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

Development Application for _____
Name of Applicant

Address of site 81 Hilltop 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 21/5/19 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 **81 Hilltop Road, Avalon**

Report Date: 21/5/19

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 81 Hilltop Road, Avalon

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 **81 Hilltop Road, Avalon**

Report Date: 21/5/19

Author: BEN WHITE

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

Please mark appropriate box

☒ Comprehensive site mapping conducted **15/4/19**
(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 **15/4/19**

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

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

☒ Geotechnical hazards described and reported

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

☒ Risk calculation

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

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

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

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

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

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

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

☐ Risk assessment within Bushfire Asset Protection Zone.

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

Signature _____

Name Ben White

Chartered Professional Status MScGEOLAusIMM CP GEOL

Membership No. 222757

Company White Geotechnical Group Pty Ltd

GEOTECHNICAL INVESTIGATION:

New Carport, Pool, and Alterations and Additions at **81 Hilltop Road, Avalon**

1. Proposed Development

1.1 Demolish the existing driveway and construct a new carport and driveway on the downhill side of the property by excavating to a maximum depth of ~2.7m into the slope.

1.2 Extend the downhill side of the house.

1.3 Install a pool on the NE side of the house.

1.4 Details of the proposed development are shown on 13 drawings prepared by Blue Sky Building Designs, project numbered 2017090, drawings numbered A101 to A112 and A120, all dated 21st May, 2019.

2. Site Description

2.1 The site was inspected on the 15th April, 2019.

2.2 This residential property is on the high side of the road and has a NW aspect. It is located on the moderate to steeply graded upper reaches and crest of a hillslope. From the road frontage to the uphill side of the house the natural slope rises at an average angle of ~26° and continues at an average angle of ~18° to the uphill boundary. The slope below the property continues at steep angles. The grade above the property eases as the crest of the slope is approached.

2.3 At the road frontage, a concrete Right of Carriageway (ROW) runs across the lower boundary of the property (Photo 1). A concrete driveway extends off the ROW up the slope to a concrete parking area on the downhill side of the property (Photo 2). A ~0.5m stable dimensioned sandstone block retaining wall and an old timber retaining wall support a cut for the ROW (Photos 3 & 4). The old timber

retaining wall will be remediated as part of the proposed works. Native vegetation covers the slope between the road frontage and the house. An excavation to a maximum depth of ~1.5m has been made for the concrete parking area. The excavation is supported by a brick retaining wall that is cracked and tilting but has been temporarily shored up with timber propping (Photo 5). The wall will be demolished as part of the proposed works. The part three-storey rendered brick house is supported on brick walls and brick piers (Photo 6). No significant signs of movement or cracking were observed in the external supporting brick walls. Some of the supporting brick piers in the foundation space are tilting at a maximum angle of ~8° downslope (Photo 7). We were informed by the owner the tilting piers will be repaired/remediated as part of the proposed works. See **Section 16** for recommendations. A ~1.5m excavation has been made to level the lower ground floor of the house. The cut is supported by the uphill supporting brick wall of the house. The slope above the house is terraced by a series of three retaining walls. The lower brick retaining wall is ~1.0m high and levels a lawn on the uphill side of the house (Photo 8). The middle timber retaining wall is ~0.4m high and is tilting at a maximum angle of ~10° downslope. As the wall is low it doesn't pose a significant risk to life or property should it collapse. The upper timber retaining wall is in a stable condition (Photo 9). Medium Strength Sandstone bedrock outcrops and steps up to the crest of the slope.

3. Geology

The Sydney 1:100 000 Geological sheet indicates the site is underlain by the contact between the Newport Formation of the Narrabeen Group and Hawkesbury Sandstone. In locations close to the boundary of the two rock types, such as this, it can be difficult to distinguish which geological group is encountered as the contact is often transitional.

4. Subsurface Investigation

One Hand Auger Hole (AH) was put down to identify the ground materials. Seven Dynamic Cone Penetrometer (DCP) tests were put down to determine the relative density of the overlying soil and the depth to weathered rock. The locations of the tests are shown on the site plan. It should be noted that a level of caution should be applied when interpreting DCP test results. The test will not pass through hard buried objects so in some instances it can be difficult to determine whether refusal has occurred on an obstruction in the profile or on the natural rock surface. DCP4 likely refused on an obstruction in the profile. This is not expected to be an issue for the rest of the testing on this site and the results are as follows:

AUGER HOLE 1 (~RL58.0) **–** AH1 (Photo 12)

Depth (m)	Material Encountered
0.0 to 0.1	**FILL**, disturbed sandy soil, brown, loose, roots, organic matter, fine to medium grained, dry.
0.1 to 0.5	**FILL**, disturbed sandy clay, orange/brown, firm, fine to medium grained, organic matter, dry.
0.5 to 0.9	**FILL**, disturbed sandy clay, orange with yellow mottling, fine to medium grained, roots, firm to stiff, rock fragments.

End of test @ 0.9m in disturbed sandy clay. No watertable encountered

SEE OVER THE PAGE FOR DCP TEST RESULTS

DCP TEST RESULTS – Dynamic Cone Penetrometer							
Equipment: 9kg hammer, 510mm drop, conical tip.					Standard: AS1289.6.3.2- 1997		
Depth(m) Blows/0.3m	**DCP1** (~RL58.0)	**DCP2** (~RL58.0)	**DCP3** (~RL60.5)	**DCP4** (~RL60.8)	**DCP5** (~RL61.8)	**DCP6** (~RL55.4)	**DCP7** (~RL54.8)
0.0 to 0.3	7	6	2	2	2	4	6
0.3 to 0.6	10	9	8	6	5	4	8
0.6 to 0.9	9	10	15	11	8	6	14
0.9 to 1.2	10	8	10	26	10	7	9
1.2 to 1.5	17	21	12	#	9	23	14
1.5 to 1.8	25	25	18		13	32	18
1.8 to 2.1	7	23	6		16	#	#
2.1 to 2.4	#	#	#		10		
2.4 to 2.7					#		
	Refusal on Rock @ 1.9m	Refusal on Rock @ 2.0m	Refusal on Rock @ 1.9m	Refusal on Rock @ 1.2m	Refusal on Rock @ 2.2m	Refusal on Rock @ 1.8m	Refusal on Rock @ 1.8m

#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 @ 1.9m, DCP bouncing off rock surface, orange rock fragments on dry tip.

DCP2 – Refusal on rock @ 2.0m, DCP thudding on rock surface, orange and yellow clay on dry tip.

DCP3 – Refusal on rock @ 1.9m, DCP thudding on rock surface, white impact dust on dry tip.

DCP4 – Refusal on rock @ 1.2m, DCP bouncing off rock surface, clean dry tip.

DCP5 – Refusal on rock @ 2.2m, DCP bouncing off rock surface, red rock fragments on dry tip.

DCP6 – Refusal on rock @ 1.8m, DCP thudding on rock surface, red rock fragments on dry tip

DCP7 – Refusal on rock @ 1.8m, DCP bouncing off rock surface, red rock fragments on dry tip.

5. Geological Observations/Interpretation

The slope materials are colluvial at the near surface and residual at depth. In the test locations, the natural ground materials consist of a thin sandy topsoil over firm to stiff sandy clay. The clay merges into the underlying weathered rock at an average depth of ~1.8m below the current ground surface. The property is cut by the contact between the Narrabeen Group Rocks and Hawksbury Sandstone. The outcropping Sandstone bedrock exposed across the upper portion of the property is indicative of a typical Hawksbury Sandstone derived slope. The tests were all taken through the lower half of the property and either bounced or thudded on refusal. This is indicative of stronger rock than what is typical in a shale-dominated profile and is likely beds of stronger rock or narrow sandstone bands that run through the shale profile on the lower portion of the property. We interpret the underlying rock to be in the range from Very Low Strength to Medium Strength. Filling to a maximum depth of ~1.0m was encountered on the downhill side of the house, pushed forward during the initial excavation and construction of the house. No other significant filling was observed or encountered on the property during the testing on the 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 clay and 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

No evidence of significant surface flows were observed on the property during the inspection. As the property is located at the crest of a ridge, the property will only be affected by surface water that accumulates on the site.

8. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed above or beside the property. The moderate to steeply graded slope that falls across the property and continues below is a potential hazard (**Hazard One**). The vibrations produced during the proposed excavation are a potential hazard (**Hazard Two**). The proposed carport excavation is a potential hazard before retaining walls are in place (**Hazard Three**).

Risk Analysis Summary

HAZARDS	Hazard One	Hazard Two	Hazard Three
TYPE	The moderate to steeply graded slope that falls across the property and continues below impacting on the house and proposed works (Photos 1 & 12).	The vibrations produced during the proposed excavation damaging the subject and neighbouring house.	The proposed garage excavation collapsing onto the worksite and impacting on the SW neighbouring property and ROW.
LIKELIHOOD	'Unlikely' (10^{-4})	'Possible' (10^{-3})	'Possible' (10^{-3})
CONSEQUENCES TO PROPERTY	'Minor' (9%)	'Medium' (10%)	'Medium' (20%)
RISK TO PROPERTY	'Low' (5×10^{-6})	'Moderate' (5×10^{-5})	'Moderate' (2×10^{-4})
RISK TO LIFE	8.3×10^{-7}/annum	4.3×10^{-7}/annum	2.7×10^{-4}/annum
COMMENTS	This level of risk is 'ACCEPTABLE'.	This level of risk to 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 the risk levels to 'ACCEPTABLE' levels the recommendations in **Section 13** 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

There is fall to Hilltop Road. 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 ~2.7m is required to construct the proposed carport and driveway. It is expected to be through a shallow sandy soil over clay with weathered rock expected at a depth of ~1.5m below the current ground surface. Medium Strength Rock may be encountered below 1.8m. It is envisaged that excavations through soil, clay, and weathered rock can be carried out by a bucket only and excavations through Medium Strength Rock will require grinding or rock sawing and breaking.

12. Vibrations

Possible vibrations generated during excavations through soil, clay, and weathered rock will be below the threshold limit for building damage.

If Medium Strength Rock is encountered, excavations should be carried out to minimise the potential to cause vibration damage to the subject house and SE neighbouring house. The excavation will be ~7.0m from the subject house and ~9.0m from the SW neighbouring house. 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 10mm/sec at the subject house walls. Vibration monitoring will be required to verify this is achieved.

If a milling head is used to grind the rock, vibration monitoring will not be required. Alternatively, if rock sawing is carried out around the perimeter of the excavation boundaries in not less than 1.0m lifts, a rock hammer up to 300kg could be used to break the rock without vibration monitoring. Peak particle velocity will be less than 10mm/sec at the supporting brick walls of the house and garage and common boundaries using this method provided the saw cuts are kept well below the rock to broken.

It is worth noting that vibrations that are below thresholds for building damage may be felt by the occupants of the subject and neighbouring house.

13. Excavation Support Requirements

On steep sites such as this one, to help maintain excavation stability, it is critical upslope runoff be diverted from the proposed excavation with temporary or permanent drainage measures. Temporary measures may be trenches and sandbag mounds and permanent measures could be a wide diameter dish drain or similar. These are to be installed before any excavation work commences.

The excavation for the carport and driveway will reach a maximum depth of ~2.7m, will quickly taper away to the NW, and will gradually decrease in depth along the line of the proposed driveway. Accounting for backwall drainage, the excavation will be located ~0.5m from the SW common boundary. The depth to weathered rock in this location is expected to be ~1.5m. Thus, the SW boundary will lie within the zone of influence of the proposed garage excavation. In this instance, the zone of influence is the area above a theoretical 30˚ line through soil and 45° line through clay and weathered rock from the top of rock towards the surrounding structures. No other structures or boundaries will lie within the zone of influence of the excavation.

Provided the shallow soil portion of the excavation is battered at 1.0 Vertical; to 1.7 Horizontal (30°) the clay and rock portion of the excavation is expected to stand unsupported for a short

period of time before retaining walls are in place provided the cut batters are prevented from becoming saturated.

Any walls that are to be demolished as part of the proposed works are to be systematically lowered from the top down. As the wall is lowered, the soil behind the wall is to be removed uniformly.

During the excavation process, the geotechnical consultant is to inspect the cut in 1.5m intervals as it is lowered to ensure the ground materials are as expected and no wedges or other geological defects are present that could require additional support.

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. Upslope runoff is to be diverted from the cut faces by sandbag mounds, or other diversion works. The materials and labour to construct the retaining structures are to be organised so on completion of the excavations they can be constructed as soon as possible. The excavations are to be carried out during a dry period. No excavations are to commence if heavy or prolonged rainfall is forecast.

All excavation spoil is to be removed from site.

14. Retaining Walls

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

SEE OVER THE PAGE FOR TABLE 1

Table 1 – Likely Earth Pressures for Retaining Structures

Unit	Earth Pressure Coefficients		
	Unit weight (kN/m^3)	'Active' K_a	'At Rest' K_0
Sandy Soil	20	0.40	0.55
Residual Clays	20	0.35	0.45
Extremely Low Strength Rock	22	0.30	0.40
Rock up to Medium Strength	22	0.20	0.25

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 do not account for any surcharge loads, assume the surface above the wall is near level, and 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 supported off the weathered rock at the base of the excavation is a suitable foundation material for the proposed garage. Where it is not exposed (on the downhill side) shallow piers are required to maintain a uniform bearing material across the structure.

The proposed pool will be suspended and piers will be required to support the structure on the underlying weathered Rock. This material is expected at a maximum depth of ~2.2m below the current ground surface. A maximum allowable bearing pressure of 600kPa can be assumed for footings on rock.

As the decking around the pool will become saturated during pool use, it is recommended the decking be supported on piers taken to the underlying weathered rock. This bearing material is expected at an average depth of ~1.5m below the current ground surface. This will reduce the risk of settlement around the pool that can result from ongoing saturation of the soil.

Ideally, footings should be founded on the same footing material across the existing house and new additions. Where the footing material changes across the structure, construction joints or similar are to be installed to prevent differential settlement, where the structure cannot tolerate such movement.

It is recommended 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 wet layer of shale 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 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

Some of the supporting brick piers in the foundation space are tilting at a maximum angle of ~8° downslope (Photo 8). We recommend any piers tilting more than 5° be remediated as part of the proposed works.

17. Inspections

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

- During the excavation process for the proposed carport and driveway, the geotechnical consultant is to inspect the cut in 1.5m intervals as it is lowered to ensure the ground materials are as expected and that no additional support is required.

- 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

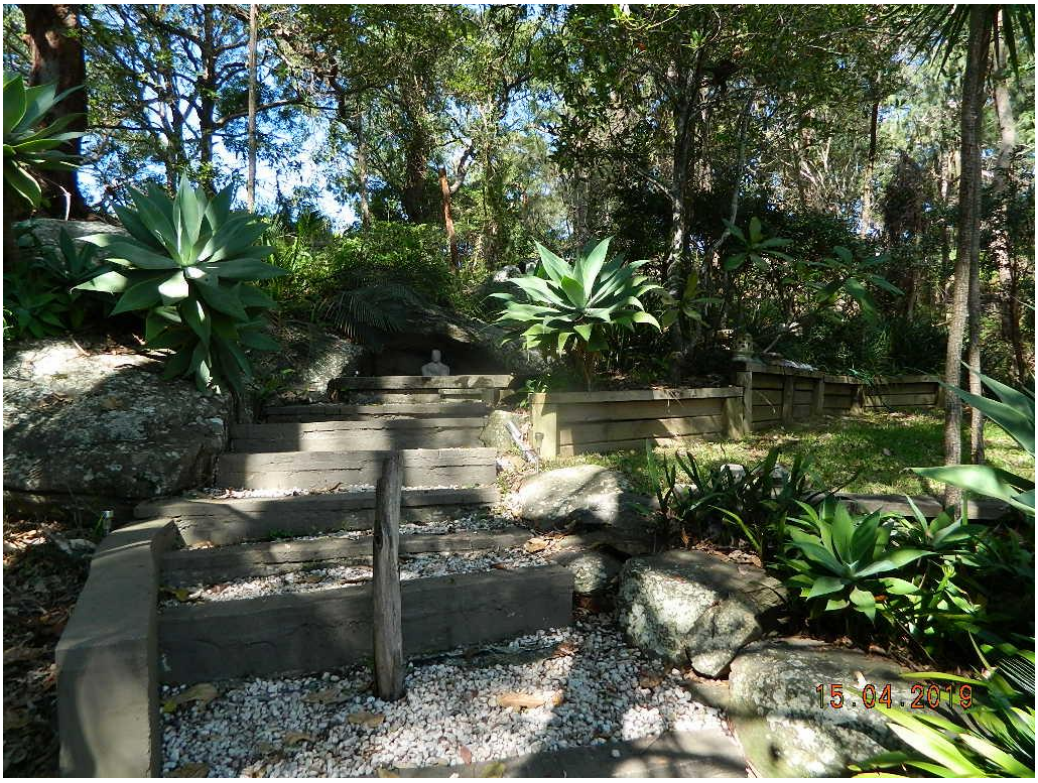


Photo 9

Photo 10

Photo 11

Photo 12:Auger hole 1, top of hole at top of image.

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 tests 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 professional. Even the most experienced practitioners cannot determine every possible feature or change that may lie below the earth. All of the subsurface features can only be known when they are revealed by excavation. As such a Geotechnical report can be considered an interpretive document. It is based on factual data but also on opinion and judgement that comes with a level of uncertainty. This information is provided to help explain the nature and limitations of your report.

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

- If upon the commencement of the works the subsurface ground or ground water conditions prove different from those described in this report it is advisable to contact White Geotechnical Group immediately, as problems relating to the ground works phase of construction are far easier and less costly to overcome if they are addressed early.

- If this report is used by other professionals during the design or construction process any questions should be directed to White Geotechnical Group as only we understand the full methodology behind the report's conclusions.

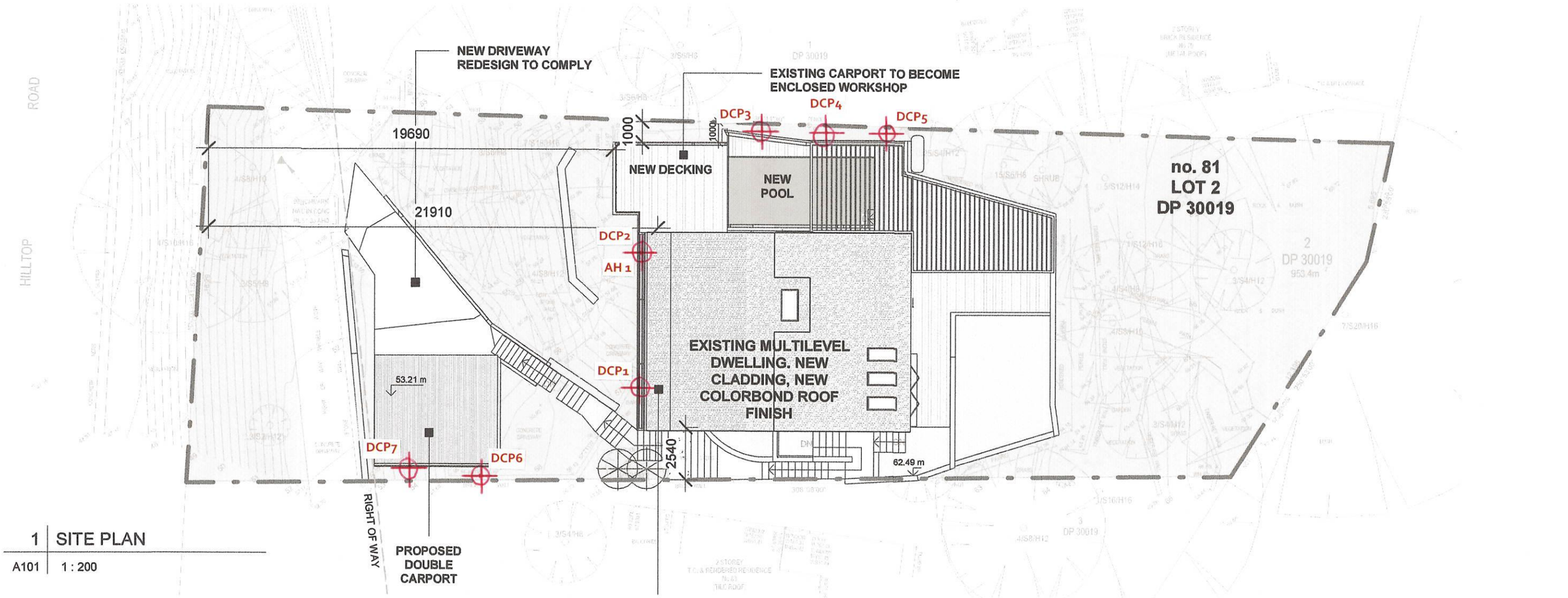
- The report addresses issues relating to your specific design and site. If the proposed project design changes, aspects of the report may no longer apply. Contact White Geotechnical if this occurs.

- This report should not be applied to any other project other than that outlined in section 1.0.

- This report is to be read in full and should not have sections removed or included in other documents as this can result in misinterpretation of the data by others.

- It is common for the design and construction process to be adapted as it progresses (sometimes to suit the previous experience of the contractors involved). If alternative design and construction processes are required to those described in this report contact White Geotechnical Group. We are familiar with a variety of techniques to reduce risk and can advise if your proposed methods are suitable for the site conditions.

SITE PLAN – showing test locations



1 | SITE PLAN

A101 | 1 : 200

NOTES:

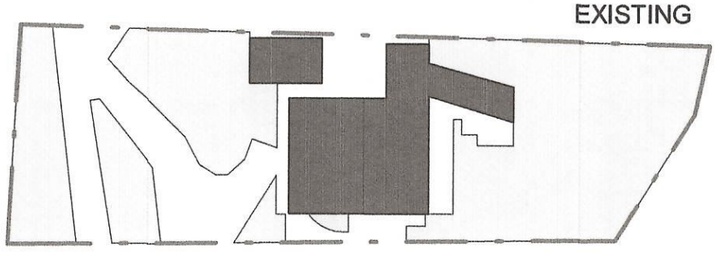
1. Demolition works to be carried out in accordance with the requirements of A2601-2001 The Demolition of Structures. Also in compliance with work cover authority of NSW requirements, including but not limited to:
   - Protection of site workers and the general public
   - Asbestos handling and disposal where applicable
2. Termite protection to be in accordance with AS 3600.1
3. All construction to comply with current BCA codes and Australian Standards.
4. Stormwater system to be connected to existing.
5. All timber framing shall comply with AS1684
6. These documents must be read in conjunction with all the sub-consultants reports and recommendations. The architectural documents form part of the total construction set and are not to be taken as exclusively being the building construction documents
7. Eaves within 900mm of allotment boundries are to be constructed of non-combustible materials. eaves must not be within 450mm of allotment boundaries as required by part 3.7.1 of BCA
8. Sediment & Erosion control are to be installed and maintained during the life of the project

ALL BUILDING WORKS MUST BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE BUILDING CODE OF AUSTRALIA (BCA) AND AUSTRALIAN STANDARDS

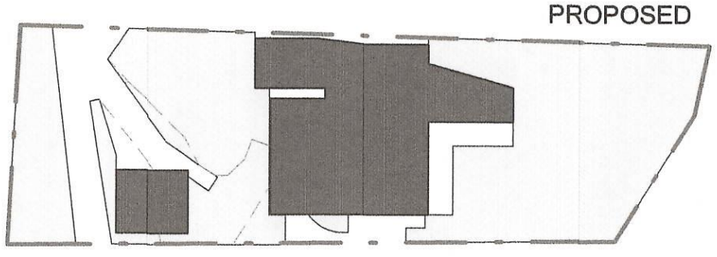
CALCULATION TABLE

ZONE	E4 - ENVIRNMENTAL LIVING	
HAZARDS	GEOTECH H1; BUSHFIRE	
SITE AREA	953.4m²	
MAX. BUILDING HEIGHT	Hmax = 8.5 m; site slope 20°	
BUILDING ENVELOPE	3.5m - envelopes; 2.5m and 1m side setbacks	
	EXISTING	PROPOSED
TOTAL FLOOR AREA	163m²	193m²
SITE COVERAGE	172m² / 18%	242.2m² / 25.4%
BUILT UPON AREA	249 m²	163.2 m²
SOFT LANDSCAPING	532.4m² / 55.5%	548m² / 57%
FLOOR SPACE RATIO	0.17 : 1	0.2 : 1

EXISTING



PROPOSED



Do not scale from plans. All dimensions and levels shown on plan are subject to confirmation on site.

ISSUE	DATE	DESCRIPTION	DRWN	CHKD
-	08.03.2018	EXISTING	KA	MW
	18.05.2018	PRELIMINARY 1	MW	
	13.03.2019	PRELIMINARY 2 - option 3	MW	
	21.05.2019	DA PLANS	MW	

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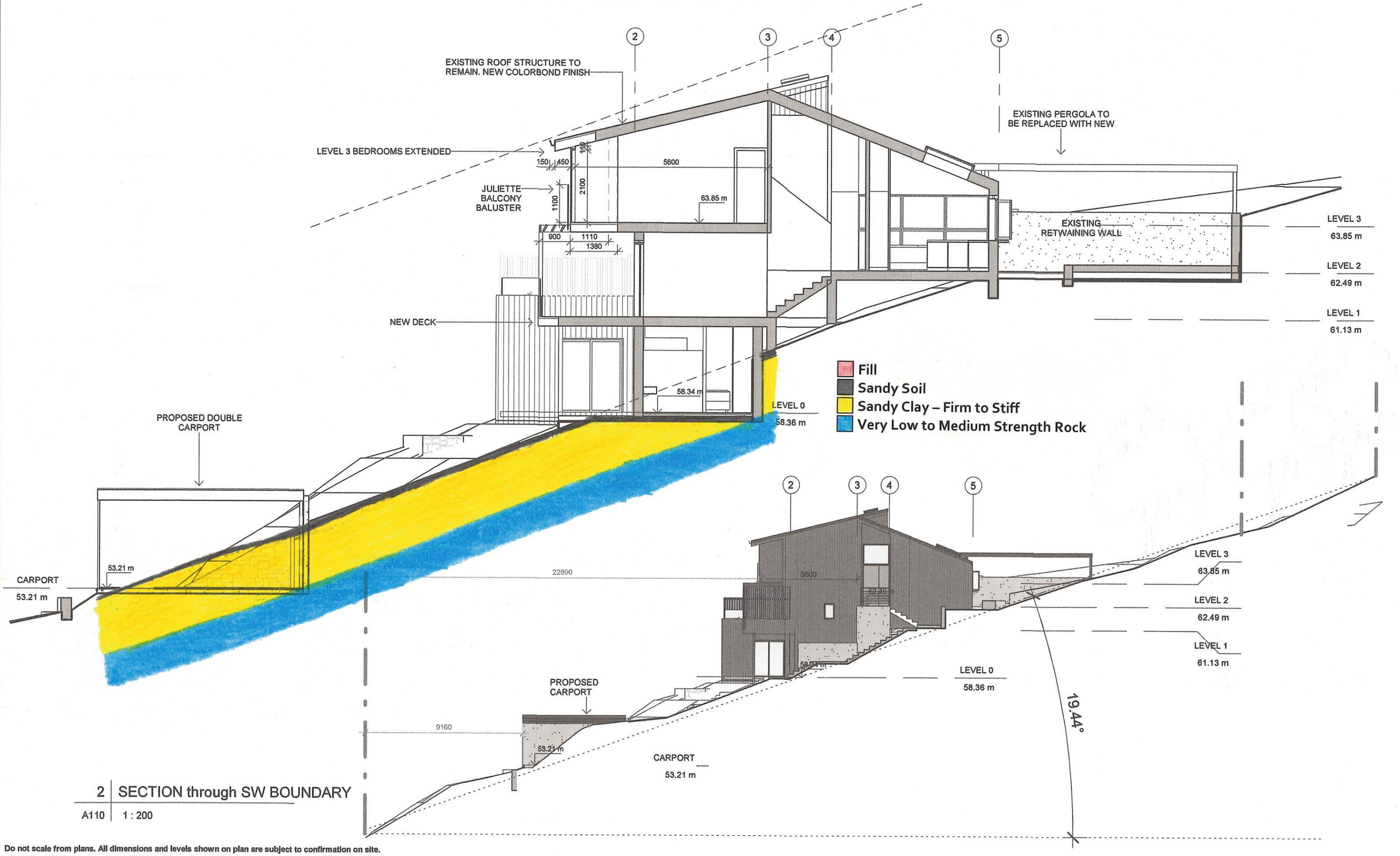
PROJECT TITLE: ALTERATION & ADDITION
PROJECT NO.: 2017090
AT: Avalon, 81 Hilltop Rd
FOR: Tara & Russell Denning

SHEET TITLE: SITE PLAN
SHEET NO: A101
SCALE A3: As indicated

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials



2 | SECTION through SW BOUNDARY

A110 | 1 : 200

Do not scale from plans. All dimensions and levels shown on plan are subject to confirmation on site.

ISSUE	DATE	DESCRIPTION	DRWN	CHKD
-	08.03.2018	EXISTING	KA	MW
	18.05.2018	PRELIMINARY 1	MW	
	13.03.2019	PRELIMINARY 2 - option 3	MW	
	21.05.2019	DA PLANS	MW	

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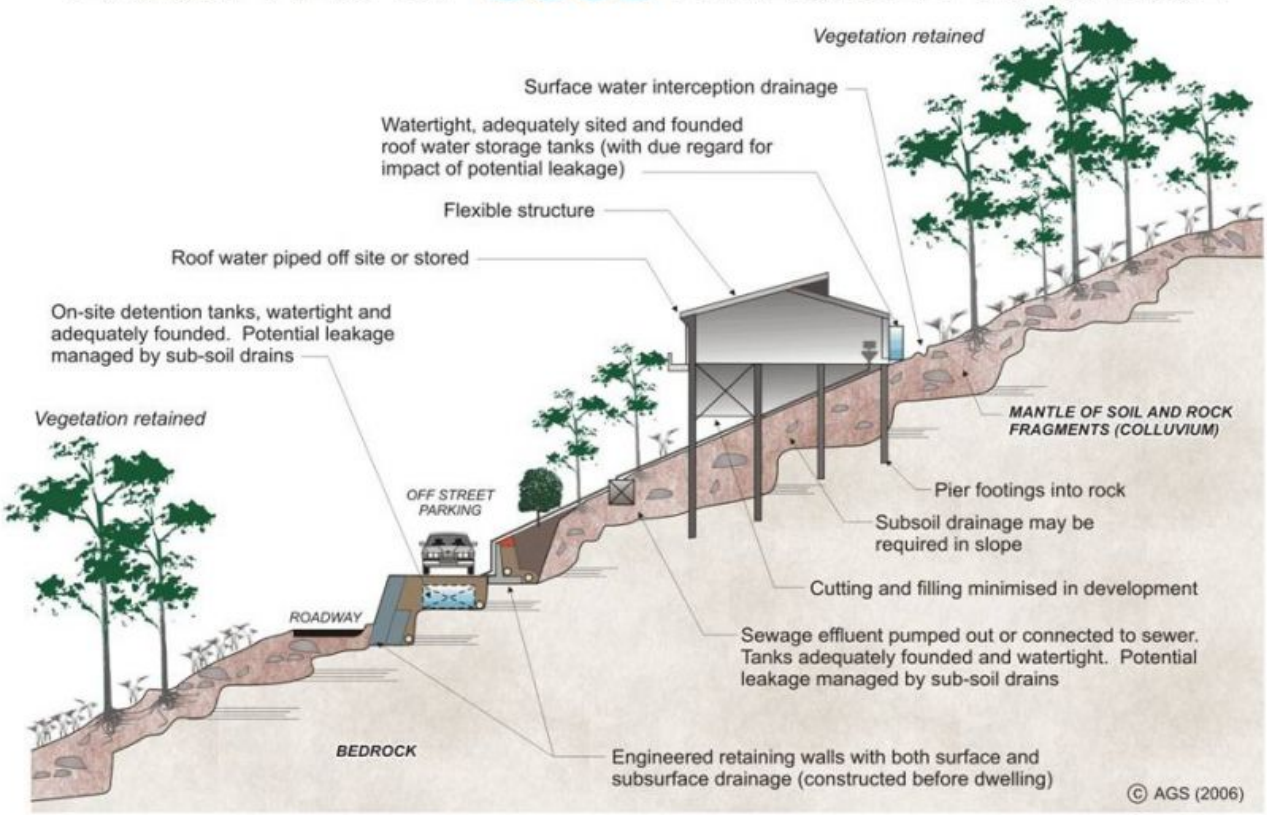
PROJECT TITLE:	ALTERATION & ADDITION
PROJECT NO.:	2017090
AT:	Avalon, 81 Hilltop Rd
FOR:	Tara & Russell Denning
SHEET TITLE:	SECTIONS
SHEET NO:	A110
SCALE A3:	As indicated

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE