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

Development Application for					
	Name of Applicant				
Address of site	187 Riverview Road, Avalon Beach				
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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 Lt	d
	(Insert Name)	(Trading or Company Name)	_

on this the <u>13/8/21</u> 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.

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 187 Riverview Road, Avalon Beach

Report Date: 13/8/21

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.

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Signature	·····
Name	Ben White
Chartered Professional St	atus MScGEOLAusIMM CP GEOL
Membership No.	222757
Company	White Geotechnical Group Pty Ltd



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187 Riverview Road, Avalon Beach

Minor Works Assessment

1. Proposed Development

A geotechnical site inspection was carried out on the 9th August, 2021.

Details of the proposed works are shown on 4 drawings prepared by Ryan Hopkins, drawings numbered 2102-N-PL00 to 2102-N-PL03, Issue D1, dated July 2021. The work involves adding a first floor addition to the existing boatshed and adding a deck connected to the boatshed addition. The boatshed addition requires no new foundations and will be supported off the existing structure. The timber deck is a light weight structure. As such the works are considered minor in scope from a geotechnical perspective.

2. Geotechnical Hazards and Risk Analysis

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

Hazard One – Qualitative Risk Assessment on Property

This waterfront property is on the low side of the road and has a W aspect. It is located on the steeply graded upper to lower reaches of a hillslope that falls to Pittwater. The slope falls across the property at an average angle of ~29°. At the road frontage, a concrete driveway runs down the slope to a rendered masonry garage that shows no significant signs of movement. Stable rendered masonry and concrete block retaining walls up to ~1.8m high beside and below the driveway support cuts and fills (Photos 1 & 2). The two storey rendered brick house is supported by brick walls. The external supporting walls show no significant signs of movement. A timber deck and balcony extend off the downhill side of the house.

An inclined lift runs from the upper floor of the house to the waterfront. Masonry retaining walls up to ~1.7m high support filled garden areas on the downhill side of the house. The retaining walls are obscured by vegetation, but from what could be seen of the walls they

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appear to be stable. A sandstone rock face up to ~6m high is located downhill of the house (Photo 3). The rock face appears to be currently stable. Large sandstone joint blocks are located in stable positions on the slope below the rock face near the waterfront (Photo 4). A concrete block boatshed in good condition is located at the waterfront. Low stone and gabion basket retaining walls support filled garden areas above the boatshed. A concrete block retaining wall ~1.8m high supports a cut beside the boatshed.

The slope above the property quickly eases to gentle angles at the crest of the slope. The likelihood of the land surface on the property failing and impacting on the house is assessed as 'Unlikely' (10^{-4}). The consequences to property of such a failure are assessed as 'Medium' (15%). The risk to property is 'Low' (2×10^{-5}).

Hazard One – Quantitative Risk Assessment on Property

For loss of life risk can be calculated as follows:

R (Lol) = **P** (H) **x P**(S: H) **x P** (T: S) **x V** (D: T) (See Aust. Geomech. Jnl. Mar 2007 Vol. 42 No 1, for full explanation of terms)

Annual Probability

No evidence of significant movement was observed on the property or on the slope immediately above.

Р (н) = 0.0001/annum

Probability of Spatial Impact

The retaining walls on the property appear to be stable.

P(s: H) = 0.1

Possibility of the Location Being Occupied During Failure

The average household is taken to be occupied by 4 people. It is estimated that 1 person is in the house for 20 hours a day, 7 days a week. It is estimated 3 people are in the house 12 hours a day, 5 days a week.



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For the person most at risk:

$$\frac{20}{24}x\frac{7}{7}$$
 = 0.83

 $P_{(T:S)} = 0.83$

Probability of Loss of Life on Impact of Failure

Based on the volume of land sliding and its likely velocity when it hits the house, it is estimated

that the vulnerability of a person to being killed when a landslide occurs is 0.1.

V (D: T) = 0.1

Risk Estimation

 $\mathbf{R}_{(Lol)} = 0.0001 \times 0.1 \times 0.83 \times 0.1$

= 0.00000083

R (Lol) = 8.3×10^{-7} /annum **NOTE:** This level of risk is 'ACCEPTABLE'.

Geotechnical Hazards and Risk Analysis - Risk Analysis Summary

HAZARDS	Hazard One
ТҮРЕ	The steeply sloping land surface that falls across the property failing and impacting on the house.
LIKELIHOOD	'Unlikely' (10 ⁻⁴)
CONSEQUENCES TO PROPERTY	'Medium' (15%)
RISK TO PROPERTY	'Low' (2 x 10 ⁻⁵)
RISK TO LIFE	8.3 x 10 ⁻⁷ /annum
COMMENTS	This level of risk is 'ACCEPTABLE', provided the recommendations in Section 3 are carried out.

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

3. Ongoing Maintenance

Where slopes are steep and approach or exceed 30°, 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



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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 2** is subject to this ongoing maintenance being carried out.

4. Conclusion

The property has an 'Acceptable Risk Level' in accordance with the 2009 Geotechnical Risk Management Policy for Pittwater.

White Geotechnical Group Pty Ltd.

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



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Photo 1



Photo 2

White Geotechnical Group ABN 96164052715

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Photo 3



Photo 4

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