

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

Development Application for \_\_\_\_\_  
Name of Applicant

Address of site 1742 & 1744 Pittwater Road, Bayview

*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 30/5/23 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 1742 & 1744 Pittwater Road, Bayview  
Report Date: 30/5/23  
  
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>1742 &amp; 1744 Pittwater Road, Bayview</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>1742 &amp; 1744 Pittwater Road, Bayview</u>
Report Date: <u>30/5/23</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 19/5/23  
(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 19/5/23
- ☒ 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:**

### **New Shared Jetty at 1742 & 1744 Pittwater Road, Bayview**

#### **1. Proposed Development**

- 1.1** Construct a jetty along the boundary between 1742 & 1744 Pittwater Road.
- 1.2** Details of the proposed development are shown on 3 drawings prepared by SDG, Job number 6966, drawings numbered 1 to 3, Revision A, dated 27.10.21.

#### **2. Site Description**

- 2.1** The site was inspected on the 19<sup>th</sup> May, 2023.
- 2.2** These residential properties are on the low side of the road and have an E aspect. The blocks run longways to the NE so the slope is a cross-fall. They encompass the steep bank that rises at the waterfront ~6m and the gentle slope above that grades at angles of ~7°. The slope rises beyond the properties at similar gentle angles for ~300m before the grade gradually increases to Bayview Plateau.
- 2.3** At the road frontage to 1742 Pittwater Road, a concrete driveway runs to a garage attached to the uphill side of the house and to a carport on the uphill side of the property (Photos 1). The part two-storey framed and clad house is recently constructed and in good condition (Photo 2). A gently sloping lawn extends off the downhill side of the house. A ~1.2m high stone clad retaining wall supports the fill for the lawn area (Photo 3). Immediately below the retaining wall is a pool that has been partially cut into the slope. No significant movement in the pool shell was observed as determined by the water level against the tiles (Photo 4). A ~1.9m high stone clad retaining wall supports a cut for the boatshed and level lawn area (Photo 5). This wall appears to be in good condition. A stable ~2.4m high sandstone block sea wall lines the lower boundary (Photo 6).

The property at 1744 Pittwater Road is currently undergoing construction (Photo 7). A cut for the lower level of the house is supported by a stable ~1.0m high soldier pile wall that lines the E common boundary (Photo 8). Another gently sloping lawn extends off the downhill side of the house to a pool shell cut into the slope. The pool is still currently being built (Photo 9). The ~1.7m cut for the boatshed is supported by the dintel walls of the boat shed (Photo 10). The fill for the level lawn area at the lower boundary is supported by a low stack rock sea wall (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. The proposed works extend into Pittwater.

### **4. Subsurface Investigation**

Three 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 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:

**GROUND TEST RESULTS ON 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 (~RL0.0)	DCP 2 (~RL0.0)	DCP 3 (~RL0.0)
0.0 to 0.3	5	5	5
0.3 to 0.6	6	6	5
0.6 to 0.9	17	6	8
0.9 to 1.2	19	10	9
1.2 to 1.5	34	11	11
1.5 to 1.8	37	18	8
1.8 to 2.1	56	31	14
2.1 to 2.4	#	41	14
2.4 to 2.7		60	18
2.7 to 3.0		#	21
			#
	Refusal on Rock @ 2.0m	Refusal on Rock @ 2.5m	End of Test @ 3.0m

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

### DCP Notes:

DCP1 – Refusal on rock @ 2.0m, DCP bouncing off rock surface, brown silty clay on wet tip.

DCP2 – Refusal on rock @ 2.5m, DCP bouncing off rock surface, brown silty clay on wet tip.

DCP3 – End of test @ 3.0m, DCP still very slowly going down, brown silty clay on wet tip.

## 5. Geological Observations/Interpretation

As the proposed works take place over Pittwater, it is likely sediment will be encountered at increasing depths overlying the Extremely Low to Medium Strength Rock underneath. The depth to Extremely Low to Medium Strength Rock ranged between ~2.0m at 20m from the shoreline to 2.5m at 40m from the shoreline. The underlying rock is likely to drop away at similar angles as it extends into Pittwater.

## 6. Groundwater

As the footings for the proposed works extend into Pittwater, water will be encountered at the surface.

## 7. Acid Sulfate Soils

The clays encountered near the lower boundary are in situ and derived from the Newport Formation Shales. This formation is Middle Triassic in age and is much older than the Holocene sediments from which acid sulphates are generally derived from on the east coast. Additionally, Newport Formation Shale does not contain high concentrations of sulphides which can provide the required iron concentrations for acid generation in older bedrock.

In the location of the jetty over the river sediment, as driven pile foundations do not require excavation and exposure of the subsurface soil profile to oxygen, there is little potential for acid generation.

## 8. Surface Water

No evidence of significant surface flows were observed on the properties during the inspection. Normal sheet wash from the slope above will be intercepted by the street drainage system for Pittwater Road above.

## 9. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed above, below, or beside the properties. The steep bank that rises from the waterfront is a potential hazard (**Hazard One**).

**RISK ANALYSIS ON THE NEXT PAGE**

## Geotechnical Hazards and Risk Analysis - Risk Analysis Summary

HAZARDS	Hazard One
TYPE	The steep bank that rises at the waterfront failing and impacting on the proposed works.
LIKELIHOOD	'Unlikely' ( $10^{-5}$ )
CONSEQUENCES TO PROPERTY	'Minor' (8%)
RISK TO PROPERTY	'Low' ( $5 \times 10^{-6}$ )
RISK TO LIFE	$8.3 \times 10^{-7}$ /annum
COMMENTS	This level of risk is 'ACCEPTABLE'.

(See Aust. Geomech. Jnl. Mar 2007 Vol. 42 No 1, for full explanation of terms)

### 10. 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.

### 11. Stormwater

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

### 12. Excavations

Apart from those for footings, no excavations are required.

### 13. Foundations

The proposed jetty is to be supported on driven timber piles embedded into the sediment.

We have provided DCP results indicating that rock was encountered at depths of between 2.0m and 2.5m at distances of 20m and 40m from the shoreline respectively. It is expected to gradually increase in depth with distance from the shoreline.

Note we do not certify driven pile foundations. As such, the piling contractor is totally responsible for ensuring the piles can support the loads on the piles and that these are within acceptable settlement limits. They are to provide certification of the foundations they install.

Any conventional footings for the jetty required on land can be taken to the underlying Extremely Low Strength Shale or better.

A maximum allowable bearing pressure of 600kPa can be assumed for footings on Extremely Low to Very Low Strength Shale. It should be noted that this material is a soft rock and a rock auger will cut through it so the builders should not be looking for refusal to end the footings.

As the bearing capacity of Extremely Low to Very Low Strength Shale reduces when it is wet, we recommend 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 layer of wet clay or 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.

## 14. Geotechnical Review

The structural plans are to be checked and certified by the geotechnical consultant 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 inspections as well as council geotechnical policy. We cannot provide certification for the regulating

authorities or the owner if the following inspection has not been carried out during the construction process.

- Any conventional foundations other than driven piles 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.

Reviewed By:



Tyler Jay Johns  
BEng (Civil)(Hons),  
Geotechnical Engineer.



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



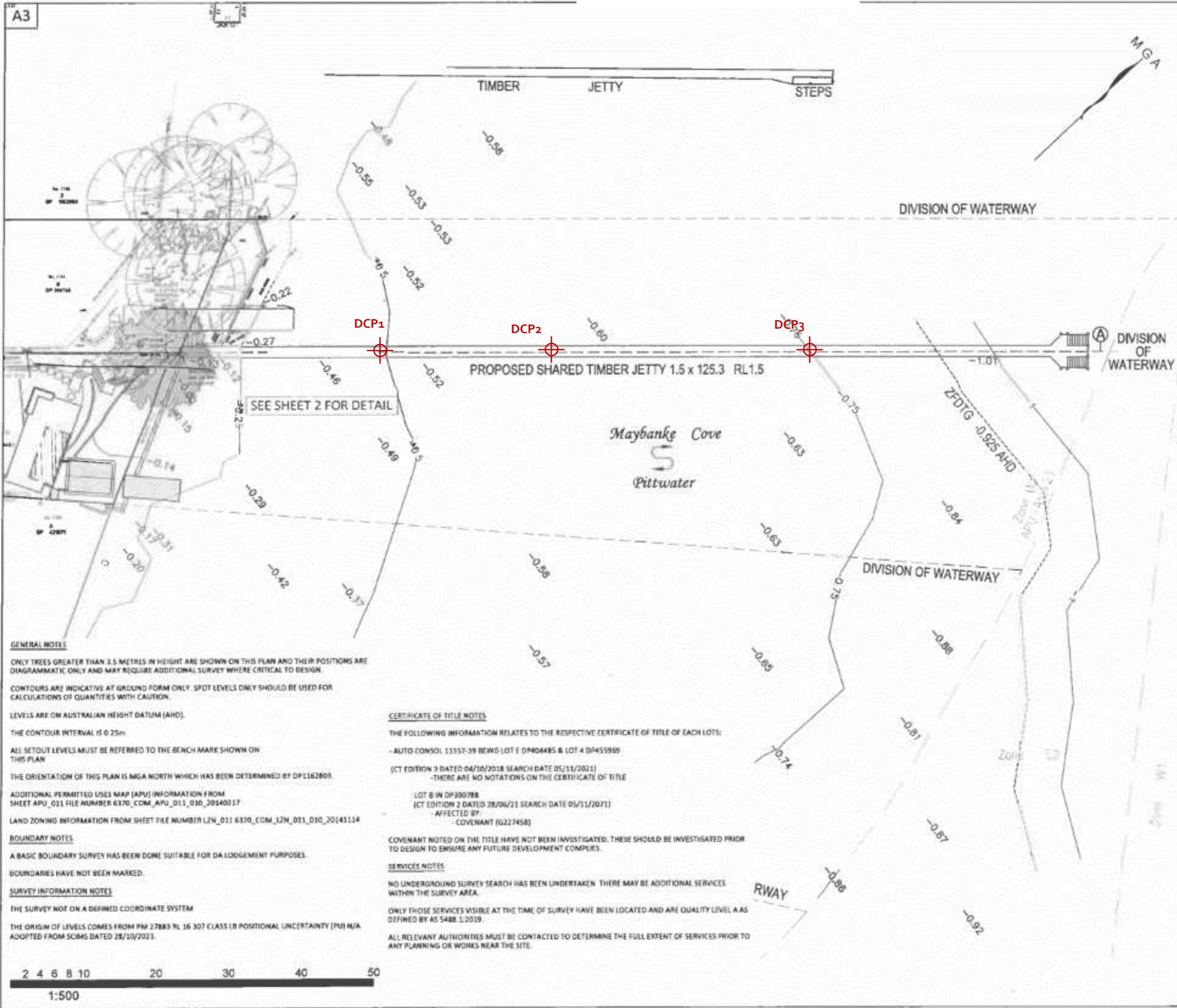
Photo 11

## 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.



ISSUE	DATE	AMENDMENT	SURV	CHK
A	27/10/21	ORIGINAL ISSUE	GS	MT

LEGEND	
TW	TOP OF WALL
BW	BOTTOM OF WALL
MLW	MEAN LOW WATER
MHW	MEAN HIGH WATER
ZFDG	ZERO FORT DENISON TIDE GAUGE (RL -0.925 AHD)
	PROPOSED WORK

PROJECT:  
PLAN SHOWING EXISTING WATERFRONT  
STRUCTURES & PROPOSED SHARED JETTY

No.1742 & 1744 PITTWATER ROAD  
BAYVIEW

CLIENT: ANDREW & MEUSSA ELMISIE AND CLINT & HELEN BRAGG  
FILE: 6966 WATERFRONT SHARED JETTY

LGA: PITTWATER	REF: 6966	CONTOURS: 0.25m
ISSUE: A	DATUM: AHD	
SURVEY DATE: 27/10/2021	AZIMUTH: MGA2020	
SCALE: 1:500	SHEET 1 OF 3 SHEETS	

SDG

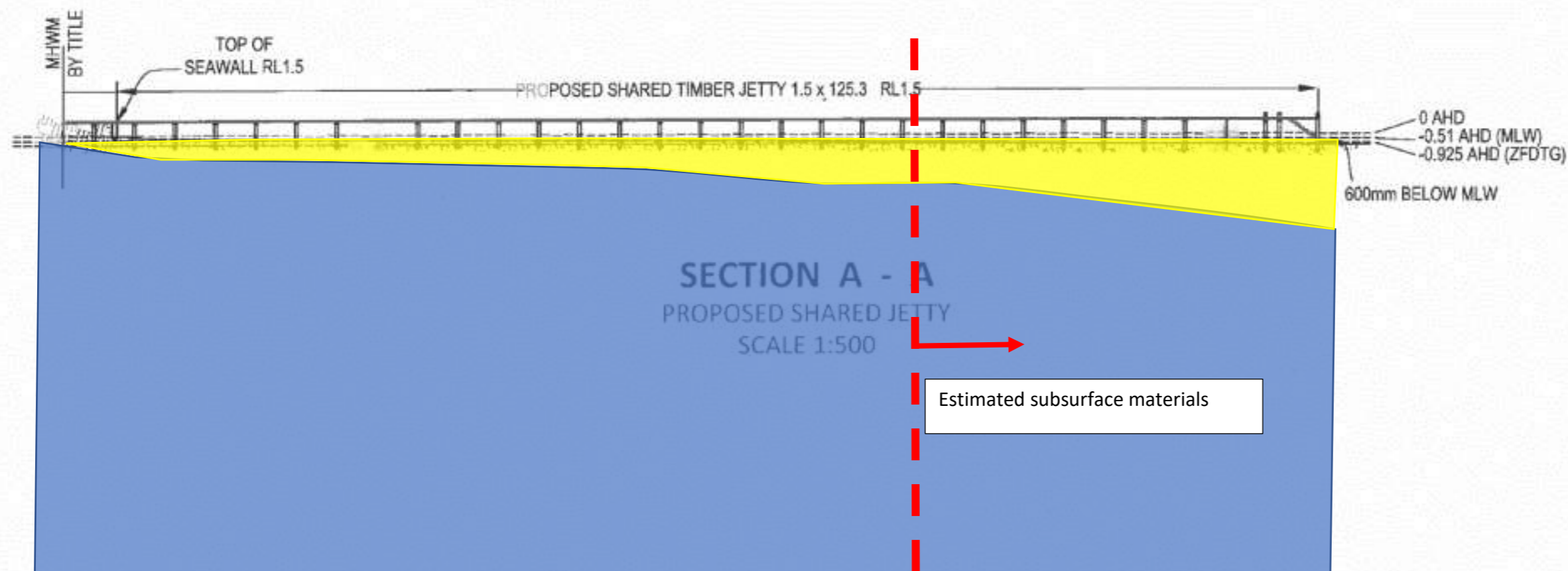
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## TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials

A3



## Expected Ground Materials

- Fill
- Topsoil
- Sediment – silts/sands/clays
- Narrabeen Group Rocks – Extremely Low Strength Shale - *after being cut up by excavation equipment can resemble a stiff to hard clay.*

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MHW	MEAN HIGH WATER MARK
ZFDTG	ZERO FORT DENISON TIDE GAUGE (RL -0.925 A.H.D.)
	PROPOSED WORKS

*Michael Trifiro*  
MICHAEL TRIFIRO ID: SU008624  
REGISTERED LAND SURVEYOR

PROJECT:  
PLAN SHOWING EXISTING WATERFRONT  
STRUCTURES & PROPOSED SHARED JETTY

No.1742 & 1744 PITTWATER ROAD  
BAYVIEW

CLIENT: ANDREW & MELISSA ELSLIE AND CLINT & HELEN BRAGG  
FILE: 6966 WATERFRONT SHARED JETTY

LGA: PITTWATER

REF: 6966	CONTOURS: 0.25m
ISSUE: A	DATUM: AHD
SURVEY DATE: 27/10/2021	AZIMUTH: MGA2020
SCALE: AS SHOWN	SHEET 3 OF 3 SHEETS

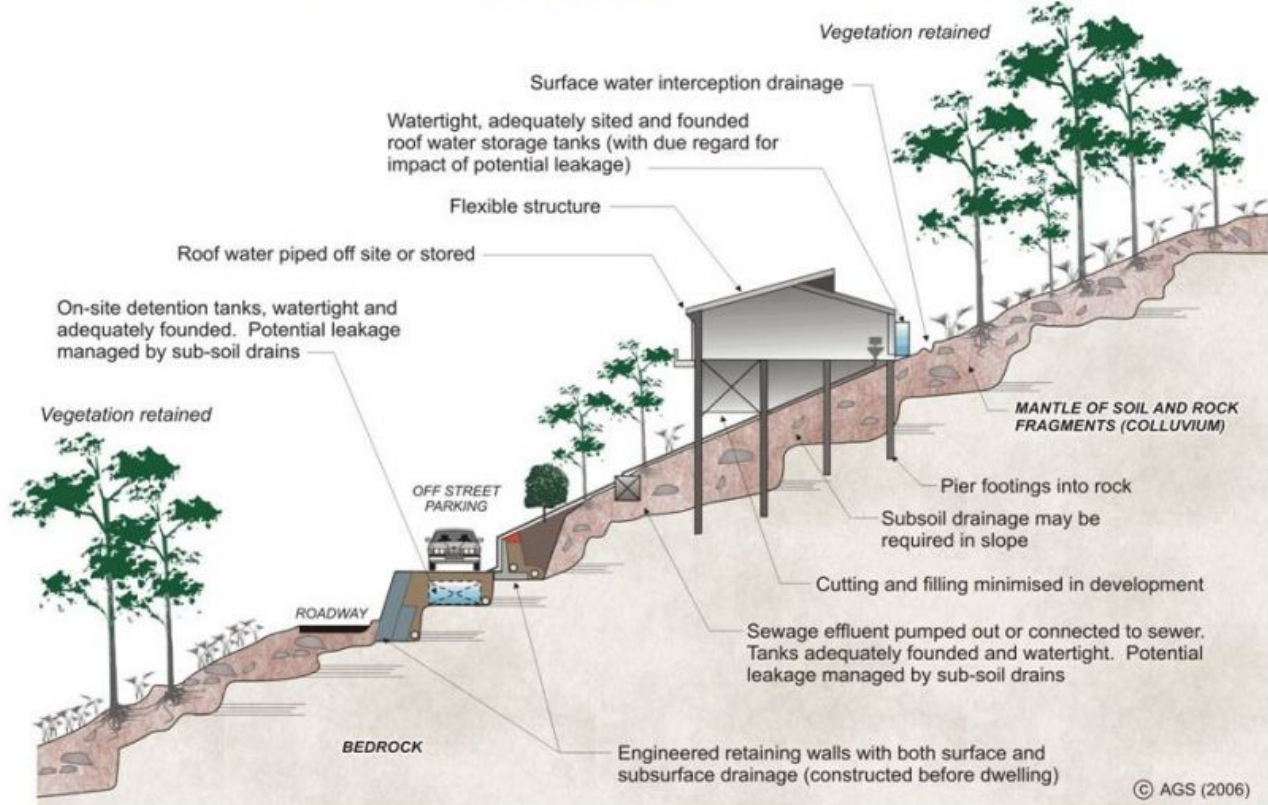
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GDA2020

# EXAMPLES OF **GOOD** HILLSIDE PRACTICE



# EXAMPLES OF **POOR** HILLSIDE PRACTICE

