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

Development Application for _____
Name of Applicant

Address of site 62 Palm Beach Road, Palm Beach

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 1/10/21 certify that I am a geotechnical engineer or engineering geologist or coastal engineer as defined by the Geotechnical Risk Management Policy for Pittwater - 2009 and I am authorised by the above organisation/company to issue this document and to certify that the organisation/company has a current professional indemnity policy of at least $10million.

I:
Please mark appropriate box

☒ have prepared the detailed Geotechnical Report referenced below in accordance with the Australia Geomechanics Society's Landslide Risk Management Guidelines (AGS 2007) and the Geotechnical Risk Management Policy for Pittwater - 2009

☒ am willing to technically verify that the detailed Geotechnical Report referenced below has been prepared in accordance with the Australian Geomechanics Society's Landslide Risk Management Guidelines (AGS 2007) and the Geotechnical Risk Management Policy for Pittwater - 2009

☐ have examined the site and the proposed development in detail and have carried out a risk assessment in accordance with Section 6.0 of the Geotechnical Risk Management Policy for Pittwater - 2009. I confirm that the results of the risk assessment for the proposed development are in compliance with the Geotechnical Risk Management Policy for Pittwater - 2009 and further detailed geotechnical reporting is not required for the subject site.

☐ have examined the site and the proposed development/alteration in detail and I am of the opinion that the Development Application only involves Minor Development/Alteration that does not require a Geotechnical Report or Risk Assessment and hence my Report is in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009 requirements.

☐ have examined the site and the proposed development/alteration is separate from and is not affected by a Geotechnical Hazard and does not require a Geotechnical Report or Risk Assessment and hence my Report is in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009 requirements.

☐ have provided the coastal process and coastal forces analysis for inclusion in the Geotechnical Report

Geotechnical Report Details:

Report Title: Geotechnical Report **62 Palm Beach Road, Palm Beach**

Report Date: 1/10/21

Author: BEN WHITE

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

Documentation which relate to or are relied upon in report preparation:

Australian Geomechanics Society Landslide Risk Management March 2007.

White Geotechnical Group company archives.

I am aware that the above Geotechnical Report, prepared for the abovementioned site is to be submitted in support of a Development Application for this site and will be relied on by Pittwater Council as the basis for ensuring that the Geotechnical Risk Management aspects of the proposed development have been adequately addressed to achieve an "Acceptable Risk Management" level for the life of the structure, taken as at least 100 years unless otherwise stated and justified in the Report and that reasonable and practical measures have been identified to remove foreseeable risk.

Signature _____

Name Ben White

Chartered Professional Status MScGEOLAusIMM CP GEOL

Membership No. 222757

Company White Geotechnical Group Pty Ltd

GEOTECHNICAL RISK MANAGEMENT POLICY FOR PITTWATER
FORM NO. 1(a) - Checklist of Requirements for Geotechnical Risk Management Report for Development Application

Development Application for _____
Name of Applicant

Address of site 62 Palm Beach Road, Palm Beach

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 **62 Palm Beach Road, Palm Beach**

Report Date: 1/10/21

Author: BEN WHITE

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

Please mark appropriate box

☒ Comprehensive site mapping conducted **9/9/21**
(date)

☒ Mapping details presented on contoured site plan with geomorphic mapping to a minimum scale of 1:200 (as appropriate)

☒ Subsurface investigation required
- ☐ No Justification _____
- ☒ Yes Date conducted **9/09/21**

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

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

☒ Geotechnical hazards described and reported

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

☒ Risk calculation

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

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

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

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

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

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

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

☐ Risk assessment within Bushfire Asset Protection Zone.

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

Signature _____

Name Ben White

Chartered Professional Status MScGEOLAusIMM CP GEOL

Membership No. 222757

Company White Geotechnical Group Pty Ltd

GEOTECHNICAL INVESTIGATION:

Alterations and Additions at **62 Palm Beach Rd, Palm Beach**

1. Proposed Development

1.1 Construct a ground floor extension on the uphill side of the house by excavating to a maximum depth of ~0.9m.

1.2 Various other minor external additions and alterations.

1.3 Details of the proposed development are shown on 5 drawings prepared by Serenescapes Landscape Design, project number 21802, drawings numbered L-01 to L05 dated 9.9.21.

2. Site Description

2.1 The site was inspected on the 9th September, 2021.

2.2 This residential property is on the high side of the road and has a SW aspect. It is located on the moderate to steeply graded middle reaches of a hillslope. From the road frontage, the natural slope rises across the property at an average angle of 19°. The slope above and below continues at similar angles.

2.3 The property is accessed by a Right of Carriageway (ROW) off the uphill side of the road. The cut for the ROW is supported by stable sprayed concrete walls (Photo 1). A concrete driveway continues from the ROW to a parking area and garage underneath the downhill side of the house (Photo 2). The house is currently undergoing renovation works as part of a separate approved application. A stable ~1.5m high sandstone clad, concrete block retaining wall supports the fill for a garden immediately upslope of the parking area (Photo 3). Competent Medium Strength Sandstone can be seen outcropping in several locations across the property. Several of the Sandstone outcrops are undercut and are supported with sprayed concrete

(Photo 4). Some of the external walls of the house can be seen directly supported off of the outcropping rock (Photo 5). The part three-storey rendered brick house is supported on brick walls. The external brick walls show no significant signs of movement. A level patio area extends off the uphill side of the house (Photo 6). A large sandstone floater is resting on the slope on the N side of the property. It has 5 rock bolts securing it to the slope and is supported by two brick piers underneath. This floater is considered stable (Photo 7 & 8). A cut for the level patio area is supported by a ~0.9m high, stable, rendered brick retaining wall. This wall is to be removed as part of the proposed works.

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 hand Auger Hole (AH) was put down to identify the soil materials. Three cored boreholes (BH) were drilled across the footprint of the pool using a portable drill rig fitted with NMLC core barrel. 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 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 (~RL57.5) **–** AH1 (Photo 10)

Depth (m)	Material Encountered
0.0 to 0.3	**SANDY SOIL**, dark brown, medium grained, loose, fine trace of organic matter, dry.
0.3 to 0.6	**SAND**, black and grey, medium grained, loose to medium dense, dry.

Refusal @ 0.6m on rock. No water table encountered.

BOREHOLE 1 ~RL47.4 **–** BH1 (Photo 11)

Depth (m)	Material Encountered
0.0 to 0.6	SANDY SOIL, grey sandy soil with sandstone gravel.
0.6 to 1.0	SANDSTONE FLOATER, floating boulder.
1.0 to 1.5	CLAYEY SAND, yellow/brown firm to stiff.
1.5 to 1.9	VERY LOW STRENGTH SANDSTONE
1.9 to 2.4	CORE LOSS, driller lost return water
2.4 to 2.8	VERY LOW STRENGTH SANDSTONE
2.8 to 4.0	MEDIUM STRENGTH SANDSTONE
4.0 to 4.2	LOW STRENGTH SANDSTONE
4.2 to 7.0	MEDIUM TO HIGH STRENGTH SANDSTONE, 0.05m thick clay seam @ 6.6m.

End of hole @ 7.0m in medium strength to high strength sandstone.

BOREHOLE 2 ~RL48.3 – BH2 (Photo 12)

Depth (m)	Material Encountered
0.0 to 1.0	SANDY SOIL grey sandy soil with sandstone gravel.
1.0 to 1.5	CLAYEY SAND yellow/brown firm to stiff.
1.5 to 4.0	LOW STRENGTH to MEDIUM SANDSTONE, variable strength through interval.
4.0 to 4.4	VERY LOW STRENGTH SANDSTONE
4.4 to 4.6	CORE LOSS
4.6 to 4.7	CLAY SEAM

4.7 to 6.9 MEDIUM TO HIGH STRENGTH SANDSTONE**,** Clay seams @ 6.0 to 6.1m & @ 6.3 to 6.4m.

End of hole @ 6.9m in medium strength to high strength sandstone.

BOREHOLE 3 ~RL50.5 – BH3 (Photo 13)

Depth (m)	**Material Encountered**
0.0 to 1.0	SANDY SOIL grey sandy soil with sandstone gravel.
1.0 to 1.4	CLAYEY SAND yellow/brown firm to stiff.
1.4 to 2.4	MEDIUM STRENGTH SANDSTONE
2.4 to 2.5	LOW STRENGTH SANDSTONE
2.5 to 3.4	MEDIUM STRENGTH SANDSTONE
3.4 to 3.9	LOW STRENGTH TO MEDIUM STRENGTH SANDSTONE
3.9 to 4.4	MEDIUM STRENGTH SANDSTONE
4.9 to 5.7	LOW STRENGTH SANDSTONE, 0.05m clay seams @ 4.9 & 5.4m.
5.7 to 6.0	MEDIUM STRENGTH SANDSTONE

End of hole @ 6.0m in medium strength sandstone.

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** (~RL57.7)	**DCP 2** (~RL57.3)	**DCP 3** (~RL 49.0)	**DCP 4** (~RL 47.6)
0.0 to 0.3	3	2	1F	28
0.3 to 0.6	#	3	7	35
0.6 to 0.9		5	18	10
0.9 to 1.2		9	21	14
1.2 to 1.5		#	29	21
			30	#
			50	
			#	
	Refusal on Rock @ 0.3m	Refusal on Rock @ 0.95m	End of Test @ 2.1m	Refusal on Rock @ 1.4m

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 5** (~RL 49.3)	**DCP 6** (~RL 51.5)	**DCP 7** (~RL 52.2)
0.0 to 0.3	20	1F	1F
0.3 to 0.6	30	13	5
0.6 to 0.9	12	8	#
0.9 to 1.2	15	#	
1.2 to 1.5	#		
1.5 to 1.8			
1.8 to 2.1			
2.1 to 2.4			
	Refusal on Rock @ 1.2m	Refusal on Rock @ 0.7m	Refusal on Rock @ 0.4m

#refusal/end of test. F=DCP fell after being struck showing little resistance through all or part of the interval.

DCP Notes:

DCP1 – Refusal on rock @ 0.3m, DCP bouncing off rock surface, white impact dust on dry tip.
DCP2 – Refusal on rock @ 0.9m, DCP bouncing off rock surface, white impact dust on dry tip.
DCP3 – End of test @ 2.1m, DCP thudding on rock surface, clean dry tip.
DCP4 – Refusal on rock @ 1.4m, DCP bouncing off rock surface, clean dry tip.
DCP5 – Refusal on rock @ 1.2m, DCP bouncing off rock surface, clean dry tip.
DCP6 – Refusal on rock @ 0.7m, DCP bouncing off rock surface, clean dry tip.
DCP7 – Refusal on rock @ 0.4m, DCP bouncing off rock surface, clean dry tip.

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. Where the rock is not exposed, it is overlain by sandy soils and

sands that fill the bench step formation. In the test locations, where the rock is not exposed, the depth to rock ranged between 0.3 to 0.9m below the current surface, being slightly deeper due to the stepped nature of the underlying bedrock. The outcropping sandstone 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 excavation.

7. Surface Water

No evidence of surface flows were observed on the property during the inspection. It is expected that normal sheet wash will move onto the site from above the property during heavy down pours.

8. Geotechnical Hazards and Risk Analysis

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

Risk Analysis Summary

HAZARDS	Hazard One	Hazard Two	Hazard Three
TYPE	The moderate to steep slope that rises across the property and	The vibrations produced during the proposed excavation	The excavation (up to a maximum depth of 0.9m) collapsing onto the work

	continues above and below failing and impacting on the proposed works.	impacting on the surrounding structures.	site before retaining structures are in place.
LIKELIHOOD	'Unlikely' (10^{-4})	'Possible' (10^{-3})	'Possible' (10^{-3})
CONSEQUENCES TO PROPERTY	'Medium' (15%)	'Medium' (15%)	'Medium' (15%)
RISK TO PROPERTY	'Low' (2×10^{-5})	'Moderate' (2×10^{-4})	'Moderate' (2×10^{-4})
RISK TO LIFE	9.1×10^{-7}/annum	5.3×10^{-7}/annum	8.3×10^{-6}/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 property is 'UNACCEPTABLE'. To move risk to 'ACCEPTABLE' levels, the recommendations in **Section 13 and 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 Palm Beach 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 ~0.9m is required to create a level platform for proposed extension. The excavation is expected to be through sandy soils and sands and with

Medium Strength Sandstone expected at depths of between 0.3m and 0.9m below the current surface in the area of the proposed excavation.

It is envisaged that excavations through fill, sandy soil and sands 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, soil and sand will be below the threshold limit for building damage.

Excavations through rock should be carried out to minimise the potential to cause vibration damage to the existing subject house and neighbouring structures to the E. Allowing for backwall drainage, setbacks are as follows:

- Near flush with the E neighbouring stone shed (Photo 9).
- ~2.5m from the subject house.
- ~7.0m from the E 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 8mm/sec at the supporting walls of the subject house and property boundaries. Vibration monitoring will be required to verify this is achieved. The vibration monitoring equipment must include a light/alarm so the operator knows if vibration limits have been exceeded. It also must log and record vibrations throughout the excavation works.

If a milling head is used to grind the rock, or if rock sawing is carried out around the perimeter of the excavation boundaries in not less than 1.0m lifts, before a rock hammer up to 300kg is used to break the rock it is likely the peak particle velocity will not be exceeded 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 house and neighbouring properties.

13. Excavation Support Requirements

The excavation for the proposed extension will reach a maximum depth of ~0.9m. Allowing for backwall drainage, the setbacks are as follows:

- Flush with the E common boundary.
- Near flush with the E neighbouring stone shed.
- ~2.5m from the subject house.

As such, only the E common boundary and E neighbouring stone shed will lie within the zone of influence of the proposed excavation. In this instance, the zone of influence is the area above a theoretical 30° line from the base of the excavation or top of Medium Strength Rock, whichever is encountered first, towards the surrounding structures and boundaries.

Where the E neighbouring stone shed (Photo 9) falls within the zone of influence of the excavation, exploration pits in this location will need to be put down by the builder to determine the foundation depth and material. The pits are to be inspected by the geotechnical consultant.

If the stone shed is found to be supported below the zone of influence of the excavation or on rock, the excavation may commence. If it is not supported below the zone of influence or on rock, the wall will need to be underpinned prior to the excavation commencing. See the minimum extent of required shoring shown on the site plan attached.

The owners of the E neighbouring property will need to provide their permission for the underpinning works. If permission cannot be granted, our office is to be contacted to provide an alternative means of support.

Underpinning is to follow the underpinning sequence ‘hit one miss two’. Under no circumstances is the bulk excavation to be taken to the edges of the wall and then

underpinned. Underpins are to be constructed from drives that should not exceed 0.6m in width along the footings but should be proportioned according to footing type and size. Allowances are to be made for drainage through the underpinning to prevent a build-up of hydrostatic pressure.

Where room permits, the remaining excavation faces through fill, soil, and sand are to be battered temporarily at 1.0 Vertical to 1.7 Horizontal (30°) until the retaining walls are in place. Excavations through natural clay are expected to stand unsupported for a short period of time at near vertical angles until the retaining walls are in place, provided they are kept from becoming saturated. Medium Strength Sandstone or better will stand at vertical angles unsupported subject to approval by the geotechnical consultant.

Upslope runoff is to be diverted from the cut faces by sandbag mounds or other diversion works. Unsupported cut batters through fill, soil, and sand 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 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 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 and Sandy Soil	20	0.40	0.55
Sand	20	0.30	0.40
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

A concrete slab and shallow piers supported directly off Medium Strength Sandstone are suitable footings for the proposed extension. This ground material is expected to be partially exposed across the uphill side of the excavation. Where the bedrock steps down past the base of the excavation, the works can be supported off shallow piers taken to 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.

16. 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.

17. Inspections

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

- The exploration pits to determine the foundation material along the W wall of the E neighbouring stone shed are to be inspected by the geotechnical consultant to determine if underpinning is necessary. This is to occur before the bulk excavation for the extension commences.

- During the excavation process, the geotechnical consultant is to inspect the excavation as it approaches to within 0.7m of the supporting walls of the shed to confirm the stability of the cut to go flush with the footings.

- 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.

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

Photo 1

Photo 2

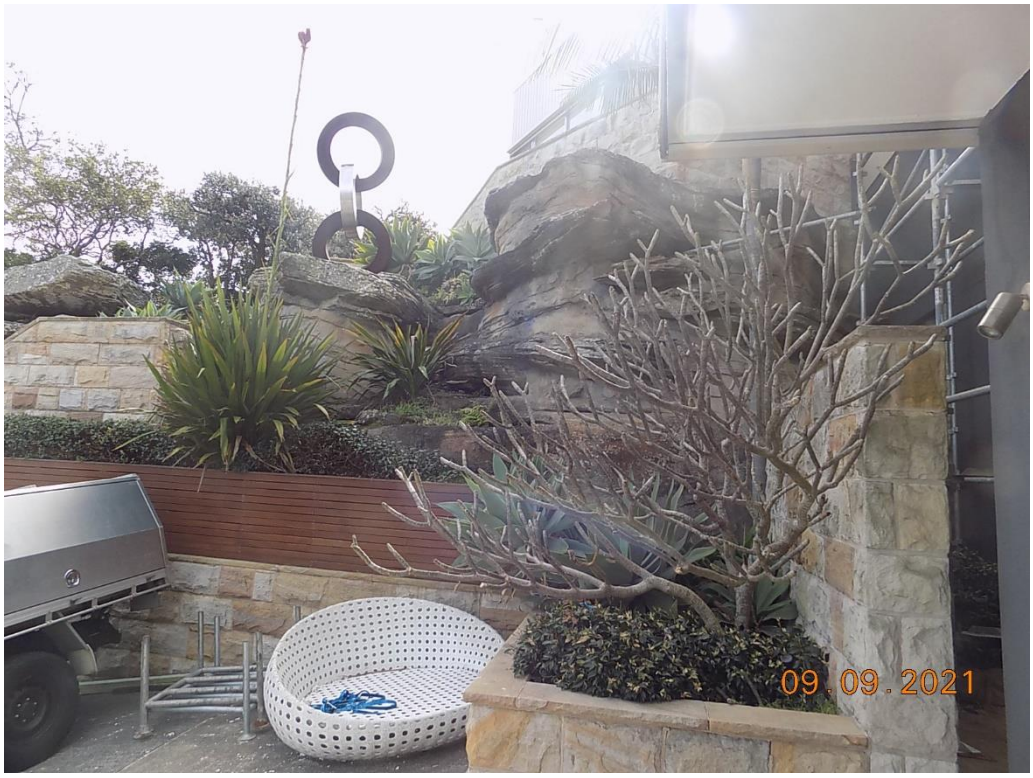


Photo 3

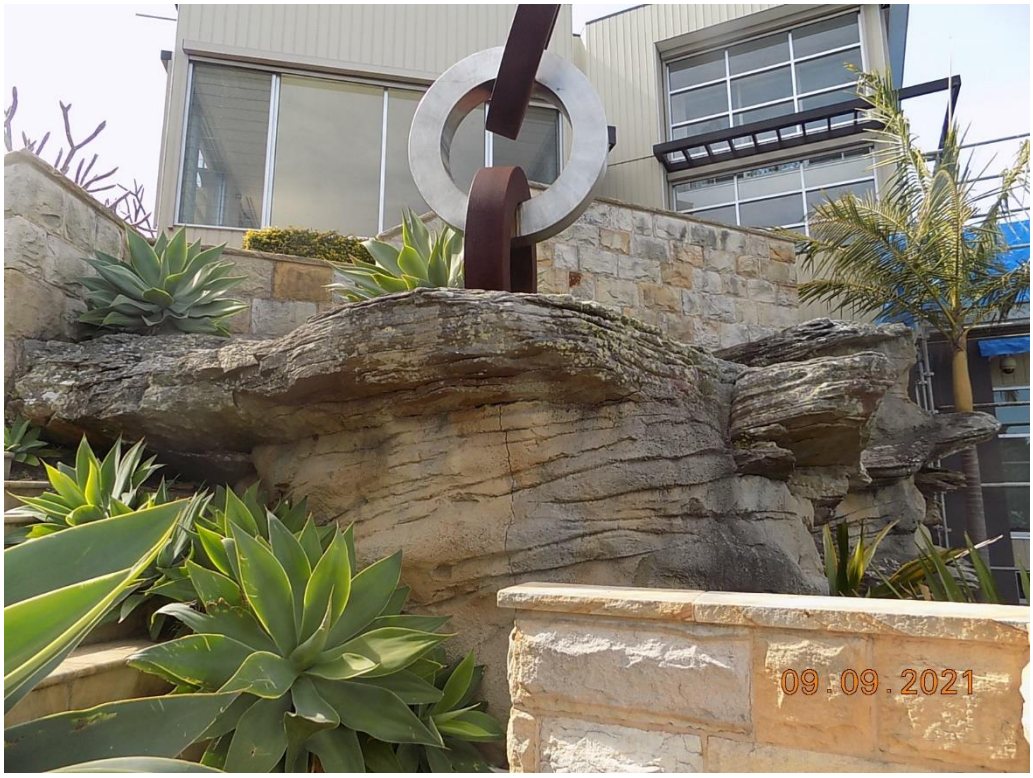


Photo 4

Photo 5

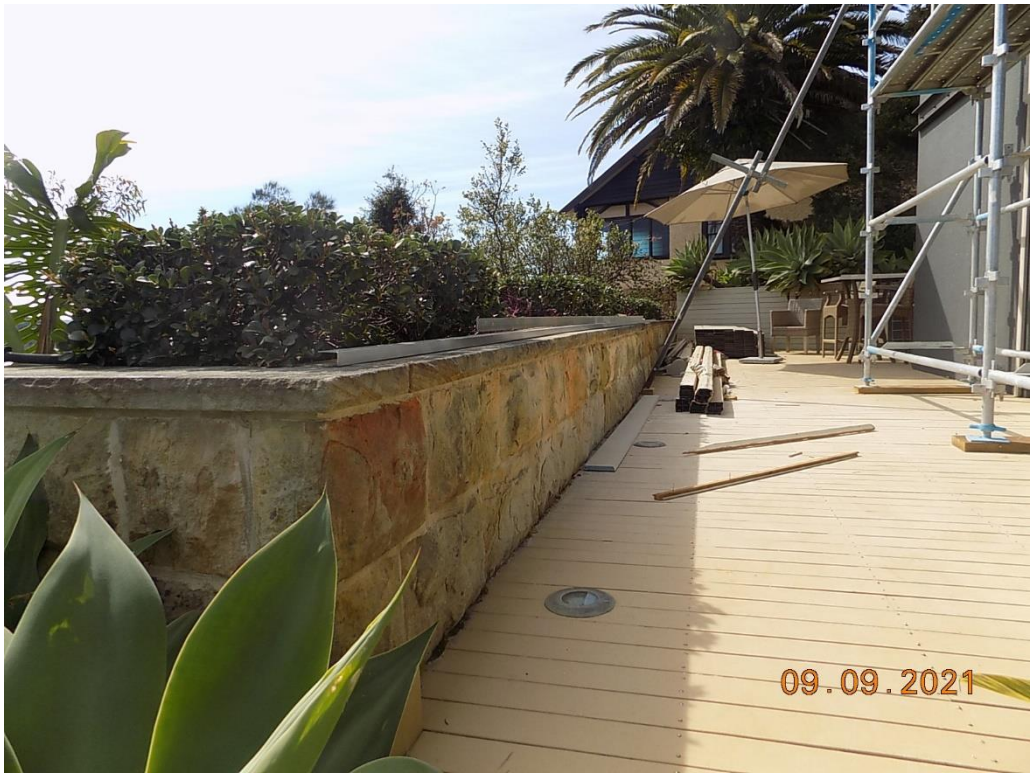


Photo 6

Photo 7

Photo 8

Photo 9

Photo 10 (left to right)

Photo 11

Photo 12

Photo 13

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.

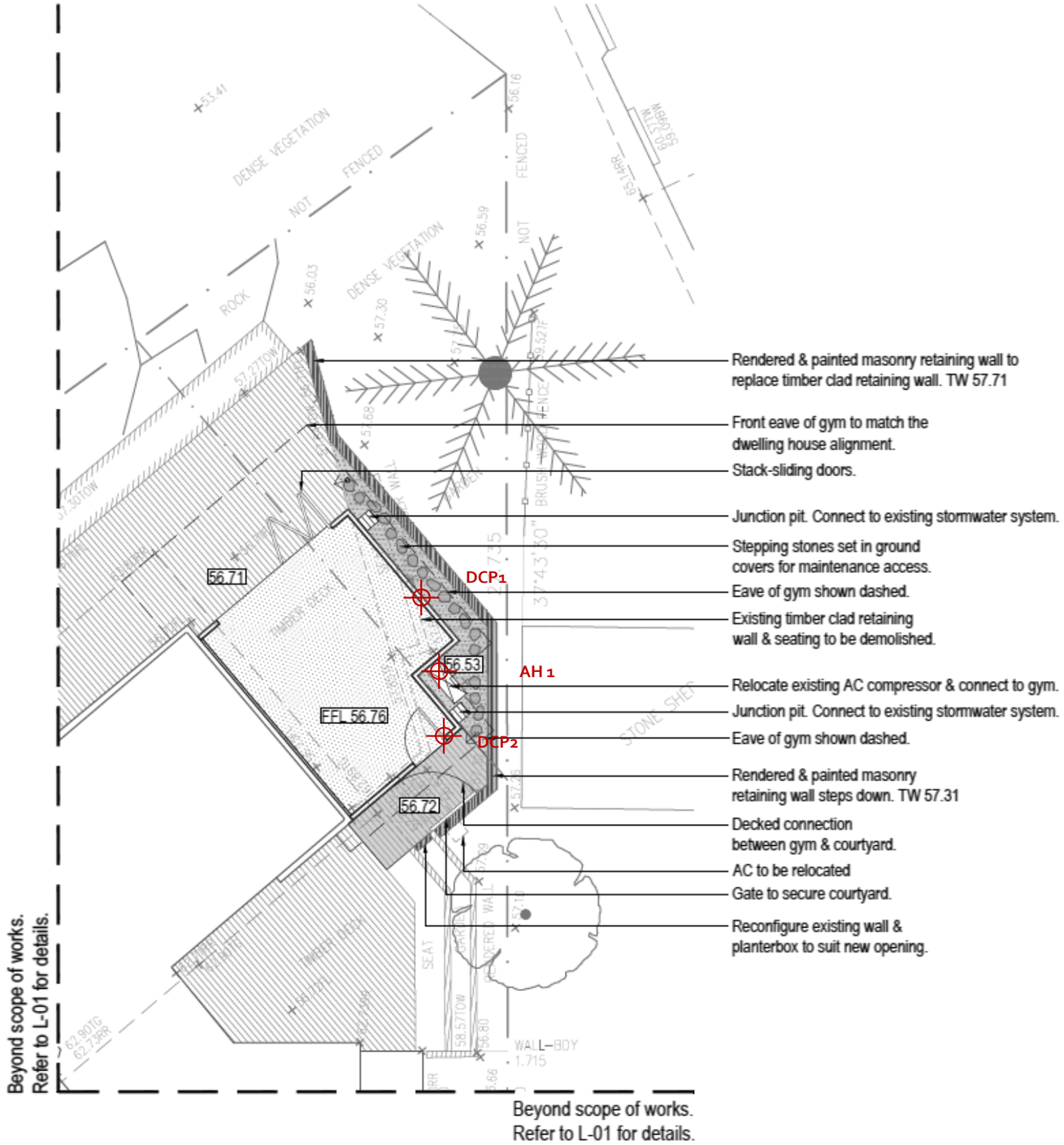
- The report addresses issues relating to your specific design and site. If the proposed project design changes, aspects of the report may no longer apply. Contact White Geotechnical if this occurs.

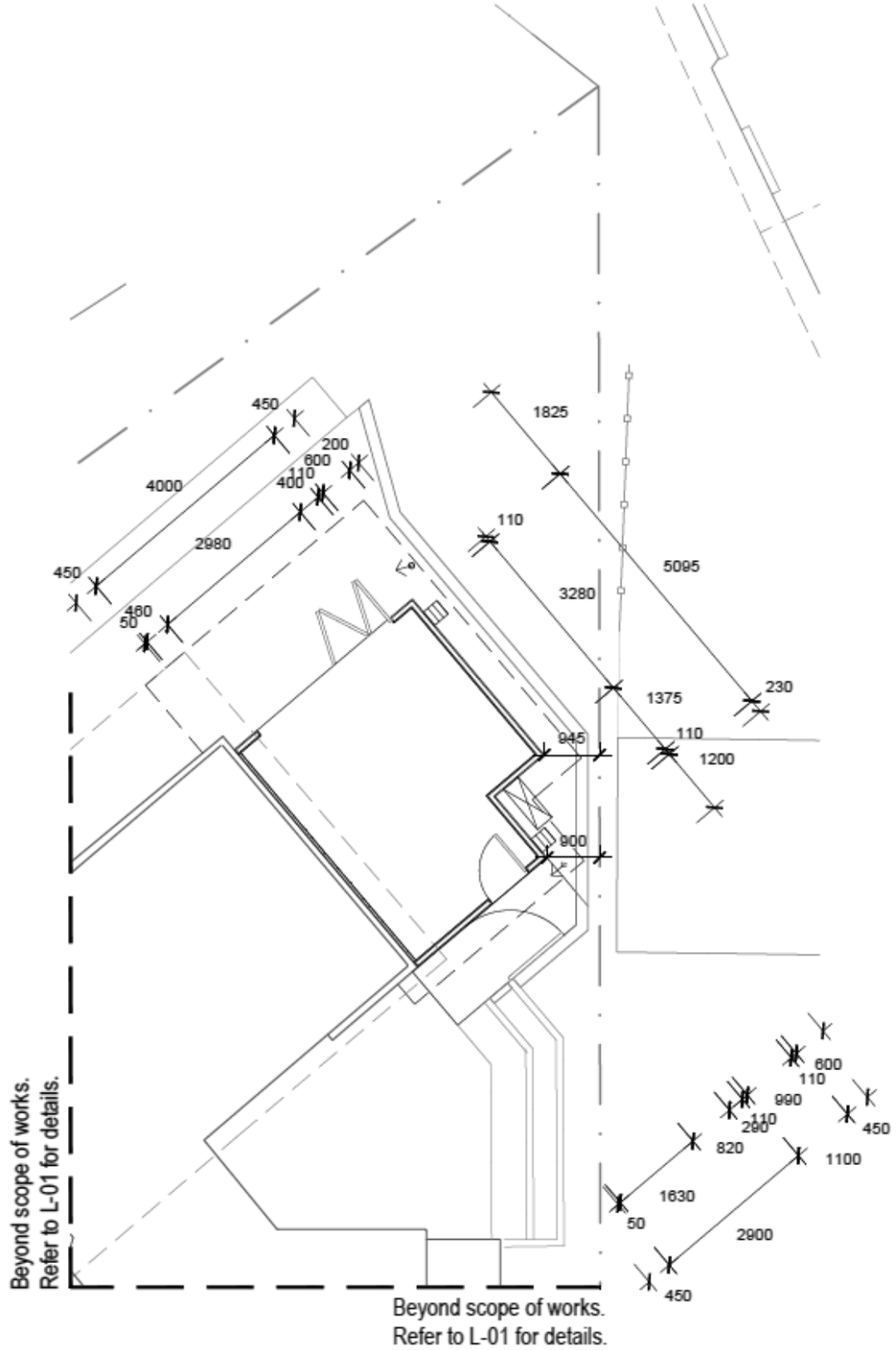
- This report should not be applied to any other project other than that outlined in section 1.0.

- 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





Note:
- Contractors to check and verify all dimensions and all levels on site prior to any works.
- Any discrepancies should be immediately referred to Serenescapes Landscape Designs.
- All work to comply with B.C.A. Statutory Authorities and relevant Australian Standards.
- Dimensions recognised over scaling. All measurements are in millimetres.
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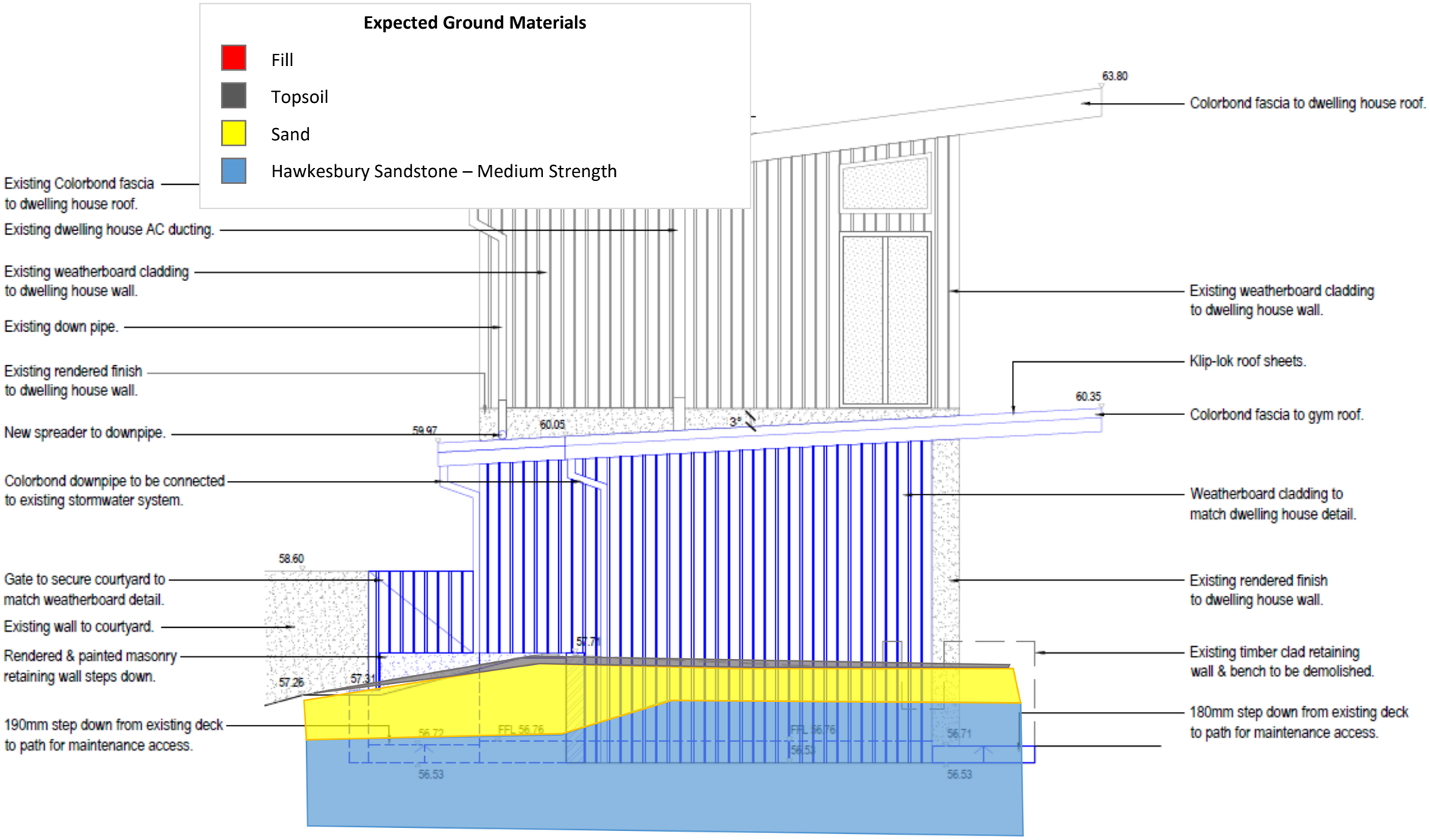
Client: Peter Taylor & Sarah Hosking	Drawing Title: Detail & Setout Plan			
Site Address: 62 Palm Beach Road Palm Beach	Drawn by: Ben Farrar TLA Member	Project Number: 21802	Scale: 1:100 @ A3	Sheet Number: L-02 of 5

Rev:	Date:	Issue:	Checked:
A	29/07/2021	Preliminary Issue	EC
B	31/08/2021	Preliminary Issue	EC
C	09/09/2021	DA Issue	EC

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials



Sectional Elevation CC
Scale 1:50

Note:
- Contractors to check and verify all dimensions and all levels on site prior to any works.
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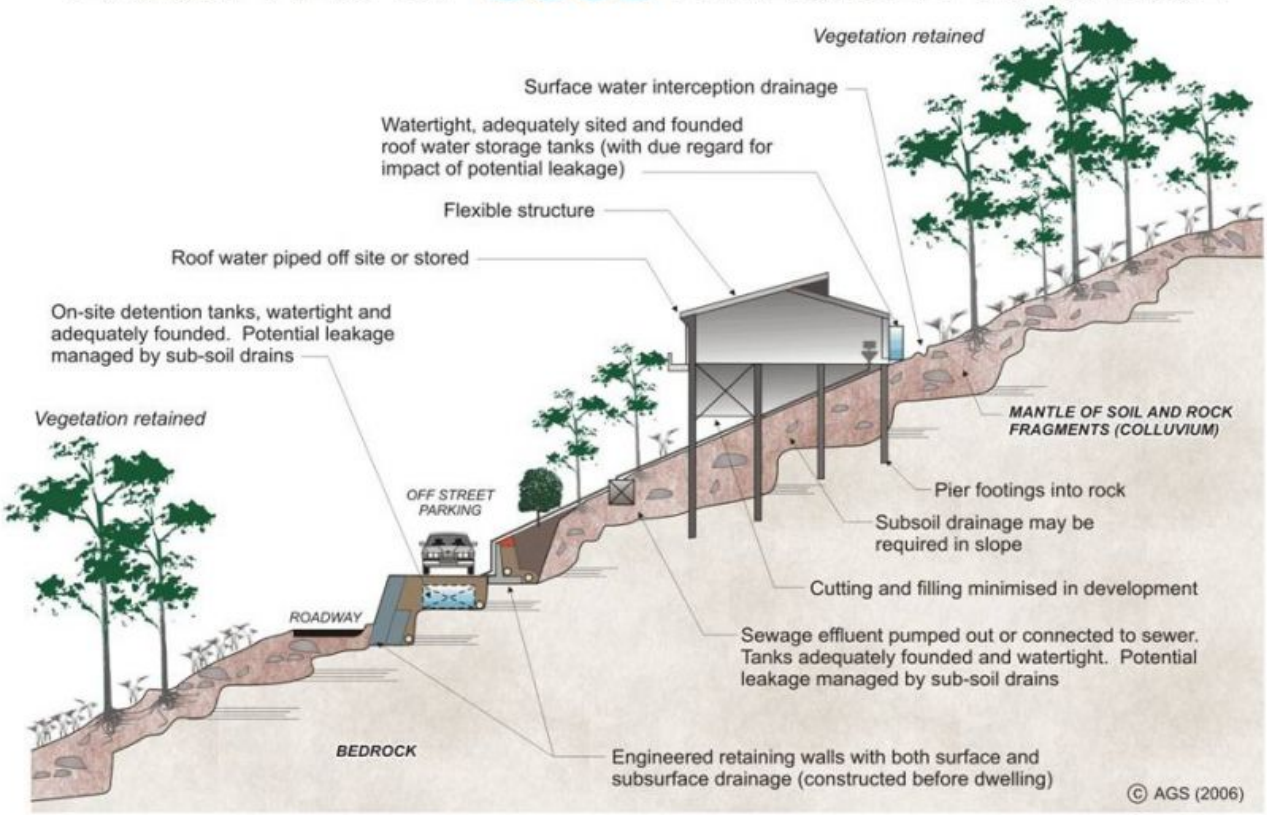
Client:	Peter Taylor & Sarah Hosking
Site Address:	62 Palm Beach Road Palm Beach
Drawing Title:	Sectional Elevations
Drawn by:	Ben Farrar TLA Member
Project Number:	21802
Scale:	1:100 @ A3
Sheet Number:	L-04 of 5

Rev:	Date:	Issue:	Checked:
A	29/07/2021	Preliminary Issue	EC
B	31/08/2021	Preliminary Issue	EC
C	09/09/2021	DA Issue	EC

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE