Hotham Heights Lodges

Preliminary Geotechnical Assessment – Lots 27 and 29, Hotplate Drive, Mount Hotham

MFGD Developments Pty Ltd

Reference: 754-MELGE227984.2 AB

22 November 2023

HOTHAM HEIGHTS LODGES

LOTS 27 AND 29, HOTPLATE DRIVE, MOUNT HOTHAM

Preliminary Geotechnical Assessment

Report reference number: 754-MELGE227984.2 AB
22 November 2023

PREPARED FOR

MFGD Developments
Suite 18, 3 Male Street
Brighton VIC 3186
Australia
ANB: 98 643 790 274

PREPARED BY

Tetra Tech Coffey
Level 11, 2 Riverside Quay,
Southbank
VIC 3006 Australia
p: +61 3 9290 7000
f: +61 3 9290 7499
ABN 55 139 460 521

Attention: Mr. Magnus Floden

DOCUMENT AUTHORISATION

We have pleasure in submitting our report for the above project. One electronic copy of the report is provided for your information.

We trust this report meets your current requirements for the above project. If you have any queries related to this report, or require further assistance, please do not hesitate to contact Michael Jamieson or the undersigned.

For and on behalf of Tetra Tech Coffey,

WaiLeung Ng
Associate Geotechnical Engineer

QUALITY INFORMATION

Revision history

Revision	Description	Date	Author	Reviewer	Approver
V0	Geotechnical report	22 Nov 2023	WaiLeung Ng	Hans Mulder	WaiLeung Ng

Distribution

Report Status	No. of copies	Format	Distributed to	Date
V0	1	PDF	Magnus Floden (MFGD Developments Pty Ltd)	22 Nov 2023

CONTENTS

APPENDICES

1. INTRODUCTION

This report presents the results of a preliminary geotechnical assessment carried out by Coffey Services Australia, now Tetra Tech Coffey Pty Ltd (Tetra Tech Coffey) for the proposed four-storey chalet buildings at Lot 27 and Lot 29 located off Hotplate Drive in Mount Hotham. This assessment was commissioned by Mr Magnus Floden of MFGD Developments Pty Ltd (MFGD) and was performed in general accordance with Tetra Tech Coffey proposal 754-MELGE227984.2AA dated 7 September 2023.

Tetra Tech Coffey prepared two geotechnical assessment reports ref. 754-MELGE227984AB and 754-MELGE227984AB Rev 2 previously for 6 land lots including Lot 22, Lot 24, Lot 26, Lot 27, Lot 29 and Lot 31. These assessment reports were provided to Incore Developments Pty Ltd on 19 April 2019 and 26 May 2021 respectively. It is understood that the buildings at Lot 22, Lot 24 and Lot 26 have been constructed and that Lot 31 is still vacant. Tetra Tech Coffey was subsequently requested by MFGD (new client) to update the report based on latest layout plans of Lot 27 and Lot 29.

This report has been revised to incorporate new client name. The results from this geotechnical assessment will assist with town planning and inform detailed design for the proposed development.

2. AIMS

The aims of this geotechnical assessment were to provide comments and recommendations on the following items:

- Subsurface and groundwater conditions;
- A risk assessment of the potential landslide hazards was required for planning approval as per Schedule 1 of the Erosion Management Overlay in the Alpine Planning Scheme (2004), Victoria;
- Excavation conditions at the site;
- Suitable retaining wall systems;
- Suitability of excavated material for use as engineered fill, and provide recommendations on the construction of engineered fill, including subgrade preparation, layer thickness, moisture conditioning and compaction requirements;
- Suitable shallow foundation systems including likely founding levels and allowable bearing pressures; and
- Site classification in accordance with AS2870-2011 “Residential Slabs and Footings”.

3. SITE CONDITIONS

A review was carried out on regional geology, previous geotechnical investigation reports for nearby sites, and the SMEC report “Alpine Resorts Geotechnical Stability Review – Mt Hotham”, dated 1999 prior to conducting fieldwork.

3.1 AVAILABLE LANDSLIDE HAZARD ZONING MAP

SMEC completed a stability review and hazard assessment of sites in Alpine areas in 1999. The results of the assessment for these sites have been shown as a Landslide Hazard Zoning Map as partially presented in Figure 3. Along Hotplate Drive, the assessed hazard rating for landside ranged as ‘high’.

3.2 SCOPE OF WORKS

The fieldwork was undertaken on 28 and 29 March 2019. The scope of fieldwork comprised:

- Drilling of seven boreholes using hand auger (denoted BH01 to BH07) to effective penetration refusal;
- Undertaking a Dynamic Cone Penetrometer (DCP) test adjacent to each borehole to assist in assessing soil strength and probable depth to rock;
- Sampling the subsurface materials for visual classification and laboratory testing; and
- A site walkover comprising surface observations and geological assessments by an engineering geologist.

Hand auger boreholes were conducted across the site due to access issues of an excavator and where access was not restricted by underground services or vegetation. The site locality and the approximate locations of the boreholes are shown on Figure 1 and Figure 2.

The fieldwork was undertaken by an engineering geologist from Tetra Tech Coffey who was responsible for logging the materials encountered in the boreholes, conducting DCP tests, and sampling materials. On completion, the boreholes were backfilled with the excavated spoil.

The site photos of the fieldwork are shown in Figure 4 and the engineering logs are provided in Appendix A. The logs also include an approximate surface elevation based on published plans and the approximate coordinates which were obtained from a hand-held GPS unit. The logs are preceded by summary sheets of descriptive terms and symbols used in their preparation.

3.3 LABORATORY TESTING

Upon completion of the fieldwork, the selected soil samples were submitted to a NATA accredited laboratory for the following testing:

- 3 Atterberg Limits (4-point) tests;
- 2 Particle Size Distribution tests; and
- 2 Hydrometer tests.

The results of the laboratory testing are summarised in Section 4.4 and the laboratory test certificates are presented in Appendix B.

4. RESULTS OF THE FIELD INVESTIGATION

4.1 SURFACE CONDITIONS

At the time of the site visit in March 2019, the site was undeveloped with grass and shrubs with scattered semi-mature to mature trees and some minor anthropogenic features associated with adjacent developments and possibly from previous site use. No structures were located on site and disturbances were limited to informal contour drains, some areas of cut and fill associated with underground services. Site specific surface conditions are summarised in Section 4.3.

As per MFGD's information, buildings have been constructed on Lot 22, Lot 24 and Lot 26 while Lot 31 remains vacant at the time of preparing this report.

4.2 REGIONAL GEOLOGY

Based on the published geological map (DEDJTR 50k Geology, 2014), the site subsurface conditions are expected to comprise variable depth colluvium overlying variably weathered siltstone.

4.3 SUBSURFACE CONDITIONS

The natural subsurface conditions encountered in BH01 to BH07 are consistent with the published geology.

Details of the materials encountered in the boreholes and the results of the DCP tests are described in the engineering logs presented in Appendix A. Site specific subsurface conditions are summarised in Table 1.

Boreholes BH05, BH06 and BH07 are located in Lot 27 and Lot 29. Refusal was met at a depth of 0.4m in these boreholes.

Table 1 - Summary of subsurface conditions

Borehole No.	Borehole Depth (m)	DCP penetration depth (m)	Topsoil/ Fill Thickness (m)	Colluvial Soil Thickness (m)	Residual Soil Thickness (m)	Extremely Weathered Rock Thickness (m)	Cobbles & Boulders?
BH01	0.7	0.9	0.1	0.3	0.3	-	Y
BH02	0.4	0.5	0.1	0.3	-	-	Y
BH03	0.6	0.6	0.1	0.4	-	0.1 (1)	Y
BH04	0.6	0.9	0.1	0.3	0.2	-	Y
BH05	0.4	0.6	0.1	0.3	-	-	Y
BH06	0.4	0.8	0.1	0.3	-	-	Y
BH07	0.4	0.4	0.1	0.3	-	-	Y

Notes:
(1) Borehole not penetrated deeper

4.4 RESULTS OF GEOTECHNICAL LABORATORY TESTING

The laboratory test results are summarised in Table 2 and the laboratory test certificates are presented in Appendix B.

Table 2 - Summary of laboratory test results

Sample Location	Depth (mbgl)	Material	Atterberg Limits				Particle Size Distribution and Hydrometer			
			LS (%)	LL (%)	PL (%)	PI (%)	% Gravel	% Sand	% Silt	% Clay
BH01	0.2-0.3	Silty Clay	6.5	58	42	16	-	-	-	-
BH03	0.1-0.2	Silty Clay	-	-	-	-	6	27	24	43
BH03	0.4-0.5	Silty Clay	9	60	44	16	26	19	22	33
BH04	0.5-0.6	Silty Clay	4	43	36	7	-	-	-	-
Notes: LS = Linear Shrinkage PI = Plasticity Index			LL = Liquid Limit PL = Plastic Limit							

4.5 GROUNDWATER

In general, the site appears to be naturally well-drained with surface runoff discharging to the north.

No groundwater was observed in the boreholes during the time of the investigation. A local perched groundwater table may be present at other times and fluctuations in their levels and seepage could occur due to rainfall, melting snow and other factors.

4.6 OBSERVATIONS OF SLOPE INSTABILITY

In general, the site is underlain by topsoil/natural soil (up to about 0.4m to 0.7m thick) which in turn is underlain by weathered rock. The slope is generally convex and steep.

No evidence indicative of deep-seated slope instability was observed within the site at the time of our field assessment. Site specific steepness and instability issues are provided in Table 3.

Fill was observed within the site as outlined in Table 3, which we interpret as sourced from the activities on site such as the underground services. The fill is unevenly distributed giving an appearance of hummocks. Details regarding the placement of the existing fill are not known and as such the fill is considered to be uncontrolled.

Table 3 - Site information

Natural Surface Conditions	Subsurface Conditions	Earthworks and Surrounding Area
Slope Angle: Fall varies from less than 25deg up to about 40deg toward north-north-east *Slope Shape:* Slightly convex, with a moderately steep to steep slope, very uneven *Vegetation:* Site covered with long grass, scrubby Eucalypts and small shrubs. Tree trunks almost horizontal out of ground curving up to vertical indicative of slow surface creep. *Features:* Siltstone cobbles-boulders observed under the grass, siltstone fragments – angular, moderately weathered *Surface Water Drainage:* Natural drainage due to site topography *Groundwater:* N/A *Instability:* No evidence of instability	*Depth to Rock (Depth of Soil):* 0.4-0.7m *Slope of Rock Face:* Approx. 30 deg *Rock Type:* Siltstone *Rock substance strength:* Med to high *Rock structure:* Closely spaced joint structure/laminations (observed from northern outcrops) *Soil Type:* Silty Clay	*Fill thickness:* Unknown thickness (fill observed in some locations on the site which may be from site works to install underground services). *Fill slope:* 20-35 degrees *Cut height:* Approx. 3m (Cut in north-east delineating the site from access track) *Cut Slope:* Near vertical *Evidence of instability:* No *Surrounding area:* Adjacent to existing 3-4 chalet structures with poles – pad and strip footings assumed

5. LANDSLIDE RISK ASSESSMENT

5.1 RISK ASSESSMENT PROCEDURE

In accordance with Schedule 1 of Erosion Management Overlay in the Victorian Alpine Planning Scheme (2004), the slope risks associated with development of the site have been considered in the context of the "Landslide Risk Management", published in the Australian Geomechanics Society publication, dated March 2007 (AGS Guidelines). The system is based on identification of likelihood of occurrence, its consequences to the structure and human life for the identified hazards. These assessments are then combined using a risk assessment matrix to obtain a risk assessment for the specific site for each hazard.

5.2 PRINCIPLES OF RISK ASSESSMENT

Risk assessment and management principles applied to slopes can be interpreted as answering the following questions:

- What are the issues? (SCOPE DEFINITION).
- What might happen? (HAZARD IDENTIFICATION).
- How likely is it? (LIKELIHOOD).
- What damage or injury might result? (CONSEQUENCE).

- How important is it? (RISK EVALUATION).
- What can be done? (RISK TREATMENT).

The risk is the combination of the likelihood, the consequences and the exposure to the identified hazard. All these factors are taken into account when evaluating a risk and deciding whether treatment is required. In the following sections of the report we have assessed the risks to properties and life using a qualitative approach as per the recommendations of the AGS Guidelines (2007).

The qualitative likelihood, consequence and risk terms used in this report for risk to property are explained in Appendix C. A matrix that brings together different combinations of likelihood and consequence defines the risk terms. Risk matrices help communicate the results of risk assessment, rank risks, set priorities and develop transparent approaches to decision making. The risk assessment of the sites with regard to the proposed new buildings is presented in Table 4.

5.3 POTENTIAL SLOPE HAZARDS

Based on the site observations and the results of our field testing, the following potential slope hazards have been identified at the site:

- Scenario 1: Failure of the adjacent building footings during the excavation for the proposed new dwelling;
- Scenario 2: Failure of the proposed footings of the building; and
- Scenario 3: Slope creep of soil or fill.

5.4 RISK TO PROPERTY

In Table 4, a list of our judgements of the likelihood, consequences and risk to property associated with the potential slope hazards in the site are presented. The assessments in Table 4 are judgements based on our understanding of the landslide hazard in the study area and our knowledge and experience. The assessment applies to the proposed development and should there be any changes, the risk assessment presented in this report may change.

Table 4 - Summary of slope instability and landslide risk assessments (risk to properties)

Scenario No.	Possible Initiating Circumstances	Likelihood(1)	Consequence	Risk	Revised Risk (2)
1	Loss of bearing capacity due to proximity of proposed footing excavation to existing footings.	Unlikely	Medium	Low	Low
	Unsupported steep slope and saturation of materials	Possible	Medium	Moderate	Low
2	Poor construction practices	Possible	Medium	Moderate	Low
	High groundwater	Likely	Medium	High	Low
3	Slope creep of soil or fill	Almost Certain	Medium	Very High	Low

Notes: (1) – Refer Appendix B for definitions of likelihood, consequence and risk terms.

(2) – Revised risk assessment if recommendations provided in Section 6 are incorporated into the design and construction for the works.

The results of the risk assessment indicate that there is a ‘Moderate’ to ‘High’ risk classification if poor construction practices are used during excavation and construction of the proposed development which is consistent with risk level shown on available hazard maps for Mt. Hotham (Figure 3). If the geotechnical recommendations provided in Section 6 of this report are adopted the potential instability risk hazard would be reduced to ‘Low’.

5.5 RISK TO LOSS OF LIFE

The AGS Guidelines recommends that the risk to life should be considered when assessing landslide risk. The landslide record from Australia and elsewhere indicates that most deaths and injuries are associated with fast moving landslides and associated high speed moving objects when there is insufficient warning for people present to take evasive action. People are most vulnerable if buried in open space, trapped in vehicles that are buried and crushed or in a building that collapses or is inundated with debris.

Scenario 1, described in Table 4, represents instabilities that could occur from unsupported temporary cut batters during the excavation and construction of the proposed footings. Such instabilities could cause serious injury or deaths, depending on several factors (e.g. time of day, speed and size of instability, where people are working at the time of failure, how failure interacts with structures etc.). We strongly recommend appropriate construction practices, such as those described in Section 6, are adopted to reduce the risk of such events from occurring. Provided such practices are adopted, we assess that the risk to life is not credible.

The landslide and creep hazards Scenarios 2 and 3, described in Table 4, represent potential instabilities, mainly after the construction period. We recommend the geotechnical recommendations in this report should be incorporated into the design of the project and the founding conditions should be assessed by a suitably experienced individual during the construction to confirm that the proposed structures are founded within competent materials. Provided these recommendations are incorporated into the design and construction of the development, we assess that the risk to life is not credible.

6. GEOTECHNICAL ASSESSMENT

The proposed building development should be carried out in accordance with sound engineering principles and good hillside practice (refer Appendix C). Geotechnical recommendations for the proposed developments as shown in Figure 5 and Figure 6 are provided in the following sections.

6.1 EARTHWORKS

A considerable volume of excavation is required for the construction of the proposed dwellings.

6.1.1 Excavation conditions

MFGD advised that the proposed excavation levels are approximately +1717.3m AHD and +1718.6m AHD for Lot 27 and Lot 29 respectively. Based on the subsurface conditions encountered within the boreholes and previous assessments nearby, the materials to be excavated would typically comprise layers of topsoil, clay and weathered rock.

We assess that excavation of the natural soils should be able to be carried out using backhoes or tracked excavators.

Our boreholes and DCP tests were terminated at penetration refusal which can be assumed as the surface of the natural soil/low strength rock. It is possible that higher strength rock could exist at greater depth (towards founding levels) and thus we consider it prudent that during excavation there is equipment available for ripping and/or rock breaking as required.

6.1.2 Batter slopes

The recommended temporary and permanent batter slopes for unsupported cuts of up to 5m depth in the various materials are provided in Table 5. It is recommended that no surcharge loadings be placed or located from the crest of a batter cut within a distance of 2m and that surface water should be diverted away from the crests of batter slopes.

Table 5 - Recommended batter slopes

Description of Material	Temporary Batter Slopes	Permanent Batter Slopes
Topsoil / new/existing fill / natural soils	1(V):1(H)	1(V):2.5(H)
Highly or less weathered/better rock	2(V):1(H)	1(V):1.5(H)

Notwithstanding the above recommended batter slopes, there may be unfavourably oriented joints or other defects leading to potential local sliding or toppling instability of blocks or wedges of rock. Rock so affected may require stabilising measures such as laying back of the slope, rock bolting and/or temporary meshing or similar stabilising works. Accordingly, it is recommended that the unsupported batters should be viewed by Tetra Tech Coffey during excavation to assess the requirements for stabilising measures.

Steeper slopes than recommended in Table 5 may be possible for the less weathered rock but would require a site specific assessment by an experienced geotechnical engineer or engineering geologist during excavation. In addition, if batter slopes are higher than 5m, detailed stability analysis is required.

6.1.3 Retaining walls

The two chalets will require excavation into the hillside and the walls of the buildings will act as retaining walls supporting the natural ground. The retained height is generally proposed to be less than about 5m.

The design pressures on these retaining walls will depend amongst other matters on the nature of the material being restrained, the amount of movement that can be tolerated by the structure and the surrounding ground, and the surcharge applied to the wall.

Where areas behind retaining walls are not occupied by existing structures or services, which may be susceptible to damage through excessive ground movement, retaining walls may be designed on the basis of the active earth pressure coefficient, Ka. If compacted crushed rock is used as backfill behind the walls, and assuming the ground surface at the top of the wall is level, an active earth pressure coefficient, Ka = 0.3 may be adopted for preliminary design purposes. If the ground surface behind the wall is sloping, this pressure coefficient will need to be increased.

• For walls which are free to rotate at the top, it is recommended that that a triangular lateral earth pressure distribution should be used, i.e., $p = 20\,Ka\,z + 0.5q$.

• For walls which are not free to rotate but are laterally restrained by floor slabs, a rectangular lateral earth pressure distribution should be used, i.e., $p = 13\,Ka\,H + 0.5q$.

In these equations, p is the lateral pressure at depth z from the top of the wall, H is the height of the wall, Ka is the active earth pressure coefficient, and q is any surcharge stress applied behind the top of the wall.

It is recommended that a minimum value of q=15 kPa be adopted for the above pressure distributions over the full wall height to allow for lateral stresses caused by compaction of the backfill. Lightweight compaction equipment only should be used directly behind retaining walls.

In view of the close proximity of the proposed developments in Lot 31 and Lot 29, a detailed assessment of the impact of the footings in Lot 31 on the retaining walls in Lot 29 is required.

It is recommended that a robust drainage system be installed behind any retaining walls. This may consist of granular backfill, which is effectively drained by a suitable system of drainage pipes leading water away from the structure.

6.1.4 Reuse of excavated in situ soils

The following comments are provided for the reuse of excavated materials for engineered or landscape fill, if required:

- Uncontrolled material which contains rootlets, large boulders and fragments of steel, plastic and glass is not considered suitable for reuse and should be removed from site;
- Natural soils are assessed as suitable for reuse in engineered fill; and
- Extremely weathered or fresher sandstone/siltstone is considered likely to be suitable for reuse as engineered fill provided particles larger than 75mm in size are broken down or excluded.

6.1.5 Fill construction procedure

New fill should be placed and compacted to an engineering specification in general accordance with the recommendations outlined in AS3798-2007 "*Guidelines on Earthworks for Commercial and Residential Developments*". The following procedure is recommended as a guide for site preparation and the placement of controlled fill:

- Remove existing fill, Colluvial soil, vegetation, root affected or other potentially deleterious material from the proposed fill area;
- The exposed natural residual soils should then be scarified to a depth of about 150mm, moisture conditioned to within ±2% of standard optimum moisture content (SOMC) and then re-compacted to a minimum dry density ratio of 98% (standard compaction) in accordance with AS1289 5.1.1, 5.4.1 or 5.7.1;
- Soft or weak areas identified during the compaction process that do not respond to further compaction should be removed and replaced with suitable site materials in layers not exceeding 250mm thickness and should be compacted to the above criteria; and
- Subsequent layers of fill should be placed in uniform 250mm thick layers, moisture conditioned and compacted to the above criteria.

Earthworks should be carried out during dry weather conditions. Provision should be made for effective diversion of surface water from outside the site. The runoff from the site should be treated to remove excess sediments before discharge.

6.1.6 Groundwater, surface water and erosion considerations

We assess that the groundwater table is likely to be below the proposed excavation level and no significant dewatering would be required during the excavation for foundations. However, we recommend that normal provision should be made for sumps and pumps to control surface and groundwater seepage that may occur from wet weather and melting of snow. Such seepages should be collected and diverted away from the site.

Erosion control is important in Alpine areas. Stripping of near-surface material should only be made where necessary during site preparation. Where it is necessary to remove vegetation but not the existing soil, the vegetation should be cut or slashed to allow the root structure to remain to assist in limiting erosion. Any exposed soil should be protected from erosion during and post construction.

6.2 FOOTINGS

It is recommended that the footings be founded in the highly or less weathered rock and proportioned using an allowable bearing pressure of 500kPa.

The footings should be founded at an adequate depth below finished ground level to provide lateral stability. Footings located on steep slopes and founded within the rock should be keyed into the rock to a depth of at least 300mm. On or adjacent to steep slopes, shallow footings are not recommended within the soils.

Shallow footings proportioned in accordance with the above recommendations are assessed to have load induced settlements of no greater than 0.5% of the width of the footing.

Excavated foundation pads and strips should be assessed by a suitably experienced geotechnical engineer or engineering geologist prior to the concreting.

6.3 SITE CLASSIFICATION

Fills have been observed in localised areas of site at the location of buried services. Details regarding the placement of the existing fill are not known and as such the fill is considered to be uncontrolled. Assuming shallow fill is encountered (not more than 0.4 m deep for clayey material) and all footings are founded on suitable natural soils/extremely weathered rock at the site (comprises low plasticity clay) characteristic surface movements similar to those of a Class M site should be expected on this site. If engineered clay fill is to be placed to depths greater than 0.4m or the site excavated by more than 0.5m, the characteristic surface movements and site classification should be re-assessed.

It should be noted that the site classification in accordance with AS2870-2011 is applicable for residential buildings or buildings that have a similar construction method and loading. The above classification is presented as a guide only and the designer should assess the applicability of the above site classification to the proposed building.

7. APPLICABILITY AND LIMITATIONS

Recommendations and opinions contained in this report are based on the interpretation of subsurface conditions from a limited number of field tests at point locations and information from published geological maps. The nature and continuity of the subsoil away from the test locations are inferred, but it must be appreciated that actual conditions could vary from the assumed geotechnical model. If conditions other than those described are encountered, Tetra Tech Coffey should be engaged to assess whether the recommendations should be revised.

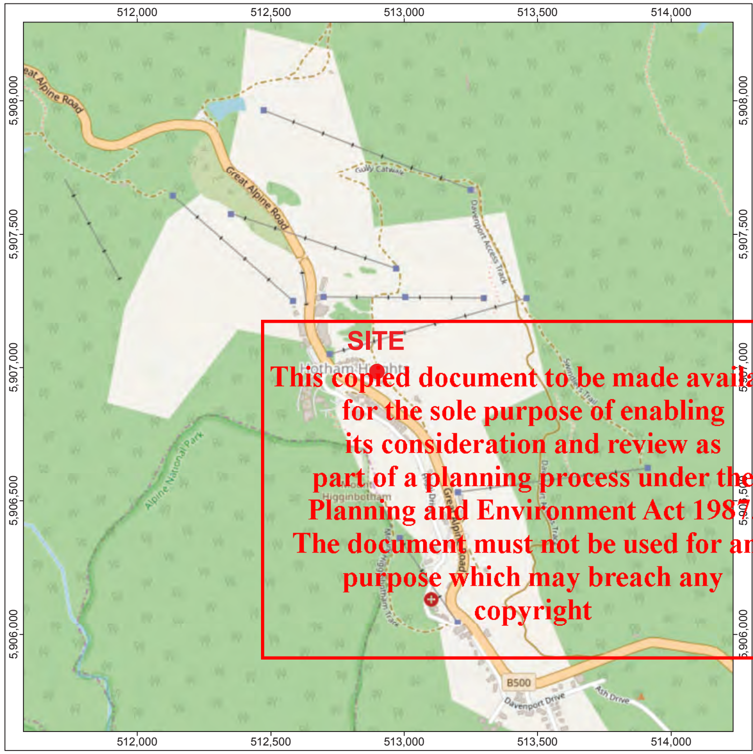
The attached *"Important Information about your Tetra Tech Coffey Report"* provides additional information in the uses and limitations of this report.

FIGURES

GENERAL AREA MAP

ADVERTISED PLAN

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright



REGIONAL AREA MAP

© Open Street Map Online

0 200 400 600 800
SCALE 1:20,000 (A3) METRES

LOCAL AREA MAP

© Bing Maps Online

0 75 150 225 300
SCALE 1:7,500 (A3) METRES

MXD ref: MELGE227984AB_01_GIS001_v0_1

revision

no.	description	drawn	approved	date
A	ORIGINAL ISSUE	MJ	WLN	22.11.23

N

Projection: GDA 1994 MGA Zone 55

drawn	MJ
approved	WLN
date	22.11.2023
scale	AS SHOWN
original size	A3

TETRA TECH COFFEY

client:	MFGD Developments
project:	LOTS 22, 24, 26, 27 AND 29 HOTPLATE DRIVE, MOUNT HOTHAM
title:	SITE LOCALITY PLAN
project no:	754-MELGE227984AB
figure no:	FIGURE 1
rev:	A

no.	description	drawn	approved	date
A	ORIGINAL ISSUE	MJ	WLN	22.11.23

revision

SCALE 0 5 10 15 20 METRES 1:500 (A3)

Projection: GDA 1994 MGA Zone 55

drawn	MJ
approved	WLN
date	22.11.2023
scale	AS SHOWN
original size	A3

TETRA TECH COFFEY

client:	MFGD Developments
project:	LOTS 22, 24, 26, 27 AND 29 HOTPLATE DRIVE, MOUNT HOTHAM
title:	BOREHOLE LOCATION PLAN
project no:	754-MELGE227984AB
figure no:	FIGURE 2
rev:	A

MXD ref: MELGE227984AB_01_GIS002_v0_1

MXD ref: MELGE227984AB_01_GIS003_v0_1

revision

no.	description	drawn	approved	date
A	ORIGINAL ISSUE	MJ	WLN	22.11.23

SCALE 0 5 10 15 20 METRES 1:500 (A3)

Projection: GDA 1994 MGA Zone 55

drawn	MJ
approved	WLN
date	22.11.2023
scale	AS SHOWN
original size	A3

TETRA TECH COFFEY

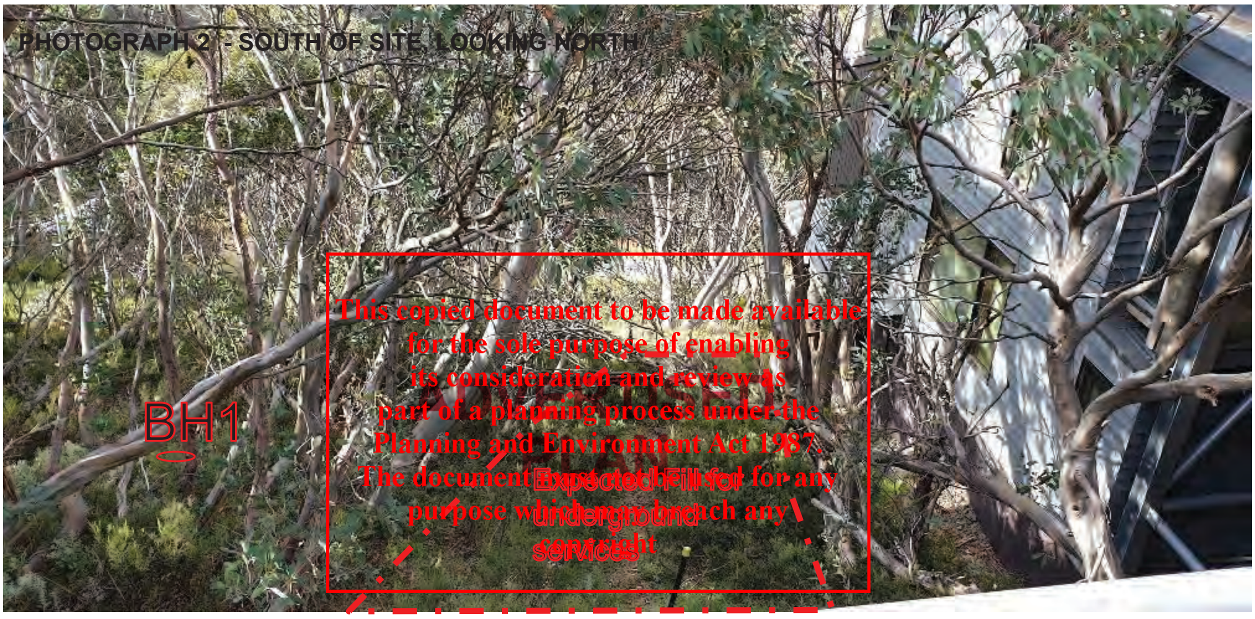
client: MFGD Developments

project: LOTS 22, 24, 26, 27 AND 29 HOTPLATE DRIVE, MOUNT HOTHAM

title: LANDSLIDE HAZARD MAP

project no: 754-MELGE227984AB | figure no: FIGURE 3 | rev: A

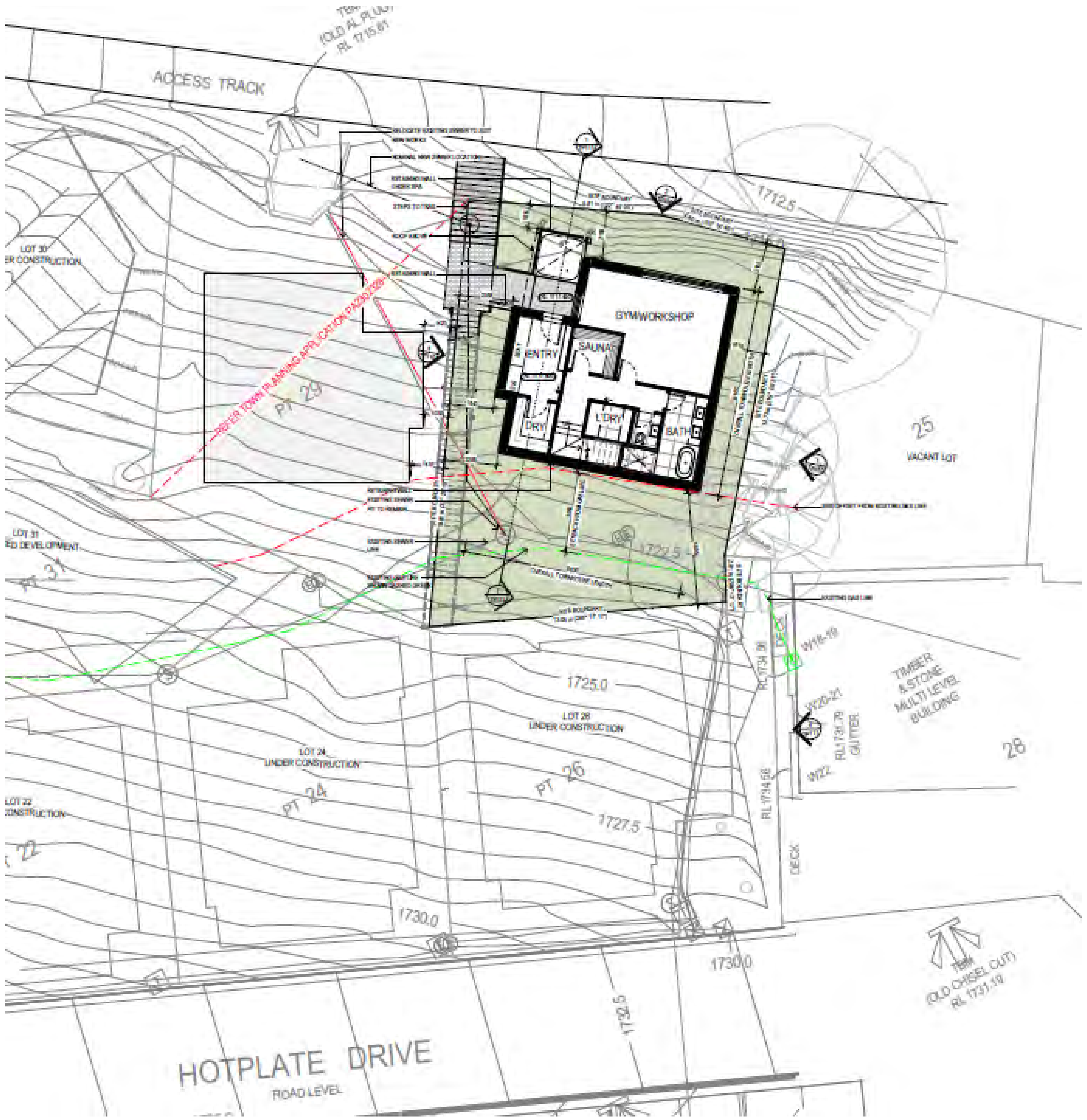
PHOTOGRAPH 1 - WEST OF SITE, LOOKING NORTH-EAST

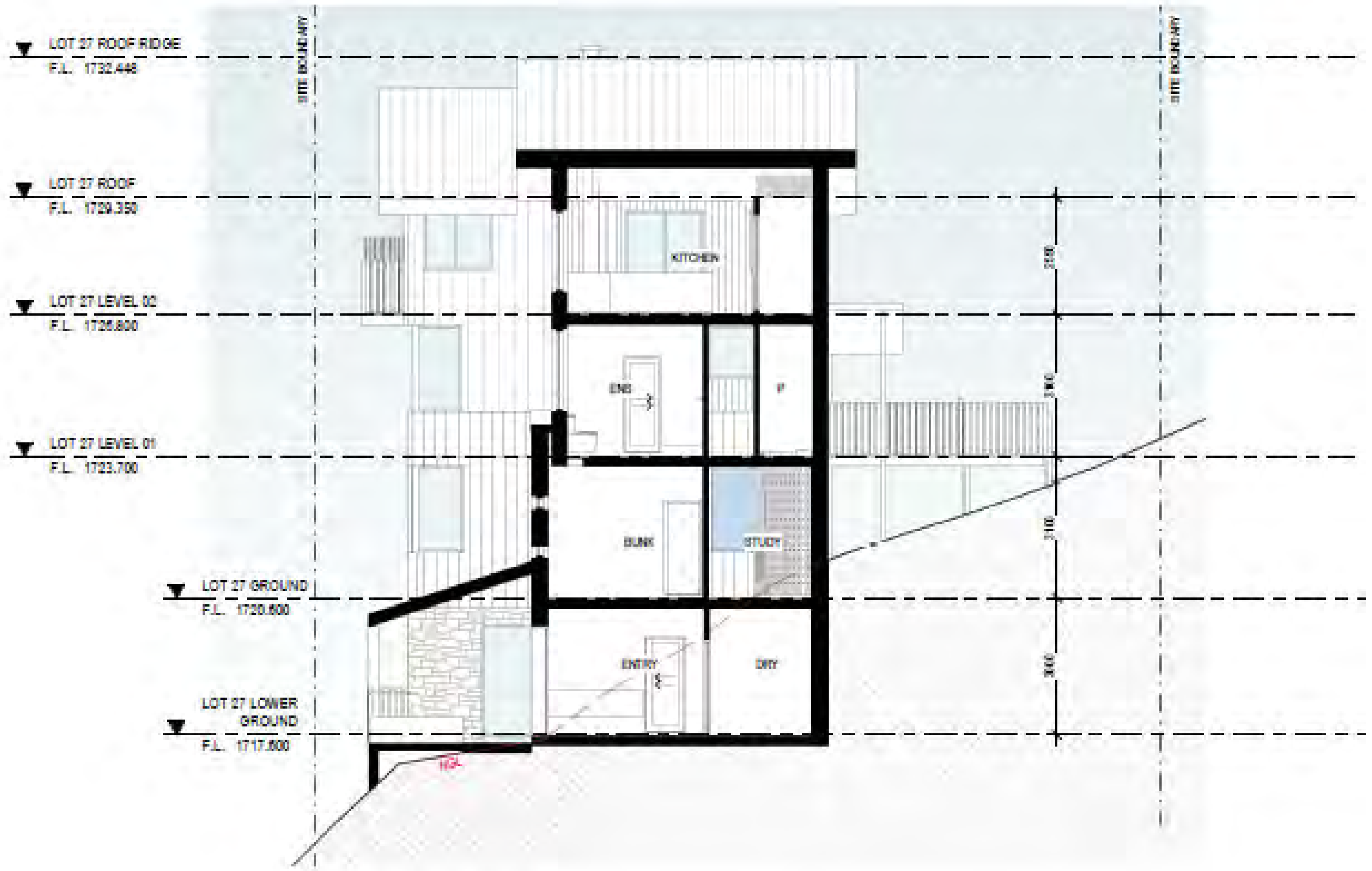


PHOTOGRAPH 2 - SOUTH OF SITE, LOOKING NORTH

PHOTOGRAPH 3 - NORTH OF SITE, LOOKING SOUTH

drawn	MJ	TETRA TECH COFFEY	client:	MFGD Developments
approved	WLN		project:	LOTS 22, 24, 26, 27 AND 29 HOTPLATE DRIVE
date	22.11.2023			
scale	NTS		title:	Site Photographs
original size	A4		project no: 754-MELGE227984AB	figure no: FIGURE 04





LOT 27 SECTION

ADVERTISED PLAN

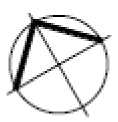
revision	description	drawn	approved	date
	Initial revision	MJ	WLN	22-11-2023

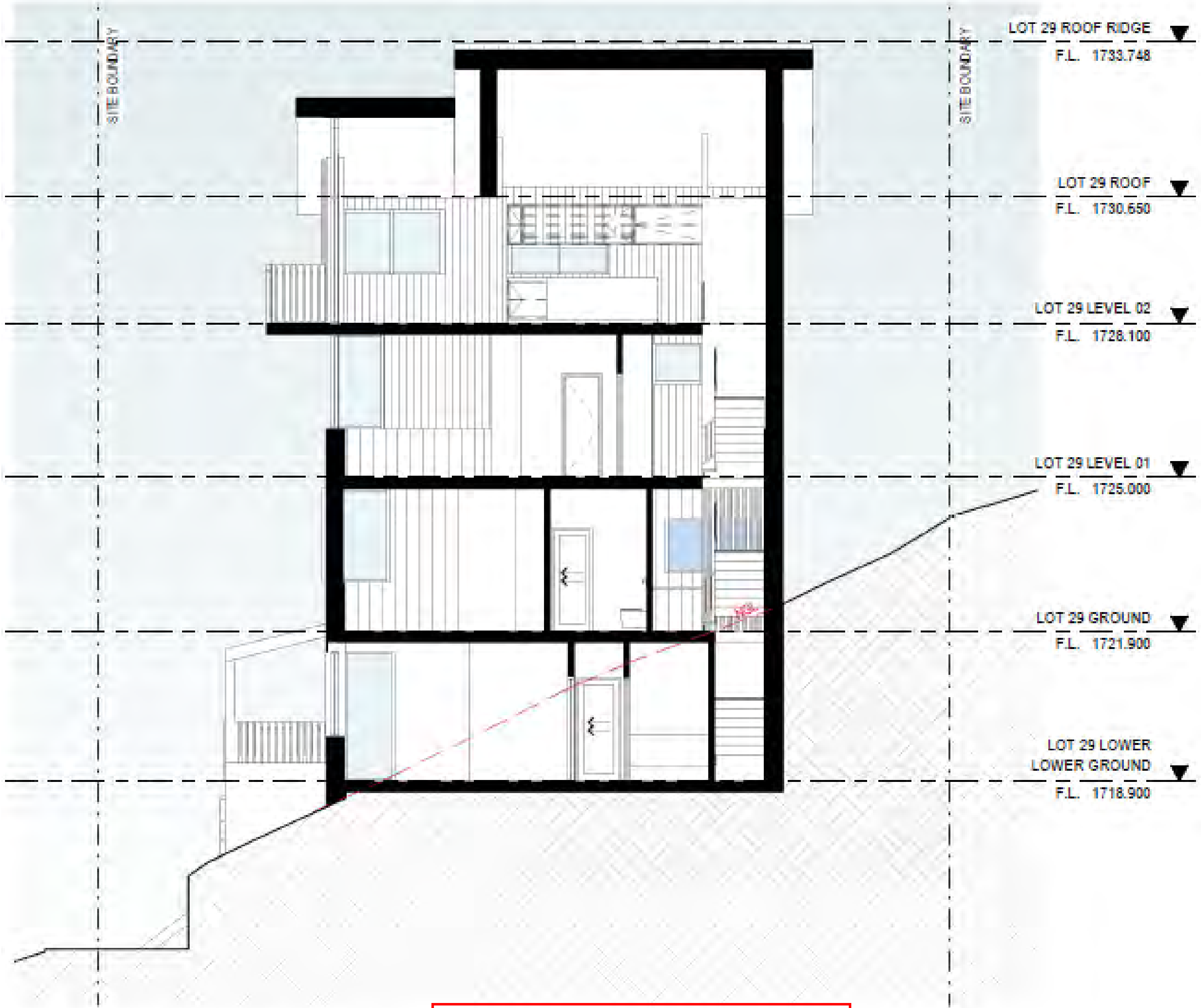
Legend:

drawn	MJ
approved	WLN
date	22-11-2023
scale	N.T.S
original size	A3

TETRA TECH COFFEY

client:	MFGD Developments
project:	LOTS 27 AND 29, HOTPLATE DRIVE, MOUNT HOTHAM
title:	Layout Plan and Section of Development Lot 27
project no: 754-NTLGE227984.2 AB	figure no: FIGURE 5





LOT 29 SECTION

ADVERTISED PLAN

revision	description	drawn	approved	date
	Initial revision	MJ	WLN	22-11-2023

Legend:

drawn	MJ
approved	WLN
date	22-11-2023
scale	N.T.S
original size	A3

TETRA TECH COFFEY

client:	MFGD Developments
project:	LOTS 27 AND 29, HOTPLATE DRIVE, MOUNT HOTHAM
title:	Layout Plan and Section of Development Lot 29
project no: 754-NTLGE227984.2 AB	figure no: FIGURE 6

APPENDIX A: ENGINEERING LOGS

TETRA TECH COFFEY

Soil Description Explanation Sheet (1 of 2)

DEFINITION:

In engineering terms soil includes every type of uncemented or partially cemented inorganic or organic material found in the ground. In practice, if the material can be remoulded or disintegrated by hand in its field condition or in water it is described as a soil. Other materials are described using rock description terms.

CLASSIFICATION SYMBOL & SOIL NAME

Soils are described in accordance with the Unified Soil Classification (UCS) as shown in the table on Sheet 2.

PARTICLE SIZE DESCRIPTIVE TERMS

NAME	SUBDIVISION	SIZE
Boulders		>200 mm
Cobbles		63 mm to 200 mm
Gravel	coarse	20 mm to 63 mm
	medium	6 mm to 20 mm
	fine	2.36 mm to 6 mm
Sand	coarse	600 µm to 2.36 mm
	medium	200 µm to 600 µm
	fine	75 µm to 200 µm

MOISTURE CONDITION

Dry Looks and feels dry. Cohesive and cemented soils are hard, friable or powdery. Uncemented granular soils run freely through hands.

Moist Soil feels cool and darkened in colour. Cohesive soils can be moulded. Granular soils tend to cohere.

Wet As for moist but with free water forming on hands when handled.

CONSISTENCY OF COHESIVE SOILS

TERM	UNDRAINED STRENGTH s_u (kPa)	FIELD GUIDE
Very Soft	<12	A finger can be pushed well into the soil with little effort.
Soft	12 – 25	A finger can be pushed into the soil to about 25mm depth.
Firm	25 – 50	The soil can be indented about 5mm with the thumb, but not penetrated.
Stiff	50 – 100	The surface of the soil can be indented with the thumb, but not penetrated.
Very Stiff	100 – 200	The surface of the soil can be marked, but not indented with thumb pressure.
Hard	>200	The surface of the soil can be marked only with the thumbnail.
Friable	–	Crumbles or powders when scraped by thumbnail.

DENSITY OF GRANULAR SOILS

TERM	DENSITY INDEX (%)
Very loose	Less than 15
Loose	15 – 35
Medium Dense	35 – 65
Dense	65 – 85
Very Dense	Greater than 85

MINOR COMPONENTS

TERM	ASSESSMENT GUIDE	PROPORTION OF MINOR COMPONENT IN:
Trace of	Presence just detectable by feel or eye, but soil properties little or no different to general properties of primary component.	Coarse grained soils: <5% Fine grained soils: <15%
With some	Presence easily detected by feel or eye, soil properties little different to general properties of primary component.	Coarse grained soils: 5 - 12% Fine grained soils: 15 - 30%

SOIL STRUCTURE

ZONING		CEMENTING	
Layers	Continuous across exposure or sample.	Weakly cemented	Easily broken up by hand in air or water.
Lenses	Discontinuous shape.	Moderately cemented	Effort is required to break up the soil by hand in air or water.
Pockets	Irregular inclusions of different material.		

GEOLOGICAL ORIGIN WEATHERED IN PLACE SOILS

Extremely weathered material	Structure and fabric of parent rock visible.
Residual soil	Structure and fabric of parent rock not visible.

TRANSPORTED SOILS

Aeolian soil	Deposited by wind.
Alluvial soil	Deposited by streams and rivers.
Colluvial soil	Deposited on slopes (transported downslope by gravity).
Fill	Man-made deposit. Fill may be significantly more variable between tested locations than naturally occurring soils.
Lacustrine soil	Deposited by lakes.
Marine soil	Deposited in ocean basins, bays, beaches and estuaries.

Soil Description Explanation Sheet (2 of 2)

SOIL CLASSIFICATION INCLUDING IDENTIFICATION AND DESCRIPTION

FIELD IDENTIFICATION PROCEDURES USC
(Excluding particles larger than 60 mm and basing fractions on estimated mass)

(A 0.075 mm particle is about the smallest particle visible to the naked eye)

Division	Group	Subgroup	Field identification	USC	PRIMARY NAME
COARSE GRAIINED SOILS More than 50% of materials less than 63 mm is larger than 0.075 mm	GRAVELS More than half of coarse fraction is larger than 2.36 mm	CLEAN GRAVELS (Little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes	GW	GRAVEL
			Predominantly one size or a range of sizes with more intermediate sizes missing.	GP	GRAVEL
		GRAVELS WITH FINES Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below)	GM	SILTY GRAVEL
			Plastic fines (for identification procedures see CL below)	GC	CLAYEY GRAVEL
	SANDS More than half of coarse fraction is smaller than 2.36 mm	CLEAN SANDS (Little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate sizes	SW	SAND
			Predominantly one size or a range of sizes with some intermediate sizes missing.	SP	SAND
		SANDS WITH FINES (Appreciabl e amount of fines)	Non-plastic fines (for identification procedures see ML below).	SM	SILTY SAND
			Plastic fines (for identification procedures see CL below).	SC	CLAYEY SAND

IDENTIFICATION PROCEDURES ON FRACTIONS <0.2 mm

Division	Group	DRY STRENGTH	DILATANCY	TOUGHNESS	USC	PRIMARY NAME
FINE GRAINED SOILS More than 50% of material less than 63 mm is smaller than 0.075 mm	SILTS & CLAYS Liquid limit less than 50	None to Low	Quick to slow	None	ML	SILT
		Medium to High	None	Medium	CL	CLAY
		Low to medium	Slow to very slow	Low	CL	ORGANIC SILT
	SILTS & CLAYS Liquid limit greater than 50	Low to medium	Slow to very slow	Low to medium	MH	SILT
		High	None	High	CH	CLAY
		Medium to High	None	Low to medium	OH	ORGANIC CLAY
HIGHLY ORGANIC SOILS		Readily identified by colour, odour, spongy feel and frequently by fibrous texture.			PT	PEAT

- Low plasticity – Liquid Limit w_L less than 35%.
- Medium plasticity – w_L between 35% and 50%.
- High plasticity – w_L greater than 50%.

COMMON DEFECTS IN SOIL

TERM	DEFINITION	DIAGRAM	TERM	DEFINITION	DIAGRAM
PARTING	A surface or crack across which the soil has little or no tensile strength. Parallel or sub parallel to layering (eg bedding). May be open or closed.		SOFTENED ZONE	A zone in clayey soil, usually adjacent to a defect in which the soil has a higher moisture content than elsewhere.	
JOINT	A surface or crack across which the soil has little or no tensile strength but which is not parallel or sub parallel to layering. May be open or closed. The term 'fissure' may be used for irregular joints <0.2 m in length		TUBE	Tubular cavity. May occur singly or as one of a large number of separate or inter-connected tubes. Walls often coated with clay or strengthened by denser packing of grains. May contain organic matter.	
SHEARED ZONE	Zone in clayey soil with roughly parallel near planar, curved or undulating boundaries containing closely spaced, smooth or slickensided, curved intersecting joints which divide the mass into lenticular or wedge shaped blocks.		TUBE CAST	Roughly cylindrical elongated body of soil different from the soil mass in which it occurs. In some cases the soil which makes up the tube cast is cemented.	
SHEARED SURFACE	A near planar curved or undulating, smooth, polished or slickensided surface in clayey soil. The polished or slickensided surface indicates that movement (in many cases very little) has occurred along the defect.		INFILLED SEAM	Sheet or wall like body of soil substance or mass with roughly planar to irregular near parallel boundaries which cuts through a soil mass. Formed by infilling of open joints.	

TETRA TECH COFFEY

ADVERTISED PLAN

Engineering Log - Hand Auger

[illegible]	**BH01**
[illegible]	[illegible]
[illegible]	**754-MELGE227984AB**

[illegible]	*Incore Developments*	[illegible]	*28 Mar 2019*
[illegible]	*Edge Chalets Unit Trust*	[illegible]	*28 Mar 2019*
[illegible]	*Lots 22, 24, 26, 27 and 29, Hotplate Drive, Mount Hotham*	[illegible]	*BP*
[illegible]	*Refer Figure 1*	[illegible]	*RCD*

drilling information | **material substance**

material description (SOIL TYPE)	structure and additional observations
TOPSOIL: Silty CLAY [illegible]	**TOPSOIL**
Silty CLAY [illegible]	**COLLUVIAL SOIL**
Silty CLAY [illegible]	**RESIDUAL SOIL**

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

method | **support** | **penetration** | **water** | **samples & field tests** | **classification symbol & soil description** | **moisture** | **consistency / relative density**

TETRA TECH COFFEY

ADVERTISED PLAN

Engineering Log - Hand Auger

		M")(8" .(ÃC9	**BH02**
		48((# -	@ÃÃ@
		2)"K(&#Ã" 9	***754-MELGE227984AB***
&.1%#	***Incore Developments***	* 3#(Ã#3#(* -	***28 Mar 2019***
2)1&123.-	***Edge Chalets Unit Trust***	*3#(Ã"0 2.(#(* -	***28 Mar 2019***
2)"K(&#	***Lots 22, 24, 26, 27 and 29, Hotplate Drive, Mount Hotham***	." ;;(*Ã 75-	***BP***
."&3#" %	***Refer Figure 1***	&8(&L(*Ã75-	***RCD***

drilling information / material substance

depth	material description	structure and additional observations
	TOPSOIL: Silty CLAY	**TOPSOIL**
	Silty CLAY	**COLLUVIAL SOIL**
	B(:' 43.	B(:' 43.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

method · **support** · **penetration** · **water** · **samples & field tests** · **classification symbol & soil description** · **moisture** · **consistency / relative density**

TETRA TECH COFFEY

ADVERTISED PLAN

M")(8" .(ÃC9	**BH03**
48((# -	@ÃÃ@
2)"K(&#Ã" 9	**754-MELGE227984AB**

Engineering Log - Hand Auger

&.1(%#	*Incore Developments*	* 3#(Ã#3#(* -	*28 Mar 2019*
2)1/&123.-	*Edge Chalets Unit Trust*	*3#(Ã&"0 2.(#(* -	*28 Mar 2019*
2)"K(&#	*Lots 22, 24, 26, 27 and 29, Hotplate Drive, Mount Hotham*	." ;;(*Ã 75-	*BP*
." &3#" %	*Refer Figure 1*	&8(&L(*Ã75-	*RCD*

drilling information

material substance

material description	moisture	consistency	structure and additional observations
TOPSOIL: Silty CLAY	H	D	TOPSOIL
Silty CLAY		E#	COLLUVIAL SOIL
Silty CLAY		+	EXTREMELY WEATHERED ROCK
B(:' 43.			B(:' 43.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

method	support	samples & field tests	classification symbol & soil description	moisture	consistency / relative density

method

support

penetration

water

samples & field tests

classification symbol & soil description

moisture

consistency / relative density

TETRA TECH COFFEY

ADVERTISED PLAN

Engineering Log - Hand Auger

&.1ĭ%#	*Incore Developments*	M")(8" .(ĂC9	**BH04**
2)ĭ/&123.-	*Edge Chalets Unit Trust*	48((# -	@ĂĂ@
2)"K(&#	*Lots 22, 24, 26, 27 and 29, Hotplate Drive, Mount Hotham*	2)"K(&#Ă% 9	*754-MELGE227984AB*
." &3#" %	*Refer Figure 1*	* 3#(Ă#3#(* -	*28 Mar 2019*
		*3#(Ă&"0 2.(#(* -	*28 Mar 2019*
		." ;;(*Ă 75-	*BP*
		&8(&L(*Ă75-	*RCD*

drilling information | **material substance**

method	support	penetration	water	depth	graphic log	classification symbol	material description (SOIL TYPE)	moisture	consistency / relative density	structure and additional observations
						Ă	**TOPSOIL:** Silty CLAY-Ă./ Ă#Ă0(* 1 0 Ă2.34#&1#56 7)" / %6Ă#8Ă" " #(#9	H	D	**TOPSOIL**
						Ă	**Silty CLAY**-Ă./ Ă234#&1#56Ă7/ %6Ă#8Ă0 (* 1 0 Ă#" &" 3)4(Ă;31ĭ(* 6Ă% ' .3)Ă)3< .6Ă#8&(Ă.%(Ă#" 0 (* 1 0 Ă)31ĭ(* Ă43%9		E#	**COLLUVIAL SOIL**
						Ă	**Silty CLAY**-Ă./ Ă234#&1#56Ă2(Ă7)" / %6Ă#8 0 (* 1 0 Ă#Ă&3)4(Ă;31ĭ(* 6Ă% ' .3)Ă)3< .6Ă#8&(:1ĭ(Ă#Ă0(* 1 0 Ă)31ĭ(* Ă43%9			**RESIDUAL SOIL**
		C	?9				+3)(Ă( )Ă8&Ă#0 Ă#3)(Ă#(9 B(:' 43.			B(:' 43.

Depth markers: ?9, @?9, @9

method	support	samples & field tests	classification symbol & soil description	consistency / relative density
,C 3';()Ă*) 1.1ĭ%;T ,E 3';()Ă4 &)(/ 1ĭ%;T +, 83%*Ă3() S /3 487")(+, 83%*Ă3() T 7#Ă#"/ %Ă7%4:1U (9;9 ,C V# M 7.3%Ă7# = =ĂĂ7# G GĂ7#	HĂĂĂ0 !ĂĂĂ%1 ĂĂĂĂ&1ĭ% **penetration** **water**	M 7'. LĂ14#)7(*Ă4 30 2.(C *14#)7(*Ă4 30 2.($ (%<)"%0 (%#3Ă#30 2.(EE 42.1#Ă4#""%Ă430 2.(OWW '%*14#)7(*Ă4 30 2.(ĂWW0Ă130 (#() +> 83%*Ă2%(#)"0 (#()ĂL>3J ! 4#3%*3)* Ă2(%(#)3#"%Ă#(#Ă>=J !T E>=ĂĂ#30 2.(Ă(&" <( )(* !& E>=Ă/ 1#3Ă4 .1Ă& %(GE <3%(Ă#3(3)XĂ2(3L/(0 ""*(* ĂL>3J B)(:' 43. +M 830 0 () Ă7""%&1%;	734(*Ă"%ĂO%(* Ă.3441#3#"1%ĂE4#0 **moisture** C *)5 H 0" 1## S /(# S2 2.34#&Ă10 1# S. .1h 1Ă101#	GE <()5Ă#" :# E 4" :# D :)10 E# 4#1: GE# <( )5Ă#1 + 83)* D7 :)137.(G <()5Ă" " 4(." " 4(HC 0 (*10 Ă*(%4 C *(%4(GC <( )5Ă*(%4

TETRA TECH COFFEY

ADVERTISED PLAN

Engineering Log - Hand Auger

M")(8" .(ÃC9	**BH05**
48((# -	@ÃÃ@
2)"K(&#Ã% 9	**754-MELGE227984AB**

&.1(%#	*Incore Developments*	* 3#(Ã#3#(* -	*28 Mar 2019*
2)1(&23.-	*Edge Chalets Unit Trust*	*3#(Ã"0 2.(#(* -	*28 Mar 2019*
2)"K(&#	*Lots 22, 24, 26, 27 and 29, Hotplate Drive, Mount Hotham*	." ;;(*Ã 75-	*BP*
." &3#" %	*Refer Figure 1*	&8(&L(*Ã75-	*RCD*

2" 4#" % $-Ã@Q6?]XÃ -Ã6?[6^[^ÃIS _EZÃÃ — 4'):3&(Ã.(<3#" %ÃÃ22)" U 3# .5Ã@AQ0ÃÃ +C — 3% .(Ã:)0 Ã8)1" %8.-ÃÃa — CÃ>Ã9-ÃÃ>?A

*)1.Ã0 " * (.-Ã 3%*Ã '; () — *)1.1% Ã'. 1-ÃÃ! % — 8". (Ã 30 (#() ÃÃ@]?Ã 0

drilling information | **material substance**

material description

SOIL TYPE-Ã234#&1#5Ã"Ã23)#&(Ã83)3&#()14#&6 &" .'")6Ã4(&"%*3)5Ã3%*Ã0%)Ã&0 2"%(%#

structure and additional observations

depth	material description	moisture	consistency	structure and additional observations
	TOPSOIL: Silty CLAY-Ã'./ Ã#Ã0(* 1 0 Ã2.34#&1#56 7)" / %6Ã#8Ã" " #(#9	H	D	**TOPSOIL**
	Silty CLAY-Ã'./ Ã234#&1#56Ã7/ %6Ã#8Ã0 (* 1 0 Ã#" &" 3)4(Ã;)31(* 6Ã% ' .3)Ã)3<(.6Ã#8(Ã.%(Ã#" 0 (* 1 0 Ã)31(* Ã43%9		E#	**COLLUVIAL SOIL**
?9	+3% Ã,' ; ( )Ã>?] Ã#)0 1/3# * Ã3#Ã9ZÃ0 B(:' 43.			B(:' 43.
@9				
@9				

method
,C 3';()Ã*) 1.1%;T
,E 3';()Ã4 &)(/ 1%;T
+, 83%*Ã3()
S /3 487")(
+, 83%*Ã3()
T 7#Ã#"/ %Ã7Ã5#:1U
(9;9 ,C V=
M 7.3%Ã7#
= =ÃÃ7#
G GÃ7#

support
HÃÃÃ0 !ÃÃÃ%1
ÃÃÃÃ&#1%

penetration

water
@?F8#F@C8#()
.(< Ã"Ã3#(Ã#"/ %
/ 3#()Ã%."/
/ 3#()Ã"'#:'/

samples & field tests
M 7'. LÃ14#)7(*Ã4 30 2.(
C *14#)7(*Ã4 30 2.(
$ (%<)"%0 (%#3Ã#30 2.(
EE 42.1#Ã#"'%Ã430 2.(
OWW '%*14#)7(*Ã4 30 2.(ÃWW0Ã130 (#()
+> 83%*Ã2%(#)"0 (#()ÃL>3J
! 4#8%*3)* Ã2(%(#)3#"1%Ã#(#Ã>=J
!T E>=ÃÃ#30 2.(Ã(&" <( )(*
!& E>=Ã/ 1#Ã4 .1Ã& %(
GE <3%(Ã#3(3)XÃ2(3LV)0 ""*(* ÃL>3J
B)(:' 43.
+M 830 0 () Ã7"'%&#%;

classification symbol & soil description
734(*Ã"%ÃO%(*
Ã.3441&3#"1%ÃE4#0

moisture
C *)5
H 0" 1##
S /(#
S2 2.34#&3Ã0 1#
S. .1h 1 Ã101#

consistency / relative density
GE <()5Ã4" :#
E 4" :#
D :)0
E# 4#1:
GE# <()5Ã4#:1
+ 83)*
D7 :)37.(
G <()5Ã" " 4(
." " 4(
HC 0 (*10 Ã*(%4(
C *(%4(
GC <()5Ã*(%4(

TETRA TECH COFFEY

ADVERTISED PLAN

Engineering Log - Hand Auger

	BH06
	754-MELGE227984AB
Client	Incore Developments
Principal	Edge Chalets Unit Trust
Project	Lots 22, 24, 26, 27 and 29, Hotplate Drive, Mount Hotham
Location	Refer Figure 1
Started	28 Mar 2019
Completed	28 Mar 2019
Logged	BP
Checked	RCD

drilling information / material substance

material description (SOIL TYPE)	structure and additional observations
TOPSOIL: Silty CLAY	TOPSOIL
Silty CLAY	COLLUVIAL SOIL

method | **support** | **penetration** | **water** | **samples & field tests** | **classification symbol & soil description** | **moisture** | **consistency / relative density**

TETRA TECH COFFEY

ADVERTISED PLAN

Engineering Log - Hand Auger

Borehole ID.	**BH07**
	@ÃÃ@
	754-MELGE227984AB

&.1%#	*Incore Developments*	*3#(Ã#3)#(*-	*28 Mar 2019*
2)1%&23.-	*Edge Chalets Unit Trust*	*3#(Ã&" 0 2.(# *-	*28 Mar 2019*
2)"K&#	*Lots 22, 24, 26, 27 and 29, Hotplate Drive, Mount Hotham*	." ;;(*Ã 75-	*BP*
."&3#" %	*Refer Figure 1*	&8(&L(*Ã75-	*RCD*

drilling information | **material substance**

material description	structure and additional observations
TOPSOIL: Silty CLAY	**TOPSOIL**
Silty CLAY	**COLLUVIAL SOIL**
B(:' 43.	B(:' 43.

method

support

penetration

water

samples & field tests

classification symbol & soil description

moisture

consistency / relative density

APPENDIX B: LABORATORY TEST CERTIFICATES

ADVERTISED PLAN

Test Results - Atterberg Limits

Ground Science

ACN 31 105 704 078
13 Brock Street, Thomastown, VIC **P** 03 9464 4617 **Email** reception@groundscience.com.au

Client:	COFFEY INFORMATION (ABBOTSFORD)	Job No.	GS4544/1
Project:	LOTS 22,24,26,27 & 29, HOTPLATE DRIVE, MOUNT HOTHAM	Report No.	PI
Location:	HOTPLATE DRIVE, HOTHAM HEIGHTS	Test Date:	03-Apr-19

Sample identification		TP01 @ 0.2m - 0.3m	TP04 @ 0.5m - 0.6m
Purchase order number			
Sample number		#500	#503
Test methods		AS1289 3.1.1 3.2.1 3.3.1 3.4.1 2.1.1	
ATTERBERG LIMITS			
Liquid Limit	%	58	43
Plastic Limit	%	42	36
Plasticity Index	%	16	7
Linear Shrinkage	%	6.5	4
Curling/ Crumbling/ Cracking		Cracking	Cracking
Sample History		Oven dried, Dry sieved	Oven dried, Dry sieved
Sample Description		SILT high plasticity dark grey (organic)	SILT low plasticity dark grey (organic)

Comments:

Sampling Method Sampled by client, tested as received

NATA ACCREDITED FOR TECHNICAL COMPETENCE

NATA Accredited Laboratory No. 15055
Accredited for compliance with ISO/IEC 17025 - Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/National Standards

Approved Signatory: Tim Senserrick

Date of issue: 4/04/2019

Ground Science
A C N 105 704 078
13 Brock Street Thomastown VIC 3074 P (03) 9464 4617 F (03) 9464 4618

Particle Size Distribution & Clay content

Client:	COFFEY INFORMATION (ABBOTSFORD)	Job No.	GS4544/1
Project:	LOTS 22,24,26,27 & 29, HOTPLATE DRIVE	Date:	1-Apr-19
Location:	HOTPLATE DRIVE, HOTHAM HEIGHTS	Report No.	PH
Lab Reference No.	#502	Sample Identification:	TP03 @ 0.4m - 0.5m

Laboratory Specimen Classification: **CLAY, high plasticity, dark grey, with gravel, with sand, with silt**

Particle Size Distribution AS1289 3.6.3

Sieve Size	% Passing	Specification
63 mm	100	
53 mm	100	
37.5 mm	100	
26.5 mm	100	
19.0 mm	100	
13.2 mm	84	
9.5 mm	81	
6.7 mm	80	
4.75 mm	77	
2.36 mm	74	
1.18 mm	72	
600 um	69	
425 um	67	
300 um	65	
150 um	60	
75 um	55	
hydrometer values		
44 um	54	
22 um	52	
15 um	51	
11 um	49	
8 um	46	
1 um	31	

Consistency Limits and Moisture Content

Test		Method	Result	Spec.
Liquid Limit	%	AS1289 3.1.2	60	
Plastic Limit	%	AS1289 3.2.1	44	
Plasticity Index	%	AS1289 3.3.1	16	
Linear Shrinkage	%	AS1289 3.4.1	9	
Moisture Content	%	AS1289 2.1.1	41.5	

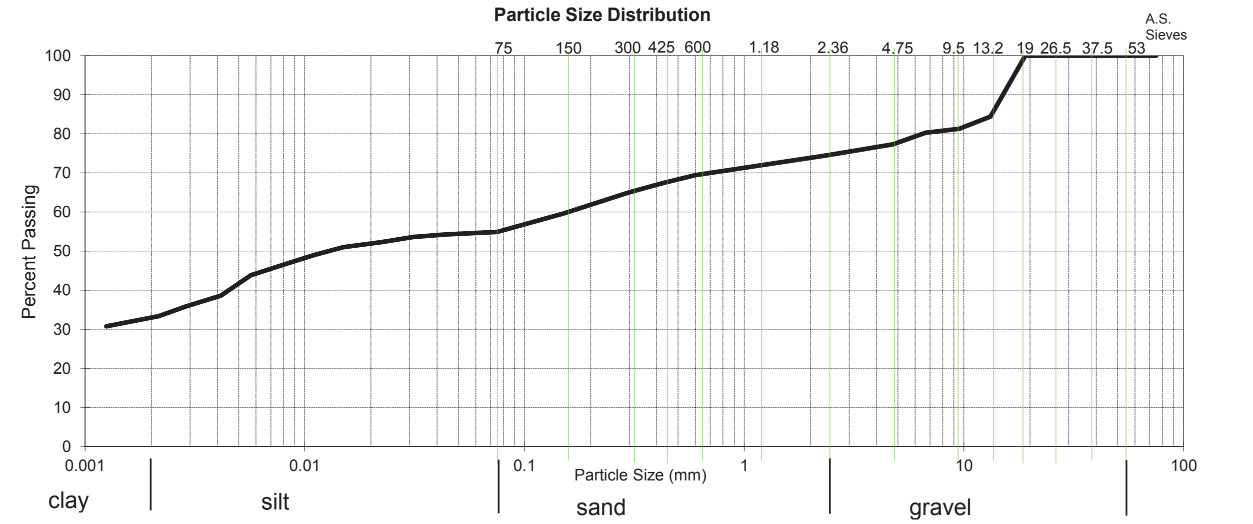
Sample History:	Oven Dried
Preparation Method:	Dry sieved
Cracking / Curling of linear shrinkage:	Cracking
Linear shrinkage mould length:	118

ND = not determined NO = not obtainable NP = non plastic

Notes Dispersion : mechanical / hydrometer: g/l
sampled by client, tested as received

Material properties

GRAVEL CONTENT =	26	%
SAND CONTENT =	19	%
SILT CONTENT =	22	%
CLAY CONTENT =	33	%



Date: 4/04/2019

NATA Accredited Laboratory No. 15055
Accredited for compliance with ISO/IEC 17025 - Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/National Standards

Simon Beggs
Approved Signatory

Form: GS005F/R version 3 20 Feb 2011

Ground Science
A C N 105 704 078
13 Brock Street Thomastown VIC 3074 P (03) 9464 4617 F (03) 9464 4618

Particle Size Distribution & Clay content

Client:	COFFEY INFORMATION (ABBOTSFORD)	Job No.	GS4544/1
Project:	LOTS 22,24,26,27 & 29, HOTPLATE DRIVE	Date:	1-Apr-19
Location:	HOTPLATE DRIVE, HOTHAM HEIGHTS	Report No.	PG
Lab Reference No.	#501	Sample Identification:	TP03 @ 0.1m - 0.2m

Laboratory Specimen Classification: **CLAY, high plasticity, dark grey, with sand, with clay, trace gravel**

Particle Size Distribution AS1289 3.6.3

Sieve Size	% Passing	Specification
63 mm	100	
53 mm	100	
37.5 mm	100	
26.5 mm	100	
19.0 mm	100	
13.2 mm	100	
9.5 mm	98	
6.7 mm	97	
4.75 mm	96	
2.36 mm	94	
1.18 mm	90	
600 um	87	
425 um	84	
300 um	81	
150 um	73	
75 um	67	
hydrometer values		
45 um	64	
23 um	63	
15 um	62	
11 um	61	
8 um	58	
1 um	39	

Consistency Limits and Moisture Content

Test		Method	Result	Spec.
Liquid Limit	%	AS1289 3.1.2	ND	
Plastic Limit	%	AS1289 3.2.1	ND	
Plasticity Index	%	AS1289 3.3.1	ND	
Linear Shrinkage	%	AS1289 3.4.1	ND	
Moisture Content	%	AS1289 2.1.1	43.0	

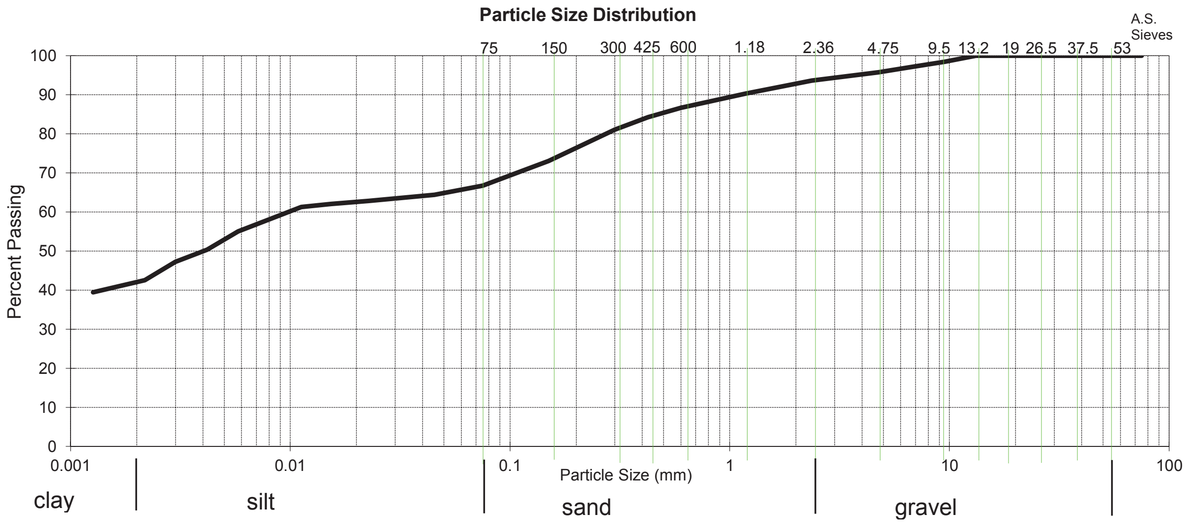
Sample History:	Oven Dried
Preparation Method:	Dry sieved
Cracking / Curling of linear shrinkage:	Curling
Linear shrinkage mould length:	-

ND = not determined NO = not obtainable NP = non plastic

Notes Dispersion : mechanical, hydrometer: g/l
sampled by client, tested as received

Material properties

GRAVEL CONTENT =	6	%
SAND CONTENT =	27	%
SILT CONTENT =	24	%
CLAY CONTENT =	43	%



Date: 4/04/2019

NATA Accredited Laboratory No. 15055
Accredited for compliance with ISO/IEC 17025 - Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/National Standards

Simon Beggs
Approved Signatory

APPENDIX C: LANDSLIDE RISK MANAGEMENT

PRACTICE NOTE GUIDELINES FOR LANDSLIDE RISK MANAGEMENT 2007

APPENDIX C: LANDSLIDE RISK ASSESSMENT

QUALITATIVE TERMINOLOGY FOR USE IN ASSESSING RISK TO PROPERTY

QUALITATIVE MEASURES OF LIKELIHOOD

Approximate Annual Probability		Implied Indicative Landslide Recurrence Interval		Description	Descriptor	Level
Indicative Value	**Notional Boundary**					
10^{-1}	$5x10^{-2}$	10 years	20 years	The event is expected to occur over the design life.	ALMOST CERTAIN	A
10^{-2}	$5x10^{-3}$	100 years	200 years	The event will probably occur under adverse conditions over the design life.	LIKELY	B
10^{-3}	$5x10^{-4}$	1000 years	2000 years	The event could occur under adverse conditions over the design life.	POSSIBLE	C
10^{-4}	$5x10^{-5}$	10,000 years	20,000 years	The event might occur under very adverse circumstances over the design life.	UNLIKELY	D
10^{-5}	$5x10^{-6}$	100,000 years	200,000 years	The event is conceivable but only under exceptional circumstances over the design life.	RARE	E
10^{-6}		1,000,000 years		The event is inconceivable or fanciful over the design life.	BARELY CREDIBLE	F

Note: (1) The table should be used from left to right; use Approximate Annual Probability or Description to assign Descriptor, not *vice versa*.

QUALITATIVE MEASURES OF CONSEQUENCES TO PROPERTY

Approximate Cost of Damage		Description	Descriptor	Level
Indicative Value	**Notional Boundary**			
200%	100%	Structure(s) completely destroyed and/or large scale damage requiring major engineering works for stabilisation. Could cause at least one adjacent property major consequence damage.	CATASTROPHIC	1
60%	40%	Extensive damage to most of structure, and/or extending beyond site boundaries requiring significant stabilisation works. Could cause at least one adjacent property medium consequence damage.	MAJOR	2
20%	10%	Moderate damage to some of structure, and/or significant part of site requiring large stabilisation works. Could cause at least one adjacent property minor consequence damage.	MEDIUM	3
5%	1%	Limited damage to part of structure, and/or part of site requiring some reinstatement stabilisation works.	MINOR	4
0.5%		Little damage. (Note for high probability event (Almost Certain), this category may be subdivided at a notional boundary of 0.1%. See Risk Matrix.)	INSIGNIFICANT	5

Notes: (2) The Approximate Cost of Damage is expressed as a percentage of market value, being the cost of the improved value of the unaffected property which includes the land plus the unaffected structures.

(3) The Approximate Cost is to be an estimate of the direct cost of the damage, such as the cost of reinstatement of the damaged portion of the property (land plus structures), stabilisation works required to render the site to tolerable risk level for the landslide which has occurred and professional design fees, and consequential costs such as legal fees, temporary accommodation. It does not include additional stabilisation works to address other landslides which may affect the property.

(4) The table should be used from left to right; use Approximate Cost of Damage or Description to assign Descriptor, not vice versa

APPENDIX C: – QUALITATIVE TERMINOLOGY FOR USE IN ASSESSING RISK TO PROPERTY (CONTINUED)

QUALITATIVE RISK ANALYSIS MATRIX – LEVEL OF RISK TO PROPERTY

LIKELIHOOD		CONSEQUENCES TO PROPERTY (With Indicative Approximate Cost of Damage)				
	Indicative Value of Approximate Annual Probability	**1: CATASTROPHIC 200%**	**2: MAJOR 60%**	**3: MEDIUM 20%**	**4: MINOR 5%**	**5: INSIGNIFICANT 0.5%**
A – ALMOST CERTAIN	10^{-1}	VH	VH	VH	H	M or **L** (5)
B - LIKELY	10^{-2}	VH	VH	H	M	**L**
C - POSSIBLE	10^{-3}	VH	H	M	M	**VL**
D - UNLIKELY	10^{-4}	H	M	**L**	**L**	**VL**
E - RARE	10^{-5}	M	**L**	**L**	**VL**	**VL**
F - BARELY CREDIBLE	10^{-6}	**L**	**VL**	**VL**	**VL**	**VL**

Notes: (5) For Cell A5, may be subdivided such that a consequence of less than 0.1% is Low Risk.

(6) When considering a risk assessment it must be clearly stated whether it is for existing conditions or with risk control measures which may not be implemented at the current time.

RISK LEVEL IMPLICATIONS

Risk Level		Example Implications (7)
VH	VERY HIGH RISK	Unacceptable without treatment. Extensive detailed investigation and research, planning and implementation of treatment options essential to reduce risk to Low; may be too expensive and not practical. Work likely to cost more than value of the property.
H	HIGH RISK	Unacceptable without treatment. Detailed investigation, planning and implementation of treatment options required to reduce risk to Low. Work would cost a substantial sum in relation to the value of the property.
M	MODERATE RISK	May be tolerated in certain circumstances (subject to regulator's approval) but requires investigation, planning and implementation of treatment options to reduce the risk to Low. Treatment options to reduce to Low risk should be implemented as soon as practicable.
L	LOW RISK	Usually acceptable to regulators. Where treatment has been required to reduce the risk to this level, ongoing maintenance is required.
VL	VERY LOW RISK	Acceptable. Manage by normal slope maintenance procedures.

Note: (7) The implications for a particular situation are to be determined by all parties to the risk assessment and may depend on the nature of the property at risk; these are only given as a general guide.

Landslide Risk Management

Important Information about AGS 2007 Appendix C (1 of 2)

INTRODUCTION

This sheet provides important information on the following Appendix C which has been copied from "Practice note guidelines for landslide risk management 2007". The "Practice Note" and accompanying "Commentary" (References 1 & 2, hereafter referred to as AGS2007) are part of a series of documents on landslide risk management prepared on behalf of, and endorsed by, the Australian Geomechanics Society. These documents were primarily prepared to apply to residential or similar development.

It should be noted that AGS2007 define landslides as "the movement of a mass of rock, debris or earth down a slope". This definition includes falls, topples, slides, spreads and flows from both natural and artificial slopes.

LANDSLIDE LIKELIHOOD ASSESSMENT

The assessment of the likelihood of landsliding requires evidence-based judgements.

Judging how often and how much an existing landslide will move is difficult. Judging the likelihood of a new landslide occurring is even harder. Records of past landslides can provide some information on what has happened, but are invariably incomplete and often provide little or no guidance on less frequent events that may occur. Often judgements have to be made about the likelihood of infrequent events with serious consequences, with little or no help from historical records. Slope models, which reflect evidence-based knowledge of how a slope was formed, how it behaved in the past and how it might behave in the future, are used to support judgements about what might happen. Because of the difficulties in assessing landslide likelihood, different assessors may make different judgements when presented with the same information.

The likelihood terms in Appendix C can be taken to imply that it is possible to distinguish between low probability events (e.g. between events having a probability of 1 in 10,000 and 1 in 100,000). In many circumstances it will not be possible to develop defensibly realistic judgements to do so, and so joint terms need to be used (e.g. Likely or Possible). For further discussion on landslide likelihood and other matters see References 3, 4 and 5.

CONSEQUENCES OF LANDSLIDES

There can be direct (e.g. property damage, injury / loss of life) and indirect (e.g. litigation, loss of business confidence) consequences of a landslide. The assessment of the importance (seriousness) of the consequences is a value judgement best made by those most affected (e.g. client, owner, regulator, public). The main role of the expert is usually to understand and explain what and who might be affected, and what damage or injury might occur.

Appendix C implies that we can anticipate total cost (direct and indirect) of landslide damage to about half an order of magnitude (e.g. the difference between $30,000 and $100,000). This involves predicting the location, size, travel distance and speed of a landslide, the response of a building (often before it has been built), the nature and the extent of damage, repair costs as well as indirect consequences such as legal costs, accommodation etc. There can be other direct and indirect consequences of a landslide which can be difficult to anticipate, let alone quantify and cost. The situation is analogous to the cost of workplace accidents where the hidden costs can range from less than one to more than 20 times the visible direct costs (Reference 5).

In many circumstances it will not be possible to develop defensibly realistic judgements to enable use of a single consequence descriptor from Appendix C, and so joint terms need to be used (e.g. Minor or Medium). In our experience, explicit descriptions of potential consequences (e.g. rocks up to 0.5m across may fall on a parked car) help those affected to make their own judgements about the seriousness of the consequences.

RISK MATRIX

The main purpose of a risk matrix is to help rank risks, set priorities and help the decision making process. The risk terms should be regarded only as a guide to the relative level of risk as they are the product of an evidence-based quantitative judgement of likelihood and a value judgement about consequences, both of which involve considerable uncertainty. Different assessors may arrive at different judgements on the risk level.

Using Appendix C, many existing houses on sloping land will be assessed to have a Moderate Risk.

Landslide Risk Management

Important Information about AGS 2007 Appendix C (2 of 2)

RISK LEVEL IMPLICATIONS

In general, it is the responsibility of the client and/or owner and/or regulatory authority and/or others who may be affected to decide whether to accept or treat the risk. The risk assessor and/or other advisers may assist by making risk comparisons, discussing treatment options, explaining the risk management process, advising how others have reacted to risk in similar situations, and making recommendations. Attitudes to risk vary widely and risk evaluation often involves considering more than just property damage (e.g. environmental effects, public reaction, political consequences, business confidence etc).

The risk level implications in Appendix C represent a very specific example and are unlikely to be generally applicable. In our experience the typical response of regulators to assessed risk is as follows:

Assessed risk	Typical response of client/ owner/ regulator/ person affected
Very High, High [1]	Treats seriously. Usually requires action to reduce risk. Will generally avoid development.
Moderate	May accept risk. Usually looks for ways to reduce risk if reasonably practicable.
Low, Very Low [1]	Usually regards risk as acceptable. May reduce risk if reasonably practicable.

1 The distinctions between Very High and High and between Low and Very Low risks are usually used to help set priorities.

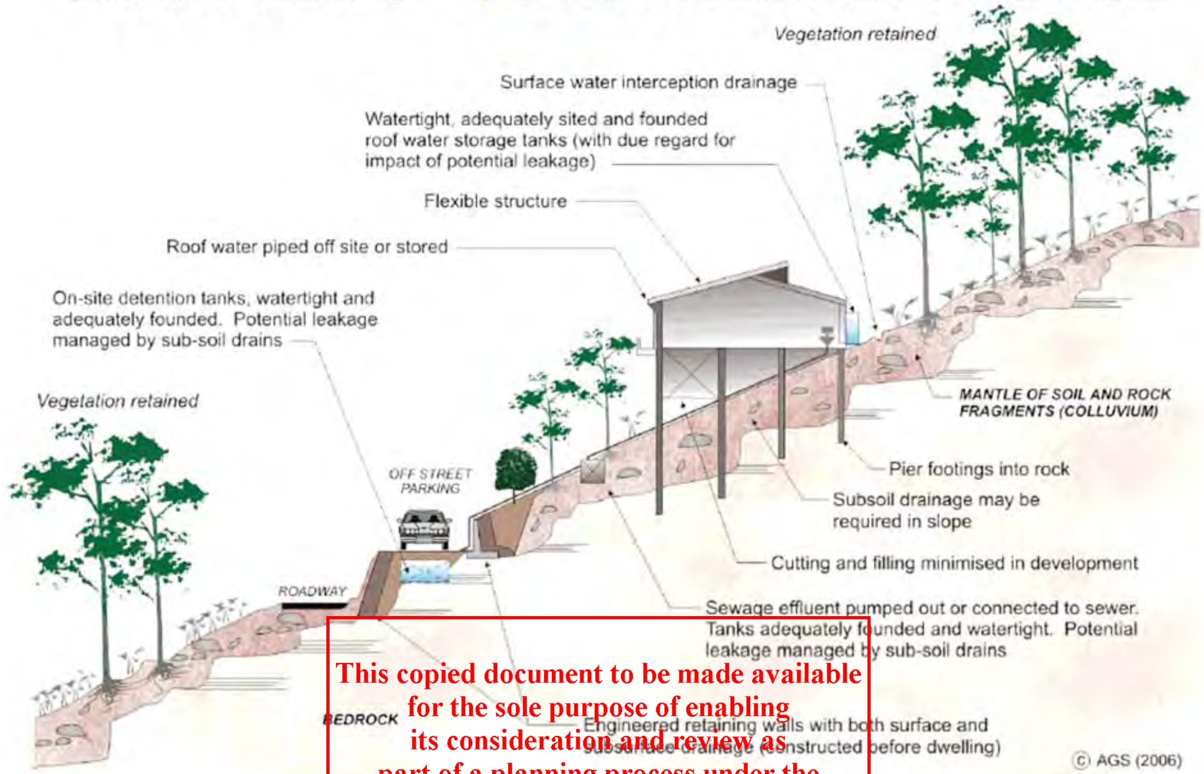
REFERENCES

1. AGS (2007). "Practice note guidelines for landslide risk management 2007". Australian Geomechanics, Vol. 42, No. 1, pp 63-114.
2. AGS (2007). "Commentary on practice note guidelines for landslide risk management 2007". Australian Geomechanics, Vol. 42, No. 1, pp 115-158.
3. Baynes, F.J., Lee I.K. and Stewart, I.E., (2002). "A study of the accuracy and precision of some landslide risk analyses." Australian Geomechanics, Vol. 37, No. 2, pp 149-156.
4. Baynes, et. al., (2007). "Concerns about the Practice Note Guidelines for Landslide Risk Management 2007." Letter to the editor, Australian Geomechanics, Vol. 2, No. 4, pp 63-114.
5. Moon, A.T., and Wilson, R,A., (2004). "Will it happen? – Quantitative judgements of landslide likelihood". Proceedings of the Australia New Zealand conference on Geomechnics, Centre of continuing education, University of Auckland, Vol. 2, pp 754-760.

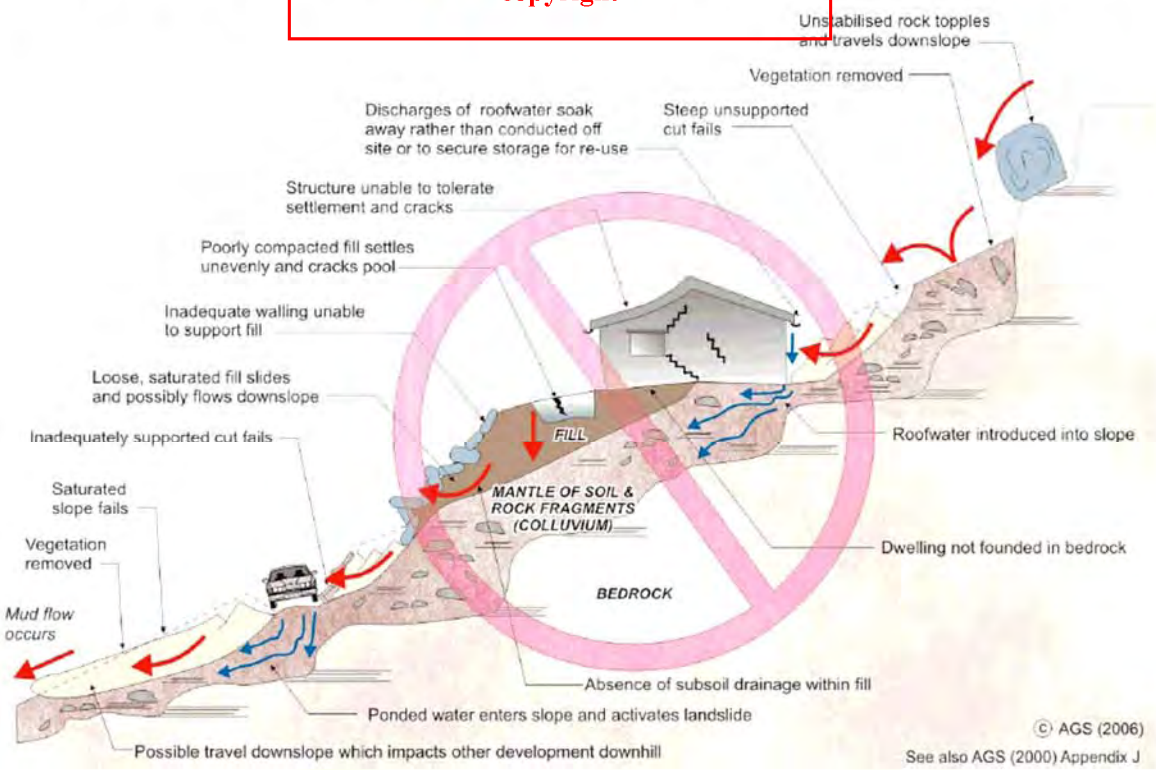
APPENDIX G - SOME GUIDELINES FOR HILLSIDE CONSTRUCTION

	GOOD ENGINEERING PRACTICE	*POOR ENGINEERING PRACTICE*
ADVICE		
GEOTECHNICAL ASSESSMENT	Obtain advice from a qualified, experienced geotechnical practitioner at early stage of planning and before site works.	Prepare detailed plan and start site works before geotechnical advice.
PLANNING		
SITE PLANNING	Having obtained geotechnical advice, plan the development with the risk arising from the identified hazards and consequences in mind.	Plan development without regard for the Risk.
DESIGN AND CONSTRUCTION		
HOUSE DESIGN	Use flexible structures which incorporate properly designed brickwork, timber or steel frames, timber or panel cladding. Consider use of split levels. Use decks for recreational areas where appropriate.	Floor plans which require extensive cutting and filling. Movement intolerant structures.
SITE CLEARING	Retain natural vegetation wherever practicable.	Indiscriminately clear the site.
ACCESS & DRIVEWAYS	Satisfy requirements below for cuts, fills, retaining walls and drainage. Council specifications for grades may need to be modified. Driveways and parking areas may need to be fully supported on piers.	Excavate and fill for site access before geotechnical advice.
EARTHWORKS	Retain natural contours wherever possible.	Indiscriminatory bulk earthworks.
CUTS	Minimise depth. Support with engineered retaining walls or batter to appropriate slope. Provide drainage measures and erosion control.	Large scale cuts and benching. Unsupported cuts. Ignore drainage requirements
FILLS	Minimise height. Strip vegetation and topsoil and key into natural slopes prior to filling. Use clean fill materials and compact to engineering standards. Batter to appropriate slope or support with engineered retaining wall. Provide surface drainage and appropriate subsurface drainage.	Loose or poorly compacted fill, which if it fails, may flow a considerable distance including onto property below. Block natural drainage lines. Fill over existing vegetation and topsoil. Include stumps, trees, vegetation, topsoil, boulders, building rubble etc in fill.
ROCK OUTCROPS & BOULDERS	Remove or stabilise boulders which may have unacceptable risk. Support rock faces where necessary.	Disturb or undercut detached blocks or boulders.
RETAINING WALLS	Engineer design to resist applied soil and water forces. Found on rock where practicable. Provide subsurface drainage within wall backfill and surface drainage on slope above. Construct wall as soon as possible after cut/fill operation.	Construct a structurally inadequate wall such as sandstone flagging, brick or unreinforced blockwork. Lack of subsurface drains and weepholes.
FOOTINGS	Found within rock where practicable. Use rows of piers or strip footings oriented up and down slope. Design for lateral creep pressures if necessary. Backfill footing excavations to exclude ingress of surface water.	Found on topsoil, loose fill, detached boulders or undercut cliffs.
SWIMMING POOLS	Engineer designed. Support on piers to rock where practicable. Provide with under-drainage and gravity drain outlet where practicable. Design for high soil pressures which may develop on uphill side whilst there may be little or no lateral support on downhill side.	
DRAINAGE		
SURFACE	Provide at tops of cut and fill slopes. Discharge to street drainage or natural water courses. Provide general falls to prevent blockage by siltation and incorporate silt traps. Line to minimise infiltration and make flexible where possible. Special structures to dissipate energy at changes of slope and/or direction.	Discharge at top of fills and cuts. Allow water to pond on bench areas.
SUBSURFACE	Provide filter around subsurface drain. Provide drain behind retaining walls. Use flexible pipelines with access for maintenance. Prevent inflow of surface water.	Discharge roof runoff into absorption trenches.
SEPTIC & SULLAGE	Usually requires pump-out or mains sewer systems; absorption trenches may be possible in some areas if risk is acceptable. Storage tanks should be water-tight and adequately founded.	Discharge sullage directly onto and into slopes. Use absorption trenches without consideration of landslide risk.
EROSION CONTROL & LANDSCAPING	Control erosion as this may lead to instability. Revegetate cleared area.	Failure to observe earthworks and drainage recommendations when landscaping.
DRAWINGS AND SITE VISITS DURING CONSTRUCTION		
DRAWINGS	Building Application drawings should be viewed by geotechnical consultant	
SITE VISITS	Site Visits by consultant may be appropriate during construction/	
INSPECTION AND MAINTENANCE BY OWNER		
OWNER'S RESPONSIBILITY	Clean drainage systems; repair broken joints in drains and leaks in supply pipes. Where structural distress is evident see advice. If seepage observed, determine causes or seek advice on consequences.	

EXAMPLES OF GOOD HILLSIDE PRACTICE



EXAMPLES OF POOR HILLSIDE PRACTICE



APPENDIX D: DECLARATION FORM (EROSION MANAGEMENT OVERLAY-SCHEDULE 1 MANAGEMENT OF GEOTECHNICAL HAZARDS)

Department of Sustainability and Environment

ALPINE RESORTS PLANNING SCHEME

Erosion Management Overlay – Schedule 1 Management of Geotechnical Hazard

FORM 1

Declaration and/or verification made by geotechnical engineer or engineering geologist as part of a geotechnical report

Name of application: Geotechnical Assessment for Proposed Building Allotment

Address of subject site: Lots 27 and 29 Hotplate Drive, Hotham Heights 3741

I, WaiLeung Ng (insert name) of Tetra Tech Coffey Pty Ltd (trading or company name)

on 22 November 2023 (insert date)

certify that I am a geotechnical engineer or engineering geologist as defined by the Erosion Management Overlay (Schedule 1 – Management of Geotechnical Hazard) and I have: (tick appropriate box):

☐ prepared the Geotechnical Report referenced below in accordance with the Australian Geomechanics Society's Geotechnical Risk Management Guidelines and Clause 3 of the EMO1

or

☒ technically verified that the geotechnical report referenced below has been prepared in accordance with the AGS's Geotechnical Risk Management Guidelines and Clause 3 of the EMO1.

Geotechnical report details:

Report title:	Geotechnical Assessment - Lots 22, 24 and 26 Hotplate Drive, Hotham Heights
Report date:	22 November 2023
Report reference:	754-MELGE227984.2 AB
Author:	WaiLeung Ng
Author's affiliation:	CPEng, 8519982

Documentation relied upon in report preparation:

I am aware that the Geotechnical Report I have either prepared or am technically verifying for the above development is to be submitted in support of a development application for the proposed development Lots 27 and 29 Hotplate Drive, Hotham Heights 3741 (name of development) requiring approval from the Minister for Planning.

Further, I hold a current professional indemnity insurance policy of at least $2 million, evidence of which is attached with this form.

Name WaiLeung Ng

Signature [signature]

Date 22 November 2023

Victoria The Place To Be

APPENDIX E: IMPORTANT INFORMATION ABOUT YOUR TETRA TECH COFFEY REPORT

IMPORTANT INFORMATION ABOUT YOUR TETRA TECH COFFEY REPORT

As a client of Tetra Tech Coffey you should know that site subsurface conditions cause more construction problems than any other factor. These notes have been prepared by Tetra Tech Coffey to help you interpret and understand the limitations of your report.

Your report is based on project specific criteria

Your report has been developed on the basis of your unique project specific requirements as understood by Tetra Tech Coffey and applies only to the site investigated. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed by scope-of-service limitations imposed by the client. Your report should not be used if there are any changes to the project without first asking Tetra Tech Coffey to assess how factors that changed subsequent to the date of the report affect the report's recommendations. Tetra Tech Coffey cannot accept responsibility for problems that may occur due to changed factors if they are not consulted.

Subsurface conditions can change

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult Tetra Tech Coffey to be advised how time may have impacted on the project.

Interpretation of factual data

Site assessment identifies actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from literature and external data source review, sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, owners should retain the services of Tetra Tech Coffey through the development stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Your report will only give preliminary recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Tetra Tech Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Tetra Tech Coffey cannot be held responsible for such misinterpretation.

Your report is prepared for specific purposes and persons

To avoid misuse of the information contained in your report it is recommended that you confer with Tetra Tech Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.

Interpretation by other design professionals

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Tetra Tech Coffey to work with other project design professionals who are affected by the report. Have Tetra Tech Coffey explain the report implications to design professionals affected by them and then review plans and specifications produced to see how they incorporate the report findings.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These logs etc. should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Geoenvironmental concerns are not at issue

Your report is not likely to relate any findings, conclusions, or recommendations about the potential for hazardous materials existing at the site unless specifically required to do so by the client. Specialist equipment, techniques, and personnel are used to perform a geoenvironmental assessment. Contamination can create major health, safety and environmental risks. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact Tetra Tech Coffey for information relating to geoenvironmental issues.

Rely on Tetra Tech Coffey for additional assistance

Tetra Tech Coffey 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 site assessment report due to concepts proposed at that time. As the project progresses through design towards construction, speak with Tetra Tech Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

Responsibility

Reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from Tetra Tech Coffey to other parties but are included to identify where Tetra Tech Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Tetra Tech Coffey closely and do not hesitate to ask any questions you may have.