GEOTECHNICAL INVESTIGATION:

New Garage and Pool at **11 Bungaloe Avenue, Balgowlah Heights**

1. Proposed Development

1.1 Demolish the existing garage on the uphill side of the property and construct a new garage with studio under by excavating to a maximum depth of ~3.0m.

1.2 Construct a new pool and pool area on the uphill side of the property by excavating to a maximum depth of ~4.0m into the slope.

1.3 Re-landscape the uphill side of the property by excavating to a maximum depth of ~2.2m.

1.4 Details of the proposed development are shown on 5 drawings prepared by Space Landscape Designs, Project numbered 191690, drawings numbered DA-02, 03, and 05 are Revision C, drawing numbered DA-01 is Revision D, and drawing numbered DA-04 is Revision F, all drawings dated 3/3/20.

2. Site Description

2.1 The site was inspected on the 6th April, 2020.

2.2 This residential property has dual access. It is on the uphill side of Bungaloe Avenue and on the downhill side of Woodland Street. The property has an E aspect. The block is located on the gentle to moderately graded middle reaches of a hillslope. The natural surface rises across the property at an average angle of ~11°. The slope above and below the property continues at similar angles.

2.3 At the road frontage to Bungaloe Avenue, a concrete driveway runs to a garage on the downhill side of the property (Photo 1). The cut for the driveway is supported by stable stack rock retaining walls reaching ~1.1m in height (Photo 2). The slope between the road frontage and the house is terraced with a series of stable stack rock

retaining walls (Photo 3). Some of these walls were observed to be supported directly onto outcropping competent Medium Strength Sandstone. The part three-storey rendered masonry house is supported on masonry walls (Photo 4). No significant signs of movement were observed in the supporting walls. An excavation has been made in the slope to create a level platform for the ground floor of the house. The cut is supported by a stable stack rock retaining wall and battered slope that will be removed as part of the proposed works (Photo 5). The slope between the uphill side of the house and the road frontage to Woodland Street is also terraced with a series of low stable stack rock retaining walls that will be removed as part of the proposed works (Photos 6 & 7). Medium Strength Sandstone outcrops through the uphill side of this slope. At the road frontage to Woodland Street, a concrete driveway runs to a brick garage in the SW corner of the property that will be demolished as part of the proposed works (Photo 8).

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

One auger hole was put down to identify the soil materials. Seven 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. 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 and the results are as follows:

AUGER HOLE 1 (~RL57.0) **–** AH1 (Photo 9)

Depth (m)	**Material Encountered**
0.0 to 0.6	**FILL**, disturbed sandy soil, dark brown and mottled brown and white, dense, dry, fine to coarse grained with fine trace organic matter.

Refusal @ 0.6m on unknown obstruction in profile. No watertable encountered.

DCP TEST RESULTS – Dynamic Cone Penetrometer							
Equipment: 9kg hammer, 510mm drop, conical tip.					Standard: AS1289.6.3.2 - 1997		
Depth(m) Blows/0.3m	**DCP 1** (~RL60.2)	**DCP 2** (~RL59.0)	**DCP 3** (~RL58.6)	**DCP 4** (~RL57.0)	**DCP 5** (~RL57.5)	**DCP 6** (~RL55.5)	**DCP 7** (~RL55.5)
0.0 to 0.3	2	2	6	12	1	7	Rock Immediately Below Surface
0.3 to 0.6	6	14	#	12	5	#	
0.6 to 0.9	#	5		27	#		
0.9 to 1.2		8		#			
1.2 to 1.5		27					
1.5 to 1.8		19					
1.8 to 2.1		10					
2.1 to 2.4		12					
2.4 to 2.7		#					
	Refusal on Rock @ 0.5m	Refusal on Rock @ 2.3m	Refusal on Rock @ 0.2m	Refusal on Rock @ 0.9m	Refusal on Rock @ 0.4m	Refusal on Rock @ 0.3m	

#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 @ 0.5m, DCP bouncing off rock surface, white impact dust on dry tip.
DCP2 – Refusal on rock @ 2.3m, DCP bouncing off rock surface, maroon sandstone fragments on dry tip, orange clay in collar above tip.
DCP3 – Refusal on rock @ 0.2m, DCP bouncing off rock surface, white impact dust on dry tip.
DCP4 – Refusal on rock @ 0.9m, DCP bouncing off rock surface, orange and maroon sandstone fragments on dry tip.

DCP5 – Refusal on rock @ 0.4m, DCP bouncing off rock surface, white and orange impact dust on dry tip.
DCP6 – Refusal on rock @ 0.3m, DCP bouncing off rock surface, white and maroon sandstone fragments on dry tip.
DCP7 – Rock immediately below surface.

5. Geological Observations/Interpretation

The surface features of the block are controlled by the outcropping and 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. Through the natural profile, the rock is overlain by sandy soils and sandy clays that fill the bench step formation. Filling has been placed across the uphill side of the property for landscaping. In the test locations, rock was encountered between 0.2 to 2.3m below the current surface, being deeper where filling has been used for landscaping and due to the stepped nature of the underlying bedrock. The sandstone outcropping on the property is estimated to be medium strength or better and similar 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 excavations.

7. Surface Water

No evidence of significant surface flows were observed on the property during the inspection. Normal sheet wash from the slope above will be intercepted by the street drainage system for Woodland Street above.

8. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed above, below, or beside the property. The vibrations from the proposed excavations are a potential hazard (**Hazard One**). A loose boulder, wedge, or similar geological defect toppling onto the work site during the excavation process is a potential hazard (**Hazard Two**). The proposed excavation for the studio undercutting the footings of the S neighbouring garage is a potential hazard (**Hazard Three**).

Risk Analysis Summary

HAZARDS	Hazard One	Hazard Two	Hazard Three
TYPE	The vibrations produced during the proposed excavations impacting on the surrounding structures.	A loose boulder, wedge, or similar geological defect toppling onto the work site during the excavation process.	The proposed excavation for the studio undercutting the footings of the S neighbouring garage causing failure.
LIKELIHOOD	'Possible' (10^{-3})	'Possible' (10^{-3})	'Possible' (10^{-3})
CONSEQUENCES TO PROPERTY	'Medium' (15%)	'Medium' (20%)	'Medium' (35%)
RISK TO PROPERTY	'Moderate' (2×10^{-4})	'Moderate' (2×10^{-4})	'Moderate' (2×10^{-4})
RISK TO LIFE	5.3×10^{-7}/annum	6.3×10^{-4}/annum	5.3×10^{-5}/annum
COMMENTS	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 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 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

The fall is to Bungaloe Avenue below. Roof water 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 ~4.0m is required to construct the proposed pool and pool area. The excavation is expected to be through a shallow overburden of manmade filling over sandy soils and firm to stiff sandy clays. Medium Strength Sandstone is expected at a maximum depth of ~0.9m below the current surface.

Another excavation to a maximum depth of ~3.0m is required to construct the proposed garage with studio under. This excavation is expected to be through a maximum of ~1.5m of manmade filling over sandy soils and firm to stiff sandy clays. Medium Strength Sandstone is expected at shallow depths of ~0.5m on the uphill side of the excavation, and at a maximum depth of ~2.3m below the current surface on the downhill side of the excavation.

A third excavation to a maximum depth of ~2.2m is required to re-landscape the area between the proposed garage and the existing house. The excavation is expected to be through a shallow sandy soil over firm to stiff sandy clays. Medium Strength Sandstone is expected at a maximum depth of ~0.4m below the current surface

It is envisaged that excavations through fill, sandy soil, and sandy clays can be carried out with a bucket and excavations through rock will require grinding or rock sawing and breaking.

12. Vibrations

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

It is expected most of the excavations will be through Medium Strength Sandstone or better. Excavations through rock should be carried out to minimise the potential to cause vibration damage to the subject house, N neighbouring house, and S neighbouring garage. The supporting walls of the subject house will be as close as ~1.2m, the N neighbouring house will be as close as ~7.0m, and the S neighbouring garage will be as close as ~0.5m from the edges of the excavations.

Excavation methods are to be used that limit peak particle velocity to 5mm/sec at the supporting walls of the subject house and common boundaries. 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 5mm/sec at the supporting walls of the subject house 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 neighbouring houses.

13. Excavation Support Requirements

The N and S common boundary fences are to be braced before any excavations commence.

Bulk Excavation for Proposed Pool and Pool Area

This excavation will be taken to a maximum depth of ~4.0m and, allowing for back-wall drainage, will be taken close to flush with the N common boundary. No structures on the N

neighbouring property will be within the zone of influence of the excavation. Rock was encountered at shallow depths not exceeding 0.9m in this location. Thus, only the N common boundary will be within the zone of influence of the excavation. The zone of influence, in this instance, is the area above a theoretical 30° line extending from the top of Medium Strength Sandstone towards the surrounding structures and boundaries.

The soil portion of the cut is to be permanently or temporarily supported along the N side before the excavation through rock commences. Alternatively, the support is to be installed systematically as the excavation progresses to ensure the integrity of the N neighbouring property. If the support is temporary, it is to remain in place until the retaining wall is built as a sacrificial-type system.

All other sides of the excavation through fill, soil, and clay are to be scraped back from the excavation line at least 0.5m and battered at 1.0 Vertical to 1.7 Horizontal (30°) until retaining walls are in place provided they are kept from becoming saturated. Excavations through Medium Strength Sandstone or better will stand at vertical angles unsupported subject to approval by the geotechnical consultant.

Bulk Excavation for Studio under Proposed Garage

This excavation will be taken to a maximum depth of ~3.0m and will be taken close to flush with the uphill and S common boundaries. Thus, the road reserve for Woodland Street and the brick garage on the S neighbouring property will both be within the zone of influence of the proposed excavation.

Due to the shallow depth of the rock in this location, it is likely that the S neighbouring garage is supported on the rock. However, it is difficult to predict the foundation materials of structures of this age and construction. Thus, prior to the commencement of the excavation, and with the permission of the owners of the S neighbouring property, we recommend exploration pits along the wall 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 wall will need to be underpinned to rock 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 edge of the wall and then underpinned. Underpins are to be constructed from drives that should not exceed 0.6m in width along strip footings. 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.

The cut is to be permanently or temporarily supported along the uphill side of the excavation as per the previous recommendations for the N side of the excavation for the pool area. The remaining cut batters through fill, soil, and clay are to be battered as per the recommendations above. Medium Strength Sandstone or better will stand at vertical angles unsupported subject to approval by the geotechnical consultant.

Bulk Excavation for Landscaping

This excavation will be taken to a maximum depth of ~2.2m and will come close to flush with the S neighbouring property. No structures on the S neighbouring property will be within the zone of influence of the excavation. Rock was encountered at shallow depths not exceeding 0.4m in this location. Thus, only the S common boundary will be within the zone of influence of the excavation.

The cut is to be permanently or temporarily supported along the S side of the excavation as per the previous recommendations for the N side of the excavation for the pool area. Medium Strength Sandstone or better will stand at vertical angles unsupported subject to approval by the geotechnical consultant.

Advice Applying to All Excavations

During the excavation process, the geotechnical consultant is to inspect the cut faces in 1.5m intervals as they are lowered or after encountering softer sections of rock, while the machine is on site to ensure the ground materials are as expected and no wedges or other geological defects are present that could require additional support. Should any weak sections of rock be encountered, works are to stop until temporary or permanent support such as rock anchors, bolts, sprayed concrete, or similar support is installed. The support is to be designed by the structural engineer in consultation with the geotechnical consultant.

Upon completion of the excavations, it is recommended all cut faces 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.

Upslope runoff is to be diverted from the cut faces by sandbag mounds or other diversion works. 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/pool structure are to be organised so on completion of the excavations it 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 following the current Environmental Protection Agency (EPA) waste classification guidelines.

14. Retaining Structures

For cantilever or singly-propped retaining structures, it is suggested the design be based on a triangular pressure distribution of lateral pressures using the parameters shown in 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
Fill, Sandy Soil, and Residual Clay	20	0.4	0.55
Medium Strength Sandstone	24	0.00	0.01

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 structures are fully drained. Rock strength 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 likely hydrostatic pressures are to be accounted for in the structural design.

15. Foundations

The proposed garage with studio under is to be supported on a concrete slab supported on the underlying Medium Strength Sandstone. This ground material is expected to be exposed across the entire base of the proposed excavation.

The proposed pool is expected to be seated on the Medium Strength Sandstone. This is a suitable foundation material.

The proposed retaining walls on the uphill side of the property are to be founded on Medium Strength Sandstone.

A maximum allowable bearing pressure of 1000kPa can be assumed for footings on Medium Strength Sandstone.

Naturally occurring vertical cracks (known as joints) commonly occur in sandstone. These are generally filled with soil and are the natural seepage paths through the rock. They can extend to depths of several metres and are usually relatively narrow but can range between 0.1 to 0.8m wide. If a footing falls over a joint in the rock, the construction process is simplified if with the approval of the structural engineer the joint can be spanned or alternatively the footing can be repositioned so it does not fall over the joint.

NOTE: If the contractor is unsure of the footing material required, it is more cost-effective to get the geotechnical consultant on site at the start of the footing excavation to advise on footing depth and material. This mostly prevents unnecessary over-excavation in clay-like shaly-rock but can be valuable in all types of geology.

REQUIRED INSPECTIONS ARE ON THE NEXT PAGE

16. Inspections

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

- The geotechnical consultant is to inspect any exploration pits that may be required to expose the foundation materials of the S neighbouring garage.

- During the excavation process, the geotechnical consultant is to inspect the cut faces in 1.5m intervals as they are lowered 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.

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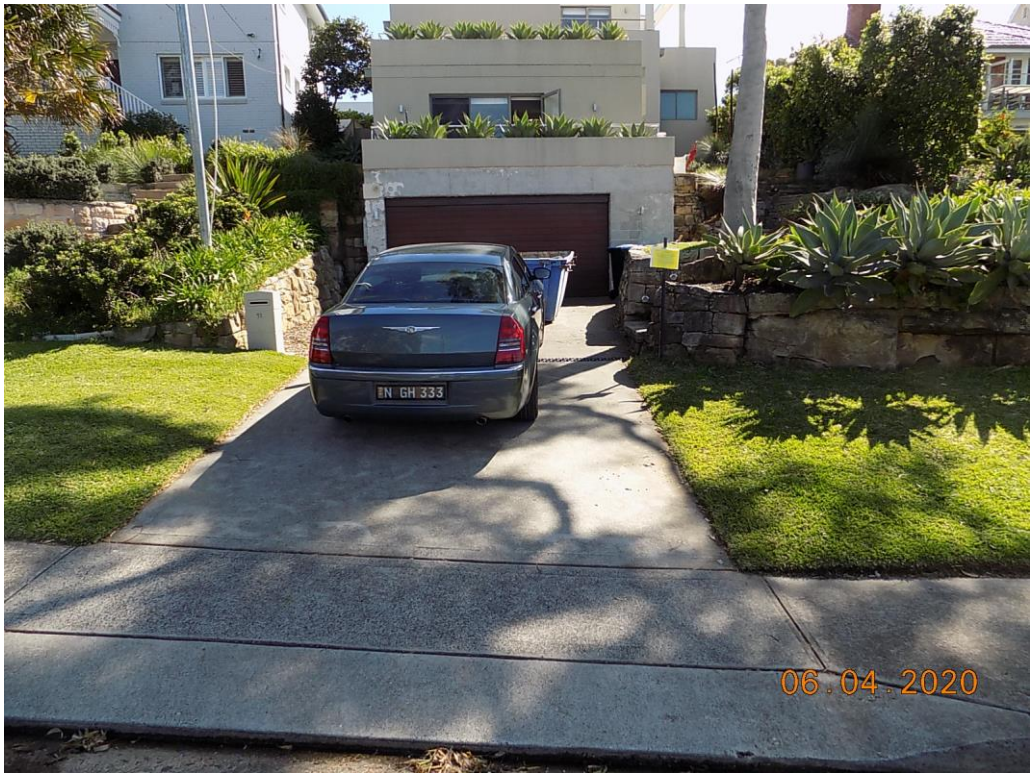


Photo 1

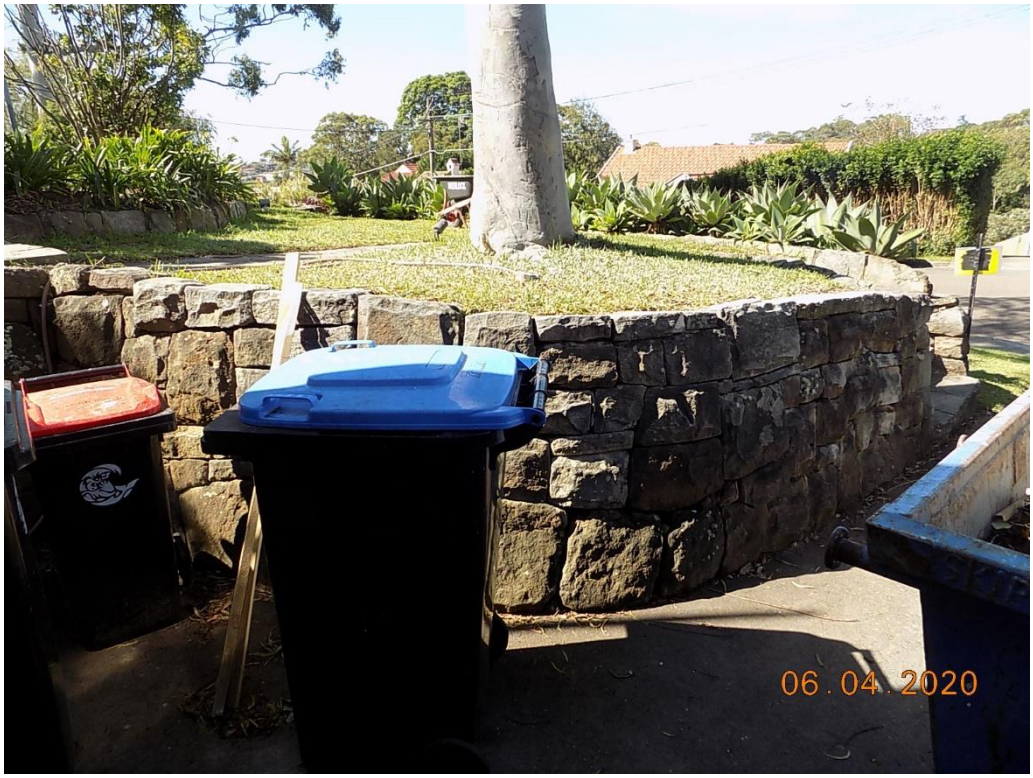


Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

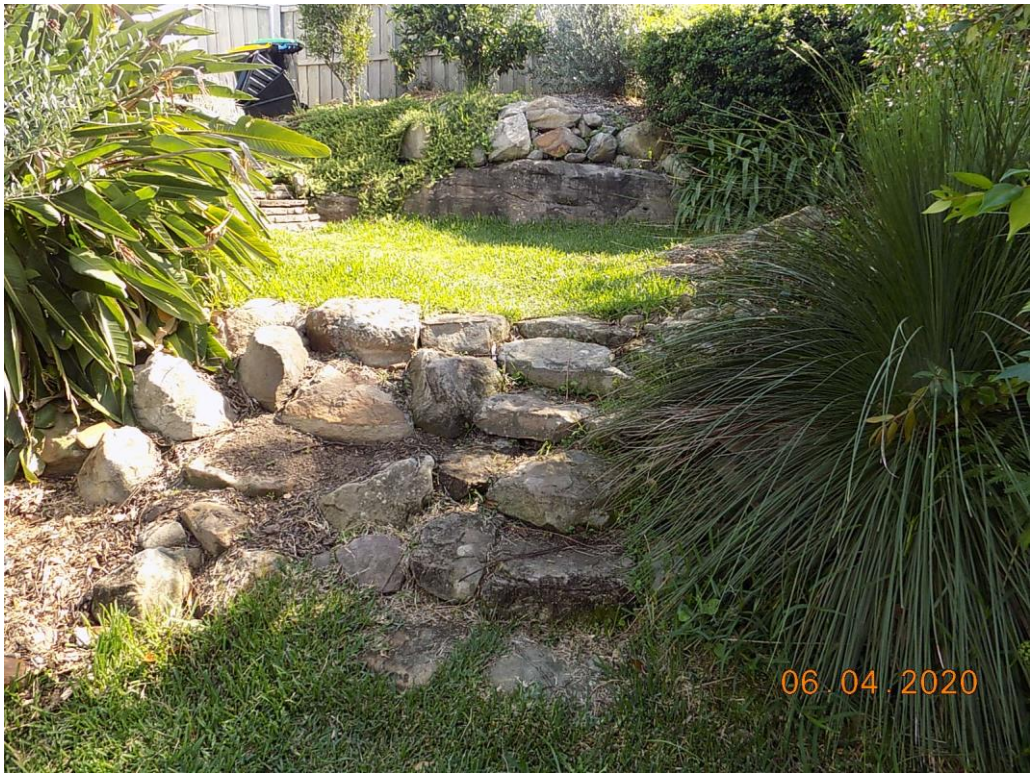


Photo 7

Photo 8

Photo 9: AH1 – 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.

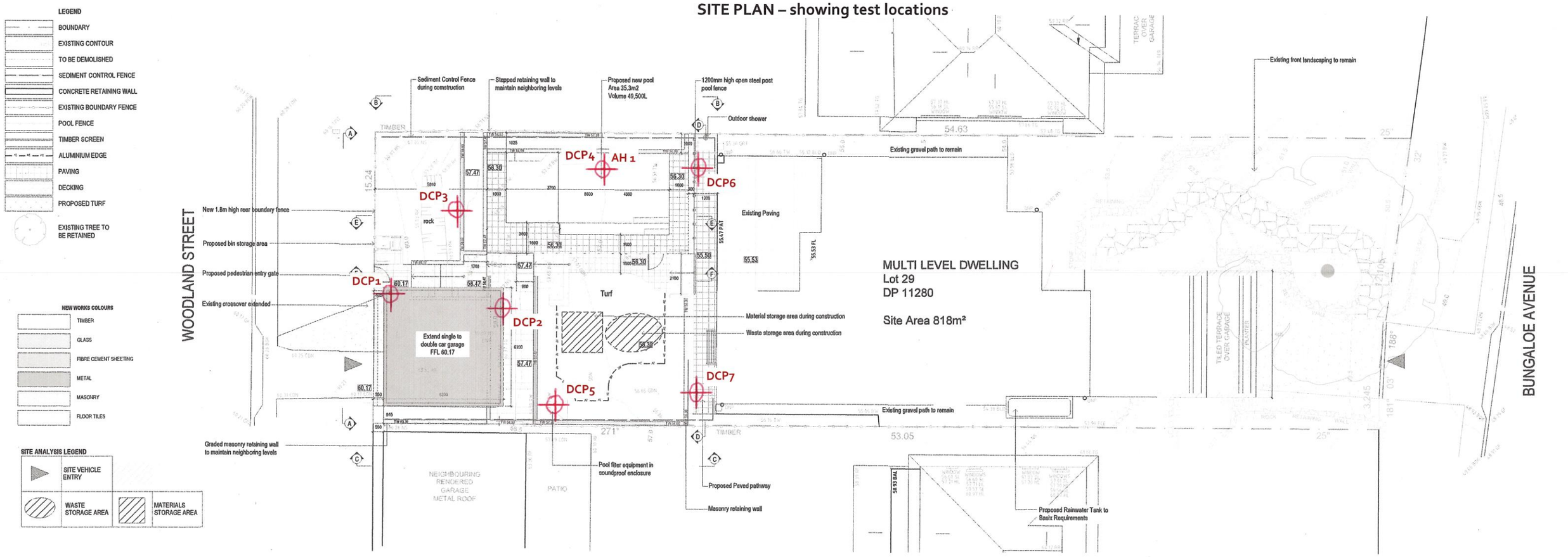
- The report addresses issues relating to your specific design and site. If the proposed project design changes, aspects of the report may no longer apply. Contact White Geotechnical if this occurs.

- 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.

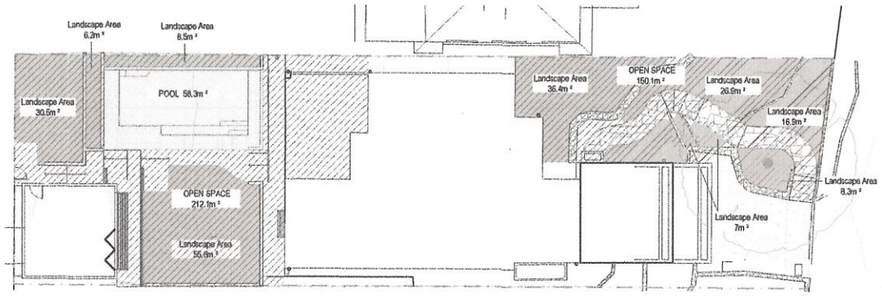
- It is common for the design and construction process to be adapted as it progresses (sometimes to suit the previous experience of the contractors involved). If alternative design and construction processes are required to those described in this report, contact White Geotechnical Group. We are familiar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

SITE PLAN – showing test locations



SITE PLAN / SITE ANALYSIS

SCALE 1:100



LANDSCAPE OPEN SPACE CALCULATIONS

SCALE 1:200

LANDSCAPE OPEN SPACE

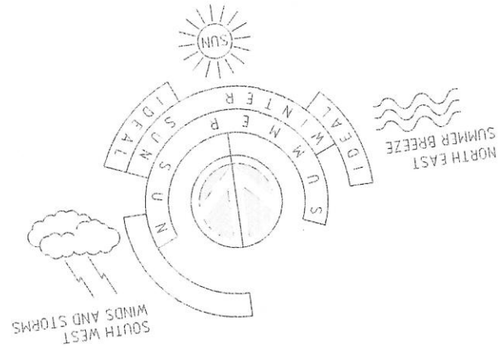
Denotes Open Space >3m

Denotes Landscape Area >0.5m

Denotes Pool Component of OS

Residential Development Control Area OS3 requires 55% of site area to be Open Space with 35% of that open space to be Landscaped Area.

Site Area:	818m²		
Open Space required:	449.9m²	55%	
Open Space proposed:	460.6m²	56%	Complies
Maximum pool component of OS	134.9m²	30%	
Pool proposed of Open Space:	58.3m²	13%	Complies
Landscape Area required:	157.5m²	35% of 449.9m²	
Landscape Area proposed:	196.3m²	44%	Complies



POOL NOTES:

1/ Refer to Pool Fencing Code per AS 1926.1 - 2012 for compliance of the safety barriers for swimming pools.

2/ Overflow of pool is to be connected to sewer according to Sydney Water specifications.

3/ Pool pavement pattern and setout shown is indicative only. No allowance has been made for coping overhang, mortar gaps and joints.

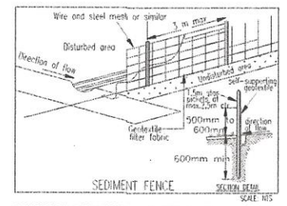
4/ Pool fence shown is the approximate position of proposed 1200mm(h) minimum childproof safety barrier with solid gate in accordance with AS1926.1-2012. The proposed pool enclosure has been designed to comply with the Australian Standard, the Swimming Pools Act and Swimming Pool Regulations.

5/ The boundary fence inside the pool zone must be a minimum height of 1800mm with a non climbable zone of 900mm on the inside of the fencing. Any shrubs or plants located adjacent to the inside of the boundary fence must be maintained for the lifetime of the development at a height that does not interfere with the 900mm non climbable zone.

BASIX REQUIREMENTS

RAINWATER TANK
THE APPLICANT MUST INSTALL A RAINWATER TANK OF AT LEAST 1203 LITRES ON THE SITE. THIS RAINWATER TANK MUST MEET, AND BE INSTALLED IN ACCORDANCE WITH, THE REQUIREMENTS OF ALL APPLICABLE REGULATORY AUTHORITIES.
THE APPLICANT MUST CONFIGURE THE RAINWATER TANK TO COLLECT RAINWATER RUNOFF FROM AT LEAST 100 SQUARE METRES OF ROOF AREA.
THE APPLICANT MUST CONNECT THE RAINWATER TANK TO A TAP LOCATED WITHIN 10 METRES OF THE EDGE OF THE POOL.

OUTDOOR SWIMMING POOL
THE SWIMMING POOL MUST BE OUTDOORS.
THE SWIMMING POOL MUST NOT HAVE A CAPACITY GREATER THAN 49.5 KILOLITRES.
THE SWIMMING POOL MUST HAVE A POOL COVER.
THE APPLICANT MUST INSTALL A POOL PUMP TIMER FOR THE SWIMMING POOL.
THE APPLICANT MUST INSTALL THE FOLLOWING HEATING SYSTEM FOR THE SWIMMING POOL THAT IS PART OF THIS DEVELOPMENT: GAS



SEDIMENT & EROSION CONTROL NOTES

During earthworks the following procedures shall be followed:
1. Install silt barriers where shown on plan prior to commencement of works.
2. Silt barriers to be maintained regularly & after heavy rain by removal of built up silt & spreading silt on existing site when 50% capacity.
3. Repair any damages to fence immediately.
4. Clean up spillages outside silt fence immediately.
5. Sediment control measures to be left in place until works completed.
6. Topsoil from the work's area will be stockpiled for later use in landscaping if necessary.
7. Approved bins for building waste, concrete and mortar slurries, paints and acid washings will be provided by contractor.

NOTES:
- Contractors to check and verify all dimensions and details prior to any works.
- Any discrepancies to be immediately referred to Space Landscape Designs.
- Work to comply with B.C.A. Statutory Authorities, relevant Australian Standards.
- Dimensions not to be scaled from drawing. All measurements are in millimetres.

Rev.	Date	Issue	Checked
A	05/02/20	Preliminary Issue	AE
B	17/02/20	Revised Issue	AE
C	25/02/20	Revised Issue	AE
D	23/03/20	DA Issue	AE

SPACE LANDSCAPE DESIGNS

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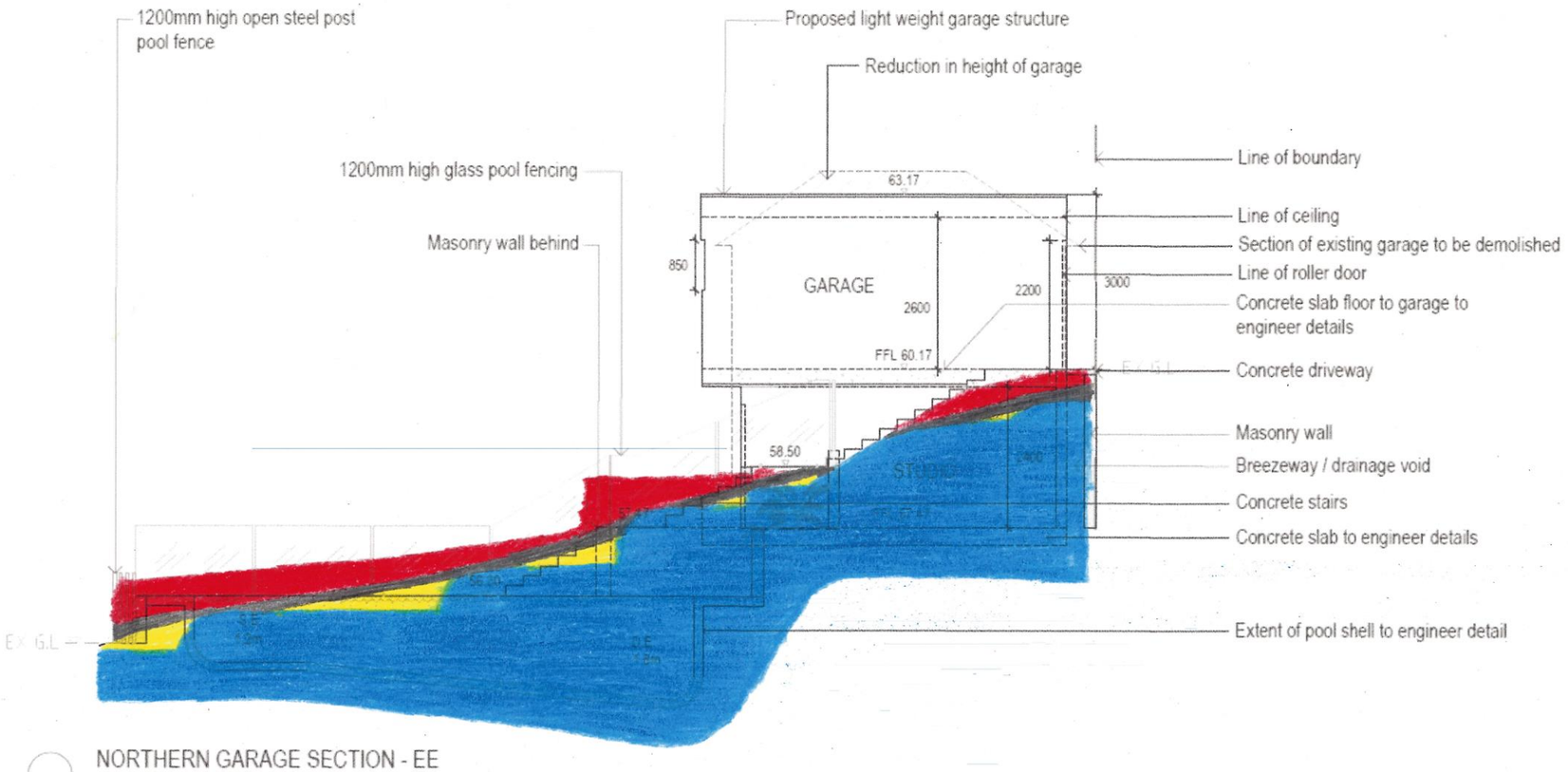
DRN: L.Poulton
DATE: 21/12/2020
SCALE: 1:100@A1
PROJECT NO: 191690

NORTH

SITE PLAN / SITE ANALYSIS
EROSION & SEDIMENT CONTROL PLAN
DA-01 Rev D

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials

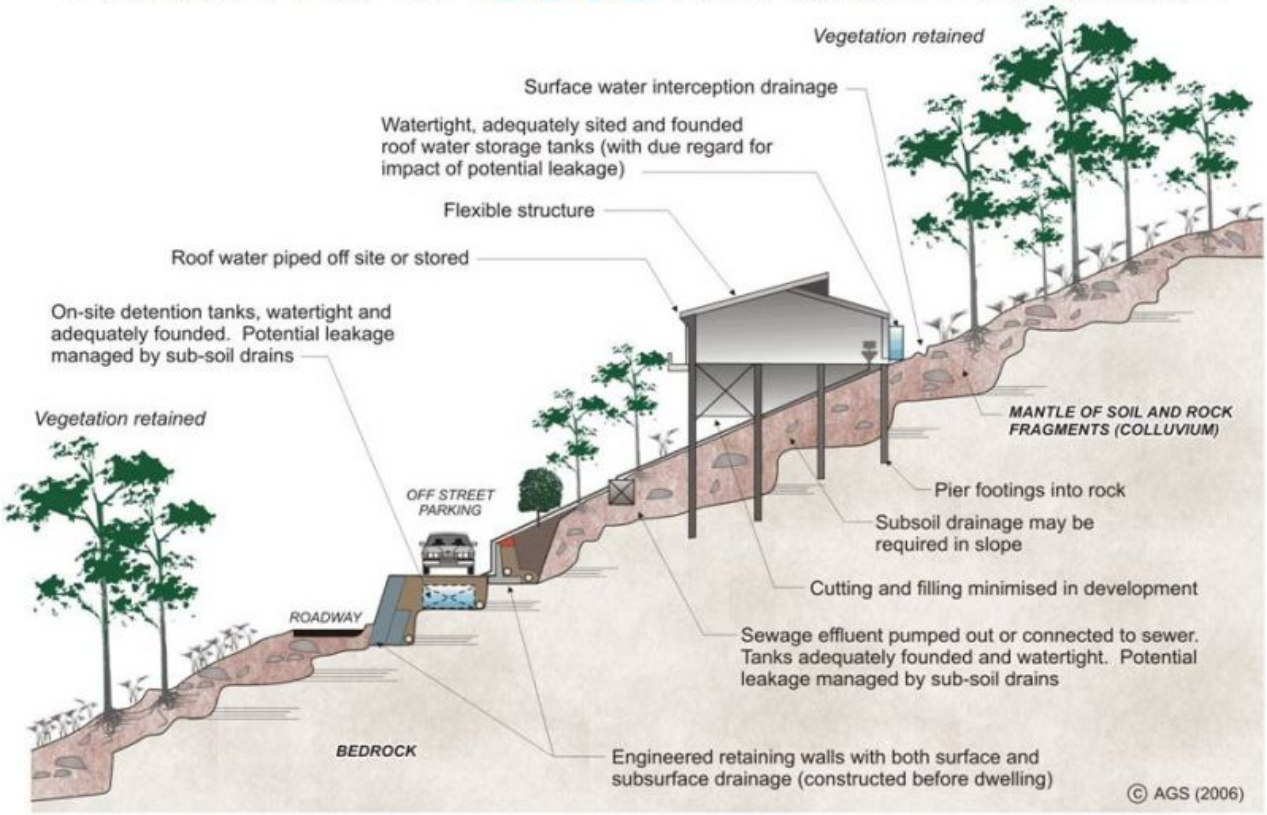


NORTHERN GARAGE SECTION - EE

SCALE 1:100

Fill
Sandy Soil
Sandy Clay – Firm to Stiff
Hawkesbury Sandstone – Medium Strength

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE