



Technics

SP232036 – Fontwell

Ground Investigation Report



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Version	Issue Date	Status	Summary of Changes
1.0	May 2024	Draft	First Issue

On behalf of Fontwell Field (West Sussex) Ltd, Technics Group was commissioned to undertake Ground Investigation works at Fontwell, West Sussex.





Executive Summary

Technics Group Ltd was instructed by Fontwell Field (West Sussex) Ltd (the Client) to undertake ground investigation works at Fontwell, West Sussex, BN18 0SE.

The investigation works were required to provide geotechnical and geoenvironmental data through Site-specific ground investigation to aid Fontwell Field (West Sussex) Ltd with its designs for the proposed range of 1-4 bed houses, flats and maisonettes with communal parking and decorative soft landscaping.

The scope of work was specified by Fontwell Field (West Sussex) Ltd via email communication on 2nd January 2024.

Instructed works comprised of the following:

- Seven (7No.) windowless sample boreholes (WS01-WS07). All boreholes were to be advanced to 7.00mbgl or practical refusal. Standard Penetration Tests (SPTs) were to be undertaken every metre from the base of the 1.20mbgl inspection pit. Dynamic Probing follow-on was to be undertaken from the bottom of the Window Sampling boreholes to maximum depth of 10.00mbgl or practical refusal. Three (3No.) windowless sample boreholes were to be installed with 50mm standpipes for future groundwater monitoring.
- Six (6No.) TRL DCP tests (DCP01-DCP06) were to be undertaken in areas of future pavements and roads.
- Three (3No.) soakaway testing in accordance with methodology described in BRE Digest.

The revisions below were made to the scope:

- Eleven (11No.) windowless sample boreholes (WS). All boreholes were advanced with dynamic sampling to a maximum depth of 2.44 due to refusal. Dynamic probing follow-on was terminated at a maximum depth of 3.10mbgl due to refusal. Six (6No.) windowless sample boreholes (WS03, WS06, WS07, WS09, WS10, WS11) were installed with 50mm standpipes.
- Six (6No.) TRL DCP tests (DCP01-DCP06) were to be undertaken in areas of future pavements and roads.
- Seven (7No.) soakaway testing by methodology described in BRE Digest, were undertaken to a maximum depth of 1.80mbgl. All infiltration tests were unsuccessful due to groundwater seepage.

The ground investigation works were carried out during four (4No.) midweek day shifts between the 26th and 29th February 2024, two (2No.) midweek days between the 3rd and 4th of April, and one (1No.) midweek day shift on the 30th of April 2024.



Groundwater was encountered at WS01 at 0.60mbgl, WS02 at 1.20mbgl, WS03 at 0.70mbgl, WS04 at 1.20mbgl, WS05 at 1.30mbgl, WS07 at 1.10mbgl, TP01 at 0.50mbgl, TP02 at 0.70mbgl, TP03 at 1.40mbgl, TP04 at 0.20mbgl.

No visual or olfactory contamination was identified as part of this ground investigation.

No obstruction, voids, and services were identified as part of this investigation.

This report aims to present the factual data obtained during the ground investigation and subsequent laboratory testing to assist Fontwell Field (West Sussex) Ltd with its designs for the proposed range of 1-4 bed houses, flats and maisonettes with communal parking and decorative soft landscaping.



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1 Introduction

1.1 Instruction

Technics Group Ltd was instructed by Fontwell Field (West Sussex) Ltd (the Client) to undertake ground investigation works at Fontwell, West Sussex.

1.2 Scope of works

The scope of work was specified by Fontwell Field (West Sussex) Ltd via email communication on 2nd January 2024.

Instructed works comprised of the following:

- Seven (7No.) windowless sample boreholes (WS01-WS07). All boreholes were to be advanced to 7.00mbgl or practical refusal. Standard Penetration Tests (SPTs) were to be undertaken every metre from the base of the 1.20mbgl inspection pit. Dynamic Probing follow-on was to be undertaken from the bottom of the Window Sampling boreholes to maximum depth of 10.00mbgl of practical refusal. Three (3No.) windowless sample boreholes were to be installed with 50mm standpipes for future groundwater monitoring.
- Six (6No.) TRL DCP tests (DCP01-DCP06) were to be undertaken in areas of future pavements and roads.
- Three (3No.) soakaway testing in accordance with methodology described in BRE Digest.

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- Six (6No.) TRL DCP tests (DCP01-DCP06) were to be undertaken in areas of future pavements and roads.
- Seven (7No.) soakaway testing by methodology described in BRE Digest, were undertaken to a maximum depth of 1.80mbgl. All infiltration tests were unsuccessful due to groundwater seepage.

Before drilling, all locations were scanned with approved Cat and Genny equipment and Ground Penetration Radar. Inspection pits were excavated to 1.20mbgl with insulated hand tools.

The ground investigation works were carried out during four (4No.) midweek day shifts between the 26th and 29th February 2024, two (2No.) midweek days between the 3rd and 4th of April, and one (1No.) midweek day shift on the 30th of April 2024.



Groundwater was encountered at WS01 at 0.60mbgl, WS02 at 1.20mbgl, WS03 at 0.70mbgl, WS04 at 1.20mbgl, WS05 at 1.30mbgl, WS07 at 1.10mbgl, TP01 at 0.50mbgl, TP02 at 0.70mbgl, TP03 at 1.40mbgl, TP04 at 0.20mbgl.

The scope of works achieved as part of this assessment is set out in the following sections of this report.

This report aims to present the factual data obtained during the ground investigation and subsequent laboratory testing to assist Fontwell Field (West Sussex) Ltd with its designs for the culvert repair and replacement.

1.3 Limitations

This report presents a description of the Site at the time of the fieldwork, results of the fieldwork and in-situ testing undertaken, strata encountered and geotechnical laboratory test data.

All the comments and opinions contained within this report, including any conclusions, are based on the information obtained by Technics during its investigations.

There may be other conditions prevailing at the Site which have not been disclosed by this investigation and which have not been considered by this report. Responsibility cannot be accepted for conditions not revealed by the investigation and confirmation of intermediate ground conditions should be considered if deemed necessary.

Except as otherwise requested by the Employer, Technics is not obliged and disclaims any obligation to update the report for events taking place after:

- a) The date on which this investigation was undertaken; and
- b) The date on which the final Report is delivered.

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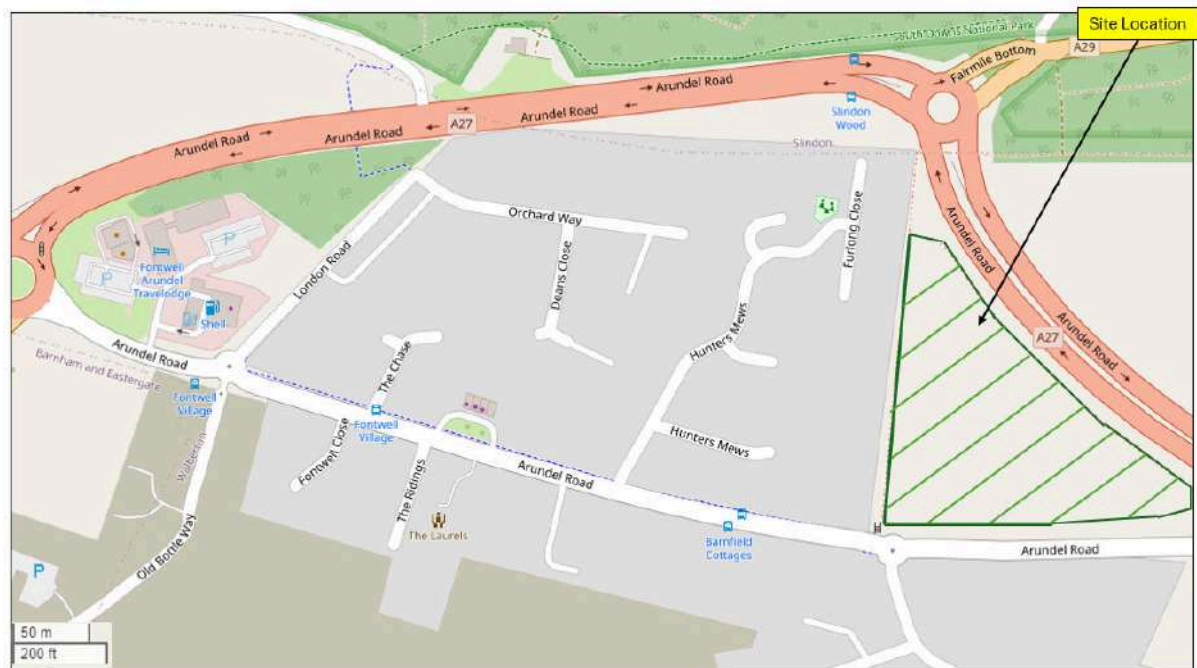
2 The Site

2.1 Site Location

The Site is a large vacant grass field with surrounding perimeter fencing located within the East side of Fontwell prior to the A27, BN18 0SE. Access is gained via Arundel Road located to the south.

The site location is shown in Figure 1.

Figure 1: Site Location Plan



2.2 Site Description

The site encompasses a large vacant grass field with surrounding perimeter fencing completed to a padlocked gated entrance accessible from Arundel Road to the south.

A pedestrian pathway runs along the western boundary of the site separated by a dense treeline, to the north and east runs the A27. Similar low scale residential developments are present to the south.

The general layout of the Site and exploratory hole location plan are presented in **Appendix A**.

2.3 Geology

Geological map data published by the British Geological Survey (BGS) online via GeoIndex Digital Map (1:50,000 scale) indicates superficial deposits of 'HEAD', often poorly sorted



and poorly stratified, angular rock debris and/or clayey colluvium and soil creep. Formed within the last 2.8 million years during the Quaternary Period.

The bedrock deposits of the Lambeth Group are additionally reported, formed between 48.1 and 59.2 million years ago over the Thanetian and Ypresian Ages.

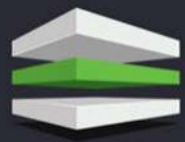
Due to the current infrastructure present at the Site, varying thicknesses of made ground were observed during the ground investigation works.

2.4 Setting out

Where possible the exploratory holes were located as close as possible to the proposed locations unless site constraints dictated otherwise i.e. access issues, 3rd party land and buried services etc.

Coordinates were recorded using VRS Leica surveying equipment.

Following completion, the exploratory hole locations were plotted on the exploratory hole location plan presented in **Appendix A**.



3 Ground Investigation

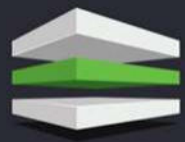
3.1 General

The ground investigation works were carried out during four (4No.) midweek day shifts between the 26th and 29th February 2024, and one (1No.) midweek day shift on the 30th April 2024.

The ground investigation comprised the following:

Table 1: Ground Investigation Methods Adopted

Hole No.	Hand Dug Excavated Pit	Windowless Sample Boreholes ¹	Dynamic Probing follow-on ² (DPSH-B)	Machine Excavated Pits	Soakaway BRE365	Comments
WS01	✓ (1.20mbgl)	✓ (1.43mbgl)	✓ (2.20mbgl)	✗	✗	Terminated due to refusal
WS02	✓ (1.20mbgl)	✓ (2.36mbgl)	✓ (2.80mbgl)	✗	✗	Terminated due to refusal
WS03	✓ (1.20mbgl)	✓ (2.07mbgl)	✓ (2.60mbgl)	✗	✗	Terminated due to refusal
WS04	✓ (1.20mbgl)	✓ (1.40mbgl)	✓ (2.00mbgl)	✗	✗	Terminated due to refusal
WS05	✓ (1.20mbgl)	✓ (2.36mbgl)	✓ (2.60mbgl)	✗	✗	Terminated due to refusal
WS06	✓ (1.20mbgl)	✓ (2.08mbgl)	✓ (2.30mbgl)	✗	✗	Terminated due to refusal
WS07	✓ (1.20mbgl)	✓ (2.44mbgl)	✓ (3.10mbgl)	✗	✗	Terminated due to refusal
WS08	✓ (1.20mbgl)	✓ (2.45mbgl)	✗	✗	✗	Complete on target depth
WS09	✓ (1.20mbgl)	✓ (2.45mbgl)	✗	✗	✗	Complete on target depth
WS10	✓ (1.20mbgl)	✓ (2.45mbgl)	✗	✗	✗	Complete on target depth



Hole No.	Hand Dug Excavated Pit	Windowless Sample Boreholes ¹	Dynamic Probing follow-on ² (DPSH-B)	Machine Excavated Pits	Soakaway BRE365	Comments
WS11	✓ (1.20mbgl)	✓ (2.45mbgl)	✗	✗	✗	Complete on target depth
TP01	✗	✗	✗	✓ (1.80mbgl)	✓	BRE365 Unsuccessful
TP02	✗	✗	✗	✓ (1.80mbgl)	✓	BRE365 Unsuccessful
TP03	✗	✗	✗	✓ (1.80mbgl)	✓	BRE365 Unsuccessful
TP04	✗	✗	✗	✓ (1.80mbgl)	✓	BRE365 Unsuccessful
TP05	✗	✗	✗	✓ (1.15mbgl)	✓	BRE365 Successful
TP06	✗	✗	✗	✓ (1.20mbgl)	✓	BRE365 Successful
TP07	✗	✗	✗	✓ (1.10mbgl)	✓	BRE365 Unsuccessful
¹ SPT = 63.5kg over 760mm ² DPSH-B = 63.5kg weight falling 760mm						

The corresponding SPT calibration certificates for each borehole are presented in Table 2.

Table 2: Corresponding SPT Calibration Certificate

Windowless Sampling SPT Calibration			
WS Hole ID	Rig	SPT ID	Energy Ratio (%)
WS01	Geotool	116	73
WS02			
WS03			



Windowless Sampling SPT Calibration			
WS04			
WS05			
WS06			
WS07			
WS08			
WS09			
WS10			
WS11			

The Calibration Certificates are presented in **Appendix I**.

Tables 3, 4 and 5 Indicate the Window Sampling, Trial Pit and CBR coordinates.

Table 3: Window Sampling coordinates

Hole No.	Northing	Easting
WS01	106,964	495,699
WS02	107,039	495,705
WS03	107,089	495,682
WS04	107,059	495,728
WS05	107,016	495,756
WS06	106,979	495,821
WS07	106,966	495,737
WS08	106,990	495,699
WS09	107,034	495,683
WS10	107,036	495,745
WS11	109,965	495,787

Table 4: Trial Pit coordinates



Hole No.	Northing	Easting
TP01	495,691	107,107
TP02	495,722	107,052
TP03	495,755	106,966
TP04	495,686	106,963
TP05	495,828	106,967
TP06	495,788	107,005
TP07	495,706	107,049

Table 5: CBR coordinates

Hole No.	Northing	Easting
CBR01	495,673	106,965
CBR02	495,683	106,993
CBR03	465,728	106,993
CBR04	495,699	107,082
CBR05	495,778	107,011
CBR06	495,822	106,985

The locations of all intrusive exploratory holes are shown in the Exploratory Hole Location Plan presented in **Appendix A**.

Fieldwork was carried out in accordance with Eurocode 7 (2007), BS5930 'Code of Practice for Site Investigations – (2015 + A1 2020); BS10175 'Investigation of Potentially Contaminated Sites – Code of Practice (2011 +A2 2017); Association of Geotechnical and Geo-Environmental Specialist Guidelines for Good Practice in Site Investigations (August 1998) and logged in accordance with BS EN ISO 14688-1:2004 and BS EN ISO 14688-2 (2004). All fieldwork was supervised by a suitably experienced Engineer.

3.2 Windowless Sampling (WLS)

Before breaking ground, all locations were scanned using an approved Cable Avoidance Tool (CAT) and Signal Generator ("Genny"); a visual inspection was undertaken for



surface markers; and the location was cross-referenced with buried services plans. A Permit to Dig was completed and the findings were briefed to the workgroup.

Prior to drilling works, a services inspection pit was hand dug to the depth shown in Table 1 to ensure that no buried utilities/services were disturbed or damaged during the drilling works.

During the first phase of ground investigation undertaken between 26th and 29th February 2024, seven (7No.) windowless sample boreholes (WS) were completed. All boreholes were advanced with dynamic sampling to a maximum depth of 2.44 due to refusal. Dynamic probing follow-on was terminated at a maximum depth of 3.10mbgl due to refusal. Three (3No.) windowless sample boreholes (WS03, WS06, WS07) were installed with 50mm standpipes.

During the second phase of ground investigation undertaken between the 3rd and 4th of April 2024, four (4No.) windowless sample boreholes (WS) were completed. All boreholes were completed on SPT's at 2.45mbgl. All four (4No.) additional windowless sample boreholes (WS08, WS09, WS10, WS11) were installed with 50mm standpipes.

A copy of the window sample borehole logs is presented in **Appendix B**.

3.3 Trial Pits (TP) with Soakaway BRE 365

Prior to breaking ground, all locations were scanned using an approved Cable Avoidance Tool (CAT) and Signal Generator ("Genny"); a visual inspection was undertaken for surface markers; and the location cross referenced with buried services plans. A Permit to Dig was completed and the findings briefed to the workgroup.

A total of seven (7No.) machine excavated trial pits (designated TP01-TP04) were undertaken to investigate the ground below the indicated locations. Seven (7No.) Soakaway BRE 365 test at locations TP01 and TP07, were undertaken to confirm the suitability of a soakaway drainage as a new drainage system. The pits were excavated to a maximum depth of 1.80mbgl.

A copy of the Soakaway results is presented in **Appendix D**.

3.4 Sampling

3.5 Soil sampling

Soil sampling was undertaken in accordance with the UK Specification for Ground Investigation, 2nd edition.

Soil samples were returned to Technics for storage and subsequent laboratory testing.

The types of samples and the depth at which they were taken are shown on the borehole logs presented in the appendices.

3.6 Water Sampling

No Water Sampling was undertaken as part of this ground investigation.



3.7 Results

A summary of the in-situ test results and the strata encountered during the investigation are shown in Table 6 below.

Table 6: Ground Investigation Summary

Stratum	Typical composition	Maximum thickness (m)	SPT N Value
TOPSOIL	Soft greyish brown slightly sandy gravelly CLAY.	0.30	N/A
Superficial Geology	Orange and grey SAND and GRAVEL [Head Deposits].	Not proven	9-50

3.8 Groundwater

Groundwater was encountered at WS01 at 0.60mbgl, WS02 at 1.20mbgl, WS03 at 0.70mbgl, WS04 at 1.20mbgl, WS05 at 1.30mbgl, WS07 at 1.10mbgl, TP01 at 0.50mbgl, TP02 at 0.70mbgl, TP03 at 1.40mbgl, TP04 at 0.20mbgl.

3.9 Obstructions, Voids & Services

No obstruction, voids, and services were identified as part of this investigation.

3.10 Laboratory Testing

All testing was undertaken at UKAS and MCERTS (as available) accredited laboratories.

3.10.1 Geotechnical

Selected samples were scheduled for the following laboratory tests:

Table 7: Geotechnical Laboratory Testing

Test	No. Scheduled
Moisture Content	6
Atterberg Limit	6
Sieve Wet/Dry	4
Water Soluble Sulphate	7



pH	7
BRE SD1 – Full Suite	4

The results of geotechnical laboratory testing are presented in **Appendix E**.

3.10.2 Environmental

No environmental testing was undertaken as part of this investigation.

3.11 Gas and Groundwater Monitoring

3.12 Groundwater Monitoring

Three (3No.) rounds of groundwater monitoring and Falling Head Tests have been specified on all installed locations. These were undertaken after the completion of the ground investigation works by a Technics qualified Engineer.

The water monitoring results are presented in **Appendix G**.

The Falling Head Test results are presented in **Appendix J**.

3.13 Gas Monitoring

No gas monitoring has been specified as part of these works.

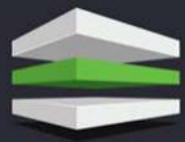
3.14 TRL DCP Testing

Technics completed six (6No.) TRL DCP tests at the assessment site. The tests were completed predominantly within the areas of proposed new roads/footpaths. Each test was carried out by dropping an 8kg weight over a distance of 575mm to drive a 20mm diameter 60-degree cone into the subsoil. The blow counts were recorded against penetration achieved and the results were plotted graphically. The CBR value of the various layers was then determined by reading from the graph showing the DCP-CBR relationship by Kleyn and Van Heerd (1983).

A summary of the TRL DCP testing results is provided in **Appendix H**.

3.15 Contamination Observations

No visual or olfactory contamination was identified as part of this ground investigation.



4 Engineering Properties

The following section discusses the engineering properties of the Superficial Deposits. The assessment is based on the results of in-situ and laboratory testing obtained during this investigation.

4.1 Geotechnical Test Results

Results of the laboratory geotechnical testing are summarised in Table 8.

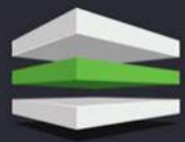
Table 8: Summary of Geotechnical Classification Test Results

Hole No.	Depth	Stratum	Particle Size Distribution	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
WS01	0.70	Sand and Gravel	48% Gravel 5% Sand 47% Silt/Clay	31	20	11	50
WS02	1.00	Sand and Gravel	N/A	42	25	17	28
WS05	0.40	Sand and Gravel	71% Gravel 6% Sand 23% Silt/Clay	48	25	23	25
WS06	1.00	Sand and Gravel	N/A	35	16	19	44
WS07	0.70	Sand and Gravel	61% Gravel 6% Sand 33% Silt/Clay	57	26	31	35
	1.40	Sand and Gravel	62% Gravel 7% Sand 31% Silt/Clay	57	25	32	34

The results of geotechnical laboratory testing are presented in **Appendix E**.

The results of the chemical testing are summarised in Table 9.

Table 9: Summary of Chemical Test Results



Hole No.	Depth (m)	Stratum	pH Value	Water Soluble Sulphate (mg/l)
WS01	0.10	SAND	6.7	<10
WS02	0.20	SAND	6.6	<10
	1.00	SAND and GRAVEL	5.1	<10
	1.40	SAND and GRAVEL	5.2	<10
WS03	1.20	SAND and GRAVEL	6.4	<10
WS04	0.20	SAND	5.8	709
WS05	1.30	SAND and GRAVEL	7.2	<10
WS06	0.20	SAND	6.5	15
	0.80	SAND and GRAVEL	6.8	<10
	1.40	SAND and GRAVEL	6.7	<10
WS07	1.40	SAND and GRAVEL	6.9	<10

The results of geotechnical laboratory testing are presented in **Appendix F**.

4.2 Design Parameters

The following section discusses the design parameters of one main strata encountered during the ground investigation works. These are:

- Head Deposits, comprised predominantly of SAND and GRAVEL with secondary constituents of clay and silt. For the design parameters, this layer will be treated as non-cohesive material identified from Ground Level to 2.50mbgl.

4.2.1 Coarse Soil (0.00mbgl to 2.50mbgl)

The findings from 12 in-situ Standard Penetration Test (SPT) assessments revealed a spectrum of SPT N60 values spanning from 9 to 50. These outcomes indicate that the surface soil tends to be predominantly loose, transitioning to dense layers at greater depths. Despite encountering SPT values as high as 50 in shallow depths, the lower values will be prioritized for foundation design considerations.



Laboratory Particle Size Distribution (PSD) tests undertaken on two samples suggest the materials tested are predominantly GRAVEL with a secondary constituent of sand, silt, and clay.

A summary of the values is presented in Table 10.

Table 10: Summary of Derived Design Values

Depth (m)	N ₆₀ Values	Angle of Shearing Resistance
1.00	7	30°
2.00	50	40°
*Based on SPT-N value and friction angle and Relative density (Meyerhoff 1956)		

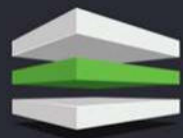
4.2.2 Dynamic Probe

Dynamic probing (DPSH) was undertaken at borehole locations WS01 - WS07 and WS05 to a maximum depth of 3.10m below the existing ground level. Dynamic probing was undertaken to get a greater understanding of the strength of soils from the ground level.

The results of the Dynamic Probing exercise have been converted to equivalent SPT N-values which indicate soil material present beneath the assessment site is generally very dense to 3.00mbgl.

Table 11: SPT N values calculated by the Dynamic Probing results

Depth (m)	WS01			WS02			WS03		
	DPN ₁₀₀	DPN ₃₀₀	SPT N	DPN ₁₀₀	DPN ₃₀₀	SPT N	DPN ₁₀₀	DPN ₃₀₀	SPT N
1.40	19	57	57	-	-	-	-	-	-
1.50	20	60	60	-	-	-	-	-	-
1.60	20	60	60	-	-	-	-	-	-
1.70	22	66	66	-	-	-	-	-	-
1.80	22	66	66	-	-	-	-	-	-
1.90	24	72	72	-	-	-	-	-	-



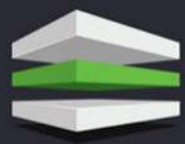
Depth (m)	WS01			WS02			WS03		
	DPN ₁₀₀	DPN ₃₀₀	SPT N	DPN ₁₀₀	DPN ₃₀₀	SPT N	DPN ₁₀₀	DPN ₃₀₀	SPT N
2.00	25	75	75	-	-	-	16	48	48
2.10	25	75	75	-	-	-	20	60	60
2.20	-	-	-	-	-	-	22	66	66
2.30	-	-	-	22	66	66	22	66	66
2.40	-	-	-	23	69	69	25	75	75
2.50	-	-	-	23	69	69	25	75	75
2.60	-	-	-	24	72	72	-	-	-
2.70	-	-	-	25	75	75	-	-	-
2.80	-	-	-	-	-	-	-	-	-
2.90	-	-	-	-	-	-	-	-	-
<p>DPN₁₀₀= Dynamic penetration resistance for 100mm penetration.</p> <p>DPN₃₀₀= Dynamic penetration resistance for 300mm penetration (ie: sum of 3 consecutive DPN₁₀₀ values), starting at the depth given.</p> <p>For the dynamic probe "heavy" test (DPH), equivalent SPT N-values were estimated using the theoretical relationship $DPN_{300} = 1.5 \text{ SPT-N}$. [see Card,G.B., Roche,D.P. & Herbert,S.M., in Geol. Soc. Special Publication No 6, Field Testing in Engineering Geology (1990)]. SPT values are estimated and are for general guidance only.</p>									

Depth (m)	WS04			WS05			WS06			WS07		
	DPN ₁₀₀	DPN ₃₀₀	SPT N	DPN ₁₀₀	DPN ₃₀₀	SPT N	DPN ₁₀₀	DPN ₃₀₀	SPT N	DPN ₁₀₀	DPN ₃₀₀	SPT N
1.40	20	60	60	-	-	-	-	-	-	-	-	-
1.50	21	63	63	-	-	-	-	-	-	-	-	-
1.60	21	63	63	-	-	-	-	-	-	-	-	-
1.70	24	72	72	-	-	-	-	-	-	-	-	-
1.80	25	75	75	-	-	-	-	-	-	-	-	-
1.90	-	-	-	-	-	-	-	-	-	-	-	-



Depth (m)	WS04			WS05			WS06			WS07		
	DPN ₁₀ 0	DPN ₃₀ 0	SPT N	DPN ₁₀ 0	DPN ₃₀ 0	SPT N	DPN ₁₀ 0	DPN ₃₀ 0	SPT N	DPN ₁₀ 0	DPN ₃₀ 0	SPT N
2.00	-	-	-	-	-	-	25	75	75	-	-	-
2.10	-	-	-	-	-	-	25	75	75	-	-	-
2.20	-	-	-	-	-	-	25	75	75	-	-	-
2.30	-	-	-	24	72	72	-	-	-	-	-	-
2.40	-	-	-	24	72	72	-	-	-	18	54	54
2.50	-	-	-	25	75	75	-	-	-	19	57	57
2.60	-	-	-	-	-	-	-	-	-	19	57	57
2.70	-	-	-	-	-	-	-	-	-	21	63	63
2.80	-	-	-	-	-	-	-	-	-	22	66	66
2.90	-	-	-	-	-	-	-	-	-	22	66	66
3.00	-	-	-	-	-	-	-	-	-	25	75	75
<p>DPN₁₀₀= Dynamic penetration resistance for 100mm penetration.</p> <p>DPN₃₀₀= Dynamic penetration resistance for 300mm penetration (ie: sum of 3 consecutive DPN₁₀₀ values), starting at the depth given.</p> <p>For the dynamic probe "heavy" test (DPH), equivalent SPT N-values were estimated using the theoretical relationship $DPN_{300} = 1.5 \text{ SPT-N}$. [see Card, G.B., Roche, D.P. & Herbert, S.M., in Geol. Soc. Special Publication No 6, Field Testing in Engineering Geology (1990)]. SPT values are estimated and are for general guidance only.</p>												

Dynamic Probing logs are presented in **Appendix C**.



5 Geotechnical Assessment

This section will provide information on the Allowable Bearing Pressure of the soil in the depths of each SPT test for all locations and considers the ground conditions identified within Section 3 alongside the design values generated from in-situ and laboratory analysis, to be used in the foundation design.

Conventional strip and pad foundations should be suitable for the proposed battery storage units. However, this will also depend on the predicted loadings and tolerance of the structure to settlement (not provided at the time of this assessment).

5.1 Foundations

Three different scenarios have been used to indicate potential allowable bearing pressures and predicted settlements. The scenarios used are:

- Shallow strip foundation of 0.60m by 1.00m.
- Shallow pad foundation of 0.75m by 0.75m.
- Shallow pad foundation of 1.50m by 1.50m.

It will be important to make sure foundations are placed in materials of similar bearing and consolidation characteristics to avoid differential settlement. Groundwater appears to be shallow, and hence dewatering should be required.

The following table summarises anticipated allowable bearing pressures for strip and pad foundations placed at depths between 1.00mbgl and 2.00mbgl. The bearing capacities are calculated based on Hansen's (1978) method, design values discussed in Section 3 and assuming a factor of safety against bearing capacity failure of 3. Groundwater is assumed to be 1.00 meters below ground level.

Table 12: Summary of Allowable Bearing Pressures

Foundation Depth (m)	Foundation Strata	Design Value (Section 3)	Foundation Type	Foundation Dimensions (m ²)	Allowable Bearing Pressure (kN/m ²)
1.00	SAND	$\Phi=30^\circ$	Strip	0.60	160
				1.00	288
			Pad	0.75 x 0.75	230
				1.50 x 1.50	270
2.00	SAND	$\Phi=40^\circ$	Strip	0.60	720
				1.00	1000
			Pad	0.75 x 0.75	1050



Foundation Depth (m)	Foundation Strata	Design Value (Section 3)	Foundation Type	Foundation Dimensions (m ²)	Allowable Bearing Pressure (kN/m ²)
				1.50 x 1.50	1010

The results from table 12 shall be used for the foundation design of the new housing development at Fontwell, West Sussex.

All foundation excavations should be inspected by a qualified engineer to prove that the founding strata are suitable and uniform along the length of the foundation, and capable of taking the anticipated structural loadings.

5.2 Chemical Attack on Buried Concrete

Chemical tests on Superficial Deposits show low levels of water-soluble sulphates, with values ranging from 10mg/l to 709mg/l and near neutral ground conditions with pH values ranging from 5.1- 7.2. Based on these conditions, it is recommended that the Design Sulphate Class, as defined in BRE Special Digest 1 (2005), be taken as DS-1, and the Aggressive Chemical Environment for Concrete (ACEC) site classification be taken as AC-1^d.

The recommendations of BRE Special Digest 1 should be followed for concrete foundations and ground bearing floor slabs.



6 Conclusions And Recommendations

Technics Group Ltd was instructed by Fontwell Field (West Sussex) Ltd (the Client) to undertake ground investigation works at Fontwell, West Sussex and help inform on parameters used in foundation design.

The investigation works were required to provide geotechnical and geo-environmental data through Site-specific ground investigation to aid Fontwell Field (West Sussex) Ltd with its designs for the construction of the new housing development. The following section provides a summary of the conclusions and recommendations based on the findings of the investigation works undertaken and laboratory testing results.

6.1 Ground conditions

In general, the ground conditions encountered can be summarised as

- Superficial Deposits is comprised predominantly of SAND and GRAVEL. For the design parameters, this layer has been treated as non-cohesive material identified from ground Level to 2.00mbgl.

During the site investigation works, groundwater was encountered at WS01 at 0.60mbgl, WS02 at 1.20mbgl, WS03 at 0.70mbgl, WS04 at 1.20mbgl, WS05 at 1.30mbgl, WS07 at 1.10mbgl, TP01 at 0.50mbgl, TP02 at 0.70mbgl, TP03 at 1.40mbgl, TP04 at 0.20mbgl.

Assessment of the ground conditions in terms of the soil bearing capacities has been undertaken and predicted values provided for a range of foundations.

Chemical tests on Superficial Deposits show low levels of water-soluble sulphates, with values ranging from 10mg/l to 709mg/l and near neutral ground conditions with pH values ranging from 5.1- 7.2. Based on these conditions, it is recommended that the Design Sulphate Class, as defined in BRE Special Digest 1 (2005), be taken as DS-1, and the Aggressive Chemical Environment for Concrete (ACEC) site classification be taken as AC-1^d.

6.2 Site Personnel

As with all construction sites, personnel working on the site during the construction period should be encouraged to maintain a high standard of personal hygiene and on-site washing facilities should be available.

6.3 Additional

Due to shallow refusal, the initial scope lacked completeness, leading to insufficient data regarding deeper strata. Should the necessity for deeper foundation analysis arise, it is advised to undertake further ground investigations utilising cable percussive or rotary coring techniques.



Due diligence is required during the construction period, and should any evidence of contamination be found, appropriate investigation and assessment should be taken. The significance of any contamination not discovered by this investigation is outside the scope of this report.



7 References

BSI (2018) BS 1377-3:2018+A1:2021 - Methods of test for Soils for Civil Engineering Purposes – Chemical and electro-chemical testing - British Standard Institution

BSI (2015) BS 5930:2015+A1:2020 - Code of Practice for Ground Investigation – British Standard Institution

BSI (2017) BS 10175:2011+A2:2017 - Investigation of Potentially Contaminated Sites- Code of Practice – British Standard Institution

BSI (2007) BS EN1997-2:2007 - Geotechnical Design: Part 2 Ground Investigation and Testing – British Standard Institution

www.openstreetmap.org



Appendix A

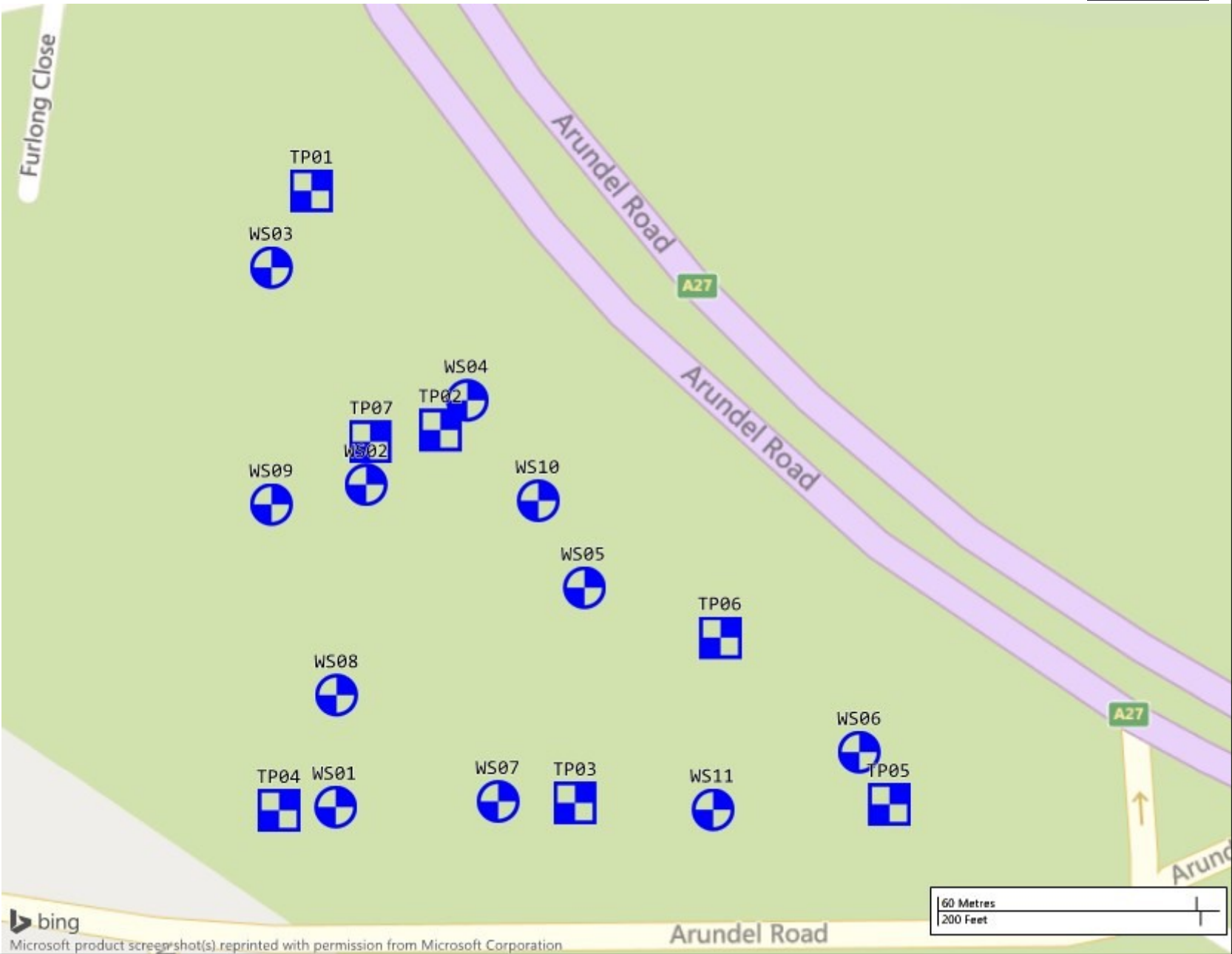
Hole Location Plans

Project Id: SP232036
Project Title: Fontwell, West Sussex, BN18 0SE
Location: Fontwell, West Sussex, BN18 0SE
Client: Fontwell Field (West Sussex) Ltd

Title: Site Plan
Scale: 1:1300
Engineer: Technics Group Ltd



- Legend Key
- Locations By Type - Empty
 - Locations By Type - CP
 - Locations By Type - TP



Project Id: SP232036
Project Title: Fontwell, West Sussex, BN18 0SE
Location: Fontwell, West Sussex, BN18 0SE
Client: Fontwell Field (West Sussex) Ltd

Title: Site Plan
Scale: 1:1300
Engineer: Technics Group Ltd



Legend Key

- Locations By Type - Empty
- Locations By Type - CP
- Locations By Type - TP





S WORLD
SCHOOL

CBR04

CBR05

CBR02

CBR03

CBR06

CBR01



Appendix B

Window Sampling Logs



Percussion Drilling Log

Project Name: Fontwell, West Sussex, BN18 0SE		Client: Fontwell Field (West Sussex) Ltd		Date: 29/02/2024	
Location: Fontwell, West Sussex, BN18 0SE		Contractor: Technics Group Ltd		Co-ords: E495699.00 N106964.00	
Project No. : SP232036		Crew Name: Simon Rush		Drilling Equipment: GTR FSX	
Borehole Number WS01	Hole Type CP	Level 30.10m AoD	Logged By	Scale 1:50	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES	N=55 (5,8/55 for 280mm)	0.30	29.80		TOPSOIL. Soft greyish brown slightly sandy gravelly CLAY. Sand is medium. Gravel is subangular to subrounded fine to coarse of flint. Orange and grey SAND and GRAVEL. Sand is medium. Gravel is subangular to rounded fine to coarse flint [Head Deposits].	1
		0.70	D						
		1.00	SPT						
		1.00	SPT						
					1.43	28.67		End of Borehole at 1.43m	2
									3
									4
									5
									6
									7
									8
									9
									10

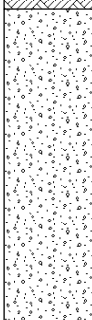
Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
1.00	87										

Remarks

1. Position scanned with cat and genny prior to excavation. 2. Inspection pit undertaken to 1.20mbgl with insulated hand tools. 3. Dynamic sampling terminated at 1.43mbgl due to refusal. 4. Dynamic Probe follow-on terminated at 2.20mbgl due to refusal.





Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES	N=13 (2,3/3,3,3,4)	0.30	33.10		TOPSOIL. Soft greyish brown slightly sandy gravelly CLAY. Sand is medium. Gravel is subangular to subrounded fine to coarse of flint. Orange and grey SAND and GRAVEL. Sand is medium. Gravel is subangular to rounded fine to coarse flint [Head Deposits].	1
		0.80	ES						
		1.00	SPT						
		1.00	SPT						
		1.40	ES						
		2.00	SPT	N=50 (25 for 140mm/50 for 215mm)	2.36	31.04		End of Borehole at 2.36m	2
		2.00	SPT						
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								10	

[illegible]

1. Position scanned with cat and genny prior to excavation. 2. Inspection pit undertaken to 1.20mbgl with insulated hand tools. 3. Dynamic sampling terminated at 2.36mbgl due to refusal. 4. Dvnamic Probe follow-on terminated at 2.80mbgl due to refusal.





Date: 29/02/2024

Co-ords: E495682.00 N107089.00

Drilling Equipment: GTR FSX

Page Number
Sheet 1 of 1

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
1.00	87										
1.70	77										

1. Position scanned with cat and genny prior to excavation. 2. Inspection pit undertaken to 1.20mbgl with insulated hand tools. 3. Dynamic sampling terminated at 2.07mbgl due to refusal. 4. Dvnamic Probe follow-on terminated at 2.60mbgl due to refusal.





Percussion Drilling Log

Project Name: Fontwell, West Sussex, BN18 0SE		Client: Fontwell Field (West Sussex) Ltd		Date: 29/02/2024	
Location: Fontwell, West Sussex, BN18 0SE		Contractor: Technics Group Ltd		Co-ords: E495728.00 N107059.00	
Project No. : SP232036		Crew Name: Simon Rush		Drilling Equipment: GTR FSX	
Borehole Number WS04	Hole Type CP	Level 32.90m AoD	Logged By	Scale 1:50	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.20	ES	N=50 (8,10/50 for 245mm)	0.25	32.65		TOPSOIL. Soft greyish brown slightly sandy gravelly CLAY. Sand is medium. Gravel is subangular to subrounded fine to coarse of flint. Orange and grey SAND and GRAVEL. Sand is medium. Gravel is subangular to rounded fine to coarse flint [Head Deposits].	1		
		0.80	ES			1.40	31.50			End of Borehole at 1.40m	2
		1.00	SPT								3
		1.00	SPT								4
									5		
									6		
									7		
									8		
									9		
									10		

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
1.00	87										

Remarks

1. Position scanned with cat and genny prior to excavation. 2. Inspection pit undertaken to 1.20mbgl with insulated hand tools. 3. Dynamic sampling terminated at 1.40mbgl due to refusal. 4. Dynamic Probe follow-on terminated at 2.00mbgl due to refusal.





Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description				
		Depth (m)	Type	Results								
		0.10	ES	N=37 (5,6/6,7,12,12)	0.25	31.25		TOPSOIL. Soft greyish brown slightly sandy gravelly CLAY. Sand is medium. Gravel is subangular to subrounded fine to coarse of flint. Orange and grey SAND and GRAVEL. Sand is medium. Gravel is subangular to rounded fine to coarse flint [Head Deposits].	1			
		0.40	D									
		1.00	SPT									
		1.00	SPT									
		1.30	ES									
		2.00	SPT	N=50 (25 for 135mm/50 for 220mm)	2.36	29.14		End of Borehole at 2.36m	2			
		2.00	SPT									
												3
												4
												5
						6						
						7						
						8						
						9						
						10						

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
1.00	87										
2.00	77										

1. Position scanned with cat and genny prior to excavation. 2. Inspection pit undertaken to 1.20mbgl with insulated hand tools. 3. Dynamic sampling terminated at 2.36mbgl due to refusal. 4. Dynamic Probe follow-on terminated at 2.60mbgl due to refusal.





Date: 01/03/2024

Co-ords: E495821.00 N106979.00

Drilling Equipment: GTR FSX

Page Number
Sheet 1 of 1

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
1.00	87										
1.80	77										

1. Position scanned with cat and genny prior to excavation. 2. Inspection pit undertaken to 1.20mbgl with insulated hand tools. 3. Dynamic sampling terminated at 2.08mbgl due to refusal. 4. Dynamic Probe follow-on terminated at 2.30mbgl due to refusal.





Date: 29/02/2024

Co-ords: E495737.00 N106966.00

Drilling Equipment: GTR FSX

Page Number
Sheet 1 of 1[illegible]

1. Position scanned with cat and genny prior to excavation. 2. Inspection pit undertaken to 1.20mbgl with insulated hand tools. 3. Dynamic sampling terminated at 2.44mbgl due to refusal. 4. Dynamic Probe follow-on terminated at 4.00mbgl due to refusal.





Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth (m)	Type	Results					
 	0.30	ES	N=24 (4,5/6,6,6,6)	0.30	30.70		TOPSOIL. Soft greyish brown slightly sandy gravelly CLAY. Sand is medium. Gravel is subangular to subrounded, fine to coarse of flint.	1
	0.60	ES		0.60	30.40		Firm Orange mottled grey sandy slightly gravelly Clay. Sand is medium. Gravel is subangular to rounded fine to coarse flint. (Head Deposits).	
	0.80	D		1.00	SPT		Orange mottled grey SAND and GRAVEL. Sand is medium. Gravel consists of sub-angular to rounded, fine to coarse flint.	
	1.40	D	N=22 (5,6/6,6,5,5)	1.40	29.60		Firm Orange mottled grey sandy CLAY. Sand is medium.	2
	2.00	SPT		2.45	28.55	End of Borehole at 2.45m		
								4
								5
								6
								7
								8
								9
								10

Remarks	
1. Position scanned with cat and genny prior to excavation. 2. Inspection pit undertaken to 1.20mbgl with insulated hand tools. 3. Borehole complete at target depth at 2.45mbgl.	



Date: 04/04/2024

Co-ords: E495683.00 N107034.00

Drilling Equipment: Geotool FSX

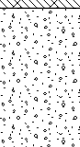
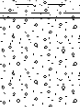
Page Number
Sheet 1 of 1[illegible]

1. Position scanned with cat and genny prior to excavation. 2. Inspection pit undertaken to 1.20mbgl with insulated hand tools. 3. Borehole complete at target depth at 2.45mbgl.





Project Name: Fontwell, West Sussex, BN18 0SE		Client: Fontwell Field (West Sussex) Ltd		Date: 04/04/2024	
Location: Fontwell, West Sussex, BN18 0SE		Contractor: Technics Group Ltd		Co-ords: E495745.00 N107036.00	
Project No. : SP232036		Crew Name: James Halls		Drilling Equipment: Geotool FSX	
Borehole Number WS10	Hole Type CP	Level 31.40m AoD	Logged By JAR	Scale 1:50	Page Number Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth (m)	Type	Results						
	0.40	ES	N=8 (1,2/2,2,2,2)	0.40	31.00		TOPSOIL. Soft greyish brown slightly sandy gravelly CLAY. Sand is medium. Gravel is subangular to subrounded, fine to coarse of flint.	1	
	0.80	ES			1.40	30.00			Firm orange mottled grey sandy slightly gravelly CLAY. Sand is medium. Gravel is subangular to rounded fine to coarse flint.
	0.90	D							
	1.00	SPT							
	1.50	D	N=23 (5,5/5,6,6,6)	1.80	29.60		Orange and grey SAND and GRAVEL. Sand is medium. Gravel is angular to subrounded fine to coarse of flint.	2	
	2.00	SPT		2.45	28.95	End of Borehole at 2.45m		3	
								4	
							5		
							6		
							7		
							8		
							9		
							10		

[illegible]

Remarks
1. Position scanned with cat and genny prior to excavation. 2. Inspection pit undertaken to 1.20mbgl with insulated hand tools. 3. Borehole complete at target depth at 2.45mbgl.



[illegible]

Remarks	
1. Position scanned with cat and genny prior to excavation. 2. Inspection pit undertaken to 1.20mbgl with insulated hand tools. 3. Borehole complete at target depth at 2.45mbgl.	



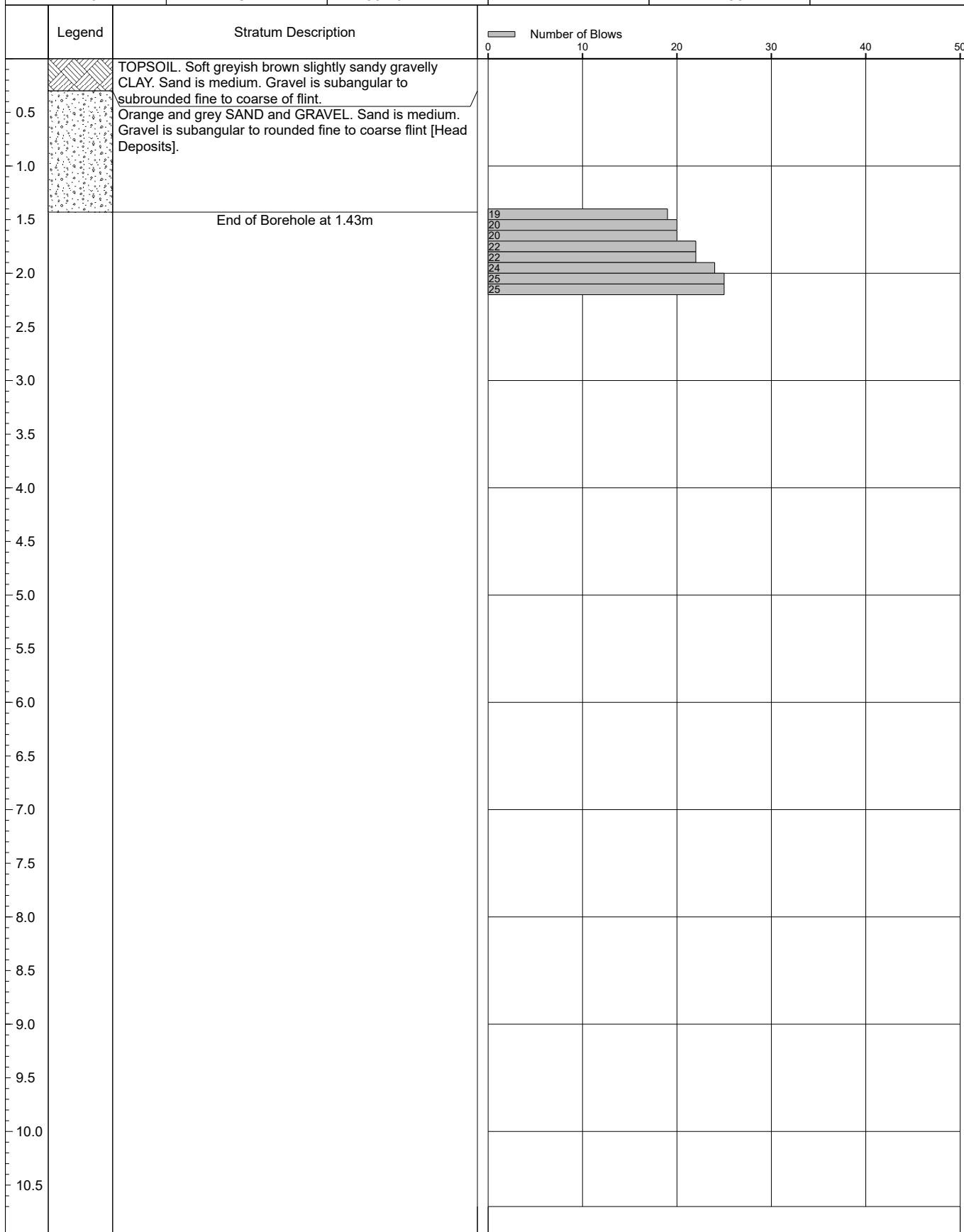
Appendix C

Window Sampling Logs



Probe Test Log

Project Name: Fontwell, West Sussex, BN18 0SE		Client: Fontwell Field (West Sussex) Ltd		Date: 29/02/2024	
Location: Fontwell, West Sussex, BN18 0SE		Contractor: Technics Group Ltd		Co-ords: E495699.00 N106964.00	
Project No. : SP232036		Crew Name: Simon Rush		Drilling Equipment: GTR FSX	
Borehole Number WS01	Hole Type CP	Level 30.10m AoD	Logged By	Scale 1:50	Page Number Sheet 1 of 1



Remarks

1. Position scanned with cat and genny prior to excavation. 2. Inspection pit undertaken to 1.20mbgl with insulated hand tools. 3. Dynamic sampling terminated at 1.43mbgl due to refusal. 4. Dynamic Probe follow-on terminated at 2.20mbgl due to refusal.





Legend		Stratum Description	Number of Blows
0.5		TOPSOIL. Soft greyish brown slightly sandy gravelly CLAY. Sand is medium. Gravel is subangular to subrounded fine to coarse of flint.	
1.0		Orange and grey SAND and GRAVEL. Sand is medium. Gravel is subangular to rounded fine to coarse flint [Head Deposits].	
2.5		End of Borehole at 2.36m	<div>22</div> <div>23</div> <div>23</div> <div>24</div> <div>25</div>
3.0			
3.5			
4.0			
4.5			
5.0			
5.5			
6.0			
6.5			
7.0			
7.5			
8.0			
8.5			
9.0			
9.5			
10.0			
10.5			

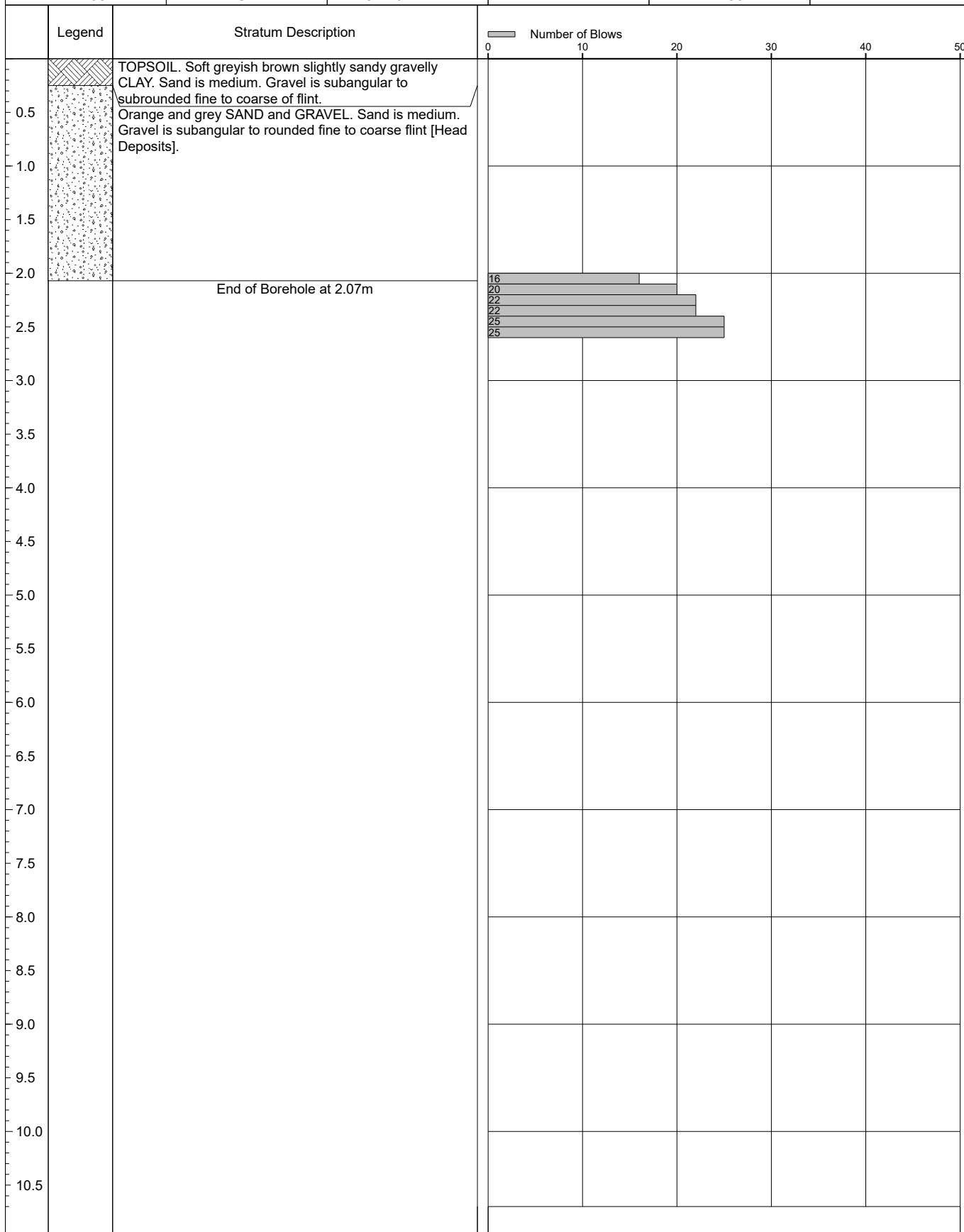
1. Position scanned with cat and genny prior to excavation. 2. Inspection pit undertaken to 1.20mbgl with insulated hand tools. 3. Dynamic sampling terminated at 2.36mbgl due to refusal. 4. Dynamic Probe follow-on terminated at 2.80mbgl due to refusal.





Probe Test Log

Project Name: Fontwell, West Sussex, BN18 0SE		Client: Fontwell Field (West Sussex) Ltd		Date: 29/02/2024	
Location: Fontwell, West Sussex, BN18 0SE		Contractor: Technics Group Ltd		Co-ords: E495682.00 N107089.00	
Project No. : SP232036		Crew Name: Simon Rush		Drilling Equipment: GTR FSX	
Borehole Number WS03	Hole Type CP	Level 34.10m AoD	Logged By	Scale 1:50	Page Number Sheet 1 of 1



Remarks

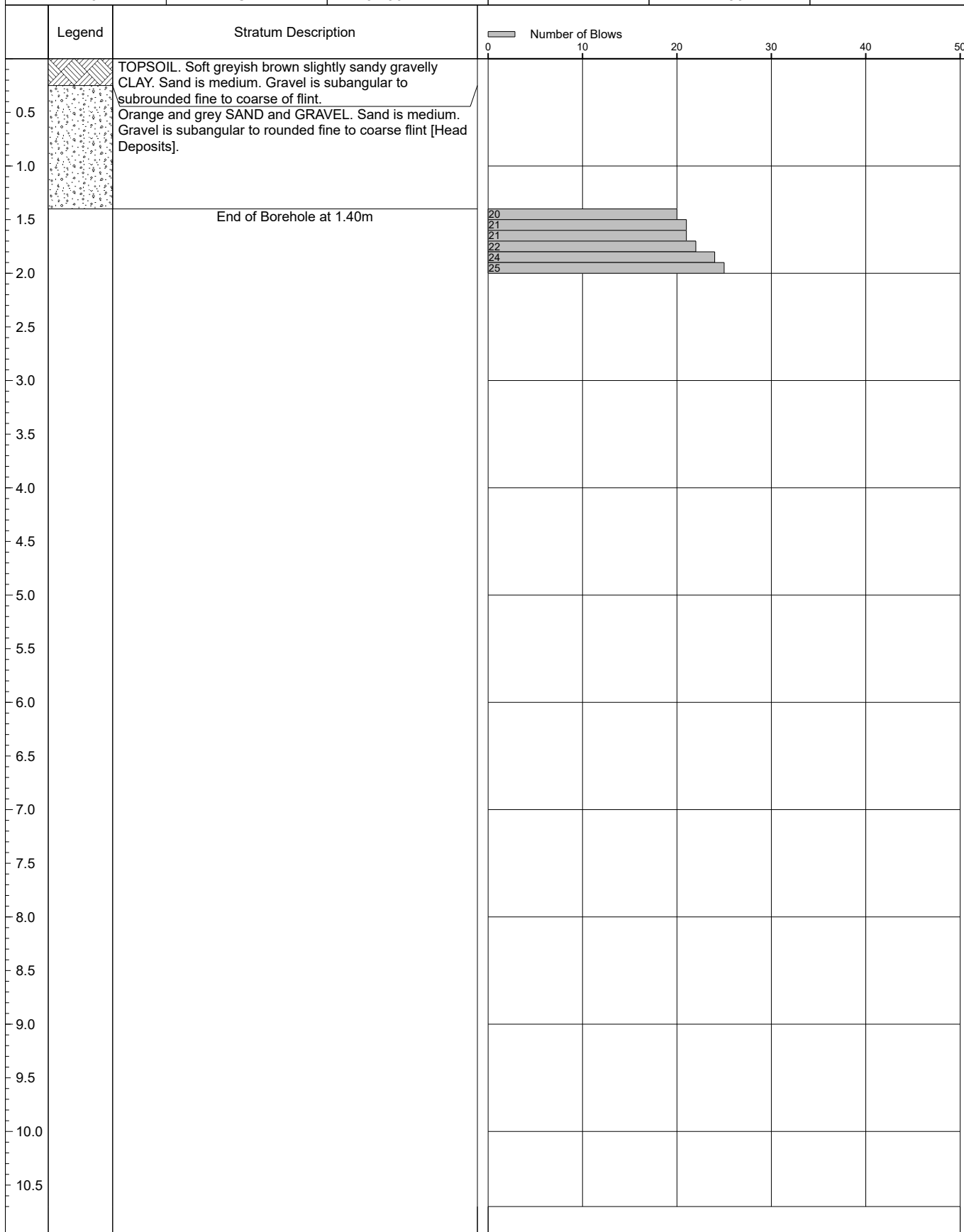
1. Position scanned with cat and genny prior to excavation. 2. Inspection pit undertaken to 1.20mbgl with insulated hand tools. 3. Dynamic sampling terminated at 2.07mbgl due to refusal. 4. Dynamic Probe follow-on terminated at 2.60mbgl due to refusal.





Probe Test Log

Project Name: Fontwell, West Sussex, BN18 0SE		Client: Fontwell Field (West Sussex) Ltd		Date: 29/02/2024	
Location: Fontwell, West Sussex, BN18 0SE		Contractor: Technics Group Ltd		Co-ords: E495728.00 N107059.00	
Project No. : SP232036		Crew Name: Simon Rush		Drilling Equipment: GTR FSX	
Borehole Number WS04	Hole Type CP	Level 32.90m AoD	Logged By	Scale 1:50	Page Number Sheet 1 of 1



Remarks

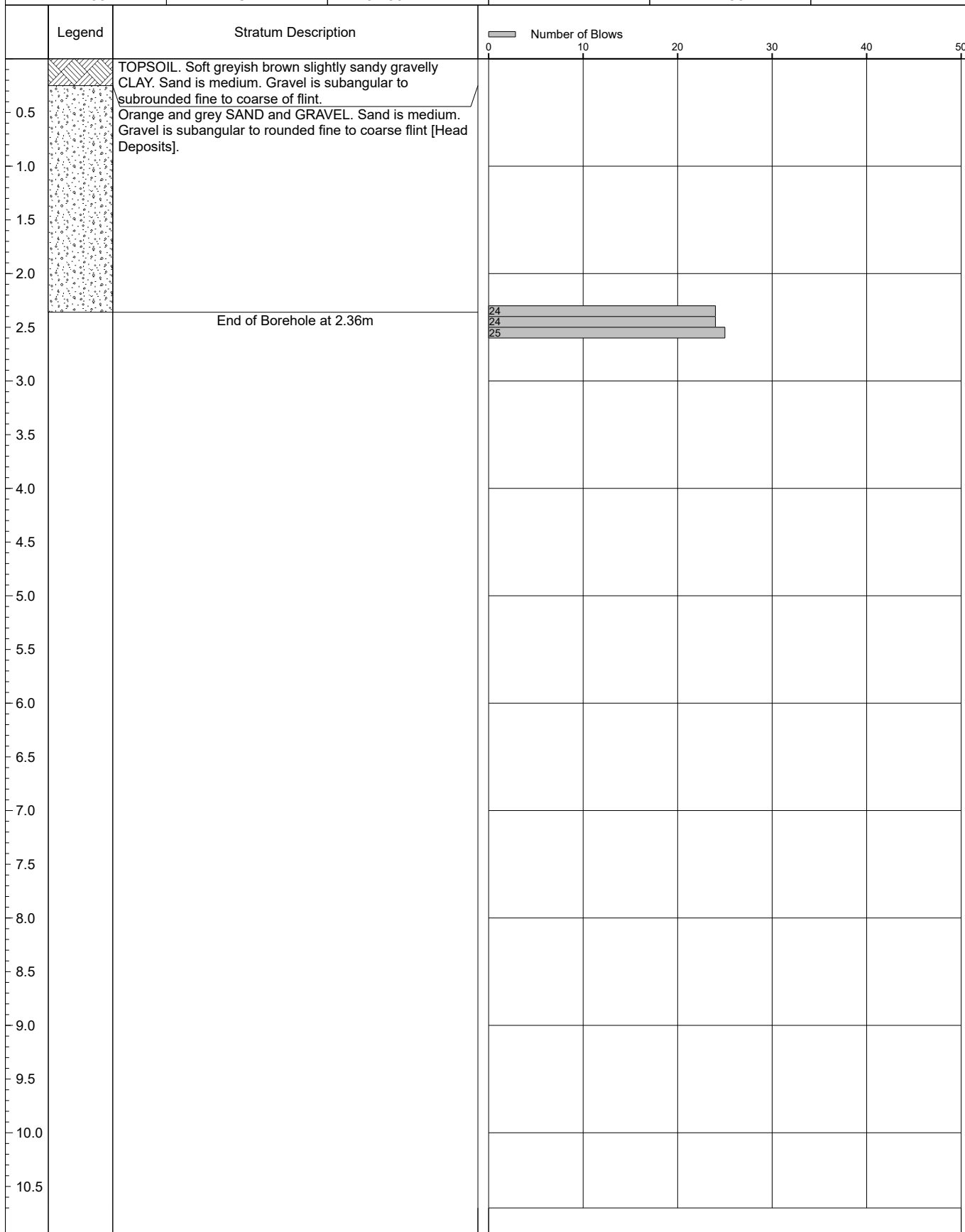
1. Position scanned with cat and genny prior to excavation. 2. Inspection pit undertaken to 1.20mbgl with insulated hand tools. 3. Dynamic sampling terminated at 1.40mbgl due to refusal. 4. Dynamic Probe follow-on terminated at 2.00mbgl due to refusal.

AGS



Probe Test Log

Project Name: Fontwell, West Sussex, BN18 0SE		Client: Fontwell Field (West Sussex) Ltd		Date: 29/02/2024	
Location: Fontwell, West Sussex, BN18 0SE		Contractor: Technics Group Ltd		Co-ords: E495756.00 N107016.00	
Project No. : SP232036		Crew Name: Simon Rush		Drilling Equipment: GTR FSX	
Borehole Number WS05	Hole Type CP	Level 31.50m AoD	Logged By	Scale 1:50	Page Number Sheet 1 of 1



Remarks

1. Position scanned with cat and genny prior to excavation. 2. Inspection pit undertaken to 1.20mbgl with insulated hand tools. 3. Dynamic sampling terminated at 2.36mbgl due to refusal. 4. Dynamic Probe follow-on terminated at 2.60mbgl due to refusal.



Probe Test Log

Project Name: Fontwell, West Sussex, BN18 0SE		Client: Fontwell Field (West Sussex) Ltd		Date: 01/03/2024	
Location: Fontwell, West Sussex, BN18 0SE		Contractor: Technics Group Ltd		Co-ords: E495821.00 N106979.00	
Project No. : SP232036		Crew Name: Simon Rush		Drilling Equipment: GTR FSX	
Borehole Number WS06	Hole Type CP	Level 32.30m AoD	Logged By	Scale 1:50	Page Number Sheet 1 of 1

	Legend	Stratum Description	Number of Blows					
			0	10	20	30	40	50
0.5		TOPSOIL. Soft greyish brown slightly sandy gravelly CLAY. Sand is medium. Gravel is subangular to subrounded fine to coarse of flint. Orange and grey SAND and GRAVEL. Sand is medium. Gravel is subangular to rounded fine to coarse flint [Head Deposits].						
1.0								
1.5								
2.0								
2.5		End of Borehole at 2.08m	25					
3.0			25					
3.5			25					
4.0								
4.5								
5.0								
5.5								
6.0								
6.5								
7.0								
7.5								
8.0								
8.5								
9.0								
9.5								
10.0								
10.5								

Remarks

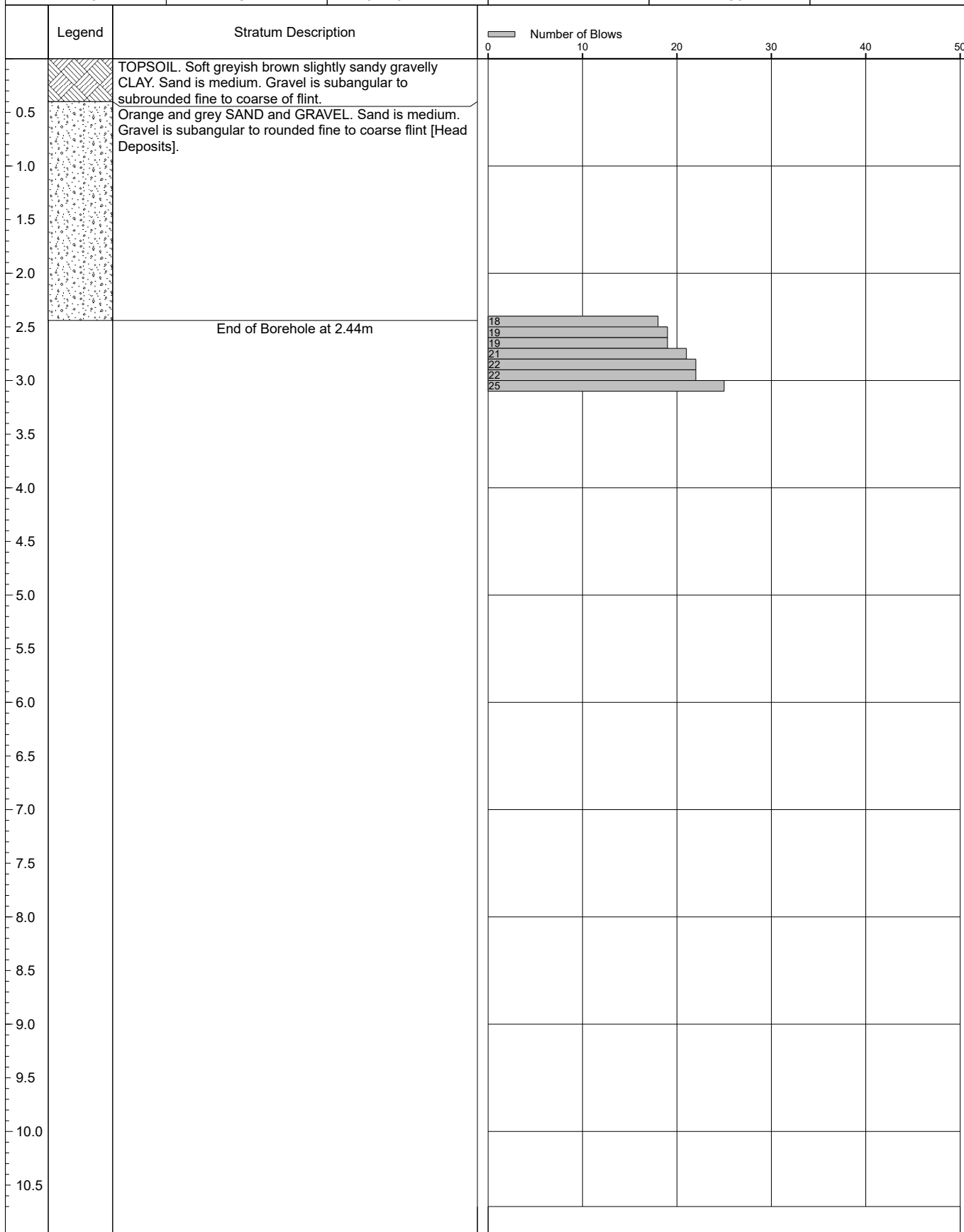
1. Position scanned with cat and genny prior to excavation. 2. Inspection pit undertaken to 1.20mbgl with insulated hand tools. 3. Dynamic sampling terminated at 2.08mbgl due to refusal. 4. Dynamic Probe follow-on terminated at 2.30mbgl due to refusal.





Probe Test Log

Project Name: Fontwell, West Sussex, BN18 0SE		Client: Fontwell Field (West Sussex) Ltd		Date: 29/02/2024	
Location: Fontwell, West Sussex, BN18 0SE		Contractor: Technics Group Ltd		Co-ords: E495737.00 N106966.00	
Project No. : SP232036		Crew Name: Simon Rush		Drilling Equipment: GTR FSX	
Borehole Number WS07	Hole Type CP	Level 32.70m AoD	Logged By	Scale 1:50	Page Number Sheet 1 of 1



Remarks

1. Position scanned with cat and genny prior to excavation. 2. Inspection pit undertaken to 1.20mbgl with insulated hand tools. 3. Dynamic sampling terminated at 2.44mbgl due to refusal. 4. Dynamic Probe follow-on terminated at 4.00mbgl due to refusal.



Appendix D

BRE 365 Soakage Testing Results

OPERATOR:	JAR
-----------	-----

TEST LOCATION:	Fontwell	TP01
----------------	----------	------

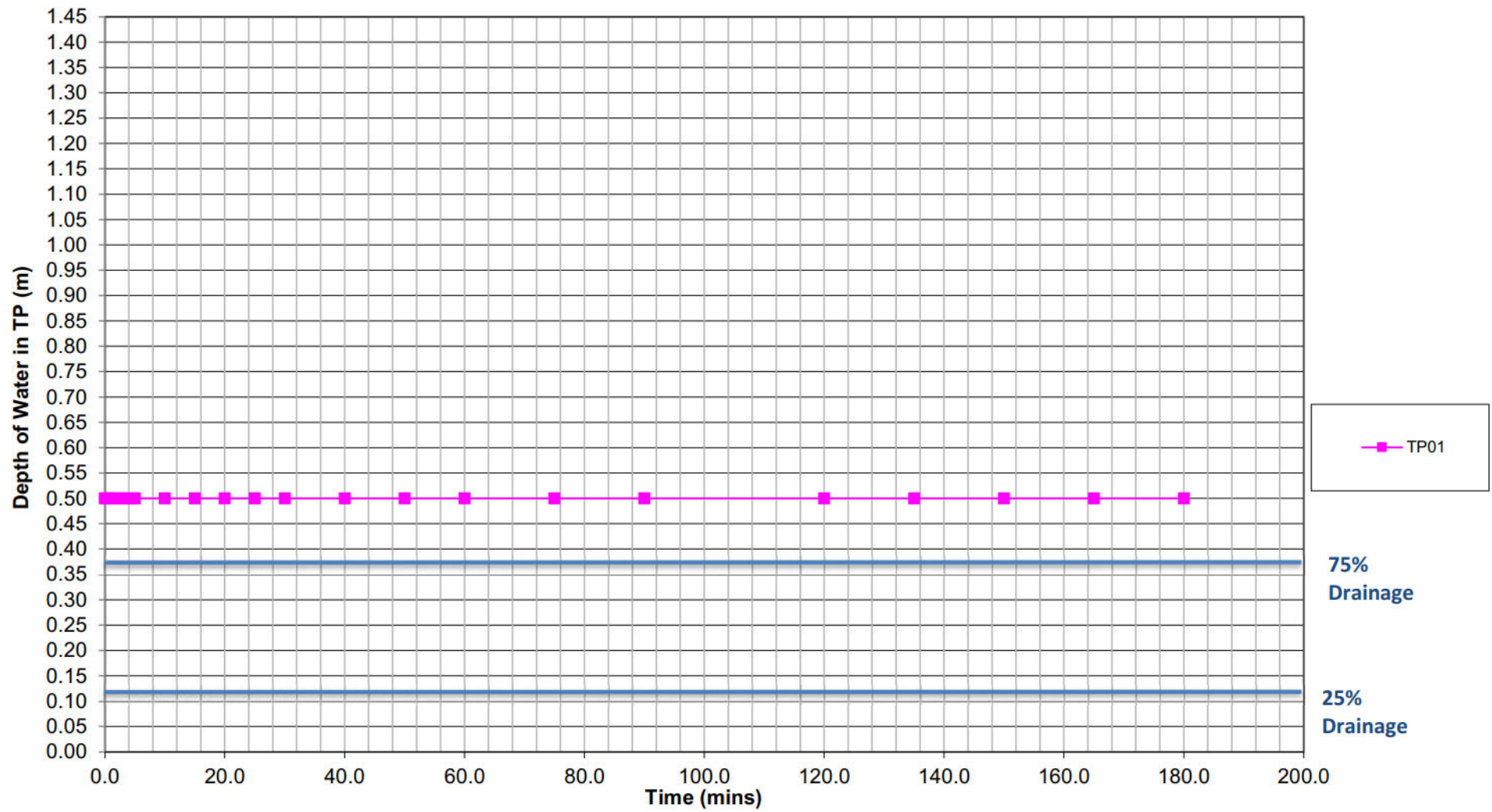
	Reading 1	Reading 2	Reading 3
Depth (m)	1.80		
Length (m)	2.40		
Width (m)	0.60		

MATERIAL:

[illegible]

Soil Infiltration Rate f =	1	2	3	
	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	
Soil Infiltration Rate f =	#REF!	#DIV/0!	#DIV/0!	m/s

TP01 Soakaway Test



OPERATOR:	JAR
-----------	-----

DATE:	27/02/2024	TEST LOCATION:	Fontwell	TP02
--------------	------------	-----------------------	----------	------

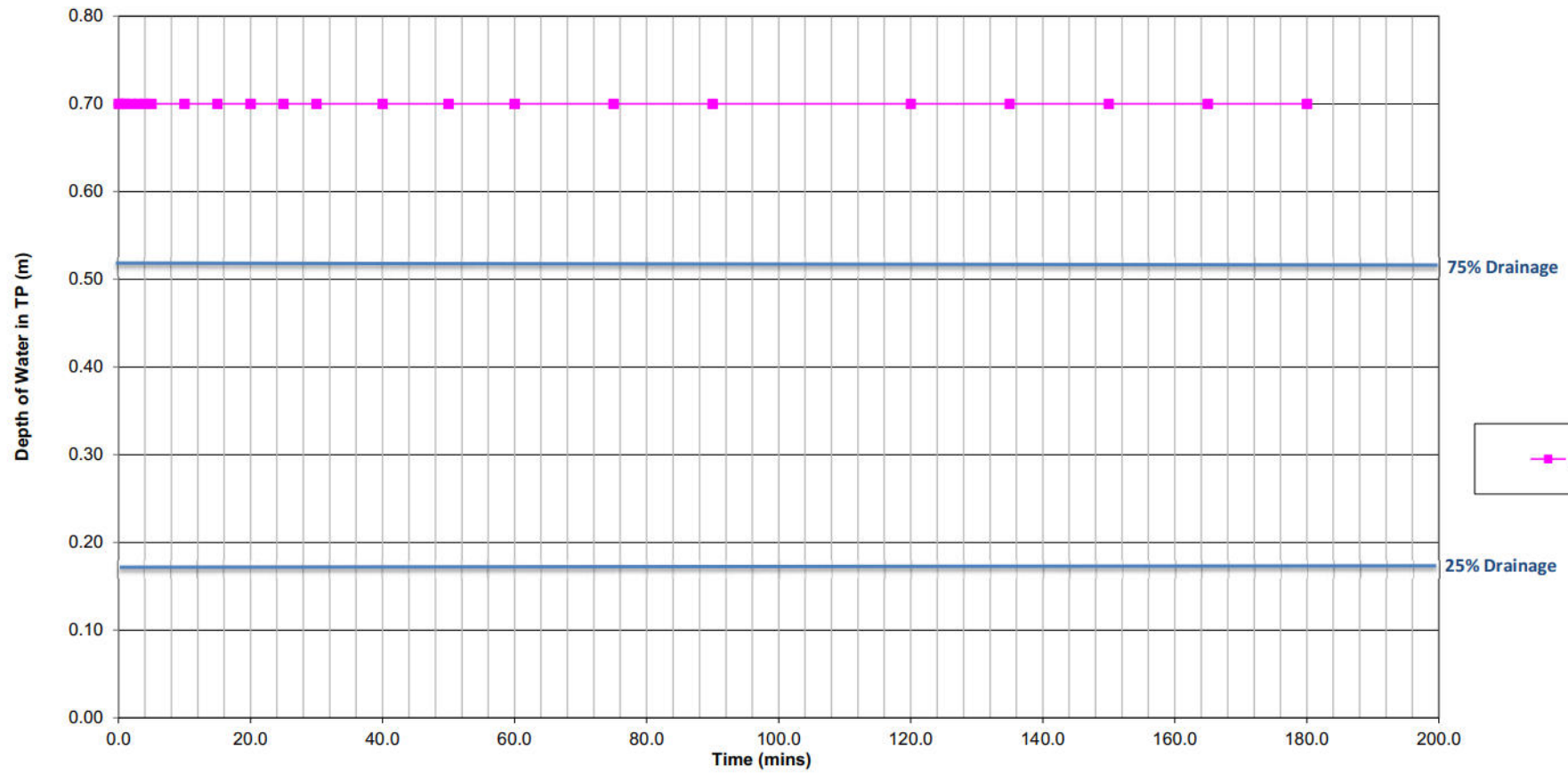
	Reading 1	Reading 2	Reading 3
Depth (m)	1.80		
Length (m)	2.10		
Width (m)	0.60		

MATERIAL:

[illegible]

Soil Infiltration Rate f =	1	2	3	
	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	
Soil Infiltration Rate f =	#REF!	#DIV/0!	#DIV/0!	m/s

TP02 Soakaway Test



OPERATOR:	JAR
-----------	-----

TEST LOCATION:	Fontwell	TP03
----------------	----------	------

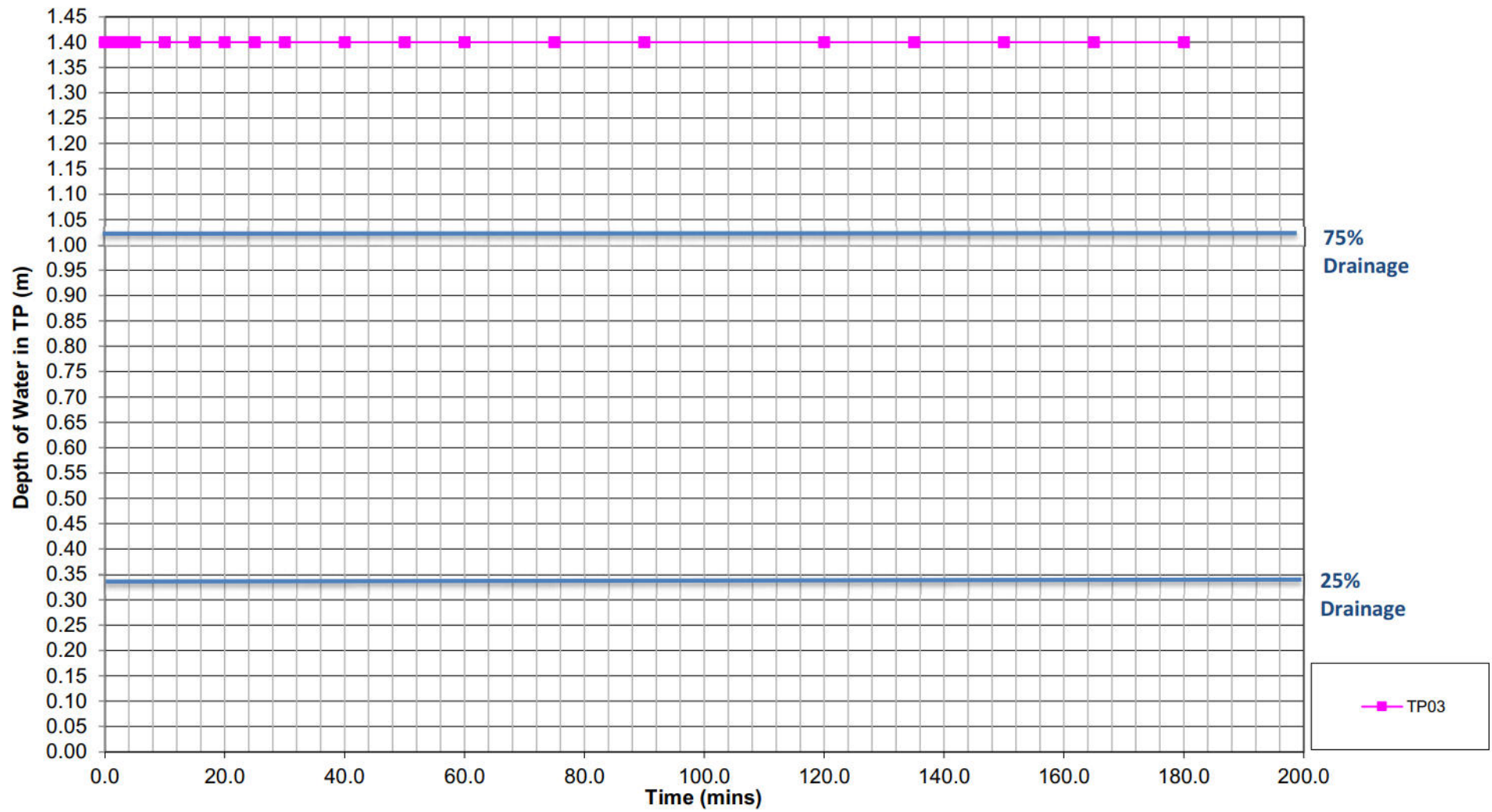
	Reading 1	Reading 2	Reading 3
Depth (m)	1.80		
Length (m)	2.40		
Width (m)	1.80		

MATERIAL:

[illegible]

Soil Infiltration Rate f =	1	2	3	
	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	
Soil Infiltration Rate f =	#REF!	#DIV/0!	#DIV/0!	m/s

TP03 Soakaway Test



OPERATOR:	JAR
-----------	-----

TEST LOCATION:	Fontwell	TP04
----------------	----------	------

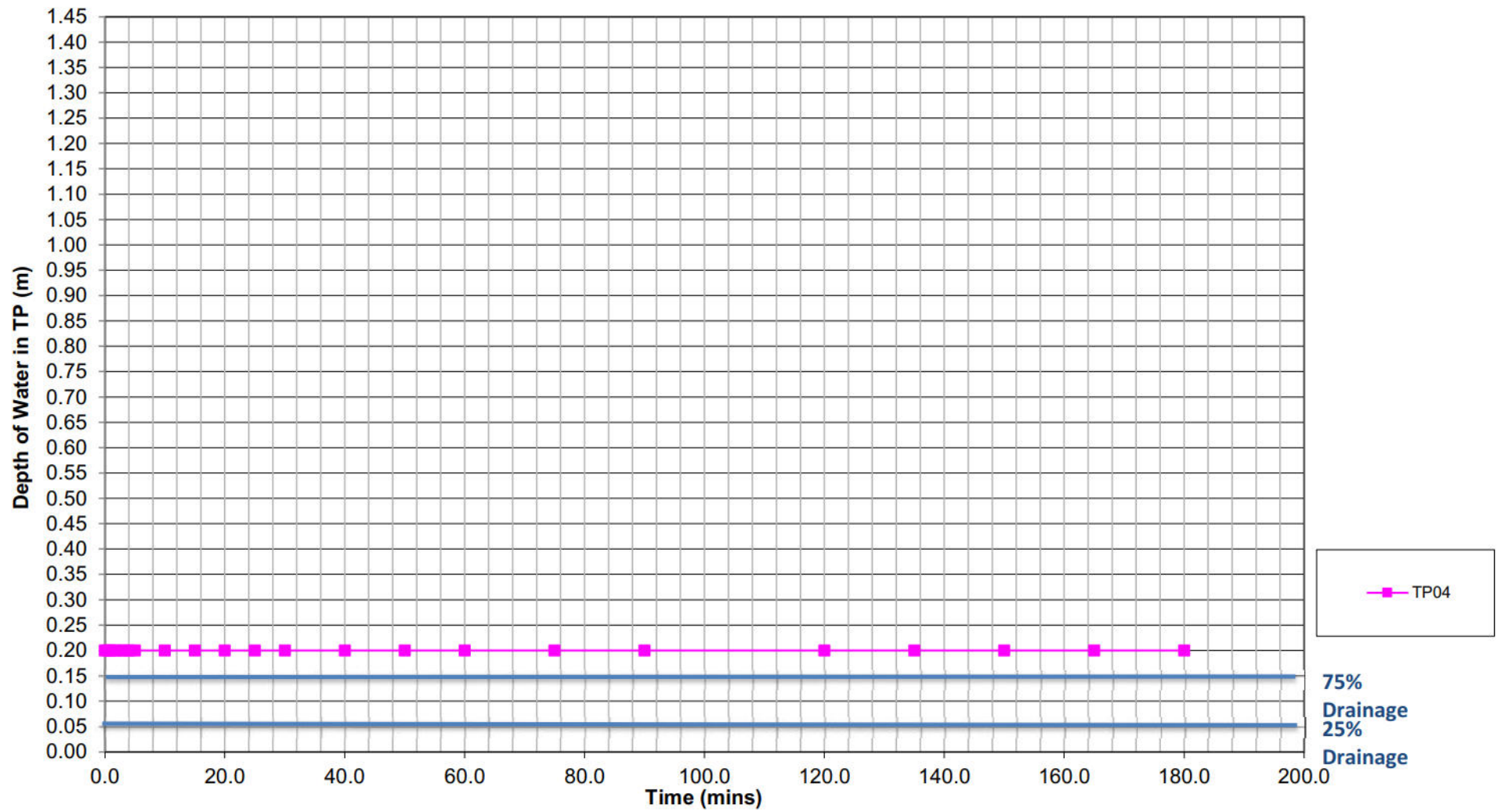
	Reading 1	Reading 2	Reading 3
Depth (m)	1.80		
Length (m)	2.20		
Width (m)	0.60		

MATERIAL:

[illegible]

Soil Infiltration Rate f =	1	2	3	
	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	
Soil Infiltration Rate f =	#REF!	#DIV/0!	#DIV/0!	m/s

TP04 Soakaway Test



OPERATOR:	KF
-----------	----

CONSULTANT:

TEST LOCATION: TP05

(in height x length x width)

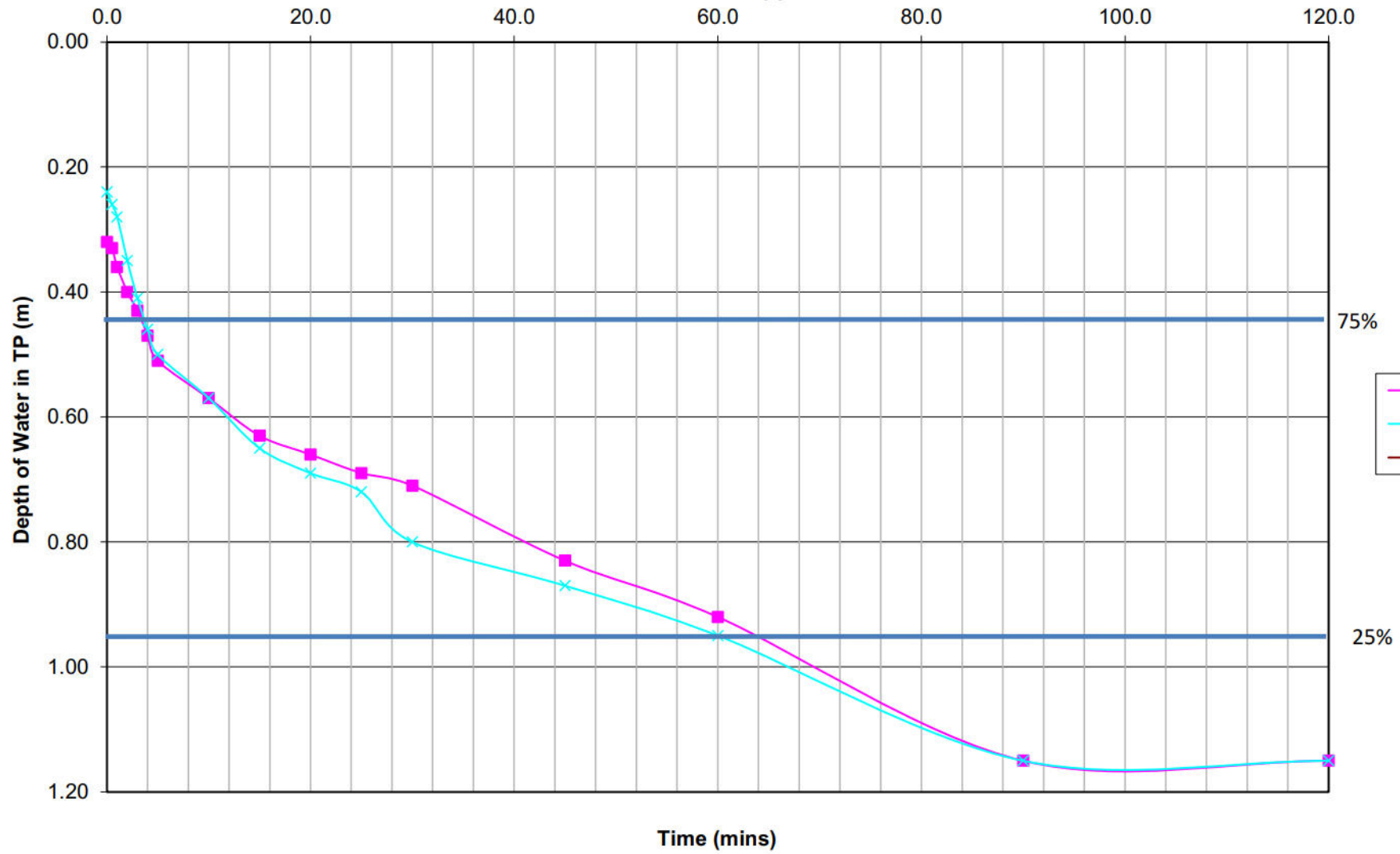
Reading 3

SAND

[illegible]

Soil Infiltration Rate f =	1	2	3	
	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	
Soil Infiltration Rate f =	2.56E-05	1.15E-05	#DIV/0!	m/s

Soakaway Test TP05



OPERATOR:	KF
-----------	----

CONSULTANT:

TEST LOCATION: TP06

(in height x length x width)

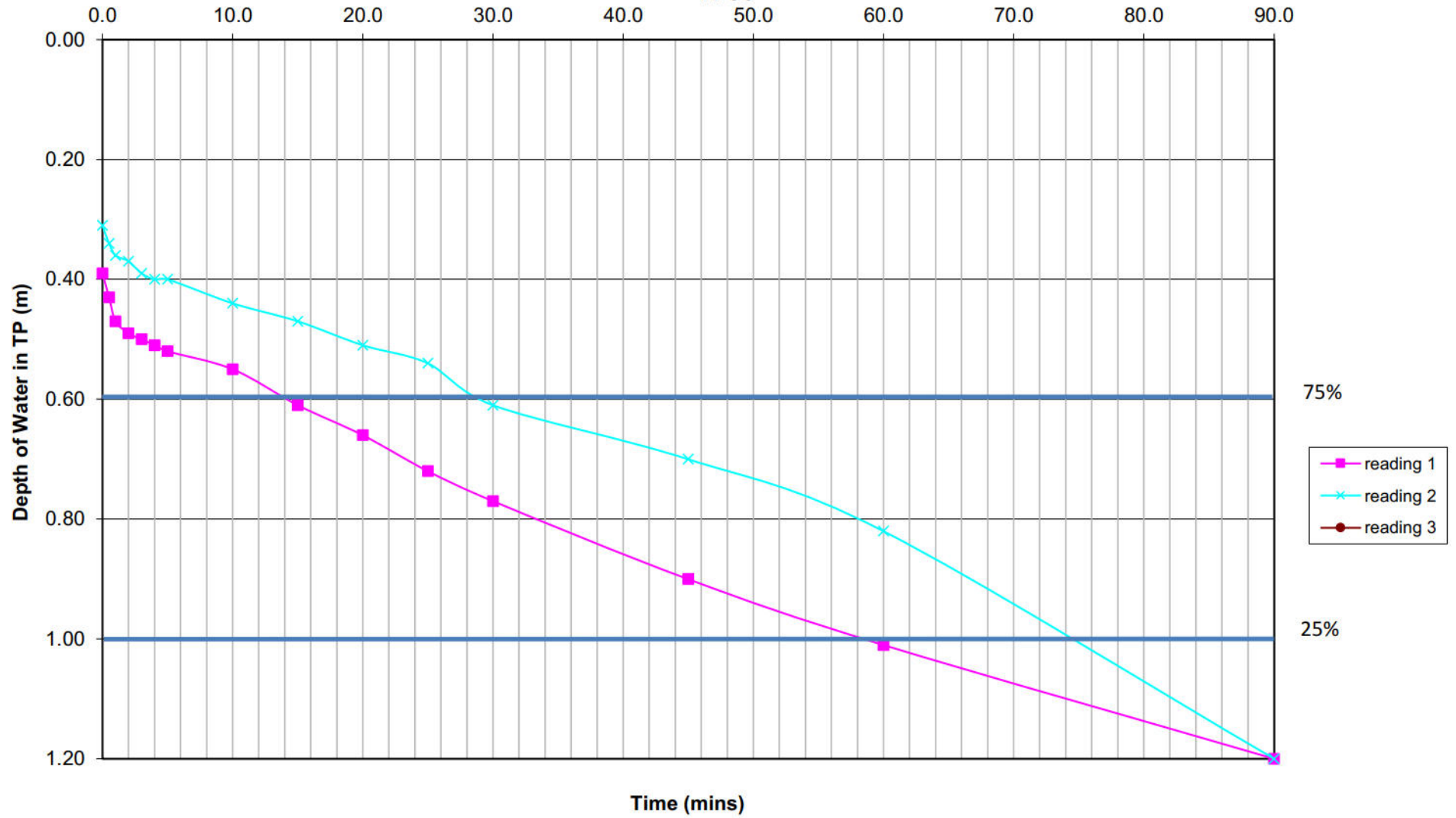
Reading 3

SAND

[illegible]

Soil Infiltration Rate f =	1	2	3	
	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	
Soil Infiltration Rate f =	2.89E-05	1.36E-05	#DIV/0!	m/s

Soakaway Test TP06



OPERATOR:	KF
-----------	----

TEST LOCATION: TP07

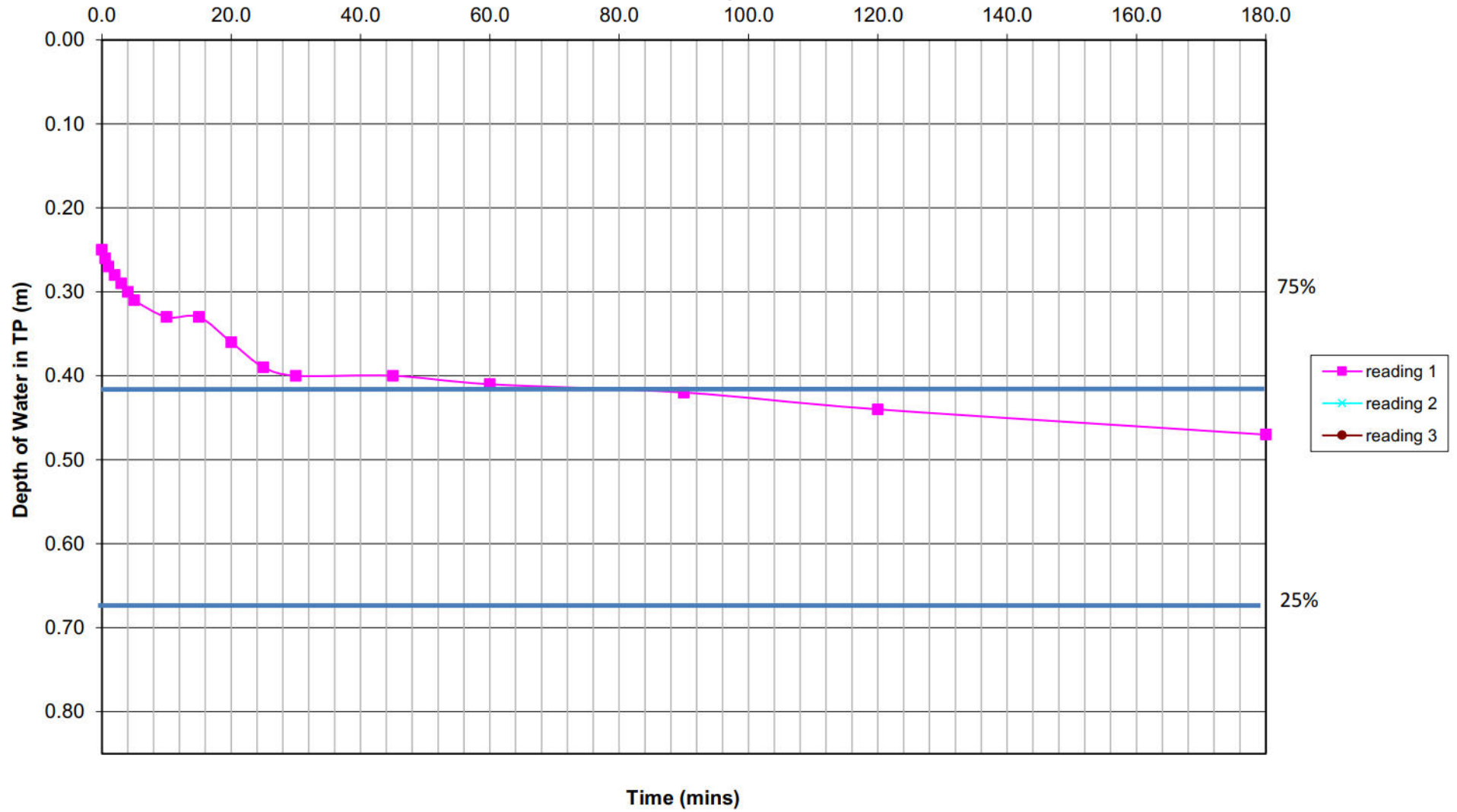
	Reading 1	Reading 2	Reading 3
Depth (m)	1.10	1.10	
Length (m)	2.60	2.60	
Width (m)	0.60	0.60	

CLAY

[illegible]

Soil Infiltration Rate f =	1	2	3	
	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$	
Soil Infiltration Rate f =	2.22E-05	0.00E+00	#DIV/0!	m/s

Soakaway Test TP07





Appendix E

Geotechnical Laboratory Results



LABORATORY REPORT



Contract Number: PSL24/1907

Report Date: 02 April 2024
Client's Reference: SP232036
Client Name: Technics Group
Unit M, Technics House
Merrow Business Park
Guildford
Surrey
GU4 7WA

For the attention of: Michail Kamperis

Contract Title: Fontwell

Date Received: 14/3/2024
Date Commenced: 14/3/2024
Date Completed: 2/4/2024

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins
(Managing Director)

R Berriman
(Associate Director)

S Royle
(Laboratory Manager)

L Knight
(Assistant Laboratory Manager)

S Eyre
(Senior Technician)



A Fry
(Section Manager)

5 – 7 Hexthorpe Road,
Hexthorpe,
Doncaster,
DN4 0AR



SUMMARY OF LABORATORY SOIL DESCRIPTIONS

[illegible]

Fontwell

Contract No:

PSL24/1907

Client Ref:

SP232036

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

[illegible]

SYMBOLS : NP : Non Plastic

*** : Liquid Limit and Plastic Limit Wet Sieved.**

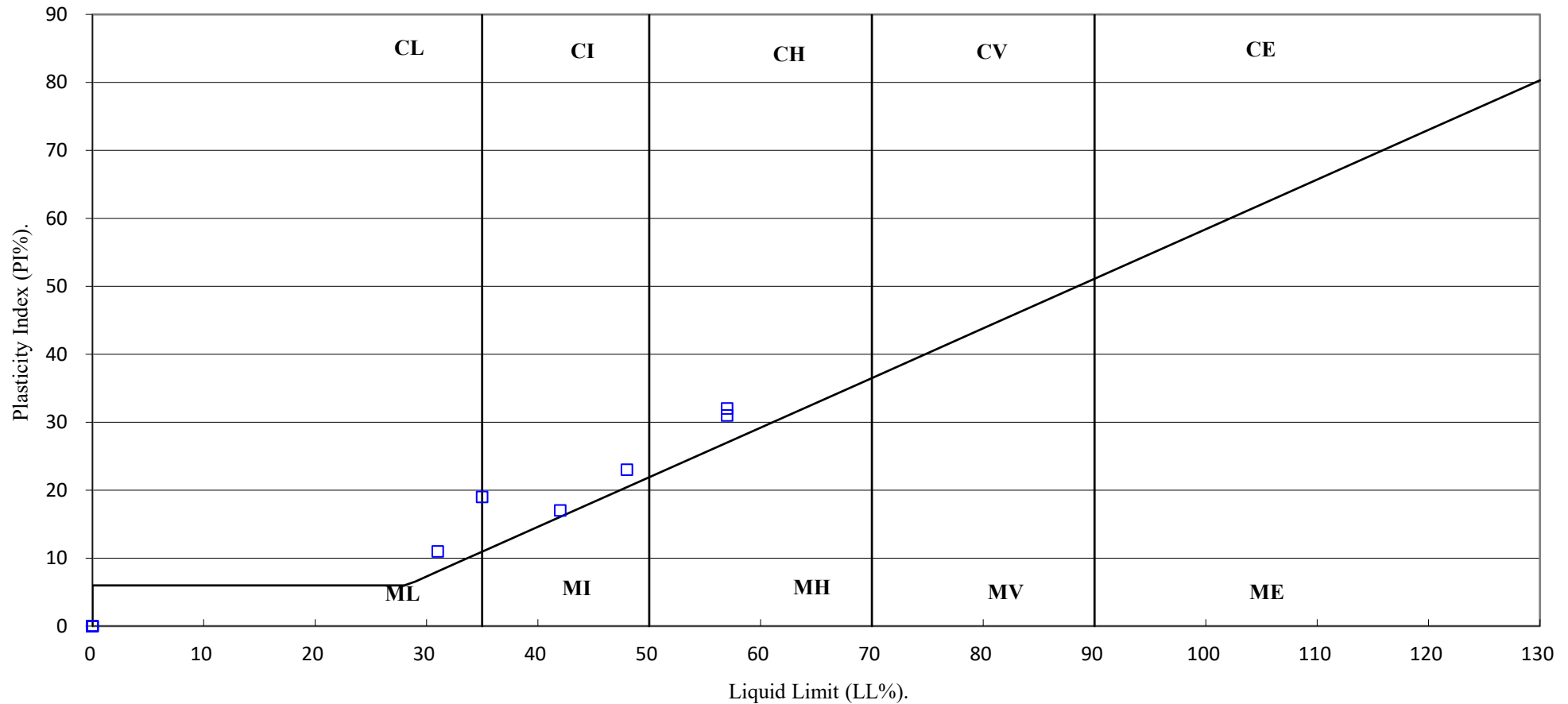
**Fontwell****Contract No:**

PSL24/1907

Client Ref:

SP232036

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



Fontwell

Contract No:

PSL24/1907

Client Ref:

SP232036

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

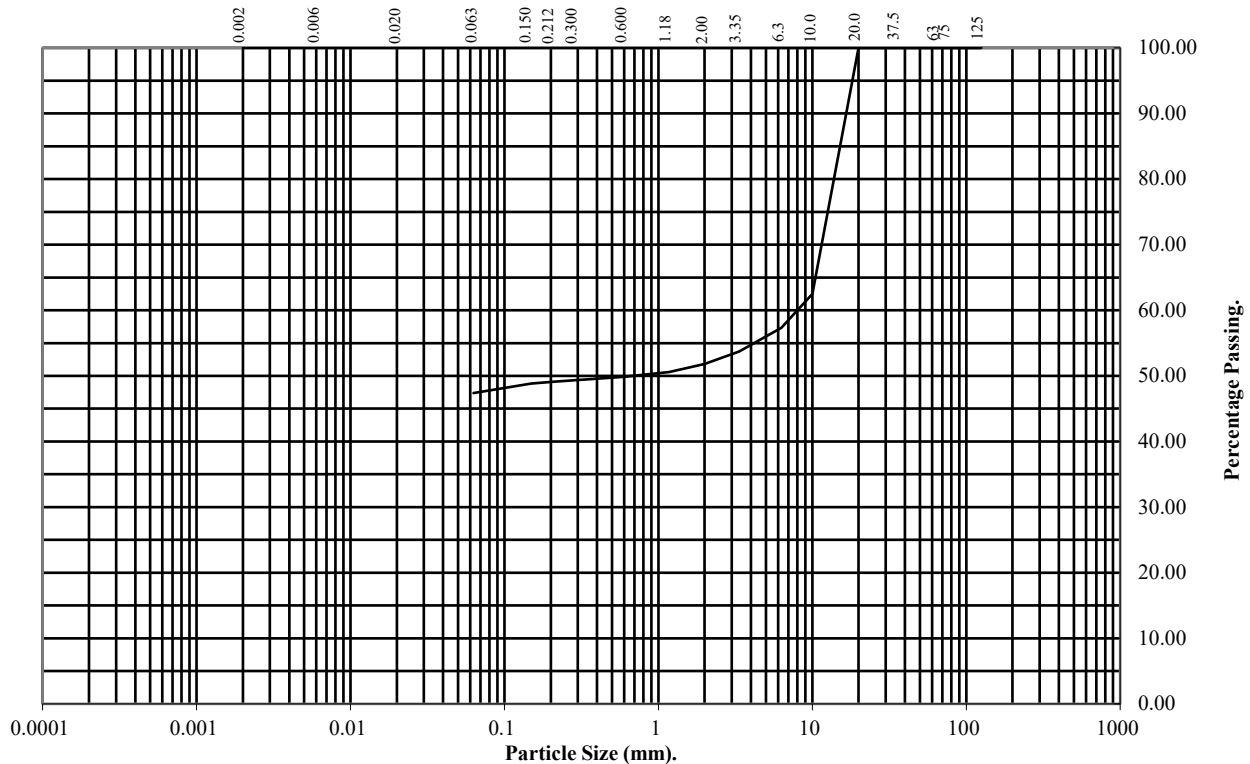
Hole Number: WS01

Top Depth (m): 0.70

Sample Number:

Base Depth(m): 0.80

Sample Type: D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	63
6.3	57
3.35	54
2	52
1.18	51
0.6	50
0.3	49
0.212	49
0.15	49
0.063	47

Soil Fraction	Total Percentage
Cobbles	0
Gravel	48
Sand	5
Silt/Clay	47

Remarks:

See Summary of Soil Descriptions



Fontwell

Contract No:
PSL24/1907
Client Ref:
SP232036

PARTICLE SIZE DISTRIBUTION TEST

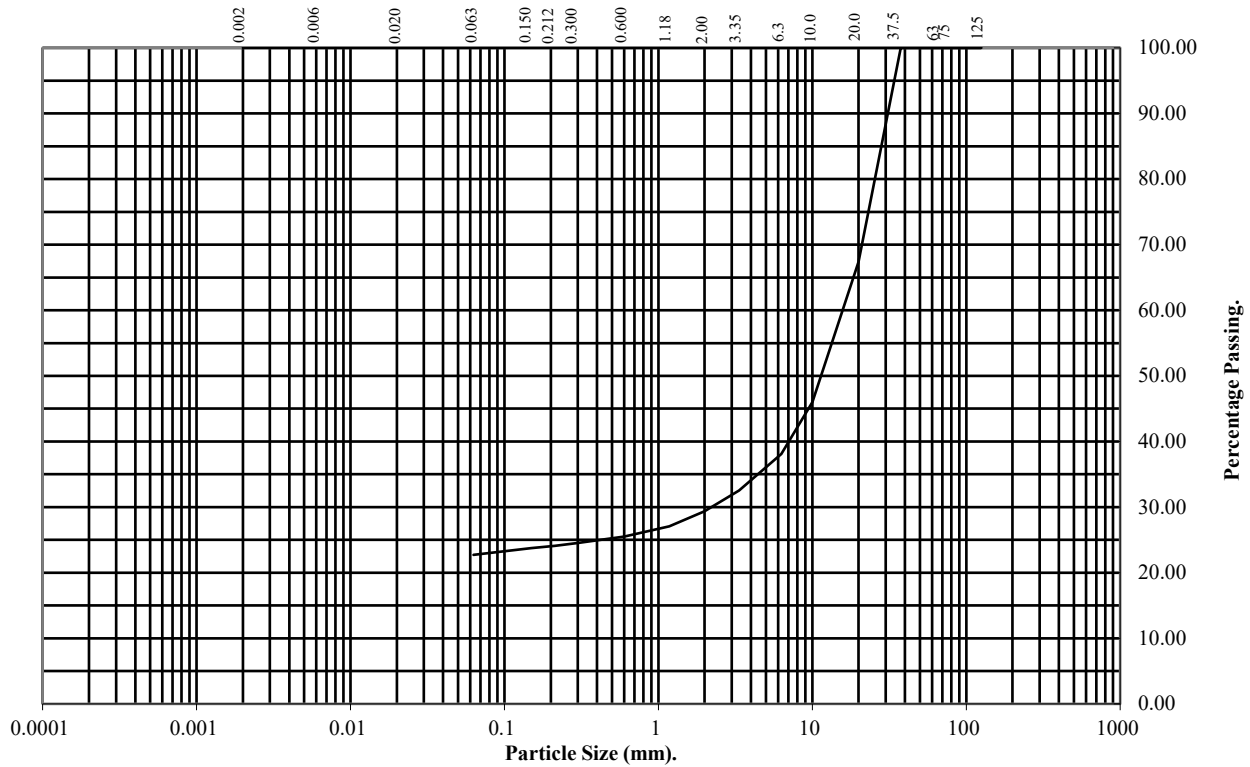
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **WS05** Top Depth (m): **0.40**

Sample Number: Base Depth(m): **0.70**

Sample Type: **D**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	67
10	46
6.3	38
3.35	33
2	29
1.18	27
0.6	26
0.3	25
0.212	24
0.15	24
0.063	23

Soil Fraction	Total Percentage
Cobbles	0
Gravel	71
Sand	6
Silt/Clay	23

Remarks:

See Summary of Soil Descriptions



Fontwell

Contract No:
PSL24/1907
Client Ref:
SP232036

PARTICLE SIZE DISTRIBUTION TEST

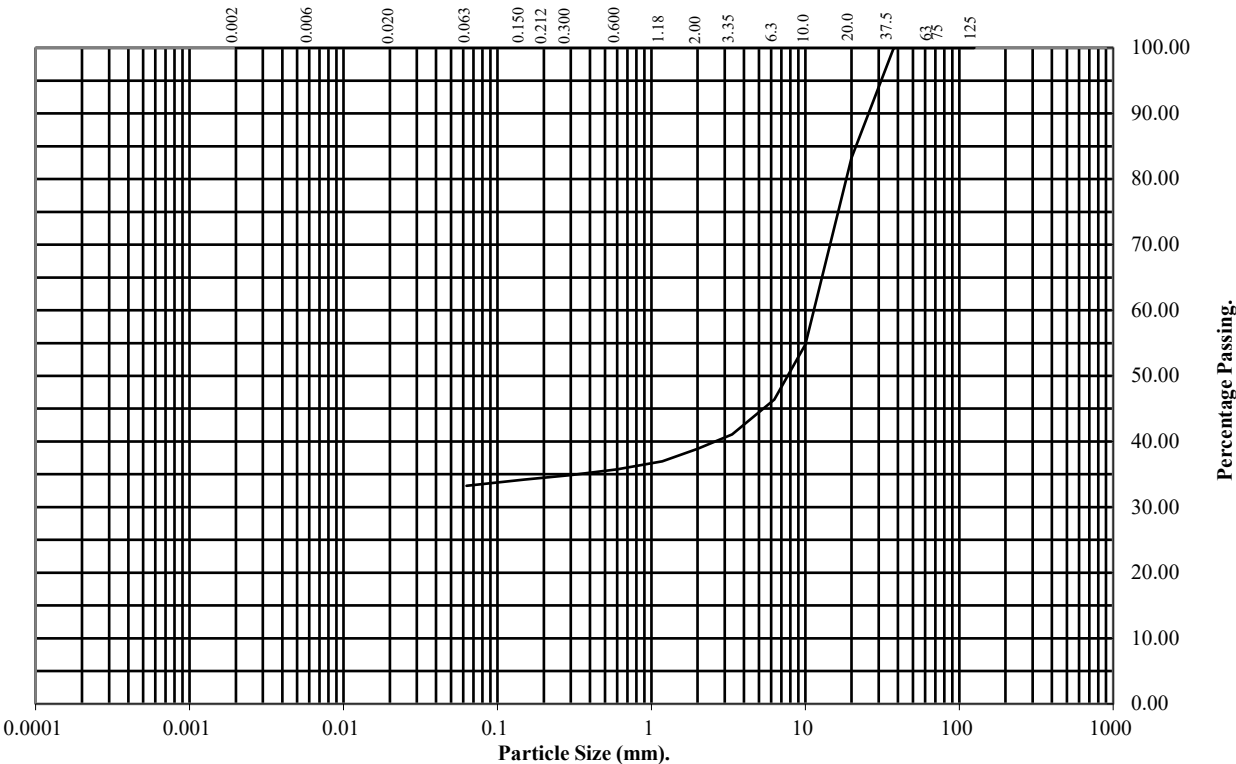
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: WS07 Top Depth (m): 0.70

Sample Number: Base Depth(m): 0.80

Sample Type: D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	83
10	55
6.3	46
3.35	41
2	39
1.18	37
0.6	36
0.3	35
0.212	35
0.15	34
0.063	33

Soil Fraction	Total Percentage
Cobbles	0
Gravel	61
Sand	6
Silt/Clay	33

Remarks:

See Summary of Soil Descriptions



Fontwell

Contract No:
PSL24/1907
Client Ref:
SP232036

PARTICLE SIZE DISTRIBUTION TEST

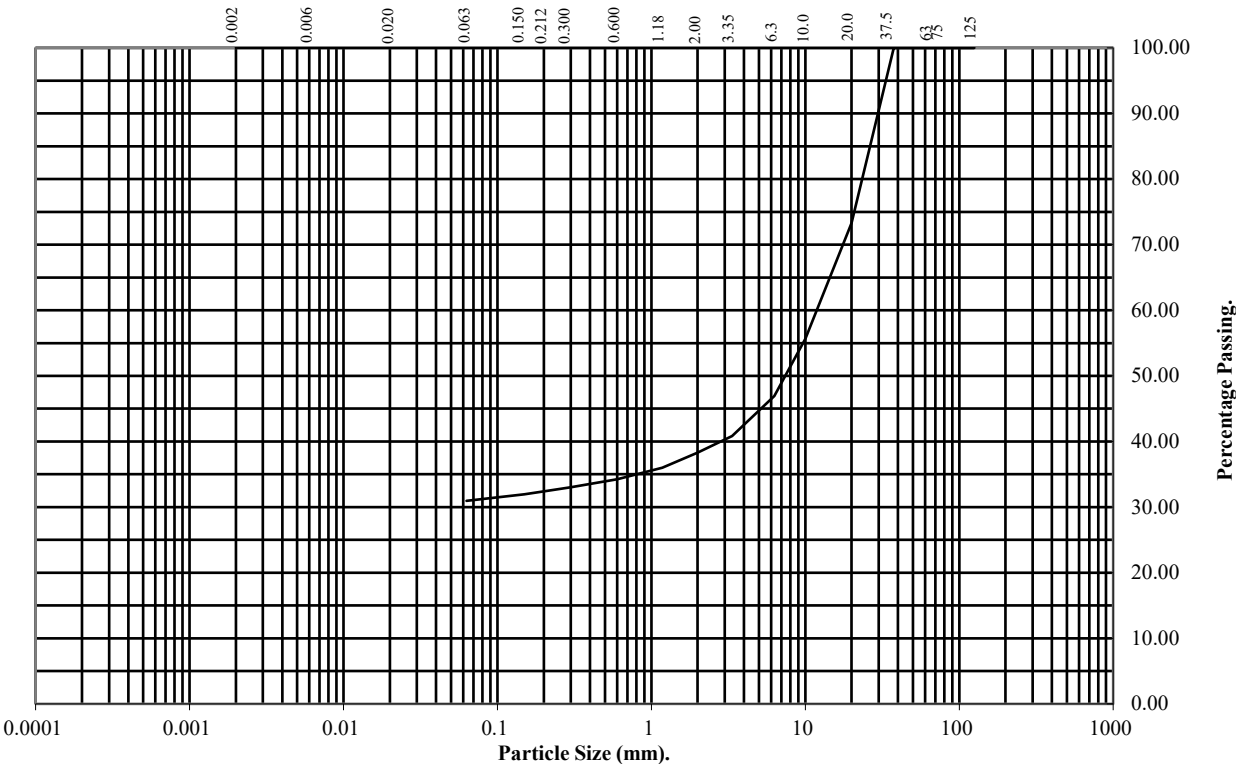
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: WS07 Top Depth (m): 1.40

Sample Number: Base Depth(m): 1.60

Sample Type: D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	73
10	56
6.3	47
3.35	41
2	38
1.18	36
0.6	34
0.3	33
0.212	32
0.15	32
0.063	31

Soil Fraction	Total Percentage
Cobbles	0
Gravel	62
Sand	7
Silt/Clay	31

Remarks:

See Summary of Soil Descriptions



Fontwell

Contract No:
PSL24/1907
Client Ref:
SP232036



Appendix F

Chemical Laboratory Results



Michail Kamperis
Technics Group
Technics House
Unit1M Merrow Business Park
Guildford
GU4 7WA

Normec DETS Limited
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent



DETS Report No: 24-02868

Site Reference: Fontwell

Project / Job Ref: SP232036

Order No: None Supplied

Sample Receipt Date: 19/03/2024

Sample Scheduled Date: 19/03/2024

Report Issue Number: 1

Reporting Date: 25/03/2024

Authorised by:



Customer Support Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.



Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone



Soil Analysis Certificate						
DETS Report No: 24-02868	~Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Technics Group	~Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: Fontwell	~TP / BH No	WS01	WS02	WS02	WS02	WS03
~Project / Job Ref: SP232036	~Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: None Supplied	~Depth (m)	0.10	0.20	1.00	1.40	1.20
Reporting Date: 25/03/2024	DETS Sample No	705097	705098	705099	705100	705101

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	MCERTS	6.7	6.6	5.1	5.2	6.4
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS			< 200		< 200
Total Sulphate as SO ₄	%	< 0.02	MCERTS			< 0.02		< 0.02
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	< 10	< 10	19	17	< 10
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	< 0.01	< 0.01	0.02	0.02	< 0.01
Total Sulphur	%	< 0.02	NONE			< 0.02		< 0.02
W/S Chloride (2:1)	mg/kg	< 1	MCERTS			9		
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS			4.5		
Water Soluble Nitrate (2:1) as NO ₃	mg/kg	< 3	MCERTS			3		
Water Soluble Nitrate (2:1) as NO ₃	mg/l	< 1.5	MCERTS			1.7		

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion

Subcontracted analysis (S)

~ Sample details provided by the customer



Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone



Soil Analysis Certificate						
DETS Report No: 24-02868	~Date Sampled	None Supplied				
Technics Group	~Time Sampled	None Supplied				
~Site Reference: Fontwell	~TP / BH No	WS04				
~Project / Job Ref: SP232036	~Additional Refs	None Supplied				
~Order No: None Supplied	~Depth (m)	0.20				
Reporting Date: 25/03/2024	DETS Sample No	705102				

Determinand	Unit	RL	Accreditation				
pH	pH Units	N/a	MCERTS	5.8			
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS				
Total Sulphate as SO ₄	%	< 0.02	MCERTS				
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	709			
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.71			
Total Sulphur	%	< 0.02	NONE				
W/S Chloride (2:1)	mg/kg	< 1	MCERTS				
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS				
Water Soluble Nitrate (2:1) as NO ₃	mg/kg	< 3	MCERTS				
Water Soluble Nitrate (2:1) as NO ₃	mg/l	< 1.5	MCERTS				

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion

Subcontracted analysis (S)

~ Sample details provided by the customer



Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone



Soil Analysis Certificate - Sample Descriptions

DETS Report No: 24-02868	
Technics Group	
~Site Reference: Fontwell	
~Project / Job Ref: SP232036	
~Order No: None Supplied	
Reporting Date: 25/03/2024	

DETS Sample No	~TP / BH No	~Additional Refs	~Depth (m)	Moisture Content (%)	Sample Matrix Description
^ 705097	WS01	None Supplied	0.10	14.4	Brown sandy clay with stones
^ 705098	WS02	None Supplied	0.20	17.1	Brown loamy sand with stones and vegetation
^ 705099	WS02	None Supplied	1.00	14	Light brown clay
^ 705100	WS02	None Supplied	1.40	12.7	Light brown sandy clay
^ 705101	WS03	None Supplied	1.20	10.6	Light brown sandy clay
^ 705102	WS04	None Supplied	0.20	28.1	Brown loamy sand with stones and vegetation

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{U/S}

Unsuitable Sample ^{U/S}

~ Sample details provided by the customer

^ no sampling date provided; unable to confirm if samples are within acceptable holding times



Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN



Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 24-02868

Technics Group

~Site Reference: Fontwell

~Project / Job Ref: SP232036

~Order No: None Supplied

Reporting Date: 25/03/2024

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenyldiazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried

AR As Received

~ Sample details provided by the customer



Michail Kamperis
Technics Group
Technics House
Unit1M Merrow Business Park
Guildford
GU4 7WA

Normec DETS Limited
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN

DETS Report No: 24-02811

Site Reference: Fontwell
Project / Job Ref: SP232036
Order No: None Supplied
Sample Receipt Date: 18/03/2024
Sample Scheduled Date: 18/03/2024
Report Issue Number: 1
Reporting Date: 22/03/2024

Authorised by:

Steve Knight
Customer Support Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.



Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN



Soil Analysis Certificate						
DETS Report No: 24-02811	~Date Sampled	01/03/24	01/03/24	01/03/24	01/03/24	01/03/24
Technics Group	~Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: Fontwell	~TP / BH No	WS05	WS06	WS06	WS06	WS07
~Project / Job Ref: SP232036	~Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: None Supplied	~Depth (m)	1.30	0.20	0.80	1.40	1.00
Reporting Date: 22/03/2024	DETS Sample No	704898	704899	704900	704901	704902

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	MCERTS	7.2	6.5	6.8	6.7	6.9
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS	< 200			< 200	
Total Sulphate as SO ₄	%	< 0.02	MCERTS	< 0.02			< 0.02	
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	< 10	15	< 10	< 10	< 10
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	< 0.01	0.02	< 0.01	< 0.01	< 0.01
Total Sulphur	%	< 0.02	NONE	< 0.02			< 0.02	

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion

Subcontracted analysis (S)

~ Sample details provided by the customer



Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN



Soil Analysis Certificate - Sample Descriptions

DETS Report No: 24-02811

Technics Group

~Site Reference: Fontwell

~Project / Job Ref: SP232036

~Order No: None Supplied

Reporting Date: 22/03/2024

DETS Sample No	~TP / BH No	~Additional Refs	~Depth (m)	Moisture Content (%)	Sample Matrix Description
\$ 704898	WS05	None Supplied	1.30	11.2	Light brown sandy clay with stones
\$ 704899	WS06	None Supplied	0.20	31.2	Light brown sandy clay with stones and vegetation
\$ 704900	WS06	None Supplied	0.80	10.2	Light brown sandy clay with stones
\$ 704901	WS06	None Supplied	1.40	10.3	Light brown sandy clay with stones
\$ 704902	WS07	None Supplied	1.00	12.3	Light brown sandy clay with stones

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{1/5}

Unsuitable Sample ^{U/5}

~ Sample details provided by the customer

\$ samples exceeded recommended holding times



Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN



Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 24-02811

Technics Group

~Site Reference: Fontwell

~Project / Job Ref: SP232036

~Order No: None Supplied

Reporting Date: 22/03/2024

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphénylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450°C	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (all: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (all: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried

AR As Received

~ Sample details provided by the customer



Appendix G

Groundwater Monitoring

JOB DETAILS: GWM

Client: Fontwell Field (West Sussex) Ltd

Site: Frontwell

Date: 01/03/24

Job No: SP232036

Visit No: 1 of 3

Operator: JAR

Project Manager: MK



				GAS CONCENTRATIONS														FLOW DATA				WELL AND WATER DATA		
Monitoring Point	Date	Time	Pressure (mbar)	PID Compensation Factor		Hexane (Vapour Equivalent) %		Methane (%v/v)		LEL (CH4 in air) %		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)
				Value		Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min	Steady	Peak			
WS03	01/03/2024	13:20																						1.1
WS06	01/03/2024	13:35																						Dry
WS07	01/03/2024	13:45																						1.3

METEOROLOGICAL AND SITE INFORMATION:

State of ground:

Wind:

Cloud cover:

Precipitation:

Barometric pressure (mbar):

Pressure trend:

☐	Dry
☐	Calm
☐	None
☐	None

☐	Moist
☒	Light
☒	Slight
☒	Slight
☐	Before
☐	Falling

☒	Wet
☐	Moderate
☐	Cloudy
☐	Moderate
☐	Steady

☐	Snow
☐	Strong
☐	Overcast
☐	Heavy
☐	After
☐	Rising
☐	Frozen

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter:

Gas concentration:

Gas Range:

Gas Flow range:

Differential Pressure:

Date of last calibration:

Date of next calibration:

CH ₄	NA	CO ₂	NA	O ₂	NA
CH ₄	NA	CO ₂	NA	O ₂	NA
+100/-50 l/hour					
(+/-) 1000 Pa					
NA					
NA					

PID meter:

Gas concentration:

Cylinder reference:

Sensor reading:

Accuracy limits:

Date of last calibration:

Date of next calibration:

C ₄ H ₈	NA
10475/4314	
Initial	NA
Final	NA
+/-10%	
NA	
NA	

JOB DETAILS: GWM

Client: Harlequin Developments

Site: Frontwell

Date: 04/04/24

Job No: SP232036

Visit No: 2 of 3

Operator: JAR

Project Manager: MK



				GAS CONCENTRATIONS														FLOW DATA				WELL AND WATER DATA		
Monitoring Point	Date	Time	Pressure (mbar)	PID Compensation Factor		Hexane (Vapour Equivalent) %		Methane (%v/v)		LEL (CH4 in air) %		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)
				Value	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min	Steady	Peak	Steady					
WS03	04/04/2024	10:30																						0.34
WS06	04/04/2024	10:45																						1.50
WS07	04/04/2024	11:00																						0.72

METEOROLOGICAL AND SITE INFORMATION:

State of ground:

Wind:

Cloud cover:

Precipitation:

Barometric pressure (mbar):

Pressure trend:

☐	Dry
☐	Calm
☐	None
☐	None

☐	Moist
☒	Light
☒	Slight
☒	Slight
☐	Before
☐	Falling

☒	Wet
☐	Moderate
☐	Cloudy
☐	Moderate
☐	Steady

☐	Snow
☐	Strong
☐	Overcast
☐	Heavy
☐	After
☐	Rising

☐	Frozen
--------------------------	--------

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter:

Gas concentration:

Gas Range:

Gas Flow range:

Differential Pressure:

Date of last calibration:

Date of next calibration:

CH₄	NA	CO₂	NA	O₂	NA
CH₄	NA	CO₂	NA	O₂	NA
+100/-50 l/hour					
(+/-) 1000 Pa					
NA					
NA					

PID meter:

Gas concentration:

Cylinder reference:

Sensor reading:

Accuracy limits:

Date of last calibration:

Date of next calibration:

C₄H₈	NA	Initial	NA	Final	NA
10475/4314					
+/-10%					
NA					
NA					

JOB DETAILS: GWM

Client: Fontwell Field (West Sussex) Ltd

Site: Frontwell

Date: 15/05/24

Job No: SP232036

Visit No: 3 of 3

Operator: JAR

Project Manager: MK



				GAS CONCENTRATIONS														FLOW DATA				WELL AND WATER DATA		
Monitoring Point	Date	Time	Pressure (mbar)	PID Compensation Factor		Hexane (Vapour Equivalent) %		Methane (%v/v)		LEL (CH4 in air) %		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)
				Value	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min	Steady	Peak	Steady					
WS03	15/05/2024	10:50																						1.24
WS06	15/05/2024	09:30																						1.42
WS07	15/05/2024	10:00																						1.58
WS08	15/05/2024	10:15																						DRY
WS09	15/05/2024	10:30																						DRY
WS10	15/05/2024	11:10																						DRY
WS11	15/05/2024	09:45																						DRY

METEOROLOGICAL AND SITE INFORMATION:

State of ground:

Wind:

Cloud cover:

Precipitation:

Barometric pressure (mbar):

Pressure trend:

	Dry
	Calm
	None
	None

	Moist
X	Light
X	Slight
X	Slight
NA	Before
NA	Falling

X	Wet
	Moderate
	Cloudy
	Moderate
NA	Steady

	Snow
	Strong
	Overcast
	Heavy
	After
NA	Rising

	Frozen
--	--------

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter:

Gas concentration:

Gas Range:

Gas Flow range:

Differential Pressure:

Date of last calibration:

Date of next calibration:

CH ₄	NA	CO ₂	NA	O ₂	NA
CH ₄	NA	CO ₂	NA	O ₂	NA
+100/-50 l/hour					
(±) 1000 Pa					
NA					
NA					

PID meter:

Gas concentration:

Cylinder reference:

Sensor reading:

Accuracy limits:

Date of last calibration:

Date of next calibration:

C ₄ H ₈	NA		
10475/4314			
Initial	NA	Final	NA
+/-10%			
NA			
NA			



Appendix H

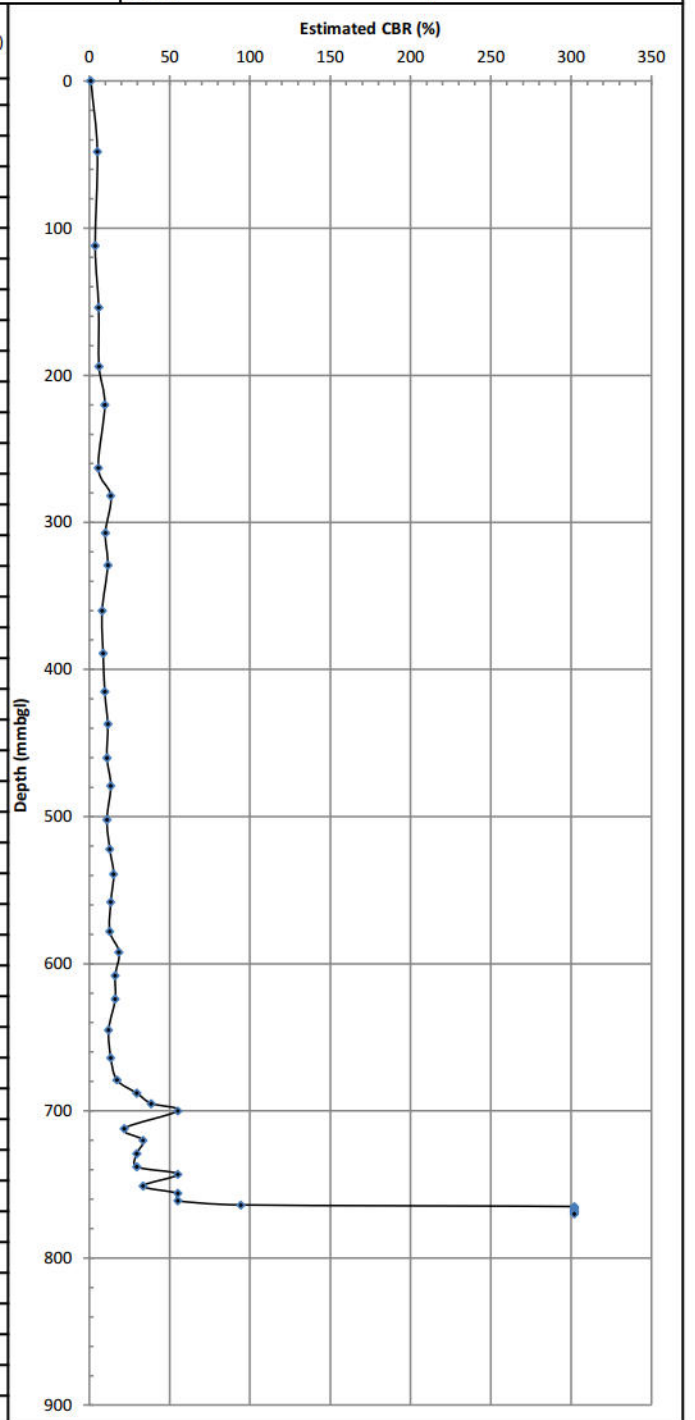
TRL DCP Results

TRL DYNAMIC CONE PENETROMETER TEST RESULTS



Project	Fontwell	Site	Fontwell, Arundel Road
Job No	SP232036	Ground Level	30.1
Test Date	4th April 2024	Latitude	106965
Client		Longitude	495673
		Hole Ref	CBR01
			Page: 1

No. of Blows	Depth Reading (mm)	Penetration / blow	Est. CBR (%)	No. of Blows	Depth Reading (mm)	Penetration/b low	Est. CBR (%)
0	0			47	769	0.0	302.0
1	48	48.0	5.0	50	770	0.0	302.0
2	112	32.0	3.7				
3	154	14.0	5.8				
4	194	10.0	6.1				
5	220	5.2	9.6				
6	263	7.2	6				
7	282	2.7	13				
8	307	3.1	10				
9	329	2.4	12				
10	360	3.1	8				
11	389	2.6	9				
12	415	2.2	10				
13	437	1.7	12				
14	460	1.6	11				
15	479	1.3	13				
16	502	1.4	11				
17	522	1.2	13				
18	539	0.9	15				
19	558	1.0	13				
20	578	1.0	13				
21	592	0.7	19				
22	608	0.7	16				
23	624	0.7	16				
24	645	0.9	12				
25	664	0.8	13				
26	679	0.6	17				
27	688	0.3	30				
28	695	0.3	39				
29	700	0.2	55				
30	712	0.4	22				
31	720	0.3	34				
32	729	0.3	30				
33	738	9.0	30				
34	743	0.1	55				
35	751	0.2	34				
36	756	0.1	55				
37	761	0.1	55				
38	764	0.1	95				
39	765	0.0	302				
40	766	0.0	302				
42	767	0.0	302				
45	768	0.0	302				
47	769	0.0	302				



Comments:

1. Position scanned with CAT & Genny prior to undertaking works.
2. Test advanced from ground level to 770mmbl.
3. Chart scaled to best represent data set.

Notes:

Estimated CBR value calculated per penetration/blow in accordance with IAN 73/06 Design Guidance for Road Pavement Foundations. Standardised dynamic cone penetrometer; 8kg weight falling 575mm with fixed 60° cone/20mm diameter. Depth presented is corrected depth (recorded field depth minus zero reading).

This graph shows the relationship between depth and estimated CBR for a 150mm thick subgrade. The x-axis represents Estimated CBR (%) from 0 to 350, and the y-axis represents Depth (mm bgl) from 0 to 800. The data points show a sharp increase in CBR starting around 100mm depth, reaching a plateau of approximately 300% CBR at a depth of 680mm.

Depth (mm bgl)	Estimated CBR (%)
0	0
10	0
20	0
30	0
40	0
50	0
60	0
70	0
80	0
90	0
100	0
110	0
120	0
130	0
140	0
150	0
160	0
170	0
180	0
190	0
200	0
210	0
220	0
230	0
240	0
250	0
260	0
270	0
280	0
290	0
300	0
310	0
320	0
330	0
340	0
350	0
360	0
370	0
380	0
390	0
400	0
410	0
420	0
430	0
440	0
450	0
460	0
470	0
480	0
490	0
500	0
510	0
520	0
530	0
540	0
550	0
560	0
570	0
580	0
590	0
600	0
610	0
620	0
630	0
640	0
650	0
660	0
670	0
680	0
690	0
700	0
710	0
720	0
730	0
740	0
750	0
760	0
770	0
780	0
790	0
800	0

Estimated CBR value calculated per penetration/blow in accordance with IAN 73/06 Design Guidance for Road Pavement Foundations. Standardised dynamic cone penetrometer; 8kg weight falling 575mm with fixed 60° cone/20mm diameter. Depth presented is corrected depth (recorded field depth minus zero reading).

[illegible]

1. Position scanned with CAT & Genny prior to undertaking works.
2. Test advanced from ground level to 457mm bgl.
3. Chart scaled to best represent data set.

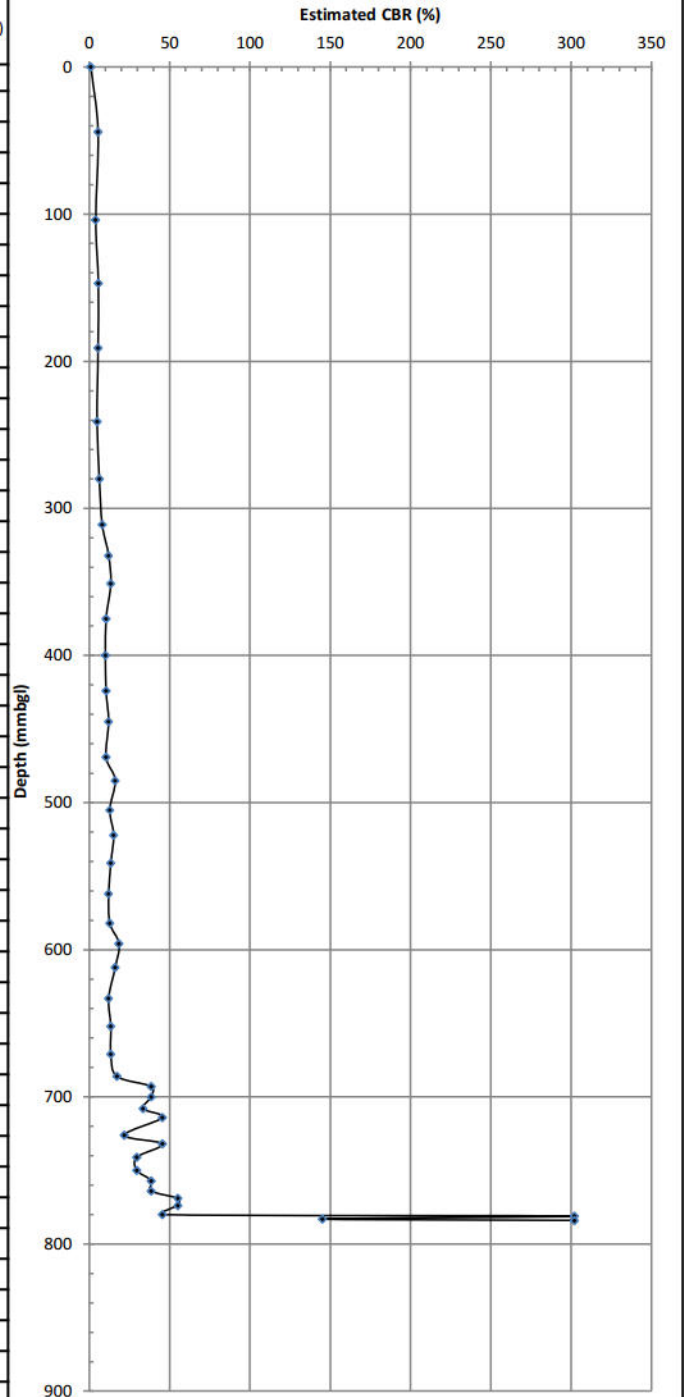
Estimated CBR value calculated per penetration/blow in accordance with IAN 73/06 Design Guidance for Road Pavement Foundations. Standardised dynamic cone penetrometer; 8kg weight falling 575mm with fixed 60° cone/20mm diameter. Depth presented is corrected depth (recorded field depth minus zero reading).

TRL DYNAMIC CONE PENETROMETER TEST RESULTS



Project	Fontwell	Site	Fontwell, Arundel Road
Job No	SP232036	Ground Level	32.5
Test Date	4th April 2024	Latitude	107011
Client		Longitude	495778
		Hole Ref	CBR05
			Page: 1

No. of Blows	Depth Reading (mm)	Penetration / blow	Est. CBR (%)	No. of Blows	Depth Reading (mm)	Penetration/b low	Est. CBR (%)
0	0						
1	44	44.0	5.5				
2	104	30.0	4.0				
3	147	14.3	5.7				
4	191	11.0	5.5				
5	241	10.0	4.8				
6	280	6.5	6				
7	311	4.4	8				
8	332	2.6	12				
9	351	2.1	13				
10	375	2.4	10				
11	400	2.3	10				
12	424	2.0	10				
13	445	1.6	12				
14	469	1.7	10				
15	485	1.1	16				
16	505	1.3	13				
17	522	1.0	15				
18	541	1.1	13				
19	562	1.1	12				
20	582	1.0	13				
21	596	0.7	19				
22	612	0.7	16				
23	633	0.9	12				
24	652	0.8	13				
25	671	0.8	13				
26	686	0.6	17				
27	693	0.3	39				
28	700	0.3	39				
29	708	0.3	34				
30	714	0.2	45				
31	726	0.4	22				
32	732	0.2	45				
33	741	9.0	30				
34	750	0.3	30				
35	757	0.2	39				
36	764	0.2	39				
37	769	0.1	55				
38	774	0.1	55				
39	780	0.2	45				
40	781	0.0	302				
41	783	0.0	145				
50	784	0.0	302				



Comments:

1. Position scanned with CAT & Genny prior to undertaking works.
2. Test advanced from ground level to 784mmbl.
3. Chart scaled to best represent data set.

Notes:

Estimated CBR value calculated per penetration/blow in accordance with IAN 73/06 Design Guidance for Road Pavement Foundations. Standardised dynamic cone penetrometer; 8kg weight falling 575mm with fixed 60° cone/20mm diameter. Depth presented is corrected depth (recorded field depth minus zero reading).

The graph displays the relationship between Estimated CBR (%) and Depth (mm bgl). The x-axis represents Estimated CBR (%) from 0 to 70, and the y-axis represents Depth (mm bgl) from 0 to 1200. The data points are connected by a line, showing a sharp increase in CBR at approximately 950 mm depth, indicating a subgrade improvement.

Depth (mm bgl)	Estimated CBR (%)
0	0
10	0
20	0
30	0
40	0
50	0
60	0
70	0
80	0
90	0
100	0
110	0
120	0
130	0
140	0
150	0
160	0
170	0
180	0
190	0
200	0
210	0
220	0
230	0
240	0
250	0
260	0
270	0
280	0
290	0
300	0
310	0
320	0
330	0
340	0
350	0
360	0
370	0
380	0
390	0
400	0
410	0
420	0
430	0
440	0
450	0
460	0
470	0
480	0
490	0
500	0
510	0
520	0
530	0
540	0
550	0
560	0
570	0
580	0
590	0
600	0
610	0
620	0
630	0
640	0
650	0
660	0
670	0
680	0
690	0
700	0
710	0
720	0
730	0
740	0
750	0
760	0
770	0
780	0
790	0
800	0
810	0
820	0
830	0
840	0
850	0
860	0
870	0
880	0
890	0
900	0
910	0
920	0
930	0
940	0
950	0
960	0
970	0
980	0
990	0
1000	0
1010	0
1020	0
1030	0
1040	0
1050	0
1060	0
1070	0
1080	0
1090	0
1100	0
1110	0
1120	0
1130	0
1140	0
1150	0
1160	0
1170	0
1180	0
1190	0
1200	0

Estimated CBR value calculated per penetration/blow in accordance with IAN 73/06 Design Guidance for Road Pavement Foundations. Standardised dynamic cone penetrometer; 8kg weight falling 575mm with fixed 60° cone/20mm diameter. Depth presented is corrected depth (recorded field depth minus zero reading).



Appendix I

SPT Hammer Certificate

22-24 Aaron Road
Whittlesey
Peterborough
PE7 2EX

SPT Hammer Ref: 116
Test Date: 09/07/2023
Report Date: 09/07/2023
File Name: 116.spt
Test Operator: NG

Instrumented Rod Data

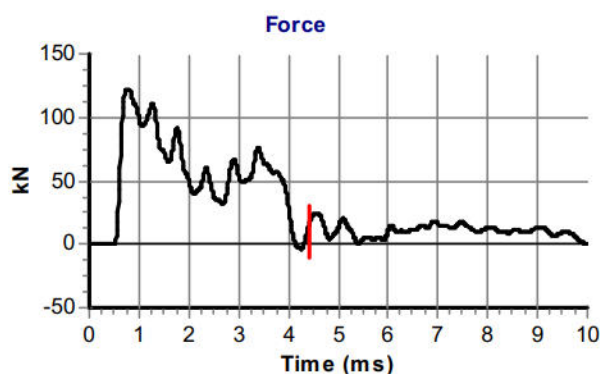
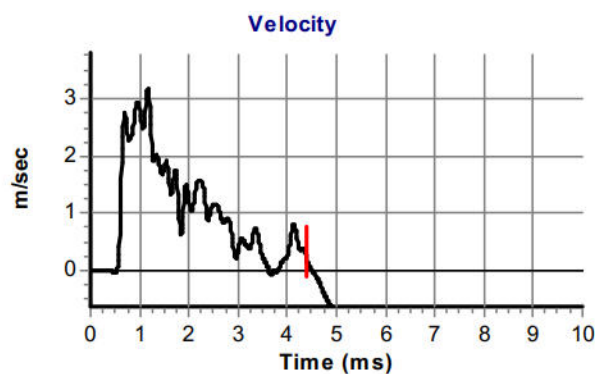
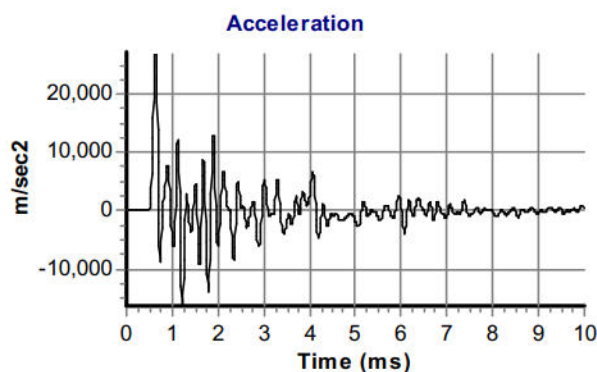
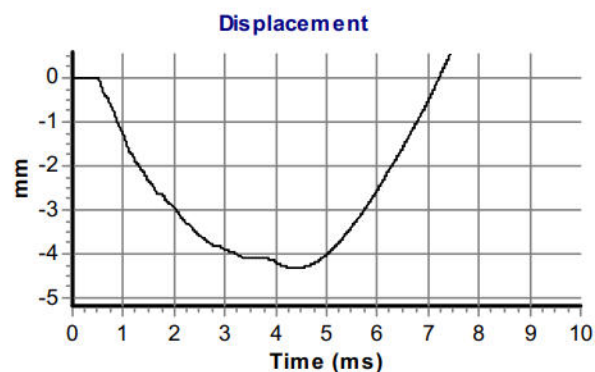
Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.6
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 11853
Accelerometer No.2: 10332

SPT Hammer Information

Hammer Mass m (kg): 5.0
Falling Height h (mm): 760
SPT String Length L (m): 15.0

Comments / Location

Maximum calibration interval is 12 months
GTR790 FSX S/N: 116/2021 DE-2006/42



Calculations

Area of Rod A (mm²): 983
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 346

Energy Ratio E_r (%): **73**

Signed: Phil Rodgman
Title: Mr



Appendix J

Falling Head Test Results

In Situ Falling Head Permeability Test



Project	Fontwell	Site	Land off Abrundel Road
Job No	SP232036	Ground Level	34.1m
Date	04/04/2024	Coords	107089 / 495682
Client	Fontwell Field (West Sussex) Ltd	Hole Ref	WS03

TYPE OF TEST							
Standpipe				a2	b2		
Falling Head				Elapsed time, t	Depth to water	Head (m)	Head ratio
DETAILS OF INSTALLATION:				0.00	0.00	0.54	1.000 H1/H0
Top of response zone	c	1.00	m BGL	0.17	0.02	0.52	0.963
Base of response zone	d	1.70	m BGL	0.33	0.03	0.51	0.944
Depth of groundwater prior to test	e	0.54	m BGL	0.50	0.05	0.49	0.907
Height of standpipe above ground level		-	m (datum)	0.67	0.05	0.49	0.907
Test Duration	f	45	mins	0.83	0.05	0.49	0.907
Diameter of standpipe or granular annulus	g	0.05	m	1.00	0.06	0.48	0.889
Area of base		0.00	m ²	1.17	0.060	0.48	0.889
Final Depth to Water		0.22	m	1.33	0.070	0.47	0.870
CONDITION OF TEST ZONE:		ef: BS EN 22282-1 Annex B: 2012		1.50	0.070	0.47	0.870
Diameter of borehole	h	0.077	m	1.67	0.070	0.47	0.870
Length of response zone (L)		0.70	m	1.83	0.070	0.47	0.870
Shape Factor (F)		1.51	F	2.00	0.070	0.47	0.870
Shape Factor (F) Calculation				5.00	0.08	0.46	0.852
$F = \frac{2 \pi L}{\ln \left\{ \left(\frac{L}{D} \right) + \sqrt{1 + \left(\frac{L}{D} \right)^2} \right\}}$ $F = \frac{4.40}{2.90}$ $F = 1.51$				10	0.09	0.45	0.833
				15	0.1	0.44	0.815
				20	0.11	0.43	0.796
				25	0.11	0.43	0.796
				30	0.12	0.42	0.778
				35	0.12	0.42	0.778
				40	0.13	0.41	0.759
				45	0.13	0.41	0.759 H2/H0

CALCULATED VALUES	
Differential head at start of test, H0	Not used in calculation
Differential head at end of test, H	Not used in calculation
Time elapsed at end of test	Not used in calculation

General Approach

Basic time lag T Not used in calculation

Coordinates of best fit line to data:

Time in seconds

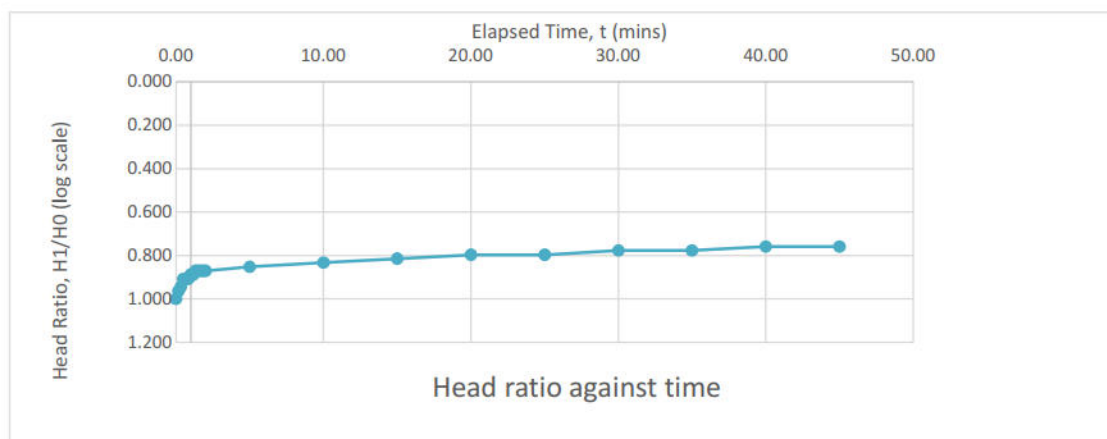
t ₁ =	0	H ₁ /H ₀ =	1.00
t ₂ =	2700	H ₂ /H ₀ =	0.68

Permeability (k) 4.39E-07 m/sec
Calculation

$$k = \frac{\text{Area of Base}}{F(t_2 - t_1)} \times \frac{H_1}{H_2}$$

$$k = \frac{0.00}{4090.06} \times \frac{1.00}{0.68}$$

$$k = 4.39E-07 \text{ m/sec}$$



Comments	0 to 45min
Notes:	1. Depth of water measured from GL 2. Permeability calculated in accordance with BS EN 22282-2: 2012

In Situ Falling Head Permeability Test



Project	Fontwell	Site	Land off Abrundel Road
Job No	SP232036	Ground Level	32.3
Date	04/04/2024	Coords	106979 / 495812
Client	Fontwell Field (West Sussex) Ltd	Hole Ref	WS06

TYPE OF TEST				a2	b2			
Standpipe				Elapsed	Depth to	Head	Head	
Falling Head				time, t	water	(m)	ratio	
DETAILS OF INSTALLATION:								
Top of response zone	c	0.80	m BGL	0.00	0.00	1.50	1.000	H1/H0
Base of response zone	d	1.80	m BGL	0.17	0.06	1.44	0.960	
Depth of groundwater prior to test	e	1.50	m BGL	0.33	0.08	1.42	0.947	
Height of standpipe above ground level		-	m (datum)	0.50	0.10	1.40	0.933	
Test Duration	f	45	mins	0.67	0.10	1.40	0.933	
Diameter of standpipe or granular annulus	g	0.05	m	0.83	0.10	1.40	0.933	
Area of base		0.00	m2	1.00	0.11	1.39	0.927	
Final Depth to Water		0.22	m	1.17	0.110	1.39	0.927	
CONDITION OF TEST ZONE:								
ef: BS EN 22282-1 Annex B: 2012				1.33	0.110	1.39	0.927	
				1.50	0.110	1.39	0.927	
Diameter of borehole	h	0.077	m	1.67	0.110	1.39	0.927	
Length of response zone (L)		1.00	m	1.83	0.120	1.38	0.920	
Shape Factor (F)		1.93	F	2.00	0.120	1.38	0.920	
Shape Factor (F) Calculation				5.00	0.13	1.37	0.913	
<div><div>F = $\frac{2 \pi L}{\ln \{(L/D) + \sqrt{1+(L/D)^2}\}}$</div><div>F = $\frac{6.28}{3.26}$</div><div>F = 1.93</div></div>				10	0.15	1.35	0.900	
				15	0.17	1.33	0.887	
				20	0.18	1.32	0.880	
				25	0.19	1.31	0.873	
				30	0.2	1.30	0.867	
				35	0.21	1.29	0.860	
				40	0.21	1.29	0.860	
				45	0.22	1.28	0.853	H2/H0

CALCULATED VALUES
Differential head at start of test, H0 Not used in calculation
Differential head at end of test, H Not used in calculation
Time elapsed at end of test Not used in calculation

General Approach

Basic time lag T Not used in calculation

Coordinates of best fit line to data:

Time in seconds

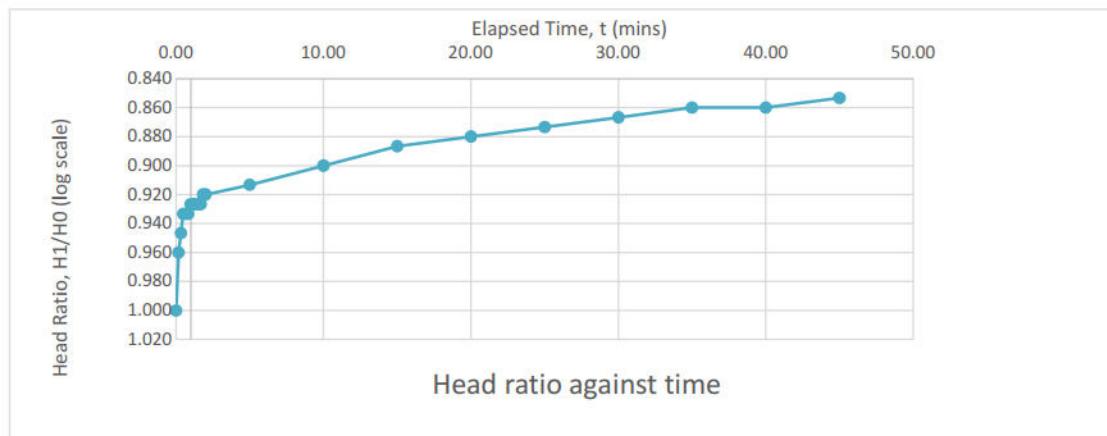
t₁ = 0 H₁/H₀ = 1.00
t₂ = 2700 H₂/H₀ = 0.68

Permeability (k) 3.45E-07 m/sec
Calculation

$$k = \frac{\text{Area of Base}}{F(t_2 - t_1)} \times \frac{H_1}{H_2}$$

$$k = \frac{0.00}{5206.14} \times \frac{1.00}{0.68}$$

$$k = 3.45E-07 \text{ m/sec}$$



Comments	0 to 45min
Notes:	1. Depth of water measured from GL 2. Permeability calculated in accordance with BS EN 22282-2: 2012

In Situ Falling Head Permeability Test



Project	Fontwell	Site	Land off Abrundel Road
Job No	SP232036	Ground Level	32.7m
Date	04/04/2024	Coords	106966 / 495737
Client	Fontwell Field (West Sussex) Ltd	Hole Ref	WS07

TYPE OF TEST				a2		b2	
				Elapsed	Depth to	Head	Head
				time, t	water	(m)	ratio
DETAILS OF INSTALLATION:							
Top of response zone	c	1.00	m BGL	0.00	0.00	0.72	1.000
Base of response zone	d	2.00	m BGL	0.17	0.03	0.69	0.958
Depth of groundwater prior to test	e	0.72	m BGL	0.33	0.05	0.67	0.931
Height of standpipe above ground level		-	m (datum)	0.50	0.07	0.65	0.903
Test Duration	f	45	mins	0.67	0.09	0.63	0.875
Diameter of standpipe or granular anr	g	0.05	m	0.83	0.10	0.62	0.861
Area of base		0.00	m2	1.00	0.11	0.61	0.847
Final Depth to Water		0.22	m	1.17	0.110	0.61	0.847
CONDITION OF TEST ZONE:							
ef: BS EN 22282-1 Annex B: 201				1.33	0.110	0.61	0.847
				1.50	0.110	0.61	0.847
Diameter of borehole	h	0.077	m	1.67	0.120	0.60	0.833
Length of response zone (L)		1.00	m	1.83	0.120	0.60	0.833
Shape Factor (F)		1.93	F	2.00	0.120	0.60	0.833
Shape Factor (F) Calculation				5.00	0.14	0.58	0.806
				10	0.16	0.56	0.778
				15	0.18	0.54	0.750
				20	0.19	0.53	0.736
				25	0.19	0.53	0.736
				30	0.2	0.52	0.722
				35	0.2	0.52	0.722
				40	0.2	0.52	0.722
				45	0.21	0.51	0.708

F =	$\frac{2 \pi L}{\ln \{(L/D) + \sqrt{1+(L/D)^2}\}}$
F =	$\frac{6.28}{3.26}$
F =	1.93

H1/H0
H2/H0

CALCULATED VALUES	
Differential head at start of test, H0	Not used in calculation
Differential head at end of test, H	Not used in calculation
Time elapsed at end of test	Not used in calculation

General Approach

Basic time lag T Not used in calculation

Coordinates of best fit line to data:

Time in seconds

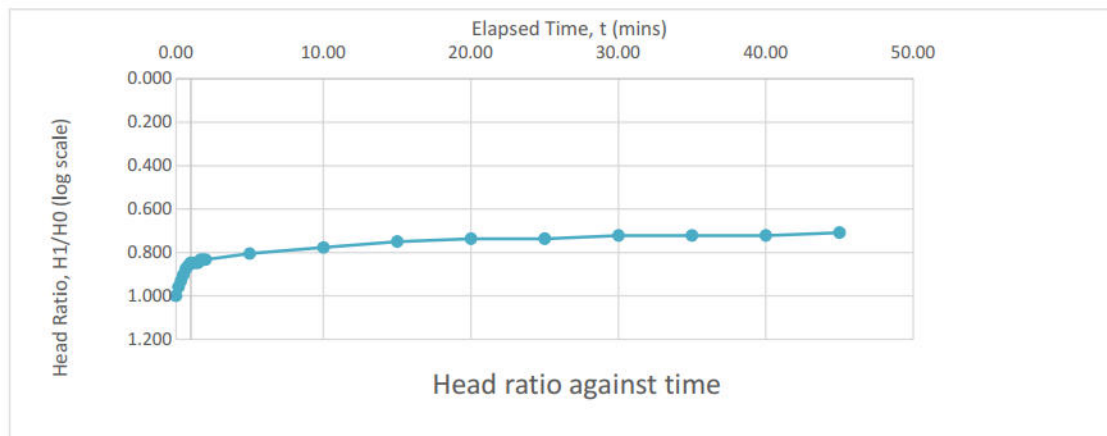
t ₁ =	0	H ₁ /H ₀ =	1.00
t ₂ =	2700	H ₂ /H ₀ =	0.68

Permeability (k) 3.45E-07 m/sec
Calculation

$$k = \frac{\text{Area of Base}}{F(t_2 - t_1)} \times \frac{H_1}{H_2}$$

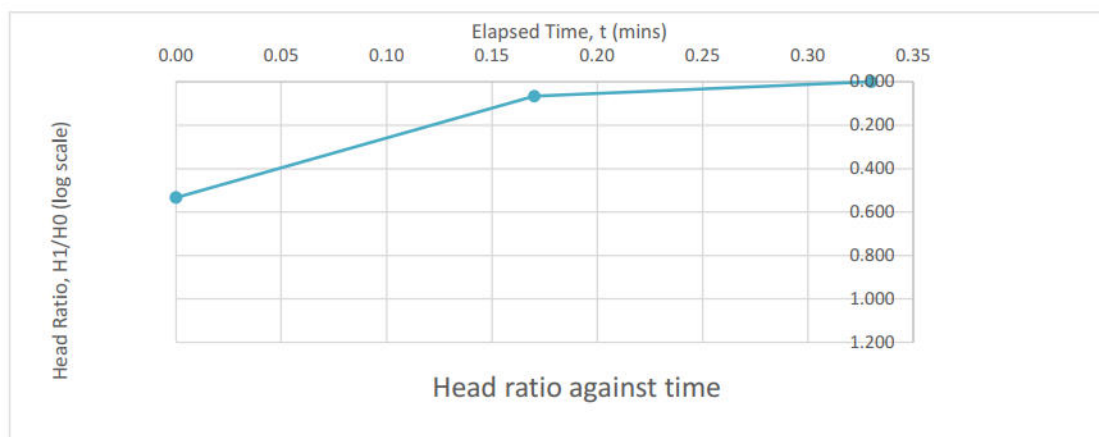
$$k = \frac{0.00}{5206.14} \times \frac{1.00}{0.68}$$

$$k = 3.45E-07 \text{ m/sec}$$



Comments	0 to 45min
Notes:	1. Depth of water measured from GL 2. Permeability calculated in accordance with BS EN 22282-2: 2012

TYPE OF TEST				a2	b2		
				Elapsed time, t	Depth to water	Head (m)	Head ratio
DETAILS OF INSTALLATION:							
Top of response zone	c	0.00	m BGL	0.00	0.21	0.24	0.533
Base of response zone	d	0.45	m BGL	0.17	0.42	0.03	0.067
Depth of groundwater prior to test	e	0.45	m BGL	0.33	0.45	0.00	0.000
Height of standpipe above ground level		-	m (datum)			0.45	1.000
Test Duration	f	45	mins			0.45	1.000
Diameter of standpipe or granular annulus	g	0.05	m			0.45	1.000
Area of base		0.00	m ²			0.45	1.000
Final Depth to Water		0.22	m			0.45	1.000
CONDITION OF TEST ZONE:						0.45	1.000
						0.45	1.000
Diameter of borehole	h	0.077	m			0.45	1.000
Length of response zone (L)		0.45	m			0.45	1.000
Shape Factor (F)		1.15	F			0.45	1.000
Shape Factor (F) Calculation						0.45	1.000
$F = \frac{2\pi L}{\ln \left\{ \left(\frac{L}{D} \right) + \sqrt{1 + \left(\frac{L}{D} \right)^2} \right\}}$						0.45	1.000
$F = \frac{2.83}{2.47}$						0.45	1.000
$F = 1.15$						0.45	1.000
						0.45	1.000

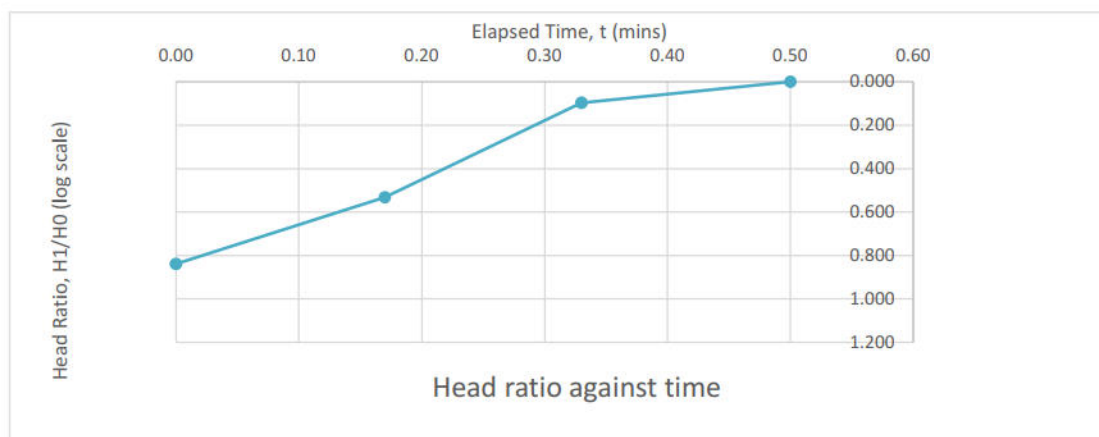
 $k = 5.80\text{E-}07 \text{ m/sec}$ 

Comments	0 to 45min
Notes:	1. Depth of water measured from GL 2. Permeability calculated in accordance with BS EN 22282-2: 2012

TYPE OF TEST				a2	b2		
				Elapsed time, t	Depth to water	Head (m)	Head ratio
DETAILS OF INSTALLATION:							
Top of response zone	c	0.00	m BGL	0.00	0.10	0.52	0.839
Base of response zone	d	0.62	m BGL	0.17	0.29	0.33	0.532
Depth of groundwater prior to test	e	0.62	m BGL	0.33	0.56	0.06	0.097
Height of standpipe above ground level	-	-	m (datum)	0.50	0.62	0.00	0.000
Test Duration	f	45	mins			0.62	1.000
Diameter of standpipe or granular annulus	g	0.05	m			0.62	1.000
Area of base		0.00	m ²			0.62	1.000
Final Depth to Water		0.22	m			0.62	1.000
CONDITION OF TEST ZONE:						0.62	1.000
						0.62	1.000
Diameter of borehole	h	0.077	m			0.62	1.000
Length of response zone (L)		0.62	m			0.62	1.000
Shape Factor (F)		1.40	F			0.62	1.000
Shape Factor (F) Calculation						0.62	1.000
$F = \frac{2\pi L}{\ln \left\{ \left(\frac{L}{D} \right) + \sqrt{1 + \left(\frac{L}{D} \right)^2} \right\}}$						0.62	1.000
$F = \frac{3.90}{2.78}$						0.62	1.000
$F = 1.40$						0.62	1.000
						0.62	1.000

Not used in calculation

$t_1 =$	0	$H_1/H_0 =$	1.00
$t_2 =$	2700	$H_2/H_0 =$	0.68

$$k = 4.75 \times 10^{-7} \text{ m/sec}$$


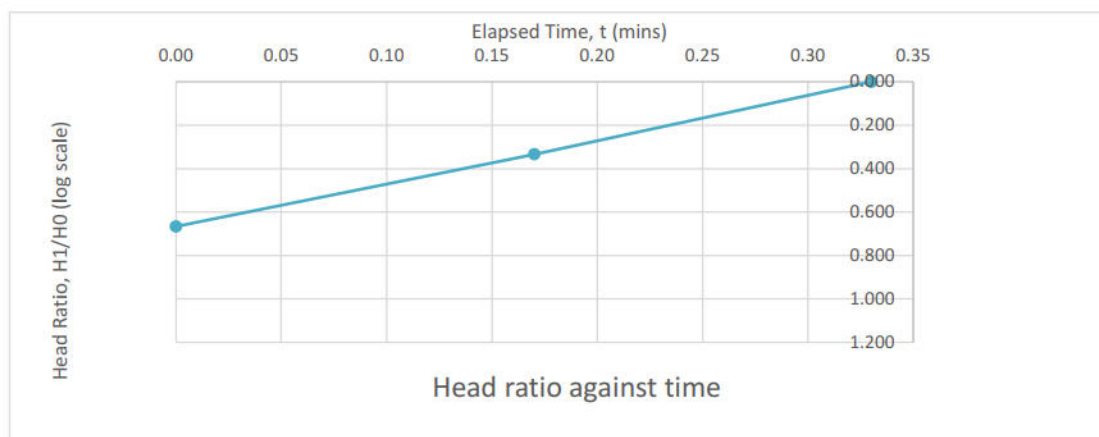
Comments	0 to 45min
Notes:	1. Depth of water measured from GL 2. Permeability calculated in accordance with BS EN 22282-2: 2012

TYPE OF TEST				a2	b2		
				Elapsed time, t	Depth to water	Head (m)	Head ratio
DETAILS OF INSTALLATION:							
Top of response zone	c	0.00	m BGL	0.00	0.15	0.30	0.667
Base of response zone	d	0.45	m BGL	0.17	0.30	0.15	0.333
Depth of groundwater prior to test	e	0.45	m BGL	0.33	0.45	0.00	0.000
Height of standpipe above ground level		-	m (datum)			0.45	1.000
Test Duration	f	45	mins			0.45	1.000
Diameter of standpipe or granular annulus	g	0.05	m			0.45	1.000
Area of base		0.00	m ²			0.45	1.000
Final Depth to Water		0.22	m			0.45	1.000
CONDITION OF TEST ZONE:						0.45	1.000
						0.45	1.000
Diameter of borehole	h	0.077	m			0.45	1.000
Length of response zone (L)		0.45	m			0.45	1.000
Shape Factor (F)		1.15	F			0.45	1.000
Shape Factor (F) Calculation						0.45	1.000
$F = \frac{2\pi L}{\ln \left\{ \left(\frac{L}{D} \right) + \sqrt{1 + \left(\frac{L}{D} \right)^2} \right\}}$						0.45	1.000
$F = \frac{2.83}{2.47}$						0.45	1.000
$F = 1.15$						0.45	1.000
						0.45	1.000

Permeability (k)	5.80E-07 m/sec
Calculation	

$$k = \frac{\text{Area of Base}}{F(t_2 - t_1)} \times \frac{H_1}{H_2}$$
$$k = \frac{0.00}{3095.94} \times \frac{1.00}{0.68}$$
 $k = 5.80\text{E-}07 \text{ m/sec}$

$t_1 =$	0	$H_1/H_0 =$	1.00
$t_2 =$	2700	$H_2/H_0 =$	0.68



Notes:	1. Depth of water measured from GL 2. Permeability calculated in accordance with BS EN 22282-2: 2012
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