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PRELIMINARY GEOTECHNICAL ASSESSMENT: 14 Lady Davidson Circuit, Forestville

1.0	LANDSLIP RISK CLASS (Highlight indicates Landslip Risk Class of property)
	A - Geotechnical Report not normally required
	B - Geotechnical Engineer (Under Council Guidelines) to decide if Geotechnical Report is required
	C - Geotechnical Report is required
	D - Geotechnical Engineer (Under Council Guidelines) to decide if Geotechnical Report is required
	E - Geotechnical Report required

2.0 Proposed Development

- 2.1 Install a new above ground pool on the N side of the house by filling to a maximum depth of ~1.7m.
- **2.2** Construct new decks on the NE and SW sides of the house.
- **2.2** No significant excavations are shown on the plans.
- 2.3 Details of the proposed development are shown on 3 drawings prepared by Rich Carr Architects, drawings numbered CDC 1051, CDC 1101 and CDC 1301, Issue P2, dated 14/12/21.

3.0 Site Location

3.1 The site was inspected on the 1st February, 2022.

3.2 This residential property is on the low side of the road and has a SW aspect. It is located on the moderately graded upper reaches of a hillslope. Medium Strength Hawkesbury Sandstone bedrock outcrops beside the house and in the foundation space 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



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with a cut for a paved area and filling for paved, lawn and garden areas across the property. The proposed development will require filling to a maximum depth of ~1.7m for the proposed pool.

3.3 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.

4.0 Site Description

The natural slope falls across the property at an average angle of ~17°. At the road frontage, a shared gravel driveway runs to a gravel parking area. A stable brick retaining wall up to ~2.5m high along the uphill property boundary supports fill on the uphill neighbouring property. A gently sloping lawn and level paved area are located on the uphill side of the house. The part two storey brick and timber clad house with storage area below is supported by brick walls, steel posts and steel acrow props. The external supporting walls show no significant signs of movement. The supporting posts and acrow props stand vertical. Medium Strength Hawkesbury Sandstone bedrock outcrops beside the house and in the foundation space of the house. The rock on the SW side of the house is undercut by up to ~2.0m. The undercut rock is supported by a brick pier which stands vertical.

A low brick retaining wall supports a cut for a paved area on the NE side of the house. Fill terraces the slope downhill of the cut. The fills are supported by low mortared sandstone and stack rock retaining walls. A moderately sloping lawn and vegetated area are located on the downhill side of the house. The area surrounding the house is mostly lawn/garden covered with some paved areas. No signs of movement associated with slope instability were observed on the grounds that could have occurred since the property was developed. The adjoining neighbouring properties were observed to be in good order as seen from the road and the subject property.



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5.0 Subsurface Investigation

Two Dynamic Cone Penetrometer (DCP) tests were put down to determine the relative density of the overlying soil and the depth to weathered rock at the location of the proposed pool. It should be noted that a level of caution should be applied when interpreting DCP test results. The test will not pass through hard buried objects so in some instances it can be difficult to determine whether refusal has occurred on an obstruction in the profile or on the natural rock surface. This is not expected to have been an issue for this site. But due to the possibility that the actual ground conditions vary from our interpretation there should be allowances in the excavation and foundation budget to account for this. The results are as follows:

DCP TEST RESULTS – Dynamic Cone Penetrometer			
Equipment: 9kg hamme	r, 510mm drop, conical tip.	Standard: AS1289.6.3.2 - 1997	
Depth(m)	DCP 1	DCP 2	
Blows/0.3m	(~RL77.3)	(~RL75.6)	
0.0 to 0.3	4	5	
0.3 to 0.6	8	25	
0.6 to 0.9	2	11	
0.9 to 1.2	15	#	
1.2 to 1.5	15		
1.5 to 1.8	13		
1.8 to 2.1	#		
	Refusal on rock @1.6m	Refusal on rock @0.9m	

#refusal/end of test. F=DCP fell after being struck showing little resistance through all or part of the interval.

DCP Notes:

DCP1 – Refusal on rock @ 1.6m, DCP bouncing off rock surface, dark grey/brown sand on wet tip.

DCP2 – Refusal on rock @ 0.9m, DCP bouncing off rock surface, muddy wet tip.



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6.0 Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed above or beside the property. The moderate slope that falls across the property and continues below is a potential hazard (**Hazard One**).

Geotechnical Hazards and Risk Analysis - Risk Analysis Summary

HAZARDS	Hazard One
ТҮРЕ	The moderate slope that falls across the property and continues below failing and impacting on the property.
LIKELIHOOD	'Unlikely' (10 ⁻⁴)
CONSEQUENCES TO PROPERTY	'Medium' (12%)
RISK TO PROPERTY	'Low' (2 x 10⁻⁵)
RISK TO LIFE	8.3 x 10 ⁻⁷ /annum
COMMENTS	This level of risk is 'ACCEPTABLE'.

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

7.0 Foundations

The concrete slab at the base of the proposed pool is to be supported on piers taken to Medium Strength Sandstone. This ground material is expected at depths from between ~0.9m to ~2.0m below the current surface, being deeper in the filled area above the existing retaining wall. The fill shown on the architectural plans is to be used as formwork only. No structures are to be supported on fill.

Naturally occurring vertical cracks (known as joints) commonly occur in sandstone. These are generally filled with soil and are the natural seepage paths through the rock. They can extend to depths of several metres and are usually relatively narrow but can range between 0.1 to 0.8m wide. If a footing falls over a joint in the rock, the construction process is simplified if with the approval of the structural engineer the joint can be spanned or alternatively the footing can be repositioned so it does not fall over the joint.

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NOTE: If the contractor is unsure of the footing material required it is more cost effective to get the geotechnical consultant on site at the start of the footing excavation to advise on footing depth and material. This mostly prevents unnecessary over excavation in clay like shaly rock but can be valuable in all types of geology.

8.0 Inspection

The following inspection is recommended and if geotechnical certification is desired/required it is mandatory.

 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.

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Fulit

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Preliminary Assessment Flow Chart – Northern Beaches Council (Warringah)





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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.