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

Development Application for _____
Name of Applicant

Address of site 37 Daly Street, Bilgola

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 9/6/21 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 **37 Daly Street, Bilgola**

Report Date: 9/6/21

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 37 Daly Street, Bilgola

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 **37 Daly Street, Bilgola**

Report Date: 9/6/21

Author: BEN WHITE

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

Please mark appropriate box

- ☒ Comprehensive site mapping conducted **26/3/21** (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 **26/3/21**
- ☒ 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 **37 Daly Street, Bilgola Plateau**

1. Proposed Development

1.1 Construct new lower floor extension on the downhill side of the house by excavating to a maximum depth of ~2.0m into the slope.

1.2 Demolish existing deck on the downhill side of the house and replace with a new deck in the same location.

1.3 Various other internal and external alterations.

1.4 Details of the proposed development are shown on 14 drawings prepared by Natalie Matthews, project number 2101, Issue A, drawings numbered DA00, DA01, DA10-DA13, DA20-DA23, DA30, DA31, DA40, and DA50, dated 6/6/21.

2. Site Description

2.1 The site was inspected on the 26th March, 2021.

2.2 This residential property is on the high side of the road and has a E aspect. It is located on the moderate to gently graded upper reaches of a hillslope. The natural slope rises across the property at an average angle of ~10°. The slopes above and below the property continue at moderate angles.

2.3 At the road frontage, a concrete driveway runs up the slope to a brick garage at the S side of the house (Photo 1). The garage has been cut into the slope. The cut for the garage is supported by a stable concrete block retaining wall (Photo 2). Along the driveway, between the road frontage and the garage, a ~1.0m high sandstone block retaining wall supports a cut for an additional parking area (Photo 3). A timber deck and pool extend off the downhill side of the house. The deck is supported on

wooden posts (Photo 4). The pool is cut directly into the slope. A part three-storey brick and timber framed and clad house is supported on brick walls and brick piers (Photo 5). The house displays no significant signs of movement in the external supporting walls. Access to the foundation space was unavailable at the time of inspection. The brick piers supporting the deck on the downhill side of the house stand vertical and are to be removed as part of the proposed works. The cut for the levelled terrace on the uphill side of the house is supported by a stable rendered brick retaining wall, ~0.6m high (Photo 6). A gently sloping garden continues to the upper common boundary. A ~2.5m high brick retaining wall lines the upper boundary and supports a fill for the neighbouring property above (Photo 7). A vertical tension crack reaching a maximum width of ~4cm runs up the return of the wall immediately behind the downhill face (Photo 8). The face of the wall is covered in creeper and was unable to be assessed adequately during our inspection. See **Section 16** for recommendations regarding this wall.

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

Four 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:

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** (~RL129.7)	**DCP 2** (~RL130.5)	**DCP 3** (~RL132.7)	**DCP 4** (~RL131.8)
0.0 to 0.3	9	4	3F	3F
0.3 to 0.6	9	30	2F	2F
0.6 to 0.9	12	#	12	12
0.9 to 1.2	16		11	15F
1.2 to 1.5	35		22	31
1.5 to 1.8	#		46	#
1.8 to 2.1			#	
	Refusal on Rock @ 1.4m	Refusal on Rock @ 0.4m	End of Test @ 1.8m	Refusal on Rock @ 1.4m

#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 @ 1.4m, DCP bouncing off rock surface, clean dry tip, yellow and grey sand in collar.
DCP2 – Refusal on rock @ 0.4m, DCP bouncing off rock surface, white clayey sand on wet tip.
DCP3 – End of test @ 1.8m, DCP still very slowly going down, orange clayey sand on wet tip, grey sand in collar.
DCP4 – Refusal on rock @ 1.4m, DCP bouncing off rock surface, Red sand on wet tip.

5. Geological Observations/Interpretation

The surface features of the block are controlled by the underlying sandstone bedrock that steps up 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. The rock is overlain by sandy soils over clayey sands that fill the bench step formation. Filling has been placed above and below the house for minor landscaping. In the test locations, the depth to rock ranged between 0.4 to 1.8m below the current surface, being

slightly deeper due to the presence of fill and due to the stepped nature of the underlying bedrock. As the DCP was bouncing at the end of three of the four tests, Medium Strength Rock is expected to underlie the entire site. 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 excavation.

7. Surface Water

Surface flows were observed on the property during the inspection, especially near the drainage easement. Normal sheet wash will move onto the site from the slope above during heavy down pours.

8. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed beside the property. The moderately graded slope that rises across the property and continues above and below at similar angles is a potential hazard (**Hazard One**). The vibrations from the proposed excavation are a potential hazard (**Hazard Two**). The proposed excavations are a potential hazard until retaining walls are in place (**Hazard Three**). The proposed excavations undercutting the footings for the house is a potential hazard (**Hazard Four**). The retaining wall lining the upper boundary of the property is a potential hazard (**Hazard Five**).

RISK ANALYSIS SUMMARY IS ON THE NEXT PAGE

Risk Analysis Summary

HAZARDS	Hazard One	Hazard Two	Hazard Three
TYPE	The moderately graded slope that rises across the property that continues above and below falling and impacting the proposed works.	The vibrations produced during the proposed excavation impacting on the surrounding structures.	The excavations (up to a depth of ~2.0m) collapsing onto the work site before retaining walls are in place.
LIKELIHOOD	'Unlikely' (10^{-4})	'Possible' (10^{-3})	'Possible' (10^{-3})
CONSEQUENCES TO PROPERTY	'Medium' (12%)	'Medium' (15%)	'Medium' (25%)
RISK TO PROPERTY	'Low' (2×10^{-5})	'Moderate' (2×10^{-4})	'Moderate' (2×10^{-4})
RISK TO LIFE	9.1×10^{-7}/annum	5.3×10^{-7}/annum	5.9×10^{-5}/annum
COMMENTS	This level of risk is 'ACCEPTABLE'.	This level of risk to life and property is 'UNACCEPTABLE'. To move risk to 'ACCEPTABLE' levels, the recommendations in **Section 12** are to be followed.	This level of risk to life and property is 'UNACCEPTABLE'. To move risk to 'ACCEPTABLE' levels, the recommendations in **Section 13** are to be followed.

RISK ANALYSIS SUMMARY CONTINUED ON NEXT PAGE

HAZARDS	Hazard Four	Hazard Five
TYPE	The proposed excavations undercutting the footings of the house causing failure.	Further movement or cracking of the brick retaining wall above the house that causes failure.
LIKELIHOOD	'Possible' (10^{-3})	'Likely' (10^{-2})
CONSEQUENCES TO PROPERTY	'Medium' (35%)	'Medium' (15%)
RISK TO PROPERTY	'Moderate' (2×10^{-4})	'High' (2×10^{-3})
RISK TO LIFE	5.3×10^{-5}/annum	1.3×10^{-5}/annum
COMMENTS	This level of risk to life and property is 'UNACCEPTABLE'. To move risk 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 to 'ACCEPTABLE' levels, the recommendations in **Section 16** 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

The fall is to Daly Street. Roof water from the 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 ~2.0m is required to construct the lower floor extension. The excavation is expected to be through soil and medium dense clayey sands. Low to Medium Strength Sandstone may be encountered near the base of the excavation.

It is envisaged that excavations through sandy soil and clayey soil can be carried out with a bucket and excavations through Low to Medium Strength Rock will require grinding or rock sawing and breaking.

12. Vibrations

Possible vibrations generated during excavations through sandy soils and sandy clays will be below the threshold limit for building damage.

It is expected that the base of the excavation may be through Low to Medium Strength Sandstone. Excavations through rock should be carried out to minimise the potential to cause vibration damage to the subject house and N neighbouring house. The subject house will be flush with the proposed excavation. The N neighbouring house will be as close as ~7.0m from the edge of the excavation.

Close controls by the contractor over rock excavation are recommended so excessive vibrations are not generated.

Excavation methods are to be used that limit peak particle velocity to 5mm/sec at the property boundaries. Vibration monitoring will be required to verify this is achieved. The vibration monitoring equipment must include a light/alarm so the operator knows if vibration limits have been exceeded. It also must log and record vibrations throughout the excavation works.

In rock up to Low Strength we expect a machine up to 20 tonnes with a bucket only will be capable to remove the material. Vibrations from this type of equipment are expected to be below the threshold limit outlined.

In Medium Strength Rock or better techniques to minimise vibration transmission will be required. These include:

- Rock sawing the excavation perimeter to at least 1.0m deep prior to any rock breaking with hammers, keeping the saw cuts below the rock to be broken throughout the excavation process.
- Limiting rock hammer size.
- Rock hammering in short bursts so vibrations do not amplify.
- Rock breaking with the hammer angled away from the nearby sensitive structures.
- Creating additional saw breaks in the rock where vibration limits are exceeded.

13. Excavation Support Requirements

The excavation will come close to flush with the supporting brick walls and piers of the subject house. Given the relatively shallow rock encountered during the ground testing results, it is possible that the walls of the house are supported on Medium Strength Rock. However, to be sure, exploration pits along the wall will need to be put down by the builder to determine the foundation depth and material. These are to be inspected by the geotechnical consultant.

If the foundations are found to be supported on rock, the excavation may commence. If they are not, the foundations will need to be underpinned prior to the excavation commencing.

Underpinning is to follow the underpinning sequence 'hit one miss two'. Under no circumstances is the bulk excavation to be taken to the edges of the walls/piers and then underpinned. Underpins are to be constructed from drives that should not exceed 0.6m in width along the supporting walls of the house. Allowances are to be made for drainage through the underpinning to prevent a build-up of hydrostatic pressure. Underpins that are not designed as retaining walls are to be supported by retaining walls. The void between the retaining walls and the underpinning is to be filled with free-draining material such as gravel.

Where the subject house falls over the footprint of the proposed excavation, the house is to be propped and supported with beams as necessary prior to the excavation through rock commencing.

During the excavation process, the geotechnical consultant is to inspect the excavation as it approaches to not less than 0.7m from the supporting walls of the house to confirm the stability of the cut to go flush with the footings.

Additionally, during the excavation process, the geotechnical consultant is to inspect the excavation as it is lowered to intervals of ~1.5m to ensure the ground materials are as expected and that no wedges or other geological defects are present that could require additional support. Should additional ground support be required, this will likely involve the use of mesh, sprayed concrete, and rock bolts.

Upon completion of the excavation, it is recommended the cut face be supported with retaining walls to prevent any potential future movement of joint blocks in the cut faces that can occur over time, when unfavourable jointing is obscured behind the excavation faces. Additionally, retaining walls will help control seepage and to prevent minor erosion and sediment movement.

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

14. Retaining Walls

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

TABLE 1 ON THE NEXT PAGE

Table 1 – Likely Earth Pressures for Retaining Walls

Unit	Earth Pressure Coefficients		
	Unit weight (kN/m^3)	'Active' K_a	'At Rest' K_0
Fill, Sandy Soil, and Residual Clay	20	0.40	0.55
Rock Up to Low Strength Rock - Jointed	24	0.25	0.35
Medium Strength Sandstone	24	0.00	0.10

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 walls are fully drained. Rock strength and relevant earth pressure coefficients are to be confirmed on site by the geotechnical consultant.

All retaining walls are to have sufficient back-wall drainage and be backfilled immediately behind the wall 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 walls, the likely hydrostatic pressures are to be accounted for in the structural design.

15. Foundations

A concrete slab and shallow piers supported directly off Low to Medium Strength Sandstone are suitable footings for the proposed lower floor extension. This ground material is expected to be encountered at shallow depths across the base of the excavation.

The proposed deck on the downhill side of the house is to be supported on piers or posts taken to the Low to Medium Strength Sandstone. This material is expected at a depth of ~1.4m below the current surface on the downhill side of the house.

A maximum allowable bearing pressure of 800kPa can be assumed for footings on Low to 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.

16. Remedial Works for Boundary Retaining Wall

The cracked boundary wall (Photo 8) has been assessed by the Scott Baty of SDA structures, the site structural engineer. His written advice from the 29.4.21 is as follows: “While the wall has a 50mm lean across the top for the full length, it appears stable in the short term, though structural remediation works will be necessary within the next 12 months to ensure long term stability for the wall”. It is proposed to install a row of anchors to support the wall. The support will be detailed by SDA Structures. These remedial works are to be carried out within the recommended time frame.

17. 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.

18. Inspections

The client and builder are to familiarise themselves with the following required inspections as well as council geotechnical policy. We cannot provide geotechnical certification for the owners or the regulating authorities if the following inspections have not been carried out during the construction process.

- During the excavation process, the geotechnical consultant is to inspect the excavations as they approach to within 0.7m of the supporting posts and piers of the house to confirm the stability of the cut to go flush with the footings.

- During the excavation process, the geotechnical consultant is to inspect the cut faces as they are lowered in 1.5m intervals to ensure ground materials are as expected and that there are no wedges or other defects present in the rock that may require additional support.

- All footings are to be inspected and approved by the geotechnical consultant while the excavation equipment is 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

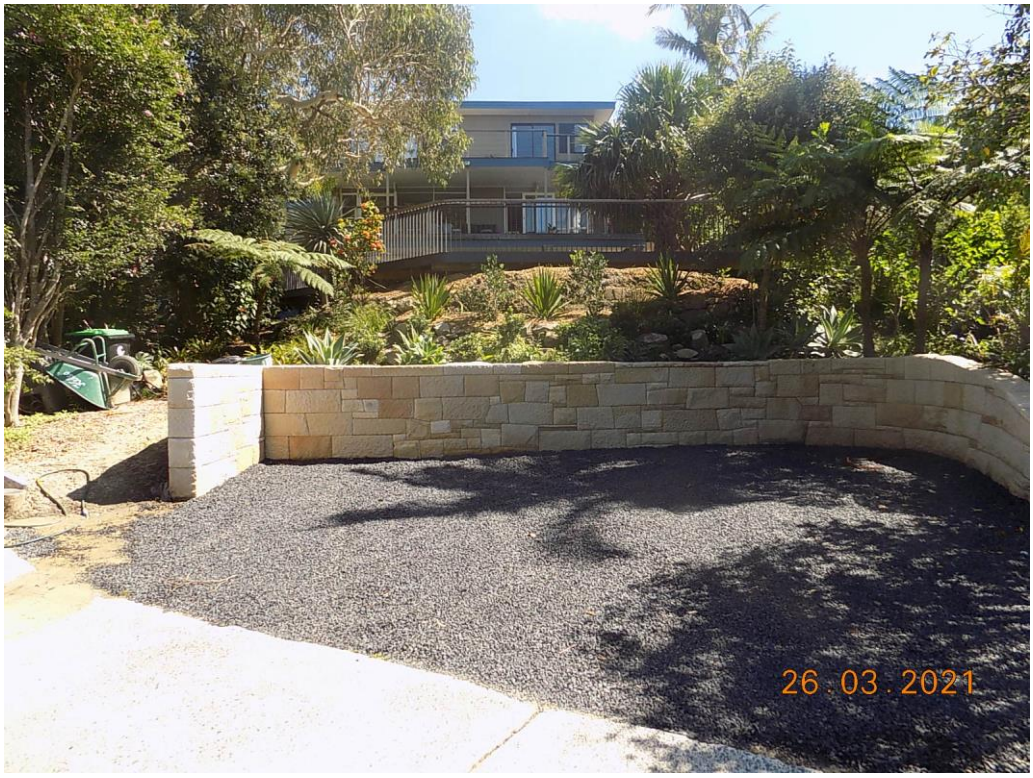


Photo 3

Photo 4

Photo 5

Photo 6

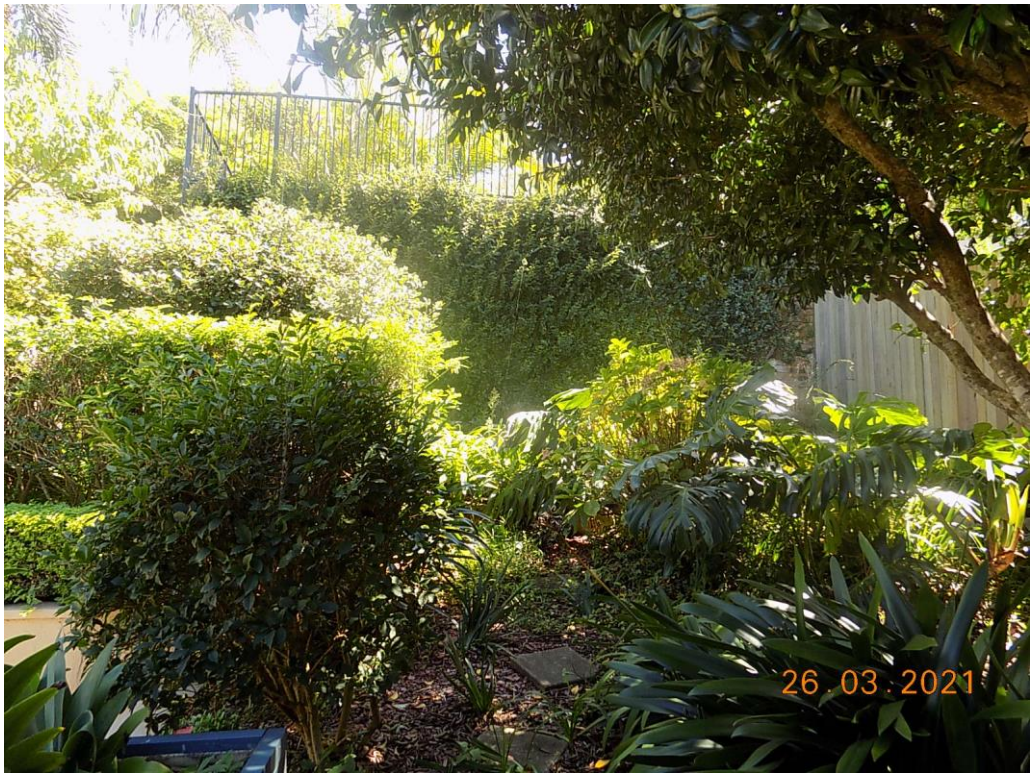


Photo 7

Photo 8

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.

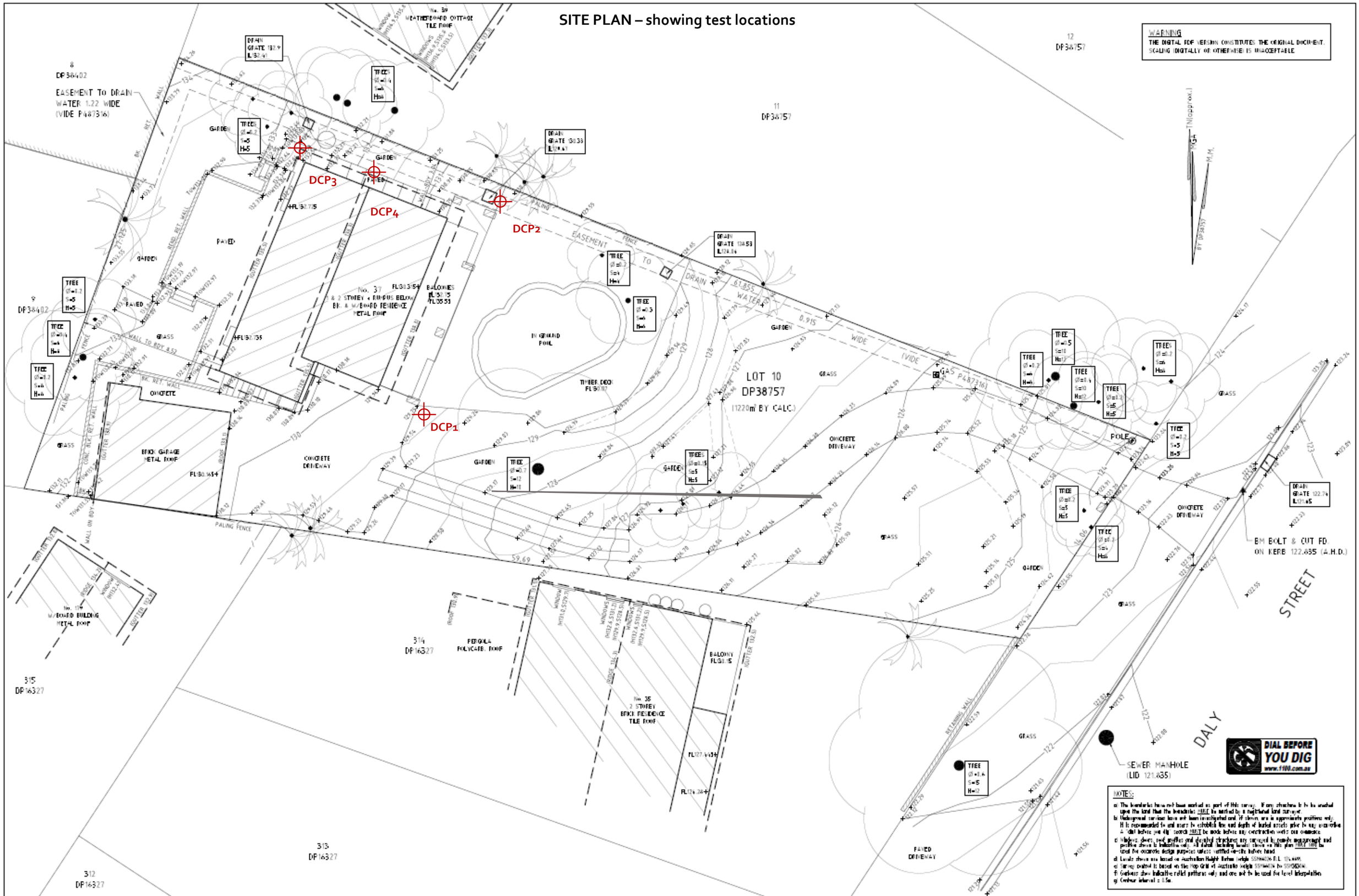
- The report addresses issues relating to your specific design and site. If the proposed project design changes, aspects of the report may no longer apply. Contact White Geotechnical if this occurs.

- 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



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NOTES:
a) The boundaries have not been marked as part of this survey. If any structure is to be erected upon the land then the boundaries MUST be marked by a registered land surveyor.
b) Underground services have not been investigated and if shown are in approximate positions only. It is recommended to and users to establish line and depth of buried assets prior to any excavation. A 'dial before you dig' search MUST be made before any construction works can commence.
c) Heights shown, road profiles and detailed structures are surveyed by pseudo measurement and position shown is indicative only. All buried building details shown on this plan MUST NOT be used for excavate design purposes unless verified on-site before hand.
d) Levels shown are based on Australian Height Datum Height SSM46006 R.L. 124.449.
e) Survey control is based on the Map Grid of Australia Height SSM46006 to SSM56644.
f) Contours show indicative relief patterns only and are not to be used for level interpolation.
g) Contour interval = 0.5m.

Surveyor Registered under the Surveying and Spatial Information Act 2002

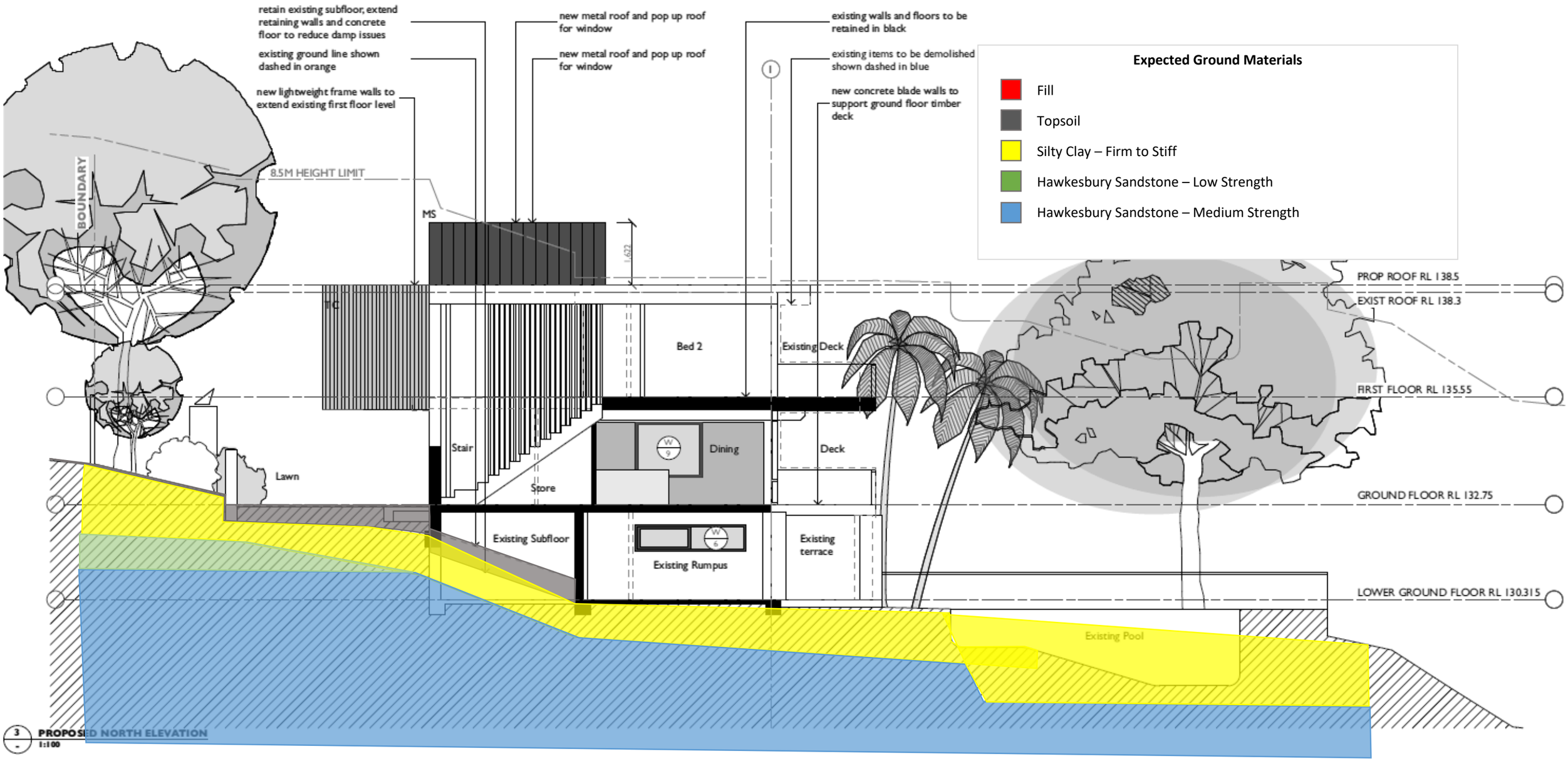
0 1 2 3 4 5 10
METRES ALL DIMENSIONS ARE IN METRES UNLESS RECORDED OTHERWISE

ROBERT FRIEND SURVEYS PTY LTD
Consulting Land Surveyor
PO Box 4292, Dandenong East, NSW, 2112
Email: admin@frsurveys.com.au Mobile: 0457 602 177

D.F.	F.F.	ISSUED FOR INFORMATION PURPOSES ONLY	FEB. 2020	A
SURVEY	DRAWN	AMENDMENTS	DATE	No.

CLIENT: SEAN MCANENEY
TITLE: DETAIL & LEVELS SURVEY OF LAND AT 37 DALY STREET BILGOLA PLATEAU NSW 2107
SCALE: 1 : 100
DRAWING No.: 1994-Z-A
SHEET: 1 of 1 | A1

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials



3 – **PROPOSED NORTH ELEVATION**
1:100

WALL CODE

- EXISTING WORK (VIEWED IN SECTION)
- EXISTING WORK (VIEWED IN ELEVATION)
- DEMOLISHED
- NEW JOINERY TALL/LOW

ABBREVIATIONS

AHD	AUSTRALIAN HEIGHT DATUM	C	CONCRETE	FCL	FINISHED CEILING LEVEL	PIT	STORMWATER PIT	TC	TIMBER CLADDING
AS	AUSTRALIAN STANDARDS	CTP	COOKTOP	FFL	FINISHED FLOOR LEVEL	PFT	PAINT FINISH	TD	TIMBER DECKING
BSN	BASIN	D	DOOR	FP	FIREPLACE	PS	PRIVACY SCREEN	TF	TIMBER FLOOR
BBQ	BARBECUE	DP	DOWN PIPE	FG	FRAMELESS GLASS	RL	REDUCED LEVEL		
BTH	BATH	EX	EXISTING	J	JOINERY	ST	STONE		
BDY	BOUNDARY	EG	EAVES GUTTER	MS	METAL SHEET ROOF				
BG	BOX GUTTER	FB	FACE BRICKWORK	N	NEW				

FOR DEVELOPMENT APPLICATION

NATALIE MATTHEWS
37 DRESS CIRCLE RD AVALON NSW 2107
TEL 0432916961

PRINT DATE AND TIME: Sunday, 6 June 2021, 4:03 pm

NM

PROJECT
DALY ST
37 Daly Street Bilgola
Plateau NSW 2107

REVISION

REV ID	ISSUE DATE	DESCRIPTION
A	6/6/21	FOR CDC APPLICATION

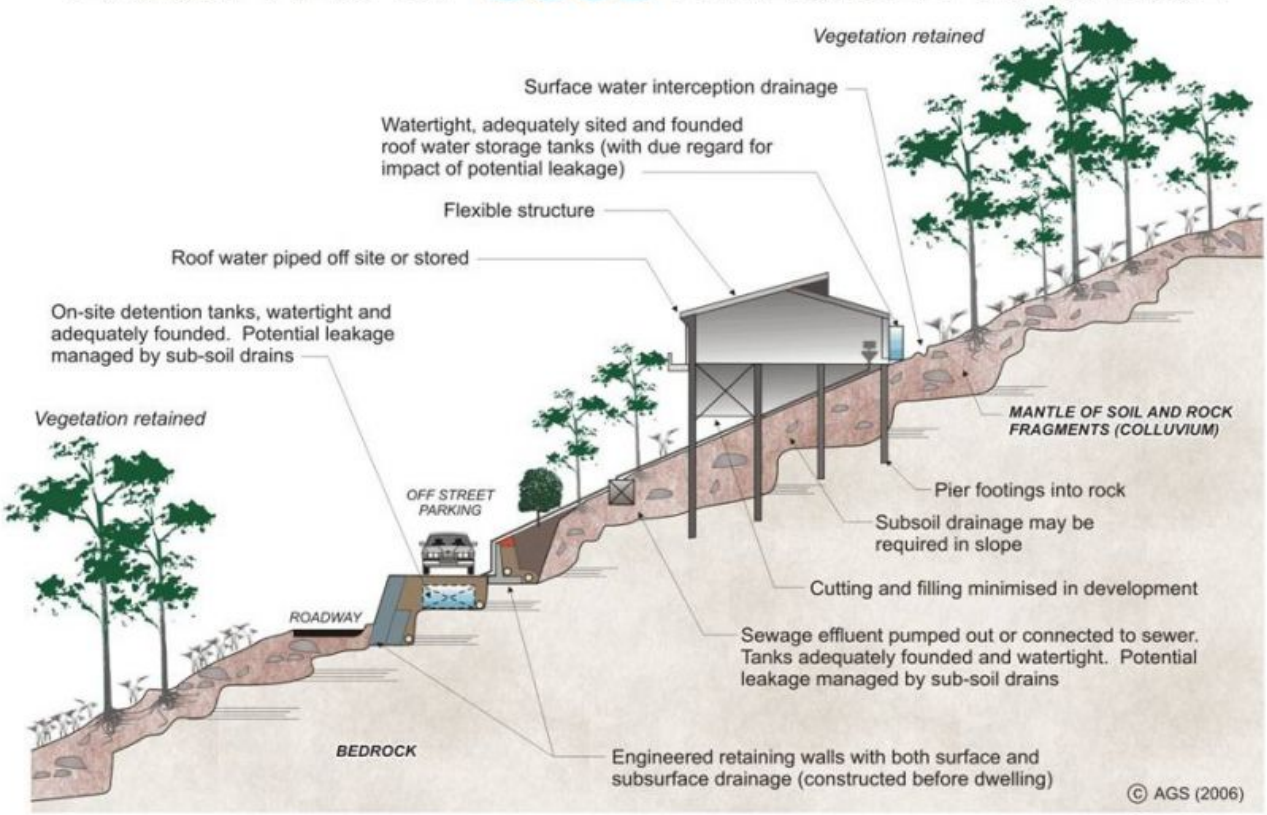
DATE 6/6/21
PROJECT 2101
SCALE 1:100 @A3
DRAWN BY NM

DRAWING TITLE
SECTIONS Y

DRAWING NO.
DA 31

REVISION
A

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE