

6 Net Road, Avalon

Comments on Updates to Plans

We have reviewed the existing geotechnical report, the plans used to carry out the report, and the updated plans shown on 13 architectural drawings prepared by Andy Lehman Design, drawings numbered MOD.09 to MOD.21, dated 18/4/24.

The changes include:

- Removed the proposed lower ground floor extension.
- Other minor internal and external alterations.

The changes to the plans are minor from a geotechnical perspective and do not alter the recommendations or the risk assessment in the report carried out by this firm numbered J4920 and dated the 25th May, 2023.

White Geotechnical Group Pty Ltd.



Dion Sheldon
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.



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

Development Application for _____
Name of Applicant

Address of site 6 Net Road, Avalon

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 25/5/23 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 6 Net Road, Avalon

Report Date: 25/5/23

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	<u>6 Net Road, Avalon</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 <u>6 Net Road, Avalon</u>
Report Date: <u>25/5/23</u>
Author: <u>BEN WHITE</u>
Author's Company/Organisation: <u>WHITE GEOTECHNICAL GROUP PTY LTD</u>

Please mark appropriate box

- ☒ Comprehensive site mapping conducted 15/5/23
(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 15/5/23
- ☒ 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 6 Net Road, Avalon

1. Proposed Development

- 1.1** Construct a new driveway and carport with garage below on the W side of the house by excavating to a maximum depth of ~2.2m. Construct a vehicle turn-around area on the downhill side of the proposed garage and existing driveway.
- 1.2** Convert the existing studio and carport on the E side of the house into a two storey secondary dwelling.
- 1.3** Demolish the existing deck on the downhill side of the house. Extend the lower floor of the house on the downhill side with new decks above and on the W side of the extension.
- 1.4** Other minor internal and external alterations to the existing house.
- 1.5** Landscape a lawn area on the downhill side of the house and fill in the existing pool by filling to a maximum height of ~2.6m.
- 1.6** Details of the proposed development are shown on 19 drawings prepared by Andy Lehman Design, drawings numbered DA01 to DA19, dated April, 2023.

2. Site Description

- 2.1** The site was inspected on the 15th May, 2023.
- 2.2** This residential property is on the low side of the road and has a N aspect. It is located on the moderately graded middle reaches of a hillslope. The natural slope falls across the property at an average angle of ~14°. The slope above and below the property continue at similar angles.

2.3 At the road frontage, a concrete driveway runs to a carport with rendered masonry studio below on the E side of the house (Photos 1 & 2). The external walls supporting the studio show no significant signs of movement. Another concrete driveway runs to the E side of the carport and to a storage area on the uphill side of the studio (Photos 3 & 4). A cut provides a level platform for the driveway and storage area. The cut is supported by timber and rendered masonry retaining walls up to ~1.5m high. The timber retaining wall displays minor bulging and the rendered masonry wall displays two horizontal cracks (Photos 4 & 5). See '**Section 17** Ongoing Maintenance'. A gravel and concrete driveway on the W side of the house runs from Net Road to a turning area on the NW side of the house and runs down the slope to the NW before reaching Gunyah Place (Photos 6 & 7).

Cuts and fills provide level platforms for garden areas on the uphill side of the house and a level platform for the lower floor of the house. The cuts and fills are supported by stable sandstone block and rendered masonry retaining walls up to ~1.5m high (Photos 7 to 8). The two storey rendered masonry house is supported by masonry walls (Photos 9 & 10). The external supporting walls show no significant signs of movement. A timber deck and stable pool are located on the downhill side of the house (Photo 11). 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. 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 may have occurred for DCP2. 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 (~RL31.5) – AH1 (Photo 12)

Depth (m)	Material Encountered
0.0 to 0.2	FILL , soil and clay, brown, dry, fine to coarse grained.
0.2 to 0.4	TOPSOIL , dark brown, dry, fine to medium grained.
0.4 to 0.5	CLAY , orange brown, firm to stiff, dry.

End of Hole @ 0.5m in firm to stiff clay. No watertable encountered.

DCP TEST RESULTS ON 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 (~RL37.0)	DCP 2 (~RL35.1)	DCP 3 (~RL33.5)	DCP 4 (~RL31.5)
0.0 to 0.3	13	15	17	10
0.3 to 0.6	27	40	21	11
0.6 to 0.9	33	#	17	10
0.9 to 1.2	#		40	12
1.2 to 1.5			#	8
1.5 to 1.8				15
1.8 to 2.1				20
2.1 to 2.4				30
2.4 to 2.7				#
	End of Test @ 0.9m	Refusal @ 0.5m	End of Test @ 1.0m	Refusal on Rock @ 2.4m

#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 @ 0.9m, DCP still very slowly going down, orange shale fragments and dark brown soil on moist tip.

DCP2 – Refusal @ 0.5m, DCP bouncing, orange and maroon rock fragments and dark brown soil on moist tip.

DCP3 – End of Test @ 1.0m, DCP still very slowly going down, orange shale fragments and orange clay on moist tip.

DCP4 – Refusal on Rock @ 2.4m, DCP bouncing off rock surface, orange and maroon 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 fill and a thin topsoil over firm to stiff clays. Fill to a maximum depth of ~1.0m provides level platforms for garden areas across the property. The clays merge into the weathered zone of the underlying rock at depths of between ~0.9m to ~2.1m below the current surface, being deeper near the downhill property boundary where

the clay layer is thicker (DCP4). DCP2 is interpreted to have hit refusal on an obstruction in the profile. The weathered zone of the underlying rock is interpreted as Extremely Low to Low Strength Rock. 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

Ground water seepage is expected to move over the denser and less permeable clay and weathered rock layers in the profile. 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

Normal sheet wash from the slope above the property will be intercepted by the street drainage system for Net Road above.

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**). The proposed excavation is a potential hazard (**Hazard Two**). The proposed landscaping fill is a potential hazard until retaining walls are in place (**Hazard Three**).

RISK ANALYSIS SUMMARY ON NEXT PAGE

Geotechnical Hazards and Risk Analysis - Risk Analysis Summary

HAZARDS	Hazard One	Hazard Two	Hazard Three
TYPE	The moderate slope that falls across the property and continues above and below failing and impacting on the property.	The proposed excavation for the garage collapsing onto the worksite and impacting the neighbouring properties during the excavation process.	The proposed landscaping fill failing and impacting on the workers below before the retaining walls are in place.
LIKELIHOOD	'Unlikely' (10^{-4})	'Possible' (10^{-3})	'Possible' (10^{-3})
CONSEQUENCES TO PROPERTY	'Medium' (12%)	'Medium' (18%)	'Medium' (13%)
RISK TO PROPERTY	'Low' (2×10^{-5})	'Moderate' (2×10^{-4})	'Moderate' (2×10^{-4})
RISK TO LIFE	2.9×10^{-7} /annum	5.6×10^{-5} /annum	4.0×10^{-5} /annum
COMMENTS	This level of risk is 'ACCEPTABLE'	This level of risk to life and property is 'UNACCEPTABLE'. To move the 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 risk to 'ACCEPTABLE' levels the recommendations in Section 14 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 Gunyah Place. 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 ~2.2m is required to construct the proposed garage. The excavation is expected to be through fill, topsoil and clay, with Extremely Low to Low Strength Rock expected at depths of between ~0.9m to ~1.8m below the current surface.

It is envisaged that excavations through fill, soil, clay and Extremely Low to Low Strength Rock can be carried out with an excavator and toothed bucket.

12. Vibrations

It is expected the proposed excavation will be carried out with an excavator and toothed bucket and the vibrations produced will be below the threshold limit for building or infrastructure damage using a domestic sized excavator up to 20 tonne.

13. Excavation Support Requirements

An excavation to a maximum depth of ~2.2m is required to construct the proposed garage. Allowing for backwall drainage, the excavation is set back ~0.6m from the W common boundary and ~0.5m from the subject house. As the lower floor of the existing house is at the same level as the proposed garage, it will be outside the zone of influence of the excavation. The W common boundary will be within the zone of influence of the excavation. In this instance, the zone of influence is the area above a theoretical 30° line (from horizontal) through fill/soil and a 45° line through clay / weathered rock from the base of the excavation towards the surrounding structures and boundaries.

The W common boundary fence is to be braced prior to the excavation commencing.

The SW corner of the excavation will need to be temporarily or permanently supported prior to the commencement of the excavation, or during the excavation process in a staged manner, so cut batters are not left unsupported. The support will need to be designed by the structural engineer. See the lower floor plan attached for the minimum extent of the required shoring shown in blue.

Where shoring is not required, the fill/topsoil portion of the excavation and at least the top 0.7m of the excavation is to be battered temporarily at 1.0 Vertical to 1.7 Horizontal (30°) until the retaining walls are in place. The clay and weathered rock portion of the excavation is expected to stand at near-vertical angles for short periods of time until the retaining walls are in place, provided the cut batters are kept from becoming saturated.

During the excavation process, the geotechnical consultant is to inspect the cut face in 1.5m intervals as it is lowered to ensure ground materials are as expected and that additional support is not required.

Upslope runoff is to be diverted from the cut faces by sandbag mounds or other diversion works. All unsupported cut batters are to be covered to prevent access of water in wet weather and loss of moisture in dry weather. The covers are to be tied down with metal pegs or other suitable fixtures so they can't blow off in a storm. The materials and labour to construct the retaining walls are to be organised so shoring walls can be installed as required. The excavation is to be carried out during a dry period. No excavations are to commence if heavy or prolonged rainfall is forecast. If the cut batters remain unsupported for more than a few days before the construction of the retaining walls they are to be temporarily supported until the retaining walls are in place.

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

14. Fill

Fill will be placed to landscape a lawn area on the downhill side of the house and to fill in the existing pool. Drainage holes are to be punched through the base of the old pool. No fills are to be laid until the retaining walls are in place. The fill will reach a maximum depth of ~2.6m. Filling to this depth without appropriate compaction will result in a significant settlement.

Before all fills are lain, strip the existing topsoil and remove all organic matter, stockpiling for later use as topsoil or remove from site.

To avoid excessive settlement, the fill is to be placed in loose layers not exceeding 0.2m thick before being compacted as follows:

Non-Cohesive Soils (sandy fills)

The proposed fill for landscaping is to be compacted to a Minimum Density Index (ID) of 65%.

Cohesive Soils (clayey fill & excavated bedrock)

The proposed fill for landscaping is to be compacted to at least 95% of Standard Maximum Dry Density.

The geotechnical consultant is to inspect and test the fill as it is laid in 1.0m rises to ensure the required density has been achieved.

Filling within ~1.5m behind retaining walls or above the old pool structure should be compacted with light weight equipment such as a hand operated plate compactor or similar so as to not damage the wall / pool structure. Where light weight compaction equipment is used fills are to be laid in a loose thickness not exceeding 0.15m. No pavements or structures are to be supported on fill.

15. 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 – Likely Earth Pressures for Retaining Walls

Unit	Earth Pressure Coefficients		
	Unit weight (kN/m ³)	'Active' K _a	'At Rest' K ₀
Fill, Topsoil	20	0.40	0.55
Residual Clays	20	0.35	0.45
Extremely Low to Low Strength Rock	22	0.25	0.38

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 wall, do not account for any surcharge loads and assume retaining structures are fully drained. Ground materials 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.

16. Foundations

The proposed garage is expected to be seated in Extremely Low Strength Rock or better on the uphill side. This is a suitable foundation material. Piers embedded into Extremely Low Strength Rock or better will be required to support the proposed house additions and the downhill side of the proposed garage where the weathered rock drops away with the slope. This ground material is expected at depths of between ~0.9m to ~2.1m below the current

surface, being deeper near the downhill property boundary. A maximum allowable bearing pressure of 600kPa can be assumed for footings embedded in Extremely Low Strength Rock or better. 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.

The foundations supporting the existing house are currently unknown, although it is likely that the house is supported on Extremely Low Strength Rock or better as the uphill side of the house is cut into the slope. Ideally, footings should be founded on the same footing material across the old and new portions of the structure. Where the footing material does change across the structure construction joints or similar are to be installed to prevent differential settlement, where the structure cannot tolerate such movement in accordance with a 'Class M' site.

The proposed vehicle turning area and uphill portion of the proposed driveway can be supported off the natural surface after any organic matter has been stripped. A maximum allowable bearing pressure of 100kPa can be assumed for soil of the natural surface. Where the downhill portion of the driveway is suspended and is not supported off the carport structure, it is to be supported on piers embedded into Extremely Low Strength Rock or better. Where the foundation material across the driveway structure changes, expansion joints are to be installed to separate the different foundation materials and to accommodate minor differential movement. Alternatively, the uphill portion of the driveway can be supported on piers taken to shale to maintain a uniform foundation material across the structure.

The proposed landscaping retaining wall footings can be embedded into the firm to stiff clays of the natural profile. A maximum allowable bearing pressure of 200kPa can be assumed for footings embedded in firm to stiff clay.

As the bearing capacity of clay and weathered rock 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 clay or weathered rock 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.

17. Ongoing Maintenance

The bulging timber retaining wall and cracked rendered masonry wall (Photos 2 to 4) are to be monitored by the owners on an annual basis or after heavy and prolonged rainfall events, whichever occurs first. A photographic record of these inspections is to be kept. Should further movement occur the walls are to be remediated so they meet current engineering standards. We can carry out these inspections upon request.

18. 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.

REQUIRED INSPECTIONS ON NEXT PAGE

19. 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 Occupation Certificate if the following inspections have not been carried out during the construction process.

- During the excavation process, the geotechnical consultant is to inspect the cut face in 1.5m intervals as it is lowered to ensure ground materials are as expected and that additional support is not required.
- All footings are to be inspected and approved by the geotechnical consultant while the excavation equipment and contractors are still onsite and before steel reinforcing is placed or concrete is poured.

White Geotechnical Group Pty Ltd.



Dion Sheldon
BEng(Civil)(Hons),
Geotechnical Engineer.

Reviewed By:



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



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7

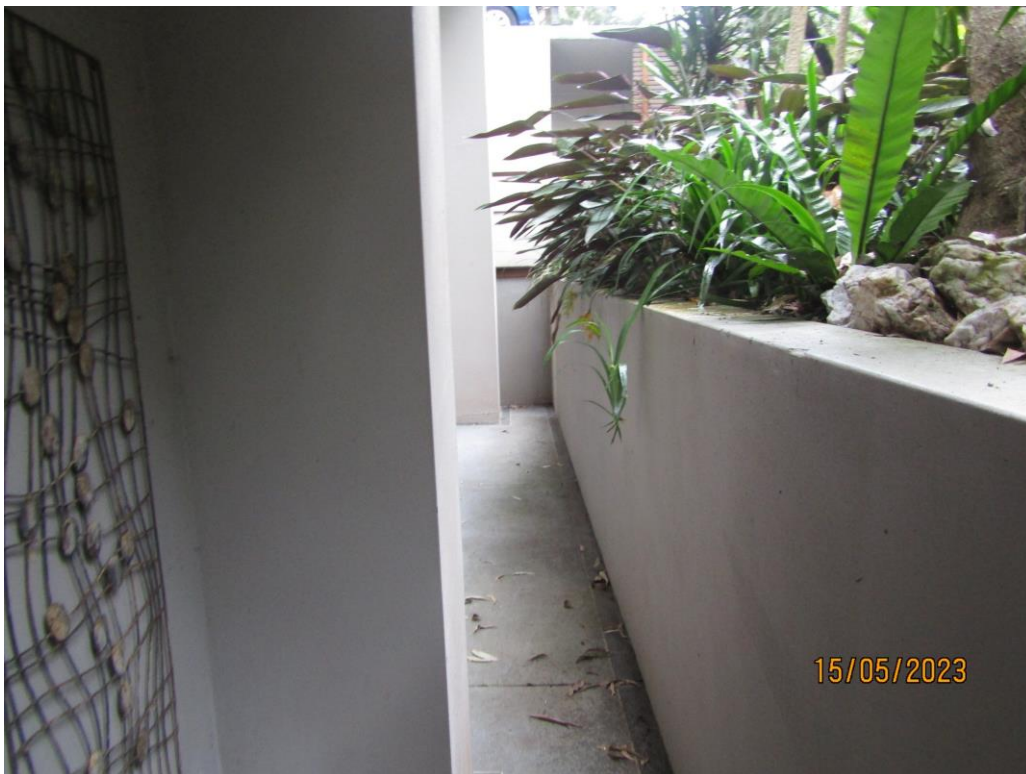


Photo 8



Photo 9



Photo 10

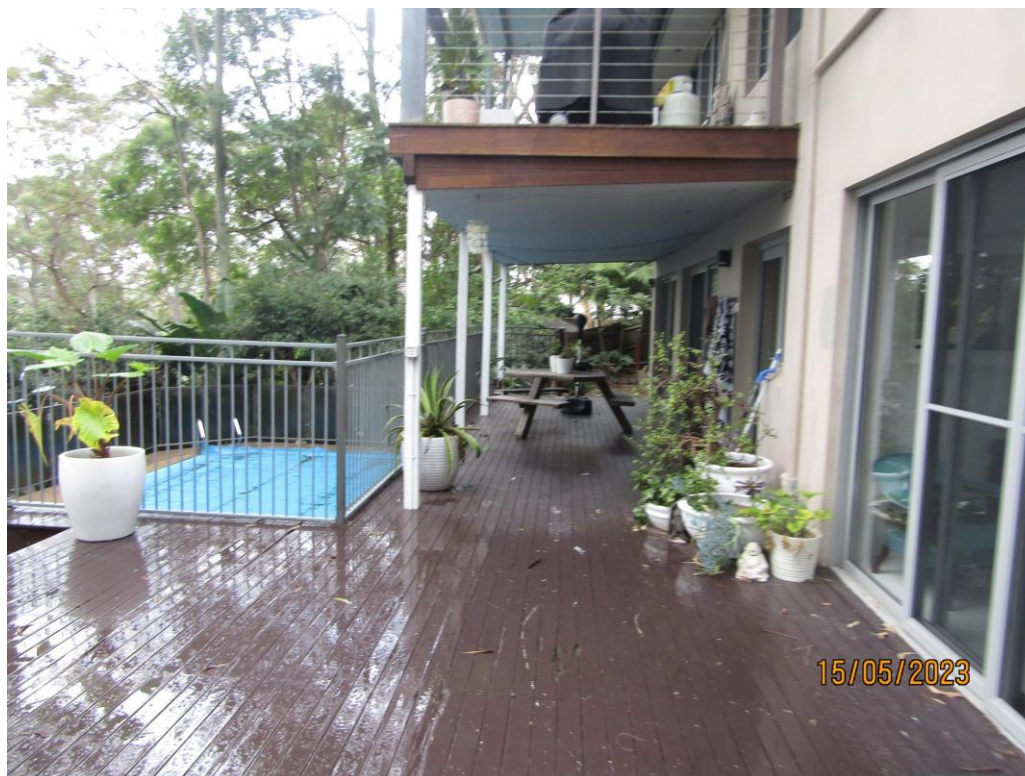


Photo 11



Photo 12: AH1 – Downhole is from left to right.

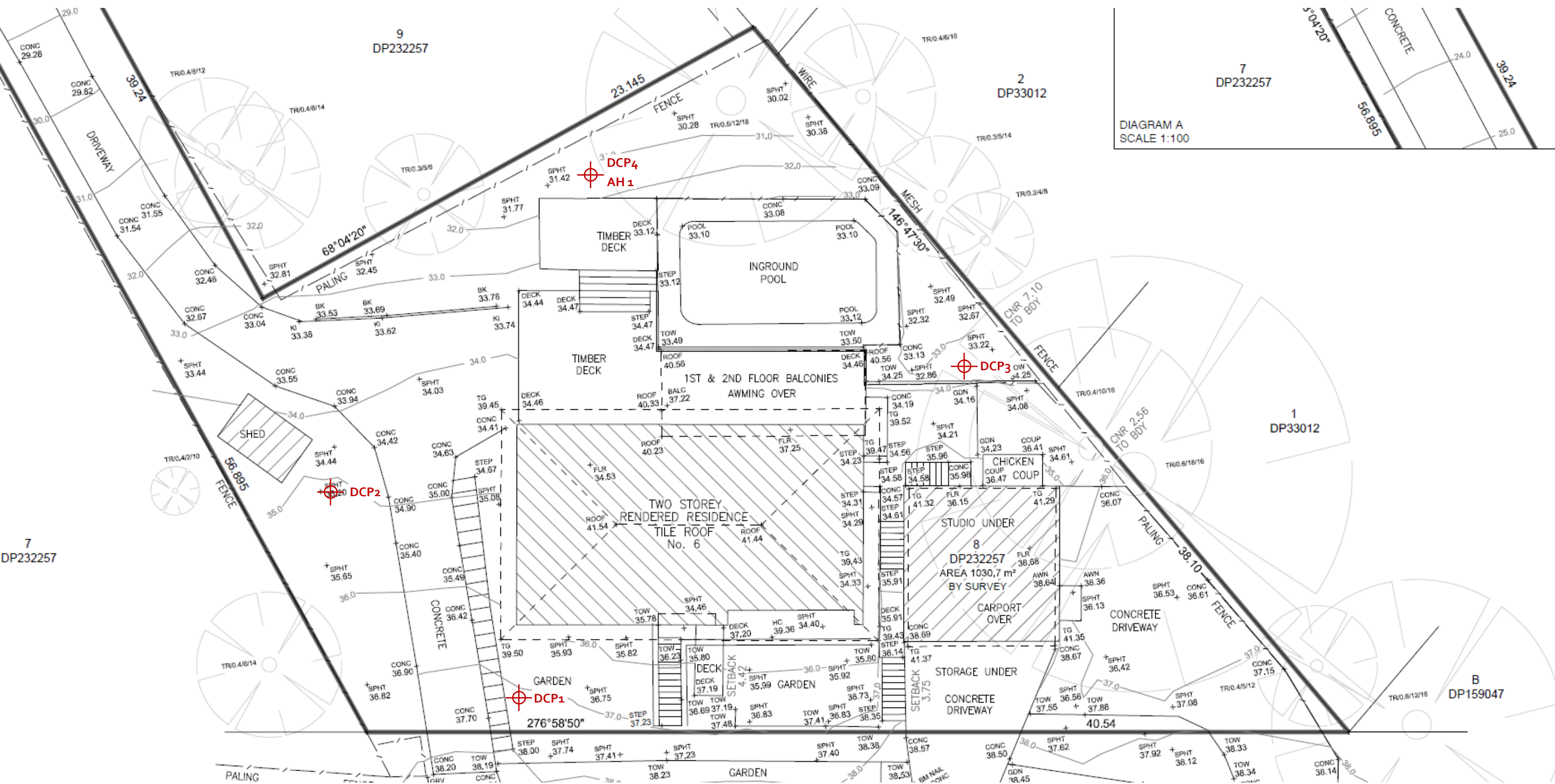
Important Information about Your Report

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.

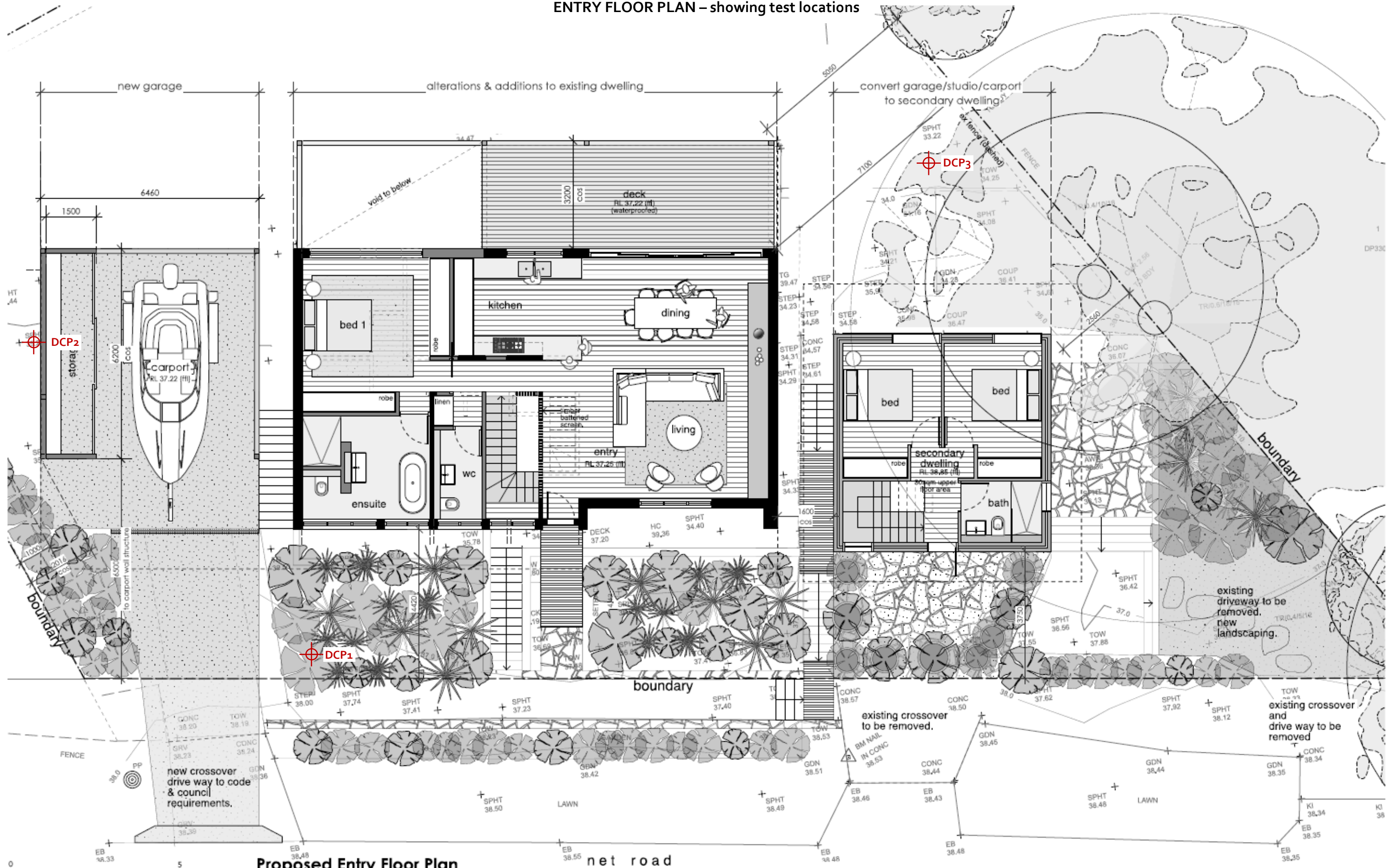
With this in mind, the following points are to be noted:

- 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.

SURVEY PLAN – showing test locations



ENTRY FLOOR PLAN – showing test locations



Proposed Entry Floor Plan

Note:
All footings, slabs, structural beams, etc., to future engineers details.
All wall/roof connections + member sizes to NCC & future engineers details.
Rainwater from gutters to connect to stormwater system to relevant Building Codes, Council requirements.
All wastewater/sewage to connect to existing sewer system to all relevant NCC, Building Codes + Council requirements.
All works to comply with all relevant NCC, Building Codes + Council requirements.

MATERIALS:
BAL BALUSTRADE
CONC CONCRETE
COS CONFIRM ON SITE
DP DOWNPIPE
FG FIXED GLAZING
HWD HARDWOOD
LC LIGHTWEIGHT CLADDING
M MASONRY
MRS METAL ROOF SHEETING
NGL NATURAL GROUND LEVEL

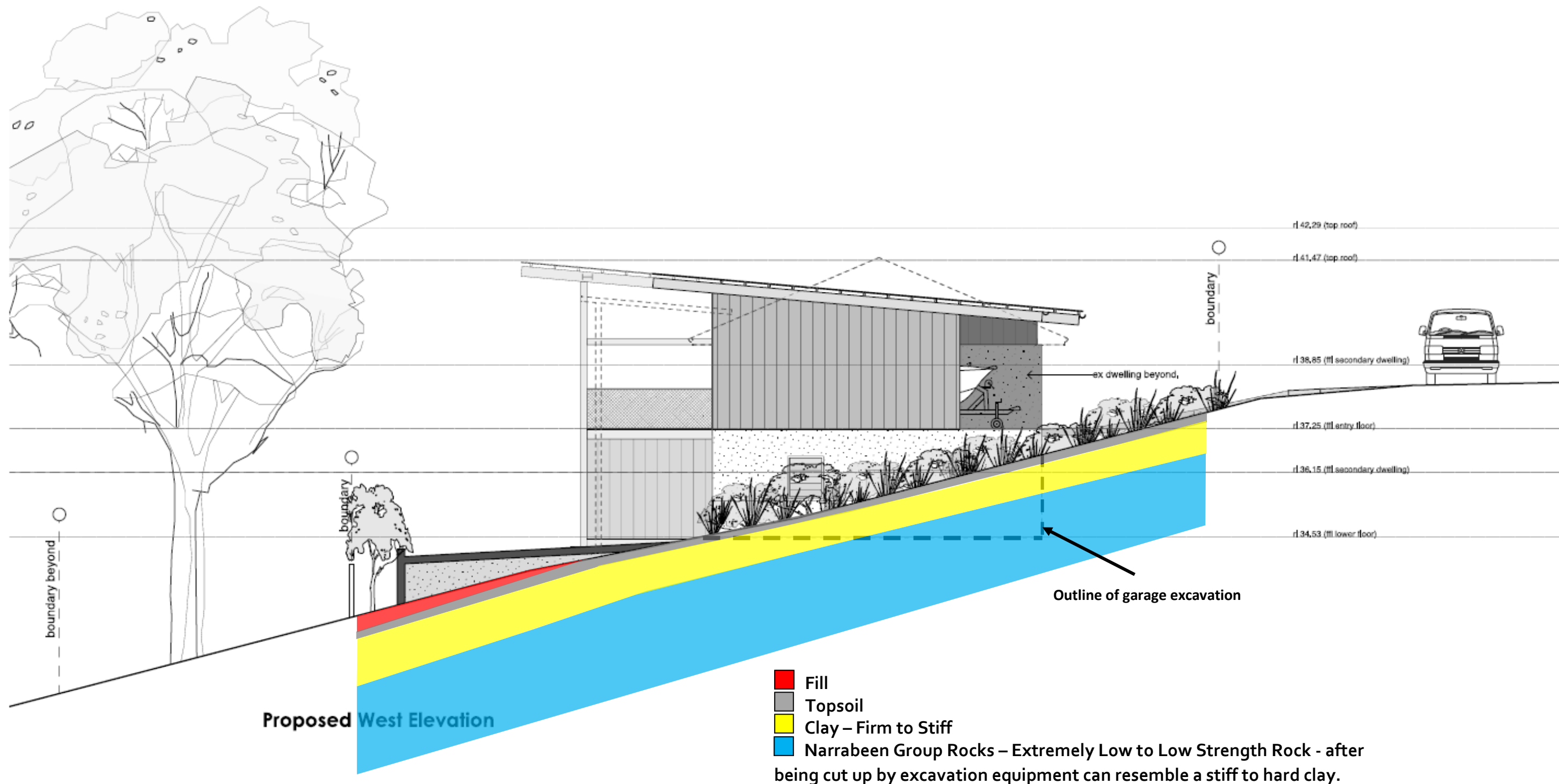
— EXISTING WALL
- - - - - TO BE REMOVED
= NEW WALL

Daniel & Mel Mussett

6 Net Road Avalon Beach NSW 2107 LOT 8 DP 232257, Site Area 1030.7m²

PROJECT	Alterations & Additions	ANDY LEHMAN DESIGN	DWG. NO.	DA. 12
DRAWING	Proposed Entry Floor Plan	14 Oct 2023	SCALE	1:100 @ A3
NOTES	Please print in A3 or A1. This drawing is copyright and is for Development Application purposes only. Do not measure off drawings.	Email: andy@andylehman.com.au	DATE	April 2023
		If in doubt ask.	DATE	

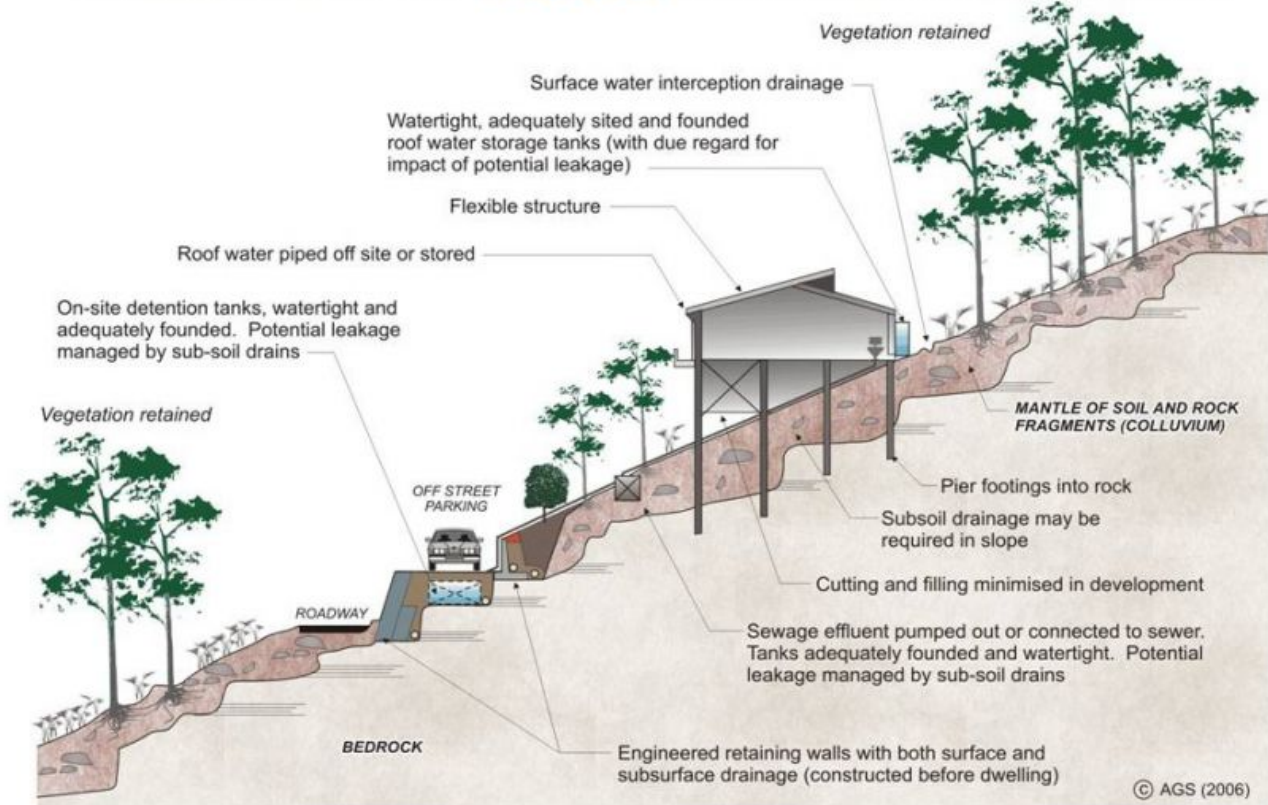
TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials



- Fill
- Topsoil
- Clay – Firm to Stiff
- Narrabeen Group Rocks – Extremely Low to Low Strength Rock - after being cut up by excavation equipment can resemble a stiff to hard clay.

Note: All footings, slabs, structural beams, etc, to future engineers details. All wall/roof connections + member sizes to NCC & future engineers details. Rainwater from gutters to connect to stormwater system to relevant Building Codes, Council requirements. All wastewater/sewage to connect to existing sewer system to all relevant NCC, Building Codes + Council requirements. All works to comply with all relevant NCC, Building Codes + Council requirements.	MATERIALS: BAL BALUSTRADE CONC. CONCRETE COS CONFIRM ON SITE DP DOWNPIPE FG FIXED GLAZING HWD HARDWOOD LC LIGHTWEIGHT CLADDING M MASONRY MRS METAL ROOF SHEETING NGL NATURAL GROUND LEVEL	EXISTING WALL TO BE REMOVED NEW WALL	Daniel & Mel Mussett 6 Net Road Avalon Beach NSW 2107 LOT 8 DP 232257, Site Area 1030.7m ²		
			PROJECT	Alterations & Additions	ANDY LEHMAN DESIGN
			DRAWING	Proposed West Elevation	DA. 16
			NOTES	Please print in A3 or A1. This drawing is copyright and is for Development Application purposes only. Do not measure off drawings.	DATE: April 2023

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE

