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

Development Application for _____
Name of Applicant

Address of site 1056 Barrenjoey Road, Palm Beach

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 8/12/21 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 **1056 Barrenjoey Road, Palm Beach**
Report Date: 8/12/21

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 1056 Barrenjoey Road, Palm Beach

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 **1056 Barrenjoey Road, Palm Beach**

Report Date: 8/12/21

Author: BEN WHITE

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

Please mark appropriate box

☒ Comprehensive site mapping conducted **1/12/21**
(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 **1/12/21**

☒ 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:

Alterations and Additions at **1056 Barrenjoey Road, Palm Beach**

1. Proposed Development

1.1 Construct a first-floor addition over the existing footprint of the house.

1.2 Various other minor internal and external additions and alterations

1.3 Details of the proposed development are shown on 6 drawings prepared by Jo Willmore Designs, drawings numbered DA-01 to DA-06, dated November, 2021.

2. Site Description

2.1 The site was inspected on the 1st December, 2021.

2.2 This residential property is on the high side of the road and has a W aspect. It is located on the gently graded lower reaches and toe of a hillslope. From the road frontage, the natural slope rises across the property at angles of <5°. The slope above the property increases to moderate to steep angles.

2.3 At the road frontage, a paved driveway runs to a parking area on the downhill side of the property (Photo 1). A single-storey brick and fibro clad building is supported on dwarf brick walls. The external brick walls show no significant signs of movement. A level lawn and paved area extends from the uphill side of the house to a second dwelling (Photos 2 & 3). A stable ~1.5m high timber log retaining wall supports a cut to create a level platform for the secondary dwelling on the uphill side of the property (Photo 4). Several large sandstone joint blocks are embedded in the slope in stable positions above the property (Photo 5).

3. Geology

The Sydney 1:100 000 Geological sheet indicates the site is underlain by marine sand (Qhf) of the foredune with the contact point of the Narrabeen Group of Rocks further upslope. Ground testing indicates the marine sand underlies the majority of the property. The Narrabeen Group of Rocks is expected to underlie the property from the upper boundary and toe of the moderate to steep slope upwards.

4. Subsurface Investigation

Four Dynamic Cone Penetrometer (DCP) tests were put down to determine the relative densities of the sands through the profile. 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 RESULTS 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** (~RL3.3)	**DCP 2** (~R3.3)	**DCP 3** (~RL3.1)	**DCP 4** (~RL3.1)
0.0 to 0.3	3	3	3	4
0.3 to 0.6	4	4	3	4
0.6 to 0.9	4	5	3	4
0.9 to 1.2	10	10	6	15
1.2 to 1.5	12	15	12	18
1.5 to 1.8	16	21	18	25
1.8 to 2.1	22	21	25	31
2.1 to 2.4	28	28	25	31
2.4 to 2.7	32	28	31	#
2.7 to 3.0	38	37	37	
3.0 to 3.3	#	#	#	
	End of Test @ 3.0m	End of Test @ 3.0m	End of Test @ 3.0m	End of Test @ 2.7m

#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 @ 3.0m, DCP still going down slowly, grey sand on damp tip.
DCP2 – End of test @ 3.0m, DCP still going down slowly, orange sand on damp tip.
DCP3 – End of test @ 3.0m, DCP still going down slowly, orange sand on tip.
DCP4 – End of test @ 2.7m, DCP still going down slowly, yellow clayey sand on damp tip.

5. Geological Observations/Interpretation

The site is underlain by sand that was encountered to the extent of the testing. To summarise the test results, Medium Dense Sands occupy the top ~2.1m of the profile, these overlie Dense Sands that extend to at least the extent of the testing. Rock was not encountered to the extent of the tests at 3.0m. See the Type Section attached for a diagrammatical representation of the expected ground materials.

6. Groundwater

Normal ground water seepage is expected to descend rapidly through the sand profile towards the water table. The water table is expected to be encountered between ~RL0.0 to ~RL1.0 across the property and will be below the footings for the proposed works.

7. Surface Water

No evidence of significant surface flows were observed on the property during the inspection. Normal sheet wash that is generated on the property will be quickly absorbed into the sandy soil where surfaces are unsealed.

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**).

Risk Analysis Summary

HAZARDS	Hazard One
TYPE	The gentle slope that rises across the property and continues above at increasing angles failing and impacting on the proposed works.
LIKELIHOOD	'Unlikely' (10^{-4})
CONSEQUENCES TO PROPERTY	'Medium' (15%)
RISK TO PROPERTY	'Low' (2×10^{-5})
RISK TO LIFE	9.1×10^{-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 to Barrenjoey 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

Any additional foundations required for the proposed first floor addition may be supported on pad footings taken to a depth of ~0.4m into the underlying Medium Dense Sand of the natural profile. The footing walls are to be shored with timber to prevent collapse.

Assume a maximum allowable bearing pressure of ~100kPa for 0.4m deep pad footings in sand.

The base of the footing excavations in sand should be compacted as the excavation will loosen the upper sands. This can be carried out with a hand-held plate compactor. Water may be used to assist in compaction in sand but footing materials should be kept damp but not saturated. As a guide to the level of compaction required a density index of >85% is to be achieved.

All footing surfaces are to be cleaned of loose material just prior to the placing of steel and concrete.

13. 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.

14. Inspection

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 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.

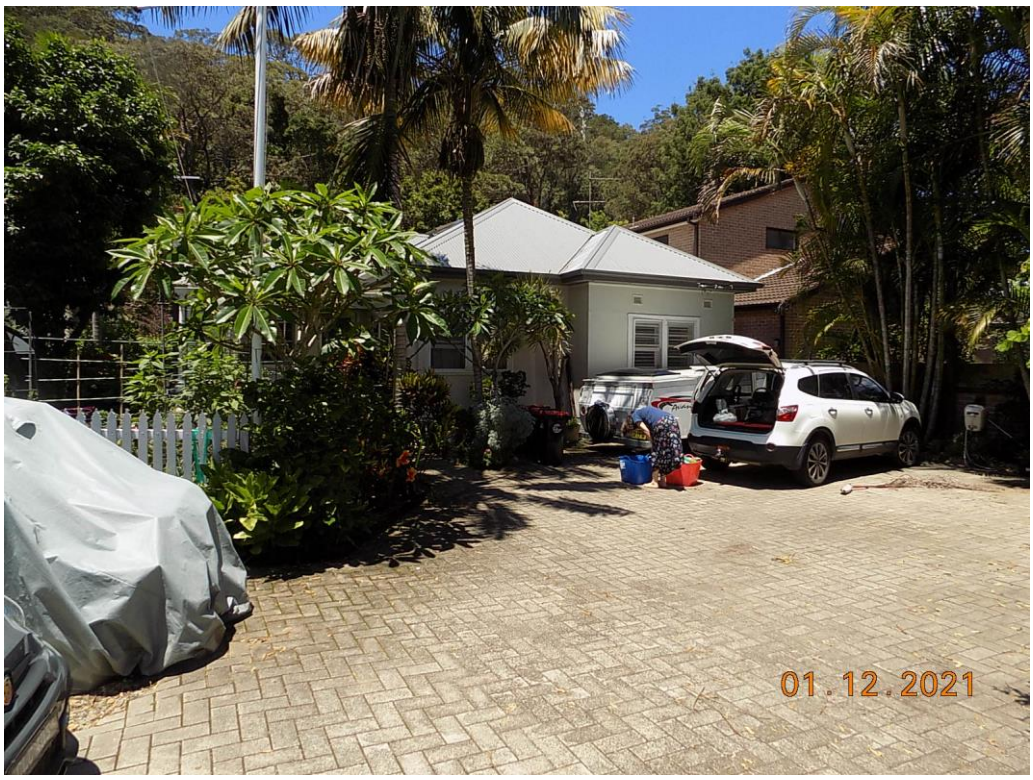


Photo 1

Photo 2

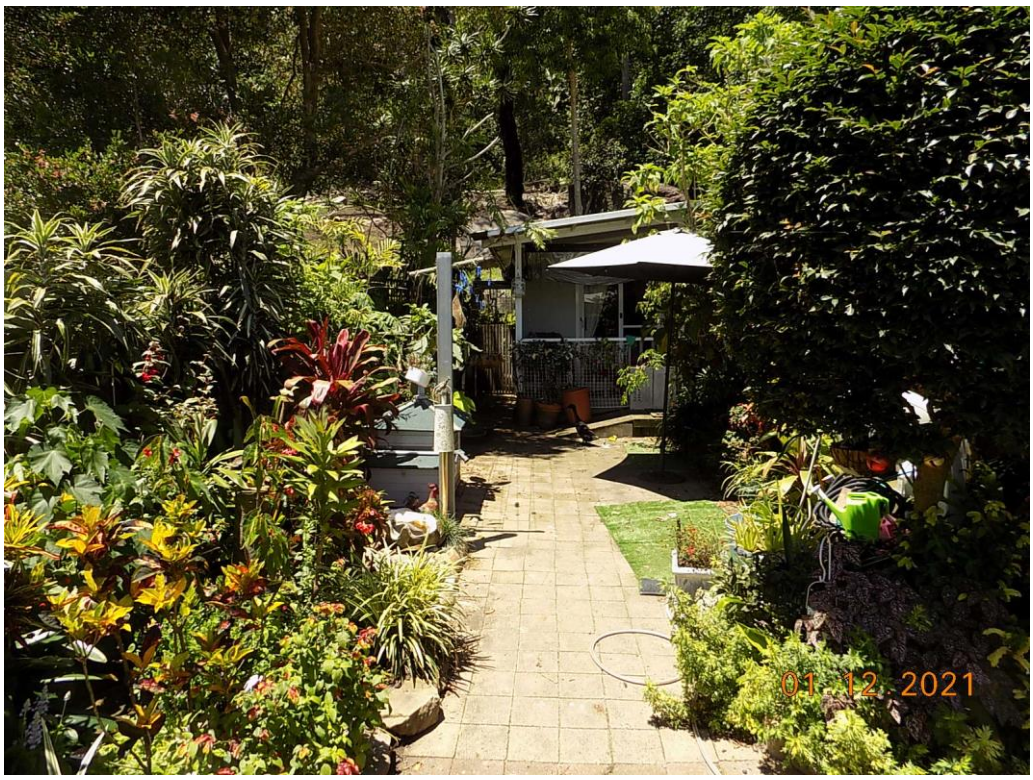


Photo 3

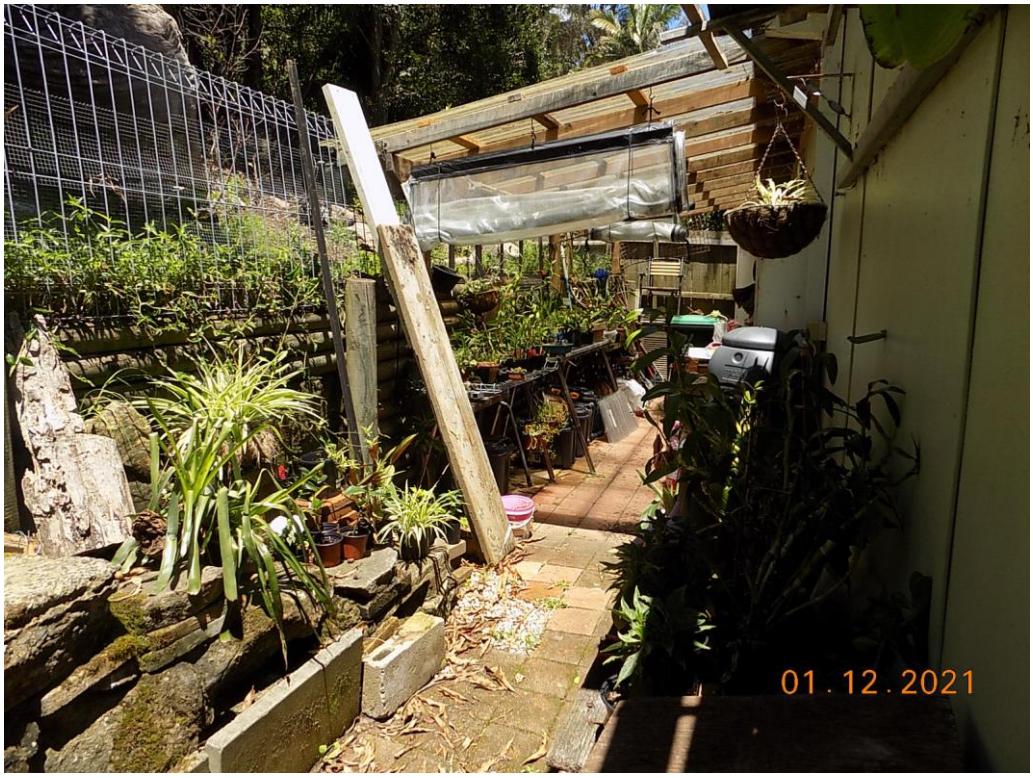


Photo 4

Photo 5

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.

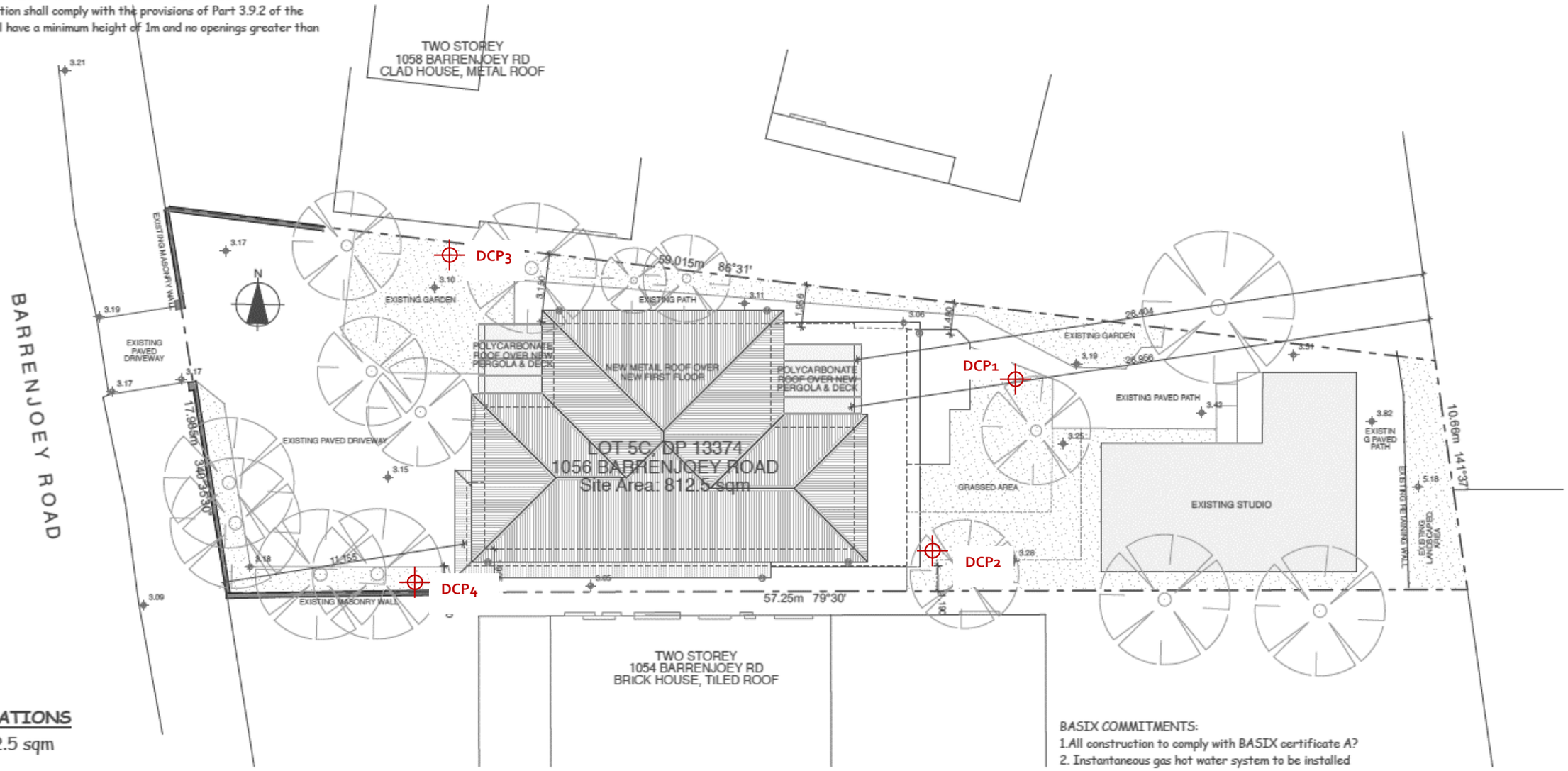
- This report is to be read in full and should not have sections removed or included in other documents as this can result in misinterpretation of the data by others.

- 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.

GENERAL NOTES

1. The Works shall be constructed in accordance with NCC2019/BCA and all relevant Australian Standards together with any amendment or replacement of those Standards
2. Smoke alarms shall be installed in accordance with 3.7.5 of the BCA, AS 3786 and Manufacturers Specification recommendations and connected to consumer mains power and interconnected where there is more than one alarm
3. Balustrade construction shall comply with the provisions of Part 3.9.2 of the BCA . Balustrades shall have a minimum height of 1m and no openings greater than 125mm

SITE PLAN – showing test locations



SITE CALCULATIONS

Site Area : 812.5 sqm

Existing Landscaped area - 188sqm = 23.14%

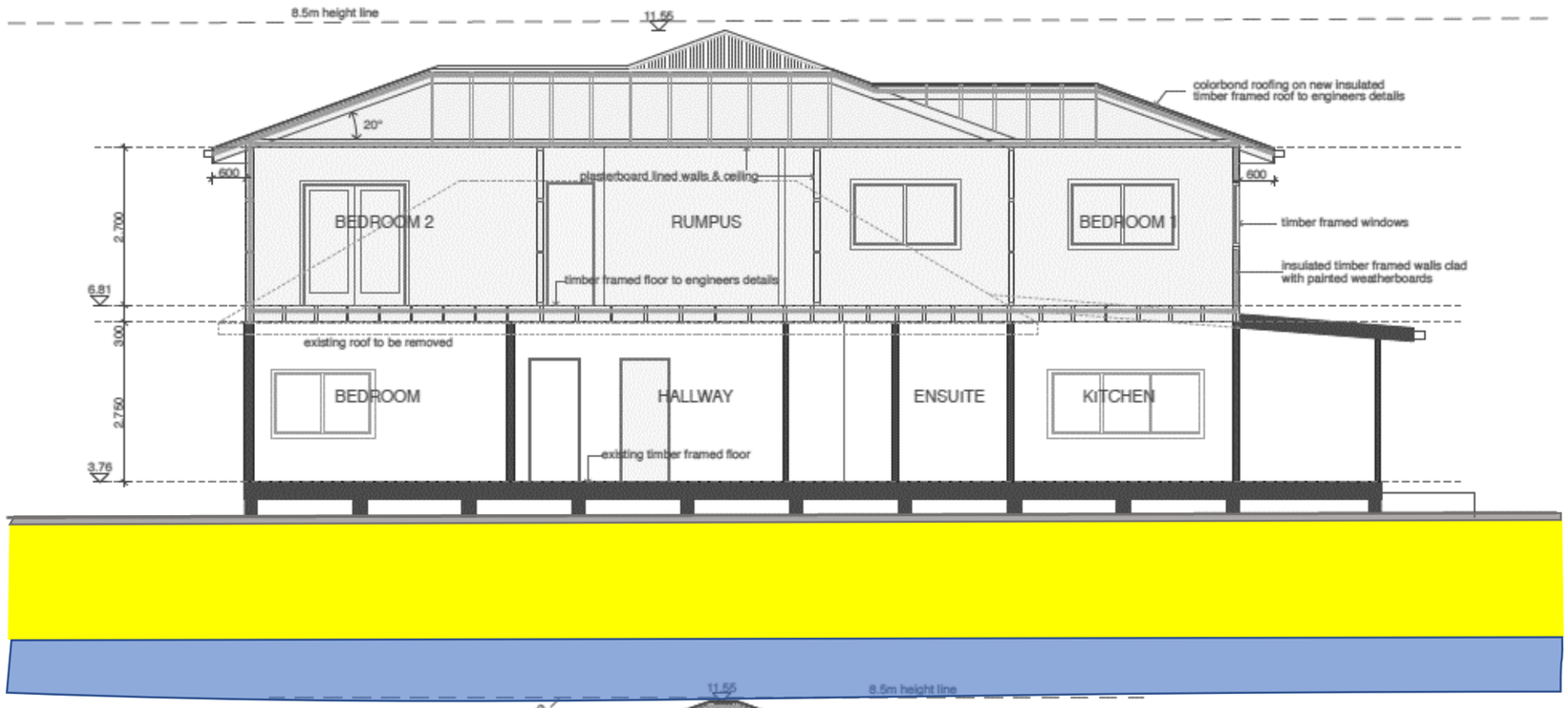
Proposed Landscaped area - 213 sqm = 26.22%
+ 48 sqm (impervious uncovered recreational space)
TOTAL Landscaped area -261sqm = 32.12%

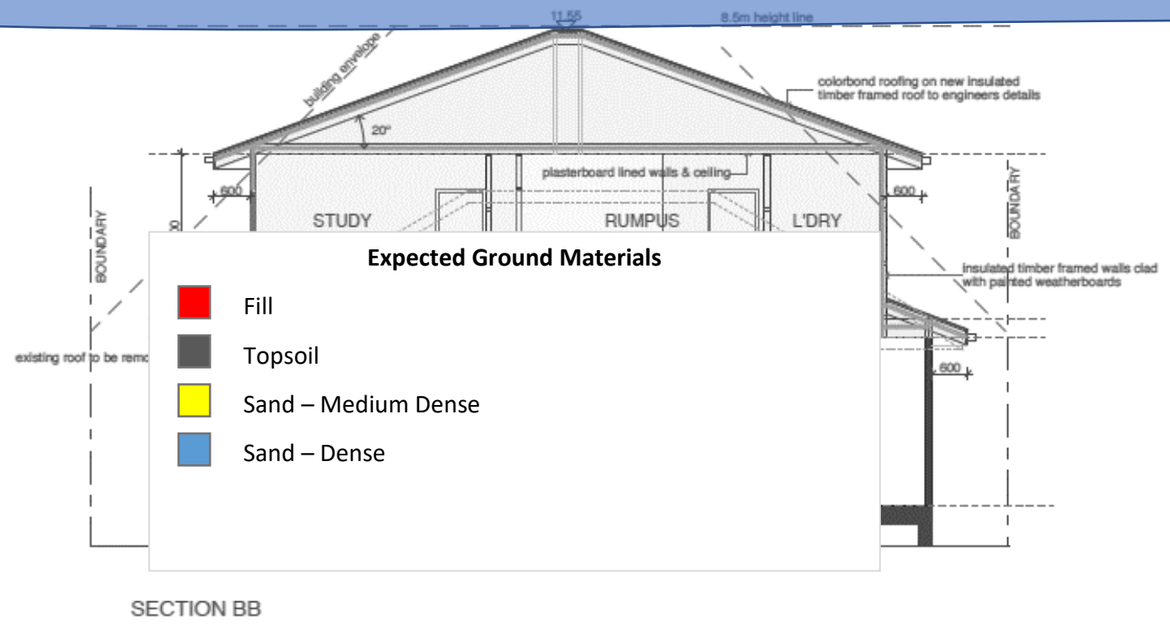
BASIX COMMITMENTS:

1.All construction to comply with BASIX certificate A?
2. Instantaneous gas hot water system to be installed
3.40% of all new or altered lighting fixtures to be fluorescent, compact fluorescent or LED
4. Minimum 3 star water rating shower heads to be installed
5. Minimum 3 star water rating toilets to be installed
6.Minimum 3 star water taps to be installed
7.Minimum R0.6 insulation to be installed below all suspended timber framed floors with enclosed subfloor
8. Minimum R1.3 insulation to be installed to all external timber framed walls (minimum combined Rvalue with construction R1.7)
9.Flat ceilings with pitched roofs to have minimum 55m foil backed insulating blanket installed below all roofs with minimum R1.95 insulation to ceiling

AMENDMENTS	JO WILLMORE DESIGNS 11 Hudson Parade Clareville NSW 2107 9918 2479 ABN 27 370 370 173	**PROPOSED ALTERATIONS & ADDITIONS** for: J.Bryant at: LOT 5C, DP 13374, 1056 Barrenjoey Road PALM BEACH 2108	drawing title **SITE PLAN** NOTE: Use figured dimension only. Do not scale off drawings . All levels and dimensions to be verified prior to construction of work	date: November 2021 scale: 1:200 (A3) drawing number DA- 01

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials

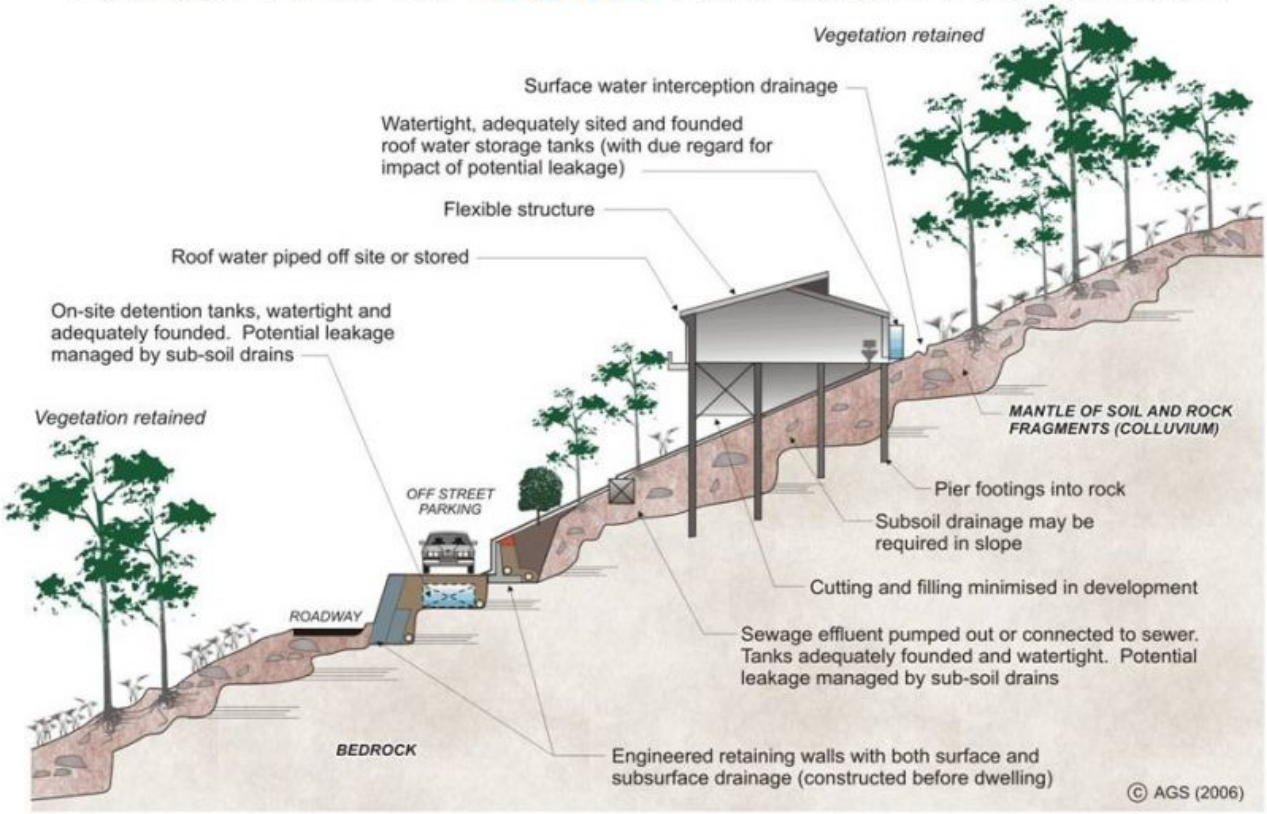




SECTION BB

AMENDMENTS	JO WILLMORE DESIGNS 11 Hudson Parade Clareville NSW 2107 9918 2479 ABN 27 370 370 173	**PROPOSED ALTERATIONS & ADDITIONS** for: J.Bryant at: LOT 5C, DP 13374, 1056 Barrenjoey Road PALM BEACH 2108	drawing title **SECTIONS** NOTE: Use figured dimension only. Do not scale off drawings . All levels and dimensions to be verified prior to construction of work	date: November 2021 scale: 1:100 (A3) drawing number DA- 06

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE