#### ABN 31 105 704 078

13 Brock Street, Thomastown Victoria 3074 (P) +61 3 9464 4617 (F) +61 3 9464 4618



# GEOTECHNICAL SITE CLASSIFICATION LOT 209 FIVE FARMS ESTATE STAGE 2, CLYDE NORTH

Prepared for Frasers Property Australia c/- Beveridge Williams Pty Ltd

Report Reference: G4589.2

Date: 17 May 2022

#### ABN 31 105 704 078

13 Brock Street, Thomastown Victoria 3074 (P) +61 3 9464 4617 (F) +61 3 9464 4618



# **PROJECT DETAILS**

Project Reference	G4589.2	Rev	Al
Project Title	Five Farms Estate Stage 2		
Project Location	Clyde North	State	VIC
Date	17 May 2022		

# **CLIENT DETAILS**

Prepared For (Client)	Frasers Property Australia		
Prepared For (Facilitator)	Beveridge Williams Pty Ltd		
Client Address	Level 9, 484 St Kilda Road	Suburb	Melbourne

# **DISTRIBUTION**

Original Held By	Ground Science Pty Ltd
One (1) Electronic Copy	Frasers Property Australia
One (1) Electronic Copy	Beveridge Williams Pty Ltd

This document presents the results of the site classification conducted for the aforementioned project and is detailed for the sole use of the intended recipient. Should you have any questions related to this report please do not hesitate to contact the undersigned.

Author:

Gee Singh, MIEAust (NER) Senior Geotechnical Engineer

# Table of Contents

1.	IN	NTRODUCTION	1
2.	Р	ROJECT BACKGROUND	1
3.	Р	ROJECT AIMS	1
4.	S	COPE OF WORKS	1
5.	R	ESULTS	2
	5.1	REGIONAL GEOLOGICAL CONDITIONS	2
	5.2	SURFACE CONDITIONS	2
	5.3	SUBSURFACE CONDITIONS	2
	5.4	GROUNDWATER	2
	5.5	LABORATORY TESTING	2
6.	D	ISCUSSION & RECOMMENDATIONS	3
	6.1	AS2870-2011 SITE CLASSIFICATION	3
	6.2	FOOTING DESIGN	3
7.	G	ENERAL RECOMMENDATIONS	4
	7.1	FOOTINGS	4
	7.2	DRAINAGE DESIGN REQUIREMENTS (AS2870-2011)	4
	7.3	SUBGRADE PREPARATION	5
8.	D	ISCLOSURE	5
9.	L	IMITATIONS	6
10	). R	EFERENCES	7
T/	ABLE	es.	
		1: LABORATORY TEST RESULTS SUMMARY	2
TA	ABLE	2: SITE CHARACTERISTICS	4
۸۵	DDEN	IDICES	
		NDIX A SITE LAYOUT PLANS	
		NDIX B BOREHOLE LOG SHEETS	
ΑI	PPEN	NDIX C LABORATORY RESULTS	



#### 1. INTRODUCTION

This report presents the results of the geotechnical site classification investigation carried out by Ground Science for the Five Farms Estate, Stage 2 located in Clyde North, Victoria (the site). This report presents the results for:

#### Lot 209

The scope of works detailed herein was commissioned by Beveridge Williams Pty Ltd (facilitator) on behalf of Frasers Property Australia (Principal).

#### 2. PROJECT BACKGROUND

The Five Farms residential development included the construction of building platforms as part of the bulk earthworks phase of the project, which primarily involved the placement of controlled fill and site cuts. Controlled fill was placed and compacted to Level 1 procedures in general accordance with AS3798 (2007) 'Guidelines on Earthworks for Residential and Commercial Developments'. Ground Science were the nominated Geotechnical Inspection and Testing Authority for the Level 1 filling works carried out within this stage (report reference: GS5860.2 AA dated 19th April 2022).

The professional advice provided in this report is based on the information provided at the time of the report preparation and may not be valid if changes are made to the site, the development proposal, or the construction methods. In the event of such changes, further advice should be sought from Ground Science.

#### 3. PROJECT AIMS

The aims of the investigation were as follows:

- To assess the subsurface conditions at the site relevant to the proposed development through a desktop regional geological study.
- To recover soil samples for laboratory analysis.
- To log the soils as per the guidelines presented in AS1726 (2017) 'Geotechnical Site Investigations'.
- To classify the site in accordance with AS2870 (2011) 'Residential Slabs and Footings'.
- To calculate the characteristic surface movement (Y<sub>S</sub>) for the site.
- To provide advice on allowable bearing pressures and geotechnical parameters for the design of footing systems.
- To provide general construction advice.

### 4. SCOPE OF WORKS

The site classification investigation for Stages 2 & 3 was carried out simultaneously. The scope of works involved the drilling of 50 boreholes (BH1 – BH50) spatially distributed across the allotments using a truck mounted (GT10) drilling rig supplied and operated by Ground Science. The soils were logged and hand classified using visual tactile methods (AS1726) by a qualified geotechnical engineer from this office. Representative soil samples were recovered from the controlled fill & residual soil deposits for a total of 12 Shrink/Swell Index (Iss) tests. Laboratory testing was carried out in Ground Science's NATA accredited testing facility in Thomastown, Victoria.

Borehole locations are shown on the site plan in **Appendix A**. Engineering borehole log sheets for this allotment and surrounding allotments are presented in **Appendix B**. Laboratory test reports are presented in **Appendix C**.



#### 5. RESULTS

#### 5.1 REGIONAL GEOLOGICAL CONDITIONS

The Geological Survey of Victoria map sheets indicate the site is underlain by Miocene to Pliocene aged 'Red Bluff Sandstone' deposits, with Pleistocene to Holocene aged alluvial deposits indicated towards exist to the west and south/west. This assessment excludes controlled (engineered) fill noted to have been placed on the allotments, however the controlled fill materials are noted to have been generally derived from blending onsite soils or imported fill materials from local source sites of relatively similar geological characteristics.

#### 5.2 SURFACE CONDITIONS

The site is located west of Pound Road and southeast of the Hardys Road / future Bells Road intersection. At the time of our investigation, the site was observed to be generally flat with fair drainage conditions noted. The surface of the allotments was dry and generally comprised barren soil. The site was generally trafficable to a 4WD mounted drilling rig. No trees were observed to be located within close proximity to the building envelopes.

#### 5.3 SUBSURFACE CONDITIONS

The subsurface soil profile encountered during the field investigation is considered to be generally consistent with our expectations of the site. The subsurface soils generally comprised **controlled (engineered) fill** recovered as Sandy CLAY, Silty CLAY or Silty/Clayey SAND overlying **naturally occurring** inferred 'Red Bluff Sandstone' residual soils comprising Silty/Sandy CLAY. The controlled fill and residual soil deposits were generally medium dense to dense, stiff to very stiff, and moisture close to the plastic limit.

#### 5.4 GROUNDWATER

Groundwater was not encountered during the borehole drilling. The Visualising Victoria's Groundwater dataset indicates the regional groundwater table is less than 5.0mbgl. During wet seasons or following torrential rainfalls, there is a possibility for a perched water table to develop in the area. This should be carefully considered during the construction stage, especially when footing excavations are left exposed or prior to topsoil application.

#### 5.5 LABORATORY TESTING

A summary of the laboratory test results are presented in Table 1:

**Table 1: Laboratory Test Results Summary** 

Sample #	Borehole	Depth (m)	Geological Origin	Shrink Swell Index Iss (%)
S1	BH1	1.0 – 1.3	Residual Soils	3.8
S2	BH6	0.8 – 1.0	Controlled Fill	0.5
S3	BH10	1.5 – 1.8	Residual Soils	1.6
S5	BH16	0.6 – 0.9	Residual Soils	0.9
S6	BH19	1.5 – 1.7	Residual Soils	1.6
S7	BH22	1.0 – 1.3	Controlled Fill	3.5
S8	BH26	0.5 – 0.8	Controlled Fill	1.3
S10	BH32	1.5 – 1.7	Residual Soils	2.8
S12	BH41	0.5 – 0.8	Controlled Fill	0.7
S13	BH44	1.5 – 1.7	Residual Soils	2.9
S14	BH46	0.7 – 1.0	Residual Soils	0.4
S15	BH50	1.2 – 1.5	Residual Soils	1.3



#### 6. DISCUSSION & RECOMMENDATIONS

#### 6.1 AS2870-2011 SITE CLASSIFICATION

The site has been classified in general accordance with the guidelines presented in AS2870 (2011) 'Residential Slabs and Footings'. The following site characteristics were adopted in the site classification assessment:

**Table 2: Site Characteristics** 

Climatic Zone	2 (Figure D1 of AS2870-2011)
Soil Profile Group	Group 3 (Table D1 of AS2870-2011)
Depth of Soil Suction Change (Hs)	1.8m

Based on the results of the geotechnical investigation, the geological setting and the guidelines presented in AS2870 (2011), the site has been classified as **Class H1**, with an assessed characteristic surface movement (y<sub>s</sub>) of between 40mm and 60mm.

According to the Building Code of Australia (BCA), the above classification is only applicable for Class 1 to 10a building types. For other building types/loads, this classification should only be used as a guide. It is recommended that precautions be taken to control moisture variations within the founding soils given the variable reactivity of subsurface soils, as follows:

- Restrict tree planting in the vicinity of the building. AS2870-2011 advises that trees be planted no closer
  to the building than a distance equal to 1.0 times their mature height on Class H1 sites. This distance
  should be increased where rows or groups of trees are involved.
- Provide paving to the edge of the building to limit soil moisture variations due to seasonal wetting and drying. The paved surface should be graded away from the building such that run-off drains away, and water cannot pond against the building.
- Service trenches, particularly plumbing and drainage, should be avoided beneath buildings. Where
  service trenches are to pass beneath or close to the building, they should be backfilled with a low
  permeability material, such as compacted clay, to prevent the ingress of water. The use of porous backfill
  materials should be avoided.
- Any leaking or damaged underground services should be repaired promptly.
- During construction, footing excavations should not be left exposed to the weather for extended periods.
   Water should not be allowed to pond in these areas, nor should it be left unprotected to dry and crack in the sun.

#### 6.2 FOOTING DESIGN

The use of shallow / spread footings suitably embedded within the controlled fill or naturally occurring soils is considered suitable for this site. Footings shall be proportioned to an allowable bearing pressure of 100kPa, under stiff/medium dense and dry to damp conditions (or better).

It should be noted that construction during wet/winter periods may experience a reduced bearing pressure, particularly if left exposed for periods of time. Where required, a reassessment of the applicable bearing pressures may be undertaken. Footings should not be founded within any fill, unless the fill has been placed as controlled fill in accordance with AS3798 (2007) 'Guidelines for Earthworks on Residential and Commercial Developments' if applicable.



#### 7. GENERAL RECOMMENDATIONS

#### 7.1 FOOTINGS

- It is recommended that all footing excavations be inspected by a geotechnical engineer from this office to confirm that the founding conditions are consistent with design recommendations. The footing size and the founding level may need to be adjusted if the required founding material is not encountered at the design founding level.
- To reduce soil moisture variations near the footings, the builder should compact clean soil (without rubble or organic matter) around the footings to reduce potential water ingress around the footings.
- To reduce, but not eliminate, the possibility of damage to the footing, tree planting should be restricted as indicated earlier in this report.
- Good drainage is important to footing performance. The Builder should prevent water accumulation near the
  building footings (even during construction). It is recommended that sufficient ground clearance be created to
  accommodate paving which slopes a minimum of 1:20 away from the building. This slope should be achieved
  by excavation and not by building up loose fill around the footings.
- The roof water should be diverted away from the footing as soon as the roof is constructed by using temporary
  pipes, if necessary. The surface water should also be provided by constructing surface gutters or grading the
  surface to divert the water away from the footing.
- During wet conditions, machinery traffic may disturb the subgrade soils and should be avoided in the area of the building
- Any proposed footings which are close to an easement, underground service trenches, and/or other
  excavations, (including those in adjoining properties) should be founded below a line projected up at 45° to the
  horizontal (for firm/stiff Clay) and measured from the nearest base of the easement excavations.
- Avoid excavations close to footings since those founded on sandy soils can experience settlements while those founded in clayey soils can also move due to the shrinking and swelling of the clay. Plumbers and drainers should follow all the recommendations made in AS 2870-2011 and other appropriate codes with respect to drainage works.
- Protection of the footing system from moisture ingress or moisture loss after construction is the responsibility of the homeowner.

#### 7.2 DRAINAGE DESIGN REQUIREMENTS (AS2870-2011)

- It should be noted that the building and site drainage design, as well as height of the floor level above the finished ground level, may be affected by factors other than structural design requirements, such as below:
  - Run-off water and influence of local topography;
  - Possibility of flooding;
  - Effects of existing and post-construction landscaping;
  - Level of the legal point of stormwater discharge;
  - Plumbing and drainage requirements;
  - Minimum height from finished ground level to the damp-proof course level;
  - Termite management.



- Surface drainage shall be designed and constructed to avoid water ponding against or near the footing. The ground in the immediate vicinity of the perimeter footing, including the ground uphill from the slab on cut and fill sites shall be graded to fall 50mm minimum away from the footing over 1m and shaped to prevent ponding of water. Where the filling is placed adjacent to the building, the filling shall be compacted and graded to ensure drainage of water away from the building. The requirements of Clause 5.2.2 of AS2870 (2011) shall be applied to reduce the possibility of surface water entering living areas. Alternative drainage systems will be required on zero lot line construction. Any paving shall also be suitably sloped.
- The site classification as stated in this report shall be stated on any construction drawings. The selected footing system and any required site work and required site drainage shall be documented.

#### 7.3 SUBGRADE PREPARATION

- The subgrade should be stripped of all topsoil and soils containing significant organic matter.
- The exposed subgrade surface should be presented in a suitably moist condition and test rolled with several
  passes of an 8-10 tonne smooth drum roller. Any soft spots identified during test rolling should be removed by
  excavation and replaced with well-compacted suitable fill.
- Under no circumstances should any additional fill contain a significant amount of organic matter or be a mixture
  of greatly different particle sizes; e.g. it should not be a mixture of rock and soil, although less than 10% rock
  may be permitted.
- It is important that any fill be compacted close to its optimum moisture content during compaction.
- The compaction method and equipment should suit the fill material used and its degree of compaction should be tested and/or inspected by a suitably accredited NATA laboratory to meet the requirements of AS 3798-2007 "Guidelines on Earthworks for Commercial and Residential Developments".

#### 8. DISCLOSURE

This document is detailed for the sole use of the intended recipient(s) or its authorized representatives. Distribution of this report may be carried out at the Clients discretion and must be reproduced in full. Should you have any questions related to this report please do not hesitate to contact this office.



#### 9. LIMITATIONS

The advice provided in this document (as per our commission) is not designed or capable of identifying all soil conditions, (which can vary with products chosen). The advice given in this document is based on the assumption that the test results are representative of the overall soil conditions. However, it should be noted that actual conditions in some parts of the site might differ from those found. If further sampling/ testing reveals soil characteristics significantly different from those shown in our findings, Ground Science must be consulted.

The scope and the period of Ground Science services are described in the document and are subject to restrictions and limitations. Ground Science did not perform a complete assessment of all possible conditions or circumstances that may exist. If a service is not expressly indicated, do not assume it has been provided. If a matter is not addressed, do not assume that any determination has been made by Ground Science in regards to it.

Where data has been supplied by the client or a third party, it is assumed that the information is correct unless otherwise stated. No responsibility is accepted by Ground Science for incomplete or inaccurate data supplied by others.

It is recognized that the passage of time affects the information and assessment provided in this document. Ground Science's assessment is based on information that existed at the time of the preparation of this document. It is understood that the services provided allowed Ground Science to form no more than an opinion of the actual site conditions observed during sampling and observations of the site visit and cannot be used to assess the effects of any subsequent changes in the quality of the site, or its surroundings, or any laws or regulations.

Any drawings or figures presented in this report should be considered only as pictorial evidence of our work. Therefore, unless otherwise stated, any dimensions should not be used for accurate calculations or dimensioning.

This document is COPYRIGHT- all rights reserved. No part of this document may be reproduced or copied in any form or by means without written permission by Ground Science Pty Ltd. All other property in this submission shall not pass until all preparation fees have been settled. This submission is for the use only of the party to whom it is addressed and for no other purpose. No responsibility is accepted to any third party who may use or rely on the whole or any part of the content of this submission. No responsibility will be taken for this report if it is altered in any way, or not reproduced in full. This document remains the property of Ground Science Pty Ltd until all fees and monies have been paid in full.

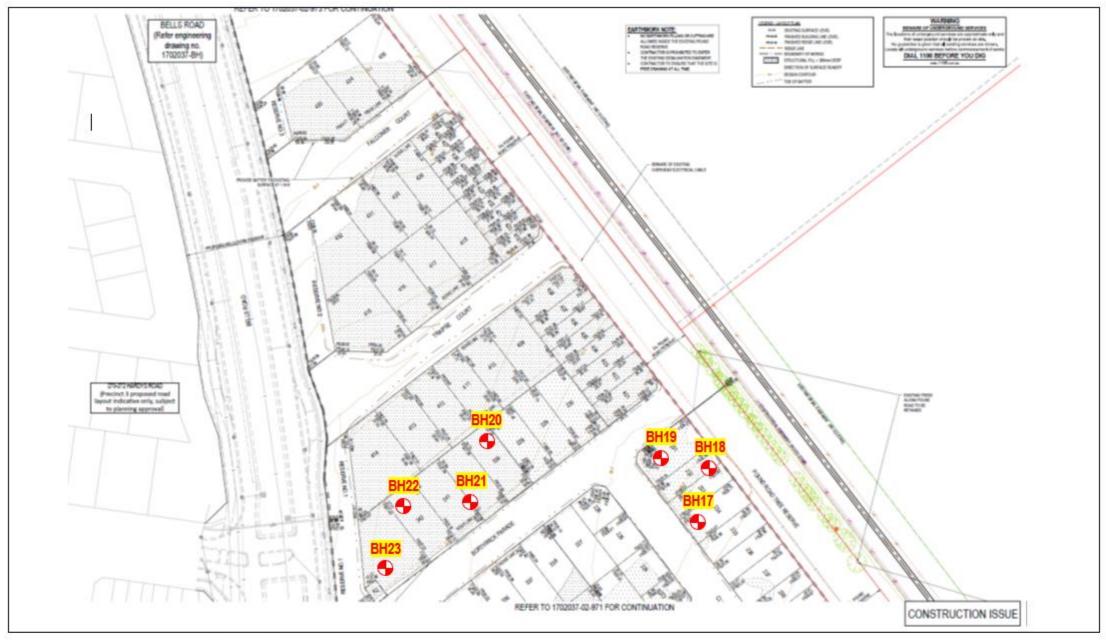


#### 10. REFERENCES

- Geological Survey of Victoria, Geological Map Sheets.
- AS2870 2011 Residential Slabs and Footings.
- AS3798 2007 Guidelines on Earthworks for Residential and Commercial Developments.
- AS1289 Testing of Soils for Engineering Purposes.
- AS1726 2017 Geotechnical Site Investigations.
- Ground Science, GS5860.2 AA 19 April 2022, Level 1 Inspection & Testing, Five Farms Stage 2.
- Ground Science, GS5860.3 AA 19 April 2022, Level 1 Inspection & Testing, Five Farms Stage 3.

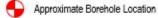
# APPENDIX A

Site & Test Location Plans



Rev	9	Drawn	Date	Checked	Scale	
				3		
0	Figure 1 of 2: Borehole Locations	cc	14.04.22	GS	NTS	

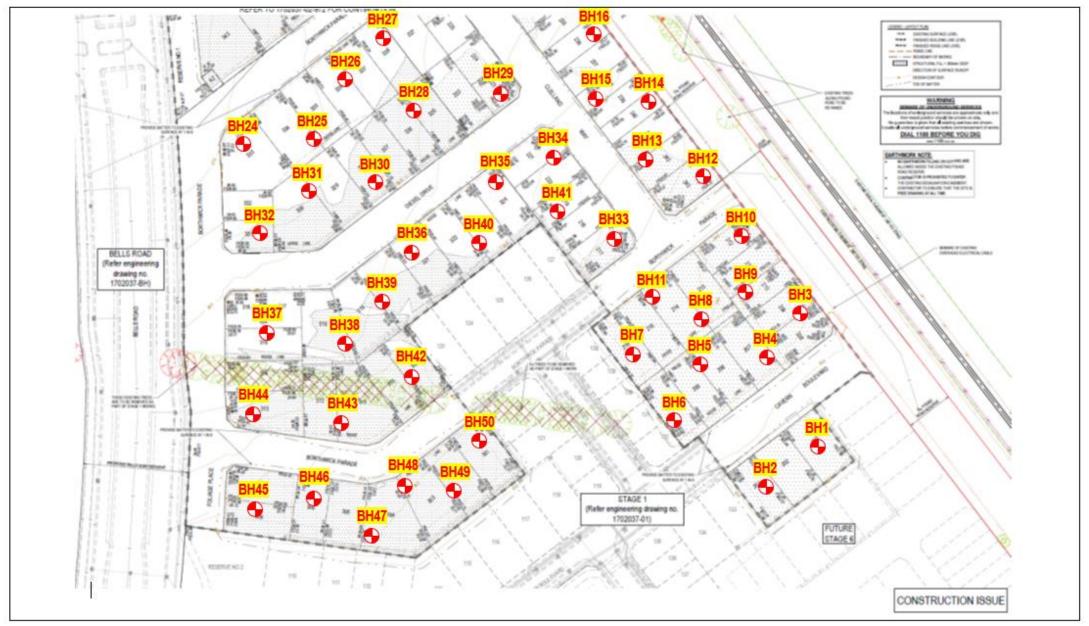
Legend



STAGE 2 & 3 BOREHOLE LOCATIONS FIVE FARMS ESTATE, CLYDE NORTH

> Prepared For: Frasers Property Australia Job No: G4589.2 & G4589.3





Rev		Drawn	Date	Checked	Scale	1
					5	0
					56 26	977 332
0	Figure 2 of 2: Proposed Boreholes	CC	14.04.22	GS	NTS	58

# Legend



STAGE 2 & 3 BOREHOLE LOCATIONS FIVE FARMS ESTATE, CLYDE NORTH

Prepared For: Frasers Property Australia

Job No: G4589.2 & G4589.3



# APPENDIX B

Engineering Borehole Logs

•			Gro	undSa	ien:	ce	•	ENGINEERING BOREHOLE LOG	Borehole JOB No :		BH3 G4589.283	
CLIENT: PROJECT: LOCATION: TEST LOCATIO		F (	Five Farms E Clyde North Refer to site p	erty Group Pty Ltd state Site Classifica olan, Appendix A	ition - Stag	e 2&3			TEST DA LOGGED CHECKE VANE SH	BY: D BY: IEAR:	11-Apr-22 NH GS N/A	
DRILL METHO HOLE DIAMET	ER:		GT10 Drill F 100mm					EASTING: ND NORTHING: ND	INCLINAT SURFAC		90° ND	
2 DENERTRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH (RL)	SAMPLE OR FIELD YS	RECOVERED	GRAPHIC LOG	JSC SYMBOL	FIELD MATERIAL DESCRIPTION  SOIL / ROCK MATERIAL DESCRIPTION	CONSISTENCY DENSITY	MOISTURE	ADDITIONAL OBSERVATION	S
1 2 3 4	+   >	0.0		S F	œ		_	FILL: silty SAND, fine to coarse grained, angular to subangular, brown, low plasticity silt, with gravel	MD - D		Controlled Fill	T -
		-   -   -   -   -	0.10					FILL: silty CLAY, medium to high plasticity, dark grey mottled brown, with sand silty CLAY, high plasticity, brown orange mottled grey and red, trace sand	St	w > PL w ≈ PL	Inferred Red Bluff Sandstone Residue Soil	
		0.5									Soll	-
	Not Encountered	1.5	1.30					clayer SAND, fine to coarse grained, angular to subangular, brown and pale brown, medium plasticity clay, trace grained, angular to subangular, brown and pale brown, medium plasticity clay, trace grained, subangular, brown and provided grained gr	vel MD - D	M W≈PL		-
		25	2.00					Borehole Terminated @ 2m				
>[	1 2	<b>-</b>	usal	Vs S F St VSt H	Very Soft Firm Stiff Very Hard	Stiff		$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Sample 63mr mple al sample	n n	▼ Groundwater Level UTP Unable to Penetrate	

<b>Un</b>		Gro	undSc	ien	ce		ENGINEERING BOREHOLE LOG	Borehole		BH4 G4589.283	
CLIENT: PROJECT: LOCATION:			erty Group Pty Ltd Estate Site Classificat	tion - Stage	e 2&3			TEST DA	BY:	11-Apr-22 NH GS	
DRILL METHOD:		Refer to site	plan, Appendix A Rig				EASTING: ND	VANE SH		N/A 90°	
HOLE DIAMETE	R: Drilling	100mm	SAMPLIN	G			NORTHING: ND FIELD MATERIAL DESCRIPTION	SURFACI	E RL:	ND	
2 PENERTRATION RESISTANCE	WATER DEPTH (metres)	DEРТН (RL)	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	JSC SYMBOL	SOIL / ROCK MATERIAL DESCRIPTION	CONSISTENCY DENSITY	MOISTURE	ADDITIONAL OBSERVATIONS	
	0.0	0.20	<i>5,</i> P				FILL: silty SAND, fine to coarse grained, angular to subangular, brown, low plasticity silt, with gravel  FILL: silty CLAY, medium to high plasticity, dark grey mottled brown, with sand		D - M		
	0.5	0.50			**************************************		brown mottled dark grey and red, with sand  clayey SAND, fine to coarse grained, angular to subangular, brown and pale brown, medium plasticity clay, trace gravel	MD - D	М	Inferred Red Bluff Sandstone Residual Soil	
	1.0	1.00				СН	sity CLAY, high plasticity, grey mottled brown-orange and red, trace sand and gravel	St - VSt	w>PL		
	Not Encountered	1.50					brown-crange motified grey and red	VSt	w≈PL		
PENETRATION	25	2.00	CONSISTENCY				Borehole Terminated @ 2m  DENSITY MOISTURE CONDITION TEST NOTES				
no resiste	2 3 4 ence	refusal	Vs S F St VSt H	Very Soft Firm Stiff Very Hard	Stiff		Fb Friable D Dry PP Pocket Penetron VL Very Loose M Moist U50 Undisturbed San L Loose W W tU60 U63 Undisturbed San MD Medium Dense w < PL Moist, dry of plastic limit D Dense w = PL Moist, near plastic limit B B Bulk Sample VD Very Dense w > PL Moist, wet of plastic limit w = LL Wet, near liquid limit W > LL Wet, wet of liquid limit C U Undrained Shear	nple 50mr nple 63mr e ample e test	n n	▼ Groundwater Level UTP Unable to Penetrate  Sheet 1 of 1	

<b>U</b>			Gro	undSo	ien	ce	)	ENGINEERING BOREHOLE LOG	Borehole JOB No :		BH5 G4589.2&3	
CLIENT: PROJECT: LOCATION: TEST LOCATIO		Fi C R	ve Farms E lyde North efer to site p	erty Group Pty Ltd state Site Classifica olan, Appendix A	ation - Stag	e 2&3			TEST DA LOGGED CHECKE VANE SH	BY: D BY: IEAR:	11-Apr-22 NH GS N/A	
DRILL METHO HOLE DIAMET	ER:		GT10 Drill F 100mm					EASTING: ND NORTHING: ND	INCLINA' SURFAC		90° ND	
2 2 PENERTRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH (RL)	SAMPLE OR FIELD YEST	RECOVERED	GRAPHIC LOG	USC SYMBOL	FIELD MATERIAL DESCRIPTION  SOIL / ROCK MATERIAL DESCRIPTION	CONSISTENCY DENSITY	MOISTURE	ADDITIONAL OBSERVATIONS	
		0.0	0.30				SM	FILL: sitly SAND, fine to coarse grained, angular to subangular, brown, low plasticity sitt, with gravel sitly CLAY, medium to high plasticity, brown mottled grey and red, with sand, trace gravel	MD - D			
		0.5										
	Not Encountered	1.5	1.30					clayey SAND, fine to coarse grained, angular to subangular, dark grey mottled brownn, medium plasticity clay, trace gravel  brown and pale brown		D-M	Soil	
		2.0	2.00				CH	sity CLAY, high plasticity, brown mottled grey, trace sand  Borehole Terminated @ 2m	St - VS	t w > PL		-
		2.5										-   -   -   -   -   -
		3.0										
PENETRATION		3.5		CONSISTENCY	Very	Soft		DENSITY MOISTURE CONDITION TEST NOTES  Fb Friable D Dry PP Pocket Penetro			▼ Groundwater Level	
no resi:	1 2 stence	3 4 refu	sal	S F St VSt H	Soft Firm Stiff Very Hard	Stiff		VL     Very Loose     M     Moist     U50     Undisturbed Sa       L     Loose     W     Wet     U63     Undisturbed Sa       MD     Medium Dense     w < PL Moist, dry of plastic limit	mple 63m ble sample ne test	m	UTP Unable to Penetrate  Sheet 1 of 1	

<b>U</b>			Gro	undSa	ien	CE	•	ENGINEERING BOREHOLE LOG  Borehole No. BH6  JOB No: G4589.263	
CLIENT: PROJECT: LOCATION: TEST LOCATIO		F C	ive Farms E Clyde North Refer to site	erty Group Pty Ltd state Site Classifica olan, Appendix A	tion - Stag	e 2&3		TEST DATE: 11-Apr-22	
DRILL METHO HOLE DIAMET	ER:		GT10 Drill I 100mm			1		NORTHING: ND SURFACE RL: ND	
C PENERTRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH (RL)	SAMPLE OR FIELD YS	RECOVERED	GRAPHIC LOG	JSC SYMBOL	SOIL / ROCK MATERIAL DESCRIPTION  SOIL / ROCK MATERIAL DESCRIPTION  SOIL / ROCK MATERIAL DESCRIPTION  ADDITIONAL OBSERVATIONS  ADDITIONAL OBSERVATIONS	
1 2 3 4	>	0.0		S F	œ	888		FILL: silty SAND, fine to coarse grained, angular to subangular, brown, low plasticity silt, with gravel MD - D D-M Controlled Fill	_
		0.5	0.10	S2	U63		CI-CH	silty CLAY, medium to high plasticity, brown-orange motified red and grey, with sand  VSt W ~ PL  dark grey motified brown  St W > PL	-
	Not Encountered	1.5	1.30					clayey SAND, fine to coarse grained, angular to subangular, grey and brown, medium plasticity day, trace gravel  MD - D  M  Inferred Red Bluff Sandstone Residual Soil  silty CLAY, high plasticity, brown-orange motified grey and brown, trace sand  VSt  W ≈ PL	
		2.5	2.00					Borehole Terminated @ 2m	
no resi	1 2		usal	Vs S F St VSt H	Very Soft Firm Stiff Very Hard	Stiff		DENSITY    DENSITY   MOISTURE CONDITION   TEST NOTES	

Ground Science					cien	ıce	•	ENGINEERING BOREHOLE LOG  Borehole No BH7  JOB No: G4589 283	
CLIENT: PROJECT: LOCATION: TEST LOCATIO		Fi C R	ive Farms E lyde North tefer to site p	erty Group Pty Ltd state Site Classific olan, Appendix A	ation - Staç	je 2&3		TEST DATE: 11-Apr-22 LOGGED BY: NH CHECKED BY: GS VANE SHEAR: N/A	
DRILL METHO HOLE DIAMET	ER:		GT10 Drill F 100mm					EASTING:         ND         INCLINATION:         90°           NORTHING:         ND         SURFACERL:         ND	
T PENERTRATION S RESISTANCE	WATER	DEPTH (metres)	DEPTH (RL)	SAMPLE OR FIELD ST TEST	RECOVERED	GRAPHIC LOG	USC SYMBOL	SOIL / ROCK MATERIAL DESCRIPTION  SOIL / ROCK MATERIAL DESCRIPTION  SOIL / ROCK MATERIAL DESCRIPTION  ADDITIONAL OBSERVATIONS  ADDITIONAL OBSERVATIONS  WAS ADDITIONAL OBSERVATIONS  ADDITIONAL OBSERVATIONS	
		0.0	0.20	3,1				FILL: silty CLAY, medium to high plasticity, brown-orange mottled red and grey, with sand  VSt W < PL  Controlled Fill  silty CLAY, medium to high plasticity, grey mottled brown, with sand, trace gravel  St - VSt W ≈ PL  Inferred Red Bluff Sandstone Residual  Soil	
		0.5							
		1.0	1.20					grey mottled brown and red, with sand	
	Not Encountered	1.5	1.60					brown-orange mottled grey and red	
		2.0	2.00					Borehole Terminated @ 2m	
		2.5							
		3.0							
PENETRATION		3.5		CONSISTENCY				DENSITY MOISTURE CONDITION TEST NOTES	-
	1 2	3 4	Jsal	Vs S F St VSt H	Soft Firm Stiff	Stiff		Priable   D Dry   PP   Pocket Penetrometer Test   V   Groundwater Level	

Company   Comp	Ground Science				ien	ce	)	ENGINEERING BOREHOLE LOG	Borehole		BH8 G4589.283		
MATCHING   19   Matching   1			Five Farms Estate Site Classification - Stage 2&3 Clyde North Refer to site plan, Appendix A						LOGGED BY: NH CHECKED BY: GS				
		ER:	10		-				NORTHING: ND				
2   3   2   3   3   3   4   5   5   5   5   5   5   5   5   5		DRILL	ING		SAMPLING	T			FIELD MATERIAL DESCRIPTION			1	
SECONOMINA CONTINUENCY Secretary to high prescript, present working any end war with search and growed   PEL 15th TSAN, recours to high prescript, grey maked bloom and sea, with sore times growed   PEL 15th TSAN, recours to high prescript, grey maked bloom and sea, with sore times growed   PEL 15th TSAN, recours to high prescript, grey maked bloom and sea, with sore times growed   PEL 15th TSAN, recours to high prescript, grey maked bloom and sea, with sore times growed   PEL 15th TSAN, recours to high prescript, grey maked bloom and sea, with sore times growed   PEL 15th TSAN, recours to high prescript, grey maked bloom and sea, with sore times growed   PEL 15th TSAN, recours to high prescript, grey maked bloom and sea, with sore times growed   PEL 15th TSAN, recours to high prescript, grey maked bloom and sea, with sore times growed   PEL 15th TSAN, recours to high prescript, grey maked bloom and sea, with sore times growed   PEL 15th TSAN, recours to high prescript, grey maked bloom and sea, with sore times growed   PEL 15th TSAN, recours to high prescript, grey maked bloom and sea, with sore times growed   PEL 15th TSAN, recours the sea of the sea of times growed   PEL 15th TSAN, recours the sea of times growed   PEL 15th TSAN, recours the sea of times growed   PEL 15th TSAN, recours the sea of times growed   PEL 15th TSAN, recours the sea of times growed   PEL 15th TSAN, recours the sea of times growed   PEL 15th TSAN, recours the sea of times growed   PEL 15th TSAN, recours the sea of times growed   PEL 15th TSAN, recours the sea of times growed   PEL 15th TSAN, recours the sea of times growed   PEL 15th TSAN, recours the sea of times growed   PEL 15th TSAN, recours the sea of times growed   PEL 15th TSAN, recours the sea of times growed   PEL 15th TSAN, recours the sea of times growed   PEL 15th TSAN, recours the sea of times growed   PEL 15th TSAN, recours the sea of times growed   PEL 15th TSAN, recours the sea of times growed   PEL 15th TSAN, recours the sea of times growed   PEL 15th TSAN, recours th	2 PENERTRATION 2 RESISTANCE	WATER	DEPTH (metres)	DEPTH (RL)	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC SYMBOL	SOIL / ROCK MATERIAL DESCRIPTION	CONSISTENCY	MOISTURE	ADDITIONAL OBSERVATIONS	6
NETIONION  CONSISTINCY  Very Scott  South Service and Scott International of Scott International Consistincy  Occurrence of Scott International Consistincy  Netional Consistincy  Very Scott  South Service International Consistincy  Very Scott  Netional Consistincy  Very Scott  Very Sco			0.0					CI-CH	FILL: silty CLAY, medium to high plasticity, brown mottled grey and red, with sand and gravel	VSt	w < PL	Controlled Fill	
To St. Very Sch. Very Loose Street V. Very Loose St. V. Very Loose			1	0.20			***		Ell I - eillu Cl AV madium to biob plashichu orau mottlad brown and rad, with sand, trace orausi	St. VS	l w > Pl	_	=
Det Malion  Consistency  Society Set 1  Society Set			7	0.20					ILE. 389 CENT, moduli to rigii piasecity, grey motecu uromi and rea, wiii sana, sacce grand	01 101			=
Det Malion  Consistency  Society Set 1  Society Set			}				<b>***</b>						
To Delay Very Soft No. 1 Consistency Very Soft No. 2 Soft No. 1 Consistency No. 2 Soft N			0.5				***						
To Delay Very Soft No. 1 Consistency Very Soft No. 2 Soft No. 1 Consistency No. 2 Soft N			‡				****						=
ANCHANDON COMESTACY Description and graph years asset and the company of the comp			4										1-
ANITHATION  CONSETTANCY  So Soft  V. Very Soft  F Fr  L Lose  F F Fr  L Lose  V. Very Soft  L Lose  V. Very Soft  H Hard  V. Very Soft  D Dry  W. Very Soft  H Hard  V. Very Soft  L Cose  V. Very Lose  W. Well  V. Very Lose  W. Well  W. Very Soft  H Hard  V. Very Soft  D Dry  W. Very Soft  W. Very Soft  H Hard  V. Very Soft  D Deres  W. Well  W. Very Soft  W. Very Soft  H Hard  V. Very Soft  W. Very Soft  W. Very Soft  H Hard  V. Very Soft  W. Very Soft  W. Very Soft  W. Very Soft  H Hard  V. Very Soft  W. Very Soft  H Hard  V. Very Soft  W. Very Soft  H Hard  V. Very Soft  W. P. Most, ver of pass climit  W. P. Most, ver of pass climit  B Bulk Sample  B Environmental sample  W. Hand Shew Ver Wee test  W. Hand Shew Ver Wee test			Ī	0.80				СН	sitty CLAY, high plasticity, grey mottled brown and black, trace sand	VSt	w≈PL		13
ANITHATION  CONSETTANCY  So Soft  V. Very Soft  F Fr  L Lose  F F Fr  L Lose  V. Very Soft  L Lose  V. Very Soft  H Hard  V. Very Soft  D Dry  W. Very Soft  H Hard  V. Very Soft  L Cose  V. Very Lose  W. Well  V. Very Lose  W. Well  W. Very Soft  H Hard  V. Very Soft  D Dry  W. Very Soft  W. Very Soft  H Hard  V. Very Soft  D Deres  W. Well  W. Very Soft  W. Very Soft  H Hard  V. Very Soft  W. Very Soft  W. Very Soft  H Hard  V. Very Soft  W. Very Soft  W. Very Soft  W. Very Soft  H Hard  V. Very Soft  W. Very Soft  H Hard  V. Very Soft  W. Very Soft  H Hard  V. Very Soft  W. P. Most, ver of pass climit  W. P. Most, ver of pass climit  B Bulk Sample  B Environmental sample  W. Hand Shew Ver Wee test  W. Hand Shew Ver Wee test			-										L
To Unable Description    Consistency   Consi			-										=
To Unable Description    Consistency   Consi			1										=
To Unable Description    Consistency   Consi			3										
To Unable Description    Consistency   Consi													-
Benefolds Terminated @ 2m    22			1.5										-
Borecole Terminated @ 2m    23		pe.	†	1.60					brown-orange mottled grey, trace sand				=
Borecole Terminated @ 2m    23		counter	1										-
Borecole Terminated @ 2m    23		Not Enc	]										
NETRATION CONSISTENCY DENSITY MOSTURE CONDITION TEST MOTES  VS Very Soft VL Very Lose L Lose L Lose W Wet USS Undisturbed Sample Somm Disturbed Sample Somm USS Unique Soft VL Very Dense W > PL Most, near plastic limit W > PL Most, near plastic limit W > PL Most, near plastic limit W = PL Most, near plastic limit W = L Went Connection with the Connection of the Connectio			-	2.00									_
ENETRATION  CONSISTENCY  DENSITY  MOISTURE CONDITION  TEST NOTES  VS Very Soft Fb Friable  S Soft VL Very Loose M Moist US0 Undisturbed Sample 50mm UTP Unable to Penetrate  F Firm L Loose W Wet US0 Undisturbed Sample 50mm UTP Unable to Penetrate  VS Very Stiff MD Medium Dense W < PL Moist, dry of plastic limit VS Very Stiff D Dense W > PL Moist, near plastic limit W > PL Moist, near plastic li			-	2.00					Doueloue Ferninateo (g. 211)				=
ENETRATION  CONSISTENCY  DENSITY  MOISTURE CONDITION  TEST NOTES  VS Very Soft Fb Friable  S Soft VL Very Loose M Moist US0 Undisturbed Sample 50mm UTP Unable to Penetrate  F Firm L Loose W Wet US0 Undisturbed Sample 50mm UTP Unable to Penetrate  VS Very Stiff MD Medium Dense W < PL Moist, dry of plastic limit VS Very Stiff D Dense W > PL Moist, near plastic limit W > PL Moist, near plastic li			1										=
ENETRATION  CONSISTENCY  DENSITY  MOISTURE CONDITION  TEST NOTES  VS Very Soft Fb Friable  S Soft VL Very Loose M Moist US0 Undisturbed Sample 50mm UTP Unable to Penetrate  F Firm L Loose W Wet US0 Undisturbed Sample 50mm UTP Unable to Penetrate  VS Very Stiff MD Medium Dense W < PL Moist, dry of plastic limit VS Very Stiff D Dense W > PL Moist, near plastic limit W > PL Moist, near plastic li			3										
ENETRATION  CONSISTENCY  DENSITY  MOISTURE CONDITION  TEST NOTES  VS Very Soft Fb Friable  S Soft VL Very Loose M Moist US0 Undisturbed Sample 50mm UTP Unable to Penetrate  F Firm L Loose W Wet US0 Undisturbed Sample 50mm UTP Unable to Penetrate  VS Very Stiff MD Medium Dense W < PL Moist, dry of plastic limit VS Very Stiff D Dense W > PL Moist, near plastic limit W > PL Moist, near plastic li			]										=
ENETRATION  CONSISTENCY  DENSITY  MOISTURE CONDITION  TEST NOTES  VS Very Soft Fb Friable D Dry Moist U50 Undisturbed Sample 50mm UTP Unable to Penetrate  S Soft VL Very Loose W W Wery L Moist, wet of plastic limit VS Very Stiff D Dense W > PL Moist, wet of plastic limit W ≈ LL Wet, near liquid limit  N = LL Wet, near liquid limit			2.5										1=
ENETRATION  CONSISTENCY  DENSITY  MOISTURE CONDITION  TEST NOTES  VS Very Soft Fb Friable D Dry Moist U50 Undisturbed Sample 50mm UTP Unable to Penetrate  S Soft VL Very Loose W W Wery L Moist, wet of plastic limit VS Very Stiff D Dense W > PL Moist, wet of plastic limit W ≈ LL Wet, near liquid limit  N = LL Wet, near liquid limit			1										=
ENETRATION  CONSISTENCY  DENSITY  MOISTURE CONDITION  TEST NOTES  VS Very Soft Fb Friable D Dry Moist U50 Undisturbed Sample 50mm UTP Unable to Penetrate  S Soft VL Very Loose W W Wery L Moist, wet of plastic limit VS Very Stiff D Dense W > PL Moist, wet of plastic limit W ≈ LL Wet, near liquid limit  N = LL Wet, near liquid limit			-]										1-
ENETRATION  CONSISTENCY  DENSITY  MOISTURE CONDITION  TEST NOTES  VS Very Soft Fb Friable D Dry Moist U50 Undisturbed Sample 50mm UTP Unable to Penetrate  S Soft VL Very Loose W W Wery L Moist, wet of plastic limit VS Very Stiff D Dense W > PL Moist, wet of plastic limit W ≈ LL Wet, near liquid limit  N = LL Wet, near liquid limit			]										] =
ENETRATION  CONSISTENCY  DENSITY  MOISTURE CONDITION  TEST NOTES  VS Very Soft Fb Friable D Dry Moist U50 Undisturbed Sample 50mm UTP Unable to Penetrate  S Soft VL Very Loose W W Wery L Moist, wet of plastic limit VS Very Stiff D Dense W > PL Moist, wet of plastic limit W ≈ LL Wet, near liquid limit  N = LL Wet, near liquid limit			-										=
Vs Very Soft Fb Friable D Dry PP Pocket Penetrometer Test ▼ Groundwater Level  Vs Very Loose M Moist U50 Undisturbed Sample 50mm UTP Unable to Penetrate  Vs Very Soft VL Very Loose W Wet U50 Undisturbed Sample 63mm UTP Unable to Penetrate  Vs Very Stiff MD Medium Dense W < PL Moist, very of plastic limit V > PL Moist, very of plastic limit W ≈ LL Wet, near liquid limit W ≈ LL Wet, near liquid limit HSV Hand Shear Vane test			5.0										=
Vs Very Soft Fb Friable D Dry PP Pocket Penetrometer Test ▼ Groundwater Level  Vs Very Loose M Moist U50 Undisturbed Sample 50mm UTP Unable to Penetrate  Vs Very Soft VL Very Loose W Wet U50 Undisturbed Sample 63mm UTP Unable to Penetrate  Vs Very Stiff MD Medium Dense W < PL Moist, very of plastic limit V > PL Moist, very of plastic limit W ≈ LL Wet, near liquid limit W ≈ LL Wet, near liquid limit HSV Hand Shear Vane test			‡										=
Vs Very Soft Fb Friable D Dry PP Pocket Penetrometer Test ▼ Groundwater Level  Vs Very Loose M Moist U50 Undisturbed Sample 50mm UTP Unable to Penetrate  Vs Very Soft VL Very Loose W Wet U50 Undisturbed Sample 63mm UTP Unable to Penetrate  Vs Very Stiff MD Medium Dense W < PL Moist, very of plastic limit V > PL Moist, very of plastic limit W ≈ LL Wet, near liquid limit W ≈ LL Wet, near liquid limit HSV Hand Shear Vane test			7										=
Vs Very Soft Fb Friable D Dry PP Pocket Penetrometer Test ▼ Groundwater Level  Vs Very Loose M Moist U50 Undisturbed Sample 50mm UTP Unable to Penetrate  Vs Very Soft VL Very Loose W Wet U50 Undisturbed Sample 63mm UTP Unable to Penetrate  Vs Very Stiff MD Medium Dense W < PL Moist, very of plastic limit V > PL Moist, very of plastic limit W ≈ LL Wet, near liquid limit W ≈ LL Wet, near liquid limit HSV Hand Shear Vane test			]										13
Vs Very Soft Fb Friable D Dry PP Pocket Penetrometer Test ▼ Groundwater Level  Vs Very Loose M Moist U50 Undisturbed Sample 50mm UTP Unable to Penetrate  Vs Very Soft VL Very Loose W Wet U50 Undisturbed Sample 63mm UTP Unable to Penetrate  Vs Very Stiff MD Medium Dense W < PL Moist, very of plastic limit V > PL Moist, very of plastic limit W ≈ LL Wet, near liquid limit W ≈ LL Wet, near liquid limit HSV Hand Shear Vane test		Ш	3.5										
F Firm St Stiff WD Medium Dense VSt Very Stiff H Hard VD Very Dense F Firm St Stiff WD Medium Dense W < PL Moist, dry of plastic limit W ≈ PL Moist, near plastic limit W > PL Moist, wet of plastic limit W ≈ LL Wet, near liquid limit W ≈ LL Wet, near liquid limit W ≈ LL Wet, near liquid limit HSV Hand Shear Vane test	PENETRATIO			C		Very	Soft			ometer Test	t	_ <u>▼</u> Groundwater Level	
St Stiff VSt Very Stiff H Hard VD Very Dense W < PL Moist, dry of plastic limit w ≈ PL Moist, near plastic limit w ≈ PL Moist, wet of plastic limit w ≈ LL Wet, near liquid limit w ≈ LL Wet, near liquid limit HSV Hand Shear Vane test	]<	1 2	3 4									UTP Unable to Penetrate	
no resistence  H Hard VD Very Dense w > PL Moist, wet of plastic limit w ≈ LL Wet, near liquid limit HSV Hand Shear Vane test		7	4		St	Stiff			MD Medium Dense w < PL Moist, dry of plastic limit D Disturbed Sar				
	H Hard VD Very Dense w > PL Moist, wet of plastic limit E Environmental sample												
HAM LOG 6.0 2019 Sheet 1 of 1				al							1		

<b>U</b>			Gro	undS	cien	ce	•	ENGINEERING BOREHOLE LOG	Borehole JOB No :		BH9 G4589.283	
CLIENT: PROJECT: LOCATION: TEST LOCATION DRILL METHO	D:	F C	Five Farms E Clyde North Refer to site	erty Group Pty Ltd Estate Site Classifica plan, Appendix A	ation - Stag	e 2&3		EASTING: ND NORTHING: ND	TEST DA' LOGGED CHECKEI VANE SH	BY: D BY: EAR: TION:	11-Apr-22 NH GS N/A 90°	
HOLE DIAMET	ER: DRILL	ING	100mm	SAMPLIN	NG			FIELD MATERIAL DESCRIPTION	SURFACE	E RL:	ND	
2 DENERTRATION 8 RESISTANCE	WATER	DEPTH (metres)	DEРТН (RL)	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC SYMBOL	SOIL / ROCK MATERIAL DESCRIPTION	CONSISTENCY DENSITY	MOISTURE	ADDITIONAL OBSERVATIONS	i
		0.0				<b>***</b>	SM	FILL: silty SAND, fine to coarse grained, angular to subangular, brown, low plasticity silt, with gravel	MD - D	D - M	Controlled Fill	-
			0.20					FILL: clayey SAND, fine to coarse grained, angular to subangular, grey, medium plasticity clay, trace gravel		М		
		0.5										
		-	0.60			<b>***</b>	CI-CH	FILL: silty CLAY, medium to high plasticity, brown mottled grey, with sand, trace gravel	St - VSt	w > PL	-	
		_				***						
		_										
		_				***						
		1.0	1.00				CH	silty CLAY, high plasticity, brown mottled grey and red, with sand	VSt	w≈Pl	Inferred Red Bluff Sandstone Residual Soil	
		_										
		_										
		_										
		1.5										
		-										=
	ntered	_										=
	Not Encountered	_										
	Not	_										7
		2.0	2.00		-			Borehole Terminated @ 2m				HJ
		_										
		_										
		_										
$\ \cdot\ $		-										
$\ \cdot\ $		2.5										
		<del>-</del>										
		_										=
$\ \cdot\ $		-										=
$\ \cdot\ $		3.0										$\parallel \exists$
		-										$\parallel \exists$
		-										=
		-										
$\ \cdot\ $		3.5										
PENETRATIO	N			CONSISTENCY	1/	Cat		DENSITY MOISTURE CONDITION TEST NOTES  The Frights D. Dry DD Pocket Page	trometer T- 1	•	▼ Crowndust-11	
no resi		ref	usal	Vs S F St VSt H	Soft Firm Stiff	Stiff		$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	al sample	n n	Groundwater Level UTP Unable to Penetrate  Sheet 1 of 1	

GroundScience				cier	ıce	•	ENGINEERING BOREHOLE LOG  Borehole No BH10  JOB No: G4589.283		
CLIENT: PROJECT: LOCATION: TEST LOCATI		Frasers Property Group Pty Ltd Five Farms Estate Site Classification - Stage 2&3 Clyde North Refer to site plan, Appendix A						TEST DATE: 11-Apr-22 LOGGED BY: NH CHECKED BY: GS VANE SHEAR: N/A	
DRILL METHO HOLE DIAMET	ER:		GT10 Drill I 100mm			,		EASTING:         ND         INCLINATION:         90°           NORTHING:         ND         SURFACE RL:         ND	
5 PENERTRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH (RL)	SAMPLE OR FIELD SAMPLE OF FIEL	RECOVERED	GRAPHIC LOG	JSC SYMBOL	SOIL / ROCK MATERIAL DESCRIPTION  SOIL / ROCK MATERIAL DESCRIPTION  SOIL / ROCK MATERIAL DESCRIPTION  ADDITIONAL OBSERVATIONS  WORK MATERIAL DESCRIPTION	
		0.0	0.20	37.			SM	FILL: silty SAND, fine to coarse grained, angular to subangular, brown, low plasticity silt, with gravel MD - D D - M Controlled Fill  FILL: clayey SAND, fine to coarse grained, angular to subangular, grey, medium plasticity clay, trace gravel M	
		0.5	0.60				CI-CH	FILL: silty CLAY, medium to high plasticity, brown mottled grey, black and red, with sand, trace gravel St - VSt w > PL	1111111
		1.0	1.00					silty CLAY, high plasticity, brown mottled grey and red, with sand  VSt W ≈ PL Inferred Red Bluff Sandstone Residual Soil	
	Not Encountered	1.5		S3	U63				
		2.0	2.00					Borehole Terminated @ 2m	
		2.5							
		3.0							
PENETRATION  PENETRATION  no resi	1 2		usal	CONSISTENCY Vs S F St VSt H	Soft Firm Stiff	Stiff		DENSITY    MOISTURE CONDITION   TEST NOTES	

<b>U</b>			<b>Gro</b>	undSc	ien	ce	•	ENGINEERING BOREHOLE LOG	Borehole		BH11 G4589.283	
CLIENT: PROJECT: LOCATION: TEST LOCAT		Fiv Cly Re	ve Farms E yde North	erty Group Pty Ltd state Site Classificati	on - Stag	e 2&3		EASTING: ND	TEST DA LOGGED CHECKE VANE SH	BY: D BY: IEAR:	11-Apr-22 NH GS N/A 90°	
HOLE DIAME	TER:	1	00mm					NORTHING: ND	SURFAC		ND ND	
	DRILL	ING		SAMPLING	1			FIELD MATERIAL DESCRIPTION				
C PENERTRATION S RESISTANCE	WATER	DEPTH (metres)	DEPTH (RL)	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC SYMBOL	SOIL / ROCK MATERIAL DESCRIPTION	CONSISTENCY DENSITY	MOISTURE	ADDITIONAL OBSERVATIONS	
		0.0				833 833 833 833	SM	FILL: silty SAND, fine to coarse grained, angular to subangular, brown, low plasticity silt, with gravel	MD - D	D-M	Controlled Fill	
		0.5	0.20				SC	FiLL: clayey SAND, fine to coarse grained, angular to subangular, grey, medium plasticity clay, trace gravel		М		
		1 1 1 1 1 1	0.60			***	SM	silty SAND, fine to coarse grained, angular to subangular, brown, low plasticity silt	_		Inferred Red Bluff Sandstone Residual Soil	
		1.0	1.00				CH	silty CLAY, high plasticity, brown mottled grey, trace	VSt	w≈PL		
	Not Encountered	1.5	1.60					brown-orange moltled grey and red	·-··			1111111
		2.5	2.00					Borehole Terminated @ 2m				
PENETRATIO	1 2	3.5		CONSISTENCY VS S F St	Very Soft Firm Stiff			DENSITY         MOISTURE CONDITION         TEST NOTES           Fb         Friable         D         Dry         PP         Pocket Penetra           VL         Very Loose         M         Moist         U50         Undisturbed Size           L         Loose         W         Wet         U63         Undisturbed Size           MD         Medium Dense         w < PL Moist, dry of plastic limit         D         Disturbed Sam	mple 50mr mple 63mr	m	▼ Groundwater Level UTP Unable to Penetrate	
	LOG_6	refus	ial	VSt H	Very Hard			D         Dense         w ≈ PL Moist, near plastic limit         Bs         Bulk Sample           VD         Very Dense         w > PL Moist, wet of plastic limit         E         Environmental           w ≈ LL Wet, near liquid limit         HSV         Hand Shear Very Land Shea	ne test	1	Sheet 1 of 1	

HAM\_LOG\_6.0 2019

# APPENDIX C

Laboratory Test Reports

# **Material Test Report**

Report Number: G4589.2-1

Issue Number:

**Date Issued:** 02/05/2022

Client: Frasers Property Australia c/- Beveridge Williams

1 Glenferrie Road, Malvern VIC 3144

Project Number: G4589.2

Project Name: Five Farms Residential Development - Stage 2/3

Project Location: Clyde North Work Request: 8075

Report Number: G4589.2-1

**Dates Tested:** 14/04/2022 - 26/04/2022



Ground Science Pty Ltd Ground Science Laboratory

13 Brock Street Thomastown Victoria 3074

Phone: (03) 9464 4617

Email: pelin@groundscience.com.au Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Pelin Erden gs-pelin

NATA Accredited Laboratory Number: 15055

Shrink Swell Index AS 1289 7.1.1 & 2.1.1					
Sample Number	4589.2-S1	4589.2-S2	4589.2-S3	4589.2-S5	4589.2-S6
Date Sampled	14/04/2022	14/04/2022	14/04/2022	14/04/2022	14/04/2022
Date Tested	19/04/2022	19/04/2022	19/04/2022	19/04/2022	20/04/2022
Material Source	**	**	**	**	**
Sample Location	BH1 (1.0 - 1.3m)	BH6 (0.8 - 1.0m)	BH10 (1.5 - 1.8m)	BH16 (0.6 - 0.9m)	BH19 (1.5 - 1.7m)
Inert Material Estimate (%)	0	10	5	5	0
Pocket Penetrometer before (kPa)	250	150	260	150	250
Pocket Penetrometer after (kPa)	135	80	200	100	125
Shrinkage Moisture Content (%)	31.7	17.6	18.1	15.9	18.6
Shrinkage (%)	6.3	0.9	1.9	1.6	2.5
Swell Moisture Content Before (%)	29.1	18.5	20.0	13.0	17.6
Swell Moisture Content After (%)	35.7	23.8	25.2	19.6	18.7
Swell (%)	1.1	-0.1	1.9	-0.0	0.9
Shrink Swell Index Iss (%)	3.8	0.5	1.6	0.9	1.6
Visual Description	silty CLAY, medium to high plasticity, mottled brown, grey	silty CLAY, low plasticity, mottled brown, grey, trace gravel, trace sand	Silty CLAY, medium to high plasticity, mottled brown, grey, trace gravel, trace sand	Sandy CLAY, low plasticity, brown, trace gravel	silty CLAY, medium plasticity, mottled brown, grey, orange, trace sand
Cracking	SC	MC	SC	MC	SC
Crumbling	No	No	No	No	No
Remarks	**	**	**	**	**

Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.

Cracking Terminology: UC Uncracked, SC Slightly Cracked, MC Moderately Cracked, HC Highly Cracked, FR Fragmented.

NATA Accreditation does not cover the performance of pocket penetrometer readings.

# **Material Test Report**

Report Number: G4589.2-1

Issue Number:

**Date Issued:** 02/05/2022

Client: Frasers Property Australia c/- Beveridge Williams

1 Glenferrie Road, Malvern VIC 3144

Project Number: G4589.2

Project Name: Five Farms Residential Development - Stage 2/3

Project Location: Clyde North Work Request: 8075

Report Number: G4589.2-1

**Dates Tested:** 14/04/2022 - 26/04/2022



Ground Science Pty Ltd Ground Science Laboratory

13 Brock Street Thomastown Victoria 3074 Phone: (03) 9464 4617

Email: pelin@groundscience.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Pelin Erden gs-pelin

NATA Accredited Laboratory Number: 15055

Shrink Swell Index AS 1289 7.1.1 & 2.1.1					
Sample Number	4589.2-S7	4589.2-S8	4589.2-S10	4589.2-S12	4589.2-S13
Date Sampled	14/04/2022	14/04/2022	14/04/2022	14/04/2022	14/04/2022
Date Tested	20/04/2022	20/04/2022	20/04/2022	21/04/2022	21/04/2022
Material Source	**	**	**	**	**
Sample Location	BH22 (1.0 - 1.3m)	BH26 (0.5 - 0.8m)	BH32 (1.5 - 1.7m)	BH41 (0.5 - 0.8m)	BH44 (1.5 - 1.7m)
Inert Material Estimate (%)	0	5	5	0	0
Pocket Penetrometer before (kPa)	200	200	300+	150	300+
Pocket Penetrometer after (kPa)	150	150	125	100	150
Shrinkage Moisture Content (%)	23.4	22.2	22.3	18.7	24.9
Shrinkage (%)	6.2	2.3	4.4	1.2	4.1
Swell Moisture Content Before (%)	23.0	24.2	19.8	16.7	25.6
Swell Moisture Content After (%)	22.2	28.1	23.6	25.9	29.7
Swell (%)	0.3	0.2	1.4	0.1	2.4
Shrink Swell Index Iss (%)	3.5	1.3	2.8	0.7	2.9
Visual Description	Silty CLAY, low to medium plasticity, mottled brown, grey, orange, trace sand	silty CLAY, low to medium plasticity, mottled brown, grey, orange, trace gravel, trace sand	silty CLAY, medium plasticity, mottled grey, orange, red, trace gravel, trace sand	sandy CLAY, low plasticity, brown	Silty CLAY, medium to high plasticity, mottled brown, grey, orange, trace sand
Cracking	SC	SC	SC	HC	SC
Crumbling	No	No	No	No	No
Remarks	**	**	**	**	**

Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.

Cracking Terminology: UC Uncracked, SC Slightly Cracked, MC Moderately Cracked, HC Highly Cracked, FR Fragmented.

NATA Accreditation does not cover the performance of pocket penetrometer readings.

# **Material Test Report**

Report Number: G4589.2-1

Issue Number:

**Date Issued:** 02/05/2022

Client: Frasers Property Australia c/- Beveridge Williams

1 Glenferrie Road, Malvern VIC 3144

Project Number: G4589.2

Project Name: Five Farms Residential Development - Stage 2/3

Project Location: Clyde North Work Request: 8075

Report Number: G4589.2-1

**Dates Tested:** 14/04/2022 - 26/04/2022



Ground Science Pty Ltd Ground Science Laboratory 13 Brock Street Thomastown Victoria 3074

Phone: (03) 9464 4617

Email: pelin@groundscience.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Pelin Erden gs-pelin

NATA Accredited Laboratory Number: 15055

Shrink Swell Index AS 1289 7.1.1 & 2.1.1				
Sample Number	4589.2-S14	4589.2-S15		
Date Sampled	14/04/2022	14/04/2022		
Date Tested	26/04/2022	26/04/2022		
Material Source	**	**		
Sample Location	BH46 (0.7 - 1.0m)	BH50 (1.2 - 1.5m)		
Inert Material Estimate (%)	10	5		
Pocket Penetrometer before (kPa)	120	160		
Pocket Penetrometer after (kPa)	110	150		
Shrinkage Moisture Content (%)	16.8	15.9		
Shrinkage (%)	0.8	2.1		
Swell Moisture Content Before (%)	15.3	15.0		
Swell Moisture Content After (%)	19.9	23.8		
Swell (%)	-0.1	0.4		
Shrink Swell Index Iss (%)	0.4	1.3		
Visual Description	silty CLAY, medium plasticity, brown, trace gravel, with sand	silty CLAY, medium plasticity, mottled brown, grey, orange, trace gravel, with sand		
Cracking	SC	SC		
Crumbling	No	**		
Remarks	**	**		

Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.

Cracking Terminology: UC Uncracked, SC Slightly Cracked, MC Moderately Cracked, HC Highly Cracked, FR Fragmented.

NATA Accreditation does not cover the performance of pocket penetrometer readings.