

# Lot 1 Hidden Court Kennington

Geotechnical Investigation for  
Agarius Pty Ltd

Report 23C 0820-1  
November 2023

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## Geotechnical Investigation for Agarius Pty Ltd

### Revision

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23C 0820-1	SEH	3/11/2023

### Distribution (this version only)

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Agarius Pty Ltd Attn: Darren Pitson	Email PDF darren@kpdgroup.com.au	3/11/2023

#### GEOTECHNICAL | ENVIRONMENTAL | CONSTRUCTION MATERIALS TESTING

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## 1 INTRODUCTION

Agarius Pty Ltd commissioned Geotechnical Testing Services (GTS) to conduct a geotechnical investigation for the proposed development at Lot 1 Hidden Court, Kennington.

The investigation has been conducted for the purpose of assessing general subsurface conditions at the site and consequently assigning a Site Classification in accordance with *AS2870 – 2011 Residential Slabs and Footings*.

## 2 INVESTIGATION

The investigation was conducted on the 23<sup>rd</sup> of October 2023 using a trailer mounted drill rig to drill 3 boreholes to depths of 0.9 to 1.5 metres within the designated area. The soil profiles and borehole locations are presented at the end of this report.

At the time of this investigation, the type of development proposed is understood by GTS to be a new residential building. If the actual construction varies from this, then changes may be necessary to this classification report.

## 3 SITE CONDITION

The site is relatively flat building envelope and is currently vacant. It is noted that controlled fill (supervised and tested by GTS – report 23C 0198) was placed across the rear of the site. At the time of the investigation, the surface of the site was dry to moist and lacked grass cover. There are no trees within proximity of the proposed development. There was no visual evidence of surface cracking or surface rock. No groundwater seepage was encountered over the investigated depths.

Full details of the soil conditions are presented in the borehole logs.

## 4 SITE CLASSIFICATION

After allowing due consideration to the site geology, soil conditions, drainage, vegetation including trees and known details of the proposed development, the site has been classified as **Class M-D**.

Class M-D sites have an expected characteristic surface movement ( $y_s$ ) of 20 to 40mm.

Foundations designed in accordance with this classification are to be subject to the overriding conditions of Section 5.

## 5 DISCUSSION

Particular attention should be paid to the design of footings as required by *AS2870 – 2011*.

In addition to the normal founding requirements arising from the above classification, particular conditions at the site dictate that the founding medium and minimum depth below existing surface levels for all footings should be as follows:

- Silty CLAY, low to medium plasticity, orange/brown, with fine to medium gravel, trace fine to coarse sand, very stiff.

At depth below 0.1 metres in the region of BHs 2 and 3 and not intersected in BH1.

Or

- SILTSTONE, distinctly weathered, pale brown, low to medium strength rock.  
At depth below 0.35 metres in the region of BH1 and at depths below 1.0 metres in the region of BH2 and BH2.

An allowable bearing pressure of 100kPa is available for edge beams, strips and stump footings founded in the natural silty clays, and an allowable bearing pressure of 300kPa is available for edge beams, strips and stump footings founded in the weathered siltstone rock. All foundations should extend a minimum of 100mm into the above foundation material.

If founding on the siltstone rock, bored or screw piers may be considered. Blinding concrete (minimum strength 15MPa) may be used to bring the excavations up to design levels.

The base of all footing excavations must be free of tree roots.

The proposed development should be located a minimum distance of 0.75 x the mature height of all trees. This distance should be increased by 50% for groups or lines of trees. If this distance is impeded, then the size and distance from the development of the tree(s) needs to be taken into account when designing the foundation.

## 6 IMPORTANT NOTES ABOUT THIS REPORT

- The site classification presented in Section 4 assumes that the current natural drainage and infiltration conditions at the site will not be markedly affected by the proposed site development work. Care should therefore be taken to ensure that surface water is not permitted to collect adjacent to the structure and that significant changes to seasonal soil moisture equilibria do not develop as a result of service trench construction or tree root action.
- Attention is drawn to Appendix B of AS2870 and CSIRO document *BTF 18 – Foundation Maintenance and Footing Performance: A Homeowner's Guide* as a guide to maintenance requirement for the proposed structure.
- This is not a comprehensive investigation nor is it economic or practical to determine every subsurface feature on the site. Although this investigation indicates that soil conditions are

relatively uniform across the site, it is recommended that the base of all footing excavations be inspected to ensure that the founding medium meets the requirements referenced herein with respect to type and strength of founding materials. If further variations in descriptions in soil types, colour or depths are discovered during construction, this office should be notified immediately so that potential influence on the footings may be assessed.

- The soil colours provided in the borehole logs attached may vary with soil moisture content and individual interpretation, therefore colour alone should not be used to identify these soils.
- Strength characteristics of soils often exhibit a large variation between wet and dry conditions. Soil characteristics of a soil profile are given on the soil conditions at the time of the investigation.
- In the event of significant earthworks being undertaken on the site after this investigation, this report may require an amendment if appropriate.
- If FILL is found during this investigation, it is an indication of what was found during the investigation and it may vary over the site. It may be in the best interest of the buyer/seller to undertake a more detailed investigation, in this instance.

Should you have any further queries concerning these results, please do not hesitate to contact GTS on 03 5441 4881.

**Prepared by**

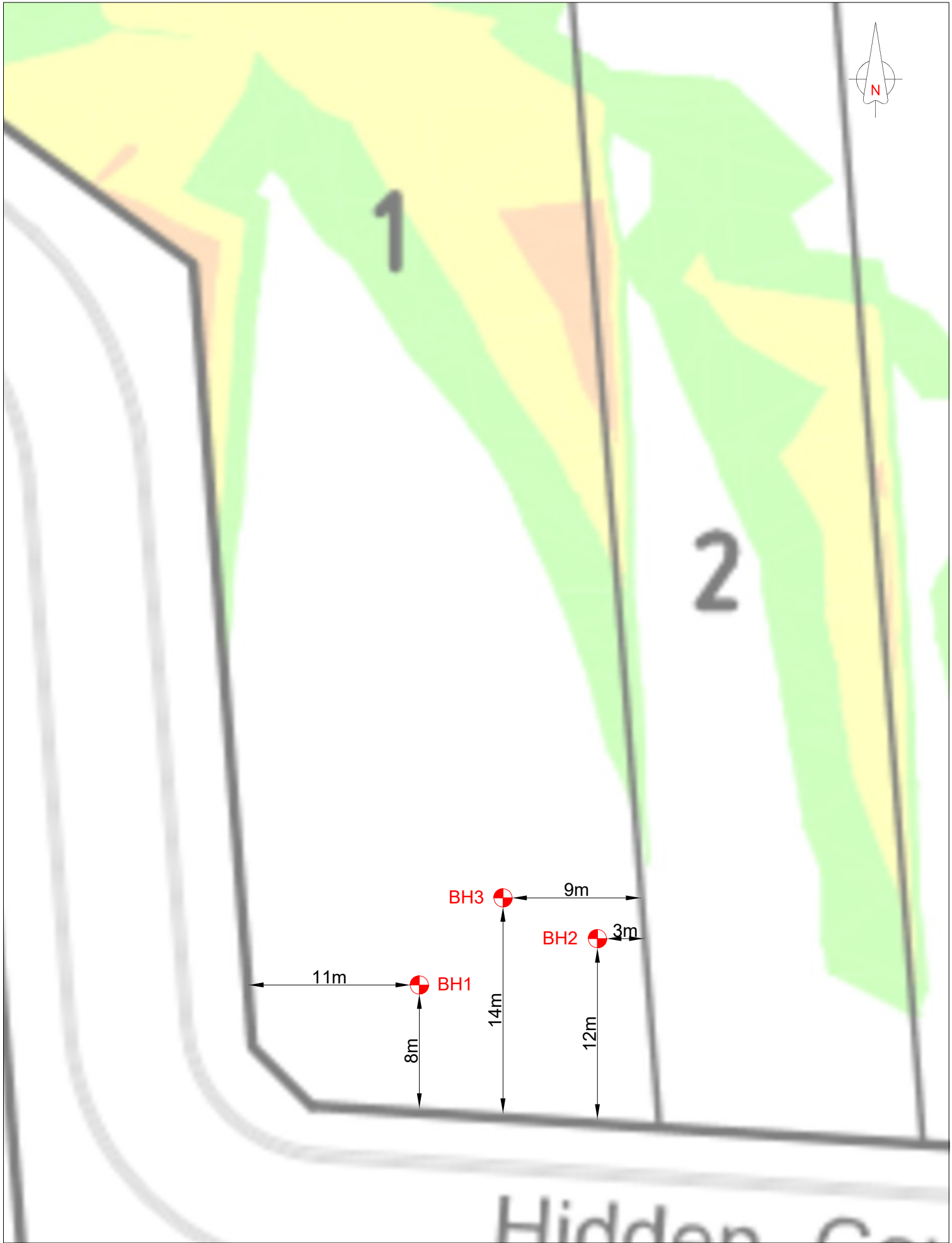


**Corey Palmer** BE (Hons) GradIEAust  
**Graduate Geotechnical Engineer**

**Reviewed by**



**Shane Hampton** BE (Hons), MIEAust  
**Principal Geotechnical Engineer**



## GEOTECHNICAL INVESTIGATION

APPROXIMATE LOCATIONS  
NOT TO SCALE

**CLIENT:** AGARIUS PTY LTD  
**PROJECT:** LOT 1 HIDDEN COURT,  
KENNINGTON

GTS REF: 23C 0820-1  
CLIENT REF:

DRAWN BY: CP  
DATE: 3 NOVEMBER 2023



# GTS - Bendigo



13 Alstonvale Court East Bendigo VIC 3550

Phone: 03 5441 4881

## Geotechnical Log - Borehole

1

UTM : Drill Rig : Honda SCR - Trailer Mount Job Number : 23C 0820-1  
Easting (m) : 0 Driller Supplier : Geotechnical Testing Services Client : Agarius Pty Ltd  
Northing (m) : 0 Logged By : PB Project : Site Classification  
Ground Elevation : Not Surveyed Reviewed By : CP Location : Lot 1 Hidden Court, Kennington  
Total Depth : 0.9 m BGL Date : 18/10/0023 Loc Comment :

Drilling Method	Water	Depth (m)	Soil Origin	Graphic Log	Classification Code	Material Description	Weathering	Moisture	Consistency/Density	Testing
100mm SFA		0.35	Fill		CL-CI	Silty CLAY (CL-CI) : low to medium plasticity, brown, very stiff, with fine to medium sized gravel, trace fine to coarse grained sand, dry.		D	VSt	
			Rock		SLT	SILTSTONE: distinctly weathered, low to medium strength, pale brown, grained, dry.	DW	D	LS-MS	
		1				1 refusal at 0.9 m (Refusal on Siltstone Rock)				




**GTS - Bendigo**

13 Alstonvale Court East Bendigo VIC 3550

Phone: 03 5441 4881

**Geotechnical Log - Borehole****2**

UTM : Drill Rig : Honda SCR - Trailer Mount Job Number : 23C 0820-1  
Easting (m) : 0 Driller Supplier : Geotechnical Testing Services Client : Agarius Pty Ltd  
Northing (m) : 0 Logged By : PB Project : Site Classification  
Ground Elevation : Not Surveyed Reviewed By : CP Location : Lot 1 Hidden Court, Kennington  
Total Depth : 1.3 m BGL Date : 18/10/0023 Loc Comment :

Drilling Method	Water	Depth (m)	Soil Origin	Graphic Log	Classification Code	Material Description	Weathering	Moisture	Consistency/Density	Testing
100mm SFA		0.7	Natural		CL-CI	Silty CLAY (CL-CI) : very stiff, low to medium plasticity, orange brown, with fine to medium sized gravel, trace fine to coarse grained sand, moist to dry.		M-D	VSt	
		1	Natural		CI	Silty CLAY (CI) : very stiff, medium plasticity, orange brown, trace fine sized gravel, trace fine to coarse grained sand, moist to dry.		M-D	VSt	
		1	Rock		SLT	SILTSTONE: distinctly weathered, low to medium strength, pale brown, grained, dry.	DW	D	LS-MS	
						2 refusal at 1.3 m (Refusal on Siltstone Rock)				





# GTS - Bendigo




13 Alstonvale Court East Bendigo VIC 3550

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## Geotechnical Log - Borehole

3

UTM : Drill Rig : Honda SCR - Trailer Mount Job Number : 23C 0820-1  
Easting (m) : 0.0 Driller Supplier : Geotechnical Testing Services Client : Agarius Pty Ltd  
Northing (m) : 0.0 Logged By : PB Project : Site Classification  
Ground Elevation : Not Surveyed Reviewed By : CP Location : Lot 1 Hidden Court, Kennington  
Total Depth : 1.5 m BGL Date : 18/10/2023 Loc Comment :

Drilling Method	Water	Depth (m)	Soil Origin	Graphic Log	Classification Code	Material Description	Weathering	Moisture	Consistency/Density	Testing
100mm SFA			Natural		CL-CI	Silty CLAY (CL-CI) : very stiff, low to medium plasticity, orange brown, with fine to medium sized gravel, trace fine to coarse grained sand, moist to dry.		M-D	VSt	
		0.5	Natural		CI	Silty CLAY (CI) : very stiff, medium plasticity, orange brown, trace fine sized gravel, trace fine to coarse grained sand, moist to dry.		M-D	VSt	
		1	Rock		SLT	SILTSTONE: distinctly weathered, low to medium strength, pale brown, grained, dry.	DW	D	LS-MS	
						3 refusal at 1.5 m (Refusal on Siltstone Rock)				

## DESCRIPTIVE TERMS BOREHOLE/EXCAVATION LOG

### Classification Symbol & Soil Name

Classification of material and its description is based on the Unified Classification System as referenced in AS1726 – 1993 Geotechnical Site Investigations, Appendix A. A summary of the more common terms is included within.

### Particle Size Descriptive Terms

Name	Subdivision	Size
Boulders		>200mm
Cobbles		63 – 200mm
Gravel	Coarse	20 – 63mm
	Medium	6 – 20mm
	Fine	2.36 – 6mm
Sand	Coarse	0.6 – 2.36mm
	Medium	200 – 600 micron
	Fine	75 – 200 micron
Silt		2 – 75 micron
Clay		< 2 micron

### Consistency of Cohesive Soils

Term	Undrained shear strength, $s_u$ (kPa)	Field Guide
Very Soft (VS)	<12	A finger can be pushed well into the soil with little effort
Soft (S)	12 – 25	A finger can be pushed into the soil to about 25mm depth
Firm (F)	25 – 50	The soil can be indented about 5mm with the thumb
Stiff (St)	50 – 100	The surface of the soil can be indented with the thumb
Very Stiff (VSt)	100 – 200	The surface of the soil can be indented by thumb nail
Hard (H)	>200	The surface of the soil can be marked only with the thumbnail
Friable (F)	-	Crumbles or powders when scraped by thumbnail

### Density of Granular Soils

Term	Density Index (%)
Very Loose (VL)	< 15
Loose (L)	15 – 35
Medium Dense (MD)	35 – 65
Dense (D)	65 – 85
Very Dense (VD)	> 85

### Minor Components

Term	Field Guide	Proportion of Minor Component In:
Trace of	Presence just detectable by feel or eye	Coarse grained soils: <5% Fine grained soils: <15%
Some	Presence easily detectable by feel or eye	Coarse grained soils: 5-12% Fine grained soils: 15-30%

### Moisture Condition

Dry (D)	Looks & feels dry. Cohesive soils are usually hard, powdery or friable. Granular soils run freely through the hand.
Moist (M)	Soil feels cool and darkened in colour. Cohesive soils can be moulded. Granular soils tend to cohere. Free water does not form.
Wet (W)	As for moist, but with free water forming on hands when remoulded.




### Method

<b>S</b>	Auger Screwing	<b>W</b>	Washboring
<b>D</b>	Auger Drilling	<b>N</b>	Natural Exposure
<b>R</b>	Roller/tricone	<b>E</b>	Existing Excavation

### Support

<b>B</b>	Blade/bucket	<b>*</b>	Nil
<b>C</b>	Coring	<b>C</b>	Casing
<b>H</b>	Hammer Drill	<b>M</b>	Mud/polymer

### Water

*	Not observed
	Observed water level (date shown)
	Observed water inflow
	Observed water outflow
R	Refer to report for details

### Structures, Additional Observations

<b>PP</b>	Pocket Penetrometer test (kPa)
<b>DCP</b>	Dynamic Cone Penetrometer test (blows/100mm)

### Notes, Samples, Tests

<b>U63</b>	Undisturbed sample, 63mm diameter
<b>D</b>	Disturbed sample
<b>N*</b>	Standard Penetration Test, (*) Sample Figure = results

### Surface

_____	Known boundary
-----	Probably boundary
-?-?-?-?-?-?	Possible boundary