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

Development Application for _____
Name of Applicant

Address of site 23 Park Avenue, 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 28/9/21 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 **23 Park Avenue, Avalon Beach**
Report Date: 28/9/21

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 23 Park Avenue, 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 **23 Park Avenue, Avalon Beach**

Report Date: 28/9/21

Author: BEN WHITE

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

Please mark appropriate box

☒ Comprehensive site mapping conducted **17/9/21**
(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 **17/9/21**

☒ Geotechnical model developed and reported as an inferred subsurface type-section

☒ Geotechnical hazards identified
- ☐ Above the site
- ☒ On the site
- ☒ Below the site
- ☐ Beside the site

☒ Geotechnical hazards described and reported

☒ Risk assessment conducted in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009
- ☒ Consequence analysis
- ☒ Frequency analysis

☒ Risk calculation

☒ Risk assessment for property conducted in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009

☒ Risk assessment for loss of life conducted in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009

☒ Assessed risks have been compared to "Acceptable Risk Management" criteria as defined in the Geotechnical Risk Management Policy for Pittwater - 2009

☒ Opinion has been provided that the design can achieve the "Acceptable Risk Management" criteria provided that the specified conditions are achieved.

☒ Design Life Adopted:
- ☒ 100 years
- ☐ Other _____
specify

☒ Geotechnical Conditions to be applied to all four phases as described in the Geotechnical Risk Management Policy for Pittwater - 2009 have been specified

☒ Additional action to remove risk where reasonable and practical have been identified and included in the report.

☐ Risk assessment within Bushfire Asset Protection Zone.

I am aware that Pittwater Council will rely on the Geotechnical Report, to which this checklist applies, as the basis for ensuring that the geotechnical risk management aspects of the proposal have been adequately addressed to achieve an "Acceptable Risk Management" level for the life of the structure, taken as at least 100 years unless otherwise stated, and justified in the Report and that reasonable and practical measures have been identified to remove foreseeable risk.

Signature 

Name Ben White

Chartered Professional Status MScGEOLAusIMM CP GEOL

Membership No. 222757

Company White Geotechnical Group Pty Ltd

GEOTECHNICAL INVESTIGATION:

Alterations and Additions at **23 Park Avenue, Avalon Beach**

1. Proposed Development

1.1 Construct a new upper level over the existing footprint of the house.

1.2 Construct a ground floor extension on the uphill side of the house.

1.3 Various other internal and external alterations and additions.

1.4 Details of the proposed development are shown on 8 drawings by JJ Drafting, project number 923/21, drawings numbered DA.01 to DA.8, dated July 2021.

2. Site Description

2.1 The site was inspected on the 17th September, 2021.

2.2 This residential property is on the high side of the road and has a SW aspect. It is located on the gently graded upper reaches and crest of a NW-SE trending ridgeline. The slope rises to the house then falls across the property at angles averaging ~5°. The slope below continues at increasing angles and the slope above levels at the crest of the ridgeline.

2.3 At the road frontage, a gravel driveway runs across the slope to a timber framed carport on the uphill side of the property (Photo 1). The part two-storey brick and timber clad house is supported on brick walls and brick piers. The brick walls show no significant signs of movement and the brick piers stand vertical (Photo 2). Some of the supporting piers were observed to be supported directly onto outcropping Medium Strength Sandstone (Photo 3). A gently sloping lawn extends from the downhill side of the house to the lower common boundary (Photo 4). Sandstone can be seen outcropping through the slope in several places (Photo 5).

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. A band of Medium Strength Sandstone underlies the location of the proposed works and extends through the otherwise shale-dominated profile.

4. Subsurface Investigation

One hand Auger Hole (AH) was put down to identify the ground materials. Four 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 (~RL37.8) **–** AH1 (Photo 6)

Depth (m)	Material Encountered
0.0 to 0.15	**SILTY SOIL**, dark brown, orange, grey, fine to coarse grained, loose to medium dense, dry.
0.15 to 0.3	**CLAYEY SAND**, brown, rock fragments, fine to medium grained, medium dense, dry.

Refusal on rock @ 0.3m. 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** (~RL37.8)	**DCP 2** (~RL38.5)	**DCP 3** (~RL38.9)	**DCP 4** (~RL39.9)
0.0 to 0.3	6	11	5	8
0.3 to 0.6	#	13	16	10
0.6 to 0.9		21	#	#
0.9 to 1.2		#		
	Refusal on Rock @ 0.3m	Refusal on Rock @ 0.9m	Refusal on Rock @ 0.6m	Refusal on Rock @ 0.4m

#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 @ 0.3m, DCP bouncing off rock surface, white impact dust on dry tip.
DCP2 – Refusal on rock @ 0.9m, DCP bouncing off rock surface, orange and white impact dust on dry tip.
DCP3 – Refusal on rock @ 0.6m, DCP bouncing off rock surface, orange clay on dry tip.
DCP4 – Refusal on rock @ 0.4m, DCP bouncing off rock surface, white impact on dry tip.

5. Geological Observations/Interpretation

Sandstone bedrock outcrops under the house and through the slope below the property. This is an unusually thick sandstone bed within the Narrabeen Group of rocks. The rock is overlain by silty soils and clayey sands that fill the bench-step formation. In the test locations, the depth to Medium Strength Sandstone ranged between 0.3 to 0.9m below the current surface, being deeper due to the stepped nature of the underlying bedrock. The sandstone underlying the area of the proposed development is estimated to be medium strength. 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 area of the proposed works.

7. Surface Water

No evidence of surface flows were observed on the property during the inspection. As the property encompasses the crest of the hill, any surface flows will be generated on the property and will flow away from the property.

8. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed above or beside the property. The gently graded land surface that falls across the property and continues below is a potential hazard (**Hazard One**).

Risk Analysis Summary

HAZARDS	Hazard One
TYPE	The gentle slope that falls across the property and continues below failing and impacting on the proposed works.
LIKELIHOOD	'Unlikely' (10^{-4})
CONSEQUENCES TO PROPERTY	'low' (5%)
RISK TO PROPERTY	'Low' (2×10^{-5})
RISK TO LIFE	5.5×10^{-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 roofing of the proposed works adds less than ~50m^2 to the current roof area so it is possible the existing stormwater system can be used with the approval of the stormwater engineer.

11. Excavations

Apart from those for footings, no excavations are required.

12. Foundations

Any additional footings required for the proposed works are to be supported on pads or piers taken to Medium Strength Sandstone. This material is expected at depths of between ~0.4m and ~0.9m below the current surface.

A maximum allowable bearing pressure of 600kPa 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.

13. Geotechnical Review

The structural plans are to be checked and certified by the geotechnical engineer as being in accordance with the geotechnical recommendations. On completion, a Form 2B will be issued. This form is required for the Construction Certificate to proceed.

14. Inspection

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

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

White Geotechnical Group Pty Ltd.

Ben White M.Sc. Geol.,
AusIMM., CP GEOL.
No. 222757
Engineering Geologist.

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6 (Top is top of hole)

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.

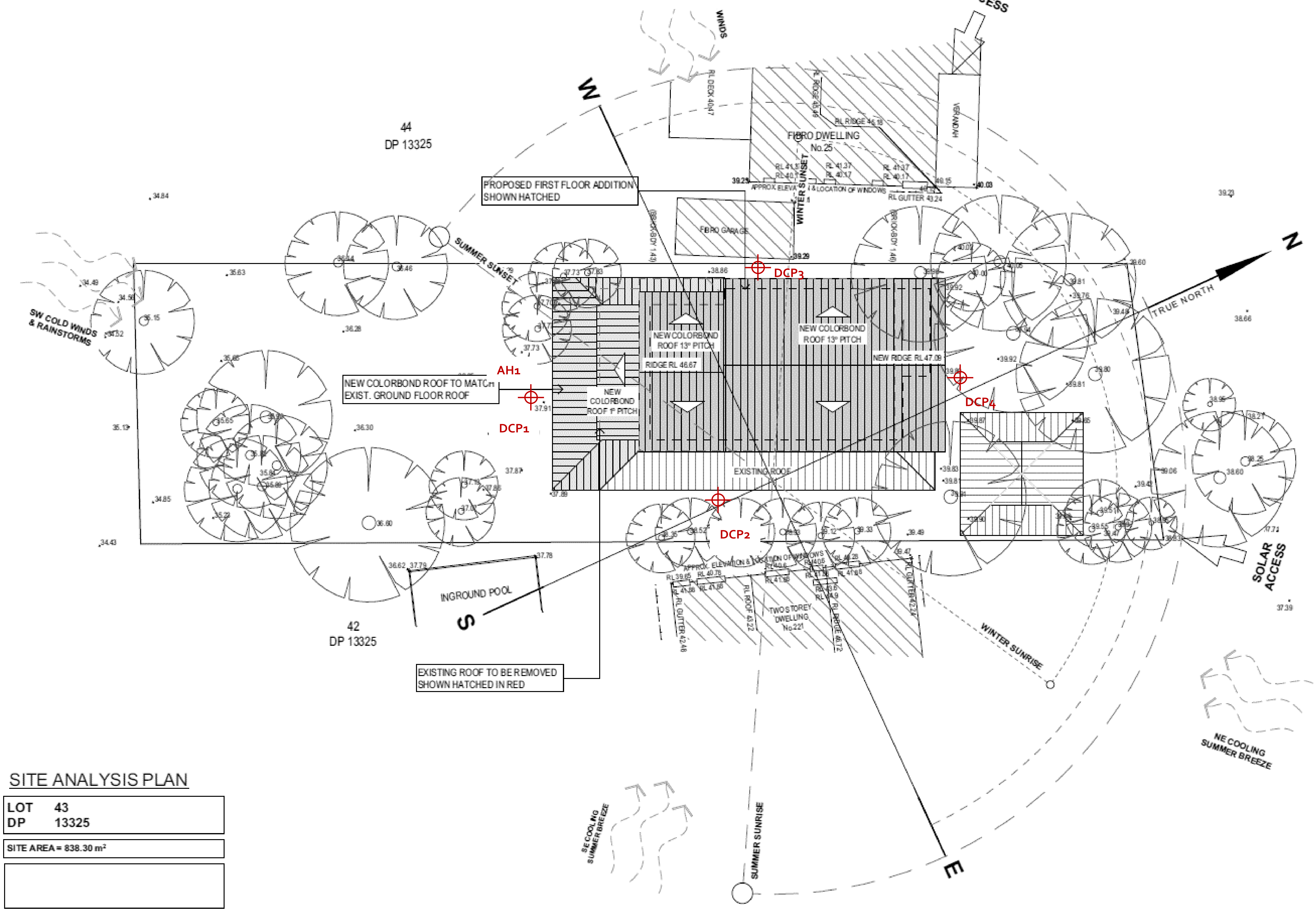
- The report addresses issues relating to your specific design and site. If the proposed project design changes, aspects of the report may no longer apply. Contact White Geotechnical if this occurs.

- 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 ANALYSIS PLAN

LOT 43
DP 13325

SITE AREA = 838.30 m²

TRUE NORTH:

NOTES: (E & OE)
- All structures including stormwater & drainage to engineer's details.
- Do not obtain dimensions by scaling drawings.
- All dimensions are to be checked on site prior to starting work.
- These drawings are to be read in conjunction with all other consultant's drawings and specifications.
- All workmanship & materials shall be in accordance with the requirements of current editions including amendments of the National Construction Code, relevant Australian Standards & local council requirements.
- New materials are to be used throughout unless otherwise noted.
- Concrete footings, slab, structural beams or any other structural members are to be designed by a practicing engineer.

JJ Drafting
26/90 Mona Vale Road, Mona Vale, NSW, 2103
PO Box 687, Dee Why, NSW, 2099
Mob. 0414 717 541
Email. jjdraft@tpg.com.au
www.jjdrafting.com.au

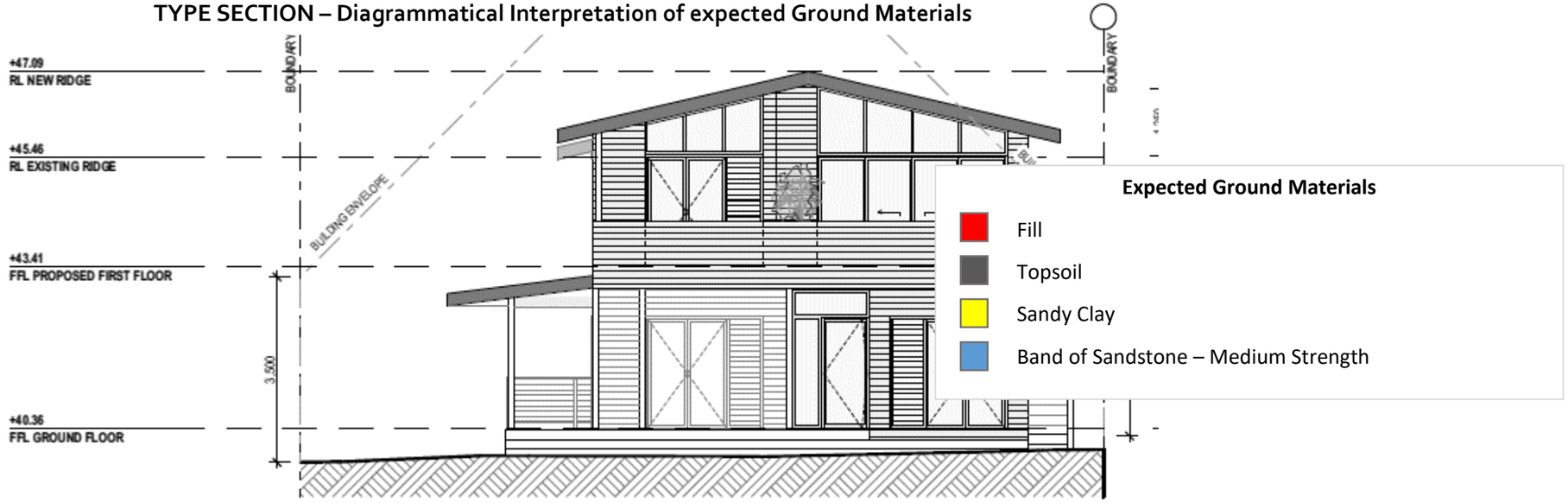
REV:	DATE:	DESCRIPTION:
A	30.07.21	PRELIM. DRAWINGS CONCEPT AMENDED

PROJECT DETAILS:
PROPOSED ALTERATIONS AND ADDITIONS
23 Park Avenue - Avalon Beach NSW 2107

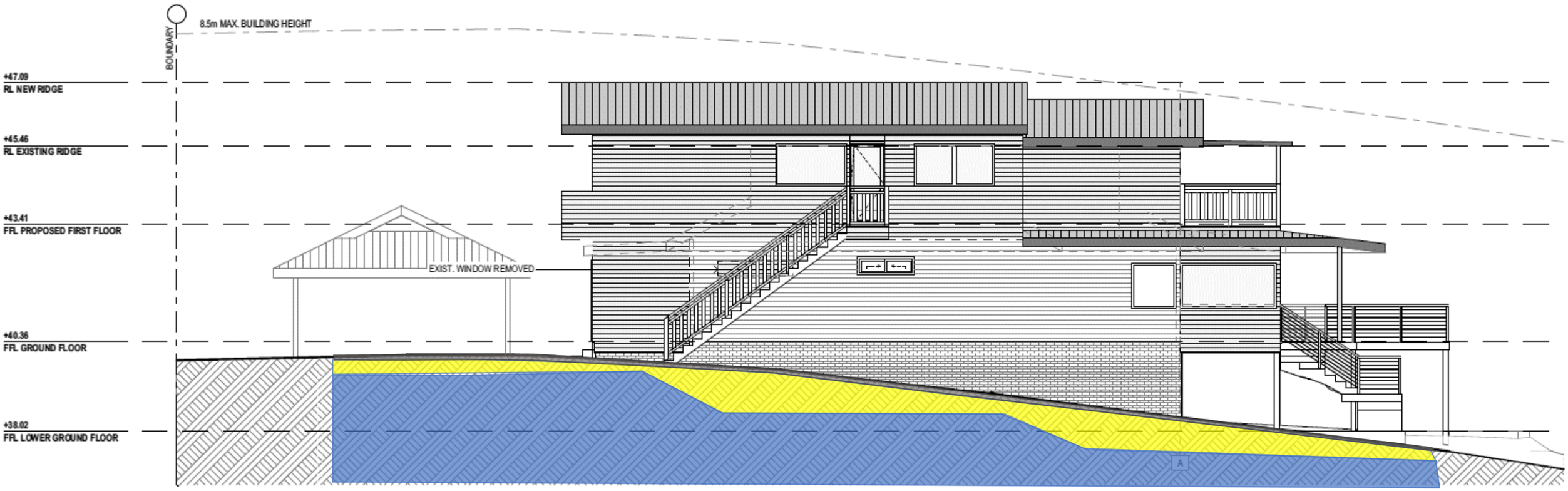
DRAWING TITLE:
SITE ANALYSIS PLAN

DATE:	DRAWN BY:	SCALE:
JULY/21	LB	1:200 @ A3
JOB No:	**CHECKED BY:**	**DRAWING No:**
923/21	JJ	DA.01

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials



NORTH ELEVATION



WEST ELEVATION

NOTES (E & OE)
- All structures including stormwater & drainage to engineer's details.
- Do not obtain dimensions by scaling drawings.
- All dimensions are to be checked on site prior to starting work.
- These drawings are to be read in conjunction with all other consultant's drawings and specifications.
- All workmanship & materials shall be in accordance with the requirements of current editions including amendments of the National Construction Code, relevant Australian Standards & local council requirements.
- New materials are to be used throughout unless otherwise noted.
- Concrete footings, slab, structural beams or any other structural members are to be designed by a practicing engineer.

JJ Drafting
174 Garden St, North Narrabeen, NSW, 2101
PO Box 687, Dee Why, NSW, 2099
Mob. 0414 717 541
Email. jjdrafts@tpg.com.au
www.jjdrafting.com.au

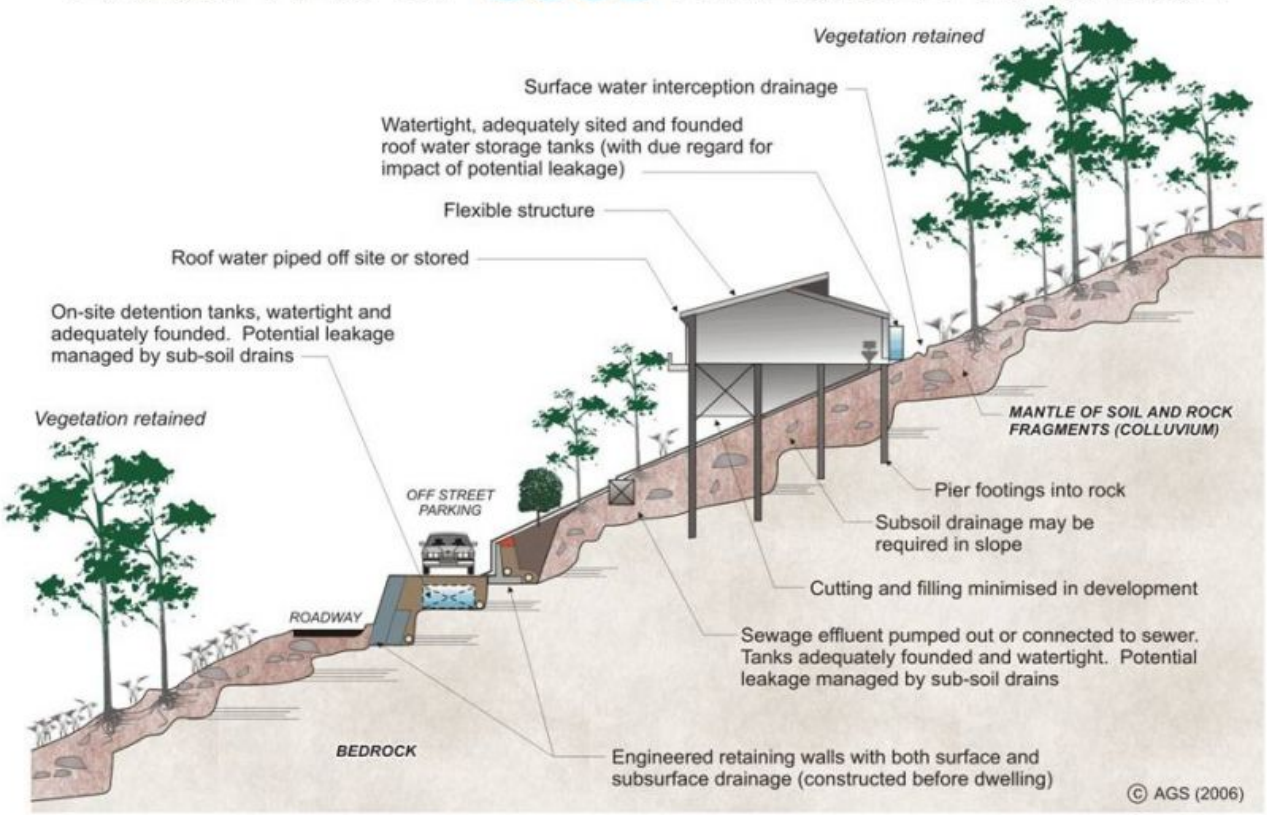
REV:	DATE:	DESCRIPTION:
A	30.07.21	PRELIM. DRAWINGS CONCEPT AMENDED

PROJECT DETAILS:
PROPOSED ALTERATIONS AND ADDITIONS
23 Park Avenue - Avalon Beach NSW 2107

DRAWING TITLE:
NORTH AND WEST ELEVATIONS

DATE:	DRAWN BY:	SCALE:
JULY/21	LB	1:100 @ A3
JOB No:	CHECKED BY:	DRAWING No:
923/21	JJ	DA.07

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE