Environmental
Geotechnical
Specialists

FACTUAL REPORT

job number	C5244/25/E/8058
date	01/08/2025
site address	Huddersfield Bus Station, Upperhead Row, Huddersfield, West Yorkshire, HD1 2JL
written by	T. Merry
checked by	R. Palmer
issued by	T. Merry

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Rogers Geotechnical Services Ltd
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Factual Report on a Ground Investigation

Location:	Huddersfield Bus Station Upperhead Row, Huddersfield, West Yorkshire, HD1 2JL		
For:	BWB Consulting Limited		
Intermediary:	Kirklees Council		
Report No:	C5244/25/E/8058	Report date:	August 2025

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

Tobias Merry MSci (Hons), FGS Geo-environmental Engineer	**Rob Palmer** MSc FGS ACIEH Engineering Director

1. Introduction

Kirklees Council propose to develop the exterior of the Huddersfield Bus Station, Upperhead Row, Huddersfield, West Yorkshire, HD1 2JL by the construction of a new canopy. Consequently, a site investigation has been undertaken in accordance with the instruction from our client, BWB Consulting, who are acting as a Consultant for the council. This work was required in order to determine the nature of the underlying soils and to assess their engineering properties. This report describes the work undertaken and presents the data obtained.

At the time of the investigation, the site was occupied by an open area of public space, with fixed seating and commercial premises to the north-east. The site was predominantly capped by brick paving to the south and concrete paving to the north.

2. Limitations

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. No liability can be accepted for the incorrect interpretation of any of the factual data supplied, particularly between investigatory locations.

3. Fieldworks

The fieldworks were undertaken between the 12th & 14th, and 17th & 18th June 2025. The completed scope of work included the following:

- GPR Clearance.
- Application of Streetworks Permit.
- Two windowless sample boreholes with rotary core and rotary open-hole follow-on, with SPT's undertaken at regular intervals through the overburden.
- Installation of two monitoring standpipes.

The investigatory locations were specified by the client on site and are indicated on the site plan which is presented in Appendix 1 to this report. It should be appreciated that a third borehole was intended, but time constraints of the Streetworks Permit resulted in RBH102 being abandoned under instruction from the client.

3.1 Acquisition of Coal Permit

In order to undertake this investigation, it was necessary to obtain permission to enter or disturb Mining Remediation Authority interests. This permission was granted by Kirklees Council on the 14th May 2025 as permit reference number 28409, which is presented in Appendix 2 to this report.

3.2 Windowless Sample and Rotary Boreholes

These boreholes were initially sunk using a drive-in windowless sampler through the near surface soils. The windowless sample cores were undertaken in 1m lengths and reduced in diameter from 97mm for the first 1.0m, through 87mm, 77mm and 67m for the final increment within BH01 and 87mm for the first 1.0m, through 77mm for subsequent 1.0m increments. The recovered cores were logged on site, then sealed and returned to the laboratory for subsequent 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 3. Also included on these records are the core diameters and percentages of core recovered.

Standard penetration tests (SPTs) were undertaken at 1.0m intervals (at the end of each sampler drive). 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 though 750mm 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. The SPT certificates are also presented in Appendix 3.

On meeting refusal, BH03 was progressed by rotary cored drilling techniques utilising water flushing and a 115mm diameter barrel, which recovers a 93mm diameter core. The recovered cores were logged on site before being sealed and returned to the laboratory for subsequent testing. The rock was described in general accordance with BS 5930: 2015 +A1: 2020, and full descriptions are given on the borehole records which are presented within Appendix 3. Also included on these records are the sample depths, ground water levels, the percentages of *Total Core Recovery* (TCR), the *Solid Core Recovery* (SCR) and *Rock Quality Designation* (RQD).

Upon meeting refusal within the soil at BH01, and underneath the rotary coring undertaken within BH03, the boreholes were progressed using rotary open-hole drilling techniques in order to assess the nature of the underlying geology with respect to the risk of potential worked coal seams beneath the site

In compliance with the license and the joint Mining Remediation Authority and Health and Safety Executive position statement, water flushing techniques were employed with gas monitoring taking place at the borehole positions throughout the drilling. The boreholes were drilled using a track-mounted rotary drilling rig, using rotary open-hole techniques with 140mm diameter drag and tricone roller bits. The drill chippings brought to the surface in the flush returns were inspected by the driller on a screen which forms part of the re-circulation tanks. The results of this work are also provided on the borehole records which are provided in Appendix 3.

4. 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[1]	Previous Name[2]	Description[2]
Superficial Geology	Head	Head Gravel	Head is poorly sorted and poorly stratified, angular rock debris and/or clayey hillwash and soil creep, mantling a hillslope and deposited by solifluction and gelifluction processes.
Solid Geology	Middle Band Rock	-	The Middle Band Rock is a thin and relatively impersistent thinly bedded rubbly sandstone notable mainly in the north of the district and around Huddersfield.

Markers within the same faulted block on the geological map suggest that the solid geology generally dips at about 2-4° to the east.

[1] Sources: British Geological Survey (NERC) Map Sheets 77; Huddersfield; Solid and Drift Edition, and Onshore GeoIndex Viewer [*online resource from www.bgs.ac.uk*]
[2] Sources: British Geological Survey (NERC) Lexicon of Named Rock Units [*online resource from www.bgs.ac.uk*]

5. Strata Conditions

The investigation revealed the following strata:

Table 2: Generalised Strata Profile

Depth m below ground level to underside of layer	**Strata Type**	**Encountered in**	**Groundwater Strikes** m below ground level
0.05	Made Ground (Paving).	BH01	None
0.10	Made Ground (Silty SAND).	BH03	None
0.25 – 0.60	Made Ground (Concrete).	BH01, BH03	None
0.40 – 0.50	Made Ground (Sandstone COBBLES with bituminous binding).	BH01, BH03	None
0.5	Made Ground (Silty gravelly SAND).	BH03	None
1.20	Made Ground (Silty very gravelly SAND with low cobble content).	BH01	None
1.20	Made Ground (Very gravelly SAND with moderate cobble content).	BH03	None
1.40	Made Ground (Very sandy CLAY).	BH01	None
3.80 – 4.85	Slightly sandy to sandy slightly gravelly silty CLAY. [Head]	BH01, BH03	None
4.55 – 5.00	Silty to very silty gravelly to very gravelly SAND. [Weathered Middle Band Rock]	BH01	None
6.40 – 8.50	SANDSTONE. [Middle Band Rock]	BH01, BH03	None
13.90 – +25.00	MUDSTONE. [Pennine Lower Coal Measures Formation]	BH01, BH03	None
20.40 – 21.50	COAL. [Soft Bed Coal]	BH01	None
23.00	VOID.	BH01	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.

5.1 General Strata

The investigation has revealed that below a moderate capping of cohesive and granular made ground, firm to stiff yellowish brown locally mottled grey slightly sandy becoming sandy slightly gravelly silty clay was recorded to between 3.80m and 4.85m below existing ground level (begl) within both locations, however in location BH01, this clay is interbedded with yellowish brown silty to very silty gravelly to very gravelly sand to depths of between 4.55 and 5.00m begl. These strata are anticipated to represent Head deposits underlain by the weathered fraction of the Middle Band Rock.

Underlying these soils, medium strong yellowish brown and greyish brown sandstone was exposed to depths of between 6.40m and 8.50m begl in each location. Taking into consideration the available geological data for the site, this stratum is anticipated to represent the Middle Band Rock.

Beneath the sandstone, dark grey mudstone was uncovered to depths of between 20.20m and 21.20m begl, underlain by intact coal in each location to a depth of between 20.40m and 21.50m begl. It is anticipated that these strata represent the Soft Bed Coal within the undifferentiated Pennine Lower Coal Measures Formation, indicated to underlie the site. Underneath the coal seam

within location BH03, the dark grey and light grey mudstone continues to termination of the borehole, however, within location BH01 broken ground was encountered to a depth of 22.20m begl, underneath which a 0.80m void was discovered. Beneath this void the dark grey mudstone was revealed to termination of the borehole.

5.2 Groundwater

A groundwater strike was observed within both borehole locations, 5.00m within BH01 rising to 4.70m begl after 20 minutes of observation, and 5.20m within BH03 remaining at 5.20m begl after 20 minutes of observation. 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.

6. Insitu Testing

6.1 Standard Penetration Tests

The standard penetration tests undertaken 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	Rock	
Head Deposits	1.40m – 4.05m 4.05m – 4.55m	24	7 to 25	–	SPTs indicate cohesive material is in a firm to stiff insitu condition and granular material is in a medium dense insitu condition.
Middle Band Rock	3.80m – 8.50m 5.00m – 6.40m	–	–	50	SPTs indicate rock.
Pennine Lower Coal Measures Formation	8.50m – 13.99m	–	–	50	SPTs indicate rock.

6.2 Gas and Water Level Monitoring

The standpipes were monitored between the 30th June and the 15th July 2025. The results of the gas monitoring undertaken to date are tabulated below and full results are presented in Appendix 4.

Table 5: Gas Monitoring

Location	Date	CH_4 (%)	CO_2 (%)	O_2 (%)	Flow (l/h)	Barometric Pressure (mb)	Water Level (m)	Standpipe Depth (m)
BH01	30.06.2025	0.0	2.0	14.2	0.0	1017↓	-	6.00
	15.07.2025	0.0	3.4	9.5	0.0	1009↑	-	
BH03	30.06.2025	0.0	0.4	17.0	0.0	1017↓	-	3.87
	15.07.2025	0.0	2.3	10.9	0.0	1009↑	-	

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

This work was undertaken using a GFM Series gas monitor (serial No 13747/270525) which was last calibrated on the 27th May 2025

7. 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
- Determination of total sulphur — BS 1377-3:2018+A1:2021: Pt3: 7.10
- Soluble sulphate content — BS 1377-3:2018+A1:2021: Pt3: 7.3
- pH value — BS 1377-3:2018+A1:2021: Pt3: 12
- Point Load Strength Index Test — ISRM (1984)

The test results are presented in Appendix 4 and are summarised below:

Table 4: Summary of Geotechnical Test Results

Test type	Number of tests	Range of results		Comments
Moisture content determinations	11	14% to 26%		Generally reducing with depth.
Index Properties (4 Point)	11	LL PL PI	33% to 60% 15% to 26% 14% to 35%	Clay of high plasticity. Consistency index 0.9 to 1.4 NHBC Class - Medium
Particle size distribution (Wet sieve and sedimentation)	1	Gravel Sand Silt Clay	46% 31% 11% 12%	Clayey silty very sandy GRAVEL.
Soluble sulphate & pH	8	SO_4 pH	0.0145 & 0.448g/l 5.7 & 10.8	
Point Loads	7	$I_{s(50)}$	0.3 to 3.9	Results indicate rock is present in a weak to strong in-situ condition.

8. Laboratory Testing - Environmental

A suite of testing was conducted on samples from across the site and the following regime was undertaken.

- 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).
- Others – pH, organic content, VOCs, MTBEs and total/soluble SO_4^{2-}.
- Asbestos.

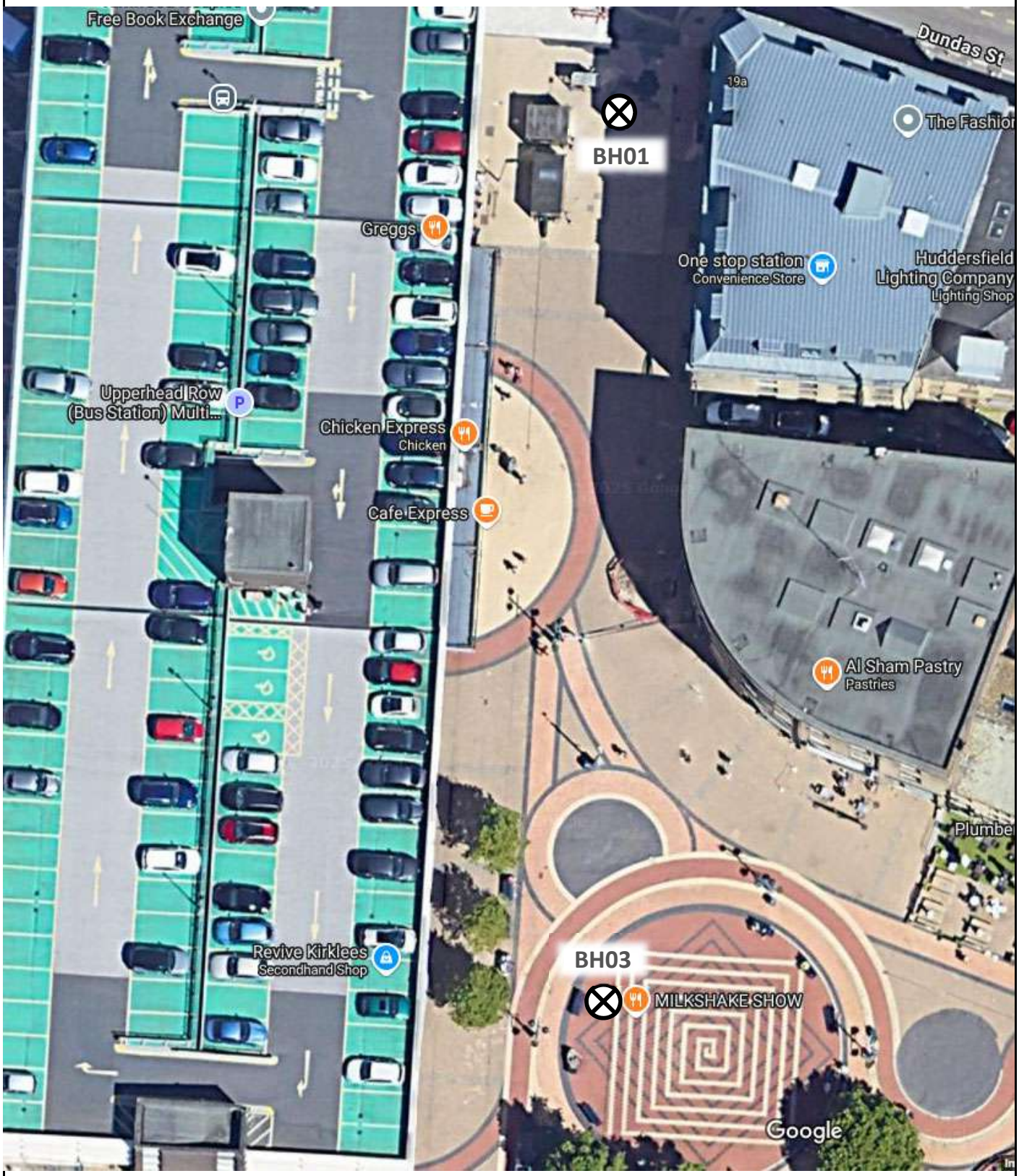
This testing was undertaken by i2 Analytical Ltd and the results of all of the chemical testing are presented in Appendix 4 of this report.

9. References

- British Standards Institution (1990) BS1377: *British standard methods of test for soils for civil engineering purposes,* B.S.I., London.
- British Standard Institution (2005 +A1: 2011) EN ISO 22476-3: *Geotechnical investigation and testing – Field testing, Part 3: Standard penetration test,* B.S.I., London.
- British Standards Institution (2015+ A1: 2020) BS5930: *Code of practice for ground investigations*, B.S.I., London.
- British Geological Survey (NERC) (2025), BGS, Keyworth.
  - Onshore GeoIndex: (*https://mapapps2.bgs.ac.uk/geoindex/home.html)*
  - Lexicon of Named Rock Units: (*http://www.bgs.ac.uk/lexicon/)*

Appendix 1

Site Plan



Plan not to scale and investigation positions approximated from site operative's notes.

Title: **Investigation Location Plan**

	Site Name:	Job No:	
RGS	**Huddersfield Bus Station**	**C5244/24/E/8058**	t. 0843 50 666 87 www.rogersgeotech.co.uk

Appendix 2

Coal Permit

Mining Remediation Authority

Permit to Enter or Disturb Coal Authority Interests

Permit 28409

Name and Address of Permit Holder:

Kirkless Council
Princess Street
Huddersfield
HD1 2TT

Site Location:

Huddersfield Bus Station
Upperhead Row
Huddersfield
HD1 2JN

This certificate hereby grants the above named Permit Holder a Permit to carry out:-

Ground investigation by three boreholes to 25m within the Authority's interests at the identified site location above as shown on the Grant Permit Boundary (overleaf) for the period of **12 months** from the granted date shown below. *The granting of this Permit does not constitute advice given by the Authority in relation to the proposed operations. It is the Permit Holder's responsibility to obtain appropriate health, safety, environmental, technical and legal advice.*

Conditions:

- *Manned entry (i.e.) into mine entries/workings) is strictly prohibited.*
- *No works to commence prior to agreement of Network Rail's Asset Protection Team.*
- *Water flush*
- *Gas Monitoring CO, CH_4, CO_2, O_2, H_2S at borehole and rig*
- *Operators undertaking the work must be in possession of this certificate and the Permit boundary plan at the time of works*
- *Appropriate borehole sealing without delay and to withstand site level changes*

Signed: Izaak Hayes Granted Date: ***14/05/2025***

For and on behalf of The Coal Authority

Nominated Representative: Izaak Hayes, Permitting Manager;

The Mining Remediation Authority, Permitting Office, 200 Lichfield Lane, Mansfield, Notts, NG18 4RG

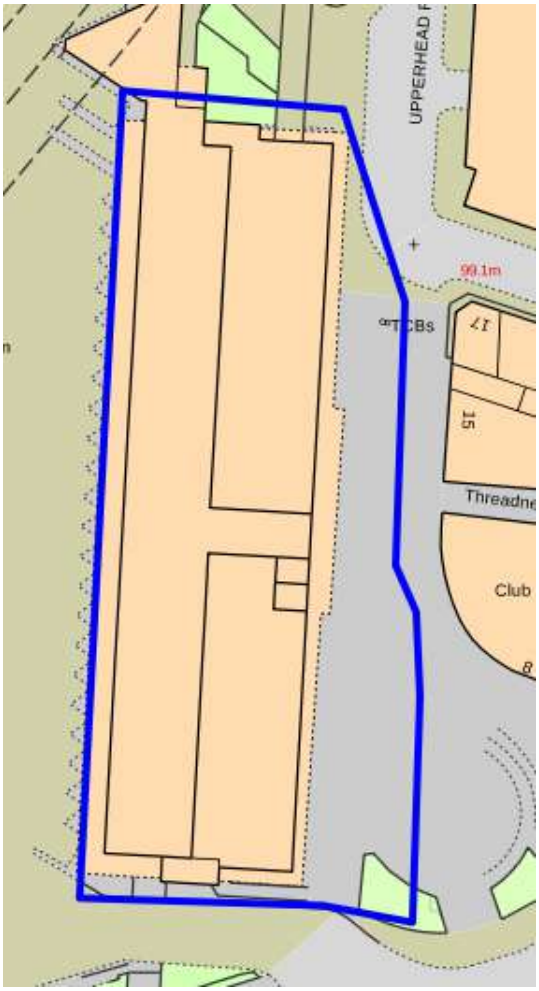
Tel: 01623 637150; E-Mail: permissions@coal.gov.uk

Mining Remediation Authority

Granted Permit Boundary

Permit Ref: 28409

Permit Boundary:



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Appendix 3

Borehole Records

Borehole Log

RGS Environmental Geotechnical Specialists

Borehole No. **BH01**

Sheet 1 of 5

Project Name:	Huddersfield Bus Station	Project No. C5244/25/E/8058	Co-ords: 414235.28E - 416592.79N
Location:	Upperhead Row, Huddersfield, West Yorkshire, HD1 2JL		Level: 99.61m aOD
Client:	BWB Consulting Limited		Dates: 18/06/2025

Hole Type: WLS+RO

Scale: 1:25

Logged By: TM

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.05	99.56		CONCRETE FLAGS.
					0.25	99.36		CONCRETE (Dark grey matrix, clasts are angular to rounded and <55mm of primarily limestone, with various lithologies. 0.0% Voids)
		0.50 - 0.70	ES		0.50	99.11		MADE GROUND (SANDSTONE COBBLES with bituminous binding).
		0.70 - 0.90	ES					MADE GROUND (Dark brown, silty, very gravelly fine to coarse SAND, with low cobble content. Gravel is sub-angular to sub-rounded and fine to coarse of various lithologies, bituminous materials, concrete and brick. Cobbles are sub-angular to sub-rounded and <150mm of various lithologies, concrete and brick).
		1.20 - 1.40	ES		1.20	98.41		MADE GROUND (Dark brown, very sandy CLAY. Sand is fine to coarse. Gravel is angular to sub-angular and fine to medium of ash and clinker).
		1.20	SPT	N=7 (1,0/1,2,2,2)				
		1.40 - 1.60	ES		1.40	98.21		Firm becoming stiff, yellowish brown mottled grey, slightly sandy, slightly gravelly, silty CLAY. Sand is fine to coarse. Gravel is angular to sub-angular and fine to coarse of sandstone. HEAD DEPOSITS
		1.60 - 1.80	C					
		1.80 - 2.00	C					
		2.00	SPT	N=15 (1,2/3,3,4,5)				
		2.50 - 2.70	C					
		2.80 - 3.00	C					
		3.00	SPT	N=20 (2,3/4,4,5,7)				
		3.50 - 3.70	C					
		3.80 - 4.00	C					
		4.00	SPT	N=24 (7,6/6,6,6,6)	4.05	95.56		Medium dense yellowish brown, clayey, silty, very gravelly fine to coarse SAND. Gravel is angular to sub-angular and fine to coarse of sandstone. Slightly to moderately weathered. HEAD DEPOSITS
		4.40 - 4.55	C					
		4.60 - 4.80	C		4.55	95.06		Soft becoming stiff, yellowish brown mottled grey, sandy, slightly gravelly, silty CLAY. Sand is fine to coarse. Gravel is angular to sub-angular and fine to coarse of sandstone.
	▼	4.70						
	▽				4.85	94.76		
		5.00	SPT	50 (25 for 85mm/50 for 190mm)	5.00	94.61		

Remarks

Inspection pit to 1.2m. Casing installed to 6m.
Termination Reason: Drilling Rod Blocked.

AGS

Borehole Log

Borehole No. **BH01**

Sheet 2 of 5

Project Name:	Huddersfield Bus Station	Project No. C5244/25/E/8058	Co-ords: 414235.28E - 416592.79N
Location:	Upperhead Row, Huddersfield, West Yorkshire, HD1 2JL		Level: 99.61m aOD
Client:	BWB Consulting Limited		Dates: 18/06/2025

Hole Type: WLS+RO

Scale: 1:25

Logged By: TM

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		5.00						Soft becoming stiff, yellowish brown mottled grey, sandy, slightly gravelly, silty CLAY. Sand is fine to coarse. Gravel is angular to sub-angular and fine to coarse of sandstone. HEAD DEPOSITS
								Yellowish brown, very silty, gravelly fine to coarse SAND. Gravel is angular to sub-angular and fine to medium of sandstone.
								Yellowish brown SANDSTONE . (Driller's notes) MIDDLE BAND ROCK
		6.00	SPT	50 (25 for 125mm/50 for 190mm)				
					6.40	93.21		Dark grey MUDSTONE. (Driller's notes - 90% drill flush returns) PENNINE LOWER COAL MEASURES FORMATION

6 7 8 9 10

Remarks

Inspection pit to 1.2m. Casing installed to 6m.
Termination Reason: Drilling Rod Blocked.

Borehole Log

Borehole No. **BH01**

Sheet 3 of 5

Project Name:	Huddersfield Bus Station	Project No. C5244/25/E/8058	Co-ords:	414235.28E - 416592.79N	Hole Type WLS+RO
Location:	Upperhead Row, Huddersfield, West Yorkshire, HD1 2JL		Level:	99.61m aOD	Scale 1:25
Client:	BWB Consulting Limited		Dates:	18/06/2025	Logged By TM

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
								Dark grey MUDSTONE. (Driller's notes - 90% drill flush returns) PENNINE LOWER COAL MEASURES FORMATION

11
12
13
14
15

Remarks

Inspection pit to 1.2m. Casing installed to 6m.
Termination Reason: Drilling Rod Blocked.

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **BH01**

Sheet 4 of 5

Project Name:	Huddersfield Bus Station	Project No. C5244/25/E/8058	Co-ords:	414235.28E - 416592.79N	Hole Type WLS+RO
Location:	Upperhead Row, Huddersfield, West Yorkshire, HD1 2JL		Level:	99.61m aOD	Scale 1:25
Client:	BWB Consulting Limited		Dates:	18/06/2025	Logged By TM

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
								Dark grey MUDSTONE. (Driller's notes - 90% drill flush returns) PENNINE LOWER COAL MEASURES FORMATION

16 17 18 19 20

Remarks

Inspection pit to 1.2m. Casing installed to 6m.
Termination Reason: Drilling Rod Blocked.

AGS

Borehole Log

Borehole No. **BH01**

Sheet 5 of 5

Project Name: Huddersfield Bus Station	Project No. C5244/25/E/8058	Co-ords: 414235.28E - 416592.79N	Hole Type WLS+RO
Location: Upperhead Row, Huddersfield, West Yorkshire, HD1 2JL		Level: 99.61m aOD	Scale 1:25
Client: BWB Consulting Limited		Dates: 18/06/2025	Logged By TM

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
								Dark grey MUDSTONE. (Driller's notes - 90% drill flush returns) PENNINE LOWER COAL MEASURES FORMATION
					21.20	78.41		Soft Ground. Loss of flush with little to no resistance during drilling. (Consultant's notes)
								21.20m to 21.50m: COAL.
					22.20	77.41		VOID.
					23.00	76.61		Broken ground. No flush returns. Drill string noted to be bouncy on uneven surfaces, with varying drilling rates. (Consultant's notes)
					23.30	76.31		Hard Ground. No flush returns. (Consultant's notes)
					23.50	76.11		End of Borehole at 23.50m

21
22
23
24
25

Remarks

Inspection pit to 1.2m. Casing installed to 6m.
Termination Reason: Drilling Rod Blocked.

Borehole Log

RGS Environmental Geotechnical Specialists

Borehole No. **BH03**

Sheet 1 of 5

Project Name:	Huddersfield Bus Station	Project No. C5244/25/E/8058	Co-ords: 414234.17E - 416530.14N
Location:	Upperhead Row, Huddersfield, West Yorkshire, HD1 2JL		Level: 99.52m aOD
Client:	BWB Consulting Limited		Dates: 12/06/2025 - 17/06/2025

Hole Type: WLS+RO+RC

Scale: 1:25

Logged By: TM

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.05	99.47		Brick Paving.
		0.10 - 0.25	ES		0.10	99.42		MADE GROUND (Light brown, silty fine to coarse SAND).
		0.25 - 0.40	ES		0.25	99.27		CONCRETE (Dark grey matrix, clasts are angular to rounded and <55mm of various lithologies. 0.5% Voids)
		0.40 - 0.50	ES		0.40	99.12		MADE GROUND (SANDSTONE COBBLES with bituminous binding.)
					0.50	99.02		MADE GROUND (Dark brown, silty, gravelly fine to coarse SAND. Gravel is angular to sub-rounded and fine to coarse of various lithologies and concrete).
		0.60 - 0.80	ES		0.60	98.92		CONCRETE (Dark grey matrix, clasts are angular to rounded and <55mm of various lithologies. 0.5% Voids)
		1.20	SPT	N=9 (1,0/2,2,3,2)	1.20	98.32		MADE GROUND (Brown, very gravelly fine to coarse SAND with moderate cobble content. Gravel is angular to sub-rounded and fine to coarse of sandstone. Cobbles are sub-rounded to rounded and <400mm of sandstone).
		1.50 - 1.70	ES					Firm becoming stiff yellowish brown, slightly sandy becoming sandy, slightly gravelly, silty CLAY. Sand is fine to coarse. Gravel is angular to sub-rounded and fine to coarse of sandstone.
		1.70 - 2.00	C					HEAD DEPOSITS
		2.00	SPT	N=25 (11,5/5,6,6,8)				*2.00m to 2.90m: No recovery.*
		2.50 - 2.70	C					
		2.80 - 3.00	C					
		3.00	SPT	N=13 (2,2/2,3,3,5)				*2.90m: Low cobble content - angular to sub-angular and <72mm of sandstone.* *3.00m: Becoming sandy.*
					3.80	95.72		
		~~3.90~~	~~SPT~~	~~50 (25 for 105mm/50 for 75mm)~~				Medium strong, thickly laminated, greyish brown, cross laminated SANDSTONE. Discontinuities are rough undulating, closed to open and commonly clean, rarely infilled with gravel. MIDDLE BAND ROCK
		4.50 - 4.60	C	Dia. (mm): 93; TCR (%): 75; SCR (%): 20; RQD (%): 0; FS (mm):				*3.90m to 4.25m: Recovered as silty GRAVEL* *4.25m to 4.50m: Recovered as sandy gravelly COBBLES*
		4.70 - 4.75	C					
		4.81 - 4.86	C					
		4.98 - 5.03	C					

Remarks

Inspection pit to 1.2m. Casing installed to 4m.
Termination Reason: Target depth reached.

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **BH03**

Sheet 2 of 5

Project Name: Huddersfield Bus Station	Project No. C5244/25/E/8058	Co-ords: 414234.17 - 416530.14	Hole Type WLS+RO+RC
Location: Upperhead Row, Huddersfield, West Yorkshire, HD1 2JL		Level: 99.52m aOD	Scale 1:25
Client: BWB Consulting Limited		Dates: 12/06/2025 - 17/06/2025	Logged By TM

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	SCR (%)	RQD (%)	FS (mm)	Depth (m)	Level (m)	Legend	Stratum Description
		5.05	C									Medium strong, thickly laminated, greyish brown, cross laminated SANDSTONE. Discontinuities are rough undulating, closed to open and commonly clean, rarely infilled with gravel. MIDDLE BAND ROCK
	▼	5.05 - 5.10	C									
		5.20 (0 mins) (20 mins)										
		5.50	SPT	N=50 (25/50 for 50mm)								*5.50m to 8.30m: No recovery.*
				93	0	0	0					
		7.00	SPT	N=50 (7,11/50 for 155mm)								
				93	15	0	0					
		8.50	SPT	50 (25 for 135mm/50 for 79mm)					8.50	91.02		Weak, thinly laminated, dark grey MUDSTONE. Discontinuities are closely spaced, smooth planar, closed to open, commonly clean, commonly infilled with gravel. PENNINE LOWER COAL MEASURES FORMATION
				93	0	0	0					*8.50m to 10.00m: No recovery.*
		10.00	SPT	N=50 (8,16/50 for 75mm)								

6 7 8 9 10

Remarks

Inspection pit to 1.2m. Casing installed to 4m.
Termination Reason: Target depth reached.

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **BH03**

Sheet 3 of 5

Project Name: Huddersfield Bus Station	Project No. C5244/25/E/8058	Co-ords: 414234.17 - 416530.14	Hole Type WLS+RO+RC
Location: Upperhead Row, Huddersfield, West Yorkshire, HD1 2JL		Level: 99.52m aOD	Scale 1:25
Client: BWB Consulting Limited		Dates: 12/06/2025 - 17/06/2025	Logged By TM

Well	Water Strikes	Samples and In Situ Testing							Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Dia. (mm)	TCR (%)	SCR (%)	RQD (%)	FS (mm)					
				93	80	0	0					Weak, thinly laminated, dark grey MUDSTONE. Discontinuities are closely spaced, smooth planar, closed to open, commonly clean, commonly infilled with gravel. PENNINE LOWER COAL MEASURES FORMATION *10.00m to 10.85m: Completely fractured.*	11
		11.38											
				93	65	0	0					*11.50m to 11.90m: Completely fractured* *11.90m to 12.20m: No recovery* *12.20m to 12.50m: Completely fractured.* *12.50m to 12.80m: Cross-cutting sub-vertical clean fracture.*	12
		12.95 - 13.00	C										
				93	60	0	0					*13.00m to 13.30m: Completely fractured.*	13
		13.90	SPT	50 (25 for 60mm/50 for 25mm)					13.90	85.62		Dark grey MUDSTONE. (Driller's notes - 80% drill flush returns) PENNINE LOWER COAL MEASURES FORMATION	14
													15

Remarks

Inspection pit to 1.2m. Casing installed to 4m.
Termination Reason: Target depth reached.

AGS

Borehole Log

Borehole No. **BH03**

Sheet 4 of 5

Project Name:	Huddersfield Bus Station	Project No. C5244/25/E/8058	Co-ords: 414234.17E - 416530.14N	Hole Type WLS+RO+RC
Location:	Upperhead Row, Huddersfield, West Yorkshire, HD1 2JL		Level: 99.52m aOD	Scale 1:25
Client:	BWB Consulting Limited		Dates: 12/06/2025 - 17/06/2025	Logged By TM

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
								Dark grey MUDSTONE. (Driller's notes - 80% drill flush returns) PENNINE LOWER COAL MEASURES FORMATION

16
17
18
19
20

Remarks

Inspection pit to 1.2m. Casing installed to 4m.
Termination Reason: Target depth reached.

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **BH03**

Sheet 5 of 5

Project Name:	Huddersfield Bus Station	Project No. C5244/25/E/8058	Co-ords: 414234.17E - 416530.14N	Hole Type WLS+RO+RC
Location:	Upperhead Row, Huddersfield, West Yorkshire, HD1 2JL		Level: 99.52m aOD	Scale 1:25
Client:	BWB Consulting Limited		Dates: 12/06/2025 - 17/06/2025	Logged By TM

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
								Dark grey MUDSTONE. (Driller's notes - 80% drill flush returns) PENNINE LOWER COAL MEASURES FORMATION
					20.20	79.32		
					20.40	79.12		COAL. (Driller's notes) SOFT BED COAL?
								Dark grey MUDSTONE. (Driller's notes) PENNINE LOWER COAL MEASURES FORMATION
					24.00	75.52		Light grey MUDSTONE/SILTSTONE. (Driller's notes) SOFT BED FLAGS?
					25.00	74.52		End of Borehole at 25.00m

21 22 23 24 25

Remarks

Inspection pit to 1.2m. Casing installed to 4m.
Termination Reason: Target depth reached.

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Appendix 4

Gas Monitoring

Post Fieldworks Discrete Well Monitoring Site Record

Job No:	C5244/25/E/8058	Client:	Kirklees Council	Visit:	1	Of	2
Site:	Huddersfield Bus Station	Date:	30.06.2025				

Rogers Geotechnical Services Ltd , Offices 1 & 2 Barncliffe Business Park, Shelley, Huddersfield, HD8 8LU

Tel: 01484 604 354
enquiries@rogersgeotech.co.uk

Location ID	Methane (%)		Carbon Dioxide (%)		Carbon Monoxide (ppm)		Hydrogen Sulphide (ppm)		Oxygen (%)		VOCs (ppm)		Flowrate (l/hr)		Water Depth (m)	Well Depth (m)	Installed Depth (m)	Comments
	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Minimum	Steady	Peak	Steady	Peak				
3	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	17.0	17.0	0.0	0.0	0.0	0.0	DRY	3.87		Tap was open upon visit.
1	0.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	14.2	14.2	0.0	0.0	0.0	0.0	DRY	6.00		
Max.	0.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	17.0	17.0	0.0	0.0	0.0	0.0	DRY			
Min.	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	14.2	14.2	0.0	0.0	0.0	0.0	DRY			

ND - Not detected DRY - No water in well NM - Not Monitored (State Reason in comments)

Meteorological & Site Information	
General Ground Condition	Dry
Precipitation	0
Wind	No data, no wind on site
Temperature	28
Barometric Pressure	1017
Pressure Trend	Falling

Monitor Technical Specifications								
Gas Monitor Used:	GFM Series							
Serial No:	13747/270525							
Monitor Gas Range	CH_4	5>60	CO_2	5<40	O_2	21.2		
Gas Flow Range	0-10 l/hr							
Date of Calibration	27.05.2025							
PID Monitor (If used)								
PID Monitor Serial No.								
Calibration Date.								

Monitoring Period Summary (All Visits)	Peak	Steady
Max CH_4	0.0	0.0
Max CO_2	3.4	3.4
Max CO	0.0	0.0
Max H_2S	0.0	0.0
Max O_2	17.0	17.0
Min O_2	14.2	17.0
Flow rate	0.0	0.0

	Start	End
Barometric Pressure	1017	1017

Operative Details.	H. Letch

Post Fieldworks Discrete Well Monitoring Site Record

Job No:	C5244/25/E/8058	Client:	Kirklees Council	Visit:	2	Of	2
Site:	Huddersfield Bus Station	Date:	15.07.2025				

Rogers Geotechnical Services Ltd , Offices 1 & 2 Barncliffe Business Park, Shelley, Huddersfield, HD8 8LU

Tel: 01484 604 354
enquiries@rogersgeotech.co.uk

Location ID	Methane (%)		Carbon Dioxide (%)		Carbon Monoxide (ppm)		Hydrogen Sulphide (ppm)		Oxygen (%)		VOCs (ppm)		Flowrate (l/hr)		Water Depth (m)	Well Depth (m)	Installed Depth (m)	Comments
	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Minimum	Steady	Peak	Steady	Peak				
3	0.0	0.0	2.3	2.3	0.0	0.0	0.0	0.0	10.9	10.9	0.0	0.0	0.0	0.0	DRY		3.98	0.08 of silt on bottom of dip meter
1	0.0	0.0	3.4	3.4	0.0	0.0	0.0	0.0	9.5	9.5	0.0	0.0	0.0	0.0	DRY		6.13	
Max.	0.0	0.0	3.4	3.4	0.0	0.0	0.0	0.0	10.9	10.9	0.0	0.0	0.0	0.0	DRY			
Min.	0.0	0.0	2.3	2.3	0.0	0.0	0.0	0.0	9.5	9.5	0.0	0.0	0.0	0.0	DRY			

ND - Not detected DRY - No water in well NM - Not Monitored (State Reason in comments)

Meteorological & Site Information	
General Ground Condition	DRY
Precipitation	0l/m2 in last 12 hours
Wind	11
Temperature	19
Barometric Pressure	1009
Pressure Trend	Rising

Monitor Technical Specifications								
Gas Monitor Used:	GFM Series							
Serial No:	13747/270525							
Monitor Gas Range	CH_4	5>60	CO_2	5<40	O_2	21.2		
Gas Flow Range	0-10 l/hr							
Date of Calibration	27.05.2025							
PID Monitor (If used)								
PID Monitor Serial No.								
Calibration Date.								

Monitoring Period Summary (All Visits)	Peak	Steady
Max CH_4	0.0	0.0
Max CO_2	3.4	3.4
Max CO	0.0	0.0
Max H_2S	0.0	0.0
Max O_2	17.0	17.0
Min O_2	14.2	17.0
Flow rate	0.0	0.0

	Start	End
Barometric Pressure	1009	1009

Operative Details.	M.Tuck

Appendix 5

Laboratory Testing

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LABORATORY REPORT

job number	C/5244/25/E/8058
date	08/07/2025
site address	Huddersfield Bus Station Upperhead Row, Huddersfield, West Yorkshire, HD1 2JL
date scheduled	26/06/2025
date issued	08/07/2025
issued by	H J Letch

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Schedule of UKAS Accredited Laboratory Tests

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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 pyknometer	Pt 2			U
iii. Small pyknometer		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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Disclaimer

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RGS Environmental Geotechnical Specialists

Rogers Geotechnical Services Ltd
Offices 1 & 2 Barncliffe Business Park, Near Bank, Shelley, Huddersfield, HD8 8LU
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Summary of Non-conforming Tests

Project No.	Project Name
C5244/25/E/8058	Huddersfield Bus Station

Hole No.	Sample				Soil Description	Reason For Non-Conformance
	Ref	Top	Base	Type		
BH03	11	4.75		C	Yellowish brown SANDSTONE	Samples are not of sufficent length to conform to preparation for UCS, No viable Point Load samples recovered due to sample fracturing.
BH03	13	4.88		C	Yellowish brown SANDSTONE	Samples are not of sufficent length to conform to preparation for UCS, No viable Point Load samples recovered due to sample fracturing.
BH03	16	5.30		C	Yellowish brown SANDSTONE	Samples are not of sufficent length to conform to preparation for UCS, No viable Point Load samples recovered due to sample fracturing.
BH03	17	11.38		C	Dark grey MUDSTONE	No viable samples recovered due to sample fracturing.

Date Printed	Approved By	Table
25/06/2025	HJL	0
		sheet 1

Summary of Classification Test Results

Project No.: C5244/25/E/8058

Project Name: Huddersfield Bus Station

Hole No.	Sample Ref	Top	Base	Type	Soil Description	Density bulk Mg/m³	Density dry Mg/m³	w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m³	1pt/4pt	Date	Increase/Decrease
BH01	3	1.20	1.40	ES	MADE GROUND (Dark brown, very sandy CLAY).			19	81	43	26	17		4pt	24-Jun	Increase
BH01	5	1.60	1.80	C	Soft becoming stiff, yellowish brown mottled grey, slightly sandy, slightly gravelly, silty CLAY.			26	97	58	24	34		4pt	24-Jun	Increase
BH01	6	1.80	2.00	C	Soft becoming stiff, yellowish brown mottled grey, slightly sandy, slightly gravelly, silty CLAY.			24	91	60	25	35		4pt	24-Jun	Increase
BH01	7	2.50	2.70	C	Soft becoming stiff, yellowish brown mottled grey, slightly sandy, slightly gravelly, silty CLAY.			19	82	48	21	27		4pt	24-Jun	Increase
BH01	8	2.80	3.00	C	Soft becoming stiff, yellowish brown mottled grey, slightly sandy, slightly gravelly, silty CLAY.			19	77	47	21	26		4pt	24-Jun	Increase
BH01	9	3.50	3.70	C	Soft becoming stiff, yellowish brown mottled grey, slightly sandy, slightly gravelly, silty CLAY.			17	55	39	19	20		4pt	24-Jun	Increase
BH01	10	3.80	4.00	C	Soft becoming stiff, yellowish brown mottled grey, slightly sandy, slightly gravelly, silty CLAY.			16	75	40	19	21		4pt	24-Jun	Increase
BH01	12	4.60	4.80	C	Soft becoming stiff, yellowish brown mottled grey, slightly sandy, slightly gravelly, silty CLAY.			20	92	33	19	14		4pt	24-Jun	Increase
BH03	6	1.70	2.00	C	Soft becoming stiff, yellowish brown, slightly sandy, slightly gravelly, silty CLAY.			16	96	39	19	20		4pt	24-Jun	Increase
BH03	7	2.50	2.70	C	Soft becoming stiff, yellowish brown, slightly sandy, slightly gravelly, silty CLAY.			14	91	32	15	17		4pt	24-Jun	Increase
BH03	8	2.80	3.00	C	Soft becoming stiff, yellowish brown, slightly sandy, slightly gravelly, silty CLAY.			17	65	43	20	23		4pt	24-Jun	Increase

All Water Content Tests perfromed to BS EN ISO 17892-1:2014+A1:2022 Unless specified Otherwise
All Index Property testing preformed to BS EN ISO 17892-12 2018+A2:2022 Unless Specified Otherwise
All Liquid Limit Tests performed on a 80g/30 Degree Cone unless specified otherwise

Key

Density test: wd - water displacement; wi - immersion in water

Linear measurement unless : 4pt cone unless : cas - Casagrande method; 1pt - single point test

Particle density: sp - small pyknometer; gj - gas jar

Date Printed: 03/07/2025

Approved By: Harry

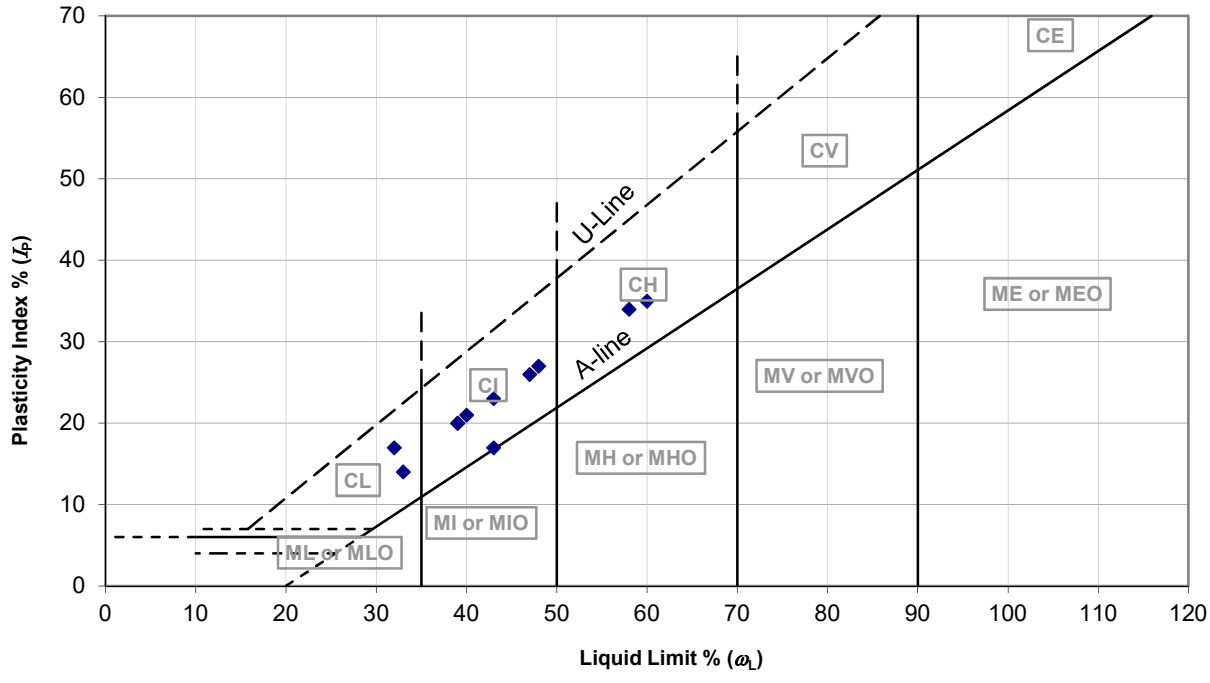
Table 1

sheet 1

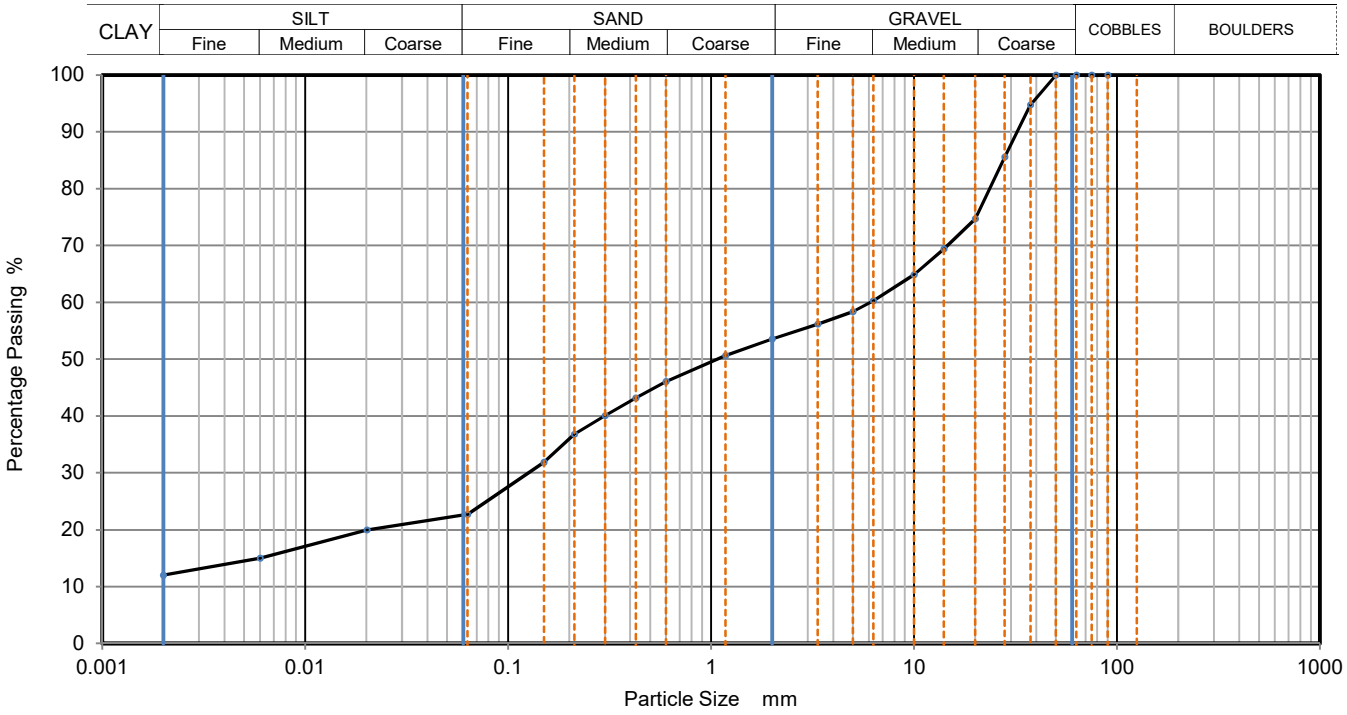
Rogers Geotechnical Services Ltd. Offices 1&2, Barncliffe Business Park, Near Bank, Shelley, Huddersfield, HD8 8LU	**Classification of Index Properties**	**C5244/25/E/8058**
Project Name: Huddersfield Bus Station	**BS EN ISO 17892-12 2018+A2:2022**	Fig. 2 Sheet. 1
Location:		Input By: Harry
Client: BWB Consulting Limited		Check By: EC

Location	Depth	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 (I_L)	Liquidity/ Consistency (I_C)	Casagrande Class	N.H.B.C Class
	(m)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)		(%)
BH01	1.20	19	43	26	17	19	23	14	-0.4	1.4	C I	LOW
BH01	1.60	26	58	24	34	3	27	33	0.1	0.9	C H	MEDIUM
BH01	1.80	24	60	25	35	9	26	32	0.0	1.0	C H	MEDIUM
BH01	2.50	19	48	21	27	18	23	22	-0.1	1.1	C I	MEDIUM
BH01	2.80	19	47	21	26	23	25	20	-0.1	1.1	C I	MEDIUM
BH01	3.50	17	39	19	20	45	31	11	-0.1	1.1	C I	LOW
BH01	3.80	16	40	19	21	25	21	16	-0.1	1.1	C I	LOW
BH01	4.60	20	33	19	14	8	22	13	0.1	0.9	C L	LOW
BH03	1.70	16	39	19	20	4	17	19	-0.2	1.2	C I	LOW
BH03	2.50	14	32	15	17	9	15	15	-0.1	1.1	C L	LOW
BH03	2.80	17	43	20	23	35	26	15	-0.1	1.1	C I	LOW

Interpretation graph based on BS EN ISO 14688-2:2018 any interpretations are expressed outside of our UKAS Accreditation.



RGS	**PARTICLE SIZE DISTRIBUTION**			Job Ref	**C5244/25/E/8058**
				Borehole/Pit No.	BH01
Site Name	Huddersfield Bus Station			Sample No.	11
Soil Description	Yellowish brown, silty, very gravelly SAND.			Depth, m	4.40
Specimen Reference	11	Specimen Depth	4.4 m	Sample Type	C
Test Method	ISO 17892 -4, by sieving and pipette sedimentation			KeyLAB ID	RGS_2025062413



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	20
90	100	0.0060	15
75	100	0.0020	12
63	100		
50	100		
37.5	95		
28	86		
20	75		
14	69		
10	65		
6.3	60		
5	58		
3.35	56		
2	54		
1.18	51		
0.6	46	Particle density (assumed)	
0.425	43	2.65	Mg/m3
0.3	40		
0.212	37		
0.15	32		
0.063	23		

Dry Mass of sample, g	1729

Sample Proportions	% dry mass
Very coarse	0
Gravel	46
Sand	31
Silt	11
Clay	12

Grading Analysis		
D_{100}	mm	50
D_{60}	mm	6.05
D_{30}	mm	0.125
D_{10}	mm	

Remarks

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

Test performance date: 01/07/2025

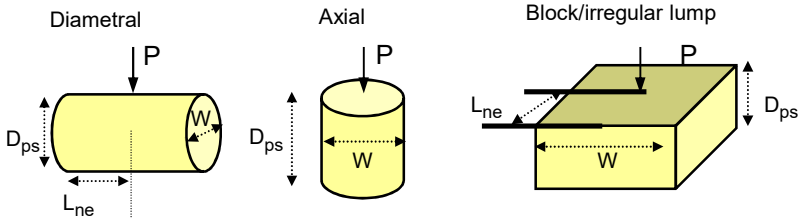
Operator	Checked	Approved	Sheet printed	Fig 3
HJL	EC	Harry	03/07/2025	Sheet 1

Point Load Strength Index Tests Summary of Results

Project No.	Project Name
C5244/25/E/8058	Huddersfield Bus Station

Borehole No.	Sample			Specimen		Rock Type and Test condition	Test Type see ISRM		Failure Valid (Y/N)	Dimensions				Force P	Equivalent diameter, De	Point Load Strength Index		Remarks (including water content if measured)
	Depth	Ref.	Type	Ref.	Depth		Type (D, A, I, B)	Direction (L, P or U)		Lne	W	Dps	Dps'			I_s	$I_{s(50)}$	
	m				m					mm	mm	mm	mm	kN	mm	MPa	MPa	
BH03	4.50	9	C	9	4.50	Greyish brown SANDSTONE.	D	U	YES	45.0	85.0	85.0	83.0	6.7	84.0	0.9	1.2	
BH03	4.70	10	C	10	4.70	Greyish brown SANDSTONE.	D	U	YES	30.0	85.0	85.0	83.0	13.5	84.0	1.9	2.4	
BH03	4.81	12	C	12	4.81	Greyish brown SANDSTONE.	A	U	YES		85.0	70.0	65.0	21.5	83.9	3.1	3.9	
BH03	4.98	14	C	14	4.98	Greyish brown SANDSTONE.	D	U	YES	45.0	85.0	79.0	76.0	6.7	80.4	1.0	1.3	
BH03	5.05	15	C	15	5.05	Greyish brown SANDSTONE.	A	U	NO		85.0	85.0	78.0	16.2	91.9	1.9	2.5	
BH03	5.05	15a	C	15A	5.05	Yellowish brown SANDSTONE.	D	U	YES	40.0	85.0	85.0	84.0	5.7	84.5	0.8	1.0	
BH03	12.95	18	C	18	12.95	Dark grey MUDSTONE.	D	P	YES	22.5	85.0	85.0	82.0	1.4	83.5	0.2	0.3	

Test Type
D - Diametral, A - Axial, I - Irregular Lump, B - Block
Direction
L - parallel to planes of weakness
P - perpendicular to planes of weakness
U - unknown or random
Dimensions
Dps - Distance between platens (platen separation)
Dps' - at failure (see ISRM note 6)
Lne - Length from platens to nearest free end
W - Width of shortest dimension perpendicular to load, P



Test performed in accordance with ISRM Suggested Methods : 2007, unless noted otherwise
Detailed legend for test and dimensions, based on ISRM, is shown above.
Size factor, F = $(De/50)^{0.45}$ for all tests.

Date Printed	Approved By	Table
25/06/2025	Harry	4
		sheet 1

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

ENVIRONMENTAL TESTING RESULTS

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ENVIRONMENTAL > GEOTECHNICAL

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Analytical Report Number : 25-033234

Project / Site name:	Huddersfield Bus Station	**Samples received on:**	23/06/2025
Your job number:	C5244 25 E 8058	**Samples instructed on/ Analysis started on:**	24/06/2025
Your order number:	PO 3398	**Analysis completed by:**	04/07/2025
Report Issue Number:	1	**Report issued on:**	07/07/2025
Samples Analysed:	8 soil samples - 2 leachate 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

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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.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 25-033234
Project / Site name: Huddersfield Bus Station
Your Order No: PO 3398

Lab Sample Number				592103	592104	592105	592106	592107
Sample Reference				BH01	BH01	BH01	BH01	BH03
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)				0.50-0.70	0.70-0.90	1.20-1.40	1.40-1.60	0.25-0.40
Date Sampled				23/06/2025	23/06/2025	23/06/2025	23/06/2025	23/06/2025
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	36.9	37.3	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	11	16	20	< 0.01
Total mass of sample received	kg	0.1	NONE	0.6	2	0.6	0.6	1.4
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	PDO	PDO	-	-	-
Analysis completed	N/A	N/A	N/A	03/07/2025	03/07/2025	-	-	-
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	-	10.8	8.4	8.4	U/S *U/S f
Total Cyanide	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	U/S *U/S f
Complex Cyanide	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	U/S *U/S f
Free Cyanide	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	U/S *U/S f
Total Sulphate as SO_4	mg/kg	50	MCERTS	-	2400	730	460	U/S *U/S
Total Sulphate as SO_4	%	0.005	MCERTS	-	-	0.073	-	-
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	-	900	630	150	U/S *U/S
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.448	0.315	0.0772	U/S *U/S
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	448	315	77.2	U/S *U/S
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	36	-	-
Total Sulphur	mg/kg	50	MCERTS	-	1600	1300	190	U/S *U/S
Total Sulphur	%	0.005	MCERTS	-	-	0.13	-	-
Organic Matter (automated)	%	0.1	MCERTS	-	5.5	2.7	0.9	U/S *U/S f
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	-	-	< 2.0	-	-
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	-	-	< 5.0	-	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	U/S *U/S f
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	44	31	2.1	< 0.05	U/S *U/S
Acenaphthylene	mg/kg	0.05	MCERTS	2.8	0.86	0.05	< 0.05	U/S *U/S
Acenaphthene	mg/kg	0.05	MCERTS	110	48	1.8	< 0.05	U/S *U/S
Fluorene	mg/kg	0.05	MCERTS	81	39	1.9	< 0.05	U/S *U/S
Phenanthrene	mg/kg	0.05	MCERTS	580	260	10	0.24	U/S *U/S
Anthracene	mg/kg	0.05	MCERTS	140	61	2.6	0.06	U/S *U/S
Fluoranthene	mg/kg	0.05	MCERTS	600	240	9.6	0.23	U/S *U/S
Pyrene	mg/kg	0.05	MCERTS	520	210	8.6	0.21	U/S *U/S
Benzo(a)anthracene	mg/kg	0.05	MCERTS	200	84	3.9	0.09	U/S *U/S
Chrysene	mg/kg	0.05	MCERTS	210	87	3.9	0.09	U/S *U/S
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	260	100	4.1	< 0.05	U/S *U/S
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	83	31	2	< 0.05	U/S *U/S
Benzo(a)pyrene	mg/kg	0.05	MCERTS	220	84	3.8	< 0.05	U/S *U/S
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	100	40	2.1	0.05	U/S *U/S
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	24	10	0.88	< 0.05	U/S *U/S
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	120	47	2.3	0.07	U/S *U/S

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 25-033234
Project / Site name: Huddersfield Bus Station
Your Order No: PO 3398

Lab Sample Number				592103	592104	592105	592106	592107
Sample Reference				BH01	BH01	BH01	BH01	BH03
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)				0.50-0.70	0.70-0.90	1.20-1.40	1.40-1.60	0.25-0.40
Date Sampled				23/06/2025	23/06/2025	23/06/2025	23/06/2025	23/06/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**					
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	3300	1380	59.7	1.03	U/S
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	32	5.6	7.4	U/S *U/S
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	240	40	34	U/S *U/S
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	2	0.72	0.73	U/S *U/S
Boron (water soluble)	mg/kg	0.2	MCERTS	-	2.3	1.3	0.9	U/S *U/S
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	0.3	< 0.2	< 0.2	U/S *U/S
Chromium (hexavalent)	mg/kg	1.8	MCERTS	-	< 1.8	< 1.8	< 1.8	U/S *U/S f
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	19	19	27	U/S *U/S
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	200	18	20	U/S *U/S
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	330	35	13	U/S *U/S
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	U/S *U/S
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	24	15	13	U/S *U/S
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	1.3	1.4	1.5	U/S *U/S
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	37	22	31	U/S *U/S
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	170	43	38	U/S *U/S
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	9.6	-	-
Magnesium (water soluble)	mg/kg	5	NONE	-	-	19	-	-
Petroleum Hydrocarbons								
TPHCWG - Aliphatic >EC5 - EC6 $_{HS_1D_AL}$	mg/kg	0.01	MCERTS	-	< 0.010	-	-	U/S *U/S *U/S
TPHCWG - Aliphatic >EC6 - EC8 $_{HS_1D_AL}$	mg/kg	0.01	MCERTS	-	< 0.010	-	-	U/S *U/S *U/S
TPHCWG - Aliphatic >EC8 - EC10 $_{HS_1D_AL}$	mg/kg	0.01	MCERTS	-	< 0.010	-	-	U/S *U/S *U/S
TPHCWG - Aliphatic >EC10 - EC12 $_{EH_CU_1D_AL}$	mg/kg	1	MCERTS	-	1.2	-	-	U/S *U/S
TPHCWG - Aliphatic >EC12 - EC16 $_{EH_CU_1D_AL}$	mg/kg	2	MCERTS	-	4.9	-	-	U/S *U/S
TPHCWG - Aliphatic >EC16 - EC21 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	-	< 8.0	-	-	U/S *U/S
TPHCWG - Aliphatic >EC21 - EC35 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	-	9.8	-	-	U/S *U/S
TPHCWG - Aliphatic >EC5 - EC35 $_{EH_CU+HS_1D_AL}$	mg/kg	10	NONE	-	16	-	-	U/S *U/S
TPHCWG - Aromatic >EC5 - EC7 $_{HS_1D_AR}$	mg/kg	0.01	MCERTS	-	0.018	-	-	U/S *U/S *U/S
TPHCWG - Aromatic >EC7 - EC8 $_{HS_1D_AR}$	mg/kg	0.01	MCERTS	-	< 0.010	-	-	U/S *U/S *U/S
TPHCWG - Aromatic >EC8 - EC10 $_{HS_1D_AR}$	mg/kg	0.02	MCERTS	-	0.035	-	-	U/S *U/S *U/S
TPHCWG - Aromatic >EC10 - EC12 $_{EH_CU_1D_AR}$	mg/kg	1	MCERTS	-	29	-	-	U/S *U/S
TPHCWG - Aromatic >EC12 - EC16 $_{EH_CU_1D_AR}$	mg/kg	2	MCERTS	-	240	-	-	U/S *U/S
TPHCWG - Aromatic >EC16 - EC21 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	-	670	-	-	U/S *U/S
TPHCWG - Aromatic >EC21 - EC35 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	-	970	-	-	U/S *U/S
TPHCWG - Aromatic >EC5 - EC35 $_{EH_CU+HS_1D_AR}$	mg/kg	10	NONE	-	1900	-	-	U/S *U/S
Petroleum Range Organics (EC6 - EC10) $_{HS_1D_TOTAL}$	mg/kg	1	ISO 17025	-	< 1.0	< 1.0	< 1.0	U/S *U/S
TPH (EC10 - EC40) $_{EH_CU_1D_TOTAL}$	mg/kg	10	MCERTS	-	2000	110	< 10	U/S *U/S

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Analytical Report Number: 25-033234
Project / Site name: Huddersfield Bus Station
Your Order No: PO 3398

Lab Sample Number				592103	592104	592105	592106	592107
Sample Reference				BH01	BH01	BH01	BH01	BH03
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)				0.50-0.70	0.70-0.90	1.20-1.40	1.40-1.60	0.25-0.40
Date Sampled				23/06/2025	23/06/2025	23/06/2025	23/06/2025	23/06/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**					
VOCs								
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	-	< 5.0	-	-	U/S *U/S
Benzene	µg/kg	5	MCERTS	-	17	-	-	U/S *U/S
Toluene	µg/kg	5	MCERTS	-	8.5	-	-	U/S *U/S
Ethylbenzene	µg/kg	5	MCERTS	-	< 5.0	-	-	U/S *U/S
p & m-Xylene	µg/kg	8	MCERTS	-	10	-	-	U/S *U/S
o-Xylene	µg/kg	5	MCERTS	-	9.4	-	-	U/S *U/S

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

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Analytical Report Number: 25-033234
Project / Site name: Huddersfield Bus Station
Your Order No: PO 3398

Lab Sample Number				592108	592109	592110
Sample Reference				BH03	BH03	BH03
Sample Number				None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A
Depth (m)				0.40-0.50	0.60-0.80	1.20-1.70
Date Sampled				23/06/2025	23/06/2025	23/06/2025
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	< 0.1	10.9	< 0.1
Moisture Content	%	0.01	NONE	15	14	15
Total mass of sample received	kg	0.1	NONE	2	0.6	0.6
Asbestos						
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	-	-
Asbestos Analyst ID	N/A	N/A	N/A	PDO	-	-
Analysis completed	N/A	N/A	N/A	03/07/2025	-	-
General Inorganics						
pH (L099)	pH Units	N/A	MCERTS	8.9	8.6	5.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Total Sulphate as SO_4	mg/kg	50	MCERTS	340	410	960
Total Sulphate as SO_4	%	0.005	MCERTS	0.034	-	-
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	89	55	230
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0444	0.0277	0.116
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	44.4	27.7	116
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	5.4	-	-
Total Sulphur	mg/kg	50	MCERTS	160	110	290
Total Sulphur	%	0.005	MCERTS	0.016	-	-
Organic Matter (automated)	%	0.1	MCERTS	1.4	1	0.8
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	< 2.0	-	-
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	< 5.0	-	-
Total Phenols						
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Speciated PAHs						
Naphthalene	mg/kg	0.05	MCERTS	3.2	0.72	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.32	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.64	0.2	< 0.05
Fluorene	mg/kg	0.05	MCERTS	1.3	0.3	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	6.5	1.8	0.12
Anthracene	mg/kg	0.05	MCERTS	1.6	0.4	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	5.3	1.5	0.17
Pyrene	mg/kg	0.05	MCERTS	5	1.4	0.17
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.9	0.56	0.07
Chrysene	mg/kg	0.05	MCERTS	2.2	0.63	0.08
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	2.1	0.61	0.09
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.74	0.22	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.9	0.54	0.08
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.95	0.28	0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.32	0.09	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.1	0.33	0.05

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 25-033234
Project / Site name: Huddersfield Bus Station
Your Order No: PO 3398

Lab Sample Number				592108	592109	592110
Sample Reference				BH03	BH03	BH03
Sample Number				None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A
Depth (m)				0.40-0.50	0.60-0.80	1.20-1.70
Date Sampled				23/06/2025	23/06/2025	23/06/2025
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**			
Total PAH						
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	35	9.63	0.88
Heavy Metals / Metalloids						
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.8	6.3	6.4
Barium (aqua regia extractable)	mg/kg	1	MCERTS	56	61	41
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.86	1	1
Boron (water soluble)	mg/kg	0.2	MCERTS	1	1	0.4
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	18	19	23
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	22	21
Lead (aqua regia extractable)	mg/kg	1	MCERTS	53	28	15
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	25	18
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1	1.1	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	22	22	27
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	49	52	37
Magnesium (leachate equivalent)	mg/l	2.5	NONE	5.4	-	-
Magnesium (water soluble)	mg/kg	5	NONE	11	-	-
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	0.014	-	-
TPHCWG - Aromatic >EC7 - EC8 $_{HS_1D_AR}$	mg/kg	0.01	MCERTS	0.017	-	-
TPHCWG - Aromatic >EC8 - EC10 $_{HS_1D_AR}$	mg/kg	0.02	MCERTS	0.042	-	-
TPHCWG - Aromatic >EC10 - EC12 $_{EH_CU_1D_AR}$	mg/kg	1	MCERTS	2.6	-	-
TPHCWG - Aromatic >EC12 - EC16 $_{EH_CU_1D_AR}$	mg/kg	2	MCERTS	6.9	-	-
TPHCWG - Aromatic >EC16 - EC21 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	15	-	-
TPHCWG - Aromatic >EC21 - EC35 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	21	-	-
TPHCWG - Aromatic >EC5 - EC35 $_{EH_CU+HS_1D_AR}$	mg/kg	10	NONE	46	-	-
Petroleum Range Organics (EC6 - EC10) $_{HS_1D_TOTAL}$	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH (EC10 - EC40) $_{EH_CU_1D_TOTAL}$	mg/kg	10	MCERTS	48	< 10	< 10

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Analytical Report Number: 25-033234
Project / Site name: Huddersfield Bus Station
Your Order No: PO 3398

Lab Sample Number				592108	592109	592110
Sample Reference				BH03	BH03	BH03
Sample Number				None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A
Depth (m)				0.40-0.50	0.60-0.80	1.20-1.70
Date Sampled				23/06/2025	23/06/2025	23/06/2025
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**			
VOCs						
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	-	-
Benzene	µg/kg	5	MCERTS	< 5.0	-	-
Toluene	µg/kg	5	MCERTS	7.5	-	-
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	-	-
p & m-Xylene	µg/kg	8	MCERTS	13	-	-
o-Xylene	µg/kg	5	MCERTS	13	-	-

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

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Analytical Report Number: 25-033234
Project / Site name: Huddersfield Bus Station

Your Order No: PO 3398

Lab Sample Number				592104	592109
Sample Reference				BH01	BH03
Sample Number				None Supplied	None Supplied
Water Matrix				N/A	N/A
Depth (m)				0.70-0.90	0.60-0.80
Date Sampled				23/06/2025	23/06/2025
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**		
Moisture of sample	%	N/A	NONE	16	18
General Inorganics					
pH (automated)	pH Units	N/A	ISO 17025	10.7	7.8
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10
Sulphate as SO_4	mg/l	0.045	ISO 17025	105	14.5
Heavy Metals / Metalloids					
Arsenic (dissolved)	µg/l	1	ISO 17025	16	< 1.0
Barium (dissolved)	µg/l	0.05	ISO 17025	12	25
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2
Boron (dissolved)	µg/l	10	ISO 17025	77	66
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.9	3.6
Copper (dissolved)	µg/l	0.7	ISO 17025	73	7.5
Lead (dissolved)	µg/l	1	ISO 17025	1	< 1.0
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	8.3	2.5
Selenium (dissolved)	µg/l	4	ISO 17025	5.3	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	27	2.4
Zinc (dissolved)	µg/l	0.4	ISO 17025	3.4	5.5

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Analytical Report Number : 25-033234
Project / Site name: Huddersfield Bus Station

* 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 *
592103	BH01	None Supplied	0.50-0.70	Brown sand with gravel and stones
592104	BH01	None Supplied	0.70-0.90	Brown sand with gravel and stones
592105	BH01	None Supplied	1.20-1.40	Brown clay and sand with gravel
592106	BH01	None Supplied	1.40-1.60	Brown clay and sand with gravel
592107	BH03	None Supplied	0.25-0.40	Non Soil. *9
592108	BH03	None Supplied	0.40-0.50	Brown clay and sand with gravel
592109	BH03	None Supplied	0.60-0.80	Brown clay and sand with gravel and stones
592110	BH03	None Supplied	1.20-1.70	Brown clay

Analytical Report Number : 25-033234
Project / Site name: Huddersfield Bus Station

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
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
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
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE
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
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
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Total sulphate (as SO4 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
Metals by ICP-OES in leachate	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
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
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	MCERTS
Complex Cyanide in soil	Determination of complex cyanide by calculation	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS

Analytical Report Number : 25-033234
Project / Site name: Huddersfield Bus Station

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
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
Total cyanide in leachate	Determination of total cyanide 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
Total cyanide in soil	Determination of total 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
Total petroleum hydrocarbons by HS-GC-MS in soil	Determination of total petroleum hydrocarbons in soil by HS-GC-MS	In-house method	L129-PL	W	ISO 17025
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
pH at 20°C in leachate (automated)	Determination of pH in leachate by electrometric measurement	In-house method	L099-PL	W	ISO 17025
One stage WAC 2:1 leachate preparation	One stage batch test at a liquid to solid ratio of 2 L/kg	BS EN 12457-1-2002	L043B	W	NONE
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
Water Soluble Nitrate (leachate equivalent)	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & 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 Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078-PL	W	NONE
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS

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

Analytical Report Number : 25-033234
Project / Site name: Huddersfield Bus Station

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

*U/S- Unsuitable for analysis due to sample matrix.

*U/S f- Unsuitable for analysis due to sample matrix (material contaminated by tar)

*g - Unaccredited sample matrix.

Sample Deviation Report

Analytical Report Number : 25-033234
Project / Site name: Huddersfield Bus Station

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container/Insufficient material provided c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH01	N/A	L	592104	b	One stage WAC 2:1 leachate preparation	L043B	b
BH03	N/A	L	592109	b	One stage WAC 2:1 leachate preparation	L043B	b

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Analytical Report Number : 25-035055

Project / Site name:	Huddersfield Bus Station	**Samples received on:**	02/07/2025
Your job number:	C5244 25 E 8058	**Samples instructed on/ Analysis started on:**	02/07/2025
Your order number:		**Analysis completed by:**	10/07/2025
Report Issue Number:	1	**Report issued on:**	10/07/2025
Samples Analysed:	5 soil 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

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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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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 25-035055
Project / Site name: Huddersfield Bus Station

Lab Sample Number				602063	602064	602065	602066	602067
Sample Reference				BH01	BH01	BH01	BH03	BH03
Sample Number				5	8	11	9	14
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				1.50-1.80	2.80-3.00	4.40-4.55	4.50-4.60	4.98-5.03
Date Sampled				23/06/2023	23/06/2023	23/06/2023	23/06/2023	23/06/2023
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	12.8	< 0.1	80	85.1
Moisture Content	%	0.01	NONE	28	16	19	1.3	0.43
Total mass of sample received	kg	0.1	NONE	0.6	0.7	0.6	0.5	0.6
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	6.1	5.7	6.4	6.4	7.5
Total Sulphate as SO_4	%	0.005	MCERTS	0.067	0.065	0.033	0.037	0.024
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	150	110	16	130	78
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	76.1	54.4	8.2	64.9	38.8
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	49	36	72	9.4	6
Total Sulphur	mg/kg	50	MCERTS	240	270	140	130	65
Total Sulphur	%	0.005	MCERTS	0.024	0.027	0.014	0.013	0.007
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	< 2.0	< 2.0	8.7	< 2.0	3.9
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Heavy Metals / Metalloids								
Magnesium (leachate equivalent)	mg/l	2.5	NONE	2.6	3.3	5.8	4.1	4.2
Magnesium (water soluble)	mg/kg	5	NONE	5.2	6.5	12	8.2	8.4

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

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Analytical Report Number : 25-035055
Project / Site name: Huddersfield Bus Station

* 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 *
602063	BH01	5	1.50-1.80	Brown clay
602064	BH01	8	2.80-3.00	Brown clay with gravel and stones
602065	BH01	11	4.40-4.55	Brown sandy clay with gravel
602066	BH03	9	4.50-4.60	Light brown clay and sand with gravel and stones
602067	BH03	14	4.98-5.03	Light brown clay and sand with gravel and stones

Analytical Report Number : 25-035055
Project / Site name: Huddersfield Bus Station

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
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
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 SO4 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
Water Soluble Nitrate (leachate equivalent)	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & 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 Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078-PL	W	NONE
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	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 : 25-035316

Project / Site name:	Huddersfield Bus Station	**Samples received on:**	02/07/2025
Your job number:	C5244 25 E 8058	**Samples instructed on/ Analysis started on:**	04/07/2025
Your order number:		**Analysis completed by:**	09/07/2025
Report Issue Number:	1	**Report issued on:**	10/07/2025
Samples Analysed:	2 soil 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

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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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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 25-035316
Project / Site name: Huddersfield Bus Station

Lab Sample Number				603187	603188
Sample Reference				BH03	BH03
Sample Number				6	17
Water Matrix				N/A	N/A
Depth (m)				1.70-2.00	11.38-11.41
Date Sampled				23/06/2025	23/06/2025
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	20	0.91
Total mass of sample received	kg	0.1	NONE	0.5	0.5
General Inorganics					
pH (L099)	pH Units	N/A	MCERTS	6.7	8.1
Total Sulphate as SO_4	%	0.005	MCERTS	0.058	0.021
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	170	200
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	87.4	101
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	22	6.8
Total Sulphur	mg/kg	50	MCERTS	410	25000
Total Sulphur	%	0.005	MCERTS	0.041	2.54
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
Heavy Metals / Metalloids					
Magnesium (leachate equivalent)	mg/l	2.5	NONE	5.6	16
Magnesium (water soluble)	mg/kg	5	NONE	11	33

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

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Analytical Report Number : 25-035316
Project / Site name: Huddersfield Bus Station

* 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 *
603187	BH03	6	1.70-2.00	Brown clay with gravel
603188	BH03	17	11.38-11.41	Brown clay and sand

Analytical Report Number : 25-035316
Project / Site name: Huddersfield Bus Station

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
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
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 SO4 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
Water Soluble Nitrate (leachate equivalent)	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & 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 Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078-PL	W	NONE
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	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 : 25-033235

Project / Site name:	Huddersfield Bus Station	**Samples received on:**	23/06/2025
Your job number:	C5244 25 E 8058	**Samples instructed on/ Analysis started on:**	24/06/2025
Your order number:	PO 3398	**Analysis completed by:**	03/07/2025
Report Issue Number:	1	**Report issued on:**	03/07/2025
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.

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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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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 25-033235
Project / Site name: Huddersfield Bus Station
Your Order No: PO 3398

Lab Sample Number				592111	592112
Sample Reference				BH01	BH03
Sample Number				None Supplied	None Supplied
Water Matrix				N/A	N/A
Depth (m)				0.70-0.90	0.40-0.50
Date Sampled				23/06/2025	23/06/2025
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**		
Stone Content	%	0.1	NONE	37.3	< 0.1
Moisture Content	%	0.01	NONE	11	15
Total mass of sample received	kg	0.1	NONE	2	2
General Inorganics					
pH (L005B)	pH Units	N/A	MCERTS	10.3	8.2
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	3.2	0.8
Loss on Ignition @ 450°C	%	0.2	MCERTS	6.4	2.1
Acid Neutralisation Capacity	+/- mmol/kg	-9999	NONE	75	5.2
Speciated PAHs					
Naphthalene	mg/kg	0.05	MCERTS	31	3.2
Acenaphthylene	mg/kg	0.05	MCERTS	0.86	0.32
Acenaphthene	mg/kg	0.05	MCERTS	48	0.64
Fluorene	mg/kg	0.05	MCERTS	39	1.3
Phenanthrene	mg/kg	0.05	MCERTS	260	6.5
Anthracene	mg/kg	0.05	MCERTS	61	1.6
Fluoranthene	mg/kg	0.05	MCERTS	240	5.3
Pyrene	mg/kg	0.05	MCERTS	210	5
Benzo(a)anthracene	mg/kg	0.05	MCERTS	84	1.9
Chrysene	mg/kg	0.05	MCERTS	87	2.2
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	100	2.1
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	31	0.74
Benzo(a)pyrene	mg/kg	0.05	MCERTS	84	1.9
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	40	0.95
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	10	0.32
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	47	1.1
Coronene	mg/kg	0.05	NONE	20	0.42
Total PAH					
Total WAC-17 PAHs	mg/kg	0.85	NONE	1400	35.4
Petroleum Hydrocarbons					
Mineral Oil (EC10 - EC40) EH_CU_1D_AL	mg/kg	10	NONE	20	< 10
VOCs					
Benzene	µg/kg	5	MCERTS	25	14
Toluene	µg/kg	5	MCERTS	9.3	31
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	16
p & m-Xylene	µg/kg	8	MCERTS	14	33
o-Xylene	µg/kg	5	MCERTS	14	23
Total BTEX	µg/kg	10	MCERTS	61	120

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Analytical Report Number: 25-033235
Project / Site name: Huddersfield Bus Station
Your Order No: PO 3398

Lab Sample Number				592111	592112
Sample Reference				BH01	BH03
Sample Number				None Supplied	None Supplied
Water Matrix				N/A	N/A
Depth (m)				0.70-0.90	0.40-0.50
Date Sampled				23/06/2025	23/06/2025
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**		
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
Total PCBs	mg/kg	0.007	MCERTS	< 0.007	< 0.007

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

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Waste Acceptance Criteria Analytical Results

Report No:	**25-033235**						
					Client:	**Rogers Geotechnical**	
Location	**Huddersfield Bus Station**						
Lab Reference (Sample Number)	592111				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	23/06/2025				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	BH01						
Depth (m)	0.70-0.90						
Solid Waste Analysis							
TOC (%)**	3.2				3%	5%	6%
Loss on Ignition (%) **	6.4				--	--	10%
BTEX (µg/kg) **	61				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg) $_{EH_1D_CU_AL}$	20				500	--	--
Total PAH (WAC-17) (mg/kg)	1400				100	--	--
pH (units)**	10.3				--	>6	--
Acid Neutralisation Capacity (mmol / kg)	75				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0146			0.146	0.5	2	25
Barium *	0.0201			0.201	20	100	300
Cadmium *	< 0.000100			< 0.00100	0.04	1	5
Chromium *	0.0016			0.016	0.5	10	70
Copper *	0.33			3.3	2	50	100
Mercury *	< 0.000500			< 0.00500	0.01	0.2	2
Molybdenum *	0.0148			0.148	0.5	10	30
Nickel *	0.0025			0.025	0.4	10	40
Lead *	0.0067			0.067	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 *	0.017			0.17	4	50	200
Chloride *	12			120	800	15000	25000
Fluoride*	0.27			2.7	10	150	500
Sulphate *	36			360	1000	20000	50000
TDS*	120			1200	4000	60000	100000
Phenol Index (Monohydric Phenols) *	0.028			0.28	1	-	-
DOC	6.15			61.4	500	800	1000
Leach Test Information							
Stone Content (%)	37.3						
Sample Mass (kg)	2						
Dry Matter (%)	89						
Moisture (%)	11						

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

** = MCERTS 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.

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Waste Acceptance Criteria Analytical Results

Report No:	**25-033235**						
					Client:	**Rogers Geotechnical**	
Location	**Huddersfield Bus Station**						
Lab Reference (Sample Number)	592112				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	23/06/2025				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	BH03						
Depth (m)	0.40-0.50						
Solid Waste Analysis							
TOC (%)**	0.8				3%	5%	6%
Loss on Ignition (%) **	2.1				--	--	10%
BTEX (µg/kg) **	120				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg) EH_1D_CU_AL	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	35.4				100	--	--
pH (units)**	8.2				--	>6	--
Acid Neutralisation Capacity (mmol / kg)	5.2				--	To be evaluated	To be evaluated
Eluate Analysis (BS EN 12457 - 2 preparation utilising end over end leaching procedure)	10:1 mg/l			10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0072			0.072	0.5	2	25
Barium *	0.0226			0.226	20	100	300
Cadmium *	< 0.000100			< 0.00100	0.04	1	5
Chromium *	0.0011			0.011	0.5	10	70
Copper *	0.0073			0.073	2	50	100
Mercury *	< 0.000500			< 0.00500	0.01	0.2	2
Molybdenum *	0.00252			0.0252	0.5	10	30
Nickel *	0.00068			0.0068	0.4	10	40
Lead *	0.0064			0.064	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 *	0.028			0.28	4	50	200
Chloride *	2.9			29	800	15000	25000
Fluoride*	0.2			2	10	150	500
Sulphate *	14			140	1000	20000	50000
TDS*	57			570	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	3.55			35.5	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2						
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)

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** = MCERTS 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.

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Analytical Report Number : 25-033235
Project / Site name: Huddersfield Bus Station

* 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 *
592111	BH01	None Supplied	0.70-0.90	Brown sand with gravel and stones
592112	BH03	None Supplied	0.40-0.50	Brown clay and sand with gravel

Analytical Report Number : 25-033235
Project / Site name: Huddersfield Bus Station

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
pH at 20°C in soil	Determination of pH in soil by addition of water followed by electrometric measurement	In-house method	L005B	W	MCERTS
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
One stage WAC 10:1 leachate preparation	One stage batch test at a liquid to solid ratio of 10 L/kg	BS EN 12457-2-2002	L043B	W	ISO 17025
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance	L046B	W	NONE
Loss on ignition of soil @ 450°C	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	In-house method	L047-PL	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 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

Analytical Report Number : 25-033235
Project / Site name: Huddersfield Bus Station

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 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025
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

Sample Deviation Report

Analytical Report Number : 25-033235
Project / Site name: Huddersfield Bus Station

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container/Insufficient material provided c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH01	N/A	L	592111	b	One stage WAC 10:1 leachate preparation	L043B	b
BH03	N/A	L	592112	b	One stage WAC 10:1 leachate preparation	L043B	b

End of Report

Constructionline
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