

PRELIMINARY GEOTECHNICAL ASSESSMENT: **14 Ocean Road, Manly**

1.0 Proposed Development

- 1.1** Construct a new carport in the NE corner of the property by excavating to a maximum depth of ~1.7m.
- 1.2** Demolish the existing parking area on the S side of the proposed carport and landscape a lawn area requiring minor levelling and minor filling.
- 1.3** Minor internal and external alterations to the existing house.
- 1.4** No significant fills are shown on the plans.
- 1.5** Details of the proposed development are shown on 6 drawings prepared by Beecraft, drawing number 02-23-OCE, sheets numbered 1 to 6, Issue DA, dated February, 2023.

2.0 Site Location

- 2.1** The site was inspected on the 18th April, 2023.
- 2.2** This residential property is on the low side of the road and has a SE aspect. The block runs longways to the E so the slope is a cross-fall. It is located on the moderately graded upper middle reaches of a hillslope. Medium Strength Hawkesbury Sandstone bedrock outcrops on uphill and downhill sides of the house. Where sandstone is not exposed, it is expected to underlie the surface at relatively shallow depths. The natural surface of the block has been altered with a cut for the house and filling for paved and garden areas across the property. The proposed new carport will require an excavation to a maximum depth of ~1.7m.

2.3 The site shows no indications of historical movement in the natural surface that could have occurred since the property was developed. We are aware of no history of instability on the property.

3.0 Site Description

The natural slope falls across the property at an average angle of $\sim 10^\circ$. A stable low rendered masonry retaining wall supports a cut for a paved area on the uphill side of the house. A stable brick retaining wall up to $\sim 1.5\text{m}$ high along the N common boundary supports fill on the N neighbouring property. The two storey brick house is supported by brick walls. The external supporting walls show no significant signs of movement. A suspended balcony and level paved area extends off the downhill side of the house. The steel posts that support the balcony stand vertical. A concrete block retaining wall up to $\sim 2.0\text{m}$ high provides a level platform for the paved area. The E and S sides of the wall display vertical cracks (Photos 1 & 2). See 'Section 4.0 Recommendations'. Competent Medium Strength Hawkesbury Sandstone bedrock outcrops in the NE corner of the property and steps down $\sim 2.5\text{m}$ on the S neighbouring property near the S common boundary. The area surrounding the house is mostly paved with some garden areas. No signs of movement associated with slope instability were observed on the grounds. No cliffs or large rock faces were observed on the property or in the near vicinity. The adjoining neighbouring properties were observed to be in good order as seen from the road and the subject property.

4.0 Recommendations

The proposed development and site conditions were considered and applied to the Council Flow Chart.

The cracked concrete block retaining wall (Photos 1 & 2) is to be monitored by the owners on an annual basis or after heavy and prolonged rainfall events, whichever occurs first. A photographic record of these inspections is to be kept. Should further movement occur the

wall is to be remediated so it meets current engineering standards. We can carry out these inspections upon request.

Given the exposed sandstone bedrock at the location of the proposed carport, the proposed excavation will encounter this ground material. As the excavation comes close to flush with the N neighbouring garage, the following advice is to be followed.

5.0 Excavations

An excavation to a maximum depth of ~1.7m is required to construct the proposed carport. The excavation is expected to be through fill, topsoil and Medium Strength Sandstone.

It is envisaged that excavations through fill and soil can be carried out with an excavator and toothed bucket and excavations through Medium Strength Sandstone or better will require grinding or rock sawing and breaking.

6.0 Vibrations

Dilapidation reporting carried out on the N neighbouring property is recommended prior to the excavation works commencing to minimise the potential for spurious building damage claims.

Excavation methods are to be used that limit peak particle velocity to 5mm/sec at the N neighbouring garage. Vibration monitoring will be required to verify this is achieved. Vibration monitoring must include a light/alarm so the operator knows if vibration limits have been exceeded. The equipment is to log and record vibrations throughout the excavation works.

In Medium Strength rock or better techniques to minimise vibration transmission will be required. These include:

- Rock sawing the excavation perimeter to at least 1.0m deep prior to any rock breaking with hammers, keeping the saw cuts below the rock to be broken throughout the excavation process.

- Limiting rock hammer size.
- Rock hammering in short bursts so vibrations do not amplify.
- Rock breaking with the hammer angled away from the nearby sensitive structures.
- Creating additional saw breaks in the rock where vibration limits are exceeded, as well as reducing hammer size as necessary.
- Use of rock grinders (milling head).

Should excavation induced vibrations exceed vibration limits after the recommendations above have been implemented, excavation works are to cease immediately and our office is to be contacted.

It is worth noting that vibrations that are below thresholds for building damage may be felt by the occupants of the subject house and neighbouring houses.

7.0 Excavation Support Requirements

The proposed carport excavation comes close to flush with the N neighbouring garage. Given the exposed bedrock in the NE corner of the property, the neighbouring garage is envisaged to be supported on rock. If, during the excavation works, this is not the case, works are to stop and our office is to be contacted for further advice.

Medium Strength Sandstone or better is expected to stand at vertical angles unsupported subject to approval by the geotechnical consultant.

During the excavation process, the geotechnical consultant is to inspect the excavation as it approaches not less than 0.8m horizontally from the foundations of the N neighbouring garage to confirm the stability of the cut to go close to flush with the footings.

During the excavation process, the geotechnical consultant is to inspect the excavation in 1.5m intervals as it is lowered to ensure ground materials are as expected and no wedges or other geological defects are present that could require additional support. If additional

ground support is required this will likely involve the use of mesh, rock bolts and sprayed concrete.

8.0 Foundations

The proposed carport is expected to be seated in Medium Strength Sandstone on the uphill side. This is a suitable foundation material. On the downhill side where the rock drops away with the slope, spread footings or shallow piers taken to rock will be required to maintain a uniform foundation material across the structure. A maximum allowable bearing pressure of 1000kPa can be assumed for footings on Medium Strength Sandstone.

9.0 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 owners or the regulating authorities if the following inspections have not been carried out during the construction process.

- The geotechnical consultant is to inspect the excavation as it approaches no less than 0.8m horizontally from the foundations of the N neighbouring garage to confirm the stability of the cut to go close to flush with the footings.
- During the excavation process, the geotechnical consultant is to inspect the excavation in 1.5m intervals as it is lowered to ensure ground materials are as expected and no wedges or other geological defects are present that could require additional support.
- All footings are to be inspected and approved by the geotechnical consultant while the excavation equipment and contractors are still onsite and before steel reinforcing is placed or concrete is poured.

White Geotechnical Group Pty Ltd.

Reviewed By:



Dion Sheldon
BEng(Civil)(Hons),
Geotechnical Engineer.



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

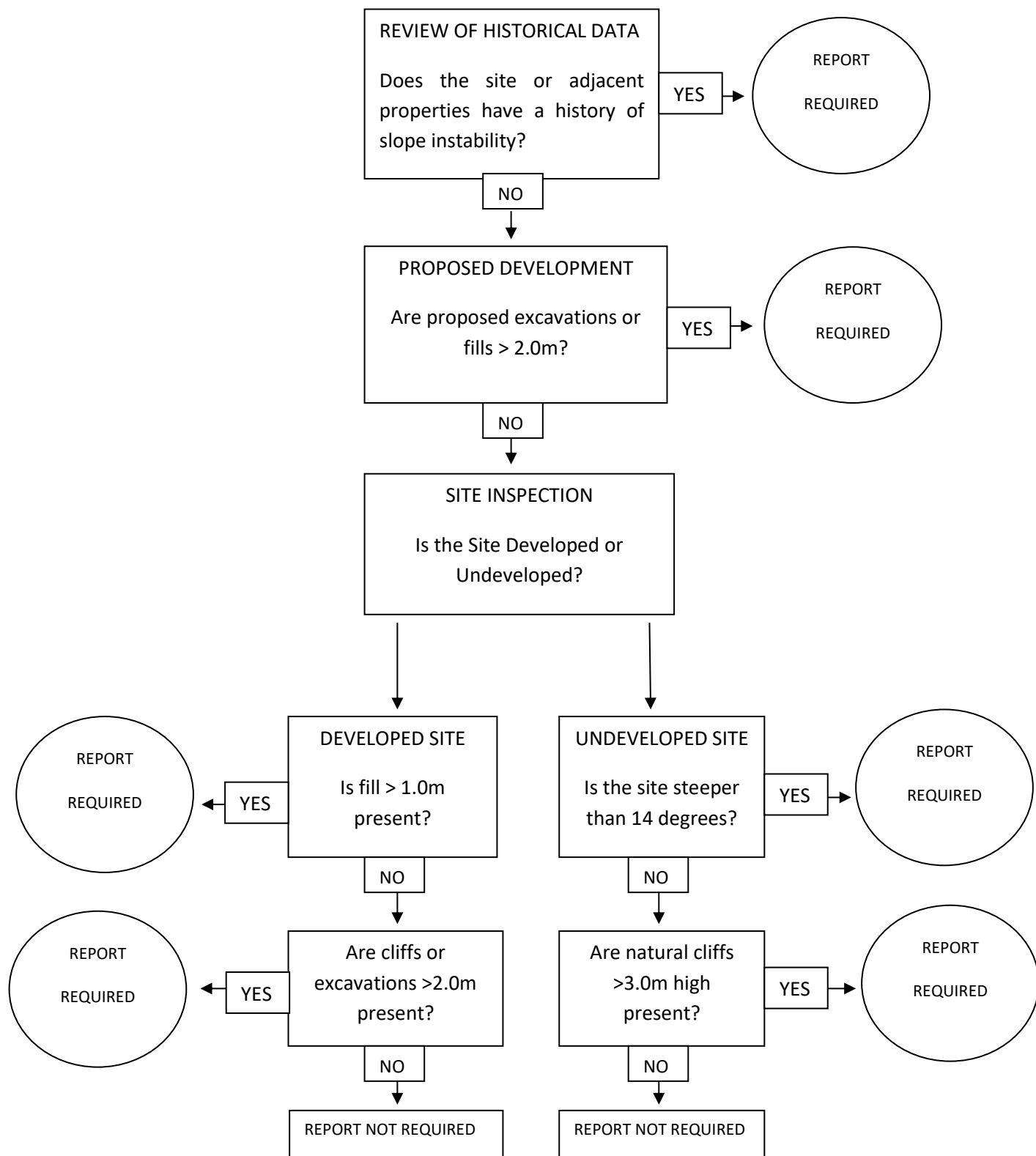


Photo 1



Photo 2

Preliminary Assessment Flow Chart – Northern Beaches Council (Manly)



Information about your Preliminary Assessment

This Preliminary Assessment relies on visual observations of the surface features observed during the site inspection. Where reference is made to subsurface features (e.g. the depth to rock) these are interpretations based on the surface features present and previous experience in the area. No ground testing was conducted as part of this assessment and it is possible subsurface conditions will vary from those interpreted in the assessment.

In some cases, we will recommend no further geotechnical assessment is necessary despite the presence of existing fill or a rock face on the property that exceed the heights that would normally trigger a full geotechnical report, according to the Preliminary Assessment Flow Chart. Where this is the case, if it is an existing fill, it is either supported by a retaining wall that we consider stable, or is battered at a stable angle and situated in a suitable position on the slope. If it is a rock face that exceeds the flow chart limit height, the face has been deemed to be competent rock that is considered stable. These judgements are backed by the inspection of over 5000 properties on Geotechnical related matters.

The proposed excavation heights referred to in section 2.0 of this assessment are estimated by review of the plans we have been given for the job. Although we make every reasonable effort to provide accurate information excavation heights should be checked by the owner or person lodging the DA. If the excavation heights referred to in in section 2.0 of this assessment are incorrect we are to be informed immediately and before this assessment is lodged with the DA.
