NSW GOVERNMENT | Planning & Environment

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 ☐ 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: AGI

Family Name: ZENON

OF

Company/organisation: JK GEOTECHNICS

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

^reviewed the report, Ref: 27811AH18rpt, dated 19/1/17, prepared by Adrian Hulskamp of JK Geotechnics

PROPOSED FRONT VALLEY EARTHWORKS, MITCHELL T-BAR LINE + CARPET-Y UNLOAD

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

(List of documentation reviewed)

- Statement of Environmental Effects report, dated December 2016, prepared by Tanya Bishop of Perisher Blue Pty Ltd.

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

Chartered professional status

CP Eng (No. 2132971), FIE Aust

Name

Agi Zenon

Date

19/1/17

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

REPORT

TO
PERISHER BLUE PTY LTD

ON
GEOTECHNICAL ASSESSMENT

FOR
PROPOSED FRONT VALLEY EARTHWORKS, MITCHELL T-BAR LINE AND CARPET 4 UNLOAD

AT
PERISHER SKI RESORT, PERISHER VALLEY, NSW

19 January 2017
Ref: 27811RH18rpt

JK Geotechnics
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Date: 19 January 2017
Report No: 27811RH18rpt
Revision No: 0

Report prepared by:

Adrian Hulskamp
Senior Associate | Geotechnical Engineer

Report reviewed by:

Agi Zenon
Principal | Geotechnical Engineer

For and on behalf of
JK GEOTECHNICS
PO Box 976
NORTH RYDE BC NSW 1670

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1 INTRODUCTION

This report presents the results of a geotechnical assessment for the proposed Front Valley earthworks, Mitchell T-bar line and Carpet 4 Unload at Perisher Ski Resort, Perisher Valley, NSW. The assessment was commissioned by Mr Andrew Kennedy of Perisher Blue Pty Ltd (PB).

Based on the supplied Statement of Environmental Effects (SEE) report prepared by Tanya Bishop of PB dated January 2017, we understand that the proposed works will comprise the following:

1. Placement and compaction of a fill embankment between Towers 1 & 2 of Mitchell T-bar over a footprint 50m long by 6m wide. The fill will be placed to a maximum depth of 1.5m above existing grade. The north-western, south-eastern and south-western sides of the fill will be battered to a gentle slope to match existing levels. The fill on its north-eastern side will be supported by large rocks i.e. the rocks will act as a retaining structure.
2. A fauna crossing will be constructed towards the south-eastern end and will extend through the fill embankment via 225mm pipe.
3. Minor regrading of the existing ground surface at the north-western end of Ski Carpet 4 over a footprint 7m long by 7m wide.

We understand that the main purpose of the fill is to reduce the amount of snow that is required in the area during the ski season. The proposed works are shown on the attached Figure 1, which is based on the figure presented in Appendix B of the supplied SEE report.

The purpose of the geotechnical assessment was to review the supplied SEE report and to determine whether the proposed works present minimal or no geotechnical impact on the site, and if so, to complete a signed Form 4 – Minimal Impact Certification. Based on our assessment, we would determine whether a further geotechnical report, which includes a risk assessment, would be required.

This report has been prepared in accordance with the requirements of the Geotechnical Policy for Kosciuszko Alpine Resorts (2003).

2 ASSESSMENT PROCEDURE

The assessment included a walkover inspection of the topographic, surface drainage and geological conditions of the site and its immediate environs by our Senior Associate Geotechnical Engineer (Adrian Hulskamp) on 15 November 2016, as well as a review of the supplied SEE report.

A subsurface investigation, geotechnical laboratory testing and a contamination screen of site soils and groundwater were outside the agreed scope of this assessment.

3 SITE OBSERVATIONS

The site is located towards the toe of a south facing hillside, which grades between approximately 5° and 15°.

At the time of our walkover inspection, the ground surface over the footprint of the proposed fill embankment was uneven and mostly grass covered. There appeared to have been fill placed in the area to a maximum height of approximately 1m where the new fill is proposed. A relatively flat 'bog' area was located to the north-west of the proposed fill embankment footprint. Refer to Plate 1 below.

Plate 1: View looking upslope to the north-west showing area of proposed fill embankment.

We did not observe any obvious signs of hillside instability, such as tension cracks, slumping etc. Further, we did not observe any obvious signs of instability of the existing fill batters.

The drainage conditions across the hillside were generally good, apart from the adjacent 'bog' area.

4 COMMENTS AND RECOMMENDATIONS

Based on our review of the supplied SEE report, the relatively shallow depth of fill to be placed and the gentle ground slopes over the footprint of the proposed fill embankment, we consider that the proposed works will constitute 'minimal or no geotechnical impact' on the site. Therefore, we consider that a geotechnical report prepared in accordance with the Geotechnical Policy for Kosciuszko Alpine Resorts (2003) is not required. Our current report is preceded by the completed Form 4 – Minimal Impact Certification.

As the site appears to be underlain by some existing fill which is expected to be 'uncontrolled', the site is Class 'P', in accordance with AS2870-2011 'Residential slabs and footings'.

We recommend that the following advice be taken into account during the design and construction phase:

Earthworks

- Initially, all grass, vegetation, root affected soils and any topsoil should be stripped from the footprint of the proposed fill embankment. These materials must be disposed appropriately off site, or alternatively used for landscaping purposes within the ski resort.
- Following the above, the exposed subgrade should be inspected by a geotechnical engineer to assess whether proof rolling of the subgrade is warranted, prior to filling. The objective of the proof rolling is to assist with the detection of any 'soft' or 'unstable' subgrade.
- The fill should be placed as engineered fill so as to reduce the potential for the fill to erode after it has been placed due to surface water runoff and to reduce post construction settlements. The fill material should comprise a high quality granular material, such as weathered granite or crushed imported granite sourced from the ski resort. The fill material must be 'clean', free of organic matter and have a particle size no greater than 75mm.
- The fill should be compacted in maximum 200mm thick loose layers to achieve a minimum density ratio of 95% of Standard Maximum Dry Density (SMDD). If compaction is carried out using a roller attachment fitted to an excavator or a small roller, then thinner loose layers may need to be placed to achieve sufficient compaction. Further, if the loose layer thickness is less than 200mm, the maximum particle size must reduce to no larger than one third of the loose layer thickness.

- Density tests should be carried out on the fill to assess that sufficient compaction has been achieved. The testing frequency should be as per the requirements of Table 8.1 in AS3798-2007. We recommend at least Level 2 control of fill compaction be adhered to.
- We recommend that the fill extend a horizontal distance of at least 1m beyond the design fill embankment slope (with exception of the north-eastern side where the retaining wall is proposed) so that adequate edge compaction can be achieved. On completion of filling, the excess fill can be trimmed back to form the required batter slopes, which must not be steeper than 1 Vertical (V) in 2 Horizontal (H) in the permanent case.
- The fill batters should be protected from erosion by re-establishing a grass cover, apart from the north-eastern side of the fill embankment which will be supported by large rocks (refer to section below).

Proposed Retaining Wall (Placement of Large Rocks)

We recommend the following for the proposed rock retaining wall:

- The rocks should be founded in competent residual soils of least very stiff strength and/or weathered granite bedrock. The embedment of the rocks must be at least 0.1m into weathered granite bedrock or at least 0.5m into soil. If there is any doubt as to the quality of the foundation material, particularly given the proximity of the 'bog' area to the north-east, then further geotechnical advice should be sought.
- Assuming a maximum retained height of 1.5m and a horizontal backfill surface, the width of the rock retaining wall over its base must be at least 1m and at least 0.5m wide at its crest, provided the face is graded no steeper than 2V in 1H.
- The rock retaining wall should have a free draining backfill material directly behind the rocks and measures taken to provide complete and permanent drainage of the ground behind the wall. Subsurface drains should incorporate a non-woven geotextile fabric (eg. Bidim A34) to act as a filter against subsoil erosion.
- The rocks should comprise sound and durable granite of at least high strength, or other rock approved by the geotechnical engineer.
- The rocks must be placed in such a manner that they are stable, they interlock and are laid on their broadest base.

5 GENERAL COMMENTS

The recommendations presented in this report include specific issues to be addressed during the construction phase of the project. In the event that any of the construction phase recommendations presented in this report are not implemented, the general recommendations may become inapplicable and JK Geotechnics accept no responsibility whatsoever for the performance of the structure where recommendations are not implemented in full and properly tested, inspected and documented.

It is possible that the subsurface soil, rock or groundwater conditions encountered during construction may be found to be different (or may be interpreted to be different) from those expected. Also, we have not had the opportunity to observe surface run-off patterns during heavy rainfall and cannot comment directly on this aspect. If conditions appear to be at variance or cause concern for any reason, then we recommend that you immediately contact this office.

This report provides advice on geotechnical aspects for the proposed civil and structural design. As part of the documentation stage of this project, Contract Documents and Specifications may be prepared based on our report. However, there may be design features we are not aware of or have not commented on for a variety of reasons. The designers should satisfy themselves that all the necessary advice has been obtained. If required, we could be commissioned to review the geotechnical aspects of contract documents to confirm the intent of our recommendations has been correctly implemented.

This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose. If there is any change in the proposed development described in this report then all recommendations should be reviewed. Copyright in this report is the property of JK Geotechnics. We have used a degree of care, skill and diligence normally exercised by consulting engineers in similar circumstances and locality. No other warranty expressed or implied is made or intended. Subject to payment of all fees due for the assessment, the client alone shall have a licence to use this report. The report shall not be reproduced except in full.

Appendix B -
Site Environmental Management Plan (SEMP)

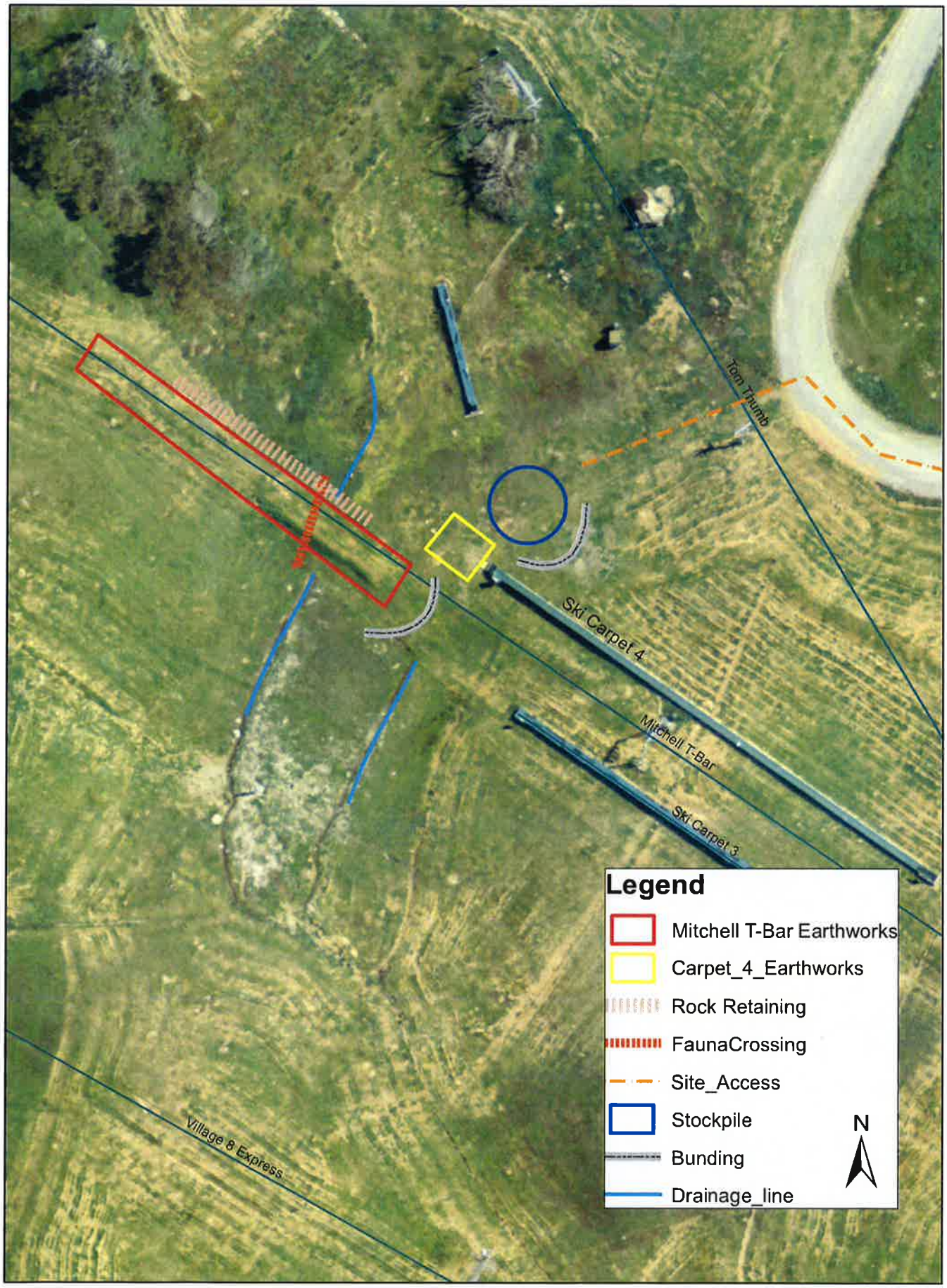

FIGURE 1 SITE LOCATION PLAN