

REPORT ON GEOTECHNICAL ASSESSMENT

for

PROPOSED SUB DIVISION

at

1744 PITTWATER ROAD, BAYVIEW, NSW

Prepared For

Graham Irwin

Project No.: 2020-111

July, 2020

Document Revision Record

Issue No	Date	Details of Revisions
0	30 th July 2020	Original issue

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

Development Application for _____	Name of Applicant _____
Address of site ____ 1744 Pittwater Road, Bayview, NSW	

Declaration made by geotechnical engineer or engineering geologist or coastal engineer (where applicable) as part of a geotechnical report

I, Troy Crozier on behalf of Crozier Geotechnical Consultants 3rd August 2020 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 \$2million.

I:

- ☐ 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:

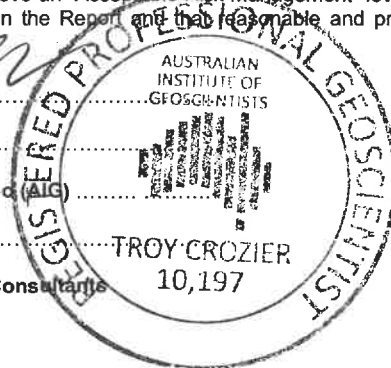
Report Title: Geotechnical Report for Proposed Sub Division	
Report Date: 30 th July 2020	Project No.: 2020-111
Author: Jun Yan & Troy Crozier	
Author's Company/Organisation: Crozier Geotechnical Consultants	

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

Engineering Drawing by NB Consulting Engineers, Job No.: 191109, Drawing No.: C01 to C05, C10, Issue: C, Dated: 24/07/2020.
Survey Plan by Total Surveying Solutions, Job No.: 192304, Plan No.: 192304_A - _B, Dated: 14/10/2019.

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 ... Troy Crozier
 Chartered Professional Status... RPGeo (AIG)
 Membership No.: ... 10197
 Company... Crozier Geotechnical Consultants



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 ____ 1744 Pittwater Road, Bayview, NSW _____

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 for Proposed Sub Division
Report Date: 30th July 2020 **Project No.:** 2020-111
Author: Jun Yan & Troy Crozier
Author's Company/Organisation: Crozier Geotechnical Consultants

Please mark appropriate box

- ☒ Comprehensive site mapping conducted ____ 3rd June 2020 ____
 (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 no bulk excavation.....
☐ Yes Date conducted
- ☐ 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 ...Troy Crozier.....
 Chartered Professional Status ...PGEO (AIG).....
 Membership No. ...10197.....
 Company... Crozier Geotechnical Consultants

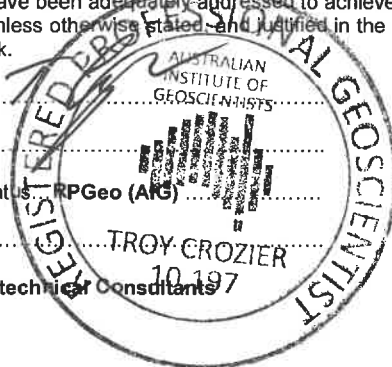


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**GEOTECHNICAL ASSESSMENT FOR PROPOSED SUB DIVISION
1744 PITTWATER ROAD, BAYVIEW, NSW**

1. INTRODUCTION:

This report details the results of a geotechnical assessment carried out for proposed sub division at No. 1744 Pittwater Road, Bayview, NSW. The assessment was undertaken by Crozier Geotechnical Consultants (CGC) at the request of the client Graham Irwin.

It is understood that the proposed works involve the sub division of the existing property into two lots. This will involve the removal of the existing residence and construction of two additional dwellings, one on the proposed lot 1 and the other on the proposed lot 2. The works will involve a new concrete driveway along the east boundary however the design of the two dwellings is not part of this DA. The driveway works appear to require minimal excavation.

Reference to Pittwater Council's LEP 2014 Geotechnical Risk Management Map (GTH_011), the site has been classified as being partly within the H1 (highest category) landslip hazard zone therefore the site requires a Geotechnical Landslip Risk Assessment to be conducted in support of a Development Application. The site is also located within class 5 and class 2 acid sulphate zones Acid Sulfate Soils Map (ASS_011). Therefore this geotechnical report is provided in support of the Development Application and assesses the landslip risks and provides details to ensure acceptable risk levels are achieved and can be maintained on the site for the life of the development.

The assessment and reporting were undertaken as per the Tender P20-180, Dated: 16th March 2020.

The investigation comprised:

- a) A detailed geotechnical inspection and mapping of the site and adjacent properties by a Geotechnical Engineer.
- b) Review of Ortho Photomaps and Aerial Photography of the site.

The following plans and diagrams were supplied for the work:

- Engineering Drawing by NB Consulting Engineers, Job No.: 191109, Drawing No.: C01 to C05, C10, Issue: C, Dated: 24/07/2020.
- Survey Plan by Total Surveying Solutions, Job No.: 192304, Plan No.: 192304_A - _B, Dated: 14/10/2019.
- Development Application assessment letter, Northern Beaches Council, Dated: 9th March 2020.

2. SITE FEATURES:

2.1. Description:

The site is a trapezoidal shaped block located on the low north side of Pittwater Road within gentle north-east dipping topography, sloping down towards the Pittwater waterfront. It has a front south boundary of 19.45m, rear north boundary of 17.73m, side west boundary of 91.62m and side east boundary of 78.23m as referenced from the provided survey plan.

The site is currently occupied by a two and three storey brick residence located at the centre of the long property with a brick garage to the southeast of the building. The site contains large lawns and gardens around the front and rear of the site, with a small jetty off the northern boundary.

2.2. Geology:

Reference to the Sydney 1:100,000 Geological Series sheet (9130) indicates that the site is underlain by Newport Formation (Upper Narrabeen Group) rocks which are of middle Triassic in age. The Newport Formation typically comprises interbedded laminite, shale and quartz to lithic quartz sandstones and pink clay pellet sandstones.

Narrabeen Group rocks are dominated by shales and thin siltstone beds and often form rounded convex ridge tops with moderate angle (<20°) side slopes. These side slopes can be either concave or convex depending on geology; internally they comprise shale beds with close spaced bedding partings that have either close spaced vertical joints or in extreme cases large space convex joints. The shale often forms deeply weathered silty clay soil profiles (medium to high plasticity) with thin silty colluvial cover.

3. FIELD WORK:

3.1. Methods:

The field investigation comprised a walk over inspection and mapping of the site and adjacent properties on the 3rd June 2020 by a Geotechnical Engineer. It included a photographic record of the site conditions as

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well as geological/geomorphological mapping of the site and adjacent land with examination of ground levels and existing structures.

3.2. Field Observations:

Pittwater Road contains a bitumen pavement and is gently east dipping where it passes the site with a concrete footpath between the site and the road. There were no signs of excessive cracking or deformation within the road pavement and footpath to suggest any movement or underlying geotechnical issues.

The site is accessed via a concrete pavement to the front of the property and the garage at the southeast corner of the existing house. The front of the property contains a large gently northeast dipping lawn with large trees on the perimeter.

The existing house is a three storey brick residence. The building structure is over 50 years of age and is in a good condition with no signs of settlement or cracking on its external walls.

The rear of the property is accessed via a pathway along the east boundary. It contains a large gentle north dipping lawn with a small jetty off the northern boundary accessed from a paved path. There were no signs of instability within this area or obvious surface stormwater flow or excess seepage/wet areas.

The neighbouring property to the west (No. 1746) is a battle axe shaped property and contains a two storey rendered house located at the rear of the property with a long driveway at the front. The structure appears in a good condition with no signs of significant cracking or settlement on the external walls and is located approximately 3.00m off the common boundary. The property is at a similar ground level as the site along the common boundary at the front and up to 0.40m higher than the site at the rear, which is retained by timber retaining walls. The remainder of the block has a similar topography to the site.

The neighbouring property to the east (No. 1742) contains a two storey weatherboard residence located broadly at the front of the property with a weatherboard garage at the front and swimming pool at the rear. The structure appears in a good condition with no signs of significant cracking or settlement on the external walls. The structures are located within 0.70m of the common boundary. The property is at a similar ground level as the site along the common boundary with the remainder of the block having a similar topography to the site.

The neighbouring buildings and properties were only inspected from within the site or from the road reserve however the visible aspects did not show any significant signs of large scale slope instability or other major geotechnical concerns which would impact the site or the proposed development.

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4. COMMENTS:

4.1. Geotechnical Assessment:

The inspection and assessment identified no obvious credible landslip hazards within the site or adjacent properties. The existing residence appears to be over 50 years old and is in good condition, with no signs of excess cracking or settlement. The soil slopes within and around the site are gently sloping and there were no signs of any significant instability. Most of the retaining walls within the site area appear stable at present. No obvious surface stormwater flow or excess seepage/wet areas were identified.

The proposed works involve the sub division of the existing property into two lots. This will involve the removal of the existing residence and construction of two additional dwellings, one on the proposed lot 1 and the other on the proposed lot 2. The works will involve a new concrete driveway however the design of the two dwellings is not part of this DA. The driveway works appear to require minimal excavation.

There were no signs of existing or previous landslip instability within the site or adjacent land whilst the existing house structure shows no signs of settlement or cracking. The proposed works require no bulk excavation, therefore the proposed works are considered separate from and not affected by a geotechnical hazard. As such no further geotechnical investigation or reporting is required as part of this Development Application to meet Council's policy requirements.

4.2. Slope Stability & Risk Assessment:

Based on our site mapping no credible geological/geotechnical landslip hazards were identified which need to be considered in relation to the existing site and proposed development. As such a risk assessment is not required as the works are considered separate from, and not affected by, a geotechnical landslip hazard.

The entire site and surrounding slopes have been assessed as per the Pittwater Council Geotechnical Risk Management Policy 2009 and no credible landslip hazards were identified, therefore the site is considered to meet the 'Acceptable' risk management criteria.

4.3. Design Life of Future Development:

We have not viewed the design for any future development on the site.

We have interpreted the design life requirements specified within Council's Risk Management Policy to refer to structural elements designed to support the adjacent slope, control stormwater and maintain the risk of instability within 'Acceptable' limits. Specific structures and features that may affect the maintenance and stability of the site in relation to proposed development are considered to comprise:

- stormwater and subsoil drainage systems,
- excavation, retaining walls and soil slope erosion and instability,
- maintenance of trees/vegetation on this and adjacent properties,

Man-made features should be designed and maintained for a design life consistent with surrounding structures (as per AS2870 ó 2011 (50 years)). In order to attain an "Acceptable Risk Management Criteria" for a design life of 100 years as detailed by the Councils Risk Management Policy, it will be necessary for the property owner to adopt and implement a maintenance and inspection program.

If a maintenance and inspection schedule are not implemented the "Acceptable" risk levels for the design life of the property may not be attained. A recommended program is given in Table: 1 below and should also include the following guidelines:

- The conditions on the block don't change from those present at the time this report was prepared, except for the changes due to new reviewed and approved development.
- There is no change to the property due to an extraordinary event external to this site, and the property is maintained in good order and in accordance with the guidelines set out in;
 - a) CSIRO sheet BTF 18
 - b) Australian Geomechanics "Landslide Risk Management" Volume 42, March 2007.
 - c) AS 2870 ó 2011, Australian Standard for Residential Slabs and Footings

Table 1: Recommended Maintenance and Inspection Program for Future Developments

Structure	Maintenance/ Inspection Item	Frequency
Stormwater Drains.	Owner to inspect to ensure that the drains and pipes are free of debris & sediment build-up. Clear surface grates and litter.	Every year or following each major rainfall event
Retaining Walls or remedial measures	Owner to inspect walls for deviation from as constructed condition or for excess deterioration/rotation or signs of soil settlement/erosion or significant cracking adjacent to crest.	Every two years or following major rainfall events. Replace existing non-engineered walls as required prior to their failure
Large Trees on or adjacent to site	Arbourist to check condition of trees and remove branches and dead trees as required	Every five years

N.B. Provided the above schedule is maintained the design life of the property should conform AS2870 and Councils 100 years stability criteria

Where changes to site conditions are identified during the maintenance and inspection program, reference should be made to relevant professionals (e.g. structural engineer, geotechnical engineer or Council). It is assumed that Northern Beaches Council will control development on neighbouring properties, carry out regular inspections and maintenance of the road verge, stormwater systems and large trees on public land adjacent to the site so as to ensure that stability conditions do not deteriorate with potential increase in risk level to the site. Also individual Government Departments will maintain public utilities in the form of power lines, water and sewer mains to ensure they don't leak and increase either the local groundwater levels or landslide potential.


5. CONCLUSION:

The inspection and assessment identified no obvious significant slope movement, excess surface stormwater flow or seepage, erosion or instability within the site or adjacent properties. The entire site and surrounding slopes have been assessed as per the Pittwater Council Geotechnical Risk Management Policy 2009 and no credible landslip hazards were identified.

The proposed works are relatively minor from a geotechnical perspective and should not create any new instability, therefore the proposed works are separate from and not affected by a geotechnical hazard, and no further geotechnical assessment or reporting is required as part of this DA.

For future development on the individual lots further assessment as per Councils policy will be required.

It is considered that the site will meet the 'Acceptable' risk management criteria for the design life of new developments taken as 100 years from the proposed works provided the developments are properly design and constructed and the properties are maintained as per the recommendations of this and future geotechnical reports.



Prepared By:

Jun Yan

Geotechnical Engineer



Reviewed By:

Troy Crozier

Principal

MEng, BSc, Dip. Civ. Eng

MAIG, PRGeo ó Geotechnical and Engineering

Registration No.: 10197

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6.0. REFERENCES:

1. Australian Geomechanics Society 2007, "Landslide Risk Assessment and Management", Australian Geomechanics Journal Vol 42, No 1, March 2007.
2. Geotechnical Risk Management Policy for Pittwater, 2009.