



Geotechnical Assessment for Deck Addition



Department of Planning
and Environment

Issued under the Environmental Planning and Assessment Act 1979

Approved Application No DA 22/4975

Granted on the 3 June 2022

Signed Sandria Butler

Sheet No 5 of 9

Aspen Creek Lodge,
Thredbo, NSW

ATTN : Wayne Lazarus

February 25th, 2022

Document: PE-2204-01

POINTE ENGINEERING PTY LTD



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1. INTRODUCTION

This report presents the findings of the geotechnical assessment carried out by Pointe Engineering Pty Ltd [Pointe] at Aspen creek lodge for a deck addition creek at the back of apartment 2 Aspen creek lodge, 8B Chimneys Way (Lot 555) Thredbo in the Kosciuszko National Park in NSW -herein referred to as 'Site'. The assessment was carried out as per Pointe's proposal PE-P2204-01, dated January 29th, 2022.

It is understood that this geotechnical assessment will be used to finalize the development application and provide factual geotechnical information for the construction.

2. SCOPE OF WORK

The geotechnical assessment for the site included the following:

- Perform a desktop review of existing site conditions;
- Develop and provide Safe Work Method Statements (SWMS) for the field work;
- Perform a field geotechnical site reconnaissance of Site, including advancing of two augerholes;
- Provide geotechnical opinion regarding the proposed works; and
- Issue a Site Geotechnical Factual Report, inclusive of geotechnical recommendations for construction and/or monitoring for the proposed deck addition.

It should be noted that geotechnical hazard assessment is outside of Pointe's scope. As part of the site reconnaissance, geotechnical hazards are expected to be noted and only factually reported in this assessment. Furthermore, Site specific flood risk assessment is excluded from Pointe's scope of work.

3. INVESTIGATION FINDINGS

3.1 Site

The site is located in the Thredbo village in Kosciuszko National Park, at the end of an access road off Chimneys way, as represented on the Site Plan in Appendix B. The Site is apartment 2, part of an existing 4 unit lodges at 8B Chimneys way, Thredbo (Lot 555, DP 1118421).

The Site is located adjacent (South-West) to an unnamed drainage/surface runoff creek, subsidiary to the Thredbo river.

The Site geology, as detailed on the 1:250 000 Kosciuszko NP Geological Map, is likely of the late Silurian origin, with its granitic nature. Specifically, the bedrock basement originates from a massive magmatic intrusion, named the Mowamba granodiorite.

Land and Soil capability is negligible. The soils are mostly within Rudosols and Tenosols. It is therefore expected that the surface soil, above the weathered granodiorite, is very shallow.

A surface geotechnical hazard mapping visit was undertaken on Feb 16th 2022 by Pointe. During the visit, the Site was observed to have been subject to human disturbances. Levelling works were evidenced by a relatively flat backyard, 8m wide behind existing building as shown on Figure 1 below. Furthermore, at the North West portion of the site (at BH22-01 location), the existing ground is about 1m higher than the North East corner of site (at BH22-02 location). The backyard of the Site then



slopes down North to the unnamed creek, at about 25 to 27 degrees from horizontal, referenced by Figure 2 below.

Rounded granitic boulders were noted to have been arranged between the building catch drain and the higher levelled backyard. More of these boulders were also noted along the slope to creek.

Evidence of surface instability was noted down the slope to creek in the form of topsoil sloughing and bent/butressed tree trunk (see Figure 2 below).



Figure 1 – BH22-01 Looking NW from extent of Site

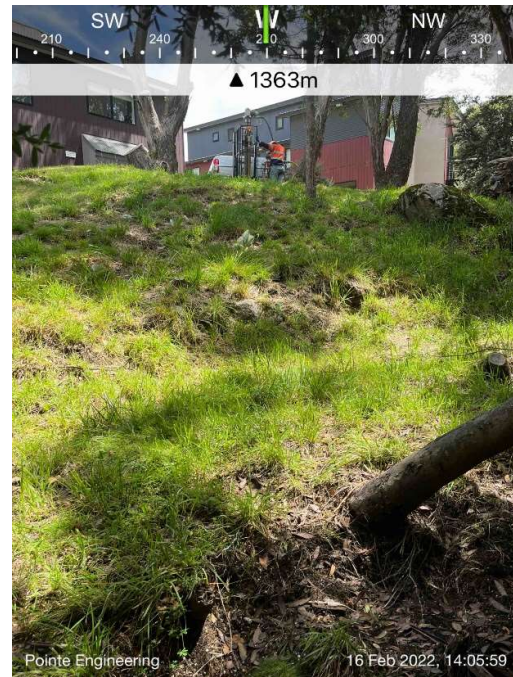


Figure 2 – Looking Up to Site, from unnamed creek

3.2 Subsurface Conditions

A subsurface investigation was carried out as part of the mapping visit on February 16th 2022. The investigation comprised of the advance of one borehole using a pneumatic powered coring rig mounted at the back of a UTE (BH22-01) and second borehole advanced manually where DCP was carried out (BH22-02). Depths of investigation varied from 1.1 to 2.1m below existing ground level. Boreholes were terminated based on refusal on inferred cobbles/boulders. A Site Plan, presented in Appendix B, outlines the investigation locations.

The following summarizes the subsurface conditions encountered at the investigation locations:

- **TOPSOIL:** dark brown to black, moist, soft Clayey SILT with root mat, about 0.3m in thickness.
- **FILL :** BH22-02 contained a 20cm thick Silty SAND layer beneath which more topsoil was found. BH22-01 is suspected to also contained some fill as reworked gravel and cobbles.
- **Cobbles :** both boreholes were terminated due to refusal on a cobbles and boulder layer. The matrix surrounding these cobbles was wet silty SAND with gravel.



Detailed subsurface condition encountered are presented on the engineering logs in Appendix C. The subsurface conditions encountered during the investigation are generally in accordance with the expected subsurface geology for the site.

Standing groundwater and groundwater seepage were not encountered but suspected to be at about 2.0m below existing ground level at BH22-01 location. The near surface soils were typically moist. Dynamic Cone Penetrometer (DCP) test mostly all terminated in refusal on cobbles and/or boulders.

4. GEOTECHNICAL RECOMMENDATIONS

Architectural plans provided for the proposed deck (New Deck to unit 2, 202154 dwg 01 to 03 dated 18th Jan 2022 issued by PRG Architects) were reviewed as part of this geotechnical assessment. This assessment covers only the construction of a new deck. No earthworks, retaining walls or the like is expected.

The proposed deck addition as presented on the architectural plans, is geotechnically appropriate, pending compliance with geotechnical recommendations provided herein. It is furthermore expected that with the recommendations below adhered to, the proposed work at Site pause minimal geotechnical impact. As such, a form 4- minimal impact certification is provided in Appendix.

4.1 Site Class

The Site contains varying level of Fill of unknown compaction history. It is furthermore adjacent to an unstable slope. The site is classified as Class P (excessive foundation settlement might occur – due to fill, not reactive soil) in accordance with AS2870-2011.

The above site classification applies to the site conditions as observed at the investigation time. The site classification may need to be reviewed if the proposed works are different than understood at the time of issuing this report. Site conditions, as exposed during footing preparation are to be reviewed by a qualified professional geotechnical engineer if competent boulders and/or bedrock is not encountered.

4.2 Design and Construction

Set Back

The footing for the proposed deck should be set back at least 3m away from edge of slope to unnamed creek.

Footing

The design of support for the proposed new deck should carried out according to engineering principles, having regards to the site constraints and factual geotechnical data presented herein.

Erosion Protection

Surface water run-off should be intercepted and be directed away from any structure or open excavation. Swale drains might be used in the landscaping to avoid pooling of water and/or infiltration into slopes, particularly the slope down to unnamed creek.



Any exposed cut should be protected by providing surface vegetation (grass) and/or geotextile cover as soon as possible post exposure. Similarly, construction should be avoided during period of heavy rain.

Geotechnical Review

It is recommended that construction progress be reviewed by a suitably qualified geotechnical engineer should the conditions encountered varied from those detailed herein.

5. LIMITATIONS

The findings presented in this report are as per geotechnical normal practices and as per the relevant standard. To the best of our knowledge, they represent a reasonable interpretation of the general condition of the site. The subsurface conditions may vary, particularly where no sampling and testing has been carried out. This report has been prepared based on the understanding that it will support the design and construction of the proposed deck addition and will be passed on to all tenders, designers, contractors and future owners of the site. We refer you to Appendix A, which presents more information regarding this report.

6. CLOSURE

We trust the information presented meets your current requirements. Pointe takes this opportunity to thank you for your invitation to offer services.

Please contact the undersigned for any additional information you might require.

Yours faithfully,

POINTE ENGINEERING PTY LTD

Emilie LAPOINTE, MIEAust. CPEng.

Principal Geotechnical Engineer

- Appendices:
- Appendix A – Information about this Report
 - Appendix B – Site Plan
 - Appendix C – Borehole Engineering Logs
 - Appendix D – Signed Form 4 – Minimal Impact Certification



APPENDIX A

Information about this Report

General

These notes have been prepared to help you interpret and understand the limitations of your report. The report contains the results of a geotechnical investigation conducted for a specific purpose and client. The results should not be used by other parties, or for other purposes, as they may contain neither adequate nor appropriate information. In particular, the investigation does not cover contamination issues unless specifically outlined in the scope of work.

Logging

The information presented on the engineering logs (boreholes, augerholes, test pits, exposures etc.) is based on a visual and tactile assessment, except at the discrete locations where test information is reported. The engineering logs include both factual data and inferred information as assessed by a suitably qualified geotechnical engineer. Location of test holes should be considered approximate, unless noted otherwise. Reference should also be made to the relevant standard sheets for the explanation of logging procedures (AS 1726).

Groundwater

Unless otherwise indicated, the water levels presented on the engineering logs are the levels of free water or seepage in the test hole recorded at the given time of measuring. The actual groundwater level may differ from this recorded level depending on material permeability. Confirmation of groundwater levels, phreatic surfaces or piezometric pressures can only be made by appropriate instrumentation techniques and monitoring programmes carried out over varying conditions (season, environment, tidal and construction).

Interpretation of Results

The discussion or recommendations contained within this report normally are based on a site evaluation from discrete test hole data, often with only approximate locations (e.g. GPS). Generalised, idealised or inferred subsurface conditions, including any geotechnical cross-sections, have been assumed or prepared by interpolation and/or extrapolation of these data. As such these conditions are an interpretation and must be considered as a guide only.

Change in Conditions

Local variations or anomalies in the generalised ground conditions do occur in the natural environment, particularly between discrete test hole locations. Additionally, certain design or construction procedures may have been assumed in assessing the soil-structure interaction behaviour of the site. Furthermore, conditions may change at the site from those encountered at the time of the geotechnical investigation through construction activities and constantly changing natural forces. Any change in design, in construction methods, or in ground conditions as noted during construction, from those assumed or reported should be referred to Pointe for appropriate assessment and comment.

Geotechnical Verification

Verification of the geotechnical assumptions and/or model is an integral part of the design process - investigation, construction verification, and performance monitoring. Variability is a feature of the



natural environment and, in many instances, verification of soil or rock quality, or foundation levels, is required. Allowance for verification by suitably qualified geotechnical personnel must be planned for.

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Additional Assistance

Pointe is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction. It is common that not all approaches will be necessarily dealt with in your geotechnical site assessment report due to concepts proposed at that time. As the project progresses through design towards construction, speak with Pointe to develop alternative approaches to problems that may be of genuine benefit both in time and cost.



Aspen Creek Lodge, Thredbo, NSW

APPENDIX B

Pointe Site Plan



**PE-2204 - Aspen creek
Lodge**





Aspen Creek Lodge, Thredbo, NSW

APPENDIX C

Borehole Engineering Logs



Borehole Log Report

Hole ID : AG 20-01

Sheet : 1 of 1

Project: Aspen Creek 2 - 8B Chimneys way, Thredbo

Client: Wayne Lazarus

Date: February 22nd 2022

Project No.: PE- 2204

Location:		back of building Unit 2- Aspen creek		Latitude:		refer to site plan		Driller:		Pointe		Equipment:		Drill Rig	
Elevation:		not surveyed -mbgl		Longitude:		refer to site plan		Method:		Auger and Core					
Weather:		Sunny, windy 8°C						Logged:		GSP		Reviewed:		EL	
Method	Depth (m)	Sample Type and Number	DCP (AS1288.6.3.2 - 1997)		Graphic Log	USCS	Material Description (AS1726 - 2017)	Moisture Cond. / Moisture Cont. (%)	Consistency	Additional Test/ Comments					
	0.2	SA1	0	15	30	45	OL	TOPSOIL dark brown to black, moist, Clayey SILT, contains sand and grass roots (organics)	M						
	1.0	SA2					C-GM	COBBLES and GRAVEL brown to light brown, moist Cobbles, contains silty Sand and Gravel	M		High strenght Cobbles with VL sandy matrix				
	2.0	SA3					C-GM	COBBLES and GRAVEL light brown, Cobbles, contains wet silty Sand and Gravel	W						
								v		suspected water					
							End of Hole at 2.1m on refusal								
	3.0														

Sample Type

A | Auger
B | Bulk
Blk | Block
SPT | Split Spoon
ShT | Tube

In Situ Testing

DCP | Dynamic Cone Penetrometer Test (blow/100mm)
pp | Pocket Pen (kPa)
SPT | Standard Penetration Test (n blows/150mm)
V | Field Vane Shear (kPa)

Moisture Condition

D | Dry
M | Moist
W | Wet
Wp | Plastic Limit (%)
Wl | Liquid Limit (%)

Water Condition

☒ | Water Level
▷ | Water Seepage

Consistency

Cohesive Non-Cohesive
Strength Density
VS | Very Soft VL | Very Loose
S | Soft L | Loose
F | Firm MD | Medium Dense
St | Stiff D | Dense
VSu | Very Stiff VDL | Very Dense
H | Hard



Borehole Log Report

Hole ID : BH 22-02

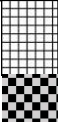
Sheet : 1 of 1

Project: Aspen Creek 2 - 8B Chimneys way, Thredbo

Client: Wayne Lazarus

Date: February 22nd 2022

Project No.: PE- 2204

Location:		back of building Unit 2- Aspen creek			Latitude:		refer to site plan		Driller:		Pointe		Equipment:		Shovel and DCP		
Elevation:		not surveyed -mbgl			Longitude:		refer to site plan		Method:		Hand Excavation						
Weather:		Sunny, windy 8°C								Logged:		GSP		Reviewed:		EL	
Method	Depth (m)	Sample Type and Number	DCP (AS1288.6.3.2 - 1997)						Graphic Log	USCS	Material Description (AS1726 - 2017)				Moisture Cond. / Moisture Cont. (%)	Consistency	Additional Test/ Comments
	0.2	SA1	4	2	2	2	1	1		OL	TOPSOIL black, moist, low plasticity Clayey SILT, contains sand and grass roots (organics)				M	S	
		SA2	3	6	1	2	3	3		SM	FILL brown, dry, silty SAND, with gravel				D	L	
		SA3	R	7	R					OL	TOPSOIL dard brown, moist, sandy SILT, contains granite gravels and cobbles, grass roots (organics)				M	S	
	1.0											End of Hole at 1.1m on refusal (suspected cobbles)					
	2.0																

Sample Type

A | Auger
B | Bulk
Blk | Block
SPT | Split Spoon
ShT | Tube

In Situ Testing

DCP | Dynamic Cone Penetrometer Test (blow/100mm)
pp | Pocket Pen (kPa)
SPT | Standard Penetration Test (n blows/150mm)
V | Field Vane Shear (kPa)

Moisture Condition

D | Dry
M | Moist
W | Wet
Wp | Plastic Limit (%)
Wl | Liquid Limit (%)

Water Condition

☒ | Water Level
▷ | Water Seepage

Consistency

Cohesive
Non-Cohesive
Strength
Density
VS | Very Soft
S | Soft
F | Firm
St | Stiff
VSt | Very Stiff
H | Hard
VL | Very Loose
L | Loose
MD | Medium Dense
D | Dense
VD | Very Dense



Aspen Creek Lodge, Thredbo, NSW

APPENDIX D

Form 4

Form 4 – Minimal Impact Certification

DA Number: _____

This form may be used where minor construction works which present minimal or no geotechnical impact on the site or related land are proposed to be erected within the "G" line area of the geotechnical maps.

A geotechnical engineer or engineering geologist must inspect the site and/or review the proposed development documentation to determine if the proposed development requires a geotechnical report to be prepared to accompany the development application. Where the geotechnical engineer determines that such a report is not required then they must complete this form and attach design recommendations where required. A copy of Form 4 with design recommendation, if required, must be submitted with the development application.

Please contact the Alpine Resorts Team in Jindabyne for further information - phone 02 6456 1733.

To complete this form, please place a cross in the appropriate boxes ☐ and complete all sections.

1. Declaration made by geotechnical engineer or engineering geologist in relation to a nil or minimal geotechnical impact assessment and site classification

I,
 Mr ☐ Ms ☒ Mrs ☐ Dr ☐ Other

First Name

Family Name

Emilie

Lapointe

OF

Company/organisation

Pointe Engineering Pty Ltd.

certify that I am a geotechnical engineer /engineering geologist as defined by the "Policy" and I have inspected the site and reviewed the proposed development known as

Aspen Creek Lodge - Unit 2 Deck Addition - 8B chimneys way (Lot 555) Thredbo

As a result of my site inspection and review of the following documentation

(List of documentation reviewed)

- Architectural Drawings 202154 Aug 01 to 03 by PRG Architects dated 18th Jan 2022.

- Print. Feb. 16th 2022 site visit investigation.

I have determined that;

- ☒ the current load-bearing capacity of the existing building will not be exceeded or adversely impacted by the proposed development, and
- ☒ the proposed works are of such a minor nature that the requirement for geotechnical advice in the form of a geotechnical report, prepared in accordance with the "Policy", is considered unnecessary for the adequate and safe design of the structural elements to be incorporated into the new works, and
- ☒ in accordance with AS 2870.1 Residential Slabs and Footings, the site is to be classified as a type
(insert classification type)

Class P

- ☒ I have attached design recommendations to be incorporated in the structural design in accordance with this site classification.

Pointe Engineering PE2204-01-Geotechnical Assessment dated Feb. 25/22

I am aware that this declaration shall be used by the Department as an essential component in granting development consent for a structure to be erected within the "G" line area (as identified on the geotechnical maps) of Kosciuszko Alpine Resorts without requiring the submission of a geotechnical report in support of the development application.

2. Signatures

Signature



Name

Emilie Lepointe

Chartered professional status

C.P. Eng.

Date

February 25th 2022

3. Contact details

Alpine Resorts Team

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