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

**Development Application for** _____
Name of Applicant

**Address of site** 99 Riverview Road, Avalon 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 27/11/24 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 **99 Riverview Road, Avalon Beach**

Report Date: 22/11/24

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 MScGEOL AIG., RPGeo

Membership No. 10306

Company **White Geotechnical Group Pty Ltd**

REGISTERED PROFESSIONAL GEOSCIENTIST
AUSTRALIAN INSTITUTE OF GEOSCIENTISTS
BENJAMIN WHITE
RPGeo No: 10306

## 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** 99 Riverview Road, Avalon 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 **99 Riverview Road, Avalon Beach**

Report Date: 22/11/24

Author: BEN WHITE

**Author's Company/Organisation:** **White Geotechnical Group Pty Ltd**

**Please mark appropriate box**

- ☒ Comprehensive site mapping conducted **18/9/24** (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 **18/9/24**
- ☒ 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 MScGEOL AIG., RPGeo

Membership No. 222757

Company **White Geotechnical Group Pty Ltd**

# GEOTECHNICAL INVESTIGATION:

New Pool and Cabana at **99 Riverview Road, Avalon Beach**

## 1. Proposed Development

**1.1** Install a pool on the uphill side of the property by excavating to a maximum height of ~1.3m.

**1.2** Construct a cabana and decking beside the proposed pool by excavating to a maximum height of ~1.0m.

**1.3** Construct a new inclinator landing at the location of the proposed works.

**1.4** Details of the proposed development are shown on 18 drawings prepared by a total concept, project number Cherikoff. Drawings numbered L/00 to L/17. All revision A. All dated 06.11.24.

## 2. Site Description

**2.1** The site was inspected on the 18th September, 2024.

**2.2** This residential property is on the low side of the road and has a W aspect. It is located on the steeply graded middle reaches of a hillslope. The natural slope falls across the property at an average angle of ~22°. The slope above and below the property continue at similar angles.

**2.3** At the road frontage (Photo 1), a concrete driveway runs to a stable timber clad garage on the uphill side of the property. The concrete piers for the garage stand vertical. The steep slope between the garage and the house which is the location of the proposed works, is terraced by low timber and dry stack stone retaining walls. These retaining walls are largely considered stable. One wall below the garage was measured to be tilting downslope up to ~11° (Photo 2) due to the loads exerted by the plants above it, which were also tilting. See '**Section 17'** for advice. A band of Medium

Strength Sandstone outcrops immediately above the subject house (Photo 3). The observable portions of the rock face were seen to be free from significant geological defects that could affect its stability. Fill for landscaping in this location is supported by a stable low mortared sandstone retaining wall which is partially supported on the outcropping rock (Photo 3). The part three-story fibre board and timber clad house is supported on concrete piers and timber posts. One of the concrete piers exhibits slight tilting. This appears to have been how it was initially constructed. As such, all foundations are considered stable. A cut for the lower ground floor of the house is supported by a stable mortared sandstone retaining wall reaching up to ~1.1m high (Photo 4). An inclined lift extends from the N of the house to the road frontage. Where the lift has been excavated into the slope, the cut is supported by a stable dry stack retaining wall (Photo 5) which is partially supported on outcropping sandstone. Stable low timber retaining walls support fill for landscaping between the downhill side of the house and the lower common boundary (Photo 6).

## 3. Geology

The Sydney 1:100 000 Geological Sheet indicates the site is underlain by the Newport Formation of the Narrabeen Group. This is described as interbedded laminite, shale, and quartz to lithic-quartz sandstone.

## 4. Subsurface Investigation

One hand Auger Hole (AH) was put down to identify the soil materials. Four Dynamic Cone Penetrometer (DCP) tests were put down to determine the relative density of the overlying soil and the depth to weathered rock. The locations of the tests are shown on the site plan attached. It should be noted that a level of caution should be applied when interpreting DCP test results. The test will not pass through hard buried objects so in some instances it can be difficult to determine whether refusal has occurred on an obstruction in the profile or on the natural rock surface. This is not expected to have been an issue for this site. But due to the possibility that the actual ground conditions vary from our interpretation there should be

allowances in the excavation and foundation budget to account for this. We refer to the appended "Important Information about Your Report" to further clarify. The results are as follows:

**AUGER HOLE 1** (~RL34.1) **–** AH1 (Photo 7)

| **Depth (m)** | **Material Encountered** |
|---|---|
| 0.0 to 0.5 | **TOPSOIL**, brown, Dense, dry, fine to coarse grained, fine organic content and rock fragments included. |

Refusal @ 0.5m. Auger not progressing through dense topsoil. No water table 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** (~RL33.8) | **DCP 2** (~RL33.0) | **DCP 3** (~RL36.5) | **DCP 4** (~RL36.3) |
| 0.0 to 0.3 | 14 | 8 | 8 | 8 |
| 0.3 to 0.6 | 15 | 33 | 22 | 15 |
| 0.6 to 0.9 | 18 | 19 | 37 | 38 |
| 0.9 to 1.2 | 21 | 22 | # | # |
| 1.2 to 1.5 | 22 | 47 | | |
| 1.5 to 1.8 | 43 | # | | |
| 1.8 to 2.1 | # | | | |
| | End of Test @ 1.8m | End of Test @ 1.5m | End of Test @ 0.9m | End of Test @ 0.9m |

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

***DCP Notes:***

DCP1 – End of test @ 1.8m, DCP still going down slowly, maroon and yellow clay on dry tip.
DCP2 – End of test @ 1.5m, DCP still going down slowly, orange clay on dry tip and in collar above tip.
DCP3 – End of test @ 0.9m, DCP still going down slowly, maroon clay on dry tip.
DCP4 – End of test @ 0.9m, DCP still going down slowly, clean dry tip.

## 5. Geological Observations/Interpretation

The natural slope materials are colluvial at the near surface and residual at depth. In the test locations, the ground materials consist of a topsoil over clays. Filling has been placed across the property for landscaping. The clays merge into the weathered zone of the underlying shale at depths of between 0.6m to 1.5m below the current surface being deeper due to the presence of filling and a variable weathering profile. The weathered zone is interpreted as Extremely Low Strength Shale. It is to be noted that this material can appear as a mottled stiff clay when it is cut up by excavation equipment. A band of sandstone immediately above the house can be seen outcropping through the otherwise shale-dominated profile. From our previous experience in the Narrabeen Group, it is likely any sandstone bands will be limited in thickness and extent. 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 denser and less permeable clay and weathered shale layers, as well as the buried surface of the sandstone. 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. Normal sheet wash from the slope above will be intercepted by the street drainage system for Riverview Road above.

Should the owners be aware, or if at a later time, become aware that overland flows enter the property during prolonged heavy rainfall, our office is to be contacted so appropriate drainage advice can be provided and drainage installed to intercept the flows. It is a condition of the risk assessment in **Section 8** that this be done.

## 8. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed beside the property. The steeply graded slope that falls across the property and continues above and below is a potential hazard (**Hazard One**). Potential vibrations generated during the proposed excavations are a potential hazard (**Hazard Two**). The proposed excavations is a potential hazard until retaining structures are in place (**Hazard Three**). The tilting retaining wall below the garage is a potential hazard (**Hazard Four**).

### Risk Analysis Summary

| HAZARDS | Hazard One | Hazard Two |
|---|---|---|
| **TYPE** | The steep slope that rises across the property and continues above and below failing and impacting on the proposed works. | Potential vibrations produced during the proposed excavations impacting on the surrounding structures. |
| **LIKELIHOOD** | 'Unlikely' ($10^{-4}$) | 'Possible' ($10^{-3}$) |
| **CONSEQUENCES TO PROPERTY** | 'Medium' (15%) | 'Minor' (10%) |
| **RISK TO PROPERTY** | 'Low' ($2 \times 10^{-5}$) | 'Moderate' ($5 \times 10^{-4}$) |
| **RISK TO LIFE** | $9.1 \times 10^{-7}$/annum | $5.3 \times 10^{-7}$/annum |
| **COMMENTS** | This level of risk is 'ACCEPTABLE', provided the recommendations in **Section 7 & 17** are followed. | This level of risk to property is 'UNACCEPTABLE'. To move risk to 'ACCEPTABLE' levels, the recommendations in **Section 12** are to be followed. |

| HAZARDS | Hazard Three | Hazard Four |
|---|---|---|
| **TYPE** | The excavations collapsing onto the work site before retaining structures are in place. | Further movement of the timber retaining wall below the garage (Photo 2) that will eventually result in failure. |
| **LIKELIHOOD** | 'Possible' ($10^{-3}$) | 'Likely' ($10^{-2}$) |
| **CONSEQUENCES TO PROPERTY** | 'Medium' (10%) | 'Minor' (10%) |
| **RISK TO PROPERTY** | 'Moderate' ($5 \times 10^{-4}$) | 'Moderate' ($5 \times 10^{-4}$) |
| **RISK TO LIFE** | $8.3 \times 10^{-6}$/annum | $1.3 \times 10^{-5}$/annum |
| **COMMENTS** | 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. | This level of risk to life and property is 'UNACCEPTABLE'. To move risk to 'ACCEPTABLE' levels, the recommendations in **Section 17** 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 away from the street. The stormwater engineer is to refer to council stormwater policy for suitable options for stormwater disposal.

## 11. Excavations

Two excavations will be required for the proposed development:

- An excavation to a maximum depth of ~1.3m is required to install the proposed pool.

- An excavation to a maximum depth of ~1.0m is required to excavate for the proposed cabana.

The excavations are expected to be through shallow soil over clay with Extremely Low Strength Shale expected at depths of between ~0.6m to ~1.5m in the area of the proposed excavations. It is envisaged that excavations through soil, clay, and Extremely Low Strength Shale can be carried out with an excavator and toothed bucket.

A Medium Strength Sandstone boulder appears to outcrop at the location of the cabana excavation (Photo 8). Excavations through Medium Strength Sandstone will require rock sawing and breaking.

## 12. Vibrations

Possible vibrations generated during excavations through fill, soil, clay, and Extremely Low Strength Shale will be below the threshold limit for building damage.

The cut for the cabana will encounter a Medium Strength Sandstone boulder which has the potential to generate vibrations that may impact on surrounding structures.

The excavation margin is to be cut with a rock saw prior to any rock breaking with a pneumatic hammer up to 200kg. Provided this advice is carried out, vibrations from the excavation will not exceed tolerable limits for building or infrastructure damage.

## 13. Excavation Support Requirements

The excavations for the proposed pool and cabana will reach a maximum depth of ~1.3m. Allowing 0.5m for back wall drainage, the excavations will be set back ~0.6m from a large eucalyptus tree on the uphill side of the proposed cut for the cabana (Photo 8).

As such, no structures or boundaries are expected to lie within the zone of influence of the excavations. However, due to the proximity of the excavation for the cabana to the eucalyptus tree upslope, an arborist is to assess the tree to provide advice in regards to its likely stability throughout the works.

As addressed in '**Section 12**', to prevent excessive vibrations from being generated during the excavation through the sandstone boulder and to ensure the integrity of the cut through rock during the excavation process. The excavation margin is to be cut with a rock saw prior to any rock breaking with a pneumatic hammer up to 200kg.

The geotechnical consultant is to inspect the excavation for the cabana while the cut through the sandstone boulder is being made. This is to confirm the boulders thickness and stability during the works.

Due to the grade of the slope across the property, the uphill side of the cut for the pool and cabana through fill, soil, clay and Extremely Low Strength Shale will need to be temporarily supported prior to the commencement of the excavation, or during the excavation process in a staged manner, so cut batters are not left unsupported. The support will need to be designed by the structural engineer in consultation with the Geotechnical Consultant. See the site plan attached for the minimum extent of the required shoring shown in blue. Medium Strength Sandstone or better is expected to 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. 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 cannot blow off in a storm. The materials and labour to construct the pool structure/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 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 Topsoil | 20 | 0.40 | 0.55 |
| Residual Clays | 20 | 0.35 | 0.45 |
| Extremely Low Strength Rock | 22 | 0.25 | 0.38 |

For rock classes refer to Pells et al "Design Loadings for Foundations on Shale and Sandstone in the Sydney Region". Australian Geomechanics Journal 1978.

It is to be noted that the earth pressures in Table 1 assume a level surface above the 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 full hydrostatic pressures are to be accounted for in the retaining structure design.

## 15. Foundations

The proposed pool excavation is expected to be partially seated in Extremely Low Strength Shale. This is a suitable foundation material. It is expected to be exposed across the uphill side of the proposed excavation for the pool. Where it is not exposed, and where weathered rock drops away with the slope, piers taken to and embedded no less than 0.6m into Extremely Low Strength Shale will be required to maintain a uniform foundation material across the structure. This material is expected at depths of between 0.6m to 1.5m below the current surface in the area of the proposed works.

The proposed cabana, inclined lift platform, and decking can be supported on piers taken to and embedded no less than 0.3m into the underlying Extremely Low Strength Shale.

A maximum allowable bearing pressure of 600kPa can be assumed for footings on Extremely Low Strength Shale. It should be noted that this material is a soft rock and a rock auger will cut through it so the builders should not be looking for refusal to end the footings.

As the bearing capacity of clay and shale reduces when it is wet, we recommend the footings be dug, inspected, and poured in quick succession (ideally the same day if possible). If the footings get wet, they will have to be drained and the soft layer of wet clay or 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 and inspected by the geotechnical consultant.

***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. Site Maintenance/Remedial Works

The timber retaining wall below the garage (Photo 2) was measured to be tilting ~11° downslope and in the process of failure due to the loads exerted by the plants above. Should the wall fail, it could impact on the steep slope below as well as the decking and garage nearby. This wall is to be remediated as part of the proposed works so that it meets current engineering standards.

Where slopes approach or exceed 20°, such as on this site, it is prudent for the owners to occasionally inspect the slope (say annually or after heavy rainfall events, whichever occurs first). Should any of the following be observed: movement or cracking in retaining walls, cracking in any structures, cracking or movement in the slope surface, tilting or movement in established trees, leaking pipes, or newly observed flowing water, or changes in the erosional process or drainage regime, then a geotechnical consultant should be engaged to assess the slope. We can carry out these inspections upon request. The risk assessment in **Section 8** is subject to this site maintenance being carried out.

## 18. Inspection

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

- The geotechnical consultant is to inspect the excavation for the cabana while the cut through the sandstone boulder is being made. This is to ensure the boulders thickness and stability during the works.

- 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.

Nathan Gardner B.Sc. (Geol. & Geophys. & Env. Stud.)
AIG., RPGeo Geotechnical & Engineering.
No. 10307
Engineering Geologist & Environmental Scientist.

Reviewed By:

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Engineering Geologist.

REGISTERED PROFESSIONAL GEOSCIENTIST
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BENJAMIN WHITE
RPGeo No:
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*Photo 1*


*Photo 2*


*Photo 3*


*Photo 4*


*Photo 5*


*Photo 6*


*Photo 7*


*Photo 8*

## 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.

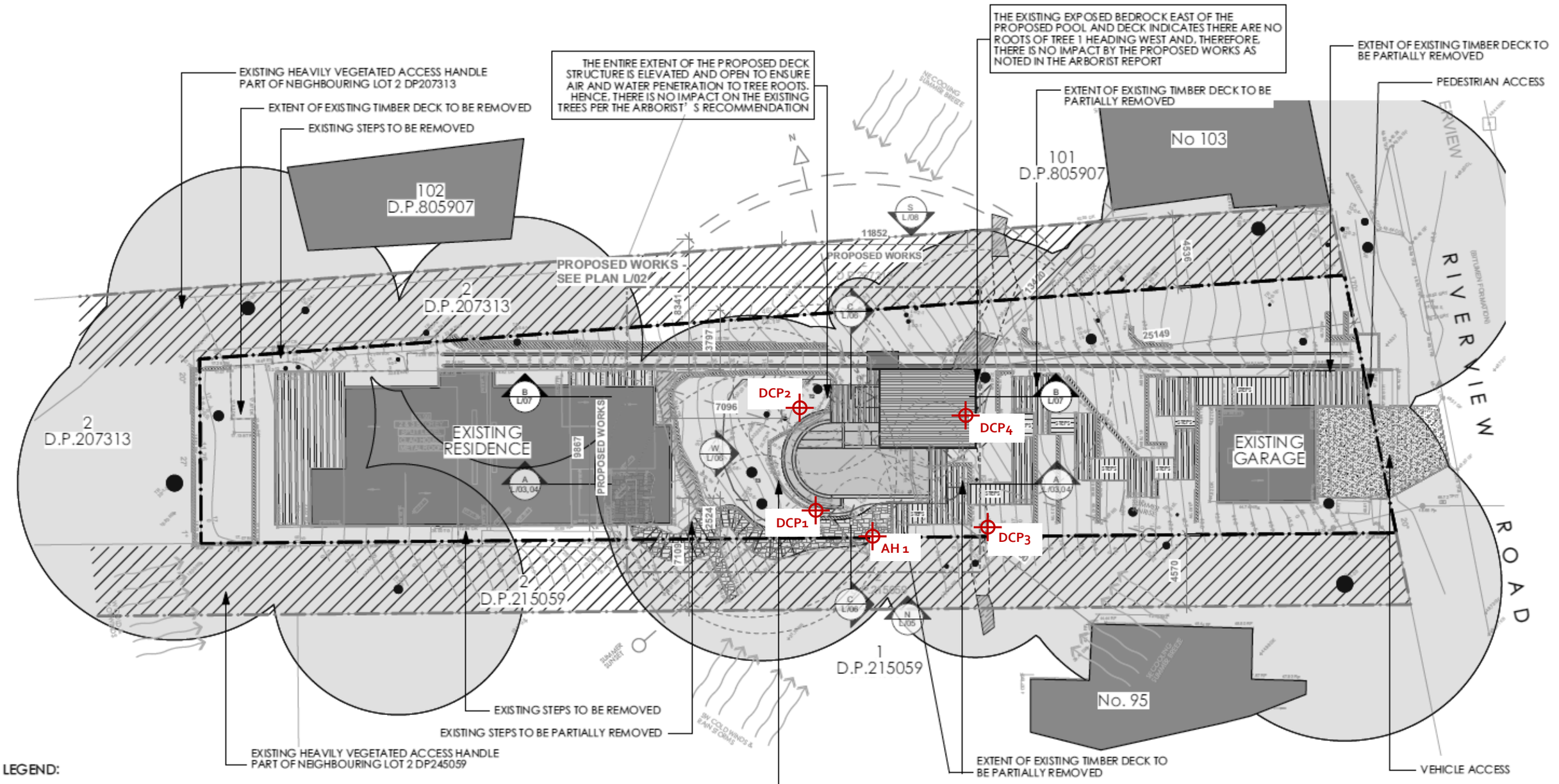
- The report addresses issues relating to your specific design and site. If the proposed project design changes, aspects of the report may no longer apply. Contact White Geotechnical if this occurs.

- 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




**LEGEND:**

- EXISTING LEVELS (GREY)
- CADASTRAL BOUNDARY
- EXISTING TIMBER DECK TO BE RETAINED
- EXISTING TIMBER STAIRS TO BE RETAINED
- EXISTING RETAINING WALL TO BE RETAINED AND ADJUSTED AS REQUIRED
- NEIGHBOURING ACCESS HANDLE AREA & BOUNDARY
- EXTENT OF EXISTING EXPOSED BEDROCK TO BE RETAINED (APPROXIMATE LOCATION)
- EXISTING TREE TO BE RETAINED
- EXISTING PALM TREES (EXEMPT SPECIES) TO BE REMOVED AS PER ARBORIST REPORT
- STRUCTURAL ROOT ZONE. REFER ARBORIST REPORT
- TREE PROTECTION ZONE. REFER ARBORIST REPORT
- EXISTING FLAGGING STEPS TO BE RETAINED
- EXISTING ROCK OUTCROP TO BE RETAINED (APPROXIMATE LOCATION)
- PROPOSED 1200mm HIGH SWIMMING POOL SAFETY FENCE/BALUSTRADE
- PROPOSED WORKS
- EXISTING STRUCTURES TO BE REMOVED

NOTE:
REFER TO SURVEY PLAN PREPARED BY CMS SURVEYORS PTY LTD
REFER TO GEOTECHNICAL REPORT PREPARED BY WHITE GEOTECHNICAL GROUP
REFER TO ARBORICULTURICULTURE IMPACT ASSESSMENT & SITE-SPECIFC PLAN OF MANAGEMENT PREPARED BY 'GROWING MY WAY' TREE CONSULTANTS

| No. | Date | Revision | By |
|---|---|---|---|
| A | 6/11/24 | ISSUE FOR DA SUBMISSION | CV |

Notes:
1. All dimensions and levels shall be verified by Contractor on site prior to commencement of work
2. Do not scale from drawings.
3. If in doubt contact Landscape Architect.
4. This design is copyright and shall not be copied, utilised or reproduced in any way without prior written permission of A Total Concept Landscape Architects.
5. This plan has been prepared for DA purposes only.
6. All Building Works shall be installed to Structural Engineers detail

NOTE:
- ALL DIMENSIONS ARE NOMINAL

Drawing: Site Plan & Site Analysis Plan
Address: No. 99 Riverview Road, Avalon Beach NSW 2107
Project: Cabana, Pool & Landscape Works
Client: Vic & Clare Cherikoff

A Total Concept Landscape Architects & Swimming Pool Designers
45 West Street, North Sydney NSW 2060
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atc a total concept landscape architects & swimming pool designers

Status: SCALE - 1:250 @ A3
Drawn By: RK Dwg Date: 30.03.24
Checked By: RS Plot Date: 30/11/24
CAD File Name: P:\01 JOBS\Cherikoff\D A.vwx

Project No.: Cherikoff
Drawing No.: L/01 A
Rev #
OF 18

# LANDSCAPE MASTER PLAN – showing minimum extent of required shoring

## LEGEND:

1. PROPOSED SWIMMING POOL
2. PROPOSED INTEGRATED SPA
3. PROPOSED CABANA WITH CONCERTINA DOORS OPENING TOWARDS POOL AND VIEW
5. PROPOSED POOLSIDE DECK ENTERTAINING AREA WITH POOL FILTER EQUIPMENT UNDER
6. PROPROSED INCLINATOR STOP TO MATCH PROPOSED DECK LEVEL
7. PROPOSED HOB RETAINING WALL WALL TO MATCH EXISTING STONE RETAINING WALLS. EXISTING FLAGGING STEPS TO BE ADJUSTED AS SHOWN
8. EXISTING DECK LANDING TO BE RETAINED AND EXTENDED TO CREATE TIMBER WALKWAY TO PROPOSED CABANA AND DECK ENTERTAINING AREA
9. PROPOSED POOL WET EDGE AND BALANCE TANK

+RL10.23 PROPOSED FINISHED GROUND LEVEL
+RW10.99 PROPOSED TOP OF WALL LEVEL
+RL10.23 EXISTING FINISHED GROUND LEVEL
+TW10.99 EXISTING TOP OF WALL LEVEL
+XT 20 EXSITING LEVELS (GREY)
CADASTRAL BOUNDARY
EXISTING TIMBER DECK TO BE RETAINED
STEPS EXISTING TIMBER STAIRS TO BE RETAINED
EXISTING RETAINING WALL TO BE RETAINED AND ASJUSTED AS REQUIRED
PROPOSED WORKS

EXISTING FLAGGING STEPS TO BE RETAINED
EXISTING ROCK OUTCROP TO BE RETAINED (APPROXIMATE LOCATION)
PROPOSED 1200mm HIGH SWIMMING POOL SAFETY FENCE/BALUSTRADE
EXTENT OF EXISTING EXPOSED BEDROCK TO BE RETAINED (APPROXIMATE LOCATION)
T1 EXISTING TREE TO BE RETAINED
STRUCTURAL ROOT ZONE. REFER ARBORIST REPORT
TREE PROTECTION ZONE. REFER ARBORIST REPORT
EXISTING STRUCTURES TO BE REMOVED

NOTE:
REFER TO SURVEY PLAN PREPARED BY CMS SURVEYORS PTY LTD
REFER TO GEOTECHNICAL REPORT PREPARED BY WHITE GEOTECHNICAL GROUP
REFER TO ARBORICULTURICULTURE IMPACT ASSESSMENT & SITE-SPECIFC PLAN OF MANAGEMENT PREPARED BY 'GROWING MY WAY' TREE CONSULTANTS

APPROXIMATE LOCATION OF EXISTING ROCK OUTCROP (SHOWN GREY)
EXTENT OF EXISTING EXPOSED BEDROCK (APPROXIMATE LOCATION. SHOWN DASHED, BLUE OUTLINE)
EXISTING HEAVILY VEGETATED ACCESS HANDLE PART OF NEIGHBOURING LOT 2 DP207313
EXTENT OF EXISTING TIMBER DECK TO BE PARTIALLY REMOVED

THE ENTIRE EXTENT OF THE PROPOSED DECK STRUCTURE IS ELEVATED AND OPEN TO ENSURE AIR AND WATER PENETRATION TO TREE ROOTS. HENCE, THERE IS NO IMPACT ON THE EXISTING TREES PER THE ARBORIST' S RECOMMENDATION

EXISTING RESIDENCE

THE PROPOSED DEVELOPMENT IS LIMITED TO 250MM TO RESPECT THE ADJACENT AREA AROUND TREES 3 & 4 TO ENSURE NO ROOTS ARE CUT PER THE ARBORIST' S RECOMMENDATION

Minimum extent of required shoring shown in blue

THE EXISTING EXPOSED BEDROCK EAST OF THE PROPOSED POOL AND DECK INDICATES THERE ARE NO ROOTS OF TREE 1 HEADING WEST AND, THEREFORE, THERE IS NO IMPACT BY THE PROPOSED WORKS AS NOTED IN THE ARBORIST REPORT

EXISTING STEPS TO BE REMOVED
EXISTING STEPS TO BE PARTIALLY REMOVED
EXISTING HEAVILY VEGETATED ACCESS HANDLE PART OF NEIGHBOURING LOT 2 DP245059
EXTENT OF EXISTING TIMBER DECK TO BE PARTIALLY REMOVED

4300 DECK 3100 | 1200 | 4800 CABANA
7756 | 650 | 200 BALANCE TANK | 5400 POOL | 8700 | 3100 | 1200 DECK | 2520
4270
CABANA 3800 | 1000 | 2400 | 3800 CABANA
DECK 2350 | 1150 | 1200 | 400 | 1200 | 8200 POOL
DECK 2050 | 200 | 3000 | 258 | 3789

| No. | Date | Revision | By |
|---|---|---|---|
| A | 6/11/24 | ISSUE FOR DA SUBMISSION | CV |

Notes:
1. All dimensions and levels shall be verified by Contractor on site prior to commencement of work
2. Do not scale from drawings.
3. If in doubt contact Landscape Architect.
4. This design is copyright and shall not be copied, utilised or reproduced in any way without prior written permission of A Total Concept Landscape Architects.
5. This plan has been prepared for DA purposes only.
6. All Building Works shall be installed to Structural Engineers detail

NOTE:
- ALL DIMENSIONS ARE NOMINAL

Drawing: Landscape Master Plan
Address: No. 99 Riverview Road, Avalon Beach NSW 2107
Project: Cabana, Pool & Landscape Works
Client: Vic & Clare Cherikoff

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Project No. Cherikoff
Drawing No. L/02 A | Rev #
OF 18

# TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials

LEGEND:

**Expected Ground Materials**

- Fill
- Topsoil
- Clay
- Narrabeen Group Rocks – Extremely Low Strength Shale
- Narrabeen Group Rocks – Medium Strength Sandstone

EXISTING UPPER DECK TO BE RETAINED

APPROXIMATE LINE OF EXISTING NATURAL GROUND (SHOWN DASHED RED)

D FINISH OF EXISTING RESIDENCE

IG POOL
ND GATE

EXISTING TREES TO BE RETAINED

PR RIDGE RL
31.67

PROPOSED 1200mm HIGH
SWIMMING POOL SAFETY
COMPLIANT FENCE AND GATE

PR DECK RL
35.47

RIDGE
34.81

T4

T3

T1

POOL

EXISTING
RESIDENCE

GF
0.66

Depth to Medium Strength Sandstone band unknown

THE EXISTING EXPOSED BEDROCK EAST OF THE PROPOSED POOL AND DECK INDICATES THERE ARE NO ROOTS OF TREE 1 HEADING WEST AND, THEREFORE, THERE IS NO IMPACT BY THE PROPOSED WORKS AS NOTED IN THE ARBORIST REPORT

## SECTION AA
SCALE 1:100

THE PROPOSED DEVELOPMENT IS LIMITED TO 250MM TO RESPECT THE ADJACENT AREA AROUND TREES 3 & 4 TO ENSURE NO ROOTS ARE CUT PER THE ARBORIST' S RECOMMENDATION

NOTE:
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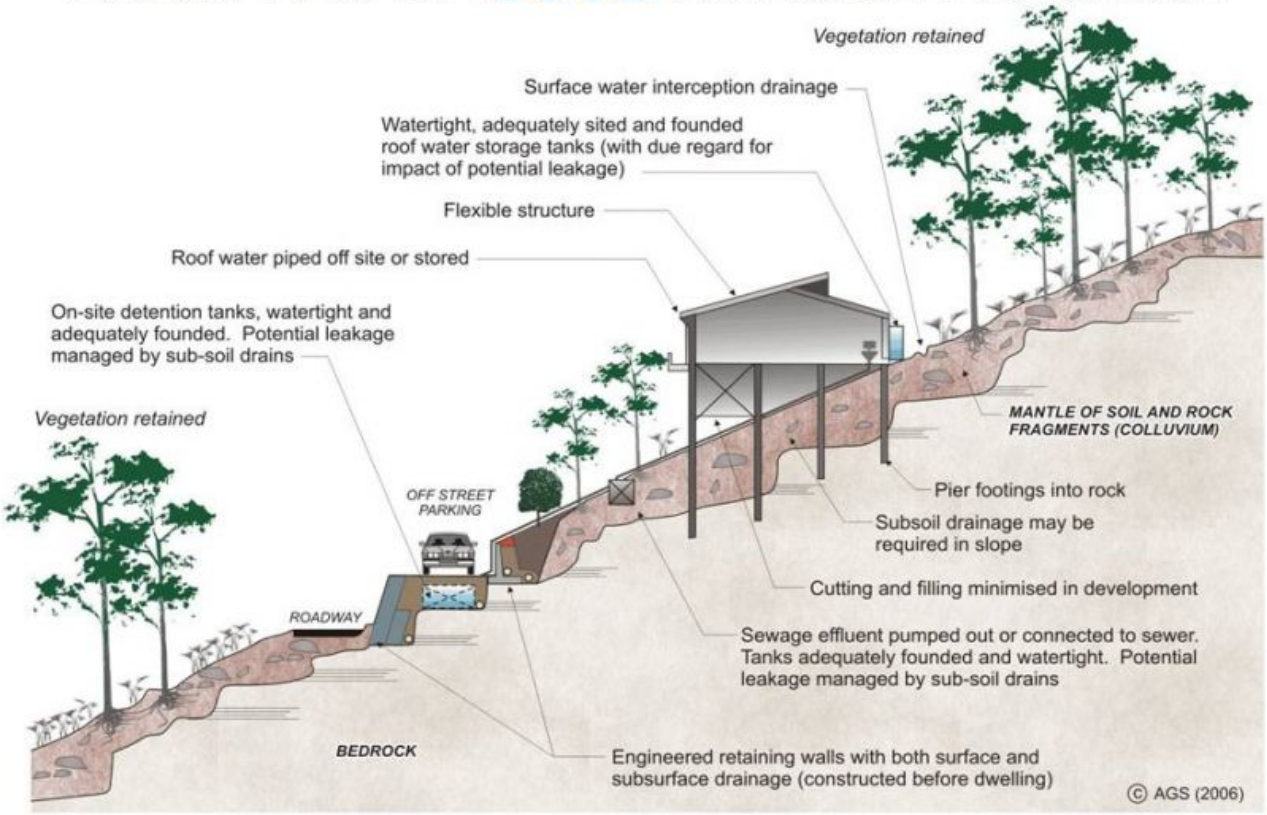
REFER TO GEOTECHNICAL REPORT PREPARED BY WHITE GEOTECHNICAL GROUP
REFER TO ARBORICULTURICULTURE IMPACT ASSESSMENT & SITE-SPECIFC PLAN OF MANAGEMENT PREPARED BY 'GROWING MY WAY' TREE CONSULTANTS

# EXAMPLES OF **GOOD** HILLSIDE PRACTICE




# EXAMPLES OF **POOR** HILLSIDE PRACTICE