



## Werribee Vale Road S96A

### Geotechnical Assessment

**Prepared for**

Plenti Property Pty Ltd

**Prepared by**

Tonkin & Taylor Pty Ltd

**Date**

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## Document control

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## 1 Introduction

Plenti Property Pty Ltd (Plenti) are proposing to develop a property straddling Hallets Way in Bacchus Marsh and wish to develop it in a sympathetic manner to the ongoing Underbank Development, located immediately to the west. Plenti have made a rezoning and subdivision application No S96A to Moorabool Shire Council (Council).

Council have requested a report on the escarpment situated to the north of the site (both east and west of Hallets Way) that assesses:

- Existing or potential future risks from rockfall, landslide or erosion; and
- Mitigation or management measures which may be required in response to any risks identified

A Senior Principal from T+T visited the site on 8 November 2022 to assess site conditions.

## 2 Site Condition

### 2.1 Surface Conditions

The proposed development site straddles the north-south road Hallets Way. An escarpment lies immediately to the north of the proposed development property. The escarpment decreases in height from the west, where it is about 20m high, towards the east where at the edge of the property it is about 10m high.

At the time of the site visit the escarpment west of Hallets Way was covered by long grass about a metre high and included a large tree near the middle of the slope. There is a historical irrigation channel on the slope, located about in the vertical centre of the slope. The overall slope angle is about 25°.

At the time of the site visit the escarpment east of Hallets Way was heavily treed with grass covering between the trees. Outcropping basalt was visible mid slope near Hallets way. The slope increased from about 30° near Hallets Way to about 40° in the mid part of the eastern area. An unsealed vehicle access track was at the toe of the slope.

### 2.2 Geological conditions

Based on published geological maps, the escarpment west of Hallets Way is shown to be underlain by basalt of the Tertiary/Quaternary age Newer Volcanics, in turn underlain by sand or clay of the Tertiary age Werribee Formation.

The escarpment east of Hallets Way is shown to be underlain by a thin veneer of Tertiary/Quaternary age Darley Gravel in turn underlain by Tertiary/Quaternary age Newer Volcanics, in turn underlain by sand or clay of the Tertiary age Werribee Formation.

### 2.3 Site observations

A Senior Principal Engineering Geologist from T+T conducted a site walkover of the escarpment on both sides of Hallets Way. The traverse in the west included a walk along the toe of the escarpment and up the slope to the irrigation channel. The traverse in the east included a walk along the toe, a traverse to the crest from the Hallets Way side, and along the crest.

The site observations from the site walkover are noted in Figure 1. Selected site photographs are attached in Appendix A.

### **2.3.1 Boulders**

On the eastern side of Halletts Way a series of boulders were noted at the most eastern extent of the historic irrigation channel and at the toe of the slope (Figure 1). The largest of these boulders was approximately 1m<sup>3</sup> in size. No boulders were observed at the toe.

On the western side of Halletts Way about ten boulders and cobbles were noted on the escarpment side of an old wire fence near the toe of the escarpment. The boulders ranged up to an irregular shape with approximate maximum dimensions of 900mm x 700mm x 600mm. Terracettes were observed on the most eastern part of the escarpment.

## **3 Discussion**

### **3.1 Boulder fall**

The boulders are considered likely to be mostly derived from residual basalt and/or basalt derived slope colluvium near the crest of the slope. Potential boulder release mechanisms include shrink/swell movements of soil due to wetting and drying and water flow during periods of higher rainfall. The slope vegetation may be assisting in retaining boulders in the soil and thus the risk of boulder fall may increase if the site were to experience fire or the vegetation on the escarpment were to be cleared for other reasons.

The considerable number of boulders observed during the site walkover indicates that boulder fall is a relatively common occurrence. Based on these observations we consider it likely that a rock catch fence, perhaps similar to that used in the neighbouring Underbank Development is likely to be required. The precise engineering requirements of the fence could be refined with a rock fall study and comparison to existing Australian road authority fence characteristics.

### **3.2 Irrigation channels**

The irrigation channel is acting to catch some boulders that are falling down the escarpment and thus is playing an important role in reducing the risk of boulder fall on the site. In order to improve the efficacy of the irrigation channels to catch boulder falls we recommend that they be cleaned out of boulders and other debris, prior to the construction of the rock fall barrier fence. We note that access to the irrigation channel with plant and equipment will be difficult and may make cleaning out of boulders and other debris impractical.

### **3.3 Slope instability**

Terracettes were observed in the escarpment east of Halletts Way. The slope in this area is relatively steep and we interpret the terracettes to indicate the ongoing presence of soil creep. These locations are likely to be more prone to small scale landslips.

The presence of a significant number of trees in the escarpment east of Halletts Way is likely to be reducing the potential for soil creep and then the overall likelihood of small-scale landslips. To further reduce the likelihood of small landslips we recommend that the property owners of the escarpment ensure that water does not drain on to the slope but rather is diverted into properly designed and constructed channels.

This report has been prepared for the exclusive use of our client Plenti Property Pty Ltd, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

Tonkin & Taylor Pty Ltd  
Environmental and Engineering Consultants

Reviewed by:



David Glover (PE0005088)  
Principal Geotechnical Engineer

Report prepared and Authorised for Tonkin & Taylor Pty Ltd by:



Trevor Smith  
Senior Principal Engineering Geologist

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## Appendix A    Figures

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PROJECT No. 1008283.2000			CLIENT <b>PLENTI PROPERTY PTY LTD</b>		
DESIGNED	TSM	Dec.22	PROJECT <b>WERRIBEE VALE ROAD S96A</b>		
DRAWN	KMJA	Dec.22	TITLE <b>ESCARPMENT ASSESSMENT</b>		
CHECKED			<b>REVISION 1</b>		
APPROVED			SCALE (A3) 1:1250	FIG No. 1008283.2000-F01	REV 1

## **Appendix B      Selected Site Photographs**

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Escarpment west of Halletts Way (looking north)



Escarpment east of Halletts Way (looking north)



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FIG. No.	Selected Site Photographs	Rev	0
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Boulders in irrigation channel west of Hallets Way



Boulders at base of escarpment east of Hallets Way (looking west)



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FIG. No.	Selected Site Photographs	Rev	0
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Exposed basalt on slope east of Hallets Way



Boulder at toe of escarpment east of Hallets Way.



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FIG. No.	Selected Site Photographs	Rev	0
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