

GROUND TESTING:

5 Vista Avenue, Balgowlah Heights

1. Scope

The aim of this assessment is to determine the nature of the ground materials across the property and provide foundation advice.

The site was inspected on the 26th March, 2024.

2. Proposed Development

2.1 5 Vista Avenue, Balgowlah Heights

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

Two hand Auger Holes (AH) were put down to identify the soil materials. Five 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:

AUGER HOLE 1 (~RL70.4) – AH1 (Photo 1)

Depth (m)	Material Encountered
0.0 to 0.5	TOPSOIL , sandy soil, dark brown, Medium Dense, dry to moist, fine to medium grained.
0.5 to 0.7	SAND , grey and orange, mottled, Medium Dense, damp, fine to coarse grained, sugary texture.

Refusal @ 0.7m, auger grinding on rock. No water table encountered.

AUGER HOLE 2 (~RL67.1) – AH2 (Photo 2)

Depth (m)	Material Encountered
0.0 to 1.3	FILL , sandy soil and clay, with some rock fragments, dark brown, brown, grey, white, dry to moist, fine to coarse grained.
1.3 to 1.5	SANDY CLAY , dark grey, brown, firm, damp.
1.5 to 1.7	CLAY , brown, stiff, damp.

End of Test @ 1.7m in stiff clay. No water table 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 (~RL70.4)	DCP 2 (~RL67.3)	DCP 3 (~RL67.1)	DCP 4 (~RL65.1)	DCP 5 (~RL63.4)
0.0 to 0.3	13	10	9	9	3
0.3 to 0.6	6	8	9	7	#
0.6 to 0.9	7	8	7	10	
0.9 to 1.2	#	12	11	14	
1.2 to 1.5		20	13	25	
1.5 to 1.8		20	26	32	
1.8 to 2.1		65	48	#	
2.1 to 2.4		#	40		
2.4 to 2.7			52		
2.7 to 3.0			#		
	Refusal on Rock @ 0.7m	End of Test @ 2.1m	End of Test @ 2.7m	Refusal on Rock @ 1.7m	Refusal on Rock @ 0.2m

#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 @ 0.7m, DCP bouncing off rock surface, grey sand and dark brown soil on damp tip.

DCP2 – End of Test @ 2.1m, DCP still very slowly going down, grey sand and dark brown soil on moist tip.

DCP3 – End of Test @ 2.7m, DCP still very slowly going down, light brown clay and dark brown soil on wet tip.

DCP4 – Refusal on rock @ 1.7m, DCP bouncing off rock surface, maroon rock fragments and light brown clay on wet tip.

DCP5 – Refusal on rock @ 0.2m, DCP bouncing off rock surface, clean dry tip.

5. Geological Observations and Interpretations

The site is underlain by fill, topsoil, sand and clay over sandstone bedrock. In the test locations, the depth to weathered rock ranged from ~0.2m to ~2.1m below the current surface, being deeper in the filled areas (DCPs 2 & 3) and slightly variable due to the stepped nature of the rock. The sandstone underlying the property is estimated to range from Very Low to Medium Strength. It is interpreted that DCPs 2 & 3 were terminated in Very Low Strength Rock and DCPs 1, 4 & 5 encountered refusal on Medium Strength Rock. It is to be noted that Very Low Strength Rock is a soft rock and can appear as a mottled stiff clay when it is cut up by excavation equipment.

6. Foundations

A maximum allowable bearing pressure of 100kPa can be assumed for the sandy topsoil of the natural profile and a maximum allowable bearing pressure of 200kPa can be assumed for the Firm to Stiff Clays of the natural profile. However, due to the variability of the subsurface profile, the proposed houses are to be supported on spread footings or piers embedded into Very Low Strength Rock or taken to Medium Strength Rock. Very Low to Medium Strength Rock is expected at depths of between ~0.2m to ~2.1m below the current surface, being deeper in the filled areas (DCPs 2 & 3) and slightly variable due to the stepped nature of the rock. A maximum allowable bearing pressure of 600kPa can be assumed for footings embedded in Very Low Strength Rock or better. It should be noted that Very Low Strength Rock 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 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 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 and inspected.

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.

7. Inspection

The following inspection is recommended and if geotechnical certification is desired, it is a requirement.

- 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.



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Photo 1: AH1 – Downhole is from top to bottom.



Photo 2: AH2 – Downhole is from top to bottom.

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

SCHEDULE OF TREES & PALMS

No.	DIAMETER	HEIGHT	SPREAD
1	0.2	5	4
*2	3x0.2	5	4
*3	0.2	4	2
*4	0.2	4	2
5	0.2	6	4
6	0.4	8	10
7	0.4	6	10
8	0.4	6	10
9	0.2	6	4
10	0.2	6	4

* DENOTES PALM

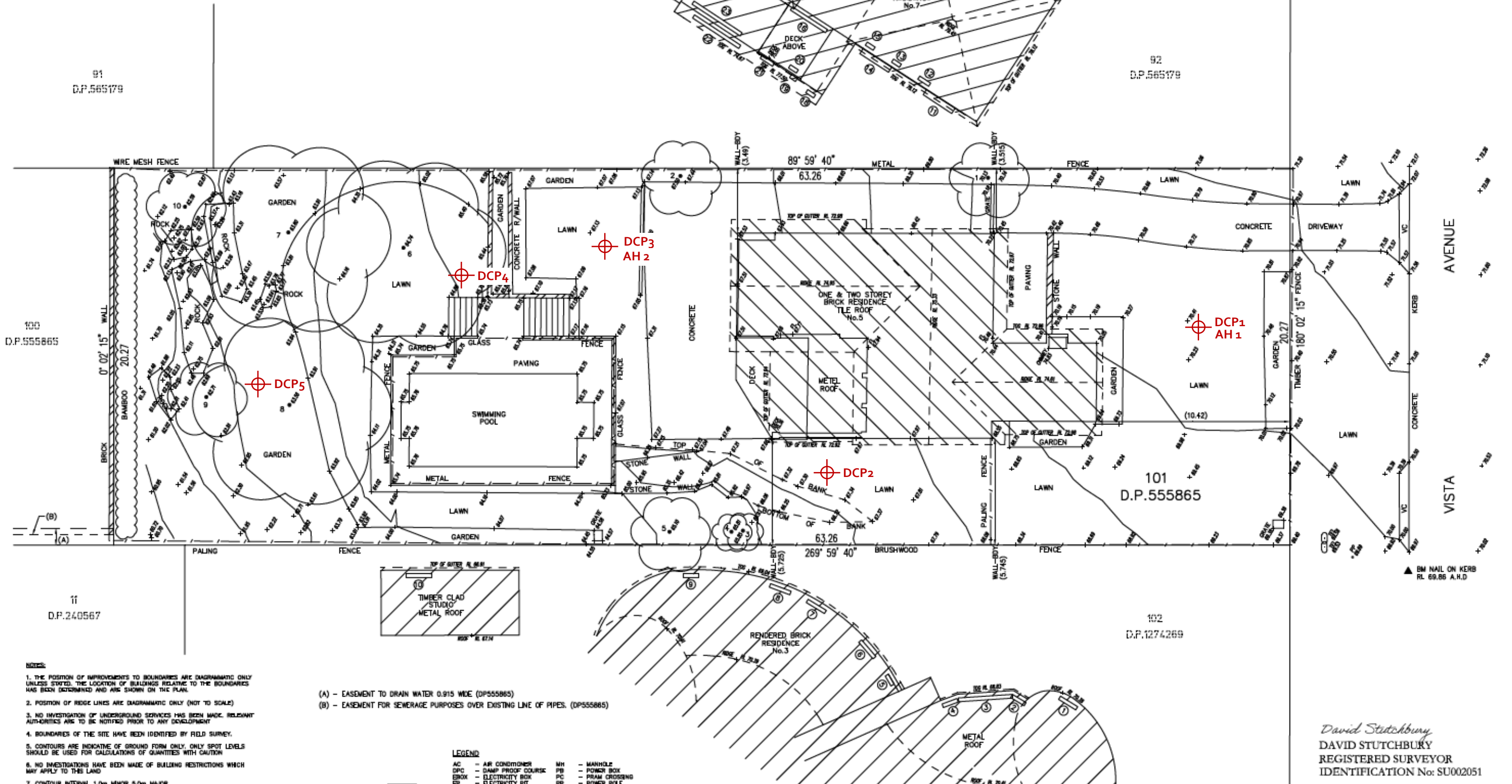
SCHEDULE OF WINDOWS & DOORS

No.	SELL RL	HEAD RL
1	66.98	67.98
2	66.70	68.40
3	66.70	68.80
* 4	66.20	68.30
5	67.01	68.02
6	66.86	68.06
7	66.86	68.06
8	66.86	68.06
9	67.05	68.06
10	65.94	66.44
11	75.52	77.61
12	73.43	74.63

* DENOTES DOOR

SCHEDULE OF WINDOWS & DOORS

No.	SELL RL	HEAD RL
13	73.43	74.63
14	75.52	77.61
15	73.43	74.63
16	75.14	77.24
17	75.14	77.23
18	70.30	71.30
19	72.72	73.41
20	70.30	71.30
21	72.73	73.39
22	69.29	70.90
23	71.83	73.90
24	69.29	70.90



- NOTES:
1. THE POSITION OF IMPROVEMENTS TO BOUNDARIES ARE DIAGNOSTIC ONLY UNLESS STATED. THE LOCATION OF BUILDINGS RELATIVE TO THE BOUNDARIES HAS BEEN DETERMINED AND ARE SHOWN ON THE PLAN.
 2. POSITION OF RIDGE LINES ARE DIAGNOSTIC ONLY (NOT TO SCALE)
 3. NO INVESTIGATION OF UNDERGROUND SERVICES HAS BEEN MADE. RELEVANT AUTHORITIES ARE TO BE NOTIFIED PRIOR TO ANY DEVELOPMENT
 4. BOUNDARIES OF THE SITE HAVE BEEN IDENTIFIED BY FIELD SURVEY.
 5. CONTOURS ARE INDICATIVE OF GROUND FORM ONLY. ONLY SPOT LEVELS SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION
 6. NO INVESTIGATIONS HAVE BEEN MADE OF BUILDING RESTRICTIONS WHICH MAY APPLY TO THIS LAND
 7. CONTOUR INTERVAL 1.0m MINOR 5.0m MAJOR
 8. ORIGIN OF LEVELS: SSM 38097 RL 57.776 A.H.D.
 9. THE SPREAD AND HEIGHT OF TREES SHOWN ARE INDICATIVE ONLY AND CANNOT BE SHOWN ACCURATELY WITHOUT ADDITIONAL DETAILED SURVEY.
 10. BEARINGS SHOWN ARE RELATED TO MAGNETIC MERIDIAN

- (A) – EASEMENT TO DRAIN WATER 0.915 WIDE (DP555865)
 (B) – EASEMENT FOR SEWERAGE PURPOSES OVER EXISTING LINE OF PIPES. (DP555865)

LEGEND

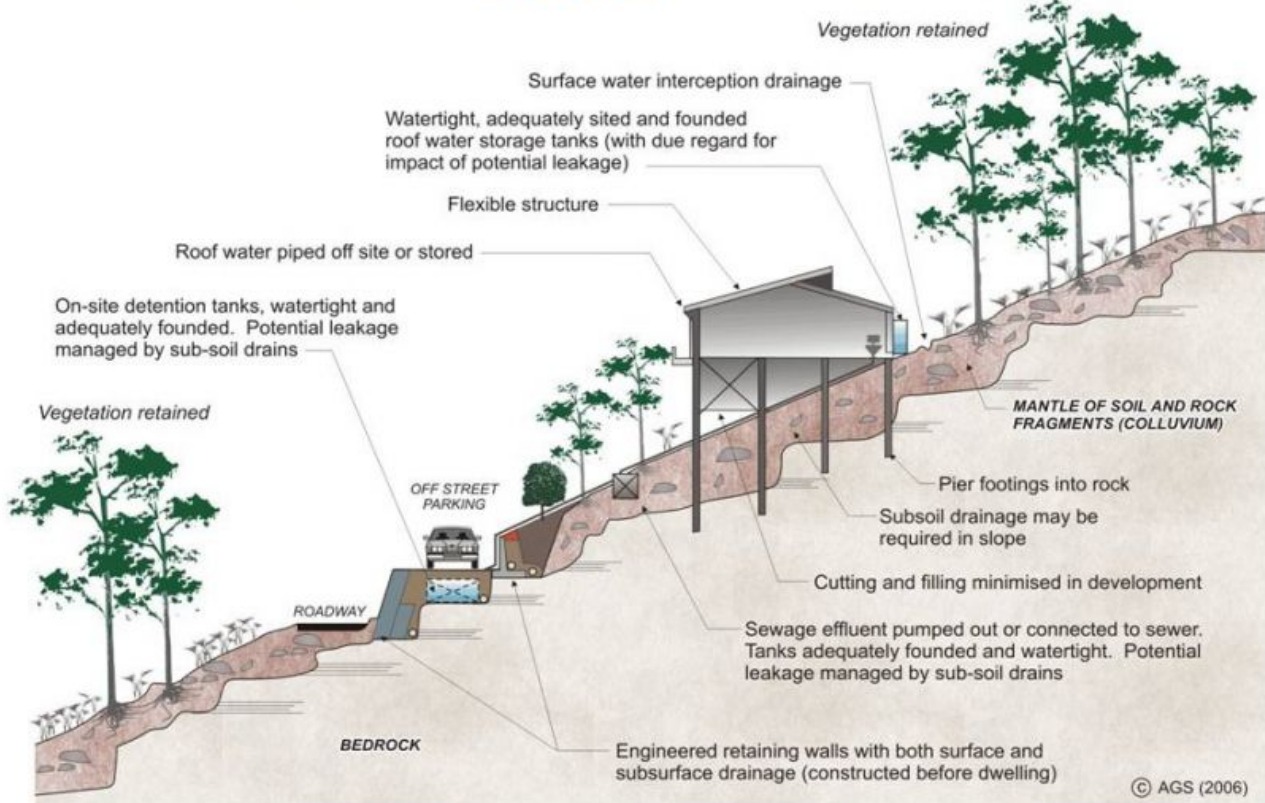
AC – AIR CONDITIONER	WH – MANHOLE
DCP – DAMP PROOF COURSE	PB – POWER BOX
EBX – ELECTRICITY BOX	PC – PAVEMENT CROSSING
EP – ELECTRICITY PIT	PP – POWER POLE
FL – FLOOR LEVEL	SMH – SEWER MANHOLE
GM – GAS METER	SO – STORMWATER OUTLET
GS – GAS SERVICE	SV – STOP VALVE
GP – GULLY PIT	S/W – STORMWATER
HW – HOT WATER HEATER	TEL – TELECOMMUNICATIONS PIT
HYD – HYDRANT	VC – VEHICLE CROSSING
IC – INSPECTION COVER	WM – WATER METER
LH – LAMP HOLE	WS – WATER SERVICE
LP – LIGHT POLE	



REFERENCES: 11882/23 REG'D SURVEYOR	STUTCHBURY JAUQUES PTY LTD LAND SURVEYING CONSULTANTS P.O. BOX 7249, BROOKVALE NSW 2100 PH: 8976 1600 E-MAIL: info@stutchbury.net.au	DATE: 31/7/2023 SCALE: 1:100 DATUM: A.H.D. SITE AREA: 1282m ² SHEET 1 OF 1 SHEETS	CLIENT: MITCH & CHELSEA TAYLOR PROJECT: LEVEL & DETAIL SURVEY LOT 101 D.P.555865 No.5 VISTA AVENUE, BALGOWLAH HEIGHTS LGA: NORTHERN BEACHES
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David Stutchbury
 DAVID STUTCHBURY
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EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE

