

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

Development Application for _____
Name of Applicant

Address of site 104 Cabarita Road, Avalon

The following checklist covers the minimum requirements to be addressed in a Geotechnical Risk Declaration made by geotechnical engineer or engineering geologist or coastal engineer (where applicable) as part of a geotechnical report

I, Ben White on behalf of White Geotechnical Group Pty Ltd
(Insert Name) (Trading or Company Name)

on this the 27/8/20 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 104 Cabarita Road, Avalon

Report Date: 24/8/20

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 <u>104 Cabarita Road, Avalon</u>	

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 104 Cabarita Road, Avalon
Report Date: <u>24/8/20</u>
Author: <u>BEN WHITE</u>
Author's Company/Organisation: WHITE GEOTECHNICAL GROUP PTY LTD

Please mark appropriate box

- Comprehensive site mapping conducted 18/8/20
(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 18/8/20
- Geotechnical model developed and reported as an inferred subsurface type-section
- Geotechnical hazards identified
 - Above the site
 - On the site
 - Below the site
 - Beside the site
- Geotechnical hazards described and reported
- Risk assessment conducted in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009
 - Consequence analysis
 - Frequency analysis
- Risk calculation
- Risk assessment for property conducted in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009
- Risk assessment for loss of life conducted in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009
- Assessed risks have been compared to "Acceptable Risk Management" criteria as defined in the Geotechnical Risk Management Policy for Pittwater - 2009
- Opinion has been provided that the design can achieve the "Acceptable Risk Management" criteria provided that the specified conditions are achieved.
- Design Life Adopted:
 - 100 years
 - Other _____
specify
- Geotechnical Conditions to be applied to all four phases as described in the Geotechnical Risk Management Policy for Pittwater - 2009 have been specified
- Additional action to remove risk where reasonable and practical have been identified and included in the report.
- Risk assessment within Bushfire Asset Protection Zone.

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



 Signature

 Name Ben White

 Chartered Professional Status MScGEOLAusIMM CP GEOL

 Membership No. 222757

 Company White Geotechnical Group Pty Ltd

GEOTECHNICAL INVESTIGATION: **New Jetty at 104 Cabarita Road, Avalon**

1. Proposed Development

- 1.1** Construct a new deck and jetty off the downhill side of the existing boathouse in the NE corner of the property.
- 1.2** Details of the proposed development are shown on 2 drawings prepared by Stephen Crosby & Associates, drawing numbered 2178-DA01 is dated July 2018, and drawing numbered 2178-DA02 id dated August 2018.

2. Site Description

- 2.1** The site was inspected on the 18th August, 2020.
- 2.2** This waterfront residential property is on the low side of the road and has a NE aspect. It is located on the moderate to steeply graded lower reaches of a hillslope. The slope above the property continues at similar angles.
- 2.3** The property is accessed by a concrete Right of Carriageway (ROW) off Cabarita Road (Photo 1). A concrete driveway diverts off the ROW and runs to a carport under the house and to a parking area on the uphill side of the house (Photos 2 & 3). The fill for the parking area is supported by a stable rendered masonry retaining wall reaching ~2.0m high (Photo 4). The old part two-storey house is supported on steel posts (Photo 5). Some of the supporting posts have rusted and tilted but have been remediated with additional supports (Photo 6). The area surrounding the house is lawn and garden-covered. These gardens slope steeply to the waterfront below the house (Photo 7). Three buildings have been constructed at the W end of the waterfront (Photo 8). An excavation has been made in the slope to create a level platform for the upper level of the larger building. The cut is supported by a stable sandstone block retaining wall ~1.1m (Photo 9). The larger building is a two-storey

boathouse supported on sandstone block foundations. The sandstone block foundation walls have weathered to a point where deterioration is occurring rapidly and this process is undercutting the walls above (Photo 10). One portion of a small brick building upslope and to the E of this building displays significant settlement downslope (Photo 11). We recommend these buildings be assessed by a structural engineer to determine the details of the required remedial works. Until this inspection is carried out, we recommend no one spend time in these structures. Another stable sandstone block boathouse has been constructed at the E end of the waterfront (Photo 12). Between the boathouses is a near-level lawn (Photo 13). The cut for the lawn and E boathouse is supported by a stable ~1.8m high sandstone block retaining wall (Photo 14). The fill for the lawn is supported by a ~1.6m high sandstone block seawall (Photo 15). The seawall was observed to be supported directly onto Low to Medium Strength Shale at the waterfront. Some of the sandstone block components of the seawall were also observed to be weathered (Photo 16). We recommend the more weathered components be replaced.

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

Five DCP (Dynamic Cone Penetrometer) tests were carried out 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. 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:

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 (~RL-0.2)	DCP 2 (~RL-0.1)	DCP 3 (~RL0.0)	DCP 4 (~RL0.1)	DCP 5 (~RL0.1)	DCP 6 (~RL0.1)
0.0 to 0.3	5	26	9	Rock exposed at surface	Rock exposed at surface	Rock exposed at surface
0.3 to 0.6	36	11	#			
0.6 to 0.9	#	#				
	Refusal on Rock @ 0.4m	Refusal on Rock @ 0.4m	Refusal on Rock @ 0.2m			

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

DCP Notes:

DCP1 – Refusal on rock @ 0.4m, DCP bouncing off rock surface, brown sand on wet tip.

DCP2 – Refusal on rock @ 0.4m, DCP bouncing off rock surface, brown sand on wet tip.

DCP3 – Refusal on rock @ 0.2m, DCP bouncing off rock surface, brown sand on wet tip.

DCP4 – Low Strength Rock exposed at surface.

DCP5 – Low Strength Rock exposed at surface.

DCP6 – Low Strength Rock exposed at surface.

5. Geological Observations/Interpretation

The site is underlain by a typical shale profile with clays to a maximum depth of ~0.4m before encountering Low to Medium Strength Shale. In the location of the proposed works, most of the foundations will be located below the mean water mark and were located below the water body of Pittwater at the time of the inspection. Here the shale profile is overlain by sediments of an unknown depth.

Testing in DCPs 1 & 2 indicate that near shore the sediment is at least 0.4m deep and is expected to get deeper further from the shore.

6. 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 Cabarita Road above.

7. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed beside or below the property. The moderate to steeply graded land surface that falls across the property and continues above is a potential hazard (**Hazard One**).

Risk Analysis Summary

HAZARDS	Hazard One
TYPE	The moderate to steep slope that falls across the property and continues above failing and impacting on the property.
LIKELIHOOD	'Unlikely' (10^{-4})
CONSEQUENCES TO PROPERTY	'Medium' (20%)
RISK TO PROPERTY	'Low' (2×10^{-5})
RISK TO LIFE	8.3×10^{-7} /annum
COMMENTS	'ACCEPTABLE' level of risk to life & property.

(See Aust. Geomech. Jnl. Mar 2007 Vol. 42 No 1, for full explanation of terms)

8. 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.

9. Stormwater

No significant stormwater runoff will be created by the proposed development.

10. Excavations

Apart from those for footings, no excavations are required.

11. Foundations

Estimating the depth of the sediment below the waterline is beyond the scope of this report. However, testing done in the water ~6m out from the shore indicates the sediment is at a maximum depth of 0.4m. We expect the sediment to get progressively deeper with an increased distance from shore. Within ~6m of the shore, Low to Medium Strength Shale was encountered at the surface or at shallow depths. The piles for the proposed jetty may be supported on concrete pads embedded in this material. Beyond ~6m, it is envisaged the jetty will be supported on driven piles, subject to sediment depth, as is typical of jetties in Pittwater.

The piling contractor is responsible for certifying these foundations but should inform the geotechnical consultant of the pile embedment depths as they are installed.

Additionally, a sewer line runs along the shore and will be located under the proposed jetty. The foundations are to be constructed to Sydney Water's requirements.

12. 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 Occupation Certificate if the following inspections have not been carried out during the construction process.

- The piling contractor is to inform the geotechnical consultant of the pile embedment depth of each pile after installation.

White Geotechnical Group Pty Ltd.



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



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10



Photo 11



Photo 12



Photo 13



Photo 14



Photo 15



Photo 16

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.



Stephen Crosby & Assoc.
Pty. Ltd.

SCOTLAND ISLAND
PO Box 204 GROUND P1 NSW 2105
M 0489107513 E sales@crosby.com.au

**JETTY & STEPS,
ACCESS DECK**

**104 CABARITA RD.
AVALON, NSW
Lot 9 DP 629464**

From BASCAYE PTY LTD
Drawing No: 11

SITE PLAN

Scale 1:200 At A3
Date JULY 2018
Drawn S C
Drawing Number

2178 - DA 01

Nº 102 LOT 8
D.P. 629464

Nº 104
LOT 9

LOT 10
LOT BOUNDARY

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials



Fill
Sandy Sediment
Narrabeen Group Rocks - Low to Medium Strength Shale

75x50 TOE RAIL ON BLOCKS
150 x 45 HARDWOOD DECK
200 x 75 H/WOOD RUNNERS
150 x 100 PAINTED HEADSTOCKS
300 DIA H/WOOD PILES

Author
Stephen Crosby & Assoc. Pty. Ltd.

Client
SCOTLAND ISLAND
PO Box 204 Church Pt. NSW 2105
M 0439 027 513 E scot@stephen-crosby.com.au

Project
JETTY & STEPS, ACCESS DECK

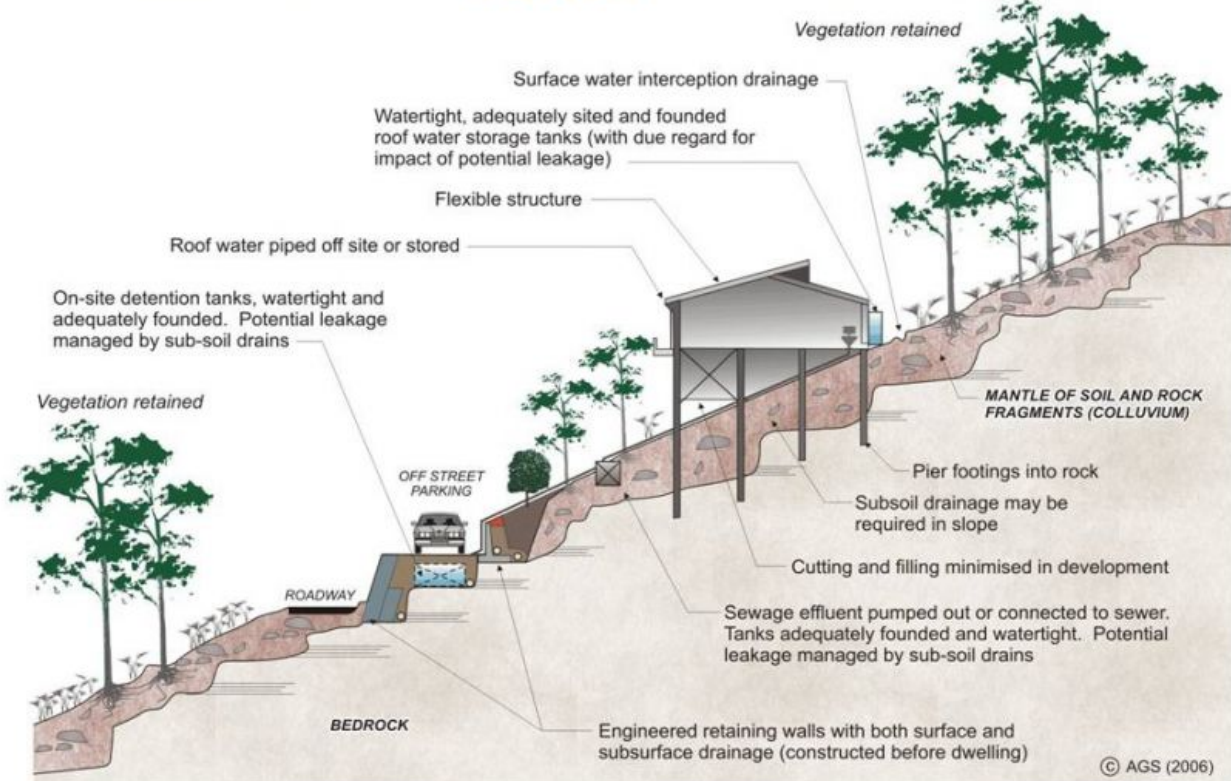
Location
104 CABARITA RD,
AVALON, NSW
Lot 9 DP 629464

Owner
PO BOX BASSCAVE PTY. LTD.

SECTIONS

Scale 1:20 & 1:100 AT AS
Date AUGUST 2018
Drawn S.C.
Checked
Drawn Number
2178 - DA 02

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE

