



Faringdon South Stage 1 Application Appendix E: Geotechnical Report



ENGEO

— Expect Excellence —

Geotechnical Investigation Faringdon South Subdivision Rolleston

Submitted to:
Hughes Developments Ltd
Canterbury

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ENGEO Document Control:

Report Title		Geotechnical Investigation - Faringdon South Subdivision, East Maddisons & Selwyn Road			
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1 Introduction

ENGEO Ltd was requested by Hughes Developments Ltd to undertake a Geotechnical Investigation for the proposed Faringdon South Subdivision, at East Maddisons & Selwyn Road, Rolleston (herein referred to as 'the site') as outlined in our proposal (ref. P2016.000.248, dated 1 March 2016).

The purpose of this investigation was to determine a geological model of the site, assess the likely future land performance, comment on the suitability of the site for residential subdivision, address the requirements of Section 106 of the Resource Management Act (RMA), and provide recommendations for subdivision works and foundations for typical timber framed residential dwellings.

Our scope of works included the following:

- A desktop study of relevant available geotechnical and geological publications, including the Canterbury Geotechnical Database (CGD) and Environment Canterbury (ECan) Databases;
- A geotechnical site walkover to assess site conditions;
- Shallow geotechnical testing comprising 14 hand augers and 51 Scala Penetrometer tests to a maximum depth of 2 m or refusal, and 20 machine excavated test pits to a maximum depth of 3 m, to assess the shallow subsurface material types and strength characteristics;
- Assessment of geohazards as required by Section 106 of the RMA;
- Provision of recommendations for subdivision works and foundations; and
- Preparation of this report outlining our findings.

2 Site Description

The site of the proposed Faringdon South Subdivision is located approximately 3 km south-east of Rolleston town centre and is bound by the existing Faringdon Subdivision to the north-west, East Maddisons Road and the Lemonwood Grove School Development to the south-west, Selwyn Road to the south-east, and farmland to the northeast (Figure 1).

The site comprises approximately 38 ha of relatively flat ground currently occupied by four residential dwellings, with associated gardens and lawn areas, a defunct pig shed, and a number of barn and shed structures. The remainder of the site is currently used for a mixture of grazing and cropping, with well-established shelter belts and pine stands, and a chestnut and walnut orchard situated in the site's east.

There are no significant watercourses in the area and the site is outside of any ECan defined flood zones as indicated in the Selwyn District Council (SDC) Operative District Plan (SDC, 2015).

CERA has categorised the site as 'N/A Rural & Unmapped', meaning future development can proceed following normal consenting processes.

Figure 1: Site Location

Image obtained from Google Earth

3 Proposed Development

It is understood the site (currently comprising five lots) is to be subdivided into approximately 400 residential lots (to be confirmed) with four park areas and a green-strip. At the time of writing this report, we understand that three of the four existing dwellings will remain, while all other structures will be demolished and/or removed from the site.

4 Geological Model

4.1 Regional Geology

The site has been regionally mapped by GNS (Forsyth et al., 2008) as being underlain by brownish grey river alluvium.

4.2 Geomorphology

The site comprises relatively flat ground, with gentle undulations and depressions in some areas. As evident on aerial imagery (Canterbury Maps, 2016) and observed during our site walkover conducted on 31 March 2016, undulating and depressed ground can be attributed to paleo-channels, which traverse the site in a general north-west to south-east trend. Based on observations, sandy deposits with variable thickness (up to 1.0 m) are expected to have in-filled the paleo-channels. Inferred paleo-channels have been mapped to give an indication of areas with potential channel in-fill (Appendix 1).

4.3 Geohazards

4.3.1 Seismicity

There are no known or mapped faults in the immediate area of the site, however the site may be at risk of ground shaking induced by movement of proximal or distal faults.

The site is located between two recently discovered fault systems, the Greendale Fault and the Port Hills Fault, the ruptures of which initiated the ongoing Canterbury Earthquake Sequence (CES). The Greendale Fault has been mapped approximately 10 km north-west/ west of the site and trends roughly east-west with a surface rupture of approximately 28 km (GNS, 2015), while the Port Hills Fault remains unmapped as the fault did not rupture at surface. Movement on the Port Hills Fault is believed to have occurred at a depth of 1 km to 2 km below ground surface.

Large regional areas of faulting (GNS, 2015) namely the Ashley Fault, Porters Pass-Amberley Fault Zone, and the Hope and Alpine Faults, are further afield but present a high seismic hazard to the Christchurch area due to the anticipated size of earthquakes generated. The largest of these faults is the Alpine Fault, which has a return period of 250-300 years and is expected to produce a M8 earthquake. The last rupture on the Alpine Fault is believed to have occurred in 1717 (Pettinga et al., 2001).

4.3.2 Liquefaction & Lateral Spreading

The site is located within an area mapped as 'damaging liquefaction unlikely' (CGD Map 5140, 2014).

Aerial photography available on the CGD and taken in the days following the September 2010 seismic event shows no sign of any ejected sand and silt at the site and surrounding areas.

4.4 Site Investigation

Site investigations to assess the shallow subsurface material types and strength characteristics were undertaken by ENGEO between 31 March and 5 April 2016. The investigations comprised 14 hand augers and 51 Scala Penetrometer tests, and logging of materials from 20 machine excavated test pits.

The investigations revealed subsurface conditions across the site are consistent with the published geological mapping, as summarised in Table 1.

Investigations undertaken within or adjacent to inferred paleo-channels revealed deeper sandy deposits to depths of approximately 0.7 m.

Table 1: Generalised Summary of Subsurface Conditions

Soil Type	Depth to top of layer (m)	Layer Thickness (m)	Density/Consistency	Comment
Topsoil	0.0	0.2 – 0.4	Soft to Stiff	-
SILT, Gravelly SILT	0.2 – 0.4	0.1 – 0.3	Very Stiff to Hard	Not encountered in all test pits
Gravelly SAND	0.2 – 0.6	0.3 – 0.4	Dense	Encountered in TP5 and TP13 only
Sandy GRAVEL	0.2 – 1.0	Unknown	Very Dense	-

“Good ground” (as defined in NZS 3604:2010) under static conditions was typically encountered immediately beneath the topsoil layer (typically 0.3 m) and at a maximum depth of 0.5 m below ground level.

Test Locations are shown on Figure 1, Appendix 1. Test pit and hand auger hole logs, showing detailed soil descriptions are presented in Appendix 2, and Scala Penetrometer test results are presented in Appendix 3.

4.5 ECan Boreholes

A review of three representative deep ECan borehole logs on the site and in the surrounding area has been conducted. The logs from these holes are presented in Appendix 4 and indicate the site is underlain by a mixture of claybound and sandy gravels to depths of at least 114 m below ground level. Some minor clay and peat layers are recorded below approximately 28 m depth in some of the boreholes.

4.6 Groundwater

Groundwater is recorded on the ECan borehole logs at depths ranging from 8 to 11 m below ground level.

4.7 Site Seismic Class

In accordance with NZS 1170.5:2004, Class D applies to this particular site, defining it as a ‘deep soft soil site’.

5 Liquefaction Assessment

Based on our site investigation and observations, and owing to the nature of the subsurface materials and depth to groundwater at the site, we consider the potential for liquefaction and lateral spreading on the site to be very low.

We therefore consider the site of the proposed Faringdon South Subdivision to have Technical Category 1 (TC1) future land performance where by future land damage from liquefaction is unlikely, and ground settlements are expected to be within normally accepted tolerances.

6 RMA Section 106 Requirements & Suitability to Subdivide

Section 106 of the Resource Management Act 1991 states a consent authority may refuse to grant a subdivision consent, or may grant a consent subject to specific consent conditions if the land is likely to be subject to the following:

- Erosion, including surface and subsurface erosion, associated with water and wind.
- Falling debris, including rockfall that could impact the site from upslope sources.
- Subsidence, which involves the removal of underlying support by natural or artificial means.
- Slippage, which is defined as the downslope transfer of materials by sliding and/or flowage.
- Inundation, which may be sourced from streams, coastal processes or excess precipitation.

Based on our observations and the nature of the site, its performance during the CES, and the site's distance from the nearest significant watercourse, we consider it is unlikely for the site to be subject to any of the above hazards and as such, the site is considered suitable for subdivision from a geotechnical perspective.

7 Geotechnical Recommendations

7.1 Earthworks

Earthworks carried out for the subdivision shall be in accordance with NZS 4404:2010, Land Development and Subdivision Infrastructure and NZS 4431:1989, Code of Practice for Earthfilling for Residential Development. In particular, any areas to receive fill should be stripped of any vegetation, topsoil, non-engineered fill, soft or organic soils prior to fill placement.

Fill may comprise clean natural sandy gravel or silty soils, or clean imported soils and/or granular fill, compacted to achieve no less than 95% of maximum dry density. Filling should be limited to no more than 600 mm above existing ground level without referring the matter back to ENGEO. Although unlikely, where any springs or groundwater seeps are encountered they should be intercepted with suitable drainage and discharged to a Council approved outlet.

All unretained batters of pond and stormwater drains constructed with the native sandy gravel material should be at an inclination of 1V:3H, with protection schemes in place to control erosion of the formed batters within the waterways.

A comprehensive earthworks specification should be provided to the earthworks contractor prior to starting excavations and an inspections/testing regime agreed, along with a robust erosion and sediment control plan.

7.2 Subdivision Roding

Vegetation, any organic or deleterious material, topsoil and non-engineered fill should be removed from the site under pavement areas prior to aggregate placement. Based on our observations during testing we consider the natural ground below the topsoil at the site should provide an adequate subgrade for the proposed pavement areas.

7.3 Stormwater Control

Concentrated stormwater flows from all impermeable areas must be collected and carried in sealed pipes to the Council system or an alternative disposal point subject to approval from Council. Uncontrolled stormwater must not be allowed to saturate the ground as this will potentially affect future foundation performance both statically and during future seismic activity.

7.4 Foundations

Foundations for future proposed residential dwellings within the subdivision may comprise pad, strip or slab foundations designed in accordance with the provisions of NZS 3604 Timber Framed Buildings.

An Ultimate Bearing Capacity of 300kPa may be assumed for foundations bearing on natural sandy gravel or engineered fill, below any topsoil or non-engineered fill.

8 References

Canterbury Earthquake Recovery Authority. (2016). Canterbury Geotechnical Database. Retrieved April 2016, from <https://canterburyrecovery.projectorbit.com/cgd>

Forsyth, P., Barrell, D. J., & Jongens, R. (2008). Sheet 16 - Geology of the Christchurch Area 1:250,000. Lower Hutt: Institute of Geological and Nuclear Sciences.

GNS Science, Earthquake Commission. (n.d.). Aftershocks. Retrieved 2013, from Geonet: www.geonet.org.nz/canterbury-quakes/aftershocks

GNS Science (2015). New Zealand Active Faults Database. Retrieved 2016, from <http://data.gns.cri.nz/af/>

NZS 1170.5:2004. Structural Design Actions Part 5: Earthquake Actions – New Zealand.

NZS 3604:2010. Timber Framed Buildings.

NZS 4404:2010. Land Development and Subdivision Infrastructure.

NZS 4431:1989. Code of Practice for Earthfilling for Residential Development

Pettinga J.R., Yetton M.D., Van Dissen R.J., & Downes G. (2001). Earthquake Source Identification and Characterisation for the Canterbury Region, South Island, New Zealand. Bulletin of the New Zealand Society for Earthquake Engineering, Vol 34, No. 4, pp 282-317

Selwyn District Council (2015), Selwyn District Council Operative District Plan. Retrieved 2016, from <http://www.selwyn.govt.nz/services/planning/district-plan>

The Ministry of Business, Innovation, and Employment. (2012). Guidance-Repairing and rebuilding houses affected by the Canterbury earthquakes. Christchurch: The Ministry of Business, Innovation, and Employment.

We also acknowledge the New Zealand GeoNet project and its sponsors EQC, GNS Science and LINZ, for providing data used in this report.

9 Limitations

- i. We have prepared this report in accordance with the brief as provided. This report has been prepared for the use of our client, Hughes Developments Ltd, their professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.
- ii. The recommendations in this report are based on the ground conditions indicated from published sources, site assessments and subsurface investigations described in this report based on accepted normal methods of site investigations. Only a limited amount of information has been collected to meet the specific financial and technical requirements of the client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it should be appreciated that actual conditions could vary from the assumed model.
- iii. Subsurface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.
- iv. This Limitation should be read in conjunction with the IPENZ/ACENZ Standard Terms of Engagement.
- v. This report is not to be reproduced either wholly or in part without our prior written permission.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on (03) 328 9012 if you require any further information.

Report prepared by



Laura Pilkington

Project Engineering Geologist

Report reviewed by

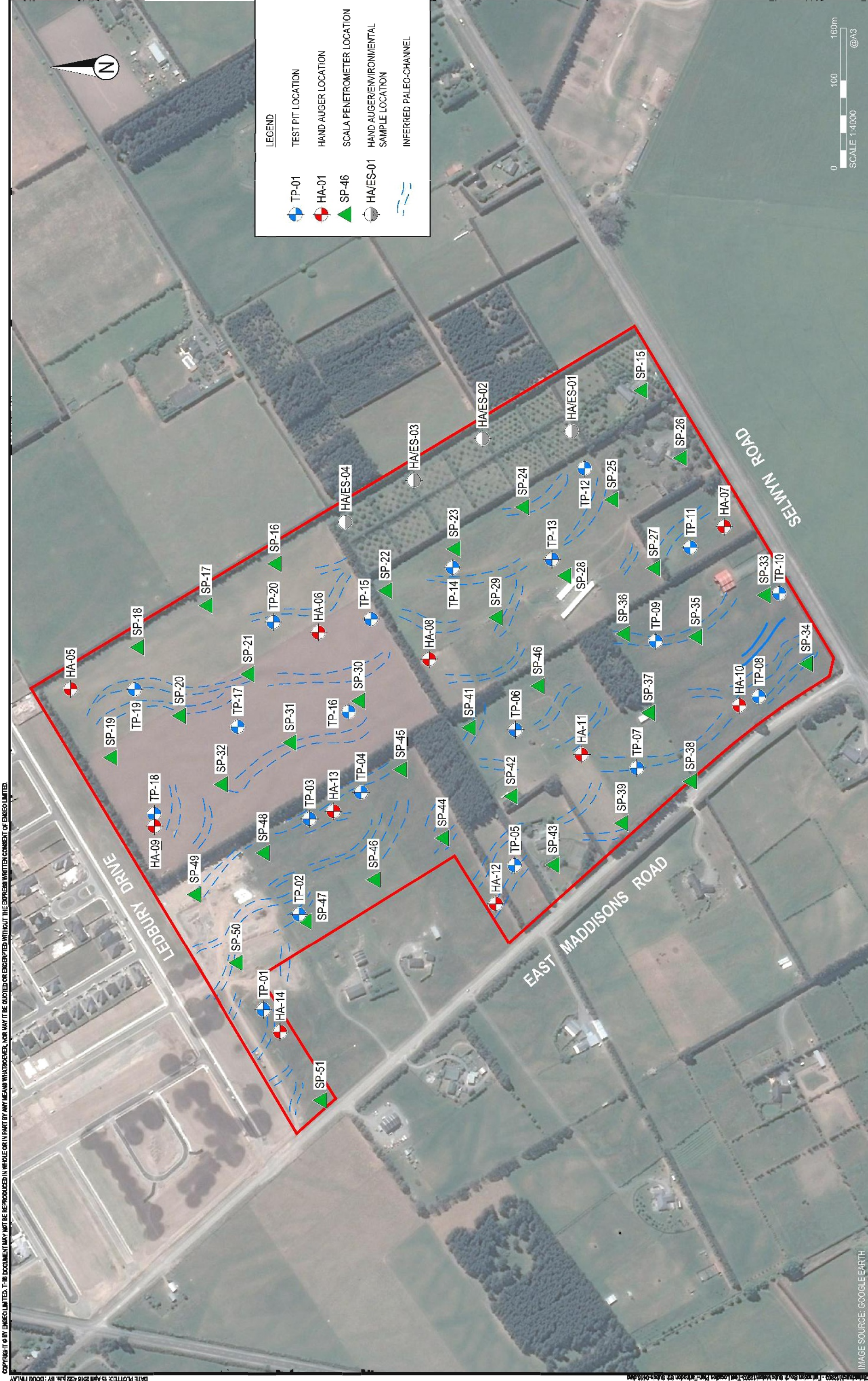


Neil Charters, MIPENZ, CPEng

Associate Geotechnical Engineer

APPENDIX 1:
Test Location Plan

DATE PLOTTED: 15 April 2016 4:22 PM BY: DOUG FINLAY



Client: HUGHES DEVELOPMENTS		Figure No: 1
Project: FARINGDON SOUTH SUBDN EAST MADDISONS ROAD ROLLESTON	Designed: LP Drawn: DF Checked: - Date: 13.04.16	Scale: A3
Proj No: 12903.000.000	Scale: 1:4000	Rev: 0

TEST LOCATION PLAN

Christchurch Office
124 Mairangi Street
Sydenham, Christchurch 8023
Tel: 03 328 8012
www.engeo.co.nz



Rev	Date	Description	Drawn	Chkd

IMAGE SOURCE: GOOGLE EARTH

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ORIGINAL FIGURE PRINTED IN COLOUR



APPENDIX 2:
Test Pit and Hand Augerhole Logs

LOG OF TEST PIT TP01

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Date : 05/04/16
 Max Test Pit Depth : 3 m
 Digger Type/Size : 13 T Hitachi
 Bucket Type/Size : 1800 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : LP
 Latitude :
 Longitude :

Depth (m)	Material	Excavability (Relative Scale)		USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scale Penetrometer						
		Easier	Harder								Blows per 100mm						
											2	4	6	8	10	12	
0.0 - 0.1	TS			ML	SILT with trace gravel and rootlets; brown. Low plasticity [TOPSOIL].				8-St								
0.1 - 3.0	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed.				M								
Depth of Excavation: 3 m Termination Condition: Target depth																	

GEOSCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16



Test pit met target depth at 3.0 m.
 TS = TOPSOIL
 Standing groundwater was not encountered

LOG OF TEST PIT TP02

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Date : 05/04/16
 Max Test Pit Depth : 3 m
 Digger Type/Size : 13 T Hitachi
 Bucket Type/Size : 1800 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : LP
 Latitude :
 Longitude :

Depth (m)	Material	Excavability (Relative Scale)		USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer						
		Easier	Harder								Blows per 100mm						
												2	4	6	8	10	12
0.0 - 0.2	TOPSOIL			ML	SILT with trace gravel and rootlets; brown. Low plasticity [TOPSOIL].				S-St			●	●				
0.2 - 3.0	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed.				M			●	●	●	●	●	
					Depth of Excavation: 3 m Termination Condition: Target depth												

GEO SCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16



Test pit met target depth at 3.0 m.
 Standing groundwater was not encountered

LOG OF TEST PIT TP03

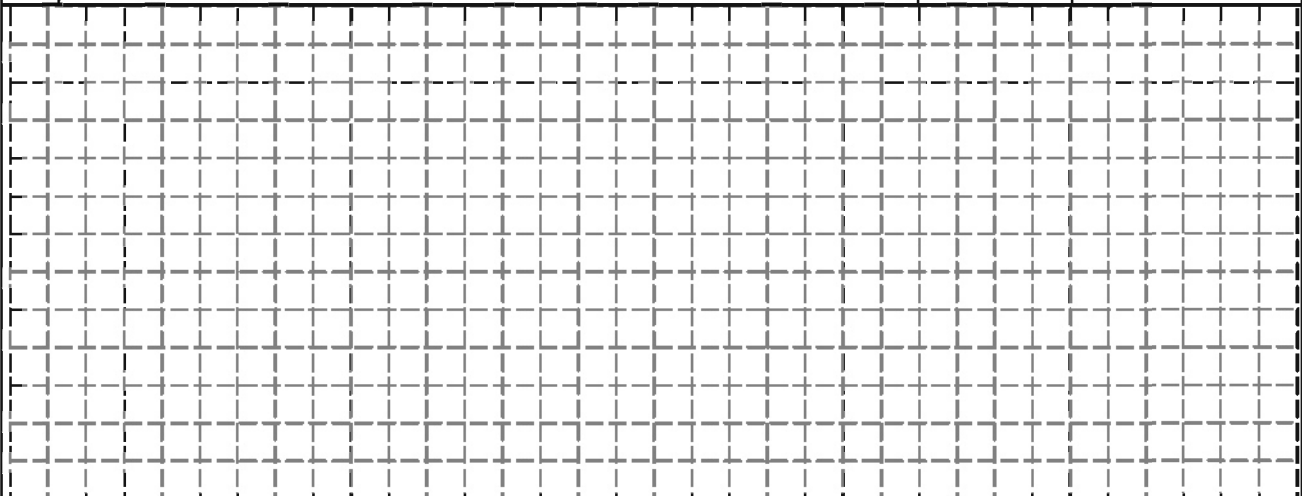
Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Date : 05/04/16
 Max Test Pit Depth : 3 m
 Digger Type/Size : 13 T Hitachi
 Bucket Type/Size : 1800 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : LP
 Latitude :
 Longitude :

Depth (m)	Excavability (Relative Scale)			USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer					
	Material	Easier	Harder								Blows per 100mm					
											2	4	6	8	10	12
0.0 - 0.1	TOPSOIL			ML	SILT with trace gravel and rootlets; brown. Low plasticity [TOPSOIL].				St-H							
0.1 - 1.4					Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are collapsing. Loose to moderately packed.											
1.4 - 3.0	ALLUVIUM			GW	Pit walls become vertical and tightly packed.			M								
Depth of Excavation: 3 m Termination Condition: Target depth																

GEOSCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16




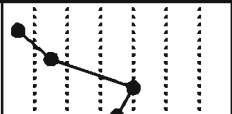

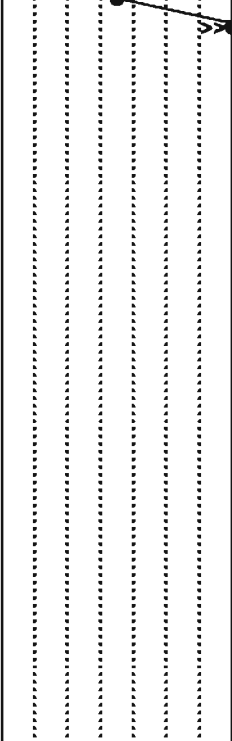
Test pit met target depth at 3.0 m.
 Standing groundwater was not encountered

LOG OF TEST PIT TP04

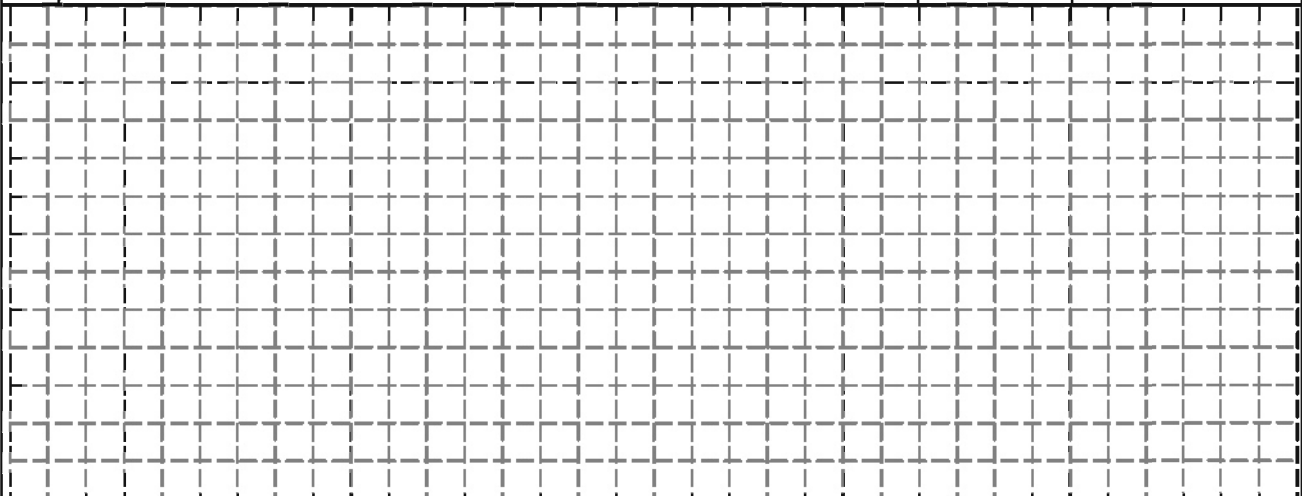
Faringdon South Subdivision
East Maddisons and Selwyn Road
Rolleston
12903

Client : Hughes Development Ltd
Date : 05/04/16
Max Test Pit Depth : 3 m
Digger Type/Size : 13 T Hitachi
Bucket Type/Size : 1800 mm

Shear Vane No :
Logged By : RB
Reviewed By : LP
Latitude :
Longitude :

Depth (m)	Material	Excavability (Relative Scale)		USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer					
		Easier	Harder								Blows per 100mm					
											2	4	6	8	10	12
0.0 - 0.5	TOPSOIL			ML	SILT with trace gravel, wood and rootlets; brown. Low plasticity [TOPSOIL].				8-St H							
0.5 - 2.4	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with minor cobbles and trace rootlets; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed. Trace rootlets encountered from 0.4 m to 1.4 m depth.				M							
2.4 - 3.0					Becomes wet at 2.4 m depth.				W							
Depth of Excavation: 3 m Termination Condition: Target depth																

GEOSCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16



Test pit met target depth at 3.0 m.

Standing groundwater was not encountered

LOG OF TEST PIT TP05

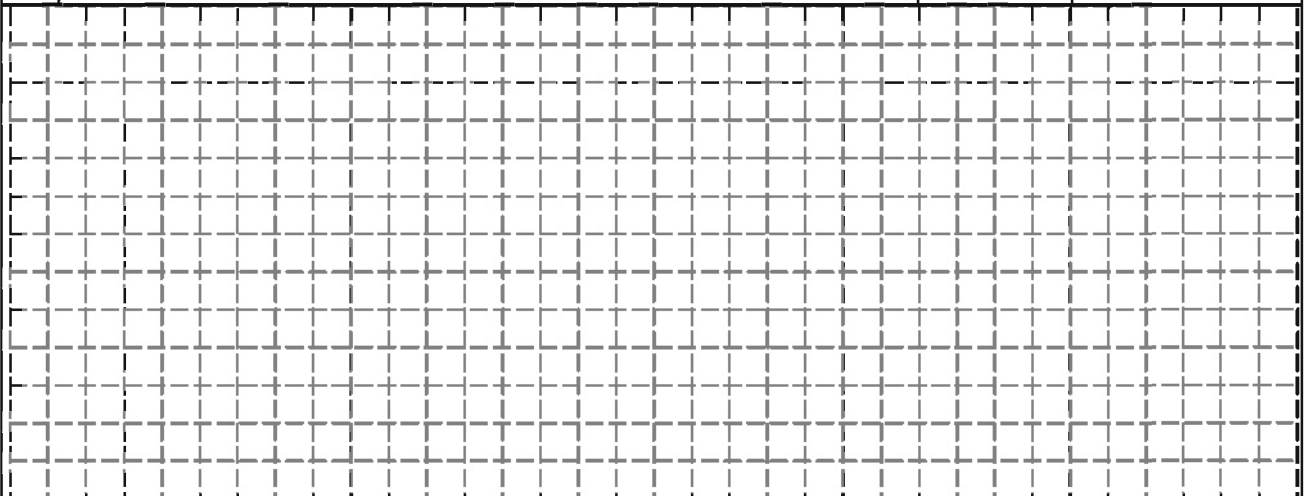
Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Date : 05/04/16
 Max Test Pit Depth : 3 m
 Digger Type/Size : 13 T Hitachi
 Bucket Type/Size : 1800 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : LP
 Latitude :
 Longitude :

Depth (m)	Material	Excavability (Relative Scale)		USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer					
		Easier	Harder								Blows per 100mm					
0.0	TOPSOIL			ML	SILT with trace gravel and rootlets; brown. Low plasticity [TOPSOIL].				St-H		2	4	6	8	10	12
0.2				ML	SILT; yellowish brown. Low plasticity.				H							
0.4				SW	Gravelly fine to coarse SAND with minor cobbles and silt; yellowish brown. Poorly graded. Gravel, fine to coarse, well graded, subrounded.				D							
0.6				GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed.			M								
3.0	Depth of Excavation: 3 m Termination Condition: Target depth															

GEO SCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16






Test pit met target depth at 3.0 m.
 Standing groundwater was not encountered

LOG OF TEST PIT TP06

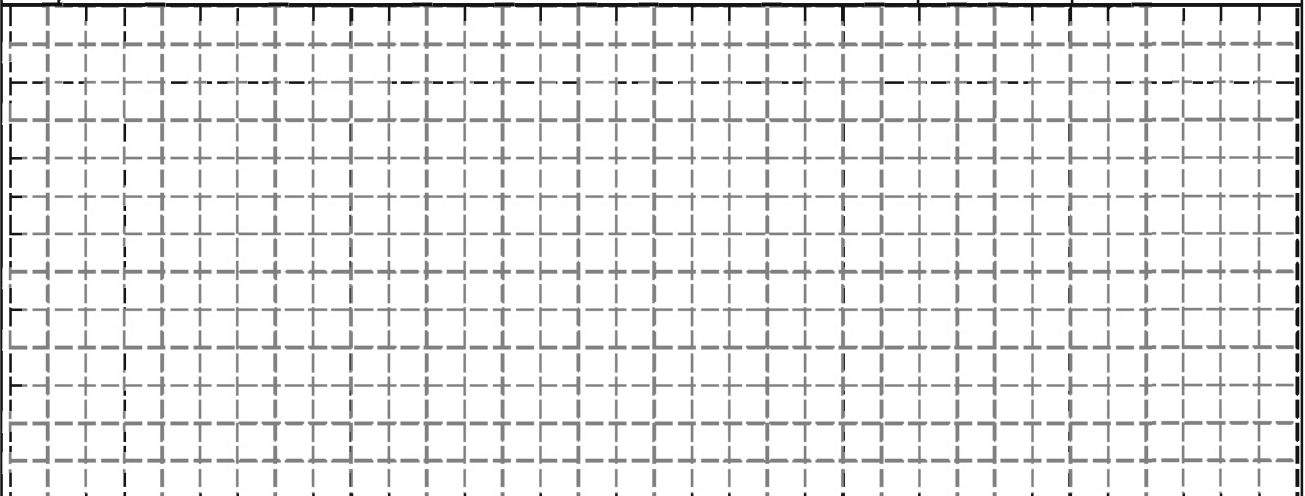
Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Date : 05/04/16
 Max Test Pit Depth : 3 m
 Digger Type/Size : 13 T Hitachi
 Bucket Type/Size : 1800 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : LP
 Latitude :
 Longitude :

Depth (m)	Material	Excavability (Relative Scale)		USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scale Penetrometer					
		Easier	Harder								Blows per 100mm					
											2	4	6	8	10	12
0.0 - 0.1	TOPSOIL			ML	SILT with trace gravel and rootlets; brown. Low plasticity [TOPSOIL].				Vst							
0.1 - 0.2				ML	SILT; yellowish brown. Low plasticity.				H							
0.2 - 3.0	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed.				M							
Depth of Excavation: 3 m Termination Condition: Target depth																

GEOSCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16



Test pit met target depth at 3.0 m.
 Standing groundwater was not encountered



LOG OF TEST PIT TP07

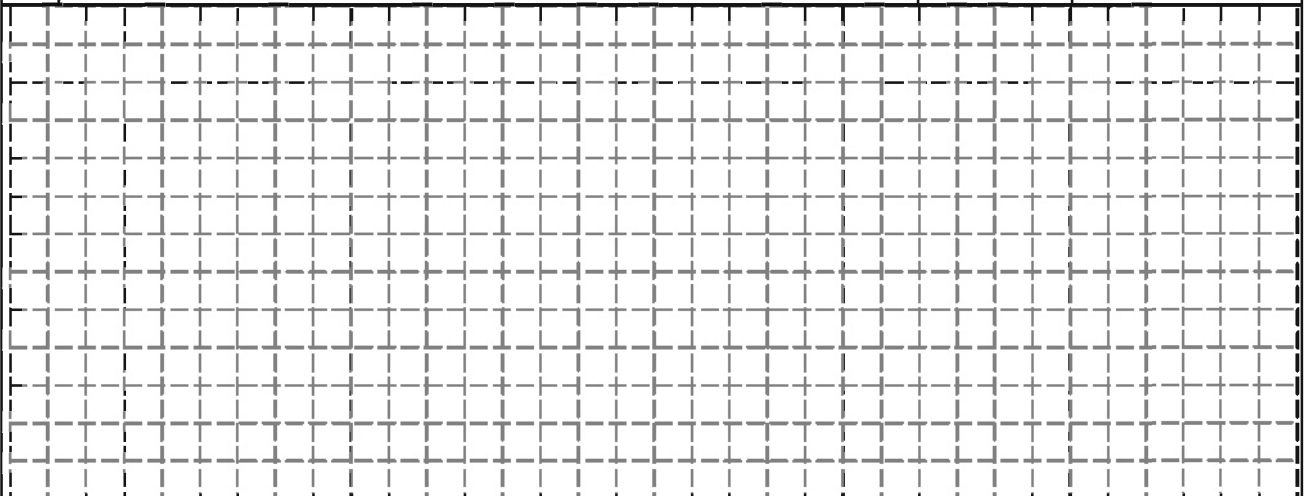
Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Date : 05/04/16
 Max Test Pit Depth : 3 m
 Digger Type/Size : 13 T Hitachi
 Bucket Type/Size : 1800 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : LP
 Latitude :
 Longitude :

Depth (m)	Material	Excavability (Relative Scale)		USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer						
		Easier	Harder								Blows per 100mm						
												2	4	6	8	10	12
0.0 - 0.1	TS			ML	SILT with trace gravel and rootlets; brown. Low plasticity [TOPSOIL].				S-St								
0.1 - 0.2				ML	SILT; yellowish brown. Low plasticity.				H								
0.2 - 1.5	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed.				M								
1.5 - 3.0					Becomes wet at 1.5 m depth.							W					
					Depth of Excavation: 3 m Termination Condition: Target depth												

GEOSCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16



Test pit met target depth at 3.0 m.
 TS = TOPSOIL
 Standing groundwater was not encountered

LOG OF TEST PIT TP08

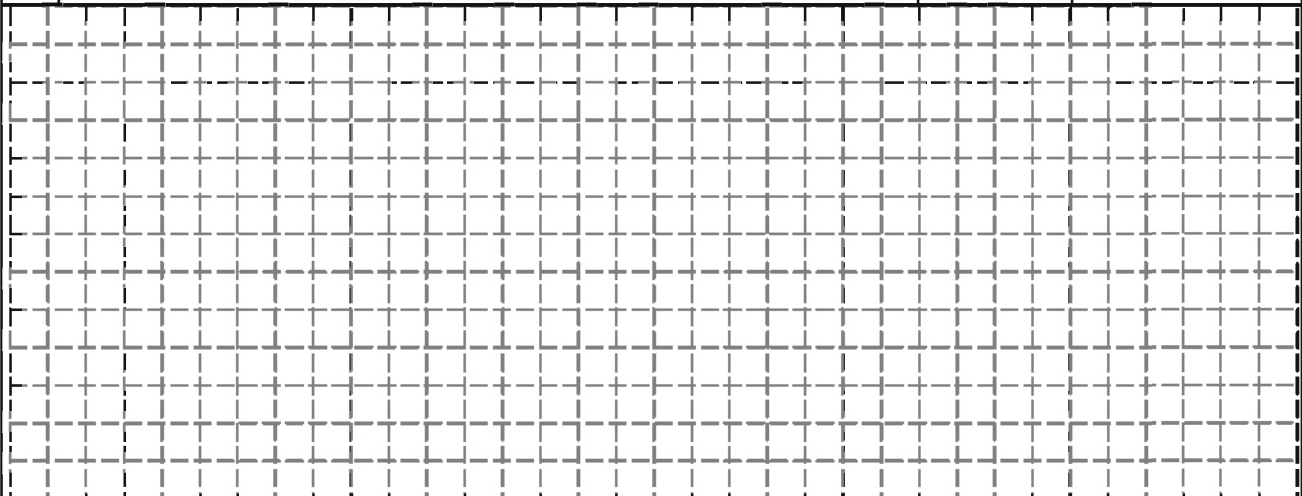
Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Date : 05/04/16
 Max Test Pit Depth : 3 m
 Digger Type/Size : 13 T Hitachi
 Bucket Type/Size : 1800 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : LP
 Latitude :
 Longitude :

Depth (m)	Material	Excavability (Relative Scale)		USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scale Penetrometer					
		Easier	Harder								Blows per 100mm					
0.0 - 0.1	TOPSOIL			ML	SILT with trace gravel and rootlets; brown. Low plasticity [TOPSOIL].				st		2	4	6	8	10	12
0.1 - 3.0	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed.											
Depth of Excavation: 3 m Termination Condition: Target depth																

GEO SCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16






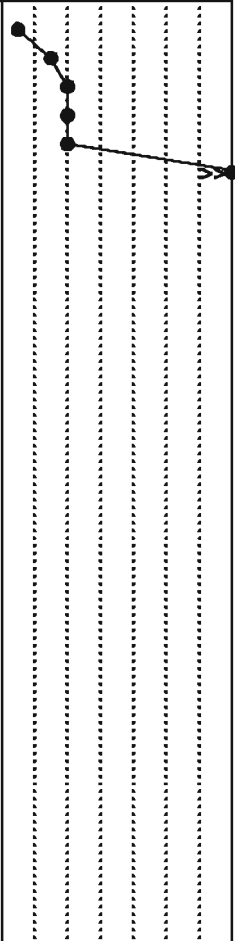
Test pit met target depth at 3.0 m.
 Standing groundwater was not encountered

LOG OF TEST PIT TP09

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Date : 05/04/16
 Max Test Pit Depth : 3 m
 Digger Type/Size : 13 T Hitachi
 Bucket Type/Size : 1800 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : LP
 Latitude :
 Longitude :

Depth (m)	Material	Excavability (Relative Scale)		USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scale Penetrometer					
		Easier	Harder								Blows per 100mm					
0.0 - 0.4	TOPSOIL			ML	SILT with trace gravel and rootlets; brown. Low plasticity [TOPSOIL].			M	S-St		2	4	6	8	10	12
0.4 - 0.6				ML	SILT; yellowish brown. Low plasticity.				St							
0.6 - 3.0	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed.											
Depth of Excavation: 3 m Termination Condition: Target depth																

GEOSCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16

Test pit met target depth at 3.0 m.

Standing groundwater was not encountered



LOG OF TEST PIT TP10

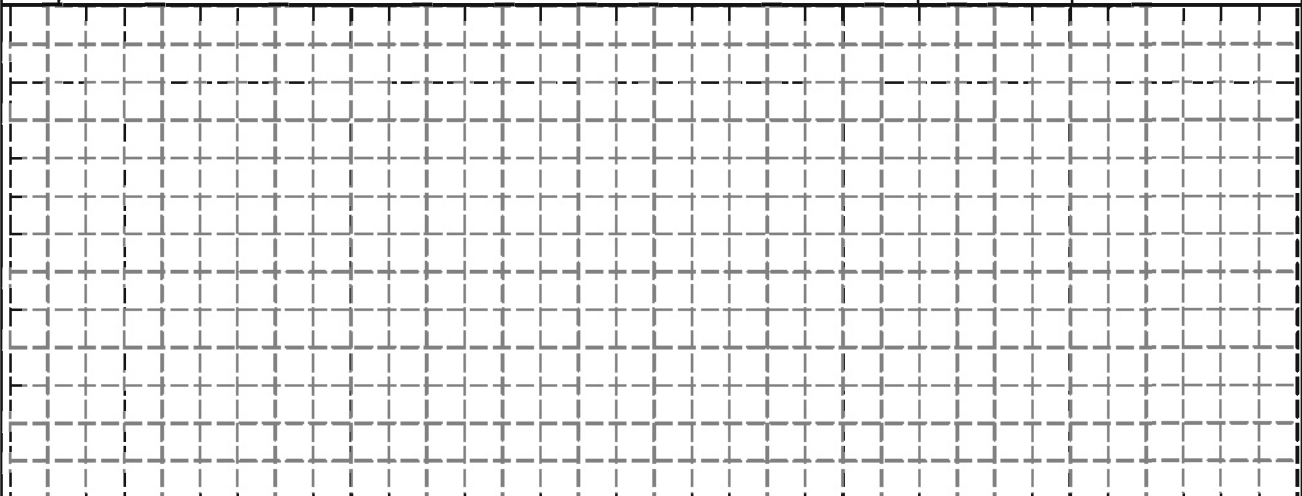
Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Date : 05/04/16
 Max Test Pit Depth : 3 m
 Digger Type/Size : 13 T Hitachi
 Bucket Type/Size : 1800 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : LP
 Latitude :
 Longitude :

Depth (m)	Material	Excavatability (Relative Scale)		USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scale Penetrometer						
		Easier	Harder								Blows per 100mm						
												2	4	6	8	10	12
0.0 - 0.1	TS			ML	SILT with trace gravel and rootlets; brown. Low plasticity [TOPSOIL].				8-St								
0.1 - 0.2				ML	SILT; yellowish brown. Low plasticity.				Vst								
0.2 - 3.0	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed.			M									
Depth of Excavation: 3 m Termination Condition: Target depth																	

GEOSCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16





Test pit met target depth at 3.0 m.
 TS = TOPSOIL
 Standing groundwater was not encountered

LOG OF TEST PIT TP11

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Date : 05/04/16
 Max Test Pit Depth : 3 m
 Digger Type/Size : 13 T Hitachi
 Bucket Type/Size : 1800 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : LP
 Latitude :
 Longitude :

Depth (m)	Material	Excavability (Relative Scale)		USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scale Penetrometer						
		Easier	Harder								Blows per 100mm						
0.0	TOPSOIL			ML	SILT with trace gravel and rootlets; brown. Low plasticity [TOPSOIL].				S-St		2	4	6	8	10	12	
0.5	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed.			M									
2.3					Becomes wet at 2.3 m depth.			W									
Depth of Excavation: 3 m Termination Condition: Target depth																	

GEO SCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16

Test pit met target depth at 3.0 m.




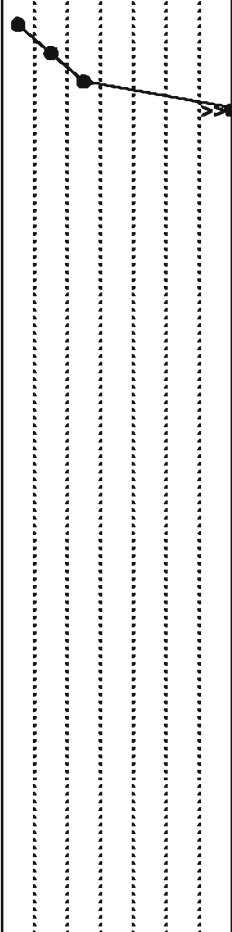
Standing groundwater was not encountered

LOG OF TEST PIT TP12

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Date : 05/04/16
 Max Test Pit Depth : 3 m
 Digger Type/Size : 13 T Hitachi
 Bucket Type/Size : 1800 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : LP
 Latitude :
 Longitude :

Depth (m)	Material	Excavability (Relative Scale)		USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer					
		Easier	Harder								Blows per 100mm					
											2	4	6	8	10	12
0.0 - 0.5	TS			ML	SILT with trace gravel and rootlets; brown. Low plasticity [TOPSOIL].				8-St							
0.5 - 1.6				ML	SILT; yellowish brown. Low plasticity.				VSt							
1.6 - 3.0	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed. Becomes wet at 1.6 m depth.				M							
					Depth of Excavation: 3 m Termination Condition: Target depth											

GEOSCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16

Test pit met target depth at 3.0 m.
 TS = TOPSOIL
 Standing groundwater was not encountered

LOG OF TEST PIT TP13

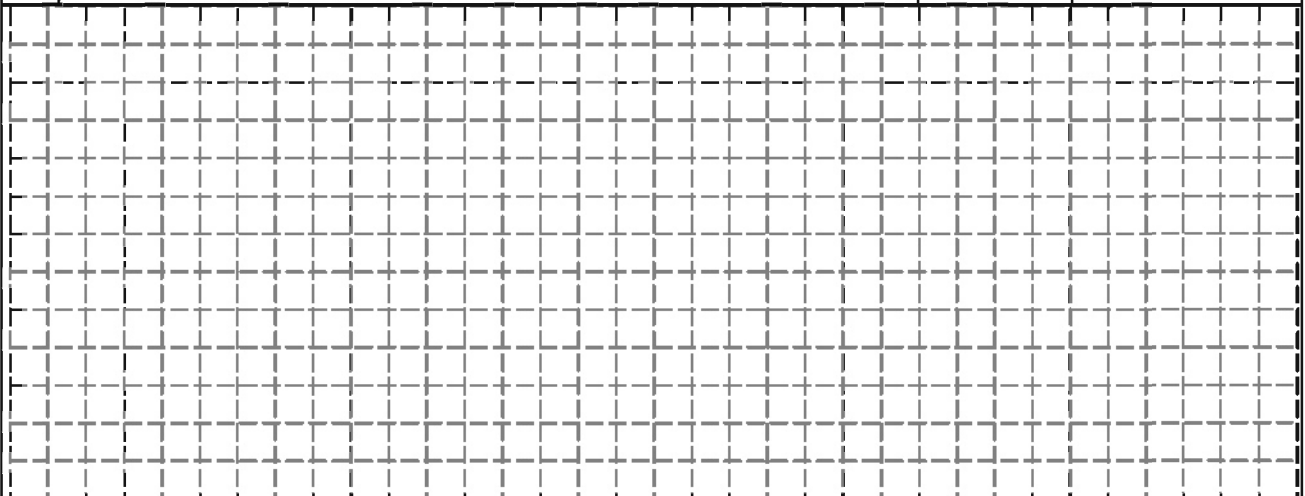
Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Date : 05/04/16
 Max Test Pit Depth : 3 m
 Digger Type/Size : 13 T Hitachi
 Bucket Type/Size : 1800 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : LP
 Latitude :
 Longitude :

Depth (m)	Excavability (Relative Scale)			USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer					
	Material	Easier	Harder								Blows per 100mm					
0.0	TOPSOIL			ML	SILT with trace gravel and rootlets; brown. Low plasticity [TOPSOIL].				St-Vst		2	4	6	8	10	12
0.5				SW	Gravelly fine to coarse SAND with minor cobbles and silt; yellowish brown. Poorly graded. Gravel, fine to coarse, well graded, subrounded.				D							
1.0				GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed.			M								
2.0	ALLUVIUM				Becomes wet at 2.0 m depth.			W								
3.0	Depth of Excavation: 3 m Termination Condition: Target depth															

GEOSCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16





Test pit met target depth at 3.0 m.
 Standing groundwater was not encountered

LOG OF TEST PIT TP14

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Date : 05/04/16
 Max Test Pit Depth : 3 m
 Digger Type/Size : 13 T Hitachi
 Bucket Type/Size : 1800 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : LP
 Latitude :
 Longitude :

Depth (m)	Material	Excavability (Relative Scale)		USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scale Penetrometer					
		Easier	Harder								Blows per 100mm					
											2	4	6	8	10	12
0.0 - 0.1	TS			ML	SILT with trace gravel and rootlets; brown. Low plasticity [TOPSOIL].				8-St							
0.1 - 1.0	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed.				M							
1.0 - 3.0					Becomes wet at 1.0 m depth.											
Depth of Excavation: 3 m Termination Condition: Target depth																

GEOSCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16

Test pit met target depth at 3.0 m.
 TS = TOPSOIL
 Standing groundwater was not encountered

LOG OF TEST PIT TP15

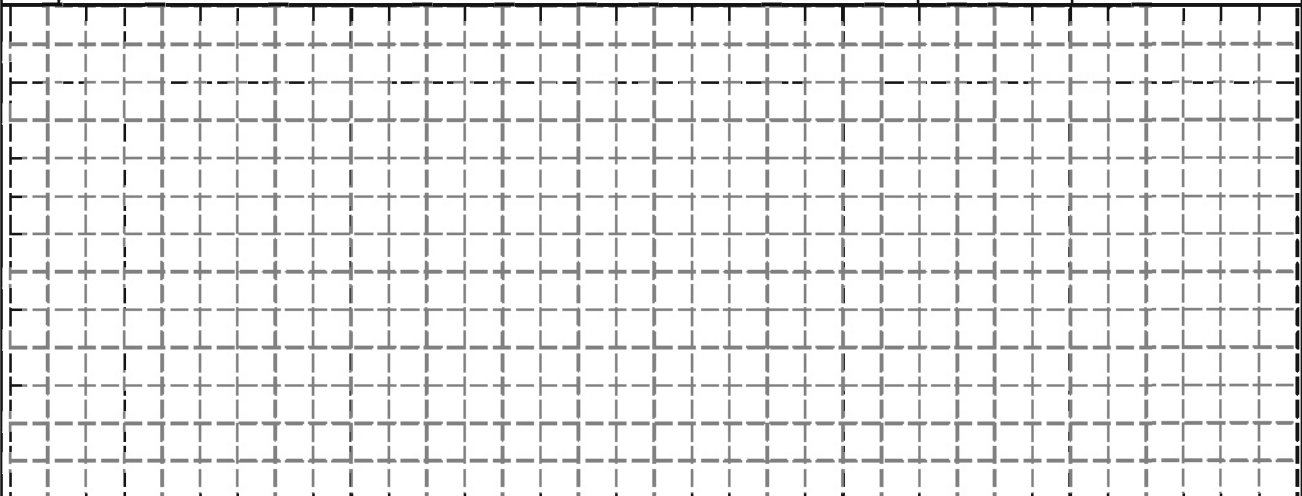
Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Date : 05/04/16
 Max Test Pit Depth : 3 m
 Digger Type/Size : 13 T Hitachi
 Bucket Type/Size : 1800 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : LP
 Latitude :
 Longitude :

Depth (m)	Excavability (Relative Scale)			USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer					
	Material	Easier	Harder								Blows per 100mm					
											2	4	6	8	10	12
0.0 - 0.1	TOPSOIL			ML	SILT with trace gravel and rootlets; brown. Low plasticity [TOPSOIL].				S-Vst							
0.1 - 3.0	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed.				M							
Depth of Excavation: 3 m Termination Condition: Target depth																

GEOSCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16






Test pit met target depth at 3.0 m.
 Standing groundwater was not encountered

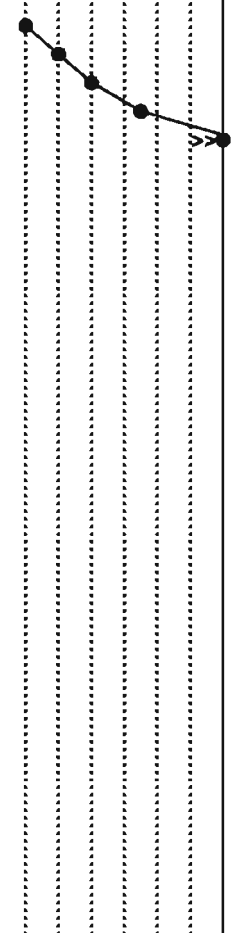
LOG OF TEST PIT TP16

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

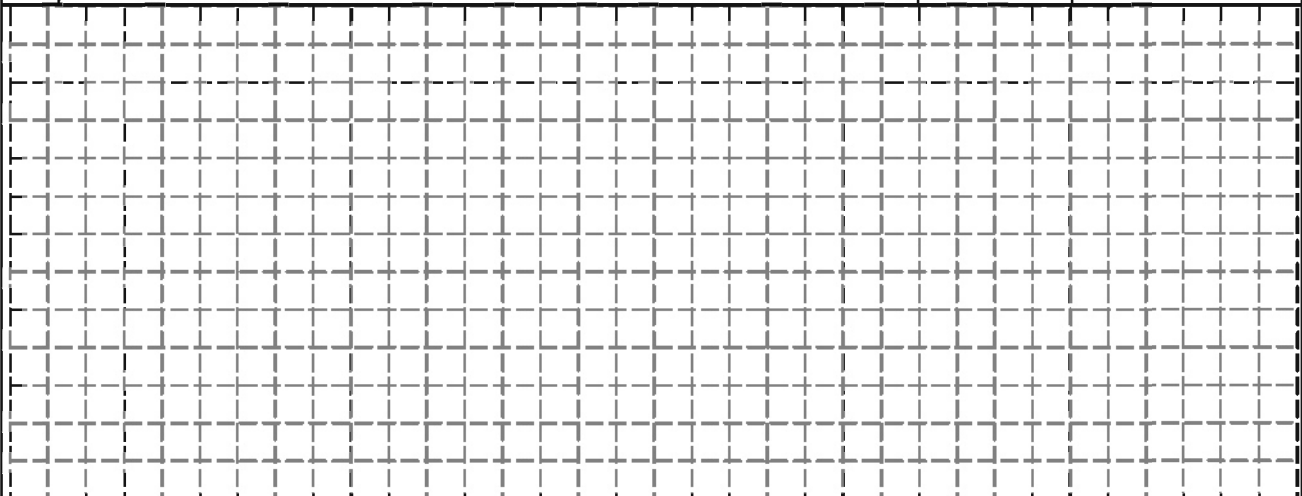
Client : Hughes Development Ltd
 Date : 05/04/16
 Max Test Pit Depth : 3 m
 Digger Type/Size : 13 T Hitachi
 Bucket Type/Size : 1800 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : LP
 Latitude :
 Longitude :

Depth (m)	Material	Excavability (Relative Scale)		USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer						
		Easier	Harder								Blows per 100mm						
												2	4	6	8	10	12
0.0 - 0.5	TS			ML	SILT with trace gravel and rootlets; brown. Low plasticity [TOPSOIL].				S-St								
0.5 - 0.8				SW	Gravelly SILT with trace rootlets; yellowish brown. Low plasticity. Gravel, fine to coarse, well graded, subrounded.				VSI-H								
0.8 - 3.0	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed. Becomes wet at 1.0 m depth			M									
Depth of Excavation: 3 m Termination Condition: Target depth																	



GEOSCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16





Test pit met target depth at 3.0 m.
 TS = TOPSOIL
 Standing groundwater was not encountered

LOG OF TEST PIT TP17

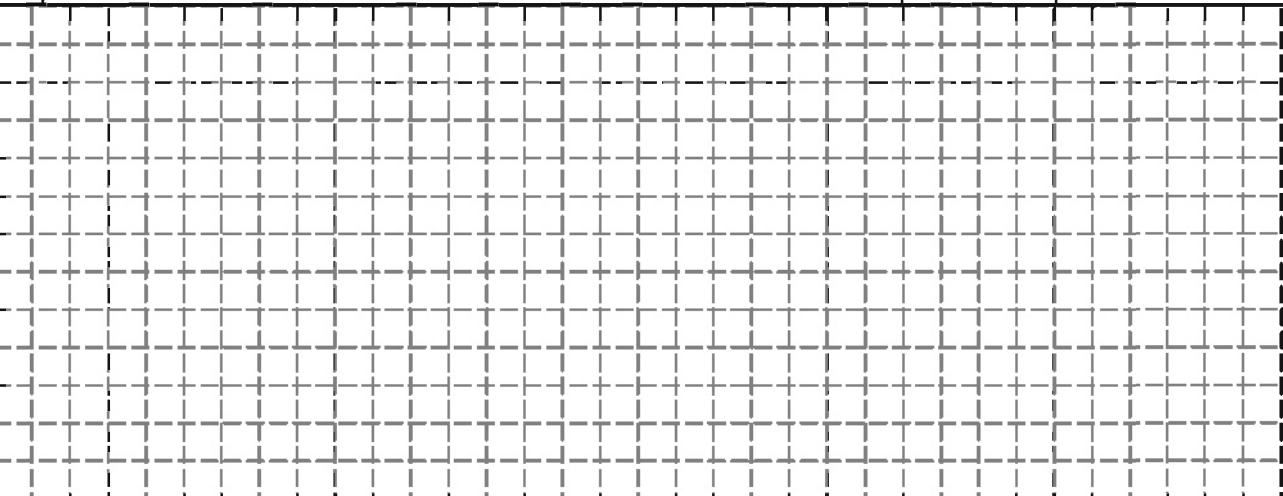
Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Date : 05/04/16
 Max Test Pit Depth : 3 m
 Digger Type/Size : 13 T Hitachi
 Bucket Type/Size : 1800 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : LP
 Latitude :
 Longitude :

Depth (m)	Material	Excavability (Relative Scale)		USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scale Penetrometer						
		Easier	Harder								Blows per 100mm						
												2	4	6	8	10	12
0.0 - 0.1	TS			ML	SILT with trace gravel and rootlets; brown. Low plasticity [TOPSOIL].				8-St								
0.1 - 3.0	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed. Becomes wet at 1.2 m depth.				M								
Depth of Excavation: 3 m Termination Condition: Target depth																	

GEOSCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16






Test pit met target depth at 3.0 m.
 TS = TOPSOIL
 Standing groundwater was not encountered

LOG OF TEST PIT TP18

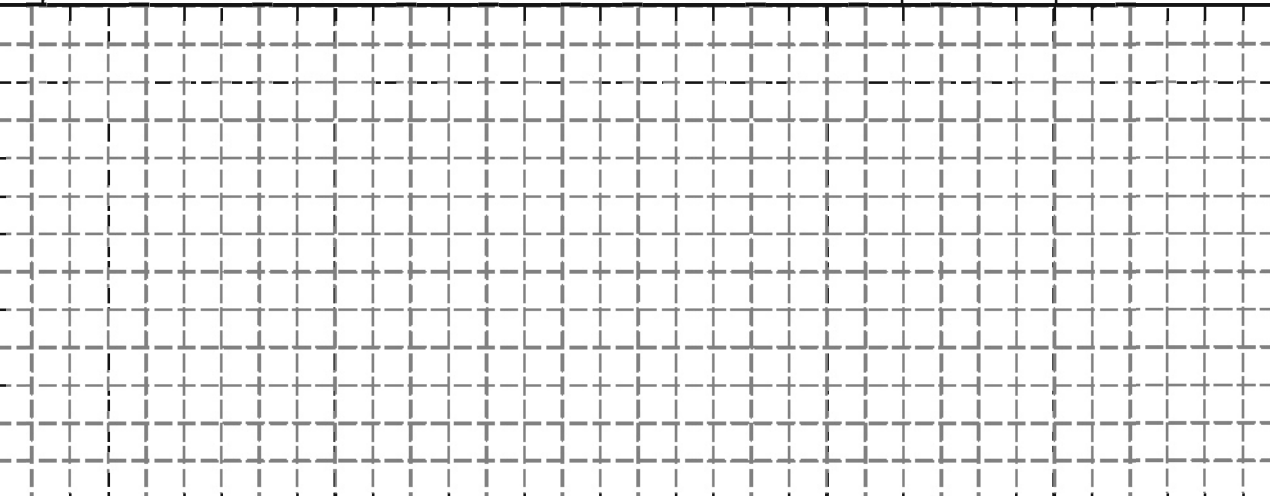
Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Date : 05/04/16
 Max Test Pit Depth : 3 m
 Digger Type/Size : 13 T Hitachi
 Bucket Type/Size : 1800 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : LP
 Latitude :
 Longitude :

Depth (m)	Excavability (Relative Scale)			USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer					
	Material	Easier	Harder								Blows per 100mm					
											2	4	6	8	10	12
0.0 - 0.1	TS			ML	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed.				8-St							
0.1 - 0.8				ML	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed.											
0.8 - 3.0				GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed. Becomes wet at 0.8 m depth.											
Depth of Excavation: 3 m Termination Condition: Target depth																

GEOSCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16





Test pit met target depth at 3.0 m.
 TS = TOPSOIL
 Standing groundwater was not encountered

LOG OF TEST PIT TP19

Faringdon South Subdivision
East Maddisons and Selwyn Road
Rolleston
12903

Client : Hughes Development Ltd
Date : 05/04/16
Max Test Pit Depth : 3 m
Digger Type/Size : 13 T Hitachi
Bucket Type/Size : 1800 mm

Shear Vane No :
Logged By : RB
Reviewed By : LP
Latitude :
Longitude :

Depth (m)	Excavability (Relative Scale)			USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scale Penetrometer					
	Material	Easier	Harder								Blows per 100mm					
											2	4	6	8	10	12
0.0 - 0.1	TS			ML	SILT with some gravel and trace rootlets; brown. Low plasticity. Gravel, fine to coarse, well graded, subrounded [TOPSOIL].				S							
0.1 - 0.8				MH	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed. Becomes wet at 0.8 m depth.				S							
0.8 - 3.0	ALLUVIUM			MH					W							
Depth of Excavation: 3 m Termination Condition: Target depth																

GEOSCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16

Test pit met target depth at 3.0 m.
TS = TOPSOIL
Standing groundwater was not encountered

LOG OF TEST PIT TP20

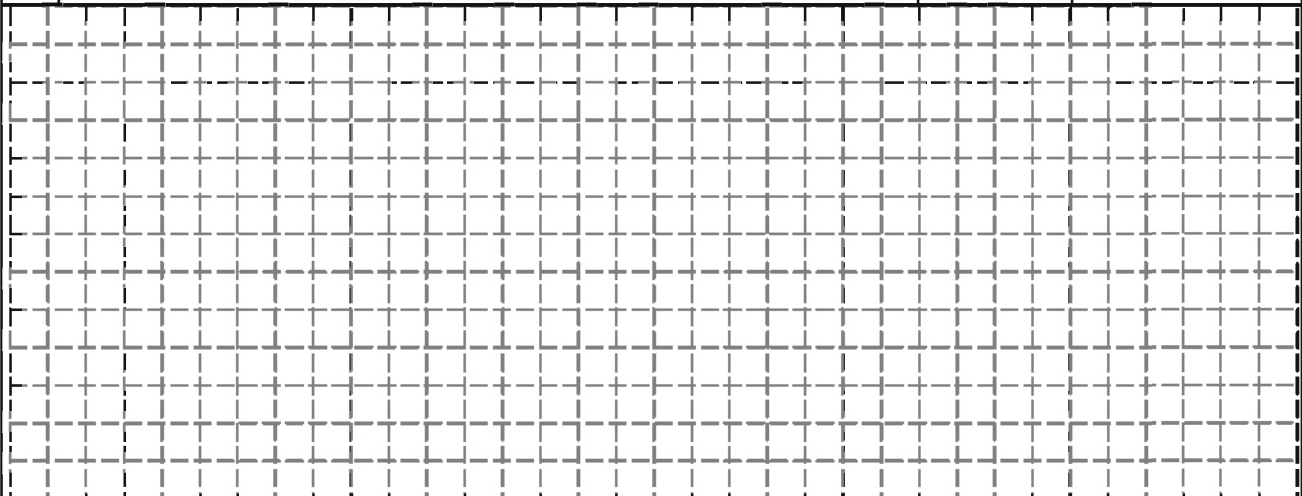
Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Date : 05/04/16
 Max Test Pit Depth : 3 m
 Digger Type/Size : 13 T Hitachi
 Bucket Type/Size : 1800 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : LP
 Latitude :
 Longitude :

Depth (m)	Excavability (Relative Scale)		USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scale Penetrometer					
	Material	Easier								Harder	Blows per 100mm				
										2	4	6	8	10	12
0.0 - 0.1	TS		ML	SILT with some gravel and trace rootlets; brown. Low plasticity. Gravel, fine to coarse, well graded, subrounded [TOPSOIL].				S							
0.1 - 0.5			ML	Gravelly SILT with trace rootlets; yellowish brown. Low plasticity. Gravel, fine to coarse, well graded, subrounded.				VSI-H							
0.5 - 1.5				Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed.				M							
1.5 - 3.0	ALLUVIUM		GW	Becomes wet at 1.5 m depth.				W							
				Depth of Excavation: 3 m Termination Condition: Target depth											

GEOSCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16



Test pit met target depth at 3.0 m.
 TS = TOPSOIL
 Standing groundwater was not encountered



LOG OF HAND AUGER HA01

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd Shear Vane No :
 Client Ref. : 12903 Logged By : RB
 Date : 30/03/16 Reviewed By : JW
 Hole Depth : 0.2 m Latitude :
 Hole Diameter : 50 mm Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer						
									Blows per 100mm						
									2	4	6	8	10	12	
	TOPSOIL	ML	SILT with trace rootlets; brown. Low plasticity [TOPSOIL].			M	st								
	End of Hole Depth: 0.2 m Termination Condition: Practical refusal														
0.5															
1.0															

GEOSCIENCE HAND AUGER HA TEMPLATE - BLANK.GPJ NZ DATA TEMPLATE 2.GDT 2/14/16

Hand auger met practical refusal at 0.2 m depth on inferred gravel.
 Scala Penetrometer met practical refusal at 0.3 m depth.
 Standing groundwater was not encountered



LOG OF HAND AUGER HA02

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd Shear Vane No :
 Client Ref. : 12903 Logged By : RB
 Date : 30/03/16 Reviewed By : JW
 Hole Depth : 0.5 m Latitude :
 Hole Diameter : 50 mm Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer									
									Blows per 100mm									
									2	4	6	8	10	12				
	TOPSOIL	ML	SILT with trace rootlets; brown. Low plasticity [TOPSOIL].															
	ALLUVIUM	ML	SILT; yellowish brown. Low plasticity.															
0.5			End of Hole Depth: 0.5 m Termination Condition: Practical refusal															

GEOSCIENCE HAND AUGER HA TEMPLATE - BLANK.GPJ NZ DATA TEMPLATE 2.GDT 2/14/16

Hand auger met practical refusal at 0.5 m depth on inferred gravel.
 Scala Penetrometer met practical refusal at 0.5 m depth.
 Standing groundwater was not encountered



LOG OF HAND AUGER HA03

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd Shear Vane No :
 Client Ref. : 12903 Logged By : RB
 Date : 30/03/16 Reviewed By : JW
 Hole Depth : 0.2 m Latitude :
 Hole Diameter : 50 mm Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer							
									Blows per 100mm							
									2	4	6	8	10	12		
	TOPSOIL	ML	SILT with trace rootlets; brown. Low plasticity [TOPSOIL].			M										
	End of Hole Depth: 0.2 m Termination Condition: Practical refusal															
0.5																
1.0																

GEOSCIENCE HAND AUGER HA TEMPLATE - BLANK.GPJ NZ DATA TEMPLATE 2.GDT 2/14/16

Hand auger met practical refusal at 0.2 m depth on inferred gravel.
 Scala Penetrometer met practical refusal at 0.3 m depth.
 Standing groundwater was not encountered



LOG OF HAND AUGER HA04

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Client Ref. : 12903
 Date : 30/03/16
 Hole Depth : 0.3 m
 Hole Diameter : 50 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : JW
 Latitude :
 Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer							
									Blows per 100mm							
									2	4	6	8	10	12		
	TOPSOIL	ML	SILT with trace rootlets; brown. Low plasticity [TOPSOIL].			M	VSI-H									
	End of Hole Depth: 0.3 m Termination Condition: Practical refusal															
0.5																
1.0																

GEOSCIENCE HAND AUGER HA TEMPLATE - BLANK.GPJ NZ DATA TEMPLATE 2.GDT 2/14/16

Hand auger met practical refusal at 0.3 m depth on inferred gravel.
 Scala Penetrometer met practical refusal at 0.4 m depth.
 Standing groundwater was not encountered



LOG OF HAND AUGER HA05

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd Shear Vane No :
 Client Ref. : 12903 Logged By : RB
 Date : 30/03/16 Reviewed By : JW
 Hole Depth : 0.2 m Latitude :
 Hole Diameter : 50 mm Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer					
									Blows per 100mm					
									2	4	6	8	10	12
	TOPSOIL	ML	SILT with minor gravel and trace rootlets; brown. Low plasticity. Gravel, fine to coarse, well graded, subrounded [TOPSOIL].			M	F-Vst							
			End of Hole Depth: 0.2 m Termination Condition: Practical refusal											
0.5														
1.0														

GEOSCIENCE HAND AUGER HA TEMPLATE - BLANK.GPJ NZ DATA TEMPLATE 2.GDT 2/14/16

Hand auger met practical refusal at 0.2 m depth on inferred gravel.
 Scala Penetrometer met practical refusal at 0.3 m depth.
 Standing groundwater was not encountered



LOG OF HAND AUGER HA06

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd Shear Vane No :
 Client Ref. : 12903 Logged By : RB
 Date : 30/03/16 Reviewed By : JW
 Hole Depth : 0.2 m Latitude :
 Hole Diameter : 50 mm Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer										
									Blows per 100mm										
									2	4	6	8	10	12					
	TOPSOIL	ML	SILT with minor gravel and trace rootlets; brown. Low plasticity. Gravel, fine to coarse, well graded, subrounded [TOPSOIL].			M	s												
			End of Hole Depth: 0.2 m Termination Condition: Practical refusal				H												
0.5																			
1.0																			


GEOSCIENCE HAND AUGER HA TEMPLATE - BLANK.GPJ NZ DATA TEMPLATE 2.GDT 2/14/16

Hand auger met practical refusal at 0.2 m depth on inferred gravel.
 Scala Penetrometer met practical refusal at 0.3 m depth.
 Standing groundwater was not encountered

LOG OF HAND AUGER HA07

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd Shear Vane No :
 Client Ref. : 12903 Logged By : RB
 Date : 30/03/16 Reviewed By : JW
 Hole Depth : 0.2 m Latitude :
 Hole Diameter : 50 mm Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer						
									Blows per 100mm						
									2	4	6	8	10	12	
	TOPSOIL	ML	SILT with minor gravel and trace rootlets; brown. Low plasticity. Gravel, fine to coarse, well graded, subrounded [TOPSOIL].			M	St-H								
			End of Hole Depth: 0.2 m Termination Condition: Practical refusal												
0.5															
1.0															

GEOSCIENCE HAND AUGER HA TEMPLATE - BLANK.GPJ NZ DATA TEMPLATE 2.GDT 2/14/16

Hand auger met practical refusal at 0.2 m depth on inferred gravel.
 Scala Penetrometer met practical refusal at 0.3 m depth.
 Standing groundwater was not encountered



LOG OF HAND AUGER HA08

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Client Ref. : 12903
 Date : 30/03/16
 Hole Depth : 0.2 m
 Hole Diameter : 50 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : JW
 Latitude :
 Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer						
									Blows per 100mm						
									2	4	6	8	10	12	
	TOPSOIL	ML	SILT with trace rootlets; brown. Low plasticity [TOPSOIL].			M	VSI-H								
			End of Hole Depth: 0.2 m Termination Condition: Practical refusal												
0.5															
1.0															

GEOSCIENCE HAND AUGER HA TEMPLATE - BLANK.GPJ NZ DATA TEMPLATE 2.GDT 2/14/16

Hand auger met practical refusal at 0.2 m depth on inferred gravel.
 Scala Penetrometer met practical refusal at 0.3 m depth.
 Standing groundwater was not encountered



LOG OF HAND AUGER HA09

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd Shear Vane No :
 Client Ref. : 12903 Logged By : RB
 Date : 30/03/16 Reviewed By : JW
 Hole Depth : 0.2 m Latitude :
 Hole Diameter : 50 mm Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer						
									Blows per 100mm						
									2	4	6	8	10	12	
	TOPSOIL	ML	SILT with minor gravel and trace rootlets; brown. Low plasticity. Gravel, fine to coarse, well graded, subrounded [TOPSOIL].			M	SS-SI								
	End of Hole Depth: 0.2 m Termination Condition: Practical refusal														
0.5															
1.0															

GEOSCIENCE HAND AUGER HA TEMPLATE - BLANK.GPJ NZ DATA TEMPLATE 2.GDT 2/14/16

Hand auger met practical refusal at 0.2 m depth on inferred gravel.
 Scala Penetrometer met practical refusal at 0.3 m depth.
 Standing groundwater was not encountered



LOG OF HAND AUGER HA10

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Client Ref. : 12903
 Date : 01/04/16
 Hole Depth : 0.6 m
 Hole Diameter : 50 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : JW
 Latitude :
 Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer						
									Blows per 100mm						
									2	4	6	8	10	12	
	TOPSOIL	ML	SILT with trace gravel and rootlets; brown. Low plasticity [TOPSOIL].				F-Vst								
0.5	ALLUVIUM	ML	SILT; yellowish brown. Low plasticity.				M	S-H							
	End of Hole Depth: 0.6 m Termination Condition: Practical refusal														
1.0															


GEOSCIENCE HAND AUGER HA TEMPLATE - BLANK.GPJ NZ DATA TEMPLATE 2.GDT 2/14/16

Hand auger met practical refusal at 0.6 m depth on inferred gravel.
 Scala Penetrometer met practical refusal at 0.6 m depth.
 Standing groundwater was not encountered

LOG OF HAND AUGER HA11

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd Shear Vane No :
 Client Ref. : 12903 Logged By : RB
 Date : 01/04/16 Reviewed By : JW
 Hole Depth : 0.2 m Latitude :
 Hole Diameter : 50 mm Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer							
									Blows per 100mm							
									2	4	6	8	10	12		
	TOPSOIL	ML	SILT with trace gravel and rootlets; brown. Low plasticity [TOPSOIL].			M	St-H									
	End of Hole Depth: 0.2 m Termination Condition: Practical refusal															
0.5																
1.0																

GEOSCIENCE HAND AUGER HA TEMPLATE - BLANK.GPJ NZ DATA TEMPLATE 2.GDT 2/14/16

Hand auger met practical refusal at 0.2 m depth on inferred gravel.
 Scala Penetrometer met practical refusal at 0.3 m depth.
 Standing groundwater was not encountered



LOG OF HAND AUGER HA12

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd Shear Vane No :
 Client Ref. : 12903 Logged By : RB
 Date : 01/04/16 Reviewed By : JW
 Hole Depth : 0.2 m Latitude :
 Hole Diameter : 50 mm Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer						
									Blows per 100mm						
									2	4	6	8	10	12	
	TOPSOIL	ML	SILT with trace rootlets; brown. Low plasticity [TOPSOIL].			M	FH								
	End of Hole Depth: 0.2 m Termination Condition: Practical refusal														
0.5															
1.0															

GEOSCIENCE HAND AUGER HA TEMPLATE - BLANK.GPJ NZ DATA TEMPLATE 2.GDT 2/14/16

Hand auger met practical refusal at 0.2 m depth on inferred gravel.
 Scala Penetrometer met practical refusal at 0.3 m depth.
 Standing groundwater was not encountered



LOG OF HAND AUGER HA13

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd
 Client Ref. : 12903
 Date : 01/04/16
 Hole Depth : 0.2 m
 Hole Diameter : 50 mm

Shear Vane No :
 Logged By : RB
 Reviewed By : JW
 Latitude :
 Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer						
									Blows per 100mm						
									2	4	6	8	10	12	
	TOPSOIL	ML	SILT with trace rootlets; brown. Low plasticity [TOPSOIL].			M	st								
End of Hole Depth: 0.2 m Termination Condition: Practical refusal															
0.5															
1.0															

GEOSCIENCE HAND AUGER HA TEMPLATE - BLANK.GPJ NZ DATA TEMPLATE 2.GDT 2/14/16

Hand auger met practical refusal at 0.2 m depth on inferred gravel.
 Scala Penetrometer met practical refusal at 0.3 m depth.
 Standing groundwater was not encountered



LOG OF HAND AUGER HA14

Faringdon South Subdivision
 East Maddisons and Selwyn Road
 Rolleston
 12903

Client : Hughes Development Ltd Shear Vane No :
 Client Ref. : 12903 Logged By : RB
 Date : 01/04/16 Reviewed By : JW
 Hole Depth : 0.2 m Latitude :
 Hole Diameter : 50 mm Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer									
									Blows per 100mm									
									2	4	6	8	10	12				
	TOPSOIL	ML	SILT with trace rootlets; brown. Low plasticity [TOPSOIL].			M	St-H											
	End of Hole Depth: 0.2 m Termination Condition: Practical refusal																	
0.5																		
1.0																		

GEOSCIENCE HAND AUGER HA TEMPLATE - BLANK.GPJ NZ DATA TEMPLATE 2.GDT 2/14/16

Hand auger met practical refusal at 0.2 m depth on inferred gravel.
 Scala Penetrometer met practical refusal at 0.3 m depth.
 Standing groundwater was not encountered

APPENDIX 3:
Scala Penetrometer Test Results

Scala Penetrometer Testing - Summary

Client Hughes Developments

Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

Test No.	Depth to NZS3604:2011 "good ground" (m)	Depth to Effective Refusal (m)	Test No.	Depth to NZS3604:2011 "good ground" (m)	Depth to Effective Refusal (m)
SP01	0.3	0.3	SP45	0.3	0.4
SP02	0.2	0.5	SP46	0.2	0.5
SP03	0.2	0.3	SP47	0.2	0.3
SP04	0.2	0.4	SP48	0.4	0.5
SP05	0.2	0.3	SP49	0.3	0.3
SP06	0.2	0.3	SP50	0.2	0.2
SP07	0.2	0.3	SP51	0.2	0.4
SP08	0.2	0.3			
SP09	0.3	0.3			
SP10	0.5	0.6			
SP11	0.2	0.3			
SP12	0.2	0.3			
SP13	0.2	0.3			
SP14	0.2	0.3			
SP15	0.3	0.4			
SP16	0.3	0.3			
SP17	0.3	0.4			
SP18	0.3	0.3			
SP19	0.3	0.4			
SP20	0.3	0.4			
SP21	0.3	0.4			
SP22	0.3	0.3			
SP23	0.3	0.3			
SP24	0.3	0.4			
SP25	0.2	0.3			
SP26	0.2	0.3			
SP27	0.2	0.3			
SP28	0.3	0.3			
SP29	0.2	0.4			
SP30	0.3	0.3			
SP31	0.3	0.4			
SP32	0.3	0.4			
SP33	0.2	0.2			
SP34	0.3	0.4			
SP35	0.4	0.4			
SP36	0.3	0.3			
SP37	0.3	0.4			
SP38	0.3	0.4			
SP39	0.3	0.3			
SP40	0.2	0.3			
SP41	0.2	0.3			
SP42	0.3	0.5			
SP43	0.3	0.3			
SP44	0.3	0.4			

Scala Penetrometer Testing

Client	Hughes Developments	Reference	12903
Site address	Faringdon South Subdivision	Date	31/03/2016 - 01/04/2016
Location	East Maddisons Road & Selwyn Road	By	RB

Test No.	SP01	Test No.	SP02	Test No.	SP03	Test No.	SP04
Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows
100	3	100	3	100	4	100	5
200	4	200	6	200	9	200	7
300	15	300	8	300	15	300	8
400		400	6	400		400	15
500		500	15	500		500	
600		600		600		600	
700		700		700		700	
800		800		800		800	
900		900		900		900	
1000		1000		1000		1000	
1100		1100		1100		1100	
1200		1200		1200		1200	
1300		1300		1300		1300	
1400		1400		1400		1400	
1500		1500		1500		1500	
Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal	
Notes: NA		Notes: NA		Notes: NA		Notes: NA	

Test No.	SP05	Test No.	SP06	Test No.	SP07	Test No.	SP08
Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows
100	2	100	1	100	4	100	5
200	5	200	8	200	8	200	9
300	15	300	15	300	15	300	15
400		400		400		400	
500		500		500		500	
600		600		600		600	
700		700		700		700	
800		800		800		800	
900		900		900		900	
1000		1000		1000		1000	
1100		1100		1100		1100	
1200		1200		1200		1200	
1300		1300		1300		1300	
1400		1400		1400		1400	
1500		1500		1500		1500	
Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal	
Notes: NA		Notes: NA		Notes: NA		Notes: NA	

Scala Penetrometer Testing

Client Hughes Developments

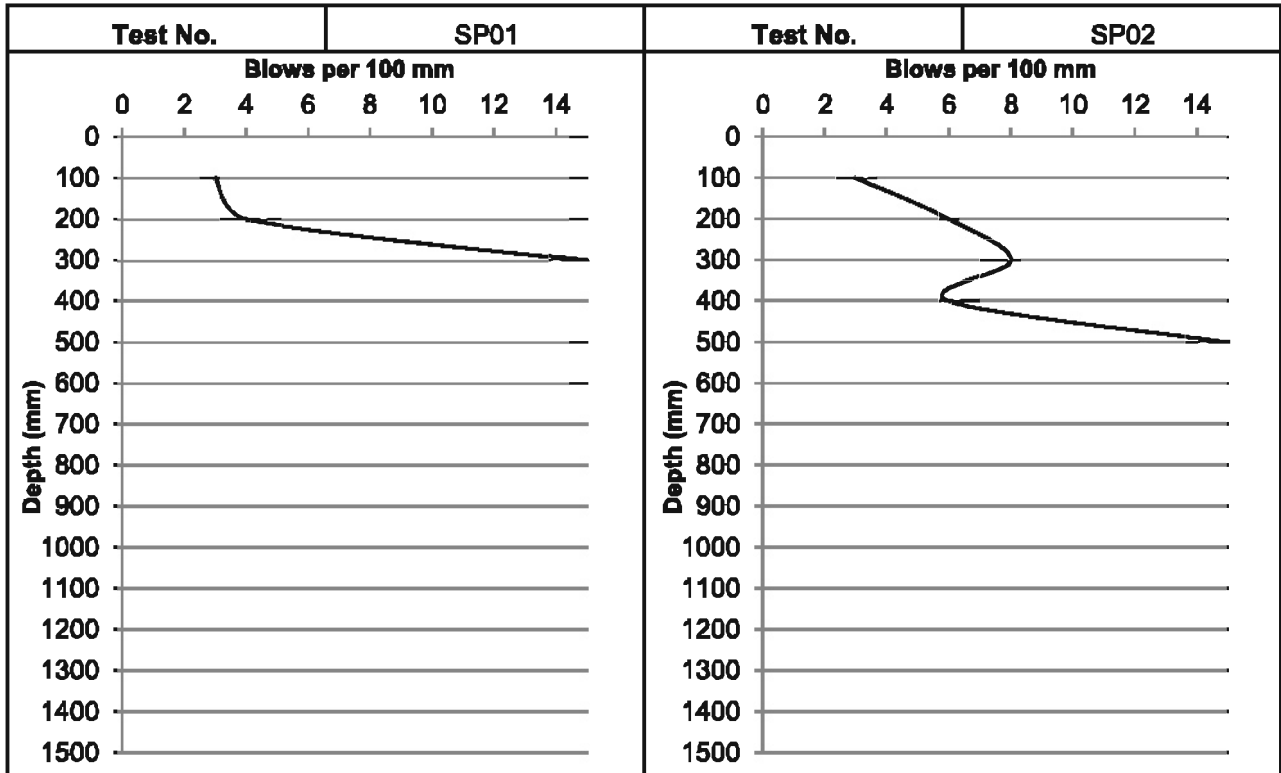
Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

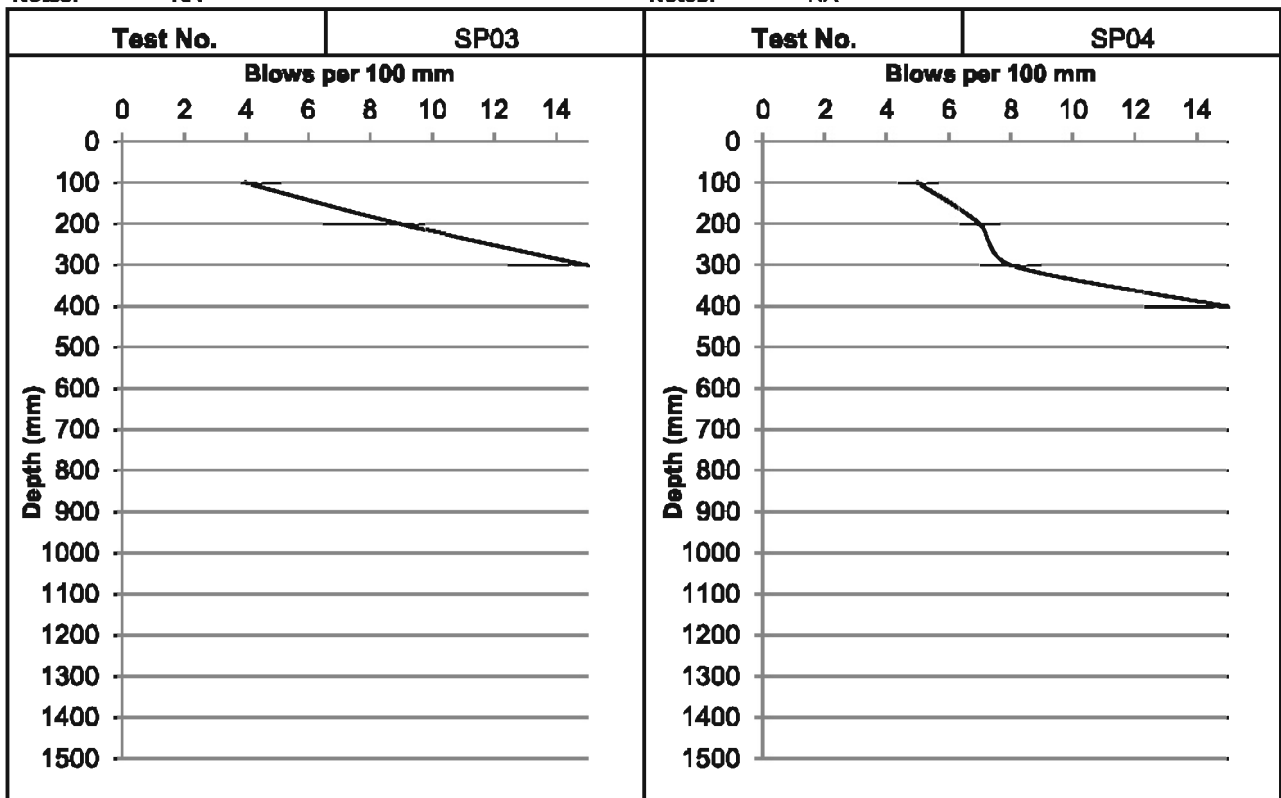


Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA



Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA

Scala Penetrometer Testing

Client Hughes Developments

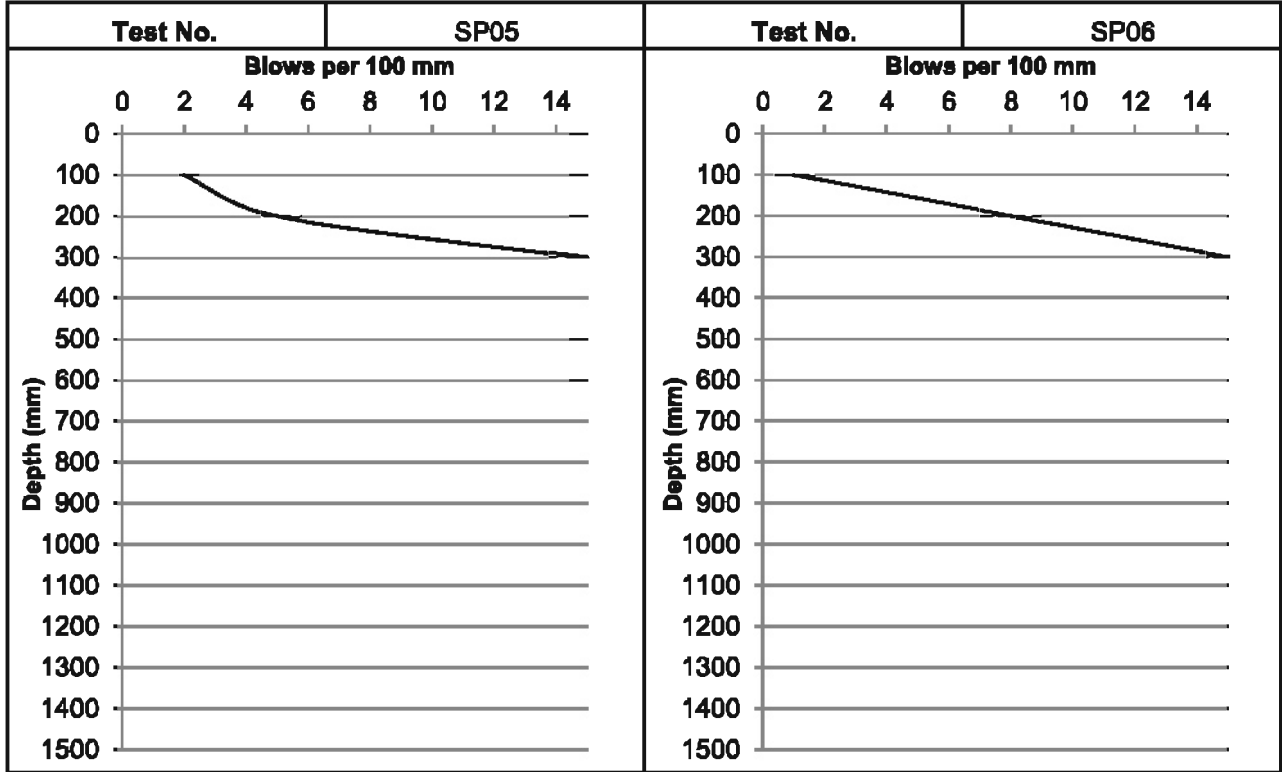
Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

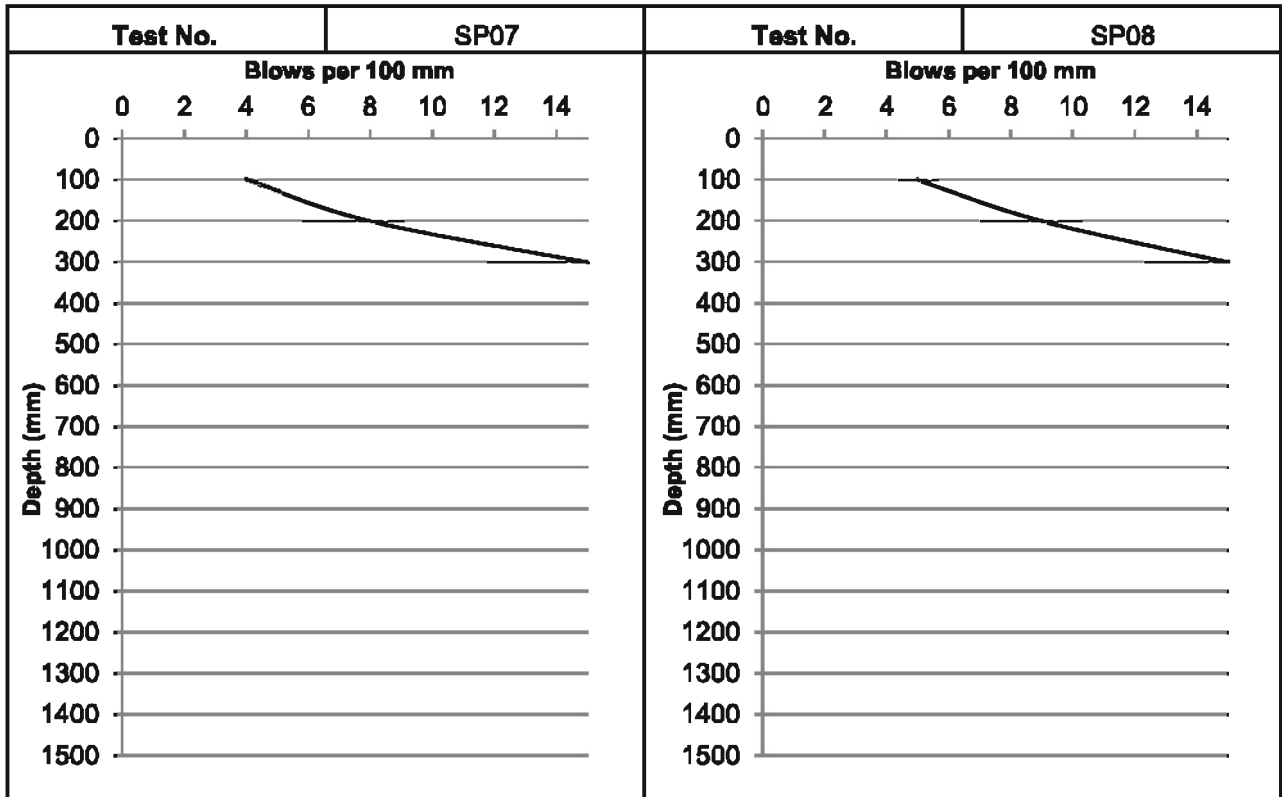


Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA



Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA

Scala Penetrometer Testing

Client Hughes Developments

Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

Test No.	SP09	Test No.	SP10	Test No.	SP11	Test No.	SP12
Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows
100	2	100	2	100	4	100	2
200	3	200	4	200	13	200	11
300	15	300	7	300	15	300	15
400		400	4	400		400	
500		500	3	500		500	
600		600	15	600		600	
700		700		700		700	
800		800		800		800	
900		900		900		900	
1000		1000		1000		1000	
1100		1100		1100		1100	
1200		1200		1200		1200	
1300		1300		1300		1300	
1400		1400		1400		1400	
1500		1500		1500		1500	
Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal	
Notes: NA		Notes: NA		Notes: NA		Notes: NA	

Test No.	SP13	Test No.	SP14	Test No.	SP15	Test No.	SP16
Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows
100	3	100	4	100	2	100	2
200	4	200	7	200	3	200	3
300	15	300	15	300	11	300	15
400		400		400	15	400	
500		500		500		500	
600		600		600		600	
700		700		700		700	
800		800		800		800	
900		900		900		900	
1000		1000		1000		1000	
1100		1100		1100		1100	
1200		1200		1200		1200	
1300		1300		1300		1300	
1400		1400		1400		1400	
1500		1500		1500		1500	
Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal	
Notes: NA		Notes: NA		Notes: NA		Notes: NA	

Scala Penetrometer Testing

Client Hughes Developments

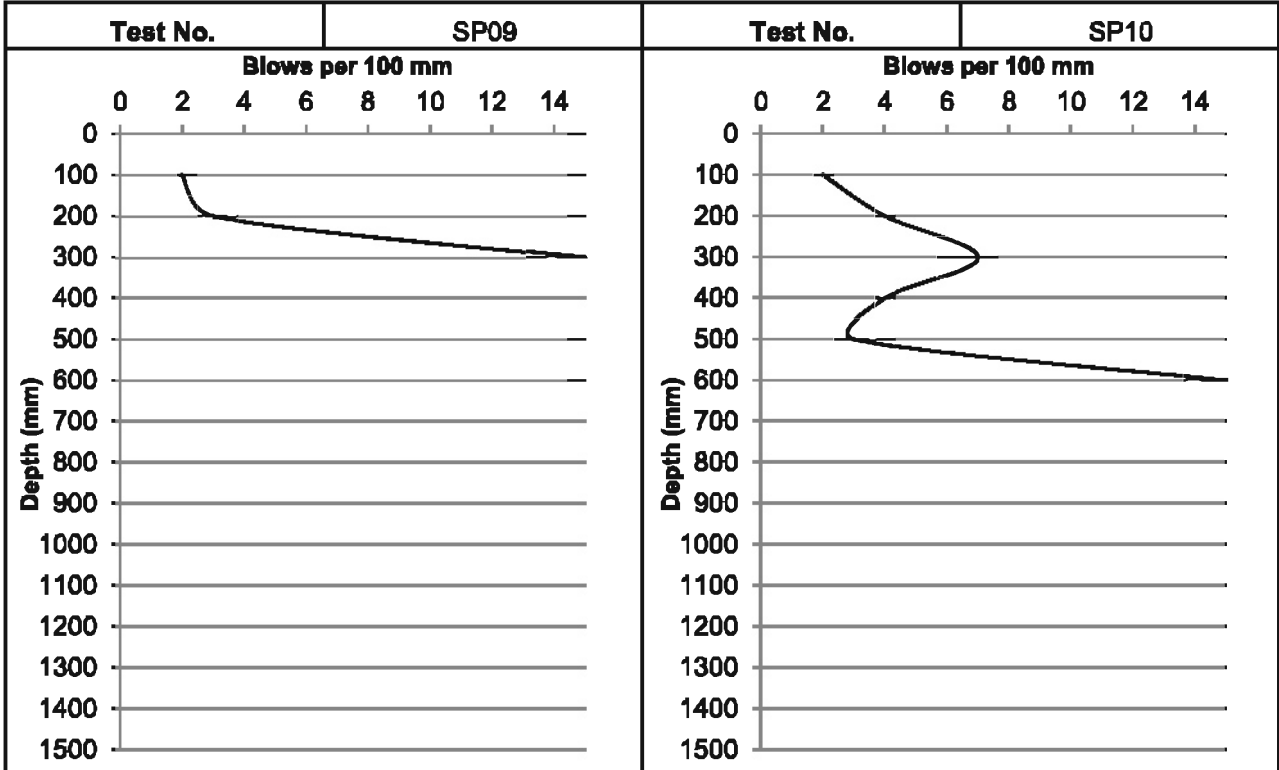
Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

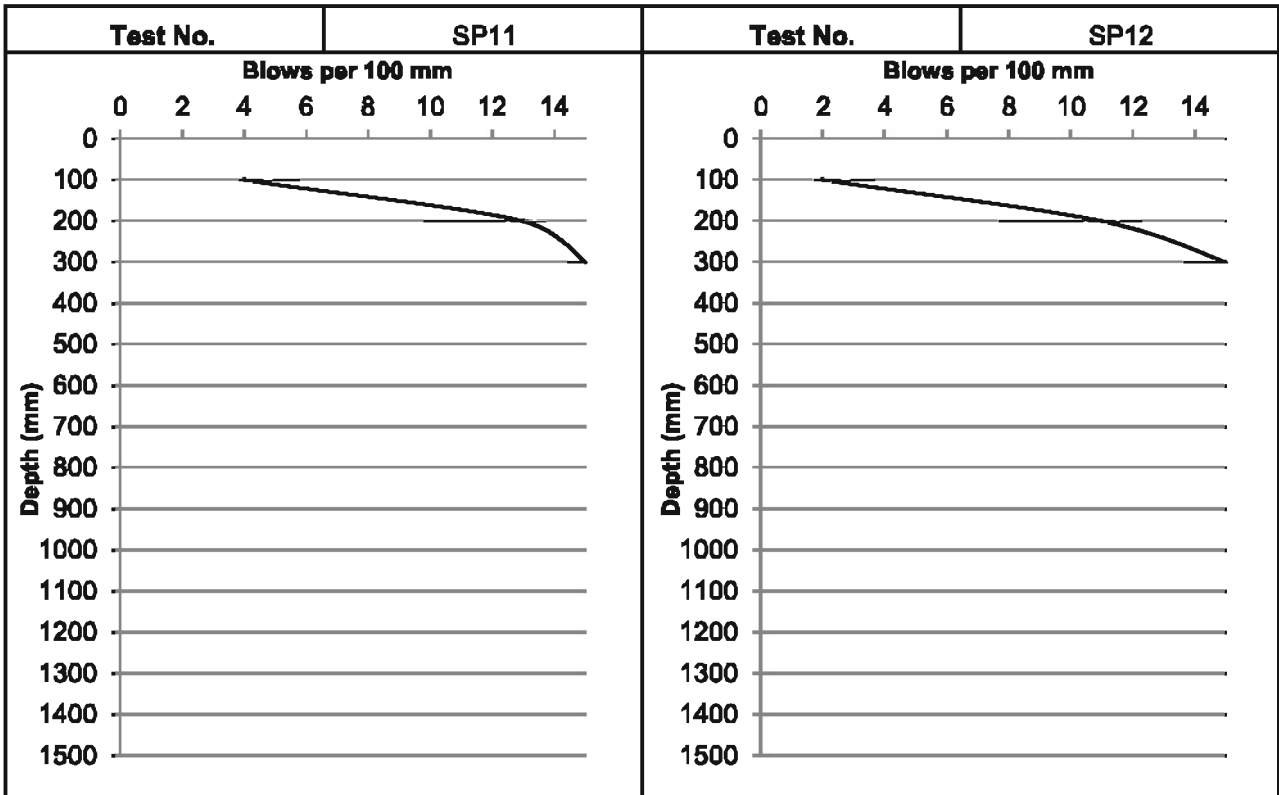


Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA



Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA

Scala Penetrometer Testing

Client Hughes Developments

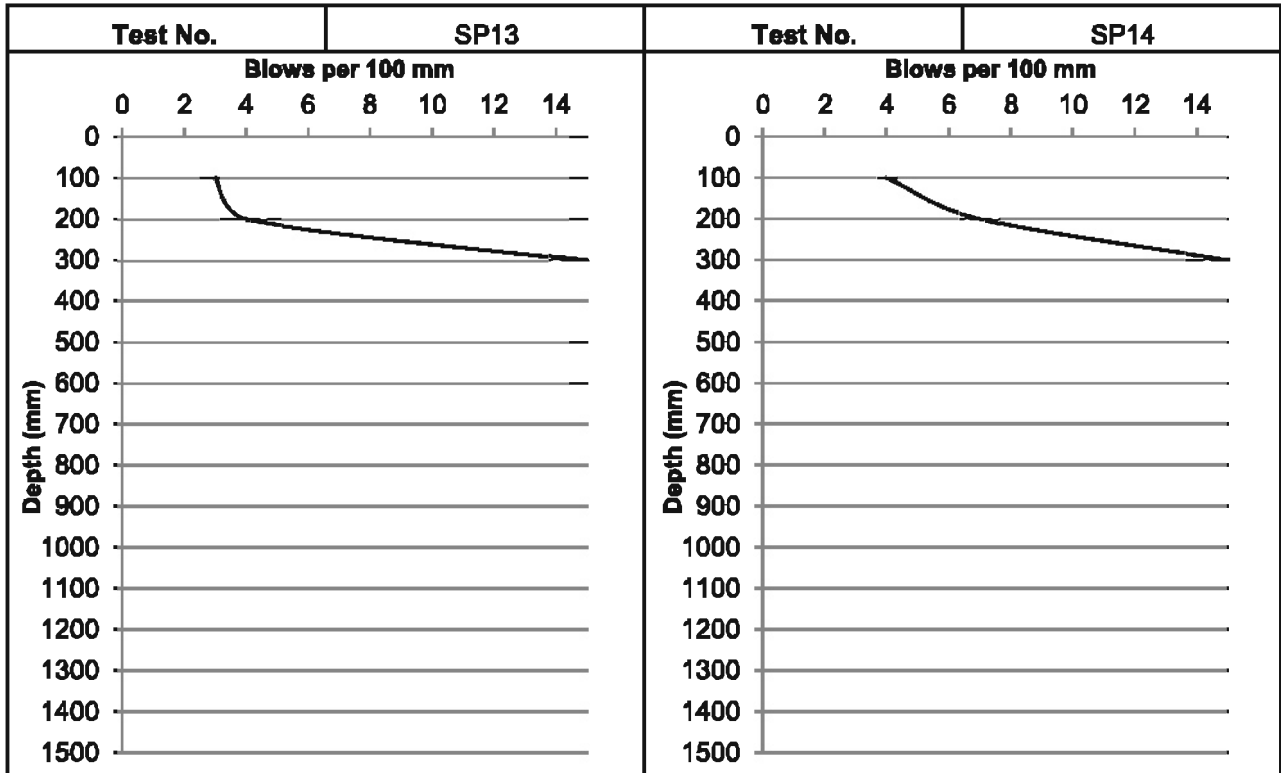
Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

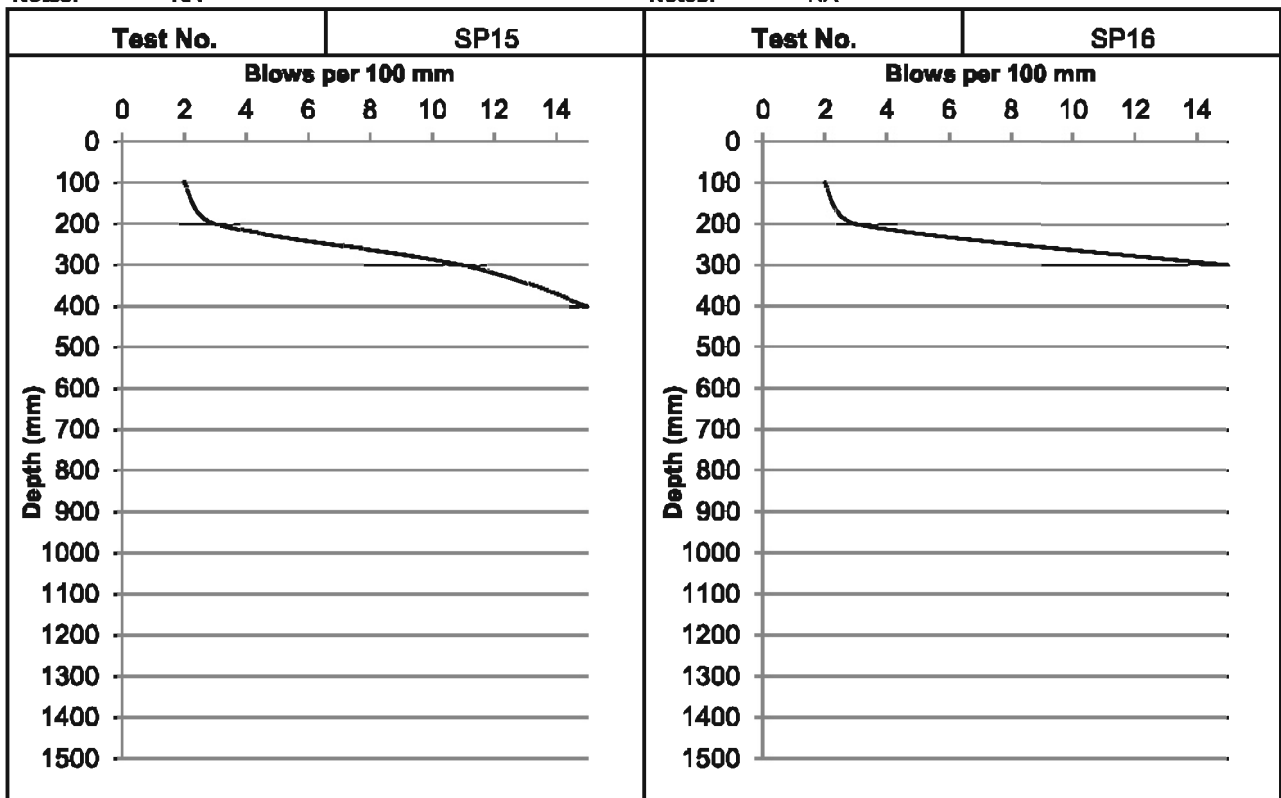


Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA



Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA

Scala Penetrometer Testing

Client Hughes Developments

Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

Test No.	SP17	Test No.	SP18	Test No.	SP19	Test No.	SP20
Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows
100	1	100	3	100	1	100	1
200	3	200	4	200	4	200	3
300	9	300	15	300	9	300	7
400	15	400		400	15	400	15
500		500		500		500	
600		600		600		600	
700		700		700		700	
800		800		800		800	
900		900		900		900	
1000		1000		1000		1000	
1100		1100		1100		1100	
1200		1200		1200		1200	
1300		1300		1300		1300	
1400		1400		1400		1400	
1500		1500		1500		1500	
Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal	
Notes: NA		Notes: NA		Notes: NA		Notes: NA	

Test No.	SP21	Test No.	SP22	Test No.	SP23	Test No.	SP24
Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows
100	2	100	3	100	2	100	2
200	4	200	4	200	3	200	4
300	8	300	15	300	15	300	11
400	15	400		400		400	15
500		500		500		500	
600		600		600		600	
700		700		700		700	
800		800		800		800	
900		900		900		900	
1000		1000		1000		1000	
1100		1100		1100		1100	
1200		1200		1200		1200	
1300		1300		1300		1300	
1400		1400		1400		1400	
1500		1500		1500		1500	
Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal	
Notes: NA		Notes: NA		Notes: NA		Notes: NA	

Scala Penetrometer Testing

Client Hughes Developments

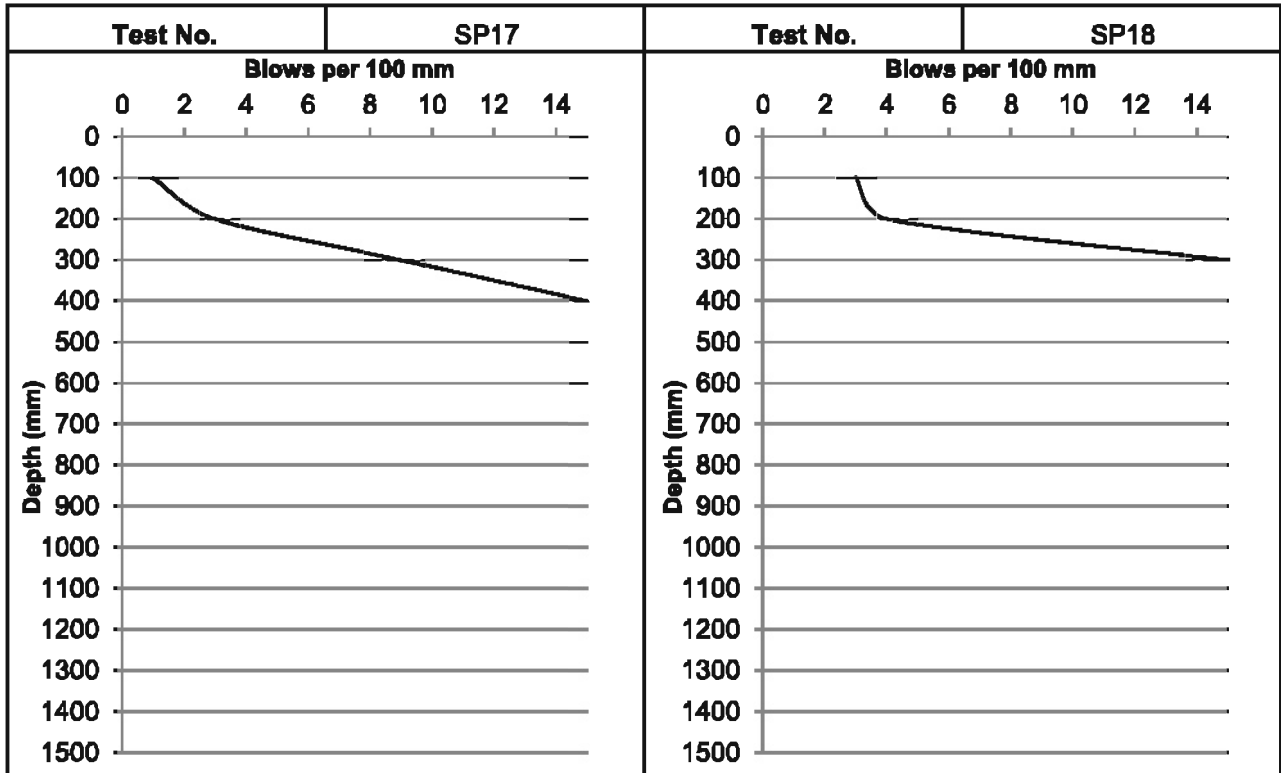
Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

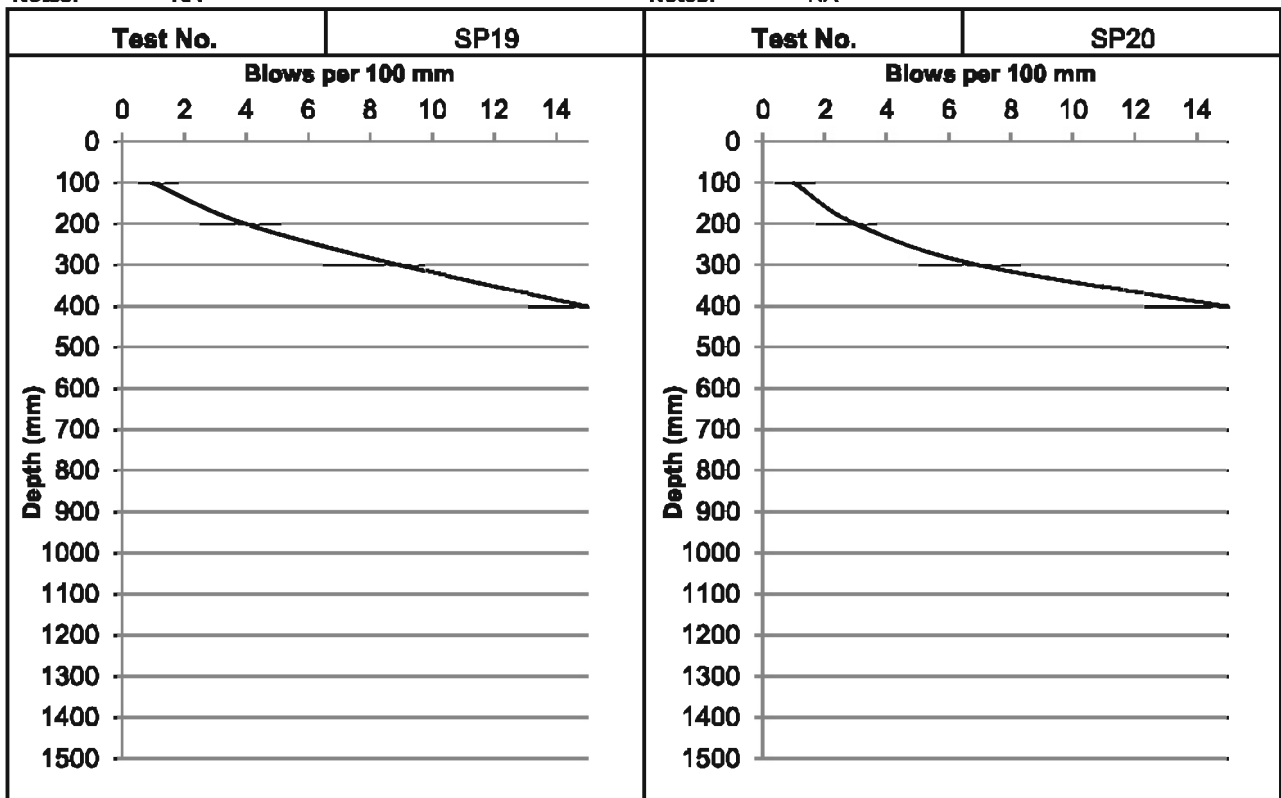


Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA



Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA

Scala Penetrometer Testing

Client Hughes Developments

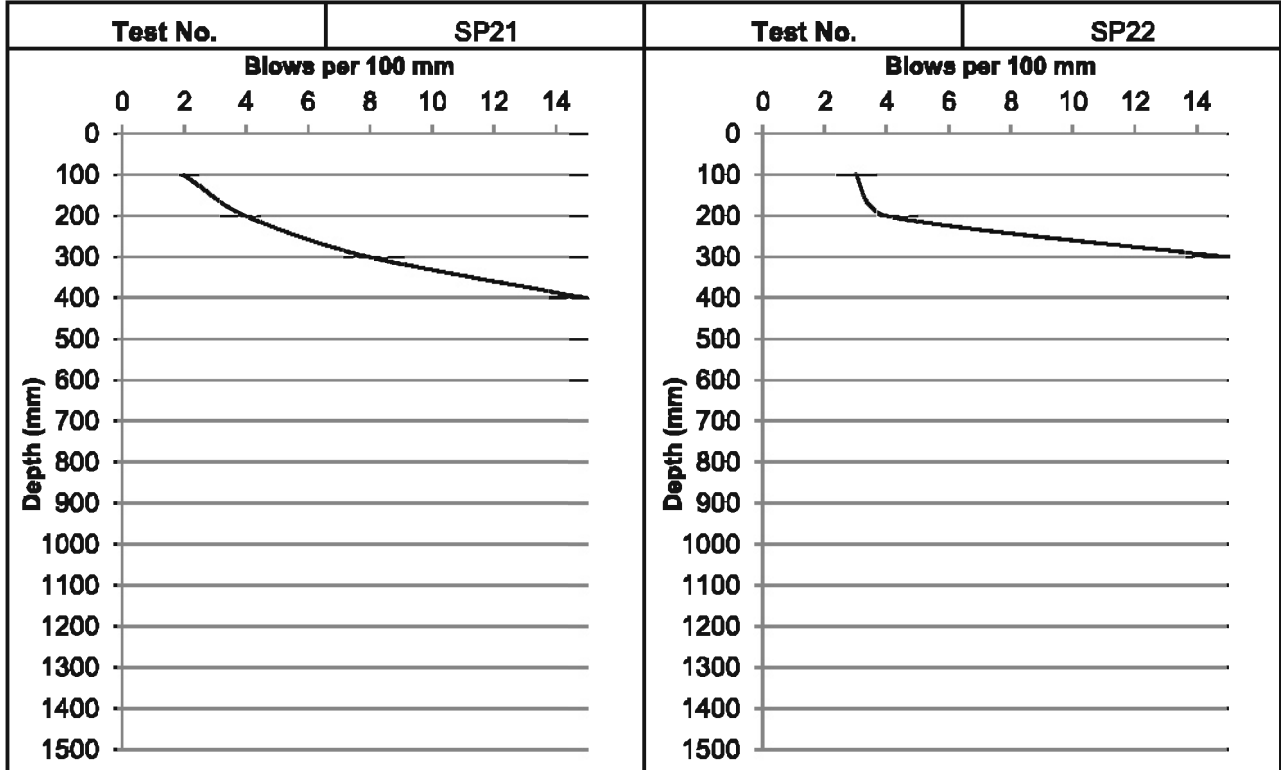
Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

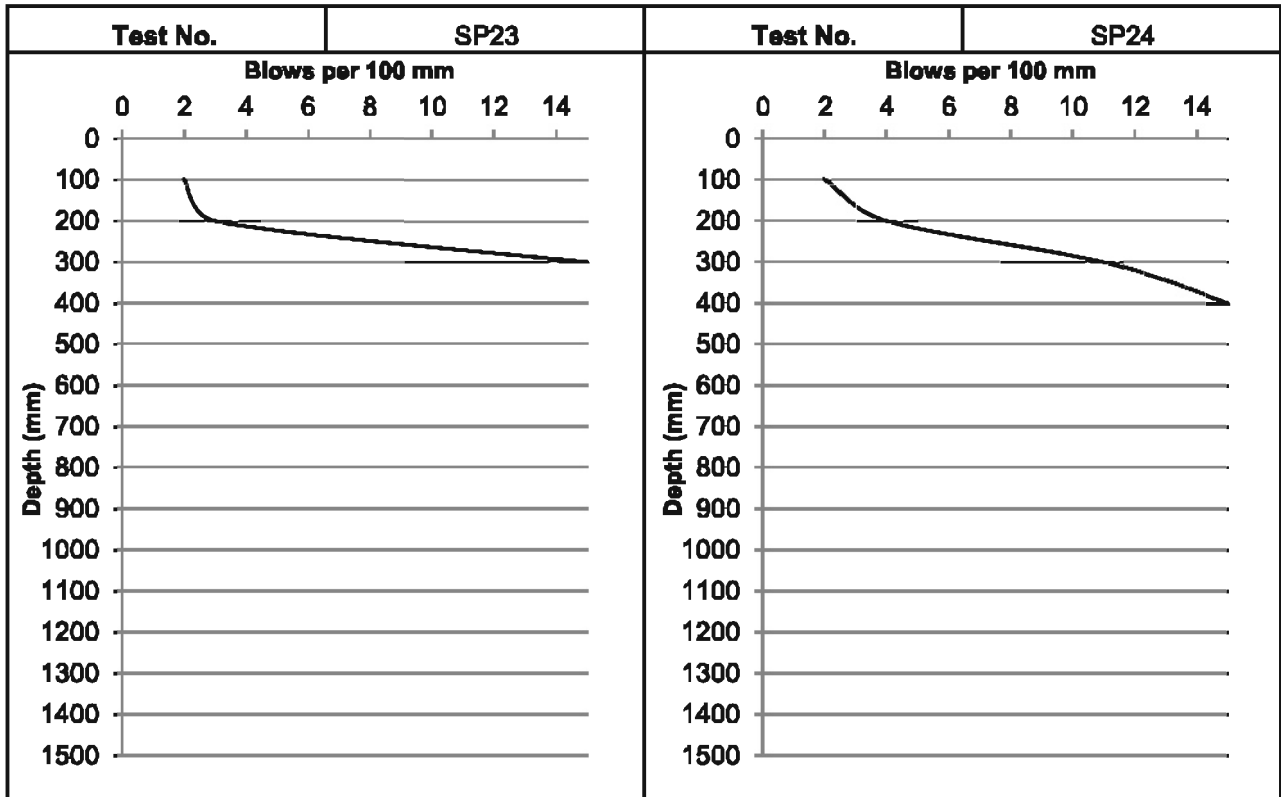


Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA



Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA

Scala Penetrometer Testing

Client Hughes Developments

Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

Test No.	SP25	Test No.	SP26	Test No.	SP27	Test No.	SP28
Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows
100	4	100	3	100	2	100	3
200	11	200	8	200	5	200	4
300	15	300	15	300	15	300	15
400		400		400		400	
500		500		500		500	
600		600		600		600	
700		700		700		700	
800		800		800		800	
900		900		900		900	
1000		1000		1000		1000	
1100		1100		1100		1100	
1200		1200		1200		1200	
1300		1300		1300		1300	
1400		1400		1400		1400	
1500		1500		1500		1500	
Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal	
Notes: NA		Notes: NA		Notes: NA		Notes: NA	

Test No.	SP29	Test No.	SP30	Test No.	SP31	Test No.	SP32
Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows
100	5	100	1	100	2	100	2
200	6	200	3	200	3	200	3
300	11	300	15	300	7	300	5
400	15	400		400	15	400	15
500		500		500		500	
600		600		600		600	
700		700		700		700	
800		800		800		800	
900		900		900		900	
1000		1000		1000		1000	
1100		1100		1100		1100	
1200		1200		1200		1200	
1300		1300		1300		1300	
1400		1400		1400		1400	
1500		1500		1500		1500	
Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal	
Notes: NA		Notes: NA		Notes: NA		Notes: NA	

Scala Penetrometer Testing

Client Hughes Developments

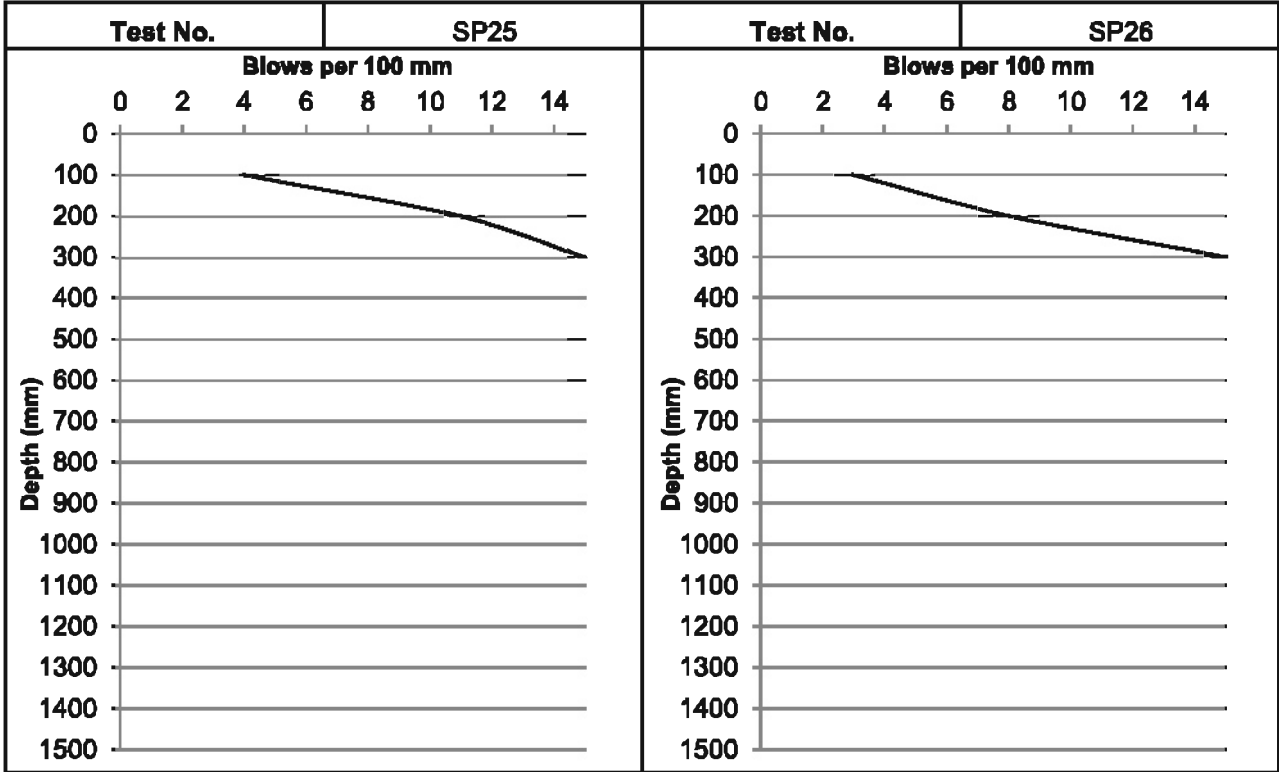
Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

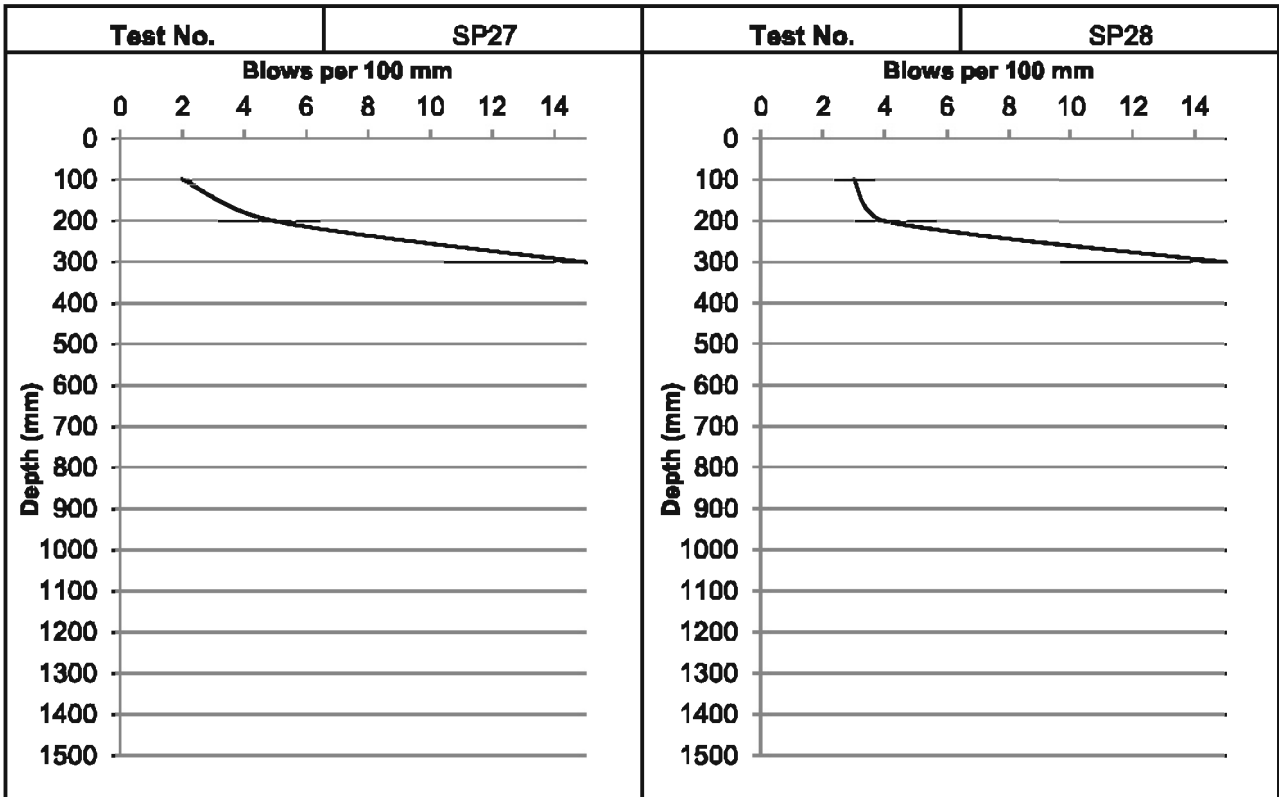


Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA



Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA

Scala Penetrometer Testing

Client Hughes Developments

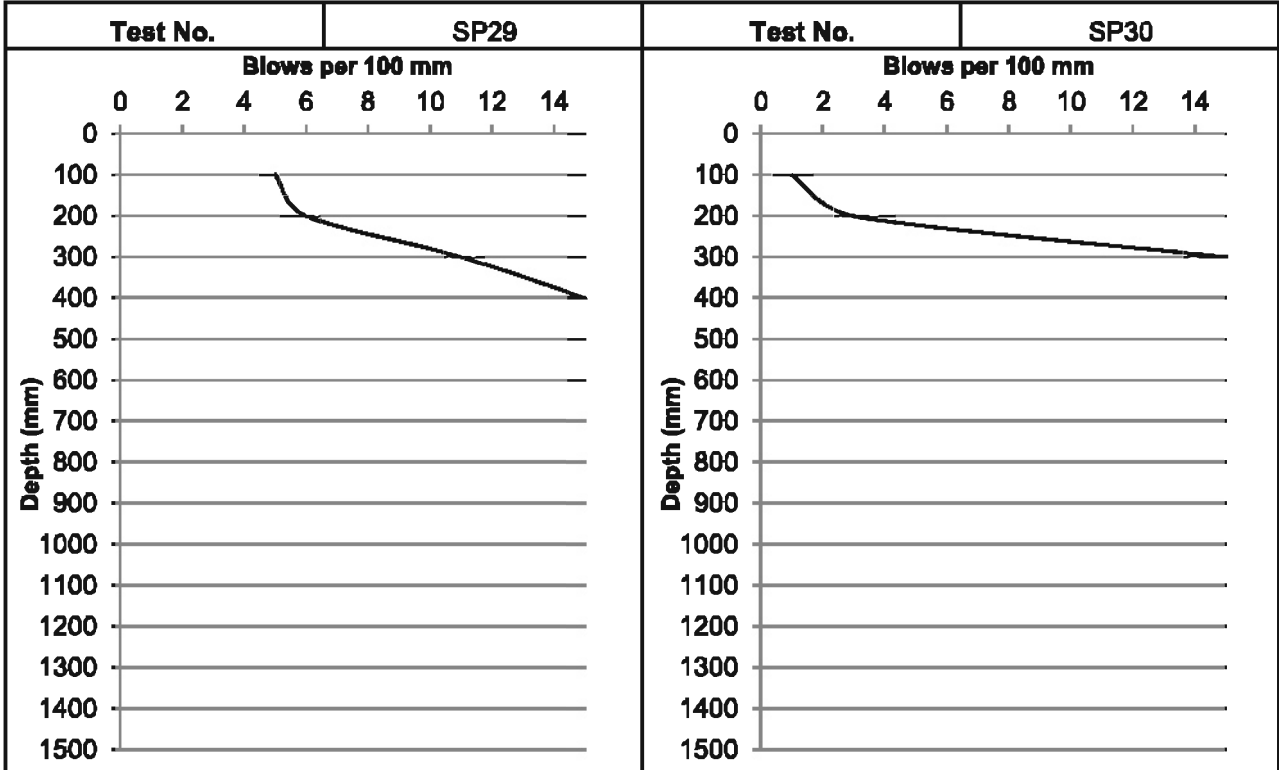
Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

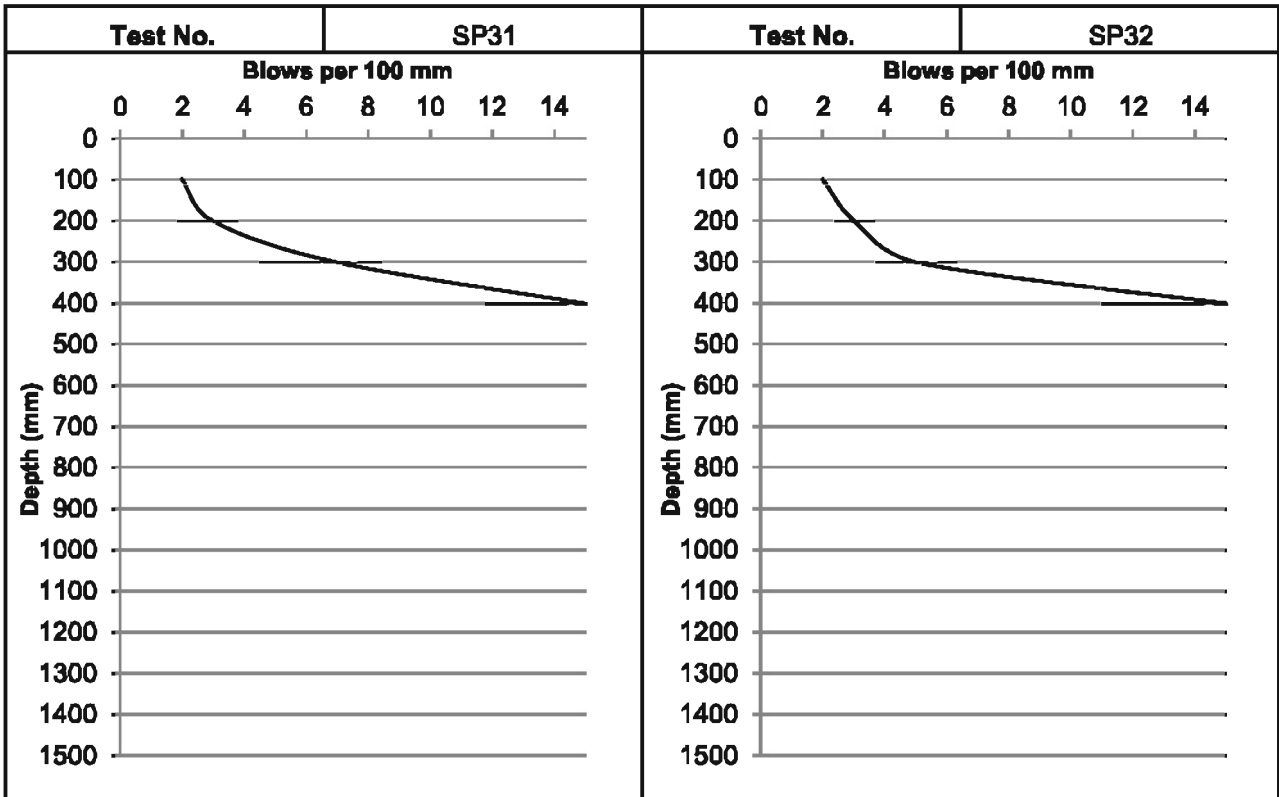


Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA



Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA

Scala Penetrometer Testing

Client Hughes Developments

Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

Test No.	SP33	Test No.	SP34	Test No.	SP35	Test No.	SP36
Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows
100	3	100	2	100	2	100	2
200	15	200	2	200	2	200	4
300		300	9	300	4	300	15
400		400	15	400	15	400	
500		500		500		500	
600		600		600		600	
700		700		700		700	
800		800		800		800	
900		900		900		900	
1000		1000		1000		1000	
1100		1100		1100		1100	
1200		1200		1200		1200	
1300		1300		1300		1300	
1400		1400		1400		1400	
1500		1500		1500		1500	
Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal	
Notes: NA		Notes: NA		Notes: NA		Notes: NA	

Test No.	SP37	Test No.	SP38	Test No.	SP39	Test No.	SP40
Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows
100	1	100	2	100	2	100	2
200	4	200	4	200	2	200	12
300	11	300	6	300	15	300	15
400	15	400	15	400		400	
500		500		500		500	
600		600		600		600	
700		700		700		700	
800		800		800		800	
900		900		900		900	
1000		1000		1000		1000	
1100		1100		1100		1100	
1200		1200		1200		1200	
1300		1300		1300		1300	
1400		1400		1400		1400	
1500		1500		1500		1500	
Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal	
Notes: NA		Notes: NA		Notes: NA		Notes: NA	

Scala Penetrometer Testing

Client Hughes Developments

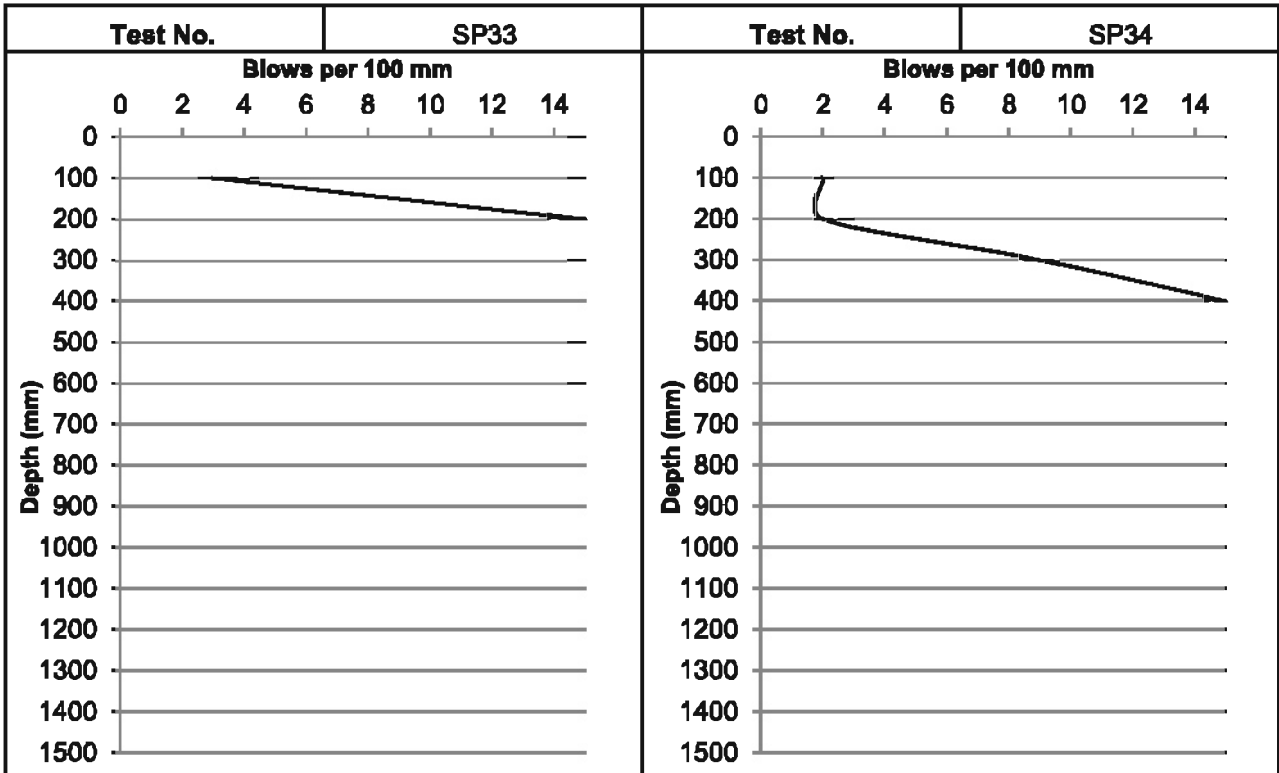
Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

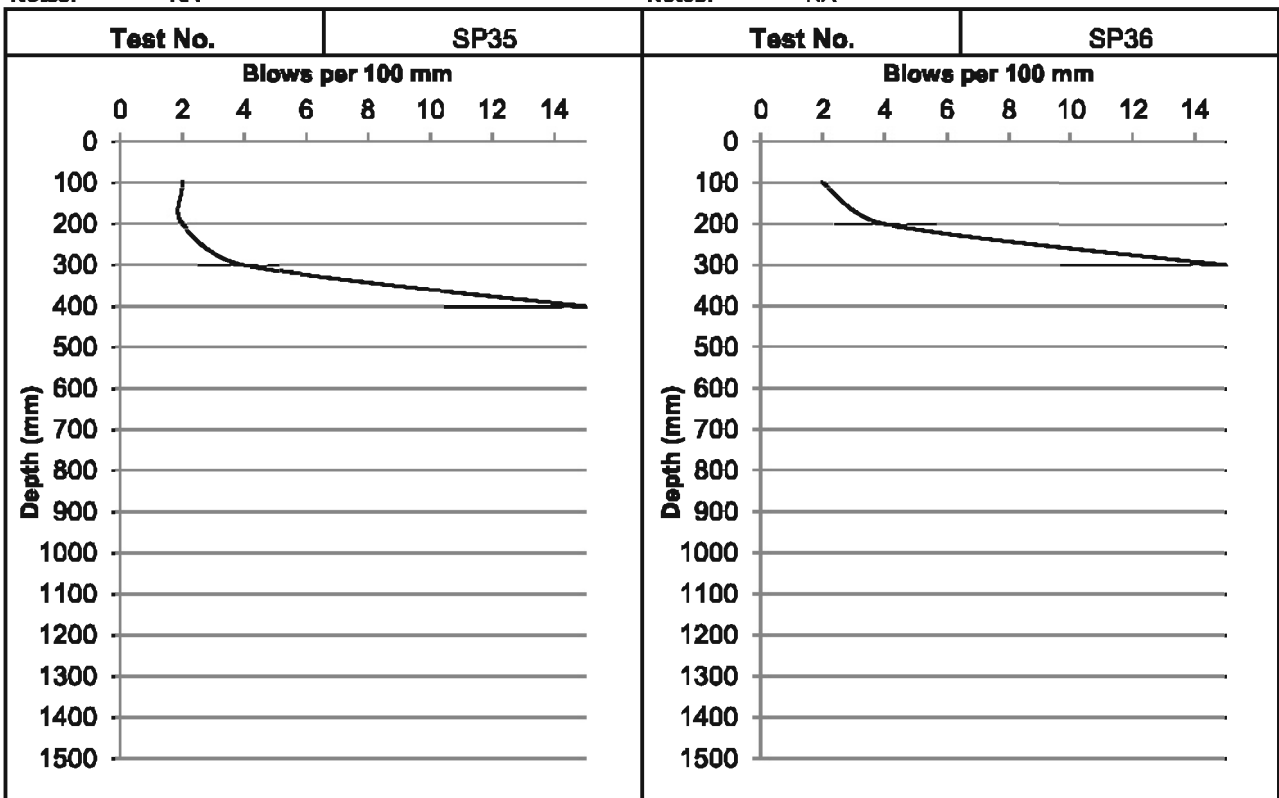


Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA



Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA

Scala Penetrometer Testing

Client Hughes Developments

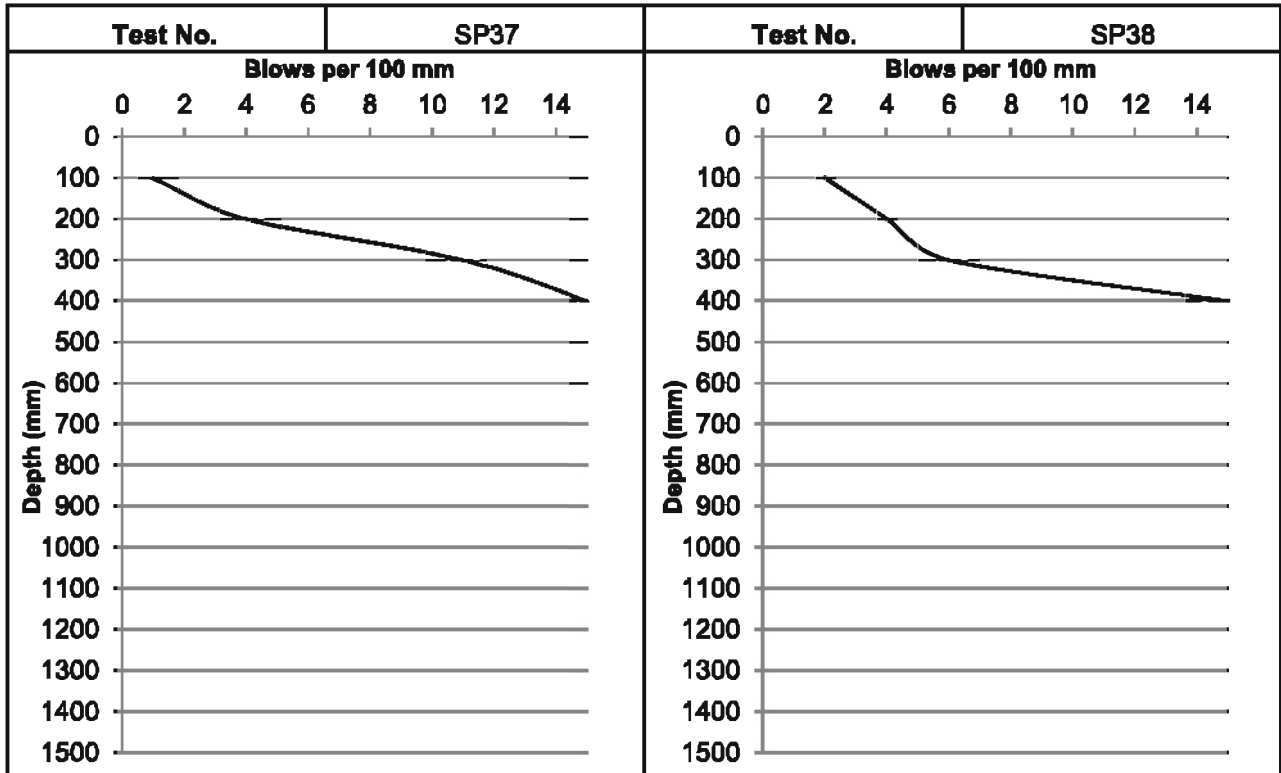
Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

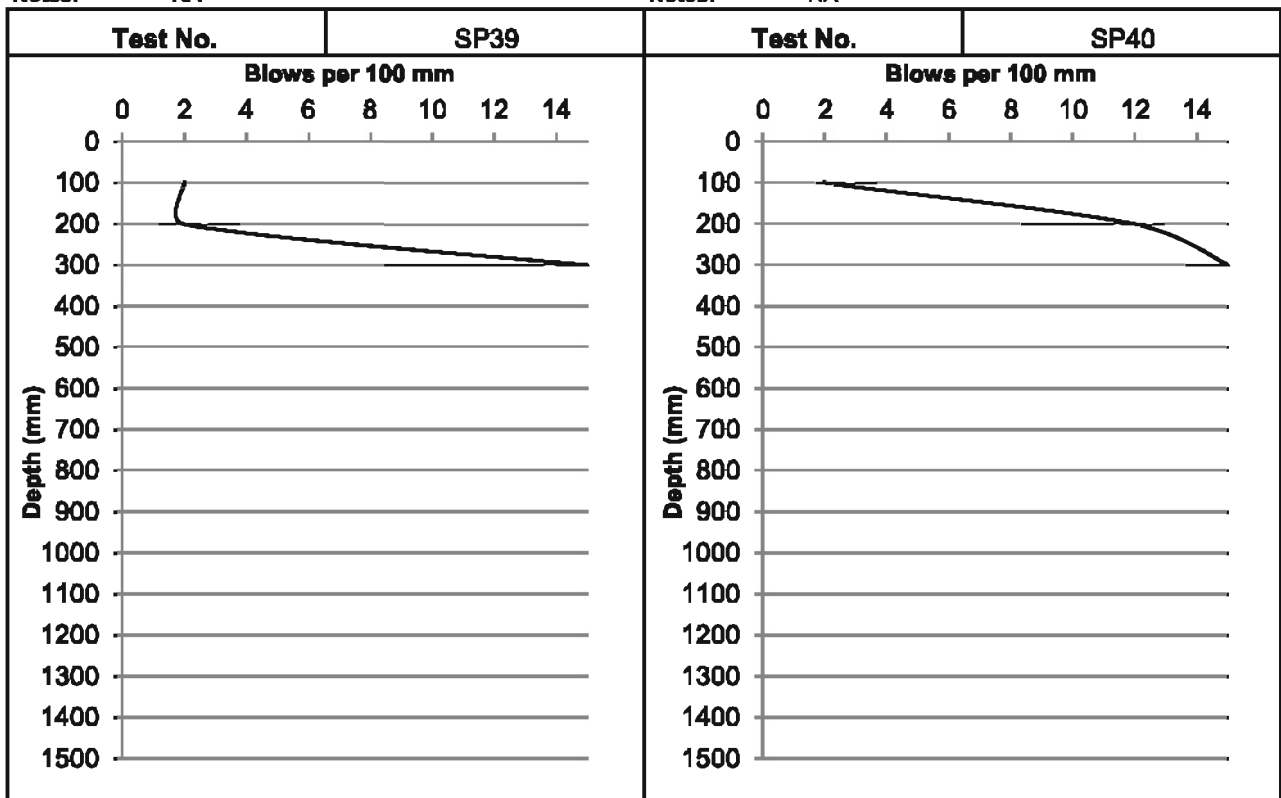


Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA



Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA

Scala Penetrometer Testing

Client Hughes Developments

Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

Test No.	SP41	Test No.	SP42	Test No.	SP43	Test No.	SP44
Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows
100	3	100	2	100	2	100	2
200	5	200	3	200	3	200	3
300	15	300	5	300	15	300	5
400		400	8	400		400	15
500		500	15	500		500	
600		600		600		600	
700		700		700		700	
800		800		800		800	
900		900		900		900	
1000		1000		1000		1000	
1100		1100		1100		1100	
1200		1200		1200		1200	
1300		1300		1300		1300	
1400		1400		1400		1400	
1500		1500		1500		1500	
Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal	
Notes: NA		Notes: NA		Notes: NA		Notes: NA	

Test No.	SP45	Test No.	SP46	Test No.	SP47	Test No.	SP48
Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows
100	3	100	4	100	4	100	3
200	4	200	6	200	7	200	4
300	6	300	7	300	15	300	4
400	15	400	8	400		400	9
500		500	15	500		500	15
600		600		600		600	
700		700		700		700	
800		800		800		800	
900		900		900		900	
1000		1000		1000		1000	
1100		1100		1100		1100	
1200		1200		1200		1200	
1300		1300		1300		1300	
1400		1400		1400		1400	
1500		1500		1500		1500	
Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal	
Notes: NA		Notes: NA		Notes: NA		Notes: NA	

Scala Penetrometer Testing

Client Hughes Developments

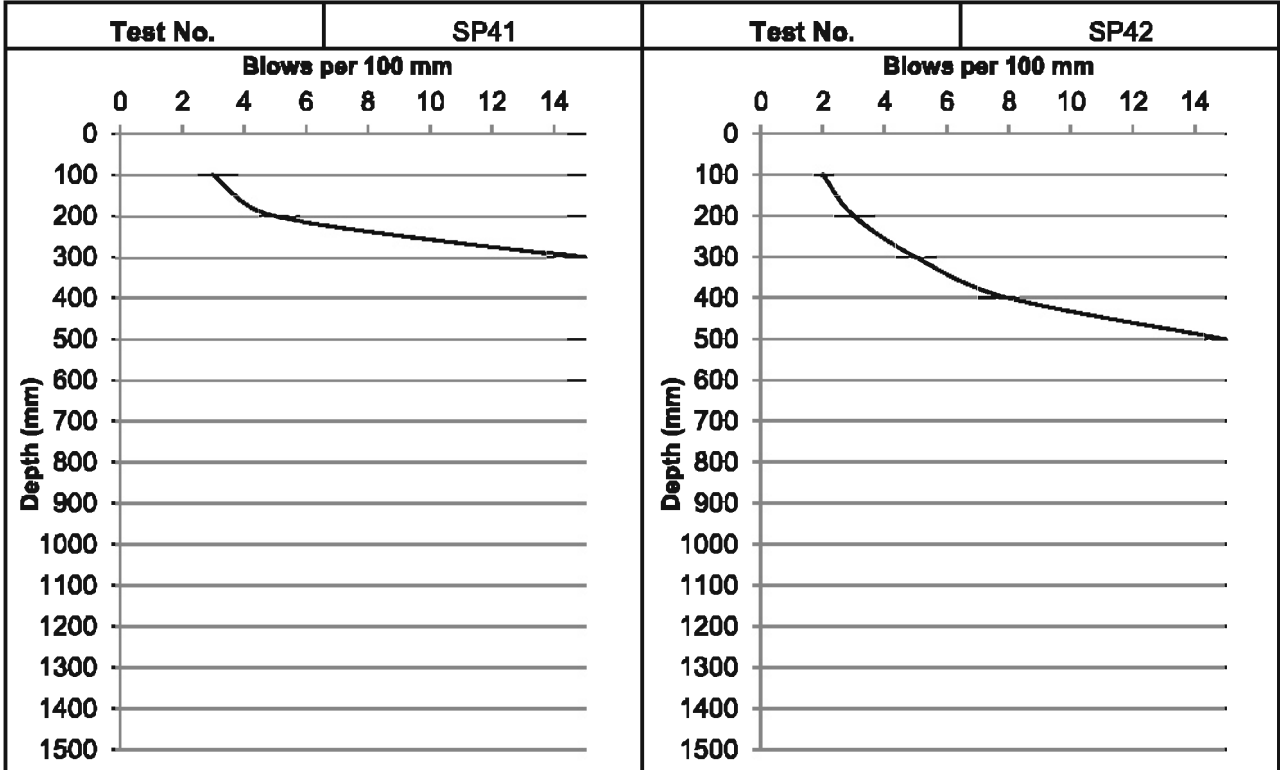
Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

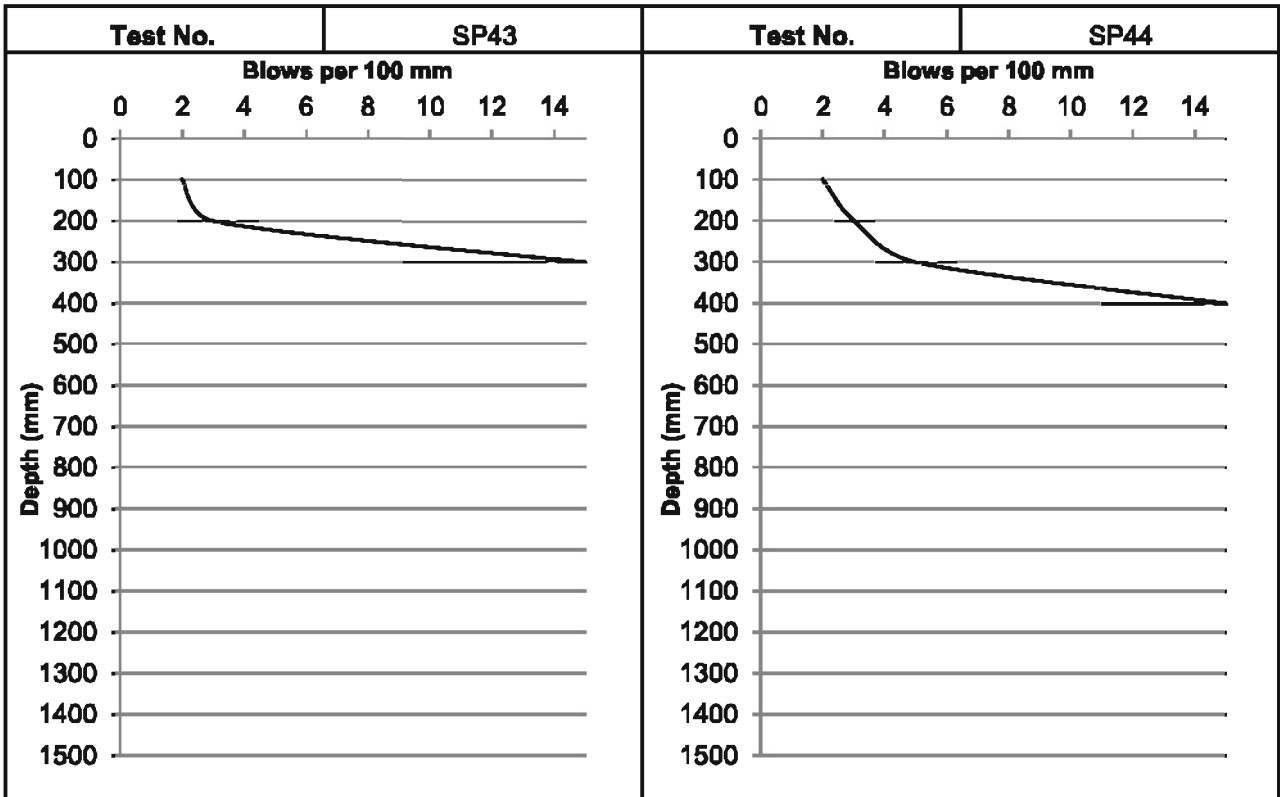


Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA



Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA

Scala Penetrometer Testing

Client Hughes Developments

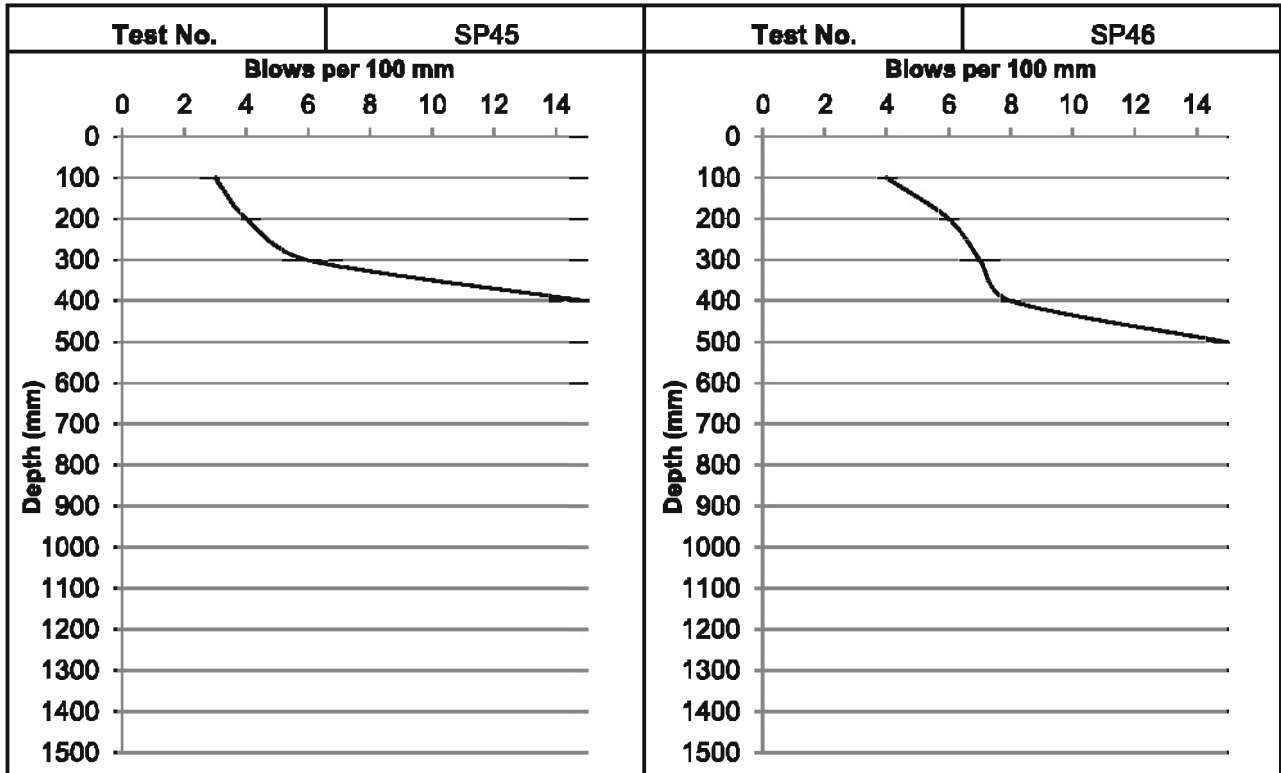
Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

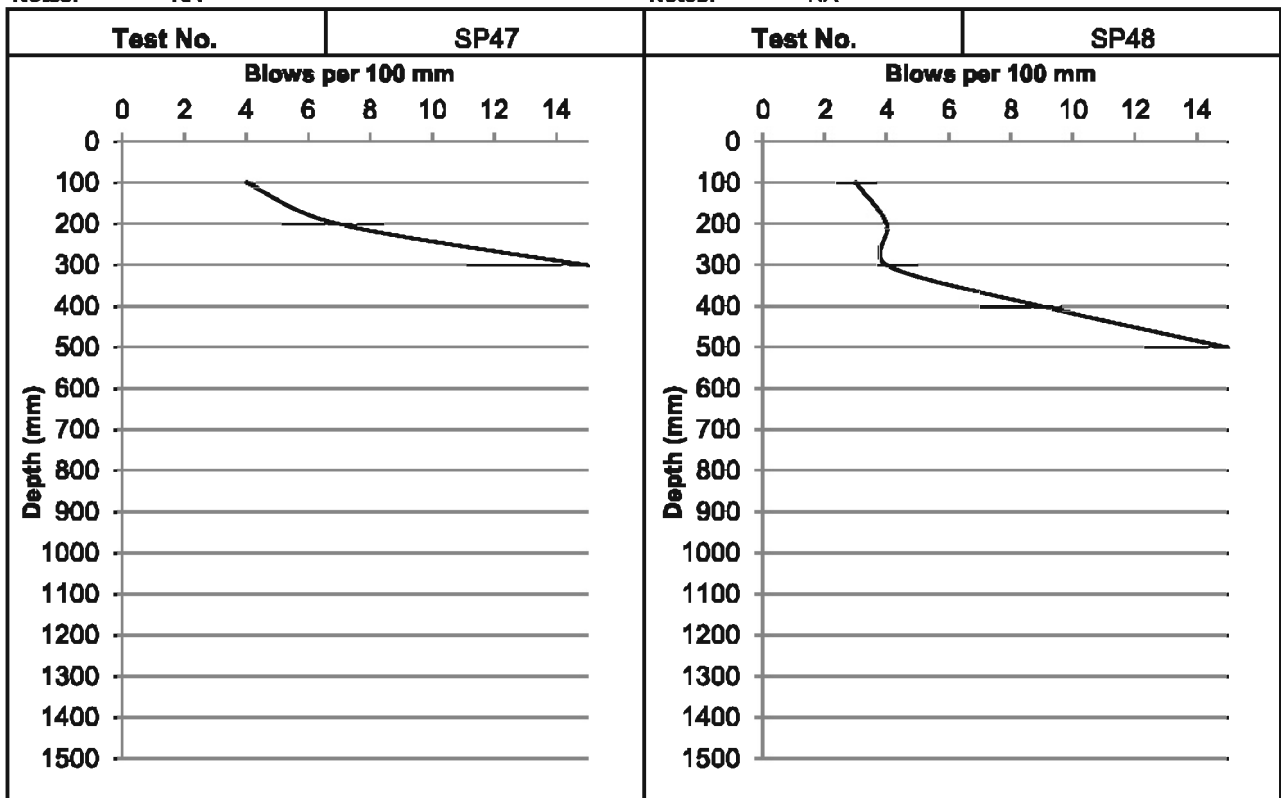


Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA



Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA

Scala Penetrometer Testing

Client Hughes Developments

Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

Test No.	SP49	Test No.	SP50	Test No.	SP51	Test No.	
Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows
100	1	100	8	100	3	100	
200	4	200	15	200	6	200	
300	15	300		300	6	300	
400		400		400	15	400	
500		500		500		500	
600		600		600		600	
700		700		700		700	
800		800		800		800	
900		900		900		900	
1000		1000		1000		1000	
1100		1100		1100		1100	
1200		1200		1200		1200	
1300		1300		1300		1300	
1400		1400		1400		1400	
1500		1500		1500		1500	
Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal		Termination:	
Notes: NA		Notes: NA		Notes: NA		Notes:	

Test No.		Test No.		Test No.		Test No.	
Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows
100		100		100		100	
200		200		200		200	
300		300		300		300	
400		400		400		400	
500		500		500		500	
600		600		600		600	
700		700		700		700	
800		800		800		800	
900		900		900		900	
1000		1000		1000		1000	
1100		1100		1100		1100	
1200		1200		1200		1200	
1300		1300		1300		1300	
1400		1400		1400		1400	
1500		1500		1500		1500	
Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal		Termination: Practical refusal	
Notes:		Notes:		Notes:		Notes:	

Scala Penetrometer Testing

Client Hughes Developments

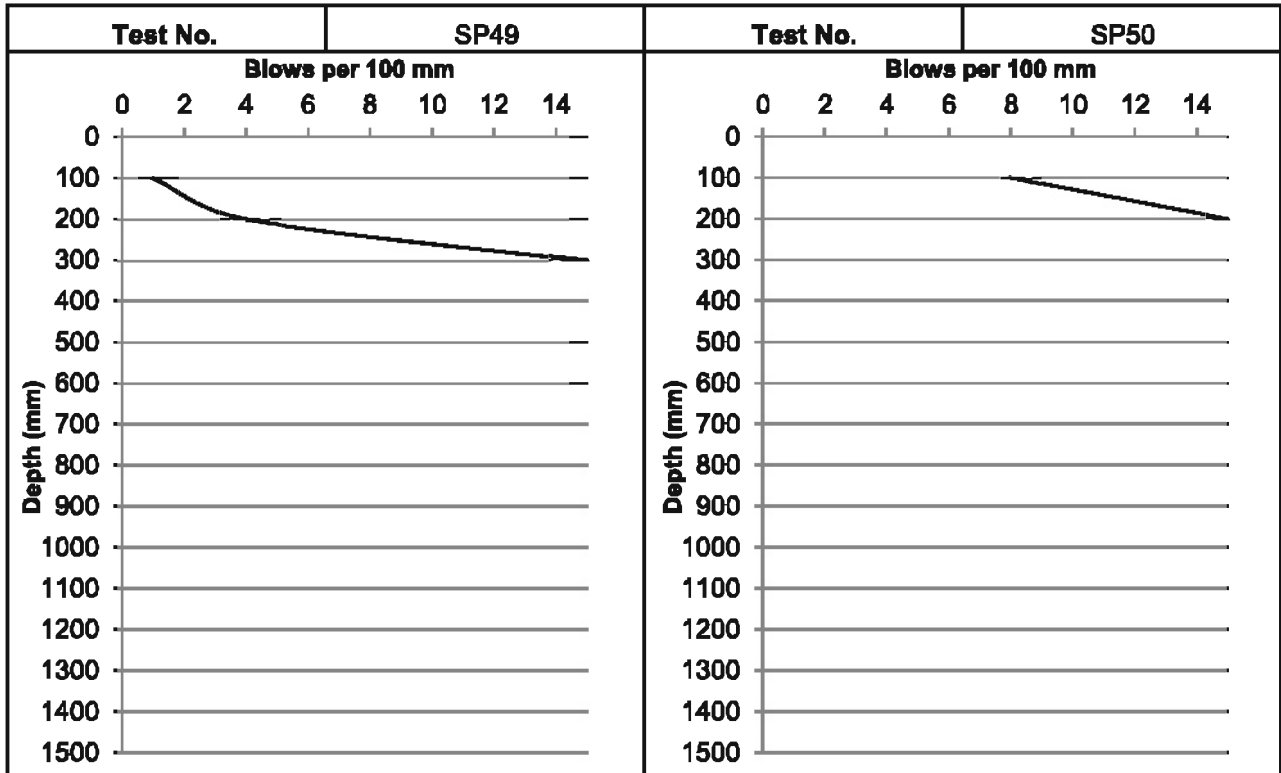
Reference 12903

Site address Faringdon South Subdivision

Date 31/03/2016 - 01/04/2016

Location East Maddisons Road & Selwyn Road

By RB

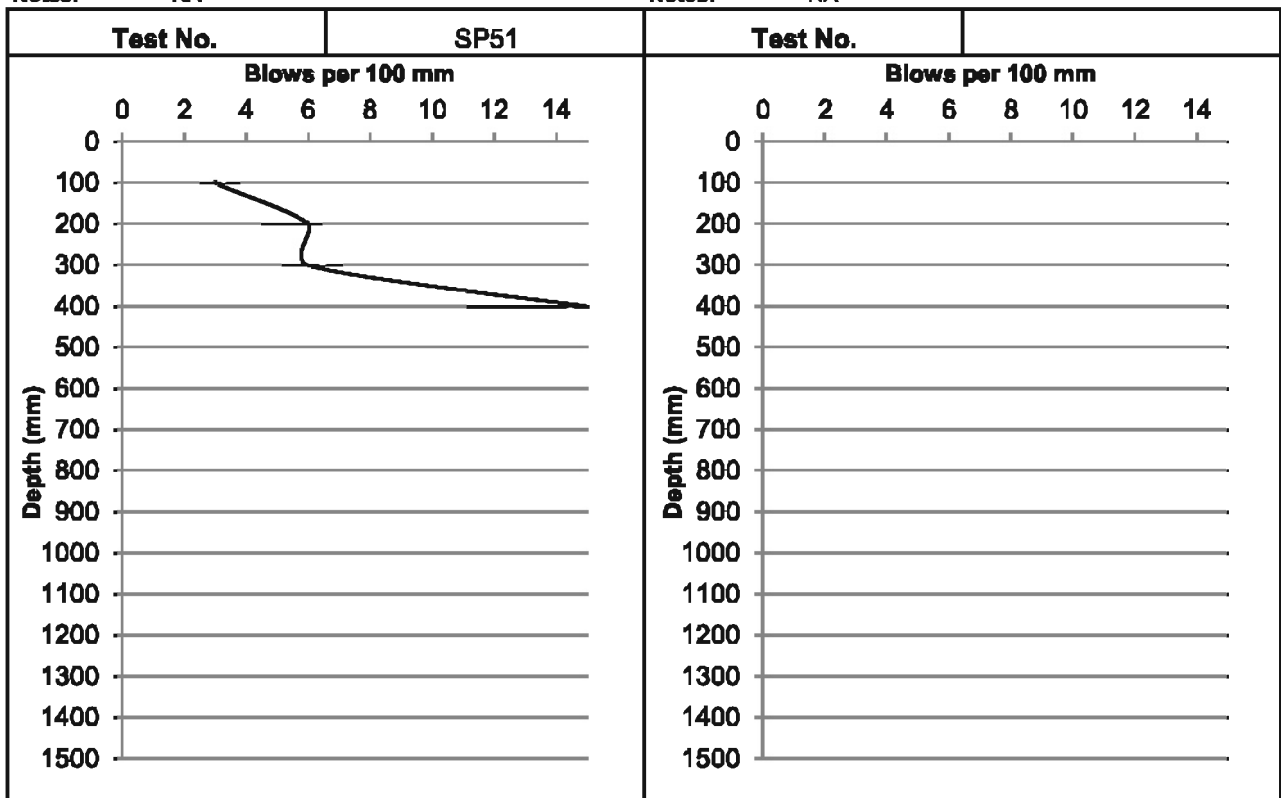


Termination: Practical refusal

Termination: Practical refusal

Notes: NA

Notes: NA



Termination: Practical refusal

Termination:

Notes: NA

Notes:

APPENDIX 4:
ECan Boreholes

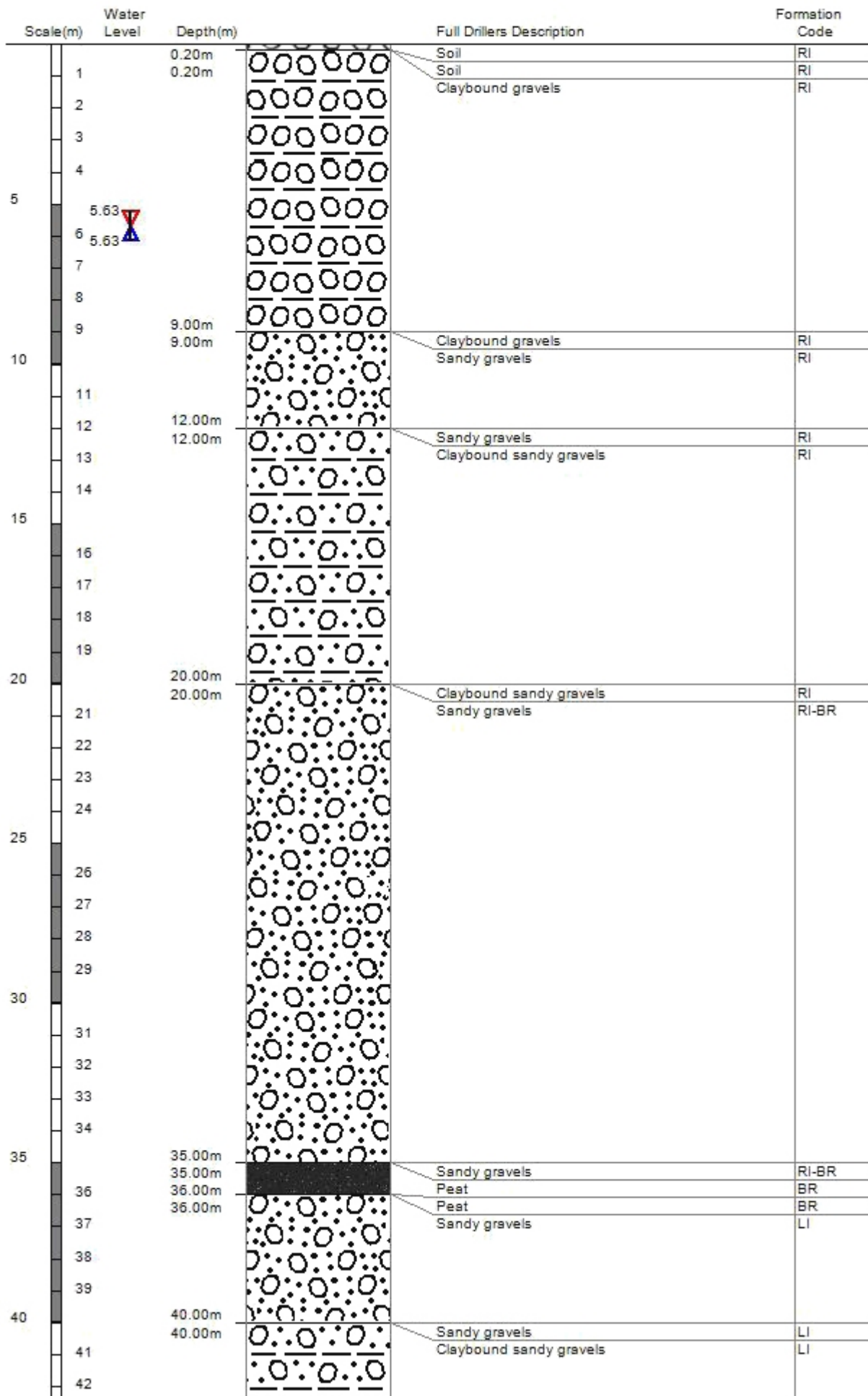
LOCATION ACCURACY: ± 10M

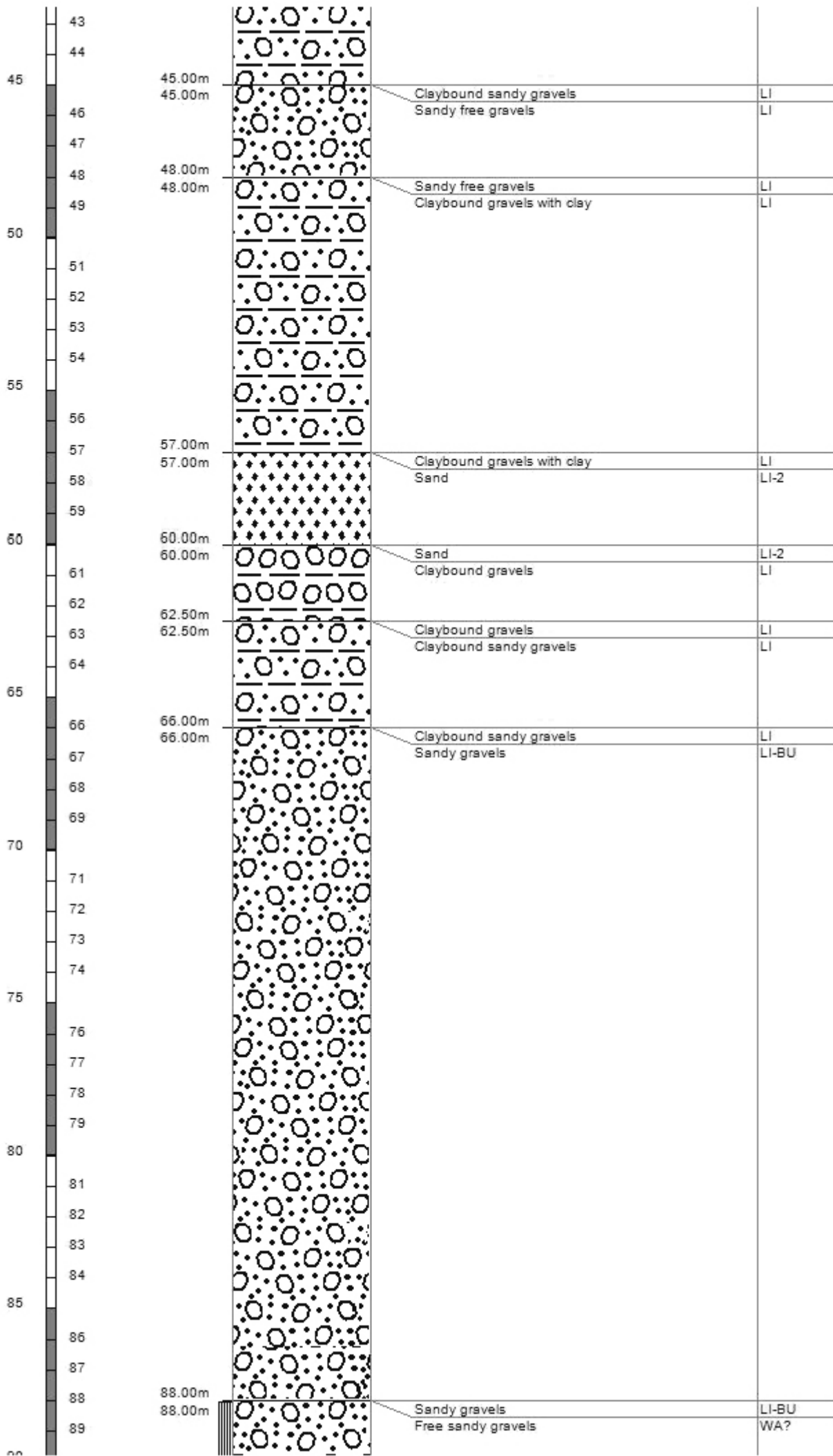
Ground Level Altitude: 35.1 m +MSD Accuracy: < 0.5 m

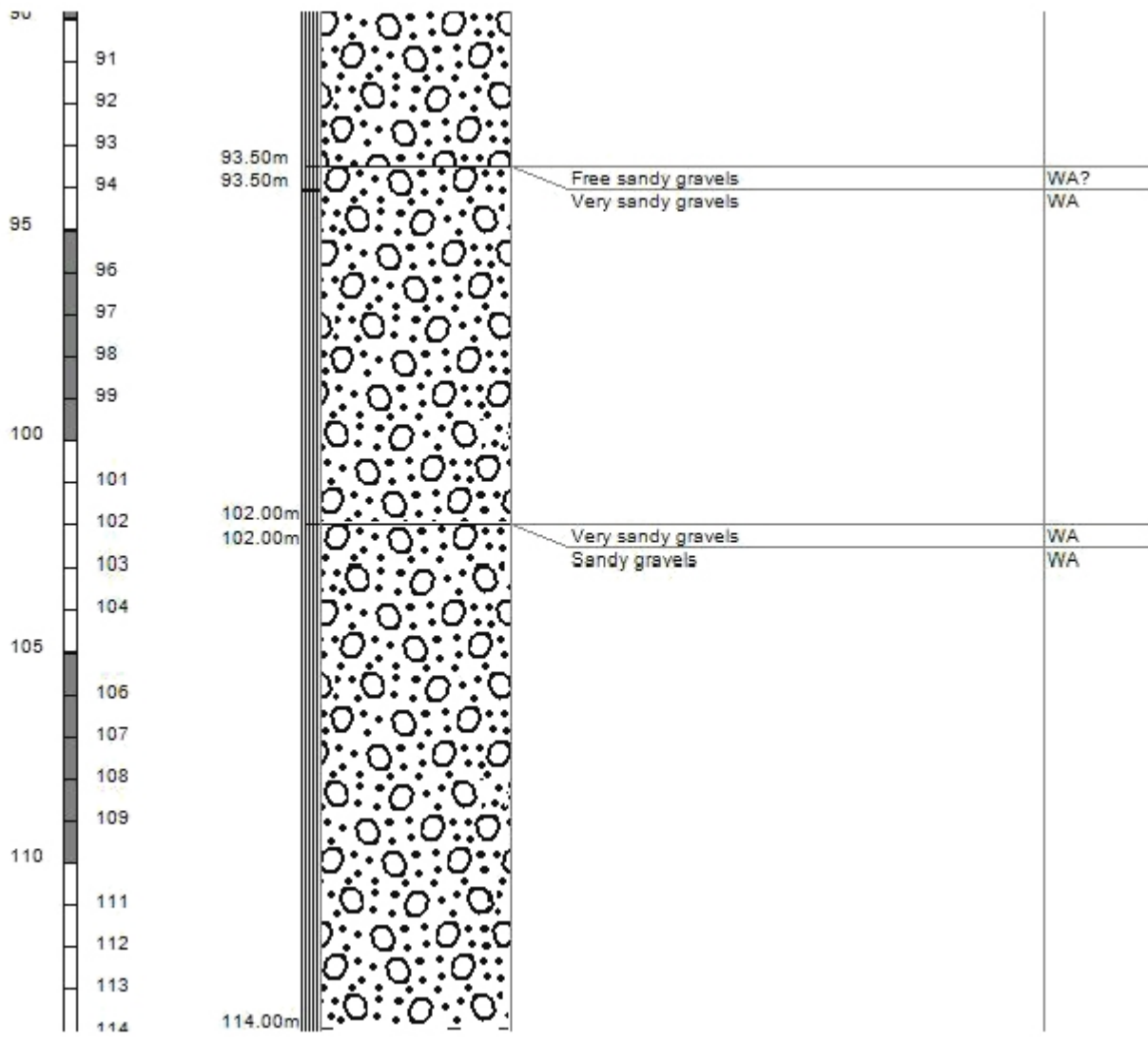
Driller: Smiths Welldrilling

Drill Method: Rotary Rig

Borelog Depth: 114.0 m Drill Date: 23-Aug-2000







Borelog for well M36/7543

Grid Reference (NZTM): 1550608 mE, 5169771 mN
 Location Accuracy: 50 - 300m
 Ground Level Altitude: 35.6 m +MSD Accuracy: < 0.5 m
 Driller: Dynes Road Drilling
 Drill Method: Cable Tool
 Borelog Depth: 26.0 m Drill Date: 03-May-2004



Scale(m)	Water Level	Depth(m)	Full Drillers Description	Formation Code
		0.40m	Brown topsoil	RI
		0.40m	Brown topsoil	RI
			Small - medium sandy gravel	RI
5				
		6.80m	Small - medium sandy gravel	RI
		6.80m	Small - medium gravel some silt	RI
10				
		11.40m	Small - medium gravel some silt	RI
		11.40m	Small - medium gravel with clay	RI
15				
		20.00m	Small - medium gravel with clay	RI
		20.00m	Silt water coming into well	RI
		21.00m	Silt water coming into well	RI
		21.00m	Stained gravel in wet silt	RI
		22.50m	Stained gravel in wet silt	RI
		22.50m	Firmer silt water dropping away a little. 23m water coming back small - medium gravel stained.	RI
25				
		26.00m		

Borelog for well M36/20382

Grid Reference (NZTM): 1550944 mE, 5169360 mN

Location Accuracy: 10 - 50m

Ground Level Altitude: 33.7 m +MSD Accuracy: < 0.5 m

Driller: East Coast Drilling

Drill Method: Rotary/Percussion

Borelog Depth: 36.0 m Drill Date: 13-Jan-2010

