

**GEOTECHNICAL SITE
CLASSIFICATION REPORT
FOR**

**1A ELVINA AVENUE
AVALON BEACH, NSW**

23 March 2022

Prepared by:



PO Box 307
Minto, NSW 2566
Phone: +61 2 8712 1487
Email: info@acconengineers.com.au
Web : www.acconengineers.com.au

Report Description

Geotechnical Site Classification Report

for

1A Elvina Ave, Avalon Beach NSW 2107

Prepared For:

Mr. Tim Parry

Prepared By:

Anil Shrestha

Civil Engineer/ Operation Manager

Accon Engineers

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1. Introduction

Accon Engineers was engaged by Tim Parry to conduct a geotechnical site investigation at 1A Elvina Avenue, Avalon Beach with the objective to determine the subsurface ground condition in order to classify under AS 2870-2011 and recommend suitable foundation types and other geotechnical constraints for proposed addition and alteration at 1A Elvina Ave, Avalon Beach NSW.

2. Site Description

The lot is legally described as Lot/ Section/ Plan no: 2/-/ DP 541280. The survey plan of the site is presented in Appendix A. During the site investigation, following observations were made by Accon Engineers.

- The site is rectangular in shape and occupies an area of about 1082 m² and generally flat topography.
- The site has lawn in the front part; single residential dwelling in the central part; lawn in the rear part. The concrete paved driveway is located at the northern part of the lot and a few trees are present at the site.

3. Site Geology

Reference to Sydney 1:100000 Geological Series Sheet 9131 by the Geological Survey of New South Wales, Department of Mineral Resources, indicates that the site is quaternary deposit (Qha), which consist of silty Clay Sand. Geological map is presented in figure 1 below.



Figure 1: Sydney 1:100000 Geological Series Sheet 9131

4. Geotechnical Investigation

4.1 Borehole Drilling

Four bore holes investigation were carried by using Hand Auger and four Dynamic Cone Penetration test (DCP) to a maximum depth of 2.0 m below the surface level, these bore holes were terminated upon very high plasticity clay. The soil encountered during field works was visually classified to 'AS 1726: Geotechnical Site Investigations'.

On completion of logging and sampling, the boreholes were backfilled with the obtained soil. The locations of boreholes are shown in Appendix B and the logs of boreholes are given in Appendix C.

4.2 In-situ Testing

Testing was carried out in accordance with Australian Standard AS 1289, 'Methods of Testing Soil for Engineering Purposes' and included:

- Dynamic Cone Penetration test (DCP)

Test results are included on the logs of the DCP test result at Appendix D.

4.3 Subsurface Conditions

The results of the investigation indicate that the subsurface profile at the test locations comprises with some fill material. Fill material; consist of Silty Sandy CLAY. Underneath of fill material, natural Silty Clayey SAND is present . Based on the information obtained from the boreholes, a geotechnical model has been developed, and is presented in Table 1

For a detailed description of the subsurface conditions encountered at the borehole locations, refer to the Engineering Logs in Appendix C.

Table 1: Summary of Subsurface Conditions and Inferred Geotechnical Model

Unit	Description	Depth	Depth	Depth	Depth
		BH01 *	BH02 *	BH03*	BH04*
Unit-A	Grey to brown Silty Sandy CLAY, poorly compacted. (Filled material)	0.0-0.8	0.0-0.5	0.0-0.5	0.0-0.5
Unit-B	Grey to brown silty Clayey SAND, loose to Medium Dense and becoming medium dense after approximately (1.2m) BGL and moist to saturated	0.8-1.5	0.5-1.5	0.5-1.0	0.5-1.3
Unit-C	Grey to brown silty Clayey SAND with traces of gravel medium dense to dense and moist	1.5-2.0	1.5-2.0	-	1.3-2.0

Notes:

*Below ground level (m)

Holes (BH01, BH02, BH04) terminated on 2m

Holes BH03 got refusal at around 1m. It is likely to encounter the old concrete.

5. Recommendation

5.1 Site Classification

In accordance with AS 2870-2011, “Residential Slabs and Footings - Construction”, this site has been classified as: CLASS S. Class S is indicative of a Slightly Reactive Site with estimated ground surface movement of 0 to 20 mm which may experience ground movement from moisture changes.

In the present condition and until the topsoil/fill is removed, the subject site presents services, trees and topsoil therefore can be classified as Class P in accordance with AS2870 2011.

Before laying foundations, all unsuitable materials (fill, topsoil, and soft clays) should be removed and, if necessary, be replaced with engineered fill in accordance with AS 3798 ‘Guidelines on earthworks for commercial and residential developments.

This classification is on the basis of the findings in this investigation, including visual-tactile identification of the soil profile combined with this writer’s local knowledge and experience, the characteristic surface movement on this site.

5.2 Wind Rating

The maximum design gust wind speed for this site is 40 m/s based on wind speed calculations (V_h) for use in ultimate limit state design only calculated in accordance with the limitations as in AS 4055. The Wind Rating for this site has been assessed as N2.

6. Important Notes Relate to This Site Classification

If a more detailed geotechnical investigation report is available for this site with regards to soil reactivity, Accon Engineers should be provided this detailed investigation report. In addition, any details relate to this site history should be supplied to this office by the client. Upon reviewing these information Accon Engineers may conduct a detailed geotechnical investigation as this report is not a detailed investigation report. This report was produced based on limited geotechnical investigation in line with the requirements of AS 2870-2011, CL2.2.2 (a).

The above site classification is based on the soil investigation conducted on 19.03.2022, if the site conditions are changed from the original investigation date Accon Engineers is not liable for any damages that may cause the client.

7. Allowable Bearing Pressures

The following allowable bearing pressures can be adopted for the soils listed in the table below. These bearing pressures apply where typically the embedment is a minimum of 300 mm into the specified material.

Table 2: Preliminary Allowable Bearing Pressures for Footings

Soil/ Rock Type	Indicative Founding Depth (mm) BGL	Minimum Allowable Bearing Capacity (kPa)
Loose to medium Dense Silty Clayey SAND	1.0	100
Medium Dense to Dense Silty Clayey SAND	2.0	200

8. Footing Design

Based on the site classification, an engineer designed foundation systems is required at this site. The foundation systems must be designed to cater for the potential movements associated with the drying effects of a tree. The designer may adopt the classification of the site soil “**Class S**”.

Deep footing systems such as bored piers, screw piles or trench blinding concrete may be considered. Foundation of deep footings system through any fill and into the undisturbed natural soil as described in Table 1.

Where screw piles are considered, additional investigation may be required to establish in-ground corrosion parameters and likely pull-up depth.

9. Additional Recommendation

All excavated materials need to be disposed of offsite in accordance with the current Office of Environment and Heritage (OEH) regulations. It should be noted that under the Protection of the Environment Operation Act (2009).

10. Construction Techniques

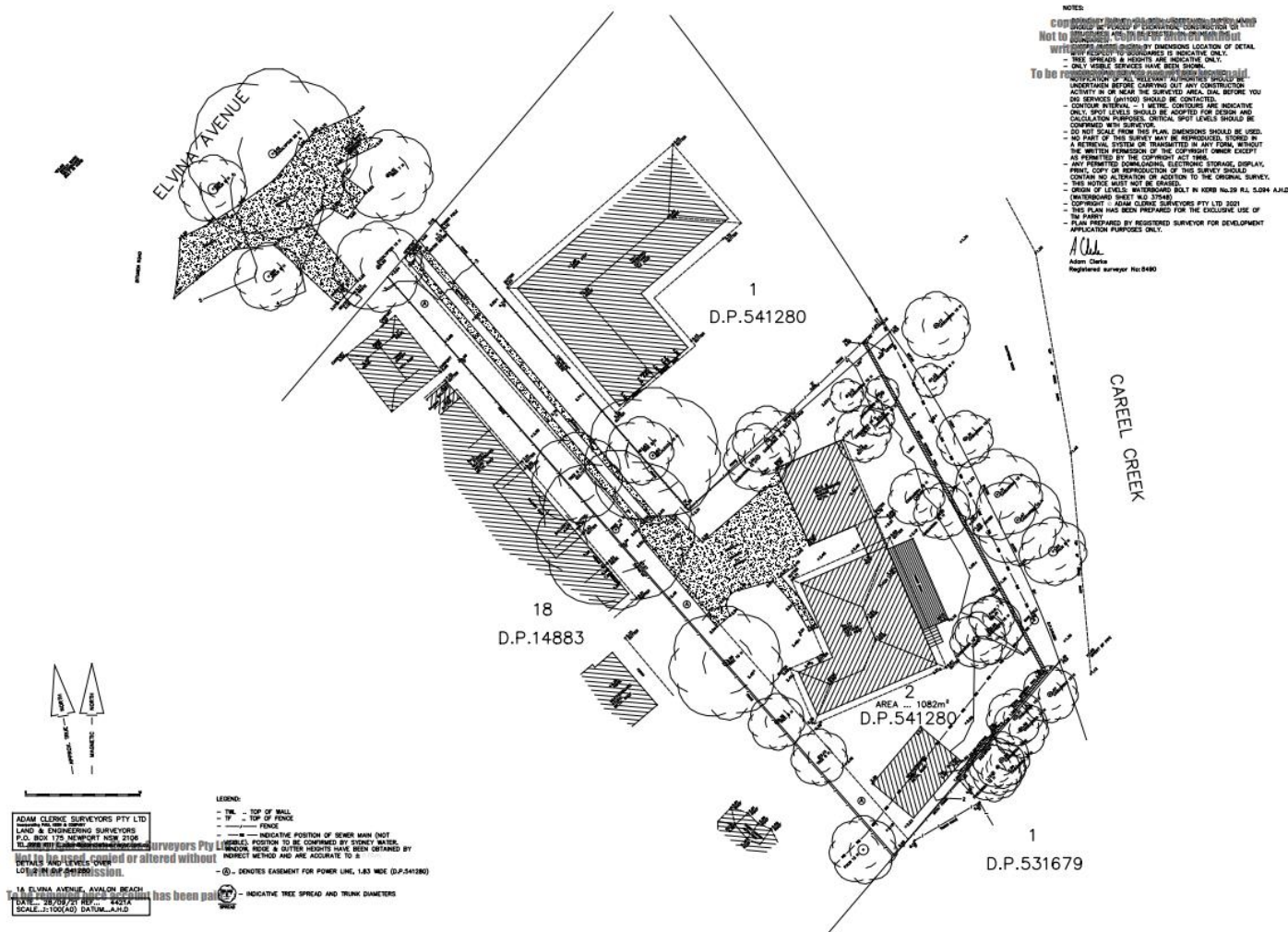
- Site should scrape a minimum 300 mm to remove any organic materials and vegetation within the proposed building envelope.
- Site should be track rolled after initial site scrape to unveil any soft spots, these soft areas to be removed and then properly compact with suitable fill material as described in AS2870-2011, cl 6.4.2.
- Site drainage is very important in reactive sites, thereby we recommended that ground surface immediately next to the perimeter footings be graded away from the slab at a minimum of 1:20 grade for a minimum distance of 1.5 m.
- Any filling placed across the site for leveling benchmark prior to slab construction should fulfill the requirement AS 2870-2011.
- As soon as the roof is constructed the roof drainage should be carried away from the slab to avoid water ponding around the slab perimeter.

11. Report Limitation

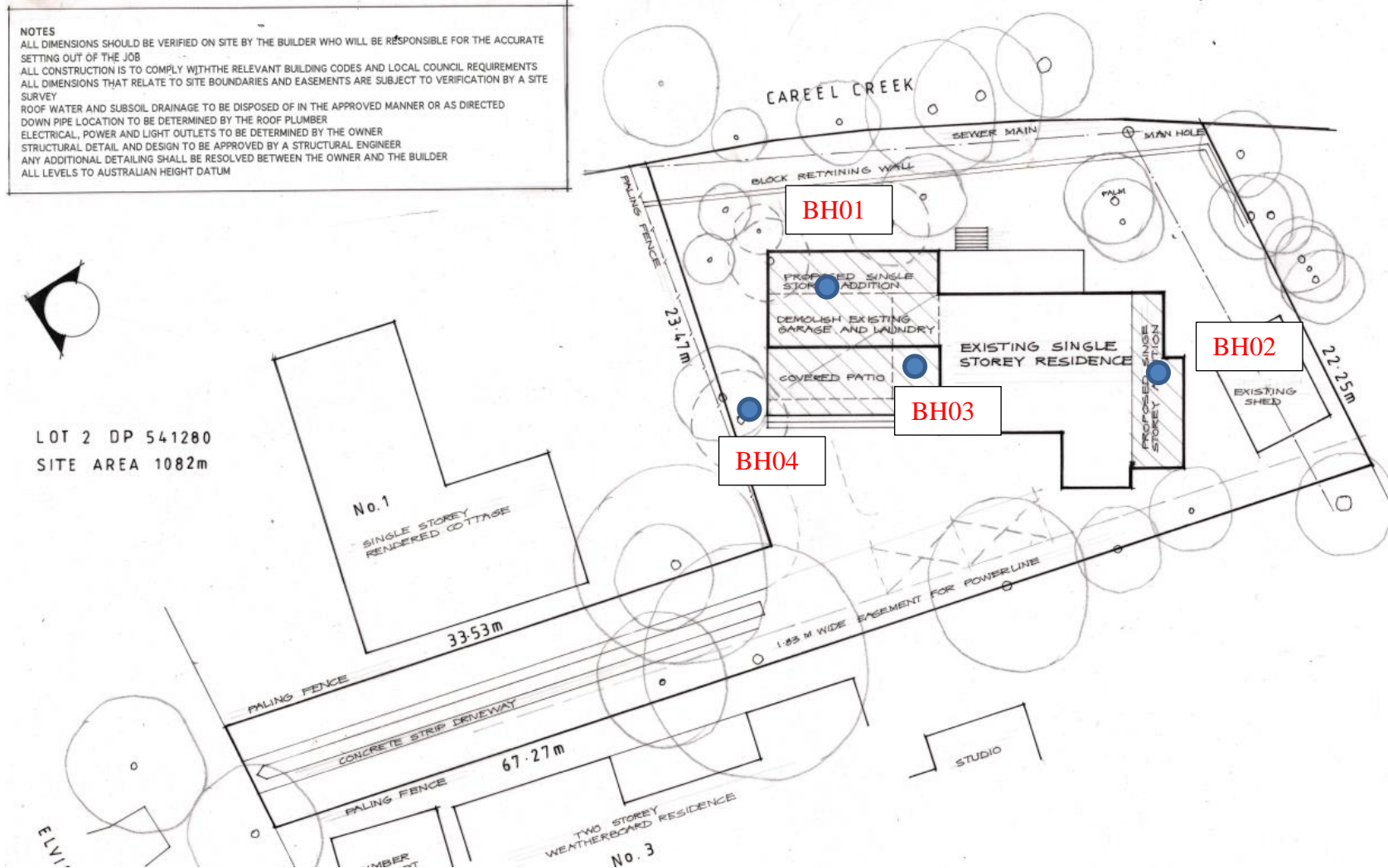
- This report is not a detailed geotechnical investigation. It complies with the requirements of AS2870-2011 and is limited to the items required under CI 2.2.2(a).
- This report was compiled on basic geotechnical investigation only, if the subsurface soil conditions encountered during construction stage is different from what described on the soil report, please contact this office immediately.
- This report does not assess the potential contamination, aggressive soil and Acid Sulphate soil. This area is defined as Class 5 Acid Sulfate Soils Map.
- Accon Engineers endeavor to assess the pre site history with available sources. However, Accon Engineers cannot be held responsibility for any financial loss in

relation to the structure and future performances of the footing if the site history has not been supplied to this office in writing by the client.

APPENDIX: A SUREVY PLAN






APPENDIX B: BORE HOLES LOCATION



APPENDIX C: BORE HOLES LOGS

						Job No: 2238				
						Hole No: BH-01				
						Date: 19/03/2022				
						Logged: AC				
Client: Tim Parry						Surface RL: -				
Location: 1A Elvina Ave, Avalon Beach NSW 2107						Test Method: Auger/DCP				
Depth (m)	Graphic Log	Unified Classification	Description	Moisture Condition	Consistency/Rel. Density	Pocket Penetrometer	Additional Comments			
0.8		SM/SC	Grey to brown Silty Sandy CLAY , poorly compacted.(Filled material)	M						
1.5			Grey to brown silty Clayey SAND, loose to Medium Dense and becoming medium dense after approximately (1.2m) BGL and moist to saturated	M	L-MD					
2.0			Grey to brown silty Clayey SAND with traces of gravel medium dense to dense and moist	VM	MD-D					
<table style="width: 100%; border: none;"> <tr> <td style="width: 33%; vertical-align: top;"> Consistency/Stiffness s Soft f Firm st Stiff vst Very Stiff h Hard vh Very Hard </td> <td style="width: 33%; vertical-align: top;"> Density VL Very loose L Loose MD Medium Dense D Dense VD very Dense </td> <td style="width: 33%; vertical-align: top;"> Moisture D Dry SM Slightly Moist M Moist VM Very Moist W Wet </td> </tr> </table>								Consistency/Stiffness s Soft f Firm st Stiff vst Very Stiff h Hard vh Very Hard	Density VL Very loose L Loose MD Medium Dense D Dense VD very Dense	Moisture D Dry SM Slightly Moist M Moist VM Very Moist W Wet
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						Job No: 2238																																											
						Hole No: BH-02																																											
						Date: 19/03/2022																																											
						Logged: SG																																											
Client: Tim Parry						Surface RL: -																																											
Location: 1A Elvina Ave, Avalon Beach NSW 2107						Test Method: Auger/DCP																																											
Depth (m)	Graphic Log	Unified Classification	Description	Moisture Condition	Consistency/Rel. Density	Pocket Penetrometer	Additional Comments																																										
0.5		SM/SC	Grey to brown Silty Sandy CLAY , poorly compacted.(Filled material)	M			Hole terminated 2m scope limitation																																										
1.5			Grey to brown silty Clayey SAND, loose to Medium Dense and becoming medium dense after approximately (1.2m) BGL and moist to saturated	M	L-MD																																												
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h	Hard	VD	very Dense	W	Wet																																												
vh	Very Hard																																																

						Job No: 2238	
						Hole No: BH-03	
						Date: 19/03/2022	
						Logged: AC	
Client: Tim Parry						Surface RL: -	
Location: 1A Elvina Ave, Avalon Beach NSW 2107						Test Method: Auger/DCP	
Depth (m)	Graphic Log	Unified Classification	Description	Moisture Condition	Consistency/Rel. Density	Pocket	Penetrometer
0.5		SM/SC	Grey to brown Silty Sandy CLAY , poorly compacted.(Filled material)	M			
1.0			Grey to brown silty Clayey SAND, loose to Medium Dense and becoming medium dense after approximately (1.2m) BGL and moist to saturated	M	L-MD		
BH terminated upon the refusal at 1.0							
Consistency/Stiffness s Soft f Firm st Stiff vst Very Stiff h Hard vh Very Hard				Density VL Very loose L Loose MD Medium Dense D Dense VD very Dense		Moisture D Dry SM Slightly Moist M Moist VM Very Moist W Wet	



Job No: 2238
Hole No: BH-04
Date: 19/03/2022
Logged: AC

Client: Tim Parry				Surface RL: -				
Location: 1A Elvina Ave, Avalon Beach NSW 2107				Test Method: Auger/DCP				
Depth (m)	Graphic Log	Unified Classification	Description	Moisture Condition	Consistency/ Rel. Density	Pocket Penetrometer	Additional Comments	
0.5		SM/SC	Grey to brown Silty Sandy CLAY , poorly compacted.(Filled material)	M			Hole terminated 2m scope limitation	
1.2			Grey to brown silty Clayey SAND, loose to Medium Dense and becoming medium dense after approximately (1.2m) BGL and moist to saturated	M	L-MD			
2.0			Grey to brown silty Clayey SAND with traces of gravel medium dense to dense and moist	VM	MD-D			
<u>Consistency/Stiffness</u>				<u>Density</u>		<u>Moisture</u>		
s	Soft			VL	Very loose		D	Dry
f	Firm			L	Loose		SM	Slightly Moist
st	Stiff			MD	Medium Dense		M	Moist
vst	Very Stiff			D	Dense		VM	Very Moist
h	Hard			VD	very Dense		W	Wet
vh	Very Hard							

APPENDIX D: DYNAMIC CONE PENETRATION TEST

TEST METHOD: AS1289.6.3-1997 (RECONFIRMED 2013)

Site Address: 1A Elvina Ave, Avalon Beach NSW

Job No: 2238

Date of Fieldwork: 19/03/2022

Test Number	DCP - 1	DCP - 2	DCP - 3	DCP - 4
Depth at Start Ground Level	0.0	0.0	0.0	0.0
0.00 – 0.10	1	1	1	1
0.10 – 0.20	2	1	3	2
0.20 – 0.30	2	1	3	2
0.30 – 0.40	2	2	3	2
0.40 – 0.50	2	2	3	2
0.50 – 0.60	2	2	3	2
0.60 – 0.70	2	2	4	2
0.70 – 0.80	2	2	4	2
0.80 – 0.90	3	3	5	3
0.90 – 1.00	2	2	Refusal/ Bouncing	3
1.00 – 1.10	3	3		3
1.10 – 1.20	3	4		3
1.20 – 1.30	3	4		4
1.30 – 1.40	4	4		4
1.40 – 1.50	3	3		6
1.50 – 1.60	5	5		5
1.60 – 1.70	4	5		5
1.70 – 1.80	4	4		5
1.80 – 1.90	5	5		5
1.90 – 2.0	Terminated			