

Environmental
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Specialists



PHASE 2

GEO-ENVIRONMENTAL REPORT

job number	C5007/25/E/7632	date	16.05.25
site address	Land East of Stretton Croft, Wolvey Road, Burbage, Hinckley, Leicestershire, LE10 3JB		
written by	S. Hale	checked by	R. Palmer
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Report on a Phase 2 Geo-environmental Investigation

Location:	Land East of Stretton Croft Wolvey Road, Burbage, Hinckley, Leicestershire, LE10 3JB	
For:	Welcome Break	
Report No.	C5007/25/E/7632	Report date: May 2025
Status:	FINAL	

For and on behalf of **Rogers Geotechnical Services Ltd**

	
Steven Hale BSc FGS Geo-environmental Technician	Rob Palmer MSc FGS ACIEH Engineering Director

Report Summary¹

Item	Comments	Section
Development	Construction of a new motorway service station.	1.
Geology	Superficial geology – Wigston Sand and Gravel Member & Oadby Till Member. Solid geology – Mercia Mudstone Group.	5.
Strata Conditions	Capping of topsoil and made ground overlying slightly sandy slightly gravelly silty clay (till).	6.
Groundwater	No groundwater strikes identified during the investigation.	6.2
Foundation Design	Shallow foundation solution may be considered following a cut and fill operation on site, however, cognisance should also be given to a piled foundation solution.	10. & 10.1
Effect of Sulphates	DC-1 concrete.	10.5
Contamination	No significant contamination identified within this investigation. However, previous assessment on site discovered localised asbestos contamination, albeit at low levels (<0.001%)	11.

¹ This summary should not be relied upon to provide a comprehensive review. All of the information contained in this document should be considered.

1. Introduction

It is understood that the land east of Stretton Croft is to be developed by the construction of a new motorway service station. Consequently, a site investigation has been undertaken in accordance with the instruction from the client. This work was required in order to determine the nature of the underlying soils, to assess their engineering properties and to assist in the design of safe and economical foundations for the proposed development. This investigation also takes into consideration the risk of any contamination present. This report describes the work undertaken, presents the data obtained and discusses the ground conditions in relation to the proposed works.

2. Limitations

The recommendations made and opinions expressed in this report are based on the ground conditions revealed by the site works, together with an assessment of the site and of the laboratory test results. Whilst opinions may be expressed relating to sub-soil conditions in parts of the site not investigated, for example between borehole positions, these are for guidance only and no liability can be accepted for their accuracy.

This report has been prepared in accordance with our understanding of current best practice. However, new information or legislation, or changes to best practice may necessitate revision of the report after the date of issue.

3. Previous Investigation

A Phase 2 Geo-Environmental Assessment was undertaken by BWB, report ref SPH-BWB-ZZ-00-RP-YE-0001-PH2_P2, dated February 2020. The report has been reviewed as part of this recent investigation and shall be discussed further within this report.

4. Fieldworks

The fieldworks were undertaken on the 24th and 25th March 2025 and included the following:

- Two cable percussive boreholes with standard penetration tests at regular intervals.
- Installation of two monitoring standpipes.
- Seven machine-dug trial pits, one of which was used for soakaway testing.
- Seven TRL DCPs adjacent to trial pit locations.

It should be appreciated that at the time of the investigation, the south-western and western sections of the site were overgrown with brambles and bushes measuring over 2m in height. As such, and as agreed with the client's representative, investigation was only completed within the eastern and northern sections of the site.

The ground investigation scope sent by the client had pre-selected locations. In view of the above, these positions had to be adjusted accordingly. The completed investigatory locations are shown on the site plan which is presented in Appendix 1 to this report.

4.1 Cable Percussive Boreholes

The boreholes were sunk using a 1.5 tonne capacity light cable percussive (shell and auger) drilling rig with 150mm diameter tools and casing.

During the boring operations, representative disturbed samples of the arisings were taken at regular depth intervals and sealed in plastic bags. Standard penetration tests (SPTs) were undertaken at regular depth increments; except in cohesive materials where SPTs and undisturbed samples (U100s) were alternated. The SPTs were conducted in accordance with the procedures given in BS EN ISO 22476: Part 3: 2005 +A1: 2011, and the results are summarised on the borehole records. During this work an automatic trip hammer of 63.5kg falling through 760mm was employed to drive either a cone or split barrel sampler assembly into the ground, the barrel samples were retained in air tight plastic containers. Groundwater levels were recorded when struck and boring stopped for a period of time to allow the water level to be monitored.

All recovered samples were returned to the laboratory for subsequent logging and testing. The soils were described in general accordance with BS5930: 2015 +A1: 2020 and full descriptions are given on the borehole records, which are presented in Appendix 2. Also included on these records are the water levels, casing details, standard penetration test results and a record of samples taken.

4.2 Monitoring Standpipes

Monitoring standpipes were installed to a depth of 9.0m and 15.0m within boreholes CP01 and CP02 respectively. In all cases, the monitoring standpipe consisted of a perforated pipe from the base of the borehole to 1.0m below surface, with a non-perforated pipe to ground level. The response zone was filled with pea gravel, with a bentonite seal at the base and above, and the installation was capped with a stop box cover in a concrete surround.

4.3 Machine-dug Trial Pits and Soakaway

Seven trial pits were excavated during the investigation with one being used for soakaway testing, the positions of which are shown in Appendix 1. The soakaway test was undertaken at the base of the pit at depths rational to the construction of soakaways. The soils exposed in the trial pits were logged on site in general accordance with BS5930: 2015 +A1: 2020, and full descriptions are given on the trial pit records which are presented in Appendix 3.

Once excavations were completed, the trial pits were carefully re-instated with the arisings. Whilst every care was taken during the infilling process, including compacting of the infill at regular intervals with the arm of the excavator, it should be appreciated that some mounding of the surface may have resulted. Moreover, the infilled soils may be subjected to settlement over time, such that a depression in the surface may also occur. Therefore, the locations of any pits undertaken in this investigation should be conveyed to the current site user, as the mounds or depressions associated with the pits may present a risk to current site operations. Furthermore, it must be realised that the infilled pits represent an area of disturbance within the site soils, thus the soils at the pit locations

may vary characteristically compared to the undisturbed ground. As such, foundations placed in this disturbed material may not perform as anticipated.

4.4 TRL Dynamic Cone Penetrometer Tests

TRL Dynamic Cone Penetrometer tests were undertaken in seven locations adjacent to the trial pits. The penetrometer consists of an 8kg slide hammer falling through 575mm onto an anvil, which drives a 20mm diameter 60° cone into the ground. The depth of the cone driven per blow of the hammer is recorded. The results of the dynamic penetration tests are presented as Appendix 4 and include graphs of penetration blows and CBR values versus depth. The percentage CBR value has been obtained from the correlation provided in TRRL Road Note 8 which is given below:

$$\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057\text{Log}_{10}(\text{mm/blow})$$

5. Geology

The available published geological data for the site has been examined and the following table presents the anticipated geology.

Table 1: Geological Data for the Site

Strata Type	Strata Name ²	Previous Name ³	Description ³
Superficial Geology	Wigston Sand and Gravel Member	-	Glaciofluvial sands and gravels with clasts generally dominated by lithologies such as Bunter pebbles and coal.
	Oadby Till Member	Oadby Till	Diamicton, grey, weathering brown, characterised by Cretaceous and Jurassic rock fragments; subordinate lenses of sand and gravel, clay and silt.
Solid Geology	Mercia Mudstone Group	Keuper Marl	Dominantly red, less commonly green-grey, mudstones and subordinate siltstones with thick halite-bearing units in the some basinal areas.

6. Strata Conditions

In accordance with the geology of the area, the succession has been shown to include the following:

Table 2: Generalised Strata Profile

Depth m below ground level to underside of layer	Strata Type	Positions Encountered	Groundwater Strikes m below ground level
Cable Percussive Boreholes			
1.00	MADE GROUND (Slightly sandy, gravelly, silty CLAY)	CP01	None
0.40	MADE GROUND (Silty, gravelly SAND)	CP02	None
2.45	Slightly sandy, silty CLAY	CP01	None

² Sources: British Geological Survey (NERC) Map Sheet 169; Coventry; Solid and Drift Edition, and Geology of Britain Viewer [online resource from www.bgs.ac.uk]

³ Sources: British Geological Survey (NERC) Lexicon of Named Rock Units [online resource from www.bgs.ac.uk]

2.45	Clayey, silty, slightly gravelly SAND	CP02	None
8.00 – 14.00	Slightly sandy, slightly gravelly, silty CLAY [OADBY TILL MEMBER]	Both	None
9.00 – 15.00	Gravelly, silty CLAY [WEATHERED MERCIA MUDSTONE GROUP]	Both	None
+9.22 – +15.27	Extremely weak, highly weathered MUDSTONE recovered as a clayey gravel [MERCIA MUDSTONE GROUP]	Both	None
Machine-dug Trial Pits			
0.15 – 0.50	TOPSOIL (Silty, slightly gravelly SAND)	TP101, TP102 & TP105	None
0.20	MADE GROUND (Clayey, silty, sandy GRAVEL)	TP103	None
0.60	Made ground (Silty, sandy GRAVEL)	TP104	None
1.10	MADE GROUND (Silty, gravelly SAND)	TP106	None
1.00	MADE GROUND (Slightly sandy, gravelly, silty CLAY)	TP107	None
+1.80 – +2.00	Clayey, silty, slightly gravelly SAND	TP101 & TP102	TP101 – 1.80m
1.10 – +1.70	Sandy, silty CLAY	TP103 – TP107	None
+1.60 – +1.80	Sandy, silty CLAY	TP103 – TP105	None

'+' denotes that the strata extended below the termination depth of the investigated positions, thus the extent of the deposit is only proven to the depths indicated

6.1 General Strata

In general, clayey, silty, gravelly sand was present to the boreholes and trial pits located to the northern end of the site beneath the topsoil and made ground. These positions consisted of CP02, TP101 and TP102 and it is considered that this material may represent the Wigston Sand and Gravel Member indicated to underlie the site. In comparison, sandy, gravelly, silty clay was revealed beneath the topsoil and made ground within the remaining positions. This clay is thought to represent the Oadby Till Member before it transitions into the weathered fraction of the Mercia Mudstone Group as shown within the borehole records. Finally, the boreholes were noted to refuse on mudstone which is anticipated to represent the beginning of the solid Mercia Mudstone Group.

6.2 Groundwater

No groundwater strikes were observed within the boreholes during the site investigation. Water seepage was noted within trial pit TP101, whereupon it was monitored for 2 hours and noted to fill from the base of the pit to 1.50m before the pit was backfilled. It should be appreciated that the normal rate of boring does not permit the recording of an equilibrium water level for any one strike, moreover, groundwater levels are subject to seasonal variation or changes on local drainage conditions.

7. Insitu Testing

7.1 Standard Penetration Tests

The standard penetration tests undertaken in the boreholes are summarised in the following table:

Table 3: Summary of Standard Penetration Tests				
Strata	Depth Range (m)	SPT 'N' (Blows/300mm)		Comments
		Granular soils	Cohesive soils	
Clayey silty gravelly SAND	1.2	7	-	SPT's indicate granular material is in a loose in-situ condition.
	2.0	5	-	
Sandy silty CLAY	1.2	-	6 to 7	SPT's indicate a soft to stiff becoming very stiff in-situ condition.
	2.0		5 to 6	
	3.0		8	
	4.0		10	
	5.0		17	
	6.5		21	
	8.0		16	
	9.5		28	
	11.0		36	
Weathered MUDSTONE	12.5		40	
	9.0	-	28	Very stiff to hard insitu condition.
	14.0		44	
	15.0		50+	

7.2 TRL Dynamic Cone Penetrometer Tests

TRL DCP tests were undertaken at specification locations. A summary of the results is presented below:

Table 4: Summary of TRL CBR Tests			
Position	Depth Range	CBR %	Comments
TRL 01	0m to 0.49m	4% to 8%	Weaker near surface soils.
	0.51m to 0.92m	16% to 55%	
TRL 02	0.13m to 0.94m	3% to 13%	No distinct layers.
TRL 03	0.07m to 0.45m	13% to >100%	No distinct layers.
TRL 04	0.12m to 0.55m	6% to >100%	Near surface soils appear to be more competent.
	0.66m to 0.95m	4% to 13%	
TRL 05	0.6m to 0.22m	1%	Near surface soils appear to be more competent.
	0.23m to 0.35m	8% to 26%	
	0.43m to 0.92m	3% to 8%	
TRL 06	0.08m to 0.9m	13% to >100%	No distinct layers.
TRL 07	0.11m to 0.94m	8% to >100%	No distinct layers.

7.3 Soakaway Test

On reaching the elected soakaway test depth, the pit was trimmed and squared as much as practicable. Water was then introduced into the pit at a controlled rate to prevent collapse of the sides and the level monitored at time intervals relative to a reference bar at ground level.

The results obtained from the soakaway tests are presented at Appendix 5 and are summarised below:

Table 5: Soakaway Test Results					
Location	Soakage Area Dimensions (average) (m)	Depths of soaked strata (m)	Soil Description (soaked strata)	Infiltration Rate (m/sec)	*Drainage Characteristics
TP105	0.3 x 1.4	1.34 To 1.80	Sandy silty CLAY	-	Practically Impermeable

During the soakaway tests the water level did not achieve a fall from 75% to 25% of the effective depth of the storage volume in both trial pits. In both tests, the water level movement ceased at around 50% effective depth. It is considered that the initial movement was observed as water filled any gaps and fissures within the made ground at the side of the pit. On this basis, the tests could not be completed within the scope of the method provided in BRE Digest 365 due to the poor soakage rate of the exposed soils. Due to the negligible water movement it was not possible to extrapolate the results obtained in order to obtain a soil infiltration rate.

7.3 Gas and Water Level Monitoring

The standpipes were monitored on the 24th April 2025. The results of the gas monitoring undertaken to date are tabulated below and full results are presented in Appendix 6:

Table 6: Gas Monitoring (RGS)								
Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Flow (l/h)	Barometric Pressure (mb)	Water Level (m)	Standpipe Depth (m)
CP01	24.04.25	0.0	0.1	20.7	0.0	1010↔	1.50	8.9m
CP02	24.04.25	0.0	0.1	21.0	0.0	1010↔	0.18	14.7m

↑ - rising pressure ↓ - falling pressure ↔ -steady pressure

This work was undertaken using a Geotechnical Instruments (UK) Ltd. GA5000 (serial No G503524) which was last calibrated on the 25th October 2024.

8. Laboratory Testing - Geotechnical

The following programme of laboratory testing has been undertaken on samples obtained during this investigation:

- Determination of water content BS EN ISO 17892-1:2014
- Determination of liquid and plastic limits BS EN ISO 17892-12:2018
- Determination of particle size distribution (Wet) BS EN ISO 17892-4:2016: 5.2
- Sedimentation by pipette BS EN ISO 17892-4:2016: 5.3 – 5.4
- Incremental loading oedometer test BS EN ISO 17892-5:2017
- Unconsolidated undrained triaxial test BS EN ISO 17892-8:2018
- Soluble sulphate content BS 1377-3:2018+A1:2021: Pt3: 7.3
- pH value BS 1377-3:2018+A1:2021: Pt3: 12

The test results are presented in Appendix 7 and are summarised below:

Table 7: Summary of Geotechnical Test Results				
Test type	Number of tests	Range of results		Comments
Water content determinations	9	19% to 30%		Generally close to or below the plastic limit.
Index properties (1 Point)	9	LL PL PI	29 to 61% 18 to 31% 11 to 36%	Clay of low to high plasticity. Consistency index 0.8 to 1.5
Particle size distribution (Wet sieve and sedimentation)	1	Gravel Sand Silt Clay	2% 72% 18% 8%	Well-graded clayey silty slightly gravelly SAND.
One-dimensional consolidation	5	c_v m_v	0.17 to 0.29 m ² /yr 0.68 to 21 m ² /MN	Relatively slow rate of settlement. High to very high compressibility.
Undrained shear strength (Triaxial)	4	c_u γ	39 to 58 kN/m ² 18.5 to 19.4 kN/m ³	
Soluble sulphate & pH	13	SO ₄ pH	8.49 & 164mg/l 7.1 to 8.8	pH results were generally above 8. 5 samples were submitted for full BRE Digest SD1 suites. See Appendix 7 for full results of these tests.

In cohesive soil the approximate cohesion, c_u , and coefficient of consolidation, m_v , may be obtained from the equivalent SPT 'N' value using the following expressions (Stroud 1975).

$$c_u = f_1 N \quad \text{where:} \quad c = \text{cohesion (kN/m}^2\text{).}$$

$$m_v = \frac{1}{f_2 N} \quad m_v = \text{Coefficient of consolidation (m}^2\text{/MN).}$$

$$f_1 \text{ \& } f_2 = \text{factors based on plasticity index.}$$

$$N = \text{SPT 'N}_{300}' \text{ value.}$$

For the cohesive soils revealed at this site the highest (worst case) plasticity index⁴ of 33% could be employed, which suggests an f_1 value of 4.5 and an f_2 value of 0.45.

⁴ See paragraph 6.2 'Index Property Tests'

8.1 Geotechnical Properties

The idealised geotechnical properties employed in design are summarised below:

Table 8: Summary of Geotechnical Properties

Property	Range of values		Comments
Volume change potential (NHBC)	Medium		Silty slightly sandy slightly gravelly CLAY (Till)
f_1 & f_2 values	f_1 f_2	4.5 0.45	Utilising a PI of 33%, based on results of testing from depths of around 1.2m depth.
Shear strength parameters (at 1.2m)	c_u γ	27kN/m ² 20kN/m ³	Stroud (1974) where $c_u = f_1 N$. Taking 'N' as 6.
Consolidation characteristics	m_v	0.37m ² /MN	Stroud (1974) where $m_v = 1/f_2 N$. Taking 'N' as 6.
Concrete classification	DC1		Brownfield ground locations (Static water).

9. Laboratory Testing - Environmental

Three suites of testing were conducted on samples from across the site. The following regimes were undertaken:

Table 9: Summary of Environmental Tests

Test type	Number of tests	Material	Laboratory
RGS Full Suite	4	Soil	i2 Analytical Ltd
RGS Basic Suite	4	Soil	i2 Analytical Ltd
Water Suite	2	Water	i2 Analytical Ltd
Waste Acceptance Criteria (WAC)	2	Soil	i2 Analytical Ltd

RGS Full Suite

- Metals – Cd, Cr^{VI}, Cu, Hg, Ni, Pb, V and Zn.
- Semi and Non-Metals - As, Se, Free CN⁻ and Phenols.
- Polycyclic aromatic hydrocarbons (PAHs).
- Petroleum hydrocarbons (TPHs).
- MTBE, BTEX
- Asbestos screen.
- Others – pH, organic content and total/soluble SO₄²⁻.

RGS Basic Suite

- Metals – Cd, Cr^{VI}, Cu, Hg, Ni, Pb, V and Zn.
- Semi and Non-Metals - As, Se, Free CN⁻.
- Polycyclic aromatic hydrocarbons (PAHs).
- Others – pH, organic content and soluble SO₄²⁻.
- Asbestos screen.

Water Suite

- Metals – Cd, Cr^{VI}, Cu, Hg, Ni, Pb, V and Zn.
- Semi and Non-Metals - As, Se, Free CN⁻ and Phenols.

- Polycyclic aromatic hydrocarbons (PAHs).
- Petroleum hydrocarbons (TPHs).
- MTBE, BTEX
- Others – pH, TOC and total SO_4^{2-} .

This testing was undertaken by i2 Analytical Ltd and the results of all of the chemical testing are presented in Appendix 7 of this report.

10. Discussion of Ground Conditions - Geotechnical

It is understood that the site is to be developed by the construction of a new motorway service station. At the time of writing this report the general layout of the site has been demonstrated on plan dwg 26p, issued by ADS Design on the 12th July 2023, however, no further details on construction have been given thus the discussion below is of a generalised nature.

It cannot be recommended that foundations be constructed directly within the made ground or weak near surface soils associated with the topsoil. Although competent near surface superficial soils are present beneath some areas of the site, it should be appreciated that these soils are also present in a weak and variable condition to depths of at least 3.0m begl across the site, such that excessive total and or differential settlement could occur under moderately light surface loading.

In light of the above, it cannot be recommended that shallow strip or spread footings are considered for the most part for the development and piles should be adopted in order to transfer foundation loads through the weak and variable made ground and superficial deposits to competent strata at depth. A piled foundation will have the advantage of limiting differential settlement of the new structure across the site.

However, it is understood that a cut and fill operation may take place on the site which may reduce levels in locations that would allow the use of a shallow foundation solution. This should only be considered after careful inspection of the subgrade by a competent person. If shallow foundations are considered, it is proposed that they could be designed assuming an allowable increase in stress given in the following table:

Table 10: Allowable Increase in Stress							
Foundation Type		Strip Footings			Spread/Pad Footings		
Foundation Breadth	B (m)	0.6	0.9	1.2	1.0	2.0	3.0
Foundation Depth from Existing Surface	D (m)	3.0			3.0		
Allowable Increase in Stress	(kN/m ²)	100	100	95	120	110	100
Net Allowable Bearing Capacity ⁵	(kN/m ²)	140	120	115	140	130	120

The allowable increase in stress given above assumes a factor of safety of 3 against general shear failure, with cohesion of 40kN/m² at the foundation depths. Settlements at the above loading intensities should remain within tolerable limits for the type of structure proposed provided that the underlying soils are carefully inspected immediately once final trimming has taken place. Should any soft or weak material be encountered they should be locally removed and replaced with lean-mix concrete or compacted granular soil. In addition, if the excavations are required to stand open for any period of time then a blinding layer of lean-mix concrete should be placed in the excavation

⁵ Assumes bulk density of material removed from footing excavations to be 20kN/m³

bases. This expedient will reduce softening or loosening of the sub-grade due to the ingress of surface water.

Alternatively, should shallow foundations not be considered then there are a number of piling options that could be considered for use at this site, which include:

- Driven piles.
- Continuous flight auger bored piles.

In order to formulate a suitable design, it is recommended that the advice of specialist piling contractors be sought. However, for preliminary design and estimating purposes the following discussion is presented.

It is considered that driven pre-cast concrete piles could be adopted at this site, although, it would be prudent to utilise a driving shoe or a lead steel section to minimise the risk of pile breakages, whilst penetrating the piles into the underlying Oadby Till Member.

Consideration may also be given to the use of bored cast-in-place piles using continuous flight augers (CFA). In this type of piling an auger borehole is formed and concrete placed via the hollow stem of the auger as they are withdrawn. A reinforcement cage is then placed into the fluid concrete filled hole to complete the pile. Given the appropriate rock auger, CFA piles can achieve significant end-bearing capacity on rock. However, spoil will be produced at the surface which will need to be disposed of.

Irrespective of the method of pile installation a working platform must be provided, the thickness of which will be determined by the type of piling rig employed and the strength of the near surface soils. The design of the platform should be undertaken in accordance with the procedures and specification given in the BRE publication entitled *Working platforms for tracked plant*.

In addition, the cohesive fraction of the superficial geology has been found to possess medium volume change potential in most onerous case. Therefore, piles should be able to cater for shrinkage or swelling of the cohesive soils should they be installed within the zone of any existing trees or shrubs. For design purposes, in particular the derivation of heave forces on the piles, the zone of desiccation may be considered as equivalent to the minimum foundation depth recommended for a shallow footing in the NHBC Standards, Chapter 4.2 – *Building Near Trees*.

11. Discussion of Ground Conditions - Environmental

11.1 Discussion of Test Results

It is understood that the site is to be developed by the construction of a new Welcome Break service station. The development will include the construction of the main service building, a fuel area, numerous car parking areas and also soft landscaping. Whilst the building itself is commercial in terms of end use, given that the soft landscaped areas shall be readily accessible to the general public, screening values for a 'public open space' end use have been utilised for contamination analyses.

11.1.1 Soil Samples

The results of the chemical testing undertaken on soil samples obtained during this investigation have been compared to the ATRISK soil screening values (SSVs) as compiled by WS Atkins plc.

With respect to the results it should be appreciated that the soil organic matter (SOM) content for the samples tested was found to range between 0.7% and 4.8%. On this basis, it is considered that the screening values associated with 1% SOM should be adopted. These values have been derived in such a way as to adhere to the principles within the revised CLEA model and include the most current release of the SGVs. A list of subscribers is provided within the website⁶ and these include many local authorities.

A comparison of the results of the testing, together with the data given above, can be found within Appendix 8. These results indicate the following:

Table 11: Summary of Contaminated Areas

Location	Depth (m)	Contaminants found to be exceeding SSVs (Public Open Space)
CP01	0.1	PAHs: (chrysene, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, benzo(g,h,i)perylene).
CP02	0.1	None.
TP102	1.0	None.
TP103	0.4	PAHs: (indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, benzo(g,h,i)perylene).
TP104	1.0	None.
TP106	0.5	PAHs: (chrysene, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, benzo(g,h,i)perylene).
TP106	1.2	None.
TP107	1.2	None.

Concentrations of chromium^{VI}, mercury, selenium, free cyanide, phenols (total) and total petroleum hydrocarbons (aliphatic C5 to C12; aromatic C5 to C12) were below the detection limits for the tests. Detectable levels of all other contaminants were recorded, but these fell below the associated Atrisk Soil Screening Values. In addition, no asbestos was detected within the soil samples tested.

It should be appreciated that the soil screening values for PAHs and TPHs (where appropriate) represents vapour saturation limits. The inhalation of vapour pathway contributes less than 10% of total exposure, which is unlikely to significantly affect the combined assessment criterion⁷. In view of this, the ATRISK soil SSVs notes that the users may wish to consider using a combined assessment criterion if free product is not observed, the values for which are also provided on the summary of contamination analysis. It is therefore considered that the criteria for no free product should be adopted for the PAHs and TPHs at this site. The results of the contaminants found to exceed these screening values are tabulated below:

Table 12: Summary of Areas Contaminated by PAHs & TPHs

Location	Depth (m)	Contaminants found to be exceeding SSVs (Public Open Space)
CP01	0.1	None.
CP02	0.1	None.
TP102	1.0	None.
TP103	0.4	None.

⁶ <http://www.atrisksoil.co.uk/pages/general/subscribers.asp>

⁷ Ref: ATRISK soil, SSVs derived using CLEA v1.071 for 1% SOM, Public Open Space land use, 23.06.17.

TP104	1.0	None.
TP106	0.5	None.
TP106	1.2	None.
TP107	1.2	None.

On the basis of the above information, the results of the investigation have concluded that the soils tested are generally suitable for the intended end use.

It should be noted that the BWB report highlights that asbestos contamination (<0.001%) was recorded within two samples of made ground; BWB locations TP101 and TP102. These investigatory locations were present in the north-western area of the site. It should be appreciated that RGS have not investigated said locations within this recent investigation.

It is considered no specific remediation is required for the tested areas within this investigation, as these are noted to be mostly present within areas of hard-standing. However, as concluded in the BWB report, RGS agree that suitable soils should be imported to soft landscaping areas. A clean cover of soil and any permanent hard-standing shall break pathways between the contaminated soils and future end users.

11.1.2 WAC Testing

Two samples were submitted for Waste Acceptance Criteria tests. In both samples, the determinands fall below the limits for inert waste. Therefore, provided the waste codes for any material to be exported are to conform as non-hazardous waste, any material exported from the areas tested may be suitable for an inert landfill. However, the north-western area where asbestos has been found should be treated independently. Indeed, material from that area may need to be sent to a separate waste site.

11.1.3 Groundwater Samples

Due to the site location and historical land uses a period of groundwater monitoring has been undertaken to determine risk on the site. Prior to extraction of the groundwater, the well was purged of three times the volume of the water contained within the borehole.

One sample was collected from each borehole and the results were compared to UK Drinking Water Standards (UK DWS) which provide the most onerous screening values. A comparison of the results against the screening values is provided in Appendix 8. The results of the determinands found to exceed these screening values are tabulated below:

Table 13: Summary of Groundwater Samples		
Location	Depth (m)	Contaminants found to be exceeding UK Drinking Water Standards (Freshwater/Commercial)
CP01 – 15/04/2025	8.88	None.
CP02 – 23/04/2025	14.65	None.

From the samples collected and undertaken for groundwater screening determinands for cadmium, mercury, lead, selenium, vanadium, chromium ^{vi}, free cyanide, total phenols, all PAHs, all TPHs (aliphatic and aromatic), and all BTEX were below detection limits. Detectable levels of all other

determinands were detected but these fell below the relevant threshold values. The groundwater can be classified as uncontaminated and does not pose a risk to the nearby controlled water.

11.1.4 Gas Concentrations (RGS & BWB)

With respect to ground gas, the results of the single monitoring visit undertaken to date indicated negligible concentrations of methane, with concentrations of carbon dioxide measuring 0.1%, in association with oxygen levels of between 20.7% and 21.0%. It should be appreciated that on non-contaminated sites there is generally about 20% by volume of oxygen, associated with low levels of carbon dioxide. In addition, a flow rate of <0.1 litres per hour was recorded.

It should be appreciated that 4 gas monitoring visits were undertaken within the BWB report. 4 gas monitoring installs were installed within that investigation; BH04 was installed within the vicinity of the main service building, with BH03 then positioned a short distance to the south-west. BH02 was positioned close to the proposed drive through coffee shop building, and BH01 within the vicinity of the HGV fuel building. In all 4 standpipes, low flow rates (<0.1l/hr) and low methane concentrations (<0.1%) were consistently recorded. Relatively low levels of carbon dioxide were detected at BH02 through BH04. The max concentration of ground gas at BH04 was 0.8% of carbon dioxide, with a peak of 2.8% and 3.2% at BH02 and BH03, respectively. However, a peak of 5.6% carbon dioxide was recorded at BH01 on one occasion when the atmospheric pressure reached 979mB (falling pressure trend).

The principal driving force for initiating the movement of gas in the ground is a change in barometric pressure. The most onerous gas condition on a site is usually observed on days of low or falling barometric pressure, preferably below 1000mB. It has been noted that measurements undertaken solely during high pressure conditions may be of lesser value. The readings undertaken by RGS to date were at an atmospheric pressure of 1010mB. It should be appreciated however that the BWB monitoring was completed during periods of low and falling pressure.

In order to establish the gas screening value (GSV) for carbon dioxide or methane, the maximum gas concentration (expressed as a decimal) is multiplied by the borehole flow rate (l/hr). In this case 0.0% methane was recorded along with 0.1% (0.001) carbon dioxide, in association with a maximum flow rate of 0.1 l/hr. This results in a GSV of 0l/hr for methane and a GSV of 0.0001l/hr for carbon dioxide for the RGS borehole installations. With reference to the BWB report, their findings found a maximum GSV of 0.0056l/hr.

Whilst the GSV limit for Characteristic Situation Level is 0.007l/hr, as >5% carbon dioxide was detected, BWB have adopted Characteristic Situation Level 2 for the site. However, on the basis that the buildings are to conform with Type C, it is reasoned that gas protection measures are not required. It is assumed that this is on the basis that a dispersal layer and floor type shall achieve a sufficient score in regards to BS8485 and therefore a gas membrane is not required.

It is therefore considered that there is a low to moderate risk of harm to end users and site operatives and no special precautionary measures are required due to the nature of the building types.

11.2 Site Specific Risk Assessment

11.2.1 Approach

The presence of contamination hazards and the risks associated with them should be assessed in accordance with industry practice and the 'suitable for use' approach. This has been conducted with reference to The Department for Environment, Food and Rural Affairs (DEFRA) and The Environment Agency⁸ advice on the assessment of risks arising from the presence of contamination in soils and using the source-pathway-receptor approach.⁹ This method dictates that there must be a risk of contaminant produced at a 'source' in sufficient concentration to cause harm and there must be a 'pathway' for the contaminant to reach an identifiable 'receptor' for the linkage to be proved and a contamination hazard to be considered present. Not all substances are contaminants and not all contaminants are considered to be a risk. Indeed DEFRA and The Environment Agency state that 'a contaminant is a substance which has the potential to cause harm, while a risk itself is considered to exist if such a substance is present in sufficient concentration to cause harm and a pathway exists for a receptor to be exposed to the substance.'¹⁰

11.2.2 Conceptual Ground Model and Risk Assessment

In view of the results of the chemical testing undertaken the conceptual site model is presented accordingly as Table 14. Sources of contamination include the following:

On-site – Made Ground (Localised Asbestos).

The preliminary risk assessment has been evaluated with reference to the following ratings and definitions:

N/A -	A source-pathway-receptor linkage is not considered to exist and therefore a risk assessment is not required.
Low -	A pollution linkage is unlikely and/or the likelihood of harm occurring is low and of minor consequence.
Moderate -	The linkage exists but the likelihood of harm occurring is not considered to be significant although remedial action may be necessary
High -	The linkage exists and the available data indicates that significant harm may be caused and remedial action could be necessary.

The results of the risk assessment are presented in Table 14.

⁸ R&D Publication CLR 8, 'Assessment of Risks to Human Health from Land Contamination: An overview of the Development of Soil Guideline Values and Related Research'.

⁹ The pollution linkage approach was developed by 'Circular 2/2000 Contaminated Land: Implementation of Part II of The Environmental Protection Act 1990' which provides meanings for the terms contained in The Environmental Protection Act 1990 Part IIA, the primary legislation for addressing the issues of contaminated land.

¹⁰ See 'Circular 2/2000 Contaminated Land: Implementation of Part II of The Environmental Protection Act 1990', appendix A.

Table 14: Conceptual Site Model and Site-Specific Risk Assessment [Contamination: Asbestos and CO2 – BWB investigation]

Conceptual Site Model			Site Specific Risk Assessment	
Pathways	Receptor	Linkage Present?	Risk Rating	Notes
Direct contact/dermal absorption/soil ingestion	Operative	Yes – elevated levels of contaminants found to be present at the site and contact with soil likely during works.	Moderate	Some contamination is present in the soils underlying the site. Precautionary measures will be required during the construction phase.
	End User	Yes – contamination in general below screening levels for intended end use.	Low	
	Neighbours	Yes – contaminants revealed unlikely to migrate and affect neighbours.	Low	
Inhalation of Dust/Vapours	Operative	Yes – dust may be derived from contaminated soils.	High	Some contamination is present underlying the site. Precautionary measures will be required during the construction phase. Remediation will be required to either remove the contamination or break pathways.
	End User	Yes – dust may be derived from contaminated soils.	Moderate	
	Neighbours	Yes – possible inhalation of dust during the works.	High	
Ingestion of fruit/vegetables and/or waters	Operative	No – no edible plants or contained water sources in the area of the proposed new works.	N/A	No further action required.
	End User	Yes – plants to be present, but contaminants unlikely to affect plants.	Low	
	Neighbours	Yes – contaminants revealed unlikely to migrate and affect neighbours.	Low	
Migration of hazardous gases via permeable strata or shallow mining activity	Operative	Yes – low concentrations of methane and carbon dioxide have been found to be present at the site during the recent monitoring visit. However, an elevated reading of carbon dioxide has previously been recorded (assuming <i>Characteristic Situation Level 2</i>).	Low	Buildings to conform to Type C. Proposed construction likely to be adequate in terms of achieving a gas protection score in relation to published guidance (BS8485).
	End User		Moderate	

	Neighbours	No – whilst concentrations of ground gas have been found to be present at the site (assuming <i>Characteristic Situation Level 1</i>), no structures directly adjoin the site, therefore gases migrating from the site would vent to atmosphere before reaching neighbouring structures. Moreover, carbon dioxide may be derived from the chalk below the site.	N/A	
Spillage/loss/run off direct to receiving water	Controlled Waters	Yes – known controlled waters within 250m. However, the site is underlain by cohesive soils of low permeability. Contamination not significantly elevated.	Low	No further action required.
Migration via permeable unsaturated strata	Controlled Waters	Yes – aquifer present at depth. However, the site is underlain by cohesive soils of low permeability. Contamination not significantly elevated.	Low	
Run off via drainage/sewers etc	Controlled Waters	Yes – old services unlikely to be present on site. In any event, low levels of contamination have been detected.	Low	
Direct contact with contaminated soils	Plants	Yes – contaminants unlikely to affect plants.	Low	No further action required.
Uptake via root system			Low	
Direct contact with contaminated soils	Building Materials	Yes – elevated levels of TPH and PAH revealed at the site may represent a risk to building materials or plastic water pipes. Moreover, testing indicates that the aggressive chemical environment for concrete classification is AC-1s.	Moderate (plastic services)	Please see section 11.3.2 for information on good building practice.
Direct contact with contaminated groundwater			Low (buried concrete)	
Exposure to Radon	Operative	Yes – in a low risk radon affected area. ¹¹	Low	Less than 1% of properties are above the action level. No radon protection measures required.
	End User			

¹¹ Radon Interactive Map Viewer. Accessed 12.05.25 <https://www.ukradon.org/information/ukmaps>

11.3 Indicative Remediation Strategy

In view of the site-specific risk assessment it is considered that remediation will be required at this site. Such a strategy should include the following main elements.

11.3.1 Remediation Objectives

Based on the site-specific risk assessment the object of the remediation is likely to be as follows.

- To protect the site operatives during the construction process from the ingestion of soil or dust, dermal contact with the soil and inhalation of dust and vapours.
- To protect the end user from the ingestion of soil or dust, dermal contact with the soil and inhalation of dust and vapours.
- To protect the end user from the elevated levels of carbon dioxide.
- To protect neighbours from the inhalation and ingestion of dust during the construction process.
- To protect plastic services from being penetrated by, or degrading due to the presence of, contamination in the soil or groundwaters.

11.3.2 Remediation Requirements

Ground-works

During the ground-works phase of the development, protection to the site operatives is required. The risk to site operatives is considered under the Health and Safety at Work Act 1974, together with regulations made under the act, which includes the Control of Substances Hazardous to Health (COSHH) regulations. Therefore, the risks to site personnel must be considered under the Construction Design and Management (CDM) regulations at the planning stage and be included in the contractor's Health and Safety Plan and site specific Method Statements. These documents should include the following main elements.

- Site operatives at all levels should be made aware of the hazards of working with contaminated soils and the potential hazards associated with materials containing volatile hydrocarbons.
- Personal hygiene facilities, including washing and messing, must be provided and site operatives be encouraged to use them.
- Where work is undertaken in dry weather the site should be dampened down to avoid dust. In addition, dust masks must be provided to all site operatives for use in dry weather.
- In order for contaminated soils to be disposed of to an appropriate landfill, it may be necessary to carry out Waste Acceptance Criteria (WAC) testing in accordance with BS EN 12457.
- Any stockpiles of contaminated soil on site should be sheeted over to prevent excessive amounts of airborne dust and cross contamination of imported fill.
- Where vehicles are transferring soil to the landfill site they should be covered to prevent contamination of the surrounding area by dust.
- Where work is undertaken in wet weather, vehicle and wheel washing facilities are required to ensure that the vehicles leaving the site do not transfer contamination to surrounding areas.

On completion of the ground-works a careful site inspection of the sub-grade would be required. Should visual or olfactory evidence of contamination be revealed then further testing may become necessary.

Construction

During the construction phase of the contract the following items are required to protect the end user from the potential contaminants revealed at this site.

- Beneath buildings, pavements and hard-standings clean inert granular sub-base should be employed.
- Any redundant services revealed at this site should be de-commissioned and piped services sealed. Any existing services that are to be employed in the new development should be carefully inspected to ensure that they are serviceable.
- New plastic services should be constructed in a surround of clean inert material and selected in accordance with the recommendation given in the United Kingdom Water Industry Research (UKWIR) website under Report Ref. No. 10/WM/03/21 - 'Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites'. The statutory water authority for the area in which site is located may have a risk assessment form to complete which allows these recommendations to be met. However, further determinand specification contamination testing may be necessary.
- For buried concrete the results of the sulphate and pH testing indicate that the design sulphate class for the site should be DS-1.

Landscaped Areas

It is anticipated that a clean cover system shall be required for soft landscaping areas. This requirement should be confirmed within a remediation statement.

Gas Protection Measures

In order to assess the gas protection measures required BS8485: 2015+A1:2019: *Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings* will need to be employed. Once confirmed, the construction of the buildings will need to be assessed to ensure sufficient measures are in place, particularly for the HGV fuel area.

11.4 Fill Materials

It should also be appreciated that any fill material, either site-won or imported, to be employed at the site should be subjected to the following assessment to determine its suitability.

Fill materials should be initially screened, by a suitably qualified engineer to establish that:

- It is a suitable growing media if it is to be employed as such, including compliance with BS3882 (2015)
- It is free from obvious contamination i.e. visual or olfactory evidence
- It has not come from areas where Japanese Knotweed or other invasive or injurious plants are suspected to be growing
- It is not a statutory nuisance, such as being odorous
- It is free from unsuitable material i.e. whole bricks, brick ties, timber or glass.

It should also be appreciated that any fill should be subjected to validation testing to assess its suitability. The following table has been taken from YALPAG¹² documentation and may be used as

¹² YALPAG Technical Guidance for Developers, Landowners and Consultants – Verification Requirements for Cover Systems V4 .1 Appendix 1a, June 2021

a guide. Depending on the origin and nature of the material, not all fill will require the sampling frequency and testing indicated, although this should be in agreement with any regulatory bodies (such as the Local Authority).

Table 15: Validation Sampling and Testing

Fill Type	Frequency	Minimum Determinands
Virgin Quarried Material	1 or 2 depending on the type of stone utilised, to confirm the inert nature of the material.	Standard metals/metalloids (should include as a minimum As, Cd, Cr, CrVI, Cu, Hg, Ni, Pb, Se, Zn)
Crushed Hardcore, Stone, Brick	Minimum 1 per 500m ³	Standard metals/metalloids (as above), PAH (16 USEPA speciation), asbestos, total TPH. Any additional analysis dependant on the history of the donor site (e.g. phenol, total cyanide, BTEX, MTBE).
Greenfield/ Manufactured Soils	Minimum 3 Dependent on source and receptor, between 1 per 50m ³ and 1 per 250m ³	Standard metals/metalloids (as above), PAH (16 USEPA speciation), asbestos, pH and soil organic matter (SOM) (or calculated from total organic carbon (TOC)).
Brownfield/ Screened Soils	Minimum 6 Dependent on source and receptor, between 1 per 50m ³ and 1 per 100m ³	Standard metals/ metalloids (as above), PAH (16 USEPA speciation), TPH (CWG banded), asbestos, pH and SOM (or calculated from TOC). Any additional analysis dependant on the history of the donor site (e.g. phenol, total cyanide, BTEX, MTBE).

The screening values for the above regime should also be agreed with any regulatory bodies; however, the following is recommended in the first instance.

Table 16: Fill Screening Values

Contaminant	Screening Value (Public Open Spaces) (mg/kg)		Reference
	1% SOM	6% SOM	
As	168	168	Atrisk ^{SOIL} SSVs
Cd	882	882	Atrisk ^{SOIL} SSVs
Cr(VI)	132 & 251	132 & 251	Atrisk ^{SOIL} SSVs
Cu	45200	45200	Atrisk ^{SOIL} SSVs
Hg	94.30	96.90	Atrisk ^{SOIL} SSVs
Ni	804	804	Atrisk ^{SOIL} SSVs
Pb	1340	1340	Atrisk ^{SOIL} SSVs
V	7490	7490	Atrisk ^{SOIL} SSVs
Zn	201000	201000	Atrisk ^{SOIL} SSVs

Please see summary sheet within Appendix 9 for full screening values including PAHs & TPHs.

The above screening values should be considered with respect to the Soil Organic Matter (SOM) of the subject material i.e. 1% SOM would be typical for granular fill and 6% SOM for topsoil. Testing should comply with UKAS and MCERTS, where applicable, and undertaken by an accredited laboratory.

Where the material has been derived from a commercial company, certificates or other industry quality protocol compliance i.e. WRAP should be obtained. However, it will be necessary to ensure

that this documentation specifically related to the material being imported, it is no more than two months old and complies with the screening and frequency requirements given above.

Suitable fill materials should be either placed immediately or sufficiently quarantined to prevent cross-contamination. If it is necessary, the quarantined material should be placed on appropriate sheeting and covered to prevent it becoming mixed with contaminated soils or dust, or penetrated by mobile contaminants.

11.5 Verification Report

In order to demonstrate that the remedial works and provision of clean cover has been sufficiently carried out where applicable, it will be necessary to produce a verification report for submission to any statutory authorities.

It will be necessary for this report to include the following:

- The extents of any areas where made ground has been partially or wholly removed.
- Characterisation of the suitability of the clean material including the derivation of the material, comments from a visual screen, the tests results of chemical screening, delivery tickets where appropriate and the conditions by which the clean material has been stored and handled on site.
- Photographic and logged evidence the clean material has been handled on site and placed in a sufficient thickness over areas where made ground remains. This may be either at the time of placement or after placement by means of hand excavated trialpits. Photographs should include visual site references or reference boards to prove the location and date taken. A measurement reference should be visible in the photographs to substantiate the thickness of material placed. Please note that it may also be necessary to undertake a topographical survey and the requirement for which should be checked with any statutory authorities.

The report detailed above should be produced by a suitably qualified engineer. The number of verification areas for the development should be confirmed with any statutory authorities for the site.

12. Recommendations for Further Work

- This report should be forwarded to the relevant authorities as soon as practicable to ensure they have sufficient time to review and discuss any issues.
- Completion of a remediation strategy.
- Discussions with ground work contractors in relation to the requirement for any further testing of materials to be disposed off-site and the suitability of imported materials.
- Discussions with service providers regarding suitable materials for pipe work given the nature of chemical determinands found within the soils on site.
- Produce a validation report to demonstrate that the geo-environmental risks discussed in this report have been mitigated.
- Produce a Geotechnical Design Report once development plans are finalised.
- Detailed design of the sub-structure.
- Complete CBR testing once a formation level is achieved.

Clearly Rogers Geotechnical Services Ltd would be happy to offer advice with respect to the above and assist where necessary.

13. References

- British Geological Survey (NERC) (2025), BGS, Keyworth.
 - Geology of Britain Viewer:
(http://maps.bgs.ac.uk/geologyviewer_google/googleviewer.html)
 - Lexicon of Named Rock Units:
(<http://www.bgs.ac.uk/lexicon/>)
- British Standards Institution (1990) BS1377: *British standard methods of test for soils for civil engineering purposes*, B.S.I., London.
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- British Standards Institution (2015 +A1: 2020) BS 5930: *Code of practice for ground investigations*, B.S.I., London.
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- British Standards Institution (2015 +A1:2019) BS8485: *Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*, B.S.I., London.
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- Building Research Establishment (BRE) Special Digest 1 (2005), Third Edition: *Concrete in aggressive ground*, BRE Press, Garston.
 - Part C: *Assessing the aggressive chemical environment*.
 - Part D: *Specifying concrete for general cast-in-situ use*.
- Department for Environment, Food and Rural Affairs and the Environment Agency (2009) DEFRA Science Report – Final SC050021/SR2, *Human Health toxicological assessment of contaminants in soil*. Environment Agency, Bristol.
- Department for Environment, Food and Rural Affairs and the Environment Agency (2009) DEFRA Science Report – SC050021/SR3, *Updated technical background to the CLEA model*. Environment Agency, Bristol.
- Department for Environment, Food and Rural Affairs (2014) SP1010: *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document*.
- Wilson S, Oliver S, Mallet H, Hutchings H, Card G, *Assessing risks posed by ground gasses to buildings*, CIRIA Report C665.

Appendix 1

Site Plan

Notes:
Investigation positions approximated from site operative's notes.



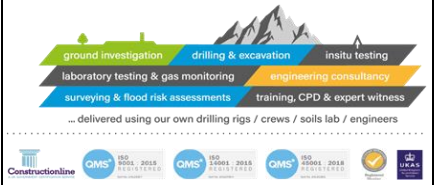
Rogers Geotechnical Services Ltd
Offices 1 & 2, Barncliffe Business Park,
Near Bank, Shelley, Huddersfield, HD8 8LU
Telephone: 0843 50 66 87
www.rogersgeotech.co.uk

Client:
Welcome Break

Job Number:
C5007/25/E/7632

Project Details:
Land East of Stretton Croft, Burbage

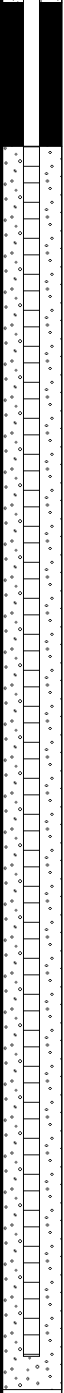
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Appendix 2

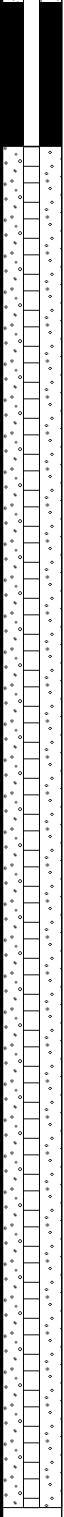
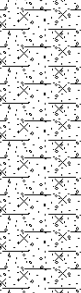
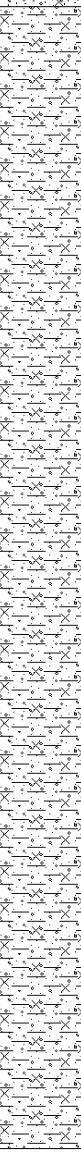
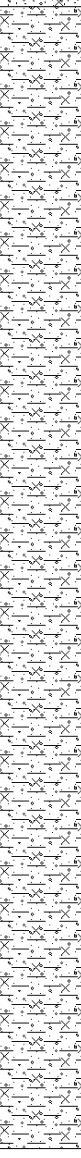
Borehole Records

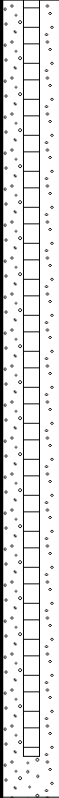
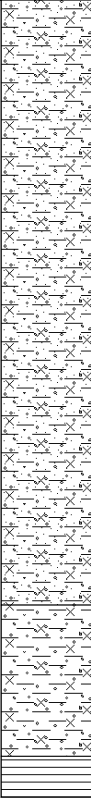
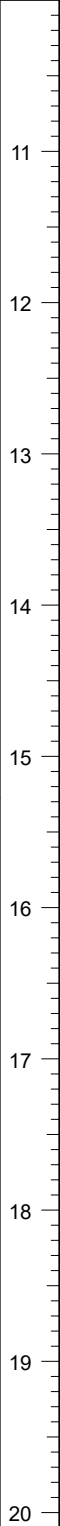
				Borehole Log			Borehole No. CP01 Sheet 1 of 1	
Project Name: Land East of Stretton Croft				Project No. C5007/25/E/7632		Co-ords:		Hole Type CP
Location: Wolvey Road, Burbage, Hinckley, Leicestershire, LE10 3JB				Level:		Scale 1:50		
Client: Welcome Break				Dates: 24/03/2025		Logged By SH		

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10 - 0.50	B				MADE GROUND (Soft, dark brown, slightly sandy, gravelly, silty CLAY. Sand is fine to coarse. Gravel is angular to sub-angular and fine to coarse of brick, concrete, sandstone and various other lithologies).		
		0.50 - 1.00	B		0.50				
		1.20 - 1.65	D		1.00		MADE GROUND (Soft, orangish brown mottled grey, slightly sandy, slightly gravelly, silty CLAY. Sand is fine to coarse. Gravel is sub-angular and fine to coarse of brick, concrete, sandstone and various other lithologies).	1	
		1.20	SPT	N=6 (1,1/1,1,2,2)					
		2.00	SPT	N=6 (1,1/1,1,2,2)	2.45		Soft, orangish brown mottled grey, slightly sandy, silty CLAY. Sand is fine to medium. [WIGSTON SAND AND GRAVEL MEMBER]	2	
		3.00 - 3.45	U				Firm to stiff, grey, slightly sandy, slightly gravelly, silty CLAY. Sand is fine to medium. Gravel is sub-angular to sub-rounded and fine to medium of various lithologies. [OADBY TILL MEMBER]	3	
		3.50	D						
		4.00 - 5.00	B				Stiff to very stiff, reddish brown, gravelly, silty CLAY. Gravel is tabular, sub-angular and fine to coarse of mudstone. [WEATHERED MERCIA MUDSTONE GROUP]	4	
		4.00	SPT	N=10 (1,2/2,2,3,3)					
		5.00 - 5.45	U				Extremely weak, highly weathered, reddish brown MUDSTONE recovered as a clayey gravel. [MERCIA MUDSTOEN GROUP]	5	
		5.50	D						
		6.00	D				End of Borehole at 9.220m	6	
		6.50	SPT	N=21 (2,4/5,5,5,6)					
		7.00 - 8.00	B					7	
		8.00 - 8.45	U		8.00			8	
	8.50	D					9		
	9.00	D		9.00			10		
	9.00	SPT	50 (8,17/50 for 75mm)	9.22					

Remarks
 1. Position cleared of services using CAT and Genny.



				Borehole Log				Borehole No. CP02	
Project Name: Land East of Stretton Croft				Project No. C5007/25/E/7632		Co-ords:		Sheet 1 of 2 Hole Type CP	
Location: Wolvey Road, Burbage, Hinckley, Leicestershire, LE10 3JB				Level:		Scale 1:50			
Client: Welcome Break				Dates: 24/03/2025 - 25/03/2025		Logged By SH			
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10 - 0.40	B		0.40		MADE GROUND (Dark greyish brown, silty, gravelly, fine to coarse SAND. Gravel is angular to sub-angular and fine to coarse of bituminous material, brick, concrete, sandstone and various other lithologies).	1	
		0.50 - 1.00	B						
		1.20	SPT	N=7 (1,2/2,2,1,2)	2.45		Loose, light brown and grey, clayey, silty, slightly gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded and fine to coarse of various lithologies. [WIGSTON SAND AND GRAVEL MEMBER]	2	
		1.30	D						
		2.00	SPT	N=5 (1,1/1,1,1,2)					
		2.40 - 3.00	B						
		3.00	SPT	N=8 (1,1/1,2,2,3)					
		4.00 - 4.45	U			Firm to stiff, grey, slightly sandy, slightly gravelly, silty CLAY. Sand is fine to medium. Gravel is sub-angular to sub-rounded and fine to medium of various lithologies. [OADBY TILL MEMBER]	3		
		4.50	D						
		5.00	SPT	N=17 (3,3/3,4,5,5)					
		6.00	D						
		6.50 - 6.95	U						
	7.00	D			Firm to stiff, grey, slightly sandy, slightly gravelly, silty CLAY. Sand is fine to medium. Gravel is sub-angular to sub-rounded and fine to medium of various lithologies. [OADBY TILL MEMBER]	4			
	8.00 - 9.00	B							
	8.00	SPT	N=16 (2,2/3,3,4,6)						
		9.50	SPT	N=28 (4,5/6,6,7,9)				5	
								6	
								7	
								8	
								9	
								10	
Continued on Next Sheet									
Remarks 1. Position cleared of services using CAT and Genny.									
									

				Borehole Log				Borehole No. CP02	
Project Name: Land East of Stretton Croft				Project No. C5007/25/E/7632		Co-ords:		Sheet 2 of 2 Hole Type CP	
Location: Wolvey Road, Burbage, Hinckley, Leicestershire, LE10 3JB				Level:		Scale 1:50			
Client: Welcome Break				Dates: 24/03/2025 - 25/03/2025		Logged By SH			
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		10.50	D						
		11.00	SPT	N=36 (5,6/8,8,10,10)					
		12.50	SPT	N=40 (5,7/8,9,11,12)					
		13.00 - 14.00	B						
		14.00 - 15.00 14.00	B SPT	N=44 (6,8/10,10,12,12)					
		15.00	SPT	60 (5,8/60 for 125mm)					
					14.00		Stiff to very stiff, reddish brown, gravelly, silty CLAY. Gravel is tabular, sub-angular and fine to coarse of mudstone. [WEATHERED MERCIA MUDSTONE GROUP]	14	
					15.00 15.27		Extremely weak, highly weathered, reddish brown MUDSTONE recovered as a clayey gravel. [MERCIA MUDSTOEN GROUP] End of Borehole at 15.270m	15	
Remarks 1. Position cleared of services using CAT and Genny.									

Appendix 3

Trial Pit Records



Trial Pit Log

Trialpit No

TP101

Sheet 1 of 1

Project Name: Land East of Stretton Croft

Project No.
C5007/25/E/7632Co-ords: -
Level:Date
24/03/2025

Location: Wolvey Road, Burbage, Hinckley, Leicestershire, LE10 3JB

Dimensions
(m):

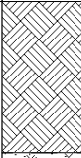
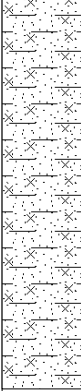
1.2

Client: Welcome Break

Depth
1.80

0.3

Scale
1:25Logged
SH

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.50			TOPSOIL (Dark brown, silty, slightly gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded and fine to medium of various lithologies).	
				1.80			Orangish brown and grey, clayey, silty, slightly gravelly, fine to coarse SAND. Gravel is sub-angular and fine to coarse of various lithologies. [WIGSTON SAND AND GRAVEL MEMBER]	1
							End of pit at 1.80 m	2
								3
								4
								5

Remarks: 1. Position cleared of services using CAT and Genny. 2. Water seepage noted to the trial pit walls.

Stability: Stable





Trial Pit Log

Trialpit No

TP103

Sheet 1 of 1

Project Name: Land East of Stretton Croft

Project No.
C5007/25/E/7632

Co-ords: -

Level:

Date

24/03/2025

Location: Wolvey Road, Burbage, Hinckley, Leicestershire, LE10 3JB

Dimensions
(m):

1.5

Depth
1.80

0.3

Scale

1:25

Logged
SH

Client: Welcome Break

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.20			MADE GROUND (Dark brown, clayey, silty, sandy, angular to sub-angular and fine to coarse GRAVEL of ash, bituminous material, brick, concrete and sandstone with moderate cobble content. Sand is fine to coarse. Cobbles are angular of brick and concrete). Firm, orangish brown mottled grey, sandy, silty CLAY. Sand is fine to coarse.	1
				1.15			Firm, brownish grey, sandy, silty CLAY. Sand is fine to medium. [OADBY TILL MEMBER]	
				1.80			End of pit at 1.80 m	2
								3
								4
								5

Remarks: 1. Position cleared of services using CAT and Genny.

Stability: Stable





Trial Pit Log

Trialpit No

TP104

Sheet 1 of 1

Project Name: Land East of Stretton Croft

Project No.
C5007/25/E/7632Co-ords: -
Level:Date
24/03/2025

Location: Wolvey Road, Burbage, Hinckley, Leicestershire, LE10 3JB

Dimensions
(m):

1.4

Depth
1.60

0.3

Scale
1:25Logged
SH

Client: Welcome Break

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.60			MADE GROUND (Brown, silty, andy, angular to sub-angular and fine to coarse GRAVEL of brick, concrete and sandstone with high cobble content. Sand is fine to coarse. Cobbles are angular of brick.	
				1.10			Firm, orangish brown mottled grey, sandy, silty CLAY. Sand is fine to medium.	1
				1.60			Firm, brownish grey, sandy, silty CLAY. Sand is fine to medium. [OADBY TILL MEMBER]	
							End of pit at 1.60 m	2
								3
								4
								5

Remarks: 1. Position cleared of services using CAT and Genny.

Stability: Stable





Trial Pit Log

Trialpit No

TP105

Sheet 1 of 1

Project Name: Land East of Stretton Croft

Project No.
C5007/25/E/7632Co-ords: -
Level:Date
24/03/2025

Location: Wolvey Road, Burbage, Hinckley, Leicestershire, LE10 3JB

Dimensions
(m):

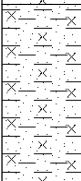
1.4

Depth
1.80

0.3

Scale
1:25Logged
SH

Client: Welcome Break

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.15			TOPSOIL (Dark brown, silty, slightly gravelly, fine to coarse SAND, Gravel is sub-angular to sub-rounded and fine to medium of various lithologies). Firm, orangish brown mottled grey, sandy, silty CLAY. Sand is fine to medium.
				1.20			Firm, brownish grey, sandy, silty CLAY. Sand is fine to medium. [OADBY MEMBER]
				1.80			End of pit at 1.80 m

1

2

3

4

5

Remarks: 1. Position cleared of services using CAT and Genny.

Stability: Stable





Trial Pit Log

Trialpit No

TP106

Sheet 1 of 1

Project Name: Land East of Stretton Croft

Project No.
C5007/25/E/7632Co-ords: -
Level:Date
24/03/2025

Location: Wolvey Road, Burbage, Hinckley, Leicestershire, LE10 3JB

Dimensions
(m):

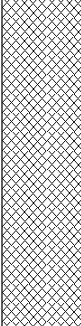
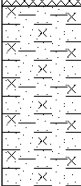
1.4

Depth
1.70

0.3

Scale
1:25Logged
SH

Client: Welcome Break

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				1.10			MADE GROUND (Reddish brown, silty, gravelly, fine to coarse SAND with low cobble content. Gravel is angular to sub-angular and fine to coarse of concrete. Cobbles are angular of concrete).	1
				1.70			Firm, orangish brown mottled grey, sandy, silty CLAY. <u>Membrane present.</u>	
							End of pit at 1.70 m	2
								3
								4
								5

Remarks: 1. Position cleared of services using CAT and Genny.

Stability: Stable





Trial Pit Log

Trialpit No

TP107

Sheet 1 of 1

Project Name: Land East of Stretton Croft

Project No.
C5007/25/E/7632Co-ords: -
Level:Date
24/03/2025

Location: Wolvey Road, Burbage, Hinckley, Leicestershire, LE10 3JB

Dimensions
(m):

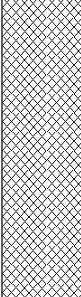
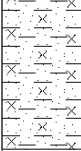
1.2

Depth
1.50

0.3

Scale
1:25Logged
SH

Client: Welcome Break

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				1.00			MADE GROUND (Soft, dark brown, slightly sandy, gravelly, silty CLAY with low cobble content. Sand is fine to coarse. Gravel is angular to sub-angular and fine to coarse of brick, concrete and various other lithologies. Cobbles are angular of brick and concrete).	
				1.50			Firm, orangish brown mottled grey, sandy, silty CLAY. Sand is fine to medium.	1
							End of pit at 1.50 m	2
								3
								4
								5

Remarks: 1. Position cleared of services using CAT and Genny.

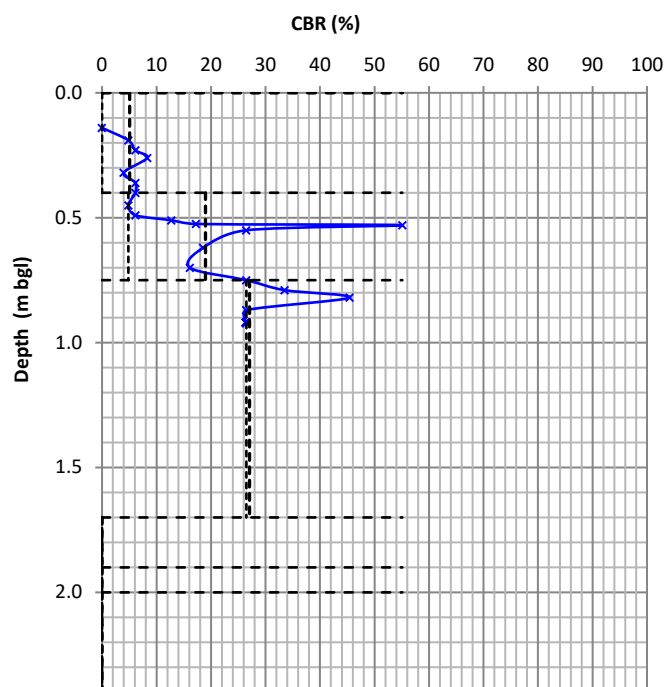
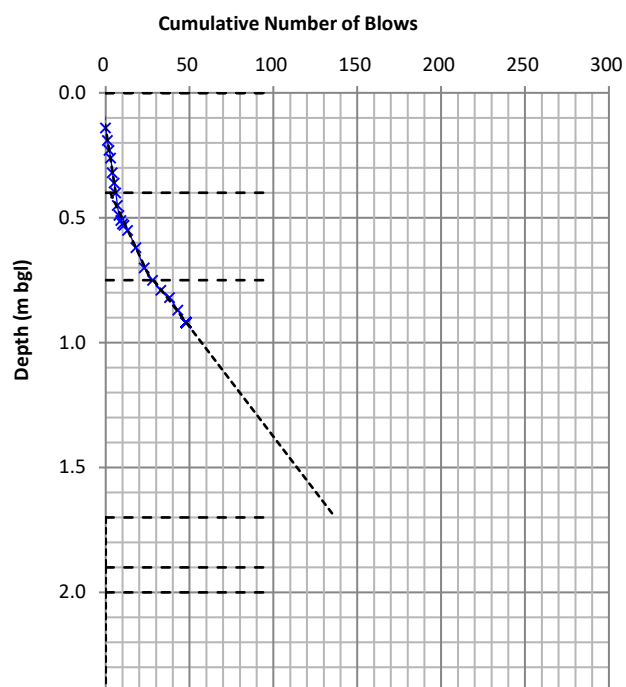
Stability: Stable

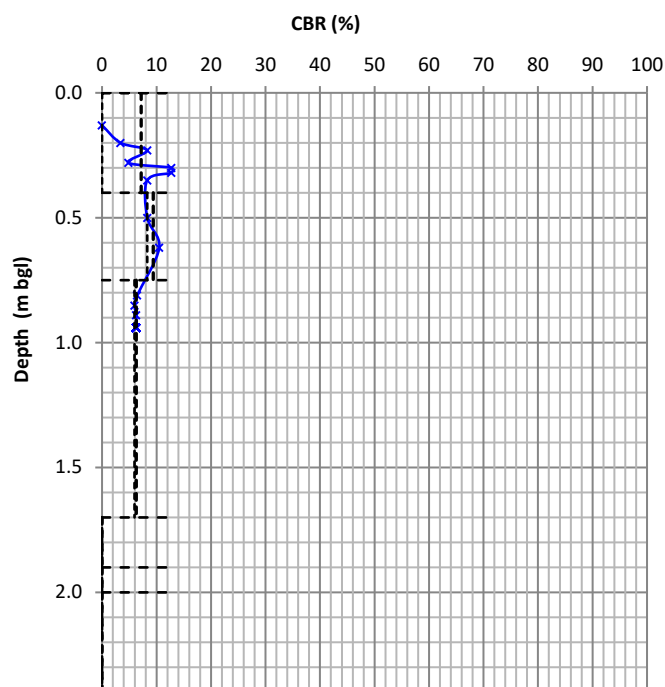


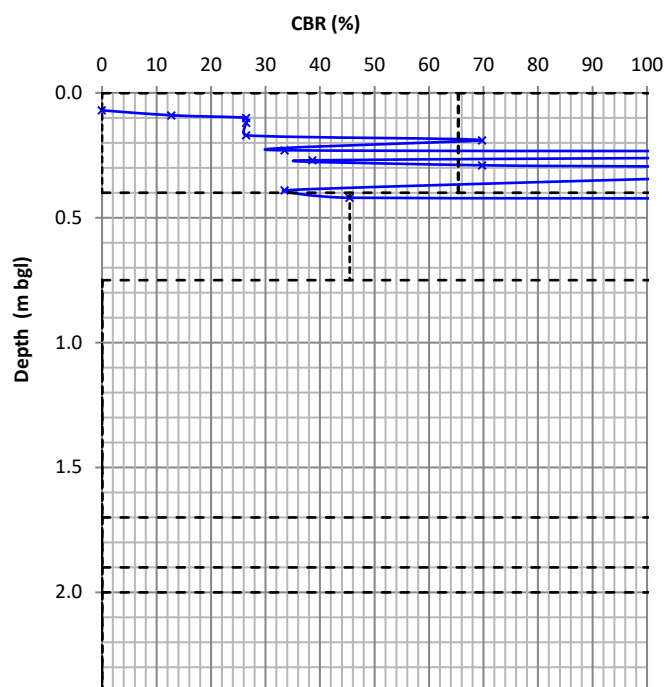
Appendix 4

TRL DCP Records

SL970, TRL Road Note 8, 60° cone.

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[illegible]

Rogers Geotechnical Services

Ltd

Offices 1&2, Barncliffe Business Park,
Near Bank, Shelley,
Huddersfield
HD8 8LU

www.rogersgeotech.co.uk

Tel : 0843 50 66687

Fax : 0843 51 59930

Job No:

C5007/25/E/7632

Location:

TRL DCP 4

Site:

Burbage

Client:

Welcome Break

Test Date:

25/03/2025

Tested By:

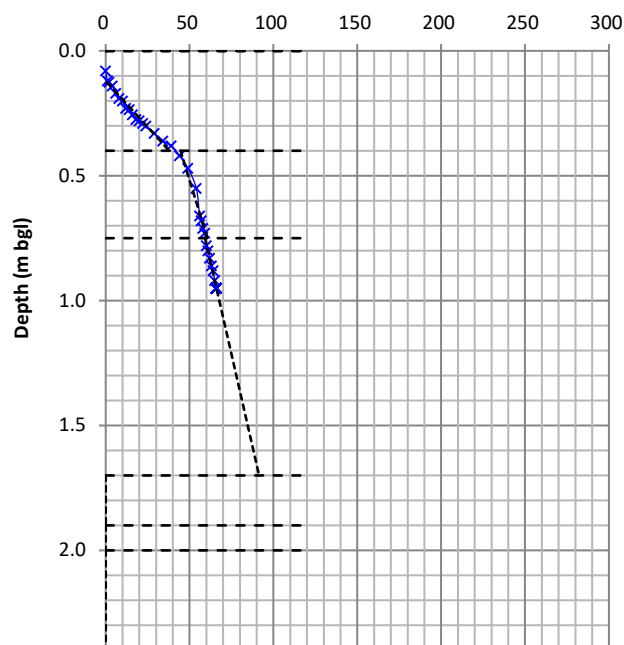
ABk

IMPACT (TRL) Dynamic Cone Penetrometer

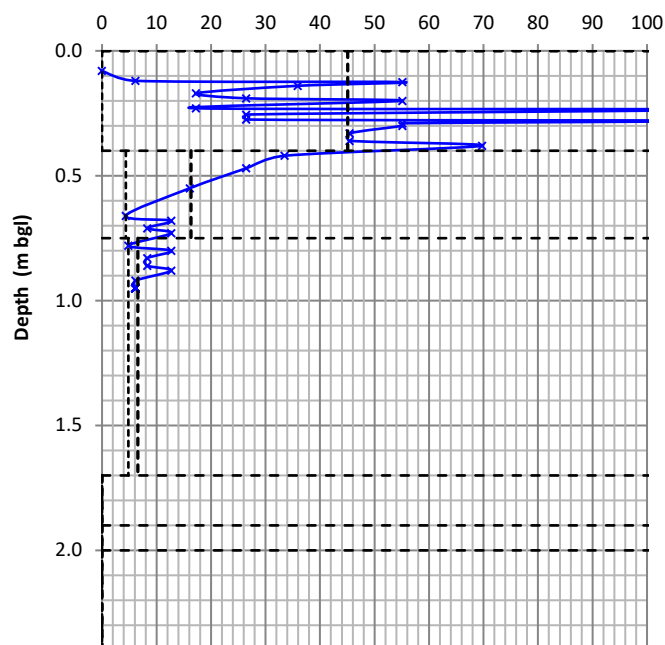
SL970, TRL Road Note 8, 60° cone.

Blow Count	Total Blows	Depth (mm)	CBR (%)	Blow Count	Total Blows	Depth (mm)	CBR (%)	Blow Count	Total Blows	Depth (mm)	CBR (%)
0	0	80	-	2	56	660	4				
1	1	120	6	1	57	680	13				
1	2	125	55	1	58	710	8				
2	4	140	36	1	59	730	13				
2	6	170	17	1	60	780	5				
2	8	190	26	1	61	800	13				
2	10	200	55	1	62	830	8				
2	12	230	17	1	63	860	8				
2	14	235	115	1	64	880	13				
2	16	255	26	1	65	920	6				
2	18	275	26	1	66	950	6				
2	20	280	115								
2	22	290	55								
2	24	300	55								
5	29	330	45								
5	34	360	45								
5	39	380	70								
5	44	420	34								
5	49	470	26								
5	54	550	16								

Cumulative Number of Blows



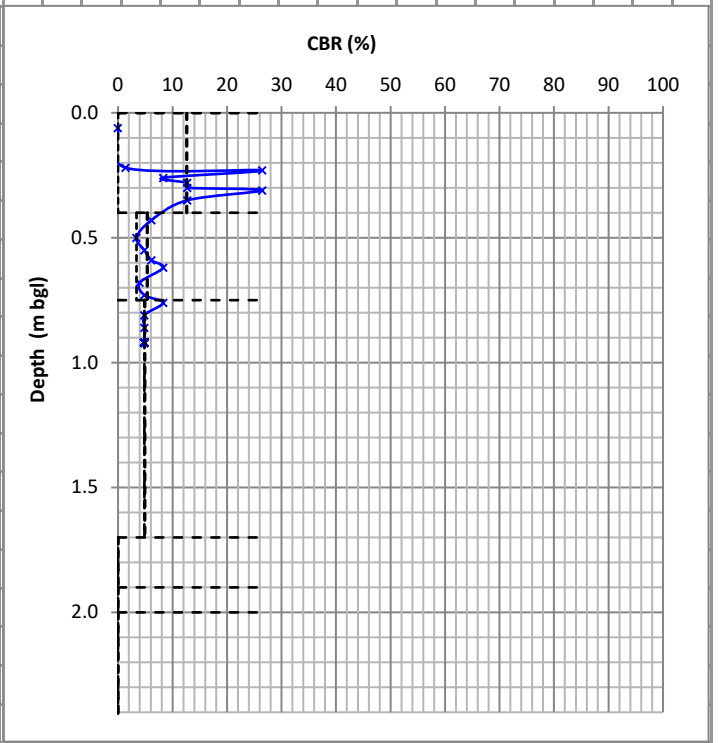
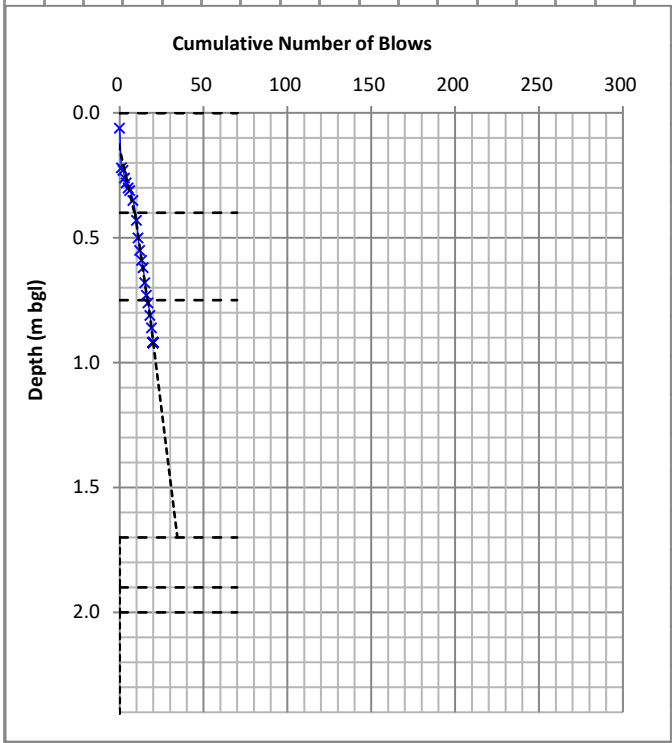
CBR (%)

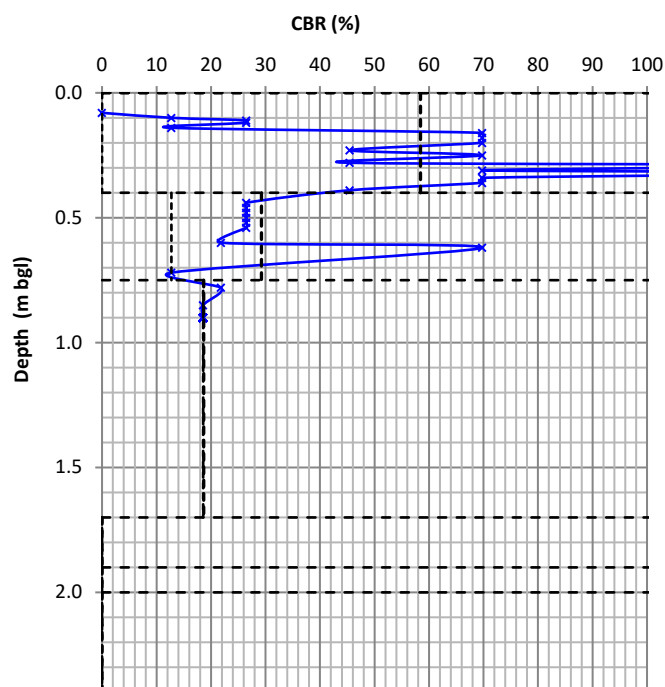


Rogers Geotechnical Services Ltd Offices 1&2, Barncliffe Business Park, Near Bank, Shelley, Huddersfield HD8 8LU www.rogersgeotech.co.uk Tel : 0843 50 66687 Fax : 0843 51 59930	Job No: C5007/25/E/7632	Location: TRL DCP 5
	Site: Burbage	Client: Welcome Break
	Test Date: 25/03/2025	Tested By: ABk

IMPACT (TRL) Dynamic Cone Penetrometer SL970, TRL Road Note 8, 60° cone.
--

Blow Count	Total Blows	Depth (mm)	CBR (%)		Blow Count	Total Blows	Depth (mm)	CBR (%)		Blow Count	Total Blows	Depth (mm)	CBR (%)
0	0	60	-										
1	1	220	1										
1	2	230	26										
1	3	260	8										
1	4	280	13										
1	5	300	13										
1	6	310	26										
2	8	350	13										
2	10	430	6										
1	11	500	3										
1	12	550	5										
1	13	590	6										
1	14	620	8										
1	15	680	4										
1	16	730	5										
1	17	760	8										
1	18	810	5										
1	19	860	5										
1	20	920	5										





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Huddersfield
HD8 8LU

www.rogersgeotech.co.uk

Tel : 0843 50 66687

Fax : 0843 51 59930

Job No:

C5007/25/E/7632

Location:

TRL DCP 7

Site:

Burbage

Client:

Welcome Break

Test Date:

25/03/2025

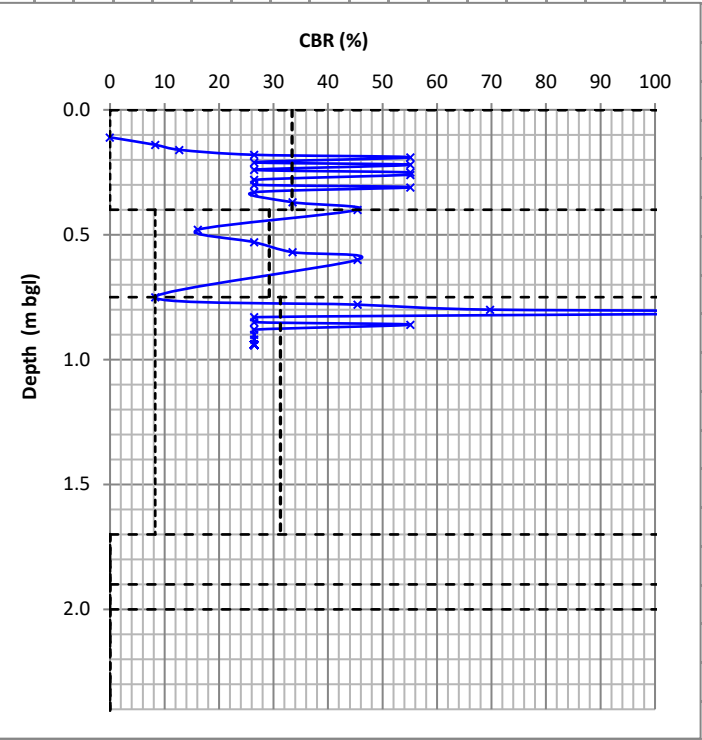
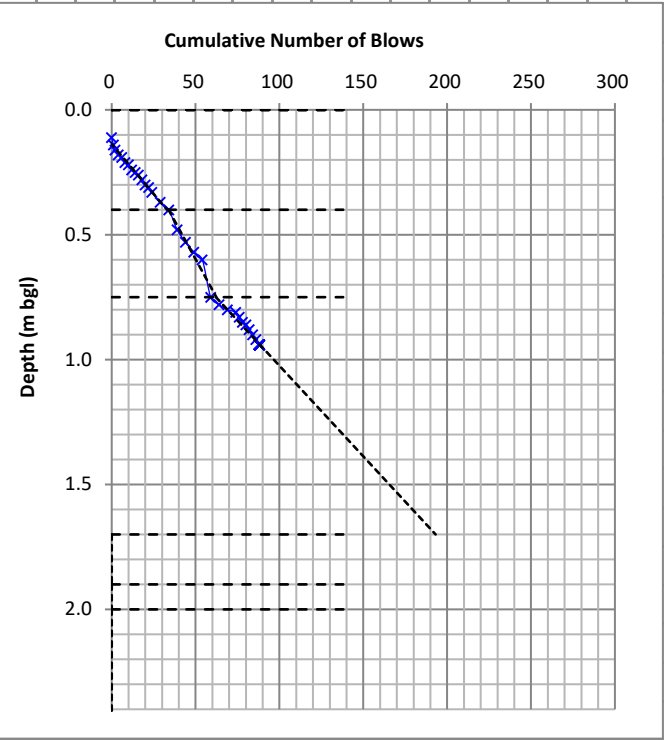
Tested By:

ABk

IMPACT (TRL) Dynamic Cone Penetrometer

SL970, TRL Road Note 8, 60° cone.

Blow Count	Total Blows	Depth (mm)	CBR (%)	Blow Count	Total Blows	Depth (mm)	CBR (%)	Blow Count	Total Blows	Depth (mm)	CBR (%)
0	0	110	-	5	59	750	8				
1	1	140	8	5	64	780	45				
1	2	160	13	5	69	800	70				
2	4	180	26	5	74	810	145				
2	6	190	55	2	76	830	26				
2	8	210	26	2	78	850	26				
2	10	220	55	2	80	860	55				
2	12	240	26	2	82	880	26				
2	14	250	55	2	84	900	26				
2	16	260	55	2	86	920	26				
2	18	280	26	2	88	940	26				
2	20	300	26								
2	22	310	55								
2	24	330	26								
5	29	370	34								
5	34	400	45								
5	39	480	16								
5	44	530	26								
5	49	570	34								
5	54	600	45								



Appendix 5

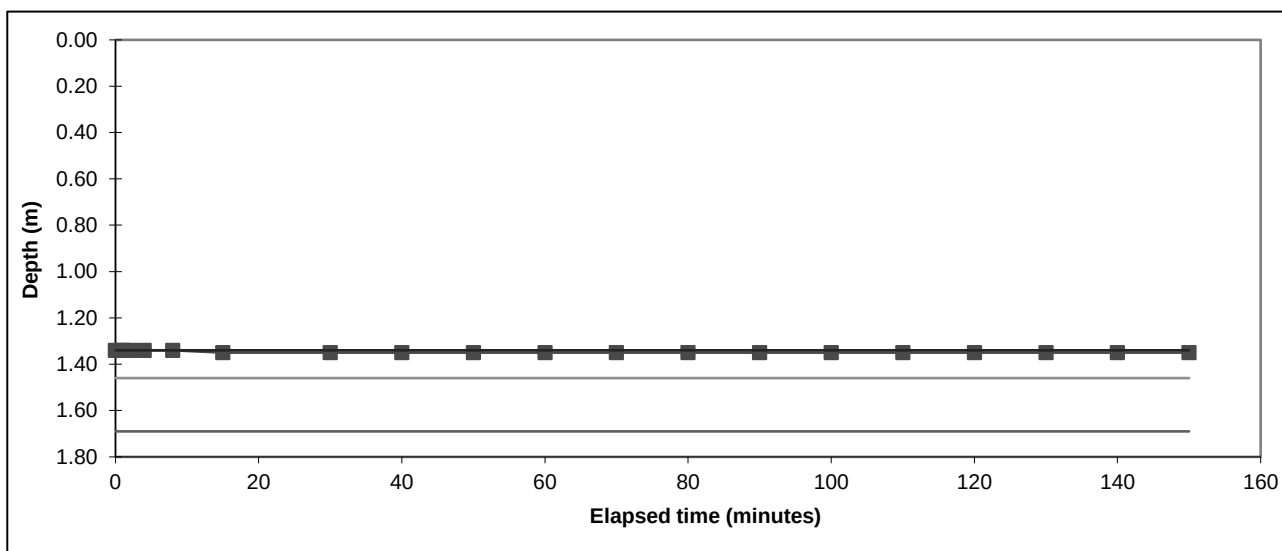
Soakaway Records

Rogers Geotechnical Services L

Soakaway Test

Trial Pit No:	TP105	Test No:	1	Date:	24.03.2025
Length (m):	1.400	Datum Height:			0.00 m agl
Width (m):	0.30	Granular infill:	None		
Depth (m):	1.80	Porosity of infill:	1	(assumed)	

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	1.340	110	1.350
1	1.340	120	1.350
2	1.340	130	1.350
4	1.340	140	1.350
8	1.340	150	1.350
15	1.350		
30	1.350		
40	1.350		
50	1.350		
60	1.350		
70	1.350		
80	1.350		
90	1.350		
100	1.350		



Start water depth for analysis (mbgl):	1.34		
75% effective depth (mbgl):	1.46	Elapsed time (mins):	#N/A
50% effective depth (mbgl):	1.57		
25% effective depth (mbgl):	1.69	Elapsed time (mins):	#N/A
Base of soakage zone (mbgl):	1.80		

Volume outflow between 75% and 25% effective depth (m³):

Mean surface area of outflow (m²): 1.20

(side area at 50% effective depth + base area)

Time for outflow between 75% and 25% effective depth (mins):

Soil infiltration rate (m/s):	Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.
--------------------------------------	--

Remarks Results processed following BRE 365 (2007).
Soil appears to be practically impermeable, test concluded.

Client:	Welcome Break	Job No:	C5007/25/E/7632
Site:	Land East of Stretton Croft		

Appendix 6

Gas Monitoring Sheets

[illegible]

Appendix 7

Laboratory Results



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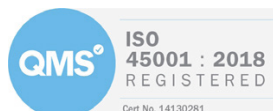
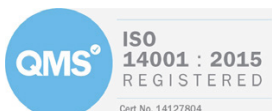
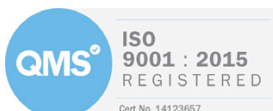


LABORATORY REPORT

job number	C/5007/25/E/7632	date	16/05/2025
site address	Land East of Stretton Croft Wolvey Road, Burbage, Hinckley, Leicestershire, LE10 3JB		
date scheduled	31/03/2025	date issued	16/05/2025
issued by	H J Letch		



Please consider the environment before printing this report.



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Rogers Geotechnical Services Ltd
Offices 1 & 2 Barncliffe Business Park, Near Bank, Shelley, Huddersfield, HD8 8LU
☎ 01484 604354 Company No. 5130864

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Environmental
Geotechnical
Specialists

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Offices 1 & 2 Barncliffe Business Park, Near Bank, Shelley, Huddersfield, HD8 8LU
☎ 01484 604354 Company No. 5130864



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Schedule of UKAS Accredited Laboratory Tests



1. CLASSIFICATION OF SOIL	BS 1377-2:2022	BS EN ISO 17892	Accredited (A)	Unaccredited (U)
1.1 Moisture / Water content determination				
i. Oven drying	Pt 2	BS EN ISO 17892-1:2014+A1:2022	A	
ii. Saturation m/c of chalk	Pt 2 :			U
1.2 Index Properties				
i. Liquid limit – cone penetrometer	Pt 2	BS EN ISO 17892-12 2018+A2:2022	A	
ii. Plastic limit	Pt 2	BS EN ISO 17892-12 2018+A2:2022	A	
iii. Shrinkage limit	:			U
iv. Linear shrinkage	Pt 2		A	
1.3 Particle Density				
i. Gas jar	Pt 2 :		A	
ii. Large pycnometer	Pt 2			U
iii. Small pycnometer		BS EN SIO 17892-3:2015	A	
1.4 Density Tests				
i. Linear measurement	Pt 2	BS EN ISO 17892-2:2014	A	
ii. Immersion in water	Pt 2	Pt 2 : 2014 : 5.2		U
iii. Fluid / Water displacement	Pt 2	Pt 2 : 2014 : 5.3		U
iv. Sand replacement	Pt 9			U
v. Core cutter	Pt 9			U
1.5 Particle Size Distribution				
i. Dry Sieve	Pt 2	BS EN ISO 17892-4:2016	A	
ii. Wet Sieve	Pt 2	BS EN ISO 17892-4:2016	A	
iii. Sedimentation by pipette	Pt 2	BS EN ISO 17892-4:2016	A	
iv. Sedimentation by hydrometer	Pt 2			U
2. CHEMICAL TESTS	BS 1377-3:2018			
ii. Mass loss on ignition	Pt 3 : 4			U
3. COMPACTION RELATED TESTS	BS 1377-2:2022			
3.1 Dry density/moisture relationship				
i. 2.5kg rammer – 1 litre mould	Pt 2		A	
- CBR mould	Pt 2		A	
ii. 4.5kg rammer – 1 litre mould	Pt 2		A	
- CBR mould	Pt 2		A	
3.2 Moisture Condition Value				
i. Single point test	Pt 2			U
ii. MCV/moisture content relationship	Pt 2			U
3.3 California Bearing Ratio				
i. Undisturbed sample	Pt 2		A	
ii. Recompacted sample	Pt 2		A	
iii. Soaked, inc measurement of swell	Pt 2		A	
4. COMPRESSIBILITY OF SOIL	BS 1377-2:2022			
i. One dimensional consolidation	Pt 2	BS EN ISO 17892-5:2017	A	
ii. Swelling pressure test	Pt 2			U
5. SHEAR STRENGTH OF SOIL	BS 1377-2:2022			
i. Hand shear vane	Makers instructions			U
ii. Shear box (100mm square sample)	BS 1377 : Pt 7 : 4			U
iii. Triaxial – quick undrained	BS 1377 : Pt 2	BS EN ISO 17892-8:2018	A	
6. PERMEABILITY				
i. Falling head	K. H. Head Vol 2			U
ii. Constant head	BS 1377 : Pt 6 : 6			U
iii Triaxial cell	BS 1377 : Pt 6 : 6			U
7. ROCK TESTS				
7.1 Classification Tests				
i. Natural moisture content	-			U
ii. Saturated moisture content	-			U
iii. Natural density	-			U
iv. Porosity	-			U
7.2 Strength Tests				
i. Point load index	ISRM '85			U
ii. Uniaxial compression test	ISRM '81			U

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GEOTECHNICAL TESTING RESULTS



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Classification of Index Properties

C5007/25/E/7632

Project Name: Land East of Stretton Croft

BS EN ISO 17892-12 2018+A2:2022

Fig. 2
Sheet. 1

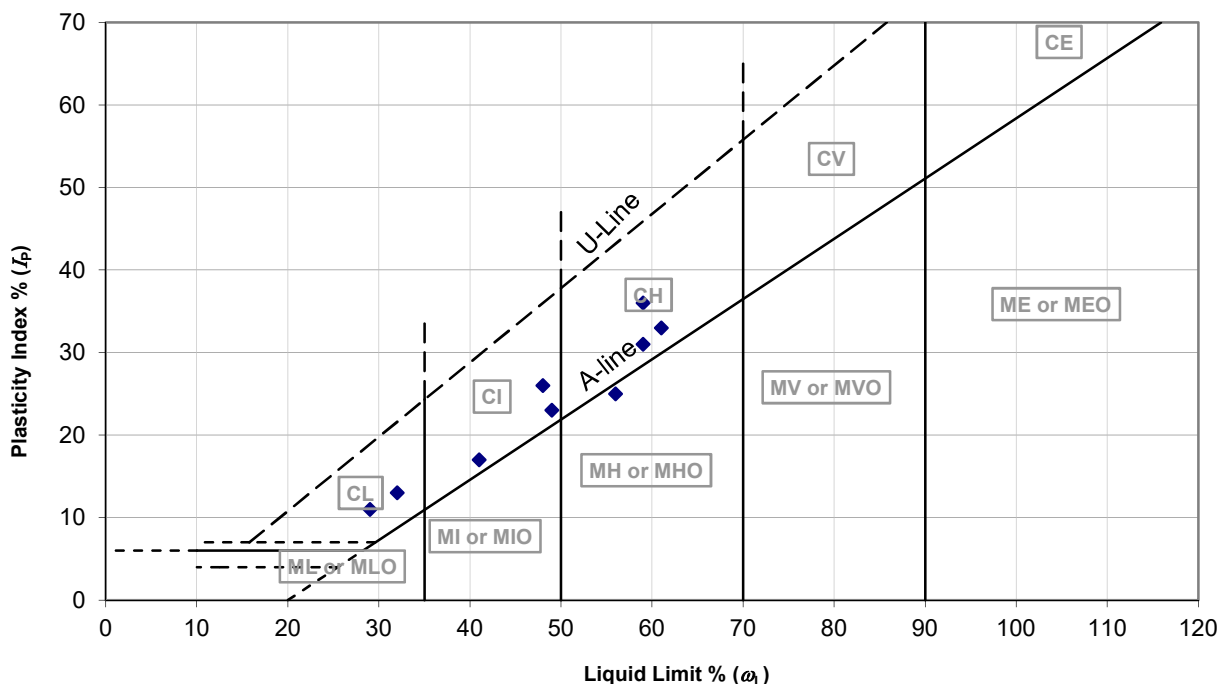
Location:

Input By: Harry

Client: Welcome Break

Check By: Harry

Location	Depth (m)	Water Content (ω) (%)	Liquid Limit (ω_L) (%)	Plastic Limit (ω_P) (%)	Plasticity Index (I_P) (%)	Retained by 0.425mm (%)	Modified (ω) (ω') (%)	Modified (I_P) (I_P') (%)	Liquidity/ Consistency		Casagrande Class	N.H.B.C Class (%)
									(I_L) (%)	(I_C) (%)		
CP01	1.20	28	49	26	23	0	28	23	0.1	0.9	C I	MEDIUM
CP01	3.50	21	41	24	17	0	21	17	-0.2	1.2	C I	LOW
CP01	5.50	19	56	31	25	0	19	25	-0.5	1.5	M H	MEDIUM
CP01	8.50	19	29	18	11	4	20	11	0.1	0.9	C L	LOW
CP02	4.50	26	48	22	26	0	26	26	0.2	0.8	C I	MEDIUM
CP02	10.50	22	59	28	31	1	22	31	-0.2	1.2	C H	MEDIUM
CP02	14.00	20	32	19	13	1	20	13	0.1	0.9	C L	LOW
TP104	1.00	25	59	23	36	0	25	36	0.1	0.9	C H	MEDIUM
TP107	1.20	30	61	28	33	0	30	33	0.1	0.9	C H	MEDIUM





PARTICLE SIZE DISTRIBUTION

Job Ref

C5007/25/E/7632

Borehole/Pit No.

CP02

Site Name

Land East of Stretton Croft

Sample No.

2

Soil Description

Loose, light brown and grey, clayey, silty, slightly gravelly, fine to coarse SAND.

Depth, m

0.50

Specimen Reference

2

Specimen Depth

0.5

m

Sample Type

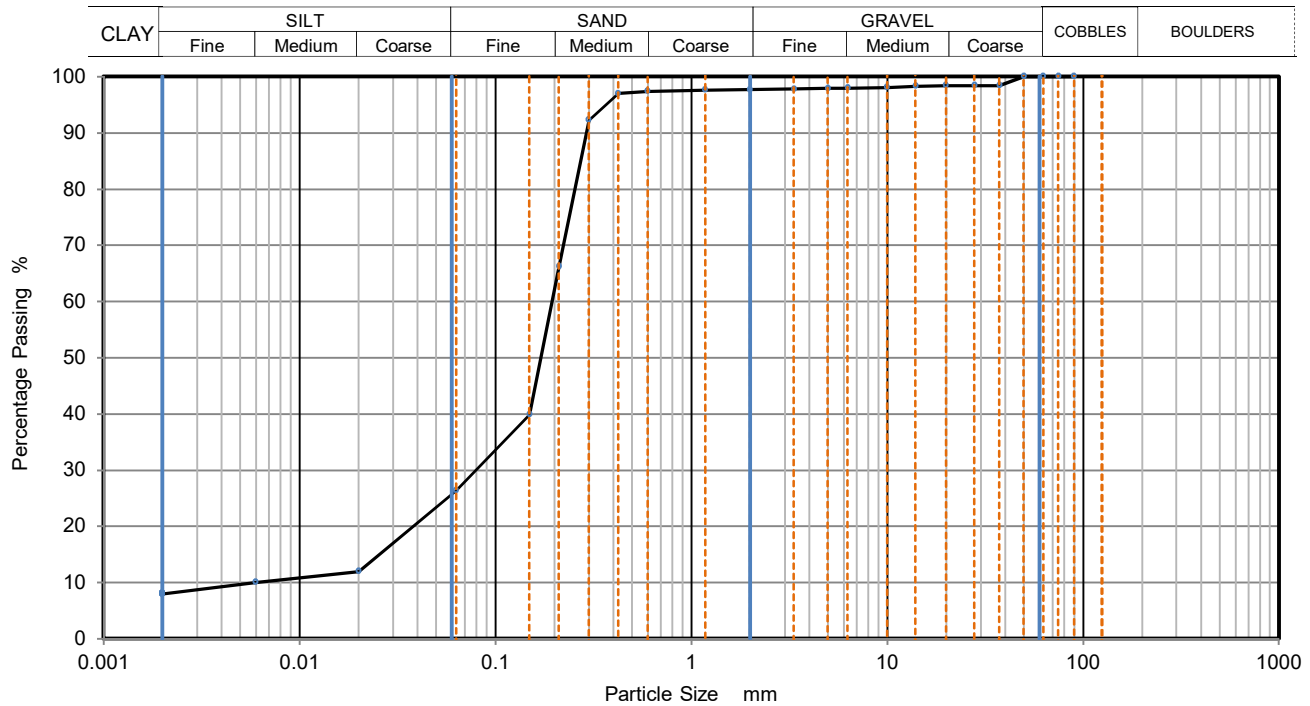
B

Test Method

ISO 17892 -4, by sieving and pipette sedimentation

KeyLAB ID

B2



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
	100	0.0201	12
90	100	0.0060	10
75	100	0.0020	8
63	100		
50	100		
37.5	98		
28	98		
20	98		
14	98		
10	98		
6.3	98		
5	98		
3.35	98		
2	98		
1.18	98		
0.6	97	Particle density (assumed) 2.65 Mg/m3	
0.425	97		
0.3	92		
0.212	66		
0.15	40		
0.063	26		

Dry Mass of sample, g

10794

Sample Proportions	% dry mass
Very coarse	0
Gravel	2
Sand	72
Silt	18
Clay	8

Grading Analysis		
D ₁₀₀	mm	50
D ₆₀	mm	0.195
D ₃₀	mm	0.0799
D ₁₀	mm	0.00654

Remarks

Preparation and testing in accordance with BS EN ISO 17892 - 4, unless noted below

Test performance date: 16/04/2025

Operator

Checked

Approved

Sheet printed

EC

Harry

Harry

22/04/2025

Fig 3

Sheet 1



Laboratory Report



Contract Number: 78353

Client Ref: **C/5007/25/E/7632**

Client PO: **0**

Date Received: **23-04-2025**

Date Completed: **07-05-2025**

Report Date: **07-05-2025**

Client: **Rogers Geotechnical Services LTD**

This report has been checked and approved by:

Contract Title: **Land East of Stretton Croft, Burbage**
For the attention of: **Harry Letch**

Richard John
Quality/Technical Manager

Description	Qty
Quick Undrained Triaxial Compression test - single specimen at one confining pressure (100mm or 38mm diameter) BS 1377:1990 - Part 7 : 8 - * UKAS	4
One-dimensional Consolidation 75mm or 50mm diameter specimens (up to 5 stages/days) BS 1377:1990 - Part 5 : 3 - * UKAS	5

Notes: Observations and Interpretations are outside the UKAS Accreditation

* - denotes test included in laboratory scope of accreditation

- denotes test carried out by approved contractor

@ - denotes non accredited tests

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Approved Signatories:

Brendan Evans (Senior Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)

Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)

Wayne Honey (HR & HSE Manager)

**ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3**

Contract Number 78353

Borehole/Trialpit No. CP01

Project Name Land East of Stretton Croft, Burbage

Sample No.

Soil Description

Grey silty CLAY

Depth Top (m)

3.00

Depth Base (m)

3.45

Lab Temperature

20°C

Sample Location

Top

Remarks

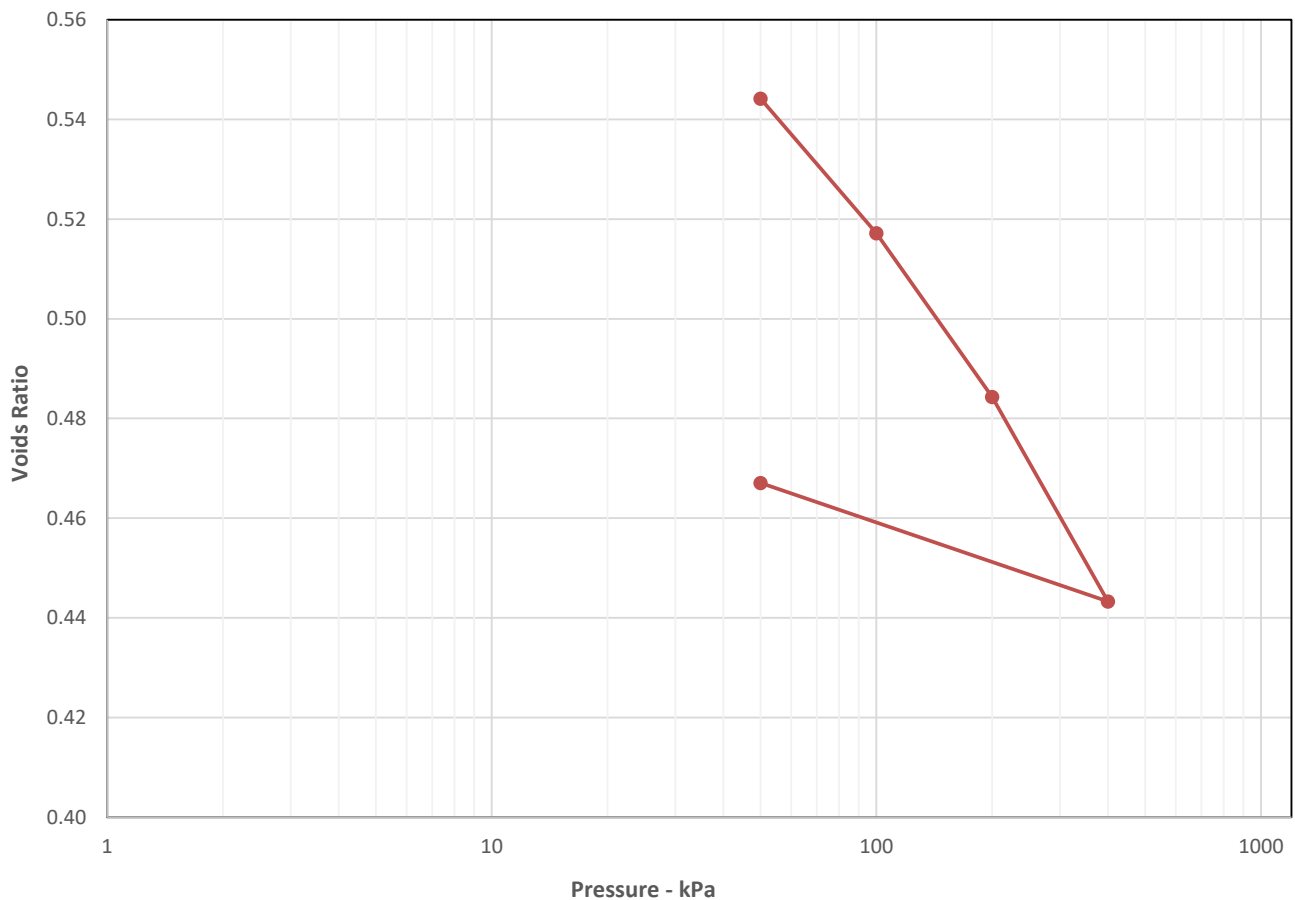
Cv Calculated Using T90
Particle Density Assumed Unless Stated Otherwise

Sample Type

U

Date Tested

30/04/2025



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	28	0	-	50	0.98	4.7		-			
Bulk Density (Mg/m3)	2.09	50	-	100	0.35	1.8		-			
Dry Density (Mg/m3)	1.63	100	-	200	0.22	2.1		-			
Voids Ratio	0.6234	200	-	400	0.14	2.8		-			
Degree of saturation	117.9	400	-	50	0.047	4.8		-			
Height (mm)	20.02		-					-			
Diameter (mm)	74.92		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator

Wayne W

**ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3**

Contract Number 78353

Borehole/Trialpit No. CP01

Project Name Land East of Stretton Croft, Burbage

Sample No.

Soil Description

Greyish brown silty CLAY

Depth Top (m) 5.00

Depth Base (m) 5.45

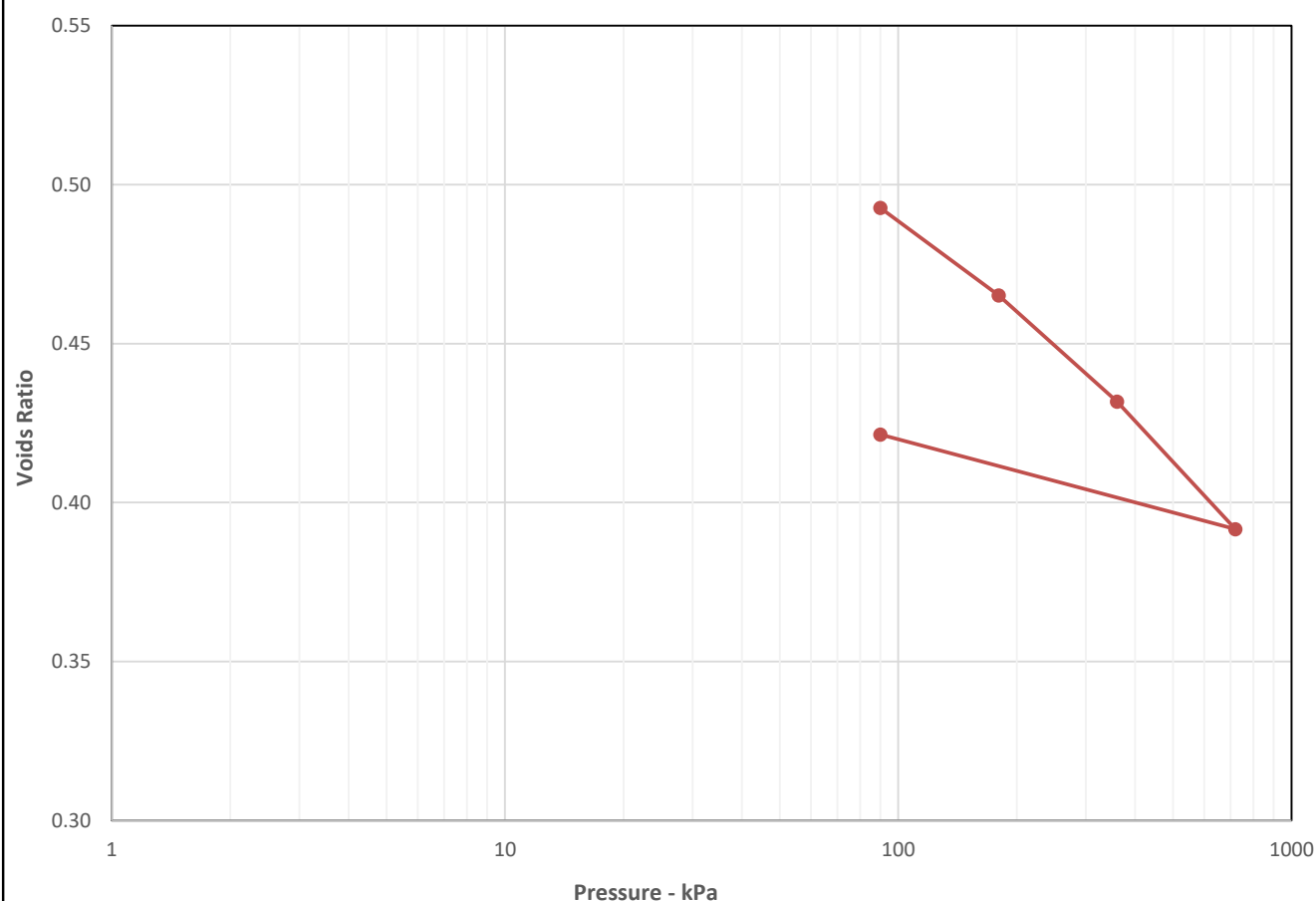
Lab Temperature 20°C

Sample Location Top

Remarks Cv Calculated Using T90
Particle Density Assumed Unless Stated Otherwise

Sample Type U

Date Tested 30/04/2025



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	25	0	-	90	0.57	1.4		-			
Bulk Density (Mg/m3)	2.11	90	-	180	0.20	2.3		-			
Dry Density (Mg/m3)	1.68	180	-	360	0.13	3.3		-			
Voids Ratio	0.5733	360	-	720	0.078	3.6		-			
Degree of saturation	117.3	720	-	90	0.034	1.7		-			
Height (mm)	20.07		-					-			
Diameter (mm)	74.95		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator

Wayne W

ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3

Contract Number 78353

Borehole/Trialpit No. CP01

Project Name Land East of Stretton Croft, Burbage

Sample No.

Soil Description

Brown silty CLAY

Depth Top (m)

8.00

Depth Base (m)

8.45

Lab Temperature

20°C

Sample Location

Top

Remarks

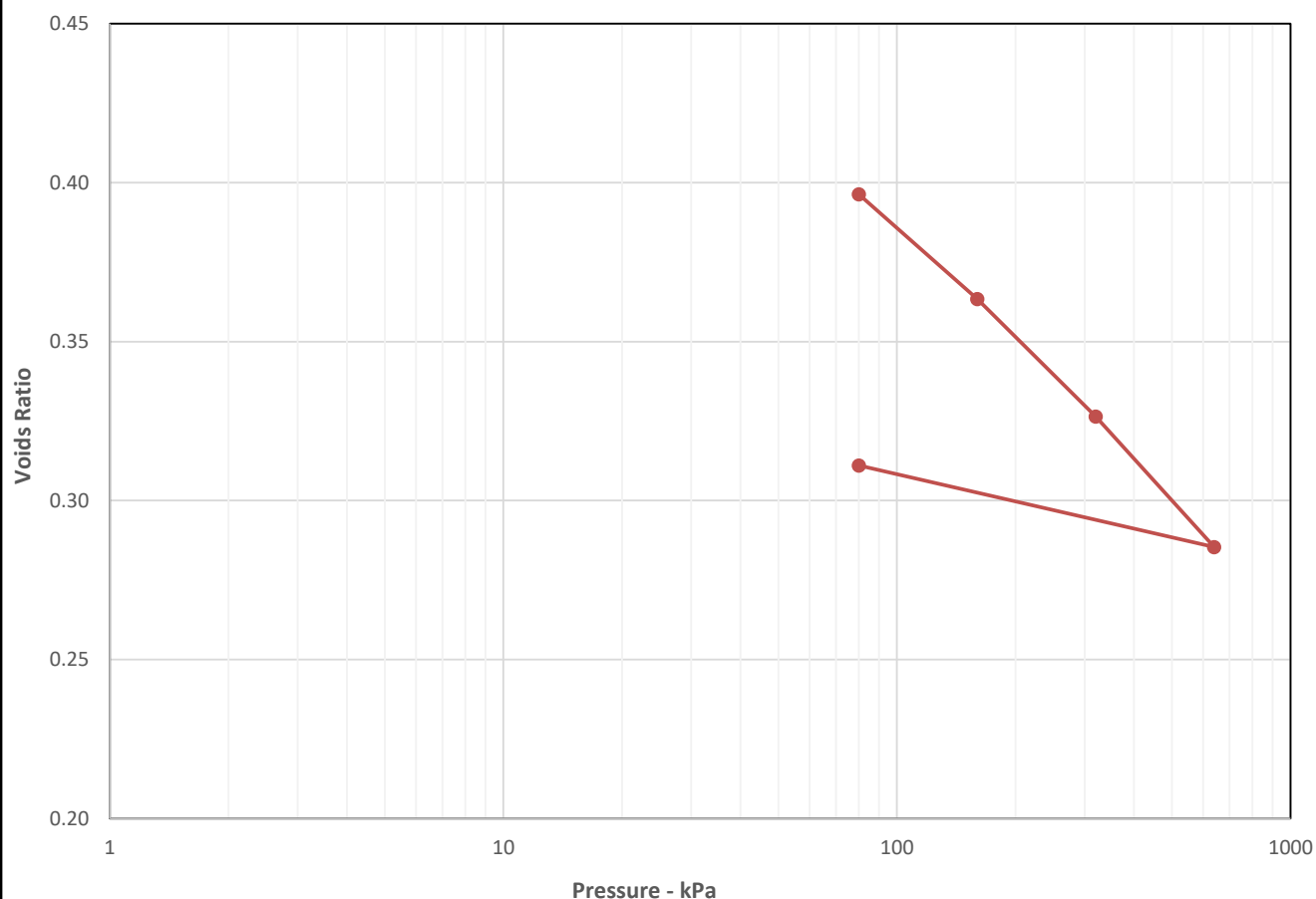
Cv Calculated Using T90
Particle Density Assumed Unless Stated Otherwise

Sample Type

U

Date Tested

30/04/2025



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	25	0	-	80	1.0	1.2		-			
Bulk Density (Mg/m3)	2.18	80	-	160	0.29	1.7		-			
Dry Density (Mg/m3)	1.74	160	-	320	0.17	2.2		-			
Voids Ratio	0.5204	320	-	640	0.097	2.9		-			
Degree of saturation	127.2	640	-	80	0.036	5.0		-			
Height (mm)	20.05		-					-			
Diameter (mm)	74.99		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator

Wayne W

**ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3**

Contract Number 78353

Borehole/Trialpit No. CP02

Project Name Land East of Stretton Croft, Burbage

Sample No.

Soil Description

Grey silty CLAY

Depth Top (m)

4.00

Depth Base (m)

4.45

Lab Temperature

20°C

Sample Location

Top

Remarks

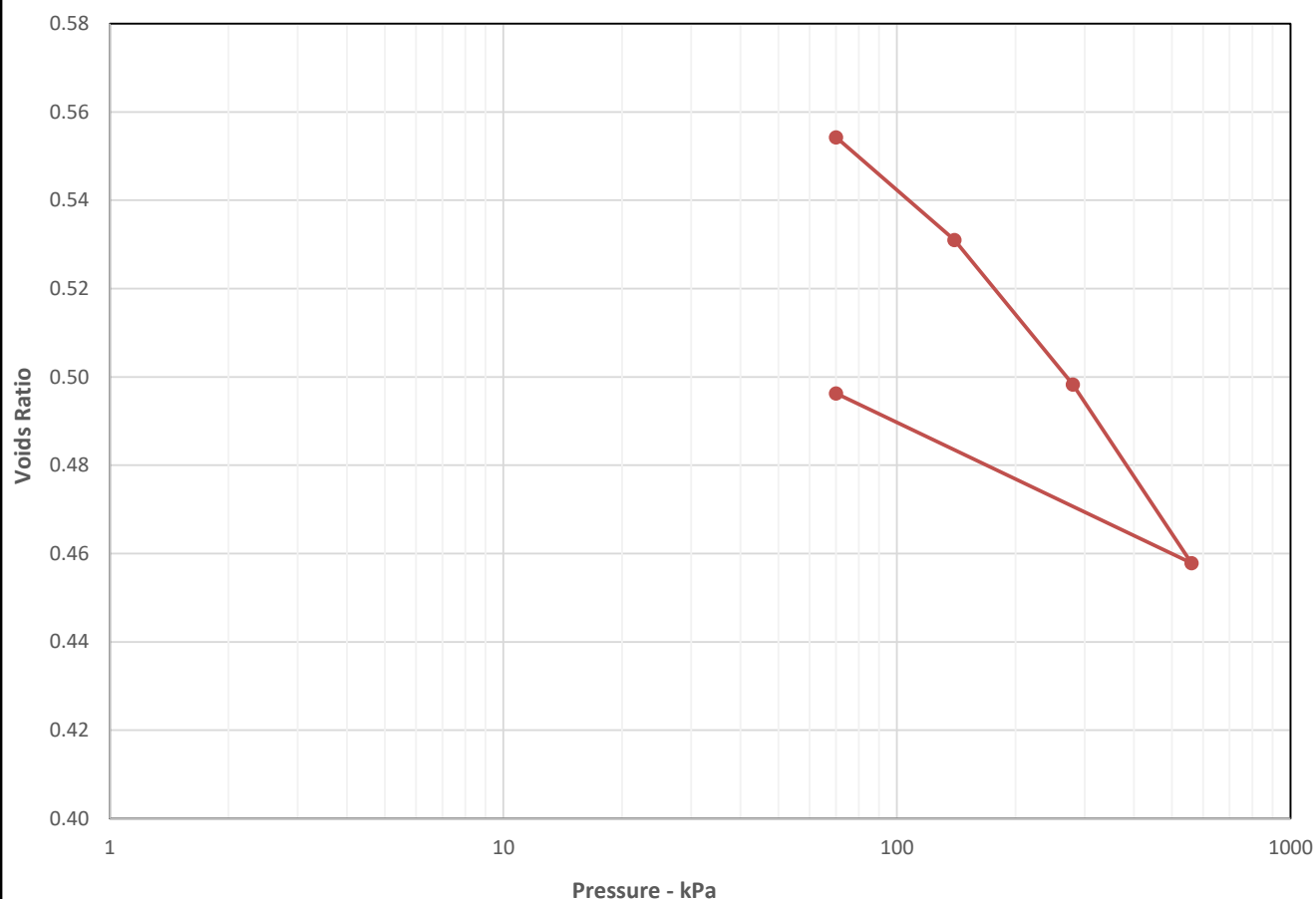
Cv Calculated Using T90
Particle Density Assumed Unless Stated Otherwise

Sample Type

U

Date Tested

30/04/2025



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	25	0	-	70	0.31	360		-			
Bulk Density (Mg/m3)	2.08	70	-	140	0.21	0.68		-			
Dry Density (Mg/m3)	1.67	140	-	280	0.15	0.63		-			
Voids Ratio	0.5893	280	-	560	0.096	0.77		-			
Degree of saturation	111.8	560	-	70	0.054	0.53		-			
Height (mm)	19.89		-					-			
Diameter (mm)	74.97		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator

Wayne W

ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3

Contract Number 78353

Borehole/Trialpit No. CP02

Project Name Land East of Stretton Croft, Burbage

Sample No.

Soil Description

Grey silty CLAY

Depth Top (m)

6.50

Depth Base (m)

6.95

Lab Temperature

20°C

Sample Location

Top

Remarks

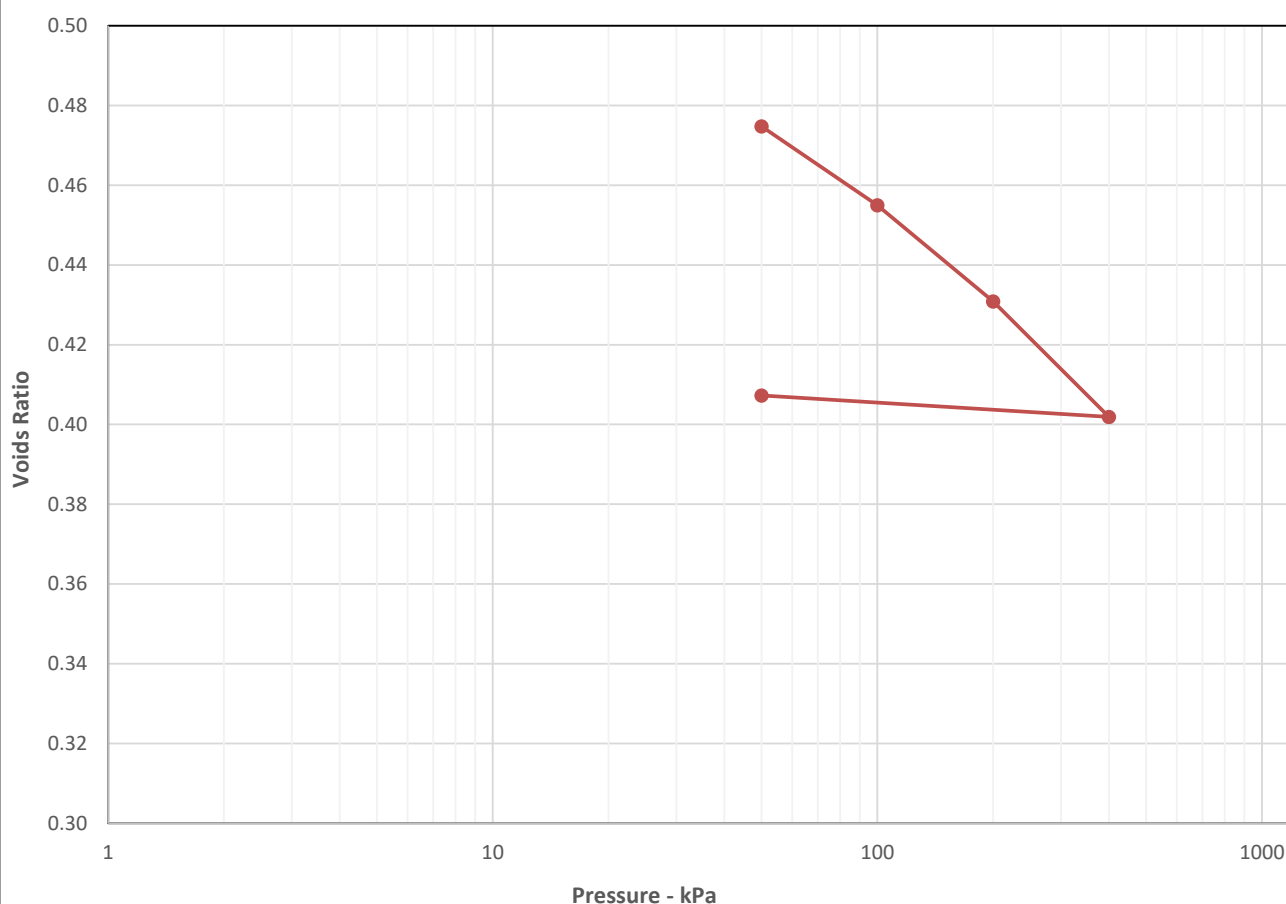
Cv Calculated Using T90
Particle Density Assumed Unless Stated Otherwise

Sample Type

U

Date Tested

30/04/2025



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	27	0	-	50	1.4	13		-			
Bulk Density (Mg/m3)	2.13	50	-	100	0.27	30		-			
Dry Density (Mg/m3)	1.67	100	-	200	0.17	21		-			
Voids Ratio	0.5847	200	-	400	0.10	22		-			
Degree of saturation	123.9	400	-	50	0.011	290		-			
Height (mm)	19.95		-					-			
Diameter (mm)	74.96		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator

Wayne W

Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number 78353

Borehole/Pit No. CP01

Project Name Land East of Stretton Croft, Burbage

Sample No.

Soil Description Brown sandy silty CLAY

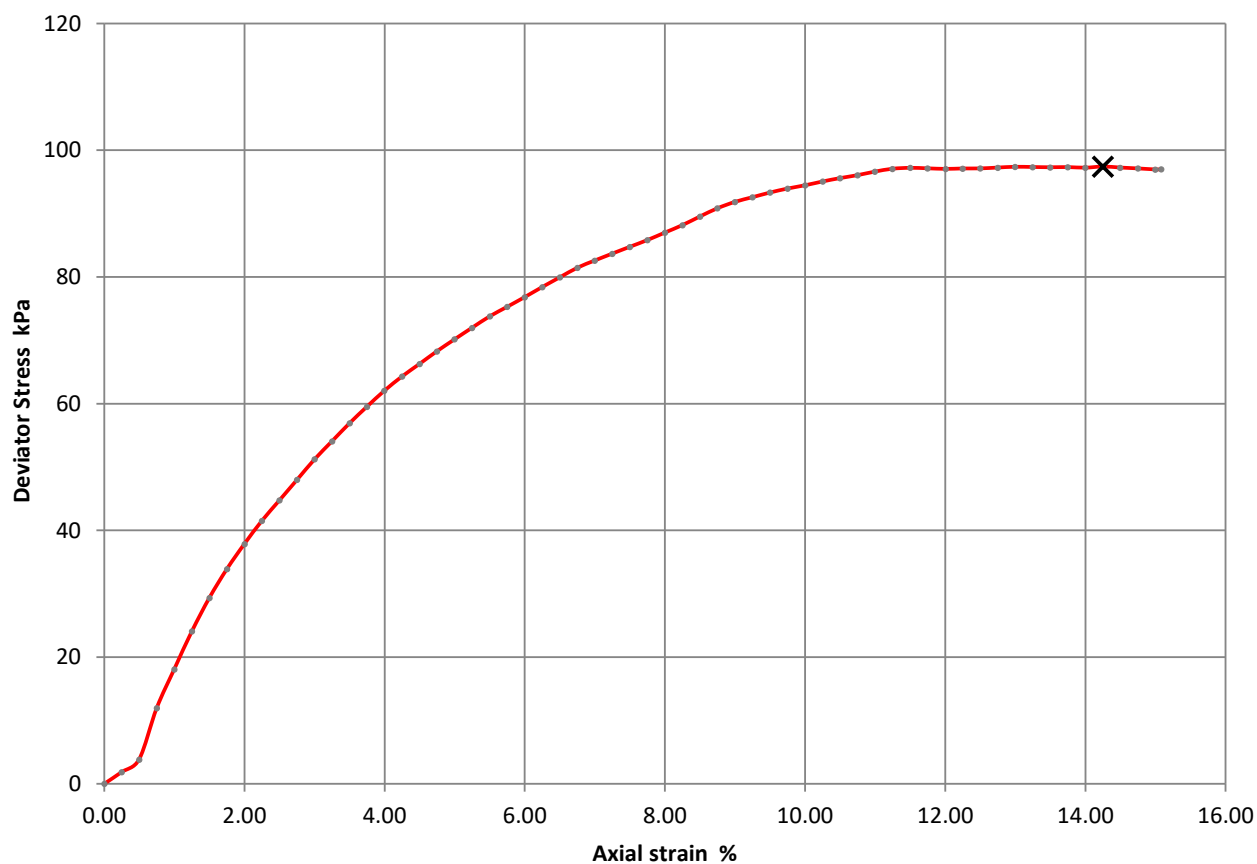
Depth Top (m) 3.00

Depth Base (m) 3.45

Date Tested 01/05/2025

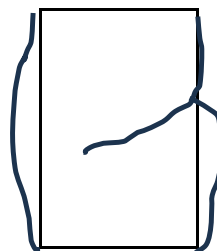
Sample Type U

Operator David E



Moisture Content (%)	27
Bulk Density (Mg/m ³)	1.98
Dry Density (Mg/m ³)	1.57
Specimen Length (mm)	208.2
Specimen Diameter (mm)	104.3
Cell Pressure (kPa)	60
Deviator Stress (kPa)	97
Undrained Shear Strength (kPa)	49
Failure Strain (%)	14
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.32

Notes.

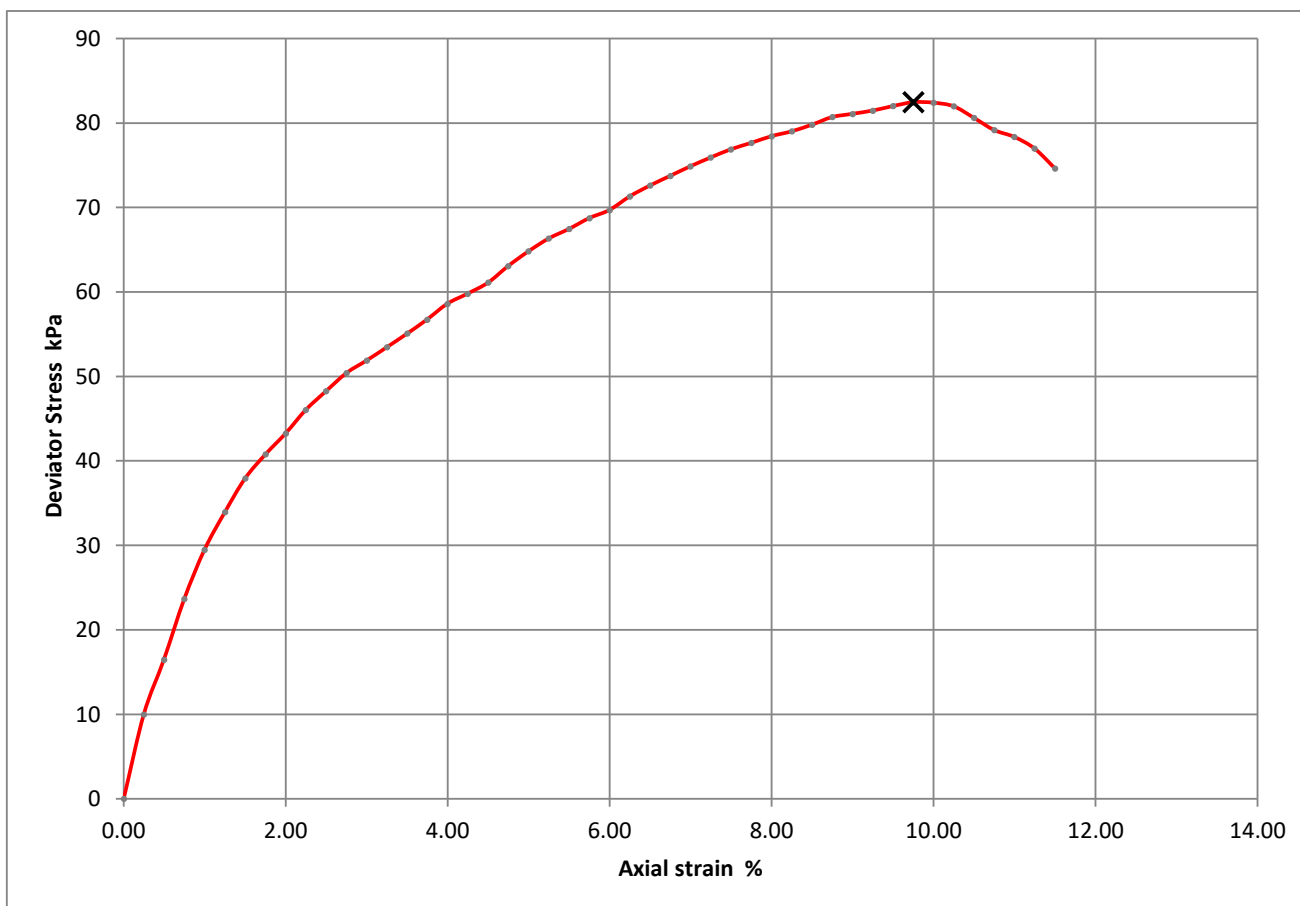


Failure Sketch.

Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number	78353
Borehole/Pit No.	CP01
Sample No.	
Depth Top (m)	5.00
Depth Base (m)	5.45
Sample Type	U
Operator	David E

Project Name	Land East of Stretton Croft, Burbage
Soil Description	Brown silty CLAY
Date Tested	01/05/2025



Moisture Content (%)	25
Bulk Density (Mg/m ³)	1.89
Dry Density (Mg/m ³)	1.52
Specimen Length (mm)	208.2
Specimen Diameter (mm)	104.2
Cell Pressure (kPa)	100
Deviator Stress (kPa)	82
Undrained Shear Strength (kPa)	41
Failure Strain (%)	10
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.32

Notes.

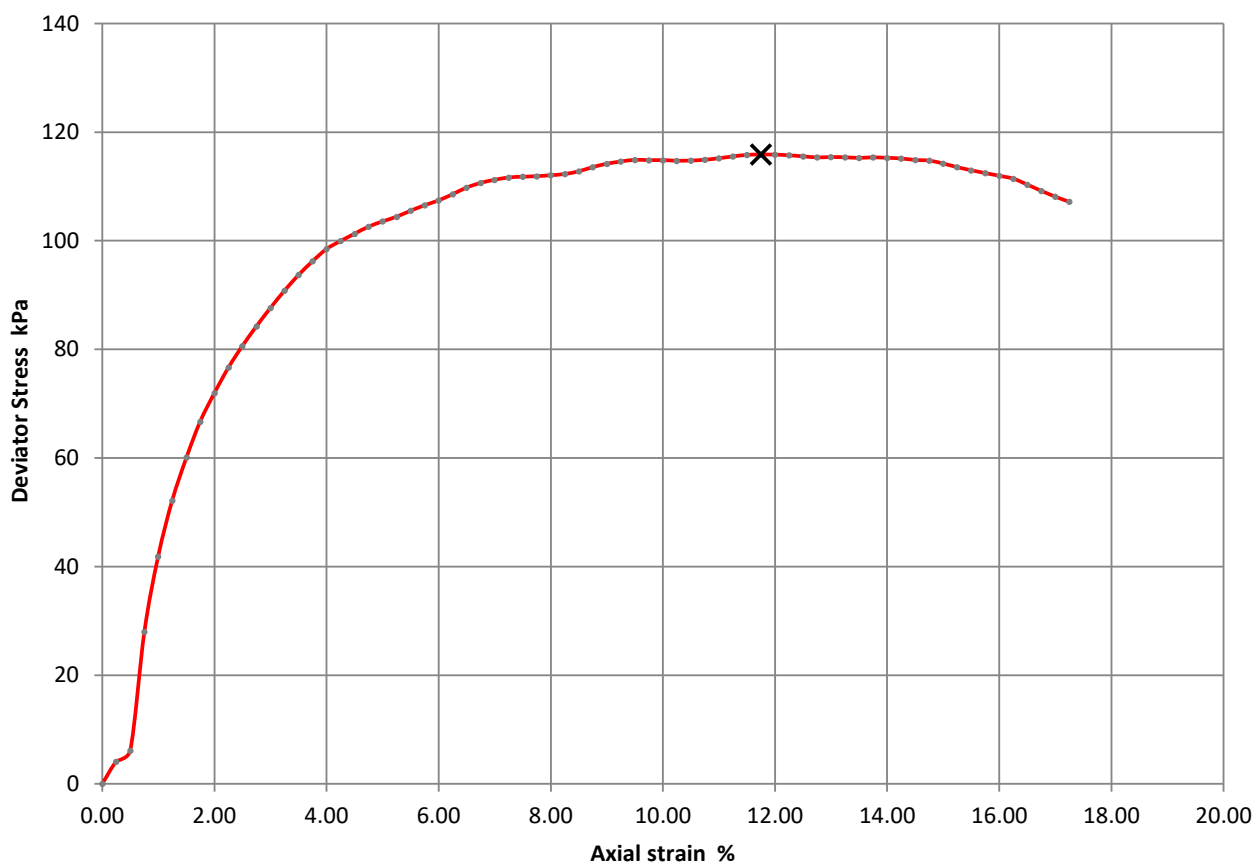


Failure Sketch.

Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

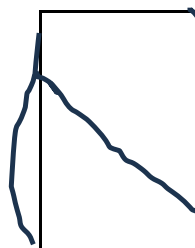
Contract Number	78353
Borehole/Pit No.	CP02
Sample No.	
Depth Top (m)	4.00
Depth Base (m)	4.50
Sample Type	U
Operator	David E

Project Name	Land East of Stretton Croft, Burbage
Soil Description	Brown sandy silty CLAY
Date Tested	01/05/2025



Moisture Content (%)	24
Bulk Density (Mg/m ³)	1.98
Dry Density (Mg/m ³)	1.60
Specimen Length (mm)	208.3
Specimen Diameter (mm)	104.3
Cell Pressure (kPa)	80
Deviator Stress (kPa)	116
Undrained Shear Strength (kPa)	58
Failure Strain (%)	12
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.32

Notes.



Failure Sketch.

**Single Stage Unconsolidated-Undrained Triaxial
Test
BS 1377 : 1990 Part 7 : 8**

Contract Number 78353

Borehole/Pit No. CP02

Project Name Land East of Stretton Croft, Burbage

Sample No.

Soil Description Brown sandy silty CLAY

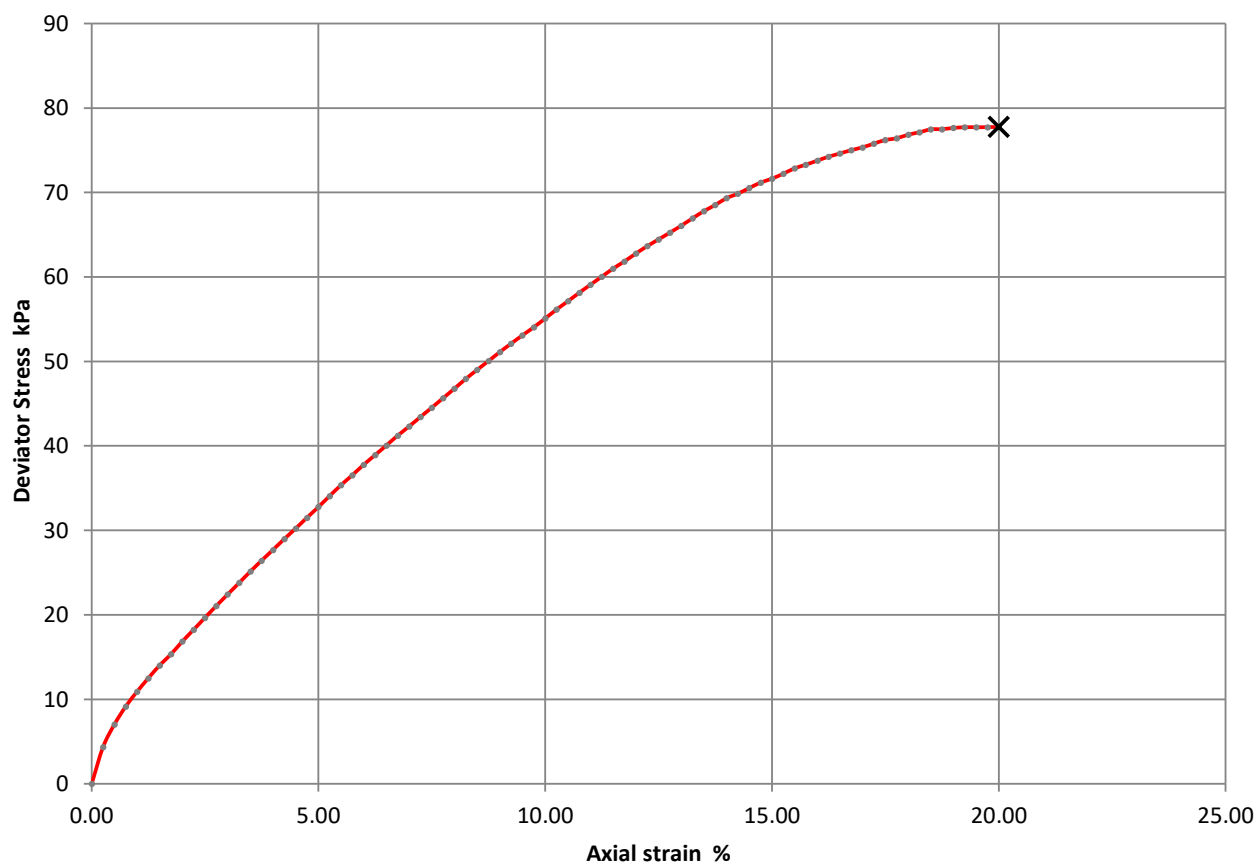
Depth Top (m) 6.50

Depth Base (m) 6.95

Date Tested 01/05/2025

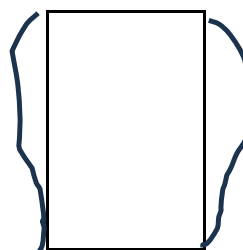
Sample Type U

Operator David E



Moisture Content (%)	26
Bulk Density (Mg/m ³)	1.96
Dry Density (Mg/m ³)	1.55
Specimen Length (mm)	192.3
Specimen Diameter (mm)	104.3
Cell Pressure (kPa)	130
Deviator Stress (kPa)	78
Undrained Shear Strength (kPa)	39
Failure Strain (%)	20
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.43

Notes.



Failure Sketch.



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ENVIRONMENTAL TESTING RESULTS



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t: 01484 604354

e: harry.letch@rogersgeotech.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404

f: 01923 237404

e: reception@i2analytical.com

Analytical Report Number : 25-016380

Project / Site name:	Burbage	Samples received on:	01/04/2025
Your job number:	C5007 25 E	Samples instructed on/ Analysis started on:	01/04/2025
Your order number:		Analysis completed by:	08/04/2025
Report Issue Number:	1	Report issued on:	08/04/2025
Samples Analysed:	13 soil samples		

Signed:



Rafał Szczepańczyk
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting
air	- once the analysis is complete

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Some records may be kept for longer according to other legal/best practice requirements.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 25-016380

Project / Site name: Burbage

Lab Sample Number	500366	500367	500368	500369	500370
Sample Reference	CP01	CP01	CP01	CP02	CP02
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix	N/A	N/A	N/A	N/A	N/A
Depth (m)	0.10-0.50	2.00-2.45	9.00-9.22	0.10-0.40	1.30
Date Sampled	31/03/2025	31/03/2025	31/03/2025	31/03/2025	31/03/2025
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	50.5	< 0.1
Moisture Content	%	0.01	NONE	15	20	12	5.1	14
Total mass of sample received	kg	0.1	NONE	0.9	0.8	0.8	0.8	0.9

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	-	-	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	MUA	-	-	MUA	-
Analysis completed	N/A	N/A	N/A	04/04/2025	-	-	04/04/2025	-

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.2	8.2	8.7	8.8	8.4
Free Cyanide	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
Total Sulphate as SO ₄	%	0.005	MCERTS	0.049	0.04	0.048	0.079	0.012
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	22	45	18	260	39
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	11.1	22.3	9.2	130	19.5
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	2.4	1.2	-	7.5
Total Sulphur	mg/kg	50	MCERTS	-	210	150	-	140
Total Sulphur	%	0.005	MCERTS	-	0.021	0.015	-	0.014
Ammoniacal Nitrogen as NH ₄ ⁺	mg/kg	0.5	MCERTS	-	< 0.5	< 0.5	-	0.8
Ammonium as NH ₄ ⁺ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	-	< 0.05	< 0.05	-	0.05
Organic Matter (automated)	%	0.1	MCERTS	4.8	-	-	2.3	-
Water Soluble Nitrate (2:1) as NO ₃	mg/kg	2	NONE	-	< 2.0	< 2.0	-	< 2.0
Water Soluble Nitrate (2:1) as NO ₃ (leachate equivalent)	mg/l	5	NONE	-	< 5.0	< 5.0	-	< 5.0

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.1	-	-	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	0.06	-	-	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	0.11	-	-	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	0.09	-	-	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	0.95	-	-	0.07	-
Anthracene	mg/kg	0.05	MCERTS	0.26	-	-	< 0.05	-
Fluoranthene	mg/kg	0.05	MCERTS	1.6	-	-	0.12	-
Pyrene	mg/kg	0.05	MCERTS	1.5	-	-	0.11	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.73	-	-	< 0.05	-
Chrysene	mg/kg	0.05	MCERTS	0.72	-	-	0.08	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	1.1	-	-	0.11	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.38	-	-	< 0.05	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.93	-	-	0.07	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.51	-	-	< 0.05	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.1	-	-	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.57	-	-	< 0.05	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	9.78	-	-	< 0.80	-
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Analytical Report Number: 25-016380
Project / Site name: Burbage

Lab Sample Number	500366	500367	500368	500369	500370
Sample Reference	CP01	CP01	CP01	CP02	CP02
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix	N/A	N/A	N/A	N/A	N/A
Depth (m)	0.10-0.50	2.00-2.45	9.00-9.22	0.10-0.40	1.30
Date Sampled	31/03/2025	31/03/2025	31/03/2025	31/03/2025	31/03/2025
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	-	-	7.4	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	-	-	0.8	-
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	-	-	< 1.8	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	51	-	-	14	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	86	-	-	26	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	82	-	-	13	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	-	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	32	-	-	11	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	66	-	-	51	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	220	-	-	62	-

Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	4.5	9.9	-	2.9
Magnesium (water soluble)	mg/kg	5	NONE	-	9	20	-	5.7

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010	-	-	< 0.010	-
TPHCWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010	-	-	< 0.010	-
TPHCWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010	-	-	< 0.010	-
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	3	-	-	< 2.0	-
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	-	-	< 8.0	-
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	38	-	-	81	-
TPHCWG - Aliphatic >EC5 - EC35 _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	41	-	-	81	-

TPHCWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	MCERTS	< 0.010	-	-	< 0.010	-
TPHCWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	MCERTS	< 0.010	-	-	< 0.010	-
TPHCWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.02	MCERTS	< 0.020	-	-	< 0.020	-
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	< 2.0	-	-	2.6	-
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	-	-	< 10	-
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	48	-	-	180	-
TPHCWG - Aromatic >EC5 - EC35 _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	48	-	-	190	-

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	-	-	< 5.0	-
Benzene	µg/kg	5	MCERTS	< 5.0	-	-	< 5.0	-
Toluene	µg/kg	5	MCERTS	< 5.0	-	-	< 5.0	-
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	-	-	< 5.0	-
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	-	-	< 8.0	-
o-Xylene	µg/kg	5	MCERTS	< 5.0	-	-	< 5.0	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 25-016380

Project / Site name: Burbage

Lab Sample Number	500371	500372	500373	500374	500375
Sample Reference	CP02	CP02	TP102	TP103	TP104
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix	N/A	N/A	N/A	N/A	N/A
Depth (m)	7.00	15.00-15.27	1.00	0.40	1.00
Date Sampled	31/03/2025	31/03/2025	31/03/2025	31/03/2025	31/03/2025
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	20	14	14	11	17
Total mass of sample received	kg	0.1	NONE	0.9	0.9	0.8	0.8	0.8

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	-	-	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	-	-	MUA	MUA	MUA
Analysis completed	N/A	N/A	N/A	-	-	04/04/2025	04/04/2025	04/04/2025

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.2	8.7	7.1	7.9	8.4
Free Cyanide	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	%	0.005	MCERTS	0.092	0.032	-	0.046	-
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	330	17	130	83	120
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	164	8.49	65.2	41.6	61.6
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	3.8	1.3	-	-	-
Total Sulphur	mg/kg	50	MCERTS	11000	180	-	-	-
Total Sulphur	%	0.005	MCERTS	1.09	0.018	-	-	-
Ammoniacal Nitrogen as NH ₄ ⁺	mg/kg	0.5	MCERTS	0.6	0.8	-	-	-
Ammonium as NH ₄ ⁺ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05	0.05	-	-	-
Organic Matter (automated)	%	0.1	MCERTS	-	-	0.7	1.7	0.8
Water Soluble Nitrate (2:1) as NO ₃	mg/kg	2	NONE	< 2.0	< 2.0	-	-	-
Water Soluble Nitrate (2:1) as NO ₃ (leachate equivalent)	mg/l	5	NONE	< 5.0	< 5.0	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	< 1.0	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.23	< 0.05
Anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	-	-	0.1	0.49	< 0.05
Pyrene	mg/kg	0.05	MCERTS	-	-	0.1	0.47	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.27	< 0.05
Chrysene	mg/kg	0.05	MCERTS	-	-	0.08	0.32	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	-	< 0.05	0.45	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	-	< 0.05	0.23	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.41	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.22	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.06	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.3	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	-	-	< 0.80	3.43	< 0.80
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Analytical Report Number: 25-016380
Project / Site name: Burbage

Lab Sample Number	500371	500372	500373	500374	500375
Sample Reference	CP02	CP02	TP102	TP103	TP104
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix	N/A	N/A	N/A	N/A	N/A
Depth (m)	7.00	15.00-15.27	1.00	0.40	1.00
Date Sampled	31/03/2025	31/03/2025	31/03/2025	31/03/2025	31/03/2025
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	2.6	12	9.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	0.3	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	-	-	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	12	37	42
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	17	40	51
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	12	39	17
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	10	27	40
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	16	50	58
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	31	98	71

Magnesium (leachate equivalent)	mg/l	2.5	NONE	16	6.4	-	-	-
Magnesium (water soluble)	mg/kg	5	NONE	32	13	-	-	-

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	-	-	< 0.010	-
TPHCWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	-	-	< 0.010	-
TPHCWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	-	-	< 0.010	-
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	-	-	-	19	-
TPHCWG - Aliphatic >EC5 - EC35 _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	-	-	-	19	-

TPHCWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	MCERTS	-	-	-	< 0.010	-
TPHCWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	MCERTS	-	-	-	< 0.010	-
TPHCWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.02	MCERTS	-	-	-	< 0.020	-
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	-	-	< 10	-
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	-	-	13	-
TPHCWG - Aromatic >EC5 - EC35 _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	-	-	-	13	-

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	-	-	-	< 5.0	-
Benzene	µg/kg	5	MCERTS	-	-	-	< 5.0	-
Toluene	µg/kg	5	MCERTS	-	-	-	< 5.0	-
Ethylbenzene	µg/kg	5	MCERTS	-	-	-	< 5.0	-
p & m-Xylene	µg/kg	8	MCERTS	-	-	-	< 8.0	-
o-Xylene	µg/kg	5	MCERTS	-	-	-	< 5.0	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 25-016380

Project / Site name: Burbage

Lab Sample Number	500376	500377	500378
Sample Reference	TP106	TP106	TP107
Sample Number	None Supplied	None Supplied	None Supplied
Water Matrix	N/A	N/A	N/A
Depth (m)	0.50	1.20	1.20
Date Sampled	31/03/2025	31/03/2025	31/03/2025
Time Taken	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status

Stone Content	%	0.1	NONE	30	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	9.5	18	21
Total mass of sample received	kg	0.1	NONE	0.8	0.9	0.9

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MUA	MUA	MUA
Analysis completed	N/A	N/A	N/A	04/04/2025	04/04/2025	04/04/2025

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.2	8.1	8
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	%	0.005	MCERTS	-	0.027	-
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	37	75	58
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	18.3	37.6	29
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	-
Total Sulphur	mg/kg	50	MCERTS	-	-	-
Total Sulphur	%	0.005	MCERTS	-	-	-
Ammoniacal Nitrogen as NH ₄ ⁺	mg/kg	0.5	MCERTS	-	-	-
Ammonium as NH ₄ ⁺ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	-	-	-
Organic Matter (automated)	%	0.1	MCERTS	0.8	0.7	1.1
Water Soluble Nitrate (2:1) as NO ₃	mg/kg	2	NONE	-	-	-
Water Soluble Nitrate (2:1) as NO ₃ (leachate equivalent)	mg/l	5	NONE	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.13	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.14	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.11	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.11	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.9	< 0.05	0.08
Anthracene	mg/kg	0.05	MCERTS	0.24	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	2	< 0.05	0.09
Pyrene	mg/kg	0.05	MCERTS	1.9	< 0.05	0.08
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.91	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	1.1	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	1.5	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.54	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.3	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.7	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.14	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.76	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	12.4	< 0.80	< 0.80
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Analytical Report Number: 25-016380

Project / Site name: Burbage

Lab Sample Number	500376	500377	500378
Sample Reference	TP106	TP106	TP107
Sample Number	None Supplied	None Supplied	None Supplied
Water Matrix	N/A	N/A	N/A
Depth (m)	0.50	1.20	1.20
Date Sampled	31/03/2025	31/03/2025	31/03/2025
Time Taken	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.1	12	14
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	16	38	47
Copper (aqua regia extractable)	mg/kg	1	MCERTS	48	11	29
Lead (aqua regia extractable)	mg/kg	1	MCERTS	22	18	25
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	19	45
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	27	57	64
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	60	54	78

Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	-
Magnesium (water soluble)	mg/kg	5	NONE	-	-	-

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	< 0.010	-
TPHCWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	< 0.010	-
TPHCWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	< 0.010	-
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	-	< 1.0	-
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	-	< 2.0	-
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	-	< 8.0	-
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	-	< 8.0	-
TPHCWG - Aliphatic >EC5 - EC35 _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	-	< 10	-

TPHCWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	MCERTS	-	< 0.010	-
TPHCWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	MCERTS	-	< 0.010	-
TPHCWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.02	MCERTS	-	< 0.020	-
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	-	< 1.0	-
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	-	< 2.0	-
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	< 10	-
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	< 10	-
TPHCWG - Aromatic >EC5 - EC35 _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	-	< 10	-

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	-	< 5.0	-
Benzene	µg/kg	5	MCERTS	-	< 5.0	-
Toluene	µg/kg	5	MCERTS	-	< 5.0	-
Ethylbenzene	µg/kg	5	MCERTS	-	< 5.0	-
p & m-Xylene	µg/kg	8	MCERTS	-	< 8.0	-
o-Xylene	µg/kg	5	MCERTS	-	< 5.0	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 25-016380
Project / Site name: Burbage

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
500366	CP01	None Supplied	0.10-0.50	Brown loam and clay with gravel and vegetation
500367	CP01	None Supplied	2.00-2.45	Brown clay
500368	CP01	None Supplied	9.00-9.22	Brown clay and sand with gravel
500369	CP02	None Supplied	0.10-0.40	Brown loam and sand with vegetation and stones
500370	CP02	None Supplied	1.3	Brown sand with gravel
500371	CP02	None Supplied	7	Grey clay and sand
500372	CP02	None Supplied	15.00-15.27	Brown clay and sand with gravel
500373	TP102	None Supplied	1	Brown sand with gravel
500374	TP103	None Supplied	0.4	Brown clay and loam with gravel and vegetation
500375	TP104	None Supplied	1	Brown clay and sand with gravel
500376	TP106	None Supplied	0.5	Brown loam and sand with stones and vegetation
500377	TP106	None Supplied	1.2	Brown clay and sand with gravel
500378	TP107	None Supplied	1.2	Brown clay

Analytical Report Number : 25-016380

Project / Site name: Burbage

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088-PL	D/W	MCERTS
Water Soluble Nitrate (leachate equivalent)	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078-PL	W	NONE
Nitrate, water soluble, in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078-PL	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS

Analytical Report Number : 25-016380

Project / Site name: Burbage

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS
Ammonium as NH ₄ in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

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Analytical Report Number : 25-016384

Project / Site name:	Burbage	Samples received on:	01/04/2025
Your job number:	C5007 25 E	Samples instructed on/ Analysis started on:	01/04/2025
Your order number:		Analysis completed by:	07/04/2025
Report Issue Number:	1	Report issued on:	08/04/2025
Samples Analysed:	2 10:1 WAC samples		



Signed: _____

Anna Goc
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting
air	- once the analysis is complete

Excel copies of reports are only valid when accompanied by this PDF certificate.

Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 25-016384

Project / Site name: Burbage

Lab Sample Number				500390	500391
Sample Reference				TP101	TP105
Sample Number				None Supplied	None Supplied
Water Matrix				N/A	N/A
Depth (m)				1.00	1.00
Date Sampled				31/03/2025	31/03/2025
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	20
Total mass of sample received	kg	0.1	NONE	1.1	1.2

General Inorganics

Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.5	0.6
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.05	0.11
Acenaphthene	mg/kg	0.05	MCERTS	0.07	0.11
Fluorene	mg/kg	0.05	MCERTS	0.1	0.14
Phenanthrene	mg/kg	0.05	MCERTS	0.82	2.4
Anthracene	mg/kg	0.05	MCERTS	0.18	0.41
Fluoranthene	mg/kg	0.05	MCERTS	1	2.3
Pyrene	mg/kg	0.05	MCERTS	0.86	1.9
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.4	0.87
Chrysene	mg/kg	0.05	MCERTS	0.46	0.91
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.5	0.86
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.25	0.43
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.45	0.67
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.19	0.29
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.05	0.08
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.22	0.29
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	5.64	11.9
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Petroleum Hydrocarbons

Mineral Oil (EC10 - EC40) EH_CU_1D_AL	mg/kg	10	NONE	32	< 10
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VOCs

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0

Total BTEX	µg/kg	10	MCERTS	< 10	< 10
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PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001	< 0.001 ~
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001	< 0.001 ~
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001	< 0.001 ~
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001	< 0.001 ~
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001	< 0.001 ~
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001	< 0.001 ~
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001	< 0.001 ~



Project / Site name: Burbage

Lab Sample Number				500390	500391
Sample Reference				TP101	TP105
Sample Number				None Supplied	None Supplied
Water Matrix				N/A	N/A
Depth (m)				1.00	1.00
Date Sampled				31/03/2025	31/03/2025
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Total PCBs	mg/kg	0.007	MCERTS	< 0.007	< 0.007
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U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



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Waste Acceptance Criteria Analytical Results								
Report No:		25-016384						
						Client: ROGERGEO		
Location		Burbage				Landfill Waste Acceptance Criteria Limits Inert Waste Landfill Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill Hazardous Waste Landfill		
Lab Reference (Sample Number)		500390						
Sampling Date		31/03/2025						
Sample ID		TP101						
Depth (m)		1.00						
Solid Waste Analysis								
TOC (%)**		0.5				3%	5%	6%
Loss on Ignition (%) **		-				--	--	10%
BTEX (µg/kg) **		< 10				6000	--	--
Sum of PCBs (mg/kg) **		< 0.007				1	--	--
Mineral Oil (mg/kg) EH, LD, CU, AL		32				500	--	--
Total PAH (WAC-17) (mg/kg)		5.64				100	--	--
pH (units)**		-				--	>6	--
Acid Neutralisation Capacity (mmol / kg)		-				--	To be evaluated	To be evaluated
Eluate Analysis (BS EN 12457 - 2 preparation utilising end over end leaching procedure)		10:1			10:1	Limit values for compliance leaching test		
						using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
		mg/l				mg/kg		
Arsenic *		0.00138			0.0138	0.5	2	25
Barium *		0.0128			0.128	20	100	300
Cadmium *		< 0.000100			< 0.00100	0.04	1	5
Chromium *		0.0039			0.039	0.5	10	70
Copper *		< 0.00070			< 0.0070	2	50	100
Mercury *		< 0.000500			< 0.00500	0.01	0.2	2
Molybdenum *		< 0.000400			< 0.00400	0.5	10	30
Nickel *		0.0029			0.029	0.4	10	40
Lead *		< 0.0010			< 0.010	0.5	10	50
Antimony *		< 0.0017			< 0.017	0.06	0.7	5
Selenium *		< 0.0040			< 0.040	0.1	0.5	7
Zinc *		0.0048			0.048	4	50	200
Chloride *		2.6			26	800	15000	25000
Fluoride*		0.17			1.7	10	150	500
Sulphate *		4.5			45	1000	20000	50000
TDS*		23			230	4000	60000	100000
Phenol Index (Monohydric Phenols) *		< 0.010			< 0.10	1	-	-
DOC		4.59			45.9	500	800	1000
Leach Test Information								
Stone Content (%)		< 0.1						
Sample Mass (kg)		1.1						
Dry Matter (%)		85						
Moisture (%)		15						
Results are expressed on a dry weight basis, after correction for moisture content where applicable.						* = UKAS accredited (liquid eluate analysis only)		
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation						** – MCFETS accredited		

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3. This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Where colour coding is used on this report, this is for guidance purposes only. This does not constitute a statement of conformity of pass or fail.

Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.



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Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3. This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Where colour coding is used on this report, this is for guidance purposes only. This does not constitute a statement of conformity of pass or fail.

Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number : 25-016384

Project / Site name: Burbage

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
500390	TP101	None Supplied	1	Brown clay and sand
500391	TP105	None Supplied	1	Brown clay

Analytical Report Number : 25-016384

Project / Site name: Burbage

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with hexane followed by GC-MS	In-house method based on USEPA 8082	L027B	D	MCERTS
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031B	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR Analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	NONE
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Sample Preparation		In-house method	L043B	W	NONE
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS	In-house method	L076B/L088-PL	D/W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025

Analytical Report Number : 25-016384

Project / Site name: Burbage

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

~ - Quality control surrogate recovery outside of limits, other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.



4041



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Analytical Report Number : 25-021321

Project / Site name:	Welcome Break	Samples received on:	24/04/2025
Your job number:	C5007 25 E 7632	Samples instructed on/ Analysis started on:	24/04/2025
Your order number:		Analysis completed by:	02/05/2025
Report Issue Number:	1	Report issued on:	02/05/2025
Samples Analysed:	2 water samples		

Signed:

Anna Goc
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting
air	- once the analysis is complete

Excel copies of reports are only valid when accompanied by this PDF certificate.

Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.



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Analytical Report Number: 25-021321

Project / Site name: Welcome Break

Lab Sample Number				526436	526437
Sample Reference				BH01	BH02
Sample Number				None Supplied	None Supplied
Water Matrix				Ground water	Ground water
Depth (m)				8.88	14.65
Date Sampled				24/04/2025	24/04/2025
Time Taken				None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Test Limit of detection	Test Accreditation Status		

General Inorganics

pH (L099)	pH Units	N/A	ISO 17025	7.2	6.8
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10
Sulphate as SO ₄	mg/l	0.045	ISO 17025	105	113
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	3.34	3.6

Total Phenols

Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	0.15	ISO 17025	1.04	0.45
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.11	0.23
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	1.6	1.4
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2
Mercury (dissolved)	µg/l	0.05	NONE	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	2.8	12
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	0.6
Vanadium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	0.2
Zinc (dissolved)	µg/l	0.5	ISO 17025	3.3	4.8

Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0
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Analytical Report Number: 25-021321

Project / Site name: Welcome Break

Lab Sample Number				526436	526437
Sample Reference				BH01	BH02
Sample Number				None Supplied	None Supplied
Water Matrix				Ground water	Ground water
Depth (m)				8.88	14.65
Date Sampled				24/04/2025	24/04/2025
Time Taken				None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Petroleum Hydrocarbons

TPH - Aliphatic >EC5 - EC6 _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH - Aliphatic >EC6 - EC8 _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH - Aliphatic >EC8 - EC10 _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH - Aliphatic >EC10 - EC12 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10
TPH - Aliphatic >EC12 - EC16 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10
TPH - Aliphatic >EC16 - EC21 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10
TPH - Aliphatic >EC21 - EC35 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10
TPH - Aliphatic >EC5 - EC35 _{HS+EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10

TPH - Aromatic >EC5 - EC7 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH - Aromatic >EC7 - EC8 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH - Aromatic >EC8 - EC10 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH - Aromatic >EC10 - EC12 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10
TPH - Aromatic >EC12 - EC16 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10
TPH - Aromatic >EC16 - EC21 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10
TPH - Aromatic >EC21 - EC35 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10
TPH - Aromatic >EC5 - EC35 _{HS+EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



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Environmental Science

Analytical Report Number : 25-021321

Project / Site name: Welcome Break

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited matrices: SW, PW, GW, except B - SW, GW, Hg - SW, PW, Al - SW, PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Total Organic Carbon in water	Determination of total organic carbon in water by TOC/DOC NDIR Analyser. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Total Petroleum Hydrocarbons with carbon banding in water by GC-MS	Determination of total petroleum hydrocarbons in water by GC-MS with carbon banding aliphatic and aromatic	In-house method	L070B	W	NONE
BTEX and/or Volatile Organic Compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW, PW, GW	In-house method based on USEPA 8260	L073B	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5-diphenylcarbazide, followed by colorimetry. Accredited matrices: SW, PW, GW, FSE, LL	In-house method by continuous flow analyser	L080-PL	W	ISO 17025
Free cyanide in water	Determination of free cyanide in water by distillation followed by colorimetry. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Total Petroleum Hydrocarbons in water by HS-GC-MS	Determination of total petroleum hydrocarbons in water by headspace GC-MS. Accredited matrices: SW, PW, GW	In-house method	L088-PL	W	ISO 17025
pH of water at 20°C (automated)	Determination of pH of water by electrochemical measurement. Accredited matrices: SW, PW, GW, FSE, LL	In-house method	L099-PL	W	ISO 17025
Speciated PAHs and/or Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds (including PAHs) in water by extraction in dichloromethane followed by GC-MS. Accredited matrices (PAHs): SW, PW, GW	In-house method based on USEPA 8270	L102B	W	ISO 17025



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Analytical Report Number : 25-021321

Project / Site name: Welcome Break

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited matrices: SW, PW, GW, PrW, DI PrW, FSE, LL	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution



< ENVIRONMENTAL > < GEOTECHNICAL >

End of Report



Environmental
Geotechnical
Specialists

Rogers Geotechnical Services Ltd
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Appendix 8

Contamination Summary Sheets



Rogers Geotechnical Services: Soil Screening Values Comparison Sheet



Rogers Geotechnical Services Ltd: Soil Screening Value (SSV) Comparison Sheet														
Job Number	C5007/25/E/7632			A = WS Atkins PLC, Atrisk Soil Screening Values. A+ = Values updated June 2017. A* = Atrisk's SSV is lower than i2's detectable limit for this compound. B = health criterion values, which are available from toxicological reviews published in the C4SL project methodology report. C = Category 4 Screening Levels (C4SLs) based on 6% soil organic matter. D = Value provided is based on Methyl Mercury. Should elemental mercury be observed or a source be known then a limit of 102 should be used. KEY Exceeds SSV Exceeds 2017, Below 2015 Below limit of detection (LOD) 										
Job Name	Land East of Stretton Croft, Burbage													
Date	08.05.25			Sample Location	CP01	CP01	CP01	CP02	CP02	CP02	CP02	TP102	TP103	TP104
Client	Welcome Break			Depth Top	0.1	2	9	0.1	1.3	7	15	1	0.4	1
				Depth Base	0.5	2.45	9.22	0.4			15.27			
Determinand	Units	Ref	LOD	Public Open Space Park 1%										
				Atrisk 2015 (No Free Product)	Atrisk 2017									
Cadmium	mg/kg	C	0.2		882	0.4			0.8			0.3	< 0.2	< 0.2
Chromium (Hexavalent)	mg/kg	B/C	1.8	251	132	< 1.8			< 1.8			< 1.8	< 1.8	< 1.8
Copper	mg/kg	A+	1.0		45200	86			26			17	40	51
Mercury	mg/kg	A/D	0.3		94.3	< 0.3			< 0.3			< 0.3	< 0.3	< 0.3
Nickel	mg/kg	A+	1.0		804	32			11			10	27	40
Lead	mg/kg	C	1.0		1340	82			13			12	39	17
Zinc	mg/kg	A+	1.0		201000	220			62			31	98	71
Vanadium	mg/kg	A+	1.0		7490	66			51			16	50	58
Arsenic	mg/kg	C	1.0		168	13			7.4			2.6	12	9.3
Selenium	mg/kg	A	1.0		2550	< 1.0			< 1.0			< 1.0	< 1.0	< 1.0
Cyanide (Free)	mg/kg	A	1.0		34	< 1.0			< 1.0			< 1.0	< 1.0	< 1.0
Total Phenols	mg/kg	A	1.0		685	< 1.0			< 1.0				< 1.0	
Naphthalene	mg/kg	A+	0.05	623	75.04	0.1			< 0.05			< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg		0.05			0.06			< 0.05			< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	A+	0.05		28600	0.11			< 0.05			< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	A+	0.05		19600	0.09			< 0.05			< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg		0.05			0.95			0.07			< 0.05	0.23	< 0.05
Anthracene	mg/kg	A+	0.05		150000	0.26			< 0.05			< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	A+	0.05		20200	1.6			0.12			0.1	0.49	< 0.05
Pyrene	mg/kg	A+	0.05		15100	1.5			0.11			0.1	0.47	< 0.05
Benzo[a]anthracene	mg/kg	A	0.05	9.52	1.71	0.73			< 0.05			< 0.05	0.27	< 0.05
Chrysene	mg/kg	A	0.05	993	0.44	0.72			0.08			0.08	0.32	< 0.05
Benzo[b]fluoranthene	mg/kg	A	0.05	11.5	1.22	1.1			0.11			< 0.05	0.45	< 0.05
Benzo[k]fluoranthene	mg/kg	A	0.05	123	0.686	0.38			< 0.05			< 0.05	0.23	< 0.05
Benzo[a]pyrene	mg/kg	B/C	0.05	21.4	8.6	0.93			0.07			< 0.05	0.41	< 0.05
Indeno(1,2,3-c,d)Pyrene	mg/kg	A*	0.05	11.2	0.0614	0.51			< 0.05			< 0.05	0.22	< 0.05
Dibenz(a,h)Anthracene	mg/kg	A	0.05	1.27	0.00393	0.1			< 0.05			< 0.05	0.06	< 0.05
Benzo[g,h,i]perylene	mg/kg	A	0.05	143	0.0187	0.57			< 0.05			< 0.05	0.3	< 0.05
Total Of 16 PAH's	mg/kg		0.8											
Aliphatic TPH >C5-C6	mg/kg	A+	0.01	109000	327	< 0.010			< 0.010				< 0.010	
Aliphatic TPH >C6-C8	mg/kg	A+	0.01	163000	157	< 0.010			< 0.010				< 0.010	
Aliphatic TPH >C8-C10	mg/kg	A+	0.01	9720	82.4	< 0.010			< 0.010				< 0.010	
Aliphatic TPH >C10-C12	mg/kg	A+	1.0	17700	49.9	< 1.0			< 1.0				< 1.0	
Aliphatic TPH >C12-C16	mg/kg	A+	2.0	23800	20.9	3			< 2.0				< 2.0	
Aliphatic TPH >C16-C21	mg/kg	A+	8.0		864000	< 8.0			< 8.0				< 8.0	
Aliphatic TPH >C21-C35	mg/kg	A+	8.0		864000	38			81				19	
Aliphatic TPH >C35-C44	mg/kg		10.0			41			81				19	
Total Aliphatic Hydrocarbons	mg/kg		10.0											
Aromatic TPH >C5-C7	mg/kg	A+	0.01		139	< 0.010			< 0.010				< 0.010	
Aromatic TPH >C7-C8	mg/kg	A+	0.01	69900	835	< 0.010			< 0.010				< 0.010	
Aromatic TPH >C8-C10	mg/kg	A+	0.02	5140	613	< 0.020			< 0.020				< 0.020	



Rogers Geotechnical Services: Soil Screening Values Comparison Sheet



Rogers Geotechnical Services Ltd: Soil Screening Value (SSV) Comparison Sheet															
Job Number	C5007/25/E/7632			A = WS Atkins PLC, Atrisk Soil Screening Values. A+ = Values updated June 2017. A* = Atrisk's SSV is lower than i2's detectable limit for this compound. B = health criterion values, which are available from toxicological reviews published in the C4SL project methodology report. C = Category 4 Screening Levels (C4SLs) based on 6% soil organic matter. D = Value provided is based on Methyl Mercury. Should elemental mercury be observed or a source be known then a limit of 102 should be used. Exceeds SSV Exceeds 2017, Below 2015 Below limit of detection (LOD) 											
Job Name	Land East of Stretton Croft, Burbage														
Date	08.05.25														
Client	Welcome Break			Sample Location	CP01	CP01	CP01	CP02	CP02	CP02	CP02	TP102	TP103	TP104	
				Depth Top	0.1	2	9	0.1	1.3	7	15	1	0.4	1	
				Depth Base	0.5	2.45	9.22	0.4			15.27				
Determinand	Units	Ref	LOD	Public Open Space Park 1%											
Aromatic TPH >C10-C12	mg/kg	A+	1.0	8260	369	< 1.0			< 1.0				< 1.0		
Aromatic TPH >C12-C16	mg/kg	A+	2.0	10600	155	< 2.0			2.6				< 2.0		
Aromatic TPH >C16-C21	mg/kg	A+	10.0		7870	< 10			< 10				< 10		
Aromatic TPH >C21-C35	mg/kg	A+	10.0		7870	48			180				13		
Aromatic TPH >C35-C44	mg/kg		10.0			48			190				13		
Total Aromatic Hydrocarbons	mg/kg		10.0												
Total Petroleum Hydrocarbons	mg/kg		10.0												
pH			N/A			8.2	8.2	8.7	8.8	8.4	8.2	8.7	7.1	7.9	8.4
Sulphate (2:1 Water Soluble) as SO4	mg/l		1.25			11.1	22.3	9.2	130	19.5	164	8.49	65.2	41.6	61.6
ACM Type			N/A												
Asbestos Identification	%					Not-detected	-	-	Not-detected	-	-	-	Not-detected	Not-detected	Not-detected
ACM Detection Stage			N/A												
Moisture	%		0.01												
Soil Colour			N/A												
Other Material			N/A												
Soil Texture			N/A												
Sulphate (Total)	%		0.005												
Organic Matter	%		0.1			4.8	-	-	2.3	-	-	-	0.7	1.7	0.8



Rogers Geotechnical Services: Soil Screening Values Comparison Sheet



Rogers Geotechnical Services Ltd: Soil Screening Value (SSV) Comparison Sheet													
Job Number	C5007/25/E/7632			A = WS Atkins PLC, Atrisk Soil Screening Values. A+ = Values updated June 2017. A* = Atrisk's SSV is lower than i2's detectable limit for this compound. B = health criterion values, which are available from toxicological reviews published in the C4SL project methodology report. C = Category 4 Screening Levels (C4SLs) based on 6% soil organic matter. D = Value provided is based on Methyl Mercury. Should elemental mercury be observed or a source be known then a limit of 102 should be used.									
Job Name	Land East of Stretton Croft, Burbage			KEY Exceeds SSV Exceeds 2017, Below 2015 Below limit of detection (LOD)									
Date	08.05.25			Sample Location	TP106	TP106	TP107						
Client	Welcome Break			Depth Top	0.5	1.2	1.2						
				Depth Base									
Determinand	Units	Ref	LOD	Public Open Space Park 1%									
				Atrisk 2015 (No Free Product)	Atrisk 2017								
Cadmium	mg/kg	C	0.2		882	0.2	< 0.2	< 0.2					
Chromium (Hexavalent)	mg/kg	B/C	1.8	251	132	< 1.8	< 1.8	< 1.8					
Copper	mg/kg	A+	1.0		45200	48	11	29					
Mercury	mg/kg	A/D	0.3		94.3	< 0.3	< 0.3	< 0.3					
Nickel	mg/kg	A+	1.0		804	16	19	45					
Lead	mg/kg	C	1.0		1340	22	18	25					
Zinc	mg/kg	A+	1.0		201000	60	54	78					
Vanadium	mg/kg	A+	1.0		7490	27	57	64					
Arsenic	mg/kg	C	1.0		168	7.1	12	14					
Selenium	mg/kg	A	1.0		2550	< 1.0	< 1.0	< 1.0					
Cyanide (Free)	mg/kg	A	1.0		34	< 1.0	< 1.0	< 1.0					
Total Phenols	mg/kg	A	1.0		685		< 1.0						
Naphthalene	mg/kg	A+	0.05	623	75.04	0.13	< 0.05	< 0.05					
Acenaphthylene	mg/kg		0.05			0.14	< 0.05	< 0.05					
Acenaphthene	mg/kg	A+	0.05	0	28600	0.11	< 0.05	< 0.05					
Fluorene	mg/kg	A+	0.05	0	19600	0.11	< 0.05	< 0.05					
Phenanthrene	mg/kg		0.05			0.9	< 0.05	0.08					
Anthracene	mg/kg	A+	0.05		150000	0.24	< 0.05	< 0.05					
Fluoranthene	mg/kg	A+	0.05		20200	2	< 0.05	0.09					
Pyrene	mg/kg	A+	0.05		15100	1.9	< 0.05	0.08					
Benzo[a]anthracene	mg/kg	A	0.05	9.52	1.71	0.91	< 0.05	< 0.05					
Chrysene	mg/kg	A	0.05	993	0.44	1.1	< 0.05	< 0.05					
Benzo[b]fluoranthene	mg/kg	A	0.05	11.5	1.22	1.5	< 0.05	< 0.05					
Benzo[k]fluoranthene	mg/kg	A	0.05	123	0.686	0.54	< 0.05	< 0.05					
Benzo[a]pyrene	mg/kg	B/C	0.05	21.4	8.6	1.3	< 0.05	< 0.05					
Indeno(1,2,3-c,d)Pyrene	mg/kg	A*	0.05	11.2	0.0614	0.7	< 0.05	< 0.05					
Dibenz(a,h)Anthracene	mg/kg	A	0.05	1.27	0.00393	0.14	< 0.05	< 0.05					
Benzo[g,h,i]perylene	mg/kg	A	0.05	143	0.0187	0.76	< 0.05	< 0.05					
Total Of 16 PAH's	mg/kg		0.8										
Aliphatic TPH >C5-C6	mg/kg	A+	0.01	109000	327		< 0.010						
Aliphatic TPH >C6-C8	mg/kg	A+	0.01	163000	157		< 0.010						
Aliphatic TPH >C8-C10	mg/kg	A+	0.01	9720	82.4		< 0.010						
Aliphatic TPH >C10-C12	mg/kg	A+	1.0	17700	49.9		< 1.0						
Aliphatic TPH >C12-C16	mg/kg	A+	2.0	23800	20.9		< 2.0						
Aliphatic TPH >C16-C21	mg/kg	A+	8.0		864000		< 8.0						
Aliphatic TPH >C21-C35	mg/kg	A+	8.0		864000		< 8.0						
Aliphatic TPH >C35-C44	mg/kg		10.0				< 10						
Total Aliphatic Hydrocarbons	mg/kg		10.0										
Aromatic TPH >C5-C7	mg/kg	A+	0.01		139		< 0.010						
Aromatic TPH >C7-C8	mg/kg	A+	0.01	69900	835		< 0.010						
Aromatic TPH >C8-C10	mg/kg	A+	0.02	5140	613		< 0.020						



Rogers Geotechnical Services: Soil Screening Values Comparison Sheet



Rogers Geotechnical Services Ltd: Soil Screening Value (SSV) Comparison Sheet													
Job Number	C5007/25/E/7632			A = WS Atkins PLC, Atrisk Soil Screening Values. A+ = Values updated June 2017. A* = Atrisk's SSV is lower than i2's detectable limit for this compound. B = health criterion values, which are available from toxicological reviews published in the C4SL project methodology report. C = Category 4 Screening Levels (C4SLs) based on 6% soil organic matter. D = Value provided is based on Methyl Mercury. Should elemental mercury be observed or a source be known then a limit of 102 should be used.									
Job Name	Land East of Stretton Croft, Burbage			KEY Exceeds SSV Exceeds 2017, Below 2015 Below limit of detection (LOD) 									
Date	08.05.25			Sample Location	TP106	TP106	TP107						
Client	Welcome Break			Depth Top	0.5	1.2	1.2						
				Depth Base									
Determinand	Units	Ref	LOD	Public Open Space Park 1%									
Aromatic TPH >C10-C12	mg/kg	A+	1.0	8260	369		< 1.0						
Aromatic TPH >C12-C16	mg/kg	A+	2.0	10600	155		< 2.0						
Aromatic TPH >C16-C21	mg/kg	A+	10.0		7870		< 10						
Aromatic TPH >C21-C35	mg/kg	A+	10.0		7870		< 10						
Aromatic TPH >C35-C44	mg/kg		10.0				< 10						
Total Aromatic Hydrocarbons	mg/kg		10.0										
Total Petroleum Hydrocarbons	mg/kg		10.0										
pH			N/A			8.2	8.1	8					
Sulphate (2:1 Water Soluble) as SO4	mg/l		1.25			18.3	37.6	29					
ACM Type			N/A										
Asbestos Identification	%					Not-detected	Not-detected	Not-detected					
ACM Detection Stage			N/A										
Moisture	%		0.01										
Soil Colour			N/A										
Other Material			N/A										
Soil Texture			N/A										
Sulphate (Total)	%		0.005										
Organic Matter	%		0.1			0.8	0.7	1.1					

Rogers Geotechnical Services: Water Screening Values Comparison Sheet

Rogers Geotechnical Services Ltd																
Job Number	C5007/25/E/7632				Sample ID.:											
Job Name	Land East of Stretton Croft, Burbage				Sample ID.:											
					Sample Location:	CP01	CP02									
					Sample Type:	WATER	WATER									
					Top Depth (m):	8.88	14.65									
Date	02.05.2025				Bottom Depth (m):											
Client	Welcome Break				Date Sampled:	24.04.2025	24.04.2025									
					Asbestos Lab:	-	-									
Determinand	Accred.	SOP	Units	LOD	UK Drinking Water Standards											
Cyanide (Free)	U	1300	mg/l	10	0.05	< 10	< 10									
Total Phenols	U	1920	mg/l	10	10	< 10	< 10									
Naphthalene	U	1700	µg/l	0.01	0.1	< 0.01	< 0.01									
Acenaphthylene	U	1700	µg/l	0.01	0.1	< 0.01	< 0.01									
Acenaphthene	U	1700	µg/l	0.01	0.1	< 0.01	< 0.01									
Fluorene	U	1700	µg/l	0.01	0.1	< 0.01	< 0.01									
Phenanthrene	U	1700	µg/l	0.01	0.1	< 0.01	< 0.01									
Anthracene	U	1700	µg/l	0.01	0.1	< 0.01	< 0.01									
Fluoranthene	U	1700	µg/l	0.01	0.1	< 0.01	< 0.01									
Pyrene	U	1700	µg/l	0.01	0.1	< 0.01	< 0.01									
Benzo[a]anthracene	U	1700	µg/l	0.01	0.1	< 0.01	< 0.01									
Chrysene	N	1700	µg/l	0.01	0.1	< 0.01	< 0.01									
Benzo[b]fluoranthene	U	1700	µg/l	0.01	0.1	< 0.01	< 0.01									
Benzo[k]fluoranthene	U	1700	µg/l	0.01	0.1	< 0.01	< 0.01									
Benzo[a]pyrene	U	1700	µg/l	0.01	0.01	< 0.01	< 0.01									
Indeno(1,2,3-c,d)Pyrene	U	1700	µg/l	0.01	0.1	< 0.01	< 0.01									
Dibenz(a,h)Anthracene	U	1700	µg/l	0.01	0.1	< 0.01	< 0.01									
Benzo[g,h,i]perylene	U	1700	µg/l	0.01	0.1	< 0.01	< 0.01									
Total Of 16 PAH's	N	1700	µg/l	0.16	2	< 0.16	< 0.16									
Aliphatic TPH >C5-C6	N	1675	µg/l	1	0.1	< 1.0	< 1.0									
Aliphatic TPH >C6-C8	N	1675	µg/l	1	0.1	< 1.0	< 1.0									
Aliphatic TPH >C8-C10	N	1675	µg/l	1	0.1	< 1.0	< 1.0									
Aliphatic TPH >C10-C12	N	1675	µg/l	10	0.1	< 10	< 10									
Aliphatic TPH >C12-C16	N	1675	µg/l	10	0.1	< 10	< 10									
Aliphatic TPH >C16-C21	N	1675	µg/l	10	0.1	< 10	< 10									
Aliphatic TPH >C21-C35	N	1675	µg/l	10	0.1	< 10	< 10									
Aliphatic TPH >C35-C44	N	1675	µg/l	0.10	0.1											
Total Aliphatic Hydrocarbons	N	1675	µg/l	5.0	5											
Aromatic TPH >C5-C7	N	1675	µg/l	1	1	< 1.0	< 1.0									
Aromatic TPH >C7-C8	N	1675	µg/l	1	1	< 1.0	< 1.0									
Aromatic TPH >C8-C10	N	1675	µg/l	1	0.1	< 1.0	< 1.0									
Aromatic TPH >C10-C12	N	1675	µg/l	10	0.1	< 10	< 10									
Aromatic TPH >C12-C16	N	1675	µg/l	10	0.1	< 10	< 10									
Aromatic TPH >C16-C21	N	1675	µg/l	10	0.1	< 10	< 10									
Aromatic TPH >C21-C35	N	1675	µg/l	10	0.1	< 10	< 10									

Rogers Geotechnical Services: Water Screening Values Comparison Sheet

Rogers Geotechnical Services Ltd																
Job Number	C5007/25/E/7632				Sample ID.:											
Job Name	Land East of Stretton Croft, Burbage				Sample ID.:											
					Sample Location:	CP01	CP02									
					Sample Type:	WATER	WATER									
					Top Depth (m):	8.88	14.65									
Date	02.05.2025				Bottom Depth (m):											
Client	Welcome Break				Date Sampled:	24.04.2025	24.04.2025									
					Asbestos Lab:	-	-									
Determinand	Accred.	SOP	Units	LOD	UK Drinking Water Standards											
Aromatic TPH >C35-C44	N	1675	µg/l	10	0.1	< 10	< 10									
Total Aromatic Hydrocarbons	N	1675	µg/l	5.0	5											
Total Petroleum Hydrocarbons	N	1675	µg/l	10	10											
pH	U	1010		N/A		7.3	7.2									
Sulphate as SO4	U	1220	mg/l	1.0	250	184	883									
Arsenic (Dissolved)	U	1455	µg/l	0.15	10	1.04	0.45									
Cadmium (Dissolved)	U	1455	µg/l	0.02	5	0.11	0.23									
Copper (Dissolved)	U	1455	µg/l	0.50	2000	1.6	1.4									
Mercury (Dissolved)	U	1455	µg/l	0.05	1	< 0.05	< 0.05									
Nickel (Dissolved)	U	1455	µg/l	0.50	20	2.8	12									
Lead (Dissolved)	U	1455	µg/l	0.2	10	< 0.2	< 0.2									
Selenium (Dissolved)	U	1455	µg/l	0.50	10	< 0.6	0.6									
Vanadium (Dissolved)	U	1455	µg/l	0.2		< 0.2	0.2									
Zinc (Dissolved)	U	1455	µg/l	0.5	5000	3.3	4.8									
Chromium (Hexavalent)	U	1490	µg/l	5	50	< 0.2	< 0.2									
Total Organic Carbon	U	1610	mg/l	2.0		3.34	3.6									
Benzene	U	1760	µg/l	1.0		< 1.0	< 1.0									
Toluene	U	1760	µg/l	1.0		< 1.0	< 1.0									
Ethylbenzene	U	1760	µg/l	1.0		< 1.0	< 1.0									
m & p-Xylene	U	1760	µg/l	1.0		< 1.0	< 1.0									
o-Xylene	U	1760	µg/l	1.0		< 1.0	< 1.0									

Appendix 9

Fill Screening Values

Rogers Geotechnical Services Ltd.

Atkins ATRISK Soil Screening Values (SSVs) - Public Open Space Landuse

Tox Data Report No.	Compound	Public Open Space Landuse (mg/kg)				Reference
	Metals	SOM: 1%		SOM: 6%		
3	Cadmium	882		882		C
4	Chromium VI	132	251	132	251	B/C
	Copper	45200		45200		A+
7	Mercury	94.30		96.90		A/D
8	Nickel	804		804		A+
	Lead	1340		1340		C
	Zinc	201000		201000		A+
	Vanadium	7490		7490		A+
	Semi and Non Metals					
1	Arsenic	168		168		C
10	Selenium	2550		2550		A
	Free Cyanide	34		34		A
9	Phenols (total)	685		3170		A
	Poly Aromatic Hydrocarbons	Free product	No free product	Free product	No free product	
20	Napthalene	75.04	623	2280		A+
	Acenaphthene	28600		30100		A+
	Fluorene	19600		20200		A+
	Anthracene	150000		152000		A+
	Fluoranthene	20200		20300		A+
	Pyrene	15100		15200		A+
	Benzo(a)anthracene	1.71	9.52	10.3	12.2	A
2	Chrysene	0.44	993	2.64	1160	A
2	Benzo(b)fluoranthene	1.22	11.5	7.29	13	A
2	Benzo(k)fluoranthene	0.686	123	4.12	137	A
2	Benzo(a)pyrene	8.6	21.4	8.99	21.4	B/C
2	Dibenzo(a,h)anthracene	0.0614	11.2	3.68	12.7	A*
2	Indeno(1,2,3-cd)pyrene	0.00393	1.27	0.236	1.42	A
2	Benzo(g,h,i)perylene	0.0187	143	0.112	154	A
	Petroleum Hydrocarbons					
	Aliphatic C5-C6	327	109000	1098	3400	A+
	Aliphatic C6-C8	157	163000	768	54200	A+
	Aliphatic C8-C10	82.4	9720	475	22700	A+
	Aliphatic C10-C12	49.9	17700	297	27800	A+
	Aliphatic C12-C16	20.9	23800	126	30000	A+
	Aliphatic C16-C21	86400		86400		A+
	Aliphatic C21-C35	86400		86400		A+
	Aromatic C5-C7 (Benzene)	139		231		A+
	Aromatic C7-C8 (Toluene)	835	69900	4350	101000	A+
	Aromatic C8-C10	613	5140	3604	10094	A+
	Aromatic C10-C12	369	8260	11600	11600	A+
	Aromatic C12-C16	155	10600	12200	10600	A+
	Aromatic C16-C21	7870		7870		A+
	Aromatic C21-C35	7870		7870		A+
Others						
Asbestos Not Detected						
A+ = Values update June 2017.						
A* Atrisk's SSV is lower than Chemtest's detectable limit for this compound.						
B = Health Criterion Values (available from toxicological reviews published in the C4SL project methodology report).						
C = Category 4 Screening Levels (C4SLs).						
D = SSV provided is for Methyl Mercury.						