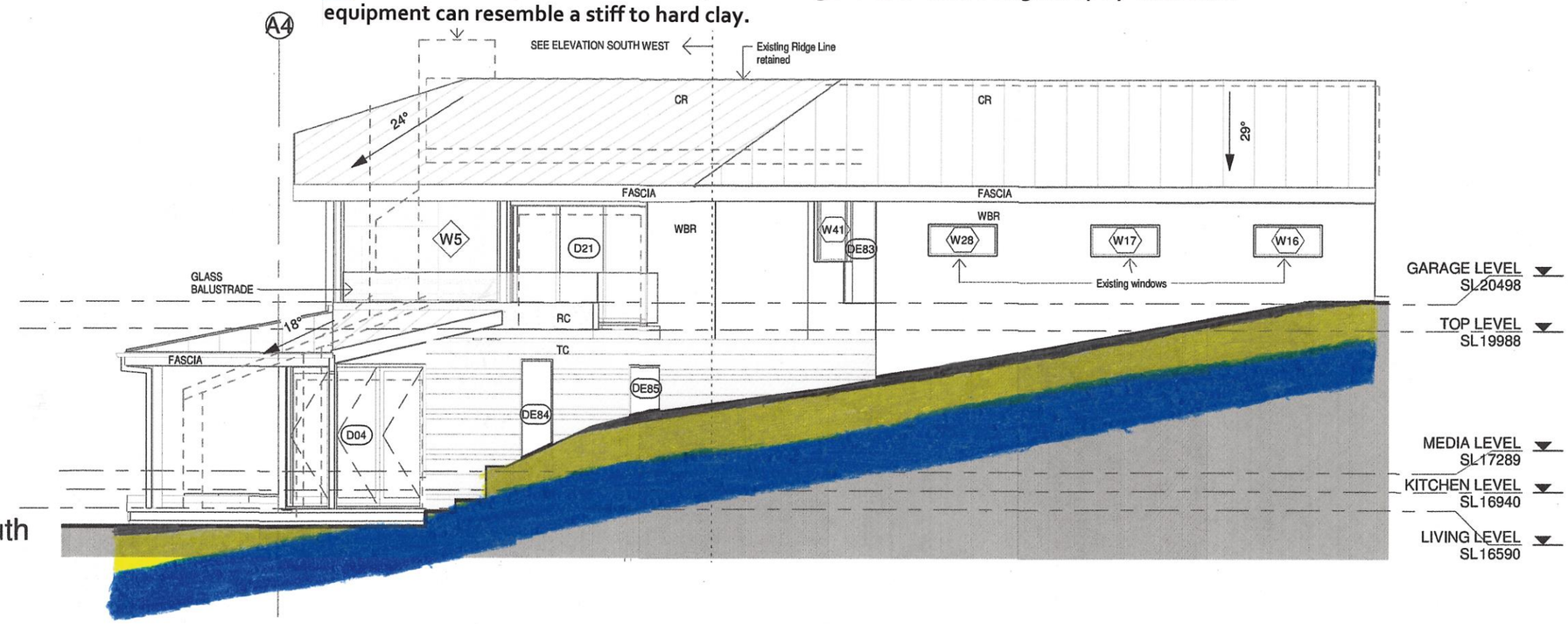
datum AHD
reference number 42235 005DT
site Area 1620m²
scale 1:100 @A1
date of survey 02/12/19
LGA NORTHERN BEACHES
SHEET 1 OF 2

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials



Elevation South West

1 : 100 @ A3



Elevation South

1 : 100 @ A3

NOTES:

- CHECK ALL DIMENSIONS ON SITE
-

LEGEND:

CR	- NEW COPPER ROOF
WBR	- BRICK BAGGED AND PAINTED WHITE
CG	- NEW COPPER GUTTER
GB	- GLASS BALUSTRADE
TC	- TIMBER CLADDING (EXISTING)
RC	- RENDERED CONCRETE
- - - -	- Line of Existing Elevation / Windows

General Notes:

Issue	Date	Amendment
B	4/12/19	DA
A	28/11/19	BASIX

BAXTER & JACOBSON ARCHITECTS

SYDNEY LEVEL 2, 37-39 THE CORSO MANLY, NSW 2095 AUSTRALIA
BYRON BAY 8 OCEANSIDE PLACE SUFFOLK PARK, NSW 2481 AUSTRALIA
PHONE +612 9977 7648
MOBILE 0408 770 294
EMAIL mark@bja.net.au
WEB www.bja.net.au

Project	314 Hudson Parade
Client	TONY WALLS
Address	314 Hudson Parade Lot 32 DP 233469
Design Stage	DA
Title	ELEVATION - SOUTH - FACING 316
Job No	346-09
Drawn	GV
Checked	MB
Scale	As indicated
Drawing no.	DA 141
Issue	B

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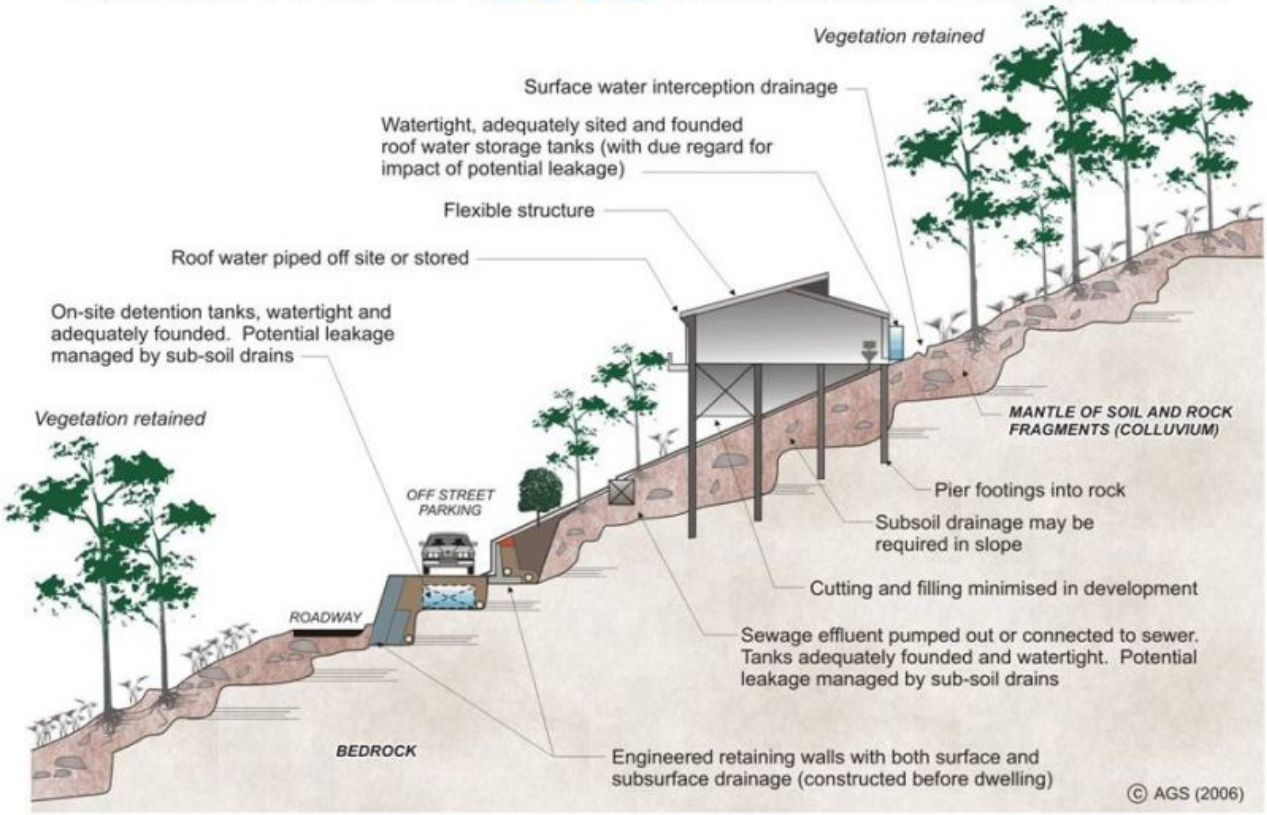
EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE