Lot 28 Bartels Run Stage 1
Jackass Flat

Geotechnical Investigation for
Arbor Estates

Report 24C 0185-28
April 2024

GTS
GEOTECHNICAL TESTING SERVICES

www.gts.com.au

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Jackass Flat

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for
Arbor Estates

Revision

Revision	Authorised	Date
24C 0185-28	SEH	26/04/2024

Distribution (this version only)

Recipient	Format	Date
GTS	On file	26/04/2024
Arbor Estates Attn: Darren Pitson	Email PDF darren@kpdgroup.com.au	26/04/2024

1 INTRODUCTION

Arbor Estates commissioned Geotechnical Testing Services (GTS) to conduct a geotechnical investigation for the proposed development at Lot 28 Bartels Run Stage 1, Jackass Flat.

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 12th of April 2024 using a vehicle mounted drill rig to drill 3 boreholes to depths of 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 general classification of the lot. If the actual construction varies from this, then changes may be necessary to this classification report.

3 SITE CONDITION

The site has a slight fall to the front and is currently vacant. At the time of the investigation, the surface of the site was dry and lacked grass cover. There are no trees across the lot. 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, medium plasticity, orange/brown, trace fine to coarse sand, stiff to very stiff. At depth below 0.2 metres in the region of BHs 2 and 3 and at depths below 0.3 metres in the region of BH1.

  Or

- SILTSTONE, distinctly weathered, yellow/brown, off-white, low strength rock. At depth below 0.6 metres in the region of BH3, below 0.8 metres in the region of BH2 and at depths below 1.1 metres in the region of BH1.

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

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Reviewed by

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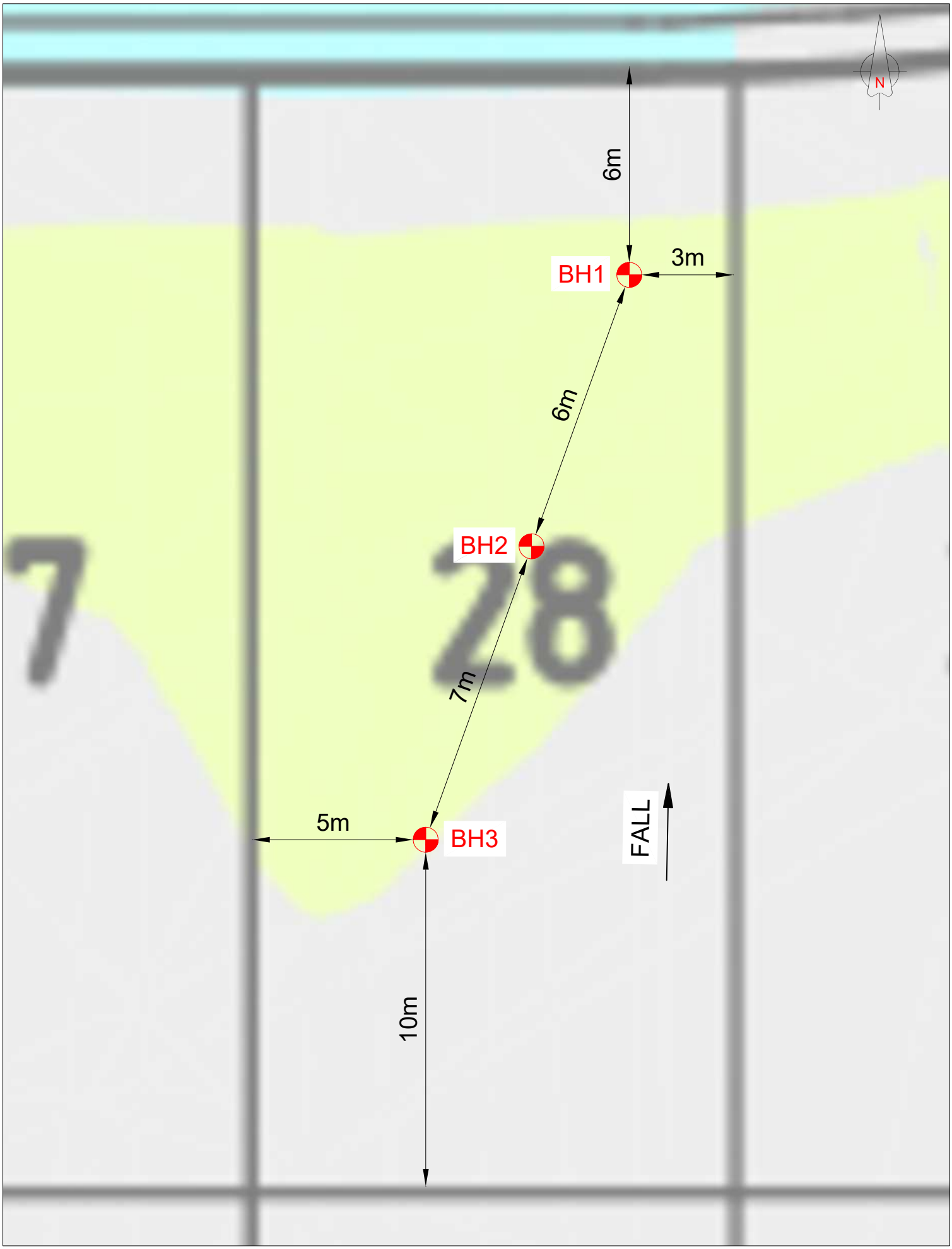
Principal Geotechnical Engineer



GTS GEOTECHNICAL TESTING SERVICES

GEOTECHNICAL INVESTIGATION

APPROXIMATE LOCATIONS
NOT TO SCALE

CLIENT: ARBOR ESTATES
PROJECT: LOT 28 BARTELS RUN STAGE 1, JACKASS FLAT

GTS REF: 24C 0185-28
CLIENT REF:

DRAWN BY: CP
DATE: 16 APRIL 2024

GTS - Bendigo
13 Alstonvale Court East Bendigo VIC 3550
Phone: 03 5441 4881

Geotechnical Log - Borehole

1

UTM	:	Drill Rig	: Drillman GT10 - Landcruiser Mount	Job Number	: 24C 0185-28
Easting (m)	: 0.00	Driller Supplier	: Geotechnical Testing Services	Client	: Arbor Estate
Northing (m)	: 0.00	Logged By	: PR	Project	: Site Classification
Ground Elevation	: Not Surveyed	Reviewed By	: CP	Location	: Lot 28 Bartels Run Stage 1, Jackass Flat
Total Depth	: 1.5 m BGL	Date	: 12/04/2024	Loc Comment	:

Water	Depth (m)	Soil Origin	Graphic Log	Classification Code	Material Description	Moisture	Weathering	Consistency	Testing: DCP	Testing: PP (kPa)	Testing: SPT	Remarks
		Fill		SM	Sandy SILT (SM) : low plasticity, pale brown, stiff, fine to coarse grained sand, with sized gravel, trace fine to coarse sized gravel, dry.	D		St				
	0.3	Natural		Cl	Silty CLAY (Cl) : very stiff, medium plasticity, orange brown, with sized gravel, trace fine to coarse grained sand, moist.	M		VSt				
	1											
	1.1	Rock		SLT	SILTSTONE: distinctly weathered, low strength, off-white, grained, dry.	D	DW	LS				
					1 Terminated at 1.5m							

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Geotechnical Log - Borehole

2

UTM	:	**Drill Rig**	: Drillman GT10 - Landcruiser Mount	**Job Number**	: 24C 0185-28
Easting (m)	: 0.00	**Driller Supplier**	: Geotechnical Testing Services	**Client**	: Arbor Estate
Northing (m)	: 0.00	**Logged By**	: PR	**Project**	: Site Classification
Ground Elevation	: Not Surveyed	**Reviewed By**	: CP	**Location**	: Lot 28 Bartels Run Stage 1, Jackass Flat
Total Depth	: 1.5 m BGL	**Date**	: 12/04/2024	**Loc Comment**	:

Water	Depth (m)	Soil Origin	Graphic Log	Classification Code	Material Description	Moisture	Weathering	Consistency	Testing: DCP	Testing: PP (kPa)	Testing: SPT	Remarks
		Fill		SM	Sandy SILT (SM) : low plasticity, pale brown, stiff, fine to coarse grained sand, with sized gravel, trace fine to coarse sized gravel, dry.	D		St				
	0.2	Natural		CI	Silty CLAY (CI) : very stiff, medium plasticity, orange brown, with sized gravel, trace fine to coarse grained sand, moist.	M		VSt				
	0.8	Rock		SLT	SILTSTONE: distinctly weathered, low strength, yellow, grained, dry.	D	DW	LS				
	1				**2 Terminated at 1.5m**							

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Geotechnical Log - Borehole

3

UTM	:	**Drill Rig**	: Drillman GT10 - Landcruiser Mount	**Job Number**	: 24C 0185-28
Easting (m)	: 0.00	**Driller Supplier**	: Geotechnical Testing Services	**Client**	: Arbor Estate
Northing (m)	: 0.00	**Logged By**	: PR	**Project**	: Site Classification
Ground Elevation	: Not Surveyed	**Reviewed By**	: CP	**Location**	: Lot 28 Bartels Run Stage 1, Jackass Flat
Total Depth	: 1.5 m BGL	**Date**	: 12/04/2024	**Loc Comment**	:

Water	Depth (m)	Soil Origin	Graphic Log	Classification Code	Material Description	Moisture	Weathering	Consistency	Testing: DCP	Testing: PP (kPa)	Testing: SPT	Remarks
		Fill		SM	Sandy SILT (SM) : low plasticity, pale brown, stiff, fine to coarse grained sand, with sized gravel, trace fine to coarse sized gravel, dry.	D		St				
	0.2	Natural		CI	Silty CLAY (CI) : very stiff, medium plasticity, orange brown, with sized gravel, trace fine to coarse grained sand, moist.	M		VSt				
	0.6	Rock		SLT	SILTSTONE: distinctly weathered, low strength, off-white, grained, dry.	D	DW	LS				
	1											
					3 Terminated at 1.5m							

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

S	Auger Screwing	**W**	Washboring	**B**	Blade/bucket
D	Auger Drilling	**N**	Natural Exposure	**C**	Coring
R	Roller/tricone	**E**	Existing Excavation	**H**	Hammer Drill

Support

*****	Nil
C	Casing
M	Mud/polymer

Water

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

Notes, Samples, Tests

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

Structures, Additional Observations

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

Surface

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