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

Development Application for _____
Name of Applicant

Address of site 57 Hillside Road, Newport

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 30/11/20 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 **57 Hillside Road, Newport**

Report Date: 30/11/20

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 57 Hillside Road, Newport

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 **57 Hillside Road, Newport**

Report Date: 30/11/20

Author: BEN WHITE

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

Please mark appropriate box

- ☒ Comprehensive site mapping conducted **20/4/20** (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 **20/4/20**
- ☒ 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

J2654.
30th November, 2020.

GEOTECHNICAL INVESTIGATION:

Alterations and Additions at **57 Hillside Road, Newport**

1. Proposed Development

1.1 Extend the downhill side of the house including a new deck.

1.2 Details of the proposed development are shown on 6 drawings prepared by JR Design Australia Pty Ltd, drawings numbered DA.01A to DA.06A, Revision A, dated 19/9/19.

2. Site Description

2.1 The site was inspected on the 20th April, 2020, and previously on the 2nd August, 2019.

2.2 This residential property is on the uphill side of the road and has a SE aspect. The block is located on the moderately graded middle reaches of a hillslope. The natural surface rises across the property at a maximum angle of ~16°. The slope above and below the property continues at similar angles.

2.3 At the road frontage, a concrete driveway runs to a garage that has been cut into the slope (Photo 1). The cut for the driveway and garage is supported by a concrete block retaining wall reaching ~3.6m high (Photo 2). Between the garage and the house is a gentle to moderately-sloping lawn (Photo 3). The two-storey house is supported on brick walls (Photo 4). The supporting brick walls display no significant signs of movement. A ~2.0m excavation has been made for a small courtyard near the uphill side of the house. The cut is supported by a stable dincel retaining wall (Photo 5). Between the house and the upper boundary is a moderately sloping lawn and garden area (Photo 6).

3. Geology

The Sydney 1:100 000 Geological sheet indicates the site is underlain by the Newport Formation of the Narrabeen Group. A band of sandstone was observed through an excavation on the N neighbouring property that likely extends under the subject property (Photo 7). This band extends through the otherwise shale-dominated profile.

4. Subsurface Investigation

One auger hole was put down to identify the soil materials. Five 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. DCPs 1 and 5 may have encountered refusal on obstructions in the profile. Construction 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:

AUGER HOLE 1 (~RL61.8) **–** AH1 (Photo 8)

Depth (m)	Material Encountered
0.0 to 0.6	**FILL**, disturbed clay, dark brown, brown, and orange, very soft to soft, dry, fine to medium grained with fine trace organic matter.
0.6 to 0.8	**CLAYEY SOIL**, dark brown, stiff, dry, fine to medium grained with fine trace organic matter.
0.8 to 1.0	**CLAY**, weathered shale, stiff, dry, fine grained.

End of test @ 1.0m in weathered shale. No watertable encountered.

DCP TEST RESULTS – Dynamic Cone Penetrometer					
Equipment: 9kg hammer, 510mm drop, conical tip.				Standard: AS1289.6.3.2 - 1997	
Depth(m) Blows/0.3m	**DCP 1** (~RL58.5)	**DCP 2** (~RL59.5)	**DCP 3** (~RL60.6)	**DCP 4** (~RL61.8)	**DCP 5** (~RL61.6)
0.0 to 0.3	13	2	F	F	3
0.3 to 0.6	#	9	1	5	4
0.6 to 0.9		10	3	10	10
0.9 to 1.2		11	#	12	4
1.2 to 1.5		10		13	#
1.5 to 1.8		#		25	
1.8 to 2.1				#	
	Refusal @ 0.2m	Refusal on Rock @ 1.4m	Refusal on Rock @ 0.7m	Refusal on Rock @ 1.8m	Refusal @ 1.0m

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

DCP Notes:

DCP1 – Refusal @ 0.2m, DCP bouncing, brown sandstone fragments on dry tip.
DCP2 – Refusal on rock @ 1.4m, DCP bouncing off rock surface, brown and orange shale fragments on dry tip, brown and orange clay in collar above tip.
DCP3 – Refusal on rock @ 0.7m, DCP bouncing off rock surface, light brown sandstone fragments on dry tip.
DCP4 – Refusal on rock @ 1.8m, DCP bouncing off rock surface, brown and orange clay on wet tip.
DCP5 – Refusal @ 1.0m on possible tree root, DCP bouncing, light brown sandstone fragments on dry tip, brown clay in collar above tip.

5. Geological Observations/Interpretation

The slope materials are colluvial at the near surface and residual at depth. Filling has been placed immediately downslope of the house. The owner informed us that the fill in this location was pushed forward from a previous excavation for the house. The fill was observed in AH1 to reach a maximum depth of ~0.6m. In the test locations across the downhill side of

the property, the natural ground materials consist of a clayey soil over firm to stiff clays. The clays merge into the underlying weathered rock at depths of between 0.9 to 1.8m below the current surface, being deeper where filling has been placed and due to a variably weathered profile. The weathered zone is interpreted to be Extremely Low to Very Low Strength Shale.

A band of Medium Strength Sandstone was observed to be exposed through an excavation on the N neighbouring property and is expected to continue under the subject property (Photo 7). This is an unusually thick sandstone bed within the Narrabeen Group of rocks. The extent of the band is not known. 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 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 beside the property. The moderately graded slope that falls across the property and continues above and below is a potential hazard (**Hazard One**).

Geotechnical Hazards and Risk Analysis - Risk Analysis Summary

HAZARDS	Hazard One
TYPE	The moderate slope that falls across the property and continues above and below failing and impacting on the property.
LIKELIHOOD	'Unlikely' (10^{-4})
CONSEQUENCES TO PROPERTY	'Medium' (20%)
RISK TO PROPERTY	'Low' (2×10^{-5})
RISK TO LIFE	8.3×10^{-7}/annum
COMMENTS	'ACCEPTABLE' level of risk to life & property.

(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 to the road. Roof water from the development is to be piped to the street drainage system through any tanks that may be required by the regulating authorities.

11. Excavations

Apart from those for footings, no excavations are required.

12. Foundations

The extension to the downhill side of the house and new deck are to be supported on piers taken to the underlying Medium Strength Rock. A maximum allowable bearing pressure of 800kPa can be assumed for footings on Medium Strength Rock.

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 Occupation Certificate 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: Excavation on N neighbouring property.

Photo 8: AH1 – Downhole is from left to right.

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.

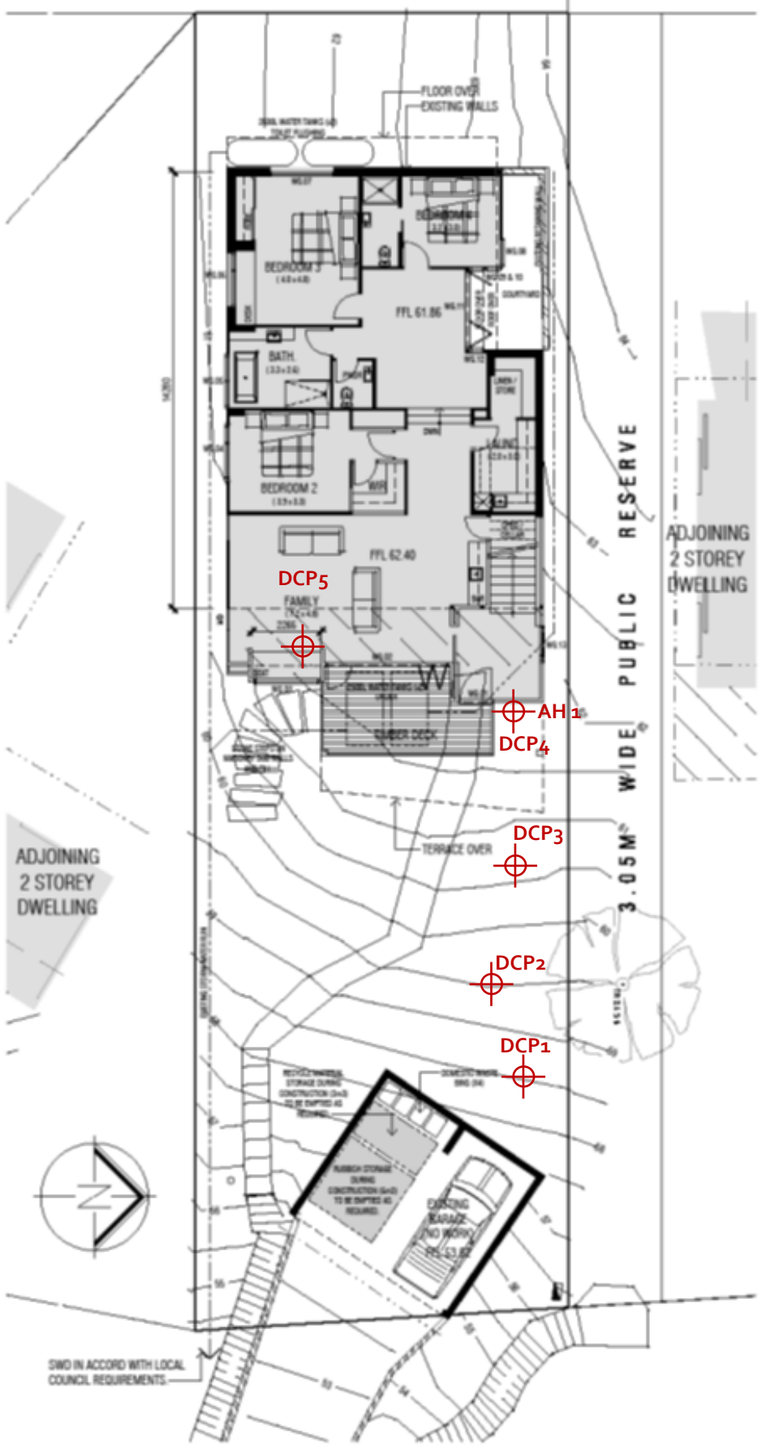
- The report addresses issues relating to your specific design and site. If the proposed project design changes, aspects of the report may no longer apply. Contact White Geotechnical if this occurs.

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

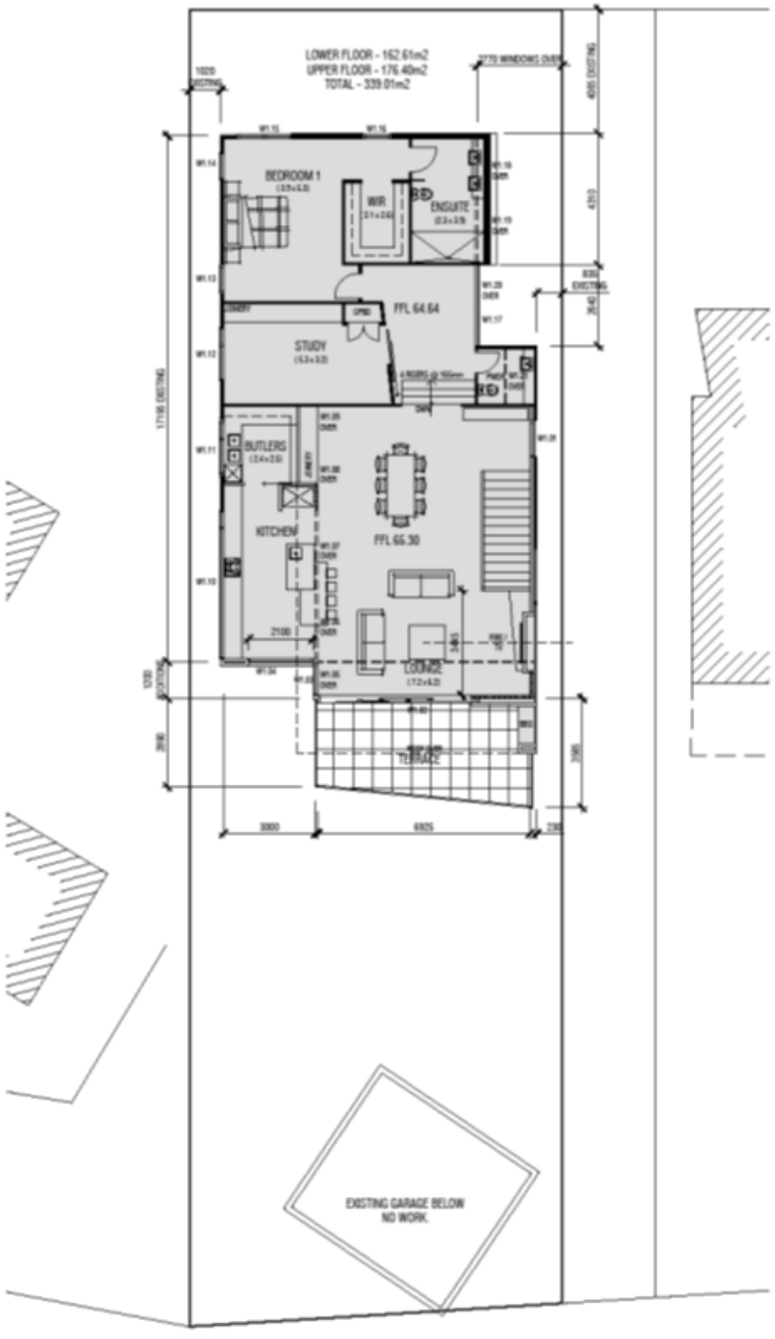
- This report is to be read in full and should not have sections removed or included in other documents as this can result in misinterpretation of the data by others.

- 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.

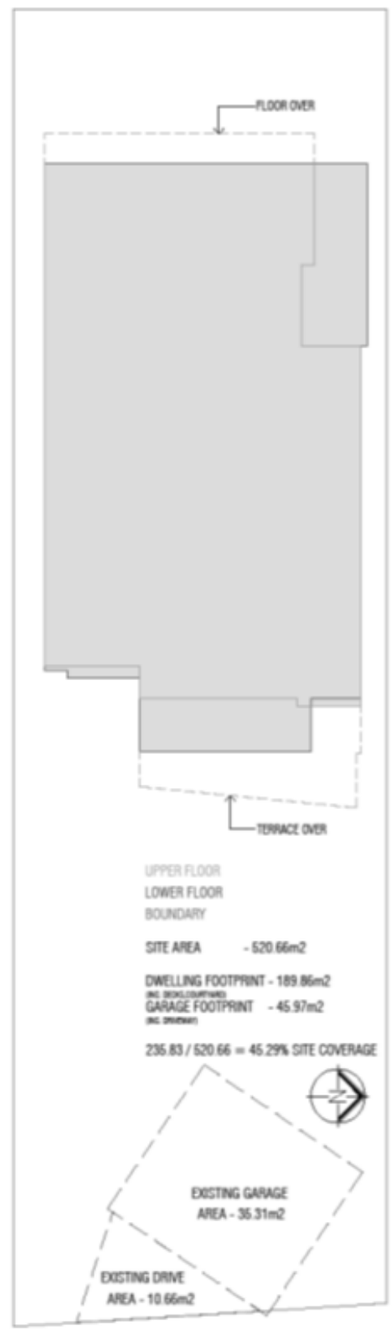
SITE PLAN – showing test locations



LOWER FLOOR PLAN



UPPER FLOOR PLAN



AREA PLAN

NOTE: SITE COVERAGE CALCULATIONS DO NOT INCLUDE EXISTING ENTRY PATH / STAIRS.

PROPOSED ALTERATIONS AND ADDITIONS

57 HILLSIDE RD, NEWPORT.

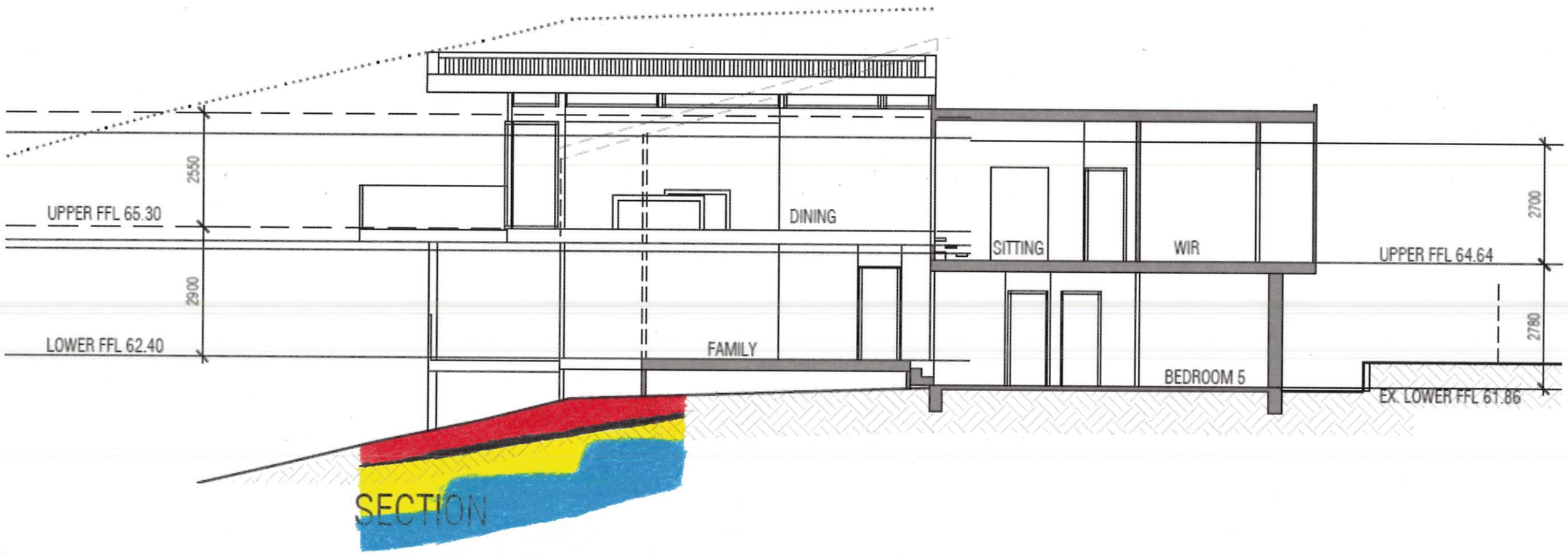
REV A - ISSUED FOR DESIGN APPROVAL - 19.09.19

J R DESIGN AUSTRALIA pty ltd

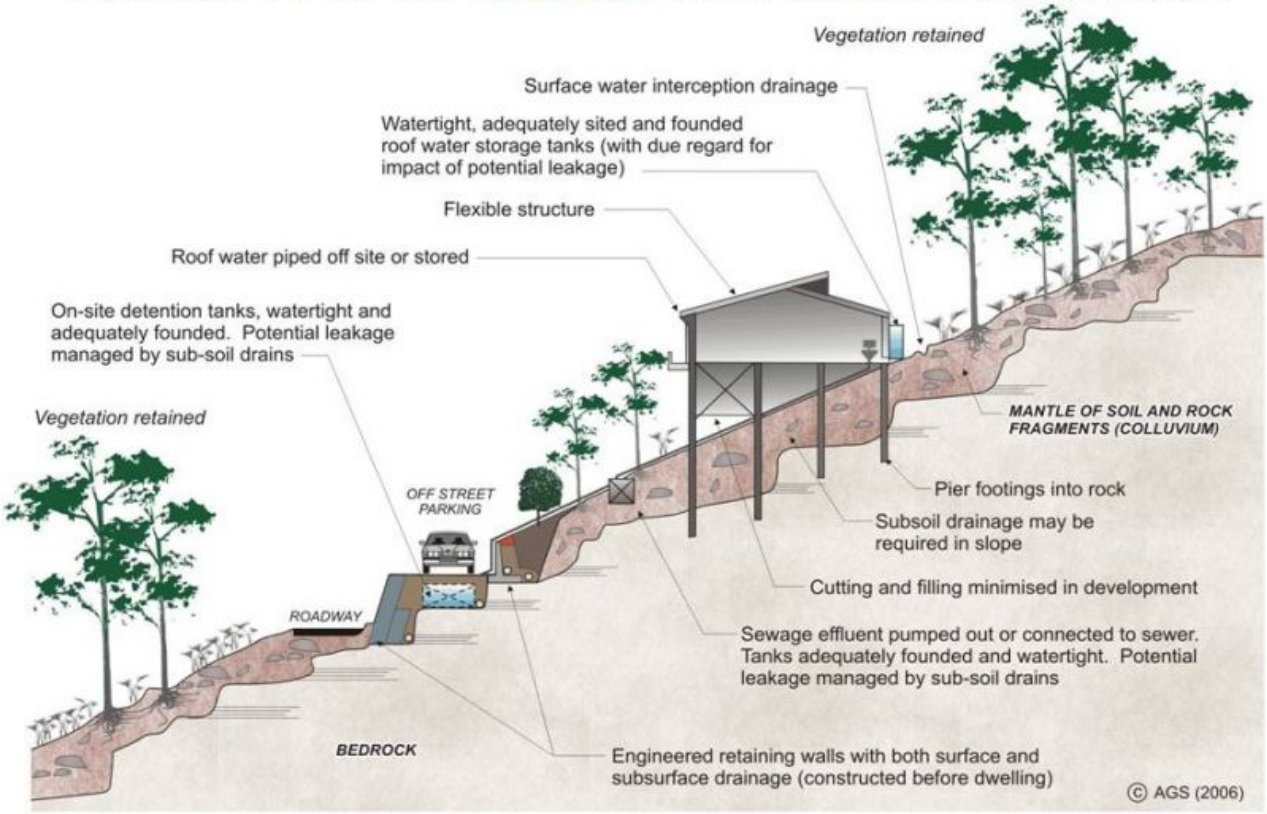
FLOOR PLANS DA.03A 1:100@A1 13.09.2019

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials

- Fill
- Topsoil
- Silty Clay
- Narrabeen Group Rocks – Band of Medium Strength Rock



EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE