assetgeoenviro

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

Our ref: 6543-G1
13 September 2021

EVT / Kosciuszko Thredbo Pty Ltd
By email: peter_fleming@evt.com

Attention: Peter Fleming

Dear Peter,

NSW GOVERNMENT Planning, Industry & Environment

Issued under the Environmental Planning and Assessment Act 1979

Approved Application No DA 21/13831

Granted on the 27 January 2022

Signed Mark Brown

Sheet No 8 of 9

Proposed Cruiser Green Mountain Bike Trail, Thredbo NSW Geotechnical Assessment

1. Introduction

As requested by Mr Peter Fleming of EVT / Kosciuszko Thredbo Pty Ltd (KT), a Senior Principal Geotechnical Engineer (Mark Bartel) inspected the site on behalf of AssetGeoEnviro (Asset) on 21 May 2021. The site inspection consisted of site walkover observations, in the company of Mr Peter Fleming.

Documents supplied to us for this assessment are attached and comprised:

- Site Plan showing Cruiser Green Alignment and Platforms (unreferenced, undated).
- Engineering Plans of Proposed Mountain Bike Off Load Extension at Cruiser Top Station (prepared by: Practical Engineering Solutions Pty Ltd; drawing number: 20210514A; dated: 21 June 2021).

It is understood that the development comprises a bike off load extension to the Cruiser Top Station, and formation of a Mountain Bike Trail (MBT) that winds downhill in a southerly and south-westerly direction. Two platforms are proposed over intermittent watercourses.

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

2. Regional Topography & Geology

The regional topography comprises moderately to steeply sloping terrain flanking the north-easterly flowing Thredbo River, with ground slopes generally ranging from 10º to 30º and some locally steeper sections on the land flanking the river, and more gentle slopes over the river shoulders. Numerous drainage depressions and watercourses flow towards the river, with some of the persistent watercourses carved several metres into the underlying granite bedrock.

The site lies within the G line as defined in DIPNR's "Geotechnical Policy – Kosciuszko Alpine Resorts", November 2003.

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

Cruiser Top Station is located about 2.5km north of Thredbo Village, as shown in Figure 1. The proposed alignment of the Cruiser Green MBT is shown in the attached Figure 2.

3. Site inspection

The site was inspected on 21st May 2021. The existing Cruiser Top Station is shown in Photos 1 and 2. A gently sloping concrete ramp provides for offloading of skiers. It is proposed to lay prefabricated segments for an extension to allow more room for mountain bike offloading. Details are attached.

Intermittent creek crossings are proposed at two locations. Typical photos of the terrain for the creek crossing are shown in Photos 3 and 4. A typical photo of natural terrain is shown in Photo 5.

The subsurface conditions are likely to comprise a mixture of slope wash and colluvial soils derived from weathered granite, overlying residual soils and variably weathered granite. Some minor filling (less than about 0.5m deep) may also be present for previous minor cut-to-fill earthworks for tracks in the vicinity.

Numerous scattered granite boulders are present across the landform.

Groundwater conditions are unknown, but it is expected that intermittent groundwater would be present within the soils overlying the weathered granite.

Surface drainage is typically by overland flow into intermittent creeks.

4. Conclusions & Recommendations

The off-loading ramp extension does not present a geotechnical constraint to the proposed development. The relatively minor earthworks for the trails, and construction of the platforms across the intermittent creeks would not be expected to present a geotechnical constraint to the proposed development. However, the following recommendations should be followed to minimise the geotechnical risks:

1. Footings for platforms over intermittent creeks should be taken into the decomposed granite (dense medium to coarse sand) and may be designed for a maximum allowable bearing pressure of 200 kPa.

2. Alternatively, additional rocks (boulders) could be placed to provide sufficient surface area to then build a surfacing over the intermittent creeks. Boulders should be placed such that they are laid flat and not exhibit movement under the action of a minimum 3 tonne hydraulic excavator.

3. Rock excavation, where required, should be carried out using relatively low vibration / impact methods such as rock hammering or low-energy explosive charges in drill holes filled with water.

4. If poor subgrade materials (e.g. soft and / or wet soils) are encountered, or significant seepage is encountered which cannot be controlled by diversion drains, a qualified and experienced Geotechnical Engineer should be consulted for further advice.

The suitably completed Form 4 – Minimal Impact Certification - is attached.

5. 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 investigations.

Asset accepts no liability where our recommendations are not followed or are only partially followed. The attached document “Important Information about your Geotechnical Report” 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), APEC IntPE(Aus)
Managing Director | Senior Principal Geotechnical Engineer

Encl: Site Photos
Site Locality (Figure 1)
Site Plan (Figure 2)
Proposed Mountain Bike Off Load Extension at Cruiser Top Station
Form 4 – Minimal Impact Certification
Important Information about your Geotechnical Report

Document Control

Distribution Register

Copy	Media	Recipient	Location
1	Secure PDF	Peter Fleming	EVT / Kosciuszko Thredbo Pty Ltd
2	Secure PDF	Ivan Pasalich	Dabyne Planning
3	Secure PDF	Mark Bartel	Asset Geotechnical Engineering

Document Status

Rev	Revision Details	Author	Reviewer		Approved for Issue		
			Name	Initials	Name	Initials	Date
0	Initial issue	M. Bartel			M. Bartel	MAB	13 September 2021

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

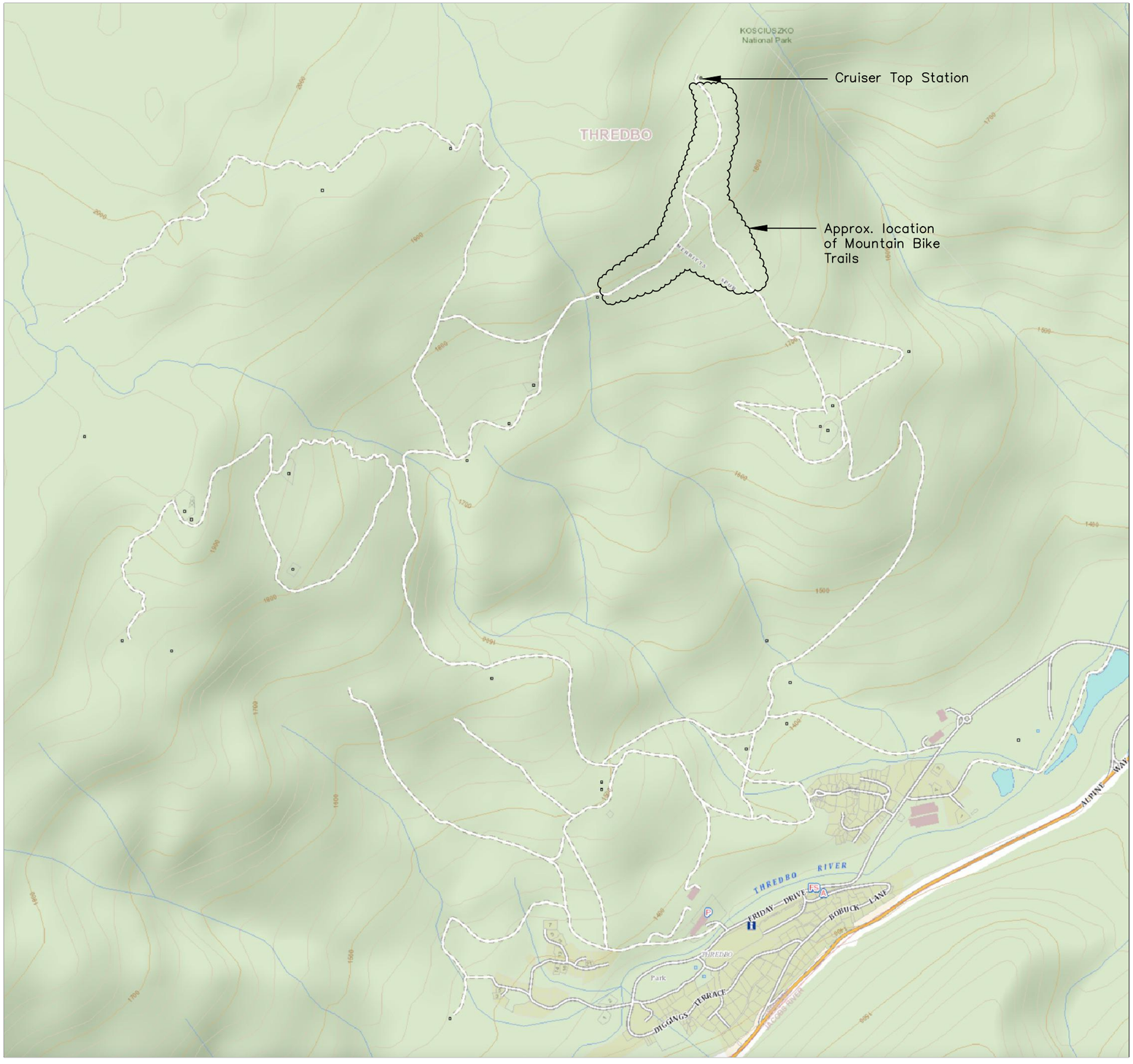
Site Photos

	**Photo 1** End view of off ramp at Cruiser Top Station
	**Photo 2** Oblique view of off ramp at Cruiser Top Station

	**Photo 3** Typical terrain in platform area over watercourse
	**Photo 4** Typical terrain in platform area over watercourse

Photo 5

Typical terrain for MTB trail



Approximate only – subject to detail survey.
Source: SixMaps.
This drawing is used to illustrate site locality only and must not be used for any other purpose. Copyright of source drawing remains with SixMaps.

0 1:12,500 A3 500m

issue	date	description
A	13.9.21	Initial issue

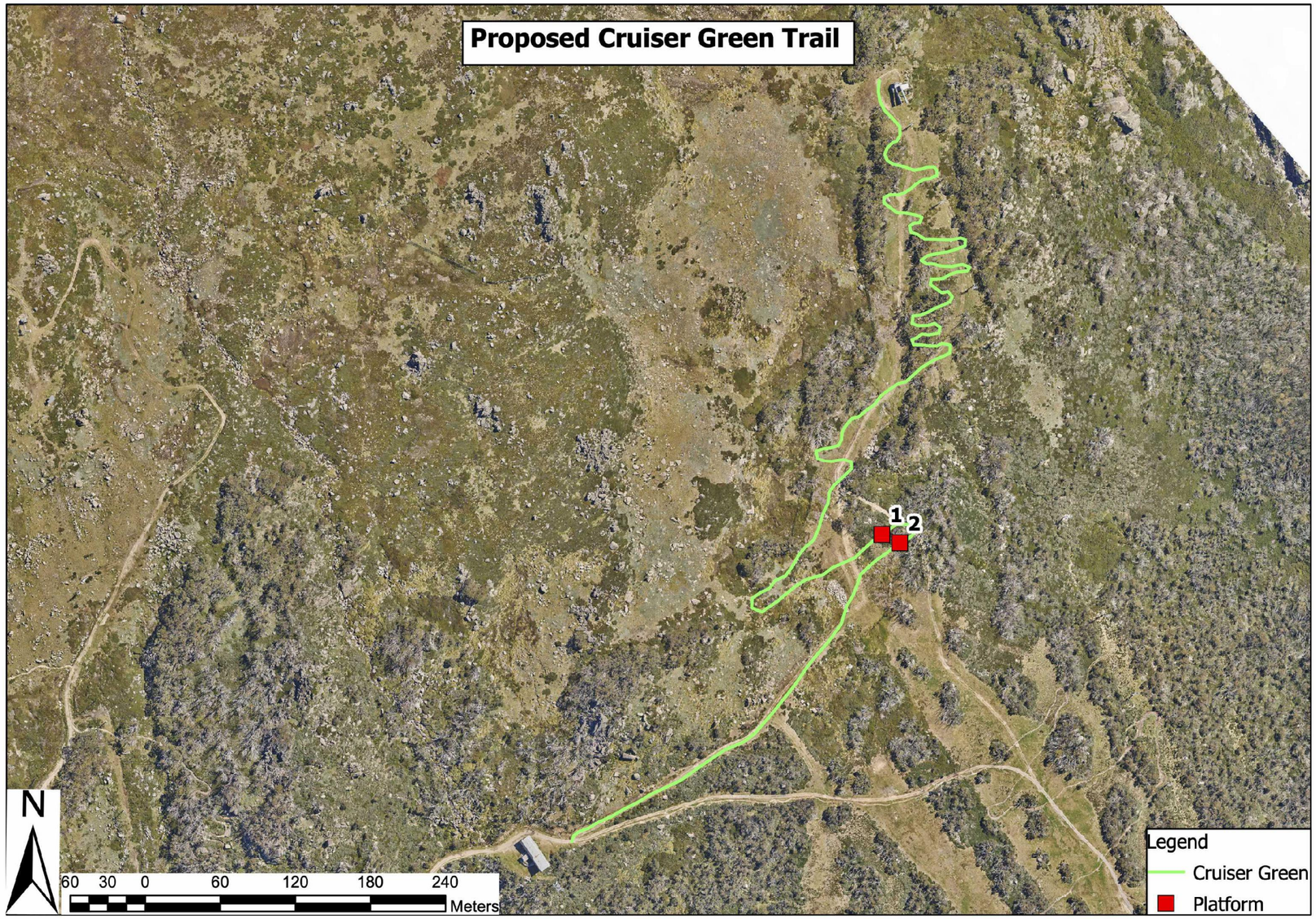
assetgeoenviro
2.06/56 Delhi Rd
North Ryde NSW 2113
t: 02 9878 6005
e: info@assetgeoenviro.com.au

Proposed Cruiser Green & Blue Mountain Bike Trails
Thredbo NSW
for
EVT / Kosciuszko Thredbo Pty Ltd

Site Locality

drawn: MAB
date: 13.9.2021
checked: MAB
scale: 1:12,500 A3

job no.: 6543
fig: 1
issue: A



Approximate only – subject to detail survey.
Source: EVT / Kosciuszko Thredbo Pty Ltd.
This drawing is used to illustrate site layout only and must not be used for any other purpose.

issue	date	description
A	13.9.21	Initial issue

assetgeoenviro
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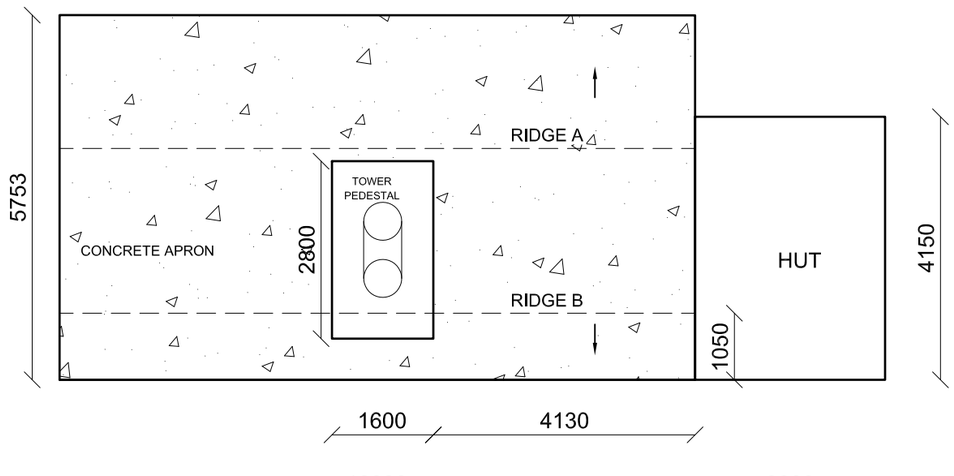
Proposed Cruiser Green Mountain Bike Trail
Thredbo NSW
for
EVT / Kosciuszko Thredbo Pty Ltd

Site Plan

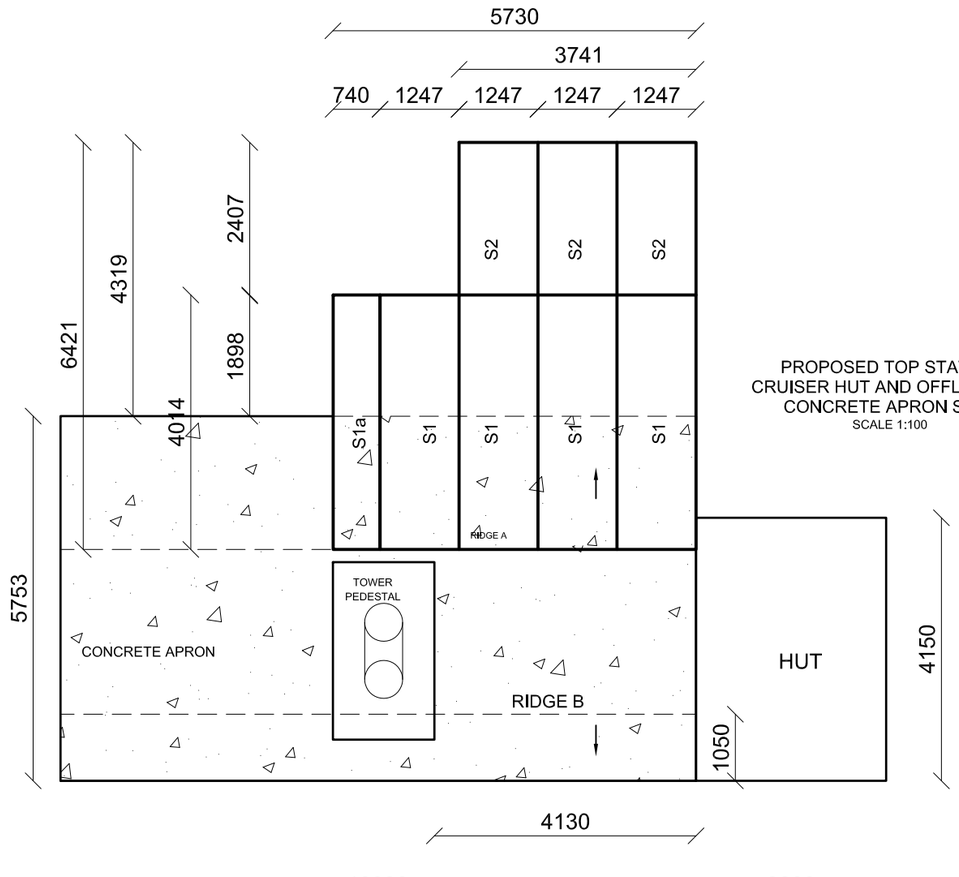
drawn: MAB
date: 13.9.2021
checked: MAB
scale: 1:4,000 A3

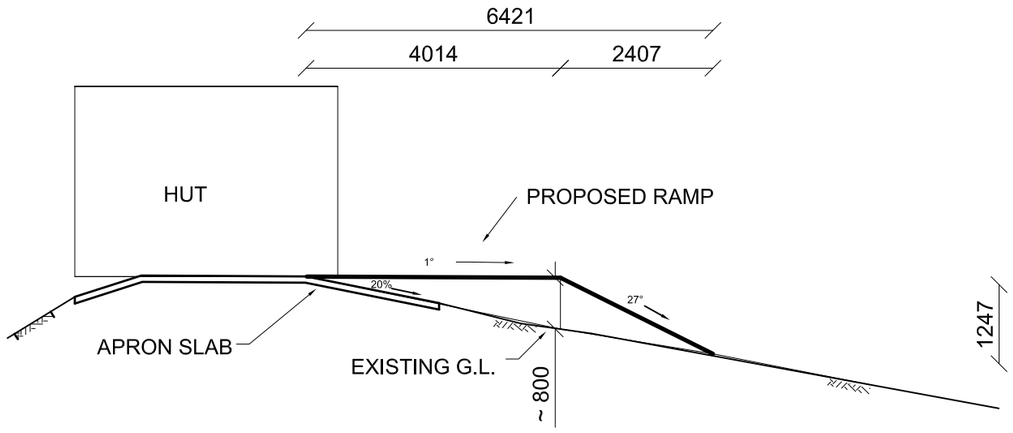
job no.: 6543
fig: 2
issue: A

EXISTING TOP STATION
CRUISER HUT AND OFFLOADING
CONCRETE APRON SLAB
SCALE 1:100

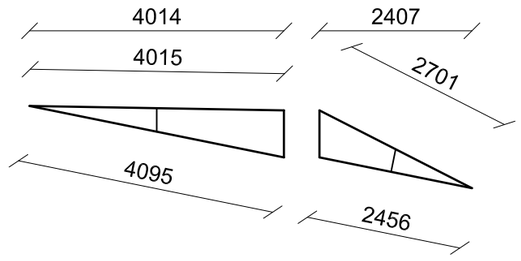


PROPOSED TOP STATION
CRUISER HUT AND OFFLOADING
CONCRETE APRON SLAB
SCALE 1:100



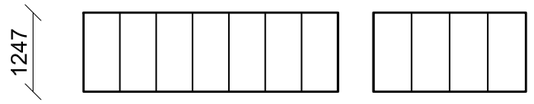


LONG SECTION - PROPOSED RAMP
SCALE 1:100



FOUR SEGMENTS S1: - 1,247 WIDE
& ONE SEGMENT S1a - 740 WIDE

THREE SEGMENTS S2:- 1,247 WIDE



PREFAB RAMP SPECIFICATIONS FOR
4 KPa LOADING
SCALE 1:100

* MAIN STRUCTURAL BEARERS - 65 x 35 x 2.5 RHS or 50 x 50 x 2.0 SHS
* CROSS MEMBERS - JOISTS @ 570 CRS - SUPPORTING MARINE PLY OF FORM PLY OR EQUIVALENT - SAME AS BEARERS - FULLY WELDED TO BEARERS
* VERTICAL PROP REDUCING THE SPAN OF THE RAMP - 40 x 40 x 2.0 or 50 x 50 x 4.0 EQUAL ANGLE FULLY WELDED OT BEARERS
* SEGMENT S1 TO BE BOLTED TO SEGMENT S2 WITH MINIMUM 6 M10 HORISONTAL BOLTS THROUGH 6 mm LUGS
* PIN SEGMENTS TO EARTH WITH STAR PICKETS OR EQUIVALENT THROUGH PREWELDED LUGS. SECURE SEGMENTS TO EXISTING CONCRETE APRON SLABS WITH M10 ANKA SCREWS OR EQUIVALENT. PROVIDE MINIMUM 6 ANCHOR POINTS TO GROUND FOR SEGMENT S1 AND MINIIMUM 4 ANCHOR POINTS FOR SEGMENT S2.
* FINAL DIMENSIONS AND MINIMUM EARTHWORKS TO BE CONFIRMED ON SITE

PRACTICAL ENGINEERING SOLUTIONS P/L
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Structural &
Project Management ENGINEERS

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Cooma NSW 2630
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M: 0402 15 22 16

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Drawing Name:
ENGINEERING REPORT ON PROPOSED MOUNTAIN BIKE OFF LOAD EXTENSION AT CRUIER TOP STATION AT THREDBO NSW

Client:
KOSCIUSZKO THREDBO P/L
C/- PETER FLEMING -
MOUNTAIN MANAGER
THREDBO NSW 2627

Structural Sheet No. S01 of 1

Scale:	1:100
Date:	21.06.2021
Drawing No:	20210514A
	PLAN AND DETAILS
Sheet Size:–	A3
Designed:	O Boaru
Drawn:	O Boaru
Checked:	O Boaru

Approved:

Ovi Boaru MIEAust CPEng

ISSUE	DATE	AMENDMENT
-	-	-

All workmanship and materials to conform with latest edition of the Building Code of Australia and relevant Australian Standards.

The contractor is to confirm all dimensions prior to commencing any works on site.

Refer to specification for other relevant information details.

Geotechnical Policy – Kosciuszko Alpine Resorts
Form 4 – Minimal Impact Certification

Date received: ____/____/____ DA no: _____

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 Assessments Team in Jindabyne for further information. Phone 02 6456 1733.

To complete this form, please place a cross in the boxes ☐ and fill out the white 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

Mark Andrew

Family name

Bartel

OF

Company/organisation

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

Cruiser Green Mountain Bike Trail

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

(List of documentation reviewed)

Proposed Cruiser Green Trail, unreferenced, undated

Proposed Mountain Bike Off Load Extension at Cruiser Top Station, by: Practical Engineering Solutions

drawing number: 20210514A; dated: 21 June 2021

NSW GOVERNMENT | Planning, Industry & Environment

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Sheet No 9 of 9

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 S, subject to recommendations in attached letter

☒ 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.

4. Signatures

Signature

Name

Mark Bartel

Chartered professional status

CPEng (35641) NER

Date

13 September 2021

5. Contact details

Alpine Resorts Assessments team
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PO Box 36 JINDABYNE 2627
t: 02 6456 1733
f: 02 6456 1736
e: alpineresorts_assessments@dipnr.nsw.gov.au