

GEOTECHNICAL SITE INVESTIGATION

PROJECT: 11 & 21-33 Owlpen Lane, Farley, NSW 2320

CLIENT: BATHLA GROUP

DATE: 28 September 2022

REPORT No.: NE1165



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1. INTRODUCTION

Geotesta was engaged by Bathla Group to conduct a geotechnical site investigation at 11 & 21-33 Owlpen Lane, Farley, NSW 2320. Based on the information received from the client, it is understood that the proposed development comprises of a residential subdivision with on-site roadways. This site investigation was carried out accordance with the fee proposal and scope of work provided to the client and approved on 22nd December 2021.

The field work was carried out on 28th March 2022. This report presents the geotechnical investigation results including sub-surface soil profile with interpreted geotechnical properties of the assessed subsurface lithology and recommendations on the design parameters of footing/foundation, footing type, founding depth, geotechnical parameters including allowable bearing capacity, site classification, salinity assessment, and construction/excavation recommendations.

This assessment has been carried out in general accordance with the following guidelines:

- Australian Standard (AS1726) 2017: Geotechnical Site Investigation
- Australian Standard (AS2870) 2011: Residential Slabs and Footings
- Australian Standard (AS) 3600 (2009), Concrete Structures
- Salinity Code of Practice March 2003 (Amended January 2004)

2. FIELD INVESTIGATION

The geotechnical site investigation involves drilling of six (6) boreholes to a maximum depth of 3.0m (BH1, 3, 6, 8, 12 and 13). All the boreholes were terminated on refusal depths from 0.8m to 3.0m. Nine (9) additional boreholes to 1.5m depth were drilled for the pavement design investigation (BH2, 4, 5, 7, 9, 10, 11, 14 and 15). The borehole location was determined by Geotesta, according to site accessibility and the locations of underground services.

A site plan showing the boreholes location is presented in Figure 1. Borehole drilling was carried out using a Ute-mounted drilling rig using a solid flight auger method. Dynamic Cone Penetrometer Testings were performed next to boreholes to determine the soil strength of soil layers.

The fieldwork was performed in the presence of a Geotesta Geotechnical Engineer who positioned borehole, collected samples, nominated testing depths, and prepared borehole logs in accordance with AS1726 – 2017 "Geotechnical Site Investigations". All field observations and in-situ test results are presented in borehole logs attached in Appendix A of this report.

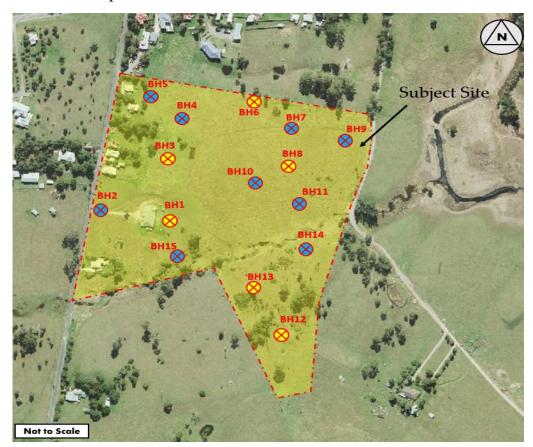


Figure 1: Site Plan and Boreholes

bore holes for geotechnical site investigation

bore holes for pavement design investigation (will be used in another report)

3. FINDINGS

3.1 Site Condition and topography

The investigation area is situated at 11 & 21-33 Owlpen Lane, Farley, NSW 2320. The site under investigation is in the east of Owlpen Lane.

The site slopes down and then up towards the southeast with slope angle varying from 3° to 7°. At the time of the investigation, there was a single storey dwelling with a floor size of 317 m². The site with area of approximately 11ha is bounded by Owlpen Lane and residential dwellings to the northwest and by vacant lands to the other sides.

The site lies at an elevation of approximately 20m above sea level (ASL) referenced to Australian Height Datum (AHD) (http://en-au.topographic-map.com). The site is located within Maitland City Council.

3.2 Site Geology

The geological origin of the soil profile was identified from our visual examination of the soil samples, geotechnical experience, and reference to geological maps of the area. The Hunter 1:100,000 Quaternary Geology map indicates the site is situated in Dalwood Group (Pda) comprising of sandstone, lithic sandstone, conglomerate, siltstone and basalt. The geology map of the site and surrounding areas is shown in Figure 2.

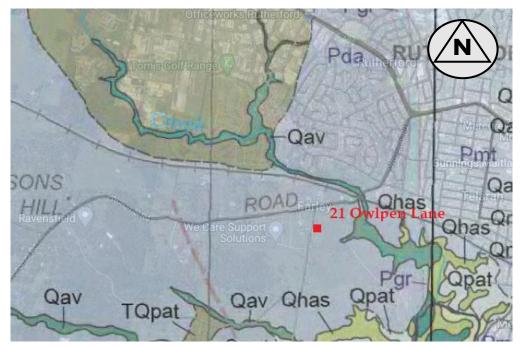


Figure 2: Geology Map of Site and surrounding area

3.3 Soil/Rock Profile

Information gathered from the geotechnical fieldwork indicates that the site is overlain by topsoil/fill to a maximum depth of 0.5m. This layer is underlain by natural soil

comprising firm to hard Silty CLAY in the depths ranging from 0.2 to 3.0m. Very low strength, extremely weathered SHALE bedrock was encountered at boreholes BH3, BH6, and BH8 in the depth from 0.9 to 1.4m. At boreholes BH12 and BH13, very low strength, extremely weathered SANDSTONE bedrock was observed at the depth of 0.7 and 0.9m, respectively. The encountered soil profiles are presented in the borehole logs in Appendix A and tabulated in Table 1.

Table 1: Summary of Sub-surface Materials

	Approximate Depth range of Unit (mBGL*)							
Unit	Material	BH1	вн3	BH6	вн8	BH12	BH13	Description
1	TOPSOIL/FILL	0.0-	0.0-	0.0-	0.0-	0.0-	0.0-	
1	TOF5OIL/FILL	0.5	0.3	0.3	0.2	0.2	0.3	-
2	Silty CLAY	0.5-	0.3-	0.3-	0.2-	0.2-	0.3-	Firm to Stiff
	Sifty CLAT	1.1	0.8	0.8	1.0	0.5	0.6	Firm to 5tm
3	Silty CLAY	1.1-		0.8-				Vous Chiff
	Sifty CLAT	1.4	-	0.9	-	-	-	Very Stiff
4	Silty CLAY	1.4- 0.8-			1.0-	0.5-	0.6-	Hard
4	Sifty CLAT	3.0	1.0	-	1.3	0.7	0.9	naru
	SHALE		1.0-	0.9-	1.3-			Very low strength,
3	SHALE	-	1.1	1.0	1.4	-	-	Extremely Weathered
6	SANDSTONE	•	•	•	•	0.7-	0.9-	Very low strength,
6	SANDSTUNE	-	-	-	-	0.8	1.0	Extremely Weathered

^{*}measured from the existing ground surface

3.4 Site Classification

Six (6) soil samples were taken from the natural silty CLAY soil in boreholes and sent to Geotesta's laboratory, a NATA accredited laboratory for testing of index properties to assess the site reactivity and classification. The laboratory test results are summarised in Table 2.

Table 2: Summary of Soil Laboratory Test Results

Bore No.	Depth (m)	Soil Type	LL %	PL %	PI%	LS %
BH1	1.40	Silty CLAY	42	20	22	9.5
ВН5	0.5	Silty CLAY	52	25	27	13
ВН6	0.5	Silty CLAY	86	32	54	20.5
BH8	0.8	Silty CLAY	89	36	53	15
ВН9	0.6	Silty CLAY	69	32	37	18
BH13	0.5	Silty CLAY	36	20	16	6.5

Note: LL= Liquid Limit; PL=Plastic Limit; PI= Plasticity Index; LS= Linear Shrinkage

Atterberg limit test results indicate that the natural Silty Clay at the site is medium to high plasticity soil. After considering the area geology, and the soil profile encountered in the bore holes; the site is classified as **CLASS 'H1'** with respect to foundation construction (Australian Standard 2870-2011 Residential Slabs and Footings). We assume the footing swill be founded on stiff or better natural silty clay soil.

It has been estimated that the Characteristic Surface Movement (*y*s) of the underlying natural soil material will be in the range of 40-60mm provided the building site is protected from "abnormal moisture conditions" and is drained as described in AS 2870.

It must be emphasized that the heave mentioned, and recommendations referred to in this report are based solely on the observed soil profile observed at the time of the investigation for this report, without taking into account any abnormal moisture conditions as defined in AS2870 – 2011, Clause 1.3.3 that might be created thereafter. With abnormal moisture conditions, distresses will occur and may result in "non-acceptable probabilities of serviceability and safety of the building during its design life," as defined in AS2870-2011, Clause 1.3.1. If these distresses are not acceptable to the builder, owner or other relevant parties then further fieldwork and revised footing recommendations must be carried out.

3.5 Groundwater

Groundwater was not encountered in any boreholes to 1.4m below the ground surface.

3.6 Earthquake Design

Australian Standard AS 1170.4 "Structural design actions, Part 4: Earthquake actions in Australia" outlines the relevant methods used in earthquake risk classification and design requirements, enabling the assessment of an earthquake design category for the structure to be determined. Based on the results of the geotechnical investigation and the soil data gathered from the boreholes, a site sub-soil class of Ce – shallow soil site can be adopted as per Section 4 of the above standard.

A hazard factor (Z) of 0.1 can be adopted for Maitland area based on information obtained from Table 3.2 and Figure 3.2(A) of AS 1170.4 – 2007.

3.7 Salinity and Aggressivity Assessment

Six (6) soil samples were submitted to Eurofin MGT Laboratory, a NATA accredited laboratory, for chemical testings for the salinity and aggressivity assessment. The

testings were carried out for aggressivity suit and to assess exposure classification for the proposed development.

Sampling was targeted to achieve a representative coverage of site conditions in line with assessed sub-surface profiles, proposed development, and the investigation scope. Laboratory test certificates are presented in Appendix B.

3.7.1 Salinity Assessment

S9 (0.6m)-BH9

S13 (0.5m)-BH13

Laboratory test results for salinity assessment are summarised in Table 3.

Conductivity (Ec) (1:5 Sample ID Ece1 (ds/m) Salinity Assessment² Aqueous extract dS/m) 0.062 0.56 Non-saline S1(1.5m)-BH1 Non-saline S5(0.5m)-BH5 0.046 0.42 0.039 0.35 Non-saline S6 (0.5m)-BH6 0.061 0.55 Non-saline S8 (0.6m)-BH8

0.36

0.45

Non-saline

Non-saline

Table 3: Soil Salinity Test Results

Referring to the above test results, the site is considered to be non-saline.

0.040

0.050

3.7.2 Aggressivity assessment

Sulphate and pH test results for aggressivity assessment are summarised in Table 4.

pΗ Sulphate Aggressivity Aggressivity Sample (1:5 Aqueous (SO4) Assessment¹ Assessment¹ ID Steel extract) (mg/kg) Concrete S1-BH1 6.0 33 Non-aggressive Non-aggressive S5-BH5 5.8 35 Non-aggressive Non-aggressive 5.9 24 Non-aggressive Non-aggressive S6-BH6 **S8-BH8** 5.8 14 Non-aggressive Non-aggressive S9-BH9 5.8 35 Non-aggressive Non-aggressive S13-BH13 6.4 15 Non-aggressive Non-aggressive

Table 4: Soil Aggressivity test results for concrete and steel piles

¹Based on EC to ECe multiplication factors in Department of Land and Water Conservation (2002) Guidelines (Table 6.1), a multiplication factor of 9 were applied to medium clays.

 $^{^2}$ Based on Table 6.2 of Department of Land and Water Conservation (2002) where ECe < 2 CdS/m = Nonsaline; ECe = 2 CdS/m = slightly saline; ECe = 2 CdS/m = moderately saline; ECe = 2 CdS/m = highly saline.

¹In accordance with AS3600 (2009)

Referring to the above test results, the site is considered non-aggressive.

3.7.3 Exposure Classifications for concrete and steel in Saline and sulfate soils

The site soil is considered non-saline and non-aggressive to steel and concrete. An exposure classification of A1 for concrete in saline soils and an exposure classification of A1 for concrete and steel in sulphate soils should be adopted for preliminary design of proposed concrete structures.

4. FOUNDATION RECOMMENDATIONS

4.1 Geotechnical Design Parameters

The estimated geotechnical parameters of the soil materials encountered below the site is provided in Table 5:

Su c′ E' Φ′ \mathbf{v}' **Unit/ Soil Type** (kN/m3)(kPa) (MPa) (kPa) 18 35 4 26 0.3 Unit 2 / Silty CLAY (Firm to Stiff) 12 Unit 3 / Silty CLAY (Very Stiff) 20 100 8 28 30 0.3 Unit 4 / Silty CLAY (Hard) 20 200 10 0.3 28 60 Unit 5 / SHALE 22 30 28 100 0.3 Unit 6 / SANDSTONE 24 100 30 300 0.3

Table 5: Estimated Geotechnical Design Parameters

4.2 Strip Footing

Engineer designed strip footing system for a Class "H1" soil can be used on this site. We recommend that the designing engineer refer to AS2870-2011 to ensure design compliance to this document. As shale and sandstone are encountered in some boreholes at shallow depths (i.e., less than 1 m), strip footings of buildings in these locations should be embedded into shale and/or sandstone to avoid differential settlements. For buildings in locations with thick silty CLAY layers, strip footing systems supported by the natural silty CLAY (stiff or better) can be considered.

As a guide with information obtained from the boreholes and DCP tests, the allowable bearing capacity for strip founding on the natural silty CLAY, SHALE, and SANDSTONE, at the test locations should be as follow:

Unit 3 Unit 2 Unit 4 Unit 6 Unit 5 Material Firm to Stiff Very Stiff Hard **SHALE SANDSTONE** Silty CLAY Silty CLAY Silty CLAY Allowable **Bearing** 70 180 300 600 700 Capacity (kPa)

Table 6: Allowable Bearing Capacity for Strip Footings

It should be noted that the soil/rock profile may vary across the site. The foundation depths quoted in this report are measured from the surface during our testing and may vary accordingly if any filling or excavation works are carried out. It is recommended that a geotechnical engineer be engaged during footing excavation stage to confirm the founding depth and founding material.

Controlled fill is material that has been placed and compacted in layers by compaction equipment within a defined moisture range to a defined density requirement. Except as provided below, controlled fill shall be placed in accordance with AS 3798.

If more than 400mm of CLAY FILL or 800mm of SAND FILL, imported or site derived, including existing FILL material, is required, then the slab must be designed as a suspended slab and supported by a grid of beams founded through any fill material in accordance with the above edge beam recommendations.

The settlement of a footing is dependent on the load applied to the footing and the foundation conditions below the footing. However, it can be expected that the settlement of a strip footing designed using the parameters in Table 5 will be \leq 1% of the footing width.

All footings for the same structure should be founded on strata of similar stiffness to minimize the risk of differential movements, with articulation provided where appropriate.

4.3 Bored Piles

Bored piles can be used to support residential buildings. The piles should be founded with an embedment of at least one (1) pile diameter in the founding material for which the footing has been designed. The allowable end bearing capacities for hard clay and shale are presented in Table 7. Additional embedment of three (3) pile diameters would be necessary to utilise adhesion for the embedment in the respective materials.

Unit 5 Unit 3 Unit 4 Unit 6 Material Very Stiff **SHALE** Hard **SANDSTONE** Silty CLAY Silty CLAY Allowable Shaft 15 kPa 30 kPa 40 kPa 70 kPa Adhesion (kPa) Allowable End Bearing 700 kPa 800 kPa Capacity (kPa)

Table 7: Allowable Skin Friction and End Bearing Capacity

Note: Minimum embedment depths of one (1) and three (3) pile diameters in/to the Shale/Sandstone are necessary to achieve these allowable design values for end bearing and adhesion, respectively.

Considering the depth and variation of soil profile across the site, concrete slab on bored piers is recommended to support the loads of the proposed residential building and, the piers should be founded onto the shale bedrock through any fill/silty clay layers. Hence, it is preferable for the piles to have a minimum length of 1.5-2m to ensure them approach the soil layer with an end bearing capacity of 700kPa (Unit 5 -SHALE) or 800kPa (Unit 6-SANDSTONE).

The pile foundation of the proposed structure is assumed to be a high redundancy system and the intrinsic test factor (ϕ tf) is assumed to be equal to basic geotechnical strength reduction factor (ϕ gb), in accordance with AS2159-2009. The overall design average risk rating (ARR) is to be calculated by the designer and the corresponding geotechnical strength reduction shall be adopted.

5. EARTHWORKS

5.1 Site Preparation

The depth of topsoil/fill varies across the site up to a depth of 0.5m. Any fill encountered during excavation should be treated as uncontrolled. The following measures should be adopted for the site preparation of the site:

- All topsoil from the construction area should be stripped to subgrade/foundation level and stockpiled on site for possible re-use. Topsoil not being re-used should be disposed of offsite following a waste classification report.
- Any evidence of contamination or asbestos containing materials found during excavation works should be brought to the attention of the Project Engineer immediately.

It is recommended that Geotesta be engaged to provide a site inspection during the early stage of construction to confirm that the ground conditions of the subgrade for the proposed construction are consistent with the assumptions/findings in this report.

Earthworks recommendations in this report should be read in conjunction with AS 3798-2007: 'Guidelines on Earthworks for Commercial and Residential Developments'. It is recommended that any uncontrolled fill material or soft spots encountered in the proposed subgrade be removed to reveal stiff/very stiff natural soil. The removed section of the subgrade shall be backfilled to the underside of the foundation level, in layers not exceeding 200 mm loose thickness with controlled fill or site derived clay material compacted to 98-102% of maximum dry density of standard compaction (AS 1289.5.1.1) with moisture condition at the equilibrium moisture content or -2% to +2% of the optimum.

5.2 Excavation

Based on the soil/bedrock profile and conditions encountered at the borehole locations, light excavation machinery should be adequate for the footing excavations (down to 1.5m) in fill materials. Soft/Intermediate excavation condition is expected in Silty Clay (i.e., Unit 2, 3 and 4), while excavations into SHALE/SANDSTONE (i.e., Unit 5/6) will encounter intermediate to hard excavation conditions per SANS 1200D. Table 8 describes the excavation classes as per SANS 1200D.

Table 8: Excavation classes as per SANS 1200D

cavation Class

Description

Excavation Class	Description
Soft	Excavation in material that can be efficiently removed by a back-acting excavator of flywheel power approximately 0.10kW per millimetre of tined-bucket width, without the use of pneumatic tools such as paving breakers
Intermediate	Excavation in material that requires a back-acting excavator of flywheel power exceeding 0.10 kW per millimetre of tined-bucket width or the use of pneumatic tools before removal by equipment equivalent to that specified for soft excavation.
Hard	Hard rock excavation shall be excavation in material (excluding boulder excavation) that cannot be efficiently removed without blasting or wedging and splitting.

Based on the current investigation, the excavation is unlikely to encounter groundwater.

All topsoil from the construction area should be stripped to subgrade level and stockpiled on site for possible re-use. Topsoil not being re-used should be disposed of offsite following a waste classification report.

Any evidence of contamination or asbestos containing materials found during excavation works should be notified to the Project Engineer immediately.

5.3 Engineered Fill

Controlled or Rolled fill can be constructed in uniform layers to provide the required design level in accordance with the project foundation design requirements (if applicable). Controlled/Rolled fill must be well compacted in layers not exceeding 200 mm thick.

The fill material shall be uniformly compacted with the required moisture content to achieve satisfactory compaction and shall be graded and trimmed parallel to the designed finished surface.

Filling used to raise levels beneath foundations must be placed and compacted as per specifications for Controlled or Rolled fill.

All fill material is to be compacted to a minimum of 98% Standard Maximum Dry Density (SMDD) ratio determined in accordance AS 1289.5.4.1.

Generally, the soils encountered on site will be suitable for reuse as engineered fill within the site. The natural clayey soils are best suited for bulk filling within site. The material should not contain any particle sizes greater than 150 mm. It is expected that bedrock of low strength or less (if applicable) should readily break down beneath the weight of the rollers, however, bedrock of medium strength or higher may potentially need to be crushed using a rock crusher.

5.4 Temporary Cut Batters

Temporary unsupported excavation up to 1.5m deep within the existing Unit 2/3 Silty Clay layer should be no steeper than 1.5H:1V; Temporary unsupported cut batters more than 1.5m up to 3.0m deep within the existing Unit 3/4 Silty Clay should not be steeper than 2H:1V.

The above recommendations assume that there is no existing structure directly adjacent to the excavation area. It should be noted that following rainy periods, some degree of deterioration and minor slumping of unsupported cut batters is to be anticipated.

It is recommended that a geotechnical engineer be engaged during excavation stage to confirm/identify the material for the whole excavation depth.

The batter slope angles are recommended subjected to the following measures:

- The batters should be protected against erosion
- Permanent batters should be drained

- Temporary batters shall not be left unsupported for more than 2 months without further advice. Following heavy rains (raining more than 6 hours with the intensity of greater than 15 mm/day) should be inspected by a geotechnical engineer.
- A minimum offset distance of 1.5 m from the batter crest should be maintained for surcharge loads and the offset distance should be increased to match the maximum depth of excavation.

5.5 Retaining Wall

Any proposed retaining walls at the site should be engineer designed adopting the geotechnical parameters summarised in Table 9 below.

Unit/ Soil Type	γ (kN/m3)	\mathbf{K}_0	Ka	K _P /Ultimate Earth Pressure Resistance
Unit 2: Sandy Clay/Silty Clay, Stiff	18	0.56	0.39	2.56
Unit 3-4: Sandy Clay/Silty Clay, Very Stiff-Hard	20	0.53	0.36	2.77
Unit 5-6: Shale/Sandstone (Class V)	22	0.4	0.3	200kPa

Table 9: Retaining wall design parameters

For construction methods which minimise deflection and where restraint is applied via struts, bracings or anchors, the temporary or short-term lateral earth pressure distribution should be approximated as a trapezoidal distribution behind the retaining wall. A maximum lateral earth pressure of 8H kPa is obtained at a depth of 0.25H, where H is the total depth of the excavation to be retained. For basement walls where wall deflections are not critical, the maximum lateral earth pressure may be reduced to 6H kPa.

It must be emphasised that where adjoining footings exist near the retaining walls, the "at rest" earth pressures must be maintained, and the active design condition is not appropriate.

5.6 Compaction Requirements

Compaction of backfill material is required to ensure that excessive surface settlement does not occur. The required backfill density and minimum frequency of testing for compaction control as detailed in AS 3798 are summarised below:

• 1 test per layer per 500 m²; or

- 1 test per 100 m³ distributed reasonably evenly throughout full depth and area; or
- 3 tests per visit (whichever requires the most tests)

Testing should be undertaken in accordance with AS 1289, *Methods of testing for soil engineering purposes*. Tested layers that do not satisfy the outlined criteria are to be stripped, replaced, re-compacted and re-tested to achieve the minimum compaction requirement specified above.

Testing of compaction density should be undertaken by a suitably qualified geotechnical testing company.

DOCUMENT CONTROL

Date	Version	Report Prepared By:	Report Reviewed by:
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2022		BEng MSc PhD	BEng MEng Ph.D MIEAust CPEng NER
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6. REFERENCES

- Australian Standard (AS1726) 2017: Geotechnical Site Investigation
- Australian Standard (AS2870) 2011: Residential Slabs and Footings
- Salinity Code of Practice March 2003 (Amended January 2004);
- Australian Standard (AS) 3600 (2009), Concrete Structures
- Australian Standard (2009), Piling Design and Installation (AS2159).
- Australian Standard (2002), Earth-retaining Structures (AS4678).
- Australian Standard (2004), Bridge Design Part 5: Concrete (AS5100.5).
- Pells, P.J.N., Mostyn, G., Walker, B.F. (1998) Design Loadings for Foundations on Shale and Sandstone in the Sydney Region.

Information about This Report

The report contains the results of Soil and water quality Assessment conducted for a specific purpose and client. The results should not be used by other parties, or for other purposes, as they may contain neither adequate nor appropriate information.

Test Hole Logging

The information on the test hole logs (boreholes, test pits, exposures etc.) is based on a visual and tactile assessment, except at the discrete locations where test information is available (field and/or laboratory results). The test hole logs include both factual data and inferred information.

Groundwater

Unless otherwise indicated, the water levels presented on the test hole logs are the levels of free water or seepage in the test hole recorded at the given time of measuring. The actual groundwater level may differ from this recorded level depending on material permeability (i.e. depending on response time of the measuring instrument). Further, variations of this level could occur with time due to such effects as seasonal, environmental and tidal fluctuations or construction activities. Confirmation of groundwater levels, pheratic surfaces or piezometric pressures can only be made by appropriate instrumentation techniques and monitoring programmes.

Interpretation of Results

The discussion or recommendations contained within this report normally are based on a site evaluation from discrete test hole data. Generalised, idealised or inferred subsurface conditions (including any geotechnical cross-sections) have been assumed or prepared by interpolation and/or extrapolation of these data. As such these conditions are an interpretation and must be considered as a guide only.

Change in Conditions

Local variations or anomalies in the generalised ground conditions do occur in the natural environment, particularly between discrete test hole locations. Additionally, certain design or construction procedures may have been assumed in assessing the soil-structure interaction behaviour of the site. Furthermore, conditions may change at the site from those encountered at the time of the geotechnical investigation through construction activities and constantly changing natural forces.

Any change in design, in construction methods, or in ground conditions as noted during construction, from those assumed or reported should be referred to GEOTESTA for appropriate assessment and comment.

Reproduction of Reports

Where it is desired to reproduce the information contained in our geotechnical report, or other technical information, for the inclusion in contract documents or engineering specification of the subject development, such reproductions should include at least all of the relevant test hole and test data, together with the appropriate standard description sheets and remarks made in the written report of a factual or descriptive nature. Reports are the subject of copyright and shall not be reproduced without the permission of Geotesta.

Appendix A

Borehole Logs

1 OF 1 Sheet



Client Bathla Group Easting As per Plan Contractor Geotesta Project 21-33 Owlpen Lane Farely NSW Drill Rig Hand Auger Northing As per Plan Job No. Grid Ref MGA94 Zone 55 Driller VL

Logged VL Date 28/03/22 Location 21-33 Owlpen Lane Farely NSW Inclination -90° Checked MHR Date Drilled Hala Donth 2 00

						Date Drilled	28/03/22		Hole [epth	3.0	0m	Check	ed MHB	Date 28/03/2	2
МЕТНОВ	WATER	ODEPTH S(metres)	DEPTH RL	GRAPHIC LOG	GROUP SYMBOL	SOIL/RO	OCK MATERIAL I	DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	DCP BLOWS PER 100mm	FIELD TESTING A	ND ADDIT	IONAL NOTES	SAMPLE	0.00
		-			FILL	TOPSOIL/FILL:	Silty CLAY, medi	um plasticity, brown	M- W	PC	1 1 1				AS 0.10m AS1	-
		1.00	0.50	X	CI	Silty CLAY: medium-grained	dium plasticity, ye d sand.	llow brown; trace	M- W	F - St	3 2 3 3 2				BD 0.50m ES 0.50m EBH1	1.00
AS	Not Encountered	- - -	1.40	x		Grades: becom	ing orange brown		М	VSt H	3 5 8 10 14 17 19 20	DCP refusal at 1.7m	ı, 20 blows ı	reached	D 1.40m Att1 E 1.50m S1	-
00.09 Datgel Lab and in Situ Tool - DGD Lib: Geoleaa 1,00.0 2019-08-26 Pq: Geoleaa 1,00.0 2019-08-26		2.00_	2.20	X		Grades: becom fragments	ing mottled red g	rey, trace shale								2.00_
sta 1.00.0 2019-08-26		3.00	3.00	x		Hole Terminate	d at 2.00 m									3.00
In Situ Tool - DGD Lib: Geote		-				Refusal	u at 5.50 m									-
		4.0 <u>0</u>														4.00_
< <drawingfile>> 5/7/2022 16:23 10.03</drawingfile>		-														-
	STAN	5.00 DARD: <i>A</i>	L AS1726	-2017												5.00
GEOTESTA 1,00,0 LIB.GLB Log GEOTESTA DCP BOREHOLE NE1166(BH1-8H15),GPJ	co	NSISTE	NCY:		REL	ATIVE DENSIT	Y: WATI	ER:	SAME	PLING	S/IN-S	ITU TESTING:				
NE116	VS		y soft		VL	very loose	\sqsubseteq	water level	С		re sar	-		standard penetra		
REHOLE	S F	so firr			L MD	loose medium der	_	water inflow	U D		be sar sturbe	nple d sample			neter reading (kPa test (uncorrected	
DCP BO	St	stit			D	dense		water loss	В		ılk san			peak shear strer		
TESTA	VS		y stiff		VD	very dense		water ioss	LB		-	lk sample		dynamic cone pe		
g GEO	Н	ha	rd						E HB			nental sample	CPT	static cone pene	etration test	
GLB to		MPACT				MOISTUR	E:		ΠĎ	na	шинег	bouncing				
0.0 LIB.	W		ll comp			D dry	-4									
TA 1.00	MC PC		deratel													
EOTES	PC	ро	orly cor	npacted	ı	W wet										
98																

CONSISTENCY:		RELA	TIVE DENSITY:	WATER:		SAMP	SAMPLING/IN-SITU TESTING:						
VS	very soft	VL	very loose	∇			core sample	SPT	standard penetration test				
S	soft	L	loose	=			tube sample	PP	pocket penetrometer reading (kPa)				
F	firm	MD	medium dense	\triangleright	water inflow	D	disturbed sample	FV	field vane shear test (uncorrected				
St	stiff	D	dense		water loss		bulk sample		peak shear strength, kPa)				
VSt	very stiff	VD	very dense		water ioss	LB	large bulk sample	DCP	dynamic cone penetration test				
Н	hard					Е	environmental sample	CPT	static cone penetration test				
COMPACTION:			MOISTURE:			HB	hammer bouncing						
WC	well compacted		D dry										

1 OF 1 Sheet



Client Bathla Group Contractor Geotesta Easting As per Plan Project 21-33 Owlpen Lane Farely NSW Drill Rig Hand Auger Northing As per Plan Job No. MGA94 Zone 55 Driller VLGrid Ref

Location 21-33 Owlpen Lane Farely NSW Inclination -90° VLDate 29/03/22 Logged 29/03/22 Date Drilled Hole Depth 1.30m Checked MHB Date 29/03/22

L							Date Drilled	29/03/22		Hole [epth	1.3	0m	Checl	ked MHE	3	Date 29/03/22	2
() .	WE HOD	WAIEK	ODEPTH S(metres)	<i>DEPTH</i> RL	GRAPHIC LOG	GROUP SYMBOL	SOIL/RC	OCK MATERIAL	DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	DCP BLOWS PER 100mm	FIELD TESTING	AND ADDIT	TONAL NO	TES	SAMPLE	0.00-
(AS	Not Encountered	- -	0.20	X x	CI	Silty CLAY: low mottled red.		ium plasticity, black ity, yellow brown, avel pieces	M	PC St						AS 0.10m AS2 B 0.20 - 0.50m CBR2 ES 0.40m EBH2	-
	TOL	Not	1.0 <u>0</u>	1.10 1.30	x				extremely weathered	. M	VLS							1.00_
. Рђ: Geotesta 1.00.0 2019-08-26			2.00				Hole Terminate Refusal	d at 1.30 m										2.00_
03.00.09 Datgel Lab and In Situ Tool - DGD Lib: Geolesta 1.00.0 2019-08-26 Prj: Geolesta 1.00.0 2019-08-28			3.00															3.00_
<cdrawingfile>> 5/7/2022 16:23 10.03:00.09 Datgel Lab and</cdrawingfile>			4.0 <u>0</u>															4.00_
			5.00															5.00
65(BH1-BH15).GP.	С	ON	ISISTE		-2017		ATIVE DENSIT	Y: WAT	ER:				ITU TESTING:					
GEOTESTA 1,00.0 LIB.GLB Log GEOTESTA DCP BOREHOLE NE1166(BH1-BH15),GPJ	S F S V H	: St /St H	sol firn stif ver hai	n f y stiff rd	acted	VL L MD D VD	very loose loose medium der dense very dense MOISTUR D dry	E:	water level water inflow water loss	C U D B LB E HB	tul dis bu lai er	ilk san ge bul vironn	mple d sample	SPT PP FV DCP CPT	field vane peak shea dynamic c	netrom shear one pe	neter reading (kPa test (uncorrected	
GEOTESTA 1.00.0		AC PC			y comp		d M moi W wet											

CONS	ISTENCY:	RELA	TIVE DENSITY:	WAT	WATER:		
VS	very soft	VL	very loose	∇	water level		
S	soft	L	loose	=	water level		
F	firm	MD	medium dense		water inflow		
St	stiff	D	dense		water loss		
VSt	very stiff	VD	very dense		water ioss		
Н	hard						

COME	PACTION:	MOIS	STURE:
WC	well compacted	D	dry

WATER: SAMPLING/IN-SITU TESTING:

С	core sample
U	tube sample
D	disturbed sample
В	bulk sample
LB	large bulk sample
Е	environmental sample
HB	hammer bouncing

1 OF 1 Sheet



Client Bathla Group Contractor Geotesta Easting As per Plan Project 21-33 Owlpen Lane Farely NSW Drill Rig Hand Auger Northing As per Plan Job No. MGA94 Zone 55 NE1165 Driller VLGrid Ref

Location 21-33 Owlpen Lane Farely NSW Inclination -90° Logged VL Date 29/03/22 Date Drilled 29/03/22 Hole Depth 1.10m Checked MHB Date 29/03/22

						Date Drilled	29/03/22		Hole [epth	1.1	0m (Checked	I MHB	Date 29/03/22	2
МЕТНОВ	WATER	ODEPTH S(metres)	DEPTH RL	GRAPHIC LOG	GROUP SYMBOL	SOIL/RC	OCK MATERIAL	DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	DCP BLOWS PER 100mm	FIELD TESTING AND A	ADDITION	NAL NOTES	SAMPLE	0.00-
		_	0.30		FILL	TOPSOIL/FILL:	Silty CLAY, medi	ium plasticity, brown	М	PC	1 1 2				AS 0.10m AS3	
S	ountered	-	0.30		CI	Silty CLAY: med	dium plasticity, ye	ellow brown.	М	F	2 2				ES 0.40m EBH3	
AS	Not Encountered	-	0.80							Н	2 2 20	DCP refusal at 0.7m, 20 b	blows rea	ached	EDNO	
		1.00	1.00 1.10	x		pieces SHALE: grey, v	very low strength,	extremely weathered,	М	VLS						1.00_
		-				trace sandstone Hole Terminate Refusal	•									
		-														
2019-08-26		2.00														2.00_
otesta 1.00.0		_														
-08-26 Prj: Ge		-														
and In Situ Tool - DGD Ub: Geolesta 1.00.0 2019-08-26 Ptj: Geolesta 1.00.0 2019-08-26		3.00														3.00_
Lib: Geotes		-														
tu Tool - DGD		-														
Lab and In S																
03.00.09 Datgel Lab		4.0 <u>0</u>														4.00_
5/7/2022 16:23 10.03.		-														
		-														
< <drawingfile>></drawingfile>		5.00														5.00
5).GPJ	STAN	DARD:	AS1726	-2017					1							
GEOTESTA 1,00,0 LIB GLB Log GEOTESTA DCP BOREHOLE NE1166(8H1-8H15), GPJ	cc	NSISTE	NCY:		REL	ATIVE DENSIT	Y: WAT	ER:	SAM	PLINC	3/IN-S	ITU TESTING:				
E NE1	VS		ry soft		VL	very loose	\sqsubseteq	water level	С		re sar	•		andard penetra		
КЕНОГІ	S F	so firr			L MD	loose medium der	nse	water inflow	U D		be sar	mple PP d sample FV		-	eter reading (kPa test (uncorrected	
SP BOR	St	sti			D D	meaium aer dense	196	water iiiiiOW	В		sturbe Ilk san	•		ak shear stren	•	
STA DC	VS		ry stiff		VD	very dense	\triangleleft	water loss	LB			lk sample DC		namic cone pe	- :	
EOTES	H	t ve ha	-		ره	vory derise			E		-	nental sample CP	,	atic cone pene		
B Log GE		MPACT				MOISTUR	Œ:		HB			bouncing	. 316	55116 POING		
LIB.GLI	W		II comp	acted		D dry										
1.00.01	MC			y comp	acted	•										
OTESTA 1	PC			npacted		W wet										
GEC																

CONSI	STENCY:	RELAT	TIVE DENSITY:	WAT	ER:	SAMF
VS	very soft	VL	very loose	∇	water level	С
S	soft	L	loose	<u></u>	water level	U
F	firm	MD	medium dense	>	water inflow	D
St	stiff	D	dense		water loss	В
VSt	very stiff	VD	very dense		water ioss	LB
Н	hard					Е

IPLING/IN-SITU TESTING:

С	core sample	SPT	standard penetration test
U	tube sample	PP	pocket penetrometer reading (kPa)
D	disturbed sample	FV	field vane shear test (uncorrected
В	bulk sample		peak shear strength, kPa)
LB	large bulk sample	DCP	dynamic cone penetration test
Е	environmental sample	CPT	static cone penetration test
HB	hammer bouncing		

1 OF 1 Sheet



Client Bathla Group Contractor Geotesta Easting As per Plan Project 21-33 Owlpen Lane Farely NSW Drill Rig Hand Auger Northing As per Plan Job No. NE1165 MGA94 Zone 55 Driller VL Grid Ref

Location 21-33 Owlpen Lane Farely NSW Inclination -90° Logged VL Date 29/03/22 29/03/202 Date Drilled Hole Depth 1.60m Checked MHB Date 29/03/22

L							Date Drilled	29/03/202		Hole [epth	1.6	Um	Chec	ked MHB	Date 29/03/2	
	METHOD	WATER	ODEPTH S(metres)	<i>DEPTH</i> RL	GRAPHIC LOG	GROUP SYMBOL	SOIL/RO	OCK MATERIAL	DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	DCP BLOWS PER 100mm	FIELD TESTING A	and addi	TIONAL NOTES	SAMPLE	0.00-
f			0.00		XX	FILL	TOPSOIL/FILL:	: Silty CLAY, medi	um plasticity, brown	М	PC						0.00
			-	0.30	× - ×	CI	Silty CLAY: me	dium plasticity, or	ange brown.	M	St					AS 0.10m AS4 B 0.30 - 0.80m CBR4 ES 0.40m	-
:	SA L	Not Encountered	- 1.0 <u>0</u>	0.80	X		Grades: low-m	edium plasticity, b	ecoming mottled red							EBH4	1.00_
			-	1.30	×												-
			-	1.50			SHALE: grey, v	ery low strength,	extremely weathered.	M	VLS						-
ŀ	+	+		1.60			Grades: become Hole Terminate	ning yellow brown,	mottled grey	 							
			-				Refusal	cu at 1.00 m									-
-26			2.00														2.00_
03.00.09 Datgel Lab and In Situ Tool - DGD LIb: Geolesta 1.00.0 2019-08-26 Pg: Geolesta 1.00.0 2019-08-26			_														
a 1.00.0																	
Geotest			_														1
3-26 Prj:			-														-
0.5019-0			-														-
ta 1.00.0			3.00														3.00_
Geotes																	
3D Lib:																	
Tool - Do			_														1
In Situ			-														-
Lab and			_														-
Datgel L			4.00														4.00
60:00:																	
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22 16:2			-														-
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ingFile>																	
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15).GPJ	STA	AND		S1726	-2017						<u> </u>						0.00_
3H1-8H	(CON	ISISTE	NCY.		RFI	ATIVE DENSIT	Y: WAT	FR·	SAMI	PI INC	3/IN-S	ITU TESTING:				
IE1165(I		/S		y soft		VL	very loose			С		re sar		SPT	standard penetr	ation test	
10LE N	5	3	sof	t		L	loose	\sqsubseteq	water level	U	tu	be sar	mple	PP	pocket penetron	neter reading (kPa	n)
BORE	F		firn			MD	medium de	nse	water inflow	D			d sample	FV		test (uncorrected	
3TA DCF		St /St	stif ver	f y stiff		D VD	dense very dense	\triangleleft	water loss	B LB		ılk san ae bu	nple Ik sample	DCP	peak shear streed dynamic cone p		
эеоте	ŀ		hai	-			.51, 401136			E			nental sample	CPT	static cone pene		
GEOTESTA 1,00.0 LIB.GLB Log GEOTESTA DCP BOREHOLE NE1166(BH1-BH15),GPJ	,	COM	IPACTI	ON-			MOISTUR	·F·		НВ			bouncing				
LIB.GLE		VC		ll compa	acted		D dry										
1.00.01		ИС		deratel		acte	•										
TESTA	F	C	pod	orly con	npacted	b	W wet										
GEC																	

CONSISTENCY:		RELAT	IVE DENSITY:	WATER:		SAMPI	SAMPLING/IN-SITU TESTING:						
VS	very soft	VL	very loose	∇			core sample	SPT	standard penetration test				
S	soft	L	loose	=	water level	U	tube sample	PP	pocket penetrometer reading (kPa)				
F	firm	MD	medium dense		water inflow	D	disturbed sample	FV	field vane shear test (uncorrected				
St	stiff	D	dense		water lase	В	bulk sample		peak shear strength, kPa)				
VSt	very stiff	VD	very dense	\sim	water loss	LB	large bulk sample	DCP	dynamic cone penetration test				
Н	hard					E	environmental sample	CPT	static cone penetration test				
COMPACTION: WC well compacted		MOISTURE: D dry				НВ	hammer bouncing						

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Client Bathla Group Contractor Geotesta Easting As per Plan Project 21-33 Owlpen Lane Farely NSW Drill Rig Hand Auger Northing As per Plan Job No. MGA94 Zone 55 Driller VLGrid Ref

Location 21-33 Owlpen Lane Farely NSW Inclination -90° Logged VLDate 29/03/22 29/03/22 Date Drilled Hole Depth 1.00m Checked MHB Date 29/03/22

						Date Drilled	29/03/22		Hole [Depth	1.0	0m	Check	ked MHB	Date 29/03/2	22
МЕТНОБ	WATER	ODEPTH S(metres)	<i>DEPTH</i> RL	GRAPHIC LOG	GROUP SYMBOL	SOIL/RC	OCK MATERIAL	DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	DCP BLOWS PER 100mm	FIELD TESTING /	and addit	IONAL NOTE	S SAMPLE	0.00
		3.30		XX	FILL	TOPSOIL/FILL:	Silty CLAY, med	ium plasticity, brown	М	PC						3.50
AS	Not Encountered	- - -	0.20	XX	CI	Silty CLAY: high grey; trace irons	n plasticity, yellov stone pieces.	v brown, mottled red	M	F - St S - VSt					AS 0.10m AS5 B 0.20 - 0.60m CBR5 ES 0.40m EBH5 D 0.50m Att5 E 0.50m	
		1.00	1.00				, very low strength		М	VLS					S5	1.00
		-				weathered, trac Hole Terminate Refusal	ce sandstone piec ed at 1.00 m	ies	_/							
		2.00														2.00
		3.00_														3.00
		4.00														4.00
		-														
		5.00														5.00
S	TAND	ARD: A	AS1726	-2017												
	CON	NSISTE	NCY:		REL	ATIVE DENSIT	Y: WAT	ER:	SAM	PLING	3/IN-S	ITU TESTING:				
	VS	ver	y soft		VL	very loose	abla	water level	С		re sar	•		-	netration test	
	S	sof			L	loose	_		U		be sar	•	PP EV	-	etrometer reading (kP	
	F St	firn stif			MD D	medium der dense	ise	water inflow	D B		sturbe ılk san	d sample			near test (uncorrected strength, kPa)	a
	VSt		y stiff		VD	very dense	\triangleleft	water loss	LB			lk sample		-	ne penetration test	
	Н	hai	-		VD	very derise			E		_	nental sample	CPT		penetration test	
							_		HB			bouncing	J	50110		
		/IPACT		oote d		MOISTUR						=				
	WC		II comp			D dry										
	MC	ma	derate	v como	nacter	1 M mai	st									
	MC PC		deratel			d M moi: W wet										

CONS	ISTENCY:	RELA	RELATIVE DENSITY: WATER					
VS	very soft	VL	very loose	∇	water level			
S	soft	L	loose	=	water level			
F	firm	MD	medium dense		water inflow			
St	stiff	D	dense		water loss			
VSt	very stiff	VD	very dense		water ioss			
Н	hard							

COMF	PACTION:	MOI	STURE:
WC	well compacted	D	dry

WC	well compacted	ט	ary
MC	moderately compacted	M	mois
PC	poorly compacted	W	wet

SAMPLING/IN-SITU TESTING:

С	core sample
U	tube sample
D	disturbed sample
В	bulk sample
LB	large bulk sample
Е	environmental sample
HB	hammer bouncing

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Client Bathla Group Contractor Geotesta Easting As per Plan Project 21-33 Owlpen Lane Farely NSW Drill Rig Northing As per Plan Hand Auger Job No. MGA94 Zone 55 Driller VL Grid Ref

Location 21-33 Owlpen Lane Farely NSW Inclination -90° Logged VL Date 29/03/22 Date Drilled 29/03/22 Hole Depth 1.00m Checked MHB Date 29/03/22

						Date Drilled	29/03/22		Hole [Depth	1.0	0m	Checke	ed MHB	Date 29/03/2	2
МЕТНОD	WATER	ODEPTH S(metres)	DEPTH RL	GRAPHIC LOG	GROUP SYMBOL	SOIL/RC	OCK MATERIAL	DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	DCP BLOWS PER 100mm	FIELD TESTING A	ND ADDITI	ONAL NOTES	SAMPLE	0.00
AS	Not Encountered	- - -	0.30	X X X X X X X X X X	FILL			ium plasticity, brown ge brown, mottled red	M	PC F	1 1 1 1 2 2				AS 0.10m AS6 ES 0.40m EBH6 D 0.50m	
	Not	1.00	0.90	x		extremely weath Hole Terminate	hered, trace sand	vers, very low strength, distone pieces.	M	St VSt VLS	3 4 7 10 20	DCP refusal at 1m, 2	0 blows rea	ached	Att6 E 0.50m S6	1.00
		- 2.0 <u>0</u> -				Refusal										2.00
		3.00														3.00
		4.0 <u>0</u>														4.00
S	TANE	5.0 <u>0</u> DARD: <i>A</i>	AS1726	-2017												5.00
		NSISTE			REI	ATIVE DENSIT	Y: WAT	·FR·	SAMI	DI INIC	3/IN-¢	ITU TESTING:				
	VS		y soft		VL	very loose			C		re sar		SPT s	standard penetra	ation test	
	S	sof			L	loose	∑	water level	U		be sar				neter reading (kPa	
	F	firn			MD D	medium der	nse	water inflow	D			d sample			test (uncorrected	
	St VSt	stif ver	y stiff		۷D	dense very dense	\langle	water loss	B LB		ılk san rae bul	npie Ik sample		oeak shear strei dynamic cone pi	- :	
	Н	hai	-		••	vory donoc			E		-	nental sample		static cone pene		
						MOISTUS	E.		HB			bouncing		,		
	WC	WPACT we	ION: Il comp	acted		MOISTUR D dry	E:									
	MC			acteu y comp	acte	•	st									
	РС			npacted		W wet										
		-														

CONS	ISTENCY:	RELA	TIVE DENSITY:	WAT	ER:	SAMPLING/IN-SITU TESTIN			
VS	very soft	VL	very loose	abla	water level	С	core sample		
S	soft	L	loose	-	water level	U	tube sample		
F	firm	MD	medium dense		water inflow	D	disturbed sample		
St	stiff	D	dense		water loss	В	bulk sample		
VSt	very stiff	VD	very dense		water ioss	LB	large bulk sample		
Н	H hard					Е	environmental sample		

standard penetration test PP FV DCP le CPT ample ΗВ hammer bouncing

pocket penetrometer reading (kPa)
field vane shear test (uncorrected
peak shear strength, kPa)
dynamic cone penetration test
static cone penetration test

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Client Bathla Group Contractor Geotesta Easting As per Plan Project 21-33 Owlpen Lane Farely NSW Drill Rig Northing As per Plan Hand Auger Job No. Grid Ref MGA94 Zone 55 Driller VL

Location 21-33 Owlpen Lane Farely NSW Inclination -90° Logged VLDate 29/03/22 Date Drilled 29/03/22 Hole Depth 1.10m Checked MHB Date 29/03/22

STANARO AS 1726-2017							Date Drilled	29/03/22		Hole [Depth	1.1	0m	Check	ked MHB	Date 29/03/2	2
AS 0.10m AS 0.20	METHOD	WATER	ODEPTH O(metres)	<i>DEPTH</i> RL	GRAPHIC LOG	GROUP SYMBOL	SOIL/RC	OCK MATERIAL	DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	DCP BLOWS PER 100mm	FIELD TESTING A	ND ADDIT	TIONAL NOTES	SAMPLE	0.00
AST					XX	FILL	TOPSOIL/FILL:	Silty CLAY, medi	um plasticity, brown	М	PC						
1.00 1.00		ntered	-	0.20	X X = x = x	CI	Silty CLAY: med	dium plasticity, or	ange brown.	M	F	2				AS7 B 0.20 - 0.60m CBR7	-
1.10	AS AS	Not Encou	-		x x x				mottled red, trace	D - M		2 3 4 7				ES 0.40m EBH7	-
2.00 Hole Terminated at 1.10 m Refusal 3.00 3.00 4.00 4.00 4.00 5.00 5.00 5.00 6.00		-	1.00		ļ		SHALE: arev. v	ery low strenath.	extremely weathered.	М	VLS	1	DCP refusal at 1.0m.	. 20 blows	reached		1.00_
3.00 3.			-				Hole Terminate		<i></i>	<u> </u>	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			, 20 5.0110			-
26 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			-	-													-
0. ES 2032/2002/2002/2002/2002/2002/2002/2002	3-26		2.00														2.00_
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0. ES 2032/2002/2002/2002/2002/2002/2002/2002	3-26 Prj: Geotes		-														-
0. ES 2032/2002/2002/2002/2002/2002/2002/2002	.00.0 2019-0		3.00														3.00
0. ES 2032/2002/2002/2002/2002/2002/2002/2002	Lib: Geotesta 1		-														-
0. ES 2032/2002/2002/2002/2002/2002/2002/2002	itu Tool - DGD		-	-													-
0. ES 2032/2002/2002/2002/2002/2002/2002/2002	el Lab and In Si		-														
0. E8291 2002/US C-2-1923	03.00.09 Datge		4.00														4.00_
\$ 5.00			-														
			-														-
STANDARD: AS1726-2017 CONSISTENCY: RELATIVE DENSITY: WATER: SAMPLING/IN-SITU TESTING: VS very soft VL very loose Service Ser	< <draw< td=""><td></td><td>5.00</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>5.00</td></draw<>		5.00														5.00
CONSISTENCY: RELATIVE DENSITY: WATER: SAMPLING/IN-SITU TESTING: VS very soft VL very loose Soft L loose Water level S soft L loose Water inflow D disturbed sample FV field vane shear test (uncorrect by the large bulk sample B bulk sample DCP dynamic cone penetration test B bulk sample B bulk sample DCP dynamic cone penetration test E environmental sample CPT static cone penetration test E environmental sample CPT static cone penetration test B hammer bouncing COMPACTION: MOISTURE: WC well compacted D dry MC moderately compacted M moist PC poorly compacted W wet	15).GPJ	TAN	DARD: A	AS1726	-2017												
VS very soft VL very loose	(BH1-BH	СО	NSISTE	NCY:		REL	ATIVE DENSIT	Y: WAT	ER:	SAMI	PLING	3/IN-S	ITU TESTING:				
S soft L loose water level U tube sample PP pocket penetrometer reading (F firm MD medium dense water inflow D disturbed sample FV field vane shear test (uncorrect B bulk sample PV peak shear strength, kPa) VSt very stiff VD very dense H hard COMPACTION: WC well compacted D dry MC moderately compacted M moist PC poorly compacted W wet	NE1165													SPT	standard penet	ration test	
F firm MD medium dense water inflow D disturbed sample FV field vane shear test (uncorrect static cone penetration test HB harmer bouncing F firm MD medium dense water inflow D disturbed sample FV field vane shear test (uncorrect BB bulk sample peak shear strength, kPa) LB large bulk sample DCP dynamic cone penetration test E environmental sample CPT static cone penetration test HB hammer bouncing COMPACTION: MOISTURE: WC well compacted D dry MC moderately compacted M moist PC poorly compacted W wet	HOLE							_					-		-	= :	•
VSt very stiff VD very dense H hard COMPACTION: WC well compacted MC moderately compacted MC moderately compacted W wet Weter loss Water loss Water loss Water loss LB large bulk sample E environmental sample CPT static cone penetration test HB hammer bouncing WC moderately compacted M moist PC poorly compacted W wet	P BORE							ise	water inflow				•			•	
H hard COMPACTION: WC well compacted D dry MC moderately compacted M moist PC poorly compacted W wet	TA DCF							\langle	water loss				•		-	- :	
COMPACTION: MOISTURE: WC well compacted D dry MC moderately compacted M moist PC poorly compacted W wet	OTES			-		۷D	very dense					_	•				
WC well compacted D dry MC moderately compacted M moist PC poorly compacted W wet	Log GE							_					· ·	O1 1	saud done pen	a.ioii 1001	
MC moderately compacted M moist PC poorly compacted W wet	B.GLB				acted												
PC poorly compacted W wet	00.00 LII					acter	•										
SECOND TO THE PROPERTY OF THE	STA 1.																
~ <u>-</u>	GEOTE																

CONSI	STENCY:	RELAT	IVE DENSITY:	WATE	ER:	SAMPLING/IN-SITU TESTING:			
VS	very soft	VL	very loose	\searrow	water level	С	core sample		
S	soft	L	loose	=	water level	U	tube sample		
F	firm	MD	medium dense		water inflow	D	disturbed sample		
St	stiff	D	dense		water loss	В	bulk sample		
VSt	very stiff	VD	very dense		water ioss	LB	large bulk sample		
H hard						E	environmental sample		

COMPACTION: MOISTURE: well compacted D dry

0	core sample	SPT	standard penetration test
J	tube sample	PP	pocket penetrometer reading (kPa)
D	disturbed sample	FV	field vane shear test (uncorrected
3	bulk sample		peak shear strength, kPa)
_B	large bulk sample	DCP	dynamic cone penetration test
Ε	environmental sample	CPT	static cone penetration test
НВ	hammer bouncing		

1 OF 1 Sheet



Client Bathla Group Contractor Geotesta Easting As per Plan Project 21-33 Owlpen Lane Farely NSW Drill Rig Northing As per Plan Hand Auger Job No. Grid Ref MGA94 Zone 55 NE1165 Driller VL

Location 21-33 Owlpen Lane Farely NSW Inclination -90° Logged VLDate 29/03/22 Date Drilled 29/03/22 Hole Depth 1.40m Checked MHB Date 29/03/22

						Date Drilled	29/03/22		Hole [Depth	1.4	0m	Check	ked MHB	Date 29/03/22	2
COLLEGE	WATER	ODEPTH S(metres)	<i>DEPTH</i> RL	GRAPHIC LOG	GROUP SYMBOL	SOIL/RC	OCK MATERIAL I	DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	DCP BLOWS PER 100mm	FIELD TESTING A	ND ADDIT	TONAL NOTES	SAMPLE	-0.00-
			0.20		FILL	TOPSOIL/FILL: brown	Silty CLAY, medi	um plasticity, dark	М	PC					AS 0.10m	
		-	0.20	× ×	CI		h plasticity, orang	e brown, mottled red	М	F - Si	t				AS8	-
o v	Not Encountered	1.0 <u>0</u>	1.00	x - x - x - x - x - x - x - x - x - x -			sandstone pieces			St - VSt					ES 0.40m EBH8 D 0.60m Att8 E 0.60m S8	1.00_
L		<u> </u>	1.40				ow plasticity, very	low strength,	М	VLS						
119-08-26		2.0 <u>0</u>	_			extremely weath Hole Terminate Refusal										2.00_
03.00.09 Datgel Lab and In Situ Tool - DGD Lib: Geolesta 1.00.0 2019-08-26 Prj: Geolesta 1.00.0 2019-08-26		3.00_														3.00_
5/7/2022 16:23 10.03.00.09 Datgel Lab and In Situ Tool - DGD		4.00														4.00_
																_
< <drawingfile>></drawingfile>																
		5.00														5.00
GEOTESTA 1.00.0 LIB.GLB Log GEOTESTA DCP BOREHOLE NE1168(8H1-8H15), GPJ	STAN	DARD: /	AS1726	-2017												
35(BH1-B	CC	NSISTE	NCY:		REL	ATIVE DENSIT	Y: WATI	ER:	SAMI	PLINC	G/IN-S	ITU TESTING:				
NE116	VS		ry soft		VL	very loose	\sqsubseteq	water level	C		re sar	-		standard penetra		,
REHOLI	S F	so firr			L MD	loose medium der	nse 🗀	water inflow	U D		be sar sturbe	npie d sample			neter reading (kPa test (uncorrected)
CP BO	St				D	dense			В		ılk san	•		peak shear strei	•	
STAD	VS		ry stiff		VD	very dense		water loss	LB			lk sample		dynamic cone p		
GEOTE	Н	ha	-						Е		_	nental sample		static cone pene		
B Log	cc	MPACT	ION:			MOISTUR	Œ:		HB	ha	ammer	bouncing				
LIB.GLI	W		ell comp	acted		D dry										
1.00.0	MC		oderatel		acte	•										
TESTA	PC	ро	orly con	npacte	b	W wet										
GEO.																

CONS	SISTENCY:	RELA	TIVE DENSITY:	WAT	ΓER:	SAM	PLING/IN-SITU TESTING:		
VS	VS very soft		very loose	∇	water level	С	core sample	SPT	standard penetration test
S	soft	L	loose	-	water level	U	tube sample	PP	pocket penetrometer readir
F	firm	MD	medium dense		water inflow	D	disturbed sample	FV	field vane shear test (uncor
St	stiff	D	dense			В	bulk sample		peak shear strength, kPa)
VSt	very stiff	VD	very dense		water loss	LB	large bulk sample	DCP	dynamic cone penetration t
Н	hard					E	environmental sample	CPT	static cone penetration test
						LID	hammar haunaina		

COMPACTION: MOISTURE:

tube sample	PP	pocket penetrometer reading (kPa)
disturbed sample	FV	field vane shear test (uncorrected
bulk sample		peak shear strength, kPa)
large bulk sample	DCP	dynamic cone penetration test
environmental sample	CPT	static cone penetration test
hammer bouncing		

Sheet 1 OF 1



ClientBathla GroupContractorGeotestaEastingAs per PlanProject21-33 Owlpen Lane Farely NSWDrill RigHand AugerNorthingAs per PlanJob No.NE1165DrillerVLGrid RefMGA94 Zone 55

Location21-33 Owlpen Lane Farely NSWInclination-90°LoggedVLDate29/03/22Date Drilled29/03/22Hole Depth1.80mCheckedMHBDate29/03/202

	⊢													
Section Sect		METHOD	WATER	SDEPTH S(metres)	<i>DEPTH</i> RL	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	DCP BLOWS PER 100mm	FIELD TESTING AND ADDITIONAL NOTES	SAMPLE	-0.00-
Page				-	0.30		FILL	TOPSOIL/FILL: Silty CLAY, medium plasticity, dark brown	М	PC			AS 0.10m AS9	- 0.00
St. St.				_		×	CI	Silty CLAY: high plasticity, brown.	М	F - St			B 0.30 - 0.90m	-
Company Comp				_	0.50	×		Grades: becoming mottled red grey		St -			ES 0.40m	_
1.80 2.00 Crades: becoming red brown, mottled grey Grades: trace shale fragments 2.00 Crades: traces 2.00 Crades: trace shale fragments 2.00 Crades: traces		AS	Not Encountered	1.0 <u>0</u>	0.90	- ^ x - x - x - x		Grades: trace gravel					D 0.60m Att9 E 0.60m	- 1.00_ -
1.80 2.00 Crades: becoming red brown, mottled grey Grades: trace shale fragments 2.00 Crades: trace shale fragments 2.00				-	1.50	×								-
1.80 2.00 Hole Terminated at 1.80 m Refusal 3.00				-		××								-
Refusal 2.00 2.00	ŀ				1.80	x								
Dawwing Files>	56			2.00				Hole Terminated at 1.80 m Refusal						2.00_
DawningFiles>	2019-08-													
DawningFiles>	а 1.00.0			_										
DawningFiles>	Geotesta			-	-									-
Dawwing Files>	3-26 Prj:			-										-
DawningFiles>	0 2019-08			-										-
Dawwing Files>	sta 1.00.0			3.00										3.00_
Dawwing Files>	: Geotes			_										_
DawningFiles>	OGD Lit													
DawningFiles>	J- loo1 r			_										
DawningFiles>	nd In Site			-										-
DawningFiles>	gel Lab a			-										-
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	ingFile>>			_										
	J «Draw			5.00										5.00

STANDARD: AS1726-2017

poorly compacted

W

wet

CONS	CONSISTENCY:		RELATIVE DENSITY:		WATER: S		SAMPLING/IN-SITU TESTING:						
VS	very soft	VL	very loose	∇			core sample	SPT	standard penetration test				
S	soft	L	loose	-	water level	U	tube sample	PP	pocket penetrometer reading (kPa)				
F	F firm MD St stiff D		medium dense		water inflowwater loss	D	disturbed sample	FV	field vane shear test (uncorrected				
St			dense			В	bulk sample		peak shear strength, kPa)				
VSt	very stiff	VD	very dense	\sim	water ioss	LB	large bulk sample	DCP	dynamic cone penetration test				
Н	hard	ard						E	environmental sample	CPT	static cone penetration test		
COMPACTION:		MOISTURE:			HB	hammer bouncing							
WC well compacted			D dry										
MC moderately compacted		M moist											

1 OF 1 Sheet



Client Bathla Group Contractor Geotesta Easting As per Plan Project 21-33 Owlpen Lane Farely NSW Drill Rig Hand Auger Northing As per Plan Job No. MGA94 Zone 55 Driller VL Grid Ref

Location 21-33 Owlpen Lane Farely NSW Inclination -90° Logged VL Date 29/03/22 Date Drilled 29/03/22 Hole Depth 1.00m Checked MHB Date 29/03/22

						Date Drilled	29/03/22		Hole [Depth	1.0	0m	Check	ed MHB	Date 29/03/2	2
METHOD	WATER	ODEPTH S(metres)	<i>DEPTH</i> RL	GRAPHIC LOG	GROUP SYMBOL	SOIL/RO	CK MATERIAL	DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	DCP BLOWS PER 100mm	FIELD TESTING A	ND ADDITI	ONAL NOTES	SAMPLE	0.00
AS	Not Encountered	-	0.30		FILL CI	trace gravel	Silty CLAY, med	ium plasticity, brown, ange brown.	M	PC F - St	1 1 1 3 1 2 4				AS 0.10m AS10 B 0.30 - 0.80m CBR10 ES 0.40m EBH10	
	2	-	0.80 0.90	× ×		Grades: becom	ing mottled red g	rev. trace shale		VSt H	10 11					
		1.00	1.00			∖fragments SHALE: grey, m	nottled red, very l e sandstone and	ow strength, extremely ironstone pieces.	/_M_	VLS	20	DCP refusal at 0.9m	, 20 blows r	reached		1.00
		2.0 <u>0</u> -														2.00
		3.0 <u>0</u>														3.00
		- 4.0 <u>0</u> -														4.0
		- 5.0 <u>0</u>														5.0
S	TANE	DARD: A	AS1726	-2017												
		NSISTE				ATIVE DENSIT	Y: WAT	ER:				ITU TESTING:	ODT			
	VS S	ver sof	y soft t		VL L	very loose loose	\subseteq	water level	C U		re sar be sar	•		standard penet pocket penetro	ration test meter reading (kPa	a)
	F	firn			MD	medium der	nse 🔀	water inflow	D	dis	sturbe	d sample			r test (uncorrected	•
	St	stif			D	dense	\triangleleft	water loss	В		lk san	-		peak shear stre	- :	
	VSt H	ver hai	y stiff rd		VD	very dense	7		LB E		-	lk sample nental sample			penetration test	
									⊨ HB			nental sample bouncing	CPI	static cone pen	etration test	
		MPACT		oots-I		MOISTUR	E:		-			· 9				
	WC MC		ll comp deratel		actor	D dry d M mois	st .									
	PC		orly cor			W wet										
	. J	Po	, 501	- 20100												

CONS	ISTENCY:	RELA	TIVE DENSITY:	WAT	ER:	SAMPLING		
VS	very soft	VL	very loose	∇	water level	С	СО	
S	soft	L	loose	=	water level	U	tul	
F	firm	MD	medium dense	\supset	water inflow	D	dis	
St	stiff	D	dense		water loss	В	bu	
VSt	very stiff	VD	very dense		water ioss	LB	lar	
Н	hard					Е	en	

IG/IN-SITU TESTING:

С	core sample	SPT	standard penetration test
U	tube sample	PP	pocket penetrometer reading (kPa)
D	disturbed sample	FV	field vane shear test (uncorrected
В	bulk sample		peak shear strength, kPa)
LB	large bulk sample	DCP	dynamic cone penetration test
Е	environmental sample	CPT	static cone penetration test
HB	hammer bouncing		

1 OF 1 Sheet



Client Bathla Group Contractor Geotesta Easting As per Plan As per Plan Project 21-33 Owlpen Lane Farely NSW Drill Rig Hand Auger Northing Job No. NE1165 Grid Ref MGA94 Zone 55 Driller VL

Location 21-33 Owlpen Lane Farely NSW Inclination -90° Logged VLDate 29/03/22 29/03/22 Date Drilled Hole Depth 1.70m Checked MHB Date 29/03/22

L							Date Drilled	29/03/22		Hole [epth	1.7	Um Ch	ecked	MHB	Date 29/03/22	
	METHOD	WATER	⊝DEPTH S(metres)	<i>DEPTH</i> RL	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROO	CK MATERIAL [DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	DCP BLOWS PER 100mm	FIELD TESTING AND AD	DITION	VAL NOTES	SAMPLE	0.00-
ŀ			0.00		XX	FILL	TOPSOIL/FILL:	Silty CLAY, loose	, brown	M - W	PC	1					0.00
			-	0.30	XX					VV		1				AS 0.10m AS11	-
			-		x	CI	Silty CLAY: med	lium plasticity, gre	ey.	M - W	F	1 1				B 0.30 - 1.00m CBR11	-
		red	-	0.60	x		Grades: hecomi	ng brown, mottled	d arev			1 2				ES 0.40m EBH11	-
	AS	onnte	_		x		Crados. Docomin	ng brown, moulo	a groy		\/C+	2					-
	⋖	Not Encountered	1.0 <u>0</u>		x - x						VSt	5					1.00_
		2	_		× ×						Н	9 10					
			_		× -							11 11					
				1.50			SHALE: grey, ve	ery low strength, ϵ	extremely weathered	d, M-	VLS	20	DCP refusal at 1.4m, 20 blo	ws rea	ched		
ŀ				1.70			trace sandstone,	, indistinct lamina	itions.	W							
			2.00				Refusal	raci./Oiii									2.00
9-08-26			2.00_														2.00_
.00.0 20			-														-
eotesta 1			-														-
-26 Prj: G			-														-
2019-08			-														-
03.00.09 Datgel Lab and In Situ Tool - DGD Lib: Geotesta 1.00.0 2019-08-26 Prj: Geotesta 1.00.0 2019-08-26			3.00_														3.00_
b: Geotes			_														
DGD Li			_														
itu Tool -																	
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atgel Lab			4.00														4.00
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-BH15).G	S	TANE	DARD: A	AS1726	-2017												
165(BH1			NSISTE				ATIVE DENSITY	r: WATE	ER:				ITU TESTING:				
OLE NE1		VS S	ver sof	y soft ft		VL L	very loose loose	\sqsubseteq	water level	C U		re sar be sar			andard penetra cket penetrom	ition test eter reading (kPa	1)
GEOTESTA 1,00.0 LIB.GLB Log GEOTESTA DCP BOREHOLE NE1166(BH1-BH15).GPJ		F	firn	n		MD	medium dens	se 🔀	water inflow	D	dis	sturbe	d sample FV	-	-	test (uncorrected	
TA DCP		St VSt	stif	f y stiff		D VD	dense very dense	\triangleleft	water loss	B LB		ılk san	nple Ik sample DCP	-	ak shear stren namic cone pe	- :	
3EOTES		vsi H	hai	-		۷U	very derise			E			nental sample CPT		namic cone pe atic cone penel		
.B Log (COI	MPACT	ION:			MOISTURE	: :		НВ	ha	mmer	bouncing				
0 LIB.GL		WC	we	II compa			D dry										
TA 1.00.		MC PC		derately orly con			d M mois W wet	t.									
SEOTES		-	po	y con	ipacie(_	vv wet										
_																	

STANDARD: AS1726-2017

CONS	ISTENCY:	RELAT	TIVE DENSITY:	WAT	ER:	SAMP	LING/IN-SITU TESTING:		
VS	very soft	VL	very loose	∇	water level	С	core sample	SPT	standard penetration test
S	soft	L	loose	=	water level	U	tube sample	PP	pocket penetrometer reading (kPa)
F	firm	MD	medium dense	\triangleright	water inflow	D	disturbed sample	FV	field vane shear test (uncorrected
St	stiff	D	dense		water loss	В	bulk sample		peak shear strength, kPa)
VSt	very stiff	VD	very dense		water ioss	LB	large bulk sample	DCP	dynamic cone penetration test
Н	hard					Е	environmental sample	CPT	static cone penetration test
COMP	ACTION:		MOISTURE:			НВ	hammer bouncing		

1 OF 1 Sheet



Client Bathla Group Contractor Geotesta Easting As per Plan Project 21-33 Owlpen Lane Farely NSW Drill Rig Hand Auger Northing As per Plan Job No. MGA94 Zone 55 NE1165 Driller VL Grid Ref

Location 21-33 Owlpen Lane Farely NSW Inclination -90° Logged VL Date 29/03/22 Date Drilled 29/03/22 Hole Depth 0.80m Checked MHB Date 29/03/22

						Date Drilled	29/03/22		Hole [epth	0.8	0m	Check	ked M	HB	Date 29/03/2	2
МЕТНОD	WATER	БОЕРТН S(metres)	DEPTH RL	GRAPHIC LOG	GROUP SYMBOL	SOIL/RC	OCK MATERIAL	DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	DCP BLOWS PER 100mm	FIELD TESTING	AND ADDIT	ΓΙΟΝΑL N	NOTES	SAMPLE	0.00
	Б		0.00		FILL	TOPSOIL/FILL:	Silty CLAY, med	ium plasticity, brown	М	PC						40.040	
AS	ountered	-	0.20	XX x	CI	Silty CLAY: low trace sand.	- medium plastic	city, yellow brown;	М	St						AS 0.10m AS12	
A	Not Encountered	-	0.50 0.70			Grades: become sandstone piece	ning grey, mottled	brown, trace		Н						EIL 0.40m EIL ES 0.40m	
			0.80	::::		SANDSTONE: extremely weath	grey brown, very	low strength,	М	VLS						EBH12	
		1.0 <u>0</u>				Hole Terminate Refusal			_								1.00
		-															
		_															
		-															
		2.00															2.00
		-															
		-															
		_															
		3.00_															3.00
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		4.00															4.00
		_															
		-															
		-															
		-															
		5.00	04700	0047													5.00
3		DARD: A		-2017	DEI	ATIVE DENSIT	Y: WAT	ED.	SAMI	DI INIC	2/INI_S	ITU TESTING:					
	vs.		y soft		VL	very loose			C		re sar		SPT	standar	d penetra	ation test	
	S	sof	ft		L	loose	\succeq	water level	U	tu	be sar	nple	PP	pocket	penetron	neter reading (kPa	a)
	F	firn			MD	medium der	nse	water inflow	D			d sample				test (uncorrected	
	St	stif			D	dense	\langle	water loss	В		ılk san	-				ngth, kPa)	
	VSt		y stiff		VD	very dense			LB		-	lk sample				enetration test	
	H	hai MPACT				MOISTUR	F.		E HB			nental sample bouncing	CPT	static c	one pene	etration test	
	WC		II comp	acted		D dry											
	MC			y comp	acte	•	st										
	РС			npacted		W wet											
		•															

CONS	ISTENCY:	RELA	TIVE DENSITY:	WAT	ER:	SAMP	LING/IN-SITU TESTING:
VS	very soft	VL	very loose	\subseteq	water level	С	core sample
S	soft	L	loose	-	water level	U	tube sample
F	firm	MD	medium dense		water inflow	D	disturbed sample
St	stiff	D	dense		water loss	В	bulk sample
VSt	very stiff	VD	very dense		water ioss	LB	large bulk sample
Н	hard					Е	environmental sample

С	core sample	SPT	standard penetration test
U	tube sample	PP	pocket penetrometer reading (kPa)
D	disturbed sample	FV	field vane shear test (uncorrected
В	bulk sample		peak shear strength, kPa)
LB	large bulk sample	DCP	dynamic cone penetration test
Е	environmental sample	CPT	static cone penetration test
HB	hammer bouncing		

1 OF 1 Sheet



Client Bathla Group Contractor Geotesta Easting As per Plan Project 21-33 Owlpen Lane Farely NSW Drill Rig Hand Auger Northing As per Plan Job No. MGA94 Zone 55 Driller VLGrid Ref

Location 21-33 Owlpen Lane Farely NSW Inclination -90° VLDate 29/03/22 Logged 29/03/22 Date Drilled Hole Depth 1.00m Checked MHB Date 29/03/22

						Date Drilled	29/03/22		Hole [epth	1.0	0m	Check	ked MHB	Date 29/03	3/22
МЕТНОD	WATER	⊝DEPTH S(metres)	<i>DEPTH</i> RL	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROO	CK MATERIAL	DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	DCP BLOWS PER 100mm	FIELD TESTING	AND ADDIT	IONAL NOT	ES SAMPLE	0.00
		_			FILL	TOPSOIL/FILL: S	Silty CLAY, med	ium plasticity, brown	М	PC						
	untered	_	0.30	XX ×	CI	Silty CLAY: medi	ium plasticity, b	rown.	М	St						
AS	Not Encountered	-	0.60			Grades: becomin fragments	ng grey, mottled	red, trace shale		Н					D 0.50m Att13 E 0.50m S13	
		1.00	1.00	::::		SANDSTONE: g extremely weath		low strength,	M	VLS						1.00
		-				Hole Terminated Refusal	l at 1.00 m									
		-														
		2.00														2.00
		=														
		-														
		3.00														3.00
		3.00_														3.00
		-														
		-														
		4.0 <u>0</u>														4.00
		-														
		-														
		-														
		5.00	0.4700	2017												5.00
5		DARD: A			DEI	ATIVE DENSITY	γ: WAT	ED:	CVWI	DI INIC	2/IN Q	ITU TESTING:				
	VS		y soft		VL	very loose			С		re san		SPT	standard p	enetration test	
	S	sof	ft		L	loose		water level	U		oe san	•			etrometer reading (F	
	F	firn			MD	medium dens	se >	water inflow	D			d sample			shear test (uncorrect	ted
	St VSt	stif			D VD	dense	\triangleleft	water loss	В		lk san	•			r strength, kPa)	
	VSt H	ver hai	y stiff rd		۷D	very dense			LB E		-	k sample nental sample			one penetration test penetration test	
							_		HB			bouncing	O. 1	2.00.00	ponoticulon toot	
	COI WC	MPACT	I ON: Il comp	acted		MOISTURE D dry	::									
	MC		ii compi deratel		acted		t									
	PC	po	oriy con	npacted	t	W wet										

CONSI	STENCY:	RELA	TIVE DENSITY:	WATE
VS	very soft	VL	very loose	∇
S	soft	L	loose	=
F	firm	MD	medium dense	
St	stiff	D	dense	
VSt	very stiff	VD	very dense	
Н	hard			

COMPACTION:	MOISTURE:

SAMPLING/IN-SITU TESTING: ER:

С	core sample
U	tube sample
D	disturbed sample
В	bulk sample
LB	large bulk sample
Е	environmental sample
HB	hammer bouncing

1 OF 1 Sheet



Client Bathla Group Contractor Geotesta Easting As per Plan Project 21-33 Owlpen Lane Farely NSW Drill Rig Hand Auger Northing As per Plan Job No. MGA94 Zone 55 NE1165 Driller VLGrid Ref

Location 21-33 Owlpen Lane Farely NSW Inclination -90° VLDate 29/03/22 Logged Date Drilled 29/03/22 Hole Depth 2.40m Checked MHB Date 29/03/22

L							Date Drilled 2	9/03/22		Hole [epth	2.40	0m	Check	ked MHB	Date 29/03/2	2
	METHOD	WATER	БОЕРТН S(metres)	<i>DEPTH</i> RL	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROC	K MATERIAL [DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	DCP BLOWS PER 100mm	FIELD TESTING A	and addit	TONAL NOTES	SAMPLE	0.00-
		pe	- - - 1.00	1.00		FILL	TOPSOIL/FILL: Sil black	lty CLAY, medi	um plasticity, brown	M- W	PC						1.00
	AS	Not Encountered	- - - 2.00	1.30		CI	Silty CLAY: mediu		own, mottled red.	M	St - VSt					B 1.00 - 1.50m CBR14	2.00
03.00.09 Datgel Lab and In Situ Tool - DGD Lib: Geolesta 1.00.0 2019-08-26 Prj; Geolesta 1.00.0 2019-08-26			- - -	2.40	X X X X X X X X X X		Hole Terminated a Refusal	at 2.40 m									-
Lab and In Situ Tool - DGD Lib: Geotesta 1.(3.0 <u>0</u> - - -														3.00_
< <drawingfile>> 5/7/2022 16:23 10.03.00.09 Datgel I</drawingfile>			4.0 <u>0</u> - -														4.00_
< <drawi< td=""><td></td><td></td><td>5.00</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>5.00</td></drawi<>			5.00														5.00
	S	TANF	0.00 DARD: A	\S1726	-2017											l	3.00_
GEOTESTA 1,00.0 LIB.GLB Log GEOTESTA DCP BOREHOLE NE1165(BH1-BH15).GPJ	-		NSISTE			DEI	ATIVE DENSITY:	WATE	= D .	CAM	DI INIC	2/INI 61	ITU TESTING:				
E1165(E		vs		y soft		VL	very loose			С		re san		SPT	standard penetra	ation test	
10LE N		S	sof			L	loose	\subseteq	water level	U	tul	be san	nple	PP	pocket penetrom	neter reading (kPa	
BORE		F	firn			MD	medium dense		water inflow	D			d sample	FV		test (uncorrected	
4 DCP		St	stif			D	dense	\langle	water loss	В		ılk sam	-		peak shear strer		
TEST		VSt		y stiff		VD	very dense	7		LB			lk sample		dynamic cone pe		
GEO		Н	hai	rd						E			nental sample	CPT	static cone pene	tration test	
B Log		CO	MPACT	ION:			MOISTURE:			HB	ha	mmer	bouncing				
LIB.GL		WC		II compa	acted		D dry										
1.00.0		МС	mo	deratel	y comp	acte	d M moist										
ESTA		PC	po	orly con	npacted	t	W wet										
GEOT																	

CONS	ISTENCY:	RELA	TIVE DENSITY:
VS	very soft	VL	very loose
S	soft	L	loose
F	firm	MD	medium dense
St	stiff	D	dense
VSt	very stiff	VD	very dense
Н	hard		

COMILY	CTION.	IVIOI	SIUKE.
1410		_	

WATER: SAMPLING/IN-SITU TESTING:

С	core sample
U	tube sample
D	disturbed sample
В	bulk sample
LB	large bulk sample
Ε	environmental sample
HB	hammer bouncing

1 OF 1 Sheet



Client Bathla Group Easting Contractor Geotesta As per Plan Project 21-33 Owlpen Lane Farely NSW Drill Rig Hand Auger Northing As per Plan Job No. MGA94 Zone 55 NE1165 Driller VL Grid Ref

Location 21-33 Owlpen Lane Farely NSW Inclination -90° Logged VL Date 29/03/22 Date Drilled 29/03/22 Hole Depth 0.90m Checked MHB Date 29/03/22

<u> </u>						Date Drilled 29/03/22	Hole	Dep	oth	0.9	0m Checked MHB	Date 29/03/22	2
МЕТНОБ	WATER	ODEPTH O(metres)	<i>DEPTH</i> RL	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY	DENSITY	DCP BLOWS PER 100mm	FIELD TESTING AND ADDITIONAL NOTES	SAMPLE	0.00-
	g	0.00			FILL	TOPSOIL/FILL: Silty CLAY, medium plasticity, brown	n M	I P	С	1			0.00
AS	Not Encountered	-	0.30	XX	CI	Silty CLAY: medium plasticity, yellow brown, mottled grey.	N	ı F-	St	1 1 1 2			-
	Not E	_	0.80 0.90	<u>x</u>		SANDSTONE: brown, very low strength, extremely	N		St	3 6 8			
		1.00	0.50			weathered. Hole Terminated at 0.90 m Refusal		<u>VI</u>	_5_	20	DCP refusal at 0.9m, 20 blows reached		1.00_
		-											-
		-											-
-08-26		2.00											2.00_
sta 1.00.0 2019		-											-
3-26 Prj: Geote		_											
03.00.09 Dargei Lab and In Situ Tool - DGD LIb: Geolesta 1.00.0 2019-08-26 Ptj: Geolesta 1.00.0 2019-08-26		3.00											3.00_
Lib: Geotesta		-											-
Situ Tool - DGE		-											-
gel Lab and In		-											
0.03.00.09 Dat		4.00											4.00_
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<u>a</u>	TAN"	5.00 DARD: <i>A</i>	01700	2017									5.00_

CONSISTENCY: RELATIVE DENSITY:		WAT	WATER:		SAMPLING/IN-SITU TESTING:					
VS	very soft	VL	very loose	∇	water level	С	core sample	SPT	standard penetration test	
S	soft	L	loose	-	water level	U	tube sample	PP	pocket penetrometer reading (kPa)	
F	firm	MD	medium dense		water inflow	D	disturbed sample	FV	field vane shear test (uncorrected	
St	stiff	D	dense			В	bulk sample		peak shear strength, kPa)	
VSt	very stiff	VD	very dense	\sim	water loss	LB	large bulk sample	DCP	dynamic cone penetration test	
Н	hard					E	environmental sample	CPT	static cone penetration test	
00145			MOIOTUBE			HB	hammer bouncing			

COMP	ACTION:	MOISTURE:

WC well compacted dry MC moderately compacted Μ moist poorly compacted W wet

Appendix B

Laboratory Test Results



GEOTESTA Pty Ltd

9 Redwood Drive

Notting Hill , Vic 3168

Ph: 1300 852216

Laboratory Geotesta Project Type Geotechnical Investigation Client Bathla Group

Report No S0382 Project No NE1165 Client ID -

Sample ID SL1053-S0382

Project 21-33 Owlpen Lane Farely Address 7 Business Park Drive, Notting Hill VIC 3168
Location ID BH13@0.50

Base Site: 9 Redwood Drive, Notting Hill, VIC 3168 Branch Site: 6/20-22 Foundry Road, Seven Hills, NSW 2147

Sample Description Silty CLAY, Medium plasticity, Light brown

Sampling Method CLIENT

Results Preparation

 Liquid limit
 36 %
 AS 1289-3.1.2

 Plastic limit
 20 %
 AS 1289-3.2.1

 Plasticity index
 16 %
 AS 1289-3.3.1

 Linear shrinkage
 6.5 %
 AS 1289-3.4.1

Shrinkage type Cracked

History of sample: Oven-dried ≤ 50 °C

Method of preparation: Dry Sieving

Linear shrinkage mould: 250 mm

Comments

Test methods: AS 1289, 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1



NATA Accredited Facility No. 19167

Accredited for compliance with ISO/IEC 17025 - Testing

The results obtained in this report correspond exclusively to the sample(s) tested.

Report issued by:

Chandana Linayage

Date issued: 5/4/2022



GEOTESTA Pty Ltd

9 Redwood Drive

Notting Hill , Vic 3168

Ph: 1300 852216

Laboratory Geotesta Project Type Geotechnical Investigation Client Bathla Group

Report No S0381 Project No NE1165 Client ID -

Sample ID SL1053-S0381

Project 21-33 Owlpen Lane Farely Address 7 Business Park Drive, Notting Hill VIC 3168
Location ID BH9@0.60

Base Site: 9 Redwood Drive, Notting Hill, VIC 3168 Branch Site: 6/20-22 Foundry Road, Seven Hills, NSW 2147

Sample Description Silty CLAY, high plasticity, brown

Sampling Method CLIENT

Results Preparation

 Liquid limit
 69 %
 AS 1289-3.1.2

 Plastic limit
 32 %
 AS 1289-3.2.1

 Plasticity index
 37 %
 AS 1289-3.3.1

 Linear shrinkage
 18 %
 AS 1289-3.4.1

Shrinkage type Cracked

History of sample: Oven-dried ≤ 50 °C

Method of preparation: Dry Sieving

Linear shrinkage mould: 250 mm

Comments

Test methods: AS 1289, 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1



NATA Accredited Facility No. 19167

Accredited for compliance with ISO/IEC 17025 - Testing

The results obtained in this report correspond exclusively to the sample(s) tested.

Report issued by:

Date issued:

Chandana Liyanage

5/4/2022



GEOTESTA Pty Ltd

9 Redwood Drive

Notting Hill , Vic 3168

Ph: 1300 852216

Laboratory Geotesta Project Type Geotechnical Investigation Client Bathla Group

Report No S0380 Project No NE1165 Client ID -

Sample ID SL1053-S0380

Project 21-33 Owlpen Lane Farely Address 7 Business Park Drive, Notting Hill VIC 3168
Location ID BH8@0.60

Base Site: 9 Redwood Drive, Notting Hill, VIC 3168 Branch Site: 6/20-22 Foundry Road, Seven Hills, NSW 2147

Sample Description Silty CLAY, high plasticity, brown

Sampling Method CLIENT

Results Preparation

53 %

Curling/Cracked

Liquid limit 89 % AS 1289-3.1.2 History of sample: Oven-dried ≤ $50 \, ^{\circ}$ C Plastic limit 36 % AS 1289-3.2.1 Method of preparation: Dry Sieving

AS 1289-3.3.1

Linear shrinkage 15 % AS 1289-3.4.1 Linear shrinkage mould: 250 mm

Comments

Plasticity index

Shrinkage type

Test methods: AS 1289, 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1



NATA Accredited Facility No. 19167

Accredited for compliance with ISO/IEC 17025 - Testing

The results obtained in this report correspond exclusively to the sample(s) tested.

Report issued by:

Date issued:

Chandana Liyanage

5/4/2022



GEOTESTA Pty Ltd

9 Redwood Drive

Notting Hill , Vic 3168

Ph: 1300 852216

Laboratory Geotesta Project Type Geotechnical Investigation Client Bathla Group

Report No S0379 Project No NE1165 Client ID -

Sample ID SL1053-S0379

Project 21-33 Owlpen Lane Farely Address 7 Business Park Drive, Notting Hill VIC 3168
Location ID BH6@0.50

Base Site: 9 Redwood Drive, Notting Hill, VIC 3168 Branch Site: 6/20-22 Foundry Road, Seven Hills, NSW 2147

Sample Description Silty CLAY, high plasticity, Brown

Sampling Method CLIENT

Results Preparation

54 %

Curling/Cracked

Liquid limit 86 % AS 1289-3.1.2 History of sample: Oven-dried \leq 50 °C Plastic limit 32 % AS 1289-3.2.1 Method of preparation: Dry Sieving

Linear shrinkage 20.5 % AS 1289-3.4.1 Linear shrinkage mould: 250 mm

AS 1289-3.3.1

Comments

Plasticity index

Shrinkage type

Test methods: AS 1289, 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1



NATA Accredited Facility No. 19167

Accredited for compliance with ISO/IEC 17025 - Testing

The results obtained in this report correspond exclusively to the sample(s) tested.

Report issued by:

Chandana Liyanage

Date issued: 5/4/2022



GEOTESTA Pty Ltd

9 Redwood Drive

Notting Hill , Vic 3168

Ph: 1300 852216

Laboratory Geotesta Project Type Geotechnical Investigation Client Bathla Group

Report No S0378 Project No NE1165 Client ID -

Sample ID SL1053-S0378

Project 21-33 Owlpen Lane Farely Address 7 Business Park Drive, Notting Hill VIC 3168
Location ID BH5@0.50

Base Site: 9 Redwood Drive, Notting Hill, VIC 3168 Branch Site: 6/20-22 Foundry Road, Seven Hills, NSW 2147

Sample Description Silty CLAY, High plasticity, Light brown

Sampling Method CLIENT

Results Preparation

 Liquid limit
 52 %
 AS 1289-3.1.2

 Plastic limit
 25 %
 AS 1289-3.2.1

 Plasticity index
 27 %
 AS 1289-3.3.1

 Linear shrinkage
 13 %
 AS 1289-3.4.1

Shrinkage type Cracked

History of sample: Oven-dried ≤ 50 °C

Method of preparation: Dry Sieving

Linear shrinkage mould: 250 mm

Comments

Test methods: AS 1289, 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1



NATA Accredited Facility No. 19167

Accredited for compliance with ISO/IEC 17025 - Testing

The results obtained in this report correspond exclusively to the sample(s) tested.

Report issued by:

Chandana Liyanage

Date issued: 5/4/2022



GEOTESTA Pty Ltd

9 Redwood Drive

Notting Hill, Vic 3168

Ph: 1300 852216

Laboratory Project Type Geotechnical Investigation Client Bathla Group Geotesta

Project No Client ID Report No S0377 NE1165

Sample ID SL1053-S0377

Location ID BH1@1.40

Sample Description

Results

Liquid limit

Plastic limit

Plasticity index

Linear shrinkage

Shrinkage type

Project 21-33 Owlpen Lane Farely

Base Site: 9 Redwood Drive, Notting Hill, VIC 3168

Address

7 Business Park Drive, Notting Hill VIC 3168

Branch Site: 6/20-22 Foundry Road, Seven Hills, NSW 2147 Silty CLAY, medium plasticity, brown

AS 1289-3.1.2

AS 1289-3.2.1

AS 1289-3.3.1

AS 1289-3.4.1

Sampling Method CLIENT

42 %

20 %

22 %

9.5 %

Curling/Cracked

Preparation

History of sample: Oven-dried ≤ 50 °C

Method of preparation: Dry Sieving

Linear shrinkage mould: 250 mm

Comments

Test methods: AS 1289, 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1



NATA Accredited Facility No. 19167

Accredited for compliance with ISO/IEC 17025 - Testing

The results obtained in this report correspond exclusively to the sample(s) tested.

Report issued by:

Chandana Liyanage

Date issued: 5/4/2022



Geotesta Pty Ltd (NSW) Unit 6, 20/22 Foundry Road Seven Hills NSW 2147





NATA Accredited Accreditation Number 1261 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: Vic Le

Report 875993-S

Project name 21-33 OWLPEN LANE FARELY NSW

Project ID NE1165
Received Date Mar 30, 2022

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	S1 Soil S22-Ma65667 Mar 28, 2022	S5 Soil S22-Ma65668 Mar 28, 2022	S6 Soil S22-Ma65669 Mar 28, 2022	\$8 \$0il \$22-Ma65670 Mar 28, 2022
	•	•				
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	62	46	39	61
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	6.0	5.8	5.9	5.8
Sulphate (as SO4)	10	mg/kg	33	35	24	14
% Moisture	1	%	22	18	24	25

Client Sample ID Sample Matrix Eurofins Sample No.			S9 Soil S22-Ma65671	S13 Soil S22-Ma65672
Date Sampled Test/Reference	LOR	Unit	Mar 28, 2022	Mar 28, 2022
Tournoismo	LOIK	Offic		
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	40	50
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	5.8	6.4
Sulphate (as SO4)	10	mg/kg	35	15
% Moisture	1	%	22	16

Report Number: 875993-S



Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Conductivity (1:5 aqueous extract at 25°C as rec.)	Sydney	Apr 05, 2022	7 Days
- Method: LTM-INO-4030 Conductivity			
pH (1:5 Aqueous extract at 25°C as rec.)	Sydney	Apr 05, 2022	7 Days
- Method: LTM-GEN-7090 pH by ISE			
Sulphate (as SO4)	Sydney	Apr 05, 2022	28 Days
- Method: In-house method LTM-INO-4270 Sulphate by Ion Chromatograph			
% Moisture	Sydney	Mar 31, 2022	14 Days

- Method: LTM-GEN-7080 Moisture

Report Number: 875993-S



Eurofins Environment Testing Australia Pty Ltd

Sydney

ABN: 50 005 085 521

Melbourne 6 Monterey Road Dandenong South VIC 3175 Girraween NSW 2066 Phone: +61 3 8564 5000 NATA # 1261 Site # 1254

Brisbane 179 Magowar Road 1/21 Smallwood Place Murarrie QLD 4172 Phone: +61 2 9900 8400 Phone: +61 7 3902 4600 NATA # 1261 Site # 18217 NATA # 1261 Site # 20794

Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone: +61 2 4968 8448 NATA # 1261 Site # 25079

ABN: 91 05 0159 898

Perth

Auckland 46-48 Banksia Road Welshpool WA 6106 Phone: +61 8 6253 4444 NATA # 2377 Site # 2370 IANZ # 1327

Christchurch 35 O'Rorke Road 43 Detroit Drive Rolleston, Christchurch 7675 Penrose, Auckland 1061 Phone: +64 9 526 45 51 Phone: 0800 856 450 IANZ # 1290

email: EnviroSales@eurofins.com **Company Name:**

web: www.eurofins.com.au

Geotesta Pty Ltd (NSW)

Unit 6, 20/22 Foundry Road Seven Hills

NSW 2147

Project Name:

Address:

21-33 OWLPEN LANE FARELY NSW

Project ID: NE1165 Order No.: Report #:

875993 1300852 216

Phone: Fax:

Received: Mar 30, 2022 5:00 PM

Due: Apr 6, 2022 **Priority:** 5 Day **Contact Name:** Vic Le

Eurofins Analytical Services Manager: Asim Khan

NZBN: 9429046024954

		Sa	mple Detail			Conductivity (1:5 aqueous extract at 25°C as rec.)	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	Moisture Set
Melb	ourne Laborato	ory - NATA # 12	61 Site # 125	4					
	ney Laboratory					Х	Х	Х	Х
	bane Laborator								
	field Laboratory			l					
	h Laboratory - N		te # 2370						
No	rnal Laboratory Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
1	S1	Mar 28, 2022		Soil	S22-Ma65667	Х	Х	Х	Х
2	S5	Mar 28, 2022		Soil	S22-Ma65668	Х	Х	Х	Х
3	S6	Mar 28, 2022		Soil	S22-Ma65669	Х	Х	Х	Х
4	S8	Mar 28, 2022		Soil	S22-Ma65670	Х	Х	Х	Х
5	S9	Mar 28, 2022		Soil	S22-Ma65671	Х	Х	Х	Х
6	S13	Mar 28, 2022		Soil	S22-Ma65672	Х	Х	Х	Х
Test	Counts					6	6	6	6



Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- 2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- 3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- 5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds
- 6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- 7. Samples were analysed on an 'as received' basis.
- 8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram mg/L: milligrams per litre μg/L: micrograms per litre

ppm: parts per million ppb: parts per billion %: Percentage

org/100 mL: Organisms per 100 millilitres NTU: Nephelometric Turbidity Units MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA American Public Health Association

COC Chain of Custody

CP Client Parent - QC was performed on samples pertaining to this report CRM Certified Reference Material (ISO17034) - reported as percent recovery

Where a moisture has been determined on a solid sample the result is expressed on a dry basis Dry

A second piece of analysis from the same sample and reported in the same units as the result to show comparison. Duplicate

LOR

LCS Laboratory Control Sample - reported as percent recovery.

In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water. Method Blank NCP Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.

RPD Relative Percent Difference between two Duplicate pieces of analysis SPIKE Addition of the analyte to the sample and reported as percentage recovery.

SRA Sample Receipt Advice

Surr - Surrogate The addition of a like compound to the analyte target and reported as percentage recovery.

твто Tributyltin oxide (bis-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured

and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits

TCLF Toxicity Characteristic Leaching Procedure TEQ Toxic Equivalency Quotient or Total Equivalence

OSM US Department of Defense Quality Systems Manual Version 5.4

United States Environmental Protection Agency US EPA

Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA WA DWER

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30% NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

- 1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided
- 2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- pH and Free Chlorine analysed in the laboratory Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt
- 4. Recovery Data (Spikes & Surrogates) where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
- 5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- 6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

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Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Conductivity (1:5 aqueous extract at 25°C as rec.)				< 10			10	Pass	
Sulphate (as SO4)			mg/kg	< 10			10	Pass	
LCS - % Recovery									
Conductivity (1:5 aqueous extract at	25°C as rec.)		%	94			70-130	Pass	
Sulphate (as SO4)			%	93			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Sulphate (as SO4)	S22-Ma65670	СР	%	91			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	S22-Ma65668	СР	uS/cm	46	52	12	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	S22-Ma65668	СР	pH Units	5.8	5.8	<1	30%	Pass	
Duplicate									
	_			Result 1	Result 2	RPD			
% Moisture	S22-Ma65672	CP	%	16	13	20	30%	Pass	

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Comments

Sample Integrity

 Custody Seals Intact (if used)
 N/A

 Attempt to Chill was evident
 Yes

 Sample correctly preserved
 Yes

 Appropriate sample containers have been used
 Yes

 Sample containers for volatile analysis received with minimal headspace
 Yes

 Samples received within HoldingTime
 Yes

 Some samples have been subcontracted
 No

Authorised by:

Asim Khan Analytical Services Manager

Glenn Jackson General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested
- * Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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