

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

Development Application for Jurgen Spangl & Karin Mundsperger

Name of Applicant

Address of site 7 Bower Street, Manly NSW 2095

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

I, RAHSEN WITT on behalf of WITT CONSULTING
(Insert Name) (Trading or Company Name)

on this the 25 JUNE 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 \$10million.

I: RAHSEN WITT
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 provided the coastal process and coastal forces analysis for inclusion in the Geotechnical Report.~~

Geotechnical Report Details:

Report Title: GEOTECHNICAL INVESTIGATION, 7 BOWER ST MANLY NSW, 2005
REF WITC-PlusC-R-C
Report Date: 19 NOVEMBER 2019
Author: RAHSEN WITT
Author's Company/Organisation: WITT CONSULTING.

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

- MANLY LANDSLIDE RISK MAP (ACCESSED VIA NORTHERN BEACHES PLANNING PORTAL.
- ARCHITECTURAL PLANS '19-030 SD DRAWING SET REV (B)'

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 [Signature]

Name RAHSEN WITT

Chartered Professional Status CPEng

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Geotechnical Investigation
7 Bower Street, Manly NSW 2095

Report Number: WittC-CplusC-R-C

Prepared for:
Jurgen Spangl & Karin Mundspurger

19 November 2019

Prepared by:
Rahsn Witt

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1 Introduction

Witt Consulting have prepared this geotechnical report for the property located at 7 Bower Street, Manly NSW 2095. The geotechnical site investigation and geotechnical report were undertaken by Witt Consulting on behalf of Jurgen Spangl and Karin Mundspurger.

The objective of the desktop geotechnical report was to assess the likely subsurface geotechnical conditions at the site, and to describe the anticipated geotechnical conditions at the site. The anticipated geotechnical conditions are based on publicly available information. The purpose of this geotechnical investigation is to assist in providing preliminary geotechnical advice regarding foundation design and excavations works at the site.

We have conducted our desktop geotechnical site investigation in general accordance with AS1726(1993) *Geotechnical Site Investigations*.

2 Scope of Works

Our scope of works for the geotechnical investigation at 7 Bower Street, Manly included the following:

- A review of published geological and soil landscape mapping.
- Review of acid sulphate soils mapping sheets.
- Site inspection carried out by a geotechnical engineer to:
 - Provide a description of the anticipated geotechnical conditions at the site,
 - Determine the nature and strength of the bedrock,
 - Explore suitability of excavated rock faces for water retention for pools and ponds
 - Determine the feasibility of using existing stone for construction, and
 - Identify potential limitations in terms of longevity and assembly types.
- General recommendations for construction including:
 - Building foundations,
 - Bearing pressures,
 - Excavation methods,
 - Temporary and permanent excavation support, and
 - Vibration control during rock excavation.

3 Site Identification

Table 1 below summarises the identification, location and setting of the site.

Item	Details
Street Address	7 Bower Street, Manly 2095
Legal Property Description	Lot 40 DP8075
Approximate Site Size	696.8 m ²
Approximate Geographic Co-ordinates	33°48'7.344"S 151°17'56.292"E
Local Government Area	Northern Beaches Council
Land Use Zoning	Environmental Management – E3
Current Land Use	Residential

Table 1 – Site Identification, Location and Setting.

The site location is presented in **Appendix A**.

4 Site Description

The site is located mid slope to the South East of Shelley Beach. A survey of the site from C.M.S Surveyors, conducted on 06 September 2019, is presented in **Appendix B**. From the survey, the ground level at the site is located between RL 29 m and RL 36 m. The ground surface at the site generally slopes down to the North West at a gradient of approximately 8.8 degrees.

A large sandstone outcrop was observed along the coastline of Shelley Beach approximately 200 m from the site. Similarly, sandstone was also observed on both sides of the road spanning from 3 to 39 Bower Street as presented in **Appendix C**.

The ground surface at the site is predominantly covered by topsoil and organic material. Sandstone was observed to outcrop throughout the backyard as can be seen in **Appendix D**.

5 Soil Landscape

The NSW Environment & Heritage eSPADE web application identifies the soil landscape at the site as Lambert (9130la). Lambert soil landscape is characterised as;

Landscape – *undulating to rolling rises and low hills on Hawkesbury Sandstone. Local relief 20-120 m, slopes 20%. Rock outcrop >50%. Broad ridges, gently to moderately inclined slopes, wide rock benches with low broken scarps, small hanging valleys and areas of poor drainage. Open and closed heathland, scrub and occasional low eucalypt open woodland.*

Soils – *shallow (<50cm) discontinuous Earthy Sands (Uc5.11, Uc5.22) and Yellow Earths (Gn2.2) on crests and insides of benches; Shallow (<20cm) Siliceous Sands/Lithosols (Uc1.2) on leading edges; Shallow to moderately deep (<150cm) Leached Sands (Uc.2.21), Grey Earths (Gn2.81) and Gleyed Podzolic Soils (Dg4.21) in poorly drained areas; Localised Yellow Podzolic Soils (Dy4.1, Dy5.2) associated with shale lenses*

Limitations – *very high soil erosion hazard, rock outcrop, seasonally perched water tables, shallow, highly permeable soil, very low soil fertility.*

An excerpt of the eSPADE web application showing the location of the site with the associated soil landscape is presented in **Appendix E**.

6 Geology

The Sydney 1:100,000 Geological Series Sheet 9130 indicates that the site is underlain by Hawkesbury Sandstone with lithology reference Rh.

An excerpt of the Sydney 1:100,000 Geological Series Sheet with the location of the site is presented in **Appendix F**.

The eSPADE report for 9130la Lambert soil landscape describes the lithology of Hawkesbury Sandstone as ‘*Medium to coarse-grained quartz sandstone, very minor shale and laminite lenses*’.

7 Acid Sulfate Soils

A review of the Manly Local Environmental Plan 2013 Acid Sulfate Soils maps indicate that the site is not located in a zone where acid sulphate soils or potential acid sulphate soils are likely to be present. It is our opinion that no further investigation works regarding acid sulfate soils are required at the site.

An excerpt of the Manly Local Environmental Plan 2013 Acid Sulfate Soils map with the location of the site is presented in **Appendix G**.

8 Hydrogeology

A review of the WaterNSW Groundwater data base indicated that there are no groundwater wells located within 500 m of the site.

9 Anticipated Geotechnical Profile

Table 2 below summarises the anticipated geotechnical profile likely to be encountered at the site.

Anticipated Geotechnical Unit	Common Description
Topsoil	Sands with organic material
Residual Soil	Clayey sand grading onto extremely weathered sandstone
Bedrock	Hawkesbury Sandstone Bedrock. Likely to increase in strength and decrease in weathering with depth.

Table 2 – Summary of Anticipated Geotechnical Units.

10 Rock Strength

On the basis of our field observations, it is our opinion that the bedrock Unconfined Compressive Strength (UCS) will be in the order of 10 to 20 MPa. This should be confirmed by way of testing 100 mm core samples from the proposed foundation depth around the site.

11 Water Retention Suitability

The permeability of Hawkesbury Sandstone is generally in the range of 10^{-3} mm/s to 10^{-6} mm/s. This is comparable to the permeability of average permeability concrete 10^{-3} mm/s to high impermeability concrete 10^{-7} mm/s. It is our opinion that the sandstone mass is appropriate to retain water for pools and ponds. Any leakage of water is likely to be controlled by flow through joints and cracks in the rock. It is our opinion that the flow on joints and cracks can be appropriately controlled.

12 Reuse of Excavated Sandstone in Construction

It is our opinion that the excavation will generate sandstone that is likely to be structurally adequate to be reused for cladding of the structure or landscaping if desired.

13 Geotechnical Hazard Assessment

The Manly Local Environmental Plan 2013 – Landslide Risk mapping indicates that the site is located in an area that is not prone to landslip, as seen in **Appendix G**.

14 Design Life

It is our opinion that maintenance of the pool will be required due to natural geological processes of stress relief within the rock mass near a valley / headland. The frequency of the maintenance is difficult to predict but is estimated to be in the order of 10 yearly cycles.

15 Site Classification

In accordance with AS2870(2011) – Residential Slabs and Footings Clause 2.1.3(d), the site classification for the proposed footing design is 'Class A'. The aforementioned site class is classified as *'Most sand and rock sites with little or no ground movement from moisture changes'*.

16 Foundations

We anticipate that sandstone would be encountered during bulk excavation works. The depth to sandstone is anticipated to be shallow.

We recommend that all foundations are constructed on sandstone. We anticipate that pad or strip footings can be utilised for this project. We recommend that the allowable bearing pressure for all foundations is limited to 1 MPa. The foundation material should be inspected by a geotechnical engineer.

17 Excavation

17.1 General Excavation

We anticipate that excavation works could be undertaken using conventional excavation equipment, rock saws and rock hammering if to be required.

17.2 Cut Batters

Table 4 summarises the allowable temporary cut grades for the anticipated geotechnical units.

Anticipated Geotechnical Units	Allowable Temporary Cut Grades
Residual Soil	2H : 1V
Class IV Sandstone or better	Vertical

Table 4 – Allowable Temporary Cut Grades

We recommend that all temporary excavations deeper than 1.5 m and/or adjacent to existing structures are inspected by a geotechnical engineer to determine if excavation support is required.

Any excavation steeper than the allowable cut grades shown in Table 4 will require excavation support (shoring, propping, anchoring etc).

17.3 Excavation Support

All excavation supports are to be designed by a geotechnical engineer. Surcharge pressures from existing buildings, construction equipment, or proposed structures as well as earth pressures should be considered in the support design.

18 Vibration Control

We recommend that measures are put in place to prevent vibrations damaging adjacent structures during excavation. We recommend that the following Peak Particle Velocity (PPV) limits at adjacent structures are adopted during construction;

- 2 mm/s adjacent to heritage or sensitive structures,
- 10 mm/s adjacent to other structures.

Rock hammer size should be limited to 500 kg for excavation within 4 m of neighbouring structures, after Hackney, G.A. (2002), Excavation Induced Vibrations in Sydney Sandstone. Proceedings of the 5th ANZ Young Geotechnical Professionals Conference, March 2002, Rotorua, New Zealand, New Zealand Geotechnical Society, p 117-122.

19 Design and Construction Monitoring

The following design and construction monitoring regime is to be followed:

1. Geotechnical engineer to review and approve the structural design drawings for compliance with the recommendations made in this report.
2. Geotechnical engineer to inspect all footings to confirm compliance with the design assumptions and verify bearing capacities.
3. Geotechnical engineer to inspect completed works to ensure no new geotechnical hazards have been created by site works and that all required stabilisation measures are in place.

The client and builder should be familiar with the requirements set out in this report for inspections during the construction phase. Witt Consulting cannot provide certification if we have not undertaken the required inspections.

20 Limitations

The recommendations presented in this report include specific issues to be addressed during the construction phase of this project. In the event that any of the construction phase recommendations presented in the report are not implemented, the general recommendations may become inapplicable and Witt Consulting accept no responsibility for the performance of the structure where recommendations are not implemented in full, inspected and documented.

Subsurface conditions at the site may vary from those anticipated. If differences from those interpreted from this report exist, we recommend that immediate geotechnical advice is sought.

This report provides advice on the geotechnical aspects for the proposed civil and structural design. As part of this documentation stage of this project, Contract Documents and Specifications may be prepared based on our report. However, there may be design features we are not aware of or have not commented on for a variety of reasons. The designers should satisfy themselves that all the necessary advice has been obtained. If required, we could be commissioned to review the geotechnical aspects of the contract documents to confirm the intent of our recommendations has been correctly implemented.

This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other use. If there are any changes to the proposed development described in this report then the recommendations in this report must be reviewed.

Appendix A. Site Location

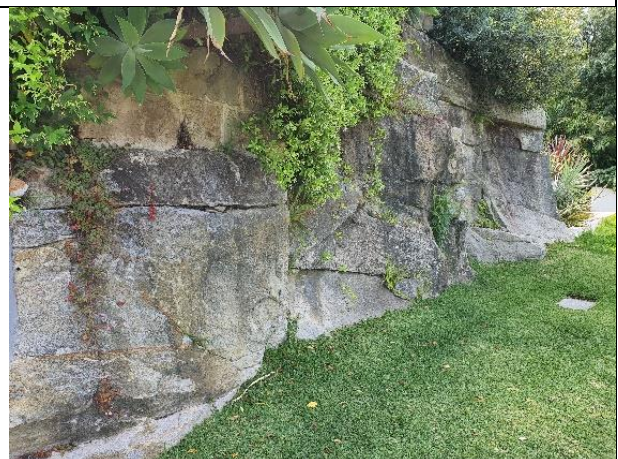


Excerpt of Google Maps satellite view with site location

Appendix C. Bower Street Site Inspection Photos



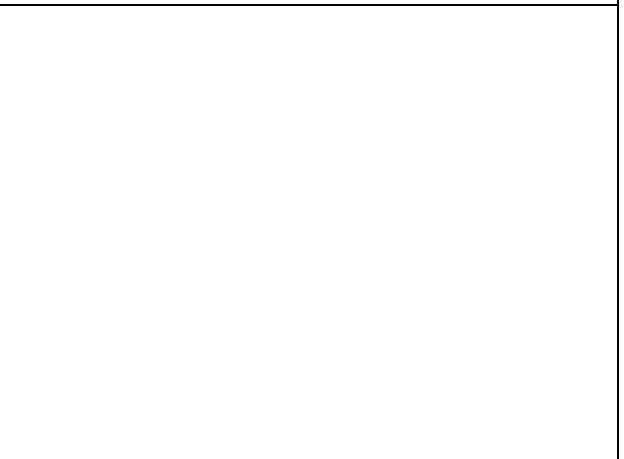




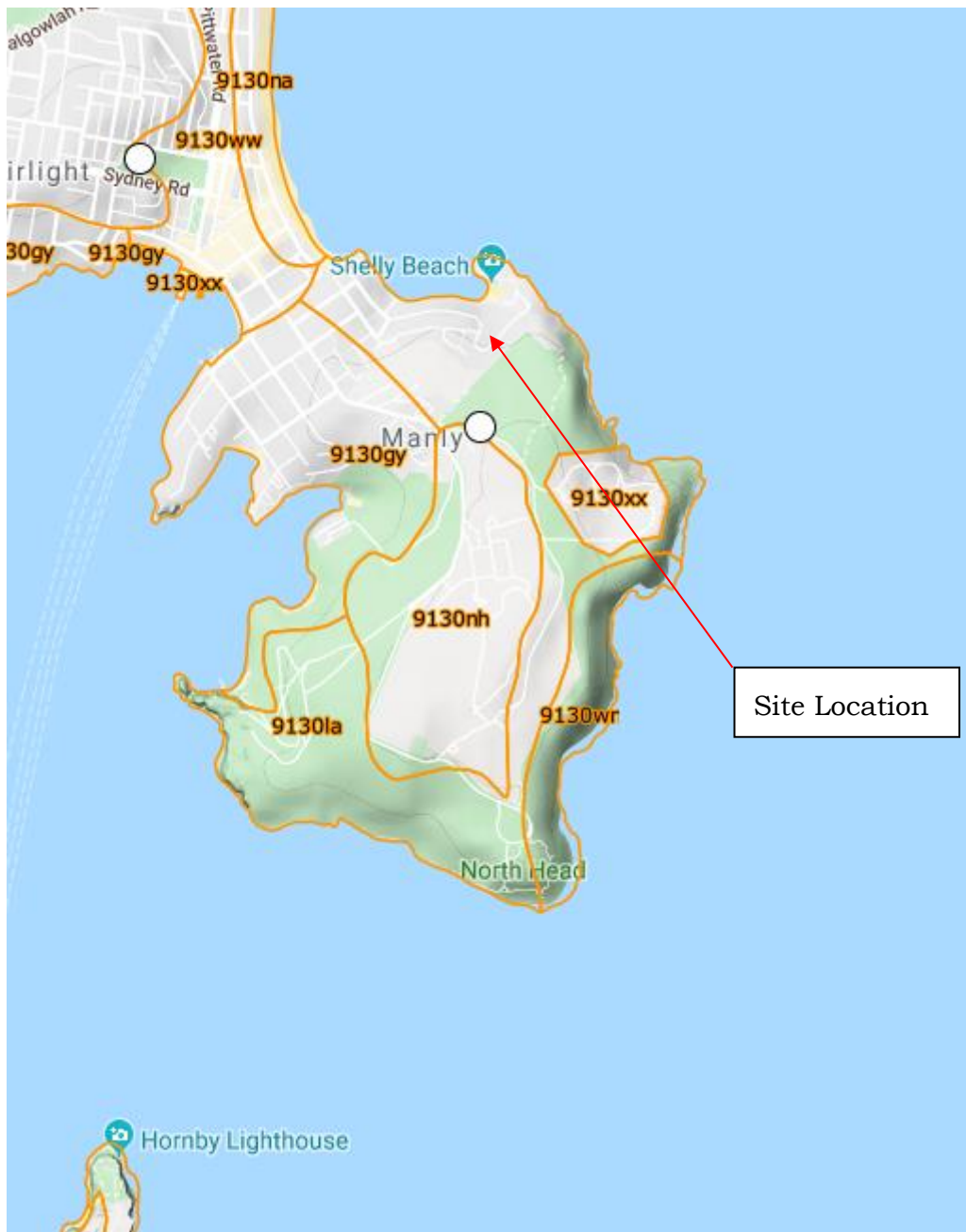




Appendix D. 7 Bower Street Backyard Site Inspection Photos



Appendix E. Soil Landscape

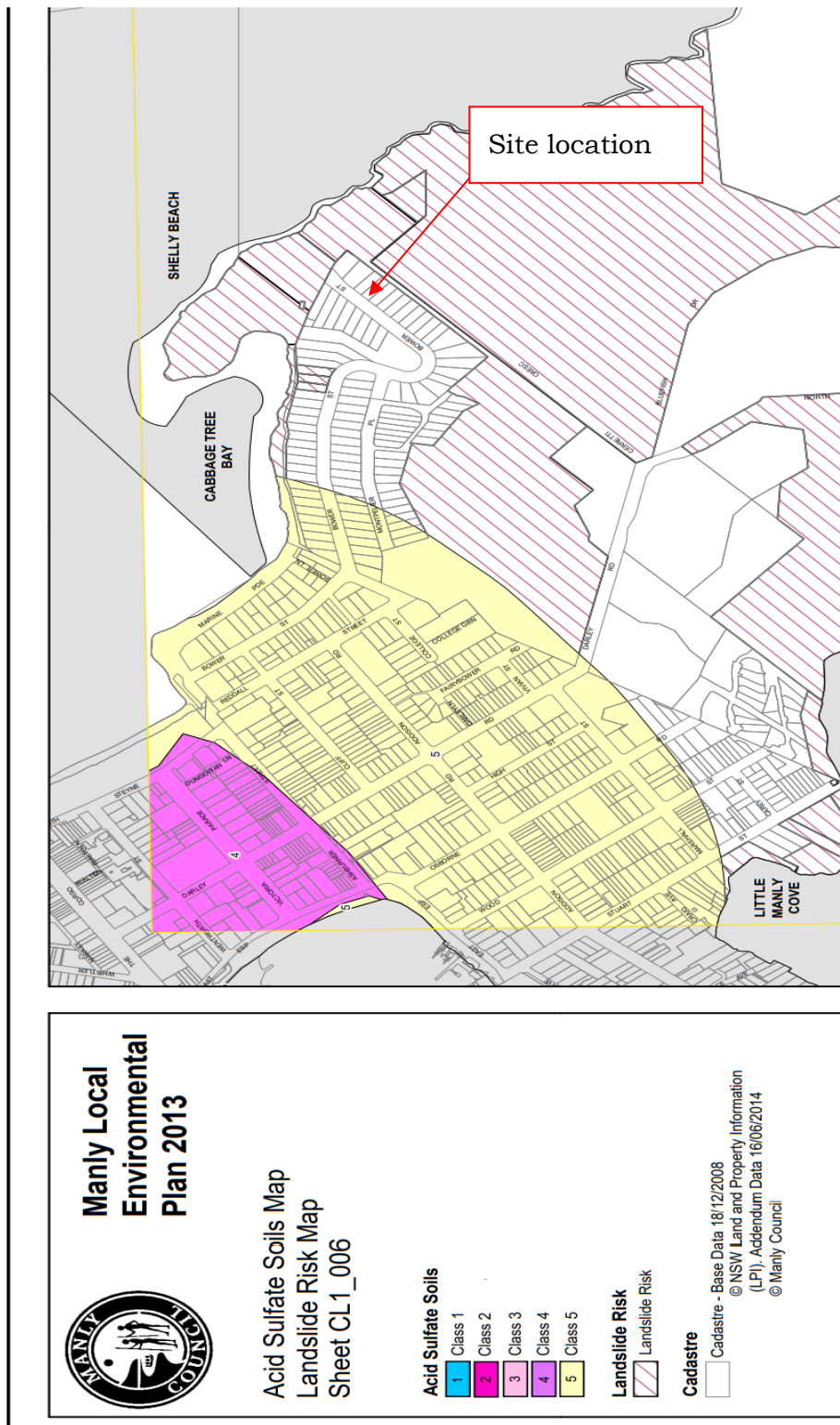


Excerpt of eSPADE web application with site location

Map of Manly, NSW, Australia, showing the site location. The map includes labels for Manly Beach, North Steyne Beach, Fairlight, North Manly, North Head, and Middle Head. A red arrow points to a location on the eastern shore of Manly, labeled 'Site location'.

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Appendix G. Landslide Risk & Acid Sulfate Soils Risk Map



Manly Local Environmental Plan 2013 Acid Sulfate Soils and Landslide Risk Map