

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

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

Address of site 30 Irrubel Road, Newport

*The following checklist covers the minimum requirements to be addressed in a Geotechnical Risk Declaration made by geotechnical engineer or engineering geologist or coastal engineer (where applicable) as part of a geotechnical report*

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

on this the 20/10/21 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 30 Irrubel Road, Newport  
Report Date: 20/10/21  
  
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	<b>30 Irrubel Road, Newport</b>

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 <b>30 Irrubel Road, Newport</b>
Report Date: <b>20/10/21</b>
Author: <b>BEN WHITE</b>
Author's Company/Organisation: <b>WHITE GEOTECHNICAL GROUP PTY LTD</b>

**Please mark appropriate box**

- ☒ Comprehensive site mapping conducted **12/10/21**  
(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 **12/10/21**
- ☒ 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:**

New Granny Flat at **30 Irrubel Road, Newport**

### **1. Proposed Development**

- 1.1** Construct a new granny flat near the uphill property boundary by excavating to a maximum depth of ~1.0m.
- 1.2** Details of the proposed development are shown on 5 drawings prepared by RK Designs, project number 21-89, sheets numbered 0 to 4, Issue A, dated 17/8/21.

### **2. Site Description**

- 2.1** The site was inspected on the 12<sup>th</sup> of October, 2021.
- 2.2** This residential property is on the high side of the road and has a S aspect. It is located on the gentle to moderately graded lower middle reaches of a hillslope. The natural slope rises across the property at an average angle of ~11°. The slope below the property gradually decreases in grade. The slope above the property gradually increases in grade.
- 2.3** At the road frontage, a concrete driveway runs up the slope to a garage attached to the house (Photo 1). Low rendered brick and timber retaining walls support filled garden and lawn areas beside the driveway. The single storey brick and timber clad house with garage below is supported by brick walls, brick piers and steel posts (Photos 1 & 2). The supporting walls, piers and posts stand vertical and show no significant signs of movement (Photo 3). Low timber retaining walls support the cut for the garage and a cut and fill on the uphill side of the house. A moderately sloping lawn extends off the uphill side of the house (Photos 2 & 4). A steel shed in good condition is located on the lawn. No signs of slope instability were observed on the

property. The adjoining neighbouring properties were observed to be in good order as seen from the street and subject property.

### 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.

### 4. Subsurface Investigation

One hand auger hole (AH) was put down to identify the soil materials. Two Dynamic Cone Penetrometer (DCP) tests were put down to determine the relative density of the overlying soil and the depth to weathered rock. The locations of the tests are shown on the site plan. It should be noted that a level of caution should be applied when interpreting DCP test results. The test will not pass through hard buried objects so in some instances it can be difficult to determine whether refusal has occurred on an obstruction in the profile or on the natural rock surface. This is not expected to have been an issue for this site. But due to the possibility that the actual ground conditions vary from our interpretation there should be allowances in the excavation and foundation budget to account for this. We refer to the appended "Important Information about Your Report" to further clarify. The results are as follows:

#### AUGER HOLE 1 (~RL38.6) – AH1 (Photo 6)

Depth (m)	Material Encountered
0.0 to 0.3	<b>TOPSOIL</b> , sandy soil, dark brown, damp, fine to medium grained with fine trace organic matter.
0.3 to 0.6	<b>CLAYEY SOIL</b> , brown and orange, damp.
0.6 to 0.7	<b>CLAY</b> , light orange brown, firm to stiff, damp.

End of hole @ 0.7m in firm to stiff clay. No watertable encountered.

<b>DCP TEST RESULTS – Dynamic Cone Penetrometer</b>		
Equipment: 9kg hammer, 510mm drop, conical tip.		Standard: AS1289.6.3.2 - 1997
<b>Depth(m) Blows/0.3m</b>	<b>DCP 1 (~RL37.4)</b>	<b>DCP 2 (~RL39.5)</b>
0.0 to 0.3	3	5
0.3 to 0.6	7	6
0.6 to 0.9	7	7
0.9 to 1.2	13	19
1.2 to 1.5	16	29
1.5 to 1.8	18	#
1.8 to 2.1	35	
2.1 to 2.4	#	
	End of Test @ 2.1m	End of Test @ 1.5m

#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, orange red and grey shale fragments on damp tip.

DCP2 – End of Test @ 1.5m, DCP still very slowly going down, red orange shale fragments on moist tip.

## **5. Geological Observations/Interpretation**

The natural slope materials are colluvial at the near surface and residual at depth. In the test locations, the ground materials consist of a sandy topsoil and clayey soil over firm to stiff clays. In the test locations, the clays merge into the underlying weathered rock at depths from between ~1.5m to ~2.1m below the current surface. The weathered zone of the underlying rock is interpreted as Extremely Low Strength Shale. It is to be noted that this material is a soft rock and can appear as a mottled stiff clay when it is cut up by excavation equipment. 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 in the rock.

Due to the slope and elevation of the block, the water table in the location is expected to be many metres below the base of the proposed works.

## 7. Surface Water

No evidence of surface flows were observed on the property during the inspection. It is expected that normal sheet wash will move onto the site from above the property during heavy down pours.

## 8. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed beside the property. The gentle to moderate slope that falls across the property and continues above and below is a potential hazard (Hazard One).

### Geotechnical Hazards and Risk Analysis - Risk Analysis Summary

HAZARDS	Hazard One
TYPE	The gentle to moderate slope that falls across the property and continues above and below failing and impacting on the property.
LIKELIHOOD	'Unlikely' ( $10^{-4}$ )
CONSEQUENCES TO PROPERTY	'Medium' (12%)
RISK TO PROPERTY	'Low' ( $2 \times 10^{-5}$ )
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)

## **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 Irrubel Road. All stormwater 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 ~1.0m is required to construct the proposed new granny flat. The excavation is expected to be through topsoil and clayey soil over clay.

It is envisaged that excavations through soil and clay can be carried out with an excavator and bucket.

## **12. Vibrations**

It is expected the proposed excavation will be carried out with an excavator and bucket and the vibrations produced will be below the threshold limit for building or infrastructure damage.

## **13. Excavation Support Requirements**

An excavation to a maximum depth of ~1.0m is required to construct the proposed new granny flat. Allowing for backwall drainage, the set backs are as follows:

- Flush with the W common boundary and W common boundary steel fence.
- Flush with the steel fence on the subject property, near the N common boundary.
- ~0.4m from the N common boundary and ~0.9m from the N neighbouring shed (Photo 5).

The N neighbouring shed will be outside the zone of influence of the excavation, provided the foundations supporting the shed posts are at least 0.4m below the current surface. The W and N common boundaries and steel fences will be within the zone of the excavation. In this instance, the zone of influence is the area above a theoretical 30° line through soil and a theoretical 45° line through clay from the base of the excavation towards the surrounding structures and boundaries.

If the W and N boundary steel fences are to remain, they are to be braced prior the excavation commencing.

The W and N cuts are to be permanently or temporarily supported. The shoring support is to be installed systematically as the excavation is progressed to ensure the integrity of the neighbouring properties. If the support is temporary, such as braced form ply or similar, it is to remain in place until the retaining wall is built as a sacrificial-type system. See the Site Plan attached for the minimum extent of the required shoring shown in blue.

Upslope runoff is to be diverted from the cut faces by sandbag mounds or other diversion works. The materials and labour to construct the retaining walls are to be organised so on completion of the excavation 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 distribution of lateral pressures using the parameters shown in Table 1.

**TABLE 1 ON NEXT PAGE**



**Table 1 – Likely Earth Pressures for Retaining Structures**

Unit	Earth Pressure Coefficients		
	Unit weight (kN/m <sup>3</sup> )	'Active' K <sub>a</sub>	'At Rest' K <sub>0</sub>
Topsoil, Clayey Soil	20	0.40	0.55
Residual Clays	20	0.35	0.45

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 full hydrostatic pressures are to be accounted for in the retaining structure design.

## 15. Foundations

The proposed granny flat can be supported on strip and pad footings embedded into the firm to stiff clays of the natural profile where some movement in accordance with a 'Class M' site can be tolerated. This ground material is expected at a depth of ~0.6m below the current surface. A maximum allowable bearing pressure of 200kPa can be assumed for footings on firm to stiff clay.

For better quality footings or where little movement can be tolerated piers can be taken to Extremely Low Strength Shale. This ground material is expected at depths from between ~1.5m to ~2.1m below the current surface. A maximum allowable bearing pressure of 600kPa can be assumed for footings on Extremely 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 shale and clay 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 shale or clay 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 professional 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. 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 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



Photo 6: AH1 – Downhole is from left to right.

## Important Information about Your Report

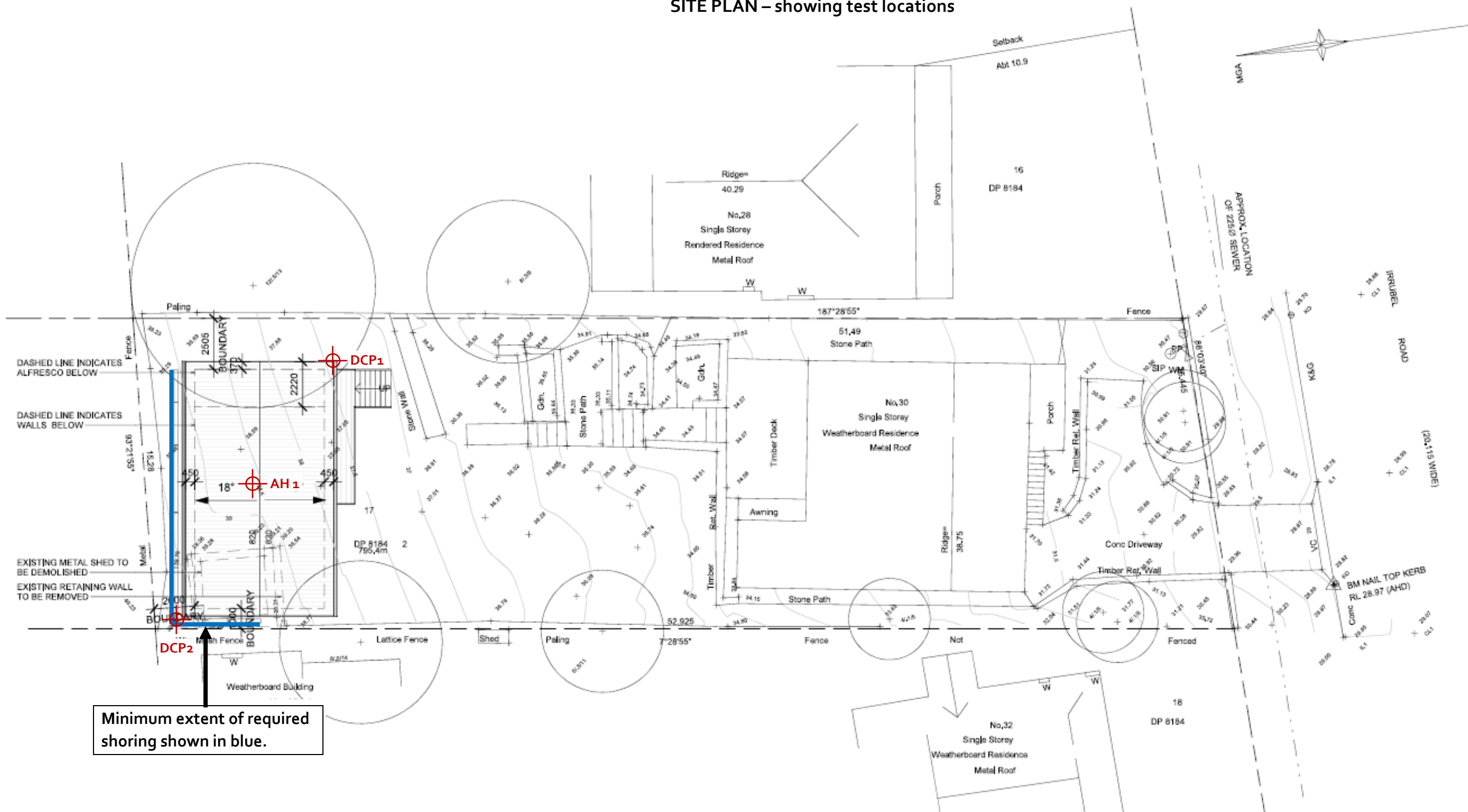
It should be noted that Geotechnical Reports are documents that build a picture of the subsurface conditions from the observation of surface features and testing carried out at specific points on the site. The spacing and location of the test points can be limited by the location of existing structures on the site or by budget and time constraints of the client. Additionally, the test themselves, although chosen for their suitability for the particular project, have their own limiting factors. The testing gives accurate information at the location of the test, within the confines of the test's capability. A geological interpretation or model is developed by joining these test points using all available data and drawing on previous experience of the geotechnical consultant. Even the most experienced practitioners cannot determine every possible feature or change that may lie below the earth. All of the subsurface features can only be known when they are revealed by excavation. As such, a Geotechnical report can be considered an interpretive document. It is based on factual data but also on opinion and judgement that comes with a level of uncertainty. This information is provided to help explain the nature and limitations of your report.

With this in mind, the following points are to be noted:

- If upon the commencement of the works the subsurface ground or ground water conditions prove different from those described in this report, it is advisable to contact White Geotechnical Group immediately, as problems relating to the ground works phase of construction are far easier and less costly to overcome if they are addressed early.
- If this report is used by other professionals during the design or construction process, any questions should be directed to White Geotechnical Group as only we understand the full methodology behind the report's conclusions.
- The report addresses issues relating to your specific design and site. If the proposed project design changes, aspects of the report may no longer apply. Contact White Geotechnical if this occurs.
- This report should not be applied to any other project other than that outlined in section 1.0.
- This report is to be read in full and should not have sections removed or included in other documents as this can result in misinterpretation of the data by others.
- It is common for the design and construction process to be adapted as it progresses (sometimes to suit the previous experience of the contractors involved). If alternative design and construction processes are required to those described in this report, contact White Geotechnical Group. We are familiar with a variety of techniques to reduce risk and can advise if your proposed methods are suitable for the site conditions.



# SITE PLAN – showing test locations



## 1 SITE AND ROOF PLAN 1 : 200

PRELIMINARY  
DO NOT USE FOR CONSTRUCTION



**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	amendment
LS	17/08/21	A	ISSUE FOR DA

project  
**PROPOSED CONSTRUCTION OF A GRANNY FLAT AT 30 IRRUBEL ROAD, NEWPORT 2106 LOT 17 DP 8184.**

client  
**FLEUR MCNICOL**



true north



drawing  
**SITE AND ROOF PLAN**

project no	date	sheet no.	scale @ A3	issue	drawn
21-89	17/08/21	1	1 : 200	A	RK

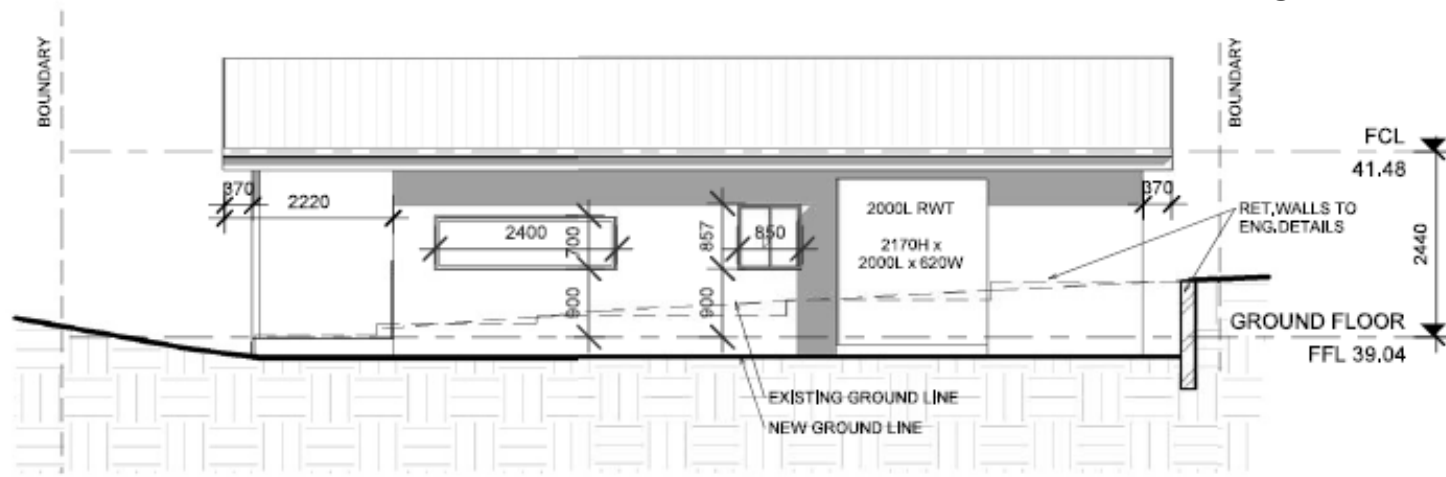


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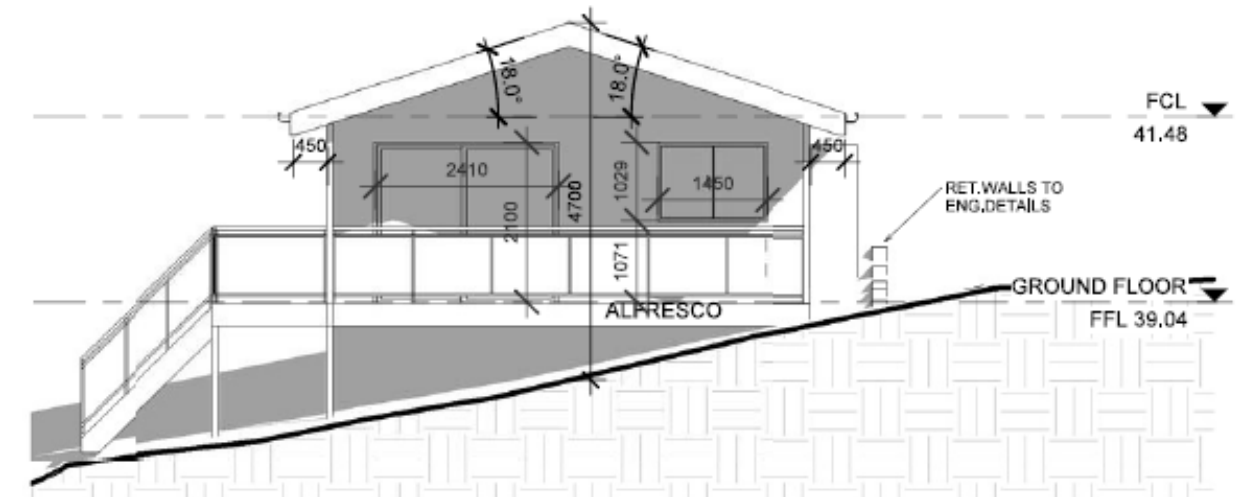
**RK  
DESIGNS**



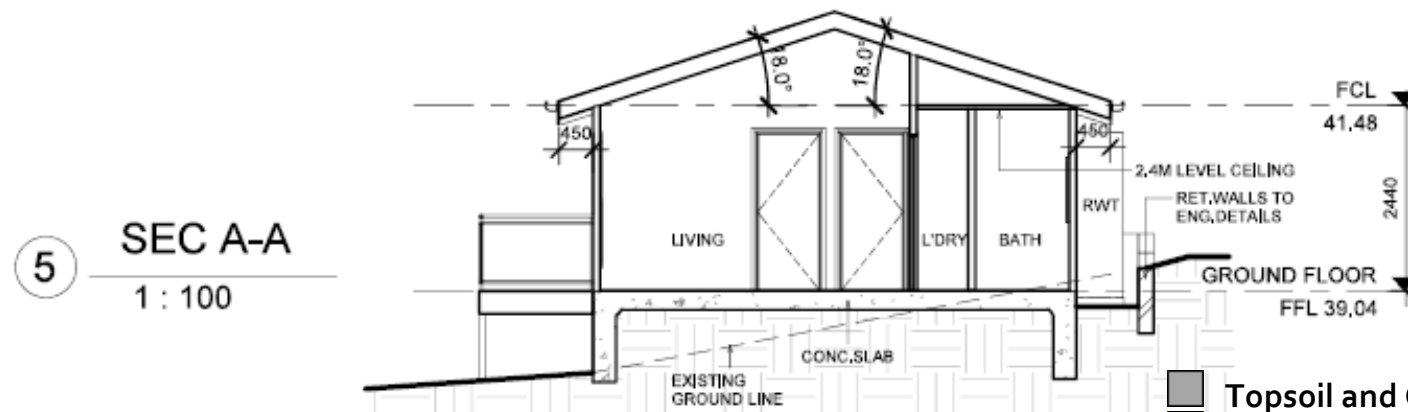
# TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials



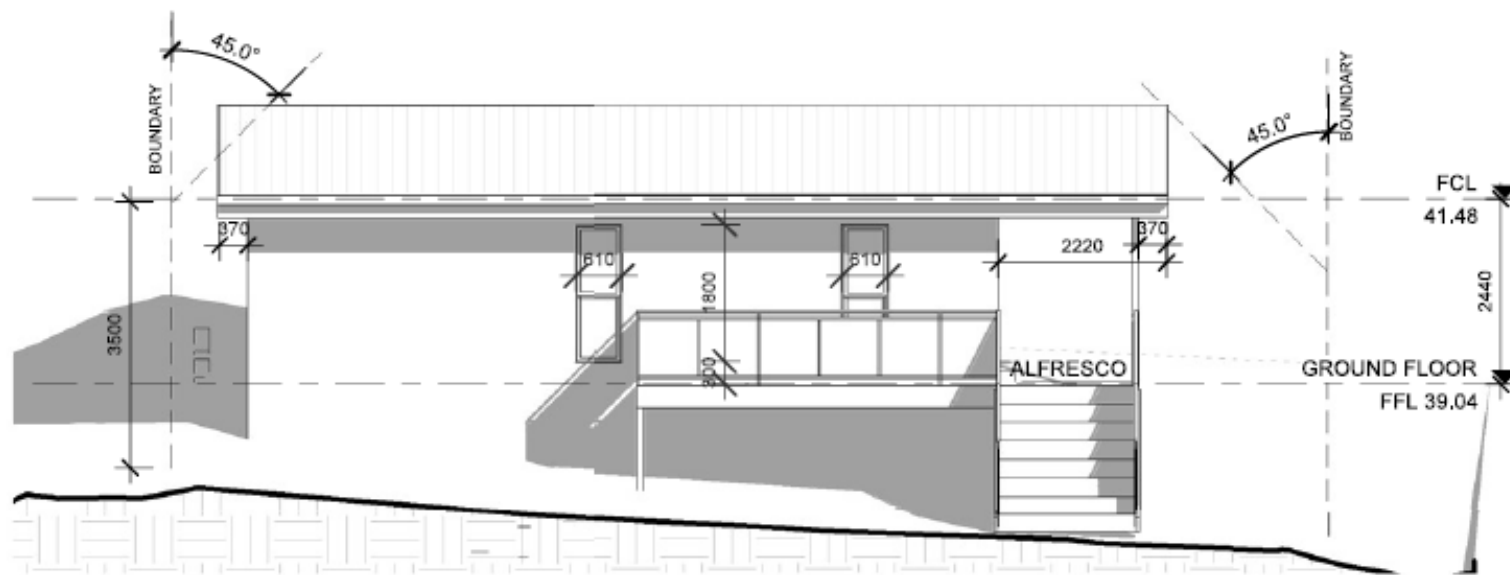
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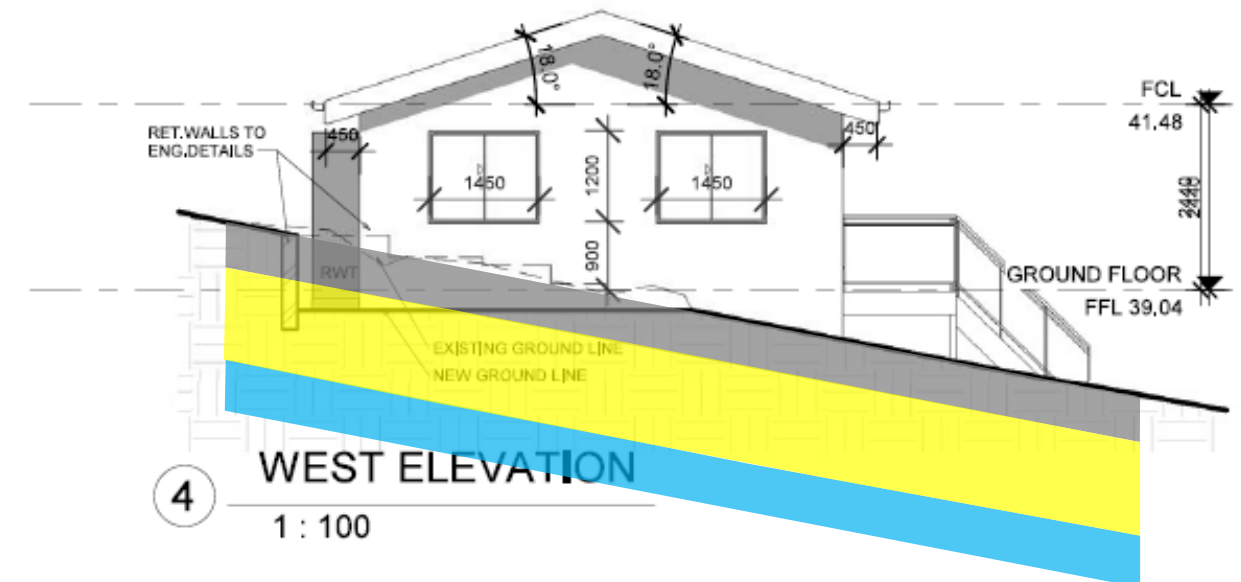
2 EAST ELEVATION  
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5 SEC A-A  
1 : 100



3 SOUTH ELEVATION  
1 : 100



4 WEST ELEVATION  
1 : 100

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

**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.  
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 . 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	amendment
LS	17/08/21	A	ISSUE FOR DA

project  
 PROPOSED CONSTRUCTION OF A GRANNY FLAT AT 30 IRRUBEL ROAD, NEWPORT 2106 LOT 17 DP 8184.

**bdad**  
 ACCREDITED  
 BUILDING DESIGNER

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 spaces designed for life

client  
 FLEUR MCNICOL

true north

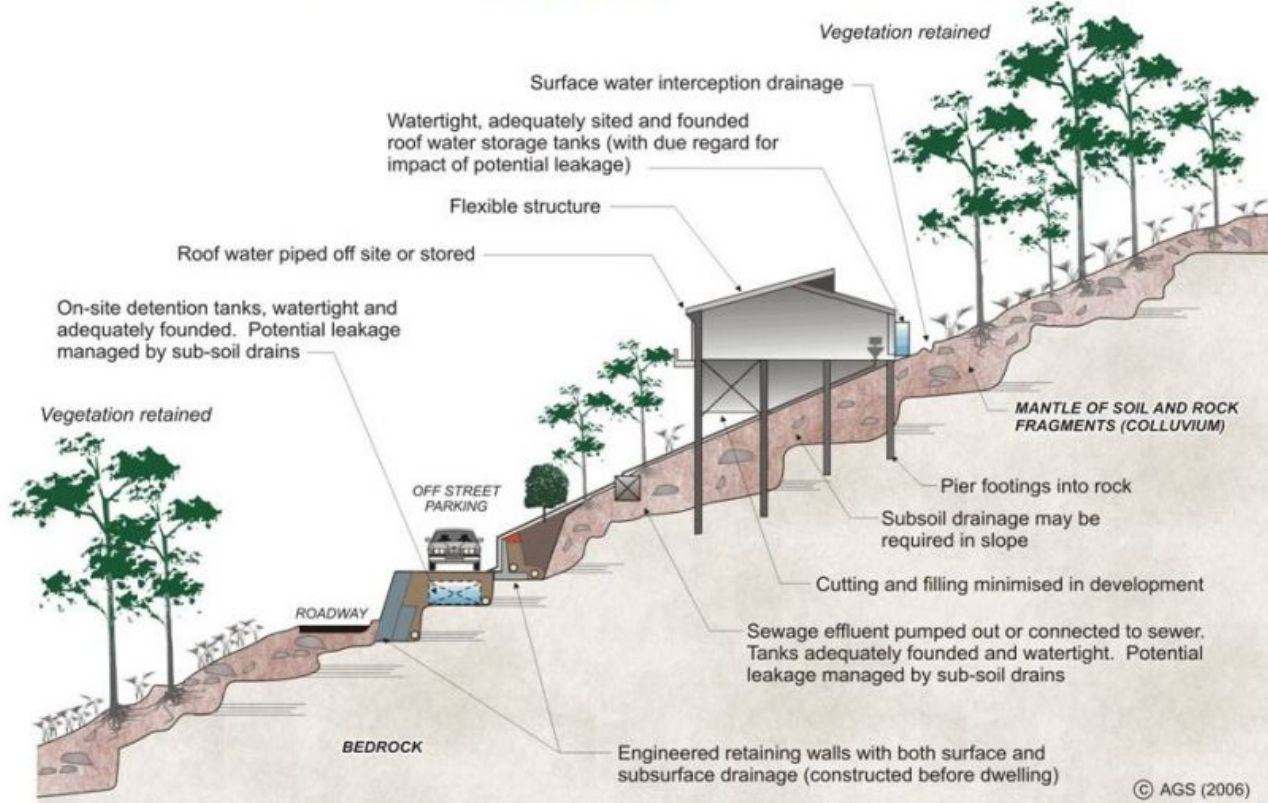
drawing  
 ELEVATIONS AND SECTIONS

project no	date	sheet no.	scale @ A3	issue	drawn
21-89	17/08/21	3	1 : 100	A	RK

**Bungalow Homes**

**RK**  
 DESIGNS

# EXAMPLES OF **GOOD** HILLSIDE PRACTICE



# EXAMPLES OF **POOR** HILLSIDE PRACTICE

