

Our Ref: PSM4690-003L

7 February 2022

Greg Holman
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Terrey Hills 2084
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Attention: Greg Holman

Dear Greg

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RE: 161 KANANGRA AVENUE, TERREY HILLS - PRELIMINARY ASSESSEMENT OF SITE CONDITIONS

1. Introduction

This letter presents the results of the geotechnical investigation undertaken at 161 Kanangra Avenue, Terrey Hills, for the preliminary assessment of site conditions for inclusion in the Development Application (DA) for the Site. The work was undertaken following your email acceptance of our fee proposal (PSM4690-001L) on 25 January 2022.

To assist in the preparation of this letter, we were provided with the following documents:

- Site survey plan by Rygate Surveyors (ref. 79017), dated 22 July 2019.

In undertaking this geotechnical assessment, we understand the following:

- The preliminary assessment of site conditions is to be prepared in accordance with the Northern Beaches Council DA requirements, specifically, the Warringah Development Control Plan, Section E10, for Landslip Risk
- The site is classified as "Area B" based on the Warringah LEP2011 – Landslip Risk Map, which requires a preliminary assessment of site conditions to determine whether a detailed geotechnical report is required
- The proposed works include a like for like replacement of the existing deck.

Other details of the proposed re-development (e.g., proposed loads) are currently not known by PSM.

2. Scope of Works

The following scope of works has been undertaken for this assessment:

- Review of site survey and development proposal
- Site inspection and Dynamic Cone Penetrometer (DCP) testing to confirm:
 - Location and extent of any sandstone rock exposures within the development footprint.
 - Depth of fill within development footprint.
 - Presence of surface and groundwater seepage.

- Letter report in PDF format outlining the preliminary geotechnical assessment for inclusion in the DA submission.

PSM note that the scope is of this assessment limited to geotechnical stability only and does not include structural engineering considerations associated with the proposed deck replacement.

3. Proposed Development

The proposed redevelopment involves demolishing the existing timber deck on the north-east side of the 2-storey rendered residence dwelling at 161 Kanangra Avenue, Terrey Hills and replacing it with a deck of similar size and profile.

We note that the existing timber deck is attached to the dwelling on one side and supported by eleven (11) steel columns on the other. The details of these columns (dimensions, capacity, etc.) are not known by PSM.

4. Site Description

A site inspection was undertaken on 1 February 2021 by a PSM geotechnical engineer. Select photos of the site and locations of the DCP tests are presented on Figure 1, that utilises the Rygate Surveyors plan. The following describes the site:

- The Site is located at the base of Kanangra Avenue, within the Northern Beaches Council area.
- The Site gently slopes to the north, with elevations ranging between approximately RL 195.0 m along the southern boundary and RL 187.0 m along the rock shelf to the north (the extent of the survey undertaken as recorded on the survey plan)
- The Site contains a tennis court and inground swimming pool in its northern half and a dwelling ('2 storey rendered residence' on the survey plan) with attached timber deck towards the southern half
- To the south of the dwelling are stepped sandstone outcrops and grassed landings located between the site boundary and the dwelling
- To the north of the dwelling is a grassed area sloping towards the north-east at a grade of less than 5 degrees. Along the edge of the grassed area is a batter sloping toward to the north-east with an inclination ranging between 40 and 60 degrees. The batter has a vertical height between 0.5 m and 1.5 m and is comprised on its surface of sand-dominant fill material containing cobbles and boulders of sandstone and concrete, as well as discrete timber, bricks, and occasional plastics
- Beyond the batter to the north is a steeper slope of approximately 10 to 20 degrees sloping towards a rock shelf which runs approximately east-west. The rock shelf appears to be approximately 3 m to 4 m in height, stepping down towards the north
- The Sydney 1:100,000 Geological Map indicates that the site is founded on Hawkesbury Sandstone
- Sub-horizontal and stepped sandstone outcrops were observed often around the Site, including at two locations beneath the timber deck. The sandstone is characterized as follows: medium to coarse grained, orangey grey, moderately weathered, medium to high strength.
- The rock mass is classified as Class II sandstone in accordance with Pells et al (2002).
- Two of the steel columns supporting the timber deck were founded directly on outcropping sandstone
- The results of the DCP tests (discussed further below) indicate shallow rock at the locations of most of the steel columns, with up to 0.7 m of soil (as encountered at DCP07) near to the inground swimming pool.

4.1 Results of Dynamic Cone Penetration (DCP) Tests

Nine (9) DCP tests were undertaken across the grassed area to the north east of the dwelling (Figure 1) to confirm both the depth to, and corresponding subsurface profile of rock. The respective locations are described as follows:

- Four (4) tests (DCP01, 3, 5, and 7) were undertaken adjacent to various columns beneath the timber deck.
- Four (4) tests (DCP02, 4, 6, and 8) were conducted approximately 3 m offset from the same columns.
- One (1) test (DCP09) was conducted on the north-western corner of the batter crest representing the highest point of the slope, adjacent to the swimming pool.

The results of the DCP tests are summarised below in Table 1 and presented in Appendix A. The ground profile inferred from the DCP tests consisted of very loose to medium dense soil atop rock.

Table 1 – Summary of DCP test results.

TEST ID	REFUSAL DEPTH (m)
DCP01	0.05
DCP02	0.2
DCP03	0.15
DCP04	0.35
DCP05	0.15
DCP06	0.75
DCP07	0.75
DCP08	0.9
DCP09*	1.3

Notes: * The location of DCP09 is not considered applicable to the proposed redevelopment and was conducted to provide context to the overall ground model being investigated.

5. Preliminary Assessment

The proposed development has been reviewed in accordance with the preliminary assessment of site conditions requirements including the Northern Beaches Council flow chat presented in Appendix B.

We note that the following about the Site and proposed development:

- Based on site observations, the development site and adjacent property do not have a history of slope instability
- No bulk excavation or filling will be undertaken at the Site as part of the redevelopment
- Soil (inferred fill) depths at the Site are up to 1.3 m in thickness. However, this soil thickness was encountered at approximately 16 m away from the proposed development area (the timber deck). At the timber deck area, the thickness of soil is up to 0.7 m
- Sandstone cliffs / outcrops possibly up to 4 m high were observed within the Site property. However, there are located a minimum of approximately 25 m from the development area.

The results of this preliminary assessment indicate that the geotechnical conditions at the Site are suitable for the proposed development. Provided good engineering and building practices are followed, no further geotechnical assessment is recommended for the proposed development.

6. Closure

We trust that this report is in keeping with your current requirements for the development application. Please don't hesitate to contact the undersigned if you have any further queries including the development of the final design or during construction.

Yours Sincerely



GREG FAZZONE
GEOTECHNICAL ENGINEER

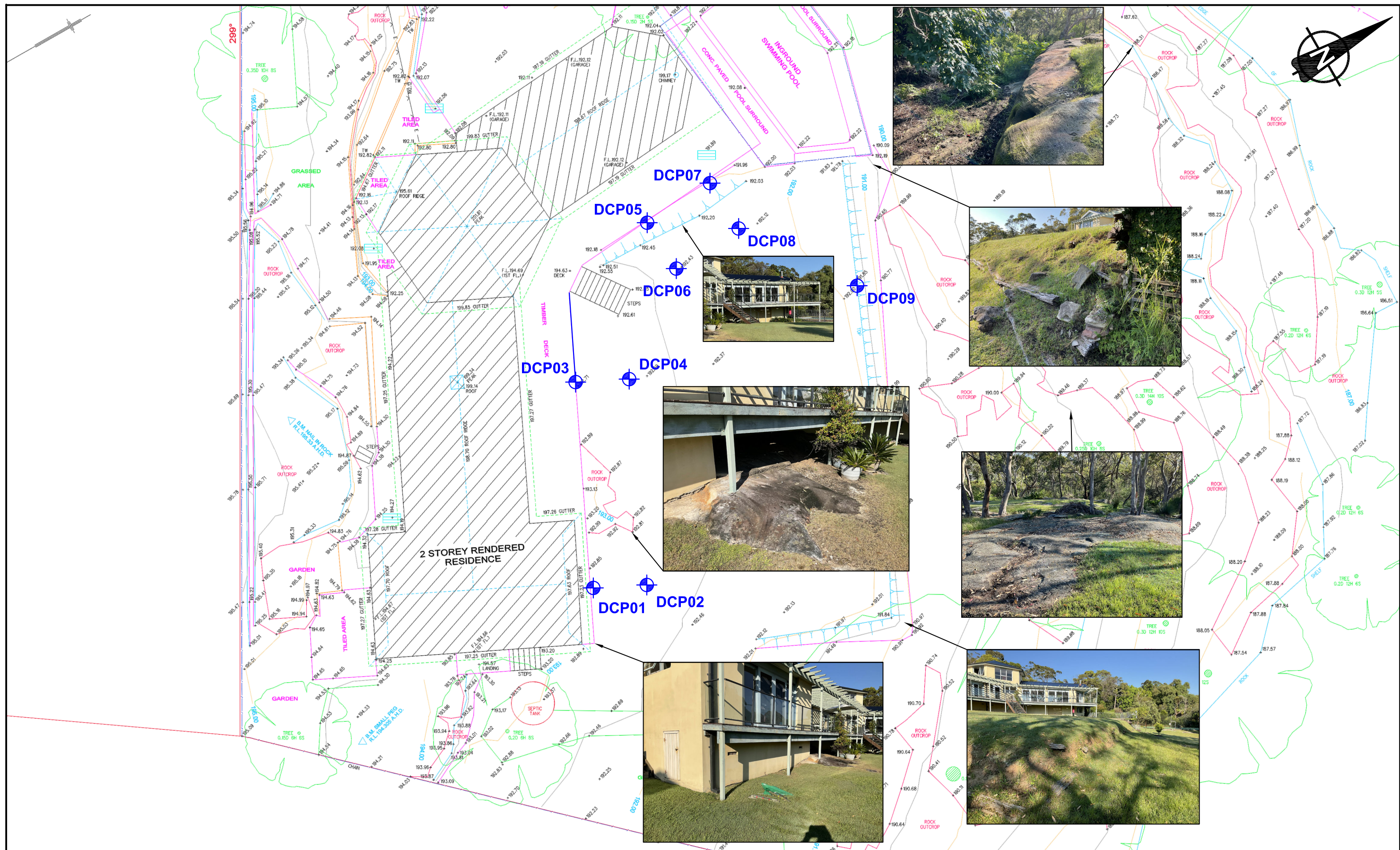


RICHARD BREHAUT
PRINCIPAL ENGINEERING GEOLOGIST



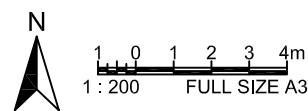
DONG WANG
ASSOCIATE (MIEAUST)

Encl.	Figure 1	Site Locality Plan
	Appendix A	Dynamic Cone Penetrometer (DCP) Test Results
	Appendix B	Northern Beaches Council – Preliminary Geotechnical Assessment Flow Chart



Legend
Dynamic Cone Penetration (DCP) Test Location

Notes:
1. Plan taken from Rygate Surveyors survey plan (ref. 79017), drawing 79017.dgn Sheet 2 of 2, dated 22 July 2019.



161 Kanangra Avenue
Terrey Hills
NSW
SITE LOCALITY PLAN

PSM4690-003L

Figure 1

Appendix A

Dynamic Cone Penetrometer (DCP) Test Results



DYNAMIC CONE PENETROMETER TEST RESULTS

Job No.	PSM4690				Sheet	1 of 2
Project	161 Kanangra Ave, Terry Hills				Date	1-Feb-22
Test Method	AS 1289.6.3.2. - 1997 <i>Methods of Testing Soils for Engineering Purposes - 9 kg Dynamic Cone Penetrometer Test</i>				Drop Height	510 mm
Tested by	GF				Hammer Mass	9 kg
					Tip Type	CONICAL
Test Depth LOCATION	DCP01	DCP02	DCP03	DCP04	DCP05	DCP06
0.10	Refusal (HB)	1	1	1	1	1
0.20	at 0.05 m	1	Refusal (HB)	0	Refusal (HB) at	0
0.30		Refusal (HB)	at 0.15 m	2	0.15 m	1
0.40				Refusal (HB)		2
0.50				at 0.35 m		10
0.60						4
0.70						3
0.80						Refusal (HB) at
0.90						0.75 m
1.00						
1.10						
1.20						
1.30						
1.40						
1.50						
1.60						
1.70						
1.80						
1.90						
2.00						
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3.10						
3.20						
3.30						
3.40						
3.50						
3.60						
3.70						
3.80						
3.90						
4.00						
Comments: HB = Hammer Bouncing						



DYNAMIC CONE PENETROMETER TEST RESULTS

Job No.	PSM4690			Sheet	2	of	2
Project	161 Kanangra Ave, Terry Hills			Date	1-Feb-22		
Test Method	AS 1289.6.3.2. - 1997 <i>Methods of Testing Soils for Engineering Purposes - 9 kg Dynamic Cone Penetrometer Test</i>				Drop Height	510 mm	
Tested by	GF				Hammer Mass	9 kg	
					Tip Type	CONICAL	
Test Depth LOCATION	DCP07	DCP08	DCP09				
0.10	1	1	1				
0.20	2	0	3				
0.30	4	1	5				
0.40	2	6	4				
0.50	2	3	1				
0.60	1	2	0				
0.70	Refusal (HB) at 0.7 m	1	1				
0.80		0	0				
0.90		Refusal (HB) at 0.9 m	4				
1.00			3				
1.10			2				
1.20			1				
1.30			Refusal (HB) at 1.3 m				
1.40							
1.50							
1.60							
1.70							
1.80							
1.90							
2.00							
2.10							
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4.00							
Comments: HB = Hammer Bouncing							

Appendix B

Preliminary Geotechnical Assessment Flow Chart – Northern Beaches Council

