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

Development Application for _____
Name of Applicant

Address of site 16A Ruskin Rowe, Avalon 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 13/12/21 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 **16A Ruskin Rowe, Avalon Beach**
Report Date: 13/12/21

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 16A Ruskin Rowe, Avalon 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 **16A Ruskin Rowe, Avalon Beach**

Report Date: 13/12/21

Author: BEN WHITE

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

Please mark appropriate box

☒ Comprehensive site mapping conducted **12/11/21**
(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 **12/11/21**

☒ 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 and New Pool at **16A Ruskin Rowe, Avalon Beach**

1. Proposed Development

1.1 Demolish the existing garage and construct a new two-storey extension to the downhill side of the house by excavating to a maximum depth of ~1.7m into the slope.

1.2 Install a new pool on the downhill side of the property by excavating to a maximum depth of ~1.2m.

1.3 Various other minor internal and external alterations.

1.4 Details of the proposed development are shown on 17 drawings prepared by RAMA Architects, drawings numbered DA-000, DA-001, DA-100, DA-101, DA-300 to DA-303, DA-400 to DA-402, DA-500 to DA-502, and DA-900 to DA-902, Revision 01, dated 23/11/21.

2. Site Description

2.1 The site was inspected on the 12th November, 2021.

2.2 This residential property is on the high side of the road and has a SE aspect. The block is located on the gentle to moderately graded lower reaches and toe of a hillslope. The slope rises across the property at gentle angles increasing up to a maximum of ~10°. The slope above the property continues at increasing angles.

2.3 At the road frontage, a gravel and brick-paved driveway runs up the slope to a garage attached to the downhill side of the house (Photos 1 & 2). The garage will be demolished as part of the proposed works. Between the road frontage and the house is a gently sloping lawn (Photo 3). A gently-sloping stone-paved fill extends off the S corner of the house. The fill is supported by a stable stack rock retaining wall that will also be demolished as part of the proposed works (Photo 4). The single-storey brick

house is supported on brick walls (Photo 5). No significant signs of movement were observed in its supporting brick walls. An excavation has been made in the slope to create a level platform for the house. The cut is supported by a stable stack rock retaining wall ~1.2m high (Photo 6). Competent Medium Strength Sandstone outcrops through the SW end of this wall (Photo 7). We think it is likely this is a floater that has rolled down from the slope above although it could be an exposed band of sandstone through the shale-dominated profile. Another gently sloping lawn extends off the uphill side of the wall to the upper common boundary (Photo 8).

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. Thin bands of Low to Medium Strength Sandstone may extend through the otherwise shale-dominated profile.

4. Subsurface Investigation

One hand Auger Hole (AH) 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 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:

AUGER HOLE 1 (~RL22.1) **–** AH1 (Photo 9)

Depth (m)	Material Encountered
0.0 to 0.1	**FILL**, gravelly sand, brown, medium dense, dry, medium to coarse grained.
0.1 to 0.2	**SAND**, grey, medium dense, dry, coarse grained.
0.2 to 0.3	**SANDY CLAY**, brown, firm, dry, fine to coarse grained.
0.3 to 0.7	**CLAY**, derived from weathered shale, brown and mottled orange, very stiff, dry, fine grained.

End of test @ 0.7m in clay derived from weathered shale. 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 (~RL22.7)	DCP 2 (~RL22.1)	DCP 3 (~RL21.3)	DCP 4 (~RL21.6)	DCP 5 (~RL20.8)
0.0 to 0.3	5	7	8	2	16
0.3 to 0.6	9	15	18	7F	22
0.6 to 0.9	8	15	15	5	37
0.9 to 1.2	6	#	11	7	#
1.2 to 1.5	12		7	17	
1.5 to 1.8	12		#	38	
1.8 to 2.1	35			#	
2.1 to 2.4	#				
	End of Test @ 2.1m	Refusal on Rock @ 0.8m	Refusal on Rock @ 1.4m	End of Test @ 1.8m	End of Test @ 0.9m

#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 @ 2.1m, DCP still very slowly going down, clean dry tip, orange clay in collar above tip.

DCP2 – Refusal on rock @ 0.8m, DCP bouncing off rock surface, white impact dust on dry tip, brown clay in collar above tip.
DCP3 – Refusal on rock @ 1.4m, DCP bouncing off rock surface, white and maroon sandstone fragments on dry tip.
DCP4 – End of test @ 1.8m, DCP still very slowly going down, maroon shale fragments on wet muddy tip, maroon clay in collar above tip.
DCP5 – End of test @ 0.9m, DCP still very slowly going down, clean dry tip.

5. Geological Observations/Interpretation

The slope materials are colluvial at the near surface and residual at depth. In the test locations, the ground materials consist of a thin topsoil over firm to hard clays. The clays merge into the underlying weathered rock at depths of between 0.6 to 1.8m below the current surface, being deeper due to a variable weathering profile. The weathered zone is interpreted to be Extremely Low to Very Low Strength Shale. Thin bands of Low to Medium Strength Sandstone may be present through the shale as the DCP was bouncing at the end of two of the five tests. 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 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 excavations.

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 below or beside the property. The gentle to moderately graded slope that rises across the property and continues above is a potential hazard (**Hazard One**). The proposed excavations are a potential hazard until retaining structures are in place (**Hazard Two**). The proposed excavation undercutting the footings of the house is a potential hazard (**Hazard Three**).

Geotechnical Hazards and Risk Analysis - Risk Analysis Summary

HAZARDS	Hazard One	Hazard Two	Hazard Three
TYPE	The gentle to moderate slope that rises across the site and continues above failing and impacting on the proposed works.	The unsupported cut batters of the excavations collapsing onto the work site before permanent support is in place.	The proposed excavation undercutting the footings of the house and causing movement.
LIKELIHOOD	'Unlikely' (10^{-4})	'Possible' (10^{-3})	'Possible' (10^{-3})
CONSEQUENCES TO PROPERTY	'Medium' (12%)	'Medium' (12%)	'Medium' (15%)
RISK TO PROPERTY	'Low' (2×10^{-5})	'Moderate' (2×10^{-4})	'Moderate' (2×10^{-4})
RISK TO LIFE	5.5×10^{-7}/annum	6.2×10^{-5}/annum	8.3×10^{-5}/annum
COMMENTS	This level of risk is 'ACCEPTABLE'.	This level of risk to life and property is '**UNACCEPTABLE'**. To move the risk levels to acceptable levels, the recommendations in **Section 13** are to be followed.	This level of risk to life and property is '**UNACCEPTABLE**'. To move the risk levels to acceptable levels, the recommendations in **Section 13** are to be followed.

(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

There is fall to Ruskin Rowe. The road is not guttered below the subject property. However, the Northern Beaches Council mapping site shows a drainage system running under the road below the subject property. Roof water from the proposed development is to be piped to the street drainage system through any tanks that may be required by the regulating authorities.

11. Excavations

An excavation to a maximum depth of ~1.7m is required to construct the garage level of the proposed house extension. Another excavation to a maximum depth of ~1.2m is required to install the proposed pool. The excavations are expected to be taken through a thin fill and topsoil over firm to hard clays with Extremely Low to Very Low Strength Shale expected at depths of between 0.6 to 1.8m below the current surface. Thin bands of Low to Medium Strength Sandstone may also be encountered during the proposed excavations.

Excavations through fill, soil, clay, and Extremely Low to Very Low Strength Shale can be carried out with an excavator and bucket and excavations through rock will require grinding or rock sawing and breaking.

12. Vibrations

No excessive vibrations will be generated by excavation through fill, soil, clay, or Extremely Low to Very Low Strength Shale. Any vibrations generated by a domestic machine and bucket up to 16 ton will be below the threshold limit for infrastructure or building damage.

13. Excavation Support Requirements

Bulk Excavation for Garage Level of Proposed Extension

The proposed excavation will reach a maximum depth of ~1.7m but will taper away in height downslope. The excavation will be taken close to flush with the downhill supporting wall of the house and, allowing for back-wall drainage, will be set back ~0.5m from the NE common boundary. The NE neighbouring house is set back sufficiently from the proposed excavation. As such, the downhill supporting wall of the subject house and NE common boundary will be within the zone of influence of the excavation.

Where the downhill supporting wall of the house falls within the zone of influence of the excavation, exploration pits in this location will need to be put down by the builder to determine the foundation depth and material. The pits are to be inspected by the geotechnical consultant.

If the wall is found to be supported below the base of the proposed excavation, the excavation may commence. If it is not supported below the base of the proposed excavation, the wall will need to be underpinned prior to the excavation commencing. See the minimum extent of the exploration pits/underpinning shown on the site plan attached.

Underpinning is to follow the underpinning sequence 'hit one miss two'. Under no circumstances is the bulk excavation to be taken to the edge of the wall and then underpinned. Underpins are to be constructed from drives that should not exceed 0.6m in width along brick footings but should be proportioned according to footing type and size. Allowances are to be made for drainage through the underpinning to prevent a build-up of hydrostatic pressure.

The cut will require staged sacrificial temporary support such as braced form ply or similar support installed along the NE side as the excavation is progressed in spans not less than 2.0m horizontally to maintain the integrity of the NE neighbouring property. The support is to be designed/approved by the structural engineer. The temporary support is to remain in place

until the retaining walls are built. See the minimum extent of the recommended temporary shoring shown on the site plan attached.

The soil and clay portions along the remaining (SW) side of the excavation that extend to a maximum depth of ~1.5m are to be battered at 1.0 Vertical to 1.0 Horizontal (45°) and cut batters through Extremely Low to Very Low Strength Shale or better are expected to stand unsupported at near-vertical angles for short periods of time until retaining walls are installed, provided they are kept from becoming saturated.

During the excavation process, the geotechnical consultant is to inspect the cut in 1.5m intervals as it is lowered, while the machine/excavation equipment is on site, to ensure the ground materials are as expected and no additional temporary support is required.

Bulk Excavation for Proposed Pool

The excavation for the proposed pool will reach a maximum depth of ~1.2m and will be sufficiently set back from any surrounding structures or boundaries.

The cut batters for the pool are expected to stand at near-vertical angles for a very short period of time until the pool structure is installed provided the cut batters are kept from becoming saturated. If the cut batters remain unsupported for more than a day before the pool construction commences, they are to be supported with typical pool shoring such as braced form ply, until the pool structure is in place.

Advice Applying to All Excavations

Upslope runoff is to be diverted from the cut faces by sandbag mounds or other diversion works. Unsupported cut batters through fill, soil, clay, and Extremely Low to Very Low Strength Shale are to be covered to prevent access of water in wet weather and loss of moisture in dry weather. The covers are to be tied down with metal pegs or other suitable fixtures so they can't blow off in a storm. The materials and labour to construct the retaining walls/pool structure are to be organised so on completion of the excavations they can be

constructed as soon as possible. The excavations are to be carried out during a dry period. No excavations are to commence if heavy or prolonged rainfall is forecast.

All excavation spoil is to be removed from site following the current Environmental Protection Agency (EPA) waste classification guidelines.

14. Retaining Structures

For cantilever or singly-propped retaining structures, it is suggested the design be based on a triangular pressure distribution of lateral pressures using the parameters shown in Table 1.

Table 1 – Likely Earth Pressures for Retaining Structures

Unit	Earth Pressure Coefficients		
	Unit weight (kN/m^3)	'Active' K_a	'At Rest' K_0
Fill, Soil, and Residual Clay	20	0.40	0.55
Rock up to Low Strength Rock - Jointed	24	0.25	0.35

For rock classes refer to Pells et al "Design Loadings for Foundations on Shale and Sandstone in the Sydney Region". Australian Geomechanics Journal 1978.

It is to be noted that the earth pressures in Table 1 assume a level surface above the structure, do not account for any surcharge loads, and assume retaining structures are fully drained. Rock strength and relevant earth pressure coefficients are to be confirmed on site by the geotechnical consultant.

All retaining structures are to have sufficient back-wall drainage and be backfilled immediately behind the structure with free-draining material (such as gravel). This material is to be wrapped in a non-woven Geotextile fabric (i.e., Bidim A34 or similar), to prevent the drainage from becoming clogged with silt and clay. If no back-wall drainage is installed in retaining structures, the likely hydrostatic pressures are to be accounted for in the structural design.

15. Foundations

The proposed extension to the downhill side of the house can be supported on a raft concrete slab and piers taken to Extremely Low to Very Low Strength Shale. This ground material is expected to be exposed across a portion of the base of the excavation. Where the slope falls away on the downhill side, this material is expected at an average depth of ~1.5m below the current surface.

The foundation materials of the existing house are not known. Ideally, footings should be founded on the same footing material across the old and new structures. Where the footing material changes across the structure, construction joints or similar are to be installed to prevent differential settlement, where the structure cannot tolerate such movement.

The proposed pool can be supported on piers taken to Extremely Low to Very Low Strength Shale. This ground material is expected at depths of between 0.6 to 1.5m below the current surface.

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.

16. 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.

17. Inspections

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 inspections have not been carried out during the construction process.

- The geotechnical consultant is to inspect any test pits dug by the builder to verify foundation depth and material of the existing footings.
- During the excavation process, the geotechnical consultant is to inspect the cuts in 1.5m intervals as they are lowered, while the machine/excavation equipment is on site, to ensure the ground materials are as expected and no temporary support is required.
- 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

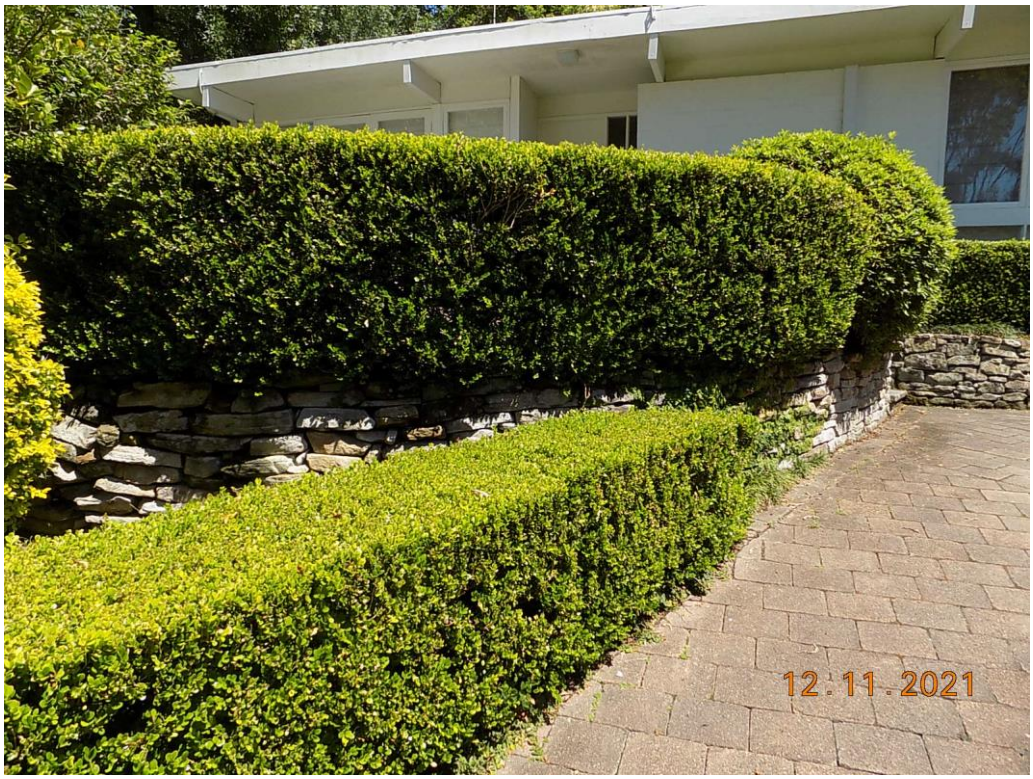


Photo 4

Photo 5

Photo 6

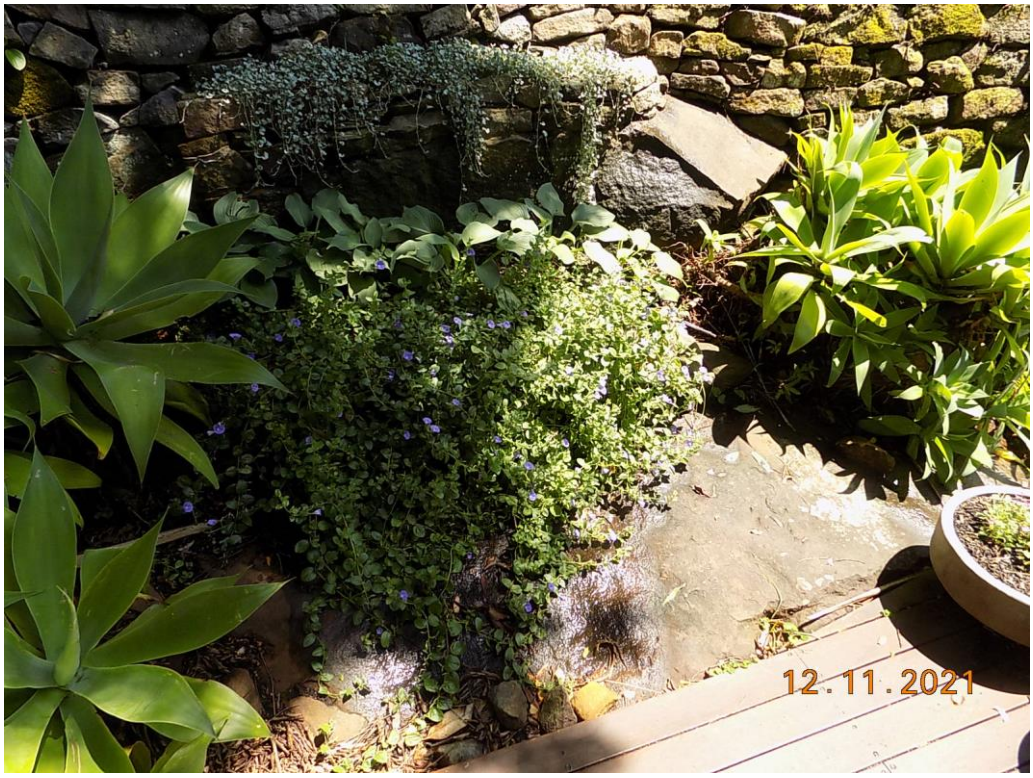


Photo 7

Photo 8

Photo 9: AH1 – Downhole is from 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.

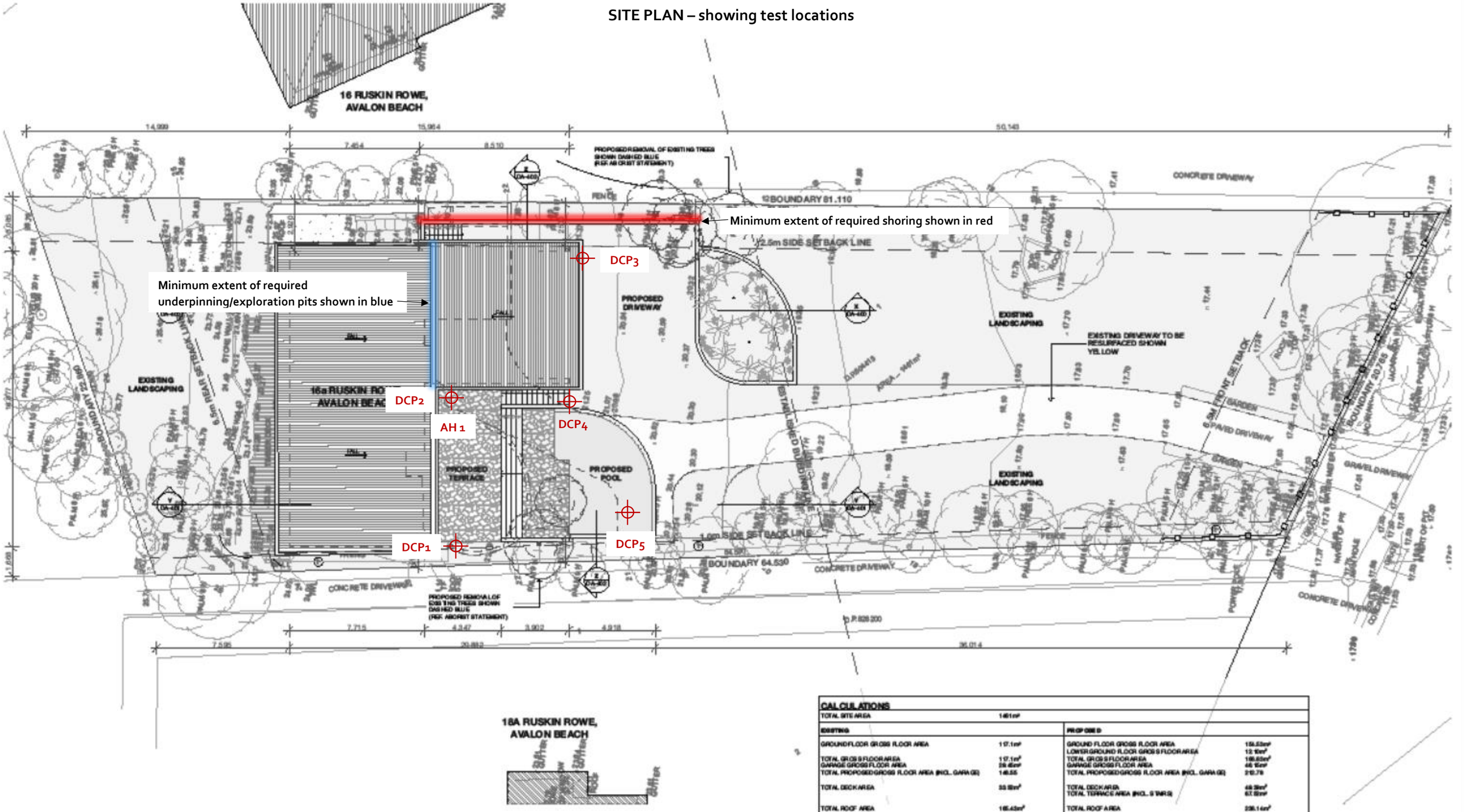
- The report addresses issues relating to your specific design and site. If the proposed project design changes, aspects of the report may no longer apply. Contact White Geotechnical if this occurs.

- 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



SITE PLAN 1:200

CALCULATIONS

TOTAL SITE AREA	1461m²		
EXISTING		PROPOSED	
GROUND FLOOR GROSS FLOOR AREA	117.1m²	GROUND FLOOR GROSS FLOOR AREA	159.53m²
		LOWER GROUND FLOOR GROSS FLOOR AREA	13.19m²
TOTAL GROSS FLOOR AREA	117.1m²	TOTAL GROSS FLOOR AREA	185.62m²
GARAGE GROSS FLOOR AREA	28.45m²	GARAGE GROSS FLOOR AREA	46.15m²
TOTAL PROPOSED GROSS FLOOR AREA (INCL. GARAGE)	146.55	TOTAL PROPOSED GROSS FLOOR AREA (INCL. GARAGE)	215.79
TOTAL DECK AREA	33.55m²	TOTAL DECK AREA	48.39m²
		TOTAL TERRACE AREA (INCL. STAIRS)	67.55m²
TOTAL ROOF AREA	185.43m²	TOTAL ROOF AREA	235.14m²
		POOL VOLUME	51.4m³
HARD SURFACE AREA	432.85m² (29.49%)	HARD SURFACE AREA (INCL. 6% PERMEABLE SURFACE)	611.07m²(41.82%)
SOFT LANDSCAPE AREA	1030.15m² (70.51%)	SOFT LANDSCAPE AREA	849.93m²(58.17%)

NORTH

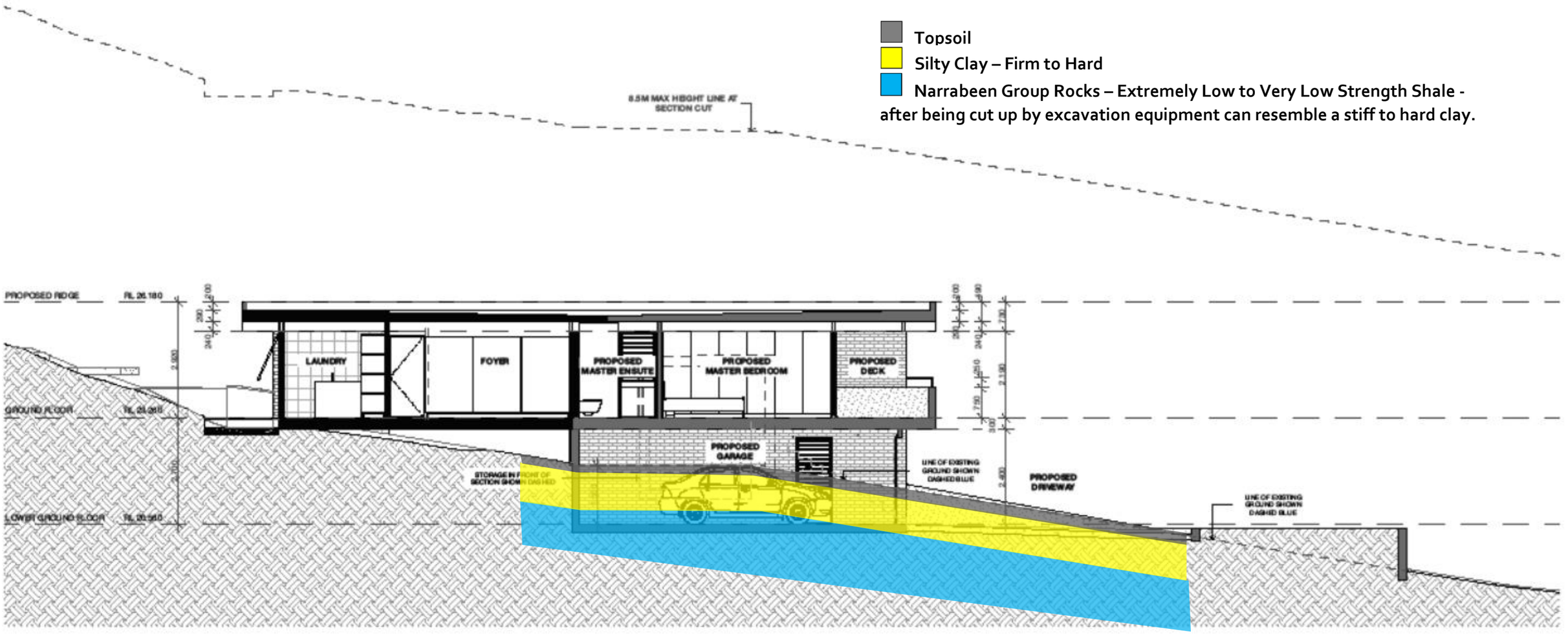
KEY:
- DENOTES AREA OF PROPOSED ALTERATIONS
- DENOTES AREA OF PROPOSED ADDITIONS
- DENOTES EXISTING STRUCTURE TO BE DEMOLISHED
- DENOTES EXISTING STRUCTURE TO BE RETAINED
- DENOTES PROPOSED NEW STRUCTURE

NOTE: THESE DRAWINGS ARE NOT FOR CONSTRUCTION PURPOSES FOR DA APPROVAL ONLY
NOTE: DO NOT SCALE OFF THESE DRAWINGS
NOTE: ALL WORKS TO BE IN ACCORDANCE WITH THE N.C.C. 2016
NOTE: ALL WORKS TO BE IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS
NOTE: ALL WORKS TO BE IN ACCORDANCE WITH THE BASIX REQUIREMENTS

PROJECT: ALTERATIONS AND ADDITIONS TO EXISTING DWELLING, INCLUDING NEW POOL & ASSOCIATED LANDSCAPING	PROJECT STAGE: DA	DATE OF ISSUE: 23/11/21
CLIENT: NICK AND JENNY THOMPSON	DRAWING TITLE: COVER & SITE INFORMATION: SITE PLAN	DRAWING NO. DA-001
LOCATION: 16a RUSKIN ROWE, AVALON BEACH, NSW	SCALE: 1:200 @ A3	REVISION: 01

rama

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials



Topsoil

Silty Clay – Firm to Hard

Narrabeen Group Rocks – Extremely Low to Very Low Strength Shale - after being cut up by excavation equipment can resemble a stiff to hard clay.

SECTION X A3 @1:100

KEY:

- DENOTES AREA OF PROPOSED ALTERATIONS
- DENOTES AREA OF PROPOSED ADDITIONS
- DENOTES EXISTING STRUCTURE TO BE DEMOLISHED
- DENOTES EXISTING STRUCTURE TO BE RETAINED
- DENOTES PROPOSED NEW STRUCTURE

NOTE: THESE DRAWINGS ARE NOT FOR CONSTRUCTION, FOR DA APPROVAL ONLY
NOTE: DO NOT SCALE OFF THESE DRAWINGS
NOTE: ALL WORKS TO BE IN ACCORDANCE WITH THE N.C.C. 2019
NOTE: ALL WORKS TO BE IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS
NOTE: ALL WORKS TO BE IN ACCORDANCE WITH THE BASIX REQUIREMENTS

PROJECT: ALTERATIONS AND ADDITIONS TO EXISTING DWELLING, INCLUDING NEW POOL & ASSOCIATED LANDSCAPING	**PROJECT STAGE:** DA
CLIENT: NICK AND JENNY THOMPSON	**DRAWING TITLE:** SECTIONS: SECTION X
LOCATION: 16a RUSSIN ROWE, AVALON BEACH, NSW	**SCALE:** 1:100 @ A3
DATE OF ISSUE: 23/11/21	**DRAWING NO.** DA-400
	REVISION: 01

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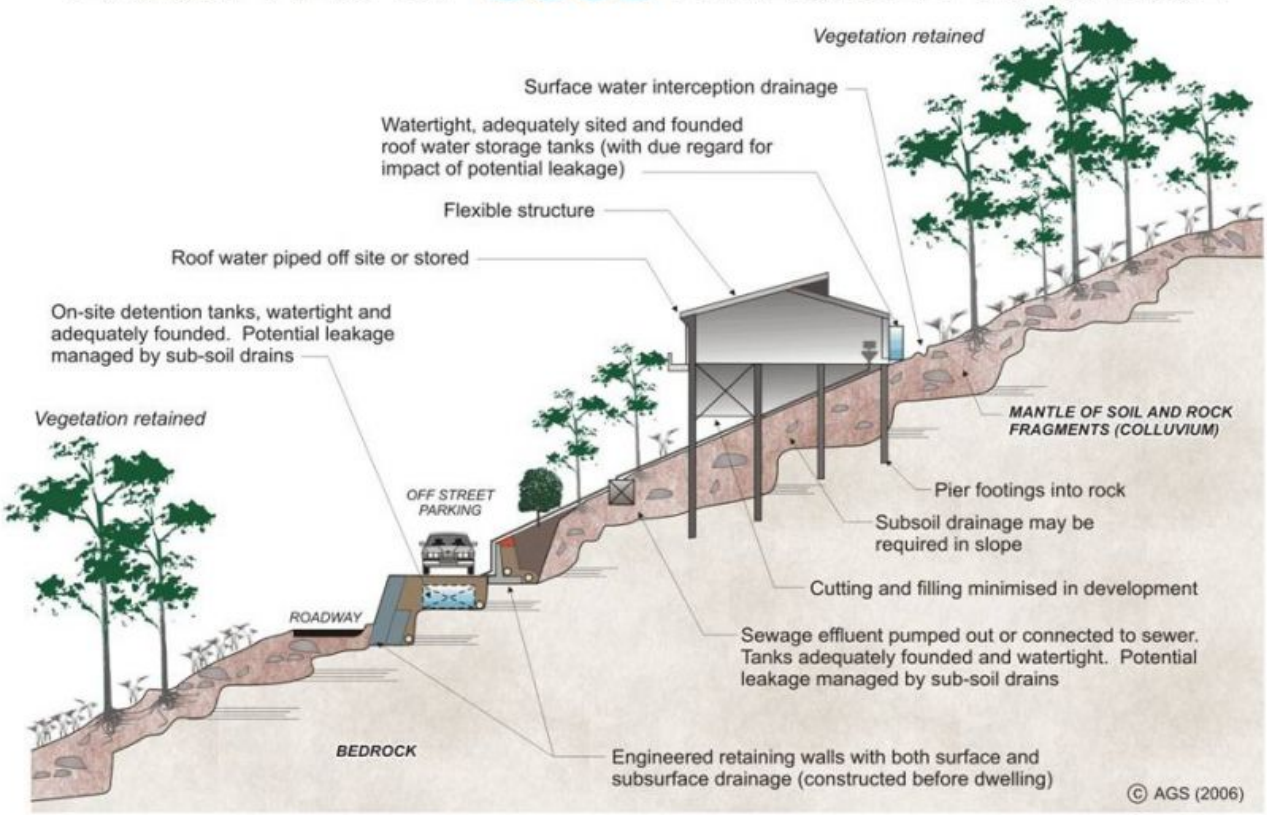
EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE