Our ref: 7471-R1 Rev2 14 September 2024



Suite 2.06 / 56 Delhi Road North Ryde NSW 2113 02 9878 6005 assetgeoenviro.com.au

Kosciuszko Thredbo Pty Ltd 1 Friday Drive Thredbo NSW 2625

Attention: Jocelyn Best

Dear Jocelyn,

Proposed Playground Upgrade, Thredbo Village NSW Geotechnical Assessment

1. Introduction

This report presents the results of a geotechnical assessment for Proposed Playground Upgrade at Thredbo Village NSW (the Site). The assessment was commissioned by Zac Mckenzie of Kosciuszko Thredbo Pty Ltd. The work was carried out in accordance with the proposal by AssetGeoEnviro (Asset) dated 3 February 2024, reference 7471-P1. This report is updated for the latest development plan comprising the following updated scope.

Playground: The design remains largely the same, with two slides now placed adjacent to each other and minor alignment adjustments. The highest point of the fort is now 1.8 meters, compared to 1.5 meters in previous plans.

Plaza: The grassed plaza area between the skate park and pump track will be paved.

Pump track: The existing pump track (approximately 850 m²) will be demolished and rebuilt in the same location with a slightly larger footprint (approximately 1,000 m²). Bermed features reach up to 1.3 meters in height, and the entire surface will be asphalted. The current emergency access near Thyne Reid Drive will be removed, with a new emergency access and a boulder gravity retaining wall approximately 1 meter high proposed.

Water main upgrade: The water main along the playground will be decommissioned and replaced with a 200mm welded uPVC pipe. The existing valve assembly on the southern section of the connecting main will be removed and replaced with a 1.5 meter section of 100 mm uPVC, connected by two Gibault fittings.

Documents supplied to us for this investigation comprised:

- Concept Plan #4 Nature Play Space, Thredbo Village Playground, undated, unreferenced (attached).
- Fort Detail Plan, prepared by Edible Kids Gardens, Play space upgrade in Thredbo, June 2024.
- Site Plan and Service Plan, prepared by Thredbo Pty Ltd, Project number: DA 6877 Mod2: Date: 18 June 2024.



- Demolition Plan, prepared by Thredbo Pty Ltd, Thredbo Playground Upgrade, 30 June 2024.
- Cross section Plan, prepared by Thredbo Pty Itd, Water main replacement trench 17 July 2024.
- Structural Plans (preliminary) for A-Frame Log Swing Set, prepared by: Erwin Structural Engineering, unreferenced, undated.

We understand that the project involves redevelopment of the existing playground with upgrade in water mains running within the western part of the Thredbo Village, with some minor excavation planned in the southern part and western part for water main trench. The site appears to be outside the "G" area as per Department of Infrastructure, Planning and Natural Resources "Geotechnical Policy – Kosciuszko Alpine Resorts" and is also expected to be of minor impact.

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.
- Visual observations of surface features.
- 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 flanking the north-easterly flowing Thredbo River, with ground slopes over the land flanking the river generally ranging from 10° to 30° and some locally steeper sections, and more gentle slopes over the river shoulders. Numerous drainage depressions and watercourses flow towards the river, with some of the persistent watercourses to the north of the river carved several metres into the underlying granite bedrock. Side slopes to creeks and watercourses are typically steeper at 20 to 35°, and typically include numerous granite boulders and cobbles.

The 1:250,000 Tallangatta Geological Map indicates the site is underlain by Silurian aged intrusive granite.

4. Site Observation

The proposed playground, adjacent plaza and pump track upgrade is understood to occupy virtually the same footprint as the existing (shown in Photos 1, 2, 4,5, and 6).

The ground surface slopes gently to the north-west at about 5° reducing to less than about 3°. Existing development for the playground area includes various playground equipment and ground surfacing with mulch, flanked by grassed area within a fenced enclosure. A large granite boulder is located in the north-



eastern part and is to remain as part of the development. Car parking areas are located to the north and west of the playground. Friday Drive is located to the north. Large gum trees are located to the east and south.

The existing plaza is located north of the pump track and primarily consists of landscaped grass, with a restroom to the south and seating benches to the east and west. A utilities distribution board and a rubbish bin are also present in the area.

The pump track is situated east of the existing playground, bordered by the village green to the west, an emergency access path to the south, a walking track to the east, and the plaza to the north. It features an undulating surface forming a wavy path, with some rock boulders observed around its perimeter.

The existing water main is located north of Thyne Reid Drive, on the flat surface of the village green. To the west of the water main, there is a play court. The emergency exit is situated south of the pump track, connected to Thyne Reid Drive, and is paved with asphalt.

There are no major structures located in the vicinity of the development.

It is possible that historic development of the site has involved some filling, more likely within the southern part of the site where the slightly steeper slope is observed, which flanks the level grassed field.

5. Discussions and Recommendations

The proposed work involves minor excavation, about 1m deep in the southern part of the site for the water main and valve assembly trenches. The water main trench will be approximately $0.6m \times 1.0m$, while the valve assembly trench will be $2m \times 2.5m \times 1.5m$ deep, with a total disturbance area of approximately $31m^2$. Additionally, minor excavation and shallow pile holes up to about 1m depth for the playground equipment footings are anticipated. Filling of up to about 1.3m depth is anticipated.

The proposed works will have 'minimal or no geotechnical impact' on the site, based on the generally relatively shallow depths of excavation required, 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, we expect that due to likely previous site disturbance, the site is Class 'P', in accordance with AS2870-2011 'Residential slabs and footings'.
- 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 1m depth may be cut vertical in clayey soils, and nominally 1H:1V in sands and gravels. Deeper temporary excavations up to about 2.5m depth should be benched / battered at no steeper than 1.5H:1V.
- Permanent excavations should be formed no steeper than 2H:1V and should be provided with erosion protection.



• Filling should be placed in horizontal layers over prepared subgrade and compact as per Table 1. We consider the pump track as the pavement structure as no structural component is planned over it and entire surface is proposed to be asphalted.

Parameter	Cohesive Fill	Non-Cohesive Fill
Fill layer thickness (loose measurement):Within 1.5m of the rear of retaining wallsElsewhere	0.2m 0.3m	0.2m 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

Table 1 – Compaction Specifications

- Subgrade for earthworks, pavements, slab-on-ground construction, and minor structures should be prepared as follows:
 - 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.
 - Compact the upper 150mm depth to a dry density ratio (AS1289.5.4.1–2007) not less than 100% Standard.
 - Areas which show visible heave under compaction equipment should be over-excavated a further 0.3m and replaced with approved fill compacted to a dry density ratio not less than 100%.
- The supplied plans indicate that poles for footings for playground equipment need to be socketed into soils with an allowable bearing capacity of at least 100kPa. This would be satisfied if the soils comprise stiff or better clays or medium dense or better granular soils. Further advice must be sought if poorer quality soils are encountered, or if the required socket cannot be achieved due to refusal of excavation equipment.

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

Mark Bartel

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

Encl: Photos

Important Information about your Geotechnical Report Supplied Plans Department of Planning & Environment Form 4

Document Control

Distribution Register

Сору	Media	Recipient	Location
1	Secure PDF	Jocelyn Best	Kosciuszko Thredbo Pty Ltd
2	Secure PDF	Mark Bartel	Asset Geotechnical Engineering

Document Status

Rev	Revision Details	Date	Author	Reviewer	Approver
0	Initial issue	28 March 2024	MAB		MAB
1	Updated scope	13 August 2024	AM	MAB	MAB
2	Comment addressed	14 September 2024	AM	MAB	MAB



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ISO 9001:2015 ISO 14001:2015 ISO 45001:2018 AS/NZS 4801:2001

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Site Photos



Photo 1: View of northern side of existing playground, looking northeast.





Photo 2: View of existing playground, looking southeast.





Photo 3: View of existing playground, looking south.



Photo 4: Existing Plaza Area, looking south. Source: Kosciuszko Thredbo Pty Ltd.





Photo 5: Existing Pump track Area, looking west. Source: Kosciuszko Thredbo Pty Ltd.



Photo 6: Existing Water Main and Emergency access area, looking east. Source: Kosciuszko Thredbo Pty Ltd.

Important Information about your Geotechnical Report



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 appraised 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.



	Edible Kids Gardens 1 Forest Lane, Bowral, NSW ABN 95606307046 Stephen Webb, Landscape Architect Phone 0401 534 476 Project Name: Playspace Upgrade in Thredbo	Project Name: Playspace Upgrade in Thredbo	Drawing Title: Accessible Play Tower Documentation		Date:
Edble AA Kids Gardens			Version: 2	Scale: 1:50	Sheet



No: 1 of 3





Date: June 2024 **Sheet No:** 2 of 3





Drawing Title: Detail				
Version: 1	Scale: 1:50	Sł		

ate: June 2024

heet No: 3 of 3



NOT FOR CONSTRUCTION





Overlapping logs & log slalom as balancing challenge in area of natural lawn



Entry gate



 Basket swing set
 with impact rubber/ wetpour rubber
 and soft fall mulch



Bunds to remain until exposed areas of soil are rehabilitated.

Existing Seesaw Swing, Small Play Tower and Large Play Tower will be removed and disposed of including footings.

Existing swing set to remain on site.

Hardwood edging and soft fall (mulch) to be removed and replaced with equivalent material.

Scale: 1:350





Barricaded parking and delivery/ laydown area for contractors.

> Site fencing to remain until completion of construction. Pedestrians can be diverted to other access to village green.

And a start she was to be

Street furniture to be removed during construction, refurbished and reinstalled.

Drainage and sediment controls to be installed as per SEMP and demolition plan.

_egend

Site Boundary

Demolition Area

Playground Fence

Earthen Bund

SiteParking

Existing perimeter fence & footings to be removed. New fence to be extended by 1m to the southwest, to be parallel with existing village green footpath.

Site Demolition Plan

Project: Thredbo Playground Upgrade

Revision: 0

Date: 30/06/2024

Produced By: ZM

Legend

Wheelchair accessible "tree house" fort with connected platforms, slides (1.2m and 1.8m high), cargo climbing net, log "stairs" and fireman's pole



- a Log 'stairs'
- **b** Fireman's pole
- Cargo Net
- d Single Slide
- Double Slide



2 3 Overlapping logs & log slalom as balancing challenge in area of natural lawn



Basket swing set

with impact rubber/wetpour rubber and soft fall mulch



Existing Gum trees +0.3m 6 +0.8m +0.6m +1.5m b Natural grass Concrete Pathway Entry Gate Existing swing set Existing giant boulder

(5) Ramped pathway of concrete and/ or rigid steel mesh

6 New sleeper retaining wall

	Edible Kids Gardens 1 Forest Lane, Bowral, NSW 2576 ABN 95606307046	Project Name Nature Play Playground Design in Thredbo	nredbo	
TIF	Stephen Webb, Landscape Architect Phone 0401 534 476	Drawing Title: Concept Plan	Scale: 1:100 @ A3	Date:



ess

edbo Village playground

6.2024

Page: 1/1 page







Geotechnical Policy

Kosciuszko Alpine Resorts

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 \Box 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

l, Mr 🗙	Ms 🗌	Mrs 🗌	Dr 🗌	Other		
First Na	me				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 Playground Upgrade, Thredbo Village NSW

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

(List of documentation reviewed)

Concept Plan #4 – Nature Play Space, Thredbo Village Playground, undated, unreferenced.

Accessible Play Tower Documentation, by Edible Kids Gardens, Version 2, June 2024, 3 sheets

Nature Play Playground Design, Concept Design by Edible Kids Gardens, June 2024

Site Plan by Kosciuszko Thredbo Pty Ltd, DA 6877 MOD 2, Rev B, dated 18/07/2024

Site Demolition Plan by Kosciuszko Thredbo Pty Ltd, Thredbo Playground Upgrade, Rev 0, dated 30/6/2024

Services Plan by Kosciuszko Thredbo Pty Ltd, DA 6877 MOD 2, Rev B, dated 18/07/2024

Water Main Replacement Trench Cross Section by Kosciuszko Thredbo Pty Ltd, DA 6877 MOD 2, Rev 0, dated 12/07/2024

I have determined that;

- It 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	Chartered professional status
Mark Bartel	CPEng 35641 NER (Civil)
Name	Date
Mark Bartel	14 September 2024

3. Contact details

Alpine Resorts Team

Shop 5A, 19 Snowy River Avenue P O Box 36, JINDABYNE NSW 2627 Telephone: 02 6456 1733 Facsimile: 02 6456 1736 Email: alpineresorts@planning.nsw.gov.au