

J.L Geotechnical
Helping others find their footing

Geotechnical Report

51 Wyndora Avenue Freshwater 2096

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Version	Date
V1	17/09/2024

1 Introduction

The site in question is **51 Wyndora Avenue Freshwater 2096**, Lot **A DP 359191**. J.L Geotechnical (JLG) was engaged by the client to conduct a site classification and foundation report to determine optimum foundation design according to the AS 2870 - 2011 and the AS 1726 - 2017. Joseph Lukas James Kongvongsa from JLG attended site where an intrusive geotechnical assessment was carried out. This included boreholes (BH's) that were progressed at **2** locations, in situ soil testing and site classification. The site is mapped to **Climatic Zone 1** as defined by Chan and Mostyn (2008).

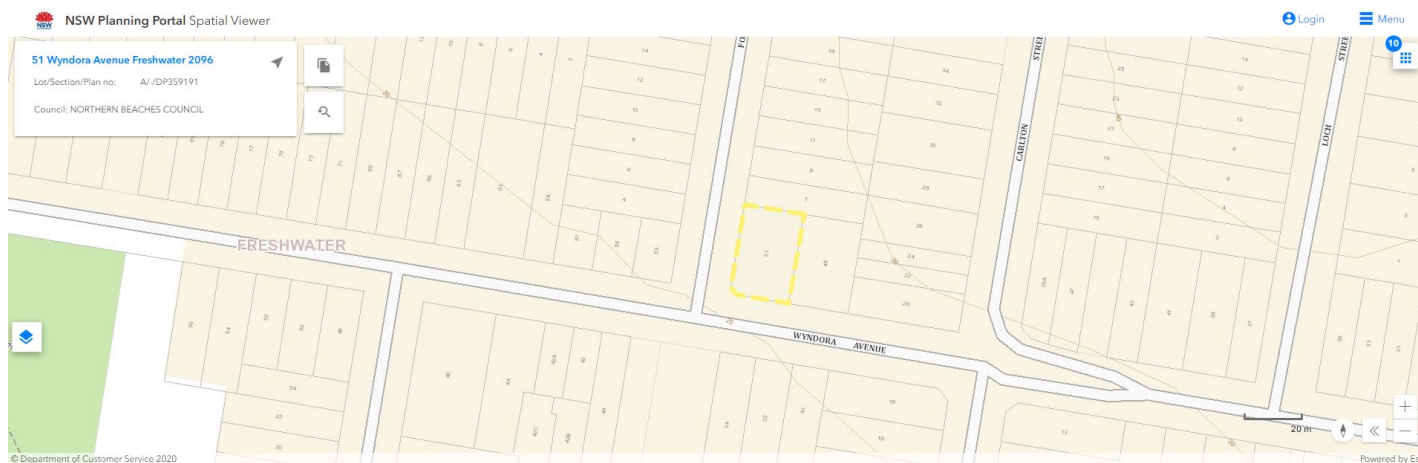


Figure 1. 1 – NSW Planning Portal Property Report

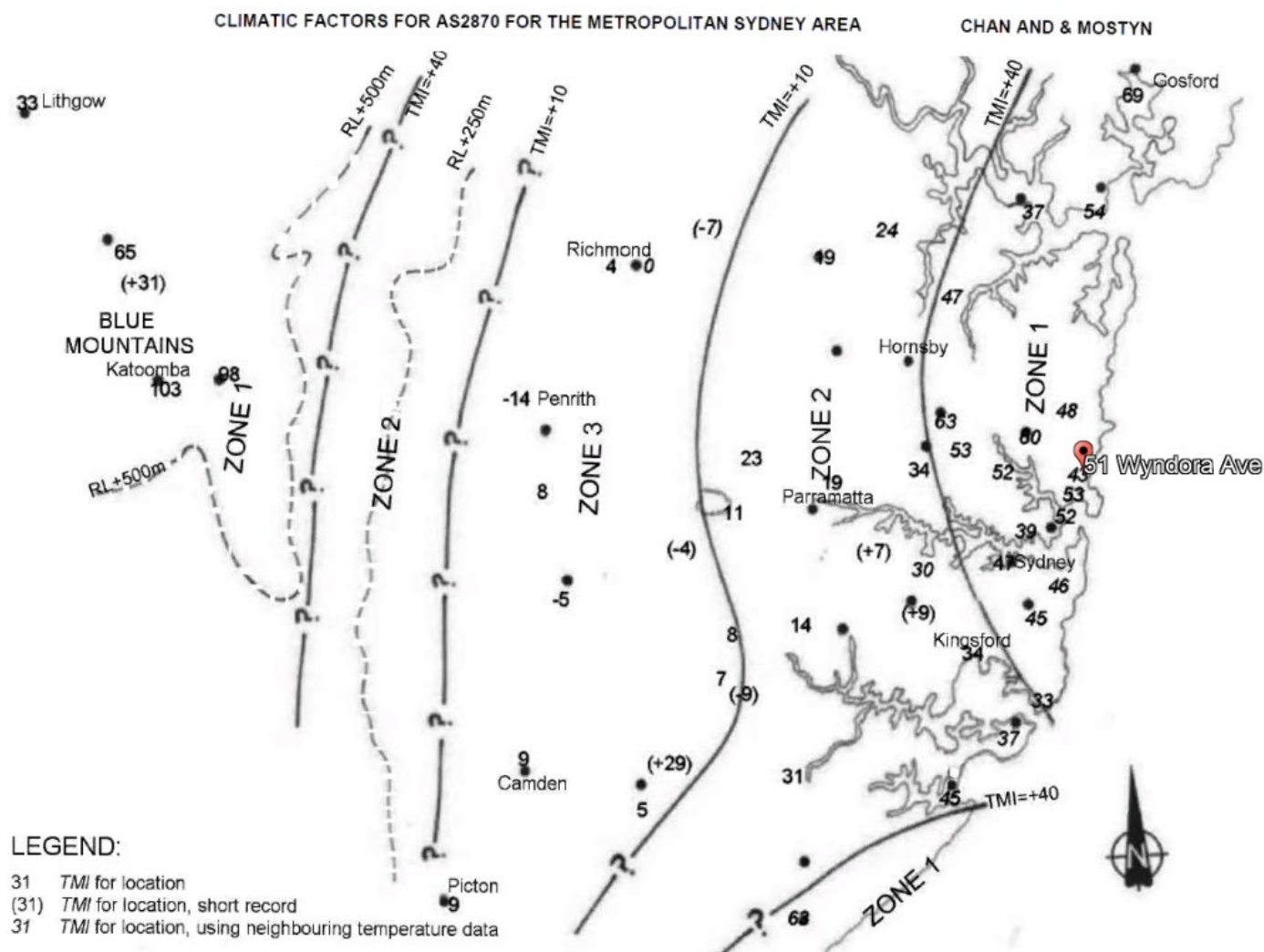


Figure 6: TMI Map of Sydney.

Figure 1 – Climatic Zones

2 Geology

The geology mapping was sourced from NSW Seamless geology V2 and the landscape mapping was sourced from eSPADE V2.1.

2.1 Geological Mapping

The site is underlain by Triassic Period sedimentary rock - Hawkesbury Sandstone (Tuth) – Medium to coarse grained quartz sandstone with minor shale and laminite lenses. The Geological mapping is shown in figure 2.



Figure 2 – Geology

2.2 Soil Landscape Mapping

The site is underlain by the **Newport Aeolian soil landscape** which is described as “gently undulating plains to rolling rises of Holocene sands mantling other soil materials or bedrock. Local relief <10 m, slopes <10% on lower slopes and plateau surface and up to 35% against obstacles facing prevailing winds. Extensively cleared low eucalypt openwoodland, scrub and open-heathland.” It has soils described as “shallow (<50 cm), well sorted Siliceous Sands (Uc1.21, Uc4.24, Uc4.31) overlying moderately deep (<150 cm) buried sands including yellow Podzolic Soils (Dy5.41, Dy5.51, Dy5.62) with sandy topsoils on crests and gentle slopes; deep (>200 cm) Podzols (Uc2.32) on steep slopes, lower slopes and in depressions.” Some limitations of the soils landscape are “very high soil erosion hazard, localised steep slopes, very low soil fertility, noncohesive topsoils.” The Soil Landscape mapping is shown in figure 3.



Figure 3– Soil Landscape

3 Site Conditions

The site conditions confirmed the data from the above mapping. The intrusive site investigations found **Shallow fill** overlaying the **Alluvial and Residual** soils over **Bedrock (Sandstone)** that is prevalent in the area. The weather was fine and there were no obstructions to the field investigation.

4 Site Classification

According to the AS 2870, the site is a **P** class site because of the **building onsite**. The site can be reclassified as a **M** in accordance with the AS 2870. The soil parameters can be found in table 1 below. These should be validated by a geotechnical engineer during construction for bearing and the classification confirmed.

Material	Parameters	Allowable Bearing Pressure (kPa)
Fill/Alluvial	NA	NA
Residual Soils	ϕ of 30° and an c' of 0 and an, γ 20 kNm ⁻³	Pad / Strip footing 150 kPa
Bedrock (Sandstone Class V)	ϕ of 32° and an c' of 34 kPa,	1000 kPa (200mm Socket Piles)
Bedrock (Sandstone Class IV)	ϕ of 34° and an c' of 100 kPa, γ 24kNm ⁻³ *, E of 500MPa	2000 kPa (200mm Socket Piles)

Table 1

*Pells et al 2002 tables 1 and 2 in conjunction with Hoek et al (1995).

5 Slope Stability

Currently the site does not show any signs of slope instability. It falls to the front Southwester corner of the property at a rough angle of 12°. There is **very shallow bedrock** underlying the site. There are no other indicators of instabilities on the site.

According to the Australian Building Code Handbook: Landslide Hazards – 2015, table 2, The site classifies as a **Very Low risk**.

	<i>Consequences to property</i>				
<i>Likelihood</i>	<i>1: CATAS-TROPHIC</i>	<i>2: MAJOR</i>	<i>3: MEDIUM</i>	<i>4: MINOR</i>	<i>5: INSIGNIFICANT</i>
A - ALMOST CERTAIN	VH	VH	VH	H	M or L
B - LIKELY	VH	VH	H	M	L
C - POSSIBLE	VH	H	M	M	VL
D - UNLIKELY	H	M	L	L	VL
E - RARE	M	L	L	VL	VL
F - BARELY CREDIBLE	L	VL	VL	VL	VL

Table 2 - Qualitative Risk Analysis Matrix – Level of Risk to Property from AGS Guidelines

6 Recommendations

The site has relatively shallow rock and no structural limitations. Founding on rock on this site is highly advantages and recommended given the high bearing pressures that can be achieved. It is also shallow and can be accessed easily by excavation with auger. Foundation to “key” into the bedrock.

Though this site is deemed as Very Low risk for landslip, appropriate structural design according to the Australian Building Code Handbook: Landslide Hazards – 2015 is to be observed. Given proper design there are no geotechnical limitations to construction on this site.

Note that perched water or slow-moving tables can present, especially during wet weather.

Any structure that is designed is to be founded on rock or soil and not a combination of the two.

The site does not suffer any geotechnical instabilities with respect to landside and subsidence, nor does it pose any threat of erosion where excavation or filling does not exceed 900mm in depth.

A footing inspection by JLG is recommended to confirm this classification and any subsequent design.

7 Limitations

This report and site investigation have been undertaken for the express purpose of the design and construction of the proposed dwelling at the site in question and may not be used for any other purpose. Furthermore, it is possible that the test locations are not indicative of the site and that conditions elsewhere on site differ from the test location. Further foundation inspections are recommended during construction, by a qualified geotechnical engineer to confirm the foundation material on site. If the soils encountered during construction differ in any way from what was found in this report, please contact the under-signed as soon as possible for an inspection and remediation of the foundation.

For this report to remain valid the homeowner needs to adhere to the recommendations in the CSIRO’s “Foundation Maintenance and Footing Performance: A Homeowner’s Guide”. Therein the guide contains advice on landscaping, erosion, drainage and other important considerations.

If there are any questions pertaining to this report, please don’t hesitate to contact the undersigned.



Joseph Lukas BE (Civil), MIEAust, NER EA ID 5324055

Principal Geotechnical Engineer

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Appendix A - Borehole Log



BOREHOLE: BH1

Project

Location

Position

Job No.

Client

Geotechnical Investigation

51 Wyndora Avenue Freshwater 2096

2425051

Coastal Lifestyle Development

Contractor

Drill Rig

Inclination

Push Tube

-90°

Sheet

1 OF 1

Date Started


11/9/2024

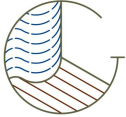
Date Completed

11/9/2024

Logged

JL

Drilling				Sampling		Field Material Description									
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION			MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0.0					ML	Clayey SILT, Black to dark Brown, with some organics, roots (Topsoil)	M	L				
			0.30						SEDIMENTARY ROCK (Sandstone) Yellow Brown, coarse to medium grained, very Low to Low Strength (Bedrock Class V ?) Hole Terminated at 0.30 m Refusal						
			0.5												
			1.0												
			1.5												
			2.0												
			2.5												
			3.0												
			3.5												



BOREHOLE: BH2

Project

Location

Position

Job No.

Client

Geotechnical Investigation

51 Wyndora Avenue Freshwater 2096

2425051

Coastal Lifestyle Development

Contractor

Drill Rig

Inclination

Push Tube

-90°

Sheet

Date Started

Date Completed

Logged

1 OF 1

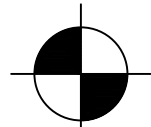
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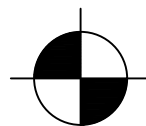
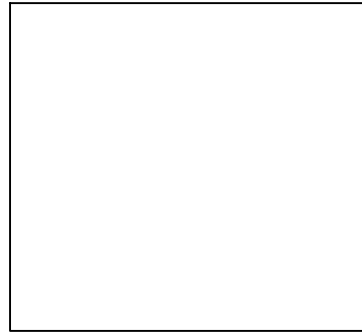
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Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0.0					ML	Clayey SITL, Black to dark Brown, with some organics, roots (Topsoil)	M	L	
			0.20					SC	Clayey SAND, Yellow Brown, Medium Grained, Well Graded (Residual)	w PL	F to St	
			0.60					SC	Clayey SAND, Yellow Brown, Medium Grained, Well Graded (Residual)	M	MD	
			0.80						SEDIMENTARY ROCK (Sandstone) Yellow Brown, coarse to medium grained, very Low to Low Strength (Class V) Hole Terminated at 0.80 m Refusal			
			1.0									
			1.5									
			2.0									
			2.5									
			3.0									
			3.5									

Appendix B – Site Map



BH 1



BH 2

Site: 51 Wyndora Avenue Freshwater 2096

GENERAL NOTES :



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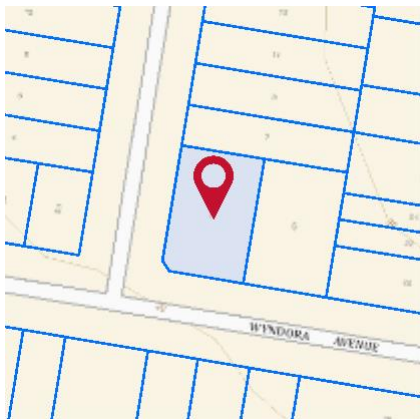
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DRAWING No.	2425051	
DATE	17/09/2024	
		A4

Appendix C – NSW Planning Portal Property Report



Property Report

51 WYNDORA AVENUE FRESHWATER 2096



Property Details

Address: 51 WYNDORA AVENUE FRESHWATER 2096
 Lot/Section /Plan No: A/-/DP359191
 Council: NORTHERN BEACHES COUNCIL

Summary of planning controls

Planning controls held within the Planning Database are summarised below. The property may be affected by additional planning controls not outlined in this report. Please contact your council for more information.

Local Environmental Plans	Warringah Local Environmental Plan 2011 (pub. 14-2-2014)
Land Zoning	R2 - Low Density Residential: (pub. 24-5-2024)
Height Of Building	8.5 m
Floor Space Ratio	NA
Minimum Lot Size	450 m ²
Heritage	NA
Land Reservation Acquisition	NA
Foreshore Building Line	NA
Landslide Risk Land	Area A - Slope <5 Area B - Flanking Slopes 5 to 25

Detailed planning information

State Environmental Planning Policies which apply to this property

State Environmental Planning Policies can specify planning controls for certain areas and/or types of development. They can also identify the development assessment system that applies and the type of environmental assessment that is required.

This report provides general information only and does not replace a Section 10.7 Certificate (formerly Section 149)



Property Report

51 WYNDORA AVENUE FRESHWATER 2096

- State Environmental Planning Policy (Biodiversity and Conservation) 2021: Excluded (pub. 21-10-2022)
- State Environmental Planning Policy (Biodiversity and Conservation) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Biodiversity and Conservation) 2021: Subject Land (pub. 2-12-2021)
- State Environmental Planning Policy (Exempt and Complying Development Codes) 2008: Land Application (pub. 12-12-2008)
- State Environmental Planning Policy (Housing) 2021: Land Application (pub. 26-11-2021)
- State Environmental Planning Policy (Industry and Employment) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Planning Systems) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Primary Production) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Resilience and Hazards) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Resources and Energy) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Sustainable Buildings) 2022: Land Application (pub. 29-8-2022)
- State Environmental Planning Policy (Transport and Infrastructure) 2021: Land Application (pub. 2-12-2021)

Other matters affecting the property

Information held in the Planning Database about other matters affecting the property appears below. The property may also be affected by additional planning controls not outlined in this report. Please speak to your council for more information

Greater Sydney Tree Canopy Cover 2019 Percentage	23.02
Greater Sydney Tree Canopy Cover 2022 Percentage	13.02
Housing and Productivity Contribution	Greater Sydney - Base HPC
Local Aboriginal Land Council	METROPOLITAN
Regional Plan Boundary	Greater Sydney

This report provides general information only and does not replace a Section 10.7 Certificate (formerly Section 149)

Appendix D – Site Photos



Photo 1. Rock in garage.



Photo 2. Soils