

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

Development Application for _____	Name of Applicant
Address of site _____	111 Woorarra Avenue, Elanora Heights

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 (Insert Name) on behalf of White Geotechnical Group Pty Ltd (Trading or Company Name)

on this the 30/1/25 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 111 Woorarra Avenue, Elanora Heights
Report Date: <u>28/1/25</u>
Author: <u>BEN WHITE</u>
Author's Company/Organisation: <u>WHITE GEOTECHNICAL GROUP PTY LTD</u>

Documentation which relate to or are relied upon in report preparation:

<u>Australian Geomechanics Society Landslide Risk Management March 2007.</u>
<u>White Geotechnical Group company archives.</u>

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 MScGEOL AIG., RPGeo

Membership No. 10306

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>111 Woorarra Avenue, Elanora Heights</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 111 Woorarra Avenue, Elanora Heights
Report Date: <u>28/1/25</u>
Author: <u>BEN WHITE</u>
Author's Company/Organisation: WHITE GEOTECHNICAL GROUP PTY LTD

Please mark appropriate box

- Comprehensive site mapping conducted 22/1/25
(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 22/1/25
- 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 MScGEOL AIG., RPGeo

Membership No. 222757

Company White Geotechnical Group Pty Ltd



GEOTECHNICAL INVESTIGATION:

Granny Flat and Parking Area at 111 Woorarra Avenue, Elanora Heights

1. Proposed Development

- 1.1** Construct a granny flat on the downhill side of the property.
- 1.2** Construct a new parking area off the existing driveway.
- 1.3** Details of the proposed development are shown on 5 drawings prepared by RK Designs, Project number 24-45, drawings numbered 1-5, dated 1.8.24.

2. Site Description

- 2.1** The site was inspected on the 22nd January, 2025.
- 2.2** This residential property is accessed by a shared driveway off the low side of the street and has a S aspect. It is located on the moderately graded middle reaches of a hillslope. The slope falls across the property at an average angle of $\sim 13^\circ$ before falling steeply at the lower boundary. The slope above the property continues at similar angles.
- 2.3** At the road frontage, a shared driveway runs down the slope to a parking area off the S side of the house (Photo 1). The fill for the parking area is supported by a series of stable timber retaining walls reaching up to $\sim 1.0\text{m}$ high (Photo 2). The part two-storey house is supported on rendered masonry walls. The walls show no significant signs of movement. Medium Strength Sandstone is observed outcropping underneath the house and it is likely the house is at least partially supported on this material (Photo 3). The cut for the house is supported by a stable $\sim 0.7\text{m}$ high concrete block retaining wall (Photo 4). A terraced lawn area extends off the uphill side of the house. The cut for the upper lawn area is supported by a stable $\sim 1.2\text{m}$ high stack rock retaining wall (Photo 5). A large sandstone floater is resting in a stable position above

this wall. A moderately sloping vegetated garden extends above this wall to the upper common boundary. A series of timber retaining walls up to ~0.8m support fills for garden beds on the uphill side of the property (Photo 6). The middle retaining wall is twisting slightly but due to its position on the slope and the height of the wall, it is not a threat to life or property should it collapse. A moderately sloping lawn extends off the downhill and E sides of the house to the common boundaries (Photos 7 & 8). Medium Strength Sandstone outcrops and steps down this slope. Many large boulders and joint blocks are embedded in the slope in stable positions.

3. Geology

The Sydney 1:100 000 Geological Sheet indicates the site is underlain by Hawkesbury Sandstone. It is described as a medium to coarse grained quartz sandstone with very minor shale and laminite lenses.

4. Subsurface Investigation

Seven Dynamic Cone Penetrometer (DCP) tests were put down to determine the relative density of the overlying soil and the depth to bedrock. 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 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 (~RL39.0)	DCP 2 (~RL39.5)	DCP 3 (~RL38.0)	DCP 4 (~RL38.0)
0.0 to 0.3	3	3	Rock exposed at the surface	Rock exposed at the surface
0.3 to 0.6	#	2		
0.6 to 0.9		#		
	Refusal on Rock @ 0.2m	Refusal on Rock @ 0.4m		

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 5 (~RL51.5)	DCP 6 (~RL52.0)	DCP 7 (~RL51.0)
0.0 to 0.3	1	1	Joint block exposed at the surface
0.3 to 0.6	1	2	
0.6 to 0.9	2	7	
0.9 to 1.2	#	7	
1.2 to 1.5		#	
	Refusal on Rock @ 0.8m	Refusal on Rock @ 1.1m	

#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 @ 0.2m, DCP bouncing off rock surface, white impact dust dry tip.

DCP2 – Refusal on rock @ 0.4m, DCP bouncing off rock surface, orange impact dust on dry tip.

DCP3 – Medium Strength Sandstone exposed at the surface.

DCP4 – Medium Strength Sandstone exposed at the surface.

DCP5 – Refusal on rock @ 0.8m, DCP bouncing off rock surface, orange impact dust on dry tip.

DCP6 – Refusal on rock @ 1.1m, DCP bouncing off rock surface, white impact dust on dry tip.

DCP7 – Medium Strength Sandstone joint block exposed at the surface.

5. Geological Observations/Interpretation

The surface features of the block are controlled by the outcropping and underlying sandstone bedrock that steps down the property forming sub-horizontal benches between the steps. Where the grade is steeper, the steps are larger and the benches narrower. Where the slope eases, the opposite is true. Where the rock is not exposed, it is overlain by shallow soils over clays that fill the bench step formation. In the test locations, where the rock is not exposed, it was encountered at depths of between 0.2 to 1.1m below the current surface, being slightly deeper due to the stepped nature of the underlying bedrock. The outcropping sandstone on the property is estimated to be Medium Strength or better and similar strength rock is expected to underlie the entire site as all the DCP tests bounced at refusal. 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 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**).

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 proposed works.
LIKELIHOOD	'Unlikely' (10^{-4})
CONSEQUENCES TO PROPERTY	'Medium' (12%)
RISK TO PROPERTY	'Low' (2×10^{-5})
RISK TO LIFE	8.3×10^{-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 away from the street. The stormwater engineer is to refer to council stormwater policy for suitable options for stormwater disposal.

11. Excavations

Apart from those for footings and minor levelling, no excavations are required.

12. Fill

For ease of construction, it is recommended the fill under the proposed parking area be used as formwork only and the parking area foundations be supported on piers taken to the underlying Medium Strength Sandstone.

If it is desired to support the parking area on fill, it will need to be laid as an engineered fill. Our office can be contacted to provide the requirements for these works upon request.

13. Site Classification

The site classification is Class S in accordance with AS2870-2011.

14. Foundations

The proposed granny flat and parking area are to be supported on piers taken to Medium Strength Sandstone. Where this material is not exposed, it is expected at depths of between ~0.2m and ~1.1m below the current surface. Where footings are over an exposed sloping rock surface, they may be supported off level pads cut into the rock and fixed with suitable bar grouted / epoxied 0.4m into the rock.

A maximum allowable bearing pressure of 1000kPa can be assumed for footings on Medium Strength Sandstone.

Naturally occurring vertical cracks (known as joints) commonly occur in sandstone. These are generally filled with soil and are the natural seepage paths through the rock. They can extend to depths of several metres and are usually relatively narrow but can range between 0.1 to 0.8m wide. If a footing falls over a joint in the rock, the construction process is simplified if, with the approval of the structural engineer, the joint can be spanned or, alternatively, the footing can be repositioned so it does not fall over the joint.

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.

15. 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.

16. Inspections

The client and builder are to familiarise themselves with the following required inspection as well as council geotechnical policy. We cannot provide geotechnical certification for the owners and Occupation Certificate if the following inspection has not been carried out during the construction process.

- All footings are to be inspected and approved by the geotechnical consultant while the excavation equipment and contractors are still onsite and before steel reinforcing is placed or concrete is poured.

White Geotechnical Group Pty Ltd.



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

Reviewed By:



Nathan Gardner B.Sc. (Geol. & Geophys. & Env. Stud.)
AIG., RPGeo Geotechnical & Engineering.
No. 10307
Engineering Geologist & Environmental Scientist.





Photo 1



Photo 2



Photo 3

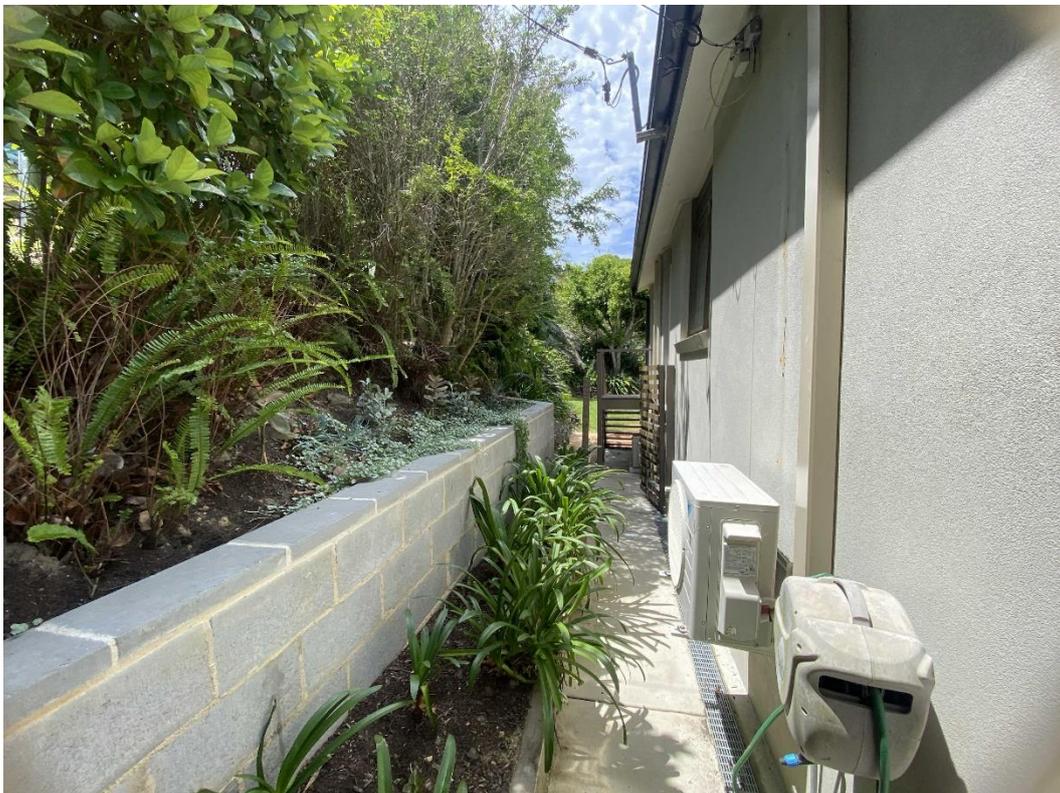


Photo 4



Photo 5



Photo 6



Photo 7



Photo 8

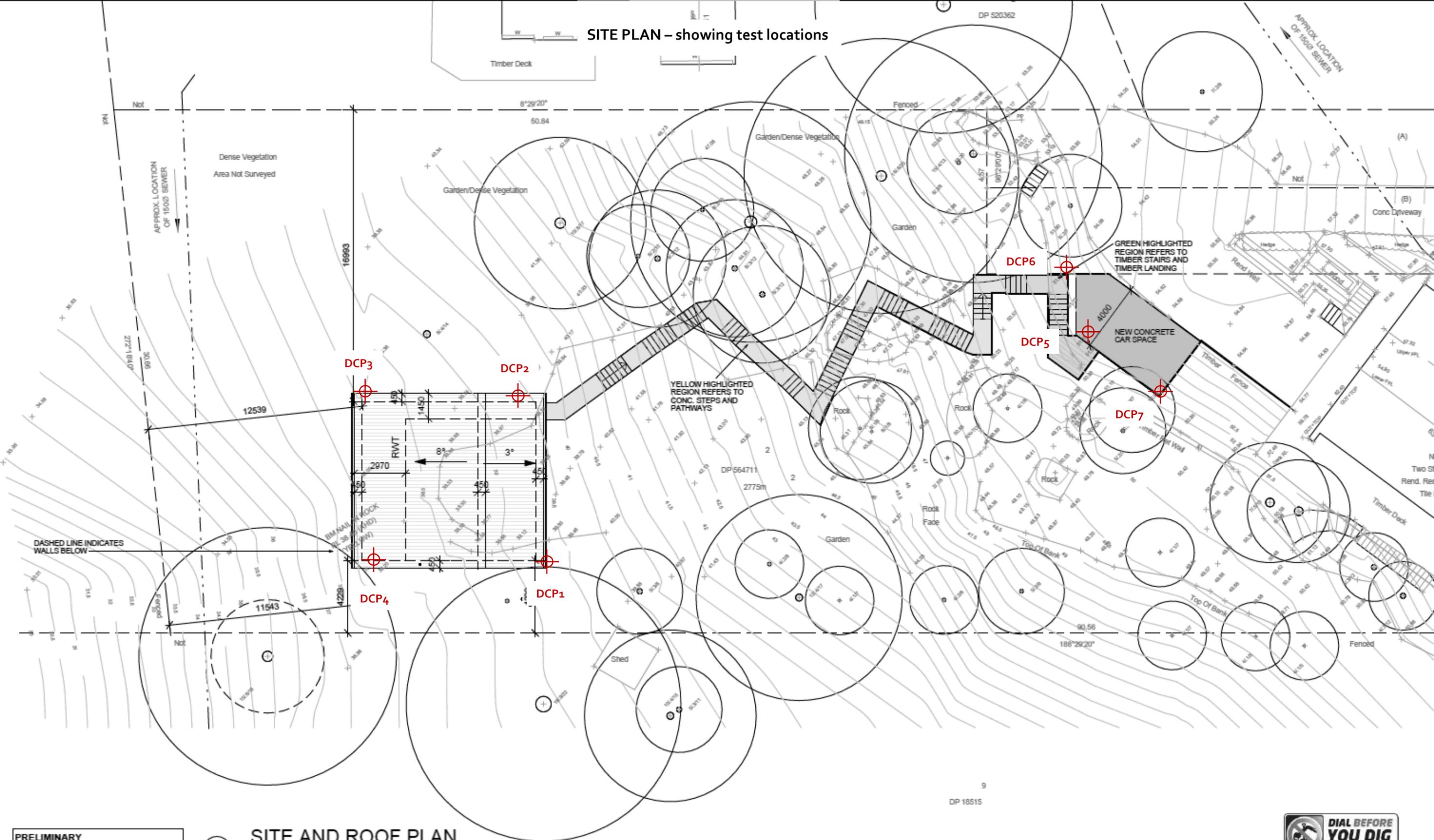
Important Information about Your Report

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



PRELIMINARY
DO NOT USE FOR CONSTRUCTION

1

SITE AND ROOF PLAN

1 : 200



GENERAL NOTES
 . All dimensions are to be confirmed on site by the builder/subcontractor, any incongruities must be reported to the Designer before commencement of any work.
 . No Survey has been made on the boundaries, all bearings, distances and areas have been taken from the contour survey plan. A Survey must be carried out to confirm the exact boundary locations.
 . No construction work shall commence until a site survey confirming the site boundaries has been completed. The contractor is to ensure that the boundary setbacks are confirmed and used, the boundary setbacks take precedence over all other dimensions. The Survey work must be performed by a registered Surveyor.
 . In the event of encountering any discrepancies on these drawings, specification or subsequent instructions issued, the Builder/Subcontractor shall contact the designer before proceeding further with any work.
 . All construction, control joints and expansion joints in the wall, floors, other locations shall be in strict accordance with the Structural Engineering details. No joints or breaks other than specified, are allowed without written permission from the Engineer.
 . Measurements for the fabrication of secondary components such as, windows, doors, internal frames, structural steel components and the like, are not to be taken from these documents. Measurements must be taken on site to suit the work as constructed.
 . All structural components shall be in strict accordance to details and specifications as prepared by a structural engineer.
 . All existing structures need to be examined for structural adequacy, and it is the Contractor's responsibility to ensure that a certificate of structural adequacy is available prior to the start of any work.

drawn	date	issue	description
LS	01/08/24	A	ISSUE FOR DA
LS	17/10/24	B	ISSUE FOR DA

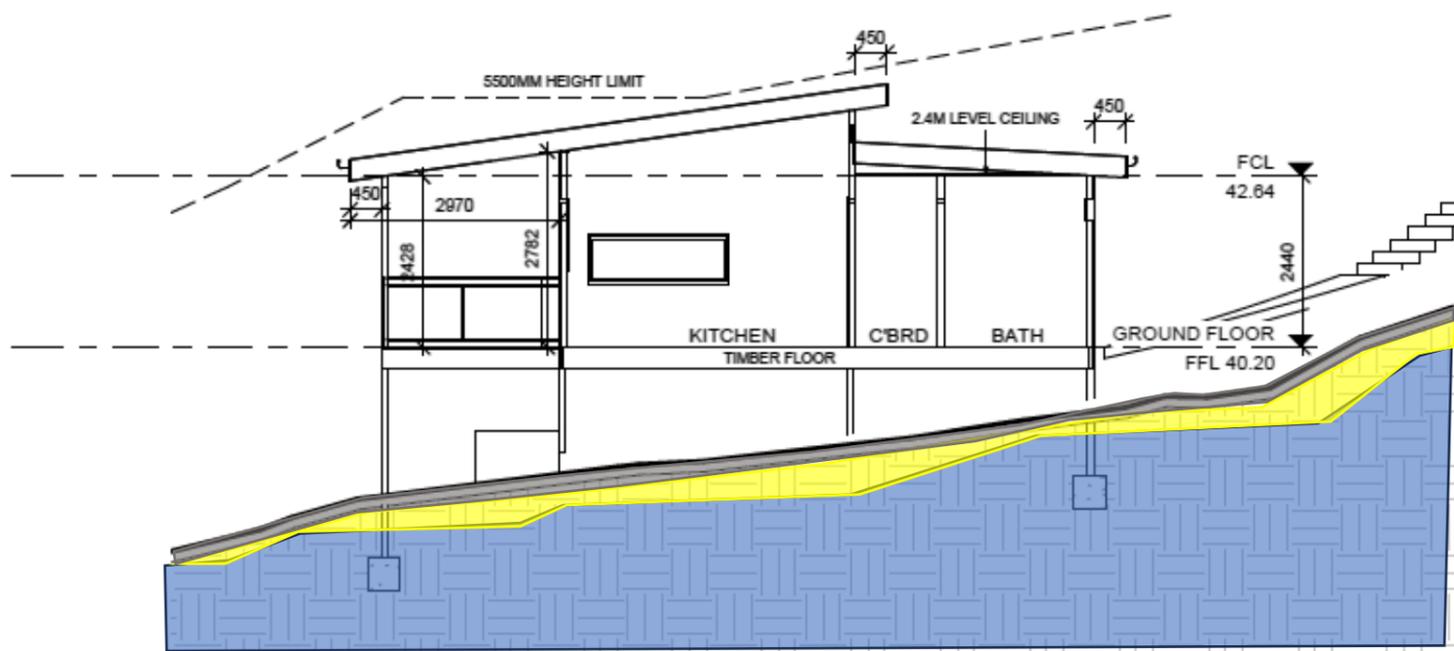
project
PROPOSED CONSTRUCTION OF A GRANNY FLAT AT 111 WOORARRA AVENUE ELANORA HEIGHTS NSW 2101 LOT 2/-DP564711

client
ALLIE GIESEN

		6/7 Parkes Street, Parramatta NSW 2150 www.rkdesigns.com.au admin@rkdesigns.com.au 02 9633 4797 abn. 68 659 200 389 spaces designed for life	
drawing	SITE AND ROOF PLAN	project no	24-46
date	01/08/24	sheet no.	1
scale @ A3	1 : 200	issue	A
checked	?		



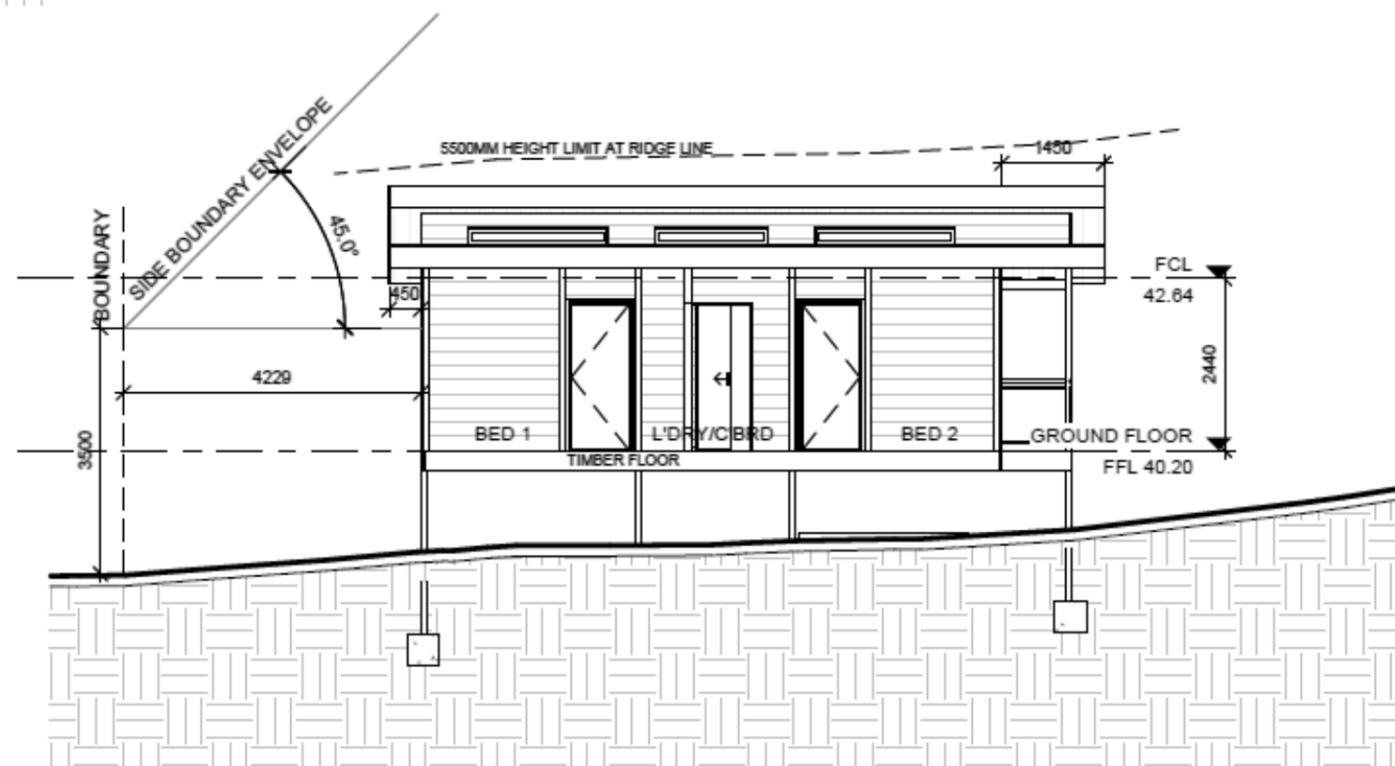
TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials



Expected Ground Materials

- Fill
- Topsoil
- Clay – Firm to Stiff
- Hawkesbury Sandstone – Medium Strength

1 SECTION A-A
1 : 100



2 SECTION B-B
1 : 100

GENERAL NOTES

- . All dimensions are to be confirmed on site by the builder/subcontractor, any incongruities must be reported to the Designer before commencement of any work.
- . No Survey has been made on the boundaries, all bearings, distances and areas have been taken from the contour survey plan. A Survey must be carried out to confirm the exact boundary locations.
- . No construction work shall commence until a site survey confirming the site boundaries has been completed. The contractor is to ensure that the boundary setbacks are confirmed and used, the boundary setbacks take precedence over all other dimensions. The Survey work must be performed by a registered Surveyor.
- . In the event of encountering any discrepancies on these drawings, specification or subsequent instructions issued, the Builder/Subcontractor shall contact the designer before proceeding further with any work.
- . All construction, control joints and expansion joints in the wall, floors, other locations shall be in strict accordance with the Structural Engineering details. No joints or breaks other than specified, are allowed without written permission from the Engineer.
- . Measurements for the fabrication of secondary components such as, windows, doors, internal frames, structural steel components and the like, are not to be taken from these documents. Measurements must be taken on site to suit the work as constructed.
- . All structural components shall be in strict accordance to details and specifications as prepared by a structural engineer.
- . All existing structures need to be examined for structural adequacy, and it is the Contractor's responsibility to ensure that a certificate of structural adequacy is available prior to the start of any work.

drawn	date	issue	description
LS	01/08/24	A	ISSUE FOR DA

project
PROPOSED CONSTRUCTION OF A GRANNY FLAT AT 111 WOORARRA AVENUE ELANORA HEIGHTS NSW 2101 LOT 21-DP564711

client
ALLIE GIESEN

Bungalow Homes

ACCREDITED BUILDING DESIGNER

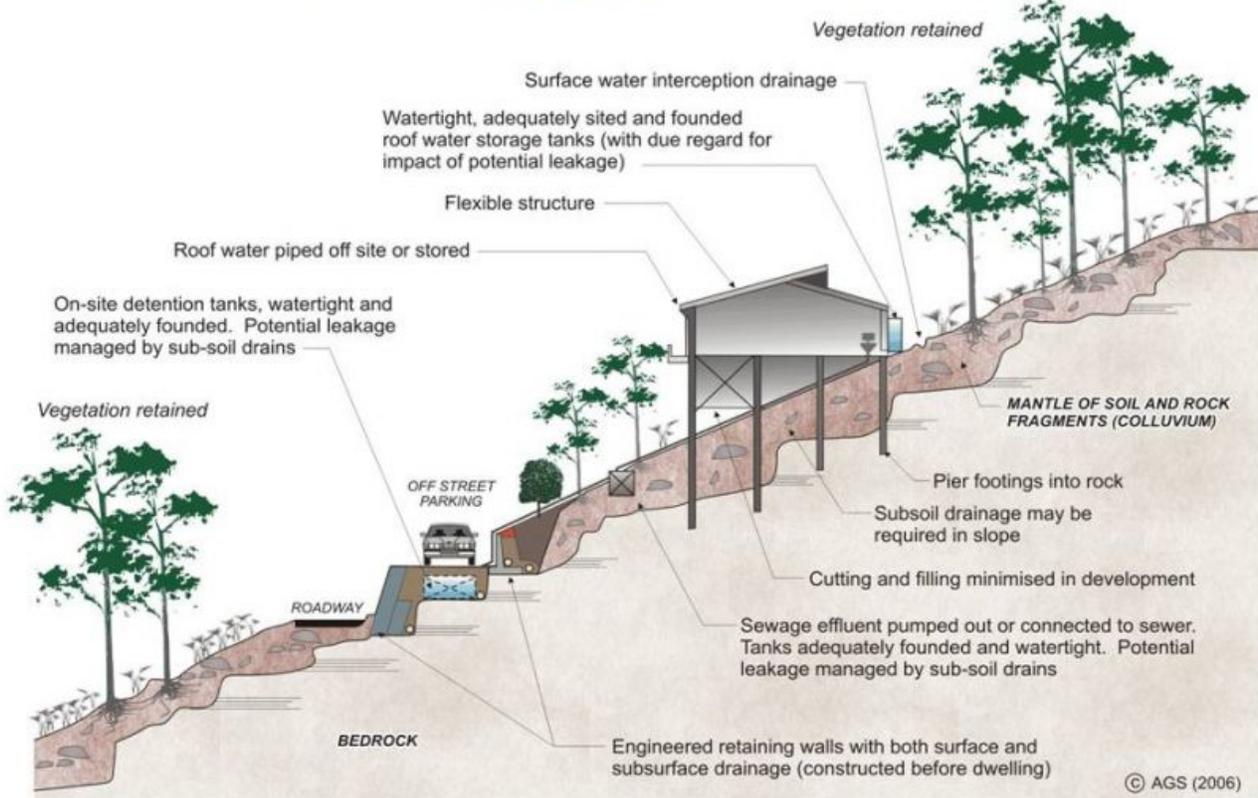
6/7 Parkes Street, Parramatta NSW 2150
 www.rkdesigns.com.au
 admin@rkdesigns.com.au
 02 9633 4797
 abn. 68 659 200 389
 spaces designed for life

true north drawing
SECTIONS

project no	date	sheet no.	scale @ A3	issue	checked
24-48	01/08/24	4	1 : 100	A	?

RK DESIGNS

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE

