



Civil Structural
Engineering
Design Services

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13th April 2023

Mr Abel Bornstein
15 Quirk Street
DEE WHY NSW 2099

D-1378

Dear Sir & Madam,

Re: Geotechnical Report – Alterations and Additions at 15 Quirk Street, DEE WHY

INTRODUCTION

I, Edward A Bennett, practicing civil, structural, geotechnical & environmental engineer, hereby confirm that our company has inspected the above site for the proposed residential development consisting of Alterations & Additions and confirm that by review of Councils Policy, a full geotechnical report is unnecessary for properties in Area "A" & "B" of the Warringah LEP 2011 Land Slip Risk Map, refer below.

PROPOSED DEVELOPMENT

The proposed development consists of structural alterations and additions, including new internal walls, new windows, and steel support posts, as shown on the architectural details prepared by Architecture, refer Appendix 'B'.

These works may include minor excavation, filling, and new piered/piled footing systems for the new support structure, for the rear addition to be founded to underlying rock.

DESCRIPTION OF SITE & SURROUNDING AREA

The site of the new works is not limited and covers most of the allotment over an area with a gradual slope not exceeding 5 degrees and steeper towards the rear of the property. Whilst the site presents NO exposed weathered sandstone, this area is generally known to have a soil profile of Topsoil fill and Sandy Clay to a depth of 600mm - 1000mm, overlying weathered sandstone boulders/bedrock layers, at depth exceeding 1000mm.

The site development slopes towards the south-western and south-eastern corners at approximately 10 degrees averaging over the entire site.

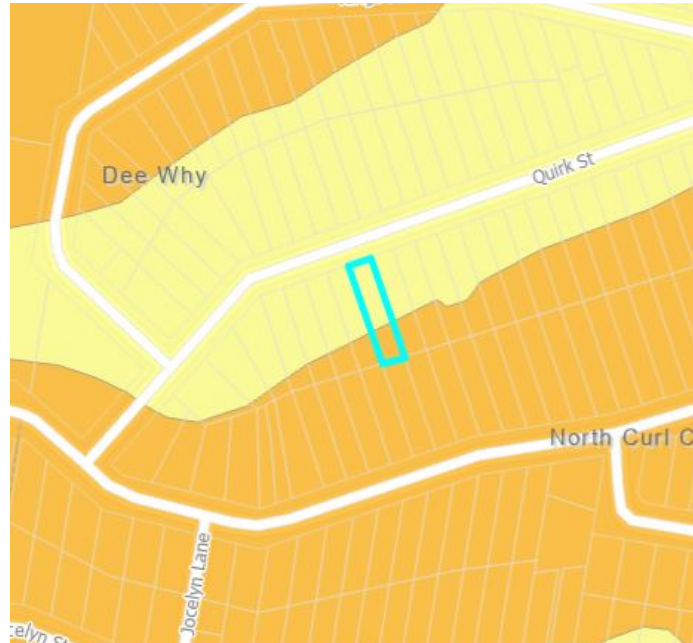


Figure 1: Land slip risk map for 15 Quirk Street, DEE WHY NSW 2099 (site location marked in Blue), in Area "A" & "B".

SITE GEOLOGY

The underlying site geology consists of Wianamatta group Hawkesbury Sandstone. This is a Mesozoic era sandstone containing medium to coarse-grained quartz sandstone with very minor shale and laminate lenses. Refer to 1:100000 Sydney geologic mapping for more details (available via references).

From the observations from the site inspection, it was deemed unnecessary to perform any extra/special investigation of the underlying site geology.

OBSERVATIONS

Please refer to appendix "A" for the photographic record.

- Soil profile is topsoil overlaying residual clay, overlaying sandstone (bedrock).
- Removal of the upper layer of unconsolidated topsoil/residual clays, the structural foundations/slabs will require, depending on the depth residual clay over the rock layer, piercing into sound solid rock.
- No evidence of particularly high risk/hazard zones (unstable slip zones or localized areas of gradient greater than 25 degrees) across the entirety of the site.

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RECOMMENDATIONS

Some practices which assist to mitigate risk are as follows and should be adhered to:

1. *CLEARING - GOOD hillside practice*

- 1.1. Provide siltation fencing and proper barriers along a portion of the western, southern and eastern boundaries to prevent remnant excavation materials being transported to the neighbouring downhill properties and council's stormwater systems, causing contamination.
- 1.2. Provide shallow diversion spoon drains as follows:
 - Along the side western and eastern boundary sloping down towards the southern boundary to control overland stormwater flooding diverting any surface run-off from uphill properties and avoid localised slippage from effects of any excavations within that zone.
- 1.3. Cover any exposed rock faces to prevent loss of moisture and at risk to spall overnight.

2. *EXCAVATION*

- 2.1. The proposed Development will require detailed excavation as mechanical equipment will be employed.
- 2.2. The excavation for the proposed structure(s) may create a build-up of disposable material which, if not being utilised as on-site suitable fill, shall be placed in special stockpiles and be protected and maintained with suitable batters and cover so as not to be transported off-site by natural localised slippage or cause instability of existing batters through heavy rains before being used at a future date.

3. *FOUNDATION MATERIALS AND FOOTINGS*

- 3.1. It is recommended that all footings for the foundations to be supported on the underlying rock using reinforced concrete piers where necessary. Allow for end bearing piers to penetrate the medium strength sandstone surface by at least 150mm. The allowable bearing capacity for the piers shall be not less than 500kPa.

4. *SUBSURFACE DRAINAGE*

- 4.1. Any retaining walls are to have adequate subsurface drains such as "strip drains" or sock covered agricultural pipes placed at the rear of the walls to prevent undue hydrostatic pressure.

5. *INSPECTIONS*

- 5.1. It is recommended that the rock jointing be discovered and inspected by the engineer. The foundation material and pier placement are to be inspected and approved prior to casting any concrete.
- 5.2. It is an obligation for the certifier/builder/contractor to organise the inspections noted above within 24 hours' notice notwithstanding that the principal certifying authority and the structural engineer needs to be notified in advance.

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6. ON-GOING MAINTENANCE

- 6.1. The property is to be maintained in good order and in accordance with the guidelines set out in CSRIO - BTF 18 "Foundation Maintenance and Footing Performance: A Homeowner's Guide" and the Australian Geomechanics Article "Landslide Risk Management Concepts and Guidelines" May 2002.

Provided all recommendations above are adhered to, the works will be completed following good geotechnical and structural engineering practice.

The development will not cause detrimental impacts because of stormwater discharge from the land and will not cause detrimental impact on the existing subsurface flow conditions including those of other properties.

Yours faithfully,



E.A. Bennett M.I.E. Aust. Cp Eng. NPER 198230, Member AGS, BCD 0820

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REFERENCES

NSW Dept. of Resourced & Energy, "Sydney 1:100 000 Geological Map", Accessed 16 July 2014 from <http://www.resourcesandenergy.nsw.gov.au/miners-and-explorers/geoscience-information/geological-maps/1-100-000/sydney-1100-000-geological-map>

Northern Beaches Council eServices, Warringah Council Development Control Plan 2011
<https://eservices.northernbeaches.nsw.gov.au/ePlanning/live/Public/XC.Track/SearchProperty.aspx?id=131124>

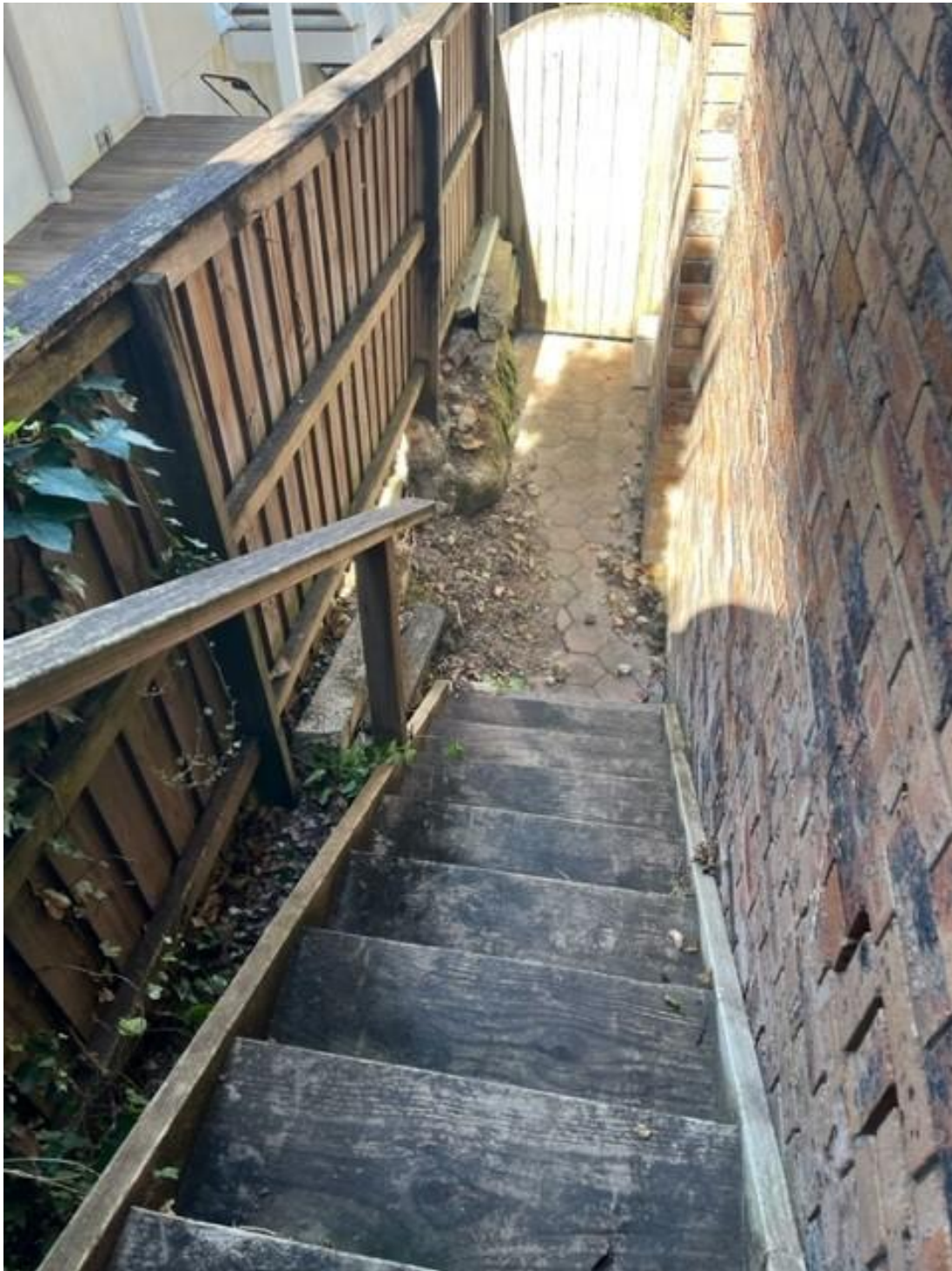


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APPENDIX "A" – Observations



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Satellite View Courtesy of Google Maps



Street View Courtesy of Google Maps

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