

Our ref: 7628-R1  
12 September 2024



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Vail Resorts  
PO Box 42  
Perisher Valley NSW 2624

**Attention: Sophie Ballinger**

Dear Sophie,

## **Proposed Accessible Lift Perisher Centre, Perisher Ski Centre, Perisher NSW Geotechnical Assessment**

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### **1. Introduction**

This report presents the results of a geotechnical assessment for Proposed Accessible Lift Perisher Centre at Perisher Ski Centre, Perisher NSW (the Site). The assessment was commissioned by Sophie Ballinger of Vail Resorts by email dated 10 September 2024. The work was carried out in accordance with the proposal by AssetGeoEnviro (Asset) dated 26 August 2024, reference 7628-P1.

Documents supplied to us for this assessment comprised:

- Architectural Plans (prepared by: DJRD Architects; project no: 22\_431; drg nos: A1.00D, A1.01c, A1.02D, A1.03D, A2.00D, dated: 29 August 2024; drg no A6.00B dated: 24 October 2023).
- Structural Plan (prepared by: Coot Consulting Engineers; ref: Proposed Ski Centre Lift; drg no: S01, S02, S03, S04, S05, S06, S07; dated: 26 August 2024).
- Site Photographs.

We understand the project involves installing accessible lift outside the Perisher Centre in front of the existing café. Excavation of about 1.3m below the current pavement level is anticipated for the base level of the lift, with four piles beneath socketed 500mm into rock.

The Site lies just within or at the boundary of the G-line as defined in DIPNR's "Geotechnical Policy – Kosciuszko Alpine Resorts", November 2003. However, given that the proposed works will likely be relatively minor, the development would fall under Minimal Impact criteria.

### **2. Scope of Work**

The objective of the Geotechnical Assessment is to provide information on the surface conditions and likely subsurface conditions, and to provide a Site Classification to AS2870-2011 'Residential Slabs and Footings' and a Form 4 certification with design recommendations.

The following scope of work was carried out to achieve the project objectives:

- A review of existing regional maps and reports relevant to the Site held within our files.
- Review of general site observations from numerous trips to Perisher Ski Centre by the undersigned.
- Review of supplied site photos (attached) of proposed site and its surrounding landscape.
- Engineering assessment and reporting.

This report must be read in conjunction with the attached "Important Information about your Geotechnical Report" in Appendix A. Attention is drawn to the limitations inherent in site investigations and the importance of verifying the subsurface conditions inferred herein.

### 3. Regional Topography & Site Geology

The regional topography comprises moderately to steeply sloping terrain to the west of the Perisher Centre, sloping down towards the Perisher Centre at about 20° flattening to about 15° and 10° in proximity to the Centre, flattening further to the east towards Perisher Creek which winds through the valley floor.

The 1:250,000 Tallangatta Geological Map indicates the Site is underlain by Lower Devonian aged intrusive granites, micro-diorites and tonalites. This is locally weathered to produce core-stones and tor outcrops. It is expected that variably weathered granite is located at relatively shallow depth below the ground surface. Some fill may also be encountered, from previous slope development

### 4. Site Observation

The proposed lift is to be located in the paved eastern entrance to the centre, adjacent to an existing cemented stone wall and retaining wall, next to the existing café and connecting to the suspended floor above. To the east of the proposed lift site, there is a steel-framed footbridge walkway and a concrete stairway. To the north and west are the existing structures of the resort, and to the south and east there is open ground and Perisher Creek.

### 5. Discussions and Recommendations

The proposed work involves the excavation of a lift pit to 1.3m deep in fill layer and the drilling of four piers, each with a 450 mm diameter, to a socket depth of 500 mm into the bedrock to support the load of the pile. The excavation is expected to occur through fill likely placed as part of construction of the paved area at the eastern entrance to the centre, then likely through soft soils anticipated within the creek area, and possibly into weathered granite. A 1000 kPa end bearing pressure is sought for the piers, which is achievable once the highly weathered granite layer is encountered, which may be within the base of the lift pit excavation but may only be encountered within piles drilled below the base of the lift pit.

The proposed works will have 'minimal or no geotechnical impact' on the site, based on the generally relatively shallow depths and limited extent of excavation required, the gentle slopes in the vicinity, and the lack of obvious signs of hillside instability observed or expected. We therefore consider that a geotechnical report prepared in accordance with the Geotechnical Policy for Kosciuszko Alpine Resorts (2003) is not required. A completed Form 4 – Minimal Impact Certification is attached to this report.

The following recommendations are provided for the development:

- Based on our site observations and due to expected previous site disturbance, the site is Class 'P', in accordance with AS2870-2011 'Residential slabs and footings'. However, if the existing filling is removed and / or foundations are within highly weathered or better rock, it may be reclassified as Class "A".
- Excavation is anticipated to be predominantly within soils of variable nature including fill and possibly completely weathered granite and cobbles and boulders. Excavation could be achieved by suitably sized excavator.
- Temporary excavation up to about 1.5m depth may be cut vertical in clayey soils, and nominally 1H:1V in sands and gravels. Deeper temporary excavations up to about 2m depth should be benched / battered at no steeper than 1.5H:1V.
- Drilling of piles could be by excavator equipped with spiral auger. If refusal is encountered within soils / cobbles / boulders above rock, it may be necessary to remove by excavator bucket before continuing.
- Filling, where required, should be placed in horizontal layers over prepared subgrade and compacted as per Table 1.

**Table 1 – Compaction Specifications**

Parameter	Cohesive Fill	Non-Cohesive Fill
Fill layer thickness (loose measurement):		
• Within 1.5m of the rear of retaining walls	0.2m	0.2m
• Elsewhere	0.3m	0.3m
Density:		
• Beneath Pavements	≥ 95% Std	≥ 70% ID
• Beneath Structures	≥ 98% Std	≥ 80% ID
• Upper 150mm of subgrade	≥ 100% Std	≥ 80% ID
Moisture content during compaction	± 2% of optimum	Moist but not wet

- The subgrade for concrete footing slab is likely to be on soft foundation given the proximity to the Creek. However, the concrete slab is to be supported by the piles to rock and we assume that the lift base slab does not require the subgrade to provide support. Notwithstanding, some subgrade preparation will be required to facilitate construction, and we provide the following recommendations:
  - Strip existing fill and topsoil. Remove unsuitable materials from the Site (e.g., material containing deleterious matter). Stockpile remainder for re-use as landscaping material or remove from site.
  - Excavate soils to design subgrade level, stockpiling for re-use as engineered fill or remove to spoil.
  - Inspect the subgrade and where soft soils are exposed that are unsuitable for forming the lift base, the subgrade should be over-excavated a further depth of 0.3m and replaced with approved granular fill placed after spreading Bidim A34 geofabric.

## 6. Limitations

In addition to the limitations inherent in site investigations (refer to the attached Information Sheets), it must be pointed out that the recommendations in this report are based on assessed subsurface conditions from limited observations.

This report and details for the proposed development should be submitted to relevant regulatory authorities that have an interest in the property (e.g. Department of Planning) or are responsible for services that may be within or adjacent to the site for their review.

Asset accepts no liability where our recommendations are not followed or are only partially followed. The document "Important Information about your Geotechnical Report" in Appendix A provides additional information about the uses and limitations of this report.



Please do not hesitate to contact the undersigned if you have any questions regarding this report or if you require further assistance.

For and on behalf of  
**AssetGeoEnviro**



**Mark Bartel**  
BE, MEngSc, GMQ, CPEng, RPEQ/NER(Civil), DEP/PRE (NSW)  
Managing Director | Senior Principal Geotechnical Engineer

Encl: Site Photos  
Important Information about your Geotechnical Report  
Department of Planning & Environment Form 4

## Document Control

### Distribution Register

Copy	Media	Recipient	Location
1	Secure PDF	Sophie Ballinger	Vail Resort
2	Secure PDF	Mark Bartel	Asset Geotechnical Engineering

### Document Status

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0	Initial issue	12 September 2024	AM	MAB	MAB



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## Site Photos



**Photo 1 – view of Lift Site Source: Vail Resort**





**Photo 2 – View looking towards lift site from stairs. Source: Vail Resort**



**Photo 3 – Overall Panoramic view. Source: Vail Resort**



### Scope of Services

The geotechnical report ("the report") has been prepared in accordance with the scope of services as set out in the contract, or as otherwise agreed, between the Client and Asset Geotechnical Engineering Pty Ltd ("Asset"), for the specific site investigated. The scope of work may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

The report should not be used if there have been changes to the project, without first consulting with Asset to assess if the report's recommendations are still valid. Asset does not accept responsibility for problems that occur due to project changes if they are not consulted.

### Reliance on Data

Asset has relied on data provided by the Client and other individuals and organizations, to prepare the report. Such data may include surveys, analyses, designs, maps, and plans. Asset has not verified the accuracy or completeness of the data except as stated in the report. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations ("conclusions") are based in whole or part on the data, Asset will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented, or otherwise not fully disclosed to Asset.

### Geotechnical Engineering

Geotechnical engineering is based extensively on judgment and opinion. It is far less exact than other engineering disciplines. Geotechnical engineering reports are prepared for a specific client, for a specific project and to meet specific needs, and may not be adequate for other clients or other purposes (e.g., a report prepared for a consulting civil engineer may not be adequate for a construction contractor). The report should not be used for other than its intended purpose without seeking additional geotechnical advice. Also, unless further geotechnical advice is obtained, the report cannot be used where the nature and/or details of the proposed development are changed.

### Limitations of Site Investigation

The investigation program undertaken is a professional estimate of the scope of investigation required to provide a general profile of subsurface conditions. The data derived from the site investigation program and subsequent laboratory testing are extrapolated across the site to form an inferred geological model, and an engineering opinion is rendered about overall subsurface conditions and their likely behavior regarding the proposed development. Despite investigation, the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies.

The engineering logs are the subjective interpretation of subsurface conditions at a particular location and time, made by trained personnel. The actual interface between materials may be more gradual or abrupt than a report indicates.

Therefore, the recommendations in the report can only be regarded as preliminary. Asset should be retained during the project implementation to assess if the report's recommendations are valid and whether changes should be considered as the project proceeds.

### Subsurface Conditions are Time Dependent

Subsurface conditions can be modified by changing natural forces or man-made influences. The report is based on conditions that existed at the time of subsurface exploration. Construction operations adjacent to the site, and natural events such as floods, or ground water

fluctuations, may also affect subsurface conditions, and thus the continuing adequacy of a geotechnical report. Asset should be kept apprised of any such events and should be consulted to determine if any additional tests are necessary.

### Verification of Site Conditions

Where ground conditions encountered at the site differ significantly from those anticipated in the report, either due to natural variability of subsurface conditions or construction activities, it is a condition of the report that Asset be notified of any variations and be provided with an opportunity to review the recommendations of this report. Recognition of change of soil and rock conditions requires experience, and it is recommended that a suitably experienced geotechnical engineer be engaged to visit the site with sufficient frequency to detect if conditions have changed significantly.

### Reproduction of Reports

This report is the subject of copyright and shall not be reproduced either totally or in part without the express permission of this Company. Where information from the accompanying report is to be included in contract documents or engineering specification for the project, the entire report should be included to minimize the likelihood of misinterpretation from logs.

### Report for Benefit of Client

The report has been prepared for the benefit of the Client and no other party. Asset assumes no responsibility and will not be liable to any other person or organization for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organization arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of Asset or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own inquiries and obtain independent advice in relation to such matters.

### Data Must Not Be Separated from The Report

The report presents the site assessment and must not be copied in part or altered in any way.

Logs, figures, drawings, test results etc. included in our reports are developed by professionals based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These data should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

### Report Recommendations not Followed

Where the recommendations of the report are not followed or are only partially followed, there may be significant implications for the project (e.g., commercial loss, property loss or damage, personal injury, or loss of life). Consult Asset if you are not intending to follow all the report recommendations, to assess what the implications could be. Asset does not accept responsibility where the report recommendations have not been followed or have only been partially followed.

### Other Limitations

Asset will not be liable to update or revise the report to consider any events or emergent circumstances or fact occurring or becoming apparent after the date of the report.



## 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
Mark	Bartel

OF

Company/organisation

Asset Geotechnical Engineering Pty Ltd ( trading as AssetGeoEnviro)

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

Proposed Accessible Lift at Perisher Centre, Perisher NSW

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

(List of documentation reviewed)

Structural Plans ( Prepared by: Coot Consulting Engineers; ref: Proposed Ski Centre Lift: Dog No: S01, S02, S03, S04, S05, S06, S07: dated 26/08/2024)

Architectural Plans (prepared by: DJRD Architects; project no: 22\_431; drg nos: A1.00D, A1.01C, A1.02D, A1.03D, A2.00D, dated: 29 August 2024; drg no A6.00B dated: 24 October 2023).

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.

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

Mark Bartel

Chartered professional status

CPEng 35641 NER (Civil)

Name

Mark Bartel

Date

12 September 2024

## 3. Contact details

### Alpine Resorts Team

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